

# PINE CREEK METER STATION HAZARDOUS AREA DOSSIER



# FYFE REFERENCE: 18756-5-HAD-012 APA REFERENCE: HAD DATA REPOSITORY/ ADP\_1317\_PCS

Prepared by:

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Reviewed by:

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Date:

Date: 18-Nov-2011

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### **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 AReport on integrity of explosion protected equipment in hazardous areasUTE NES 107Install explosion-protected equipment and wiring systems (Ex)UTE NES 707Design 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.
- *I)* 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 (Éx 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

Prepared by Sarah Petrides Administration Assistant

Approved by Sam Zacha Managing Director

Date of Issue: 5 December 2007



This statement of attainment is recognised within the Australian Qualifications Framework

Certificate No.: 1089-1-07

National Provider Code 51160

# This is to certify that

# Neville Green

# **GPA Engineering Pty Ltd**

# Completed the 3 day Electrical Safety in Hazardous Areas



26th to 28th February 2001

Signed:



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

#### FYFE Earth Partners ENVIRONMENT RESOURCES

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#### **Revision History:**

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



# 1 Site Information

An inspection on the Pine Creek meter station site was performed on 7 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.

Pine Creek meter station is located at KP1317 on the ADP.

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 an 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.

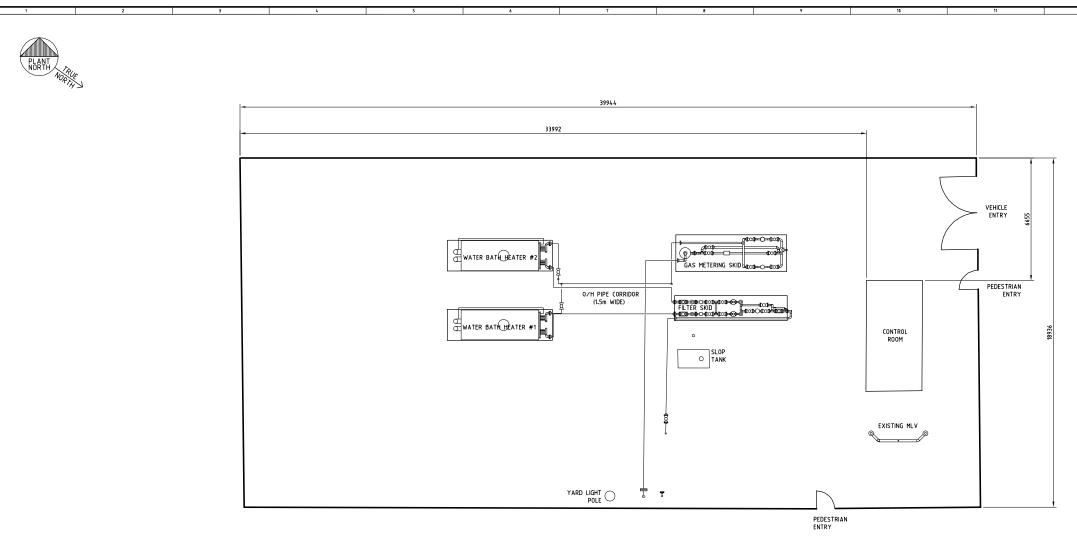
Instrument gas is conditioned centrally for the site from a connection from the outlet knock out pot.

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.

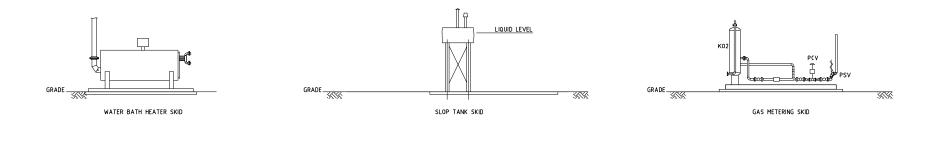


The site arrangement drawings and P&IDs for Pine Creek meter station can be found overleaf.

Drawing Numb	er Description	Revision
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Fyfe Updated I	Plot Plan	
AD 1317-6014	Meter Station– Pine Creek MS	0
P&ID		
AD 1317-7000	Pine Creek Station Gas Conditioning Skid	0
AD 1317-7001	Pine Creek Station Water Bath Heater No 1A & No 1B	0
AD 1317-7002	Pine Creek Station Metering Skid	0
AD 1317-7003	Pine Creek Station Slops Tank	0

