DARWIN CITY GATE METER STATION
HAZARDOUS AREA DOSSIER



FYFE REFERENCE: 18756-5-HAD-010

APA REFERENCE: HAD DATA REPOSITORY/ ADP_1498_DCG

Prepared by: _____ Date: 18-Nov-2011
Arjun Patel
Graduate Mechanical Engineer

Reviewed by: _____ Date: 18-Nov-2011
Tony Bird
Principal Process Engineer - Fyfe

Client Accepted: _____ Date:
Anthony Comerford
Pipeline Engineer – APA Group

Manager: _____ Date:
Henry Dupal
Engineering Manager - APA Group Northern Territory

FYFE EARTH PARTNERS
80 FLINDERS STREET, ADELAIDE 5000
PHONE (08) 8201 9600 - FAX (08) 8201 9650 - EMAIL info@fyfe.com.au

Credential Exposure

PERSONNEL

Tony Bird from Fyfe Pty Ltd is a principal process engineer with over ten years of experience in hazardous area classifications of new and existing projects. His experience in the development of retrospective hazardous area classifications includes Palm Valley gas plant, Torrens Island power station, Pelican Point power station and numerous Santos facilities.

His experience covers oil and gas pipeline and facility projects during all stages of design from concept, feasibility, and FEED through to detailed design. He also has experience in procurement, construction supervision, commissioning and operations support of pipeline facilities.

Tony's responsibilities for this project included the examination of site, confirmation of installed equipment, and development of hazardous area classification and hazardous area mapping drawings.

Neville Green from Sitzler Pty Ltd is an electrical engineer with over ten years of experience in the design, construction, commissioning and inspection of installation in hazardous environment in the oil and gas industry. Neville has the following competencies in accordance to AS/NZS 4761(Refer attachments):

UTE NES 010 A	Report on integrity of explosion protected equipment in hazardous areas
UTE NES 107	Install explosion-protected equipment and wiring systems (Ex)
UTE NES 707	Design electrical installations in hazardous areas (Ex)

Neville's role was to perform close inspection of all electrical equipment in accordance to AS/NZS 60079 series on site to verify installation. His role was also to review inspection sheets and provide recommendations for remedial actions to ensure compliance.

David Bourke from Fyfe Pty Ltd is the surveyor who completed three dimensional (3D) scanning and photography of the facilities. The 3D images were used by Fyfe drafters to update site arrangement drawings. The 3D scan data is retained by Fyfe for future use if required by APA Group.

METHODOLOGY

The Hazardous Area Verification Dossier is produced to ensure that the installation complies with the appropriate certification documents as well as with AS/NZS 2381.1 and any other relevant part of the AS/NZS 2381 and AS/NZS 60079 series. In addition equipment and installations where hazardous areas exist are required to comply with the applicable regulations of the applicable Australian State or Territory. It should be borne in mind that an installation can come under the jurisdiction of several authorities with different areas of responsibility, e.g. mining, electrical safety, handling and transport of flammable materials and occupational health and safety.

This dossier has been prepared in accordance with the following codes and standards:

- Dossiers AS 2381.1:2005 - Electrical equipment for explosive gas atmospheres - Selection, installation and maintenance Part 1: General requirements
- Hazardous area AS/NZS 60079.10.1:2009 - Explosive atmospheres: Classification of areas - Explosive gas atmospheres (IEC 60079-10-1, Ed. 1.0 (2008) MOD) (2009)
- AS/NZS 60079.17:2009 : Explosive atmospheres - Electrical installations inspection and maintenance (IEC 60079-17, Ed.4.0 (2007) MOD)

Note that a Hazardous Area Verification Dossier is a living document and should be updated by APA and / or its contractors. Any modifications to electrical equipment, including removing an instrument cover should be recorded and stored within the Dossier. Changes to the operation or equipment installed within the station will require a review of the hazardous area classification and may require revision of the classification, hazardous area mapping drawings, hazardous area equipment lists and associated certificates of conformity. An extract from AS 2381.1 (2005) is included to provide guidance to APA.

Equipment requires conformity to the following standards:

- AUS Ex
- IEC Ex

Previously AS / NZS Ex and FLP have been recognised certification standards for equipment in hazardous areas and may have been applicable at the time of construction / installation. Equipment that was identified as having any of the certification to show conformity to the above standards was deemed to be acceptable. Where no certification was available or certification was available to standards not recognised in Australia, a conformity assessment document (CAD) is required. The CAD shall be completed by a suitably qualified organisation and the associated residual risk shall be accepted by the head of APA. For new installations, equipment with the correct certificates of conformity should be used unless no item exists and then a CAD should be produced. No information on the date of installation/ of equipment purchase/manufacturer has been provided of the site. Therefore no checking has been undertaken to determine the currency of the certificate at the time of installation.

DISCLAIMER

Opportunities for improvements (OFI) are provided for items associated with hazardous area and general engineering. The scope of work for the project was to identify hazardous area and provide visual inspection of the equipment. The visual inspection did not include opening of equipment and the OFIs are limited to the level of inspection. General engineering OFIs are non-exhaustive and require APA to confirm the OFI and the recommendation.

Extract from AS 2381.1 (2005)

1.6 DOCUMENTATION

It is necessary to ensure that any installation complies with the appropriate certification documents as well as with this Standard and any other requirements specific to the plant on which the installation takes place.

To achieve this result, a verification dossier shall be prepared for every plant and shall be either kept on the premises or stored in another location in which case a document shall be left on the premises indicating who the owner or owners are and where that information is kept, so that when required, copies may be obtained. This dossier should contain the information detailed in the appropriate Parts of this series of Standards for the types of protection concerned.

Up-to-date information typically required is as follows:

a) *Where applicable a statement of the identity of the person(s) having legal ownership of the installation or parts thereof and where the verification dossier is located.*

b) *The classification of hazardous areas and the Standards used for the classification.*

c) *Equipment group and temperature class.*

d) *Installation instructions.*

e) *Documentation/certification for electrical equipment, including those items with special conditions, for example, equipment with certificate numbers that have the suffix 'X'.*

f) *Descriptive system document for the intrinsically safe system.*

g) *Documentation relating to the suitability of the equipment for the area and environment to which it will be exposed, e.g. T rating, Ex rating, IP rating, corrosion resistance.*

h) *Documentation certifying that the equipment is rated for the voltages and frequency applied during normal operation.*

i) *Manufacturer's/qualified person's declaration, e.g. tradesperson's documentation and inspector's inspection reports.*

j) *Records sufficient to enable the explosion-protected equipment to be maintained in accordance with its type of protection (for example, list and location of equipment, spares, technical information).*

k) *Records covering any maintenance, overhaul and repair of the equipment.*

l) *Records of selection criteria for cable entry systems for compliance with the requirements for the particular explosion technique.*

m) *Drawings and schedules relating to circuit identification (see Clause 3.8.16).*

n) *In New Zealand, the Hazardous Area Statement of Periodic Verification on completion of a periodic inspection. (Refer to Appendix B).*

Where alternative methods of equipment identification are used for inspection in accordance with Clause 4.3 then additional documentation to support the traceability of the equipment shall be provided.

It shall be the responsibility of the person(s) having legal ownership of the installation or parts thereof to ensure that the relevant information is produced but the preparation of the document may be delegated to expert bodies/organizations. The dossier may be kept as hard copy or in electronic form.

1.7 QUALIFICATIONS OF PERSONNEL

The design, construction, maintenance, testing and inspection of installations covered by this Standard shall be carried out only by competent persons whose training has included instruction on the various types of protection and installation practices, relevant rules and regulations and on the general principles of area classification. The competency of the person shall be relevant to the type of work to be undertaken.

Appropriate continuing education or training should be undertaken by personnel on a regular basis.

Competency may be demonstrated in accordance with AS/NZS 4761, Competencies for working with electrical equipment for hazardous areas (EEHA), or equivalent training and assessment framework.

moxi / SKILL + LEARNING

This is a Statement that

Neville Owain Green

has been assessed as having fulfilled the following requirements

UTE NES 010 A	Report on the integrity of explosion-protected equipment in hazardous areas
UTE NES 107 TA	Install explosion-protected equipment & wiring systems (Ex mixed)
UTE NES 107 WA	Install explosion-protected equipment & wiring systems (Ex n)
UTE NES 107 XA	Install explosion-protected equipment & wiring systems (Ex i)
UTE NES 107 YA	Install explosion-protected equipment & wiring systems (Ex e)
UTE NES 107 ZA	Install explosion-protected equipment & wiring systems (Ex d)
UTE NES 707 TA	Design electrical installations in hazardous areas (Ex mixed)
UTE NES 707 WA	Design electrical installations in hazardous areas (Ex n)
UTE NES 707 XA	Design electrical installations in hazardous areas (Ex i)
UTE NES 707 YA	Design electrical installations in hazardous areas (Ex e)
UTE NES 707 ZA	Design electrical installations in hazardous areas (Ex d)

in partial completion of the following qualification
Certificate IV in Electrotechnology (Explosion-protection) UTE 4 07 99

Sarah Petrides
Prepared by
Sarah Petrides
Administration Assistant

Approved by
Sam Zacha
Managing Director

National Provider Code 51160

Date of Issue: 5 December 2007

THE INSTITUTION OF ENGINEERS AUSTRALIA

NATIONALLY RECOGNISED TRAINING

Training Accreditation Council WESTERN AUSTRALIA

This statement of attainment is recognised within the Australian Qualifications Framework

Certificate No.: 1089-1-07

This is to certify that

Neville Green

of

GPA Engineering Pty Ltd

Completed the 3 day

Electrical Safety in Hazardous Areas

Training Course

26th to 28th February 2001

Signed: *C R Baker*

Colin Baker CEng, MIEE, MInstMC, FIICA
Partner, Principal Consultant & H-Class Electrical Inspector

Certificate Number: 2001.02.26-28/05

This 24 hour short course is recognised by
The Institution of Engineers, Australia, for Continuing Professional Development (CPD) purposes

Explosion Protection Technology, 8 Kirkfell Court, Berwick, Victoria 3806, Australia

Table of Contents

Revision History:

Rev.	Status	Date	Prepared	Reviewed	Approved
A	Preliminary issue for client's review	28-Sep-2011	AZP	TCB	
0	Original Issue	18-Nov-2011	AZP	TCB	EZG

1 Site Information

An inspection on the Darwin City Gate meter station site was performed on 10 September 2011 by Tony Bird, a principal process engineer from Fyfe, Neville Green, an electrical engineer from Sitzler and David Bourke a surveyor from Fyfe.

Darwin City Gate meter station is located at KP1498 on the ADP.

Darwin City Gate receives gas from the ADP. Gas flows to three locations, Wickham Point, Channel Island and Trunk Package Offtake Station (TPOTS). The Wickham Point (Corroco Philips, Darwin LNG plant) pipeline can be reversed to ensure gas supply to Darwin/Channel Island. The gas supply to Wickham point is fitted with an actuated valve. The gas supply to Channel Island and TPOTS is filtered, reduced in pressure to 5,800 kPag and the gas composition and moisture dew point is analysed. The gas to TPOTS is regulated to a 850 kPag and metered.

The Darwin City Gate Station comprises of scraper vessels, a multicyclone, two filter separators, an atmospheric slop tank, gas chromatograph system, moisture analyser, control valves, pressure regulator, pressure relief valves, blowdown stack and the related pipework. Liquids (condensate, water and compressor lube oil) removed from the gas is stored in the slop tank for batch treatment.

The station consists of DN 300 above ground connection. A scraper receiver is installed with buried hydraulically actuated valve. The actuated valve includes electric solenoids to allow remote operation. During normal operation gas bypasses the scrapers and flows through the actuated valve, the scraper vessels are closed and isolated from the pipeline. At the station inlet, the pipeline divides in two, with one supplying gas to Weddell interconnect and one supplying to the City Gate station. The main line is installed with DN20 blowdown, temperature transmitter and pressure transmitter. The line then divides in to two, the normal flow is through the multi-cyclone to remove solids. The multicyclone is fitted with a PSV with a set point of 9,650 kPag. Both parallel streams include a temperature control valve and a filter separator. The filter separators are horizontal and fitted with quick opening closures to allow removal of the filter elements. The liquids removed from the gas are collected in a drain boot underneath the filter separator and flow under level control to a slop tank. The filter separators are fitted with the following instrumentation and connections; pressure indicator, differential pressure transmitter, level glasses, high level switches, high high level switches, local drains and level controllers. The temperature and level control valves are pneumatically controlled and actuated. Local instrument gas conditioning skid is provided with PSV to provide over pressure protection.

Common line of the outlet from the filter separators is installed with temperature indicators, temperature transmitter, pressure indicators, and pressure transmitters. The connection point for the gas chromatograph and dew point analyser has been installed to this section of pipework to allow analysis of the gas. The gas chromatograph and dew point analyser are installed in a shelter adjacent to the filter skid. The chromatograph receives a sample of the transmission gas at a pressure of approximately 140 kPag from an insertion regulator installed in the pipe. The carrier and calibration gases are stored in gas bottles and regulated for use at 140 kPag. The chromatograph vents gas to exhaust vents above the analyser shelter roof. The mainline then passes through a mainline valve. Downstream of

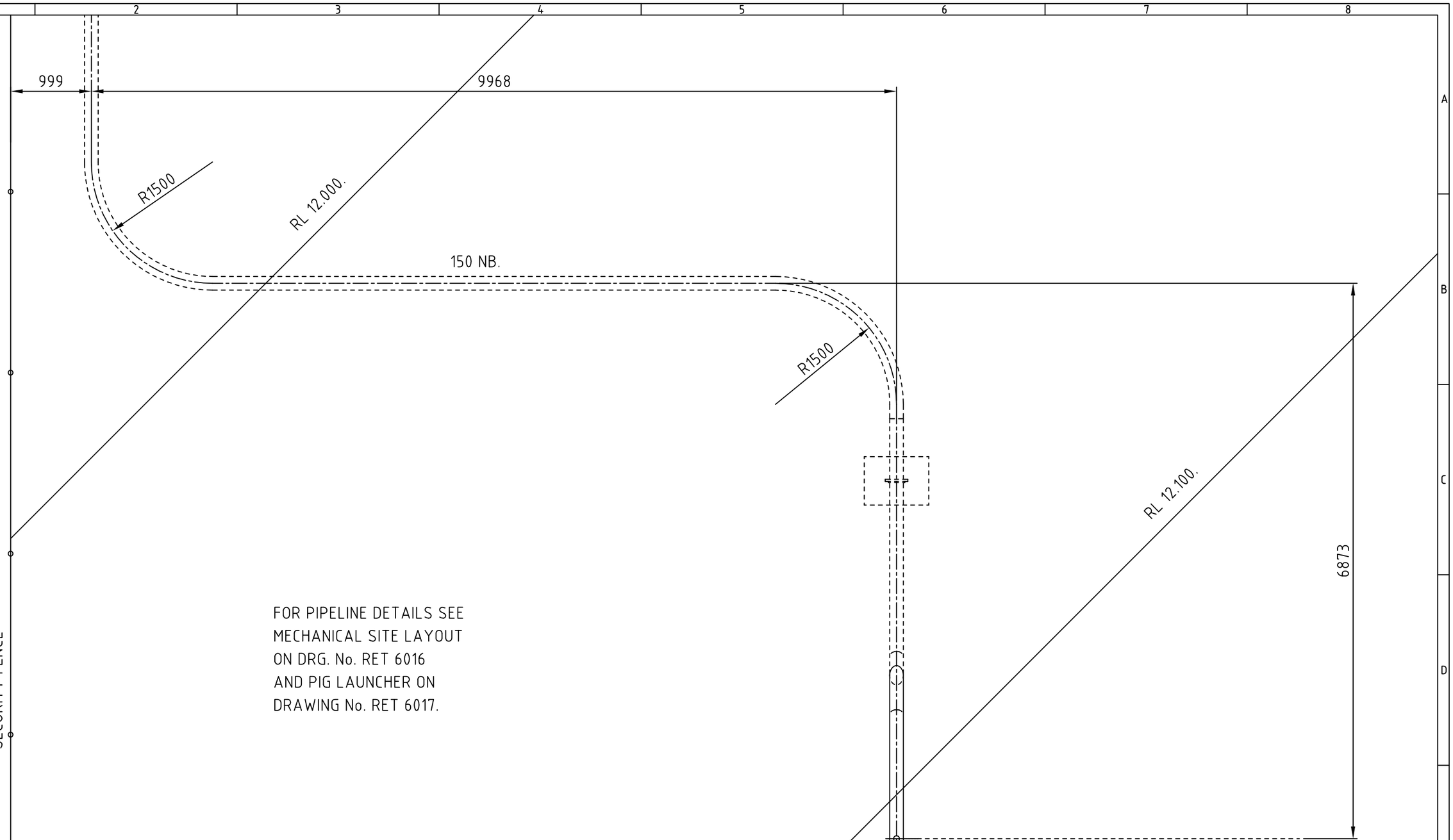
the mainline valve is installed with pressure indicator and transmitter before the pipeline directed to Channel Island meter station.

A separate offtake to TPOTS passes gas to a DN 50 pressure regulation and metering skid. The skid has duty and standby arrangement with each containing active and monitor pressure regulators and turbine meters. A high pressure trip is provided that closes an actuated valve at the inlet. The meter runs, with one serving as duty run and other as standby run. The gas is then directed to Berrimah Road.

A control system provides measurement and telemetry for the various process instruments. The control system allows remote operator shutdown. The control system is powered by single phase 230 VAC power supply, with back up batteries.

The site arrangement drawings and P&IDs for Darwin City Gate meter station can be found overleaf.

Drawing Number	Description	Revision
APA Group Arrangement Drawing		
AD 1498-5000	Darwin City Gate Station Piping Arrangement Sheet 1	0
AD 1498-5001	Darwin City Gate Station Piping Arrangement Sheet 2	0
AD 1498-5002	Darwin City Gate Station Piping Arrangement Sheet 3	0
AD 1498-5003	Darwin City Gate Station Piping Arrangement Sheet 4	0
AD 1498-5004	Darwin City Gate Station Piping Arrangement Sheet 5	0
AD 1498-5005	Darwin City Gate Station Piping Arrangement Sheet 6	0
AD 1498-5006	Darwin City Gate Station Piping Arrangement Sheet 7	0
AD 1498-5007	Darwin City Gate Station Piping Arrangement Sheet 8	0
AD 1498-5008	Darwin City Gate Station Piping Arrangement Sheet 9	0
AD 1498-5009	Darwin City Gate Station Piping Arrangement Sheet 10	0
AD 1498-5010	Darwin City Gate Station Piping Arrangement Sheet 11	0
AD 1498-5011	Darwin City Gate Station Piping Arrangement Sheet 12	0
AD 1498-5012	Darwin City Gate Station Piping Arrangement Sheet 13	0
AD 1498-5013	Darwin City Gate Station Piping Arrangement Sheet 14	0
AD 1498-5014	Darwin City Gate Station Piping Arrangement Sheet 15	0
AD 1498-5021	Darwin City Gate Station Piping Arrangement Sheet 16	0
AD 1498-5022	Darwin City Gate Station Piping Arrangement Sheet 17	0
AD 1498-5024	Darwin City Gate Station General Arrangement	0
Fyfe Updated Plot Plan		
AD 1498-6001	Meter Station – Darwin City Gate	0
P&ID		
AD 1498-7001	Darwin City Gate Station Receiver and Mainline Valve	2
AD 1498-7002	Darwin City Gate Station Temperature Regulators & Filter/Separators	2
WP 0000-7001	Darwin City Gate Wickham Point Pipeline	0
DB 0000-7000	Darwin City Gate TPOTS (Trunk Package Offtake Station)	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DRAWING NO. REF AD1495-5000 REV 2	BP	ML		6/7/07	RET 6017	G.A. PIG LAUNCHING FACILITIES (DARWIN RETICULATION)
						RET 6016	DCG MECHANICAL SITE LAYOUT (DARWIN RETICULATION)

	INITS.	SIGNATURE	DATE
DRAWN	KAS		19.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 1

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5000	0

SHEET 1. DRG. No. AD1498-5000

5500

528

10643

3000

2159

622

N

11096

3437

3292

4

1200

301

4

3450

350

600

300

1181

50 NB.

100 NB.

440

1640

600

301

158

175

175

246

154

205

254

1400

4804

1200

5000

1

112

FOR PIPEWORK DETAILS
SEE DRAWING No. RET 6013

FOR DETAILS OF PIG LAUNCHER
SEE DRAWING No. RET 6017.

SHEET 10. DRG. No. AD1498-5009

SHEET 3. DRG. No. AD1498-5002

8
5019

8
5019

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
						RET 6017	G.A. PIG LAUNCHING FACILITIES (DARWIN RETIC)
						RET 6013	DCG G.A. OF SKID M OUNTED PIPEWORK (DARWIN RETIC)
0	NEW DRAWING NO. REF AD1495-5001 REV 2	BP	ML		6/7/09	AD1498-5019	DARWIN CITY GATE STATION SECTIONS SHEET 3

	INITS.	SIGNATURE	DATE
DRAWN	KAS		20.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 2

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5001	0

8/5019

CONTINUED ON SHEET 2. DRG. No. AD1498-5001

RL 12.200.

10000

4156

2038

297

297

459

1300

457

CP TEST POINT
DRG No. TY0000-9003

6/5018

300 NB.

94

1

112

5000

158

248

254

254

SPARE

1

320

640

320

320

320

502

PS

85 107 37 85

67

51

20

59

1

PSL 24

PT 22

TI 21

TE 20A

TE 20

90

1

94

1

8/5019

85

107

78

94

85

103

107

37

37

SHEET 8. DRG. No. AD1498-5007

N

RL 12.300.

300 NB.

6/5018

CONTINUED ON SHEET 4. DRG. No. AD1498-5003

10643

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE
0	NEW DWG NO. REF AD1495-5002 REV 3	BP	ML		6/7/09

REFERENCE DRAWINGS	
TY0000-9003	CP TEST POINT INSULATING JOINT TYPE #21
AD1498-5019	DARWIN CITY GATE STATION SECTIONS SHEET 3
AD1498-5018	DARWIN CITY GATE STATION SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		15.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 3

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5002	0

CONTINUED ON SHEET 3. DRG. No. AD1498-5002

300 NB.

900 COVER

RL 12.300.

RL 12.400.

1

4950

504

254

499

2439

1254

254

26

66

54

5
5018

41

50 NB.

600

50 NB.

254

254

5
5018

200

519

959

700

156

2184

7 GROVE SERIAL No. 711377

29

CP TEST POINT
DRG. No. TY0000-9003

CONTINUED ON SHEET 5. DRG. No. AD1498-5004

CONTINUED ON SHEET 6.
DRG. No. AD1498-5005

302

73 33
U/S PIPE

45

N

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG NO. REF AD1495-5003 REV 2	BP	ML		6/7/09	AD1498-5018	DARWIN CITY GATE STATION SECTIONS SHEET 2
						TY0000-9003	CP TEST POINT INSULATING JOINT TYPE #21

	INITS.	SIGNATURE	DATE
DRAWN	KAS		15.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 4

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5003	0

RL 12.300.

5/5018

66 54

900 COVER

519

600

26

2184

200

959

152

700

302

3416

SHEET 4. DRG. No. AD1498-5003

SHEET 6. DRG. No. AD1498-5005

RL 12.400.

2184

5600

3416

SHEET 7. DRG. No. AD1498-5006

N

55

200 NB

27

2

2

3000

1500

14950

62

952 COVER

55

25

61

4950

11500

16450

RL 12.500.

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG NO. REF AD1495-5004 REV 2	BP	ML		6/7/09		
	ABOVE GROUND PIPEWORK ADDED					AD1498-5018	DARWIN CITY GATE STATION SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		26.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 5

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5004	0

1000
8200
3850
254
504
4950
499
2439
1254
900 COVER
5000
NTS
5
5018
254
66
54
41
1
300 NB.
300 NB.
600
254
254
200
519
63
7
2184
959
156
700
302
29
CP TEST POINT
DRG. No. TY0000-9003
SHEET 4. DRG. No. AD1498-5003
SHEET 5. DRG. No. AD1498-5004
44
57
74
5600
RL 12.300.
45
U/S PIPE
73
33
3416
200 NB.
1500
3450
SHEET 5. DRG. No. AD1498-5004
55
200 NB.
27
952 COVER
61
3000
RL 12.400.
62
19
OPENING 1.75 M ABOVE
FINISHED SURFACE LEVEL.
55
100 NB.
SHEET 17. DRG. No. AD1498-5022
25
FOR CONTINUATION SEE ALIGNMENT SHEET DRG. No. AD1488-1100
RECOVERY PEGS
FENCE
300 NB.
WEDDELL INTERCONNECT PIPELINE
N

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
						TY0000-9003	CP TESET POINT INSULATING JOINT TYPE #21
0	NEW DWG. REF AD1495-5005 REV 2 AND	BP	ML		6/7/09	AD1488-1100	AS BUILT ALIGNMENT SHEET
	WP0000-6007 REV 5					AD1498-5018	DARWIN CITY GATE STATION SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		30.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 6

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5005	0

CONTINUED ON SHEET 8. DRG. No. AD1498-5007

RL 12.400.

1300

20

59

3 / 6008

1 / 6008

20

50 NB.

100 NB.

20

2500

12400

600

501

750 COVER

10000

900 COVER

300 NB

1

CONTINUED ON SHEET 5. DRG. No. AD1498-5004

CONTINUED ON SHEET 13. DRG. No. AD1498-5012

N

4 / 5018

20

RL 12.500.

14

6 54

645

254

31 4 64

63

1002

150 NB.

1

300 NB.

900 COVER

600

168

200 NB.

952 COVER

2

59

75

3 / 6008

2500

13500

2 29 7

63

RL 12.600.

CONTINUED ON SHEET 16. DRG. No. AD1498-5021

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE
0	NEW DRAWING NO. REF AD1495-5006 REV 2 AND WP0000-6004 REV 8	BP	ML		22/9/09

REFERENCE DRAWINGS	
WP0000-6010	WEDDELL PIPELINE DCG STATION 200 VENT LINE PIPE SPOOL
WP0000-6009	WEDDELL PIPELINE DCG STATION PIPE SPOOLS
WP0000-6008	WEDDELL PIPELINE DCG STATION SECTIONS
AD1498-5018	DARWIN CITY GATE STATION SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		29.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 7

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5006	0

SHEET 9. DRG. No. AD1498-5008

SHEET 3. DRG. No. AD1495-5002

TEMPERATURE REGULATING SKID
DRG. No. AD1495-6003

7 / 5019

1 IN 100 FALL

1 IN 141.4 BOTH WAYS.

RL 12.400.

1 / 6008

23

22

110

113

3357

12400

600

500

3 / 5017

3 / 6008

PIPE SUPPORTS
REFER WP0000-6105

100 NB.

9084

WPP PIG TRAP

DCG-PS3

85

107

37

2 / 6008

DCG-PS1

DCG-PS2

PS

16

85

107

37

2419

OLD DRG. No. AD1495-6000

SHEET 12. DRG. No. AD1498-5011

50 NB.

100 NB.

SHEET 7. DRG. No. AD1498-5006

CP TEST POINT
DRG. No. TY0000-9003

3 / 5017

3 / 6008

4

3

RL 12.500.

1 / 6008

LIMIT OF PIPELINE CONTRACT

AS 2885

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE
0	NEW DRAWING NO. REF AD1495-5007 REV 3	BP	ML		1/10/09
	AND WP0000-6003 REV 9				

REFERENCE DRAWINGS	
WP0000-6102	PIPE SUPPORTS
WP0000-6105	PIPE SUPPORTS
WP0000-6009	PIPE SPOOLS & MATERIALS LIST
WP0000-6008	SECTIONS
TY0000-9003	CP TEST POINT INSULATING JOINT TYPE #21
AD1498-5019	SECTIONS
AD1498-5017	SECTIONS
AD1495-6003	DCG STATION - TEMPERATURE REGULATING SKID

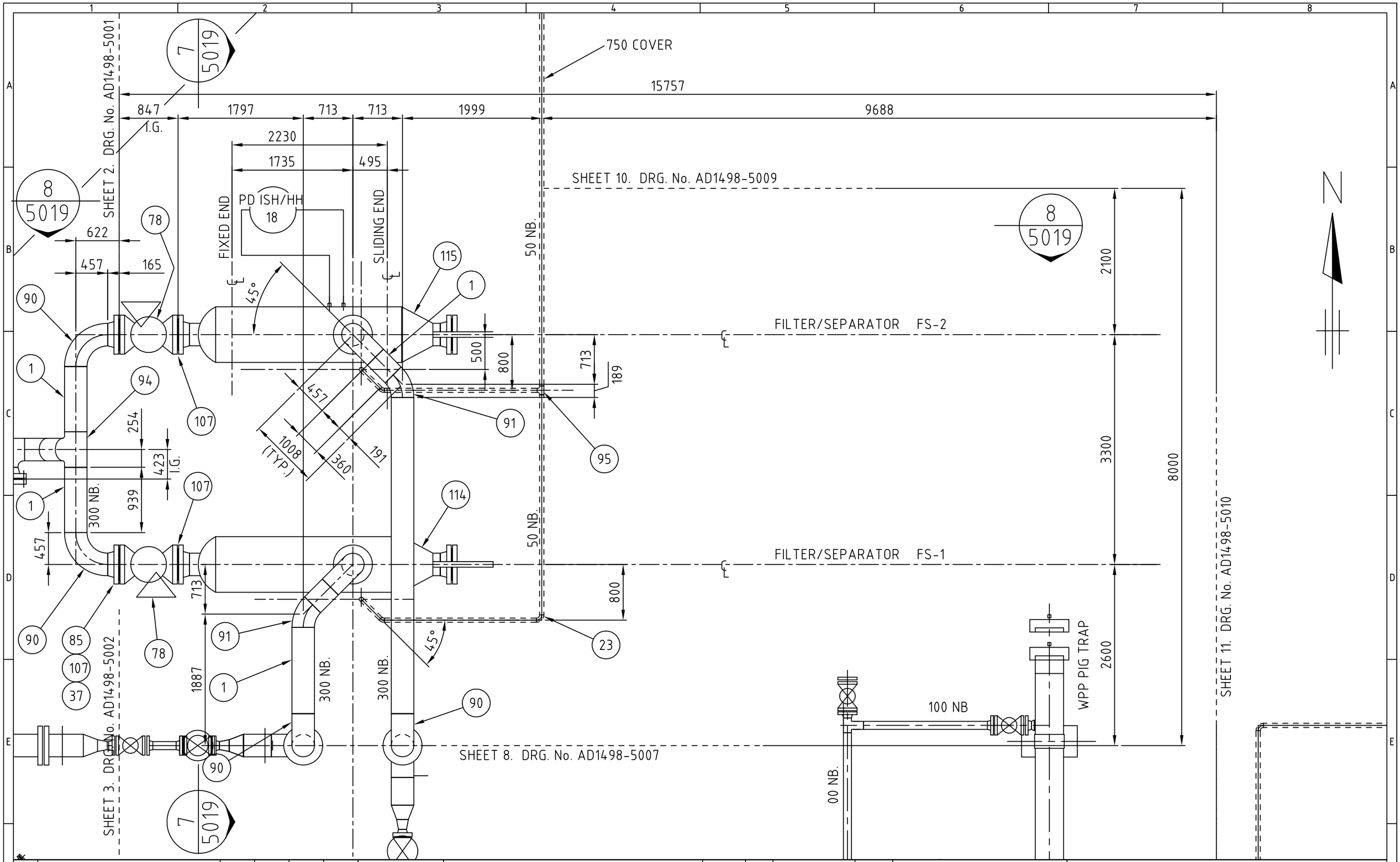
	INITS.	SIGNATURE	DATE
DRAWN			
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
ACN 050 221 415

16 Georgina Crescent PALMERSTON NT
PO Box 7 PALMERSTON NT 0831
Telephone: (08) 8935 1611
Facsimile: (08) 8932 1663

TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 8

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5007	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS
0	NEW DWG NO. REF AD1495-5008 REV 3 &	BP	ML		1/10/09	
	WP0000-6002 REV 2					AD1498-5019 DCG STATION - SECTIONS SHEET 3

	INITS.	SIGNATURE	DATE
DRAWN	KAS		16.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

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ACN 050 221 415
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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 9

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5008	0

3357
9900
3000
5100
TO ℄ ROAD
713
1999
7838
2000
350
50 NB.
301
158
152
116 ROAD TANKER CONNECTION 50 NB.
ANSI #600
ANSI #150
497
956
76
DETAIL B 5020
RL 12.300.
9 5020
9 5020
FILTER/SEPARATOR INLET
50 NB.
8156
4
100 NB.
50 NB. INLET
50 NB. SPARE
600 NB. MANWAY
50 NB. GAUGING
50 NB. VENT
50 NB. TANKER PUMPOUT.
LSH 30
9300
7 5018
N
SHEET 2. DRG. No. AD1498-5001
85
107
37
78
107
37
115
90
2100
SHEET 9. DRG. No. AD1498-5008
RL 12.400.
FILTER/SEPARATOR FS-2

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
						AD1498-5020	DCG STATION - SECTIONS SHEET 4
0	NEW DWG. REF AD1495-5009 REV 2	BP	ML		14/7/09	AD1498-5018	DCG STATION - SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		25.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T. GAS Pty. Limited
ACN 050 221 415
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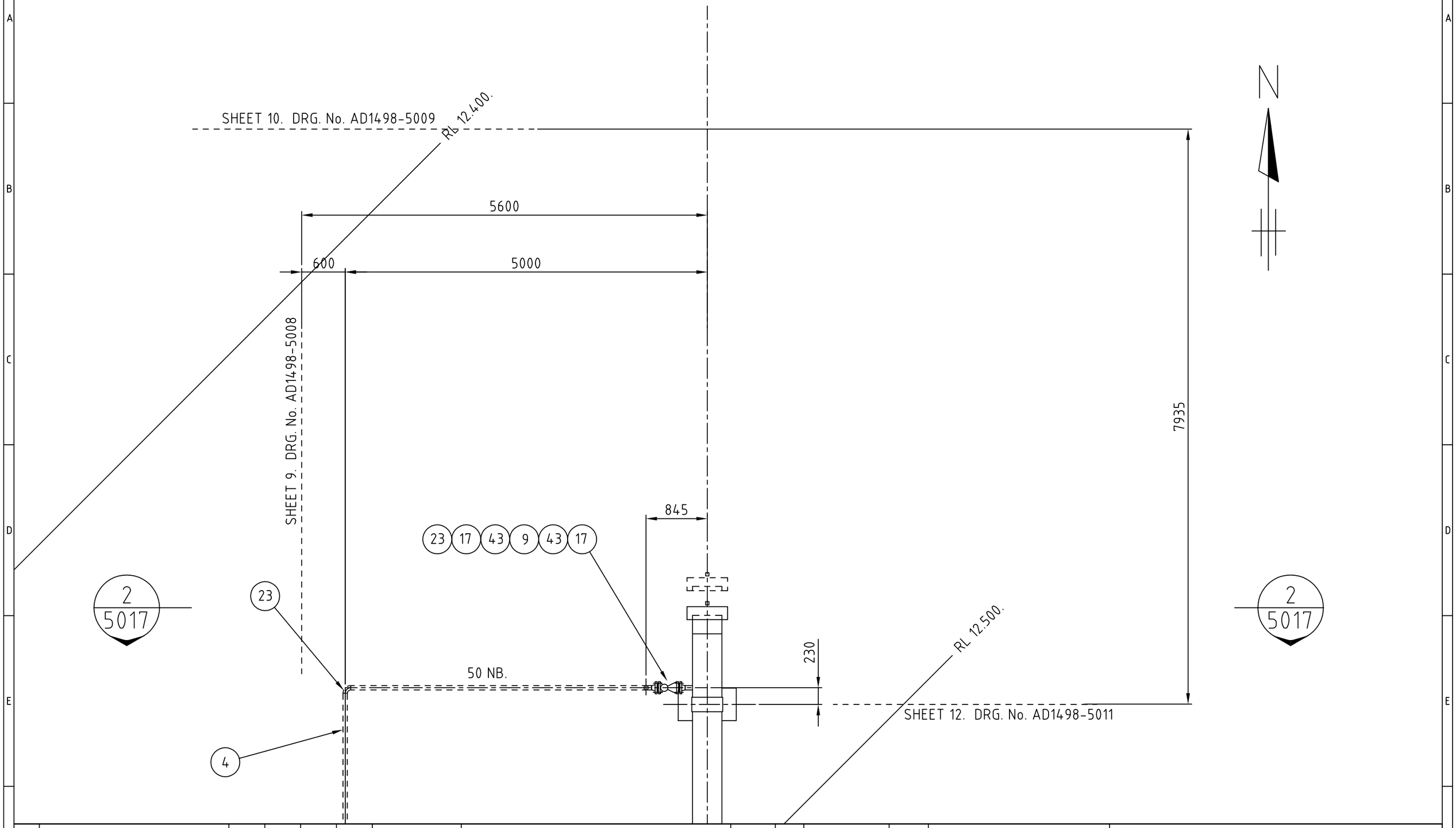
TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 10.

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5009	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG. REF AD1495-5010 REV 2	BP	ML		14/9/09	AD1498-5017	DCG STATION - SECTIONS SHEET 1

	INITS.	SIGNATURE	DATE
DRAWN	KAS		20.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
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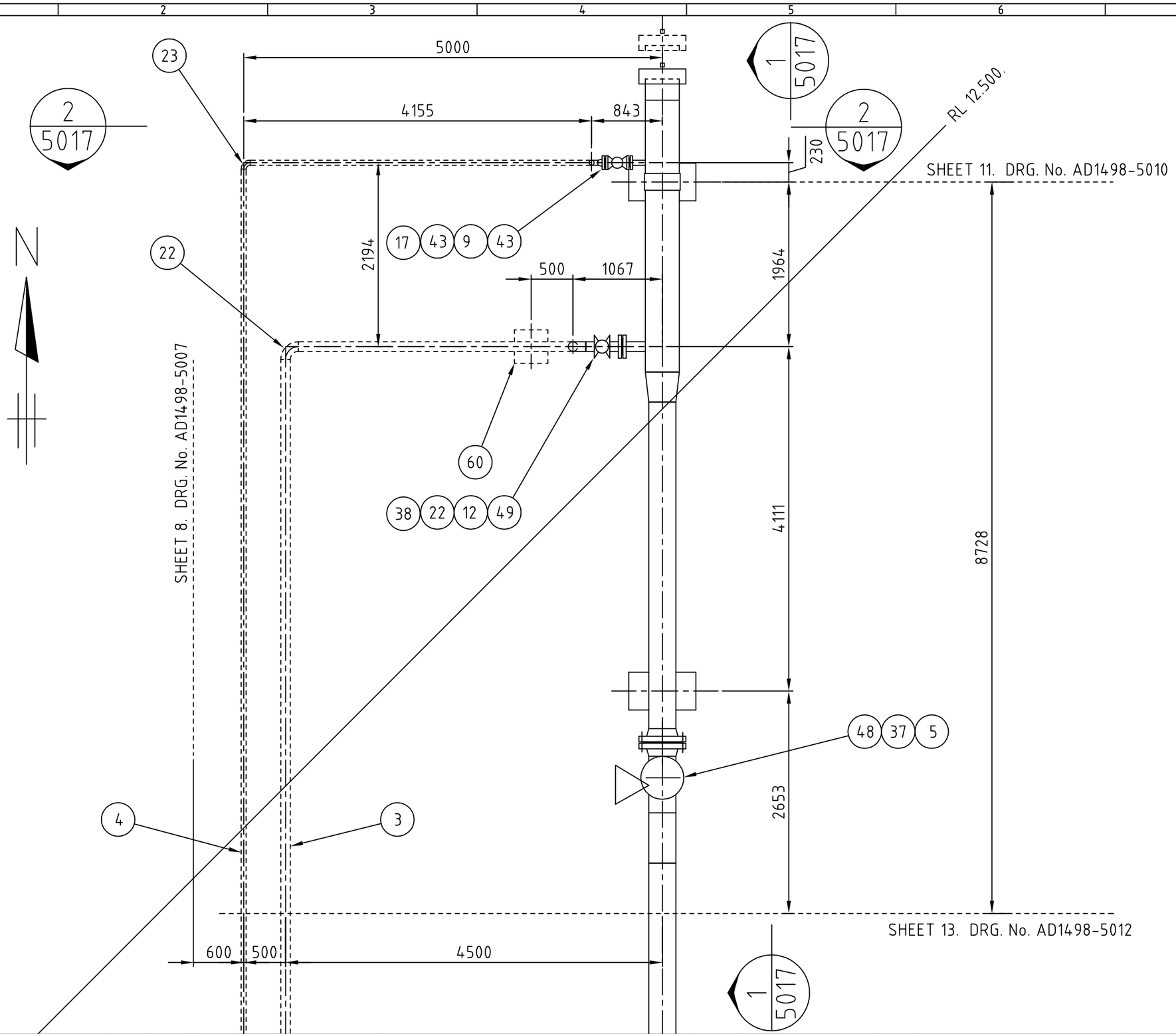
TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 11

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5010	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG. REF AD1495-5011 REV 2	BP	ML		14/9/09	AD1498-5017	DCG STATION - SECTIONS SHEET 1

	INITS.	SIGNATURE	DATE
DRAWN	KAS		9.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
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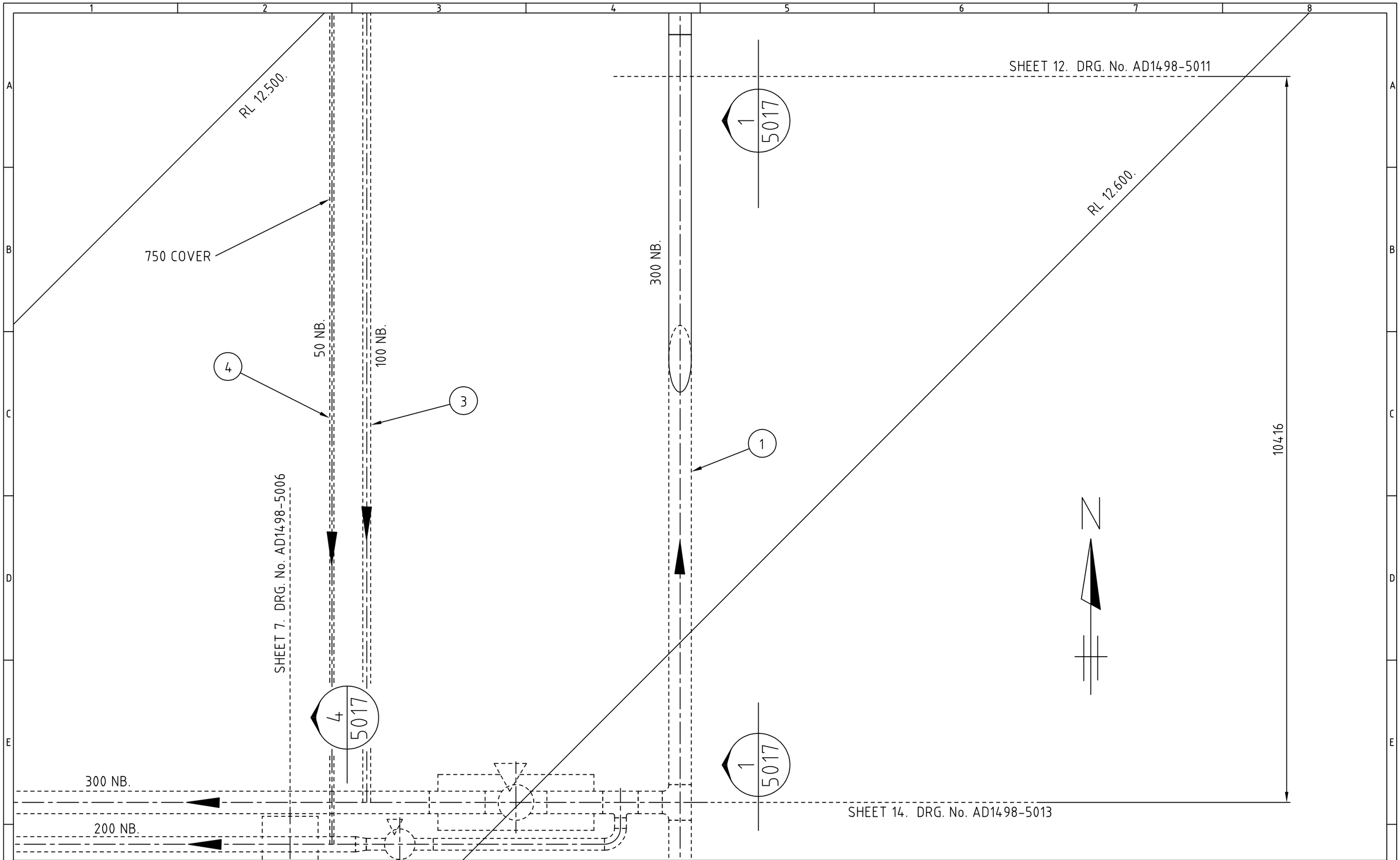
TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 12

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5011	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG NO. REF AD1495-5012 REV 2	BP	ML		14/9/09	AD1498-5017	DCG STATION - SECTIONS SHEET 1

	INITS.	SIGNATURE	DATE
DRAWN	KAS		9.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 13

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5012	0

50 NB. 750 COVER

100 NB.

4 / 5018

4500

24 30

3

6 54

256 256

500 899 2489 601

68

26

1

4

31 4 64

300 NB. 900 COVER

SHEET 13. DRG. No. AD1498-5012

63

200 NB. 952 COVER

150 NB.

28

959 2461 856

600 156 339 229

2

59

63

3800

5600

SHEET 16. DRG. No. AD1498-5021

4 / 5018

8000

RL 12.600.

7 GROVE SERIAL No. 71378V

29

2

44 57

4200

N

1

SHEET 15. DRG. No. AD1498-5014

RL 12.700.

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS
0	NEW DWG NO. REF AD1495-5013 REV 2	BP	ML		14/9/09	AD1498-5018 DCG STATION - SECTIONS SHEET 2

	INITS.	SIGNATURE	DATE
DRAWN	KAS		7.4.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T. GAS Pty. Limited ACN 050 221 415

16 Georgina Crescent PALMERSTON NT
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Facsimile: (08) 8932 1663

TITLE

AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 14

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5013	0

RL 12.600

1
5017

CONTINUED ON SHEET 14. DRG. No. AD1498-5013

4000

300 NB.

RL 12.700

FENCE 74

3000

1

EDGE OF GRADED AREA.

2000

RECOVERY PEGS

1
5017

50000 TO RECOVERY PEGS

35000 TO RECOVERY PEGS

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS
0	NEW DWG NO. REF AD1495-5014 REV 2	BP	ML		14/9/09	AD1498-5017 DCG STATION - SECTIONS SHEET 1

	INITS.	SIGNATURE	DATE
DRAWN	KAS		25.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
ACN 050 221 415
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TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 15

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5014	0

CONTINUED ON SHEET 7. DRG. No. AD1498-5006

CONTINUED ON SHEET 17. DRG. No. AD1498-5022

RL 12.400

R1943 (6D)
1520 COVER

300 NB. WEDDELL INTERCONNECT PIPELINE

1
6008

4215

1
6008

CONTINUED ON SHEET 14. DRG. No. AD1498-5013

N

REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
						WP0000-6009	Darwin City Gate - Pipe Spools
0	NEW DWG NO. REF WP0000-6005 REV 5	BP	ML		15/9/09	WP0000-6008	Darwin City Gate - Sections

	INITS.	SIGNATURE	DATE
DRAWN	JLS	J SKINNER	10.5.07
DESIGN CHECKED	PW	P WEBER	2.7.07
DRAWING CHECKED	RF	R FREESTONE	2.7.07
APPROVED	FRF	R FAGARASAN	2.7.07

N.T. GAS
N.T.GAS Pty. Limited
ACN 050 221 415

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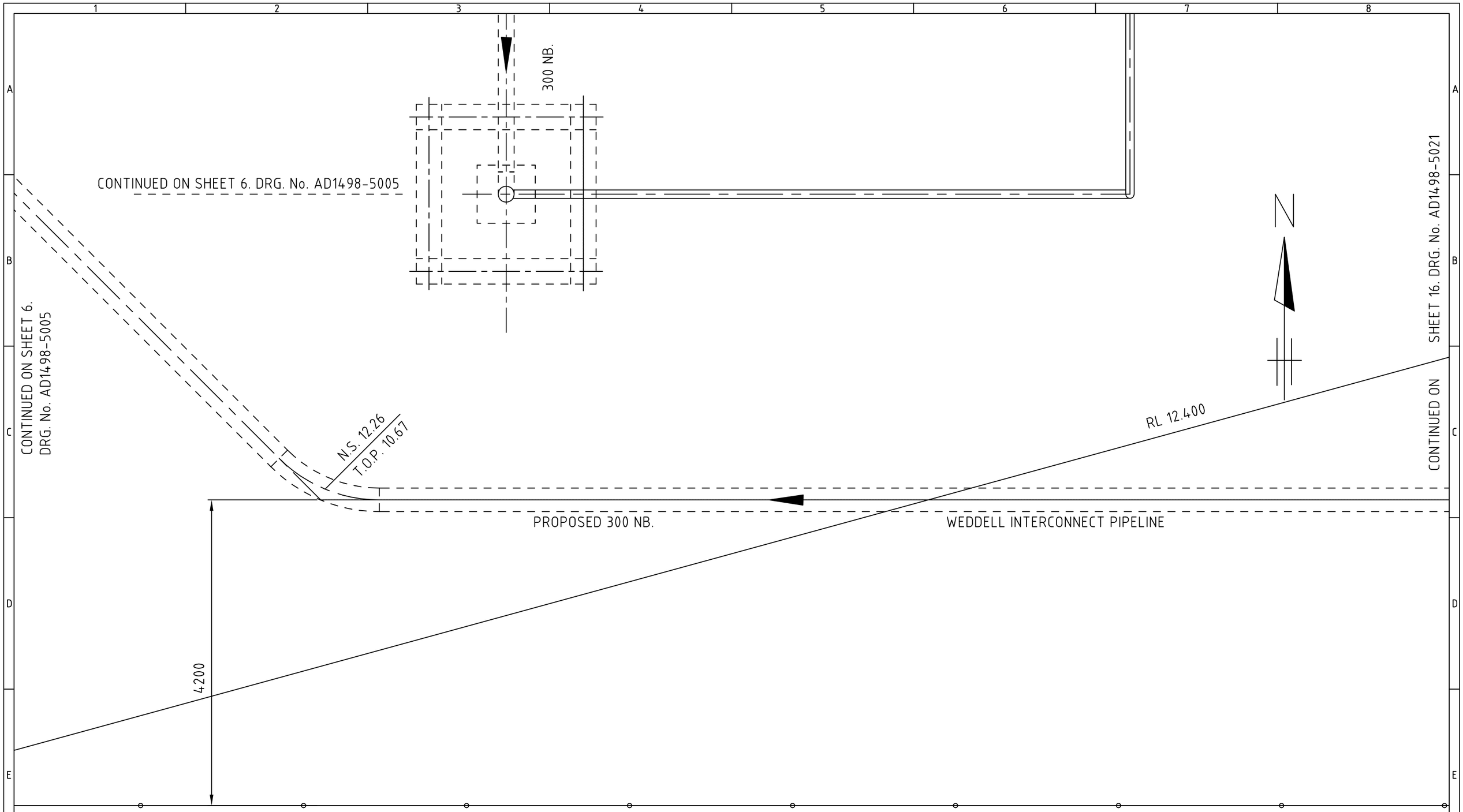
TITLE
WEDDELL INTERCONNECT PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 16

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5021	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE	REFERENCE DRAWINGS	
0	NEW DWG NO. REF WP0000-6006 REV 5	BP	ML		22/9/09	WP0000-6009	Darwin City Gate - Pipe Spools

	INITS.	SIGNATURE	DATE
DRAWN	JLS	J SKINNER	10.5.07
DESIGN CHECKED	PW	P WEBER	2.7.07
DRAWING CHECKED	RF	R FREESTONE	2.7.07
APPROVED	FRF	R FAGARASAN	2.7.07

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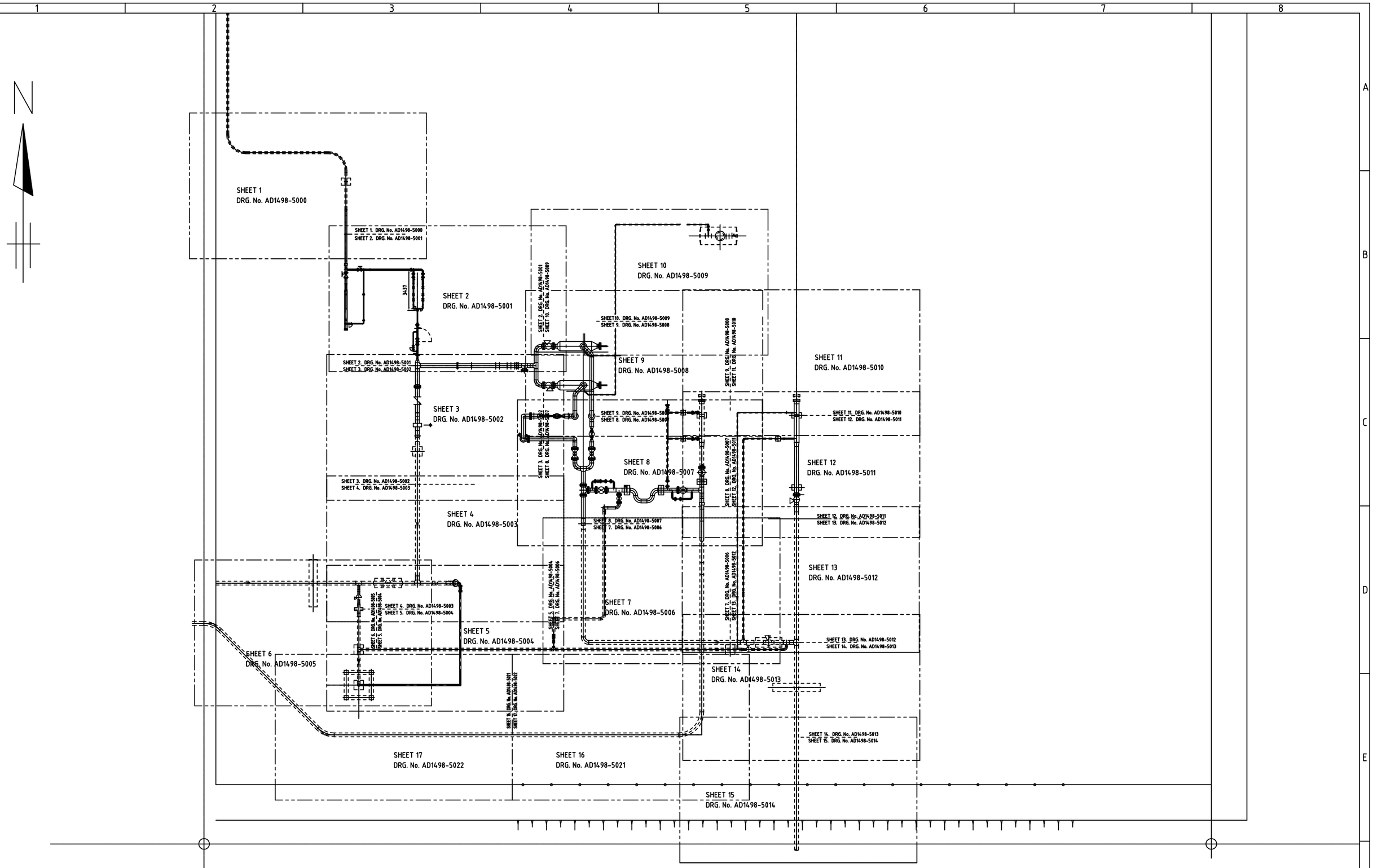
TITLE
WEDDELL INTERCONNECT PIPELINE
DARWIN CITY GATE STATION
PIPING ARRANGEMENT SHEET 17

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5022	0



REV.	REVISION DESCRIPTION	DRAWN	CHECKED	APP'D	DATE
0	NEW DWG NO. REF AD1495-5024 REV 3 & WP0000-6001 REV 7	BP	ML		22/9/09

REFERENCE DRAWINGS

	INITS.	SIGNATURE	DATE
DRAWN	KAS		25.3.99
DESIGN CHECKED			
DRAWING CHECKED			
APPROVED			

N.T.GAS Pty. Limited
ACN 050 221 415
16 Georgina Crescent PALMERSTON NT
PO Box 7 PALMERSTON NT 0831
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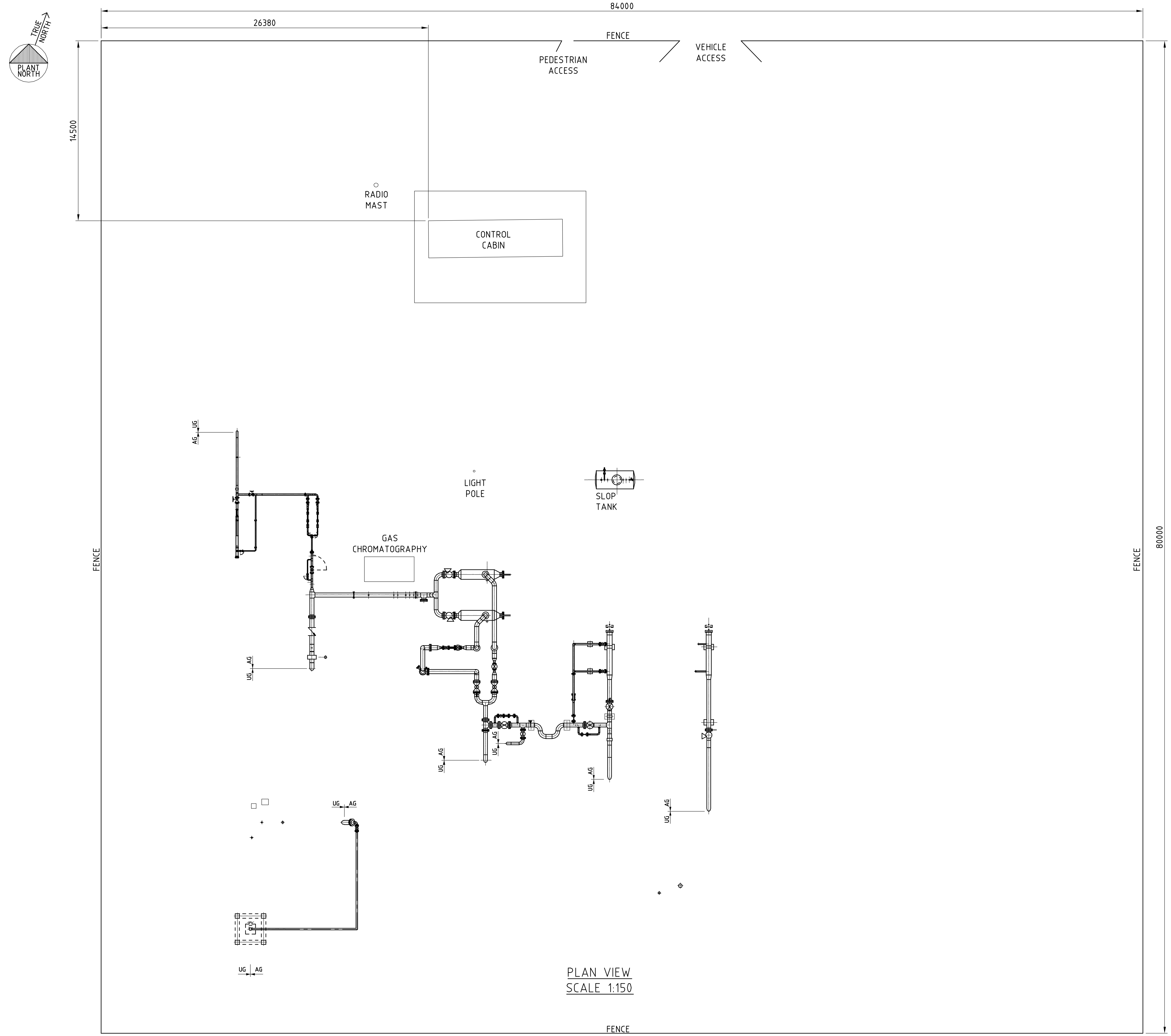
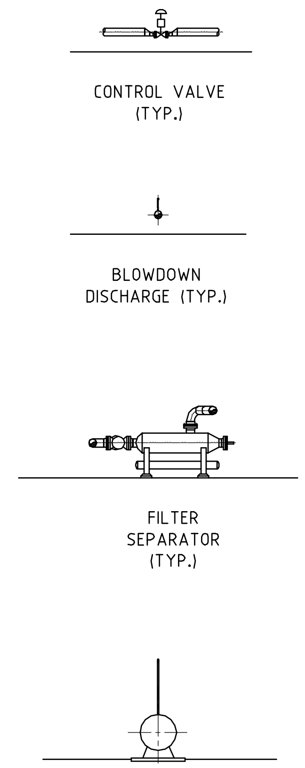
TITLE
AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
GENERAL ARRANGEMENT

DRG. SIZE	SCALE	DRAWING NUMBER	REV.
A3	1:50	AD1498-5024	0



PLAN VIEW
SCALE 1:150



ELEVATIONS
SCALE 1:150

0 2.5 5 7.5 10 12.5 15
SCALE 1:150 METRES

NOTES:
1. LOCATION OF UNDERGROUND SERVICES NOT CONFIRMED AND NOT SHOWN ON THIS DRAWING, REFER TO DRAWING AD1498-1001 FOR ALL PIPING DETAILS.
2. ALL DIMENSIONS ARE BASED ON 3D SCAN DATA. ALL 3D DATA RETAINED BY FYFE

HOLDS:

REV	REVISION DESCRIPTION	DATE	DRN.	CKD.	APP.
0	ORIGINAL ISSUE AS PER FYFE 3D SCAN DATA	30/11/11	FYFE	TCB	

REFERENCE DRAWINGS	DRG.NO.
P & I DIAGRAM	AD1498-7002
P & I DIAGRAM	AD1498-7001
GENERAL ARRANGEMENT	AD1498-1001

FYFE Earth Partners
ACN 008 115 130
LEVEL 3, 80 FLINDERS STREET, ADELAIDE, SA, 5000
TEL (08) 8201 9600
FAX (08) 8201 9650
E-mail info @ fyfe.com.au
FYFE Earth Partners
ENVIRONMENT DEVELOPMENT RESOURCES

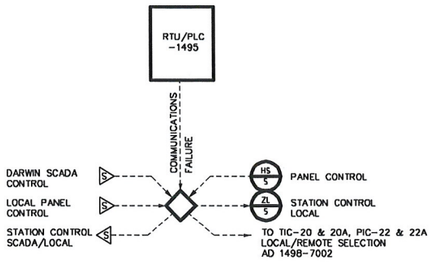
APA Group

SHEET NO.	
LEVEL DATUM	
FIELD BOOK	
DESIGN ENGINEER	
SCALE	
FILENAME	
DATE	30/11/2011
DRAWN	FYFE
CHECKED	TCB
APPROVING ENGINEER	

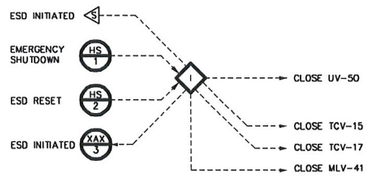
PROJECT: AMADEUS BASIN TO DARWIN PIPELINE

TITLE: METERING STATION
PLOT PLAN - DARWIN CITY GATE
DARWIN CITY GATE PLOT PLAN

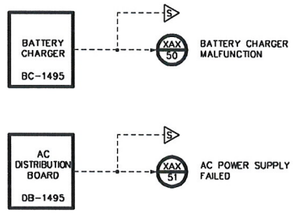
PROJECT NO.	DRAWING NO.	REV
	AD1498-6001	0

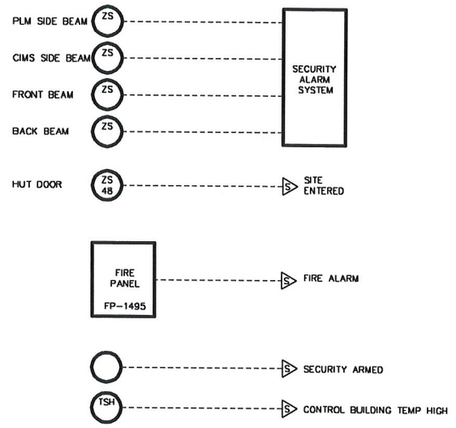


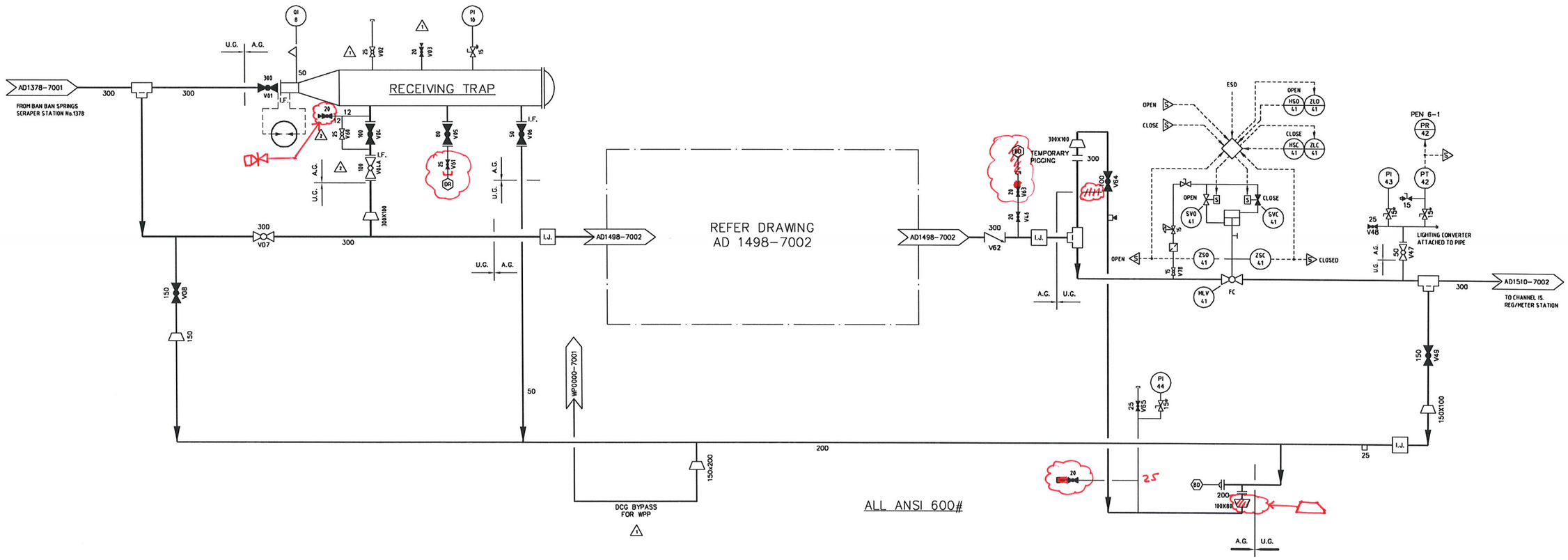
STATION CONTROL



EMERGENCY SHUTDOWN







NOTES
1) ALL EQUIPMENT INSTRUMENT TAG NUMBERS SHALL BE SUFFIXED WITH THE STATION NUMBER eg. QI-8-1495.