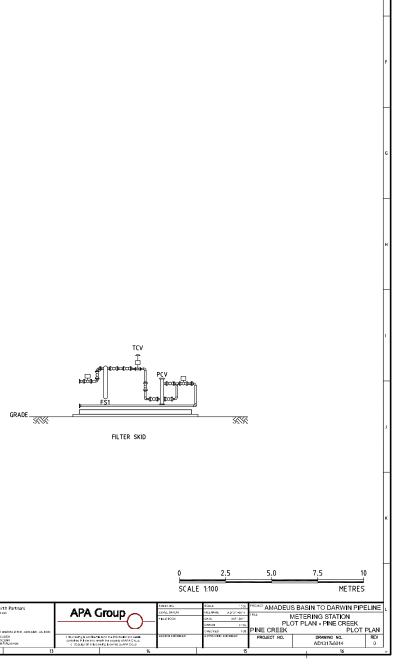


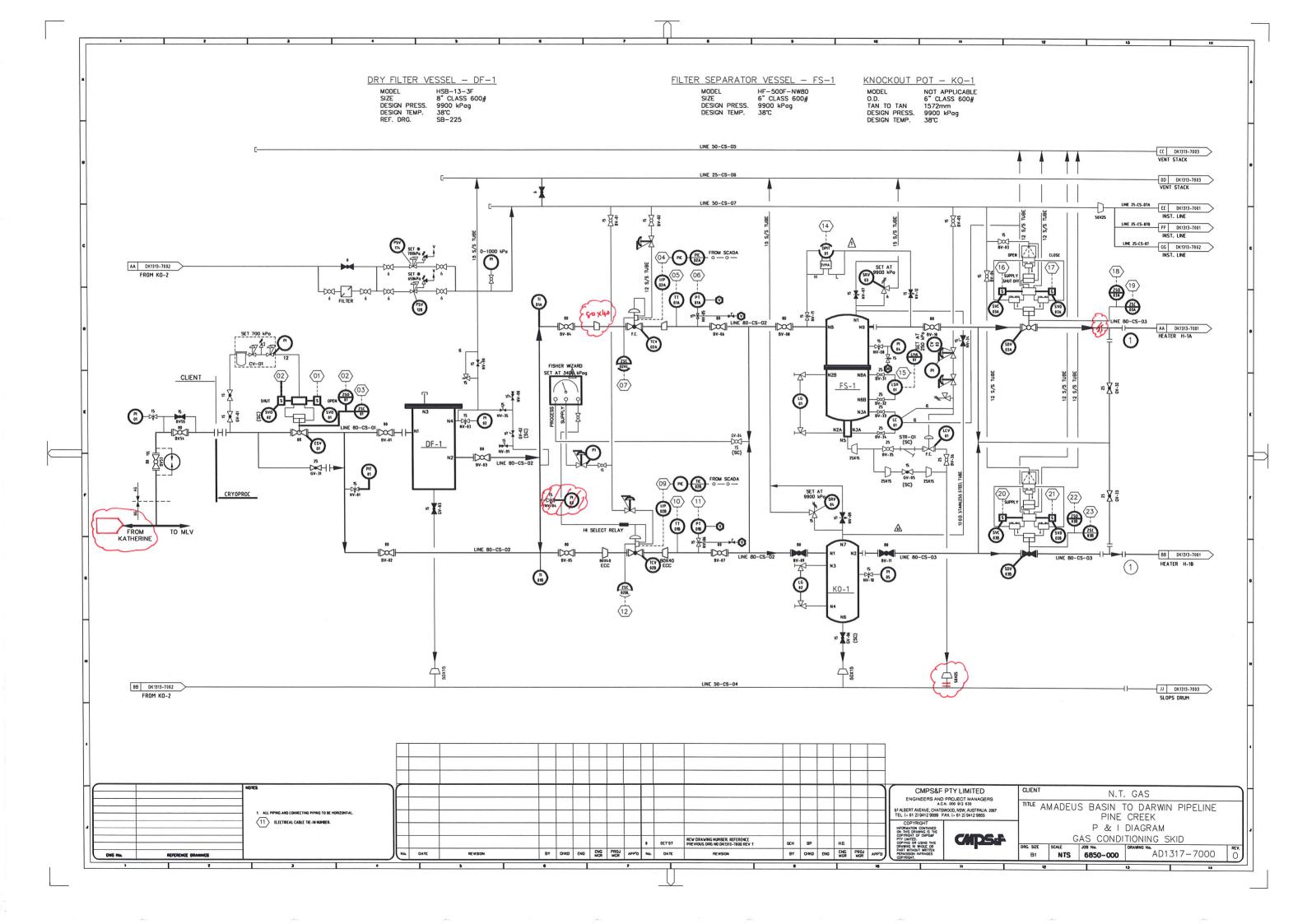
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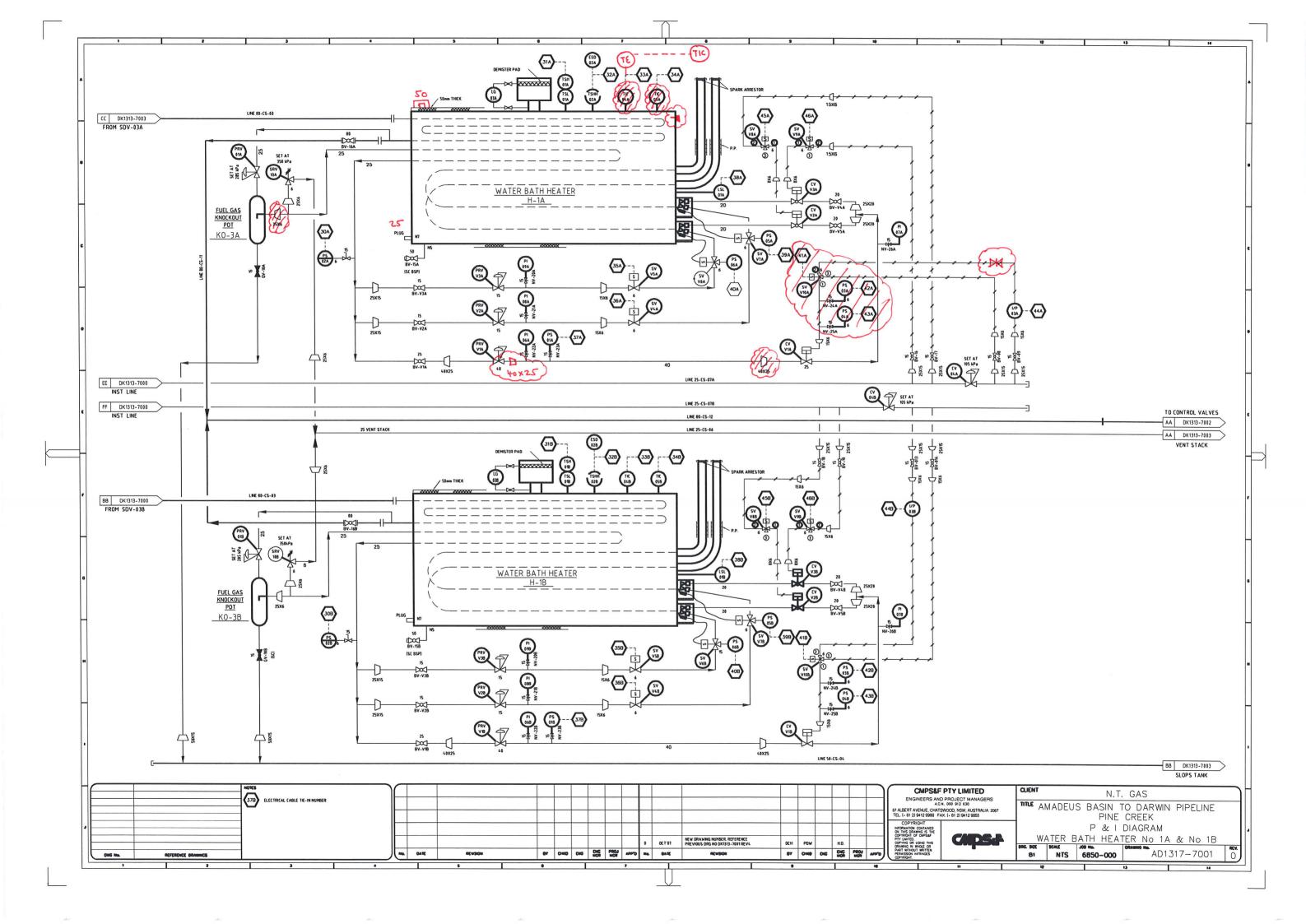