DWG No.	REFERENCE DRAWINGS
AD 1498-7002	P & I DIAGRAM – FILTER/SEPARATOR
AD 1498-7001	SIMPLIFIED P & I DIAGRAM

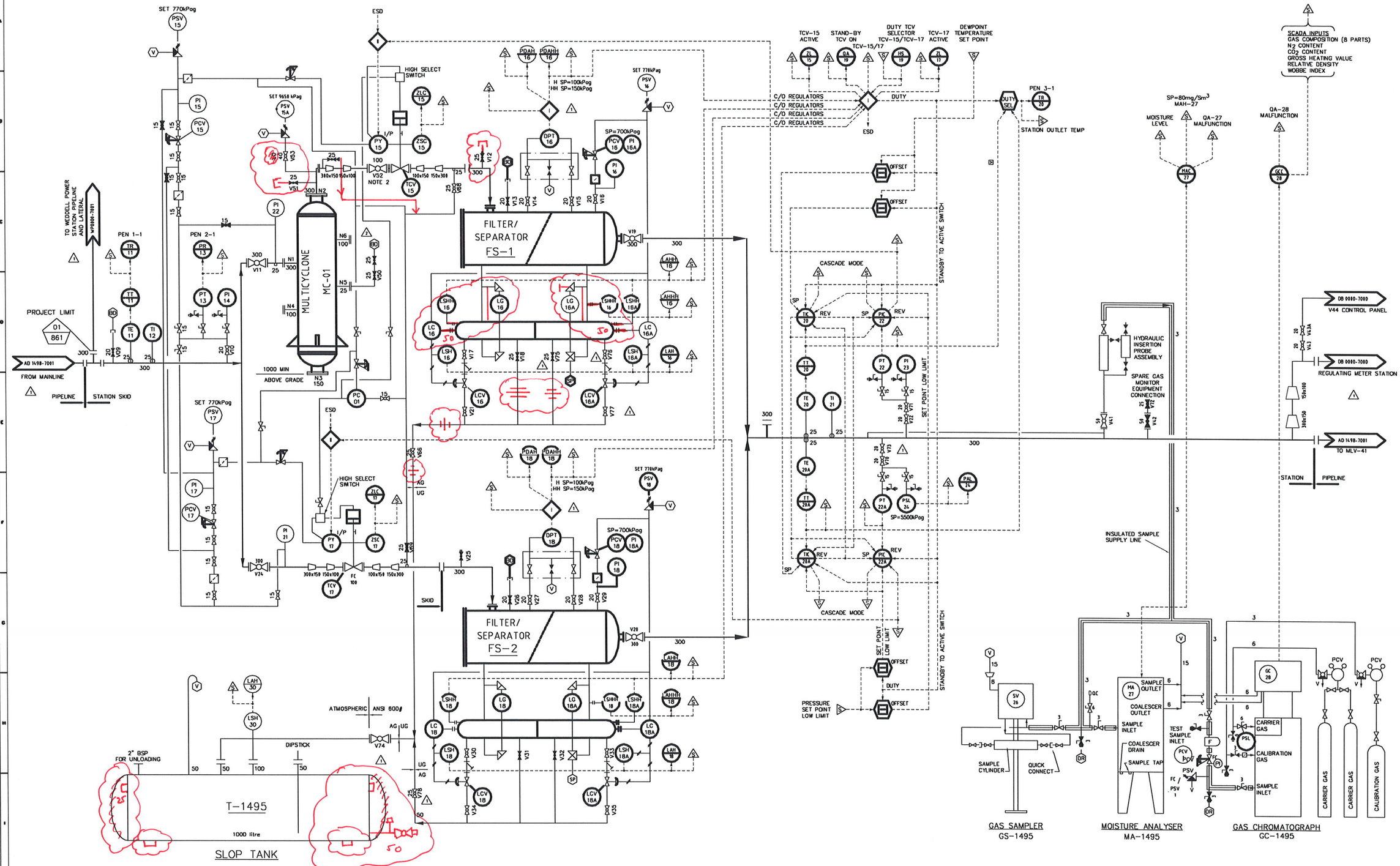
No.	DATE	REVISION	BY	CHKD	ENG	ENG MGR	PROJ MGR	APP'D
2	MAY'10	DRAWING REFERENCES UPDATED, V60 & V64A OPENED	ML	BP		HD		
1	SEP'09	WPP BYPASS ADDED REF AD1495-7001 REV 10, UPDATED DRAWING NUMBERS, PSV REMOVED	BP	ML		HD		
0	MAY'08	NEW DRAWING NUMBER. REFERENCE PREVIOUS DRG NO AD1495-7001 REV8	DEH	BP		HD		

CMPS&F PTY LIMITED
ENGINEERS AND PROJECT MANAGERS
A.C.N. 000 912 830
67 ALBERT AVENUE, CHATSWOOD, NSW, AUSTRALIA. 2067
TEL. I- 61 2I 9412 9999 FAX. I- 61 2I 9412 9855

CLIENT: N.T. GAS

TITLE: AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
P & I DIAGRAM
RECEIVER AND MAINLINE VALVE

ORG. SIZE	SCALE	JOB No.	DRAWING No.	REV.
B1	NTS	6850-000	AD 1498-7001	2



NOTES

1) ALL EQUIPMENT/INSTRUMENT TAG NUMBERS SHALL BE SUFFIXED WITH THE STATION NUMBER eg. PT-13-1495.
2) 100 NB VALVE ADDED IN ACCORDANCE WITH MULTICYCLONE HAZOP ITEM #14

DWG No.	REFERENCE DRAWINGS
AD 1498-7001	P & I DIAGRAM RECEIVER AND MLV

No.	DATE	REVISION	BY	CHKD	ENG	ENG MGR	PROJ MGR	APP'D
2	MAR'10	ADDITIONAL 25MM VALVE ADDED D/S OF V59 ON MULTICYCLONE	BP	ML		HD		
1	OCT'09	UPDATED FOR WEDDELL REF AD1495-7002 REV1K, UPDATED CONTINUANCE DWG NOS. CHANGED DUPLICATED VALVE NOS AND FILTER DP LOGIC.	BP	ML		HD		
0	MAY'08	NEW DRAWING NUMBER. REFERENCE PREVIOUS DRG NO AD1495-7002 REV1K	DCH	BP		HD		

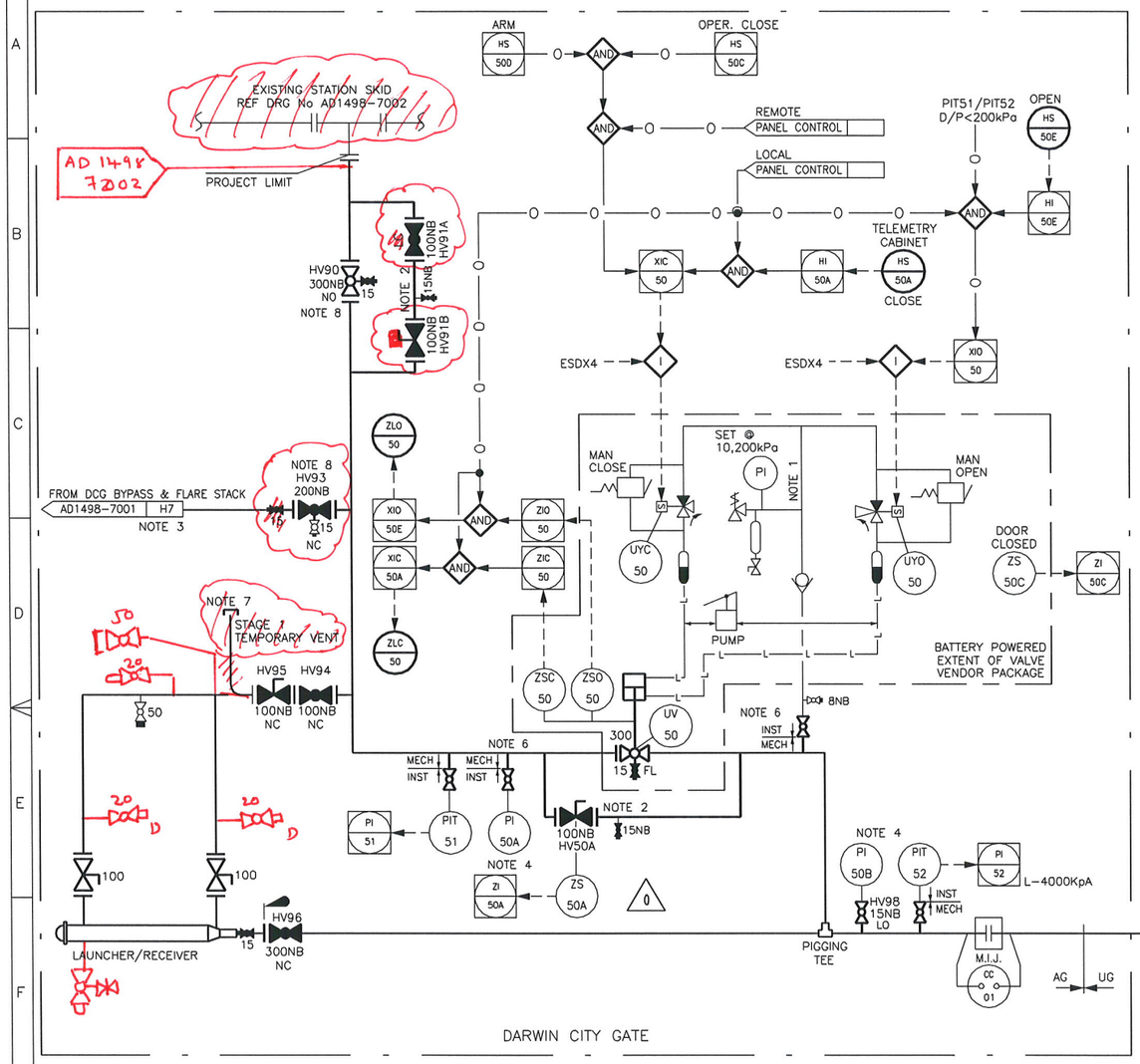
CMPS&F PTY LIMITED
ENGINEERS AND PROJECT MANAGERS
A.C.N. 000 912 630
67 ALBERT AVENUE, CHATSWOOD, NSW, AUSTRALIA 2067
TEL. (+ 61 2) 9412 9099 FAX (+ 61 2) 9412 9855

CLIENT: N.T. GAS

TITLE: AMADEUS BASIN TO DARWIN PIPELINE
DARWIN CITY GATE STATION
P & I DIAGRAM
TEMP. REGULATORS & FILTER/SEPARATORS

ORG. SIZE	SCALE	JOB No.	DRAWING No.	REV.
B1	NTS	6850-000	AD 1498-7002	2

WEDDELL INTERCONNECT



NOTES:

1. PRESSURE FLOW CONTROL VALVES :
   DESIGN INLET PRESSURE : 10.200kPa
   MIN DELIVERY TEMP : 2°C
2. START-UP RE-PRESSURISING LINE.
3. CONNECTION TO THE EXISTING DCG VENT STACK.
4. PRESSURE GAUGE TO BE VISIBLE BY OPERATOR DURING PRESSURE EQUALISATION.
5. HV55 AND HV57 HAVE MECHANICAL POSITION INDICATORS INSTALLED ABOVE GROUND.
6. SEE DRAWING S100-01-21 FOR TYPICAL PI CONNECTION TO PIPELINE.
7. ALL VENTS (EXCEPT THOSE SHOWN AS PLUGGED) HAVE LOCAL DISCHARGE, LOCATED ABOVE PERSONNEL HEIGHT AND A WATERPROOF HINGED CAP TO OPEN END.
8. OPEN HV93 BEFORE CLOSING HV90 WHEN BYPASSING DARWIN CITY GATE. CLOSE HV93 BEFORE OPENING HV90 WHEN NORMAL SUPPLY IS RESUMED.

REV	REVISION	DATE	DRN	CKD	APP	REFERENCE DRAWINGS	DRG NO.
						PRESSURE GAUGE INSTALLATION STANDARD	WP0000-8901
						WEDDELL CC P&ID	WP0001-7005
						WEDDELL METER P&ID	WP0001-7004
0	NEW DRAWING NUMBER. REF WP0000-8001 REV E,	2/10/09	BP	ML	HD	WEDDELL FILTERS P&ID	WP0001-7003
	HV50A RENAMED FROM HV50B AS PER SITE LABEL					WEDDELL MLV P&ID	WP0001-7002

R:\Drawings\Dwg Sheet Information\Logos\apa_group.jpg

SHEET NO.	SCALE	N.T.S	PROJECT
LEVEL DATUM	FILE	WP0000-7001	TITLE: WICKHAM POINT PIPELINE DARWIN CITY GATE P&ID
FIELD BOOK	DATE	19 APRIL 2007	
	DRAWN	J.S.	
	CHECKED	FRF	
DESIGN ENGINEER	APPROVING ENGINEER	PROJECT NO.	DRAWING NO. / REV
D Little	C Bonar	861	WP0000-7001 / 0

DARWIN CITY GATE TELEMETRY

FROM V43

AD1498-7002

~~DR1495-7002~~

SET @ 770kPa

PSV 44

F

PCV44A SET @ 700kPa

PCV44B SET @ 300kPa

PSH 44

SV044

SV044

V44 100

V45 50

100 NB

100/50

50 NB

10000 kPa INLET MAX.
5000 kPa INLET MIN.

FROM D.C.G. FILTER/ SEPARATOR

AD1498-7002

~~DR1495-7002~~

SKID

8

50 V201

PI 001 0 - 10000 kPa

15 V001

15 NB TUBE INSULATION

SP = 1000 kPa

SP = 850 kPa

PCV 201

PCV 202

6 V209

0 - 10000 kPa

SP = 4400 kPa

PI 201

LP SW

15 V204

15 V205

15 V206

8

15

50 NB

50 NB

AFV 201

PASSIVE MONITOR

AFV 202

ACTIVE REGULATOR

50x80

M

FLEXIBLE 6mm

M215

0 - 6000 kPa

PI 202

15 V207

15 V208

TT201 15

80x100

100 NB

100 V210

PI 002

0 - 6000 kPa

40 V306

50

15

15 V305

25 NB

25 V304

150 V302

200 NB. SCRAPER LAUNCHER

150 NB

200 SL301

50 V303

100 V301

50 NB

SURGE DIVERTER

IJ

50

TO BERRIMAH RD

1200 kPa OUTLET

POTENTIAL EQUALIZATION CLAMP

STANDBY RUN

MAOP = 10000 kPa
ANSI 600 LB

MAOP = 5000 kPa
ANSI 300 LB

EQUIMETER
TURBO METER
C/W MERCOREC
ELECTRONIC CORRECTOR

AMCO AFV
RESTRICTED CAGE
STANDARD MANIFOLD BLOCK
02 600 B7 CS174

AMCO
ZSC-320-100
C/W 3/32" ORIFICE
1050 TO 4100 kPa RANGE

AMCO AFV
RESTRICTED CAGE
STANDARD MANIFOLD BLOCK
02 600 B7 CS174

AMCO
ZSC-320-100
C/W 3/32" ORIFICE
1050 TO 4100 kPa RANGE

PI 001 0 - 10000 kPa

15 V001

15 NB TUBE INSULATION

SP = 1000 kPa

SP = 900 kPa

PCV 101

PCV 102

TO TELEMETRY

0 - 10000 kPa

SP = 4400 kPa

PI 101

LP SW

15 V104

15 V105

15 V106

8

15

50 NB

50 NB

AFV 101

PASSIVE MONITOR

AFV 102

ACTIVE REGULATOR

50x80

TURBINE METER

80x50

50x50 & 50x100

0 - 6000 kPa

PI 102

15 V107

15 V108

TT

100 NB

100 V110

PI 002

0 - 6000 kPa

PT 001

15 V003

SP = 1200 kPa

HP SW 1

15 V004

15 V111

15

DUTY RUN

MAOP = 10000 kPa
ANSI 600 LB

MAOP = 5000 kPa × SEE NOTE 1×
ANSI 300 LB

NOTES

1. MAXIMUM OPERATING INLET PRESSURE = 8000 kPa
2. MINIMUM OPERATING INLET PRESSURE = 5000 kPa
3. OUTLET MAIN MAOP = 1200 kPa
4. MAXIMUM DESIGN CAPACITY = 11000 scmh
5. STATION OUTLET PIPING MAOP = 5000 kPa
6. STATION INLET PIPING MAOP = 10000 kPa
7. STATION MAXIMUM OUTLET PRESSURE = 1200 kPa

REFERENCE DRAWINGS

(ORIGINAL NUMBER)

G.A. OF SKID MOUNTED PIPEWORK ---------RET 6013 (B1-466-074)
SPOOL DETAILS OF SKID MOUNTED PIPEWORK-- RET 6002 (A1-466-075)
SKID DETAILS ---------- RET 6014 (B1-466-076)
SMALL BORE PIPEWORK ---------- RET 6015 (B1-466-077)
MECHANICAL SITE LAYOUT ---------- RET 6016 (B1-466-078)
SPOOL DETAILS FOR SITE LAYOUT -------- RET 6007 (A1-466-079)

REV	PARTICULARS	CHKD	DATE	CAD	APPR
0	NEW DRAWING NUMBER. REFERENCE PREVIOUS DRAWING NO RET 7000 REV 9	BP	OCT'97	DEH	HD

TPOTS (TRUNK PACKAGE OFFTAKE STATION)
DARWIN CITY GATE.
P & I DIAGRAM.

AGIG

PROJECT No.	APPROVED	ENGINEER	CHECKED	DRAWN	DATE	SCALE
4466-03		SLG		RW	08-11-1994	-

DRAWING No. DB0000-7000 REV. 0

2 Hazardous Area Classification Report

This section contains the hazardous area classification report written for the Amadeus Basin to Darwin pipeline facilities.

APA Group

FYFE Earth Partners
ENVIRONMENT DEVELOPMENT RESOURCES

AMADEUS BASIN TO DARWIN PIPELINE
HAZARDOUS AREA CLASSIFICATION



FYFE REFERENCE: 18756-4-HAD-001

APA REFERENCE: HAD DATA REPOSITORY/ADP_XXXX_SECTION_2

Prepared by: _____ Date: 26-Sep-2011
Tony Bird
Principal Process Engineer - Fyfe

Reviewed by: _____ Date: 26-Sep-2011
Rowan Kilsby
Manager, Mechanical Engineering - Fyfe

Client Accepted: _____ Date:
Anthony Comerford
Pipeline Engineer – APA Group

Manager: _____ Date:
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TABLE OF CONTENTS

Revision History:

Rev.	Status	Date	Prepared	Reviewed	QA
A	Preliminary Issue	30/08/2010	YZW	TCB	
B	Revised to Incorporate Information from 2011 Site Inspection	24/08/2011	TCB	RDK	
C	Revised to Incorporate Comments from Client	19/09/2011	TCB	RDK	
D	Revised to following Part 3 and Part 4 site inspections	26/09/2011	TCB	RDK	

2.1 INTRODUCTION

2.1.1 OBJECTIVE

The hazardous area classification covers the above ground gas regulating and metering stations, scraper stations and mainline valves in the Northern Territory Gas Network.

The pipeline and facilities were originally constructed in 1985 with the additional facilities added to supply new users and supply points. No hazardous area documentation was completed at the time of the construction as there were no Australian Standards for hazardous area classification in 1985. The selection, installation and maintenance of electrical equipment were covered by AS 1076 series (1977).

This report documents the results of a Hazardous Area Classification undertaken for the facilities mentioned in Section 2.4.

The interpretation and application of this classification should take into account that Hazardous Area Classifications are inherently “imprecise” and involve assumption based estimates, code interpretation and engineering judgement.

2.1.2 SCOPE OF STATIONS

The scope of stations covered by this hazardous area classification is shown below:

Station	Description	KP
Palm Valley	Meter station	0000
Palm Valley Alice Springs	Meter Station	0000
Mereenie	Meter Station	0000*
Tylers Pass	Transfer Station	0045
Tanami Road	Scraper Station	0161
Aileron	Mainline valve	0241
Ti Tree	Scraper Station	0316
Barrow Creek	Mainline valve	0401
Wauchope	Scraper Station	0458
Kelly Well	Mainline valve	0546
Tennant Creek	Meter Station	
Warrego	Scraper Station ONLY	0610
Morphett Creek	Mainline valve	0660
Renner Springs	Scraper Station	0733
Fergusson	Mainline valve	0791
Elliot Meter Station	Meter Station	
Daly Waters	Meter Station	0982
Newcastle Waters	Scraper Station	0844
Katherine Offtake	Scraper Station	0000**
Katherine	Meter Station	0005**
Larrimah	Mainline valve	1053
Mataranka	Scraper Station	1108
Tindal	Mainline valve	1209
Helling	Scraper Station	1243
Pine Creek	Meter Station	1317
Ban Ban Springs	Scraper Station	1378
Batchelor	Mainline valve	1441
Acacia	Mainline valve	1465
Berry Springs	Mainline valve	1486
Darwin City Gate	Meter Station	1498
Channel Island	Meter Station	1510

* On Mereenie to Tylers Pass Pipeline

** On ADP to Katherine Pipeline

2.1.3 EXCLUSIONS

The following stations are excluded from this hazardous area classification

- Alice Springs facilities (owned and operated by Envestra),
- McArthur River Mine pipeline lateral facilities,
- Warrego compression facilities (scraper facilities are included),
- Tenant Creek offtake,
- Katherine offtake,
- Helling scraper station training pipework,
- Cosmo Howley facilities,
- Mt Todd facilities,
- Weddell facilities,
- Mataranka meter station.

The hazardous area classification does not consider the hazardous area associated with equipment not included in the pipeline licence, e.g. gas plants at Mereenie and Palm Valley, and the gas reticulation facilities at Darwin.

2.1.4 REVISION HISTORY

2.1.4.1 Revision A

The hazardous area classification was raised and issued following the inspection of four sites on the Amadeus Basin to Darwin Pipeline in 2010, as listed below:

- Darwin City Gate Station
- Channel Island Station
- Helling Scraper Station
- Pine Creek Station

2.1.4.2 Revision B

Further inspection of sites was undertaken in August 2011 and the hazardous area classification updated to incorporate sources of hazardous release from the equipment at these sites. The additional sites inspected were:

- Mereenie Station
- Palm Valley Meter Station
- Palm Valley Interconnect / Alice Springs Meter Station
- Tylers Pass Station
- Tanami Road Scraper Station
- Aileron Valve Site
- Ti Tree Scraper Station

2.1.4.3 Revision C

The hazardous area classification updated to incorporate comments and recommendations from APA.

2.1.4.4 Revision D

Further inspection of sites was undertaken in September 2011 and the hazardous area classification updated to incorporate sources of hazardous release from the equipment at these sites. The additional sites inspected were:

- Katherine Meter Station
- Mataranka Scraper Station
- Ban Ban Springs Scraper Station
- Batchelor Valve Site
- Berry Springs Valve Site

2.2 METHODOLOGY

This Hazardous Area Classification has been carried out in accordance with the “source-by-source” guidance taken from AS/NZS 60079.10.1 (Standards Association of Australia and New Zealand), in association with IP Code Part 15 (Institute of Petroleum – UK) and API RP 505 (American Petroleum Institute – USA).

The potential leaks that can be anticipated in both normal and abnormal operations have been considered, such as the failure of a valve gland and the partial failure of a gasket flange. The application of explosion proof (Ex) equipment will make sure that ignition does not take place. The classification does not allow for catastrophic failure of pipework or equipment where the associated mechanical effects are almost certain to cause ignition.

The extent of Zone 0, 1 and 2 areas has been identified by investigating each relevant source or type of source.

Due to the imprecision inherent in hazardous area classification, the designation of small non-hazardous area within larger hazard areas has been avoided.

Natural boundaries have been used to define zone limits where reasonably practical. In some cases, where believed adequate, this has reduced the assigned area to some extent. In other cases, where there is no economic disadvantage, the zone areas have been extended to simplify their arrangement.

The equipment and pipework in the stations are installed in open outdoor (all sides of the compounds are open and the stations are not installed in natural depressions), therefore they are considered adequately ventilated. This classification assumes that all stations on the ADP covered by this report are well maintained at all times.

2.3 REFERENCES

2.3.1 AUSTRALIAN STANDARDS

AS/NZS 60079.10.1:2009	Explosive atmospheres Part 10.1: Classification of areas – Explosive gas atmospheres (IEC 60079-10-1, Ed.1.0(2008) MOD)
AS/NZS 60079.20:2000	Electrical apparatus for explosive gas atmospheres Part 20: Data for flammable gases and vapours, relating to the use of electrical apparatus

2.3.2 INTERNATIONAL STANDARDS

IP 15 Third Edition, 2005	Model code of safe practice Part 15: Area classification code for installations handling flammable fluids
API RP 505 First Edition, 1997	Classification of locations for electrical installations at petroleum facilities classified as Class I, Zone 0, Zone 1, and Zone 2

2.4 PROCESS DESCRIPTION AND OPERATIONS

2.4.1 PROCESS DESCRIPTION

2.4.1.1 Overview

The Amadeus Darwin Pipeline (ADP) was constructed to deliver gas from the Palm Valley and Mereenie gas plants in the south of the Northern Territory to Darwin in the north of the territory. Several offtakes have been added to supply users along the length of the pipeline. The pipeline is approximately 1,513 km long.

Currently, the majority of the gas is supplied to the ADP from Wadeye via the Bonaparte pipeline. The Bonaparte pipeline connects in to the ADP at Ban Ban Springs.

Typically drains and vents in the facilities are fitted with plugs or caps and therefore are not a source of release during normal operation. Drains are operated only when then the pipeline is depressured and do not require further consideration, vent points marked with BD on the P&IDs are assumed to be operated during routine operation and maintenance of the station and require consideration as a source of release.

2.4.1.2 Mereenie

Gas to the Mereenie station comes from the Santos operated Mereenie gas plant. Currently there is no contract for the supply of gas from Mereenie, however the station remains pressurised and can be returned to operation if required.

The station consists of DN 200 above ground connection to the Mereenie gas plant. Close to the connection point are temperature and pressure transmitters and high temperature and pressure trips and a station limit valve (SLV). The SLV is pneumatically actuated from instrument gas conditioned locally. The instrument gas system is provided with a local PSV that vents to atmosphere.

The gas then passes to two parallel filter separators. The filter separators are horizontal and fitted with quick opening closures to allow removal of the filter elements. The filter separators have been swapped with the filters originally installed at Palm Valley and this required some pipework modifications. The liquids removed from the gas are collected in a drain boot underneath the filter separator. The liquids are drained back to the Mereenie production facility. The filter separators are fitted with the following instrumentation; pressure indicator, differential pressure transmitter, level glasses, high level switches and a PSV.

From each filter separator the gas flows to a meter run. The flow meters are orifice meters that are fitted with flow conditioners, pressure transmitter, a low range and a high range differential pressure transmitter and a temperature transmitter. A blowdown point is provided on each meter run that can blow down the meter run and filter separator.

The pipework downstream of each meter run joins to a common line. There is a DN 20 blowdown point and an insertion sample probe installed to provide gas samples for the gas chromatograph and dew point analyser.

The gas then passes underground through a manual station limit valve to the Mereenie to Tylers Pass pipeline. There is a scraper launcher installed with quick opening closure, pressure indicator, blow down vent and associated valving for the launching of pigs.

2.4.1.3 Palm Valley

The Palm Valley metering station receives gas from the Magellan Petroleum operated Palm Valley gas plant.

The station consists of DN 300 above ground connection to the Palm Valley gas plant. Close to the connection point are temperature and pressure transmitters and high value trips and a station limit valve (SLV). The SLV is pneumatically actuated from instrument gas conditioned locally. The instrument gas system is provided with a local PSV that vents to atmosphere.

The gas then passes to two parallel filter separators. The filter separators are horizontal and fitted with quick opening closures to allow removal of the filter elements. The filter separators have been swapped with the filters originally installed at Mereenie; the filters are installed in the same location and have required minimal pipework modifications. The liquids removed from the gas are collected in a drain boot underneath the filter separator. Liquids are removed to temporary containers. The filter separators are fitted with the following instrumentation; pressure indicator, differential pressure transmitter, level glasses, high level switches and a PSV.

From each filter separator the gas passes to a meter run. The flow meters are orifice meters that are fitted with flow conditioners, pressure transmitter, a low range and a high range differential pressure transmitter and a temperature transmitter. A blowdown point is provided on each meter run that can blow down the meter run and filter separator.

The pipework downstream of each meter run joins to a common line. There is a DN 20 blowdown point and an insertion sample probe installed to provide gas samples for the gas chromatograph and dew point analyser.

The gas then passes underground through a manual station limit valve to the Palm Valley to Tylers Pass pipeline. The underground section of pipe is fitted with a blowdown point. A connection point and additional valve has been installed on the blowdown stack to provide gas to the Palm Valley to Alice Springs station. The connection point for the gas analyser has been relocated to this section of pipework to allow measurement of the gas that passes from the Amadeus Darwin Pipeline to the Alice Springs Pipeline. The pipework to the Palm Valley to Alice Springs Pipeline passes underground to a point adjacent to the Palm Valley to Alice Springs compound. There is a flanged connection to the compound fence line.

There is a scraper launcher installed with quick opening closure, pressure indicator, blow down vent and associated valving for the launching of pigs to the ADP.

2.4.1.4 Palm Valley Alice Springs

The Palm Valley Alice Springs site, also referred to as the Palm Valley Interconnect receives gas from either the Magellan operated Palm Valley gas plant or from the ADP via the Palm Valley metering station.

The gas supply from the ADP is fed to a skid. The skid has recently been modified by APA, although no information is available. From the existing P&IDs and inspection; the pipe from the Palm Valley station is DN 100. The pipe decreases to DN 80 on the skid. At the inlet to the skid there is a pressure transmitter and indicator. The gas passes to a flow meter with pressure and temperature correction. Isolation valves and a manual bypass are provided. The skid is supplied with two pressure control valves, the main one is electro-pneumatic and the stand-by one is pneumatic controlled and actuated. Downstream of the control valves is an actuated valve fitted with pressure pilots and solenoids. The instrument gas for the control valves is conditioned from the transmission gas. The instrument gas is fitted with dual pressure regulators, knock out pot, filter, a PSV and high and low pressure pilots that close the actuated valve. The vents from all two valve instrument manifolds are tubed to a location at the edge of the skid roof.

The line from the Palm Valley gas plant is DN 100 which increases to DN 200. The gas then passes to a restriction orifice (RO). Upstream of the RO is the DN 50 kicker line connection to the scraper launcher. Downstream of the RO is the connection from the ADP. Next there is a station limit valve (SLV) that isolates Palm Valley to Alice Springs pipeline from both gas feeds. The SLV is pneumatically actuated from instrument gas conditioned locally and closes when a low pressure is sensed in the pipeline.

The scraper launcher is fitted with a quick opening closure, a pressure indicator, pressure relief valve and valves to allow operation.

Parallel to the scraper launcher is a wall. The wall is 1.8 m away from the centre line of the scraper launcher. The impact of the wall on the hazardous zones will be to extend the size of the hazardous area zone (refer section 2.7.11).

2.4.1.5 Tylers Pass

At Tylers Pass the gas from Mereenie and Palm Valley are commingled and odorant is added. The DN 250 pipeline from Mereenie passes to an above ground scraper receiver, fitted with pig sig, vent, pressure indicator, quick opening closure and valving to allow operation. During normal operation the gas bypasses the scraper vessel via underground pipework. A pipeline riser is fitted with pressure transmitter, pressure indicator and high pressure trip. Downstream, there is a buried valve with above ground pneumatic actuator. The actuator is powered by instrument gas conditioned locally from the transmission gas.

The gas from Palm Valley is similar to the Mereenie connection but does not have a scraper receiver. The pipeline is DN 350 and includes a riser with pressure transmitter and pressure indicator upstream of a buried valve with above ground pneumatic actuator. The actuator is powered by instrument gas conditioned locally from the transmission gas.

There is a DN 200 vertical blowdown stack fitted with quick opening closure. The stack has buried connections and valves to the pipeline sections to Mereenie, Palm Valley and Tanami Road, as well as the scraper receiver.

Downstream of the two actuated valves the two pipeline sections join and are fitted with a temperature transmitter, pressure transmitter, pressure indicator, instrument gas offtake and odorant injection point.

The odorant injection package consists of an odorant storage pressure vessel, instrument gas conditioning and control and odorant dosing pumps. The storage vessel is fitted with a pressure relief valve, pressure indicator, two level glasses, a level transmitter and a continuous vent fitted with adsorption vapour filter. The vent from the tank is fitted with a cap so that the discharge point is vertically downwards. The instrument gas conditioning equipment comprises two regulators to reduce the pressure to 400 kPag. The tank blanket instrument gas is regulated to 15 kPag by a pressure regulator / over pressure shut off (OPSO) valve. The injection pump instrument gas is regulated to 400 kPag by a regulator. Control of the odorant injection pumps is by solenoid valves. The odorant dosing pumps suction is connected to the bottom of the odorant storage vessel. The discharge of each odorant dosing pump is fitted with a flow switch and pressure relief valve. The odorant injection point is fitted with an averaging chamber and a site flow indicator.

Note that there is no gas supply from Mereenie or Palm Valley and the gas flow through Tylers Pass is in the reverse direction. At the time of inspection the odorant plant was not operating.

2.4.1.6 Katherine Offtake

The Katherine Offtake is installed on the ADP at approximately KP 1,221. The site consists of a take-off from the mainline. The offtake is fitted with a DN 100 buried valve. The valve is manual operated and has above ground gear box, maintenance ports and cavity bleed. The valve has DN 50 risers either side of the valve fitted with manual valves. A scraper launcher is installed at the site. The scraper vessel is fitted with pressure indicator, PSV and local vent. An above ground DN 100 valve with DN 50 bypass is also provided at the station. The valve may be a plug valve, a ball valve or a globe valve in accordance with the P&ID, details drawing or site photographs respectively.

2.4.1.7 Katherine Meter / Regulating Station

The Katherine Meter/Regulating Station includes two filter separator, two water bath heaters, a slop tank, a main line valve, control valves, pressure relief valves and the related pipework and valving.

The inlet to the station is DN 100 and consists of a buried station limit valve (MLV 11) with above ground actuator, maintenance ports and cavity bleed. A scraper receiver vessel is installed in parallel to MLV 11. The scraper vessel is fitted with local vent, PSV, pressure indicator and associated pipework and valving. The closure on the vessel is a blind flange.

The following instrumentation is installed at the inlet; pressure indicator, a pressure transmitter and a temperature indicator.

The gas then passes through two parallel filter separators. Upstream of both filter separators are temperature control valves that reduce the pressure to 4,400 kPag / 16°C [based on operating conditions at the site visit]. The temperature control valves are provided with cascade control for pressure and temperature. One valve is fitted with a pneumatic controller to continue supply during outage of the electronic control system. The filter separators are fitted with differential pressure transmitter, pressure indicator, high liquid level switches and high-high liquid level switches. The liquids are drained manually to an elevated slops tank. The slop tank is fitted with a liquid level glass and a hose to allow emptying. Gas from filter separators is then heated by indirect fired water bath heaters up to approximately 60 °C. The water bath heaters are operated as duty - standby, with the standby heater remaining "hot" to allow quick change over of the that is controlled by actuated valves on the inlet to each heater.

The heated gases from heaters pass through two parallel regulator / meter runs. The regulator / meter runs are operated in duty - standby and each contains active - monitor pressure regulators. The meter skids are provided with two actuated valves that close on high pressure downstream of the regulators. Additional high pressure switches at the station outlet provide a station ESD. Further over pressure protection is provided by a PSV at the station outlet. A meter is provided in each run. The meters are orifice meters with upstream flow conditioners, temperature transmitters, pressure transmitters and high and low range differential pressure transmitters. Each run is provided with a local blowdown point, pressure indicators and valving.

The station outlet is provided with a temperature indicator, temperature transmitter and low temperature switches. There is also provision for the installation of a future gas sampler. The connection to the Katherine power generation site is DN 100.

Instrument gas is conditioned locally for each actuated valve and temperature control valve. Gas is conditioned at each water bath heater to provide fuel gas for the pilot and main burners. The fuel gas conditioning trains comprise of pre-heat coil, strainer, primary pressure regulating valve, actuated ESD valves, secondary pressure regulating valve, meter and temperature control valve.

The gas released in emergency directs to the vent stack that discharges to atmosphere and the liquid removed from the gas flows to the slop tank. The maximum PSV set point is 3,200 kPag and the temperature limit is set at 60 °C in the station.

A control system provides control and telemetry for the various process measurement parameters. The control system provides flow control and high pressure automatic shutdown functionality and allows remote operator shutdown. The control system is powered by single phase 230 VAC power supply, with back up batteries.

2.4.1.8 Pine Creek

The Pine Creek pressure reduction and metering station receives gas from ADP to supply the Pine Creek power generation site. The Pine Creek Station comprises of a dry gas filter vessel, a filter separator, a knockout pot, two water bath heaters, an atmospheric slop tank, control valves, pressure relief valves, and the related pipework instrumentation and valving.

The Pine Creek station is located close to the ADP and a mainline valve is located within the station. The inlet connection to the station has two DN 80 manual valves. One valve is fitted with a insulation flange and a surge arrestor, the second is fitted with a pressurising bypass. Downstream of the manual valves is an actuated valve that is also fitted with a pressurising bypass. The gas then passes to a dry filter vessel that is fitted with a pressure indicator, PSV, a vent valve, pressurising line and a bypass line to allow maintenance of the filter. From the filter, the gas passes to a duty standby temperature control valve that drops the gas pressure from 7,800 to 4,200 kPag and a temperature of 16°C [based on observations during the site visit]. The gas then passes to a filter separator that is fitted with level gauge, level controller, level control valve, high level switch, pressure indicator, PSV, vent valve and differential pressure transmitter. In parallel to the filter separator is a knock out pot to allow maintenance on the filter separator. The knock out pot is fitted with level gauge, pressure indicator, PSV, vent valve and drain valve.

Gas from filter separator / knock out pot is then heated by indirect fired water bath heaters up to approximately 60 °C. The water bath heaters are operated as duty - standby, with the standby heater remaining "hot" to allow quick change over of the that is controlled by actuated valves on the inlet to each heater.

The heated gas then passes to parallel pressure control valves. The valves are operated as duty and standby. The valves are pneumatically controlled. Over pressure protection is provided by a PSV downstream of the pressure control valves. Gas metering is by a single orifice meter fitted with a pressure transmitter; high and low range differential pressure transmitters and a temperature transmitter. A bypass is provided around the meter for maintenance.

Metered gas then passes to a second knock out pot fitted with a drain valve, PSV and level gauge. The piping from the knock out pot contains a temperature transmitter, temperature indicator, high pressure switches and a pressure transmitter. A double block and bleed valving arrangement is provided. The connection to the Pine Creek power generation site is via an underground pipework and the above ground flange is provided with an insulation gasket. A spare flange is provided at the connection point for a future connection to the Pine Creek power generation site, the flange is fitted with a blind flange, insulation gasket and a surge arrestor.

Liquids collected from the dry filter, filter separator and knock out pots is sent to an elevated slops tank. The slops tank is fitted with a safety relief valve (SRV, pressure vacuum vent valve, flame arrestor, pressure indicator, high liquid level switch and hose for emptying.

Vents and PSV discharges from the dry filter, filter separator and knock out pots and vents from instrument manifolds and pneumatic controllers are sent to a local vent stack. The vent stack is fitted with a flame arrestor.

Instrument gas is conditioned centrally for the site from a connection from the outlet knock out pot.

Gas is conditioned at each water bath heater to provide fuel gas for the pilot and main burners. The fuel gas conditioning trains comprise of pre-heat coil, strainer, primary pressure regulating valve, actuated ESD valves, secondary pressure regulating valve, meter and temperature control valve. A control system provides control and telemetry for the various process measurement parameters. The control system provides flow control and high pressure automatic shutdown functionality and allows remote operator shutdown. The control system is powered by single phase 230 VAC power supply, with back up batteries.

2.4.1.9 Darwin City Gate

Darwin City Gate receives gas from the ADP. Gas flows to three locations, Wickham Point, Channel Island and Trunk Package Offtake Station (TPOTS). The Wickham Point (Corroco Philips, Darwin LNG plant) pipeline can be reversed to ensure gas supply to Darwin/Channel Island. The gas supply to Wickham point is fitted with an actuated valve. The gas supply to Channel Island and TPOTS is filtered, reduced in pressure to 5800 kPag and the gas composition and moisture dew point is analysed. The gas to TPOTS is regulated to a 850 kpag and metered.

The Darwin City Gate Station comprises of scraper vessels, a multicyclone, two filter separators, an atmospheric slop tank, gas chromatograph system, moisture analyser, control valves, pressure regulator, pressure relief valves, blowdown stack and the related pipework. Liquids (condensate, water and compressor lube oil) removed from the gas is stored in the slop tank for batch treatment.

The station consists of DN 300 above ground connection. A scraper receiver is installed with buried hydraulically actuated valve. The actuated valve includes electric solenoids to allow remote operation. During normal operation gas bypasses the scrapers and flows through the actuated valve, the scraper vessels are closed and isolated from the pipeline. At the station inlet, the pipeline divides in two, with one supplying gas to Weddell interconnect and one supplying to the City Gate station. The main line is installed with DN20 blowdown, temperature transmitter and pressure transmitter. The line then divides in to two, the normal flow is through the multi-cyclone to remove solids. The multicyclone is fitted with a PSV with a set point of 9,650 kPag. Both parallel streams include a temperature control valve and a filter separator. The filter separators are horizontal and fitted with quick opening closures to allow removal of the filter elements. The liquids removed from the gas are collected in a drain boot underneath the filter separator and flow under level control to a slop tank. The filter separators are fitted with the following instrumentation and connections; pressure indicator, differential pressure transmitter, level glasses, high level switches, high high level switches, local drains and level controllers. The temperature and level control valves are pneumatically controlled and actuated. Local instrument gas conditioning skid is provided with PSV to provide over pressure protection.

Common line of the outlet from the filter separators is installed with temperature indicators, temperature transmitter, pressure indicators, and pressure transmitters. The connection point for the gas chromatograph and dew point analyser has been installed to this section of pipework to allow analysis of the gas. The gas chromatograph and dew point analyser are installed in a shelter adjacent to the filter skid. The chromatograph receives a sample of the transmission gas at a pressure of approximately 140 kPag from an insertion regulator installed in the pipe. The carrier and calibration gases are stored in gas bottles and regulated for use at 140 kPag. The chromatograph vents gas to exhaust vents above the analyser shelter roof. The mainline then passes through a mainline valve. Downstream of the mainline valve is installed with pressure indicator and transmitter before the pipeline directed to Channel Island meter station.

A separate offtake to TPOTS passes gas to a DN 50 pressure regulation and metering skid. The skid has duty and standby arrangement with each containing active and monitor pressure regulators and turbine meters. A high pressure trip is provided that closes an actuated valve at the inlet. The meter runs, with one serving as duty run and other as standby run. The gas is then directed to Berrimah Road.

A control system provides measurement and telemetry for the various process instruments. The control system allows remote operator shutdown. The control system is powered by single phase 230 VAC power supply, with back up batteries.

2.4.1.10 Channel Island

Channel Island regulating and metering station receives gas from Darwin City Gate meter station. The Channel Island Regulating Meter Station consists of two water bath heaters, solids filter, four filter separators, slam shut valves, active and monitor regulators, meters, pressure relief valves, local vent points and the associated valving and pipework.

The gas passes to a solids filter. The filter is fitted with a pressure indicator, differential pressure transmitter, local vent point and local drain. The filter has a quick opening closure and a bypass, with manual valving. The filtered gas is then heated to approximately 60°C in two parallel water bath heaters. One water bath heater is operating and the other is in hot-standby. Actuated valves at the heater inlets control the gas flow.

The combined outlet line from the water heaters as a high temperature switch, temperature indicator and temperature transmitter. The line then passes to one of two filter, regulation and metering runs to supply gas to either Unit 1 or Unit 7 at the Channel Island Power Generation Site.

The Unit 1filter, regulation and metering run comprises of two parallel runs each containing actuated valve, active-monitor pressure regulators, filter separators and meters. The actuated valves are both normally open and are closed on either signal from the control system or high pressure downstream of the regulators. The pressure regulators are self acting and externally sensed. The gas of each regulator pair flows to the corresponding filter separator. The filter separators are horizontal and fitted with quick opening closures to allow removal of the filter elements. The liquids removed from the gas are collected in a drain boot underneath the filter separator. No slops tank is installed at site at liquids are drained from the filter separators manually. The filter separators are fitted with the following instrumentation and connections; pressure indicator, differential pressure transmitter, level glasses, high-high level switches, local drains and level controllers. The filtered gas is metered in orifice meters, each meter is fitted with flow conditioner, pressure transmitter, high and low range differential pressure transmitters and temperature transmitters. Additional overpressure protection is provided by a PSV. The combined outlet from the Unit 1 regulation, filter and metering runs is fitted with low pressure switch and high pressure switches that all initiate an ESD, and a pressure transmitter, pressure indicator, temperature transmitter, temperature indicator, low temperature switch connection for future gas analysis and an isolation valve.

The Unit 7 filter, regulation and metering run comprises of two parallel runs each consisting of filter separator, pressure regulators, metering and associated instrumentation and valving. There is an actuated valve at the inlet before a split to two filters. The filters are fitted with pressure indicator and differential pressure transmitter. Downstream of each filter is an actuated valve. The valves are normally open and are closed on signal from the control system or high pressure downstream of the pressure regulators. Metering is provided by a Coriolis meter and a AVT turbine meter. The primary duty meter is the Coriolis meter, but the turbine meter can be operated in series or parallel. Both meters are provided with temperature and pressure correction. Downstream of the meters the combined outlet has a PSV, local manual vent, temperature transmitter and pressure transmitter.

Instrument gas is conditioned locally for each actuated valve

A control system provides measurement and telemetry for the various process instruments. The control system allows remote operator shutdown. The control system is powered by single phase 230 VAC power supply, with back up batteries.

2.4.1.11 Scraper Stations

The scraper stations are provided along the length of the pipeline to allow cleaning and inspection of the pipeline. The scrapers stations are installed at Tanami Road, Ti Tree, Wauchope, Renner Springs, Newcastle Water, Helling and Ban Ban Springs. Additionally scraper vessels are included at some of the stations along the pipeline. A scraper receiver and launcher are installed at each site along with a buried hydraulically actuated valve. The actuated valve includes electric solenoids to allow remote operation. During normal operation gas bypasses the scrapers and flows through the actuated valve, the scraper vessels are closed, isolated from the pipeline and depressured.

The pipeline is provided with buried isolation valves. A pressure transmitter and indicator are installed on a pipe riser either side of the actuated valve. A temperature transmitter is installed downstream of the actuated valve.

The scraper vessels are fitted with quick opening closures, a DN 25 local vent, a pressure gauge and connections with valves to allow operation. The vessels also include connections for pressure relief valves that have been removed on some / all scraper vessels. Pig passage indicators are installed on the pipeline and scraper vessels.

There is also a pipeline vent installed at the site within a separate compound. During normal operation the vent is closed with a quick opening closure.

The scraper station at Ban Ban Springs also includes an off take connection to Cosmo-Howley and a supply connection from the Wadeye pipeline. The off take to Cosmo Howley is a blind flange on a pipeline riser. The pipeline is decommissioned and the meter station has been removed. The connection from the Wadeye pipeline is underground pipework from the Ban Ban Springs meter station. The pipeline connections is to the upstream connection for a future compressor. There is an above ground valve with bypass installed adjacent to the connection.

At the Helling scraper station there are pipework and vents that are used for training The training pipework is not connected to the station pipework during normal operation of the pipeline and the training pipework is unpressurised. No records have been provided for the training pipework and it is not included in the hazardous area classification.

2.4.1.12 Mainline Valves

There are several mainline valve sites located at Aileron, Barrow Creek, Kelly Well, Morphett Creek, Fergusson, Larrimah, Tindal, Acacia and Berry Springs. The data used for classifying the mainline valves' hazardous area is obtained solely from the Aileron site. Each of the sites is assumed to be identical and comprises of a buried valve with an above ground bypass and vent points with no instrumentation installed on the mainline valve. The buried valve has a manual actuator and gear box, injection ports and cavity bleed extended above ground. This is shown in the photograph below.

2.4.1.13 Bachelor Mainline Valve

The Batchelor mainline valve site is located at KP 1441 between Ban Ban Springs and Darwin City Gate. The Batchelor Mainline valve site is similar to other mainline valve sites but the mainline valve has an actuator, similar to the scraper stations. The mainline valve consists of a DN300 underground valve with an above ground actuator, maintenance ports and cavity bleed. The valve has an above ground DN100 bypass. Pressure transmitters are fitted either side of the valve. The site also has a control room.

2.4.2 OPERATING CONDITIONS

The maximum operating pressures and temperatures at the stations are summarised in Table 1.

Table 1 Operating pressures and temperatures

Temperature	Pressure (Process)	Pressure (Fuel gas)	Pressure (Instrument gas)
Max. (°C)	Max. (kPag)	Max. (kPag)	Max. (kPag)
60	9,650	≤ 650	770

2.4.3 VENTILATION

Each of the sites is in the open air and is considered to have good ventilation. Some equipment is installed in open-sided shelters. These are not considered to have any impact on ventilation.

2.5 PROPERTIES OF HAZARDOUS MATERIALS

2.5.1 GASES HANDLED

The gas processed through the regulating and metering stations contains mainly methane (typically 87 mol%) and nitrogen (about 8 mol%), along with small quantities of hydrocarbons (C2+) and carbon dioxide (totally < 5 mol%). The specific gravity of the gas is 0.62, which is lighter than air (SG=1.0). It is classified as a Category G(i) fluid in accordance with IP15 Section 1 (Table 1.2 – fluid categories) and as a Group IIA in accordance to AS/NZS 60079.20 section 4.6. The composition of the gas is shown in Table 2.

Note that on release from high pressure, the gas will be cooled due to Joule-Thomson cooling. At lower temperatures the gas is less dense and the dispersion in air will be slightly impacted, but the flammable range is reduced. Similarly, for higher temperatures the flammable range is increased, but the dispersion is increased. At the dilute concentrations at the lower explosive limit, the gas-air mixture temperature will be close to ambient temperature therefore, there will be no additional consideration for temperature effects.

Table 2 Gas Composition

Component	Symbol	mol%
Methane	CH_4	86.954
Ethane	C_2H_6	2.557
Propane	C_3H_8	0.829
i-Butane	C_4H_{10}	0.118
n-Butane	C_4H_{10}	0.216
i-Pentane	C_5H_{12}	0.066
n-Pentane	C_5H_{12}	0.054
n-Hexane	C_6H_{14}	0.074
n-Heptane	C_7H_{16}	0.017
n-Octane	C_8H_{18}	0.004
n-Nonane	C_9H_{20}	0.004
Carbon Dioxide	CO_2	0.936
Nitrogen	N_2	8.172
Total		**100**
Specific Gravity (mixture)		**0.62**

The chromatograph used for gas composition analysis requires carrier and calibration gases. The carrier gas (helium) is not flammable, while the calibration gas (mainly methane) is classified as a Category G(i) fluid with similar compositions as process gas.

2.5.2 LIQUIDS HANDLED

2.5.2.1 Filter Separator Drains

The liquids handled at the facilities may consists of condensate, compressor lubrication oil or water, which is removed from the gas by the filter separators. The condensate is considered to be flammable liquid and based on hexane is considered to be a group IIA liquid in accordance to AS/NZS 60079.20. The compressor lube oil used in the stations is combustible, but not flammable, with a typical flash point (closed cup) over 60 °C. Therefore, it is treated as a non-hazardous material for the purpose of the hazardous area classification. Water is considered to be non-hazardous liquid.

2.5.2.2 Odorant

Odorant is injected into the pipeline at Tylers Pass. The odorant is SpotLeak 1005 and is a flammable liquid. It consists of Thiophene, Propanethiol and methyl as per the product specification. The odorant is classified as group IIA in accordance to AS/NZS 60079.20 and category C fluid in accordance with IP15 Section 1 (Table 1.2 – fluid categories).

2.6 EQUIPMENT SELECTION

The general requirements for selection, installation and maintenance of explosion proof (Ex) electrical equipment are described in AS/NZS 2381.1:2005.

To ensure the Ex electrical equipment performs satisfactorily, without the risk of ignition, the data shown in Table 3 must be used as area specification requirements.

Table 3 Gas Group and Temperature Class

Performance Criterion	Requirement	Reference
Ambient temperature	0 - 50 °C	Bureau of Meteorology
Auto-ignition temperature (Methane)	537 °C	AS/NZS 60079.20
Apparatus Group	IIA	AS/NZS 60079.20
Temperature Class	T1 / T3	AS/NZS 60079.20

The recommendations on equipment group and temperature class should be regarded as ***minimum*** requirements. Equipment selection must take into account local conditions, such as the presence of hot surfaces close by and electrical equipment design.

2.7 CLASSIFICATION

2.7.1 PIPING

2.7.1.1 Process Piping

Welded piping at the stations is designed and constructed to ANSI/ASME B 31.3 and is not considered as a source of release. However, the possible release of flammable material occurs at flanges, valves and fittings due to the possible leakage from a gasket or seal. A majority of process gas service pipework installed in the stations is flanged. The screwed connections are limited to the small bore piping with a nominal size less than DN25. The screwed piping has tapered threads with similar leakage integrity to the flanged connections. The piping in the facilities is a permanent fixture and not subject to vibration.

All flanges and infrequently used valves are considered to be well maintained and located in an adequately ventilated area in the gas regulating and metering stations. Leakage of the flammable material at connection points is considered abnormal and the quantity of the hazardous material released is considered minor. Consequently, they are regarded as sources of *Secondary* grade release and a hazardous Zone 2 within a sphere area with 2 m radius from the potential leakage points is claimed around the piping with flanges or threaded joints, meters or regulators and valves other than relief valve in accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.4 for high pressure gas transmission system.

As a worst case the liquid piping is assumed to carry condensate which is a flammable liquid in accordance with AS/AZS 60079.10.1 clause ZA 5.2.8 that claims a hazardous area of Zone 2 of 1.5m in all directions of potential release points. However the liquid drain lines may contain sufficient quantities of dissolved and entrained. Since this hazardous area classification must account for a number of installations with a range of process conditions, liquid piping is classified as gas piping.

All process drains and vents used infrequently for maintenance or start-ups are normally plugged. Similarly, the sample points are taken on an infrequent or as required basis (maximum once every six months). To simplify hazardous area management, the classification for process gas piping will be assigned to the uncommonly operated process drains, vents and sample points, meaning a Zone 2 area of radius 2 m is declared around those potential leakage points.

The hazard zones adopted for the process piping, flanges, joints, valves and fittings are summarised below:

Zone 2 2 m radius from the edge of the process piping routes, including infrequently used process drains, vents and sample points

2.7.1.2 Instrument Gas Piping

The instrument gas pipework is fabricated from screwed pipe and tube with compression fittings. Similar to process gas piping, the instrument gas piping has potential leakage points at connection points. The leakage is considered abnormal with minor quantities of flammable material. Hence, they are regarded as sources of *Secondary* grade release and the associated hazardous area zone will be classified as Zone 2.

According to AS/NZS 60079.10.1 Clause ZA.6.4.2.3c, for the lighter-than-air flammable gas operating with a pressure between 700 and 2,000 kPag, a hazardous Zone 2 within a sphere area with 1 m radius from the potential leakage points is assigned to the piping with flanged and screwed joints.

The hazard zone adopted for instrument gas piping is summarised below:

Zone 2 1 m radius from the edge of the instrument gas piping routes

2.7.1.3 Fuel Gas Piping

Fuel gas piping is fabricated with screwed connections, except those pipes with a nominal diameter less than DN25 and with flanges for larger diameters. The screwed piping has tapered threads with similar leakage integrity to flanged connections. The leakage is considered abnormal with the presence of minor quantities of flammable material. Hence, they are regarded as sources of *Secondary* grade release and the associated hazardous area zone will be classified as Zone 2.

According to AS/NZS 60079.10.1 Clause ZA.6.4.2.3c, for the lighter-than-air flammable gas operating with a pressure between 100 and 700 kPag, a hazardous Zone 2 within a sphere area with 0.5 m radius from the potential leakage points is declaimed around the piping with flanged and screwed connections.

The hazard zone adopted for fuel gas piping is summarised below:

Zone 2 0.5 m radius from the edge of the fuel gas piping routes

2.7.1.4 Control Valves

There are several shut down valves, pressure / temperature control valves and level control valves installed in the stations. Similar to process piping, the process connections of control and actuated valves are considered well maintained and leakage is considered abnormal. Therefore connection points are considered the same as process pining as described in Sections 2.7.1.1, 2.7.1.2 and 2.7.1.3.

In addition, the control valves are in regular use and leakage is more likely due to wear on the packing. An additional *Primary* grade of release (Zone 1) with a nominal hazard radius of 0.3 m around the glands is claimed in accordance with IP15 Section 5.4.5.1.

Control valves will release minor amounts of flammable gas with a small continuous bleed from the positioners or exhausts at a low discharge velocity in normal operation. It contributes a *Continuous* grade of release and in accordance with AS/NZS 60079.10.1 clause ZA 6.6.2.5, a Zone 1 area with a 0.5m radius will be claimed. A larger region that represents infrequent higher gas velocities that may exist surrounding the Zone 1 area due to abnormal operation or failure of the valves. A Zone 2 area within 1 m radius in all directions is assigned to the low velocity vents.

The additional hazard zones adopted for the control valves are summarised below:

Zone 1 0.5 m radius around the control valve positioners and exhausts

0.3 m radius around the control and actuated valve glands

Zone 2 1 m radius around the control valve positioners and exhausts

2.7.1.5 Pressure Relief and Safety Relief Valves

Pressure relief valves (PSVs) and safety relief valves (SRVs) are mounted on the multi-cyclone, filters, process gas piping, fuel gas and instrument pipework to provide the protection against operational overpressure for the piping and equipment.

Note that SRVs in Pine Creek Station piped to the vent stack do not contribute to the extent of the hazardous classification except as discussed under Section 2.7.1.1 for process piping.

PSVs and SRVs venting directly to atmosphere are normally treated as a *Secondary* grade of release due to no action on normal operating conditions, and as a result the associated hazard zone will be classified as Zone 2. In accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.9, a Zone 2 area is assigned within 6 m diameter cylinder with its axis on the line

of discharge from 1 m behind the points of discharge to a distance 8 m in front of the points of discharge.

The seats on the PSVs and SRVs will be metal to metal and tight shut-off, which will contribute to a small leakage at the vent tips during the normal operation. In line with the specification described in IP15 Section 5.4.4.5, a Zone 2 area of nominal 1 m radius should be placed around the end of the discharge point to account for any small leakages. It is recommended to upgrade the *Secondary* grade of release to a *Primary* grade of release accounting for the presence of the flammable material in the normal operating. Hence, an additional Zone 1 area with a nominal hazard radius of 1 m is claimed around the PSV and SRV discharge points to account for the minor leak through the valve seats.

The hazard zones of the PSVs and RSVs are considered to be the same due to lack of the discharge rates, which actually affect the extending zone of hazardous area.

The hazard zones adopted for the PSVs and RSVs are summarised below:

Zone 1 1 m radius from the vent tips

Zone 2 6 m laterally, 8 m above and 1 m below the discharge points

2.7.1.6 Mainline Valves

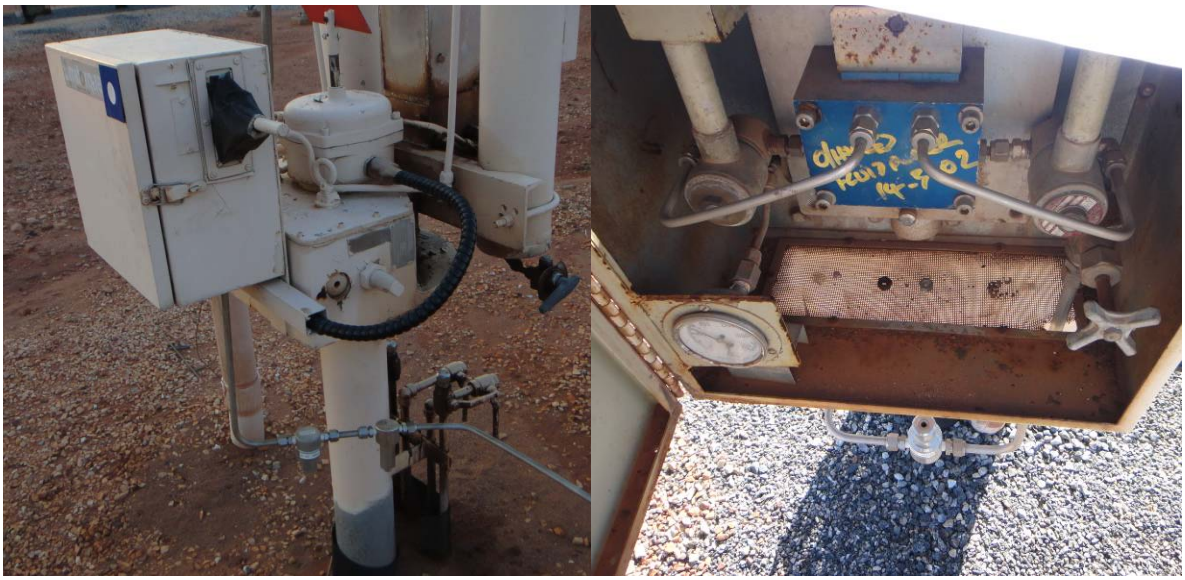
Some of the actuated mainline valves (MLV) installed at the scraper stations as shown in the following photographs include an enclosure containing the solenoids and a hand pump for the valve. The solenoids vent to a location outside of the enclosure, however the tubing connections to the solenoid are a *Secondary* source of release. The enclosure has minimal ventilation and released gas can accumulate within the enclosure. Therefore a Zone 1 hazardous area is claimed within the enclosure.

Body bleeds valves maintenance ports and instrument gas connections from the buried valve are brought above grade. These provide potential leak sources and are treated the same as process piping connections as per section 2.7.1.1.

The hazard zone adopted for the actuated valve enclosures is summarised below:

Zone 1 Within the solenoid valve enclosure

Zone 2 2m radius from point of discharge



2.7.1.7 Local Vent Point

There are several local vent points installed in the facilities to allow the purging of gas from the stations following isolation. Each manual vent generally consists of a ball valve to control blow down rate. The ball valve provides high integrity isolation and wear is not considered on the valves. Hence, no leak is taken into account during the normal operation.

The hazardous area classification for those points is considered to be the same as PSVs and RSVs due to the similar operation which happens only during the period of system depressurisation. Therefore, they are treated as a *Secondary* grade of release and a Zone 2 area within 6 m diameter cylinder with its axis on the line of discharge from 1 m behind the points of discharge to a distance 8 m in front of the points of discharge are declared in accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.9.

Note: Majority of the vents are fitted with a cap and have a hole drilled in the vent pipe.

The hazard zone adopted for the local vent points is summarised below:

Zone 2 6 m laterally, 8 m above and 1 m below the discharge points

2.7.1.8 Pine Creek Vent Stack

There is a vent stack installed in the Pine Creek Station. Gas released from the PSVs, instrument manifold vents and vented instrument gas from the pneumatic controllers is sent to the vent stack. During normal operation, there is minimal flow from the vent stack from the pneumatic controllers. The vent stack is fitted with a flame arrester that offers protection against fire and explosion from outside sources of ignition. The flame arrestor is fitted with a cover to prevent rain ingress but also acts to direct gas downwards. and will increase the diameter of the hazardous area.

The hazardous area is increased to a Zone 2 area within 12 m diameter cylinder and 6 m below the discharge point is claimed, compared with 8 m distance stated for vertical up discharge.

Furthermore, minor leakage of flammable mixture may occur through the PSV seats under normal operation as analysed in Section 2.7.1.5. As a result, it contributes to a *Primary* grade of release and an additional Zone 1 hazardous area with a nominal radius of 1 m is claimed around the vent stack discharge point to account for any small leakages from safety relief valve seats.

The continuous bleed from the pneumatic controllers also vents through the vent stack. As per Section 2.7.1.4, a 0.5 m Zone 1 hazardous area is claimed. This is within the hazardous area claimed for leakage through PSV seats.

The pipework to the vent stack is flanged and will generally be at close to atmospheric pressure. However for continuity the claimed hazardous area will be claimed to be as for process pipework, refer section 2.7.1.2.

The hazard zones adopted for the vent stack are summarised below:

Zone 1 1 m radius from the vent tip

Zone 2 12 m laterally, 6 m below and 8 m above the vent tip

2.7.1.9 Pipeline Blowdown

There are pipeline blowdown points at the scraper stations and meter stations. The vents are approximately 2.4 m tall, discharge vertically upwards and are fitted with quick opening closures. Pipeline blowdowns have the potential to release large volumes of gas to atmosphere and to obtain a representative hazardous area zone it would be required to

undertake plume analysis based on the blowdown conditions. An estimate of the extent of the plume from previous experience for pipeline blowdown vents is a cylinder with a radius of 15 m and a length of 30 m extending in the direction of the discharge and 1 m below the discharge point to account for the localised turbulence at the vent tip. Pipeline blowdowns are a done infrequently and therefore a *Secondary* release that results in a Zone 2 hazardous area. The discharge is vertically upwards and therefore no ground effect would occur.

During normal operation a quick opening closure in the closed position is considered to provide similar containment as a pipe flange or fitting. Therefore the associated release would be *Secondary* providing a Zone 2 hazardous area of 2 m as per AS/NZS 60079.10.1 Clause ZA.6.4.2.4.

Zone 2 A cylinder of radius 15 m extending 30 m vertically upwards and 1 m downwards from the point of discharge

HOLD The exact shape of the hazardous area zone should be determined using plume dispersion modelling based on the blowdown operation and conditions.

2.7.1.10 Low Velocity Vents

There are numerous pressure relief valves installed on instrument gas systems, for example on the station limit valves. The relief from these pressure relief valves are similar to low velocity vents in accordance with AS/NZS 60079.10.1 ZA.6.6.2.8 that has an associated Zone 1 hazardous area of 0.5 m in all directions surrounded by a Zone 2 hazardous area of 1.0 m from the point of discharge. The pressure relief valves will not typically be relieving gas and the release will be *Secondary,* therefore the Zone 1 area is not appropriate. Therefore a Zone 2 hazardous area of 1 m radius from the point of discharge is claimed.