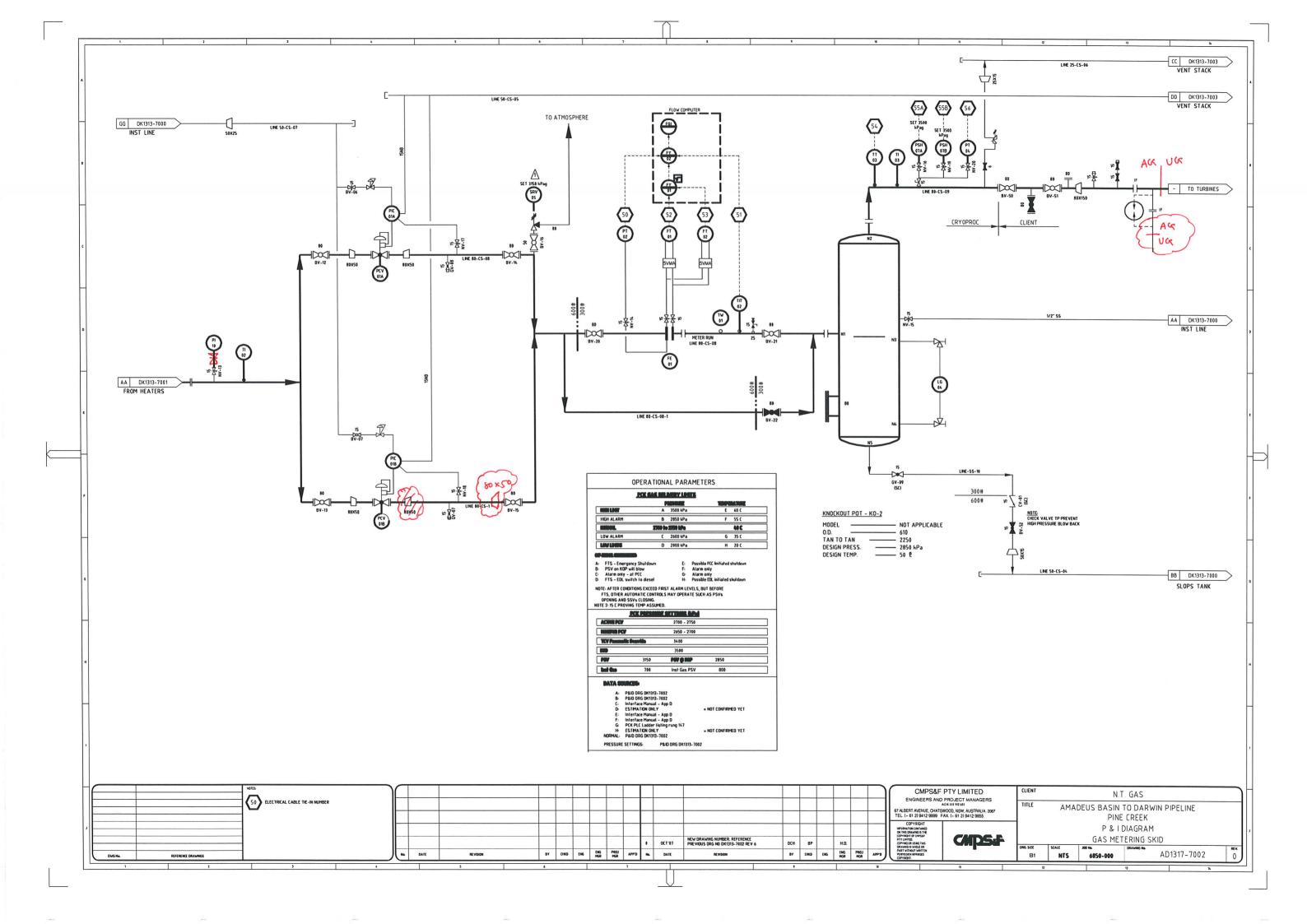
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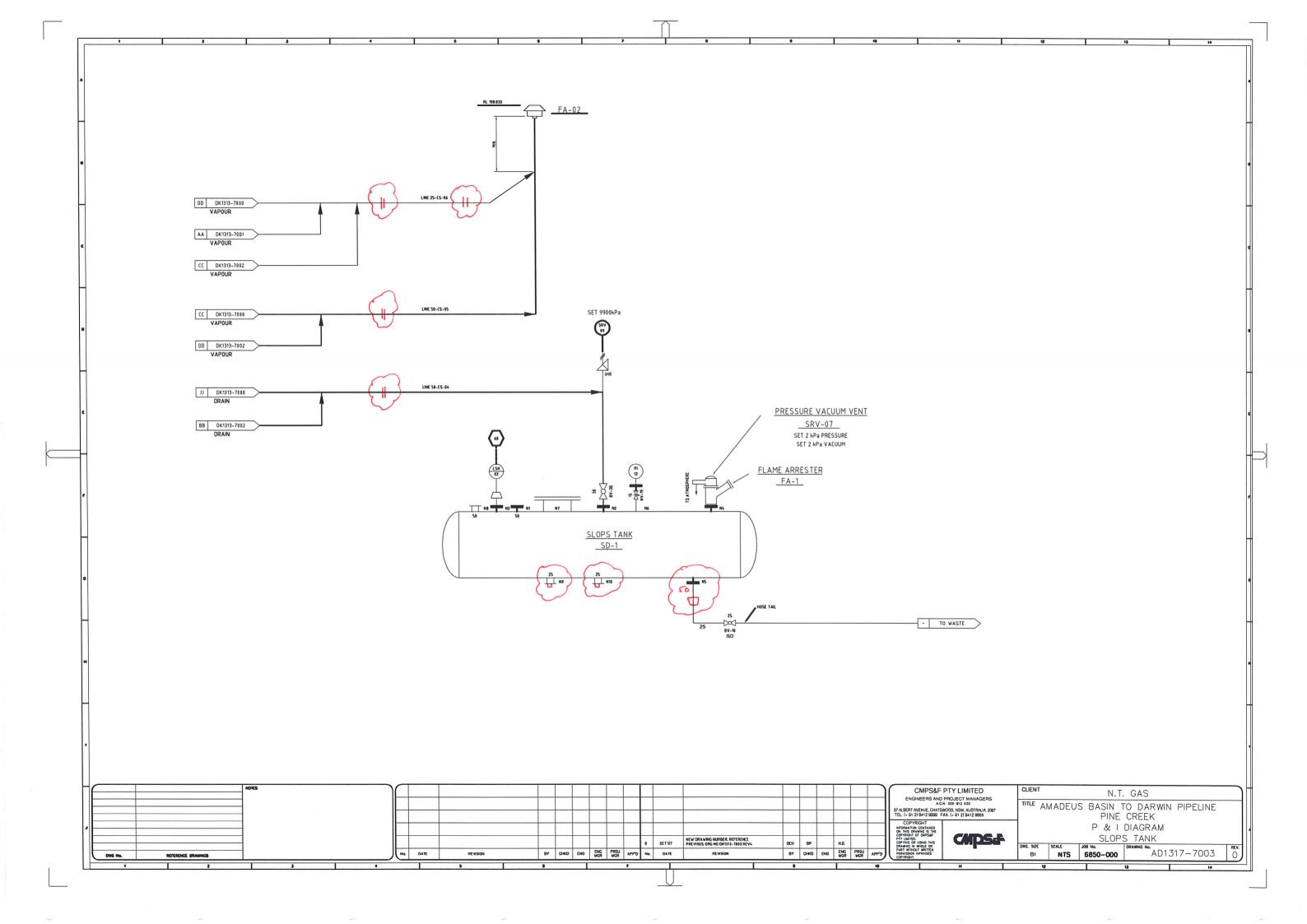
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# 2 Hazardous Area Classification Report

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





# 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:

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Reviewed by:

Date: 26-Sep-2011

26-Sep-2011

Rowan Kilsby Manager, Mechanical Engineering - Fyfe

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#### **Revision History:**

Rev.	Status	Date	Prepared	Reviewed	QA
А	Preliminary Issue	30/08/2010	YZW	ТСВ	
В	Revised to Incorporate Information from 2011 Site Inspection	24/08/2011	ТСВ	RDK	
С	Revised to Incorporate Comments from Client	19/09/2011	ТСВ	RDK	
D	Revised to following Part 3 and Part 4 site inspections	26/09/2011	ТСВ	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	КР
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 "sourceby-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 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.

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

#### Table 1 Operating pressures and temperatures



#### 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.

Component	Symbol	mol%
Methane	CH <sub>4</sub>	86.954
Ethane	C <sub>2</sub> H <sub>6</sub>	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 <sub>5</sub> H <sub>12</sub>	0.054
n-Hexane	C <sub>6</sub> H <sub>14</sub>	0.074
n-Heptane	C <sub>7</sub> H <sub>16</sub>	0.017
n-Octane	C <sub>8</sub> H <sub>18</sub>	0.004
n-Nonane	C <sub>9</sub> H <sub>20</sub>	0.004
Carbon Dioxide	CO <sub>2</sub>	0.936
Nitrogen	N <sub>2</sub>	8.172
Total		100
Specific Gravity (r	nixture)	0.62

#### **Table 2 Gas Composition**

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 multicyclone, 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<sup>3</sup>. 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 10.5 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

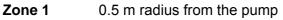
The odorant injection pumps are pneumatically powered from instrument gas that is derived from the transmission gas. During operation of pumps there will be a continuous vent of gas. There will be a *Continuous* release from the pump discharge through a bug screen located on the pump, refer photograph 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.





#### 2.7.10 GROUND EFFECT

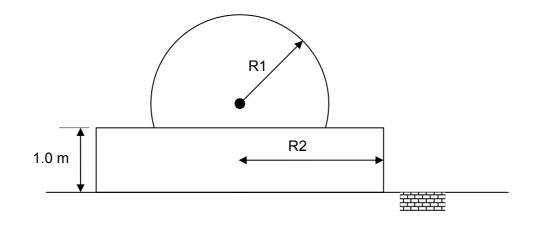
IP 15 Section 5.5 states that the determination of the full three dimensional envelope of the hazardous area zone shall consider the location of the release. The shape factor depends on height and orientation of the release. The key factors are:

- 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.

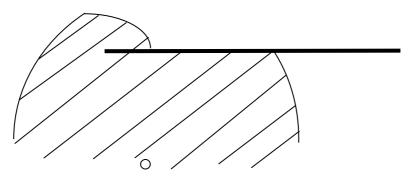
The ground effect increases the hazardous radius in accordance with IP 15 Table C9(b). A majority of the pipework in the facilities is to be located less than 1 m above grade. Interpolation of IP 15 Table C9(b) shows that the hazardous area for ground effect is 0.5 m larger than the hazardous area radius 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.



Source of release



# 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								Revisio	on:	A	В	С	D	
Flammable material list and	d characte	ristics					-	Author:	:	YZW	тсв	ТСВ	тсв	
Amadeus Basin to Darwin Pi	peline							Checke	ed:	ТСВ	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 ⁰C	ASTM D86 5%(vol) Point of Stabilised Liquid at Atmospheric Pressure	Relative Density Of Fluid Vapour (Air SG=1) Liquid (Water SG=1)	Flash Poin Stabilise Liquid a Atmosphe Pressur ⁰C	ed It eric	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	С	82	-	0.939 (liquid) 3.06 (vapour)	-8		1.1*	12.1*	224	T3*	IIA	AS/NZS 60079.20 MSDS
Condensate	Liquid	3	С	69 <sup>†</sup>	-	2.97 <sup>†</sup>	-21 <sup>†</sup>		1.0 <sup>†</sup>	8.4 <sup>†</sup>	233 <sup>†</sup>	$T3^{\dagger}$	IIA	AS/NZS 60079.20

Part	II – Sheet 1 of 4							Revision:	А	В	С	D	
List o	of sources of rel	ease					Ale and a second se	Author:	YZW	ТСВ	тсв	тсв	
Amac	leus Basin to Da	rwin Pipeline						Checked:	ТСВ	RDK	RDK	RDK	
Surfa	ce facilities						Earth Partners	QA:	ARD				
							DEVELOPMENT RESOURCES	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	
Р	rocess Equipm	ent Item	Flammable	Operating Conditions	Description of Flammable	Ventilation	Source Of R	elease	Distance From Source To			Equipment Group and	Section
No.	Description	Location	Material	Pressure and Temperature	Material Containment	Ventilation	Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2	Temperature Class	occion
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Process piping		Vap. Cat "G(i)"	<u>&lt;</u> 9,650 kPag <u>&lt;</u> 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)"	<u>&lt;</u> 770 kPag <u>&lt;</u> 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	Amadeus	Vap. Cat "G(i)"	<u>&lt;</u> 700 kPag <u>&lt;</u> 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	Basin to Darwin Pipeline surface facilities	Vap. Cat "G(i)"	<u>≤</u> 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)"	<u>≤</u> 9,650 kPag <u>≤</u> 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)"	<u>≤</u> 9,650 kPag <u>≤</u> 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)"	<u>≤</u> 9,650 kPag <u>≤</u> 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	4						and the second	Revision:	А	В	С	D	
List	of sources of re	elease							Author:	YZW	тсв	тсв	тсв	
Ama	deus Basin to D	arwin Pipelin	e						Checked:	ТСВ	RDK	RDK	RDK	
Surfa	ce facilities							YFE arth Partners WIRONMENT	QA:	ARD				
							DI	NVIRONMENT EVELOPMENT ESOURCES	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	
Pr	ocess Equipmo	ent Item		Operating Conditions	Description of		Source Of	Release		Distance From	Source To		Equipment	
No.	Description	Location	Flammable Material	Pressure and Temperature	Flammable Material Containment	Ventilation	Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary	of Zone 2	Group and Temperature Class	Section
1	2	3	4	5	6	7	8	9	10	11	1	2	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		ly, 6 m below bove vent tip	IIA, T1	2.7.1.8
9	Pipeline blowdown		Vap. Cat "G(i)"	<u>&lt;</u> 9,650 kPag _≤ 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	S	N/A	N/A	extending 3 upwards downwards f	f radius 15 m 0 m vertically s and 1 m rom discharge bint be confirmed	IIA, T1	2.7.1.9
10	Low velocity vents	Amadeus Basin to	Vap. Cat "G(i)"	<u>≤</u> 9,650 kPag <u>≤</u> 60 °C	Valves and piping discharging vertically upwards	Natural (open air)	Pipe vent to atmosphere	S	N/A	N/A	Radius of 1 r all directions	n extending in from the point charge	IIA, T1	2.7.1.10
11	Scraper vessels	Darwin Pipeline surface facilities	Vap. Cat "G(i)"	<u>&lt;</u> 9,650 kPag <u>&lt;</u> 60 °C	Enclosed system with closures	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	quick oper As per secti piping for rer	directions from ning closure on 2.7.1.1 for nainder of the ssel	IIA, T1	2.7.2
12	Multicyclone and filter separators		Vap. Cat "G(i)"	<u>≤</u> 9,650 kPag <u>≤</u> 60 °C	Enclosed vessels with quick opening closures	Natural (open air)	Flanges, joints, valve seals, drains and vents	S	N/A	N/A	closures an	around the d 2 m radius of the vessels	IIA, T1	2.7.3
			Liq. Cat "C"	<u>&lt;</u> 9,650 kPag <u>&lt;</u> 60 °C	Liquid drain pipework	Natural (open air)	Piping connections	S	N/A	N/A		ctions down to d level	IIA, T3	2.7.1.1

Part II – Sheet 3 of

List of sources of re

Amadeus Basin to Da

Surface facilities

No.