The hazard zone adopted for the instrument gas relief and vent points is summarised below:

Zone 2 Radius of 1 m extending in all directions from the point of discharge

2.7.2 SCRAPER VESSELS

The scraper vessels shall be operated such that it is normally isolated from the pipeline. There are no regular pigging operations. It is expected that the scraper vessels are opened at approximately yearly intervals and the small quantities of flammable gas may occur at the closures. Accordingly, they are treated as sources of *Secondary* grade release and a hazardous Zone 2 within a radius of 3 m centred at the closure is claimed as indentified in AS/NZS 60079.10.1 ZA.6.6.2.2b for the equipment located at an adequately ventilated area.

The scraper vessels are enclosed vessels containing nozzle connections with piping, valves and fittings, which are also potential release sources. These are classified as piping as per section 2.7.1.1.

The hazard zone adopted for the pig receivers and launchers is summarised below:

Zone 2 3 m radius in all directions from quick opening closure

As per section 2.7.1.1 for piping for remainder of the vessel

2.7.3 MULTICYCLONE AND FILTER SEPARATORS

Similar to receiving traps, the multicyclone and filter separators have quick opening closures that are operated at approximately yearly intervals under normal operation. The hazard zone assigned to the receiving traps in accordance with AS/NZS 60079.10.1 ZA.6.6.2.2b is also applicable to the filter coalescers, resulting in a hazardous Zone 2 area within 3 m radius around the discharge points is claimed.

Since the multicyclone and filter coalescers are enclosed vessels which handle process gas and liquids removed from the gas, the nozzle connections with piping, valves and fittings are also potential release points. To simplify hazardous area management, the classification for process gas piping will be applied to the vessels meaning a Zone 2 area of radius 2 m will be declared from the shell of the vessels.

The hazard zone adopted for the multicyclone and filter coalescers is summarised below:

Zone 2 3 m radius around the quick opening closures and 2 m radius from the edge of the vessels

2.7.4 SLOP TANKS

The slop tank installed at some stations are above ground storage tank used to collect condensate, compressor lube oil and water from the filter separators. The liquids in the tank are treated as a flammable fluid. The capacity of the tanks are approximately 1 kL. The tanks are provided with a vent that discharges to atmosphere. During the short period of the drainage from the filter coalescers to slop tank, the liquids may form a flammable mist and additionally the gas may break through into the drain tank. The freely vented tank allows vapour/air mixtures to be released during the normal operation.

Therefore, the slop tank will contain flammable vapours and a range of hazard zones is required. As such, it is likely that a small amount of flammable gas mixture would continuously exist in the tank and within close proximity of the tank vent, surrounded by a larger region that may sometimes exist due to occasional higher gas quantities and an even larger region that represents very infrequent high gas quantities.

The slop tank installed at the Pine Creek Station has a pressure vacuum vent set at 2 kPa pressure / vacuum. The vapour or released gas is directed to atmosphere though the vent that installed in conjunction with an inline flame arrester and a cap. The flame arrester is required to provide protection against internal fire and explosion from outside sources of ignition. The vented gas will be discharged vertical downwards to the surrounding

equipment or pipework due to the installation of the cap. However, the additional extent zones are not claimed considering the relatively low operating pressure in the tank.

In accordance with API RP 505 Section 8.2.1, a Zone 0 area within 0.5 m radius, a Zone 1 area within 1.5 m radius and a Zone 2 area within 3 m radius of the vent point are declared. It is also stated in API RP 505 Section 8.2.1, a Zone 0 area should be claimed inside the tank above the liquid level due to the possibility of the continuous presence of the flammable mixture and a Zone 2 area with radius of 3 m should be placed around the shell of the equipment.

The hazard zones adopted for the slop tanks in the stations are summarised below:

Zone 0 Inside the tanks above the liquid level and 0.5 m radius from the tank discharge points

Zone 1 1.5 m radius from the tank discharge points

Zone 2 3 m radius around the shell of the tanks and from the tank discharge points

2.7.5 WATER BATH HEATERS

The indirect fired water bath heaters are fitted in some stations to heat the high pressure gas up to a temperature of 60 °C prior to pressure reduction, which prevents hydrate formation that may occur due to the Joule-Thomson effect when the temperature drops. The water bath heater consists of an insulated shell, removable process coils, removable fire tubes, stack burners, fuel gas conditioning train and control system.

During normal operation, a flame is projected into a submerged "fire-tube" located at the bottom of a horizontal cylindrical shelf. Energy is transferred through the tube wall to the surrounding bath fluid water. By means of natural convection, the water then transfers the required amount of energy into a series of process coils located at the top of the heater shell.

The water bath burners are continuously flaming and provided with burner elements to ensure that the flame is maintained. On loss of flame the fuel gas supply is shut down. Therefore it no hazardous area zones are claimed from the stacks.

The process tube within the water bath is fully welded with no potential points for release and would not normally provide a hazardous area. If there was a history of failure of the process coils leading to corrosion or erosion of the tubes, then a hazardous area should be claimed on the vent of the water bath heater. APA has not indicated that there have been failures of the process coils. Further, the maximum operating temperature of the water bath heaters is 95°C, the pH and the nitrate content of the water in the baths is checked frequently and APA has confirmed that the water bath heaters are treated with oxygen scavenger. Therefore no hazardous area is claimed from the water bath vent.

The potential release points on the vessels are process connections to the heaters. The classification for process piping will be applied to the process connections resulting in a *Secondary* grade of release and a related Zone 2 area with 2 m radius from the connection points in accordance with AS/NZS 60079.10.1 Clause ZA.6.4.2.4.

The hazard zone adopted for the water bath heaters is summarised below:

Zone 2 2 m radius from the high pressure gas connections of the vessel

2.7.6 KNOCKOUT POTS

The knockout pots are enclosed vessels which do not contribute to the hazardous area classification. However, the nozzle connections with piping, valves and fittings on the vessels are potential release points where small amounts of flammable mixture may

present. To simplify hazardous area management, the classification for process gas piping will be applied to the vessels meaning a Zone 2 area of radius 2 m will be declared from the shell of the vessels.

The hazard zone adopted for the knockout pots is summarised below:

Zone 2 2 m radius from the edge of the vessels

2.7.7 GAS CHROMATOGRAPH SYSTEM

Gas chromatograph (GC) system is a specific analyser to determine natural gas stream composition and anticipated concentration of the selected components.

The chromatograph system comprises of several components: the analyser, sample tubing, process vents, pressure control valve, pressure safety valve, carrier gas cylinders and tubing, calibration gas cylinder and tubing. The chromatograph system is located under a shelter with open sides, therefore it is considered as being adequately ventilated.

The process tubing and analyser contain gas at approximately 140 kPag. The tubing will be well maintained and minor release of the flammable gas may occur at the connections due to leakage, and as a result the grade of release is considered to be *Secondary*. Therefore, a Zone 2 hazardous area with 0.5 m radius is assigned around the whole chromatography system to cover the process tubing potential leakage points according to AS/NZS 60079.10.1 Clause ZA.6.4.2.3c, for the lighter-than-air flammable gas operating at a pressure between 100 and 700 kPag.

The carrier gas is helium that is a non-hazardous material and therefore the carrier gas cylinders and tubing do not contribute to the hazardous zone.

The calibration gas comprises mainly methane and stores in a gas cylinder with an approximate volume of less than 10 L. AS/NZS 60079.10.1 Clause ZA.6.4.2.6d states that cylinder located in ventilated area, whether in storage or installed for use, is not associated with a hazardous zone when the gas capacity is less than 30 m^3. Therefore, no hazardous zone is claimed around the calibration gas cylinder. The calibration gas tubing is at the same operating pressure as the process tubing and will have the same Zone 2 hazardous with 0.5 m radius around the calibration gas tubing connections.

The chromatograph system has several vent points that release the sample line contents at low velocity during the normal operation. The amount of the released gas will be small and the discharge rate will be slow and readily dispersed. Consequently, they are regarded as sources of *Primary* grade release and a hazard Zone 1 within a sphere area with 0.5 m radius is declared from the vent tips in accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.8 for the low velocity vents in adequately ventilated area.

In addition, a larger region that represents infrequent higher gas quantities may exist surrounded the Zone 1 area due to the failure of pressure regulator or PSV. It results a *Secondary* grade of release and an additional Zone 2 area with 1 m radius is considered around the vents in accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.8.

The pressure relief valve will be activated in emergency. To simplify the hazardous area arrangement, it is treated the same as a vent as described above.

The hazard zones adopted for the chromatograph system are summarised below:

Zone 1 0.5 m radius from the vent tips

Zone 2 0.5 m radius around the gas chromatograph system, excluding the cylinders

1.0 m radius around the vent tips

2.7.8 WATER DEW POINT ANALYSER / GAS SAMPLER

The water dew point analyser uses a chilled mirror to determine the dew point of the gas. The analysers receive gas from the sampler as shown in the photographs below. The gas sampler consists of an insertion regulator installed in the pipework, a heated capillary tube a sample cylinder, solenoid valve, further regulators and pressure relief valves. A solenoid valve is installed inside a box with a removable cover. The box prevents ventilation and therefore the declared hazardous area zone is increased to Zone 1 for the interior of the box.

The water dew point analyser comprises of several components: the analyser, sample tubing, process vents, pressure control valve, pressure safety valve, gas cylinders and tubing, calibration gas cylinder and tubing. The analyser system is located under a shelter with open sides, therefore it is considered as being adequately ventilated.

The process tubing and analyser contain gas at approximately 140 kPag. The tubing will be well maintained and minor release of the flammable gas may occur at the connections due to leakage, and as a result the grade of release is considered to be *Secondary*. Therefore, a Zone 2 hazardous area with 0.5 m radius is assigned around the whole analyser system to cover the process tubing potential leakage points according to AS/NZS 60079.10.1 Clause ZA.6.4.2.3c, for the lighter-than-air flammable gas operating at a pressure between 100 and 700 kPag.

The water dew point analyser and gas sampler have local vents that will frequently vent gas at low velocity to atmosphere during the normal operation. The amount of the released gas will be small and the discharge rate will be slow due to the characterisation of the systems. Consequently, they are regarded as sources of *Primary* grade release and a hazard Zone 1 within a sphere area with 0.5 m radius is declared from the vent tips in accordance with AS/NZS 60079.10.1 Clause ZA.6.6.2.8 for the low velocity vents in adequately ventilated area.

The hazard zone adopted for the water dew point analyser / gas sampler is summarised below:

Zone 1 0.5 m radius from the vent tips

Inside the sampler box

Zone 2 0.5 m radius around the water dew point analyser system

1.0 m radius around the vent tips

2.7.9 ODORANT INJECTION SYSTEM

2.7.9.1 Odorant Pipework

A majority of the odorant pipework is tubing fitted with compression fittings, these are considered to be well maintained and infrequently operated. This provides a *Secondary* source of release and a Zone 2 hazardous area. In accordance with AS/NZS 60079.10.1 Clause ZA.5.2.8 the associated hazardous area is 1.5 m in all directions down to ground level.

Zone 2 1.5 m in all directions extending down to ground level

2.7.9.2 Odorant Storage Tank

The odorant storage tank is a pressure vessel supplied with a natural gas blanket and a pressure relief valve.

AS/NZS 60079.10.1 Clause ZA.5.2.1.2c describes the hazardous area associated with the above ground vent on a storage tank as Zone 1 within 1.5 m radius in all directions from point of discharge and Zone 2 within the cylindrical volume below the Zone 1 area. This is applicable for a vent on a storage vessel. There will be a constant release from the vent however the volume of release is small and is considered to be a *Primary* and a Zone 1 area is claimed.

The connections on the pressure vessel will have the same Zone 2 hazardous area as the odorant pipework.

The tank pressure relief valve will provide a *Secondary* release. This will result in a Zone 2 hazardous area. The extent of the hazardous area will be as the Zone 1 area for the vent, but without the additional Zone 2 area.

Zone 1 1.5 m in all directions from vent tip

Zone 2 Cylindrical volume below the Zone 1 area

1.5 m in all directions extending down to ground level for tank connections

2.7.9.3 Odorant Injection Pumps

The odorant injection pumps are pneumatically powered from instrument gas that is derived from the transmission gas. During operation of pumps there will be a continuous vent of gas. There will be a *Continuous* release from the pump discharge through a bug screen located on the pump, refer photograph below. The minimum diameter of the instrument gas is small. It is reasonable to assume that the solenoid valve has a reduced bore, and a typical size is 1/8” (3.2 mm). Based on Table C9(a) from IP15 for a G(i) gas, a pressure of 5 bar(a) (400 kPag) and a 5 mm hole the hazard radius is <1 m. Therefore a hazardous radius of 0.5 m is claimed around the pump.

The pump is a high integrity positive displacement pump capable of developing high discharge pressures to the odorant, therefore it is assumed that any hazardous area

associated with leakage from the pump seals would be small and within the hazardous zone associated with the gas vent.

Zone 1 0.5 m radius from the pump

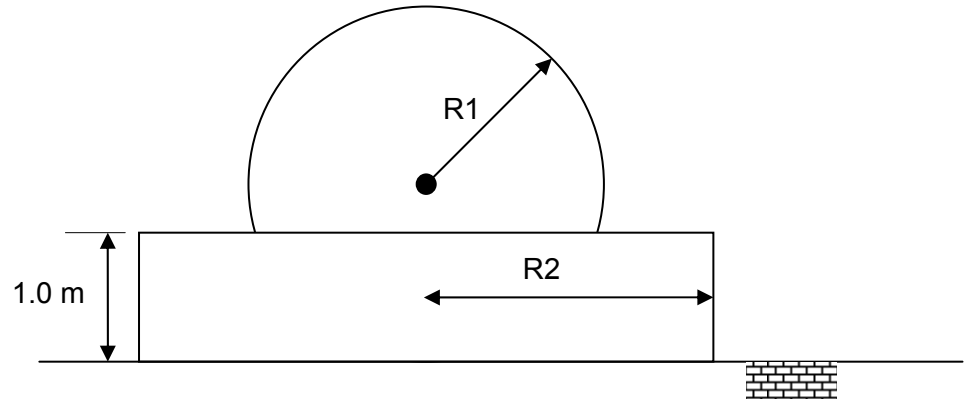
2.7.10 GROUND EFFECT

IP 15 Section 5.5 states that the determination of the full three dimensional envelope of the hazardous area zone shall consider the location of the release. The shape factor depends on height and orientation of the release. The key factors are:

1. For sources of release that are higher from grade than the hazardous radius, there is no impact due to ground effect.
2. For sources of release that are higher than 1 m from grade but less than the hazardous radius, there is a ground effect, up to 1 m above grade.
3. For sources of release that are 1 m or less from grade, there is a ground effect up to 1 m above grade.

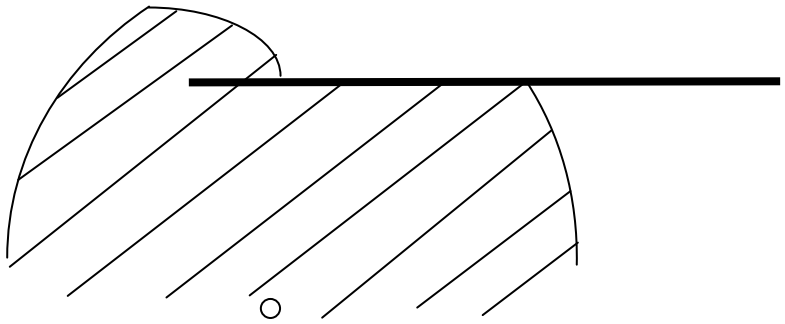
The main process pipework has a hazardous area of radius 2 m, and is located less than 2 m above grade. The direction of release from flanged joints and screwed fittings could be in any direction, therefore ground effects are to be considered. Other hazardous area zones will be sufficiently above grade so that there is no ground effect, or the direction of release will be upwards and therefore ground effect is negligible.

The ground effect increases the hazardous radius in accordance with IP 15 Table C9(b). A majority of the pipework in the facilities is to be located less than 1 m above grade. Interpolation of IP 15 Table C9(b) shows that the hazardous area for ground effect is 0.5 m larger than the hazardous area radius defined above, from the figure below, R2 = R1 + 0.5. Therefore the hazardous area at grade for gas pipework at transmission pressure will be 2.5 m to a height of 1 m.



2.7.11 VAPOUR BARRIERS

At Palm Valley Alice Springs and Mereenie the hazardous area zone impacts on a wall and the control hut, respectively. At these locations the hazardous area zone will extend around the barrier as shown in the diagram below. This is in accordance with AS/NZS 60079.10.1 Clause ZA.2 for measurements of distances.



APPENDIX A HAZARDOUS AREA CLASSIFICATION DATA SHEET

Part I : Flammable material list and characteristics
Part II : List of sources of release

Part I – Sheet 1 of 1	Revision:	A	B	C	D	
Flammable material list and characteristics	**Author:**	YZW	TCB	TCB	TCB	
Amadeus Basin to Darwin Pipeline	**Checked:**	TCB	RDK	RDK	RDK	
Surface facilities	**QA:**					
	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	

Material	Phase	ADG Class	IP 15 Fluid Category	Boiling Point °C	ASTM D86 5%(vol) Point of Stabilised Liquid at Atmospheric Pressure	Relative Density Of Fluid Vapour (Air SG=1) Liquid (Water SG=1)	Flash Point of Stabilised Liquid at Atmospheric Pressure °C	Vapour LEL (Vol %) In Air	Vapour UEL (Vol %) In Air	Ignition Temperature °C	Temperature Class	Equipment Group	Source Of Data
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Process gas and calibration gas (mixture)	Vapour	2.1	G(i)	-162	-	0.62	Gas	4.4 (Methane)	17 (Methane)	537 (Methane)	T1	IIA	AS/NZS 60079.20
Odorant (tetrahydrothiophene and tertiary butyl mercaptan)	Liquid	3	C	82	-	0.939 (liquid) 3.06 (vapour)	-8	1.1*	12.1*	224	T3*	IIA	AS/NZS 60079.20 MSDS
Condensate	Liquid	3	C	69†	-	2.97†	-21†	1.0†	8.4†	233†	T3†	IIA	AS/NZS 60079.20

* Values obtained for Tetrahydrothiophene

† Based on Hexane

Part II – Sheet 1 of 4

List of sources of release

Amadeus Basin to Darwin Pipeline

Surface facilities

Revision:	A	B	C	D	
Author:	YZW	TCB	TCB	TCB	
Checked:	TCB	RDK	RDK	RDK	
QA:	ARD				
Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	

Process Equipment Item			Flammable Material	Operating Conditions Pressure and Temperature	Description of Flammable Material Containment	Ventilation	Source Of Release		Distance From Source To			Equipment Group and Temperature Class	Section
No.	Description	Location					Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Process piping	Amadeus Basin to Darwin Pipeline surface facilities	Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	2 m radius from the edge of piping routes	IIA, T1	2.7.1.1
2	Instrument gas piping		Vap. Cat "G(i)"	≤ 770 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	1 m radius from the edge of piping routes	IIA, T1	2.7.1.2
3	Fuel gas piping		Vap. Cat "G(i)"	≤ 700 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	0.5 m radius from the edge of piping routes	IIA, T1	2.7.1.3
4	Control valves		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Valves with packed gland / positioner / exhaust	Natural (open air)	Valve glands, positioners and connections	C & P & S	N/A	0.5 m radius around control valve positioners and exhaust	1 m radius around control valve positioners and exhausts;	IIA, T1	2.7.1.4
5	Pressure relief and safety relief valves		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	C & P	N/A	1 m radius from vent tips	6 m laterally, 8 m above and 1 m below discharge points	IIA, T1	2.7.1.5
6	Mainline valves		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Connections and valve seals	S	N/A	Within solenoid valve enclosure	As Piping	IIA, T1	2.7.1.6
7	Local Vent Points		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	S	N/A	N/A	6 m laterally, 8 m above and 1 m below discharge points	IIA, T1	2.7.1.7

* C – Continuous; S – Secondary; P – Primary

Part II – Sheet 2 of 4	**Revision:**	A	B	C	D	
List of sources of release	**Author:**	YZW	TCB	TCB	TCB	
Amadeus Basin to Darwin Pipeline	**Checked:**	TCB	RDK	RDK	RDK	
Surface facilities	**QA:**	ARD				
	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	

Process Equipment Item			Flammable Material	Operating Conditions Pressure and Temperature	Description of Flammable Material Containment	Ventilation	Source Of Release		Distance From Source To			Equipment Group and Temperature Class	Section
No.	Description	Location					Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	Pine Creek Vent stack	Pine Creek	Vap. Cat "G(i)"	Atmospheric pressure Ambient temperature	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	P & S	N/A	1 m radius from the vent tip	12 m laterally, 6 m below and 8 m above vent tip	IIA, T1	2.7.1.8
9	Pipeline blowdown	Amadeus Basin to Darwin Pipeline surface facilities	Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	S	N/A	N/A	A cylinder of radius 15 m extending 30 m vertically upwards and 1 m downwards from discharge point **HOLD – To be confirmed**	IIA, T1	2.7.1.9
10	Low velocity vents		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	S	N/A	N/A	Radius of 1 m extending in all directions from the point of discharge	IIA, T1	2.7.1.10
11	Scraper vessels		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Enclosed system with closures	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	3 radius in all directions from quick opening closure As per section 2.7.1.1 for piping for remainder of the vessel	IIA, T1	2.7.2
12	Multicyclone and filter separators		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Enclosed vessels with quick opening closures	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	3 m radius around the closures and 2 m radius from the edge of the vessels	IIA, T1	2.7.3
			Liq. Cat "C"	≤ 9,650 kPag ≤ 60 °C	Liquid drain pipework	Natural (open air)	Piping connections	S	N/A	N/A	2 m in all directions down to ground level	IIA, T3	2.7.1.1

* C – Continuous; S – Secondary; P – Primary

Part II – Sheet 3 of 4	**Revision:**	A	B	C	D	
List of sources of release	**Author:**	YZW	TCB	TCB	TCB	
Amadeus Basin to Darwin Pipeline	**Checked:**	TCB	RDK	RDK	RDK	
Surface facilities	**QA:**	ARD				
	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	

Process Equipment Item			Flammable Material	Operating Conditions Pressure and Temperature	Description of Flammable Material Containment	Ventilation	Source Of Release		Distance From Source To			Equipment Group and Temperature Class	Section
No.	Description	Location					Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	Slop tanks	Amadeus Basin to Darwin Pipeline surface facilities	Vap. Cat "G(i)"	Atmospheric pressure Ambient temperature	Open vessels	Natural (open air)	Piping connections and vents	C & P & S	Inside the tank above liquid level and 0.5 m radius from tank discharge points	1.5 m radius from tank discharge points	3 m radius from around shell of tanks and from tank discharge points	IIA, T1	2.7.4
14	Water bath heaters		Vap. Cat "G(i)"	≤ 9,900 kPag ≤ 60 °C	Enclosed vessels	Natural (open air)	Piping connections	S	N/A	N/A	2 m radius from high pressure gas connections of vessel	IIA, T1	2.7.5
15	Knockout pots		Vap. Cat "G(i)"	≤ 9,900 kPag ≤ 38 °C	Enclosed vessels	Natural (open air)	Piping connections	S	N/A	N/A	2 m radius from edge of vessels	IIA, T1	2.7.6
16	Gas chromatograph systems		Vap. Cat "G(i)"	≤ 140 kPag ≤ 60 °C	Closed tubing systems with joints and vents	Shelter with open sides (open air)	Tubing joints, drains and vents	P & S	N/A	0.5 m radius from vent tips	0.5 m radius around system, excluding cylinders 1.0 m radius around vent tips	IIA, T1	2.7.7
17	Water dew point analysers / gas samplers		Vap. Cat "G(i)"	≤ 140 kPag ≤ 60 °C	Closed tubing systems with joints and vents	Shelter with open sides (open air)	Tubing joints, drains and vents	P & S	N/A	0.5 m radius from vent tips Inside sampler box	0.5 m radius around the system, 1.0 m radius around vent tips	IIA, T1	2.7.8
18	Odorant injection system pipework		Vap. Cat "C"	≤ 9,650 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	1.5 m in all directions down to ground level	IIA, T3	2.7.9.1

* C – Continuous; S – Secondary; P – Primary

Part II – Sheet 4 of 4

List of sources of release

Amadeus Basin to Darwin Pipeline

Surface facilities

Revision:	A	B	C	D	
Author:	YZW	TCB	TCB	TCB	
Checked:	TCB	RDK	RDK	RDK	
QA:	ARD				
Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	

Process Equipment Item			Flammable Material	Operating Conditions Pressure and Temperature	Description of Flammable Material Containment	Ventilation	Source Of Release		Distance From Source To			Equipment Group and Temperature Class	Section
No.	Description	Location					Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
19	Odorant injection system storage tanks	Amadeus Basin to Darwin Pipeline surface facilities	Vap. Cat "C"	15 kPag ≤ 60 °C	Enclosed vessel	Shelter with open sides (open air)	Connections	S	N/A	N/A	1.5 m in all directions down to ground level	IIA, T3	2.7.9.2
					Blanket gas vent		Pipe vent to atmosphere	P		Radius of 1.5 m in all directions from vent tip	Within cylindrical volume below Zone 1		
					Pressure relief valve and piping discharging vertically upwards		Pipe vent to atmosphere	S		N/A	Radius of 1.5 m in all directions from vent tip		
20	Odorant injection system pumps		Vap. Cat "G(i)"	≤ 400 kPag ≤ 60 °C	Pneumatic pump instrument gas exhaust	Shelter with open sides (open air)	Piping connections and vents	C	N/A	N/A	Radius of 0.5 m	IIA, T1	2.7.9.3
21	Ground effect		Vap. Cat "G(i)"	≤ 9,650 kPag ≤ 60 °C	Closed system with flanges, piping joints and valves	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	2.5 m laterally and extending to 1 m above grade for all process piping less than 2 m above grade	N/A	2.7.10

* C – Continuous; S – Secondary; P – Primary

APPENDIX B HAZARDOUS AREA MAPPING DRAWINGS

For hazardous area mapping drawings, refer to Section 4 of the Hazardous Area Dossiers for each site.

3 Observation For Improvement (OFI)

OFI No.	Description	Proposed Remedy
AD 1498-OFI-1 Valve Limit Switch (Open) AD 1498-ZSO-41	Equipment and circuit ID required	Provide equipment and circuit ID
	Remediate UV damaged cable sheath	Repair as per description
	Nil hazardous area certification detail available for JB and limits	Obtain hazardous area certification for JB and limits or replace equipment
AD 1498-OFI-2 Solenoid Valve (Open) AD 1498-SVO-41	Equipment and conduit ID required	Provide equipment and conduit ID
	Corrosion and poor condition suggesting replacement prior to failure	Replace any corroded areas before failure
	Nil Australian Ex certification available	Obtain (if any) Australian Certification for valve
	Vermin ingress evident, sealing of JB required	Seal JB
AD 1498-OFI-3 Solenoid Valve (Closed) AD 1498-SVC-41	Equipment and conduit ID required	Provide equipment and conduit ID
	Corrosion and poor condition suggesting replacement prior to failure	Replace any corroded areas before failure
	Nil Australian Ex certification available	Obtain (if any) Australian Certification for valve
	Vermin ingress evident, sealing of JB required	Seal JB
AD 1498-OFI-4 Pressure Transmitter AD 1498-PT-42	Circuit ID required	Provide circuit ID
	Tighten loose cable gland	Review as per description
	Provide blue cable sheath	Review as per description
	Visible external corrosion requiring internal inspection	Review as per description
	Cable support required	Provide cable support

OFI No.	Description	Proposed Remedy
AD 1498-OFI-5 Pressure Transmitter AD 1498-PT-13	Provide blue cable sheath	Review as per description
	Remediate UV damaged cable sheath	Review as per description
	Corrosion to device, suggest internal inspection	Review as per description
AD 1498-OFI-6 Valve Limit Switch (Closed) AD 1498-ZSC-15	Equipment & cable ID required	Provide equipment and cable ID
	Remediate cable sheath with UV damage	Repair as per description
	Provide blue sheath to cable	Review as per description
	Cable support required	Provide cable support
AD 1498-OFI-7 Valve Limit Switch (Closed) AD 1498-ZSC-17	Equipment & cable ID required	Provide equipment and cable ID
	Blue sheath to be replaced and remediate UV damaged cable sheath	Review as per description
AD 1498-OFI-8 Pressure Regulator AD 1498-PY-15	Equipment & cable ID required	Provide equipment and cable ID
	Remediate UV damaged sheath	Repair as per description
	Refer Ex d/Ex i notes for PY-17 regarding barrier	Review as per description
	Cable support required	Provide cable support
AD 1498-OFI-9 Pressure Regulator AD 1498-PY-17	Equipment & cable ID required	Provide equipment and cable ID
	Remediate UV damaged sheath	Repair as per description
	Cable appears to have blue sheath, however device Ex rating not available and IS barrier not confirmed within control hut. Item (DVC 5010) does contain duel Ex d/Ex i certification. Further investigation required	Review as per description
	Uncertified gland/plug if Ex d method of protection	Obtain certified gland/plug method of protection
	Cable support required	Provide cable support

OFI No.	Description	Proposed Remedy
AD 1498-OFI-10 Junction Box AD 1498-ISJB-1	Unused cable and JB	Review use of cable and JB
	Remove from installation or make safe and identify cable, JB etc.	Review as per description
AD 1498-OFI-11 Junction Box AD 1498-ISJB-2	Unused cable and JB with exposed cabling	Review use of cable and JB and cover exposed cabling
	Remove from installation or make safe and identify	Review as per description
AD 1498-OFI-12 Level Switch AD 1498-LSHH-16	Equipment and cable ID required	Provide equipment and cable ID
	UV damaged sheath	Repair as per description
	Provide blue sheath to cable	Review as per description
	Poor condition and age suggesting replacement	Review as per description
	Corrosion visible	Mitigate corrosion
AD 1498-OFI-13 High-High Level Switch AD 1498-LSHH-16A	Equipment and cable ID required	Provide equipment and cable ID
	Remediate UV damaged sheath	Repair as per description
	Provide blue sheath to cable	Review as per description
	Poor condition and age suggesting replacement	Review as per description
	Corrosion visible	Mitigate corrosion
AD 1498-OFI-14 High Level Switch AD 1498-LSH-16	Cable labels required	Provide cable labels
	Tighten loose gland	Review as per description
	Remediate UV damaged sheath	Repair as per description
	Replace blue cable sheath	Review as per description
AD 1498-OFI-15 High Level Switch AD 1498-LSH-16A	Cable labels required	Provide cable labels
	Remediate UV damaged cable sheath	Repair as per description
	Replace blue cable sheath	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-16 Level Switch AD 1498-LSHH-18	Equipment and cable ID required	Provide equipment and cable ID
	Remediate UV damaged sheath	Repair as per description
	Replace blue cable sheath	Review as per description
	JB damage/cracking at gland entry, visible corrosion	Mitigate corrosion and repair as per description.
	Poor condition and age suggesting replacement	Review as per description
AD 1498-OFI-17 Level Switch AD 1498-LSHH-18A	Equipment and cable ID required	Provide equipment and cable ID
	Remediate UV damaged sheath	Repair as per description
	Provide sheath to cable	Review as per description
	Visible corrosion	Mitigate corrosion
	Poor condition and age suggesting replacement	Review as per description
AD 1498-OFI-18 High Level Switch AD 1498-LSH-18	Cable ID required	Provide cable ID
	Equipment label illegible (apart from model no.), suggest new labels for future reference	Provide equipment labels
AD 1498-OFI-19 High Level Switch AD 1498-LSH-18A	Cable label required	Provide cable label
	Remediate UV damaged cable sheath	Repair as per description
	Replace blue cable sheath	Review as per description
ADP1498-OFI-20 Temperature Transmitter AD 1498-TT-20	Equipment and circuit ID required	Provide equipment and circuit ID
	Provide cable support	Review as per description
	Remediate cable sheath and replace blue sheath	Review as per description
AD 1498-OFI-21 Temperature Transmitter AD 1498-TT-20A	Equipment and cable ID required	Provide equipment and cable ID
	Provide cable support	Review as per description
	Remediate cable sheath and replace blue sheath	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-22 Pressure Transmitter AD 1498-PT-22	Cable ID required	Provide cable ID
	Remediate cable sheath and provide blue sheath	Review as per description
AD 1498-OFI-23 Pressure Transmitter AD 1498-PT-22A	Remediate cable sheath and provide blue sheath	Review as per description
AD 1498-OFI-24 Low Pressure Switch AD 1498-PSL-24	Remediate cable sheath and provide blue sheath	Review as per description
	Equipment corrosion, poor condition, illegible label	Mitigate corrosion and replace label
AD 1498-OFI-25 High Level Switch AD 1498-LSH-30	Tighten loose gland	Review as per description
	Replace damaged (UV) blue sheath to cable	Review as per description
	Illegible equipment nameplate, severe corrosion	Provide new nameplate and mitigate corrosion
	Provide cable support	Review as per description
AD 1498-OFI-26 Valve Limit Switch AD 1498-ZSC-44	Equipment and certification ID required	Provide equipment certification and ID
	Nil evidence of I.S. Installation hence flameproof installation considered	Review as per description
	Uncertified gland, plug and adaptor required replacement	Replace certified gland/plug
	Corroded equipment suggesting further inspection for fitness for purpose	Review as per description
AD 1498-OFI-27 Pressure Transmitter AD 1498-PT-51	Device stamped with instrument tag of poor visibility. Recommend legible label/tag be installed similar to other transmitters on site	Review as per description
AD 1498-OFI-28 Pressure Transmitter AD 1498-PT-52	Device stamped with instrument tag of poor visibility. Recommend legible label/tag be installed similar to other transmitters on site	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-29 Solenoid Valve AD 1498-UYO-50	Equipment ID required	Provide equipment ID
	Verify washer (nil cert.) at gland entry to solenoid complies with Ex e install	Review as per description
AD 1498-OFI-30 Solenoid Valve AD 1498-UYC-50	Equipment I.D. Required	Provide equipment ID
	Verify washer (nil cert.) at gland entry to solenoid complies with Ex e install	Review as per description
AD 1498-OFI-31 Valve Limit Switch AD 1498-ZSO-50	Equipment ID required	Provide equipment ID
	Nil certification exists to Aus Ex standards	Obtain Aus Stand. certification
AD 1498-OFI-32 Valve Limit Switch AD 1498-ZSC-50	Equipment ID required	Provide equipment ID
	Nil certification exists to Australian Ex standards	Obtain certification to Australian Standards
AD 1498-OFI-33 Junction Box AD 1498-UV-50 IS JB	Corrosion to glands within JB requires attention and appropriate remediation	Review as per description
AD 1498-OFI-34 Junction Box AD 1498-UV-50 IS JB	Corrosion to glands and DIN rail within JB requires attention and appropriate remediation	Review as per description
AD 1498-OFI-35 Temperature Element AD 1498-TE-11	Equipment & cable ID to be provided	Provide equipment and cable ID
	Blue sheath to cable required	Provide blue sheath to cable
	UV damage to cable requires remediation	Remediate UV damage
AD 1498-OFI-36 Differential Pressure Transmitter AD 1498-DPT-16	Equipment and circuit ID required	Provide equipment and circuit ID
	Remediate UV damaged sheath	Review as per description
	Provide blue sheath	Review as per description
	Ex certification label not visible, provide new label and verify certification as I.S.	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-37 Pressure Transmitter AD 1498-DPT-18	Circuit ID required	Provide circuit ID
	Remediate UV damaged sheath	Review as per description
	Provide blue cable sheath	Review as per description
	Ex certification label not visible, provide new label and verify certification is I.S.	Review as per description
	Corrosion visible	Mitigate corrosion
	Un-certified plug adaptor	Obtain certification for plug adaptor
AD 1498-OFI-38 Solenoid Valve AD 1498-SVC-44	Equipment and certification ID required	Provide equipment certification ID
AD 1498-OFI-39 Solenoid Valve AD 1498-SVO-44	Circuit ID required	Provide circuit ID
AD 1498-OFI-40 Pressure Switch AD 1498-LP-SW	Equipment and circuit ID required	Provide equipment and circuit ID
	Equipment Ex d rated however aid conduit system installed. Nil evidence of I.S. Circuit, further investigation required to verify design method of installation	Review as per description
	Corrosion visible on conduit	Mitigate corrosion on conduit
AD 1498-OFI-41 Pressure Switch AD 1498-LP-SW	Equipment and full ID required	Provide equipment and full ID
	Equipment Ex d rated however aid conduit system installed. Nil evidence of I.S. Circuit, further investigation required to verify design method of installation	Review as per description
	Corrosion visible on conduit	Mitigate corrosion on conduit

OFI No.	Description	Proposed Remedy
AD 1498-OFI-42 Meter AD 1498-TURBINE METER	Equipment and cable ID required	Provide equipment and cable ID
	Blue cable sheath required	Provide blue cable sheath
	Ex certification not applicable to Australian Standards, conformity assessment required	Review as per description
AD 1498-OFI-43 Meter AD 1498-TURBINE METER	Equipment and cable ID required	Provide equipment and cable ID
	Blue cable sheath required	Provide blue cable sheath
	Ex certification not applicable to Australian Standards, conformity assessment required	Review as per description
	Corrosion visible on conduit	Mitigate corrosion
AD 1498-OFI-44 Temperature Transmitter AD 1498-TT	Equipment and full ID required	Provide equipment and full ID
	Blue sheath/I.S. label to conduit required	Provide blue sheath/I.S. label to conduit
AD 1498-OFI-45 Temperature Transmitter AD 1498-TT	Equipment and cable ID required	Provide equipment and cable ID
	Blue sheath/I.S. Label required	Provide blue sheath/I.S. label
AD 1498-OFI-46 Pressure Transmitter AD 1498-PT0001	Equipment and full ID required	Provide equipment and full ID
	Corrosion visible at conduit adaptor	Mitigate corrosion at conduit adaptor
	Blue sheath/I.S. Label required	Provide blue sheath/I.S. label
AD 1498-OFI-47 Pressure Switch AD 1498-HP SW1	Equipment and full I.D. Required	Provide equipment and full ID
	Blue sheath/I.S. Label to conduit required	Provide blue sheath/I.S. label
AD 1498-OFI-48 Heat Trace Junction Box AD 1498-JB	Equipment label required, label heat trace	Provide equipment label
	Verify adapting reducer complies to maintain I.P. Of installation, Ex certificates etc	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-49 Moisture Analyser AD 1498-MA-27	Equipment ID required	Provide equipment ID
	Nil Australian Certification detail available, conformity assessment required. Ex d or e device assumed as Ex c install as per connecting JB	Review as per description
AD 1498-OFI-50 MA-27 Junction Box AD 1498-JB	Equipment ID required	Provide equipment ID
	Seal conduit below JB	Review as per description
	Verify maximum circuit power dissipation does not exceed 7 watts	Review as per description
	Verify adaptor on circuit gland to be Ex e rated, replace as required	Review as per description
AD 1498-OFI-51 Chromatograph AD 1498-GC 28	Equipment I.D. Required	Provide equipment ID
	Verify conduit between GC and posifit JB is installed Ex d method of protection to Australian Certifications/Standards	Review as per description
	Seal cable conduit located through concrete	Review as per description
AD 1498-OFI-52 Junction Box AD 1498-JB	Equipment and cable conduit ID required	Provide equipment and cable conduit ID
	Verify conduit between JB and GC is installed Ex e method of protection to Australian certifications/standards	Review as per description
	Seal cable conduit located through concrete	Review as per description
AD 1498-OFI-53 Switch AD 1498-Switch	Equipment ID required	Provide equipment ID
	Moderate UV damage to sheath	Remediate UV damage to sheath
AD 1498-OFI-54 Limit Switch JB AD 1498-ZS 50C	Equipment ID required	Provide equipment ID
	Further inspection on site required, only photographic inspection completed	Review as per description

OFI No.	Description	Proposed Remedy
AD 1498-OFI-55 AD 1498-IR SECURITY BEAM	Equipment and circuit ID required	Provide equipment and circuit ID
	Equipment not rated for hazardous area installations	Obtain certification for equipment in hazardous area
AD 1498-OFI-56 Light & Switch	Light & switch labels required	Provide light and switch labels
	UV damaged power cable requires remediation	Remediate UV damage on power cable
AD 1498-OFI-57 Refer additional information	Fibreglass surge diverter boxes decomposed	Replace decomposed boxes
AD 1498-OFI-58 Slops Tank	The slops tank is not compliant with AS 1940 / AS 1692. Some concerns include; no bunding, evidence of wooden dipstick, no flame arrestor or explosion hatch, no tank nameplate, vent point directed downwards, no restriction orifice on the liquid drain lines.	Refer additional information
AD 1498-OFI-59 Slops Tank Cabling	The cable for the level transmitter on the slop tank is not supported. As shown in the photograph for AD 1498-OFI-58	Provide cable support in accordance with AS 3000: 2007 ": Electrical installations (known as the Australian/New Zealand Wiring Rules)"
AD 1498-OFI-60 Unsealed cable conduits Refer additional information	Unsealed cable conduits provide a route for flammable gases to pass to the control room and potential ignition sources	Seal conduits with suitable sealant (expanding foam)
AD 1498-OFI-61	Earth cables not secured	Secure cables and fit conduit
AD 1498-OFI-62 Vent holes	Refer additional information	Remove caps on local vents and add canvas caps to avoid rain ingress
AD 1498-OFI-63 CP test point	A cathodic protection test point is located close to the	Review test point. Relocate if necessary or undertake testing under a work permit with gas testing and monitoring as required.

OFI No.	Description	Proposed Remedy
AD 1498-OFI-64 Infrared Security sensors Refer additional information	This has been installed on the support for the vent stack. This is within the hazardous area.	Relocate security sensor
AD 1498-OFI-65 Instrument gas PSV discharge	The tail Instrument gas PSV are typically short and terminate close to the valve. It is recommended that the discharge is directed to discharge vertically upwards at a safe location.	Modify PSV tail pipes
AD 1498-OFI-66 Pyrophoric iron	Pipeline corrosion products collected in the filter elements can spontaneously combust on exposure to the atmosphere. This can be rectified by immersing the elements in water as they are removed from the filter vessel	Install a water trough close to the filter vessels with drain point and update filter change out procedures
AD 1498-OFI-67 Pyrophoric iron	Solids collected in the cyclone may also contain pyrophoric iron that may can spontaneously combust on exposure to the atmosphere. Refer OFI 11	Review procedure for emptying cyclone
AD 1498-OFI-68 Cyclone platform	The cyclone platform may not be compliant to AS 1597	APA to conduct audit and modify as required
AD 1498-OFI-69 Non-current P&IDs	The P&IDs did not reflect the installed equipment at the site. The P&ID for the TPOTS metering skid was not in accordance with standard P&ID symbols. Inconsistent P&ID continuation arrows	Develop / adopt APA standard P&ID symbols Review and revise P&IDs as required.

Additional Information

AD 1498-OFI-57: Degraded junction box

AD 1498-OFI-58: Non-Compliant Slops Tanks

The slops tank receives liquids collected from the filter separators. The liquids could be condensate, compressor oil or water and therefore the tank should be designed as a storage tank for flammable liquids which is covered by Australian standards AS 1940 “The storage and handling of flammable and combustible liquids” and AS 1692 “Steel tanks for flammable and combustible liquids”. Some deficiencies identified in the tank arrangement include:

- No spill containment bund.
- No flame arrestor on the tank.
- No explosion / fire protection.
- No evidence that the liquid inlet to the tank included a drop pipe and a liquid seal
- No obvious earthing of tank.
- Appeared to be a wooden dipstick. Typically dipsticks are fabricated from aluminium.
- No restriction orifices in the drain lines to minimise gas break through.
- The tank vent is pointing vertically downwards that increases the size of the hazardous area.
- No local signage

There is an existing underground tank that was used previously as the slops tank. The operator on site advised that the tank is filled with sand.

The tank should be replaced with a properly designed tank that meets the requirements of the Australian standard and environmental (EPA) requirements.

Fyfe’s recommendation would be to install a double skinned fibreglass tank at grade. The tank should include an orifice on the inlet line from the filter vessels (the location would be dependent on the pressure rating of the line), flame arrestor and explosion hatch. The vents should be sized in accordance with AS 1940 and API 2000

"Venting atmospheric and low-pressure storage tanks: non-refrigerated and refrigerated".

APA should consider the addition of an orifice in the liquid drain line to minimise the gas flow rate if the control valve fails open. Calculations should be performed on the maximum gas rate through the level control valves and the associated capacity of the vent points. It is recommended that plume dispersion is performed on the vent point of the tank to determine the extent of the hazardous area.

The integrity of the buried drain pipe work between the filter vessels and the slops tank should be investigated.

AD 1498-OFI-60 Un-sealed conduits

AD 1498-OFI-62 Vent Holes

A majority of the vents are installed with a threaded cap and a 6 mm holes drilled in the vent pipe, refer photograph below. The hole provides a potential weep point.

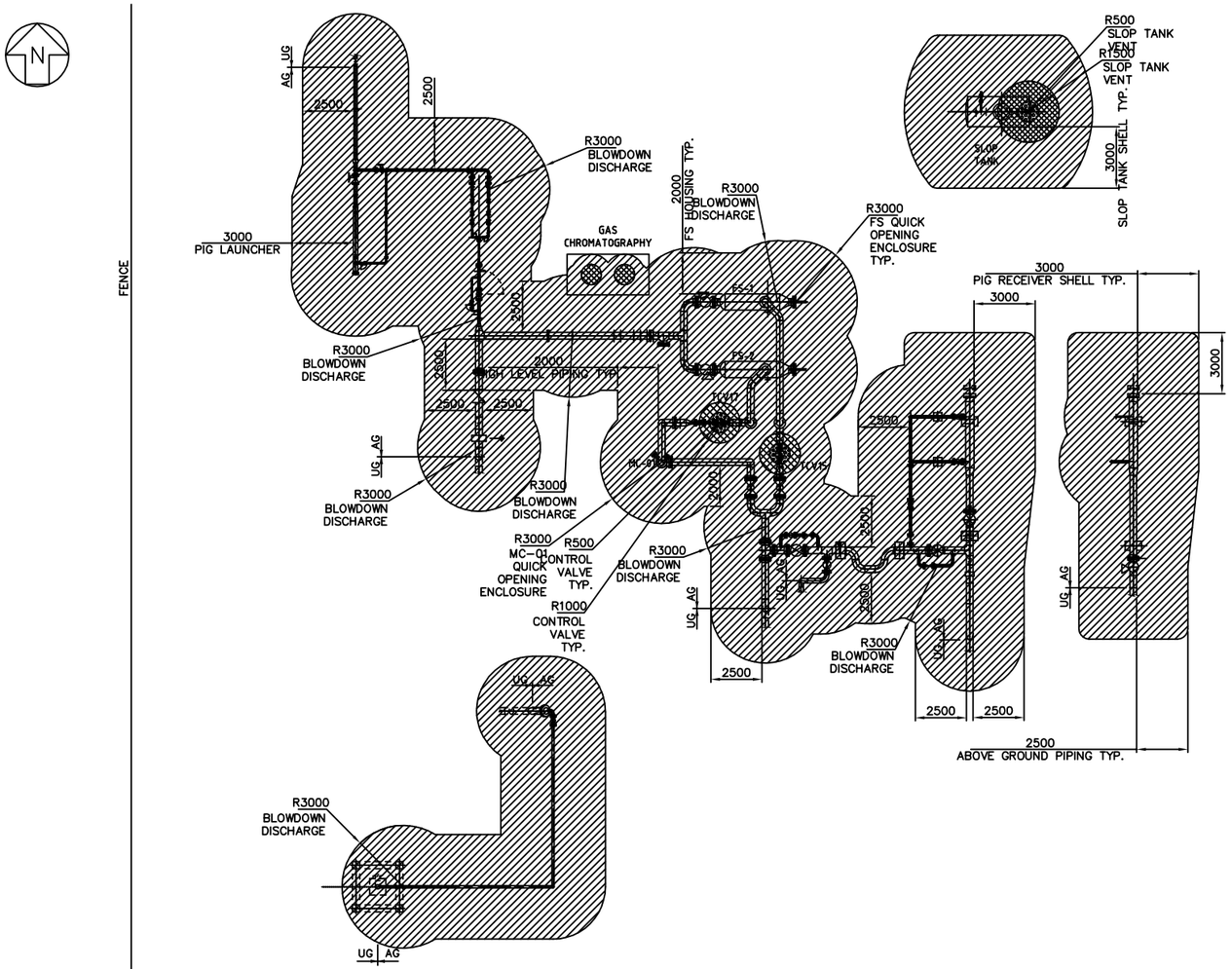
AD 1498-OFI-64 Security Sensors

Security sensors installed within hazardous area

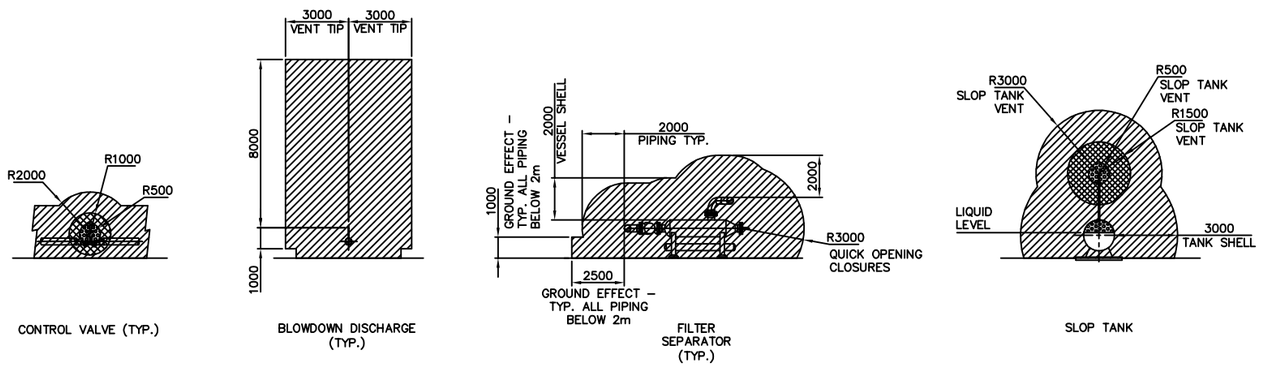
4 Hazardous Area Mapping Drawings

This section contains the hazardous area mapping drawings.

Drawing Number	Description	Revision
AD 1498-9402	Darwin City Gate Meter Station Hazardous Area	0



PLAN VIEW
SCALE 1:150



ELEVATIONS
SCALE 1:150

PROCESS EQUIPMENT ITEM				OPERATING CONDITIONS	DESCRIPTION OF FLAMMABLE		SOURCE OF RELEASE		DISTANCE OF SOURCE TO			EQUIPMENT GROUP AND TEMPERATURE	REMARKS
EQUIPMENT No.	DESCRIPTION	LOCATION	FLAMMABLE MATERIAL	PRESSURE & TEMPERATURE	& MATERIAL CONTAINMENT	VENTILATION	DESCRIPTION	GRADE	BOUNDARY OF ZONE 0	BOUNDARY OF ZONE 1	BOUNDARY OF ZONE 2	CLASS	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
–	PROCESS PIPING, JOINTS, VALVES & INSTRUMENT	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	CLOSED SYSTEM WITH FLANGES, PIPING, JOINTS & VALVES	NATURAL (OPEN AIR)	FLANGES, JOINTS, VALVE SEALS, DRAINS & VENTS	SECONDARY	N/A	N/A	2m RADIUS FROM EDGE OF PIPING ROUTES.	IIA, T1	SECTION 7.1.1 & SECTION 7.8
–	INSTRUMENT PIPING, JOINTS, VALVES & CONTROL	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤770 kPag ≤60°C	CLOSED SYSTEM WITH FLANGES, PIPING, JOINTS & VALVES	NATURAL (OPEN AIR)	FLANGES, JOINTS, VALVE SEALS, DRAINS & VENTS	SECONDARY	N/A	N/A	1m RADIUS FROM EDGE OF PIPING ROUTES.	IIA, T1	SECTION 7.1.2
–	CONTROL VALVES	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	VALVES WITH PACKED GLAND/ POSITIONER/ EXHAUST	NATURAL (OPEN AIR)	VALVES & BLEEDING, POSITIONERS & CONNECTIONS	CONTINUOUS PRIMARY &SECONDARY	0.5m RADIUS AROUND FLOW CONTROL POSITIONERS	0.3m RADIUS FROM VALVE GLANDS; 1m RADIUS AROUND FLOW CONTROL POSITIONERS.	AS CLASSIFIED FOR PIPING.	IIA, T1	SECTION 7.1.4
–	PRESSURE RELIEF VALVES	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	VALVES & PIPING DISCHARGING VERTICALLY UPWARDS	NATURAL (OPEN AIR)	PIPE VENT TO ATMOSPHERE	PRIMARY &SECONDARY	N/A	1m RADIUS FROM VENT TIPS	6m LATERALLY, 8m ABOVE AND 1m BELOW THE DISCHARGE POINT	IIA, T1	SECTION 7.1.5
–	BLOWDOWN DISCHARGES	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	VALVES & PIPING DISCHARGING VERTICALLY UPWARDS	NATURAL (OPEN AIR)	PIPE VENT TO ATMOSPHERE	SECONDARY	N/A	N/A	8m LATERALLY, 8m ABOVE AND 1m BELOW THE DISCHARGE POINT	IIA, T1	SECTION 7.1.6
–	SCRAPER TRAPS	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	ENCLOSED SYSTEM WITH CLOSURES	NATURAL (OPEN AIR)	FLANGES, JOINTS, VALVE SEALS, DRAINS & VENTS	SECONDARY	N/A	N/A	3m RADIUS FROM THE EDGE OF THE VESSEL	IIA, T1	SECTION 7.2
MC–01 FS–1	MULTICYCLONE & FILTER SEPARATORS	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	ENCLOSED VESSELS WITH QUICK OPENING CLOSURES	NATURAL (OPEN AIR)	FLANGES, JOINTS, VALVE SEALS, DRAINS & VENTS	SECONDARY	N/A	0.3m RADIUS AROUND THE QUICK OPENING CLOSURES	3m RADIUS AROUND THE QUICK OPENING CLOSURES AND 2m RADIUS FROM THE EDGE OF THE VESSELS	IIA, T1	SECTION 7.3
T–1495	SLOP TANK	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	ATM. PRESSURE & AMB. TEMP.	OPEN VESSEL	NATURAL (OPEN AIR)	PIPING CONNECTIONS & VENTS	CONTINUOUS PRIMARY &SECONDARY	INSIDE THE TANK ABOVE LIQUID LEVEL AND 0.5 m RADIUS FROM VENT TIPS.	1.5m RADIUS FROM TANK VENT TIPS.	3m RADIUS FROM TANKS SHELL AND VENT TIPS.	IIA, T1	SECTION 7.4
GS–1495 MA–1495 GC–1495	GAS CHROMATOGRAPHY SYSTEM	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤140 kPag ≤60°C	CLOSED TUBING SYSTEM WITH JOINTS & VENTS.	SHELTER WITH OPEN SIDES (OPEN AIR)	TUBING JOINTS, DRAINS & VENTS	PRIMARY & SECONDARY	N/A	0.5m RADIUS FROM VENT TIPS.	0.5m RADIUS AROUND CHROMATOGRAPH SYSTEM (EXCLUDING CYLINDERS) AND 1.0m RADIUS AROUND VENT TIPS.	IIA, T1	SECTION 7.7
–	GROUND EFFECT	DARWIN CITY GATE STATION	VAP. CAT "G(i)"	≤9,650 kPag ≤60°C	CLOSED SYSTEM WITH FLANGES, PIPING, JOINTS & VALVES	NATURAL (OPEN AIR)	FLANGES, JOINTS, VALVE SEALS, DRAINS & VENTS	SECONDARY	N/A	N/A	2m LATERALLY AND EXTENDING TO 1m ABOVE GRADE FOR ALL PROCESS PIPING LESS THAN 2m ABOVE GRADE.	IIA, T1	SECTION 7.8

NOTES:
1. THIS HAZARDOUS AREA CLASSIFICATION IS BASED ON CALCULATION 18756–1–REP–001 "HAZARDOUS AREA REPORT FOR NT GAS REGULATING AND METERING STATIONS".
2. GAS APPARATUS GROUP IIA AND GAS TEMPERATURE CLASS T1 ARE APPLIED TO HAZARDOUS AREA CALCULATIONS.
3. A ZONE 1 AREA OF 0.3m RADIUS EXISTS AROUND THE QUICK OPENING CLOSURES ON THE FILTERS.
4. A ZONE 1 AREA OF 0.3m RADIUS EXISTS AROUND ALL CONTROL VALVES.

LEGEND
- ZONE 0
- ZONE 1
- ZONE 2

0 2.5 5 7.5 10 12.5 15
SCALE 1:150 METRES

DWG. No.	REFERENCE DRAWINGS

REV	DESCRIPTION	PROJ. ENGINEER	DATE	DRAWN	DATE	CHECKED	DATE	PROJ. MANAGER	DATE
0	ORIGINAL ISSUED FOR DOSSIER								
A	ISSUED FOR HAZARDOUS AREAS CLASSIFICATION			FYF	20.8.10				

CLIENT: NT GAS — CLIENT — DATE

FYFE REF No

AMADEUS BASIN TO DARWIN PIPELINE

DARWIN CITY STATION
HAZARDOUS AREA PLAN

DRAWING NUMBER	SHEET	REVISION
AD1498–9402	A1	0

5 Hazardous Area Equipment Register and Certificates of Conformity

This section contains the hazardous area equipment register and associated certificates of conformity.

FYFE
Earth Partners
ENVIRONMENT
DEVELOPMENT
RESOURCES

Darwin City Gate Meter Station
Hazardous Area Equipment Register

Color Code Notes:
Certification is not Australian

Doc No.: 18756-5-70-010
Rev: 0
Date: 18-Nov-2011

APA Group

Tag	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Hazard Area Drawing No.	Haz Area Classification			Ex Protection	Certification
								Zone	Gas Group	Temp.		
AD1498-TE-11		Station Inlet	Temperature Element								Ex i	
AD1498-PT-13	AD 1498-7002	MC-01 inlet pipe	Pressure transmitter	Rosemount	3051TG4A2B21BB4I7M5T1	RS0503742	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 (40°C) Ex ia IIC T4 (70°C)	Aus Ex 1249X
AD1498-PY-17	AD 1498-7002	TCV-17	I/P Transducer	Fisher	DVC 5010	13184549	AD 1498-9402	2	IIA	T1		
AD1498-ZSC-17	AD 1498-7002	TCV-17	Valve limit switch (close)	Fisher	304	9644633	AD 1498-9402	2	IIA	T1	Class 1, Group C & D, ENCL4	
AD1498-PY-15	AD 1498-7002	TCV-15	Pressure regulator	Fisher	DVC 5010	16049199	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 (80°C), T5 (70°C), T6 (60°C)	AUS Ex 3155X
AD1498-ZSC-15	AD 1498-7002	TCV-15	Valve limit switch (close)	Fisher	304	9644629	AD 1498-9402	2	IIA	T1	Class 1, Group C & D, ENCL4	
AD1498-LSHHH-16	AD 1498-7002	Filter FS-1	High High Level Switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 609
AD1498-LSHH-16	AD 1498-7002	Filter FS-1	High High Level Switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 609
AD1498-LSHH-16A	AD 1498-7002	Filter FS-1	High high level switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 609
AD1498-LSH-16	AD 1498-7002	Filter FS-1	High level switch	United Electric			AD 1498-9402	2	IIA	T1		
AD1498-LSH-16A	AD 1498-7002	Filter FS-1	High Level switch	United Electric			AD 1498-9402	2	IIA	T1		
AD1498-DPT-16		FS1	Differential Pressure Transmitter	Rosemount	3051C03A22A1AMSB4I7L4T1	RS0347136	AD 1498-9402					
AD1498-ISJB-1		FS-1	Junction box	Crouse-Hinds	WDU 2.5		AD 1498-9402	2	IIA	T1	Ex ia IIC T6 IP66	
AD1498-JB		FS-2	Junction box	SAE	FNJ1		AD 1498-9402	2	IIA	T1	Class I & II Div 1 & 2 IIB T6	SAA CERT No FLP 693
AD1498-LSHHH-18	AD 1498-7002	Filter FS-2	High High Level switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 609
AD1498-LSHH-18	AD 1498-7002	Filter FS-2	High High Level switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 609
AD1498-LSHH-18A	AD 1498-7002	Filter FS-2	High High Level switch	Frank W Murphy	L1200		AD 1498-9402	2	IIA	T1	Ex d IIC, IIB T6	Aus Ex 609
AD1498-LSH-18	AD 1498-7002	Filter FS-2	High level switch	United Electric	J400-553		AD 1498-9402	2	IIA	T1		
AD1498-LSH-18A	AD 1498-7002	Filter FS-2	High level switch	United Electric	J400-553		AD 1498-9402	2	IIA	T1		
AD1498-DPT-18		FS2	Pressure Transmitter	Rosemount	3051CD3A22A1AM5B419L4T1	RS0347135	AD 1498-9402					
AD1498-ISJB-2		FS-2	Junction box	SAE	FNJ1		AD 1498-9402	2	IIA	T1	Class I & II Div 1 & 2 IIB T6	SAA CERT No FLP 693
AD1498-TT-20	AD 1498-7002	Filter outlet process pipe	Temperature transmitter	Yokogawa	YTA 210 EA4DB/SO1/S3	C2JA 00686 941	AD 1498-9402	2	IIA	T1	Ex d IIC T6 (75°C) / Ex	Aus Ex 3640/3652X
AD1498-TT-20A	AD 1498-7002	Filter outlet process pipe	Temperature transmitter	Yokogawa	YTA 110 EA4 DB/SU1/S3	C2JA00685941	AD 1498-9402	2	IIA	T1	Ex ia, n IIC T4 IP 66167	Aus Ex 3652X
AD1498-PT-22	AD 1498-7002	Filter outlet process pipe	Pressure transmitter	Rosemount	3051 TG4A2B21BK7M5T1	01234918	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 (40°C) Ex ia IIC T4 (70°C)	Aus Ex 1249X
AD1498-PT-22A	AD 1498-7002	Filter outlet process pipe	Pressure transmitter	Rosemount	3051 TG4A2B21BK7M5T1	01234917	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 (40°C) Ex ia IIC T4 (70°C) IP66	Aus Ex 1249X
AD1498-PSL-24	AD 1498-7002	Filter outlet process pipe	Low pressure switch	Ashcroft	P7 (?)		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 547
AD1498-ZSC-44	DB0000-7000	Gas offtake	Valve limit switch	Keystone	F792K	535812	AD 1498-9402	2	IIA	T1	Ex d IIB T6 IP65	Aus Ex 1416
AD1498-SVC-44		V44	Solenoid Valve	Lucifer	49219003 (Coil)		AD 1498-9402	2	IIA	T1	Ex m, e IIC T4 (40°C) IP66	Aus Ex 321
AD1498-SVO-44		V44	Solenoid Valve	Lucifer	49219003		AD 1498-9402	2	IIA	T1	Ex m, e IIC T4 (40°C) IP66	Aus Ex 321
AD1498-LP SW		Standby Run	Pressure Switch	United Electric Controls	H119 189	7000 PSI 49 MPA 613	AD 1498-9402	2	IIA	T1	Ex d IIB T6 IP66	Aus Ex 1211
AD1498-TURBINE METER		Standby Run	Meter	ITRON	DE-07-MI002-PTBD018	3400334499/C 2010	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 & T6	LCIE 06 ATEX 6031X
AD1498-TT		Standby Run	Temperature Transmittor	Yokogawa	YTA 110 (STYLE 53) EA4DB/SV1	C2J901750933	AD 1498-9402	2	IIA	T1	Ex d, ia, n IIC T6, T4, T4 IP66/67	Aus Ex 3640, 3652X
AD1498-LP SW		Duty Run	Pressure Switch	United Electric Controls	H119 190	7001 PSI 49 MPA 613	AD 1498-9402	2	IIA	T1	Ex d IIB T6 IP67	Aus Ex 1211
AD1498-TURBINE METER		Duty Run	Meter	ITRON	DE-07-MI002-PTBD019	3400334499/C 2011	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 & T7	LCIE 06 ATEX 6031X
AD1498-TT		Duty Run	Temperature Transmittor	Yokogawa	YTA 110 (Style 53) EA4DB/SV1	C2J901749 933	AD 1498-9402	2	IIA	T1	Ex d, ia, n, IIC T6, T4, T4	Aus Ex 3640, 3652X

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Darwin City Gate Meter Station
Hazardous Area Equipment Register

Color Code Notes:
Certification is not Australian

Doc No.: 18756-5-70-010
Rev: 0
Date: 18-Nov-2011

APA Group

Tag	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Hazard Area Drawing No.	Haz Area Classification			Ex Protection	Certification
								Zone	Gas Group	Temp.		
AD1498-PT-0001		Berrimah RD Outlet (Near PI 002)	Pressure Transmitter	Rosemount	3051T44A2B21BK7M5TIP104Q8C5AO227	2178140	AD 1498-9402	2	IIA	T1	Ex iiL, iiA, d, ia, IIC T5, T5, T5/T6, T5	IEC Ex BAS 09.0076X
AD1498-HP SW1		Berrimah RD Outlet	Pressure Switch	United Electric Controls	J120 188		AD 1498-9402	2	IIA	T1	Ex d IIC T6 IP66	Aus Ex 542
AD1498-1JB 001		Analyser Shelter	Junction Box	N/A			AD 1498-9402	2	IIA	T1		
AD1498-PIT 31		Carrier Gas Pressure	Pressure Transmitter	Yokogawa	EJX 530A-EDS4N-014EF-SU2-X2	91L439334117	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 IP66/67	IECEx CSA 05.0005
AD1498-PIT 32		Carrier Gas Pressure	Pressure Transmitter	Yokogawa	EJX 530A EDS4N-014EF/SU2/X2	91L439335 117	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 IP66/67	IECEx CSA 05.0005
AD1498-PIT 33		Carrier Gas Pressure	Pressure Transmitter	Yokogawa	EJX 530A ED5SN-014EF/SU2/X2	91L439336 117	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 IP66/67	IECEx CSA 05.0005
AD1498-JB		Analyser Shelter	Heat Trace Junction Box	Thermon	PN 27610		AD 1498-9402	2	IIA	T1	Ex e II T4-T6 IP66	95043/IECEx UL 05.0003
AD1498-MA 27		Analyser Shelter	Moisture Analyser	Ametek	3050-0LV	305 C714	AD 1498-9402	2	IIA	T1	Eex d/de IIC T6	ATEX-6007X
AD1498-JB		MA27-Analyser Shelter	MA-27-Junction Box	Govan	ES 2315	20 999-01	AD 1498-9402	2	IIA	T1	Ex e IIC T6 IP66	IECEx SIM 09.0001X
AD1498-GC 28		Moisture Analyser	Chromatograph	Emerson	7-0771-101	9011362	AD 1498-9402	2	IIA	T1	Ex d IIC T4 (60°C)	IECEx SIR 08.0008X
AD1498-JB		Analyser Shelter	Junction Box	CCG	POSIFIT 1		AD 1498-9402	2	IIA	T1	Ex e IIC T6 IP66/68	ANZ Ex 06.2001
AD1498-PT-42	AD 1498-7001	DN300 outlet process pipe	Pressure transmitter	Rosemount	3051TG4A2B21BB4M5T1	RS0619762	AD 1498-9402	2	IIA	T1	Ex ia IIC T5 (40°C) Ex ia IIC T4 (70°C)	Aus Ex 1249X
AD1498-SVO-41	AD 1498-7001	1498-MLV-41	Solenoid valve (open)	Skinner valve			AD 1498-9402	2	IIA	T1	Ex m IIA	Aus Ex 2541X
AD1498-SVC-41	AD 1498-7001	1498-MLV-41	Solenoid valve (close)	Skinner valve			AD 1498-9402	2	IIA	T1	Ex m IIA	Aus Ex 2541X
AD1498-ZSO-41	AD 1498-7001	1498-MLV-41	Valve limit switch (open)	Limitorque	SY	700315B-L001399	AD 1498-9402	2	IIA	T1		
AD1498-ZSC-41	AD 1498-7001	1498-MLV-41	Valve limit switch (close)	Limitorque	SY	700315B-L001399	AD 1498-9402	2	IIA	T1		
AD1498-UV-50 IS JB		Wickham point pipeline	Junction box	Govan	GE33S-1	204679	AD 1498-9402	2	IIA	T1	Ex e IIC T6 IP67	Aus Ex 869X
AD1498-UV-50 IS JB		Wickham point pipeline	Junction box	Govan	GE33S-1	204679	AD 1498-9402	2	IIA	T1	Ex i IIC T6 IP67	
AD1498-PT-52	WP0000-7001	Wickham point pipeline	Pressure transmitter	Rosemount	3051CG5A02A1BM5K701S5Q4TR	01700765	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 (70°C) IP66	Aus Ex 1249X
AD1498-PT-51	WP0000-7001	Wickham point pipeline	Pressure transmitter	Rosemount	3051CG5A02A1BM5K7A135Q4TR	01700764	AD 1498-9402	2	IIA	T1	Ex ia IIC T4 (70°C) IP66	Aus Ex 1247X
AD1498-Switch		HV50A	Switch	Elomatic	H2	10017702/1	AD 1498-9402	2	IIA	T1	Ex d IIC T6 IP66	Aus Ex 1246
AD1498-UYO-50	WP0000-7001	Wickham point pipeline	Solenoid valve	Parker Lucifer			AD 1498-9402	2	IIA	T1	Ex me IIC T3/T4 IP65	Aus Ex 321
AD1498-UYC-50	WP0000-7001	Wickham point pipeline	Solenoid valve	Parker Lucifer			AD 1498-9402	2	IIA	T1	Ex me IIC T3/T4 IP65	Aus Ex 321
AD1498-ZSO-50	WP0000-7001	Wickham point pipeline	Valve limit switch	Elomatic			AD 1498-9402	2	IIA	T1		
AD1498-ZSC-50	WP0000-7001	Wickham point pipeline	Valve limit switch	Elomatic			AD 1498-9402	2	IIA	T1		
AD1498-ZS 50C		UV 50 Door Limit	Limit Switch JB	Govan	FG4-RA	20423104	AD 1498-9402	2	IIA	T1	Ex d IIB T6 IP65	Aus Ex 157X
AD1498-IR Security Beam		Station Security - Right Hand Corner		Sunwave			AD 1498-9402	2	IIA	T1		
AD1498-Light & switch		Analyser Shelter	Light + switch	Burn Brite + wild	FLP2-2X40-240 HPF ME+WPS110		AD 1498-9402	2	IIA	T1	Ex d IIB T5 IP65	Aus Ex 229
AD1498-LSH-30	AD 1498-7002	Slop tank	High level switch				AD 1498-9402	2	IIA	T1		
AD1498-HSO-41	AD 1498-7001	1498-MLV-41	Valve hand switch (open)				AD 1498-AAAA	Not in hazardous area				
AD1498-HSC-41	AD 1498-7001	1498-MLV-41	Valve hand switch (close)				AD 1498-AAAA	Not in hazardous area				
AD1498-ZLO-41	AD 1498-7001	1498-MLV-41	Light switch (open)				AD 1498-AAAA	Not in hazardous area				
AD1498-ZLC-41	AD 1498-7001	1498-MLV-41	Light switch (close)				AD 1498-AAAA	Not in hazardous area				
AD1498-TT-11	AD 1498-7002	MC-01 inlet pipe	Temperature transmitter				AD 1498-9402	2	IIA	T1		
AD1498-PDAH-16	AD 1498-7002	Filter FS-1	High pressure differential alarm	Fisher			AD 1498-9402	2	IIA	T1		
AD1498-PDAHH-16	AD 1498-7002	Filter FS-1	High high pressure differential alarm	Fisher			AD 1498-9402	2	IIA	T1		
AD1498-PDAH-18	AD 1498-7002	Filter FS-2	High pressure differential alarm	Fisher			AD 1498-9402	2	IIA	T1		
AD1498-PDAHH-18	AD 1498-7002	Filter FS-2	High high pressure differential alarm	Fisher			AD 1498-9402	2	IIA	T1		

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Darwin City Gate Meter Station
Hazardous Area Equipment Register

Color Code Notes:

Certification is not Australian

Doc No.: 18756-5-70-010

Rev: 0

Date: 18-Nov-2011

APA Group

Tag	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Hazard Area Drawing No.	Haz Area Classification			Ex Protection	Certification
								Zone	Gas Group	Temp.		
AD JBs		GC system	Junction boxes	Adalet	XJT		AD 1498-9402	2	IIA	T1	Ex d IIB	Aus Ex 1009
AD PSL	AD 1498-7002	GC system	Low pressure switch	United Electric	J120-156		AD 1498-9402	2	IIA	T1	CL I GR B, C & D CL II GR E, F & G and CL III	Aus Ex 542
AD1498-JBs		Gas offtake	Junction boxes	Crouse-Hinds	GUA16		AD 1498-9402	2	IIA	T1	Ex d IIC T6 IP66/67	Aus Ex 319
AD1498-TT-201	DB0000-7000	Gas offtake	Temperature transmitter	United Electric	J120		AD 1498-9402	2	IIA	T1	Ex d IIC T6	Aus Ex 542
AD1498-PT	DB0000-7000	Gas offtake	Pressure transmitter	Rosemount	3051		AD 1498-9402	2	IIA	T1	Ex ia IIC T5 (40°C) Ex ia IIC T4 (70°C)	Aus Ex 1249X
AD1498-AFL	DB0000-7000	Gas offtake	Gas volume corrector	Mercury instruments	Mercor EC-AT		AD 1498-9402	2	IIA	T1	Ex ia IIA T3	Aus Ex 2046X
AD1498-PSH-44	DB0000-7000	Gas offtake	High pressure switch	United Electric	J119		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 1211
AD1498-ZSO-44	DB0000-7000	Gas offtake	Valve limit switch	Keystone	F792K		AD 1498-9402	2	IIA	T1	Ex d IIB T6	Aus Ex 1416
AD1498-RTU		Control room	Remote terminate unit					Not in hazardous area			-	-
AD1498-ESD		Control room	Emergency shut down					Not in hazardous area			-	-

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Darwin City Gate Meter Station
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Tag	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Hazard Area Drawing No.	Haz Area Classification			Ex Protection	Certification
								Zone	Gas Group	Temp.		

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No: AUS Ex 1249X

Issue 0: Original Issue 17/7/1991
Issue 5: 30/05/2003 (Revalidation)

Date of Expiry: 30/05/2013

Certificate Holder: Fisher-Rosemount Pty Ltd
471 Mountain Highway
BAYSWATER Victoria 3153

Electrical Equipment: Model 3051-series Pressure Transmitter and Model 3001-series Hydrostatic Pressure Transmitter, including optional Fieldbus/Profibus outputs, LCD indicator and T1 Transient-protection Terminal Board.

Type of Protection: Ex ia
Ex n

Marking Code: Ex ia IIC T4 (T_{amb} = 70 °C) / T5 IP66 (for non-Fieldbus)
Ex ia IIC T4 (T_{amb} = 60 °C) / T5 IP66 (for Foundation Fieldbus/Profibus)
Ex n IIC T4(T_{amb} = 70 °C) / T5 IP66
AUS Ex 1249X

Manufactured By: Rosemount Inc
8200 Market Boulevard
Chanhassen MN 55317 USA

Emerson Process Management
Document Control
PDC No.: 4-70538561-001 Rev: 0 Date: 31/7/03
ORDER NUMBERS
Customer: 626973
Emerson: 70538561

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 Fax: (02) 4724 4999

JAS-ANZ

Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements (incorporating Amendment 1)
AS 2380.7-1987	Electrical Equipment for explosive atmospheres - Explosion-protection techniques - Intrinsic safety 'i'
AS 2380.9-1991	Electrical Equipment for Explosive atmospheres - Explosion-protection Techniques - Non-sparking Apparatus - Type of protection 'n'
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standards listed above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: LOSC 11812; 16864; 16910 and TestSafe 20320, 21599 and 22468

File Reference: TestSafe 94/5985-TSA 0007

Signed for and on behalf of issuing authority
Laboratory Systems Manager
TestSafe Australia

Position
30/05/2003

Date of issue

Ex 1249X-5

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 1249X **Issue:** 5 **Date of Issue:** 30/05/2003

Certified Equipment: The range of transmitters is designed to convert signals from a pressure transducer into an electrical signal. The electronics provide an analogue 4-20 mA output with HART, or optionally a d.c. output for low power applications or Foundation Fieldbus, or Profibus output for Fieldbus applications. The transmitter is intended for connection to separately certified apparatus having a source of potential not exceeding 30 Volts d.c. and a short circuit current not exceeding 200 mA for the low power and analog/HART output or 300 mA for the Fieldbus output.

The equipment may be manufactured in a number of combinations from the ranges of optional boards according to the configurations, and they are tabulated in the following tables.

(a) Foundation Fieldbus/Profibus Transmitter Configuration		
Ref.	**Description**	**Drawing No.**
Any one of the following terminal boards:		
Ter.e	Standard 3051 Fieldbus	03031-0467
Ter.f	Transient Protection 3051 Fieldbus (T1 Option)	03031-0486
Micro-board assembly:		
Micro.a1	3051 Fieldbus Analog	03031-0477
Micro.a2	3051 Fieldbus Digital	03031-0481
Optional LCD Indicator assembly:		
Dis.c	CCA, Vortex Shrouded, LCD Board, 2 Line	08800-7611
Any one of the sensor boards can be used: (Refer to Sensor Board List below)		

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Certified Equipment: (Continued)

(b) Low Power Transmitter Configuration		
Ref.	**Description**	**Drawing No.**
Any one of the following terminal boards can be used:		
Ter.a	Potted Low Power Terminal Block Assembly	03031-0607
Ter.b	Transient Protection Terminal Brd, 3-Wire (T1 Option)	03031-0506
Microboard assembly:		
Micro.b	Low Power Microboard Conformal Coated	03031-0275
Optional LCD Indicator assembly:		
Dis.a	Coated CCA Meter/LCD Board	03031-0162
Any one of the sensor boards can be used: (Refer to Sensor Board List below)		

(c) Analog/HART Transmitter Configuration		
Ref.	**Description**	**Drawing No.**
Any one of the following terminal boards can be used:		
Ter.c	4-20mA Standard Terminal Block Assembly	03031-0657
Ter.d	Standard Transient Protection Terminal Block Assembly (T1 Option)	03031-0665
Microboard Assembly:		
Micro.c	Micro Brd 5, Coated & Spot Potted, 3051/3001 & Probar	03031-0584
Optional LCD Indicator assembly:		
Dis.b	Shrouded/Spot-Potted/Labelled LCD Board, 2 Line	03031-0591
Any one of the sensor boards can be used: (Refer to Sensor Board List below)		

Sensor Boards List		
Ref.	**Description**	**Drawing No.**
Sen.a	Low Cost Sensor Card Conformal Coated	03031-0283
Sen.b	Sensor Board 3, Uncoated, 3051C	03031-0587
Sen.c	Sensor Board IV Coated, 3051C	03031-0817
Sen.d	AP Sensor Card Conformal Coated	03031-2011
Sen.e	Sensor Board, Coated, 3051T	03031-0923
Sen.f	Sensor Taconite, Coated, 3051/2088	03031-0929

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Addendum to Certificate No.... Ex 1249X-5

Variations Permitted By Issue 5:

1. The complete range of the equipment has been classified as documented in the Certified Equipment.

Conditions of Certification relating to Variations Permitted by Issue 5:

1. It is a condition of manufacture that the 3051 or 3001 pressure transmitters that do not include the transient protection on the terminal board assembly must be capable of withstanding a test voltage of not less than 500 Volts, 48 Hz to 62 Hz applied between input terminals and case for a period not less than 1 minute.

2. It is a condition of safe use that the following parameters are to be taken into account for Intrinsic Safety applications:

(a) Foundation Fieldbus/Profibus Transmitter Configuration	
Entity Parameters	**With or without transient protected T1 option**
Ui	30 V
Ii	300 mA
Pi	1.3 W
Ci	0 µF
Li	0 µH

(b) Low Power Transmitter Configuration		
Entity Parameters	**Without transient protected T1 option**	**With transient protected T1 option**
Ui	30 V	30 V
Ii	200 mA	200 mA
Pi	0.9 W	0.9 W
Ci	0.042 µF	0.042 µF
Li	10 µH	0.75 mH

(c) Analog/HART Transmitter Configuration		
Entity Parameters	**Without transient protected T1 option**	**With transient protected T1 option**
Ui	30 V	30 V
Ii	200 mA	160 mA
Pi	0.9 W	0.9 W
Ci	0.01 µF	0.01 µF
Li	10 µH	1.05 mH

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Conditions of Certification relating to Variations Permitted by Issue 5: (continued)

3. It is a condition of safe use that the apparatus may only be used with a passive current limited power source for Intrinsic Safety applications. The power source parameters must be such that Po ≤ (Uo x Io) / 4.

4. It is a condition of safe use that for models using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm^2 minimum cross-sectional area.

5. It is a condition of safe use that the Fieldbus option is to be supplied from a voltage source not exceeding 35.0 V dc for Non-Sparking applications. The Low Power and Analog/HART options are to be supplied from a voltage source not exceeding 55 V dc for Non-sparking applications

6. It is a condition of safe use that where the equipment is installed such that there is an unused conduit entry, the entry must be sealed with a suitable blanking plug to maintain the minimum degree of protection of IP66 for Non-Sparking applications.

7. It is a condition of safe use that upon completion of commissioning the apparatus with a label plate with more than one marking on it, the irrelevant marking code(s) shall be permanently scribed off.

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 1249X-5

Drawings Relating to Variations Permitted by Issue 5

Document No.	Document Title	Sheets	Issue	Date
00268-0031	Index of I.S. Barrier System for MOD.268 Smart Family Interface	1 to 7	M	08/04/1993
03031-0059	Label, Nameplate / Customer Tag	1 to 16	AY	17/12/2001
03031-0060	Label, Approvals, 3051C	1 to 8	BG	04/04/2002
03031-0087	Schematic Diagram, 3051/3001 CENELEC I.S. Approval	1 of 1	AC	10/10/1997
03031-0160	Schematic Diagram, Meter/LCD Board	1 of 1	H	07/05/1990
03031-0161	Printed Wiring Board LCD/Meter Board	1 to 4	U	05/08/1996
03031-0162	Coated CCA Meter/LCD Board	1 of 1	AC	22/11/1999
03031-0272	Schematic Diagram 3051C Low Power	1 of 2	AA	17/02/1999
03031-0273	Printed Wiring Board Low Power Microboard	1 to 4	J	06/08/1996
03031-0275	Circuit Card Assy Low Power Microboard Conformal Coated	1 to 3	AB	10/11/1999
03031-0280	Schematic Diagram Low Cost Sensor BRD	1 of 1	F	12/01/1995
03031-0281	Printed Wiring Board Low Cost Sensor Card	1 to 4	G	06/08/1996
03031-0283	Circuit Card Assy Low Cost Sensor Card Conformal Coated	1 of 1	F	21/03/1991
03031-0464	Schematic Drawing Standard Terminal Block, 3051 Fieldbus	1 of 1	AA	20/03/1998
03031-0467	Terminal Block Assy, Standard 3051 Fieldbus	1 to 2	AC	12/1998
03031-0475	3051 Fieldbus Analog Electronics	1 to 2	AC	12/1998
03031-0476	Printed Wiring Board - Fieldbus Analog	1 to 3	AC	10/06/1998
03031-0477	Circuit Card Assy 3051 Fieldbus Analog	1 to 2	AH	29/05/2001
03031-0479	3051 Fieldbus Digital Electronics	1 of 1	AB	12/1998
03031-0480	Printed Wiring Board - 3051 Fieldbus Digital	1 to 3	AC	12/1998
03031-0481	Circuit Card Assy - 3051 Fieldbus Digital	1 to 3	AD	01/2000
03031-0483	Schematic Drawing Transient Terminal Block, 3051 Fieldbus	1 of 1	AB	22/02/2001
03031-0484	Printed Wiring Board Transient Protection 3051 Fieldbus	1 to 3	AC	22/02/2001
03031-0486	Terminal Block Assy, Transient Protection, 3051 Fieldbus	1 to 2	AC	12/1998
03031-0488	Ass'y Output Electronics, Fieldbus	1 of 1	AG	29/05/2001
03031-0504	Schematic Diagram Terminal Block 3-wire Configuration	1 of 1	C	21/05/1991
03031-0505	Printed Wiring Board Terminal Board, 3-Wire Configuration	1 to 2	E	23/06/1995
03031-0506	Circuit Card Assy, Transient Protection Terminal BRD, 3-Wire	1 to 3	AA	24/08/1998

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 Fax: (02) 4724 4999

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Drawings Relating to Variations Permitted by Issue 5 (Continued)

Document No.	Document Title	Sheets	Issue	Date
03031-0519	3051P Label, Nameplate / Customer Tag	1 to 8	AG	10/08/2001
03031-0520	Label, Approvals, 3051P	1 to 8	AJ	06/01/2000
03031-0521	Label, Nameplate / Customer Tag 3051C-Low Power	1 to 7	AH	15/02/2001
03031-0535	Label, Nameplate / Customer Tag 3051P-Low Power	1 to 3	F	19/05/1995
03031-0581	Schematic Drawing Micro Board #5 3051C	1 to 3	AD	01/03/2002
03031-0582	Printed Wiring Board, Micro BRD 5, 3051C	1 to 3	AD	17/07/2000
03031-0584	Shrouded Assembly Micro BRD 5, Coated & Spot Potted, 3051/3001 & Probar	1 to 4	AK	04/03/2002
03031-0585	Schematic Sensor Board 3	1 to 2	B	13/11/1995
03031-0586	Printed Wiring Board Sensor Board 3 3051C	1 to 4	AA	08/10/1997
03031-0587	Circuit Card Assy Sensor Board 3, Uncoated, 3051C	1 to 2	AC	25/06/1998
03031-0589	Schematic Diagram 160 Segment LCD Board	1 to 1	A	31/01/1995
03031-0590	Printed Wiring Board LCD Board, 2 Line	1 to 4	AA	30/11/1998
03031-0591	Circuit Card Assembly Shrouded/Spot-Potted/labeled LCD Board, 2 Line	1 to 3	AF	19/06/2000
03031-0604	Schematic Diagram 3051C Low Power Terminal Block	1 of 1	A	12/02/1996
03031-0605	Printed Wiring Board, Low Power, Terminal, Block, 3051C	1 to 3	A	12/02/1996
03031-0607	Potted Low Power Terminal Block Assembly	1 of 1	AC	15/11/2001
03031-0655	Schematic Diagram 4-20mA Standard Terminal Block	1 of 1	AB	15/10/2001
03031-0656	Printed Wiring Board, Standard 4-20mA, Terminal Block, 3051C	1 to 3	AD	20/06/2000
03031-0657	4-20mA Standard Terminal Block Assembly	1 to 2	AF	15/11/2001
03031-0663	Schematic Diagram Standard Trans. Protection Terminal Block	1 of 1	AB	10/2001
03031-0664	Printed Wiring Board, Transient Protection Standard, Term. Block, 3051C	1 to 3	AC	07/08/1997
03031-0665	Standard Transient Protection Terminal Block Assembly	1 to 2	AD	15/11/2001
03031-0687	Schematic Diagram, 3051 Fieldbus CENELEC I.S. Approval	1 of 1	AB	16/08/2001
03031-0815	Schematic Sensor Board IV	1 to 2	AE	13/01/1999
03031-0816	Printed Wiring Board Sensor Board IV, 3051C	1 to 3	AE	11/06/1998

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 1249X-5

Drawings Relating to Variations Permitted by Issue 5 (Continued)

Document No.	Document Title	Sheets	Issue	Date
03031-0817	Circuit Card Assy Sensor Board IV Coated, 3051C	1 to 2	AH	13/01/1999
03031-0920	Schematic Sensor, 3051T	1 to 2	G	13/12/1995
03031-0921	Printed Wiring Board, Sensor Board 3051T	1 to 3	C	25/02/1997
03031-0923	Circuit Card Assy Sensor Board Coated, 3051T	1 of 1	AA	07/10/1997
03031-0926	Schematic Sensor, 3051TAC	1 to 3	AE	01/04/2001
03031-0927	Printed Wiring Board Sensor Taconite, 3051/2088	1 to 3	AF	25/05/2001
03031-0929	Circuit Card Assembly Sensor Taconite, Coated, 3051/2088	1 of 1	AJ	01/04/2001
03031-1017	Approval Drawing For Module Housing Ass'y, Intrinsically Safe	1 to 6	AH	30/11/2000
03031-1022	Model 3051C/L/P/H, 3001C/S Intrinsically Safe and Type N Configuration, SAA	1 to 10	AG	28/05/2003
03031-1026	SAA I.S. Index For 3051 and 3001	1 to 4	AB	26/04/1999
03031-2008	Schematic Diagram AP Sensor Brd	1 of 1	L	23/09/1996
03031-2009	Printed Wiring Board AP Sensor Card	1 to 4	K	23/09/1996
03031-2011	Circuit Card Assy AP Sensor Card Conformal Coated	1 of 1	AA	07/10/1997
03031-2041	3051T Sensor Board Standoff	1 of 1	AC	05/09/2000
08800-7609	Schematic Diagram, Vortex LCD Board	1 of 1	AA	15/10/1997
08800-7610	Printed Wiring Board, LCD 2 Line	1 to 3	AA	15/10/1997
08800-7611	CCA, Vortex, Shrouded, LCD Board, 2 Line	1 to 2	AE	06/07/2000

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REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AA	UPDATE ENTITY PARAMETERS	RTC1002910	J.D.J.	12/2/97
AB	ADD FIELDBUS AND PROFIBUS	RTC1006448	J.D.J.	4/26/99

TestSafe Australia
This drawing forms part of certification document under Certificate Number AUS Ex 1249X
Amendments require Supplementary Certification

SAA ENTITY CONCEPT APPROVALS

3051C	3001C
3051L	3001CL
3051P	3001CH
3051H	3001S
3051CA	
3051T	

OUTPUT CODE A (4-20 mA HART) SEE SHEETS 2
OUTPUT CODE M (LOW POWER) SEE SHEETS 3
OUTPUT CODE F / W (FIELDBUS, PROFIBUS) SEE SHEETS 4

THE ROSEMOUNT PRESSURE TRANSMITTERS LISTED ABOVE ARE INTRINSICALLY SAFE WHEN USED IN THE CURCUIT WITH SAA APPROVED BARRIERS WHICH MEET THE LIST ENTITY PERAMETERS.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING INSTRUCTIONS AND THE APPLICABLE CIRCUIT DIAGRAM.

CAD Maintained, (MICROSTATION)

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

-TOLERANCE-
.X ± .1 [2,5]
.XX ± .02 [0,5]
.XXX ± .010 [0,25]
FRACTIONS ± 1/32
ANGLES ± 2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. Mike Dobe 12/30/91

CHK'D

APP'D. GLEN MONZO 5/8/92

APP'D. GOVT.

ROSEMOUNT® MEASUREMENT
FISHER-ROSEMOUNT

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

TITLE SAA I.S. INDEX FOR 3051 & 3001

SIZE A | FSCM NO | DWG NO. 03031-1026

SCALE N/A | WT. | SHEET 1 OF 4

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB		RTC1006448		

OUTPUT CODE "A" (4–20MA / HART)
SAA ENTITY CONCEPT APPROVALS

THE ROSEMOUNT PRESSURE TRANSMITTERS LISTED BELOW ARE INTRINSICALLY SAFE WHEN USED IN THE CIRCUIT WITH SAA APPROVED BARRIERS WHICH MEET THE LISTED ENTITY PARAMETERS.

APPROVED TRANSMITTERS

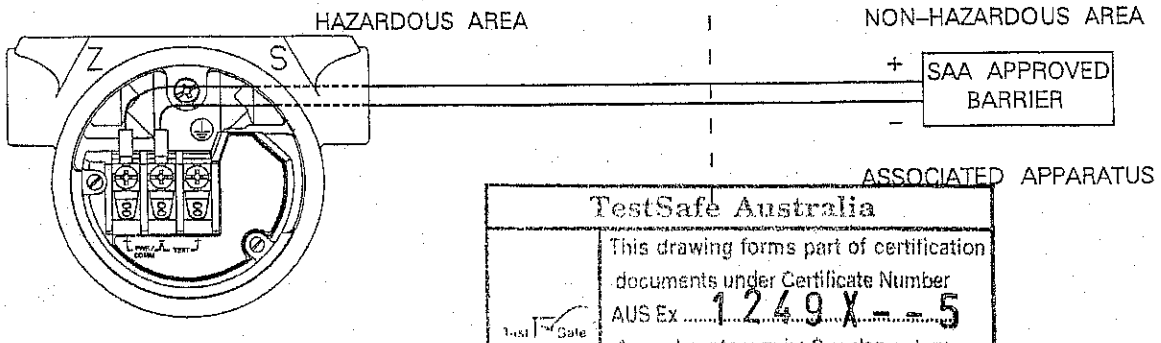
3051C	3051H	3001C	3001S
3051L	3051T	3001CL	
3051P	3051CA	3001CH	

ENTITY PARAMETER FOR Ex ia IIC T5 CLASS I, ZONE 0 PROTECTION:

APPARATUS PARAMETER	BARRIER PARAMETER
Vmax = 30V	Voc IS LESS THAN OR EQUAL TO 30V
Imax = 200mA	Isc IS LESS THAN OR EQUAL TO 200mA
Pmax = 0.9W	$\frac{Voc * Isc}{4}$ IS LESS THAN OR EQUAL TO 0.9W
Ci = 0.01μF	Ca IS GREATER THAN 0.01 MICROFARADS
Li = 10μH	La IS GREATER THAN 10 MICROHENRIES
FOR T1 OPTION ONLY	
Imax = 160mA	Isc IS LESS THAN OR EQUAL TO 160mA
Li = 1.05mH	La IS GREATER THAN 1.05 MILLIHENRIES

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURERS FIELD WIRING INSTRUCTIONS AND THE CIRCUIT DIAGRAM SHOWN BELOW.



TestSafe Australia

This drawing forms part of certification documents under Certificate Number AUS Ex 1249X – 5

Amendments require Supplementary Certification

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

CAD Maintained, (MICROSTATION)

DR. Mike Dobe	SIZE A	FSCM NO	DWG NO. 03031-1026
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 4

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB		RTC1Ø06448		

OUTPUT CODE "M" (LOW POWER)
SAA ENTITY CONCEPT APPROVALS

THE ROSEMOUNT LOW POWER CONFIGURED PRESSURE TRANSMITTERS LISTED BELOW ARE SAA APPROVED AS INTRINSICALLY SAFE WHEN USED IN THE CIRCUIT WITH SAA APPROVED BARRIERS WHICH MEET THE LISTED ENTITY PARAMETERS.

APPROVED TRANSMITTERS WITH LOW POWER CONFIGURATION

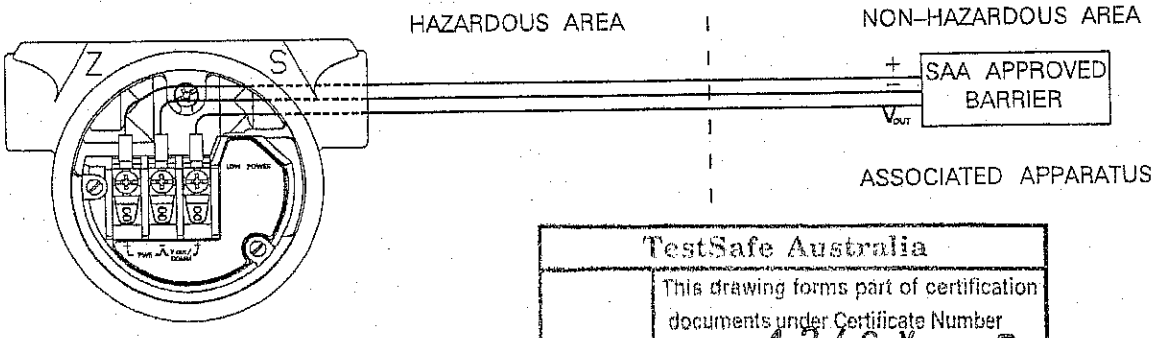
3051C	3051T
3051L	3051CA
3051P	
3051H	

ENTITY PARAMETER FOR Ex ia IIC T5 CLASS I, ZONE 0 PROTECTION:

APPARATUS PARAMETER	BARRIER PARAMETER
Vmax = 30V Imax = 200mA Pmax = 0.9W	Voc IS LESS THAN OR EQUAL TO 30V Isc IS LESS THAN OR EQUAL TO 200mA $\frac{Voc * Isc}{4}$ IS LESS THAN OR EQUAL TO 0.9W
Ci = 0.042μF Li = 10μH	Ca IS GREATER THAN 0.042 MICROFARADS La IS GREATER THAN 10 MICROHENRIES
FOR T1 OPTION ONLY Li = 0.75mH	La IS GREATER THAN 0.75 MILLIHENRIES

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURERS FIELD WIRING INSTRUCTIONS AND THE CIRCUIT DIAGRAM SHOWN BELOW.



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This drawing forms part of certification documents under Certificate Number AUS Ex 1249X - 5
Amendments require Supplementary Certification

CAD Maintained (MICROSTATION)

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

DR. Mike Debe	SIZE A	FSCM NO	DWG NO. Ø3031-1Ø26
ISSUED	SCALE N/A	WT. ———	SHEET 3 OF 4

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB		RTC1006448		

OUTPUT CODE F/W (FIELDBUS, PROFIBUS)
SAA ENTITY CONCEPT APPROVALS

THE ROSEMOUNT PRESSURE TRANSMITTERS LISTED BELOW ARE INTRINSICALLY SAFE WHEN USED IN THE CIRCUIT WITH SAA APPROVED BARRIERS WHICH MEET THE LISTED ENTITY PARAMETERS.

APPROVED TRANSMITTERS

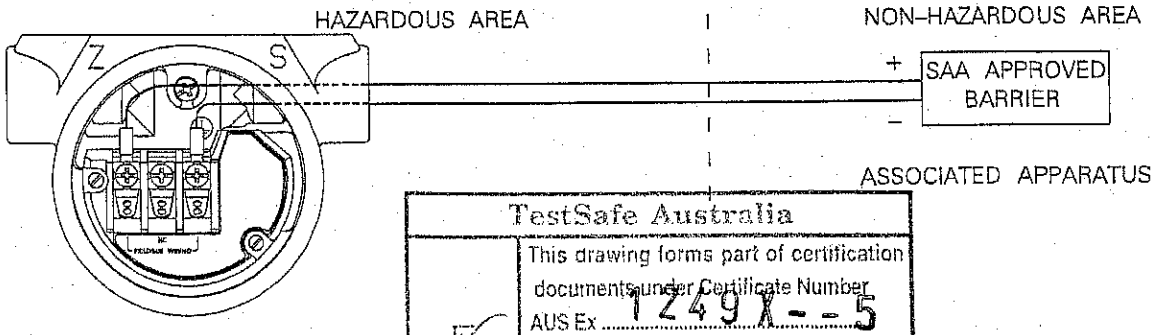
3051C	3051H	3001C	3001S
3051L	3051T	3001CL	
3051P	3051CA	3001CH	

ENTITY PARAMETER FOR Ex ia IIC T5 CLASS I, ZONE 0 PROTECTION:

APPARATUS PARAMETER	BARRIER PARAMETER
Vmax = 30V Imax = 300mA Pmax = 1.3W Ci = 0 μF Li = 0μH	Voc IS LESS THAN OR EQUAL TO 30V Isc IS LESS THAN OR EQUAL TO 300mA $\frac{Voc * Isc}{4}$ IS LESS THAN OR EQUAL TO 1.3W Ca IS GREATER THAN 0 MICROFARADS La IS GREATER THAN 0 MICROHENRIES

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURERS FIELD WIRING INSTRUCTIONS AND THE CIRCUIT DIAGRAM SHOWN BELOW.



TestSafe Australia

This drawing forms part of certification documents under Certificate Number AUS Ex 1249X - - 5

Amendments require Supplementary Certification

Test Safe

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

CAD Maintained, (MICROSTATION)

DR.	SIZE	FSCM NO	DWG NO.
Mike Dobe	A		03031-1026
ISSUED	SCALE N/A	WT. ———	SHEET 4 OF 4

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No: AUS Ex 3155X

Issue 0: Original Issue 09/05/1995
Issue 8: 29/08/2003

Date of Expiry: 09/05/2005

Certificate Holder: Fisher Controls Pty Limited
8 Walker Place
WETHERILL PARK NSW 2164

Electrical Equipment: Models DVC5000 and DVC5000f Digital Valve Controllers, with 4-20 mA / HART, Foundation Fieldbus, Profibus, or FISCO input.

Type of Protection: Ex n
Ex ia

Marking Code:
DVC5000-series (HART)
Ex n IIC T6 (T_{amb}= 70 °C)/T5 (T_{amb}= 80 °C) IP65
Ex ia IIC T6(T_{amb}= 60 °C)/T5 (T_{amb}= 70 °C)/T4(T_{amb}= 80 °C) IP65
DVC5000f-series (Fieldbus)
Ex n IIC T6 (T_{amb}= 70 °C) / T5 (T_{amb}= 80 °C) IP65
Ex ia IIC T6(T_{amb}= 45 °C) / T5 (T_{amb}= 60 °C) / T4(T_{amb}= 80 °C) IP65
DVC5000f-series (FISCO)
Ex ia IIC T6(T_{amb}= 45 °C) / T5 (T_{amb}= 60 °C) / T4(T_{amb}= 80 °C) IP65
AUS Ex 3155X

Manufactured By: Fisher Controls International Inc
MARSHALLTOWN IOWA USA

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

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STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP69 and the Procedure (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989 Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements (incorporating Amendment 1)
AS 2380.7-1987 Electrical equipment for explosive atmospheres – Explosion-protection techniques – Intrinsic safety 'i'
AS 2380.9-1991 Electrical equipment for explosive atmospheres – Explosion-protection techniques – Non-sparking apparatus – Type of protection 'n'
AS 1939-1990 Degrees of protection provided by enclosures of electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standards listed above.

The equipment listed successfully met the examination and test requirements as recorded in

Test Report No: LOSC 12628, 13632, 15825, 17271, and TestSafe 18781, 19360, 20527, 21904 and 23229

File Reference: TestSafe 95/6811-TSA 0001, 0002, 0003, 0004, 0005, 0006 and 2002/031096

Signed for and on behalf of issuing authority

Laboratory Systems Manager
Position

29/08/2003
Date of Issue

Ex 3155X-8

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of it being revoked or not renewed.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753 Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

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Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 3155X **Issue:** 8 **Date of Issue:** 29/08/2003

Certified Equipment: The 'FIELDVUE' DT-Series of Digital Transducers and DVC-Series Digital Valve Controllers and Positioners are designed for use in process control application and comprises:

(a) Model DT4000 Digital Transducer, which is an electro-pneumatic device that converts an analog input signal to a pneumatic pressure, output which can be fed to an actuator.
(b) Series DVC5000 Digital Valve Controller, which is a loop, powered device that provides a control valve position proportion to the input signal.
(c) Series EVP500 Digital Positioner, which receives a direct analog, input and converts it to the required pneumatic output signal pressure, providing a valve stem position proportional to the input signal.
(d) Minor modifications to the terminal box and the I/P Transducer.

The equipment in the range utilise identical die cast aluminium enclosures, consisting of a cylindrical terminal enclosure with a threaded cover, which connects to the module base through a potted neck.

Conditions of Certification:
Protection to IP65 is conditional on the transducer being mounted in the vertical plane with the terminal compartment uppermost.

Drawing Schedule Relating to Original Issue

Drawing No	Drawing Title	Issue	Date
44B2014 Shts 1 to 6	Type DT4000 Transducer Certification Drawing	B	6/2/95
44B2014 Shts 7 to 12	Type DT4000 Transducer Certification Drawing	A	2/6/94
44B2014 Sht 13	Type DT4000 Transducer Certification Drawing	B	6/2/95
14B9533 Sht 1	Type DVC5010 Nameplate SAA Explosion-proof	A	23/3/95
14B9534 Sht 1	Type DVC5020 Nameplate SAA Explosion-proof	A	23/3/95
14B2020 Sht 1	Type 4B2021 Nameplate SAA Explosion-proof	A	23/3/95
12B4541	Additional Drawing Information Etched Nameplate	A	12/7/90
IP4269	Self-Tapping Screw	A	12/10/64

Issued by:

Test Safe AUSTRALIA

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Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Schedule of Variations

Variations Permitted by Issue 1:

1. Change of Certificate Holder's name from Fisher-Controls Pty Limited to Fisher-Rosemount Pty Limited.

2. The inclusion of an Intrinsically safe (Ex ia) version of the Model DT4000 Digital Transducer and the Models DVC5010, DVC5020 and DVC5030 Digital Valve Controllers.

Conditions of Certification Relating to Variations Permitted by Issue 1:

The equipment has been assessed to the 'Entity' Concept and accordingly the following electrical parameters must be taken into account during installation:

Maximum Input Voltage (U_i)	=	30 Volts
Maximum Input Current (I_i)	=	226 milliamperes
Input Capacitance (C_i)	=	0 F
Input Inductance (L_i)	=	0 H

Drawing Schedule Relating to Variations Permitted by Issue 1

Drawing No	Drawing Title	Issue	Date
2929.002 Shts 1 & 2	DFI PCB Schematic	012781	10/7/95
2929.003 Shts 1 to 11	Digital field Instruments	012781	10/7/95
2929.005	DFI Board-Assembly	EC12427	2/2/95
44B8241 Shts 1 to 10	Certification Drawing	A	20/7/95

Variations Permitted by Issue 2:

1. A change to the name of the Certificate Holder.

2. Addition to the Model DVC5040 Digital Valve Controller to the range of certified equipment. The Model DVC5040 is identical to the Models DVC5010, DVC5020 and DVC5030 except for the mounting base.

3. Inclusion of modified I/P Converter differing only in mechanical arrangement.

4. A change in group classification to include IIC for the 'Ex n' models.

5. Omission of the Condition of Certification relating to the mounting orientation for IP65.

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Conditions of Certification Relating to Variations Permitted by Issue 2:

1. The equipment has been assessed to the 'Entity' Concept and accordingly the following electrical parameters must be taken into account during installation:

Maximum Input Voltage (U_i)	=	30 Volts
Maximum Input Current (I_i)	=	226 milliamperes
Maximum Internal Capacitance (C_i)	=	6 nF
Maximum Internal Inductance (L_i)	=	40 µH

2. It is a condition of safe use for installation in an environment with ambient temperature in excess of 75° C that the interconnecting cables have a minimum thermal rating of 85 °C.

Drawing Schedule Relating to Variations Permitted by Issue 2

Drawing No	Drawing Title	Issue	Date
44B8 241 Sht 1	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	F	14/5/97
44B8 241 Sht 2 & 3	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	C	14/11/96
44B8 241 Sht 4	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	C	15/11/96
44B8 241 Sht 5	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	D	29/10/96
44B8 241 Sht 8	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	C	19/11/96
44B8 241 Shts 9 & 10	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	D	15/11/96
44B8 241 Shts 11 & 12	Type DT 4000 Transducer DVC5000 Series Valve Controller Certification Drawing	D	14/5/97
34B3146	Type DVC 5000 Series, Terminal Box Printed Wiring Board Schematic	B	8/5/97
24B0553	Type DVC 5000 Series Coil Assembly	F	22/11/96
14B1555	Type DVC 5000, DT4000 Filter	F	18/6/96

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

JAS-ANZ

Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Variations Permitted by Issue 3:

1. A change to the terminal board assembly with the provision of additional filtering components.

2. Minor electrical and mechanical changes to the main printed circuit board, involving:
   - (i) Use of an alternative pressure sensor having a changed mechanical arrangement.
   - (ii) A change to the material used to encapsulate the equipment.
   - (iii) Omission of a DIP switch assembly.

Conditions of Certification Relating to Variations Permitted by Issue 3:

1. The equipment has been assessed to the 'Entity' Concept and accordingly the following electrical parameters must be taken into account during installation:

Maximum Input Voltage (U_i)	=	30 Volts
Maximum Input Current (I_i)	=	226 milliamperes
Maximum Internal Capacitance (C_i)	=	6 nF
Maximum Internal Inductance (L_i)	=	40 µH

2. It is a condition of safe use for installation in an environment with ambient temperature in excess of 75 °C that the interconnecting cables have a minimum thermal rating of 85 °C.

Drawing Schedule Relating to Variations Permitted by Issue 3

Drawing No	Drawing Title	Issue	Date
17B8800	Capacitor	A	4/8/97
27B8098	Type DVC5000 Series inductor	A	4/8/97
44B8241 Sht 1	DVC5000 Series valve controller Certification drawing	J	12/12/97
44B8241 Sht 3	DVC5000 Series valve controller Certification drawing	D	4/6/97
44B8241 Sht 4	DVC5000 Series valve controller Certification drawing	D	4/6/97
44B8241 Sht 5	DVC5000 Series valve controller Certification drawing	E	4/6/97
44B8214 Sht 8	DVC5000 Series valve controller Certification drawing	D	4/6/97
44B8241 Sht 9	DVC5000 Series valve controller Certification drawing	E	21/7/97
44B8241 Sht 10	DVC5000 Series valve controller Certification drawing	G	12/12/97
44B8241 Sht 11	DVC5000 Series valve controller Certification drawing	F	12/12/97
47B8099	Type DVC5000 Series I.S. PWB assy Hart	D	17/12/97
15P0245 Shts 1 & 2	Type DVC5000 Series digital field instrument (Fieldvue) PWB	C	5/1/98
47B8809 Shts 1 to 6	Hart DVC5000 Schematic	D	6/1/98
15P0245.L9	Side 1 Silkscreen (Main Board)	C	6/1/98
15P0245.L1	Side 1 Copper (Main Board)	C	6/1/98
15P0245.L2	Ground Plane (Main Board)	C	6/1/98
15P0245.L3	Inner Copper 1 (Main Board)	C	6/1/98

Issued by:

Test Safe AUSTRALIA

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Australia

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Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

Drawing Schedule Relating to Variations Permitted by Issue 3 continued

Drawing No	Drawing Title	Issue	Date
15P0245.L4	Inner Copper 2 (Main Board)	C	6/1/98
15P0245.L5	Inner Copper 3 (Main Board)	C	6/1/98
15P0245.L6	Inner Copper 4 (Main Board)	C	6/1/98
15P0245.L7	Power Plane (Main Board)	C	6/1/98
15P0245.L8	Side 2 Copper (Main Board)	C	6/1/98
15P0245.L10	Side 2 Silkscreen (Main Board)	C	6/1/98

Variations Permitted by Issue 4:

1. Minor changes to the DVC5000 Series Schematic and PWB Assembly drawings.
2. The addition of the DVC5000f Fieldbus Digital Valve Controller (Non-Sparking [Exn] only).
3. The deletion of the DT Series Digital Transducer
4. Limiting the routine dielectric test to 500V a.c.
5. Models now included are: DVC5010, DVC5020, DVC5030 and DVC5040 (Exi) and DVC5010, DVC5010f, DVC5020, DVC5020f, DVC5030, DVC5030f, DVC5040 and DVC5040f (Exn).

Conditions of Certification Permitted by Issue 4:

1. It is a condition of safe manufacture that the following condition be adhered to:
   Each apparatus is to be capable of withstanding a test voltage of not less than 500 Volts with a frequency between 48 Hz and 62 Hz applied between input terminals and case for a period not less than 1 minute.
2. It is a condition of safe use that the following parameters are not exceeded for the Model DVC5010, DVC5020, DVC5030, and DVC5040 where they are installed as intrinsically safe equipment.

Input Parameters	
Maximum Input Voltage Ui	30 Volts
Maximum Input Current Ii	226 mA
Maximum Input Power Pi	1.7 Watt
Maximum Internal Capacitance Ci	6 nF
Maximum Internal Inductance Li	40 µH

Addendum to Certificate No. 3155X-8

Conditions of Certification Permitted by Issue 4 continued:

3. The inductance of the connecting cable between the associated electrical equipment and the input terminals of the Digital Valve Controller must not exceed the value allowed by the associated electrical equipment parameters or 20 mH, whichever is the lower value.

4. It is a condition of safe use in an environment with ambient temperature in excess of 75 °C that the interconnecting cables have a minimum thermal rating of 85 °C.

Additional Information Relating To Issue 4:

The front sheet of this certificate was updated to show the current situation.

Drawing Schedule Relating to Variations Permitted by Issue 4

Drawing No.	Drawing Title	Issue	Date
38B6470	Type DVC5010, DVC5021, DVC5030 Terminal Box Assembly	B	13 Sep 99
48B1710 Sht 1	Type DVC5000, DVC5000f Series Valve Controller	K	09 Nov 99
48B1710 Sht 2	Type DVC5000, DVC5000f Series Valve Controller	E	01 Nov 99
48B1710 Sht 3	Type DVC5000, DVC5000f Series Valve Controller	C	13 Apr 99
48B1710 Sht 4	Type DVC5000, DVC5000f Series Valve Controller	D	01 Nov 99
48B1710 Sht 5	Type DVC5000, DVC5000f Series Valve Controller	B	13 Apr 99
48B1710 Sht 6	Type DVC5000, DVC5000f Series Valve Controller	D	09 Nov 99
48B1710 Sht 7	Type DVC5000, DVC5000f Series Valve Controller	E	13 Apr 99
48B1710 Sht 8	Type DVC5000, DVC5000f Series Valve Controller	E	09 Nov 99
48B6039	Type DVC 5000 Series I.S. PWB Assy Hart	A	26 Feb 99
48B6040	Type DVC 5000F Series PWB Assy Fieldbus	A	02 Mar 99
27B6446, Shts 1-7	DVC 5000f Analog Card	E	30 Mar 99
27B6937, Shts 1-6	DVC 5000f Digital Card	C	30 Mar 99
15P0461 Shts 1 and 2	DVC 5000f Fieldbus Digital Field Instrument-Analog PWB	B	02 Feb 99
15P0462 Shts 1 and 2	DVC 5000f Fieldbus Analog Card PWB Assembly	C	02 Feb 99
	Analog Board		
15P0461.L1	Side 1 Copper	A	
15P0461.L2	Ground Plane	A	
15P0461.L3	Inner Copper 1	A	
15P0461.L4	Inner Copper 2	A	
15P0461.L5	Power Plane	A	
15P0461.L6	Side 2 Copper	A	

Drawing Schedule Relating to Variations Permitted by Issue 4 continued

Drawing No.	Drawing Title	Issue	Date
15P0461.L7	Side 1 Soldermask	A	
15P0461.L8	Side 2 Soldermask	A	
18B0642 Pages 1-7	Fieldbus Analog Board, Bill of Materials	D	20 Oct 98
15P0459 Shts 1 and 2	DVC5000f Fieldbus Digital Field Instrument PWB	B	02 Feb 99
15P0460 Shts 1 and 2	DVC 5000f Bus Fieldbus Digital PWB-Digital PWB Assembly **Digital Board**	B	02 Feb 99
15P0459.L1	Side 1 Copper	A	
15P0459.L2	Ground Plane	A	
15P0459.L3	Inner Copper 1	A	
15P0459.L4	Inner Copper 2	A	
15P0459.L5	Inner Copper 3	A	
15P0459.L6	Inner Copper 4	A	
15P0459.L7	Power Plane	A	
15P0459.L8	Side 2 Copper	A	
15P0459.L9	Side 1 Solder Mask	A	
15P0459.L10	Side 2 Solder Mask	A	
18B0641 Pages 1 and 2	Fieldbus Digital Board, Bill of Materials	B	24 Mar 98

Variations Permitted by Issue 5:

1. Addition of the range of DVC5000f Fieldbus Digital Valve Controllers to the range of certified Intrinsically Safe equipment. The range of equipment now covered by this certificate is: DVC5010, DVC5010f, DVC5020, DVC5020f, DVC5030, DVC5030f, DVC5040 and DVC5040f for Non-sparking (Ex n) as well as for Intrinsic Safety (Ex ia).

2. Modification to some of the tracks on the digital and the analog boards.

3. A change in the ambient temperatures for Category Ex ia for classification T6 and T5. The front page of the certificate has been changed to reflect this change.

Conditions of Certification Permitted by Issue 5:

1. It is a condition of safe manufacture that each apparatus be capable of withstanding a test voltage of not less than 500 Volts with a frequency between 48 Hz and 62 Hz applied between input terminals and case for a period not less than 1 minute.

Conditions of Certification Permitted by Issue 5 continued:

2. It is a condition of safe use that the following parameters are not exceeded for the Model DVC5010f, DVC5020f, DVC5030f, and DVC5040f where they are installed as intrinsically safe equipment.

Input Parameters	
Maximum Input Voltage Ui	24 Volts
Maximum Input Current Ii	226 mA
Maximum Input Power Pi	1.36 Watt
Maximum Internal Capacitance Ci	6 nF
Maximum Internal Inductance Li	40 µH

3. For Non-sparking the Maximum Input Voltage = 24 Volts

4. The inductance of the connecting cable between the associated electrical equipment and the input terminals of the Digital Valve Controller must not exceed the value allowed by the associated electrical equipment parameters or 20 mH, whichever is the lower value.

5. It is a condition of safe use in an environment with ambient temperature in excess of 75 °C that the interconnecting cables have a minimum thermal rating of 85 °C.

Additional Information Relating to Issue 5:

The front sheet of this certificate was updated to show the current situation.

Drawing Schedule Relating to Variations Permitted by Issue 5

Drawing No.	Drawing Title	Issue	Date
19B3442	Type DVC5000F Inductor Cover	A	08 Nov 00
48B1710 Sht 1	Type DVC5000, DVC5000f Series Valve Controller	Q	05 Mar 01
48B1710 Sht 2	Type DVC5000, DVC5000f Series Valve Controller	F	24 Apr 00
48B1710 Sht 3	Type DVC5000, DVC5000f Series Valve Controller	D	24 Apr 00
48B1710 Sht 4	Type DVC5000, DVC5000f Series Valve Controller	E	24 Apr 00
48B1710 Sht 5	Type DVC5000, DVC5000f Series Valve Controller	B	13 Apr 99
48B1710 Sht 6	Type DVC5000, DVC5000f Series Valve Controller	E	24 Apr 00
48B1710 Sht 7	Type DVC5000, DVC5000f Series Valve Controller	H	27 Nov 00
48B1710 Sht 8	Type DVC5000, DVC5000f Series Valve Controller	H	05 Mar 01
48B6040	Type DVC 5000F Series PWB Assy Fieldbus	E	20 Nov 00
27B6446, Shts 1-7	DVC 5000f Analog Card	H	06 Oct 00

Drawing Schedule Relating to Variations Permitted by Issue 5 continued

Drawing No.	Drawing Title	Issue	Date
27B6937, Shts 1-6	DVC 5000f Digital Card	E	09 Mar 00
15P0461 Shts 1 and 2	DVC 5000f Fieldbus Digital Field Instrument-Analog PWB	C	24 Apr 00
15P0462 Shts 1 and 2	DVC 5000f Fieldbus Analog Card PWB Assembly	F	11 Oct 00
	Analog Board		
15P0461.L1	Side 1 Copper	C	
15P0461.L2	Ground Plane	C	
15P0461.L3	Inner Copper 1	C	
15P0461.L4	Inner Copper 2	C	
15P0461.L5	Power Plane	C	
15P0461.L6	Side 2 Copper	C	
15P0461.L7	Side 1 Soldermask	C	
15P0461.L8	Side 2 Soldermask	C	
18B0642 Pages 1-7	Fieldbus Analog Board, Bill of Materials	D	20 Oct 98
15P0459 Shts 1 and 2	DVC5000f Fieldbus Digital Field Instrument PWB	C	31 Mar 00
15P0460 Shts 1 and 2	DVC 5000f Bus Fieldbus Digital PWB-Digital PWB Assembly	D	31 March 00
	Digital Board		
15P0459.L1	Side 1 Copper	C	
15P0459.L2	Ground Plane	C	
15P0459.L3	Inner Copper 1	C	
15P0459.L4	Inner Copper 2	C	
15P0459.L5	Inner Copper 3	C	
15P0459.L6	Inner Copper 4	C	
15P0459.L7	Power Plane	C	
15P0459.L8	Side 2 Copper	C	
15P0459.L9	Side 1 Solder Mask	C	
15P0459.L10	Side 2 Solder Mask	C	
18B0641 Pages 1 and 2	Fieldbus Digital Board, Bill of Materials	B	24 Mar 98

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Variations Permitted by Issue 6:
This supplementary certificate was issued to correct several typographical errors in the conditions of supplementary 4 and 5.

Conditions of Certification Permitted by Issue 6:

1. It is a condition of safe manufacture that each apparatus be capable of withstanding a test voltage of not less than 500 Volts with a frequency between 48 Hz and 62 Hz applied between input terminals and case for a period not less than 1 minute.

2. It is a condition of safe use that the following parameters are not exceeded for the Model DVC5010f, DVC5020f, DVC5030f, and DVC5040f where they are installed as intrinsically safe equipment.

Input Parameters	
Maximum Input Voltage Ui	24 Volts
Maximum Input Current Ii	226 mA
Maximum Input Power Pi	1.36 Watt
Maximum Internal Capacitance Ci	6 nF
Maximum Internal Inductance Li	40 µH

3. For Models DVC5010, DVC5020, DVC5030 and DVC5040 where installed as Non-sparking equipment, the Maximum Input Voltage = 30 Volts

4. For Models DVC5010f, DVC5020f, DVC5030f and DVC5040f where installed as Non-sparking equipment, the Maximum Input Voltage = 32 Volts

5. The inductance of the connecting cable between the associated electrical equipment and the input terminals of the Digital Valve Controller must not exceed the value allowed by the associated electrical equipment parameters or 20 mH, whichever is the lower value.

6. It is a condition of safe use in an environment with ambient temperature in excess of 75 °C that the interconnecting cables have a minimum thermal rating of 85 °C.

Additional Information Relating to Issue 6:
The front sheet of this certificate was updated.

Issued by:

Test Safe AUSTRALIA

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Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Variations Permitted by Issue 7:

1. Additional capacitor (C61=0.039 μF) on VCC detect line on the HART Board.
2. Dual footprint for Crystals Y1 and Y2 on the HART Board to allow the use of alternative components.
3. Replacement of the Terminal Box for the previously certified (Ex 3725X) model on the DVC5000 model.
4. Changes to the marking label drawings with respect to the application of labels to the HART final assembly.

Drawing Schedule Relating to Variations Permitted by Issue 7

Drawing No	Drawing Title	Issue	Date
15P0245 Sheets 1 and 2	Type DVC5000 Series Digital Field Instrument (Fieldvue) PWB	E	24 May 2000
15P0245.L1	Side 1 Copper	E	-
15P0245.L2	Ground Plane	E	-
15P0245.L3	Inner Copper 1	E	-
15P0245.L4	Inner Copper 2	E	-
15P0245.L5	Inner Copper 3	E	-
15P0245.L6	Inner Copper 4	E	-
15P0245.L7	Power Plane	E	-
15P0245.L8	Side 2 Copper	E	-
15P0245.L9	Side 1 Solder Mask	E	-
15P0245.L10	Side 2 Solder Mask	E	-
15P0246 Sheets 1 and 2	Type DVC5000 Series Digital Field Instrument (Fieldvue) PWB Assembly	H	24 May 2000
28B3398	Type DVC6000 Series PWB/Term Strip Assy	A	11 Jan 2001
29B2137	Terminal Board Schematic	C	12 Dec 2000
29B2138	Type DVC6000 Series Terminal PWB	B	20 Nov 2000
39B3401 Sheets 1 and 2	Type DVC5010, DVC5020, DVC5030 Terminal Box Assembly	A	08 Mar 2001
39B3402 Sheets 1 and 2	Type DVC 5040 Terminal Box Assembly	A	08 Mar 2001
47B8809 Sheets 1 to 6	Hart DVC 5000 Schematic	F	8 Jun 2000

Issued by:

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Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

Drawing Schedule Relating to Variations Permitted by Issue 7 continued

Drawing No	Drawing Title	Issue	Date
48B1710 Sheet 1	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	R	15 Mar 2001
48B1710 Sheet 2	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	G	15 Mar 2001
48B1710 Sheet 3	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	E	15 Mar 2001
48B1710 Sheet 4	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	F	15 Mar 2001
48B1710 Sheet 5	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	B	13 Apr 1999
48B1710 Sheet 6	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	F	15 Mar 2001
48B1710 Sheet 7	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	H	27 Nov 2000
48B1710 Sheet 8	Type DVC5000, DVC5000f Series Valve Controller Certification DWG	H	05 Mar 2001
48B6039	Type DVC5000 Series I.S. PWB ASSY HART	C	06 June 2000

Conditions of Certification Permitted by Issue 7:

1. It is a condition of safe manufacture that each apparatus be capable of withstanding a test voltage of not less than 500 Volts with a frequency between 48 Hz and 62 Hz applied between input terminals and case for a period not less than 1 minute.

2. It is a condition of safe use that the following parameters are not exceeded for the Model DVC5010, DVC5020, DVC5030, and DVC5040 where they are installed as intrinsically safe equipment.

Input Parameters	
Maximum Input Voltage Ui	30 Volts
Maximum Input Current Ii	226 mA
Maximum Input Power Pi	1.7 Watt
Maximum Internal Capacitance Ci	6 nF
Maximum Internal Inductance Li	40 µH

Conditions of Certification Permitted by Issue 7 continued:

3. It is a condition of safe use that the following parameters are not exceeded for the Model DVC5010f, DVC5020f, DVC5030f, and DVC5040f where they are installed as intrinsically safe equipment.

Input Parameters	
Maximum Input Voltage Ui	24 Volts
Maximum Input Current Ii	226 mA
Maximum Input Power Pi	1.36 Watt
Maximum Internal Capacitance Ci	6 nF
Maximum Internal Inductance Li	40 µH

4. For Models DVC5010, DVC5020, DVC5030 and DVC5040, where installed as Non-sparking equipment, the Maximum Input Voltage = 30 Volts

5. For Models DVC5010f, DVC5020f, DVC5030f and DVC5040f, where installed as Non-sparking equipment, the Maximum Input Voltage = 32 Volts

6. The inductance of the connecting cable between the associated electrical equipment and the input terminals of the Digital Valve Controller must not exceed the value allowed by the associated electrical equipment parameters or 20 mH, whichever is the lower value.

7. It is a condition of safe use in an environment with ambient temperature in excess of 75 °C that the interconnecting cables have a minimum thermal rating of 85 °C.

Variations Permitted by Issue 8:

1. The new DVC5000f Analog Card (Schematic) Drawing no. 20C2184 issue B, in addition to the existing DVC5000f Analog Card (Schematic) Drawing no. 27B6446 issue H.

2. The new DVC5000f Terminal Board (Schematic) Drawing no. 20C0988 issue A, in addition to the existing DVC5000 Terminal Board Schematic Drawing no. 29B2137 issue C.

3, To include FISCO option with revised terminal board and analog board.

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Conditions of Certification Permitted by Issue 8:

1. All Conditions of Certification used in the previous issues of this Certificate remain unchanged.

2. It is a condition of safe use that the following input parameters for FISCO (fieldbus) option shall be taken into account during installation.

I.S. Inputs/Outputs Parameters	Power / Loop Terminals J1
Maximum Input Voltage U_i	17.5 V
Maximum Input Current I_i	380 mA
Maximum Input Power P_i	5.32 W
Maximum Internal Capacitance C_i	5 nF
Maximum Internal Inductance L_i	10 µH

The input parameters for Fieldbus options may also be used if required.

I.S. Input Parameters	Power / Loop Terminals J1
Maximum Input Voltage U_i	24 V
Maximum Input Current I_i	226 mA
Maximum Input Power P_i	1.36 W
Maximum Internal Capacitance C_i	6 nF
Maximum Internal Inductance L_i	40 µH

Drawing Schedule Relating to Variations Permitted by Issue 8

Document No.	Document Title	Sheets	Rev	Date
20C0988	DVC5000F Terminal Board	1 of 1	A	15/05/2002
20C0989	Type DVC5000F Terminal PWB	1 of 1	A	15/05/2002
20C0990	Type DVC5000F Series PWB/Term Strip Assy	1 of 1	B	17/01/2003
20C2184	DVC5000F Analog Card	1 to 7	B	24/09/2002
29B9815	Type DVC5000F Series Loop Schematic, SAA Intrinsically Safe	1 to 3	B	11/08/2003
29B2138	Type DVC6000 Series Terminal PWB	1 of 1	C	20/12/2001
30C0977	Type DVC5010F, DVC5020F, DVC5030F Terminal Box Assembly	1 to 2	B	20/02/2003
30C0978	Type DVC5000F Terminal Box Assembly	1 to 2	A	16/05/2002

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. 3155X-8

Drawing Schedule Relating to Variations Permitted by Issue 8 continued

Document No.	Document Title	Sheets	Rev	Date
30C2186	DVC5000f Fieldbus Digital Field Instrument – Analog PWB	1 to 2	A	08/05/2002
30C2187	DVC5000f Fieldbus Analog Card PWB Assembly	1 to 2	B	07/04/2003
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	1	W	22/07/2003
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	2	J	23/07/2002
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	3	G	23/07/2002
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	4	H	23/07/2002
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	5	D	23/07/2002
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	6	K	21/02/2003
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	7	L	21/02/2003
48B1710	Type DVC5000, DVC5000F Series Valve Controller SAA Certification DWG	8	K	22/07/2003
49B3525	Type DVC5000F Series PWB Assy Fieldbus	1 of 1	C	24/07/2003
30c2186	*Artwork*	1 to 2 L1 to L6	A	13/08/2002

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 609

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Equipment

'Murphy' Liquid Level Switches, Series L-1100 and L-1200

Drawing No(s) 15-00-0197; 15-00-0195; 15-00-0155; 15-00-0154; 15-01-0082 Rev C; 15-05-344 Rev P; 15-05-345 Rev J; 15-05-346 Rev G; 15-05-348 Rev G; 15-05-349 Rev A; 15-05-376 Rev R; 15-05-474; 15-05-497 Rev E; 15-05-650 Rev A; 15-05-0466 Rev D; 65.05.403 Rev D; Bulletin LL7434; 15-01-0090 Rev 1; 15-05-0462 Sheets 1 & 2 Rev R; Sketch No L1100/L1200

Certification Conditions

Remarks

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6

Certificate Holder

Murphek Pty Ltd
215 Parramatta Road
AUBURN NSW 2144

Manufacturer

Frank W Murphy Manufacturer Inc
3131 South Sheridan
Tulsa
OKLAHOMA 74145 USA

Test Report No(s)

SCC TR NO: 60015

Australian Standard(s)

AS 2480-1981

SAA File Reference

P/3: 84122/M121

Effective Date

1985-09-05

Date of Issue

1985-09-06

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

12 AUG 1980

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. EL,P 693 - 1

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee EL/29, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

To recognize changes in the components and catalogue numbers of the following instruments

(a) Switch Enclosure Cat. No. FNS51

(b) Pilot Light System Cat. No. FNL11

(c) Push-button Station Cat. No. FNP1L

as detailed in Schedule

Drawing Nos.

From 79 - 007 - AD - 002 Issue A
to 79 - 023 - AD - 002 Issue A
inclusive

Hazardous Location

N/A

Type of Protection

N/A

Certificate Holder

Safe Appliance and Equipment Co. Pty. Ltd.,
26-28 Kent Road
MASCOT, NSW, 2020.

Manufacturer

Metalcraft Engineering Co.
26-28 Kent Road
MASCOT, NSW, 2020.

Test Report No(s)

N/A

Australian Standard(s)

N/A

SAA File Reference

EL/29: 79068/M90

Effective Date

1980-02-20

Date of Issue

1980-07-03

Director
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

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STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 — Continuation of Certificate No. FLP 693 -1

New Cat. No.	Short Description	Originated from	Changes
FNL 1.1 (1M) FNL 1.2 (2M)	Indicating Lamp Single Position	FNL 1	One position deleted
FNP 1.1 (1M) FNP 1.2 (2M)	Push Button Station 2 Positions	FNP 1I	One position was to stay put. Now both positions no stay put and external modification.
FNP 1S.1 (1M) FNP 1S.2 (2M)	Push Button Station 2 Positions	FNP 1L	As for FNP 1.1/FNP 1.2 but with both buttons shrouded
FNP 11.1 (1M) FNP 11.2 (2M)	Push Button Station 1 position	FNP 1L	One position deleted and no position stay put and external modification.
FNP 11K.1 (1M) FNP 11K.2 (2M)	Push Button Station Key operated 1 position	FNP 1L	One position deleted and external modification.
FNP 11M.1 (1M) FNP 11M.2 (2M)	Push Button Station Palm operated 1 position	FNP 1L	One position deleted and no position stay put and external modification.
FNP 11S.1 (1M) FNP 11S.2 (2M)	Push Button Station 1 position (shrouded)	FNP 1L	One position deleted and no position stay put with button shrouded and external modification
FNP 1K.1 (1M) FNP 1K.2 (2M)	Push Button Station 2 positions with 1 key operated	FNP 1L	External modification
FNP 11L.1 (1M) FNP 11L.2 (2M)	Push Button Station 1 position stay put	FNP 1L	One position deleted and single position stay put only and external modification.
FNP L1 (1M) FNP L2 (2M)	Push Button Station and Pilot Light combined.	FNP 1L	Combinations of FNP 1L and FNL 11 with one button position deleted and pilot light deleted.
FNS 15.1 (1M) FNS 15.2 (2M)	Switch 240 V a.c. 15A DPDT or 240 V a.c. 15A 2 ways	FNS 51	Changing interiors of switch to Ring-Grip FS 169/15 DP.