1

13

14

15

16

17

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rt	II – Sheet 3 of 4							Revision:	А	В	С	D	
st e	of sources of relea	se					- Contraction of the local division of the l	Author:	YZW	ТСВ	тсв	ТСВ	
nad	deus Basin to Darwi	n Pipeline					EVEE	Checked:	тсв	RDK	RDK	RDK	
rfa	ce facilities						Earth Partners	QA:	ARD				
							DEVELOPMENT RESOURCES	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011	
	Process Equipme	nt Item	Flammable	Operating Conditions	Description of Flammable		Source	Of Release	Dist	ance From Sou	urce To	Equipment Group and	
).	Description	Location	Material	Pressure and Temperature	Material Containment	Ventilation	Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2	Temperature Class	Section
	2	3	4	5	6	7	8	9	10	11	12	13	14
3	Slop tanks		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
Ļ	Water bath heaters	Amadeus	Vap. Cat "G(i)"	<u>&lt;</u> 9,900 kPag <u>&lt;</u> 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
5	Knockout pots	Basin to Darwin Pipeline	Vap. Cat "G(i)"	<u>&lt;</u> 9,900 kPag <u>&lt;</u> 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
6	Gas chromatograph systems	surface facilities	Vap. Cat "G(i)"	≤ 140 kPag <u>&lt;</u> 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
,	Water dew point analysers / gas samplers		Vap. Cat "G(i)"	<u>&lt;</u> 140 kPag <u>&lt;</u> 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
3	Odorant injection system pipework		Vap. Cat "C"	<u>≤</u> 9,650 kPag <u>≤</u> 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	4						Revision:	А	В	С	D		
List	of sources of re	elease					atter the state of	Author:	YZW	ТСВ	ТСВ	ТСВ		
Amad	deus Basin to D	arwin Pipelir	ie					Checked:	ТСВ	RDK	RDK	RDK		
Surface facilities							Earth Partners	QA:	ARD					
							DEVELOPMENT RESOURCES	Date:	31/08/2011	24/08/2011	19/09/2011	26/09/2011		
Pr	ocess Equipm	ent Item	Flammable	Operating Conditions	Description of Flammable		Source C	of Release	Dis	tance From Sour	се То	Equipment Group and	Ocation	
No.	Description	Location	Material	Pressure and Temperature	Material Containment	Ventilation	Description	Grade*	Boundary of Zone 0	Boundary of Zone 1	Boundary of Zone 2	Temperature Class	Section	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
					Enclosed vessel		Connections	S		N/A	1.5 m in all directions down to ground level			
19	Odorant injection system		Vap. Cat	Vap. Cat "C"	15 kPag	Blanket gas vent	Shelter with open sides	Pipe vent to atmosphere	Р	N/A	Radius of 1.5 m in all directions from vent tip	Within cylindrical volume below Zone 1	IIA, T3	2.7.9.2
	storage tanks	Amadeus Basin to Darwin Pipeline surface		<u>≤</u> 60 °C	Pressure relief valve and piping discharging vertically upwards	(open air)	Pipe vent to atmosphere	S		N/A	Radius of 1.5 m in all directions from vent tip			
20	Odorant injection system pumps	facilities	Vap. Cat "G(i)"	≤ 400 kPag <u>&lt;</u> 60 °C	Pneumatic pump instrument gas exhaust	Shelter with open sides (open air)	Piping connections and vents	с	N/A	N/A	Radius of 0.5 m	IIA, T1	2.7.9.3	
21	Ground effect		Vap. Cat "G(i)"	<u>≤</u> 9,650 kPag <u>≤</u> 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	



## 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 1317-OFI-1 Slops tank	Various non compliance issues in accordance with AS 1692, AS 1940	Replace slop tank with double skinned tank (self bunded tank)
(Refer additional information)	and AS 1597.	Add restriction orifice to liquid drain line from filter vessels
<b>AD 1317-OFI-2</b> Vent tip	The pressure vacuum (PV) vent tip on the slop tank should be relocated so that the hazardous zone does not extend into the areas where personnel may be present.	Replace PV vent for one that allows discharge to be piped away and vertically upwards
<b>AD 1317-OFI-3</b> 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.
<b>AD 1317-OFI-4</b> Light	The light pole at inlet / outlet piping is within the extent of hazardous area zone 2 area specified for piping. Following previous hazardous area investigation in 2010, the light has been disconnected (refer photograph) however the cables are within a hazardous area and should be suitably terminated.	Terminate cables properly.
<b>AD 1317-OFI-5</b> Flappers used on PSV tail pipe.	Flappers are designed for low velocity engine exhausts and they can come off due to high velocity gas vents. Canvas caps can be used to prevent rain and debris ingress. The canvas caps also provide an indication if the PSV has discharged	Replace flapper with canvas cap.
AD 1317-OFI-6 Vent holes	Refer additional information	Remove caps on local vents and add canvas caps to avoid rain ingress.



OFI No.	Description	Proposed Remedy
<b>AD 1317-OFI-7</b> Data manuals	Data manuals are not current with the equipment installed at site. The manuals appear to be generic and include information for all sites.	Review manuals and update to reflect current equipment at that site.
AD 1317-OFI-8 Water bath heater stack	The stack on the water bath heater does not have personnel protection insulation or guarding.	Install protective guarding.
<b>AD 1317-OFI-9</b> P&IDs	P&IDs are not up to date	As build drawings and revise P&IDs
AD 1317-OFI-10 Blowdown vent	The exact dimensions and shape of the hazardous area of the plume from the pipeline vent requires review.	Undertake plume dispersion modelling.
AD 1317-OFI-11 vent	The hazardous area from the vent will extend outside of the fenced compound	Recommend temporary exclusion zone during pipeline blowdowns
AD 1317-OFI-12 Control room	The control room is within the extent of hazardous area zone 2 area. The height of the blowdown on MLV bypass needs to be adjusted so that the control room will be out of the range of hazardous zone specified for the blowdown.	Modify the vent stack so that blowdowns are above the height of the control room (dependent on plume analysis).
<b>AD 1317-OFI-13</b> Isolation from the power station	The outlet flange connection to the power station is fitted with an insulation gasket but no surge arrestor is fitted. A similar concern is raised at the Katherine meter station and the findings of that OFI should be adopted at Pine Creek.	APA to review requirements and update as required. Reference to outcomes from the review at Katherine meter station.
	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-OFI-14	UV damage to sheath.	Repair as required.
Solenoid Valve AD 1317-SVO-	Solenoid housing cracked at gland entry.	Replace solenoid housing.
01/02	Replace gasket preshished at solenoid cable termination.	Replace as necessary.
	Ex ratings of glands are illegible.	Verify Ex ratings.



OFI No.	Description	Proposed Remedy
AD 1317-OFI-15	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-OFF13 Valve limit switch AD 1317- ZSC/ZSO-01	Verification of equipments and accessories is required.	Verify equipment details to confirm AUS Ex compliance for flameproof instalment.
200/200-01	UV damaged cabling.	Repair as required.
	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-OFI-16 Junction box	Nil certification available for plugs.	Replace uncertified plugs (High priority).
AD 1317-JB	UV damage to cables.	Repair as required.
	Exposed armour at main control cable requires re-termination.	Repair as required.
	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-OFI-17 Pressure Transmitter	Blue cable sheath required.	Fit equipment with blue sheath.
AD 1317-PIT-01	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.
AD 1317-OFI-18 Differential	Equipment and cable ID required.	Fit Equipment and cable ID.
Pressure Transmitter AD 1317-DPIT- 01	Blue cable sheath required.	Fit equipment with blue sheath.
	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-OFI-19	UV damage to cables.	Repair as required.
Valve limit switch AD 1317-ZSC-	Cable resting or process pipe requires support.	Repair as required.
02AL	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.
AD 1317-OFI-20 Pressure convertor	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-I/P-02A AD 1317-I/P-02B	Blue cable sheath and IS labelling required.	Fit equipment with blue sheath and IS label.



OFI No.	Description	Proposed Remedy
AD 1317-OFI-21	Equipment and cable ID required.	Fit Equipment and cable ID.
Junction box AD 1317-JB	Blue cable sheath required.	Fit equipment with blue sheath.
AD 1317-OFI-22	Equipment and cable ID required.	Fit Equipment and cable ID.
Temperature transmitter	Blue cable sheath required.	Fit equipment with blue sheath.
AD 1317-TT-01A	Re-route cabling and fix the support to process piping.	Repair as required.
AD 1317-OFI-23 Pressure	Equipment and cable ID required.	Fit Equipment and cable ID.
Transmitter AD 1317-PT-01A	Blue cable sheath required.	Fit equipment with blue sheath.
AD 1317-PT-01B	Ex nameplate is faded.	Replace Ex nameplate.
<b>AD 1317-OFI-24</b> Valve limit switch	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317-	UV damage to cables.	Repair as required.
ZSC/ZSO-03A AD 1317- ZSC/ZSO-03B	Verification of equipments and accessories is required.	Verify equipment details to confirm AUS Ex compliance for flameproof installation.
AD 1317-OFI-25 Solenoid Valve	Equipment and cable ID required.	Fit Equipment and cable ID.
AD 1317- SVO/SVC-03A	Equipment painted heavily, hence illegible.	Replace the equipment due to
AD 1317- SVO/SVC-03B	Ex certification expired 2001.	age and condition.
AD 1317-OFI-26	Equipment and cable ID required.	Fit Equipment and cable ID.
Valve limit switch AD 1317-ZSC-	UV damage to cables.	Repair as required.
02BL	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.