Director
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 (Continued) Continuation of Certificate No. FLP 693 -

New Cat. No.	Short Desctiption	Originated from	Changes
FNS 52.1 1M) FNS 52.2 2M)	Switch 500 V a.c. 15A DP 3 positions	FNS 51	Changing interiors of switch to Federal type 15810302 PM1 and external excutcheon plate
FNS 51K.2 1M) FNS 52K.2 2M)	Switch with key lockable device 500 V a.c. 15A	FNS 51	Changing interiors of switch to Kraus & Naimer type B11 B2K911 and external locking device.
FNS 65/*1 (1M) FNS 65/*2 (2M)	Switch 500 V a.c. 20 A 3 positions	FNS 51	Changing interiors of switch to Kraus & Naimer type B11 and C17 series
FNS 66/*1 (1M) FNS 66/*2 (2M)	Switch 500 V a.c. 20 A Multi-positions	FNS 51	Changing interiors of switch to Kraus & Naimer type B11 and C17 series and external modification.
FNP 1SG.1 (1M) FNP 1SG.2 (2M)	Push button Station 2 position with pad-locking facility	FNP 1L	One position was to stay put Now both positions no stay put with both buttons shrouded and external modification.
FNP 11SG.1(1M) FNP 11SG.2(2M)	Push Button Station 1 position with padlocking facility	FNP 1L	One position deleted and no position to stay put and external modification.

J R Gray

Director
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

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STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No. FLP 693 -

SCHEDULE 1 (Continued)

NOTES:

Code of Cat. No.

Suffix .1 denotes 0.75 in entries
Suffix .1M denotes 20 mm entries
Suffix .2 denotes 1 in entries
Suffix .2M denotes 25 mm entries

2. The * for switches FNS 65 and FNS 66 will be a number which is allocated to denote a switch function from one of the Fraus & Naimer B11 or C17 switch series.

Director
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

INCORPORATED BY ROYAL CHARTER

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY N.S.W.

CERTIFICATE FOR FLAMEPROOF ENCLOSURE

No. FLP 693

This certifies that the flameproof enclosure described hereunder has been EXAMINED and TESTED and has been found to comply with the requirements for a flameproof enclosure in accordance with AS C98- Flameproof Enclosure of Electrical Equipment, Including Amendment No.(s)

This Certificate applies only to the flameproof features of the equipment described herein and does not purport, nor is it intended to certify compliance with the relevant electrical safety requirements of the SAA Wiring Rules, AS CC1 Parts I and II.

DETAILS OF EQUIPMENT: "S.A.E." Flameproof Enclosures, Cert. Nos, FNJ1, FNJ2, FNS51, FNL11 and FNP1L.

See Sheet 2 of 2 for a description of enclosures.

DRAWING NUMBER: 1483 GA5-1, 1483 GA4-1, 148328-2, 148330-3, 148330-1, 140319-2, 053917-1, 148322-1, 148321-1, 0107127-2, 148327-1, "Retainer Clip" information sheet, ED/211/2.

GROUPING AND CLASSIFICATION: GROUP IIC Enclosures; Temperature Classification T6

APPLICANT: Safe Appliance and Equipment Co. Pty. Ltd.,
26-28 Kent Road,
MASCOT N.S.W. 2060

MANUFACTURER: Metalcraft Engineering Co. Pty.Ltd.,
26-28 Kent Road,
MASCOT, N.S.W. 2060

TESTING STATION AND REPORT No.: SCC TR. NO.46601

REMARKS:

DETAILS OF ENCLOSED ELECTRICAL COMPONENTS

Cat. No. FNJ1 - Four-way terminal block "Siemens BK4"
Cat. No. FNJ2 - Four-way terminal block "Siemens BK4"
Cat. No. FNS51 - One "Federal" 3 pole 15 A switch
Cat. No. FNL11 - Two "Klockner-Moeller" Lampholders 2.5W, Two B.S.9.S. size lamps
Cat. No. FNP1L - Two "Klockner-Moeller" push button switches

Chairman of Committee EL/29

L. Director, Standards Association of Australia

EL/29

Date 13. 6. 74

STANDARDS ASSOCIATION OF AUSTRALIA

INCORPORATED BY ROYAL CHARTER
STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR FLAMEPROOF ENCLOSURE

No. FLP 693

REMARKS:

CAST ALUMINIUM ENCLOSURES

Cat. No FNJ1, Junction Box - One bore and spigot joint, four ¾ in. conduit entries 16 T.P.I.

Cat. No.FNJ2, Junction Box - One bore and spigot joint Four 1" conduit entries 16 T.P.I.

Cat. No.FNS51, Isolating Switch - One bore and spigot joint, Four ¾ in. or 1 in. conduit entries 16 T.P.I. One operating spindle.

Cat. No.FNL11, Pilot Lamp Station - One bore and spigot joints, Four ¾ in. or 1 in. conduit entries 16 T.P.I. Two indicator Lamp inspection windows.

Cat. No.FNP1L, Push Button Station - One bore and spigot joint, Four ¾ in. or 1 in. conduit entries 16 T.P.I. Two operating rods.

Chairman of Committee EL/29

Director, Standards Association of Australia

EL/29

Date 3.6.74

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No:	AUS Ex 3640	**Issue 0:**	Original Issue 8/12/1999
		Issue 1:	24/7/2001
Date of Expiry:	8/12/2009		
Certificate Holder:	Yokogawa Electric Corporation 2-9-32 Nakacho, Musashino-Shi TOKYO 180-8750 JAPAN		
Electrical Equipment:	Model YTA Series Temperature Transmitter		
Type of Protection:	Ex d		
Marking Code:	Ex d IIC T6 (T_{amb} 75°C) IP66/67 AUS Ex 3640		
Manufactured By:	Yokogawa Electric Corporation 2-9-32 Nakacho, Musashino-Shi TOKYO 180-8750 JAPAN		

Issued by.

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 ***Fax: (02) 4724 4999***

STANDARDS AUSTRALIA DSA012-C02

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 3640-1

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements (incorporating Amendment 1)
AS 2380.2-1991	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Flameproof enclosure 'd' (incorporating Amendment 1)
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standard(s) above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: TestSafe 19223 and 21620

File Reference: TestSafe 99/9156 and 99/9157-TSA0004

Signed for and on behalf of issuing authority

Technical Services Manager

TestSafe Australia

Position

24/7/2001

Date of issue

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

Phone: (02) 4724 4900 ***Fax: (02) 4724 4999***

Schedule

Certificate No: AUS Ex 3640 **Issue:** 1 **Date of Issue:** 24/7/2001

Certified Equipment: The Model YTA Series Temperature Transmitter consists of a cast aluminium or a stainless steel enclosure having two separate compartments. One compartment houses a series of field wiring terminals and having two ½" NPT threaded entries. The other compartment is for the amplifier/electronics. Each compartment has a threaded cover which may have an optional window, cemented and clamped in place. Electrical connection between compartments is via a potted joint.

'O' Ring seals on both covers afford a degree of protection of IP66/IP67.

Drawing Schedule Relating to Original Issue

Drawing No	Drawing Title	Issue	Date (dd/mm/yy)
DSA012-A05	Model Code	Original	24/4/99
DSA012-A06	General Description	Original	24/4/99
DSA012-A09 Page 1	8.1 Housing Assembly (without indicator)	1	8/9/99
DSA012-A09 Page 2	8.1 Housing Assembly (without indicator)	Original	24/4/99
DSA012-A09 Page 3	8.2 Housing Assembly (with indicator)	Original	24/4/99
DSA012-A09 Page 4	8.3 Chemical Composition of Aluminium Alloy Casting	Original	24/4/99
DSA012-A11	Marking	2	29/11/99

Schedule of Variations

Variation Permitted by Issue 1:

- Addition of "fieldbus" which is a new software package.
- Optional stainless steel housing.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

Phone: (02) 4724 4900 ***Fax: (02) 4724 4999***

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 3640-1

Drawing Schedule Relating to Variations Permitted by Issue 1

Drawing No	Drawing Title	Issue	Date (dd/mm/yy)
DSA012-A05	Model Code	1	16/8/2000
DSA012-A09 Page 2	8.1 Housing Assembly (without indicator)	1	16/8/2000
DSA012-A09 Page 3	8.2 Housing Assembly (with indicator)	1	16/8/2000
DSA012-A10	Block Diagram	1	16/8/2000

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No:	AUS Ex 3652X	**Issue 0:**	Original Issue 14/10/1999
		Issue 1:	22/12/1999
		Issue 2:	14/3/2000
Date of Expiry:	14/10/2009		
Certificate Holder:	Yokogawa Electric Corporation 2-9-32 Naka-cho, Musashino-shi TOKYO, 180-8750 JAPAN		
Electrical Equipment:	Model YTA Series Temperature Transmitter		
Type of Protection:	Ex ia IIC T4 (Tamb=70°C) IP66/IP67 Zone 0 Ex n IIC T4 (Tamb=70°C) IP66/IP67 Zone 2		
Marking Code:	Ex ia IIC T4 (Tamb=70°C) IP66/IP67 Ex n IIC T4 (Tamb=70°C) IP66/IP67 AUS Ex 3652X		
Manufactured By:	Yokogawa Electric Corporation 2-9-32 Naka-cho, Musashino-shi TOKYO, 180-8750 JAPAN		

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 3652X-2

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements (incorporating Amendment 1)
AS 2380.7-1987	Electrical Equipment for explosive atmospheres - Explosion-protection techniques - Intrinsic safety 'i'
AS 2380.9-1991	Electrical Equipment for Explosive atmospheres - Explosion-protection Techniques - Non-sparking Apparatus - Type of protection 'n'
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standard(s) listed above

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: TestSafe 19225 and 19899

File Reference: TestSafe 99/9157-TSA-0003

Signed for and on behalf of issuing authority

Technical Services Manager
TestSafe Australia

Position

14/3/2000

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 Fax: (02) 4724 4999

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No.Ex.3652X-2

Schedule of Variations

Variations Permitted by Issue 1:
The label may be manufactured showing three types of protection provided the two that are not relevant for a particular application are crossed out on the label. The drawings listed in this table supersede and replace all previously listed drawings

Drawings Relating to Variations Permitted by Issue 1

Drawing No	Drawing Title	Issue	Date
ISA019-A13 P.2	Outline Dimensions	Original	10/4/99
ISA019-A13 P.3	Mechanical Construction	Rev 1	14/10/98
ISA019-A13 P.4	Composition of the Printed Circuit Boards and Internal Wiring	Original	10/4/99
ISA019-A13 P.5	Block Diagram	Original	10/4/99
ISA019-A13 P.6	Schematic Circuit Diagram – Terminal Board	Original	10/4/99
ISA019-A13 P.7	Base Board	Original	10/4/99
ISA019-A13 P.8	CPU Board 1/2	Original	10/4/99
ISA019-A13 P.9	CPU Board 2/2	Original	10/4/99
ISA019-A13 P.10	LCD Board	Original	10/4/99
ISA019-A13 P.11	Trace Layout of the Printed Circuit Boards – Terminal Board	Original	10/4/99
ISA019-A13 P.12	Base Board	Original	10/4/99
ISA019-A13 P.13	CPU Board 1/2	Original	10/4/99
ISA019-A13 P.14	CPU Board 2/2	Rev.1	6/10/99
ISA019-A13 P.15	LCD Board	Original	10/4/99
ISA019-A13 P.16	Name Plate	Rev 2	1/12/99

Issued by

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No Ex.3652X-2.

Variations Permitted by Issue 2:

1. Addition of a stainless steel enclosure option.
2. Minor changes to the CPU board artwork.
3. Addition of R90 to R95 and C17.
4. Modification of resistance values for resistors R44 and R56.
5. Modification of the type of resistor R1 and values of resistors R7, R19, R20 and capacitor value of C43.
6. Changes to the internal capacitance Ci with the new input parameters as follows:

Input Parameters	Terminals +&-/ C
Maximum Input Voltage U_i	30 V
Maximum Input Current I_i	165 mA
Maximum Input Power P_i	0.9 W
Maximum Internal Capacitance C_i	31.45 nF
Maximum Internal Inductance L_i	738 µH

Drawings Relating to Variations Permitted by Issue 1

Drawing No	Drawing Title	Issue	Date
ISA019-A11 P.1&P.2	Part List	Rev 1	28/1/2000
ISA019-A13 P.3	Mechanical Constructions	Rev 2	6/3/2000
ISA019-A13 P.8	CPU Board 1/2	Rev 1	28/1/2000
ISA019-A13 P.13	CPU Board 1/2	Rev 1	28/1/2000
ISA019-A13 P.14	CPU Board 2/2	Rev 2	28/1/2000

Issued by:

Test

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

NoEx 547 (Sheet 1 of 2)

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued

Austral Engineering Supplies Pty. Limited,
36-38 Richmond Road, Keswick, S.A. 5035.
Tel: (08) 297 2677. Telex: AA82368.

Description of Equipment

'Dresser and Ashcroft' B7 and D7 Series Pressure and Differential Pressure switches

Refer Schedule 1

Drawing No(s)

476C103 Rev G, BD-003-03, 476C104 Rev HH, 552A105 Rev M, 110A124, 117A168, 117A117 Rev H and AD-003-04 Rev 2

Certification Conditions

Remarks

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6

Certificate Holder

Austral Engineering
Supplies Pty Ltd
Mary Street
ERMINGTON NSW 2115

Manufacturer

Dresser Instrument
Division
Stratford
CONNECTICUT 06497 USA.

Test Report No(s)

SCC TR NO: 59294

Australian Standard(s)

AS 2480-1981

SAA File Reference

P/3: 84016/M117

Effective Date

1984-07-09

Date of Issue

1984-07-16

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 547 (Sheet 2 of 2)

Austral Engineering Supplies Pty. Limited,
36-38 Richmond Road, Keswick, S.A. 5035.
Tel: (08) 297 2677. Telex: AA82368.

SCHEDULE 1 DESCRIPTION

An aluminium enclosure incorporating:

(a) One - 3 5/8 inch 16UN2B threaded joint
One - Neoprene 'O' ring gasket
Two - ½ inch NPT conduit entries or alternatively:
Two - 3/4 inch NPT conduit entries

(b) A pressure operated actuator seal assembly with:

One - Plunger (see Drawing No. 552A105 Rev M)
One - Nut (see Drawing No. 117A168)
One - Guide (see Drawing No. 110A124)

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 547-1

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

Dresser Ashcroft T7 Series Temperature Switches

This supplementary certificate has been issued to cover the optional fitting of T7 series Temperature Switches to the enclosures certified on Ex 547, to replace the Pressure or Differential Pressure Switches.

Drawing No(s)

451B149; 451B154; 451B157 and 577A118

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6

Certificate Holder

Austral Engineering Supplies Pty Ltd
Mary Street
ERMINGTON NSW 2115

Manufacturer

DResser Instrument Division
250 East Main Street
STRATFORD CONN 06497 USA

Test Report No(s)

Australian Standard(s)

AS 2480-1981

SAA File Reference

P/3: 86132/M132

Effective Date

1986-09-10

Date of Issue

1986-10-13

Director—Administration & Approvals
Standards Association of Australia

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT

Certificate No Ex 1416 - /

Certificate of Compliance

This certificate is issued for the electrical equipment:

F792K Series Switch Boxes

Submitted for certification by: **Keystone Pacific Pty Ltd**
114 Albatross Road
NOWRA NSW 2541

and manufactured by: **Keystone Pacific Pty Ltd**

This electrical equipment and any acceptable variation thereto is specified in the Schedule or Schedules attached hereto and in the documents referred to therein.

This certifies that the equipment described has been found to comply with AS 2380.1-1989, AS 2380.2-1991 incorporating Amendment 1, AS 2236-1985 and AS 1939-1990.

TYPE OF PROTECTION: **Ex d IIB T6 IP65/IP67 Class I Zone 1**
DIP T6 IP65/IP67 Class II

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP42 and any additional conditions as may be prescribed by Standards Australia.

Test Report No: LOSC 8443, 8444

File: P/3: 92135.M170

Date of Issue: 13 April 1993

Date of Expiry of Validity: 13 April 2003

Signed for and on behalf of Standards Australia T. Leslie

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Certificate No Ex 1416-1

Certificate of Compliance

This is to certify that Standards Australia Certificate No. Ex 1416 issued to:

Keystone Pacific Pty Ltd
114 Albatross Road
NOWRA NSW 2541

for the F79ZK Series Switch Boxes is hereby extended to include changes as detailed in the following schedule.

SCHEDULE

Description of changes:

Change of part numbers as shown in the following tables.
The flameproof range comprises:

AUST 6 DIGIT PART NUMBER	USA 15 DIGIT PART NUMBER	CONFIGURATION
274384	221-954-307-792-710	2-SPDT, BZ Style Switches
830590	221-954-307-792-720	2-DPDT, DT Style Switches
535812	221-954-307-792-711	2-SPDT, V3 Style Switches with Terminal Strip
586868	221-954-507-792-713	2-SPDT, V3 Style Switches with Terminal Strip and Potentiometer
160705	221-954-507-792-810	4-SPDT, BZ Style Switches
720941	221-954-507-792-820	4-DPDT, DT Style Switches
420460	221-954-507-792-811	4-SPDT, V3 Style Switches with Terminal Strip
141950	221-954-507-792-813	4-SPDT, V3 Style Switches with Terminal Strip and Potentiometer

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Continuation of Certificate No Ex 1416-1

Certificate of Compliance

The DIP range comprises:

AUST 6 DIGIT PART NUMBER	USA 15 DIGIT PART NUMBER	CONFIGURATION
274384	221-954-307-792-710	2-SPDT, BZ Style Switches
830590	221-954-307-792-720	2-DPDT, DT Style Switches
535812	221-954-307-792-711	2-SPDT, V3 Style Switches with Terminal Strip
386868	221-954-507-792-713	2-SPDT, V3 Style Switches with Terminal Strip and Potentiometer
160705	221-954-507-792-810	4-SPDT, BZ Style Switches
720941	221-954-507-792-820	4-DPDT, DT Style Switches
420460	221-954-507-792-811	4-SPDT, V3 Style Switches with Terminal Strip
141950	221-954-507-792-813	4-SPDT, V3 Style Switches with Terminal Strip and Potentiometer

File: P/3: 93134

Date of Issue: 23 August 1993

Date of Expiry of Validity: 13 April 2003

Page 3 of 3

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No:	AUS Ex 321	**Issue 0:** **Issue 5:**	Original Issue 20/4/1982 17/9/1998
Date of Expiry:	16/5/2004		
Certificate Holder:	Parker Hannifin (Australia) Pty Ltd 9 Carrington Road CASTLE HILL NSW 2154		
Electrical Equipment:	"LUCIFER" Explosion Proof Coil/Housing Assemblies		
Type of Protection	Ex m IIC T* IP65/IP67 Class I Zone 1 Ex me IIC T* IP65/IP67 Class I Zone DIP T* IP65/IP67 Class II		
Marking Code:	Ex m IIC T* IP65/IP67 Ex me IIC T* IP65/IP67 DIP T* IP65/IP67 AUS Ex 321 (* see schedule)		
Manufactured By	Parker Lucifer		

Issued by:

WorkCover NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753

Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

QUALITY SYSTEM AS3902.1/ISO9002

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 321-5

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements
AS 2380.6-1988	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Increased safety 'e'
AS 2431-1981	Electrical equipment for explosive atmospheres - Encapsulated apparatus - Type of protection 'm'
AS 2236-1994	Electrical equipment for explosive atmospheres - Dust-excluding Ignition-proof (DIP) enclosures
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No. LOSC 10601

File Reference: LOSC 92/4654

K.I Finlay
Signed for and on behalf of issuing authority

Coordinator, Approvals & Certification
Position

17/9/1998
Date of issue

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

WorkCover NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753

Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

QUALITY SYSTEM NACCAS REGISTERED AS3902.ISO9002

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 321 **Issue:** 5 **Date of Issue:** 17/9/1998

Certified Equipment: A range of "Lucifer" Explosion Proof Coil/Housing Assemblies.

Schedule of Variations

Variations Permitted by Issue 3:
Inclusion of additional solenoid coils, designated Series 49 Models 492070.03, 492190.03 and 492310.03, to the range of certified equipment. The additional solenoid coils are classified as shown in Table 1 and arc rated for operation at up to and including 440 Volta 50/60Hz ac or 120 Volts dc.

Table 1: Classification of Series 49 Solenoids

Model	IP Classification	Temperature Classification	
		@ 40°C ambient	@ 75°C ambient
492070.03	IP65/IP67	T5	T4
492190.03	IP65	T4	T3
492310.03	IP65	T5	T4

Drawings Relating to Variations Permitted by Issue 3

Drawing No	Drawing Title	Issue	Date
DY 492310.03	Electrical Part Ex me	2	4/2/94
DY 492190.03	Electrical Part Ex me	1	4/2/94
CY 492070.03	Electrical Part Ex me	original	24/3/93
CZ 6982	Characteristics	2	12/12/91
CZ 1203	Characteristics	0	12/12/91

Issued by:

WorkCover NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

QUALITY SYSTEM NATA CERTIFIED AS3902.1608002

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 321-5

Drawings Relating to Variations Permitted by Issue 3 (continued)

Drawing No:	Drawing Title	Issue	Date
BZ 1222	Comparative Table	original	1/4/93
BZ 1202	Characteristics for Fuses and Diodes	1	17/3/92
BY 492165	Bobin EEx me	1	24/11/92
BY 492065	Bobin EEx m	1	27/11/91
BY 492063	Circuit Electronics	1	27/11/91
BY 492061	Circuit Electronics	1	27/11/91
BY 481000E	Coil 8W	original	20/2/91
482696	Label Detail	5	3/3/94
482697	Label Detail	6	3/3/94

Variations Permitted by Issue 4:
Certificate of Conformity re-issued to correct typographical errors

Variations Permitted by Issue 5:
A change to the name and address of the Certificate Holder.

Issued by:

WorkCover New South Wales

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

QUALITY SYSTEM NAQA CERTIFIED AS3902.16QS002

Standards
Association
of Australia
INCORPORATED BY ROYAL CHARTER

HEAD OFFICE: STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W

Mail: P.O. BOX 458,
NORTH SYDNEY, N.S.W. 2060
Telephone: 929 6022
Telegrams: Australstd North Sydney
Telex: 26514 GDV/sc

Your reference:
Our reference: P/3:83193

11th April 1984

Sperry Vickers
Automation & Pneumatics
19 Pakington Street
ST KILDA VIC. 3182

Attention: Mr A G Ainslie

Dear Sir,

Re: SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

We have pleasure in forwarding the enclosed supplementary certificate of compliance:

Certificate No [redacted]

Date of Issue 1984 04 11

We would remind you of the undertaking that you have entered into in signing the application; that is not to make any modifications whatsoever to the equipment before applying to and obtaining from the Association a supplementary certificate covering such modification. Further, the Association reserves the right to cancel any certificate issued to you if in the opinion of SAA Committee P/3, the relevant standard(s) has been altered to a degree that the equipment is no longer considered suitable for installation in the hazardous location, or if the certificate holder has breached any of the terms or conditions under which the certificate was issued.

Yours faithfully,

Gayle Valentine

Gayle Valentine
Executive Officer
COMMITTEE P/3 - CERTIFICATION OF ELECTRICAL EQUIPMENT FOR HAZARDOUS LOCATIONS

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 321-1 (Page 1 of 3)

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

'Lucifer' Explosion Proof Coil/Housing Assemblies

This supplementary certificate relates to the range of assemblies as detailed in Schedule 1, and which add to the range of equipment already certified under SAA Certificate No. Ex 321.

Drawing No(s)

CA 48.8210.03E Modification 3, CA 488890.03E Modification 3, CY 482697 Modification 2, CY 48 2060.03E Modification 2, CY 483430 Modification 1, BZ 1028 page 1 and BZ 1029 page 2.

Hazardous Location

Class I Zone 1

Type of Protection

Refer Schedule 2

Certificate Holder

Sperry Vickers
Automation and Pneumatics
19 Pakington Street
ST KILDA VIC. 3182

Manufacturer

Sperry Vickers
Automation and Pneumatics
Lucifer Division
P.O. Box 465
Geneva Switzerland

Test Report No(s)

SCC TR No: 58892

Australian Standard(s)

AS 2431-1981
AS 1593-1982

SAA File Reference

P/3:83193/M115

Effective Date

1984 04 10

Date of Issue

1984 04 11

Director—Administration & Approvals
Standards Association of Australia

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 Description of Modification (Continued)

'Lucifer' Explosion-Proof Coil/Housing Assemblies

Assembly Type	Voltage V	Frequency Hz	Power W
48.2060.03	24 a.c.	50 and 60	6
	110 a.c.	50 and 60	6
	220 a.c.	50 and 60	6
	24 d.c.	-	6
	48 d.c.		6
48.8210.03	24 a.c.	50 and 60	11
	48 a.c.	50 and 60	11
	110 a.c.	50 and 60	11
	220 a.c.	50 and 60	11
	24 d.c.	-	9
	48 d.c.	-	9
	60 d.c.	-	9
	110 d.c.	-	9
	220 d.c.	-	9
48.5900.03	24 a.c.	50 and 60	8
	48 a.c.	50 and 60	8
	110 a.c.	50 and 60	8
	220 a.c.	50 and 60	8
	12 d.c.	-	8
	24 d.c.	-	8
	48 d.c.	-	8
	60 d.c.	-	8
	110 d.c.	-	8
48.8880.03	24 a.c.	50 and 60	5
	110 a.c.	50 and 60	5
	220 a.c.	50 and 60	5
	24 d.c.	-	5
	48 d.c.		5
48.8890.03	24 a.c.	50 and 60	6
	110 a.c.	50 and 60	6
	220 a.c.	50 and 60	6
	24 d.c.	-	6
	48 d.c.	-	6

Director—Administration & Approvals
Standards Association of Australia

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 Description of Modification (Continued)

NOTES:

1. All assemblies are totally encapsulated with "Scotchcase 241" epoxy resin enclosed in a plastic case.

2. Assemblies Type 48.5900.03 and 48.8880.03 are provided with a three-core flexible cord.

3. Assemblies Type 48.2060.03, 48.8210.03 and 48.8890.03 are provided with a terminal enclosure.

SCHEDULE 2 Type of Protection (Continued)

Types 48.2060.03, 48.8890.03	: Ex m e IIC T6
Type 48.8210.03	: Ex m e IIC T5
Type 48.8880.03	: Ex m IIC T6
Type 48.5900.03	: Ex m IIC T5

Director—Administration & Approvals
Standards Association of Australia

AUSEx_1211

Price: $27.50 (incl 10 % GST)

Certificate #:	AUSEx_1211	**Issue Date:**	14/08/1995
Issue #:	2	**Expiry Date:**	8/04/2001
		Status:	EXPIRED
Certificate Holder:	United Electric Controls (Aust) Pty Ltd		
Address:	615 Warrigal Road Ashburton Victoria 3147 Australia		
Manufacturer:	United Electric Control Co		
Product Description:	Series 119 | Pressure and Temperature Controls with M903 Option		
Equipment Category:	Process Control Equipment		
Protection Type:	d DIP		
Gas Group:	IIC		
Marking Group:			
IP Rating:	IP 66		
Test Report #:	" LOSC12961A, LOSC4441 "	**Issued by:**	TestSafe Australia
Standards:	AS 2380.1-1989 AS 2380.2-1991 AS 2236-1994		
Notes:	N/A		

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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BAS 09.0076X issue No.:0

Certificate history:
Issue No. 1 (2011-7-22)
Issue No. 0 (2010-6-2)

Status: **Current**

Date of Issue: **2010-06-02** Page 1 of 3

Applicant: **Rosemount Incorporated**
8200 Market Boulevard
Chanhassen
Minnesota 55317
United States of America

Electrical Apparatus: **Model 3051 Series Pressure Transmitters**
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: **IECEx BAS 09.0076X**
Ex ia IIC T5 (-60°C ≤ Ta ≤ +40°C) or
T4 (-60°C ≤ Ta ≤ +70°C) – HART Versions
Ex ia IIC T4 (-60°C ≤ Ta ≤ +60°C) – Fieldbus Version

Approved for issue on behalf of the IECEx Certification Body: R.S. Sinclair

Position: Managing Director

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Baseefa
Rockhead Business Park
Staden Lane
Buxton
Derbyshire
SK17 9RZ
United Kingdom

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 09.0076X

Date of Issue: **2010-06-02** Issue No.: **0**

Page 2 of 3

Manufacturer: **Rosemount Incorporated**
8200 Market Boulevard
Chanhassen
Minnesota 55317
United States of America

Manufacturing location(s):

This equipment maybe manufactured at any of the locations listed in QAR GB/BAS/QAR06.0072/02

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
Edition: 4.0
IEC 60079-11 : 2006 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition: 5

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/BAS/ExTR09.0220/00

Quality Assessment Report:

GB/BAS/QAR06.0072/02

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 09.0076X

Date of Issue: **2010-06-02** Issue No.: **0**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Model 3051 Series Pressure Transmitters is designed to convert process pressure measurements into a 4-20mA HART, Fieldbus or FISCO signal. The apparatus contains a number of printed circuit boards consisting of an appropriate terminal block, one or two output boards, a sensor board, a sensor and an optional liquid crystal display all housed in either a polyurethane coated aluminium or stainless steel enclosure. When the optional display is fitted the housing cover contains a glass window. External connections to the integral terminal block are made via one of two tapped holes.

When the apparatus is installed in combustible dust environments the installation of external connections and the plugging of the unused entry must be carried out using appropriate Ex e or Ex n cable glands or blanking plug components with a minimum IP rating of IP66 certified by an approved certification body.

This certificate covers the Revision 1 Model 3051C, 3051L, 3051H, 3051P, 3051T, 3051CA, 3001C, 3001CL and 3051CH Pressure Transmitters and the Revision 5 Model 3051C/T Pressure Transmitters with 4-20mA HART connection, which vary in the process connection.

This certificate also covers the Model 3051 Fieldbus Pressure Transmitter designed to be connected to either Foundation Fieldbus or Profibus PA systems. This variant can alternatively be fitted with a FISCO transient protection board to form a FISCO variant of the Model 3051 Fieldbus Pressure Transmitter.

All variants of the Model 3051C Pressure Transmitters can be alternatively mounted on process pipework to form the following Flow meters:-

i) Model 3051CFA Integral Orifice Tiered Flow meter
ii) Model 3051CFA Integral Orifice Tiered Flow meter
iii) Model 3051CFP Integral Orifice Tiered Flow meter

CONDITIONS OF CERTIFICATION: YES as shown below:

1) If the apparatus is fitted with an optional 90V transient suppressor, it is not capable of withstanding the 500V insulation test required by clause 6.3.12 of IEC 60079-11: 2006. This must be taken into account when installing the apparatus.

2) The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

See Certificate Annex for apparatus parameters.

Annexe: IECEx BAS 09.0076X Annex.pdf

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Certificate No **Ex 542-3**

Certificate of Compliance

This is to certify that Standards Australia Certificate No Ex 542, Ex 542-1 and Ex 542-2 issued to:

United Electric Controls (Aust) Pty LTd

for the 120 series Temperature and Pressure Controls are hereby extended to include changes as detailed in the following schedule.

SCHEDULE

Description of changes:

Change of Address of Certificate Holder to:

Unit 2, 615 Warrigal Road
Ashburton Vic 3147

File: P/3: 92220

Date of Issue: 21 December 1992

Date of Expiry of Validity: 21 April 2002

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 542 (Sheet of 3)

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Equipment

A range of Pressure and Temperature Controls, 120 Series.

As detailed in Schedule 1

Drawing No(s)

Refer Schedule 2

Certification Conditions

Refer Schedule 1

Remarks

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6 IP66

Certificate Holder

United Electric Controls
(Aust) Pty Ltd
83 Murphy Street
RICHMOND VIC 3121.

Manufacturer

United Electric Controls Co
83 School Street
Watertown
MASSACHUSETTS USA

Test Report No(s)

Londonderry Centre
TR NO: 974

Australian Standard(s)

AS 2480-1939 and
AS 1939-1981

SAA File Reference

P/3: 82153/M117

Effective Date

1984-10-29

Date of Issue

1984-10-30

This certificate is not transferable and remains the property of the Standards Association of Australia and must be returned to the Association in the event of it being revoked.

Director—Administration & Approvals
Standards Association of Australia

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 Description of Equipment cont'd

PRESSURE AND TEMPERATURE CONTROLS, 120 SERIES

(a) Pressure controls, Types J120, J120H, J120K, J120KH, H121, H122, H121K and H122K

(b) Temperature controls, Types B121, B122, C120, C120H, F120, F120H, E121, E122, 820E and 822E.

Each control comprises one or two snap switches and externally attached temperature or pressure sensor.

Each control may be provided with one ormore of the following options:

M315 enclosure with expoxy coating
M430 cover lock option
M440 cover chain option
M505 overtravel actuating plunger
XXXX other options which may occur and will have no bearing on explosion-protection nor electrical properties.

Certification Conditions cont'd

1. As the threaded entries are NPT, flameproof thread adaptors shall be used to permit the use of SAA certified flameproof cable glands.
2. Controls equippped with the manual reset arrangement, as detailed in Drawing No: E6296-185 Issue C, shall not be marked 'IP66'.
3. Shell petroleum jelly EDP code 82287 may be used for the lid thread

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 2 Drawing No(s) cont'd

E6296-185	Issue C
E6296-186	Issue C
E6296-187	Issue B
E12259	Issue A
E12260	Issue A
E12261	Issue A
E12262	Issue B
E12263	Issue B
E12264	Issue B
E12265	Issue A
E12266	Issue A
E12267	Issue A
E12198	Issue A
E12200	Issue A
D6201-167	Issue B
D6201-203	Issue A
D6201-204	Issue A
UEA-1200G	Original
UEA-1200L	Revision 2

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 542-1

This is to certify that SAA Certificate Nos Ex 542 issued to:

United Electric Controls (Aust) Pty LTd
83 Murphy Street
RICHMOND VIC 3121

for the 120 series range of Pressure and Temperature controls, is hereby extended to include modifications as detailed in the following schedule.

Schedule

Description of Modifications

1. Addition of various pressure sensors to the pressure controls type J120, J120K, H121, H121K, H122 and H112K.

2. Addition of the weather protected junction or indication box, fitted externally to flameproof control enclosure.

3. Removal of an unused second adjustment shaft hole from type H121 control enclosures.

4. Addition of option 1010, which includes replacement of DPDT switch for controls type C120, F120, J120,E121, B121 and H121.

5. Removal of the flat gasket type B, and replacement with the uniform O-ring gasket type A for the fitting of pressure sensors.

Drawings

E-6296-277 Sheets 1 & 2, Issue C
E-6296-278 Sheets 1 & 2, Issue B
E-6296-279 Issue B
E-12559 Sheet 1 Issue B
E-12559 Sheet 2 Issue D
E-12262 Sheet 1 Issue C
E-12262 Sheet 2 Issue D
E-12263 Issue A
E-12264 Issue A
E-12265 Sheet 1 Issue B
E-12265 Sheet 2 Issue C
UEA-1200G Issue B
UEA-1201G Issue A

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 542-1

Certification Conditions

The conditions specified in certificate Ex 542 shall apply to Ex 542-1

Type of Protection: Ex d IIB T6 IP66

Test Report: LOSC 2010 to AS 2480-1986 and 1939-1986

File: P/3: 85015/M137

Date of Issue: 28 July 1987

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Certificate No Ex 542-2

Certificate of Compliance

This is to certify that Standards Australia Certificate Nos Ex 542 and Ex 542-1 issued to:

United Electric Controls (Aust) Pty Ltd
83 Murphy Street
Richmond Vic 3121

for the 120 Series Temperature and Pressure Controls are hereby extended to include modifications as detailed in the following schedule.

SCHEDULE

Description of modifications:

Change of gas group to IIC

Models in the range

Temperature controls	B121 series: 119,120,121, E121, E122, C120, B122, F120 series: 2ACA, 2ASA, 2BCA, 2BSA, 2CCA, 2CSA, 2ACB, 2ASB, 2BCB, 2BSB, 2CCB, 2CSB, 3AC, 3AS, 3BC, 3BS, 3CC, 3CS, 4AC, 4AS, 4BC, 4BS, 4CC, 4CS, 5AC, 5AS, 5BC, 5BS, 5CC, 5CS, 8AC, 8AS, 8BC, 8BS, 8CC, 8CS, M9AA, M9BA, M9CA, M9BB, M9CB, 1BS, 2BS, 6BS, 7BS, M9B
Pressure controls (non-vented)	J120, J120K, H121, H122 series: 126, 137, 144, 134, 152, 156, 164, S126, S137, S144, S134, S152, S156, S164, S126B, S137B, S144B, S134B, S152B, S156B, S164B, 450, 451, 452, 453, 454
Pressure controls (vented)	J120, J120K, H121, H122, H121K, H122K series: 270, 274, 358, 361, 376, 550, 551, 552, 553, 554, 555, 612, 614, 455, 456, 457, 559, 701, 702, 703, 704, 705, 190, 191, 192, 193, 194, 147, S147, S147B, 157, S157, S157B, 36, 37, 38, 39, 40, 183, 184, 185, 186, 188, 189, 612, 616, 50, 51, 52, 53, 54, 55

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia
Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certificate of Compliance

Drawings:

E-6296-277 Sheet 1	Revision D	28 January 1992
E-6296-277 Sheet 2	Revision C	12 February 1986
E-6296-278 Sheet 1	Revision C	28 January 1992
E-6296-278 Sheet 2	Revision B	2 July 1985
E-6296-279	Revision C	28 January 1992
E-12259 Sheet 1	Revision C	28 January 1992
E-12259-Sheet 2	Revision E	29 January 1992
E-12262 Sheet 1	Revision D	28 January 1992
E-12262 Sheet 2	Revision D	12 February 1986
E-12263	Revision B	28 January 1992
E-12264	Revision B	28 January 1992
E-12265 Sheet 1	Revision C	28 January 1992
E-12265 Sheet 2	Revision D	12 February 1986
EUA-1200 G	Revision B	5 July 1985
UEA-1201 G	Revision A	8 July 1985
UEA-1200 L	Issue E	undated
E-12260	Revision B	29 January 1992
E-12261	Revision B	29 January 1992
E-12266	Revision B	29 January 1992
E-12267	Revision B	29 January 1992

TYPE OF PROTECTION: Ex d IIC T6 IP66 Class I Zone 1

Test Report No: NET 92/024 to AS 2380.1-1989 and AS 2380.2-1991

File: P/3: 91193.M165

Date of Issue: 21 April 1992

Date of Expiry of Validity: 21 April 2002

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Certificate No Ex 542-3

Certificate of Compliance

This is to certify that Standards Australia Certificate No Ex 542, Ex 542-1 and Ex 542-2 issued to:

United Electric Controls (Aust) Pty LTd

for the 120 series Temperature and Pressure Controls are hereby extended to include changes as detailed in the following schedule.

SCHEDULE

Description of changes:

Change of Address of Certificate Holder to:

Unit 2, 615 Warrigal Road
Ashburton Vic 3147

File: P/3: 92220

Date of Issue: 21 December 1992

Date of Expiry of Validity: 21 April 2002

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx CSA 05.0005 issue No.:2

Status: **Current**

Date of Issue: **2006-12-15** Page 1 of 4

Certificate history:
Issue No. 6 (2011-6-23)
Issue No. 5 (2010-5-7)
Issue No. 4 (2009-7-24)
Issue No. 3 (2008-6-24)
Issue No. 2 (2006-12-15)

Applicant: **Yokogawa Electric Corporation**
2-9-32 Naka-cho, Musashino-shi
Tokyo 180-8750
Japan

Electrical Apparatus: **Pressure Transmitters, Series EJX**
Optional accessory:

Type of Protection: **Ex i; Ex n**

Marking: **IECEx CSA 05.0005**
Ex ia IIC T4, Ex nL IIC T4
IP66, IP67
(Refer to Schedule)

Approved for issue on behalf of the IECEx Certification Body: Joe Gryn

Position: Director, Conformity Assessment

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

CSA International
178 Rexdale Boulevard
Toronto, Ontario M9W IR3
Canada
and
1707 - 94th Street
Edmonton, AB T6N 1E6
Canada

CSA INTERNATIONAL

IECEx Certificate of Conformity

Certificate No.: IECEx CSA 05.0005

Date of Issue: **2006-12-15** Issue No.: **2**

Page 2 of 4

Manufacturer: **Yokogawa Electric Corporation**
2-9-32 Naka-cho, Musashino-shi
Tokyo 180-8750
Japan

Manufacturing location(s):
Yokogawa Electric Corporation
155 Takamuro-cho, Kofu-shi
Yamanashi-ken, 400-8558
Japan

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2000 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements

Edition: 3.1

IEC 60079-11 : 1999 Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety 'i'
Edition: 4

IEC 60079-15 : 2001 Electrical apparatus for explosive gas atmospheres - Part 15: Type of protection 'n'
Edition: 2

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

IECEx ATR:
CA/CSA/05/TR172608-1626032
CA/CSA/ExTR06.0027/00

File Reference:
172608-1626032
172608-1862781(1626032)

IECEx Certificate of Conformity

Certificate No.: IECEx CSA 05.0005

Date of Issue: **2006-12-15** Issue No.: **2**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The EJX series are two wire electronic transmitters which convert differential pressure, gauge pressure or absolute pressure into a 4 to 20mA dc output signal with a possibility for digital communication.

The EJX series transmitter consists of a field wiring compartment, an electronic amplifier in an aluminum alloy housing and pressure sensor assembly.

The electrical amplifier consists of four printed-circuit boards:
Terminal board, CPU board, Driver board and LCD board. (Refer to ICS014-A12 P.5 and P.6)

Model: EJX Series Pressure Transmitters
for Electrical Equipment for Explosive Atmospheres

Type of Protection:	Ex ia IIC T4, Ex nL IIC T4
Ambient Temperature:	-50 to 60oC
Process Temperature:	120oCmax
Ambient Humidity:	0 to 100% (No condensation)
Degree of Protection of Enclosure:	IP66 and IP67
Electrical Parameters (Ex ia):	Ui=30V, Ii=200mA, Pi=0.9W, Ci=10nF, Li=0
Electrical Parameters (Ex nL):	Ui=30V, Ci=10nF, Li=0

The model variations and configurations covered by this IECEx Certificate are detailed in the attached Addendum. REFER TO ANNEX.
CONDITIONS OF CERTIFICATION: NO

IECEx Certificate of Conformity

Certificate No.: IECEx CSA 05.0005

Date of Issue: **2006-12-15** Issue No.: **2**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Revision of model codes in accordance with Document ICS014. Rev 2: Minor revisions not affecting explosion protection - CA/CSA/ExTR06.0027/00

Annexe: IECEx CSA 05.0005_ICS014.pdf

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx UL 05.0003 issue No.:1

Certificate history:

Status: **Current**

Date of Issue: **2006-12-05** Page 1 of 5

Applicant: **Thermon Manufacturing Co.**
100 Thermon Drive
San Marcos, TX 78666
United States of America

Electrical Apparatus: **Terminator Series, Power, Splice and End-Termination Kits**
Optional accessory:

Type of Protection: **Increase Safety**

Marking: **Ex e II T4-T6**
-60°C ≤ Tamb ≤ +55°C

Approved for issue on behalf of the IECEx Certification Body: Paul T. Kelly

Position: Operations Manager

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Underwriters Laboratories Inc (UL)
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

Working for a safer world

IECEx Certificate of Conformity

Certificate No.: IECEx UL 05.0003

Date of Issue: **2006-12-05** Issue No.: **1**

Page 2 of 5

Manufacturer: **Thermon Manufacturing Co.**
100 Thermon Drive
San Marcos, TX 78666
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-7 : 2001 Edition: 3	Electrical apparatus for explosive gas atmospheres - Part 7: Increased safety 'e'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

IECEx Certificate of Conformity

Certificate No.: IECEx UL 05.0003

Date of Issue: **2006-12-05** Issue No.: **1**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Other information

Ratings

Temperature Class	6mm2 Terminals		4mm2 Terminals		
	8.4 mm2 Wire	6 mm2 Wire	5.3mm2 Wire	4mm2 Wire	3.3mm2 Wire
T4	70A, Ta=+40°C	62A, Ta=+40°C	52A, Ta=+40°C	42A, Ta=+40°C	38A, Ta=+40°C
T5	55A, Ta=+40°C	48A, Ta=+40°C	40A, Ta=+40°C	32A, Ta=+40°C	30A, Ta=+40°C
T6	46A, Ta=+40°C	41A, Ta=+40°C	34A, Ta=+40°C	28A, Ta=+40°C	25A, Ta=+40°C
T4	64A, Ta=+55°C	56A, Ta=+55°C	45A, Ta=+55°C	37A, Ta=+55°C	35A, Ta=+55°C
T5	46A, Ta=+55°C	41A, Ta=+55°C	34A, Ta=+55°C	28A, Ta=+55°C	25A, Ta=+55°C
T6	36A, Ta=+55°C	32A, Ta=+55°C	27A, Ta=+55°C	21A, Ta=+55°C	20A, Ta=+55°C

The current rating and temperature class might be limited by the current and temperature rating of applied terminal.

Other information
Terminator Series: Power, Splice and End-Termination Kits Nomenclature:

I-	Terminator Series Designation
II-	Z – Zone, ATEX or IEC Ex Categories Designation
III-	Kit Type Designation P - Power Connection S - Splice Connection E - End Termination L - End of Circuit (Voltage Indication Light)
IV-	Cable Profile Designation L – Large S – Small
V-	Mounting Designation XP – Pipe WP – Wall

The maximum pipe temperature exposure is 250°C.
The minimum temperature exposure is -60°C.

The maximum rated operating voltage is 750V. The maximum rated operating voltage might be limited by the voltage rating of applied terminals. Terminator series is intended to be used with Thermon certified trace heating cables, as specified in the relevant IECEX heating cable certificates.

The temperature classification is depending on the terminal temperature rating, current and size of the terminals and on the heating cables mounted. If cables used in the Junction Box have a lower temperature class (T5, T4, T3 etc.) the temperature class for the Junction Box shall be de-rated in accordance with the temperature class of the cable.
Conduit and Cable entries provided by the end-user must be Certified as Exe II, IP66 as marked on product label.

CONDITIONS OF CERTIFICATION: NO

IECEx Certificate of Conformity

Certificate No.: IECEx UL 05.0003

Date of Issue: **2006-12-05** Issue No.: **1**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1: -The construction features have not changed. -No updated drawings or documents are to be referenced in 'Manufacturer Documents'. -The designation "TracePlus" was removed from the Product Name, Product Description, Test item and the Nomenclature in 'Other Information' per the manufacturer's request. -Added list of cables evaluated under original examination, in section 'Other Information'. List contains the following IEC-EX Certified cables :BSX, FP, HPT, HTSX, KSX, RSX, TSX, and VSX trace heating cables. -Corrected item number in 'Manufacturer's Documents" to read 5 instead of 10, under Installation Instructions. -The designation 'TracePlus' was removed from the Scope. Note corresponding to

called out in the table that follow s. -The designation 'Terminator Series' w as added to several clauses. The specific clauses are called out in the table that follow s. -There w as a typographical error that w as corrected in Clause 26.14. Under the heading 'Charging tests of test sample', in the voltage column of all three methods (A,B,C) the voltage w as corrected to < 100mV instead of <600mV. Both values are correct so this revision does not impact the investigation.

IECEx Certificate of Conformity

Certificate No.: IECEx UL 05.0003

Date of Issue: **2006-12-05** Issue No.: **1**

Additional information:

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIM 09.0001X issue No.:2

Status: **Current**

Date of Issue: **2010-12-03** Page 1 of 5

Certificate history:
Issue No. 2 (2010-12-3)
Issue No. 1 (2009-11-10)
Issue No. 0 (2009-3-19)

Applicant: **Govan Industries Pty Ltd**
131-149 Link Drive
CAMPBELLFIELD VIC 3061
Australia

Electrical Apparatus: **ES/DS & EM/DM Range of Junction Boxes and Control Stations**
Optional accessory:

Type of Protection: **e, tD**

Marking: **Refer Annex**

Approved for issue on behalf of the IECEx Certification Body: Ashraf Chowdhury

Position: Principal Engineer

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Safety in Mines Testing and Research Station (Simtars)
2 Smith Street
REDBANK QLD 4301
Australia

Simtars

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 09.0001X

Date of Issue: **2010-12-03** Issue No.: **2**

Page 2 of 5

Manufacturer: **Govan Industries Pty Ltd**
131-149 Link Drive
CAMPBELLFIELD VIC 3061
Australia

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
IEC 61241-0 : 2004	Electrical apparatus for use in the presence of combustible dust - Part 0: General

Edition: 1	requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
AU/SIM/ExTR09.0002/00 AU/SIM/ExTR09.0002/01 AU/SIM/ExTR09.0002/02

Quality Assessment Report:

AU/TSA/QAR06.0004/03

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 09.0001X

Date of Issue: **2010-12-03** Issue No.: **2**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The ES/DS Range of Junction Boxes and Control Stations are of stainless steel construction with a bolt-on cover. The ES Range employs the increased safety (Ex e) concept whereas the DS Range are for combustible dust (Ex tD concept) applications. A gasket in the cover provides protection against ingress of dust and water into the enclosures. The cover may incorporate two types of windows as per manufacturer's documentation. Cable access is via separately certified cable glands fitted to holes drilled into the walls of the enclosure for the ES/DS 1110, 1511 and 2315 Enclosures and via gland plates fitted to the ES/DS 3030, 4050, 5060 and 6090 Enclosures or holes drilled in the walls as per manufacturer's documentation.

The covers for the ES/DS 3030, 4050, 5060 and 6090 Enclosures are fitted with hinges. Either one (in the bottom of the enclosure) or three (left-hand side, right-hand side and bottom of enclosure) gland plates can be fitted. The ES/DS 4050, 5060 and 6090 enclosures can be mounted in either of the two vertical planes with the hinges located to suit.

The ES Range of Junction Boxes is fitted with certified terminals (IECEx ULD 05.0008U, IECEx KEM 06.0014U, IECEx KEM 06.0034U, IECEx SIR 05.0032U, IECEx SIR 05.0035U, IECEx SIR 05.0036U, IECEx SIR 05.0037U, IECEx SIR 05.0038U or equivalents).

The cover for the ES Range of Control Stations can be fitted with certified Indicator Lights (IECEx PTB 06.0016U, IECEx PTB 07.0012U or equivalents), Ammeter (IECEx BAS 07.0043U or equivalent), Fuse (IECEx PTB 06.0056U or equivalent), separately certified Pushbutton and Switch operators as per manufacturer's documentation.

The DS Range of Junction Boxes houses terminals and/or fuses. The cover for the DS Range of Control Stations can be fitted with separately certified Pushbutton, Switch operators and Indicator lights as per manufacturer's documentation. Terminals can be fitted inside the DS Range of Control Stations.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refer Annex
Refer Annex for a list of the models, limiting parameters and marking details.

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 09.0001X

Date of Issue: **2010-12-03** Issue No.: **2**

Page 4 of 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Refer Annex

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 09.0001X

Date of Issue: **2010-12-03** Issue No.: **2**

Page 5 of 5

Additional information:

Suitable heat-resistant cables and cable glands, with a continuous operating temperature of at least 95 °C must be used at the entry point for the Range of ES/DS enclosures with temperature classification T5/T95°C.

Annexe: IECEx SIM 09.0001X-2 Annex.pdf

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 08.0008X issue No.:0

Status: Current

Date of Issue: 2009-01-20 Page 1 of 4

Certificate history:
Issue No. 2 (2011-4-12)
Issue No. 1 (2010-6-1)
Issue No. 0 (2009-1-20)

Applicant: **Rosemount Analytical Gas Chromatograph Division**
5650 Brittmoore Road
Houston
Texas 77041
United States of America

Electrical Apparatus: **Analyzer Model 700 Gas Chromatograph (GC)**
Optional accessory:

Type of Protection: **Flameproof**

Marking: **Ex d IIC T4 Gb**
Tamb = 60°C

Approved for issue on behalf of the IECEx Certification Body: C Ellaby

Position: Certification Officer

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 08.0008X

Date of Issue: **2009-01-20** Issue No.: **0**

Page 2 of 4

Manufacturer: **Rosemount Analytical Gas Chromatograph Division**
5650 Brittmoore Road
Houston
Texas 77041
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2007-10 Explosive atmospheres - Part 0:Equipment - General requirements
Edition: 5
IEC 60079-1 : 2007-04 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition: 6

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExTR09.0002/00 GB/SIR/ExTR09.0003/00

Quality Assessment Report:

GB/SIR/QAR08.0016/01

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 08.0008X

Date of Issue: **2009-01-20** Issue No.: **0**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Analyzer Model 700 is a gas chromatograph (GC) type analyser that comprises of three main parts, an Analyser Assembly, a Controller Assembly and an Enclosure Connection, see EQUIPMENT (continued) for further details.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The maximum constructional gap (i_c) is less than that required by Table 2 of IEC 60079-1:2004; therefore, as a result of any maintenance and/or repair, the following gaps shall be maintained:

Flamepath	Maximum Gap (mm)	Comment
Fitting tube adaptor/fitting tube taper	0.000	Taper fit
Fitting tube taper/tubes	0.132	Parallel fit
Pin/Exhaust Assembly	0.07	Cylindrical

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 08.0008X

Date of Issue: **2009-01-20** Issue No.: **0**

EQUIPMENT(continued):

Analyser Assembly: The Analyser Assembly (upper enclosure) consists of a GUB 5 flameproof enclosure with a domed cover, manufactured by EGS-Curlee of Houston Texas. This enclosure contains the columns, detectors, pre-amplifier, pneumatically operated stream switching valves and solenoids that make up the analyser assembly. Process pipes enter the analyser assembly through a purpose designed tube entry that is screwed into an M32 X 1.5 ISO threaded entry tapped in the enclosure wall. This device incorporated a tapered, cylindrical flamepath. The interface between the process pipes and the tube entries form a cylindrical flamepath.

Controller Assembly: The controller assembly (lower enclosure) consists of a GUB 5 flameproof enclosure manufactured by EGS-Curlee, modified to give additional depth. This enclosure contains electronics and ports for signal processing, data storage, personal computer (PC) interface and telecommunications. This allows the user to control the GC functions via a PC and appropriate software. Cable entry to the lower enclosure is via two, M32 X 1.5 tapped entries machined into the bottom side of the enclosure.

Enclosure Connection: The upper and lower enclosures are physically connected by a purpose machined aluminium conduit fitting, the conduit fitting consists of two parts, a straight conduit pipe with an M32 X 1.5 male thread machined at each end and a connector nut with a M40 X 1.5 male thread and a through tapped M32 X 1.5 female thread. To connect the enclosures, the straight conduit is screwed into an M32 X1.5 entry machined into the upper wall of the lower enclosure. The upper enclosure has an M40 X 1.5 entry machined into the base, this entry is placed over the upper thread of the straight conduit and the connector nut is simultaneously screwed into the upper enclosure base and onto the straight conduit upper thread. Flamepaths are formed by the machined threads. The cables connecting the upper and lower chambers pass through the conduit and are sealed by epoxy putty tightly packed through the entire length of the conduit. The putty is keyed to a ¾" - 14 NPS female thread machined in the conduit.

General: The Analyser Model 700 comprises all of the above equipment, electrically connected and mounted on a metal framework along with non-electrical components. The analyser can be protected from the weather by an optional purpose built shade, in addition, it may have an alternative enclosure lid for the Controller Assembly (lower enclosure) that incorporates a glass window.

AUSEx_2541X

Price: $27.50 (incl 10 % GST)

Certificate #:	AUSEx_2541X	**Issue Date:**	19/03/2002
Issue #:	0	**Expiry Date:**	19/03/2012
		Status:	Valid
Certificate Holder:	Parker Hannifin (Australia) Pty Limited		
Address:	9 Carrington Road CASTLE HILL NSW 2154 Australia		
Manufacturer:	Parker Skinner Valve & Parker Lucifer SA		
Product Description:	Solenoid Coils		
Equipment Category:	Solenoids		
Protection Type:	m		
Gas Group:	IIA		
Marking Group:			
IP Rating:	N/A		
Test Report #:	NE02/0004	**Issued by:**	SIMTARS
Standards:	AS 2431-1981		
Notes:	N/A		

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IEC Ex Certificates

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No.:	Ex 869X	Issue 0:	1 November 1988	Original Issue
		Issue 1:	6 August 1990	Design Modifications
		Issue 2:	8 October 1996	Modification to Seal
		Issue 3:	20 December 1999	Revalidation

Date of expiry: **20 December 2009**

Certificate Holder: **Govan Industries Pty Ltd**
156 Bamfield Rd
WEST HEIDELBERG VIC 3081

Electrical Equipment: **Govan GE Range of Ex e Metal Enclosures**

Type of Protection and Marking Code: **Ex e IIC T6 IP66/67 Enclosure Only**
Ex e IIC T6 IP6* as Control Stations
(Refer Table 1 for second numeral)
AUS Ex 869X

Manufactured by: **Govan Industries Pty Ltd**

Issued by:

Engineering, Testing and Certification Centre
2 Smith Street, REDBANK, QLD 4301, Australia
Postal Address: PO Box 467, GOODNA, QLD 4300, Australia
Phone: (07) 3810 6381 Fax: +61 7 3810 6366

SIMTARS
Quality System Certified to AS/NZS ISO 9001 Certification No 6039

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1 - 1989	**Electrical equipment for explosive atmospheres - Explosion-protection techniques - Part 1 : General requirements**
AS 2380.6 - 1988	**Electrical equipment for explosive atmospheres - Explosion-protection techniques - Part 6 : Increased safety**

This certificate does not ensure compliance with electrical safety and performance requirements other than those included in the standards listed above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: **NE99/0029**

File Reference: **99/0077** **(P80815)**

Signed for and on behalf of issuing authority

Manager
Engineering, Testing and Certification Centre
Position

20 December 1999
Date of issue

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

Certificate No.: Ex 869X **Issue: 3**

Engineering, Testing and Certification Centre
2 Smith Street, REDBANK, QLD 4301, Australia
Postal Address: PO Box 467, GOODNA, QLD 4300, Australia
Phone: (07) 3810 6381 *Fax: +61 7 3810 6366*

Quality System Certified to AS/NZS ISO 9001 Certification No 6039

STANDARDS AUSTRALIA

Schedule

Equipment:

This supplementary certificate covers the revalidation of the GE Range of Ex e metal enclosures as listed in Table 1. The range of enclosures are constructed from 1.6 or 2.0mm sheet steel or stainless steel with the latter identified by suffix S on model number. Each enclosure has a double hinged door which is secured with two fastening bolts on model GE33 and four fastening bolts on models GE45 and GE56. Model GE33 incorporates four 3mm thick gland plates and models GE45 and GE56 have two 3mm thick gland plates. The enclosure depth may be either 150mm or 200mm.

The enclosures may be manufactured as control stations by fitting separately certified components and operators as listed in Table 1. Push button and rotary switch operators are made from Nylon 6 and sealing is achieved by an 'O' ring and flat gasket. The control stations may also be supplied with a glass window and/or indicator lens. The degree of protection (IP rating) of a control station is determined by the lowest IP rated panel mount component installed. See Table 1 below.

TABLE 1: ENCLOSURE AND COMPONENT OPTION DETAILS.

ENCLOSURE TYPE					
Enclosure Model No.	Material Steel	Number of Gland Plates	Size (mm)	Explosion Protection	IP Rating
GE33 GE33S	Mild Stainless	4	300 x 300 x 150/200	Ex e	IP66/67
GE45 GE45S	Mild Stainless	2	500 x 400 x 150/200	Ex e	IP66/67
GE56 GE56S	Mild Stainless	2	600 x 500 x 150/200	Ex e	IP66/67
PANEL MOUNT COMPONENT OPTIONS AND DEGREE OF PROTECTION (IP RATING) FOR CONTROL STATIONS					
Indicator lens					IP66
Rotary operator					IP66
Meter window					IP66
Push button operators: Mushroom head - Twist to release Raised head					IP65

Certificate No.: Ex 869X Issue: 3 Date of Issue: 20 December 1999

Issued by:

Engineering, Testing and Certification Centre

2 Smith Street, REDBANK, QLD 4301, Australia
Postal Address: PO Box 467, GOODNA, QLD 4300, Australia
Phone: (07) 3810 6381 Fax: +61 7 3810 6366

SIMTARS
Quality System Certified to AS/NZS ISO 9001 Certification No 6039

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No.....: **Ex.869X**

Issue: **3**

Date of Issue: **20 December 1999**

Drawings:

DRAWING NO.	DRAWING TITLE	REVISION NO.	DRAWN/ REVISION DATE
C4184	GE ENCLOSURE EXTERNAL AND INTERNAL MOUNTING DETAIL	1	29/8/95
C4476	HINGE DETAIL ASSEMBLY FOR GOVAN (GE) VERSION "2" RANGE OF ENCLOSURES	2	23/7/96
C4840	Ex e IIC T6 E7 IP6* ref' note#6) SHEET METAL ENCLOSURE GE33 '4' G/PLATE ASSEMBLEY	2	9/8/99
C4841	Ex e IIC T6 (IP6* ref' note#6) SHEET METAL ENCLOSURE GE45 '2' G/PLATE ASSEMBLEY	2	9/8/99
C4842	Ex e IIC T6 E7(IP6* ref' note#6) SHEET METAL ENCLOSURE GE56 '2' G/PLATE ASSEMBLEY	2	9/8/99
C4843	SECTION DETAILS FOR GOVAN GE ENCLOSURES	1	9/8/99
C5031	GE ENCLOSURES GLAND PLATE SEALING DETAIL	0	12/11/96
C5361	DIP IP66 INDICATOR LENS DETAIL	-	22/2/99
C5422	Ex e IIC DIP T6 IP66 METER WINDOW DETAILS	0	27/2/95
C6132	DIP IP65 OPERATOR SHROUD DETAIL	3	25/6/99
C6148	Ex e DIP IP6* CONTROL STATION OPERATORS GENERAL ASSEMBLY GOVAN Cat No: EOP -	2	25/6/99

Issued by:

Engineering, Testing and Certification Centre

2 Smith Street, REDBANK, QLD 4301, Australia
Postal Address: PO Box 467, GOODNA, QLD 4300, Australia
Phone: (07) 3810 6381 Fax: +61 7 3810 6366

SIMTARS

Quality System Certified to AS/NZS ISO 9001 Certification No 6039

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No.....: Ex.869X

Issue: 3

Date of Issue: **20 December 1999**

Conditions of Certification:

The power dissipation per enclosure shall not exceed the values given in Table 2 based on an even distribution of separately certified components throughout the enclosure.

TABLE 2 Maximum Allowable Power Dissipation

Type of Enclosure	Maximum Dissipation (Watts)
GE33	35.4
GE33S	23.2
GE45	70.8
GE45S	46.3
GE56	137.6
GE56S	90.0

The maximum number of terminals in an enclosure may be calculated by determining the terminal resistance, cable resistance, current and the maximum allowable power dissipation per enclosure type.

The power dissipation of the enclosure may be calculated using the following equation for each terminal type and conductor size used in the enclosure. Calculated power dissipations for each terminal type and conductor size are to be summated.

$$P = I^2 (n.Rc + L.Rt)$$

Where:

P	-	Power dissipation per terminal and conductor size in an enclosure in Watts
I	-	Current through terminal and conductor in Amperes (Calculated maximum permissible continuous current)
Rc	-	Resistance of conductor in ohms per metre
Rt	-	Internal resistance of terminal in ohms
N	-	Number of terminals
L	-	Total length of conductor in metres

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Addendum to Certificate No.....Ex 869X

Issue: 3

Date of Issue: 20 December 1999

Terminals installed in the Ex e enclosures shall be separately certified Ex e and grouped for an even distribution of heat dissipation throughout the enclosure

For enclosures constructed of 2mm sheet steel or stainless steel the derating factors in Table 3 shall be applied to maximum power dissipation.

TABLE 3 DERATING FOR 2MM SHEET ENCLOSURES

Type	Derating Factor	
	150 mm deep	200 mm deep
GE 56, GE 56S	0.8	0.895
GE 45, GE 45S	0.8	0.908
GE 33, GE 33S	0.8	0.933

For looms containing from 7 to 15 conductors and looms containing 15 or more conductors, the maximum permissible continuous current calculated to achieve the maximum allowable power dissipation in Table 2 shall be further derated by a factor of 0.8 or 0.7 respectively.

Components installed in the Ex e enclosures shall be separately certified to an appropriate explosion protection technique and grouped for an even distribution of heat dissipation throughout the enclosure.

Components shall have a temperature class of T6.

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FW0001 (826x1165x16Mjpeg)

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No.	Ex: 157	Issue 0:	Original Issue 24/2/1993
		Issue 1:	21/9/1982
		Issue 2:	30/6/1988
		Issue 3:	15/12/1993

Date of Expiry: 15/12/2003

Certificate Holder: Govan Drewburn Pty Ltd
156 Bamfield Road
WEST HEIDELBERG Victoria 3081

Electrical Equipment: FW Range of Flameproof Enclosures

Type of Protection and Marking Code: Ex d IIB T6 IP65 Class I Zone 1

Manufactured By: Govan Drewburn Pty Ltd
156 Bamfield Road
WEST HEIDELBERG Victoria 3081

Issued by:

WORKCOVER AUTHORITY

Londonderry Occupational Safety Centre

132 Londonderry Road LONDONDERRY NSW 2753
Phone: (047) 244 900 Fax: (047) 244 999

STANDARDS AUSTRALIA

FW0002 (826x1165x16Mjpeg)

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989, AS 2380.2-1991(incorporating Amendment No 1) and AS 1939-1990

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: LOSC 9955

File Reference: 93/5071

K J Foale
Signed for and on behalf of issuing authority

Coordinator, Approvals & Certification
Position

15/12/1993
Date of issue

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Issued by:

WORKCOVER AUTHORITY

Londonderry Occupational Safety Centre

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STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No. Ex: 157 Issue: 3 Date of Issue: 15/12/1993

Equipment: A range of Flameproof Enclosures designated Series FW. The range includes both control stations and junction boxes in various configurations and having up to 5 entries, as required.

Allowable Variations:
Alterations to the range of certified equipment.

This supplementary certificate also covers revalidation of the entire range of enclosures.

Drawing Schedule

C2031	Revision 1	28 July 1993
C2359	Original	8 February 1993
C2353	Original	3 February 1993
C0774-Rev.2	Revision 2	21 June 1991
C1510	Original	22 October 1992

Issued by:

Londonderry Occupational Safety Centre

132 Londonderry Road LONDONDERRY NSW 2753
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WORKCOVER AUTHORITY

STANDARDS AUSTRALIA

EPEE
Explosion Protection Electrical Equipment

EPEE Certificate: Ex 229

SAI Global Assurance Services

Certificate No.	Ex 229	**Latest Issue**	Issue 5
		Issue Date	15-09-1993
Expiry Date	27-03-2000	**Expired**	
Certificate Holder	Burn Brite Lights (Vic) Pty Ltd 2-18 Canterbury Road Kilsyth Melbourne Victoria 3137 Australia		
Equipment Category	Luminaires		
Product Description	Luminaires FLP2 | This supplementary certificate relates to the range of luminaires previously certified under SAA Certificate Nos: Ex 229 and Ex 229-1		
Protection Type	Type d		
Marking Code	T5 100 Deg C | Class I | Zone 1		
Gas Group	IIB		
IP Rating	IP 67		
Manufacturer			
Test Report Number	4397A		
Issued By	Quality Assurance Services		
Standard	AS 2480-1986 AS 1939-1986		

NOTES

AUSEx_1009

Price: $27.50 (incl 10 % GST)

Certificate #:	AUSEx_1009	**Issue Date:**	12/11/1990
Issue #:	0	**Expiry Date:**	12/11/2000
		Status:	EXPIRED

Certificate Holder:	POGC Pty Ltd
Address:	79 Victoria Avenue Chatswood New South Wales 2067 Australia
Manufacturer:	Adalet PLM
Product Description:	Box XJ-DA | Adalet Junction Box
Equipment Category:	Junction boxes
Protection Type:	d
Gas Group:	IIB
Marking Group:	
IP Rating:	N/A
Test Report #:	LOSC4376
Issued by:	Quality Assurance Services
Standards:	AS 2480-1986
Notes:	N/A

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No:	AUS Ex 319	**Issue 0:** **Issue 6:**	Original Issue1/6/1982 29/9/1998
Date of Expiry:	29/9/2008		
Certificate Holder:	Crouse-Hinds (Australia) Pty Ltd 391 Park Road REGENTS PARK NSW 2143		
Electrical Equipment:	Series GUA16 Junction Box and ELS10 Limit Switch		
Type of Protection:	GUA16: ELS10:	Ex d I/IIC T6 IP66/IP67 Class I Zone 1 Ex d IIB T6 IP65 Class I Zone 1	
Marking Code:	GUA16: ELS10: AUS Ex 319	Ex d I/IIC T6 IP66/IP67 Ex d IIB T6 IP65	
Manufactured By:	Crouse-Hinds (Australia) Pty Ltd 391 Park Road REGENTS PARK NSW 2143		

Issued by:

WORKCOVER NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753
Phone: (02) 4724 4900 ***Fax: (02) 4724 4999***

QUALITY SYSTEM NAQA CERTIFIED AS3902.ISO9002

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 319-6

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements
AS 2380.2-1991	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Flameproof enclosure 'd' (incorporating Amendment 1)
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: LOSC 17734

File Reference: LOSC 97/8300

K.J Tisle
Signed for and on behalf of issuing authority

Coordinator Approvals & Certification
Position

29/9/1998
Date of issue

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Issued by:

WORKCOVER NEW SOUTH WALES

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QUALITY SYSTEM NATA CERTIFIED AS3902.ISO9002

STANDARDS AUSTRALIA

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 319 **Issue:** 6 **Date of Issue:** 29/9/1998

Certified Equipment: The GUA16 Series Junction Boxes consist of a base and screwed access cover, both manufactured from aluminium, cast iron, stainless steel or high tensile brass. The aluminium version of the equipment is suitable only for group II applications. Electrical connections to the equipment is provided by up to 4 threaded entries in the base.

The ELS10 Series Limit Switch is similar in design and construction to junction box except that the base has provision a single threaded entry and an opening fitted with an operator that actuates a switch block mounted in the base. Table 1 includes a summary of the limit switch variants covered by the certificate.

Table 1: Summary of Limit Switch Variants

Cat No	Description	Operator
ELS10/FL	Float Switch	ZCK D59
ELS10/P	Plunger Operated Limit Switch	ZCK D10
ELS10/RL	Roller Arm Limit Switch	ZCK D21
ELS10	Foot Pedal Switch	ZCK D21

Drawing Schedule

Drawing No	Drawing Title	Issue	Date
21-148-GA029	General Arrangement of ELS10 Type Limit Switches	2	13/7/98
21-148-GA22	General Arrangement	7	14/7/98

Schedule of Variations

Variations Permitted by Issue 6:
Re-validation of the Certificate of Conformity.

Issued by:

WorkCover NEW SOUTH WALES

Londonderry Occupational Safety Centre

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Phone: (02) 4724 4900 Fax: (02) 4724 4999

QUALITY SYSTEM NATA CERTIFIED AS3902.ISO9002

AUSEx_2046X

Price: $27.50 (incl 10 % GST)

Certificate #:	AUSEx_2046X	**Issue Date:**	11/06/1996
Issue #:	1	**Expiry Date:**	26/07/2004
		Status:	EXPIRED
Certificate Holder:	" Mercury Instruments, Inc. "		
Address:	3940 Virginia Avenue Cincinnati 45227 United States of America		
Manufacturer:	" Mercury Instruments, Inc. "		
Product Description:	Mercor EC-AT | Gas Volume Corrector		
Equipment Category:	Gas Detectors and Monitors		
Protection Type:	ia ib		
Gas Group:	IIA		
Marking Group:			
IP Rating:	N/A		
Test Report #:	" NI94/0013, N195/0012 "	**Issued by:**	SIMTARS
Standards:	AS 2380.1-1989 AS 2380.7-1987		
Notes:	N/A		

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

AUSEx Scheme

Certificate of Conformity

Certificate No:	AUS Ex 03.3904	**Issue 0:**	21/11/2003
		Issue 1:	12/04/2005
Date of Expiry:	21/11/2013		
Certificate Holder:	Elmako Pty Ltd 9 Damosh Ave Carrum Downs Vic 3201		
Electrical Equipment:	HAW Range of Cable Glands		
Type of Protection:	Ex d I/IIC Ex e I/II DIP		
Marking Code:	Ex d I/IIC Ex e I/II DIP A21 IP66/IP68 (30 m) AUS Ex 03.3904		
Manufactured By:	Chi An Industrial Co Ltd Changhwaa Taiwan ROC		

Issued by:

Test Safe AUSTRALIA

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

AUSEx Scheme

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP69 and the Procedure (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS/NZS 60079.0:2000	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements
AS/NZS 60079.1:2002	Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures 'd'
AS/NZS 60079.7:2002	Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety 'e'
AS/NZS 61241.1.1:1999	Electrical apparatus for use in the presence of combustible dust – Part 1.1: Electrical apparatus protected by enclosures and surface temperature limitation - Specification for apparatus
AS 1939-1990	Degrees of protection provided by enclosures for electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standards listed above.

The equipment listed successfully met the examination and test requirements as recorded in

Test Report No: TestSafe 24225, 25530

File Reference: TestSafe 2002/034451, 2004/015114

Signed for and on behalf of issuing authority

Quality & Certification Manager
Position

12 April 2005
Date of Issue

AUS Ex 03.3904-1

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Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

Schedule

Certificate No: AUS Ex 03.3904 **Issue:** 1 **Date of Issue:** 12/04/2005

Certified Equipment:

The HAW range of cable glands is suitable for inserting circular steel wire armoured cables into flameproof (Ex d) enclosures having threaded entries and increased safety (Ex e) or dust ignition protection (DIP) equipment having either plain or threaded entries. Each gland may be used as either a compression gland, utilizing the supplied inner seals, or a barrier gland, utilizing the supplied insert filled with Epoxy Putty #E14M06 manufactured by Polymeric Systems Inc. The glands consist of a body, cone, ring, sleeve, inner seal (A or B), outer seal, nut and insert. Attachment of the glands to an enclosure is facilitated by means of the male threaded portion on the body. A locknut and flat washer is required for securing glands to equipment having plain entries.

When the glands are used as compression glands, the cable inner sheath is passed through the appropriate sized inner seal and sealing of the cable is achieved by compressing the inner seal between the body and cone. In this case, the insert is not required. When the glands are used as barrier glands, the cable cores are passed through the insert and sealing of the cable is achieved by filling the insert with setting compound. In this case, the inner seal is not required. The cable wire armour is clamped between the male tapered portion on the cone and the female tapered portion on the ring. An 'O' ring is used to seal the joint between the body and sleeve to prevent dust and moisture ingress to the wire armour clamping facility. The outer seal forms a seal on the outer sheath of the cable. The outer seal also clamps the cable to prevent pulling or twisting forces from being transmitted to the conductor connections.

The HAW range is manufactured from brass alloy to Japanese Standard JIS C3604 B, which is nickel plated, and has ISO (1.5 mm pitch) mounting threads. All metallic components of the glands are manufactured from the same material. The inner and outer seals and 'O' rings for all gland ranges are made from 'NBR 1052 Rubber' manufactured by Li Ming Industrial Co., Taiwan. An entry thread seal made of red fibre is provided for DIP and IP66/IP68 applications to maintain ingress protection of the equipment on which the glands are mounted. Each gland is marked with the certification information by means of laser etching. The glands may also be used with intrinsically safe circuits, in which case the glands will have specific parts painted light blue.

Certified Equipment continued:

Alco HAW Range of Cable Glands (Compression Configuration)

Gland Code Number	Mounting Thread Dia x Length (mm)	Tightening Torque (Nm)	SWA Diameter (mm)		Cable Diameter (mm)					
					Over Bedding				Over Cable	
					Inner Seal B		Inner Seal A		Seal A	
			Min	Max	Min	Max	Min	Max	Min	Max
ALCHAW20	M20 x 20	26	0.8	1.25	6.5	8.0	8.0	10.0	11.5	16.0
ALCHAW25A	M25 x 20	41	0.8	1.25	10.0	12.0	12.0	14.0	16.0	20.0
ALCHAW25B	M25 x 20	41	1.25	1.6	14.0	16.0	16.0	18.0	20.0	24.0
ALCHAW32A	M32 x 20	68	1.25	1.6	18.0	19.5	19.5	21.5	24.0	28.0
ALCHAW32B	M32 x 20	68	1.6	2.0	21.5	23.0	23.0	25.0	28.0	32.0
ALCHAW40A	M40 x 20	106	1.6	2.0	25.0	27.0	27.0	29.0	32.0	37.0
ALCHAW40B	M40 x 20	106	2.0	2.5	28.5	31.0	31.0	33.5	37.0	42.0
ALCHAW50A	M50 x 20	166	2.0	2.5	33.0	35.0	35.0	37.5	41.0	46.0
ALCHAW50B	M50 x 20	166	2.0	2.5	36.5	39.0	39.0	42.0	45.0	51.0
ALCHAW63A	M63 x 25	260	2.5	3.15	42.0	44.5	44.5	47.0	51.0	57.0
ALCHAW63B	M63 x 25	260	2.5	3.15	47.0	50.0	50.0	53.0	57.0	63.0
ALCHAW75A	M75 x 25	375	2.5	3.15	52.5	55.5	55.5	58.5	62.0	69.0
ALCHAW75B	M75 x 25	375	2.5	3.15	58.0	61.0	61.0	64.0	66.0	75.0
ALCHAW90A	M90 x 25	540	2.5	3.15	63.0	66.0	66.0	69.0	73.0	82.0
ALCHAW90B	M90 x 25	540	2.5	3.15	68.0	71.5	71.5	75.0	81.0	90.0

Certified Equipment continued:

Alco HAW Range of Cable Glands (Barrier Configuration)

Gland Code Number	Mounting Thread Dia x Length (mm)	Tightening Torque (Nm)	Max Dia Over Cable Cores (mm)	Max No. of Cores in Compound / Core CSA (mm^2)	SWA Diameter (mm)	
					Min	Max
ALCHAW20	M20 x 20	26	7.8	7 / 0.5	0.8	1.25
ALCHAW25A	M25 x 20	41	11.8	16 / 0.5	0.8	1.25
ALCHAW25B	M25 x 20	41	15.8	21 / 0.5	1.25	1.6
ALCHAW32A	M32 x 20	68	19.1	37 / 0.5	1.25	1.6
ALCHAW32B	M32 x 20	68	22.6	51 / 0.5	1.6	2.0
ALCHAW40A	M40 x 20	106	26.6	51 / 1.5	1.6	2.0
ALCHAW40B	M40 x 20	106	31.1	51 / 2.5	2.0	2.5
ALCHAW50A	M50 x 20	166	34.5	51 / 4.0	2.0	2.5
ALCHAW50B	M50 x 20	166	39.0	4 / >16.0*	2.0	2.5
ALCHAW63A	M63 x 25	260	44.0	4 / >16.0*	2.5	3.15
ALCHAW63B	M63 x 25	260	50.0	4 / >16.0*	2.5	3.15
ALCHAW75A	M75 x 25	375	55.0	4 / >16.0*	2.5	3.15
ALCHAW75B	M75 x 25	375	60.5	4 / >16.0*	2.5	3.15
ALCHAW90A	M90 x 25	540	64.4	4 / >16.0*	2.5	3.15
ALCHAW90B	M90 x 25	540	70.4	4 / >16.0*	2.5	3.15

* For conductors greater than 16 mm^2 the largest number of cores permitted is four plus any required earth core(s).

Conditions of Certification:

1. The manufacturer shall provide the mounting instructions with the cable glands.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

JAS-ANZ

Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

Addendum to Certificate No. AUS Ex 03.3904-1

Drawing Schedule

Drawing No	Drawing Title	Issue	Date
487-42	HAW20	Original	15/09/03
487-42A	Alco HAW Glands Marking	Original	30/09/03
487-42B	Alco HAW Glands Marking	Original	30/09/03
487-42C	Alco HAW Glands Marking	Original	30/09/03
487-43	HAW25A	Original	15/09/03
487-44	HAW25B	Original	15/09/03
487-45	HAW32A	Original	15/09/03
487-46	HAW32B	Original	15/09/03
487-47	HAW40A	Original	15/09/03
487-48	HAW40B	Original	15/09/03
487-49	HAW50A	Original	15/09/03
487-50	HAW50B	Original	15/09/03
487-51	HAW63A	Original	15/09/03
487-52	HAW63B	Original	15/09/03
487-53	HAW75A	Original	15/09/03
487-54	HAW75B	Original	15/09/03
487-55	HAW90A	Original	15/09/03
487-56	HAW90B	Original	15/09/03
ALCHAWGEN	Hagemeyer Australia Alco Glands HAW Range	1.1	30/09/03
ALCHAWINST Pages 1 & 2	Hagemeyer Australia Alco Glands HAW Series Glands – Fitting Instructions	1.0	18/11/03
ALCHAWFLMPTH	Hagemeyer Australia Alco Glands HAW Range Flameproof Joint Data	1.0	09/09/03
ALCHAWSPEC	Hagemeyer Australia Alco Glands HAW Range Specification	1.0	17/09/03
ALCHAWBARLIM	Alco - HAW Range – Barrier Glands	1/0	17/09/03
ALCHAWSCHDRG	Alco Glands – Schedule of Drawings HAW Range – Hazardous Area, Armoured Weatherproof	1.0	30/09/03

Addendum to Certificate No. AUS Ex 03.3904-1

Schedule of Variations

Variations permitted by issue 1

a) Addition of an HAW20SB cable gland to the HAW Range.
b) A change of epoxy sealing compound used for the barrier glands from Epoxy Putty #E14M06 manufactured by Polymeric Systems Inc to "Kneadaseal" epoxy putty manufactured by Polymeric Systems Inc.
c) A change in the permissible operating temperature range for the HAW Range of barrier glands from -20 °C to +75 °C to -20 °C to +100 °C, as specified in the HAW Series Glands – Fitting Instructions.
d) Modification of the gland sleeve on the HAW20 cable gland to allow easier fitment on the cable.

Alco HAW20SB Cable Gland (Compression Configuration)

Gland Code Number	Mounting Thread Dia x Length (mm)	Tightening Torque (Nm)	SWA Diameter (mm)		Cable Diameter (mm)					
					Over Bedding				Over Cable	
					Inner Seal B		Inner Seal A		Seal A	
			Min	Max	Min	Max	Min	Max	Min	Max
ALCHAW20SB	M20 x 16	26	0.8	1.25	-	-	9.1	12.3	14.0	18.0

Alco HAW20SB Cable Gland (Barrier Configuration)

Gland Code Number	Mounting Thread Dia x Length (mm)	Tightening Torque (Nm)	Max Dia Over Cable Cores (mm)	Max No. of Cores in Compound / Core CSA* (mm^2)	SWA Diameter (mm)	
					Min	Max
ALCHAW20SB	M20 x 16	26	10.0	10 / 0.5	0.8	1.25

*For conductors greater than 16 mm^2 the largest number of cores permitted is four plus any required earth core(s).

Conditions relating to issue 1

All previous conditions still apply.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Australia

Phone: +61 2 4724 4900 **Fax: +61 2 4724 4999**

JAS-ANZ
Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. Z2221100AS

Addendum to Certificate No. AUS Ex 03.3904-1

Drawings relating to issue 1

Drawing No	Drawing Title	Issue	Date
487-42	HAW20	Original	15/09/03
487-110	HAW20SB	Original	17/03/04
487-110-11	HAW20SB - Markings	Original	02/06/04
ALCHAWGEN	Elmako Pty Ltd Alco Glands HAW Range	1.3	01/12/04
ALCHAWINST Pages 1 & 2	Elmako Pty Ltd - Alco Glands HAW Series Glands – Fitting Instructions	1.5	16/03/05
ALCHAWSPEC	Elmako Pty Ltd Alco Glands HAW Range Specifications	1.1	01/12/04
ALCHAWBARLIM	Alco - HAW Range – Barrier Glands	1.1	19/03/04
ALCHAWSCHDRG	Alco Glands – Schedule of Drawings HAW Range – Hazardous Area, Armoured Weatherproof	1.2	02/06/04
ALCHAWFLMPTH	Elmako Pty Ltd Alco Glands HAW Range Flameproof Joint Data	1.1	19/03/04

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EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Certificate of Conformity

Certificate No:	AUS Ex 1108U	**Issue 0:** **Issue 2:**	14 January 1991 19/12/2001 (Revalidation)
Date of Expiry:	19/12/2011		
Certificate Holder:	Cooper Electrical (Australia) Pty Ltd 207-209 Woodpark Road SMITHFIELD NSW 2164		
Electrical Equipment:	Threaded Conduit Fittings and Accessories		
Type of Protection:	Ex d I/IIC (IIB for unions UNYA and UNFA) IP67 DIP A		Zone 1 Zone 21
Marking Code:	Ex d I/IIC (IIB for unions UNYA and UNFA) IP67 DIP A21 IP67 AUS Ex 1108U		
Manufactured By:	Cooper Electrical (Australia) Pty Ltd 207-209 Woodpark Road SMITHFIELD NSW 2164		

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 Fax: (02) 4724 4999

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 642

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements (incorporating Amendment 1)
AS 2380.2-1991	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Flameproof enclosure 'd'(incorporating Amendment 1)
AS/NZS 6124.1.1: 1999	Electrical apparatus for use in the presence of combustible dust – Part 1.1:Electrical apparatus protected by enclosures and surface temperature limitation – Specification for apparatus.
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standard(s) listed above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: TestSafe 21999

File Reference: TestSafe 2001/008545 0001

Signed for and on behalf of issuing authority
Director
TestSafe Australia

Position
19/12/2001

Date of issue

Ex 1108U-2

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 Fax: (02) 4724 4999

Schedule

Certificate No: AUS Ex 1108U **Issue:** 2 **Date of Issue:** 19/12/2001

Certified Equipment: The range of equipment includes plugs, reducers, nipples, adaptors, couplers, unions, elbows and tee pieces.

All are available in metric, imperial conduit, NPT and BSP thread forms.

Materials of manufacture are 385 alloy brass, 304/316 stainless steel, mild steel 1020 zinc plated or passivated and 2011 T3 aluminium (Group II only). The elbows and tee pieces may be cast from manganese bronze 865C alloy or aluminium AP601 (Group II only).

The equipment is marked either by engraving or a rollmark process.

Table 1 lists the range of fittings.

TABLE 1

Equipment	Cat No	Thread Type	Thread Size/Range	Ex d	DIP
Plugs	PLM	ISO Metric	16mm to 75mm		
	PLN	NPT	½" to 2 ½"		
	PLB	BSP	½" to 2 ½"	I/IIC	✓
	PLI	Imperial Conduit	5/8" to 2 ½"		
Headed Plugs	PLHM	ISO Metric	16mm to 75mm		
	PLHN	NPT	½" to 2 ½"		
	PLHB	BSP	½" to 2 ½"	I/IIC	✓
	PLHI	Imperial Conduit	5/8" to 2 ½"		
Reducers	REM	ISO Metric	16mm to 75mm		
	REN	NPT	½" to 2 ½"		
	REB	BSP	½" to 2 ½"	I/IIC	✓
	REI	Imperial Conduit	5/8" to 2 ½"		

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

TABLE 1 (continued)

Equipment	Cat No	Thread Type	Thread Size/Range	Ex d	DIP
Straight Nipples	NSM	ISO Metric	16mm to 75mm		
	NSN	NPT	½" to 2 ½"		
	NSB	BSP	½" to 2 ½"	I/IIC	✓
	NSI	Imperial Conduit	5/8" to 2 ½"		
Hexagonal Nipples	NHM	ISO Metric	16mm to 75mm		
	NHM	NPT	½" to 2 ½"		
	NHB	BSP	½" to 2 ½"	I/IIC	✓
	NHI	Imperial Conduit	5/8" to 2 ½"		
Hexagonal Couplers	CHM	ISO Metric	16mm to 75mm		
	CHN	NPT	½" to 2 ½"		
	CHB	BSP	½" to 2 ½"	I/IIC	✓
	CHI	Imperial Conduit	5/8" to 2 ½"		
Adaptors	AMN	Any variant of	Any variant of		
	AMB	thread type	Thread size		
	AMI				
	ANM	ISO Metric	16mm to 75mm		
	ANB	NPT	½" to 2 ½"		
	ANI	BSP	½" to 2 ½"	I/IIC	✓
	ABM	Imperial Conduit	5/8" to 2 ½"		
	ABN				
	ABI				
	AIM				
	AIN				
Unions	UNFA/UNYA-M	ISO Metric	16mm to 75mm		
	UNFA/UNYA-B	BSP	½" to 2 ½"	I/IIB	✓
	UNFA/UNYA-I	Imperial Conduit	5/8" to 2 ½"		

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

Addendum to Certificate No. Ex.1108U-2.

TABLE 1 (continued)

A numerical suffix is used to show thread size:

		ISO	NPT	BSP	IMP. Cond.
16	=	16mm	-	-	5/8"
1	=	20mm	½"	½"	¾"
2	=	25mm	¾"	¾"	1"
3	=	32mm	1"	1"	1¼"
4	=	40mm	1¼"	1¼"	1½"
5	=	50mm	1½"	1½"	2"
6	=	63mm	2"	2"	2½"
7	=	75mm	2½"	2½"	

Conditions of Certification:

1. It is a condition of safe use that a suitable thread sealant be used to maintain an IP rating of IP67.
2. It is a condition of safe use that for Group I applications fittings and accessories manufactured from aluminium alloys must not be used.

Drawing Schedule

Drawing No	Drawing Title	Issue	Date
20-148-GA001 Sht 1 of 2	Plugs	6	6/12/01
20-148-GA001 Sht 2 of 2	Plugs – Headed	2	6/12/01
20-148-GA002	Reducers (Hand Marked)	4	6/12/01
20-148-GA2/RM	Reducers (Roll Marked)	5	6/12/01
20-148-GA003	Straight Nipples	2	6/12/01
20-148-GA004	Hexagonal Nipples	2	6/12/01
20-148-GA005	Adaptors (Hand Marked)	6	6/12/01
20-148-GA5/RM	Adaptors (Hand Marked)	5	6/12/01
20-148-GA006	Hexagonal Couplers (Sockets)	2	6/12/01
28-148-GA001	Unya Union Straight Nipple	2	6/12/01
33-148-GA001	General Arrangement FE Elbows and FT Tees	1	6/12/01

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

Addendum to Certificate No. Ex 1108U-2

Schedule of Variations

Variations Permitted by Issue 2:

1. Re-validation of certificate.
2. Change in name and address of certificate holder.
3. The inclusion of Group I.
4. The inclusion of thread code size 7 to each range of equipment.

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 319 (Sheet 1 of 2)

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Equipment

"Crouse-Hinds" Enclosures

Refer Schedule 1

Drawing No(s)

Refer Schedule 1

Certification Conditions

Remarks

Hazardous Location

Class I Zone 1

Type of Protection

Refer Schedule 1

Certificate Holder

Crouse-Hinds Aust Pty Ltd
31 Moxon Road
PUNCHBOWL NSW 2196

Manufacturer

Crouse-Hinds Aust Pty Ltd
31 Moxon Road
PUNCHBOWL NSW 2196

Test Report No(s)

Londonderry Centre TR No. LFP 698

Australian Standard(s)

AS 2480-1981 and
AS 1939-1981

SAA File Reference

P/3: 81194/M101

Effective Date

1982.05.05

Date of Issue

1982.06.01

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 Description of Equipment (Continued)

"Crouse-Hinds" Enclosures

Cat. Nos.	Entries
GUALA; GUACA; GUATA; GUAXA; GUAMA: GUAWA; GUABA and GUADA.	(i) 20mm-¾" ET-½" N.P.T.-½" BSP (ii) 25mm-1" ET-¾" N.P.T.-¾" BSP
EABLA; EABCA; EABTA; EABXA; EABMA; EABWA; EABBA and EABDA.	(i) 20mm-¾" ET-½" N.P.T.-½" BSP (ii) 25mm-1" ET-"/4 N.P.T.-¾" BSP

Drawing No(s)

21-148-4 Issue 5 D/- 18.2.82;
21-148-5 Issue 6 D/- 18.2.82;
21-148-7 Sheet 1 Issue 4 D/- 18.2.82;
21-148-7 Sheet 2 Issue 3 D/- 18.2.82;
21-148-7 Sheet 3 Issue 4 D/- 18.2.82;
CH-3 Issue 6 D/- 18.2.82;
21-148-2 Sheet 1 Issue 3 D/- 18.2.82;
21-148-2 Sheet 2 Issue 3 D/- 18.2.82;
21-148-GA3 Sheet 1 Issue 3 D/- 18.2.82;
21-148-GA3 Sheet 2 Issue 3 D/- 18.2.82;
21-148-GA2 Issue 2 D/- 15.2.82 and
21-148-16 Original D/- 17.2.82

Type of Protection

1. For enclosures, Cat. Nos: GUALA; GUACA; GUATA; GUAXA; GUAMA; GUAWA; GUABA and GUADA.

   Ex d IIB T6 IP65

2. For enclosures, Cat. Nos: EABLA; EABCA; EABTA; EABXA; EABMA; EABWA; EABBA; and EABDA.

   Ex d IIC T6 IP65

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 319 (Sheet 1 of 2)

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Equipment "Crouse-Hinds" Enclosures Refer Schedule 1	Hazardous Location Class I Zone 1 Type of Protection Refer Schedule 1 Certificate Holder Crouse-Hinds Aust Pty Ltd 31 Moxon Road PUNCHBOWL NSW 2196
Drawing No(s) Refer Schedule 1	Manufacturer Crouse-Hinds Aust Pty Ltd 31 Moxon Road PUNCHBOWL NSW 2196
Certification Conditions	Test Report No(s) Londonderry Centre TR No. LFP 698 Australian Standard(s) AS 2480-1981 and AS 1939-1981 SAA File Reference P/3: 81194/M101
Remarks	Effective Date 1982.05.05 Date of Issue 1982.06.01

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

SCHEDULE 1 Description of Equipment (Continued)

"Crouse-Hinds" Enclosures

Cat. Nos.	Entries
GUALA; GUACA; GUATA; GUAXA; GUAMA: GUAWA; GUABA and GUADA.	(i) 20mm-¾" ET-½" N.P.T.-½" BSP (ii) 25mm-1" ET-¾" N.P.T.-¾" BSP
EABLA; EABCA; EABTA; EABXA; EABMA; EABWA; EABBA and EABDA.	(i) 20mm-¾" ET-½" N.P.T.-½" BSP (ii) 25mm-1" ET-"/4 N.P.T.-¾" BSP

Drawing No(s)

21-148-4 Issue 5 D/- 18.2.82;
21-148-5 Issue 6 D/- 18.2.82;
21-148-7 Sheet 1 Issue 4 D/- 18.2.82;
21-148-7 Sheet 2 Issue 3 D/- 18.2.82;
21-148-7 Sheet 3 Issue 4 D/- 18.2.82;
CH-3 Issue 6 D/- 18.2.82;
21-148-2 Sheet 1 Issue 3 D/- 18.2.82;
21-148-2 Sheet 2 Issue 3 D/- 18.2.82;
21-148-GA3 Sheet 1 Issue 3 D/- 18.2.82;
21-148-GA3 Sheet 2 Issue 3 D/- 18.2.82;
21-148-GA2 Issue 2 D/- 15.2.82 and
21-148-16 Original D/- 17.2.82

Type of Protection

1. For enclosures, Cat. Nos: GUALA; GUACA; GUATA; GUAXA; GUAMA; GUAWA; GUABA and GUADA.

   Ex d IIB T6 IP65

2. For enclosures, Cat. Nos: EABLA; EABCA; EABTA; EABXA; EABMA; EABWA; EABBA; and EABDA.

   Ex d IIC T6 IP65

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 319-1

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

'Crouse-Hinds' Enclosures, Cat Nos GUA Series and Variants ELS and ELFS Series

This supplementary certificate relates to the following items:

(a) Modification of existing marking to improve its legibility.

(b) Modification of the cover design to include the optional centre boss as a label screw attachment.

(c) Extension of the range of equipment already certified under SAA Certificate No. Ex 319 to include Limit Switch Cat. No. ELS-10 and Foot Pedal Switch Cat. No. ELFS-10 Series.

Drawing No(s)

3-148-GA1 Issue 2; 3-148-GA2 Issue 4; 3-148-GA3 Original; 3-148-3 Issue 3 and 21-148-18 Issue 3

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6 IP 65

Certificate Holder

Crouse-Hinds Australia Pty Ltd
31 Moxon Road
PUNCHBOWL NSW 2196

Manufacturer

Crouse-Hinds Australia Pty Ltd
31 Moxon Road
PUNCHBOWL NSW 2196

Test Report No(s)

Londonderry Centre

TR NO: 1701

Australian Standard(s)

AS 2480-1981
AS 1939-1981

SAA File Reference

P/3:83161/M118

Effective Date

1984-08-15

Date of Issue

1984-08-16

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. EX 319-2

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

'Crouse Hinds' Junction Box

Model GUACA 16M

This supplementary certificate relates to the addition of a mild steel adaptor to facilitate connection of this junction box to an air conditioner compressor unit. The junction box was previously certified under SAA Certificate No. Ex 319 & 319-1.

Drawing 21-148-GA11 Issue 2

Certification condition

The manufacturer must carry out on all enclosures a routine pressure test to Clause 3.3.3, i.e. 1,005kPa (1.5 times the reference pressure of 670 kPa).

Hazardous Location
Class I Zone 1

Type of Protection
Ex d IIB T6 IP65

Certificate Holder
Crouse Hinds (Aust.) Pty. Ltd.,
31 Moxon Road
PUNCHBOWL. N.S.W. 2196

Manufacturer
Crouse Hinds (Aust.) Pty. Ltd.,
31 Moxon Road
PUNCHBOWL N.S.W. 2196

Test Report No(s)

SCC TR No. 61271

Australian Standard(s)
AS 2480-1981 with Amendment No.1

SAA File Reference
P/3: 85 137/M128

Effective Date
1986.02.18

Date of Issue
1986.03.06

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 319-3

This certifies that the equipment described hereunder has been examined and tested in accordance with the requirements of the Australian standard(s) specified herein, and such equipment has been found to comply with these requirements.

This certificate may be withdrawn at any time if in the opinion of SAA Committee P/3, Certification of Electrical Equipment for Hazardous Locations, the relevant standard has been altered or revised to a degree that the equipment is no longer considered suitable for installation in the hazardous location stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Description of Modification

"Crouse-Hinds" GUA and EAB Series Junction Boxes

This Supplementary Certificate relates to the addition of grade 316 stainless steel as a material option for equipment previously certified under SAA Certificates Ex 319, Ex319-1, & Ex319-2

Drawing No(s)

21-148-2 Sheets 1 and 2, Issue 4
21-148-4 Issue 6
21-148-5 Issue 7
21-148-7 Sheet 1 Issue 5
21-148-7 Sheet 2 Issue 4
21-148-7 Sheet 3 Issue 5
21-148-16 Issue 2
21-148-18 Issue 4
21-148-GA2 Sheet 1 Issue 3
21-148-GA3 Sheet 1 Issue 4

Hazardous Location

Class I Zone 1

Type of Protection

Ex d IIB T6 IP65-GUA Series

Ex d IIC T6 IP65-EAB Series

Certificate Holder

Crouse-Hinds (Aust) Pty. Ltd.,
31 Moxon Road
PUNCHBOWL. N.S.W. 2196

Manufacturer

Crouse-Hinds (Aust) Pty. Ltd.,
31 Moxon Road
PUNCHBOWL. N.S.W. 2196

Test Report No(s)

N/A

Australian Standard(s)

AS 2480-1981
AS 1939-1981

SAA File Reference

P/3: 86026/M128

Effective Date

1986-02-18

Date of Issue

1986.03.24

Director—Administration & Approvals
Standards Association of Australia

STANDARDS ASSOCIATION OF AUSTRALIA

Incorporated by Royal Charter

STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 319-4

This is to certify that SAA Certificate Nos Ex 319, Ex 319-1, Ex 319-2 and Ex 319-3 issued to:

Crouse Hinds (Aust) Pty Ltd
31 Moxon Road
PUNCHBOWL NSW

for 'Crouse Hinds' Junction Box Model GUA are hereby modified as detailed in the following Schedule.

Schedule

Description of Modification

The GUA series air conditioner junction box has had a cast iron adaptor added and the range has been extended to cover 32 mm entries and Group 1 compliance.

Drawings

21-148-GA20 Issue 3
21-148-GA22 Issue 2

Type of Protection: Ex d IIB T6 IP65 for GUALA16 series air conditioner junction box
Ex d I/IIB T6 IP65 for GUA series junction boxes Cat No GUA
Ex d IIC T6 IP65 for GUA series junction boxes Cat No EAB

Test Report: LOSC 2892 to AS 2480-1986 and AS 1939-1986

File: P/3: 87031/M137

Remarks: This supersedes SAA Certificate No Ex 319-3 dated 21 July 1987 which contained typographical errors.

Date of Issue: 29 July 1987

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT SUPPLEMENTARY Certificate No **Ex 319-5**

Certificate of Compliance

This is to certify that Standards Australia Certificate No Ex 319, Ex 319-1, Ex 319-2, Ex 319-3 and Ex 319-4 issued to:

Crouse Hinds (Australia) Pty Ltd

for the "Crouse Hinds Junction Box Model GUA" are hereby extended to include changes as detailed in the following schedule.

SCHEDULE

Description of changes:

1. Change of address of certificate holder to:

   391 Park Road
   Regents Park NSW 2143

2. Delete EAB series from the certificate
3. Change apparatus group of GUA series from IIB to IIC
4. Change apparatus group of GUA series Air Conditioner Junction Boxes from IIB to IIC
5. Increase degree of protection from IP65 to IP66/IP67

Drawings: 21-148-GA11 Issue 6 18 November 1991
21-148-GA20 Issue 6 18 November 1991
21-148-GA22 Issue 5 18 November 1991

TYPE OF PROTECTION: Ex d IIC T6 IP66/IP67 for GUA series air conditioner junction box
Ex d I/IIC T6 IP66/IP67 for GUA series junction boxes

Test Report No: LOSC 6953 to AS 2480-1986 and AS 1939-1990

File: P/3: 91137.M164

Date of Issue: 23 December 1991

Date of Expiry of Validity: 29 July 1997

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia
Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No: AUS Ex 319

Issue 0: Original Issue 1/6/1982
Issue 6: 29/9/1998

Date of Expiry: 29/9/2008

Certificate Holder: Crouse-Hinds (Australia) Pty Ltd
391 Park Road
REGENTS PARK NSW 2143

Electrical Equipment: Series GUA16 Junction Box and ELS10 Limit Switch

Type of Protection:
GUA16: Ex d I/IIC T6 IP66/IP67 Class I Zone 1
ELS10: Ex d IIB T6 IP65 Class I Zone 1

Marking Code:
GUA16: Ex d I/IIC T6 IP66/IP67
ELS10: Ex d IIB T6 IP65
AUS Ex 319

Manufactured By: Crouse-Hinds (Australia) Pty Ltd
391 Park Road
REGENTS PARK NSW 2143

Issued by:

WORKCOVER NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753
Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

QUALITY SYSTEM NATA CERTIFIED AS3902.ISO9002

STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex.319-6

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1-1989	Electrical equipment for explosive atmospheres - Explosion-protection techniques - General requirements
AS 2380.2-1991	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Flameproof enclosure 'd' (incorporating Amendment 1)
AS 1939-1990	Degrees of protection provided by enclosures of electrical equipment (IP Code)

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: LOSC 17734

File Reference: LOSC 97/8300

K.J Fisher
Signed for and on behalf of issuing authority

Coordinator, Approvals & Certification
Position

29/9/1998
Date of issue

This certificate and schedule may not be reproduced except in full.

This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

Issued by:

WORKCOVER NEW SOUTH WALES

Londonderry Occupational Safety Centre

919 Londonderry Road LONDONDERRY NSW 2753

Phone: (02) 4724 4900 ***Fax: (02) 4724 4999***

QUALITY SYSTEM NATA CERTIFIED AS3902.ISO9002

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 319 **Issue:** 6 **Date of Issue:** 29/9/1998

Certified Equipment: The GUA16 Series Junction Boxes consist of a base and screwed access cover, both manufactured from aluminium, cast iron, stainless steel or high tensile brass. The aluminium version of the equipment is suitable only for group II applications. Electrical connections to the equipment is provided by up to 4 threaded entries in the base.

The ELS10 Series Limit Switch is similar in design and construction to junction box except that the base has provision a single threaded entry and an opening fitted with an operator that actuates a switch block mounted in the base. Table 1 includes a summary of the limit switch variants covered by the certificate.

Table 1: Summary of Limit Switch Variants

Cat No	Description	Operator
ELS10/FL	Float Switch	ZCK D59
ELS10/P	Plunger Operated Limit Switch	ZCK D10
ELS10/RL	Roller Arm Limit Switch	ZCK D21
ELS10	Foot Pedal Switch	ZCK D21

Drawing Schedule

Drawing No	Drawing Title	Issue	Date
21-148-GA029	General Arrangement of ELS10 Type Limit Switches	2	13/7/98
21-148-GA22	General Arrangement	7	14/7/98

Schedule of Variations

Variations Permitted by Issue 6:
Re-validation of the Certificate of Conformity.

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QUALITY SYSTEM NACA CERTIFIED AS3902.ISO9002

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No: AUS Ex 03.3844X **Issue 0:** 10/7/2003

Date of Expiry: 10/7/2013

Certificate Holder: CCG Cable Terminations (Pty) Ltd
33-37 Forge Road
Spartan Industrial Area 1619
SOUTH AFRICA

Electrical Equipment: E1EX, D1EX, A2EX and Ex Corrosion Guard ranges of cable glands

Type of Protection:

Ex d IIC	Zone 1
Ex e II	Zone 1
DIP	Zone A21

Marking Code:
Ex d IIC
Ex e II
DIP A21 IP66/IP68 (2 m)
AUS Ex 03.3844X

Manufactured By: CCG Cable Terminations (Pty) Ltd
33-37 Forge Road
Spartan Industrial Area 1619
SOUTH AFRICA

Issued by:

Test Safe AUSTRALIA

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EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS/NZS 60079.0:2000	Electrical apparatus for explosive gas atmospheres Part 0: General requirements (incorporating Amendment 1)
AS/NZS 60079.1:2002	Electrical apparatus for explosive gas atmospheres Part 1: Flameproof enclosures 'd' (incorporating Corrigendum 1)
AS/NZS 60079.7:2001	Electrical apparatus for explosive gas atmospheres Part 1: Increased safety 'e'
AZ/NZS 61241.1.1:1999	Electrical apparatus for use in the presence of combustible dust Part 1.1: Electrical apparatus protected by enclosures and surface temperature limitation - Specification for apparatus
AS 1939-1990	Degrees of protection provided by enclosures for electrical equipment (IP Code)

This certificate does not ensure compliance with electrical safety requirements and performance other than those included in the Standards listed above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: TestSafe 23260

File Reference: TestSafe 2001/016928

Signed for and on behalf of issuing authority
Laboratory Systems Manager
TestSafe Australia

Position
10/7/2003

Date of issue

Ex 03.3844X

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STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by Standards Australia Quality Assurance Services

Schedule

Certificate No: AUS Ex 03.3844X **Issue:** 0 **Date of Issue:** 10/7/2003

Certified Equipment: The EIEX, DIEX, A2EX and Ex corrosion guard ranges of cable glands are suitable for inserting circular cables into enclosures having threaded entries, as appropriate for the type of protection.

The ranges of glands are as follows:

The 'EIEX' range of cable glands for armoured cables each comprising of a brass, stainless steel or bronze body, a front seal, an armour cone, an armour compression element, a rear seal and a seal compression nut. An optional moulded oversleeve may be interposed between the armour element and rear compression nut. The glands are available with Metric (M16 to M75) or NPT (½" to 3") entry threads.

The 'DIEX' range of cable glands for armoured cables each comprising of a brass, stainless steel or bronze body, seal, an armour cone with spring retaining ring, an armour compression element, a rear seal and a seal compression nut. An optional moulded oversleeve may be interposed between the armour element and rear compression nut. The glands are available with Metric (M16 to M75) or NPT (½" to 3") entry threads.

The 'A2EX' range of cable glands for un-armoured cables each comprising of a brass, stainless steel or bronze body, a inner seal, a spacer / cone element with spring retaining ring and a compression nut and ring. The glands are available with Metric (M16 to M75) or NPT (½" to 3") entry threads.

The 'Ex corrosion guard' range of cable glands for armoured cables each comprising of a brass body, a front seal, an armour cone, an armour compression element, a rear seal and a seal compression nut. They have a moulded oversleeve guard, which is interposed between the armour element and rear compression nut. The glands are available with Metric (M16 to M75) entry threads.

The glands are marked with the certification information by means of stamping. The full ranges of cable glands are shown in the following schedule.

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Ex 03.3844X

Addendum to Certificate No.....

Certified Equipment continued:

Schedule

E1EX Metric Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread		Inner sheath diameter (mm)		Outer Sheath Diameter (mm)		Armouring Wire Diameter (mm)	
	Diameter	Length (mm)	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
00-16ss	M16 x 1.5	17.0	3.0	8.0	8.0	13.5	0.2	1.25
00-20ss	M20 x 1.5	17.0	3.0	8.0	8.0	13.5	0.2	1.25
0-20s	M20 x 1.5	17.0	8.0	12.0	11.5	16.0	0.2	1.25
1-20	M20 x 1.5	17.0	11.0	15.5	14.5	21.0	0.2	1.25
2-25	M25 x 1.5	17.5	15.0	20.5	20.5	27.0	0.2	1.6
3-32	M32 x 1.5	17.0	20.0	26.5	26.5	33.5	0.2	2.0
4-40	M40 x 1.5	21.5	26.0	34.5	33.0	43.0	0.3	2.0
5-50	M50 x 1.5	22.0	34.0	44.5	42.5	52.5	0.4	2.5
6-63	M63 x 1.5	22.0	44.0	57.0	52.5	65.5	0.4	2.5
7-75	M75 x 1.5	22.0	56.0	68.0	65.5	78.0	0.4	3.0

E1EX NPT Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread			Inner sheath diameter (mm)		Outer Sheath Diameter (mm)		Armouring Wire Diameter (mm)	
	Diameter		Length (mm)	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
00-20ss	½	:14 TPI	20	3.0	8.0	8.0	13.5	0.2	1.25
0-20s	½	:14 TPI	20	8.0	12.0	11.5	16.0	0.2	1.25
1-20	½ / ¾	:14 TPI	20/21	11.0	15.5	14.5	21.0	0.2	1.25
2-25	¾ / 1	:14 / 11.5 TPI	21/25	15.0	20.5	20.5	27.0	0.2	1.6
3-32	1 / 1 ¼	:11.5 TPI	25/26	20.0	26.5	26.5	33.5	0.2	2.0
4-40	1 ¼ / 1 ½	:11.5 TPI	26/26	26.0	34.5	33.0	43.0	0.3	2.0
5-50	1 ½ / 2	:11.5 TPI	26/27	34.0	44.5	42.5	52.5	0.4	2.5
6-63	2 / 2 ½	:11.5 / 8 TPI	27/40	44.0	57.0	52.0	65.5	0.4	2.5
7-75	2 ½ / 3	:8 TPI	40/42	56.0	68.0	65.0	78.0	0.4	3.0

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EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 03.3844X
Addendum to Certificate No.....

Certified Equipment continued:

EX Corrosion Guard Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread		Inner sheath diameter (mm)		Outer Sheath Diameter (mm)		Armouring Wire Diameter (mm)	
	Diameter	Length (mm)	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
00-16ss	M16 x 1.5	15	3.0	8.0	8.0	13.5	0.2	1.25
00-20ss	M20 x 1.5	15	3.0	8.0	8.0	13.5	0.2	1.25
0-20s	M20 x 1.5	15	8.0	12.0	11.5	16.0	0.2	1.25
1-20	M20 x 1.5	15	11.0	15.5	14.5	21.0	0.2	1.25
2-25	M25 x 1.5	15	15.0	20.5	20.5	27.0	0.2	1.6
3-32	M32 x 1.5	15	20.0	26.5	26.5	33.5	0.2	2.0
4-40	M40 x 1.5	20.0	26.0	32.5	33.0	43.0	0.4	2.5
5-50	M50 x 1.5	20.0	32.0	44.5	42.5	52.5	0.4	2.5
6-63	M63 x 1.5	20.0	44.0	57.0	52.5	65.5	0.4	2.5
7-75	M75 x 1.5	20.0	56.0	68.0	65.5	78.0	0.4	3.0

DIEX Metric Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread		Inner sheath diameter (mm)		Outer Sheath Diameter (mm)	Armouring Wire Diameter (mm)	
	Diameter	Length (mm)	*Min*	*Max*	*Max*	*Max*	
00-16ss	M16 x 1.5	17.0	3.0	8.0	13.5	0.2	1.25
00-20ss	M20 x 1.5	17.0	3.0	8.0	13.5	0.2	1.25
0-20s	M20 x 1.5	17.0	8.0	12.0	16.0	0.2	1.25
1-20	M20 x 1.5	17.0	11.0	15.5	21.0	0.2	1.25
2-25	M25 x 1.5	17.5	15.0	20.5	27.0	0.2	1.6
3-32	M32 x 1.5	17.0	20.0	26.5	33.5	0.2	2.0
4-40	M40 x 1.5	21.5	26.0	34.5	43.0	0.3	2.0
5-50	M50 x 1.5	22.0	34.0	44.5	52.5	0.4	2.5
6-63	M63 x 1.5	22.0	44.0	57.0	65.5	0.4	2.5
7-75	M75 x 1.5	22.0	56.0	68.0	78.0	0.4	3.0

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Addendum to Certificate No. Ex 03.3844X

Certified Equipment continued:

D1EX NPT Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread			Inner sheath diameter (mm)		Armouring Wire Diameter (mm)	
	Diameter		Length (mm)	Min	Max	Min	
00-20ss	½	:14 TPI	20	3.0	8.0	0.2	1.25
0-20s	½	:14 TPI	20	8.0	12.0	0.2	1.25
1-20	½ / ¾	:14 TPI	20/21	11.0	15.5	0.2	1.25
2-25	¾ / 1	:14 / 11.5 TPI	21/25	15.0	20.5	0.2	1.6
3-32	1 / 1 ¼	:11.5 TPI	25/26	20.0	26.5	0.2	2.0
4-40	1 ¼ / 1 ½	:11.5 TPI	26/26	26.0	34.5	0.3	2.0
5-50	1 ½ / 2	:11.5 TPI	26/27	34.0	44.5	0.4	2.5
6-63	2 / 2 ½	:11.5 / 8 TPI	27/40	44.0	57.0	0.4	2.5
7-75	2 ½ / 3	:8 TPI	40/42	56.0	68.0	0.4	3.0

A2EX Metric Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread		Inner sheath diameter (mm)	
	Diameter	Length (mm)	Min	Max
00-16ss	M16 x 1.5	17.0	3.0	8.0
00-20ss	M20 x 1.5	17.0	3.0	8.0
0-20s	M20 x 1.5	17.0	8.0	12.0
1-20	M20 x 1.5	17.0	11.0	15.5
2-25	M25 x 1.5	17.5	15.0	20.5
3-32	M32 x 1.5	17.0	20.0	26.5
4-40	M40 x 1.5	21.5	26.0	34.5
5-50	M50 x 1.5	22.0	34.0	44.5
6-63	M63 x 1.5	22.0	44.0	57.0
7-75	M75 x 1.5	22.0	56.0	68.0

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EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

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Addendum to Certificate No. Ex 03.3844X

Certified Equipment continued:

A2EX NPT Range (Ex de IIC / DIP)

Gland Size Ref	Entry Thread		Inner sheath diameter (mm)	
	Diameter	Length (mm)	*Min*	*Max*
00-20ss	½ :14 TPI	20	3.0	8.0
0-20s	¼ :14 TPI	20	8.0	12.0
1-20	½ / ¾ :14 TPI	20/21	11.0	15.5
2-25	¾ / 1 :14 / 11.5 TPI	21/25	15.0	20.5
3-32	1 / 1 ¼ :11.5 TPI	25/26	20.0	26.5
4-40	1 ¼ / 1 ½ :11.5 TPI	26.0	26.0	34.5
5-50	1 ½ / 2 :11.5 TPI	26/27	34.0	44.5
6-63	2 / 2 ½ :11.5 / 8 TPI	27/40	44.0	57.0
7-75	2 ½ / 3 :8 TPI	40/42	56.0	68.0

Conditions of Certification:

1. It is a condition of safe use that the cable gland sizes 00, 0, 1, 2, 3, 4, 5 and 6 are not permitted for installation with Ex d IIC apparatus that have a volume in excess of 2000 cm^3.

2. It is a condition of safe use that the cable glands are not permitted to be installed outside of the temperature range -20 °C to 80 °C.

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Ex 03.3844X
Addendum to Certificate No.....

Drawing Schedule

Drawing No	Drawing Title	Issue	Date
054700-SG	NO 0 EXCG SEALING GASKET	1	Nov 2002
054701-SG	NO 1 EXCG SEALING GASKET	1	Nov 2002
054702-SG	NO 2 EXCG SEALING GASKET	1	Nov 2002
054703-SG	NO 3 EXCG SEALING GASKET	1	Nov 2002
054704-SG	NO 4 EXCG SEALING GASKET	1	Nov 2002
054705-SG	NO 5 EXCG SEALING GASKET	1	Nov 2002
054706-SG	NO 6 EXCG SEALING GASKET	1	Nov 2002
054707-SG	NO 7 EXCG SEALING GASKET	1	Nov 2002
E.00.00.48.000/B	EX CORROSION GUARD Exde	6	May 2003
E.00.0048.000/A	EXCG Exde Cable Gland	6	Apr 2003
E.00.00.48.000/Body-Ass	EXCG BODY COMPONENTS	3	Jun 2003
E.00.00.48.000-OS	EXCG OUTER SEAL	Original	June 2003
054707-SR	7 EXCG SKID RING	1	Feb 2003
054706-SR	6 EXCG SKID RING	1	Feb 2003
054705-SR	5 EXCG SKID RING	1	Feb 2003
054702-SR	4 EXCG SKID RING	1	Feb 2003
054703-SR	3 EXCG SKID RING	1	Feb 2003
054702-SR	2 EXCG SKID RING	1	Feb 2003
054701-SR	1 EXCG SKID RING	1	Feb 2003
0547-0-SR	0 EXCG SKID RING	1	Feb 2003
E.00.00.26.000/A	E1EX Exde CABLE GLAND	5	Apr 2003
E.00.00.26.000/B	E1EX Exde CABLE GLAND	5	Jun 2003
E.00.00.26.000/C	E1EX Exde CABLE GLAND – NPT	5	May 2003
E.00.00.26.000./D	E1EX EExde CABLE GLAND – NPT	5	Jun 2003
052300-OS	00 E1EX OUTER SEAL	2	Jun 2003
0523-0-OS	0 E1EX OUTER SEAL	2	Jun 2003
052301-OS	1 E1EX OUTER SEAL	1	Jun 2003
052302-OS	2 E1EX OUTER SEAL	1	Jun 2003
052303-OS	3 E1EX OUTER SEAL	2	Jun 2003
052304-OS	4 E1EX OUTER SEAL	1	Jun 2003

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Ex 03.3844X
Addendum to Certificate No.....

Drawing Schedule continued

Drawing No	Drawing Title	Issue	Date
052305-OS	5 E1EX OUTER SEAL	1	Jun 2003
052306-OS	6 E1EX OUTER SEAL	2	Jun 2003
052307-OS	7 E1EX OUTER SEAL	1	Jun 2003
052300-I-16	E1EX INNER NO 00 A2EX INNER NO 00 D1EX INNER NO 00 EXCG INNER NO 00	Original	Jun 2003
052300-I	E1EX INNER NO 00 A2EX INNER NO 00 D1EX INNER NO 00 EXCG INNER NO 00	3	Jun 2003
052300-I-½" NPTx1.81	E1EX INNER NO 00 A2EX INNER NO 00 D1EX INNER NO 00	1	Jun 2003
0523-0-I	E1EX INNER NO 00 A2EX INNER NO 00 D1EX INNER NO 00 EXCG INNER NO 00	3	Jun 2003
0523-0-I-½" NPTx1.81	E1EX INNER NO 00 A2EX INNER NO 00 D1EX INNER NO 00	1	Jun 2003
052301-I	E1EX INNER NO 1 A2EX INNER NO 1 D1EX INNER NO 1 EXCG INNER NO 1	4	Jun 2003
052301-I-½" NPTx1.81	E1EX INNER NO 1 A2EX INNER NO 1 D1EX INNER NO 1	1	Jun 2003
052301-I-¾"NPTx1.81	E1EX INNER NO 1 A2EX INNER NO 1 D1EX INNER NO 1	1	Jun 2003
052302-I	E1EX INNER NO 2 A2EX INNER NO 2 D1EX INNER NO 2 EXCG INNTER NO 2	5	Jun 2003

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Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No	Drawing Title	Issue	Date
052302-I-¾NPT	E1EX INNER NO 2 A2EX INNER NO 2 D1EX INNER NO 2	1	Jun 2003
052302-I-1" NPT	E1EX INNER NO 2 A2EX INNER NO 2 D1EX INNER NO 2	1	Jun 2003
052303-I	E1EX INNER NO 3 A2EX INNER NO 3 D1EX INNER NO 3 EXCG INNER NO 3	3	Jun 2003
052303-I-1" NPT	E1EX INNER NO 3 A2EX INNER NO 3 D1EX INNER NO 3	1	Jun 2003
052303-I-1¼" NPT	E1EX INNER NO 3 A2EX INNER NO 3 D1EX INNER NO 3	1	Jun 2003
052304-I	E1EX INNER NO 4 A2EX INNER NO 4 D1EX INNER NO 4 EXCG INNER NO 4	3	Jun 2003
052304-I-1¼" NPT	E1EX INNER NO 4 A2EX INNER NO 4 D1EX INNER NO 4	2	Jun 2003
052304-I-1½" NPT	E1EX INNER NO 4 A2EX INNER NO 4 D1EX INNER NO 4	1	Jun 2003
052305-I	E1EX INNER NO 5 A2EX INNER NO 5 D1EX INNER NO 5 EXCG INNER NO 5	3	Jun 2003
052305-I-1½NPT	E1EX INNER NO 5 A2EX INNER NO 5 D1EX INNER NO 5	1	Jun 2003
052305-I-2" NPT	E1EX INNER NO 5 A2EX INNER NO 5 D1EX INNER NO 5	1	Jun 2003

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Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No.	Drawing Title	Issue	Date
052306-I	E1EX INNER NO 6 A2EX INNER NO 6 D1EX INNER NO 6 EXCG INNER NO 6	3	Jun 2003
052306-I-2" NPT	E1EX INNER NO 6 A2EX INNER NO 6 D1EX INNER NO 6	1	Jun 2003
052306-I-2½" NPT	E1EX INNER NO 6 A2EX INNER NO 6 D1EX INNER NO 6	1	June 2003
052307-I	E1EX INNER NO 7 A2EX INNER NO 7 D1EX INNER NO 7 EXCG INNER NO 7	3	Jun 2003
052307-I-2½" NPT	E1EX INNER NO 7 A2EX INNER NO 7 D1EX INNER NO 7	1	Jun 2003
052307-I-3" NPT	E1EX INNER NO 7 A2EX INNER NO 7 D1EX INNER NO 7	1	Jun 2003
052300-B	00 E1EX BODY 00 EXCG BODY	2	Jun 2003
0523-0-B	0 E1EX BODY 0 EXCG BODY	2	Jun 2003
052301-B	1 E1EX BODY 1 EXCG BODY	3	Jun 2003
052302-B	2 E1EX BODY 2 EXCG BODY	2	Jun 2003
052303-B	3 E1EX BODY 3 EXCG BODY	3	Jun 2003
052304-B	4 E1EX BODY 4 EXCG BODY	2	Jun 2003
052305-B	5 E1EX BODY 5 EXCG BODY	3	Jun 2003

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

Phone: (02) 4724 4900 Fax: (02) 4724 4999

JAS-ANZ

Accreditation by the Joint Accreditation System of Australia and New Zealand, Acc No. 2223100AS

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No	Drawing Title	Issue	Date
052306-B	6 E1EX BODY 6 EXCG BODY	3	Jun 2003
052307-B	7 E1EX BODY 7 EXCG BODY	3	Jun 2003
052300-CR	00 E1EX CONE RING 00 D1EX CONE RING 00 EXCG CONE RING	1	Feb 2003
0523-0-CR	0 E1EX CONE RING 0 D1EX CONE RING 0 EXCG CONE RING	2	May 2003
052301-CR	1 E1EX CONE RING 1 D1EX CONE RING 1 EXCG CONE RING	1	Feb 2003
052302-CR	2 E1EX CONE RING 2 D1EX CONE RING 2 EXCG CONE RING	1	Feb 2003
052303-CR	3 E1EX CONE RING 3 D1EX CONE RING 3 EXCG CONE RING	1	Feb 2003
052304-CR	4 E1EX CONE RING 4 D1EX CONE RING 4 EXCG CONE RING	1	Feb 2003
052305-CR	5 E1EX CONE RING 5 D1EX CONE RING 5 EXCG CONE RING	2	Feb 2003
052306-CR	6 E1EX CONE RING 6 D1EX CONE RING 6 EXCG CONE RING	1	Feb 2003
052307-CR	7 E1EX CONE RING 7 D1EX CONE RING 7 EXCG CONE RING	1	Feb 2003
052300-C	00 E1EX CONE 00 D1EX CONE 00 EXCG CONE	1	Feb 2003

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Administered by Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No	Drawing Title	Issue	Date
052301-C	1 E1EX CONE	1	Feb 2003
	1 D1EX CONE		
	1 EXCG CONE		
052302-C	2 E1EX CONE	3	Feb 2003
	2 D1EX CONE		
	2 EXCG CONE		
052303-C	3 E1EX CONE	2	Feb 2003
	3 D1EX CONE		
	3 EXCG CONE		
052304-C	4 E1EX CONE	1	Feb 2003
	4 D1EX CONE		
	4 EXCG CONE		
052305-C	5 E1EX CONE	1	Feb 2003
	5 D1EX CONE		
	5 EXCG CONE		
052306-C	6 E1EX CONE	1	Feb 2003
	6 D1EX CONE		
	6 EXCG CONE		
052307-C	7 E1EX CONE	2	Feb 2003
	7 D1EX CONE		
	7 EXCG CONE		
052300-O	00 E1EX OUTER NUT	4	Jun 2003
0523-0-O	0 E1EX OUTER NUT	1	Jun 2003
052301-O	1 E1EX OUTER NUT	1	Jun 2003
052302-O	2 E1EX OUTER NUT	1	Jun 2003
052303-O	3 E1EX OUTER NUT	1	Jun 2003
052304-O	4 E1EX OUTER NUT	1	Jun 2003
052305-O	5 E1EX OUTER NUT	1	Jun 2003
052306-O	6 E1EX OUTER NUT	2	Jun 2003
052307-O	7 E1EX OUTER NUT	1	Jun 2003
052300-IS	00 A2EX INNER SEAL	2	Feb 2003
	00 E1EX INNER SEAL		
	00 D1EX INNER SEAL		
	00 EXCG INNER SEAL		

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Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

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STANDARDS AUSTRALIA

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Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No.	Drawing Title	Issue	Date
0523-0-IS	0 A2EX INNER SEAL 0 E1EX INNER SEAL 0 D1EX INNER SEAL 0 EXCG INNER SEAL	2	Feb 2003
052301-IS	1 A2EX INNER SEAL 1 E1EX INNER SEAL 1 D1EX INNER SEAL 1 EXCG INNER SEAL	3	Feb 2003
052302-IS	2 A2EX INNER SEAL 2 E1EX INNER SEAL 2 D1EX INNER SEAL 2 EXCG INNER SEAL	3	Feb 2003
052303-IS	3 A2EX INNER SEAL 3 E1EX INNER SEAL 3 D1EX INNER SEAL 3 EXCG INNER SEAL	2	Apr 2003
052304-IS	4 A2EX INNER SEAL 4 E1EX INNER SEAL 4 D1EX INNER SEAL 4 EXCG INNER SEAL	2	Feb 2003
052305-IS	5 A2EX INNER SEAL 5 E1EX INNER SEAL 5 D1EX INNER SEAL 5 EXCG INNER SEAL	2	Feb 2003
052306-IS	6 A2EX INNER SEAL 6 E1EX INNER SEAL 6 D1EX INNER SEAL 6 EXCG INNER SEAL	2	Feb 2003
052307-IS	7 A2EX INNER SEAL 7 E1EX INNER SEAL 7 D1EX INNER SEAL 7 EXCG INNER SEAL	3	Jun 2003
05230-0-SR	00 E1EX SKID RING	1	Apr 2003
05230-SR	0 E1EX SKID RING	1	Apr 2003
052301-SR	1 E1EX SKID RING	1	Apr 2003
052302-SR	2 E1EX SKID RING	1	Apr 2003

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Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 03.3844X

Drawing Schedule continued:

Drawing No	Drawing Title	Issue	Date
052303-SR	3 E1EX SKID RING	1	Apr 2003
052304-SR	4 E1EX SKID RING	1	Apr 2003
052305-SR	5 E1EX SKID RING	1	Apr 2003
052306-SR	6 E1EX SKID RING	1	Apr 2003
052307-SR	7 E1EX SKID RING	1	Apr 2003
E.00.00.27.000/A	D1EX Exde CABLE GLAND	5	Apr 2003
E.00.00.27.000/B	D1EX Exde CABLE GLAND	5	Jun 2003
E.00.00.27.000/C	D1EX Exde CABLE GLAND – NPT	4	7/10/2002
E.00.00.27.000/D	D1EX EExde CABLE GLAND – NPT	5	Jun 2003
051900-O	00 D1EX OUTER	1	Jun 2003
0519-0-O	0 D1EX OUTER	1	Jun 2003
051901-O	1 D1EX OUTER	1	Jun 2003
051902-O	2 D1EX OUTER	2	Jun 2003
051903-O	3 D1EX OUTER	2	Jun 2003
051904-O	4 D1EX OUTER	1	Jul 2002
051905-O	5 D1EX OUTER	2	Jun 2003
051906-O	6 D1EX OUTER	2	Jun 2003
051907-O	7 D1EX OUTER	2	Jun 2003
E.00.00.25.000/A	A2EX Exde CABLE GLAND	5	Apr 2003
E.00.00.25.000/B	A2EX Exde CABLE GLAND	5	Jun 2003
E.00.00.25.000/C	A2EX Exde CABLE GLAND – NPT	4	27/9/02
E.00.00.25.000/D	A2EX Exde CABLE GLAND – NPT	3	Jun 2003
053700-SR	00 A2EX SKID RING	Original	Jun 2003
053700-SR	0 A2EX SKID RING	Original	Jun 2003
053701-SR	1 A2EX SKID RING	Original	Jun 2003
053702-SR	2 A2EX SKID RING	Original	Jun 2003
053703-SR	3 A2EX SKID RING	Original	Jun 2003
053704-SR	4 A2EX SKID RING	Original	Jun 2003
053705-SR	5 A2EX SKID RING	Original	Jun 2003
053706-SR	6 A2EX SKID RING	Original	Jun 2003
053707-SR	7 A2EX SKID RING	Original	Jun 2003
053600-C	00 A2EX CONE	1	Jun 2003
05360-C	0 A2EX CONE	1	Oct 2002
05361-C	NO 1 A2EX CONE	1	Jun 2003
05362-C	NO 2 A2EX CONE		

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Test Safe AUSTRALIA

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Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 03.3844X

Addendum to Certificate No.....

Drawing Schedule continued:

Drawing No	Drawing Title	Issue	Date
05363-C	NO 3 A2EX CONE	1	Jun 2003
05364-C	No.4 A2EX CONE	Original	Jun 2003
05365-C	NO 5 A2EX CONE	Original	Jun 2003
05366-C	NO 6 A2EX CONE	Original	Jun 2003
05367-C	NO 7 A2EX CONE	Original	Jun 2003
053700-0-GS	00 A2EX GRIPPER SEAL	Original	Jun 2003
053700-GS	0 A2EX GRIPPER SEAL	Original	Jun 2003
053701-GS	1 A2EX GRIPPER SEAL	Original	Jun 2003
053702-GS	2 A2EX GRIPPER SEAL	Original	Jun 2003
053703-GS	3 A2EX GRIPPER SEAL	Original	Jun 2003
053704-GS	4 A2EX GRIPPER SEAL	Original	Jun 2003
053705-GS	5 A2EX GRIPPER SEAL	Original	Jun 2003
053706-GS	6 A2EX GRIPPER SEAL	Original	Jun 2003
053707-GS	7 A2EX GRIPPER SEAL	Original	Jun 2003
053700-O	00 A2EX OUTER	3	Jun 2003
053700-O	0 A2EX OUTER	1	Jun 2003
053701-O	1 A2EX OUTER	2	Jun 2003
053702-O	2 A2EX OUTER	2	Jun 2003
053703-O	3 A2EX OUTER	1	Jun 2003
053704-O	4 A2EX OUTER	1	Jun 2003
053705-O	5 A2EX OUTER	1	Jun 2003
053706-O	6 A2EX OUTER	1	Jun 2003
053707-O	7 A2EX OUTER	1	Jun 2003
051900-03W	A2EX WASHER 00-07 D1EX WASHER 00-07 E1EX WASHER 00-07	2	Jun 2003
100302	Gland Marking	2	Apr 2003

Issued by:

Test Safe AUSTRALIA

919 Londonderry Road Londonderry NSW 2753

Phone: (02) 4724 4900 *Fax: (02) 4724 4999*

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STANDARDS AUSTRALIA

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BAS 06.0013X issue No.:2

Status: **Current**

Date of Issue: **2007-04-26** Page 1 of 4

Certificate history:
Issue No. 5 (2011-6-21)
Issue No. 4 (2009-9-17)
Issue No. 3 (2008-10-1)
Issue No. 2 (2007-4-26)

Applicant: **Hawke International**
A Division of Hubbell Ltd.
A member of the Hubbell Group of Companies
Oxford Street West, Ashton-under-Lyne
Lancashire, OL7 0NA
United Kingdom

Electrical Apparatus: **A Range of Compression Type Cable Glands,**
Optional accessory:

Type of Protection: **Ex d, Ex e, Ex tD**

Marking: **Ex d IIC Ex e II Ex tD A21 IP66**
(- 60°C ≤ ta ≤ + 80°C [or +100°C see Special Conditions])

Approved for issue on behalf of the IECEx Certification Body: R S Sinclair

Position: Managing Director

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Baseefa (2001) Ltd.
Rockhead Business Park
Staden Lane
Buxton
Derbyshire
SK17 9RZ
United Kingdom

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0013X

Date of Issue: **2007-04-26** Issue No.: **2**

Page 2 of 4

Manufacturer: **Hawke International**
A Division of Hubbell Ltd.
A member of the Hubbell Group of Companies
Oxford Street West
Ashton-under-Lyne
Lancashire
OL7 0NA
United Kingdom

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-7 : 2001 Edition: 3	Electrical apparatus for explosive gas atmospheres - Part 7: Increased safety 'e'

Edition: 1 enclosures "D"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/BAS/ExTR06.0011/00

Quality Assessment Report:

GB/BAS/QAR06.0061/00

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0013X

Date of Issue: **2007-04-26** Issue No.: **2**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

A range of compression type cable glands manufactured in brass, stainless steel or aluminium. The glands may be supplied with metric or specified non-metric equivalent thread forms. These glands are intended for use with effectively filled circular cables. The cable type and/or cable protection/retention method is specific to each gland type designation – see annex for detail.