OFI No.	Description	Proposed Remedy		
	Equipment and cable ID required.	Fit Equipment and cable ID.		
AD 1317-OFI-27 Junction box AD 1317-JB	Blue cable sheath and IS labelling required.	Fit equipment with blue sheath and IS label.		
	Re-route cabling and fix the support to process piping.	Repair as required.		
AD 1317-OFI-28	Equipment and cable ID required.	Fit Equipment and cable ID.		
Temperature transmitter	Blue cable sheath required.	Fit equipment with blue sheath.		
AD 1317-TT-01B	UV damage to cables.	Repair as required.		
	Equipment ID required.	Fit Equipment ID.		
AD 1317-OFI-29 Low level switch AD 1317-LSH-01	Equipment painted heavily, hence illegible.	Replace the equipment.		
AD 1317-ESH-01	Ex certification expired 2001.	_		
AD 1317-OFI-30	Equipment ID required.	Fit Equipment ID and remove existing PS02A tag.		
Pressure switch AD 1317-PS-01A	UV damage to cables.	Repair as required.		
AD 1317-PS-01A AD 1317-PS-01B	Verify compound filled barrier type gland is installed to cabling.	Verify as required.		
AD 1317-OFI-31	Equipment ID required.	Fit Equipment ID.		
Pressure switch	UV damage to cables.	Repair as required.		
AD 1317-PS-02A AD 1317-PS-02B	Verify compound filled barrier type gland is installed to cabling.	Verify as required.		
	Equipment ID required.	Fit Equipment ID.		
AD 1317-OFI-32	Cable ID seems incorrect.	Review as per P&ID.		
Solenoid valve AD 1317-SV-V4A/	Top entry cable gland installation not recommended.	Suggest rotating 180 degree vertically for bottom entry.		
5A AD 1317-SV- V4B/V5B	SV-V4B has DIP adaptor between cable gland and solenoid housing.	Remove if adaptor is not consistent with cable installation method of protection.		



OFI No.	Description	Proposed Remedy					
AD 1317-OFI-33	Equipment ID required.	Fit Equipment ID.					
Pressure convertor AD 1317-I/P-03A	IS circuit installation requires blue cable sheath and labels.	Fit equipment with blue sheath and labels.					
AD 1317-I/P-03B	UV damage to cables.	Repair as required.					
	Equipment ID required.	Fit Equipment ID.					
AD 1317-OFI-34	UV damage to cables.	Repair as required.					
Solenoid valve AD 1317-SV-9A	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.					
	Verify cable ID with cable schedule.	Verify as required.					
	Equipment ID required.	Fit Equipment ID.					
AD 1317-OFI-35 Solenoid valve	UV damage to cables.	Repair as required.					
AD 1317-SV-10A	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.					
AD 1317-OFI-36 Cables	Unterminated cabling exits within cable tray above fuel gas lines.	Terminate/earth cables within suitable rates enclosure or remove completely.					
	Equipment ID required.	Fit Equipment ID.					
AD 1317-OFI-37	UV damage to cables.	Repair as required.					
Solenoid valve AD 1317-SV-8B	Nil hazardous area certification available.	Replace the equipment or get hazardous area certification.					
AD 1317-SV-9B	Adaptor is cracked at solenoid housing.	Replace the adaptor.					
AD 1317-OFI-38	Equipment ID required.	Fit Equipment ID.					
Pressure	UV damage to cables.	Repair as required.					
Transmitter AD 1317-PIT-02	Blue cable sheath required.	Fit equipment with blue sheath.					
AD 1317-OFI-39	Equipment ID required.	Fit Equipment ID.					
Temperature Transmitter	UV damage to cables.	Repair as required.					
AD 1317-TT-01	Blue cable sheath required.	Fit blue sheath.					
	Equipment ID required.	Fit Equipment ID.					
AD 1317-OFI-40	UV damage to cables.	Repair as required.					
Flow Transmitter AD 1317-FT-02	Blue cable sheath required.	Fit equipment with blue sheath.					



OFI No.	Description	Proposed Remedy					
AD 1317-OFI-41	Equipment ID required.	Fit Equipment ID.					
Temperature	UV damage to cables.	Repair as required.					
Transmitter AD 1317-TIT-02	Exposed armour at gland entry.	Re-terminate cabling for armour.					
	Circuit ID required.	Fit circuit ID.					
AD 1317-OFI-42	UV damage to cables.	Repair as required.					
Temperature Transmitter AD 1317-TT-03	Blue cable sheath required.	Fit equipment with blue sheath.					
	Cable support required.	Fit cable support.					
AD 1317-OFI-43	Equipment ID is incorrect.	Fit Equipment ID.					
High pressure switch	Circuit ID required.	Fit circuit ID.					
AD 1317-PSH-07 A/B	UV damage to cables.	Repair as required.					
AD 1317-OFI-44	Equipment and cable ID required.	Fit Equipment and cable ID.					
Pressure Transmitter	Nil certification available for plugs.	Replace uncertified plugs (High priority).					
AD 1317-PT-04	Nil evidence of IS barrier installed.	Flameproof installation required.					
	Circuit ID required.	Fit circuit ID.					
AD 1317-OFI-45	Cable support required.	Fit cable support.					
High level switch	UV damage to cables.	Repair as required.					
AD 1317-LSH-02	Flameproof device substantially painted and potentially compromising flame paths.	Further investigation required.					



## **Additional Information**

#### AD 1317-OFI-1

#### **Slops tank**

The slops tank receives liquids collected from the filter separators the tank is elevated to allow emptying under gravity for disposal. At the time of the site visit the tank was approximately 20% full. 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" and AS 1692 "Steel tanks for flammable and combustible liquids". Additionally there is an access ladder / platform that should comply with AS 1657 "Fixed platforms, walkways, stairways and ladders - Design, construction and installation". Some deficiencies identified in the tank arrangement include:

- No spill containment bund.
- No evidence that the liquid inlet to the tank included a drop pipe and a liquid seal
- No obvious earthing of tank.
- No obvious earth connection point for vehicle / container during draining of the tank.
- The tank was fitted with a rubber hose for emptying the tank. There is a potential for static generation in the hose.
- 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 explosion / fire over pressure protection on tank (explosion hatch).
- No safe break connection on hose.
- Access ladder at incorrect angle, rungs round steel that present a fall / slip potential (partially remedied with anti-slip tape).

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

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 requirement for an elevated tank should be evaluated. 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".



The generation of static in the emptying connection should conform to velocity requirements in AS/NZS 1020 "The control of undesirable static electricity". It is recommended that the hose is replaced with one with an integral earth.



AD 1317-OFI-4 Light Pole Cabling





## AD 1317-OFI-5 PSV Discharge Flapper



## AD 1317-OFI-8 Water Bath Heater Stack

The stacks on the water bath heaters are not provided with any personnel protection or insulation.