CONDITIONS OF CERTIFICATION: YES as shown below:

These glands are suitable for use within an operating temperature range of -60°C to +80°C, or +100°C for the gland types not using the iris type outer seal assembly.
When the gland is used for increased safety or dust protection, the entry thread shall be suitably sealed in accordance with IEC 60079-14 to maintain the ingress protection rating of the associated enclosure
Glands for use with conduit, unarmoured or braided cables are only suitable for fixed installations, the cable for which must be effectively clamped to prevent pulling and twisting.

IECEx Certificate of Conformity

Certificate No.: IECEx BAS 06.0013X

Date of Issue: **2007-04-26** Issue No.: **2**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Variation 1.1

To allow the use of an alternative entry component and rear compression nut on the Type 501/421 Cable Gland intended for use with an effectively filled and circular unarmoured cable and comprises the following components:

a. An alternative entry component, in the size range Os to F (M16 to M75)

The alternative rear compression nut can be readily interchanged with the existing certified components.

Variation 1.2

To allow the use of an alternative entry component, body nut and rear compression nut on the Type 501/423 Cable Gland intended for use with an effectively filled and circular unarmoured cable and comprises the following components:-

a. An alternative entry component, in the size range Os to F (M16 to M75)
b. Two compressible sealing rings
c. Two compression spigots
d. An alternative body nut in size range Os to F
e. An alternative rear compression nut in size range Os to F
f. An optional earth continuity device for use with metallic sheathed cables

The alternative body nut and rear compression nut can be readily interchanged with the existing certified components.

Variation 1.3

To allow the use of an alternative entry component, and alternative compression spigot (body) and integral rear compression nut on the Type 501/414 Conduit Stopping Gland intended for use with an effectively filled and circular unarmoured cable enclosed within a conduit and comprises the following components:

a. An alternative entry component, in the size range O to F (M16 to M75)
b. A compressible sealing ring
c. An alternative compression assembly comprising a compression spigot with a female thread at the rear (body) and integral alternative rear compression nut.

The alternative compression spigot and integral rear compression nut can be readily interchanged with the existing certified components

Variation 1.4

To allow the use of an alternative entry component, an alternative compression spigot and integral rear compression nut on the Type SB474 Conduit Stopping Gland intended for use with a number of circular conductors enclosed within a conduit and comprises the following components:

a. An alternative entry component, in the size range A to C (M20 to M32)
b. A compressible seal, punched to accept a number of individual conductors
c. An alternative compression assembly comprising a compression spigot with a female thread at the rear (body) and integral back nut

Annexe: IECEx BAS 06.0013x.pdf

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIM 10.0003X issue No.:0

Certificate history:
Issue No. 1 (2010-7-16)
Issue No. 0 (2010-4-21)

Status: **Current**

Date of Issue: **2010-04-21** Page 1 of 4

Applicant: **Govan Industries Pty Ltd**
131-149 Link Drive
CAMPBELLFIELD VIC 3061
Australia

Electrical Apparatus: **DSM & DST Range of Stopping Plugs**
Optional accessory:

Type of Protection: **e, tD**

Marking: **Ex e II T6 IP66**
Ex tD A21 IP66
-20 °C ≤ Ta ≤ +65 °C

Approved for issue on behalf of the IECEx Certification Body: Ashraf Chowdhury

Position: Principal Engineer

Signature:
(for printed version) _____

Date: _____

1. This certificate and schedule may only be reproduced in full.
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3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Safety in Mines Testing and Research Station (Simtars)
2 Smith Street
REDBANK QLD 4301
Australia

Simtars Queensland Government

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 10.0003X

Date of Issue: **2010-04-21** Issue No.: **0**

Page 2 of 4

Manufacturer: **Govan Industries Pty Ltd**
131-149 Link Drive
CAMPBELLFIELD VIC 3061
Australia

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
IEC 61241-0 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
AU/SIM/ExTR10.0003/00

Quality Assessment Report:

AU/TSA/QAR06.0004/03

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 10.0003X

Date of Issue: **2010-04-21** Issue No.: **0**

Page 3 of 4

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The DSM & DST range of Stopping Plugs are available in aluminium alloy (2011), 316L or 304 stainless steel, brass alloy 385 with optional Nickel plating and Nylon 6 for use in threaded entries or in plain holes with backnut. A BUNA N' rubber O-ring provides sealing to degree of protection IP66. Table 1 of the Annex lists the models covered by this certificate.

CONDITIONS OF CERTIFICATION: YES as shown below:

Nylon 6 stopping plugs of size larger than M32 or 1" NPT, can only be fitted to fixed equipment and an antistatic warning provided in accordance with manufacturers instruction.

The equipment has been assessed for use in the special ambient range of -20°C ≤ Ta ≤ +65°C.

IECEx Certificate of Conformity

Certificate No.: IECEx SIM 10.0003X

Date of Issue: **2010-04-21** Issue No.: **0**

Page 4 of 4

Additional information:

The following limitations apply when fitting the DSM & DST stopping plugs to separately certified Ex e or Ex tD apparatus:

• Maximum service temperature of the plugs of Nylon 6 material is limited to 65 ºC.

• Maximum service temperature of the BUNA N' rubber O-ring is limited to 120 ºC.

• When plugging plain holes in enclosures, a locknut must be fitted in accordance with manufacturers instructions.

• Clearance hole diameter of a plain hole must not be greater than 1 mm of the plug diameter.

• In order to avoid potential ignition due to electrostatic discharge, the Nylon 6 stopping plugs of size larger than M32 or 1" NPT, can only be wiped with a damp cloth.

Annexe: IECEx SIM 10.0003X-0 Annex.pdf

EXPLOSION PROTECTED
ELECTRICAL EQUIPMENT

Certificate No **Ex 1424X**

Certificate of Compliance

This certificate is issued for the electrical equipment:

Range of Cable Glands

Submitted for certification by: **Crouse-Hinds Australia Pty Ltd**
391 Park Road
REGENTS PARK NSW 2143

and manufactured by: **Crouse-Hinds Australia Pty Ltd**

This electrical equipment and any acceptable variation thereto is specified in the Schedule or Schedules attached hereto and in the documents referred to therein.

This certifies that the equipment described has been found to comply with AS 2380.1-1989, AS 2380.2-1991 including amendment 1, AS 1939-1990 and AS 1828-1984 including amendment 1.

TYPE OF PROTECTION: Ex d IIC IP66/IP67 Class I Zone 1

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP42 and any additional conditions as may be prescribed by Standards Australia.

Test Report No: Redbank NE92/0133

File: P/3: 92027.M170

Date of Issue: 24 May 1993

Date of Expiry of Validity: 24 May 2003

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia
Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certificate of Compliance

SCHEDULE

Description of Equipment:

The Range of Cable Glands covered by this certificate is shown in Schedule 1.

Drawings:

101-GA001 Sheet 1	Revision 3	19 March 1993
101-GA001 Sheet 2	Revision 2	19 March 1993
101-GA002 Sheet 1	Revision 2	19 March 1993
101-GA002 Sheet 2	Revision 1	19 March 1993
101-GA003 Sheet 1	Revision 1	19 March 1993
101-GA003 Sheet 2	Revision 2	19 March 1993
102-GA001 Sheets 1,2	Revision 2	19 March 1993
102-GA002 Sheets 1	Revision 1	19 March 1993
102-GA002 Sheets 2	Revision 2	19 March 1993

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

QUALITY ASSURANCE SERVICES
Standards Australia

Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642

Certificate of Compliance

SCHEDULE 1

ENTRY TYPE	"TERMINATOR" GLANDS	
	SWA Barrier Cable Gland with Neoprene Outer Seal and Epoxy Compound Inner Seal	SWA Flameproof Cable Glands with Neoprene Inner Seal and Outer Seal
METRIC (ISO)-NPT-BSP OR PG ENTRY TYPES (Add M-N-B-P to the space in the Cat. No. description as necessary) Drawing Number 101-GA003 Sheet 1 of 2 Refers	TWAB1-16 TWAB1-20 TWAB2-27 TWAB3-34 TWAB4-40 TWAB5-53 TWAB6-66 TWAB7-78	
NPT ENTRY TYPES Drawing Number 101-GA002 Sheet 1 of 2 Refers for TWAB Glands Drawing Number 102-GA002 Sheet 1 of 2 Refers for TWAX Glands	TWAB1N16 TWAB1N20 TWAB2N27 TWAB3N34 TWAB4N40 TWAB5N53 TWAB5N66 TWAB7N78 ---- ---- ---- ---- ---- ---- ----	TWAX1N13 TWAX1N16 TWAX1N20 TWAX2N24 TWAX2N27 TWAX3N30 TWAX3N33 TWAX4N38 TWAX5N43 TWAX5N48 TWAX6N52 TWAX6N60 TWAX7N65 TWAX7N71 TWAX8N78

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

Certificate of Compliance

SCHEDULE 1 - (Cont'd)

ENTRY TYPE	"TERMINATOR" GLANDS	
	SWA Barrier Cable Gland with Neoprene Outer Seal and Epoxy Compound Inner Seal	SWA Flameproof Cable Glands with Neoprene Inner Seal and Outer Seal
METRIC (ISO) Drawing Number 101-GA001 Sheet 1 of 2 Refers for TWAB Glands	TWAB1M16 TWAB1M20 TWAB2M27 TWAB3M34 TWAB4M40 TWAB5M53 TWAB6M66	TWAX16M13 TWAX1M13 TWAX1M16 TWAX1M20 TWAX1M24 TWAX1M27 TWAX3M30
Drawing Number 102-GA001 Sheet 1 of 2 Refers for TWAX Glands	TWAB7M78 TWAB8M88 ---- ---- ---- ---- ---- ---- ----	TWAX3M33 TWAX4M38 TWAX5M43 TWAX5M48 TWAX5M52 TWAX6M60 TWAX6M65 TWAX7M71 TWAX7M78

Signed for and on behalf of Standards Australia

General Manager
Quality Assurance Services

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Certificate of Conformity

Certificate No.: Ex 1424

Issue 0: **24 May 1993** Original Issue
1: **18 January 1995. Extension to range.**

Date of expiry: **24 May 2003**

Certificate Holder: **Crouse-Hinds Australia Pty Ltd**
391 Park Road
REGENTS PARK NSW 2143

Electrical Equipment: **Series of TWAE, TWAB and TWAX Cable Glands**
(Refer to Schedule for List)

Type of Protection and Marking Code:

Ex d e IIC IP66/67	Class I Zone 1
DIP IP66/67	Class II
AUS Ex 1424	

Manufactured by: **Crouse-Hinds Australia Pty Ltd**

Issued by:

SIMTARS

Redbank Testing and Certification Centre
2 Smith Street, REDBANK, QLD 4301, Australia
Postal Address: PO Box 467, GOODNA, QLD 4300, Australia
Phone: (07) 810 6370 Fax: (617) 810 6363

NATA
Quality System Certified to AS3902/ISO9002 Registration No 6039

STANDARDS AUSTRALIA

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedures (Doc Q7134) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this certificate and the identified documents, was found to comply with the following standards:

AS 2380.1 - 1989	**Electrical equipment for explosive atmospheres - Explosion-protection techniques Part 1: General requirements**
AS 2380.6 - 1988	**Electrical equipment for explosive atmospheres - Explosion-protection techniques Part 6: Increased safety**
AS 2236 - 1994	**Electrical equipment for explosive atmospheres - Dust-excluding ignition-proof (DIP) enclosure**
AS 1939 - 1990	**Degrees of protection provided by enclosures for electrical equipment (IP Code)**

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No: **NE94/0053, NE94/0057**

File Reference: **30/001/0172 (P80044)**

Signed for and on behalf of issuing authority

Manager - Redbank Testing and Certification Centre

Position

18 January 1995

Date of issue

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This certificate is not transferable and remains the property of Standards Australia Quality Assurance Services and must be returned in the event of its being revoked or not renewed.

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Schedule

Equipment:

This certificate covers the full range of cable glands including the flameproof glands previously certified under original Certificate Aus Ex 1424X and are listed in Table 1 of this Schedule.

TABLE 1

TERMINATOR GLANDS	ENTRY TYPE				
	METRIC	NPT	BSP	PG	IMP
SWA BARRIER GLANDS OUTER SEAL AND E POXY COMPOUND. INNER SEAL. O-RING SEAL IN GLAND BODY OPTION	TWAB1M-16 TWAB1M-20 TWAB2M-27 TWAB3M-34 TWAB4M-40 TWAB5M-53 TWAB6M-66 TWAB7M-78	TWAB1N-16 TWAB1N-20 TWAB2N-27 TWAB3N-34 TWAB4N-40 TWAB5N-53 TWAB6N-66 TWAB7N-78	TWAB1B-16 TWAB1B-20 TWAB2B-27 TWAB3B-34 TWAB4B-40 TWAB5B-53 TWAB6B-66 TWAB7B-78	TWAB13.5P-16 TWAB13.5P-20 TWAB21P-27 TWAB29P-34 TWAB36P-40 TWAB42P-53	TWAB2I-16 TWAB2I-20 TWAB2I-27 TWAB3I-34 TWAB4I-40 TWAB5I-53 TWAB6I-66 TWAB7I-78
SWA FLAMEPROOF CABLE GLAND WITH INNER AND OUTER SEAL	TWAX16M13 TWAX1M13 TWAX1M16 TWAX1M20 TWAX2M24 TWAX2M27 TAWX3M30 TAWX3M33 TWAX4M38 TWAX5M43 TWAX5M48 TWAX5M52 TWAX6M60 TWAX6M65 TWAX7M71 TWAX7M78	TWAX1N13 TWAX1N16 TWAX1N20 TWAX2N24 TWAX2N27 TWAX3N30 TWAX3N33 TWAX4N38 TWAX5N43 TWAX5N48 TWAX6N52 TWAX6N60 TWAX7N65 TWAX7N71 TWAX8N78	TWAX1B13 TWAX1B16 TWAX1B20 TWAX2B24 TWAX2B27 TWAX3B30 TWAX3B33 TWAX4B38 TWAX5B43 TWAX5B48 TWAX6B52 TWAX6B60 TWAX7B65 TWAX7B71 TWAX8B78	TWAX13.5P13 TWAX13.5P16 RWAX16P16 TWAX21P24 TWAX21P27 TWAX21P30 TWAX29P33 TWAX36P38 TWAX42P43 TWAX42P48 TWAX42P52 -- -- -- --	TWAX1I13 TWAX1I16 TWAX2I20 TWAX2I24 TWAX2I27 TWAX3I30 TWAX3I33 TWAX4I38 TWAX5I43 TWAX5I48 TWAX6I52 TWAX6I60 TWAX7I65 TWAX7I71 TWAX8I78

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Addendum to Certificate No.....: Ex.1424

Issue: 1

Date of Issue: 18 January 1995

TABLE 1 (Continued)

TERMINATOR GLANDS	ENTRY TYPE				
	METRIC	NPT	BSP	PG	IMP
SWA EX e DIP CABLE GLANDS WITH OUTER SEALS. RETAINED 1.5m NYLON SEALING WASHER FOR METRIC ENTRIES. OPTION O-RING SEAL IN GLAND BODY.	TWAE 1M16 TWAE 1M20 TWAE 2M27 TWAE 3M34 TWAE 4M40 TWAE 5M53 TWAE 6M66 TWAE 7M78	TWAE 1N16 TWAE 1N20 TWAE 2N27 TWAE 3N34 TWAE 4N40 TWAE 5N53 TWAE 6N66 TWAE 7N78	TWAE 1B16 TWAE 1B20 TWAE 2B27 TWAE 3B34 TWAE 4B40 TWAE 5B53 TWAE 6B66 TWAE 7B78	TWAE 13.5 P16 TWAE 13.5 P20 TWAE 21 P27 TWAE 29 P34 TWAE 36 P40 TWAE 42 P53	TWAE 1I16 TWAE 1I20 TWAE 2I27 TWAE 3I34 TWAE 4I40 TWAE 5I53 TWAE 6I66 TWAE 7I78

The following drawings are included in the documentation for this Certificate of Conformity:

Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
103-GA003	CERTIFICATION DWG 'TERMINATOR' SWA EX e DIP CABLE GLANDS SHEET 1 OF 1	3	2-11-93
103-001	WEATHERPROOF GLAND BODY (METRIC) SHEET 1 OF 1	10	23.9.94
103-002	WEATHER PROOF N.P.T. GLAND BODY SHEET 1 OF 1	8	23.9.94

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
101-GA003	CERT. DWG "TERMINATOR" SWA BARRIER C/GLANDS WITH 'O' RING SEAL SHEET 1 OF 2	2	16-02-94
101-GA003	CERTIFICATION DWG "TERMINATOR" SWA BARRIER C/GLANDS FOR METRIC (I.S.O.) ENTRIES WITH 'O' RING SEAL SHEET 2 OF 2	4	25-05-94
102-GA001	CERTIFICATION DWG "TERMINATOR" SWA FLAMEPROOF C/GLANDS FOR METRIC (I.S.O.) ENTRIES WITH INNER AND OUTER SEAL SHEET 1 OF 2	3	16-02-94
102-GA001	CERTIFICATION DWG "TERMINATOR" SWA FLAMEPROOF C/GLANDS FOR METRIC (I.S.O.) ENTRIES WITH INNER SEAL AND OUTER SEAL SHEET 2 OF 2	4	25-05-94
102-GA002	CERTIFICATION DWG "TERMINATOR" SWA FLAMEPROOF C/GLANDS FOR N.P.T. ENTRIES WITH INNER SEAL AND OUTER SEAL SHEET 1 OF 2	2	16-02-94
102-GA002	CERTIFICATION DWG "TERMINATOR" SWA FLAMEPROOF C/GLANDS FOR N.P.T. ENTRIES WITH INNER SEAL AND OUTER SEAL SHEET 2 OF 2	4	25-05-94

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6 Equipment Datasheets and Electrical Drawings

Documentation in relation to this section is to be included and maintained by APA Group.

7 Calculations

Documentation in relation to this section is to be included and maintained by APA Group.

Calculations need to be confirmed for equipment installed in hazardous areas. These include heat dissipation calculation for Ex e and intrinsically safe barrier assessment for Ex i, which are relevant for the ADP sites.

This section contains sample calculation sheet for intrinsically safe barrier assessment and extracts from AS 2381.6-1993 and AS 2381.7-1989.

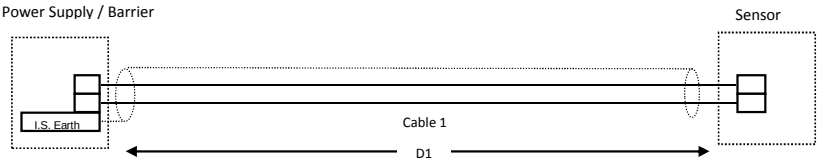
Intrinsically Safe Barrier Assessment Sheet

Document No:		**Prepared By:**	
Site:		**Checked:**	
Loop Description:		**QA:**	
		Approved:	
Loop Drawing Number:		**Date:**	

Hazardous Area:

H. A. Report:		**Area Class:**	
H. A. Drawing No.:		**Gas Group:**	
		Temperature Class:	

Cable Screens shall be connected to intrinsically safe earth at the Intrinsically Safe Barrier end.



I.S. Device details (Hazardous Area) [Note 2]

Tag:		**Max Voltage Um:**		V
Type of instrument:		**O/C Voltage Uo:**		V
Manufacturer:		**S/C Current Io:**		mA
Model Number:		**Power Po:**		mW
Serial No:		**Allowable Cap. Co:**		uF
Certificate Number:		**Allowable Ind. Lo:**		mH
Certifying Authority:		**L/Ro:**		uH/Ohm
Protection Type:				

Cables:

Cable 1:			**Cable 2:**			**Total Cable:**		
Tag:			**Tag:**					
Capacitance:		uF/m	**Capacitance:**		uF/m	**Capacitance:**		uF
Inductance:		mH/m	**Inductance:**		mH/m	**Inductance:**		mH
L/R_C:		mH/Ohm	**L/R_C:**		mH/Ohm	**Max L/Rc**		mH/Ohm
Length(D1):		m	**Length(D2):**		m			

I.S. Apparatus Parameters (Hazardous Area):

Tag:		**O/C Voltage Ui:**		V
Type of instrument:		**S/C Current Ii:**		mA
Manufacturer:		**Power Pi:**		mW
Model Number:		**Capacitance Ci:**		uF
Serial No:		**Inductance Li:**		mH
Certificate Number:				
Certifying Authority:				
Protection Type:				

Checks:

			PASS/FAIL/NA
1	Uo <= Ui	<=	
2	Io <= Ii	<=	
3	Po <= Pi	<=	
4	$Ci+C_{Cable}$ <= Co	<=	
6	$Li+L_{Cable}$ <= Lo	<=	
	OR		
7	L/R_{Cable} < L/Ro	<	

Conclusion: The circuit IS Loop Calculation

Notes:

1- Calculation is based on AS.NZS 2381.1:2005, AS2381.7-1989 & AS/NZS 60079.25:2004 for a single power supply loop in an intrinsically safe system.

2- The I.S. Barrier is an integral part of the discrete input wireless transmitter.

3- The above calculation, check and conclusion are also applicable to wireless transmitter LSL and LSLL level switch I.S. circuits used for pump 1161C/D, 1162C/D, 1163C/D and 1164C/D sealoil pots.

4- The level switch in this I.S. Circuit is classified as simple device.

APPENDIX A

DETERMINATION OF EXTERNAL CIRCUIT PARAMETERS FOR INTRINSICALLY SAFE SYSTEMS

(This Appendix forms an integral part of this Standard.)

A1 CERTIFICATION METHODS. As specified in Clause 1.4, intrinsically safe electrical equipment may be certified under one of three categories as follows:

(a) *Self-contained equipment.* Since this equipment has no external cabling, there are no external parameters to be specified, and hence, such equipment will not be considered further in this Appendix.
(b) *Entity concept equipment.*
(c) *Integrated systems.*

A2 PARAMETERS TO BE DEFINED.

A2.1 Entity concept equipment. For certified entity concept equipment the following parameters should be defined:

(a) *Associated electrical equipment.*
  (i) Maximum open circuit voltage (U_o).
  (ii) Maximum output current (I_o).
  (iii) Maximum external capacitance (C_o).
  (iv) Maximum external inductance (L_o).
  (v) Maximum external connected inductance to resistance ratio (L/R).
(b) *Intrinsically safe equipment.*
  (i) Maximum input voltage (U_i).
  (ii) Maximum input current (I_i).
  (iii) Maximum internal capacitance (C_i).
  (iv) Maximum internal inductance (L_i).

The parameters are marked on the equipment or specified in the accompanying documentation.

A2.2 Integrated systems. For integrated systems, either one of the following cable parameters should be defined:

(a) Maximum capacitance, inductance, and inductance to resistance ratio.
(b) Maximum cable lengths for defined cable types.

These parameters are specified in the system documentation or the certificate.

A3 INSTALLATION OF ENTITY CONCEPT EQUIPMENT. For entity concept equipment to be installed, the total of the cable parameters and those for the intrinsically safe equipment shall be less than those permitted to be connected to the associated electrical equipment, i.e.

(a) $C_i + C_{cable} < C_o$; and
(b) either $L_i + L_{cable} < L_o$, or $L/R_{cable} < L/R$.

Also, the voltage and current allowed for the intrinsically safe equipment shall be greater than those available from the associated electrical equipment, i.e. $U_i > U_o$; $I_i > I_o$.

Where shunt diode safety barriers are being used and their capacitance, inductance and L/R ratio parameters have not been specified in the documentation, the values specified in Table A1 may be used.

A4 INSTALLATION OF INTEGRATED SYSTEMS. For an integrated system to be installed correctly, the cable characteristics shall be below those specified in the system certification, i.e. the total cable capacitance and either the total lumped cable inductance or the L/R ratio must be less than those shown in the certificate or installation diagram. Cable characteristics may be obtained from the manufacturer or the values specified in Tables A2 and A3 may be used.

Alternatively, the following cable characteristics represent probable maximums:

(a) C = 0.11 μF/km.
(b) L = 0.8 mH/km.
(c) L/R = 56 μH/Ω.

If the parameters are only specified in the system certification for Group IIC they may be multiplied by 3 for Group IIB, by 8 for Group IIA, or by 10 for Group I installations.

Where the system documentation specifies cable types and corresponding lengths it is simply a matter of adhering to those specific requirements.

TABLE A1

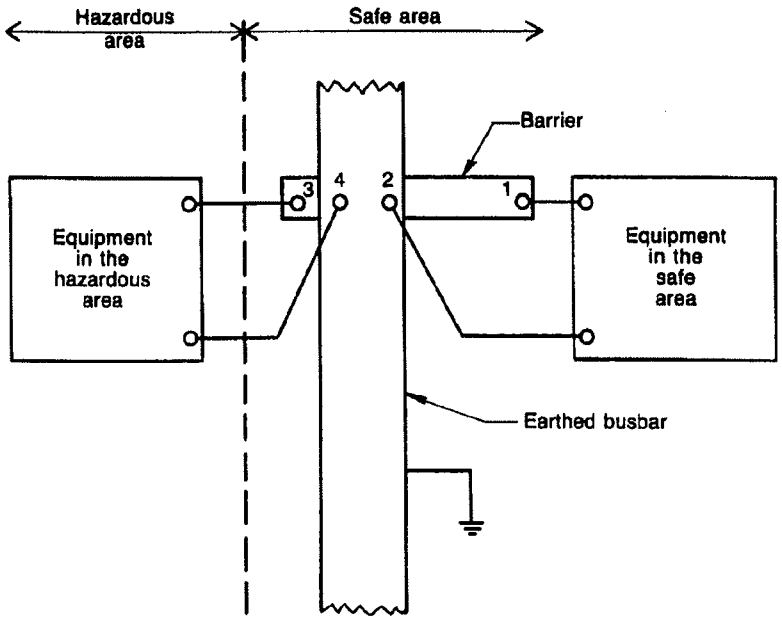
EXTERNAL PARAMETERS
MAXIMUM VALUES FOR GROUP IIC (HYDROGEN)*

Barrier type	Permissible configuration	Max. permissible capacitance μF	Max. permissible inductance mH	Max. permissible *L/R* ratio μH/Ω
27 V 270 Ω	Figure A1	0.15	3.7	55
22 V 150 Ω	Figure A1	0.2	1.5	40
15 V 100 Ω	Figure A1	0.8	1.5	60
	Figure A2	0.8	1.5	60
10 V 47 Ω	Figure A1	3.0	1.0	80
	Figure A2	3.0	1.0	80
	Figure A3	0.2	1.0	40
47 V 10 Ω	Figure A1	>1 000	0.16	100
	Figure A2	>1 000	0.16	100
	Figure A3	3.0	0.16	50
1 V 2 Ω	Figure A1	>1 000	0.16	320
	Figure A2	>1 000	0.16	320
	Figure A3	>1 000	0.16	160

* For most practical purposes, the value for gases of Group IIB are 3 times these values, and for gases of Group IIA are 8 times these values.

† The *L/R* ratio of the cable is defined as follows:

$$L/R \text{ ratio} = \frac{\text{Inductance per unit length } (\mu H)}{\text{Resistance per unit length } (\Omega)}$$



NOTE: Barrier can be either positive or negative.

FIGURE A1 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH SINGLE BARRIER

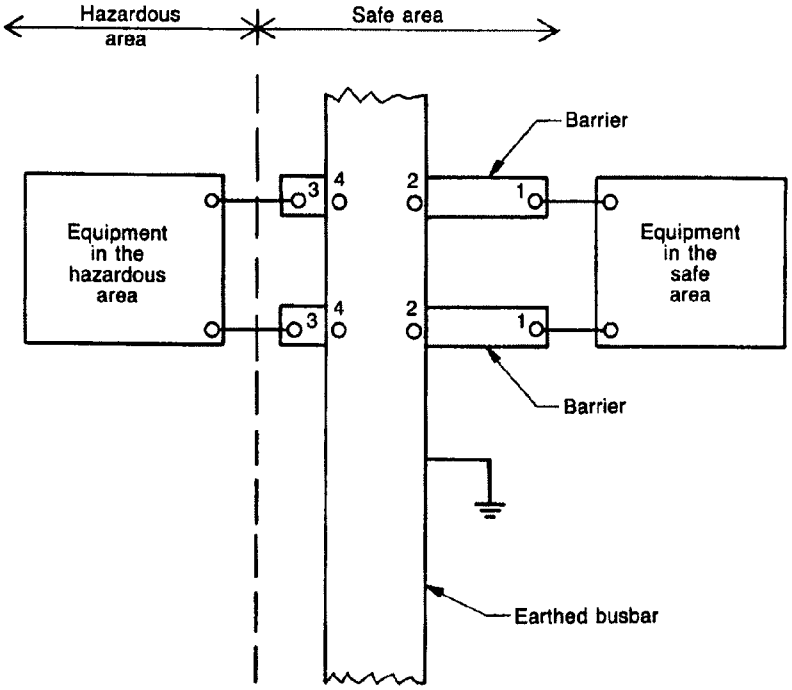


FIGURE A2 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH TWO BARRIERS OF LIKE POLARITY

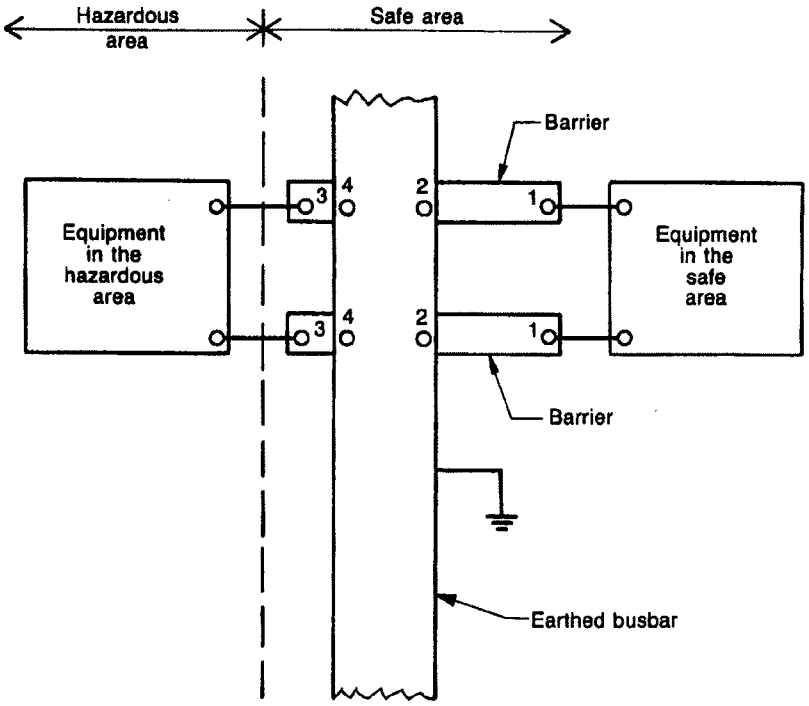


FIGURE A3 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH TWO BARRIERS OF OPPOSITE POLARITY

TABLE A2

TYPICAL CABLE CHARACTERISTICS FOR PVC CABLES WITH 0.3 mm RADIAL THICKNESS

Nominal conductor size, number and dia. of wires	7/0.3 mm (0.5 mm^2)		7/0.5 mm (1.5 mm^2)	
Screening	**Screened**	**Unscreened**	**Screened**	**Unscreened**
Conductor resistance at 20°C (Ω/100 m)	3.8	3.8	1.4	1.4
Capacitance of pairs (μF/km)	0.145	0.090	0.2	0.12
Inductance at 1 kHz (mH/km)	0.9	0.9	0.8	0.8
***L/R* ratio (μH/ohm)**	12	12	31	31

TABLE A3

TYPICAL CABLE CHARACTERISTICS FOR 2-CORE MICC CABLE

Nominal conductor size (mm^2)	1
Conductor resistance single core (Ω/100 m)	3.45
Capacitance of pairs (μF/km)	0.1194
Capacitance, conductor to earth (μF/km)	1.1612
Inductance at 1 kHz (mH/km)	0.684
***L/R* ratio (μH/ohm)**	20

APPENDIX C

SELECTION OF Ex e COMPONENTS

(Normative)

C1 GENERAL Each enclosure is allocated a permissible maximum dissipating power, expressed in watts, taking into account—

(a) the dissipation per component for a given cable conductor size;

(b) the size of each cable used and the resistance of its length, equal to the diagonal of the enclosure;

(c) the maximum allowable current for the Ex e component or the maximum current allowable for each cable, if below the maximum allowable for the terminal block; and

(d) the bunching of cables within each enclosure and the effect this has in producing 'hot spots'.

The selection of an acceptable combination in any assembly is based upon the requirement that enclosures shall not exceed a specified total dissipation of power (in watts) from the cables and the components which are to be housed within each enclosure.

The permissible maximum dissipating power (*MDP*) for the temperature classification of the enclosure, determined by test, will appear on the manufacturer's rating plate, e.g. 15.5 W.

Having established maximum dissipation of power from the enclosures, the wired assembly may be expressed in power loss in the following way:

Dissipation per terminal: $P = I^2[R_t + L \times R_c]$ . . . . E(1)

$P = I^2[R_t + R_d]$ . . . . E(2)

where

P = power dissipation, in watts

I = current through terminal (max. allowable or limited by cable size)

R_t = internal resistance of terminal, in ohms

R_c = cable resistance per metre, in ohms

L = length of cable equal to the diagonal of the enclosure, in metres

MDP = maximum dissipating power, in watts—the sum total of all terminals and wiring within the enclosure

R_d = resistance of a length of cable equal to the diagonal of the enclosure

Therefore, for a combination of terminals and cables the watts loss can be calculated from the basic test information and cable data as follows:

$MDP = aP_1 + bP_2 + cP_3 \ldots + zP_n$ . . . . E(3)

where

aP_1; bP_2; cP_3, ... zP_n represent the heat dissipation of different combinations and numbers (a; b; c ...z) of terminals and cables.

C2 EXAMPLE: SELECTION OF TERMINAL BLOCKS FOR COMPLIANCE WITH T6 CLASSIFICATION

Assume that the following is derived from tests:

Enclosure *MDP* = **15 watt**

Terminal block TBK2.5 = 15 A max.
Terminal block TBK16 = 47 A max.
L = 270 mm

A. ***P* (TBK2.5) for**

P_1 3 amps 0.5 mm^2 cable = 0.092 W

P_2 12 amps 1.0 mm^2 cable = 0.763 W

P_3 15 amps 2.5 mm^2 cable = 0.530 W

B. ***P* (TBK16) for**

P_4 47 amps 16 mm^2 cable = 0.790 W

Maximum number of allowable terminals:

$$P_1 \text{ only} = \frac{15.0}{0.092} = 163; \quad \textit{or}$$

$$P_2 \text{ only} = \frac{15.0}{0.763} = 19; \quad \textit{or}$$

$$P_3 \text{ only} = \frac{15.0}{0.530} = 28; \quad \textit{or}$$

$$P_4 \text{ only} = \frac{47.0}{0.790} = 59;$$

Now assume the following combination of terminals—

$(60 \times P_1) + (6 \times P_2) + (3 \times P_3) + (3 \times P_4)$

$(60 \times 0.092) + (6 \times 0.763) + (3 \times 0.530) + (3 \times 0.790)$

Total Heat Dissipation is—

$5.52 + 4.578 + 1.590 + 2.37 =$ **14.058 Watt**

It is concluded that the combination of terminals and cables does not exceed MDP of 15 W and is therefore satisfactory for T6.

NOTE: The cables should not be bunched in quantities greater than the number of cores from each cable or conduit entering the enclosure and in any case should not exceed six per bunch.

C3 CABLE SELECTION v TERMINAL SELECTION The maximum current density permitted in any conductor inside or outside the enclosure is to be established as though the conductors are insulated with V75 material and enclosed in conduit in air and derated according to the ambient temperature and in any case not less than 50°C as established according to AS 3008.1. Additional derating factors may be necessary where bunching of cables occurs.

However, where the cables are run in situations that allow an increase of current-carrying capacity, the Ex e installation is placed at risk, particularly when the cable enters the terminal enclosure.

It is important to keep in mind that—

(a) the Ex e terminal block rated current must not be exceeded; and

(b) the cable connected to each terminal block is of a size acceptable to that block and the current carried by that cable complies with the requirements of Clause 2.7.2.

C4 FACTORS TO BE CONSIDERED IN SELECTING EQUIPMENT CERTIFIED TO Ex e The establishment of criteria which can lead to practical installation of terminal boxes for use in Class I, Zones 1 and 2 hazardous areas can only be made by testing and from the tests a manufacturer can tabulate and mark—

(a) maximum power for each enclosure to meet the temperature class—generally T6 or as certified;

(b) maximum current per Ex e terminal—marked thereon, in amps;

(c) resistance per terminal, in ohms;

(d) average length per conductor—box diagonal in metres;

(e) resistance per conductor length, in ohms;

(f) actual load current per terminal for the installation in amps; and

(g) maximum current per conductor, in amps in accordance with AS 3008.1.

For a particular manufacturer's terminal box, these criteria lead to the following tabulations:

TABLE C1

CONDUCTOR RESISTANCE PER BOX FOR EACH CONDUCTOR SIZE

Size mm^2	Enclosure types No. 1 No. 2 No. 3 No. 4 No. 5
0.5	
1.0	
2.5	$\frac{ohms/1000\ m \times L}{1000}$
4.0	
6.0	
10.0	
16.0	
25.0	
35.0	
50.0	where L is in metres
70.0	
95.0	

TABLE C2

TERMINAL/COMPONENT RESISTANCE (R_t)

Component type	Average resistance (ohms)
TBK 2.5 TBK 4 TBK 6 TBK 10 TBK ... *n*	Determined by test

From Tables C1 and C2, details for each enclosure can be derived:

Assume ..... Enclosure type box No. 1. **MDP = 15 watt**

Ex e component			Cable	Total
Type	Qty	Load or rating A	mm^2	W
TBK 2.5	60	3.0	0.5	5.52
TBK 2.5	6	12.0	1.0	4.578
TBK 2.5	3	15.0	2.5	1.590
TBK 16	3	47.0	16.0	2.37
			Enclosure Total =	14.058

It is possible to determine a large variety of enclosure combinations for different components, given—

(a) conductor resistance;

(b) component resistance;

(c) current drawn through each cable and component; and

(d) enclosure MDP.

The manufacturer should be able to supply details of certified components and enclosures. Cable resistances are readily available from tables or the enclosure manufacturer may provide the values for each enclosure size and each cable length, equal to the enclosure diagonals.

C5 ENCLOSURE CONTENTS AND LABEL Having established the contents for each enclosure for a known application, it is important that any spare space within is **not** filled at some later stage with equipment which—

(a) exceeds the certified MDP;

(b) is not certified Ex e; or

(c) arcs or sparks.

The user or the supplier should attach to the inside of the enclosure a label showing—

(i) certified MDP;

(ii) original component contents; and

(iii) calculated total power dissipation of original installed components.

If the user changes the contents, it would be his responsibility to secure a revised list, having first established that the enclosure temperature class and certified MDP will not be exceeded by the proposed changes.

8 Manufacturer's Data Report (MDR) and Installation, Operation and Maintenance (IOM) Manual

Documentation in relation to this section is to be included and maintained by APA Group.

9 Maintenance Register

Documentation in relation to this section is to be included and maintained by APA Group. This section includes sample maintenance sheet.

FYFE
Earth Partners
ENVIRONMENT
DEVELOPMENT
RESOURCES

MAINTENANCE REGISTER

Site:

APA Group

DATE	DESCRIPTION	ASSOCIATED TAGS	DOSSIER UPDATE AS REQUIRED (YES / NO / NA)								
			P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY	INSTALLATION CHECK LIST	REPAIR & EXAMINATION REPORT	HA CLASSIFICATION	HA DRAWING	REMARKS

FYFE Earth Partners ENVIRONMENT DEVELOPMENT RESOURCES	**MAINTENANCE REGISTER**	 **Site:**	APA Group

DATE	DESCRIPTION	ASSOCIATED TAGS	DOSSIER UPDATE AS REQUIRED (YES / NO / NA)								
			P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY	INSTALLATION CHECK LIST	REPAIR & EXAMINATION REPORT	HA CLASSIFICATION	HA DRAWING	REMARKS

FYFE Earth Partners
ENVIRONMENT
DEVELOPMENT
RESOURCES

MAINTENANCE REGISTER

Site:

APA Group

DATE	DESCRIPTION	ASSOCIATED TAGS	DOSSIER UPDATE AS REQUIRED (YES / NO / NA)									
			P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY	INSTALLATION CHECK LIST	REPAIR & EXAMINATION REPORT	HA CLASSIFICATION	HA DRAWING	REMARKS	

HAD 1.9
Rev 0

10 Inspection Register

Close visual inspection to confirm equipment installations was performed by Neville Green, an electrical engineer from Sitzler during a site visit on 10 September 2011.

This Section contains the inspection sheets. The Section also contains sample inspection sheet(s) for future inspection.

Documentation in relation to this section is to be maintained by APA Group.

SITZLER
ABN 17 091 273 013
SITZLER Pty Ltd
Construction and Civil Contractors,
Project Managers and Developers

Ref: I:\data\sitzler\contracts\darwin\sbsj12\fyf1 fyfe pty ltd hazardous areas reporting award 28.07.11\fyf3 fyfe northern end pipline\reports\darwin city gate\electrical equipment for hazardous area summary report - darwin city gate 22.09.11.docx

22 September 2011

FYFE PTY LTD
Level 3, 80 Flinders St
Adelaide SA 5000

Attention: Tony Bird

Dear Tony,

RE: AMADEUS PIPELINE – DARWIN CITY GATE STATION

HAZARDOUS AREA ELECTRICAL INSPECTION REPORTING

Please find attached hazardous area device inspection sheets for the above site as part of the visual grade of inspection reporting completed on September 9th 2011. A broad range of findings have been identified and documented within the 'action required' section of each check sheet in order to identify the non compliance of the equipment/installation with respect to current standards.

We list the items of deliverables requested by FYFE below and trust the scope of work delivered is in accordance with the specified requirements.

1. Preparation of hazardous area device inspection check-sheets
2. Attend sites and inspect all electrical equipment at each site
3. Complete inspection check-sheets for each instrument
4. Production of a memo stating what work was done and a summary of rectification work
5. To provide ongoing support to the client, it is recommended that a cost estimate is provided for any rectification work.

The level of electrical inspections were carried out in accordance with the Australian/New Zealand Standard AS/NZS 60079 series for explosive atmospheres and in particular parts 14 and 17 relating to electrical installations, design, selection, inspections and maintenance.

The grade of inspection completed was a combination of visual and close techniques only as defined within the above standards. Detailed equipment/installation inspections in accordance with the above standards were not performed however it is a requirement that detailed inspections be performed prior to initial energising of equipment installed within hazardous classified areas and in the absence of any information it is assumed this has been completed by others.

The visual inspections were conducted on energised equipment with emphasis on the condition reporting of the equipment and installation techniques applicable to the hazardous area classification and associated environment. It is also acknowledged that at the commissioning date of the original installation the Australian standards have since been revised which has been taken into consideration in the compliance evaluation of each device.

In some cases the nameplate detail of the installed equipment was illegible and hence the equipment method of protection and associated certification could not be identified.

A compilation of the inspection findings/actions across the installation is provided as follows:

1. Re- tightening of loose cable glands.
2. Terminate exposed cabling appropriately and earth or completely remove where located within and/or passing through hazardous classified areas.
3. Sealing of conduit surrounding instrument cabling to prevent transmission of flammable gases.
4. Equipment and cable identification labelling required (where not provided) and alteration of existing where incorrectly labelled in accordance with the piping and instrumentation diagrams and electrical loop drawings.
5. Application of blue cable sheathing and/or labelling to clearly identify intrinsically safe installations.
6. Provide additional cable support and cover to prevent further mechanical and ultraviolet damage and where cabling rests on process piping.
7. Replace/remediate cabling where long term ultraviolet damage has occurred.
8. Replacement of uncertified hazardous area installed equipment and insufficiently ingress protected/damaged components with certified equipment.
9. Verification of flameproof versus I.S. installation & design techniques with respect to mixed certified adaptors and uncertified equipment.
10. Provide approved rated labels to poorly legible explosion proof equipment.
11. Replacement of equipment impending failure due to corrosion, age and poor condition.
12. Verification of installed explosion proof equipment, however not certified to Australian standards, by performing conformity and/or fitness for purpose assessments to Australian standards.

It is evident that the lifetime expectancy of some equipment installed would be considered approaching a nominal design life of 30 years. Where nil evidence of Australian hazardous area certification exists, and nameplate details are illegible, we recommend replacement with Australian certified equipment. Where evidence of Australian certification was valid at the time of installation, and the general condition is acceptable for use within the hazardous area, minor remediation works can be completed with minimal operational impacts. The establishment of a regular periodic maintenance regime with respect to hazardous area compliance is also recommended as a minimum in accordance with AS/NZS 60079 Part 14/17.

We look forward to providing further advice and discussions with FYFE in order to assist the client with a remediation plan and associated cost estimating of the works. Trusting the above is satisfactory, please do not hesitate to contact the undersigned should you require any further information on the above or attached.

Yours faithfully,

Neville Green
Engineering Services Manager
Encl. Device Inspection Sheets.

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Ref: I:\data\sitzler\company operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,ex-i,ex-n,ex-p and other ex devices.doc

Specifications

General

Device ID or tag:	(TE-11)	Asset:	STATION INLET
Circuit ID:	-	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	RTD	Type of protection: (d,e, i, n, p etc)	(i)
Manufacturer:	-	Gas group: (IIA/B/C)	-
Full model number:	-	Temp class: (T1-T6)	-
Serial number:	-	Certificate number:	-
IP Class	-	Test authority: (BAS, PTB, SAA etc)	-

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	ALCO		
Model:	WG203		
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CCT - EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required
- Blue sheath to cable required
- UV damage to cable required remediation.

Reviewed by: N. GREEN
Date: 20/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: PT-13	Asset: STATION INLET
Circuit ID: J008	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i,n, p etc) EX ia
Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C) IIC
Full model number: 3051TG4A2B21B4I7M5T1	Temp class: (T1-T6) T5 (40°C), T4 (70°C)
Serial number: RS0503742	Certificate number: AUS Ex 12491X
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	~~others~~ PLUG
Gland manufacturer:	ANCO		REDAPT
Model:	WG203		
Gland type of protection: (d,e)			Ex d, IIC

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊠ CORROSION
2	No undue accumulation of dust or dirt	all	X	⊠
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Blue sleath to cable.
- Remediate UV damaged cable sleath.
- Corrolian to device, suggest internal inspection.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PY-17	Asset:	DARWIN CITY GATE.
Circuit ID:	–	Physical location:	STATION SEPARATOR FS-2 INLET TCV-17
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	I/P TRANSDUCER	Type of protection: (d,e, i, n, p etc)	–
Manufacturer:	FISHER	Gas group: (IIA/B/C)	–
Full model number:	DVC 5010	Temp class: (T1-T6)	–
Serial number:	13184549	Certificate number:	–
IP Class	–	Test authority: (BAS, PTB, SAA etc)	–

Number of cables:	1

For each cable entry	gland 1	gland 2	~~others~~
Gland manufacturer:	ADAPTOR CLIPSAL	~~[illegible]~~ ALCO	BUNG/PLUG –
Model:	FAINM	W G202	–
Gland type of protection: (d,e)	d		–

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	- EQP
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE SHEATH 2. NON I.S. 2.
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	- UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	- SUPPORT
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- equipment + cable I.D. required
- Remediate UV damaged sheath
- Cable appeal to have blue sheath however device ex rating not available and I.S. barier not confirmed within control hut. Item (DVC5010) does contain dual Ex d / Ex i certification. Further investigation required.
- Uncertified gland / plug if Ex d method of protection.
- Cable support required.

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: (ESC-17)	Asset: TCV-17
Circuit ID: —	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p etc) class 1 (ENCL4)
Manufacturer: FISHER	Gas group: (IIA/B/C) GROUP C & D
Full model number: 304	Temp class: (T1-T6)
Serial number: 9644633	Certificate number: AUS Ex 736 ?
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1

For each cable entry	gland 1	~~gland 2~~ ADAPTOR	others
Gland manufacturer:	?	?	
Model:	?	?	
Gland type of protection: (d,e)	?	?	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	-EQ -CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	✓
2	No undue accumulation of dust or dirt	all	X	✓
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~**Yes:**~~ List action required

Contractor (write): Inspector	**Supervisor** N.GREEN	**Client (write): Inspector**
Date: 9/9/11		**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.O. required
- Blue sheath to be replaced, remediate UV damaged cable sheath

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PY-15	Asset:	TCV-15 FS-1 INLET
Circuit ID:	—	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	I/P TRANSDUCER	Type of protection: (d,e, i, n, p etc)	Ex ia
Manufacturer:	FISHER	Gas group: (IIA/B/C)	IIC
Full model number:	DVC5010	Temp class: (T1-T6)	T4(80) T5(70) T6(60)
Serial number:	0016049199	Certificate number:	AUS Ex 315X
IP Class		Test authority: (BAS, PTB, SAA etc)	confirm.

Number of cables:	1

For each cable entry	~~gland 1~~ ADAPTOR	gland 2	~~others~~ PLUG
Gland manufacturer:	CLIPSAL	ALCO	—
Model:	FAZINM	WG202	—
Gland type of protection: (d,e)	Exd		—

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	- EQ - CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	?
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	- UV - support
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗
2	No undue accumulation of dust or dirt	all	X	⊗
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable T.O. required.
- Remediate UV damaged sheath.
- Refer Exd / Exi notes for PY-17. regarding barrier.
- Cable support required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: ESC-15	Asset: TCV-15
Circuit ID: J005	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p etc) CLASS 1 (ENCL4)
Manufacturer: FISHER	Gas group: (IIA/B/C) GROUP C & D
Full model number: 304	Temp class: (T1-T6)
Serial number: 9644629	Certificate number: ~~AUS Ex~~ 736
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	- DOES ACCESSIBLE		
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	- UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	- support
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	✓
2	No undue accumulation of dust or dirt	all	X	✓
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required.
- Remediate cable sheath with UV damage.
- Provide line sheath to cable.
- Cable support required.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: –	Asset: FS1
Circuit ID: –	Physical location: DARWIN CITY GATES
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) JB (APPEARS UN USED)	Type of protection: (d,e, i, n, p etc) –
Manufacturer: SAE	Gas group: (IIA/B/C) –
Full model number: –	Temp class: (T1-T6) –
Serial number: –	Certificate number: –
IP Class –	Test authority: (BAS, PTB, SAA etc) –

Number of cables: 1

For each cable entry	gland 1	~~gland 2~~ PVC GLAND	~~others~~ BUNG
Gland manufacturer:	?		
Model:			
Gland type of protection: (d,e)	NO CERT	NO CERT. NO CABLE	NO CERT

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	Ø	- CIRCUIT - EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	Ø	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X		
19	The circuit is isolated from earth or earthed at one point only	i	X		
20	Separation is maintained with non-IS circuits	i	X		
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X		

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag -

Action required to make device compliant:

- Unused cable + JB
- Remove from installation or make safe & identify cable, JB etc..

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:- (LSHHH 16)	Asset: FS 1
Circuit ID: -	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

SWITCH

Apparatus type: (light, JB, Motor) ~~HIGH~~ HIGH LEVEL	Type of protection: (d,e, i, n, p etc) ~~Ex i~~ Ex d
Manufacturer: ~~SMITED ELECTRIC~~ FRANK W MURRAY	Gas group: (IIA/B/C) ~~IIC~~ Ex d IIB
Full model number: ~~JX66-553~~ L1200	Temp class: (T1-T6) T6
Serial number:	Certificate number: ~~NOT SAA APPROVED~~ Aus Ex 609
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

JB

For each cable entry	~~gland 1~~	~~gland 2~~	others 2 x ADAPTORS BUNG
Gland manufacturer:	W6202	JILCO	
Model:			
Gland type of protection: (d,e)	NO CERT	NO CERT.	NOT CERT NO CERT

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	CIRCUIT EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

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18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X UV
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 7/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required
- Remediate UV damaged sheath
- Provide blue sheath to cable.

Reviewed by: N. GREEN
Date: 12/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	(LSHH-16) ? ~~(LSL-16 OR LSHH-16)~~	Asset:	FS1
Circuit ID:	-	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	LEVEL SWITCH	Type of protection: (d,e, i, n, p etc)	1
Manufacturer:	FRANK W MURPHY	Gas group: (IIA/B/C)	IIB
Full model number:	L1200	Temp class: (T1-T6)	T6
Serial number:	—	Certificate number:	AVS Ex 609
IP Class		Test authority: (BAS, PTB, SAA etc)	

ILLEGIBLE DUE TO PAINT.

Number of cables:	1

For each cable entry	gland 1	~~gland 2~~	others
Gland manufacturer:	JQ. pro WILCO	ADAPTORS x 2	BUNK
Model:			
Gland type of protection: (d,e)	NO CERT	NO CERT	NO CERT.

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	- CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	- EQUIP
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	- UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	Ø	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D required.
- Remediate UV damaged sheath.
- Provide blue sheath to cable.
- Poor condition + age suggesting replacement.
- Corrosion visible.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

(LSHH-16A)

Device ID or tag: ? (~~LSL-16A~~ OR ~~LSHH~~ Vaset)	FS1
Circuit ID: –	Physical location: DARWIN CITY GATES.
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) d
Manufacturer: FRANK W MURPHY	Gas group: (IIA/B/C) IIB
Full model number: U1200	Temp class: (T1-T6) T6
Serial number: –	Certificate number: AUS Ex 609
IP Class –	Test authority: (BAS, PTB, SAA etc)

ILLEGIBLE DUE TO PAINT.

Number of cables:	

For each cable entry

	JB ~~gland 1~~	ADAPTORS x2 gland 2	others
Gland manufacturer:	WILCO	–	
Model:			
Gland type of protection: (d,e)	NO CERT.	NO CERT.	NO CERT.

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CIRCUIT EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. SPRIGGINS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.O. required.
- Remediate UV damaged sheath.
- Provide blue sheath to cable.
- Poor condition + age suggesting replacement.
- Corrosion visible

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

Ref: I:\data\sitzler\company operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,ex-i,ex-n,ex-p and other ex devices.doc

Specifications

General

Device ID or tag: LSH-16 ✓	Asset: FS
Circuit ID: –	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

ILLEGIBLE

Apparatus type: (light, JB, Motor) HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) Ex ia
Manufacturer: (UNITED ELECTRIC)	Gas group: (IIA/B/C) IIC
Full model number: (J400-553)	Temp class: (T1-T6) T6
Serial number:	Certificate number: NOT SAA APPROVED
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	

For each cable entry	gland 1	gland 2	others
Gland manufacturer:			
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	– CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	LOOSE GLANDS.
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

* GLAND USES LOCKNUT WITHOUT SEALING WASHER IS FOUND

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of (he power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X	UV
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Cable labels required
- Tighten loose gland
- Remediate UV damaged sheath
- ~~Paint~~ Replace blue cable sheath.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

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Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: LSH-16A	Asset: FS1
Circuit ID: -	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) ILLEGIBLE EX ia
Manufacturer: (UNITED ELECTRIC)	Gas group: (IIA/B/C) IIC
Full model number: (J400-553) ILLEGIBLE	Temp class: (T1-T6) T6
Serial number:	Certificate number: NOT SAA APPROVED
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:			
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

* GLANDS USES LOCKNUT WITHOUT SEALING WASHER BEHIND.

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(X) UV
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Cable labels required
- Remediate UV damaged cable sheath.
- Replace blue cable sheath.

Reviewed by: N. GREEN
Date: 12/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	– (DPT 16)	Asset:	FS 1
Circuit ID:	–	Physical location:	DARWIN CITY GATE.
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	DIFF PRESSURE TRANS.	Type of protection: (d,e, i, n, p etc)	NIT VISIOLE
Manufacturer:	ROSEMOUNT	Gas group: (IIA/B/C)	
Full model number:	3051CD3A22A1AM5B4I7L4T1	Temp class: (T1-T6)	
Serial number:	RS0347136	Certificate number:	
IP Class		Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	gland 1	~~gland 2~~ ADAPTOR	others BUNG
Gland manufacturer:	?		
Model:			
Gland type of protection: (d,e)		NO CERT	NO CERT.

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	Ø	– CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	– EQUIP.
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	Ø	BLUE SKIN.
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	Ø	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	Ø	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	Ø UV
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + circuit I.D. required.
- Remediate UV damaged sheath.
- Provide Blue sheath.
- Ex certification label not visible, provide new label and verify certification as I.S.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	15 JB - 1	Asset:	FS 1
Circuit ID:		Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	15 JB	Type of protection: (d,e, i, n, p etc)	?
Manufacturer:	?	Gas group: (IIA/B/C)	?
Full model number:	?	Temp class: (T1-T6)	?
Serial number:	?	Certificate number:	?
IP Class	?	Test authority: (BAS, PTB, SAA etc)	?

Number of cables:	6

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	—	—	—
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	I.S.
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗ Corrosion
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~Yes~~: List action required

Contractor (write): Inspector D.WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- I.S. labelling required to identify intrinsically safe circuits within.
- severe corrosion within JB which required replacement prior to circuit failure.
- Replace blue cable sheathing

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	-	Asset:	FS 2.
Circuit ID:	-	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	JB	Type of protection: (d,e, i, n, p etc)	CLASS 1+N DIV 1+2
Manufacturer:	SAE	Gas group: (IIA/B/C)	IIB
Full model number:	FNJ1 20mm	Temp class: (T1-T6)	T6.
Serial number:		Certificate number:	SAA CERT No. FLP 693
IP Class		Test authority: (BAS, PTB, SAA etc)	SAA

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	?	ALW	
Model:		UFPTB	
Gland type of protection: (d,e)			

CABLE CUT OFF & EXPOSED.

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CIRCUIT - EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	Ø	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector P. WILLIAMS Supervisor	Client (write): Inspector
Date: 9/9/11	Date:

Device ID or tag

Action required to make device compliant:

- Unused cable + JB with exposed cabling.
- Remove from installation or make safe + identify accordingly.

Reviewed by: N. GREEN
Date: 12/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: (LSHH18) –	Asset: FS2
Circuit ID: –	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) ~~HIGH~~ HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) ~~Ex ia~~ Ex d
Manufacturer: ~~UNITED ELECTRIC~~ FWM ~~Corp~~	Gas group: (IIA/B/C) ~~IIC~~ IIB
Full model number: ~~J400-553~~ U200	Temp class: (T1-T6) ~~T6~~ T6
Serial number:	Certificate number: ~~NOT SAA APPROVED~~ AUS Ex 609
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	~~gland 2~~ JB	others ADAPTORS X2 BUNG
Gland manufacturer:	?	WILCO	
Model:			
Gland type of protection: (d,e)		NIL	NO CERTS NDCERT

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	⊗ - CIRCUIT - EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	⊗ BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗ UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X CORROSION
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required.
- Remediate UV damaged cable sheath.
- Provide blue sheath to cable.
- Visible corrosion + poor condition + age suggesting replacement.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: LSHH - 18[illegible]	Asset: FS2
Circuit ID:	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

ILLEGIBLE DUE TO PAINT.

Apparatus type: (light, JB, Motor) ~~HIGH~~ HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) Ex ia Ex d
Manufacturer: ~~UNITED~~ ELECTRIC ~~FRANCE~~	Gas group: (IIA/B/C) IIC IIB
Full model number: 5400-553 L1200	Temp class: (T1-T6) T6
Serial number:	Certificate number: ~~NOT SAA APPROVED~~ AUSEx 609
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	JB gland 2	ADAPTORS x2 others
Gland manufacturer:	?	WALCO	
Model:			
Gland type of protection: (d,e)		NO CERT	NO CERTS

RUNG

NO CERT.

Inspection → Circle as checked

	-A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CIRCUIT - EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	JB CRACKED
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	LOOSE
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

* JB CRACKED AT CABLE ENTRY ✓
* Exposed armour

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

CORROSION

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 1/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + Cable I.O. required.
- Remediate UV damaged sheath.
- Replace blue cable sheath.
- IS damage/cracking at gland entry, visible corrosion.
- Poor condition + age suggesting replacement.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: (LSHH - 18A) —	Asset: FS2.
Circuit ID: —	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) ~~HIGH~~ HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) ~~Ex to~~ Exd
Manufacturer: ~~UNITED ELECTRIC~~ FRANK ~~MURPHY~~	Gas group: (IIA/B/C) IIC MD
Full model number: ~~J400-553~~ L1200	Temp class: (T1-T6) T6
Serial number:	Certificate number: ~~NOT SAA APPROVED~~ AUS Ex 604
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	~~gland 2~~ JB	~~others~~ ADAPTORS x2
Gland manufacturer:	?	~~WILCO~~ BUNKS	
Model:			
Gland type of protection: (d,e)		NO CERT	NO CERTS

NO CERTS

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X) CIRCUIT EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X) BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X) UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X CORROSION
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required.
- Remediate UV damaged sheath.
- Provide blue sheath to cable.
- Visible corrosion
- Poor condition + age suggesting replacement.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: LSH-18 ✓	Asset: FS-2
Circuit ID: –	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) Ex ia
Manufacturer: UNITED ELECTRIC ✓	Gas group: (IIA/B/C) IIC
Full model number: J400-553 ✓	Temp class: (T1-T6) T6
Serial number:	Certificate number: NOT SAA APPROVED
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	?		
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	CIRCUIT.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

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18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X		
19	The circuit is isolated from earth or earthed at one point only	i	X		
20	Separation is maintained with non-IS circuits	i	X		
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X		

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X		X
2	No undue accumulation of dust or dirt	all	X		X
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

~~**Yes:**~~ List action required

Contractor (write): Inspector	**Supervisor**	**Client (write): Inspector**
D.Williams		
Date: 9/9/11		**Date:**

Device ID or tag

Action required to make device compliant:

- CABLE I.D. required.
- Equipment label illegible (apart from model #). Suggest new labels for future reference.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

* GLAND USES LOCKNUT WITHOUT SEALING WASHER BEHIND.

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: LSH - 18A	Asset: ES-2
Circuit ID: -	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) HIGH LEVEL SWITCH	Type of protection: (d,e, i, n, p etc) Ex ia
Manufacturer: UNITED ELECTRIC	Gas group: (IIA/B/C) IIC
Full model number: J400 - 553	Temp class: (T1-T6) T6
Serial number:	Certificate number: NOT SAA APPROVED
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	?		
Model:			
Gland type of protection: (d,e)			

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	⊗ CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have.sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	⊗
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗ UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector P. WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Cable label required.
- Remediate UV damaged cable sheath
- Replace blue cable sheath.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

* GLAND USES LOCKNUT WITHOUT SEALING WASHER

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	DPT - 18	Asset:	FS 2
Circuit ID:	--	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc)	
Manufacturer:	ROSEMOUNT.	Gas group: (IIA/B/C)	
Full model number:	3051CD3A22A1AM5B4R4L4T1	Temp class: (T1-T6)	
Serial number:	RS 0347135	Certificate number:	
IP Class		Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	gland 1	gland 2	others ADAPTOR
Gland manufacturer:	?		
Model:			
Gland type of protection: (d,e)			NO CERT

BUNG

NO CERT

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	CIRCUIT EQUIP
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE JACKET
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

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18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector O. WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Circuit I.D. required.
- Remediate UV damaged sheath.
- provide blue cable sheath.
- Ex certification label not visible, provide new label and verify certification is I.S.
- corrosion visible
- Un-certified plug + adaptor.

Reviewed by: N. GREEN
Date:
Priority: 21/9/11

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: ISJB-2	Asset: FILTER JERKLATOR #2
Circuit ID: 5019	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) JB	Type of protection: (d,e, i, n, p etc) ~~Ex ia~~
Manufacturer: ~~CROUSE-HINDS~~	Gas group: (IIA/B/C) ~~IIC~~
Full model number: ~~VDU 2.5~~	Temp class: (T1-T6) ~~T6~~
Serial number: -	Certificate number: -
IP Class ~~66~~	Test authority: (BAS, PTB, SAA etc) -

NO LABEL

Number of cables:	6

For each cable entry	gland 1 x1	gland 2 x 1	~~others~~ GLAND x 4
Gland manufacturer:	ALCO	ALCO	2.
Model:	WG 1.54	WG202	2.
Gland type of protection: (d,e)			2

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	LABELS NOT LEGIBLE.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	SIGNAGE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	DV
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X	CORROSION
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- I.S. labelling to identify intrinsically safe circuits within.
- Severe corrosion within JB which requires replacement prior to circuit failure.
- Replace blue cable sheathing.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

NOT TAGGED

Device ID or tag: (TT - 20) (UPSTREAM) –	Asset: ANALYSER RUN
Circuit ID: NONE	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?) OUTDOOR - SUNSHADE

Data from Label

Apparatus type: (light, JB, Motor) TEMPERATUR TRANSMITTER		Type of protection: (d,e, i, n, p etc) Ex d	ia
Manufacturer: YOKOGAWA		Gas group: (IIA/B/C) IIC	IIC
Full model number: YTA 710 EA4DB/SD1/S3		Temp class: (T1-T6) T6	T4
Serial number: C2JA00686 941		Certificate number: AUS Ex 3640	3652X
IP Class 66/67		Test authority: (BAS, PTB, SAA etc)	

Number of cables: (1)

For each cable entry	gland 1	gland 2	others ADAPTOR
Gland manufacturer:	ALCO		~~CLIPSAL~~
Model:	~~TEPW~~ WG 205		ADAPTAFLEX 90° (NO SEAL)
Gland type of protection: (d,e)	NO CERT.		NO CERT.

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	X	- EQUIP - CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	X	CABLE SUPPORT + UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	Date:

Device ID or tag

Action required to make device compliant:

- Equipment + circuit I.D. required.
- Provide cable support.
- Remediate cable sheath and replace due sheath.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Not TAGGED

Device ID or tag: TT-20A (DOWNSTREAM)	Asset: ANALYSER RUN
Circuit ID: NONE	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?) OUTDOOR – SUN SHADE

Data from Label

Apparatus type: (light, JB, Motor) TEMPERATURE TRANSMETTER	Type of protection: (d,e, i, p, n etc) EX ia, n
Manufacturer: YOKOGAWA	Gas group: (IIA/B/C) IIC
Full model number: YTA 110 EA4 DE/SU1/53	Temp class: (T1-T6) T4
Serial number: C2JA00685 941	Certificate number: AUS Ex 3652X
IP Class 66/67	Test authority: (BAS, PTB, SAA etc)

Number of cables: (1)

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	ALCO		ADAPTOR ~~ADAPTAFLEX~~ CLIPSAL
Model:			IP NOT MAINTAINED
Gland type of protection: (d,e)	NO CERT		NO CERT

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	– EQUIP – CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	CABLE SUPPORT & UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other . . .	. . . all	X	⊗
2	No undue accumulation of dust or dirt	all	X	⊗
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~**Yes:**~~ (C) List action required

Contractor (write): Inspector D. Vicary	**Supervisor**	**Client (write): Inspector**
Date: 9/9/11		**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.O. required.
- Provide cable support
- Remediate cable sheath + replace blue sheath.

Reviewed by: M. Green
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PT-22 ✓	Asset:	ANALYSER RUN.
Circuit ID:	–	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc)	EX ia
Manufacturer:	ROSEMOUNT	Gas group: (IIA/B/C)	IIC
Full model number:	3051 T64A2.B21B K7M5T1	Temp class: (T1-T6)	(40°C) T5, T4 (70°C)
Serial number:	0123918	Certificate number:	AUS Ex 1249X ✓
IP Class	66	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	gland 1	gland 2	others PLUG
Gland manufacturer:	ALCO		~~CA. NOT READ~~ READAPT
Model:	BICHAW 20 M20		PA-D M20
Gland type of protection: (d,e)	d IIC		EEx d

AUSEX 03:3094

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	⊗ CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	⊗ PLUG SHORTH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗ UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately.protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Cable I.D. required
- Remediate cable sheath + provide blue sheath.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: PT-22A	Asset: ANALYSER RUN
Circuit ID: 3011?	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?) OUTDOOR SUNSHADE

Data from Label

Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, n,p etc) Ex ia
Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C) IIC
Full model number: 3051 T4A2B2UBK1M5T1	Temp class: (T1-T6) T5, T4 (70°C)
Serial number: 01234 917	Certificate number: AUS Ex 1249X
IP Class IP 66	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others PLUG
Gland manufacturer:	ALCO		PLUG - RED HAT
Model:	ALCHAW-20/M20		~~NO DATA~~ AM M20
Gland type of protection: (d,e)	d IIC e II AUS Ex 03 3094X		Ex d

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	CIRCUIT ID UNREADABLE
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Remediate cable sheath + provide blue sheath.

Reviewed by: N. GREEN
Date: 24/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: PSL - 24	Asset: ANALYSER RUN
Circuit ID: JOZ.6	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?) OUTDOOR – SUNSHADE

Data from Label

Apparatus type: (light, JB, Motor) LOW PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc) Ex d
Manufacturer: ASHCROFT	Gas group: (IIA/B/C) IIB
Full model number: P7 ?	Temp class: (T1-T6) T6
Serial number: NONE	Certificate number: AUS Ex 547
IP Class	Test authority: (BAS, PTB, SAA etc)

NOT LEGIBLE

Number of cables:	1

For each cable entry	gland 1	gland 2	others ADAPTOR
Gland manufacturer:	NOT ABLE TO READ		
Model:			
Gland type of protection: (d,e)			NOT EXT.

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X)
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X) UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗ CORROSION.
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Remediate cable sheath + provide blue sheath
- Equipment corrosion, poor condition, illegible label.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag: (ESC - 44)	Asset: V44 (OUTDO) TPOTS INLET
Circuit ID:	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p etc) Ex d
Manufacturer: KEYSTONE	Gas group: (IIA/B/C) IIB
Full model number: F792K	Temp class: (T1-T6) T6
Serial number: 535812	Certificate number: AUS Ex. 1416
IP Class 65	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1

For each cable entry	gland 1	gland 2 (ADAPTOR)	~~others~~ PLUG
Gland manufacturer:	ALCD	?	-
Model:	WA20Z	?	-
Gland type of protection: (d,e)		?	-

Inspection → **Circle as checked** (CORROSION)

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X - CLT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X - EQ
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X ?
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X (CORROSION)
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

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18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X		
19	The circuit is isolated from earth or earthed at one point only	i	X		
20	Separation is maintained with non-IS circuits	i	X		
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X		

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION RUSH.
2	No undue accumulation of dust or dirt	all	X	⊗	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cet I.D. required.
- Nil evidence of I.S. installation hence flameproof installation considered.
- Uncertified gland, plug + adaptor required replacement.
- Corroded equipment suggesting further inspection for fitness for purpose.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: - (SVC-44)	Asset: V44
Circuit ID: -	Physical location: DARWIN CITY CAFE.
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) SOLENOID VALVE	Type of protection: (d,e, i, n, p etc) m, e
Manufacturer: LUCIFER	Gas group: (IIA/B/C) IIC
Full model number: 49219003 (Coil)	Temp class: (T1-T6) T4 (40°C)
Serial number: -	Certificate number: AUS Ex 321
IP Class 66	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1

For each cable entry	~~gland 1~~ CONDUIT	gland 2	others
Gland manufacturer:	ADAPTAFLEX	NIL.	
Model:	[illegible]		
Gland type of protection: (d,e)	DIP AUS Ex 950		

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

- ccc
- eo

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

DIP? ✓ O.K.

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cat I.D. required

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	SVO- 44	Asset:	V44
Circuit ID:	–	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	SOLENOID VALVE	Type of protection: (d,e, i, n, p etc)	m, e
Manufacturer:	LUCIFER	Gas group: (IIA/B/C)	IIC
Full model number:	4921908?3	Temp class: (T1-T6)	T4 (40°C)
Serial number:	–	Certificate number:	AUS Ex 321
IP Class	66	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	~~gland 1~~ CONDUIT	gland 2	others
Gland manufacturer:	AUMATORLEUS		
Model:			
Gland type of protection: (d,e)	DIP AUS Ex 970		

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	Ø	-CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	Ø	
4	There are no damage or evidence of unauthorised modifications	all	X	Ø	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	Ø	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	Ø	
2	Sealing of ducts and/or conduits is satisfactory	all	X	Ø	DIP 2,
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	Ø	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Cct. I.O. required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	LP SW.	Asset:	STANDBY RUN.
Circuit ID:	–	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc)	Exd
Manufacturer:	UNITED ELECTRIC CONTROLS.	Gas group: (IIA/B/C)	IIB
Full model number:	H119 189	Temp class: (T1-T6)	T6
Serial number:		Certificate number	~~ANSEx~~ 1211
IP Class	66	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry

	~~gland 1~~ ADAPTOR	gland 2	~~others~~ J. BOX
Gland manufacturer:			CROUSE-HINDS
Model:	C-H ADAPTOR II		GUA
Gland type of protection: (d,e)	Ex d Ex IIC 8U		Exd IIC T5 ANS Ex 319

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	Ø	– CIRCUIT – EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(X)	CORROSION OF ANTICONDIT
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D WILLIAMS	Supervisor	Client (write): Inspector
Date: 9/9/11		**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D required.
- Equipment Ex d rated however SIP conduit system installed. Nil evidence of I.S. circuit, further investigation required to verify design method of installation.
- corrosion visible on conduit.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag:	– (TURBINE METER)	Asset:	STANDBY RUN
Circuit ID:	–	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	METER	Type of protection: (d,e, i, n, p etc)	Ex ia
Manufacturer:	ITRON	Gas group: (IIA/B/C)	IIC
Full model number:	DE-07-MI002-PTB018	Temp class: (T1-T6)	T5 & T6
Serial number:	24003344991C 2010	Certificate number:	LCIE 06 ATEX 6031X
IP Class N/A	DELTA-S-FLOW G40	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	?		
Model:	?		
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X) — CIRCUIT & EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X) — BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector P. WILLIAMS Supervisor	Client (write): Inspector
Date: 9/9/11	Date:

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.O. required.
- Blue cable sheath required.
- Ex certification not applicable to Aus. standards, conformity assessment required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: – (TT)	Asset: STANDBY RUN
Circuit ID: –	Physical location: DARWIN CITY GATES
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) TEMP TRANSMITTOR	Type of protection: (d,e, i, n, p etc) d, ia, n
Manufacturer: YOKOGAWA	Gas group: (IIA/B/C) IIC
Full model number: YTA 110 (STYLE S3)	Temp class: (T1-T6) T6, T4, T4 ✓
Serial number: EA40B / SU1.	Certificate number: AUSEX 3640, 3652X, 3652X
IP Class 66/67	Test authority: (BAS, PTB, SAA etc)
Number of cables:	seial: C2J901750933

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	ANACONDA		
Model:	90° ADAPTOR	E20 (PVC)	
Gland type of protection: (d,e)	NO CERT	Exe DMT 02 ATEXE 047X	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	= CIRCUIT EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~Yes:~~ List action required

Contractor (write): Inspector P. Williams **Supervisor** **Date:** 9/9/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.O. required
- Blue sheath / I.S. label to conduit required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag: (LP-SW) -	Asset: DUTY RUN
Circuit ID: -	Physical location: DARWIN CITY GATES.
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) LOW PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc)
Manufacturer: UE	Gas group: (IIA/B/C) IIB
Full model number: H119 189	Temp class: (T1-T6) T6
Serial number: 7000 PSI 49 MPA 613	Certificate number: AUST Ex 1211
IP Class 66	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	~~gland 1~~ ADAPTOR	~~gland 2~~	others
Gland manufacturer:		CROUSE HINDS	
Model:	C-H, AMNTI	GUA	
Gland type of protection: (d,e)	Exd Ex1108U	Exd IIC AUS Ex 319	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	= CIRCUIT EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	(X)
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(X)	CORROSION TO JUNCTION BOX.
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams	**Supervisor**	**Client (write): Inspector**
Date: 9/9/11		**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D. required.
- Refer standby run LP-SW note on Ex d.
- Corrosion visible on JB.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	—	Asset:	DUTY RUN
Circuit ID:	—	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	TORRINE METER	Type of protection: (d,e, i, n, p etc)	Ex ia
Manufacturer:	ITRON	Gas group: (IIA/B/C)	IIC
Full model number:	AE-07-MI002-PTB018	Temp class: (T1-T6)	T5 & T6.
Serial number:	24003183 06/C 2010	Certificate number:	LCIE 06 ATEX 6031 X
IP Class N/A	(DELTA S-FLOW 440)	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	~~gland 1~~	gland 2	others
Gland manufacturer:			
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	Ø	CIRCUIT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	Ø	REQUIR.
4	There are no damage or evidence of unauthorised modifications	all	X	Ø	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	Ø	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	Ø	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	Ø	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	X	SUPPORT
2	Sealing of ducts and/or conduits is satisfactory	all	X	Ø	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required.
- Blue cable sheath required.
- Ex certification not applicable to AUS. standards, conformity assessment required.

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

(UPSTREAM? DOWNSTREAM OF TURBINE METER)

Device ID or tag: (TT) —	Asset: DUTY RUN
Circuit ID: —	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) TEMP TRANSMITTER	Type of protection: (d,e, i, n, p etc) d, ia, n
Manufacturer: YOKOGAWA	Gas group: (IIA/B/C) IIC
Full model number: YTA 110 (STYLE S3)	Temp class: (T1-T6) T6, T4, T4
Serial number: EA408/SU1	Certificate number: AUS Ex 3640, 3652X, 3652X
IP Class 66/67	Test authority: (BAS, PTB, SAA etc)
Number of cables:	SERIAL: C2J901749 933

For each cable entry

	gland 1	gland 2	others
Gland manufacturer:	ANDERSON	DMT or ATEX E014X	
Model:	90° ADAPTER	M20 (PVC)	
Gland type of protection: (d,e)	—	Ex e IP	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	X	CIRCUIT - EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗
2	No undue accumulation of dust or dirt	all	X	⊗
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.WILLIAMS **Supervisor** **Date:** 9/09/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable I.D. required.
- Blue Health / I.S. label required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

(NEAR PI 002)

Device ID or tag:	(PT-001)	Asset:	BERRIMAH RD OUTLET
Circuit ID:		Physical location:	DARWIN - CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc)	nL, nA, d, ia
Manufacturer:	ROSEMOUNT	Gas group: (IIA/B/C)	T5, T5, T5/T6, T5
Full model number:	3051TG4A2B21BK7M5T1P1Q4 Q8C5AD227	Temp class: (T1-T6)	IIC
Serial number:	2178140	Certificate number:	IEC Ex BAS 09.0076X
IP Class		Test authority: (BAS, PTB, SAA etc)	BAS 09.0077X, ~~BAS KEM 09.0033~~ KEM 09.0034X BAS 09.0076X

Number of cables:	

For each cable entry	gland 1	gland 2	others RUNG
Gland manufacturer:	ANACONDA		ROSEMOUNT.
Model:	20mm		M20,
Gland type of protection: (d,e)	NO CERT		Ex dE IIC KEMA 07 ATEX 0074

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	CIRCUIT - EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

CORROSION OF ANTICON

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D. required.
- Corrosion visible at conduit adaptor.
- Blue Sheath / I.S. label required.

Reviewed by: N. GREEN
Date: 22/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	- (HP SW1)	Asset:	BERRIMAH RD OUTLET.
Circuit ID:	-	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc)	Ex d
Manufacturer:	UNITED ELECTRIC CONTROLS	Gas group: (IIA/B/C)	IIC
Full model number:	J120 1CB	Temp class: (T1-T6)	T6
Serial number:		Certificate number:	AUS Ex 542
IP Class	66	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	1

For each cable entry	gland 1	gland 2	others ADAPTOR
Gland manufacturer:	ANDCONDA		NO CERT
Model:	20mm.		
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CIRCUIT - ENCLOS.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗ CORRODED TO CABLE ENTRY
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor** **Date:** 9/9/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D. required
- Blue sheath / I.S. label to conduit required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	IJB 001	Asset:	ANALYSER SHELTER
Circuit ID:	IJB 028	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	OUTDOOR - SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	JB	Type of protection: (d,e, i, n, p etc)	
Manufacturer:	?	Gas group: (IIA/B/C)	
Full model number:	N/A	Temp class: (T1-T6)	
Serial number:	N/A	Certificate number:	
IP Class	N/A	Test authority: (BAS, PTB, SAA etc)	

NO DATA.

Number of cables:	(4)

For each cable entry	IJB028 gland 1	PIT051 gland 2	PIT032 others	PIT033
Gland manufacturer:	CCG	HAWKE	HAWKE	HAWKE
Model:	IE/EX M20	501/453 RAC	501/453 RAC	501/453 RAC
Gland type of protection: (d,e)	Exd IIC			

Inspection → AUSEX 03.3844X IECEX BAS 06.0013X

Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X)
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector **Supervisor**	**Client (write): Inspector**
Date: 9/9/11 N. GREEN	**Date:**

Device ID or tag

Action required to make device compliant:

Reviewed by:
Date:
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PIT 31	Asset:	CARRIER GAS PRESSURE
Circuit ID:	PIT031	Physical location:	DARWIN CITY GATE
Area classification :	ZONE 2	Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TX	Type of protection: (d,e, i, n, p etc)	ia
Manufacturer:	YOKOGAWA	Gas group: (IIA/B/C)	IIC
Full model number:	EJX 530A-EDS4N-014EF-SV2 -X2	Temp class: (T1-T6)	T4
Serial number:	91L489334 117	Certificate number:	IECEx 05.0005
IP Class	IP66 & IP67	Test authority: (BAS, PTB, SAA etc)	CSA

Number of cables:	1

For each cable entry	gland 1	gland 2	others PWG
Gland manufacturer:	MAWICE		CCG
Model:	501 1453 RAC		M20
Gland type of protection: (d,e)	EXD		EEx d, e
	IECEx BAS 060013X		ATEX 13 0325X

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X)
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 8/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

Reviewed by:
Date:
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PIT 32	Asset:	CARRIER GAS PRESSURE
Circuit ID:	PIT 032	Physical location:	DARWIN CITY GATE
Area classification :	ZONE 2	Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TX	Type of protection: (d,e, i, n, p etc)	ia
Manufacturer:	EJX 530A ~~STYLE 02~~	Gas group: (IIA/B/C)	IIC
Full model number:	YOKOGAWA	Temp class: (T1-T6)	T4
Serial number:	91L439335 117	Certificate number:	IECEx CSA 05.0005
IP Class	IP66 & IP67	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	

EJ54N-014EF/SU2/X2

For each cable entry	gland 1	gland 2	others PLUG
Gland manufacturer:	HAWKE		CCG
Model:	501/453 RAC		M20
Gland type of protection: (d,e)	ExD IECEx BAS 06.0013X		ExD d,e ATEX 130325X

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

Reviewed by:
Date:
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PIT 33	Asset:	CAL. GAS PRESSURE
Circuit ID:	PIT031	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TX	Type of protection: (d,e, i, n, p etc)	iG
Manufacturer:	YOKOGAWA	Gas group: (IIA/B/C)	IIC
Full model number:	EJX 530 A ~~STYLE 0~~	Temp class: (T1-T6)	T4
Serial number:	91L 439336 117	Certificate number:	IECEx CSA 05.0005
IP Class	67 & 66	Test authority: (BAS, PTB, SAA etc)	

EDS4N-014EF/SU2/X2

Number of cables:	

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	HAWKE	-	PLUG - CCG
Model:	501 453 RAL		M20
Gland type of protection: (d,e)	EXD		EEx d,e
	IECEx BAS 06.0013X		ATEX 130 325X

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	Ø
2	No undue accumulation of dust or dirt	all	X	Ø
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

Reviewed by:
Date:
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	HEAT TRACING	Asset:	ANALYSER SHELTER
Circuit ID:	R004	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	HEAT TRACE JB	Type of protection: (d,e, i, n, p etc)	Ex e
Manufacturer:	THERMON	Gas group: (IIA/B/C)	II
Full model number:	PN 27610	Temp class: (T1-T6)	T4-T6 IECEx ULS 5.0003
Serial number:		Certificate number:	95048 / UL ~~E5003~~
IP Class	66	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	

For each cable entry	gland 1	~~gland 2~~ MOTOR	others
Gland manufacturer:	CCG	ILLEGIBLE ?	
Model:	ISTOPEX M2	3	
Gland type of protection: (d,e)	Ex d IIC	?	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

EG TRACE.

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN Supervisor	Client (write): Inspector
Date: 9/9/11	Date:

Device ID or tag

Action required to make device compliant:

- Equipment label required, label heat trace.
- Verify adapting reducer complies to maintain I.P. of installation, Ex certs etc.

Reviewed by: N.GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	MA 27	Asset:	ANALYSER SHELTER
Circuit ID:	P001 MA27 / J001 MA27 / DATA MA2701	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	MOISTURE ANALYSER	Type of protection: (d,e, i, n, p etc)	EEx d / de
Manufacturer:	AMETEK	Gas group: (IIA/B/C)	IIC
Full model number:	3050-OLV	Temp class: (T1-T6)	T6
Serial number:	305C714	Certificate number: (LIKELY)	ATEX - 6007X
IP Class		Test authority: (BAS, PTB, SAA etc)	NOT IEC / SAA APPROVED ✓

Number of cables:	2

For each cable entry	gland 1	gland 2	others PLUG [X 2]
Gland manufacturer:	REDAPT UK	REDAPT UK	SABS
Model:	ADU	ADU	WSW447U
Gland type of protection: (d,e)			E Ex de
	AUSEX 23410	AUSEX 23410	ATEX 130325X

Inspection

COMPOUND FILLED ENTRIES: FB-25 15mm HD EXD IIB AUS Ex 2341U

Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	INCOMPLETE
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector P.WILLIAMS **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required.
- Nil AUS cert. detail available, conformity assessment required. Ex d or e device assumed as Ex e install as per connecting TB.

Reviewed by: N.GREEN
Date: 12/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag:	MA27 JUNCTION BOX	Asset:	MA27 - ANALYSER SHELTER
Circuit ID:	P001 - MA27 / J001 - MA27 / DATA - MA27 B1	Physical location:	DARWIN CITY GATE
Area classification :	2 IIA	Environment: (hot?)	OUTDOOR - SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	JB	Type of protection: (d,e, i, n, p etc)	e
Manufacturer:	GOUAN	Gas group: (IIA/B/C)	IIC
Full model number:	E6 2315	Temp class: (T1-T6)	T6
Serial number:	20 9999 - 01	Certificate numb	IECEx SIM 09.0001X
IP Class	66	Test authority: (BAS, PTB, SAA etc)	SIM

Number of cables:	5

For each cable entry

	P001 gland 1	& J001	DATA gland 2	others PLUG	+ 2 AS MA27
Gland manufacturer:	CCG		HAUKE	GOUAN	
Model:	IECEX 20		501/453 RAC	M25	
Gland type of protection: (d,e)	d IIC Ex e II			Ex e	
	AUS Ex 03.3844X		AUS Ex 0015X	IECEx SIM 10.0003X	

ADAPTOR ON CLG NO CERT

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	X	EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	?
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	X	
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	CONDUIT NOT SEALED.
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector · **Supervisor**	**Client (write): Inspector**
D. Williams	
Date: 7/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.O. required.
- Seal conduit below JB.
- Verify maximum cct power dissipation does not exceed 7 watts.
- Verify adaptor on CCLi gland to be Ex'e' rated, replace as required.

Reviewed by: N. GREEN.
Date:
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

~~FOR ENCLOSURE~~

Device ID or tag:	(GC 28) —	Asset:	MOISTURE ANALYSER
Circuit ID:	P001 - GC28	Physical location:	DARWIN CITY GATE
Area classification :	ZONE 2 IIA	Environment: (hot?)	OUTDOOR SHELTER

Data from Label

Apparatus type: (light, JB, Motor)	CHROMATOGRAPH	Type of protection: (d,e, i, n, p etc)	d
Manufacturer:	EMERSON	Gas group: (IIA/B/C)	IIC
Full model number:	7-0771-101	Temp class: (T1-T6)	T4 (60°C)
Serial number:	Q011362	Certificate number:	~~SIRA 04ATEX 1056X~~ IECEx SIRA 08.0008X
IP Class		Test authority: (BAS, PTB, SAA etc)	

Number of cables:	2

PLUG REDAPT ?

For each cable entry	P001 gland 1	P001 Adaptor gland 2	gland others DATA
Gland manufacturer:	CCA		FLC 25
Model:	STOPGX 20	FR 31M	
Gland type of protection: (d,e)	d IIC + eII		A
	MASC S/10 020X		AUSEX 2314 U

Adaptor CSEEx FR 32M d IECEx SIM 05.0017U ↑ FLC 25 Ex2341U

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

CONDUIT NOT SEALED

- CONFIRM BARRIER GLANDS
- ANACOND USED. FROM POSIFIT JB.

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	✓
2	No undue accumulation of dust or dirt	all	X	✓
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor**	**Client (write): Inspector** D.
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required
- Verify conduit between GC & Posifit JB is installed Ex'd' method of protection to AUS cert/standards.
- Seal cable conduit located through concrete.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	CL28 JB	Asset:	ANALYSER SHELTER
Circuit ID:	CL28 DATA 01A & DATA02A	Physical location:	DARWIN CITY GATE
Area classification :	ZONE 2	Environment: (hot?)	OUTDOOR - SHELT

Data from Label

Apparatus type: (light, JB, Motor)	JB	Type of protection: (d,e, i, n, p etc)	e
Manufacturer:	CCG	Gas group: (IIA/B/C)	IIC
Full model number:	POSIFIT 1	Temp class: (T1-T6)	T6
Serial number:	NONE	Certificate number:	ANZEx 06.2001
IP Class	IP66 / 68	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	3

For each cable entry	gland 1	gland 2	~~others~~ ADAPTOR
Gland manufacturer:	HAWK	CCG	CCG
Model:			M20 - M25
Gland type of protection: (d,e)	d	de	de

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	EQUIP. CIRCUIT.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	X	
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	CONDUIT NOT SEALED
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D.Williams **Supervisor** **Date:** 9/9/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cable conduit T.O. required.
- Verify conduit between JB + GC is installed i'x'e method of protection to AUS cert./standards.
- Seal cable conduit located through concrete.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	PT-42	Asset:	CHANNEL ISLAND OUTLET
Circuit ID:	NONE	Physical location:	DARWIN CITY GATE
Area classification :	—	Environment: (hot?)	OUT DOOR / SUNSHADE

Data from Label

Apparatus type: (light, JB, Motor)	PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc)	EX ia
Manufacturer:	ROSEMOUNT	Gas group: (IIA/B/C)	IIC
Full model number:	3051TG4A2B21BB4M5 T1	Temp class: (T1-T6)	T5(40°C) T4(70°C
Serial number:	RS0619762	Certificate number:	AUS Ex 1249X
IP Class		Test authority: (BAS, PTB, SAA etc)	

NO DATA

ASSUMED INFO.

Number of cables:	1

For each cable entry	gland 1	gland 2	others PLUG
Gland manufacturer:	ALCO		PLUG-REDAPT
Model:	FLPW 203		M20
Gland type of protection: (d,e)			Exd IIC

IP68 Ex IIC Aus Sg. - LOOSE NUT

GAS No. 831ZIBU

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	- CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	GLAND LOOSE
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	SHEATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	SUPPORT
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

corrosion

Faults found? (circle as appropriate)

No:

~~**Yes:**~~ List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	Date:

Device ID or tag

Action required to make device compliant:

- CCT I.D. required.
- Tighten loose cable gland.
- Provide blue cable sheath.
- Visible external corrosion requiring internal inspection.
- Cable support required.

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

NO LABEL

Device ID or tag: SVO-41	Asset: CHANNEL ISLAND OUTLET MLV
Circuit ID: N/A	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?) OUTDOOR

Data from Label

Apparatus type: (light, JB, Motor) SOLENOID VALVE	Type of protection: (d,e, i, n, p etc) EX m
Manufacturer: SKINNER VALVE	Gas group: (IIA/B/C) IIA
Full model number: — N/A	Temp class: (T1-T6)
Serial number: N/A	Certificate number: AUS Ex 2541 X
IP Class N/A	Test authority: (BAS, PTB, SAA etc)

NO INFORMATION NO DATA PLATE

Number of cables:	1

For each cable entry	gland 1 CONDUIT	gland 2	others
Gland manufacturer:	NO DATA - PAINTED		
Model:			
Gland type of protection: (d,e)			

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	Ø
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	Ø
4	There are no damage or evidence of unauthorised modifications	all	X	Ø
5	Bolts, cable entries and blanking elements are correct and tight	all	X	Ø
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	Ø
2	Sealing of ducts and/or conduits is satisfactory	all	X	Ø
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	Ø
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION
2	No undue accumulation of dust or dirt	all	X	⊗	VERMIN
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + conduit I.D required
- Corrosion and poor condition suggesting replacement prior to failure.
- No AUS Ex certification available.
- Vermin ingress evident, sealing of JB required.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

NOT LABELLED

Device ID or tag: SVC-41	Asset: CHANNEL ISLAND OUTLET.
Circuit ID: N/A	Physical location: DARWIN CITY GATE
Area classification : -	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) SOLENOID VALVE	Type of protection: (d,e, i, n, p etc) Ex m
Manufacturer: SKINNER VALVE	Gas group: (IIA/B/C) IIA
Full model number: — N/A	Temp class: (T1-T6)
Serial number: N/A	Certificate number: AUS. Ex 2541X
IP Class N/A	Test authority: (BAS, PTB, SAA etc)

NO TAGS

Number of cables:	(1)

For each cable entry	~~gland~~ 1 CONDUIT	gland 2	others
Gland manufacturer:	NO DATA PAINTED		
Model:			
Gland type of protection: (d,e)			

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

EQ - CUT

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗
2	No undue accumulation of dust or dirt	all	X	⊗
3	Electrical insulation is clean and dry	all	X	

CORROSION VERMIN

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Refer SVO-41 notes

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag:	(ZSO/ZSC -41) -	Asset:	CHANNEL ISLAND OUTLET - MLV41
Circuit ID:	NONE	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	OUTDOOR - SUNSHADE

Data from Label

Apparatus type: (light, JB, Motor)	LIMIT SWITCH & ENCLOSURE	Type of protection: (d,e, i, n, p etc)	N/A
Manufacturer:	LIMITORQUE	Gas group: (IIA/B/C)	N/A
Full model number:	SY	Temp class: (T1-T6)	N/A
Serial number:	700315B-L001399	Certificate number:	N/A
IP Class	7	Test authority: (BAS, PTB, SAA etc)	N/A

Number of cables:	2

For each cable entry	gland 1	gland 2	~~others~~ ADAPTOR
Gland manufacturer:	NO INFO		NO INFO
Model:			
Gland type of protection: (d,e)			

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	- CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	- EQ
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	- UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	- SHEATH
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	⊗	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D. required.
- Remediate OV damaged cable sheath.
- N:1 hazardous area cert. detail available for JB and limits.

Reviewed by: N.GREEN
Date: 20/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: UV - 50 (ExeSB)	Asset:
Circuit ID: IJR03	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) JB	Type of protection: (d,e, i, n, p etc) Ex e
Manufacturer: GOVAN	Gas group: (IIA/B/C) IIC
Full model number: GE33S-1	Temp class: (T1-T6) T6
Serial number: 204679	Certificate number: AUS Ex. 869X
IP Class 67	Test authority: (BAS, PTB, SAA etc)

Number of cables: 5

For each cable entry	gland 1 x 1	gland 2 x 4	others PLUG.
Gland manufacturer:	CROUSE HINDS	CCG	CCG
Model:	TWAE IM20	00E1x 2055	M20 M25
Gland type of protection: (d,e)	Ex e AUS Ex1424	Ex d IIC, Ex e II AUS Ex 03.3844X	Ex e AUS Ex 2395/60

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION WITHIN
2	No undue accumulation of dust or dirt	all	X	⊗	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- corrosion to glands within JB requires attention and appropriate remediation.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: UV-50 (IS JB)	Asset:
Circuit ID: IJR1501	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) JB	Type of protection: (d,e, i, n, p etc) Ex ~~e~~ i
Manufacturer: GOVAN	Gas group: (IIA/B/C) IIC
Full model number: GE33S-1	Temp class: (T1-T6) T6
Serial number: 204679	Certificate number: AUS Ex ~~E6~~ X NO MARKING
IP Class 67	Test authority: (BAS, PTB, SAA etc)

Number of cables:	4

For each cable entry	gland 1 x1	gland 2 x3	others PLUG
Gland manufacturer:	CROUSE HINDS	CROUSE HINDS	GOVAN
Model:	TWAGIM16	TWAGIM12	M20
Gland type of protection: (d,e)	Ex e AUS Ex 1424	Ex e	Ex e AUS Ex 2476U

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	(X)
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)
4	There are no damage or evidence of unauthorised modifications	all	X	(X)
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	'n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	(X)
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊗	CORROSION WITHIN
2	No undue accumulation of dust or dirt	all	X	⊗	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Corrosion to glands + DIN rail within IB requires attention and appropriate remediation.

Reviewed by: N. GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: PT-52	Asset: WICKHAM POINT LINE PRESSURE
Circuit ID: PIT-52	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc) Ex d i a
Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C) IIC
Full model number: 3051CGSA02A1BM5K7D1SSQ 4TR	Temp class: (T1-T6) ~~(T5)~~, ~~T6 (60°C)~~ T4 (70°C)
Serial number: 01700765	Certificate number: AUS.Ex ~~03.1347X~~ 1249X
IP Class IP66	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1	~~gland 2~~ SURGE DEVICE	others
Gland manufacturer:	CROUSE HINDS	MTL	
Model:	TWAIM13	TP48-1	
Gland type of protection: (d,e)	-	-	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	⊗
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗
4	There are no damage or evidence of unauthorised modifications	all	X	⊗
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	⊗ ✓
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗ ✓
14	Entity calculation/documentation is available	i	X	X

DEVICE TAGGED WITH STAMP HOWEVER RECOMMEND S.S. TAG.

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	✓
2	No undue accumulation of dust or dirt	all	X	✓
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

-Device stamped with instrument tag of poor visibility. Recommend legible label/tag be installed similar to other transmitters on site.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: ~~PIT-51~~ PIT-51	Asset: WICKHAM POINT SUPPLY PRESSURE
Circuit ID: PIT 51	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, etc) Ex ~~e~~ ia
Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C) IIC
Full model number: 3051CGSA02A1B1M5K7A1I5 Q4TR	Temp class: (T1-T6) ~~(80°C) T4~~, ~~T6 (40°C)~~
Serial number: 01700764	Certificate number: AUS.Ex ~~03.1347X~~ 1249X
IP Class 66	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1	

For each cable entry	gland 1	gland 2	~~others~~ SURGE DEVICE
Gland manufacturer:	CROUSE HINDS		MTL
Model:	TWAIM 13		MP48 – 1
Gland type of protection: (d,e)	-		?

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	RECOMMEND SS. ID TAG.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	(X)	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	(X)
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Refer comments PIT-52

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

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Specifications

General

Device ID or tag: -	Asset: HV50A
Circuit ID: ZS50B	Physical location: DARWIN GTY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor)	Type of protection: (d,e, i, n, p etc) d (I.S. INSTALL)
Manufacturer: ELOMATIC	Gas group: (IIA/B/C) IIC
Full model number: HJ	Temp class: (T1-T6) T6
Serial number: 10017702/1	Certificate number: AUS Ex 1246
IP Class 66	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1	

For each cable entry	gland 1	gland 2	~~others~~ PLUG
Gland manufacturer:	CROUSE HINDS ?		CMP
Model:	TWA1M13 ?		747 AM20
Gland type of protection: (d,e)	-		Ex de
			SEAL 2 MBX 1002

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	UV (paint)
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~Yes:~~ List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required.
- Moderate UV damage to sheath.

Reviewed by: N.GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: (UY0-50) —	Asset: UV-50
Circuit ID: UY0-50	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) SOLENOID VALVE	Type of protection: (d,e, i, n, p etc) Ex me
Manufacturer: PARKER LUCIFER	Gas group: (IIA/B/C) IIC
Full model number: —	Temp class: (T1-T6) T3, T4
Serial number:	Certificate number: AUS.Ex 321
IP Class 65	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	CCG		
Model:	00 E1 Ex 2055		
Gland type of protection: (d,e)	d IIC, e II		
	AUS Ex 03.3844X - WAGNER?		

Inspection → Circle as checked

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required.
- Verify washer (n.i cert.) at gland entry to solenoid complies with Ex e' install.

Reviewed by: N.GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: (UYC-50)–	Asset: UV-50
Circuit ID: UYC-50	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) SOLENOID VALVE	Type of protection: (d,e, i, n, p etc) Ex me
Manufacturer: PARKER LUCIFER	Gas group: (IIA/B/C) IIC
Full model number: –	Temp class: (T1-T6) T3, T4
Serial number:	Certificate number: AUS Ex 321
IP Class 65	Test authority: (BAS, PTB, SAA etc)

Number of cables:	1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	CCG		
Model:	CCG1 Ex 20 SS		
Gland type of protection: (d,e)	d IIC, e II		

AUS Ex 03.3844X – WASHER ?

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required.
- Verify washer (mil cert.) at gland entry to solenoid complies with 'Ex e' install.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag: - (250 + 250 S0)	Asset: UV-050
Circuit ID: - 250 & 50	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

Apparatus type: (light, JB, Motor) LIMIT SWITCH	Type of protection: (d,e, i, n, p etc)
Manufacturer: ? - (OMATIC?)	Gas group: (IIA/B/C)
Full model number: –	Temp class: (T1-T6)
Serial number: –	Certificate number:
IP Class –	Test authority: (BAS, PTB, SAA etc)

NO LABEL.

Number of cables:

For each cable entry	gland 1	gland 2	others BLDG.
Gland manufacturer:	CCG		REDAPT
Model:	DO EIEY 20SS		PA-D M25
Gland type of protection: (d,e)	Exd IIC Gr e 20SS AUS Ex 03.3844X		Ex d I & IIC SIRA 99ATEX1113

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	- EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	⊗
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	⊘
2	No undue accumulation of dust or dirt	all	X	⊘
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

~~Yes~~: List action required

Contractor (write): Inspector N. GREEN **Supervisor** **Date:** 9/9/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Equipment I.D. required.
- N:1 certification exists to AUS Ex standards.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	- (ZS SOC)	Asset:	UV SO DOOR LIMIT
Circuit ID:	ZS SOC (AT UV-SO JB)	Physical location:	DARWIN CITY GATE
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	LIMIT SWITCH JB	Type of protection: (d,e, i, n, p etc)	d
Manufacturer:	GOVAN	Gas group: (IIA/B/C)	IIB
Full model number:	FG4-RA	Temp class: (T1-T6)	T6
Serial number:	20423104	Certificate number:	AUS Ex 157X
IP Class	IP65	Test authority: (BAS, PTB, SAA etc)	

Number of cables:	

For each cable entry	gland 1	gland 2 (SWITCH / ADAPTOR)	others (PLUG)
Gland manufacturer:	?	?	?
Model:	?	?	?
Gland type of protection: (d,e)		?	?

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X
2	Equipment ID or circuit ID is correct	all	X	X
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	X
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	X	
9	Hermetically sealed devices are undamaged	n	X	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	
11	Motor fans have sufficient clearance	motors only	X	
12	Installation clearly labelled	i	X	X
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X
14	Entity calculation/documentation is available	i	X	X

	B Installation			
1	Type of cable is appropriate, cables are undamaged	all	X	X
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	X	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	X	
11	No obstructions adjacent to flameproof flanged joint	d	X	X
12	Ducts, pipes and enclosures are in good condition	p	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	X
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: (circled) | List action required

Contractor (write): Inspector N.GREEN **Supervisor**	**Client (write): Inspector**
Date: 21/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment ID required
- Further inspection on site required, only photographic inspection completed.

Reviewed by: N.GREEN
Date: 21/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

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Specifications

General

Device ID or tag:	IR SECURITY BEAM x2	Asset:	STATION SECURITY - RIGHT HAND CORNER NEAR BUILDING
Circuit ID:	NONE	Physical location:	DARWIN CITY GATE
Area classification :	ZONE 11 A ?	Environment: (hot?)	OUTDOOR

Data from Label

Apparatus type: (light, JB, Motor)		Type of protection: (d,e, i, n, p etc)	NO INFORMATION ✓
Manufacturer:	SUNWAVE	Gas group: (IIA/B/C)	
Full model number:		Temp class: (T1-T6)	
Serial number:		Certificate number:	
IP Class		Test authority: (BAS, PTB, SAA etc)	

Number of cables:

For each cable entry	~~gland 1~~ J/BOX	gland 2 x2	~~others~~ CONDUIT
Gland manufacturer:	CLIPSAL		PVC ANACONDA
Model:	H.D.T.	BIX BOYD	
Gland type of protection: (d,e)	IP56 JUNCTION BOX	IP56	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	⊗	- ELR - CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	⊗	
4	There are no damage or evidence of unauthorised modifications	all	X	⊗	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	
2	Sealing of ducts and/or conduits is satisfactory	all	X	⊗	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	⊗	- STAND
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Equipment + cct I.D. required
- Equipment not rated for hazardous area installation.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

Based on AS/NZS 60079 part 17

SITZLER

Ref: I:\data\sitzler\company operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,ex-i,ex-n,ex-p and other ex devices.doc

Specifications

General

Device ID or tag: –	Asset: ANALYSER SHELTER
Circuit ID: POOD?	Physical location: DARWIN CITY GATE
Area classification :	Environment: (hot?)

Data from Label

LIGHT + SWITCH (ILLEGIBLE)

Apparatus type: (light, JB, Motor) LIGHT + SWITCH	Type of protection: (d,e, i, n, p etc) d + d
Manufacturer: BURN BRITE + WILO	Gas group: (IIA/B/C) IIB
Full model number: FLP2-2x40-240 HPF ME + WPS110	Temp class: (T1-T6) T5
Serial number:	Certificate number: AUS Ex 229 + AUS Ex???
IP Class IP55	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1 LIGHT	gland 2 x 2 SWITCH	others PLUG
Gland manufacturer:	ALCO	?	?
Model:	FLPW 205	?	?
Gland type of protection: (d,e)	Ex d	?	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	(X)	GR - LIGHT - SW.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	(X)	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	X	
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	(X)	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	(X)	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	(X)	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	(X)	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	
2	No undue accumulation of dust or dirt	all	X	
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector N. GREEN **Supervisor**	**Client (write): Inspector**
Date: 9/9/11	**Date:**

Device ID or tag

Action required to make device compliant:

- Light + switch labels required
- UV damaged power cable requires remediation.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices

SITZLER

Based on AS/NZS 60079 part 17

Ref: I:\data\sitzler\company operations\darwin\tenders\sbs\11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,ex-i,ex-n,ex-p and other ex devices.doc

Specifications

General

Device ID or tag:	LSH-30	Asset:	VESSEL T-1495 (SLOPS TANK)
Circuit ID:	J027	Physical location:	DARWIN CITY GATES
Area classification :		Environment: (hot?)	

Data from Label

Apparatus type: (light, JB, Motor)	LEVEL SWITCH	Type of protection: (d,e, i, n, p etc)	
Manufacturer:	?	Gas group: (IIA/B/C)	
Full model number:	?	Temp class: (T1-T6)	
Serial number:	?	Certificate number:	
IP Class		Test authority: (BAS, PTB, SAA etc)	

NOT LEGIBLE

NOT LEGIBLE

Number of cables:	1

ADAPTOR / BARRIER?

For each cable entry	gland 1	~~gland 2~~	others
Gland manufacturer:	ALL	?	
Model:	WG202	?	
Gland type of protection: (d,e)	NIL	?	

Inspection → **Circle as checked**

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	
2	Equipment ID or circuit ID is correct	all	X	X	
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	⊗	LOOSE GLAND
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	⊗	BLUE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	X	⊗	✓
14	Entity calculation/documentation is available	i	X	X	

	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	⊗	UV + CABLE SUPPORT
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	
3	Stopper boxes or barrier glands are properly filled	d	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	X	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		
9	Special certification conditions U,X or B have been complied with	all	X		
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	X	
12	Ducts, pipes and enclosures are in good condition	p	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
14	Protective gas flow/pressure is adequate	p	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	p	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	X	

C Environment

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(X)	CORRODE
2	No undue accumulation of dust or dirt	all	X	X	
3	Electrical insulation is clean and dry	all	X		

Faults found? (circle as appropriate)

No:

Yes: List action required

Contractor (write): Inspector D. Williams **Supervisor** **Date:** 9/9/11	**Client (write): Inspector** **Date:**

Device ID or tag

Action required to make device compliant:

- Tighten loose gland
- Replace damaged (UV) blue sheath to cable.
- ILLEGIBLE equipment nameplate, severe corrosion.
- Provide cable support.

Reviewed by: N. GREEN
Date: 9/9/11
Priority:

Comments:

All action items now completed: ☐
Job closed: ☐

Device now fully compliant, spreadsheet register has been updated
Supervisor (write):
Date:

INSPECTION CHECK SHEET
Intrinsically Safe Ex i

TAG/IDENTIFICATION	DESCRIPTION

Area Classification - Zone 0 1 2 20 21 22 Non Hazardous - Group I IIA IIB IIC - Temp T1 T2 T3 T4 T5 T6

Record Name Plate Details						Record other nameplate information that may be relevant
Manufacturer		Vin		Chin		
Serial No.		Lin		Lin		
Model						
Certificate no.		T		IP		
Certifying authority						

Inspection Type Performed (I=Initial, P=Periodic, S=Sample)	**I**	**P**	**S**	
Inspection Grade Performed (D=Detailed, C=Close, V=Visual)	**D**	**C**	**V**	Detailed requires de-energization

Equipment Y=OK, N=Not Acceptable, N/A=Not Applicable, N/C=Not Checked					**Inspect Grade**	**Remarks**
Equipment is Australian or IEC Certified	Y	N	N/A	N/C	DCV	
EX markings are suitable for the area	Y	N	N/A	N/C	DCV	
Equipment is clearly marked and has appropriate tag/identification details	Y	N	N/A	N/C	DCV	
Enclosure is not damaged and maintains its weatherproofing	Y	N	N/A	N/C	DCV	
Terminations are tight	Y	N	N/A	N/C	DC	
All unused conductors terminated	Y	N	N/A	N/C	DC	
Bolts, bungs, plugs/blank plates installed and tight	Y	N	N/A	N/C	DCV	
Fuses and lamps are correct rating	Y	N	N/A	N/C	DCV	
No unautorised modifications (Y=OK)	Y	N	N/A	N/C	DCV	
Installation					**Grade**	**Remarks**
Cable type is as per the documentation	Y	N	N/A	N/C	D	
IS Entity and cable parameters are suitable for installation	Y	N	N/A	N/C	D	
The device is securely mounted	Y	N	N/A	N/C	DC	
Cables/conduits in acceptable condition	Y	N	N/A	N/C	D	
Cables/conduit entry correct, complete, and tight	Y	N	N/A	N/C	DCV	
No excessive vibration present that may cause conductors to work loose (Y=OK)	Y	N	N/A	N/C	DCV	
Segregation between IS and non IS circuits at junction boxes	Y	N	N/A	N/C	DCV	
Segregation between IS and non IS circuits in cable ladder and conduit	Y	N	N/A	N/C	DCV	
Earthing and equipotential bonding satisfactory	Y	N	N/A	N/C	D	
Insulation resistance is satisfactory (NB Danger of MEGGER testing HA)	Y	N	N/A	N/C	D	
Cable screens earthed as per documentation (normally one point only)	Y	N	N/A	N/C	D	
Barriers					**Grade**	**Remarks**
Record Safety Barriers manufacturer and model no. (available on device = Y)	Y	N	N/A	N/C	DC	
Equipment is Australian or IEC Certified (Enter certification details in 'Remarks')	Y	N	N/A	N/C	DCV	
Record Safety Barriers certification details (available on device = Y)	Y	N	N/A	N/C	DC	
Safety Barriers are the correct type as per the drawings	Y	N	N/A	N/C	DC	
Safety Barriers are securely connected to the earth bar	Y	N	N/A	N/C	DCV	
Barrier/Isolator terminations are tight	Y	N	N/A	N/C	DCV	
Maximum voltage on the safe side of the barrier/isolator is 240V	Y	N	N/A	N/C	DCV	
IS circuits are all free from external power circuit infiltration	Y	N	N/A	N/C	DCV	
No energy storing devices in excess of the max energy permitted	Y	N	N/A	N/C	DC	
Relays acting as safety barriers are in good condition	Y	N	N/A	N/C	DCV	
Earth continuity from barrier bar to the transformer neutral point is <1ohm	Y	N	N/A	N/C	D	Check one connection at a time
Environment					**Grade**	**Remarks**
Equipment adequately protected against corrosion, weather, vibration, etc	Y	N	N/A	N/C	DCV	
Dust and dirt on the equipment and cable are within acceptable limit	Y	N	N/A	N/C	DCV	
Special conditions					**Grade**	**Remarks**
Special conditions on certificate are satisfied	Y	N	N/A	N/C	D	

Notes:

Inspected:_____ Date:_____ Checked:_____ Date:_____

INSPECTION CHECK SHEET - Increased Safety Ex e

TAG/IDENTIFICATION	DESCRIPTION

Area Classification - Zone 0 1 2 Non Hazardous - Group I IIA IIB IIC - Temp T1 T2 T3 T4 T5 T6

Record Name Plate Details						Record other nameplate information that may be relevant
Manufacturer		KW		FLC		
Serial No.		Volts		RPM		
Model						
Certificate No.		T		IP		
Certifying authority						

Inspection type performed (I=Initial, P=Periodic, S=Sample)	**I**	**P**	**S**	
Inspection Grade Performed (D=Detailed, C=Close, V=Visual)	**D**	**C**	**V**	Detailed requires de-energization

Equipment Y=OK, N=Not Acceptable, N/A=Not Applicable, N/C=Not Checked					**Inspect Grade**	**Remarks**
Equipment is Australian or IEC Certified	Y	N	N/A	N/C	DCV	
EX markings are suitable for the area	Y	N	N/A	N/C	DCV	
Equipment is clearly marked and has appropriate tag/identification details	Y	N	N/A	N/C	DCV	
Enclosure is not damaged and maintains its weatherproofing (min IP54)	Y	N	N/A	N/C	DCV	
Enclosure gaskets are in a satisfactory condition	Y	N	N/A	N/C	D	
Bolts, bungs, plugs/blank plates installed and tight	Y	N	N/A	N/C	DCV	
Terminals are sized correctly for the rating	Y	N	N/A	N/C	D	
Conductors > 0.5mm2 for multistranded and 1mm2 for single strand	Y	N	N/A	N/C	D	
No chafing parts that may cause local hot spots (motor fans) (Y=OK)	Y	N	N/A	N/C	D	
Guards are correctly fitted	Y	N	N/A	N/C	D	
No unautorised modifications (Y=OK)	Y	N	N/A	N/C	DCV	
Lamp rating, type and position are correct	Y	N	N/A	N/C	D	
Installation					**Grade**	**Remarks**
Equipment carries correct circuit identification at switchboard and local isolator	Y	N	N/A	N/C	D	
Effective means of isolation of all live conductors (including neutral)	Y	N	N/A	N/C	D	
Installation is in compliance with documentation	Y	N	N/A	N/C	DC	
Cable type is as per the documentation	Y	N	N/A	N/C	D	
The device is securely mounted	Y	N	N/A	N/C	DCV	
Cables/conduits in acceptable condition	Y	N	N/A	N/C	DCV	
Cables/conduit entry correct, complete, and tight (Exd or Exe glands used)	Y	N	N/A	N/C	DCV	
Exd glands have additional weatherproofing	Y	N	N/A	N/C	DCV	
Electrical connections are tight	Y	N	N/A	N/C	D	
Creapage and clearance distance are maintained	Y	N	N/A	N/C	D	
All unused conductors terminated in Exe terminals	Y	N	N/A	N/C	D	
Earthing and equipotential bonding satisfactory	Y	N	N/A	N/C	DCV	
Insulation resistance is satisfactory (NB Danger of MEGGER testing HA)	Y	N	N/A	N/C	D	
Motor parameters (Ia/In and te) and TOLs coordinate (record TOL mfr/model)	Y	N	N/A	N/C	D	
Cable Glands and adaptors					**Grade**	**Remarks**
Cable glands details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	DCV	
Cable glands certificate details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	DCV	
Adaptors and plugs details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	DC	
Glands and adaptors Ex markings are suitable for area	Y	N	N/A	N/C	DCV	
Environment					**Grade**	**Remarks**
Equipment adequately protected against corrosion, weather, vibration, etc	Y	N	N/A	N/C	DCV	
Dust and dirt on the equipment and cable are within acceptable limit	Y	N	N/A	N/C	DCV	
Special conditions					**Grade**	**Remarks**
Special conditions on certificate are satisfied	Y	N	N/A	N/C	D	

Notes:

Inspected:_____ Date:_____ Checked:_____ Date:_____

Hazardous Area Check Sheet
Flameproof Ex d

TAG/IDENTIFICATION	DESCRIPTION

Area Classification - Zone 0 1 2 Non Hazardous - Group I IIA IIB IIC - Temp T1 T2 T3 T4 T5 T6

Record Name Plate Details						Record other nameplate information that may be relevant
Manufacturer		KW		FLC		
Serial No.		Volts		RPM		
Model						
Certificate No.		T		IP		
Certifying authority						

Inspection Type Performed (I=Initial, P=Periodic, S=Sample)	**I**	**P**	**S**		
Inspection Grade Performed (D=Detailed, C=Close, V=Visual)	**D**	**C**	**V**	Detailed requires de-energization	

Equipment Y=OK, N=Not Acceptable, N/A=Not Applicable, N/C=Not Checked					**Inspect Grade**	**Remarks**
Equipment is Australian or IEC Certified	Y	N	N/A	N/C	DCV	
EX markings are suitable for the area	Y	N	N/A	N/C	DCV	
Equipment is clearly marked and has appropriate tag/identification details	Y	N	N/A	N/C	DCV	
Enclosure is not damaged and maintains its flameproof characteristics	Y	N	N/A	N/C	DCV	
Locking sealing, fastening devices are of type certified by manufacturer	Y	N	N/A	N/C	DCV	
Locking sealing, fastening devices operate correctly and are tight	Y	N	N/A	N/C	DC	
Bolts, bungs, plugs/blank plates installed and tight	Y	N	N/A	N/C	DCV	
Sealing gaskets and components in acceptable condition	Y	N	N/A	N/C	DCV	
Flange faces are clean and undamaged	Y	N	N/A	N/C	D	
Flange gap dimensions are less than_____ mm	Y	N	N/A	N/C	DC	
No unauthorised modifications (Y= OK)	Y	N	N/A	N/C	DCV	
Equipment is clear of obstructions (minimum dimensions 40mm)	Y	N	N/A	N/C	DCV	
No chafing parts that may cause local hot spots (motor fans) (Y=OK)	Y	N	N/A	N/C	D	
Guards are correctly fitted	Y	N	N/A	N/C	D	
Lamp rating, type and position are correct	Y	N	N/A	N/C	D	

Installation					**Grade**	**Remarks**
Equipment carries correct circuit identification at switchboard and local isolator	Y	N	N/A	N/C	D	
Effective means of isolation of all live conductors (including neutral)	Y	N	N/A	N/C	D	
Cable type is as per the documentation	Y	N	N/A	N/C	D	
The device is securely mounted	Y	N	N/A	N/C	DCV	
Cables/conduits in acceptable condition	Y	N	N/A	N/C	DCV	
Cables/conduit entry correct, complete, and tight with sufficient threads	Y	N	N/A	N/C	DCV	
Sealing of conduits, ducts or other connections is satisfactory	Y	N	N/A	N/C	D	
Integrity of conduit system and mixed system interface satisfactory	Y	N	N/A	N/C	D	
Earthing and equipotential bonding satisfactory	Y	N	N/A	N/C	DCV	
Insulation resistance is satisfactory (NB Danger of MEGGER testing HA)	Y	N	N/A	N/C	D	
Protection devices (Limit sws, phase rot, TOLs) operate correctly	Y	N	N/A	N/C	D	

Cable Glands and adaptors					**Grade**	**Remarks**
Cable glands details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	DCV	
Cable glands certificate details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	DCV	
Adaptors and plugs details available, record (available=Y, not recorded=N/C)	Y	N	N/A	N/C	D	
Adaptors and plugs have sufficient engaged threads	Y	N	N/A	N/C	DCV	
Glands and adaptors Ex markings are suitable for area	Y	N	N/A	N/C	DCV	

Environment					**Grade**	**Remarks**
Equipment adequately protected against corrosion, weather, vibration, etc	Y	N	N/A	N/C	DCV	
Dust and dirt on the equipment and cable are within acceptable limit	Y	N	N/A	N/C	DCV	

Special conditions					**Grade**	**Remarks**
Special conditions on certificate are satisfied	Y	N	N/A	N/C	D	

Notes:

Inspected:_____ Date:_____ Checked:_____ Date:_____

11 Overhaul, Repair, Modification and Replacement Register

Documentation in relation to this section is to be maintained by APA Group.

This Section contains the sample repair and examination report(s).

REPAIR AND EXAMINATION REPORT FOR ENCAPSULATED EQUIPMENT (EX 'm')

FYFE Earth Partners
ENVIRONMENT DEVELOPMENT RESOURCES

General

Tag no.:	Site:
P&ID:	Area Classification:

Equipment Details

Equipment type:	Gas group (IIA/B/C):
Manufacturer:	Temp class (T1-T6):
Model no.:	Certificate no.:
Serial no.:	Test authority:

Operator

Name:	Identification no.:
Company:	Company registration:

Condition upon receipt:……
Old repair label details:……
Reported fault (if any):……
Repair action:……
Parts replaced:……..
Test performed:……

Results:

Item	Description of check	Remarks
(a)	Cracks in compound	
(b)	Crazing	
(c)	Exposure of encapsulated parts	
(d)	Flaking	
(e)	Shrinking	
(f)	Swelling	
(g)	Decomposition	
(h)	Discoloration	
(i)	Failure of adhesion	
(j)	Change in hardness	

Certification drawing no(s).:……

Remarks:……
……
……

I,……confirm that the above equipment, repaired/overhaul/modified (strike out whichever is not applicable) as above, complies/does not comply with the relevant requirements of AS/NZS 3800 (including markings as required by Appendix D) and AS……..and that this Report has been recorded in the logbook of the service facility.

Sign:…… Date:…../……./……

REPAIR AND EXAMINATION REPORT FOR INTRINSICALLY SAFE EQUIPMENT (EX 'i')

General

Tag no.:	Site:
P&ID:	Area Classification:

Equipment Details

Equipment type:	Gas group (IIA/B/C):
Manufacturer:	Temp class (T1-T6):
Model no.:	Certificate no.:
Serial no.:	Test authority:

Competent Operator

Name:	Identification no.:
Company:	Company registration:

Condition

Condition upon receipt:
Old repair label details:
Reported Fault (if any):

Action

Repair action:…… …… …… …… …… ……
Remarks:…… …… …… …… …… …… ……

I,……confirm that the above equipment, repaired/overhaul/modified (strike out whichever is not applicable) as above, complies/does not comply with the relevant requirements of AS/NZS 3800 (including markings as required by Appendix D) and AS……..and that this Report has been recorded in the logbook of the service facility.

Sign:…… Date:……/……./……

REPAIR AND EXAMINATION REPORT FOR INCREASED SAFETY ENCLOSURES (EX 'e')

FYFE Earth Partners
ENVIRONMENT DEVELOPMENT RESOURCES

General

Tag no.:	Site:
P&ID:	Area Classification:

Equipment Details

Equipment type:	Gas group (IIA/B/C):
Manufacturer:	Temp class (T1-T6):
Model no.:	Certificate no.:
Serial no.:	Test authority:

Competent Operator

Name:	Identification no:
Company:	Company Registration:

Enclosure Condition

Old repair label no.:		
External surface cleaned for inspection - Yes / No		
Covers and fasteners:		Base of enclosure:
Threaded holes:		External corrosion:
Surface coating:		Gland entries and glands:
General external condition:		
Enclosure dismantled:		Degree of protection: IP
Internal Condition - Dust/Liquids:		Corrosion: Heat:
Missing parts:		
Cables and terminations:		Terminal blocks:
Earth terminals:		Insulation:
Windows and seals:		Actuators and seals:
Ex 'de' parts:		Meters:
Lamps:		Transformers:
Switches:		Others:
Relays:		Interlocks:
Luminaire:		Lamp power (W):
Transparent part:		Lampholders:
Ballasts:	Capacitors:	Batteries:

Action

Repair ……
Remarks:…… ……

I,……confirm that the above equipment, repaired/overhaul/modified (strike out whichever is not applicable) as above, complies/does not comply with the relevant requirements of AS/NZS 3800 (including markings as required by Appendix D) and AS……..and that this Report has been recorded in the logbook of the service facility.

Sign:…… Date:……/……./……

REPAIR AND EXAMINATION REPORT FOR ELECTRICAL EQUIPMENT INSTALLED WITHIN FLAMEPROOF ENCLOSURE (EX'd')

General

Tag no.:	Site:
P&ID:	Area Classification:

Equipment Details

Equipment type:	Gas group (IIA/B/C):
Manufacturer:	Temp class (T1-T6):
Model no.:	Certificate no.:
Serial no.:	Test authority:

Operator

Name:	Identification no.:
Company:	Company registration:

Equipment Condition Checklist

Item	Description of check	No work	Repaired	Replaced
(a)	Isolator mechanism and switch operation			
(b)	Earthing device and operation			
(c)	All auxiliary mechanisms, trip bars, latching arrangements, etc.			
(d)	All locking devices, function and operation			
(e)	All parts for mechanical condition			
(f)	All insulation checked – no heat, cracks, etc.			
(g)	Phase barriers fitted correctly and functional			
(h)	Oil levels and/or gas pressure			
(i)	Gas pressure-sensing devices			
(J)	All wiring and terminations			
(k)	Earth continuity; phase/earth fault lock units			
(l)	Overcurrent, overload and earth-fault devices			
(m)	Earth-fault trip devices			
(n)	Timing devices			
(o)	Temperature-sensing devices			
(p)	Transformer connections, bolts, tapes. bracing, insulators and fittings, etc.			
(q)	Installation			
(r)	Machine cables and glands			

Details of repair or modification (attach extra pages if required):

Results of insulation resistance tests on transformers:

Transformers ratio:…….. Capacity:……. Serial no.:……

Manufacturer:…….. Type of cooling:……

Tested with:……. V (megohmmeter)

Primary winding to secondary winding:…… MΩ

Primary winding to earth:…….. MΩ

Secondary winding to earth:…….. MΩ

Earth continuity of earth screen to core:……

Continued….

REPAIR AND EXAMINATION REPORT FOR ELECTRICAL EQUIPMENT INSTALLED WITHIN FLAMEPROOF ENCLOSURE (EX'd')

Assembled unit tested for insulation resistance with: V megohmmeter, and power frequency tested on the following circuits:

Circuit description	Insulation resistance MΩ	Test voltage kV	Test frequency Hz	Result

Certification no(s).……..
……
Remarks:……
……
……
……
……
……

I,…….confirm that the above equipment, repaired/overhaul/modified (strike out whichever is not applicable) as above, complies/does not comply with the relevant requirements of AS/NZS 3800 (including markings as required by Appendix D) and AS…….and that this Report has been recorded in the logbook of the service facility.

Sign:…… Date:…../……/……

REPAIR AND EXAMINATION REPORT FOR FLAMEPROOF ENCLOSURE (EX'd')

General

Tag no.:	Site:
P&ID:	Area Classification:

Equipment Details

Equipment type:	Gas group (IIA/B/C):
Manufacturer:	Temp class (T1-T6):
Model no.:	Certificate no.:
Serial no.:	Test authority:

Operator

Name:	Identification no.:
Company:	Company registration:

Equipment Condition Checklist

Item	Description of check	Remarks
(a)	Check of external and internal damage	
(b)	Dimensional check	
(c)	Corrosion on flamepaths	
(d)	Result of static pressure test	
(e)	Check of flanged joint surfaces	
(f)	Check of all threaded holes	
(g)	Check of all windows and lenses	
(h)	Check of breathers	
(i)	Check of all bolt holes, studs, screws,	
(J)	Check of all gland entries and fixing	
(k)	Check of all cables glands	
(l)	Check of all handhole and inspection	
(m)	Check of all mechanical interlocks	
(n)	Check of all flamepath gaps	

Main control panel

1. Max. out of plane of box flanges:……
2. Max. out of plane of cover:……
3. Max. flameproof gap when bolted up:……
4. Max. diametral clearance of spindles:……
5. Max. diametral clearance of gland to gland apertures:……
6. Static pressure test – pressure:……
7. Water jacket – pressure test:……Capacity:……

Certification drawing no(s).:……

Remarks:……
……
……

I,……confirm that the above equipment, repaired/overhaul/modified (strike out whichever is not applicable) as above, complies/does not comply with the relevant requirements of AS/NZS 3800 (including markings as required by Appendix D) and AS…….and that this Report has been recorded in the logbook of the service facility.

Sign:…… Date:……/……/……

12 Schedule of Equipment and Conditions Requiring Compliance Status Attention

Tag	P&ID No.	Location	Description
ADP1498-ZSO-41	AD 1498-7001	1498-MLV-41	Nil hazardous area certification detail available for JB and limits
ADP1498-SVO-41	AD 1498-7001	1498-MLV-41	Nil Aus Ex certification available
ADP1498-SVC-41	AD 1498-7001	1498-MLV-41	Nil Aus Ex certification available
ADP1498-PY-15	AD 1498-7002	TCV-15	Refer Ex d/Ex i notes for PY-17 regarding barrier
ADP1498-PY-17	AD 1498-7002	TCV-17	Cable appears to have blue sheath, however device Ex rating not available and IS barrier not confirmed within control hut. Item (DVC 5010) does contain duel Ex d/Ex i certification. Further investigation required
			Uncertified gland/plug if Ex d method of protection
ADP1498-ISJB-1	AD 1498-7002	FS-1	Remove from installation or make safe and identify cable, JB etc.
ADP1498-ISJB-2	AD 1498-7002	FS-2	Remove from installation or make safe and identify accordingly
ADP1498-ZSC-44	DB0000-7000	Gas Off take	Equipment and certification ID required
			Nil evidence of I.S. Installation hence flameproof installation considered
			Uncertified gland, plug and adaptor required replacement

Tag	P&ID No.	Location	Description
ADP1498-PT-51	WP0000-7001	Wickham Point Pipeline	Refer comments for PT-52
ADP1498-UYO-50	WP0000-7001	Wickham Point Pipeline	Verify washer (nil cert.) at gland entry to solenoid complies with Ex e install
ADP1498-UYC-50	WP0000-7001	Wickham Point Pipeline	Verify washer (nil cert.) at gland entry to solenoid complies with Ex e install
ADP1498-ZSO-50	WP0000-7001	Wickham Point Pipeline	Nil certification exists to Australian Ex standards
ADP1498-ZSC-50	WP0000-7001	Wickham Point Pipeline	Nil certification exists to Australian Ex standards
ADP1498-DPT-16	AD 1498-7002	FS-1	Ex certification label not visible, provide new label and verify certification as IS
ADP1498-DPT-18	AD 1498-7002	FS-2	Ex certification label not visible, provide new label and verify certification is I.S.
			Un-certified plug adaptor
ADP1498-SVC-44	DB0000-7000	V44	Equipment and certification I.D. Required
ADP1498-LP-SW	DB0000-7000	Standby Run	Equipment Ex d rated however aid conduit system installed. Nil evidence of I.S. Circuit, further investigation required to verify design method of installation
ADP1498-LP-SW	DB0000-7000	Duty Run	Equipment Ex d rated however aid conduit system installed. Nil evidence of I.S. Circuit, further investigation required to verify design method of installation

Tag	P&ID No.	Location	Description
ADP1498-TURBINE METER	DB0000-7000	Standby Run	Ex certification not applicable to Australian Standards, conformity assessment required
ADP1498-TURBINE METER	DB0000-7000	Duty Run	Ex certification not applicable to Australian Standards, conformity assessment required
ADP1498-JB	AD 1498-7002	Analyser Shelter	Verify adapting reducer complies to maintain I.P. Of installation, Ex cert etc
ADP1498-MA-27	AD 1498-7002	Analyser Shelter	Nil Australian Certification detail available, conformity assessment required. Ex d or e device assumed as Ex c install as per connecting JB
ADP1498-JB	AD 1498-7002	MA27-Analyser Shelter	Verify maximum circuit power dissipation does not exceed 7 watts
			Verify adaptor on circuit gland to be Ex e rated, replace as required
ADP1498-GC 28	AD 1498-7002	Moisture Analyser	Verify conduit between GC and posifit JB is installed Ex d method of protection to Aus Cert/Standards
ADP1498-JB	AD 1498-7002	Analyser Shelter	Verify conduit between JB and GC is installed Ex e method of protection to Aus cert/standards
ADP1498-IR SECURITY BEAM		Station Security – Right Hand Corner	Equipment not rated for hazardous area installations