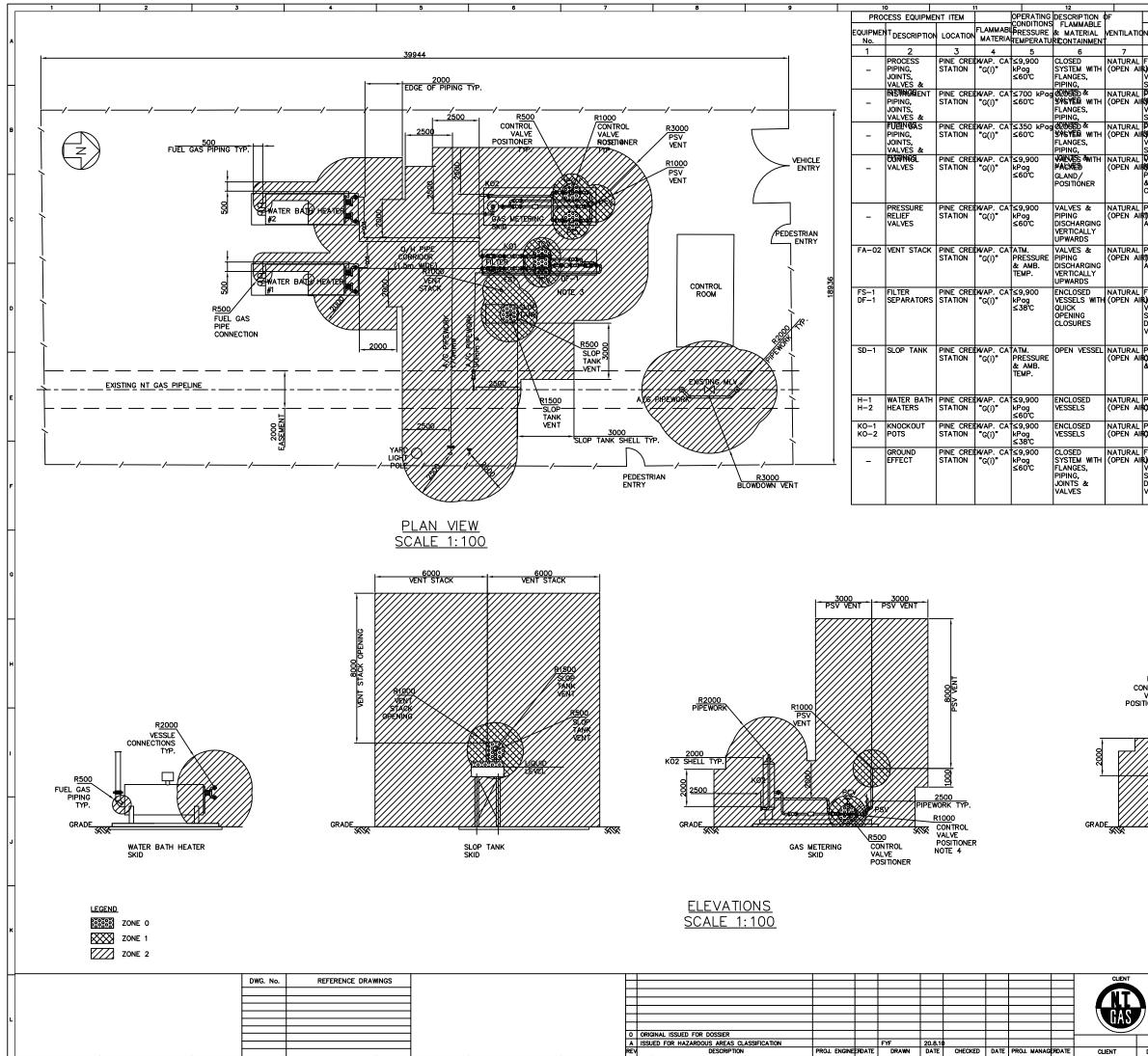




# 4 Hazardous Area Mapping Drawings

This section contains the hazardous area mapping drawings.

Drawing Number	Description	Revision
AD 1317-9401	Pine Creek Meter Station Hazardous Area	0



	13		14		15		16	
		F RELEASE		DISTANCE OF S	OURCE TO	EQUIPMEN GROUP AN	ţ	1
IC	NDESCRIPTIO	GRADE	BOUNDARY ( ZONE 0	BOUNDARY OF ZONE 1	BOUNDARY O ZONE 2	TEMPERATU	REREMARKS	
_	8	9	10	11	12	13	14	1^I
	FLANGES, NOINTS,	SECONDAR	N/A	N/A	2m RADIUS FROM EDGE		SECTION 7. & SECTION	<b>i</b> .1
21	VALVE SEALS,				OF PIPING ROUTES.	IIA, T1	7.8	Ц
	PEANICE St	SECONDAR			1m RADIUS		SECTION	ſ
đ	<b>UNEINTIS,</b> VALVE		N/A	N/A	FROM EDGE OF PIPING	IIA, T1	7.1.2	$\left  \right $
	SEALS, PEANGES	SECONDAR	<b> </b>		ROUTES. 0.5m RADIUS		SECTION	$\left  \right $
ū	eyisintis,	SECONDAR	N/A	N/A	FROM EDGE	IIA, T1	7.1.3	в
	VALVE SEALS,				of Piping Routes.	-		
ā	DRAVALS & KVENNĪDS.	CONTINUOU	SQ.5m RADIU: AROUND	SO.3m RADIUS	AS CLASSIFIED	IIA. T1	SECTION 7.1.4	
	POSITIONERS	&SECONDA	FILOW	GLANDS; 1m RADIUS	FOR PIPING.	11A, 11		H
	CONNECTION	s	POSITIONERS	AROUND				
_	PIPE VENT	PRIMARY		FLOW	6m		SECTION	
ll	NIO ATMOSPHERE	&SECONDA	RY N/A	FROMTIQUERRS. TIPS	LATERALLY, 8m ABOVE	IIA, T1	7.1.5	c
					AND 1m BELOW THE			
_	PIPE VENT	PRIMARY		1m RADIUS	DISCHARGE		SECTION	
ll	NIO ATMOSPHERE	&SECONDA	RY N/A	FROM VENT TIPS	EATERALLY, 8m ABOVE	IIA, T1	7.1.6	L
					AND 6m BELOW THE			
	FLANGES,	SECONDAR	ł	0.3m RADIUS	BELOW THE BISCHADRES AROUND THE		SECTION 7.	<b>;</b>
11	UOINTS, VALVE		N/A	AROUND THE	AROUND THE	IIA, T1		ľ
	SEALS,			OPENING	OPENING			ľ
	DRAINS & VENTS			CLOSURES.	CLOSURES AND 2m			$\left  \right $
	PIPING	CONTINUOU	SINSIDE THE	1.5m RADIUS	RADIUS FROM		SECTION 7.	
	CONNECTION	PRIMARY	TANK	FROM TANK	THE PAGE OF	IIA, T1	JECTION 7.	П
	& VENTS	&SECONDA	LIQUID	VENT TIPS.	SHELL AND VENT TIPS.			$\left  \right $
			LEVEL AND 0.5 m					
		SECONDAR	RADIUS		2m RADIUS		SECTION 7.	ξE
1	CONNECTION:	1	FROM VENT	N/A	FROM VESSEL CONNECTIONS.	IIA, T1		$\left  \right $
		SECONDAR			2m RADIUS		SECTION 7.	<b>k</b>
1	©ONNECTION:	1	N/A	N/A	FROM THE EDGE OF THE	IIA, T1		Н
	FLANGES, NJOINTS,	SECONDAR			ZESSELS. LATERALLY		SECTION 7.	<b> </b>
	NUMBER OF STREET		N/A	N/A	AND	IIA, T1		
	VALVE	1						11
i	VALVE SEALS, DRAINS &				EXTENDING TO 1m ABOVE			F
i	VALVE SEALS,				1m ABOVE GRADE FOR			F
i	VALVE SEALS, DRAINS &				1m ABOVE GRADE FOR ALL PROCESS PIPING LESS THAN 2m			F
i	VALVE SEALS, DRAINS &				1m ABOVE GRADE FOR ALL PROCESS PIPING LESS			F
i	VALVE SEALS, DRAINS &				1m ABOVE GRADE FOR ALL PROCESS PIPING LESS THAN 2m			F
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## 5 Hazardous Area Equipment Register and Certificates of Conformity

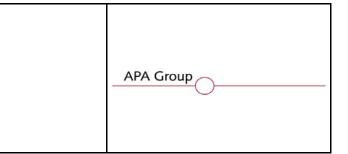
This section contains the hazardous area equipment register and associated certificates of conformity.

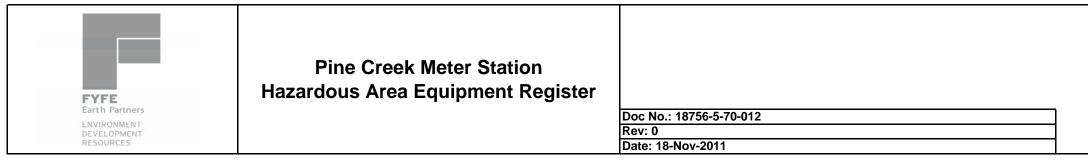


## Pine Creek Meter Station Hazardous Area Equipment Register

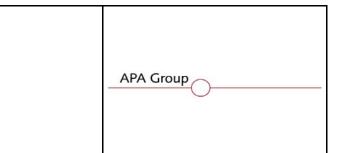
Doc No.: 18756-5-70-012 Rev: 0 Date: 18-Nov-2011

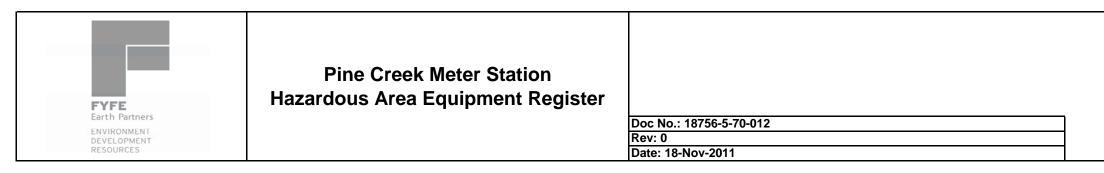
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Тад	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Drawing No.	Zone	Gas Group	Temp.	Ex Protection	Certification
AD-1317-SVO-01	AD 1317-10-7000	ESV-01	Solenoid valve (open)	Lucifer		821003	AD 1317-9401	2	IIA	T1	Ex m, e IIC T5	AUS Ex 321
AD-1317-SVO-02	AD 1317-10-7000	ESV-01	Solenoid valve (open)	Lucifer			AD 1317-9401	2	IIA	T1	Ex m, e IIC T5	AUS Ex 321
AD-1317-ZSC/ZSO-01	AD 1317-10-7000	ESV-01	Valve limit switch (close)/ (open)	Bettis	3R-321 AFC		AD 1317-9401	2	IIA	T1	Ex d IIB T6	SAA ? Ex 95?
AD-1317-JB		Gas Conditioning Skid	Junction box	Govan	F150		AD 1317-9401	2	IIA	T1	Ex d IIA/IIB T6 IP65	AUS Ex 349
AD-1317-PIT-01		Gas Conditioning Skid	Pressure Transmitter	Rosemount	3051TG4A2B21BS4M5T1	P50754039	AD 1317-9401	2	IIA	T1	IP 66/67	
AD-1317-DPIT-01	AD 1317-10-7000	FS-01	Pressure differential transmitter	Rosemount	3051CD4A02A1BM5I7T1S5	R50517285	AD 1317-9401	2	IIA	T1	Ex ia IIC T5 (40C)	AUS Ex 1249x
AD-1317-ZSC-02AL	AD 1317-10-7000	TCV-02A/B	Valve limit switch (close)	Masoneilan	400496-911		AD 1317-9401	2	IIA	T1	Class 1 Group B,C,D	Not SAA Approved
AD-1317-I/P-02A	AD 1317-10-7000	TCV-02A/B	Pressure converter (posioner)	Masoneilan	8012-2C	X34555-1-88-8	AD 1317-9401	2	IIA	T1	Ex ia IIC T6	SAA Ex 94
AD-1317-JB		TCV-02A/B	Junction box	Govan	FW4W		AD 1317-9401	2	IIA	T1	Ex d IIB T6 IP 65	AUS Ex 157
AD-1317-TT-01A	AD 1317-10-7000	TCV-02A/B	Temperature transmitter	Rosemount	444-RI2-U1-A1-I7	A212445	AD 1317-9401	2	IIA	T1	Ex ia IIC T6 (40C) T5	
											(70C)	
AD-1317-PT-01A	AD 1317-10-7000	TCV-02A/B	Pressure transmitter	Rosemount	3051CG5A22A1AB4I7M5	R50523853	AD 1317-9401	2	IIA	T1	Ex ia IIC T5(40C) T4 (60C)	AUS Ex 1249x
AD-1317-ZSC/ZSO-03A	AD 1317-10-7000	SDV-03A	Valve limit switch	Bettis	3R-021-AFC		AD 1317-9401	2	IIA	T1	Ex d IIB T6	SAA ? Ex 95?
AD-1317-SVO/SVC-03A	AD 1317-10-7000	SDV-03A	Solenoid valve	Herion			AD 1317-9401	2	IIA	T1	Ex e IIC IP 65	AUS Ex 198
AD-1317-ZSC-02BL	AD 1317-10-7000	TCV-02A/B	Valve limit switch (close)	Masoneilan	400496-911		AD 1317-9401	2	IIA	T1		
AD-1317-I/P-02B	AD 1317-10-7000	TCV-02A/B	Pressure converter (posioner)	Masoneilan	8012-2C	X34555-1-88-3	AD 1317-9401	2	IIA	T1	Ex ia IIC T6	SAA Ex 94
AD-1317-JB		TCV-02A/B	Junction box	Govan	FW4W		AD 1317-9401	2	IIA		Ex d IIB T6 IP 65	AUS Ex 157
AD-1317-PT-01B	AD 1317-10-7000	TCV-02A/B	Pressure transmitter	Rosemount	3051CG5A22A1AB4I7M5	0957563	AD 1317-9401	2	IIA	T1	Ex ia IIC T5(40C)	AUS Ex 1249x
AD-1317-TT-01B	AD 1317-10-7000	TCV-02A/B	Temperature transmitter	Rosemount	444-RI2-U1-A1-I7	A212446	AD 1317-9401	2	IIA	T1	Ex ia IIC T6 (40C)	AUS Ex 122x
AD-1317-ZSC/ZSO-03B	AD 1317-10-7000	SDV-03B	Valve limit switch	Bettis	3R-021-AFC	/	AD 1317-9401	2	IIA		Ex d IIB T6	SAA ? Ex 95?
AD-1317-SVO/SVC-03B	AD 1317-10-7000	SDV-03B	Solenoid valve	Herion			AD 1317-9401	2	IIA		Ex e IIC IP 65	AUS Ex 198
AD-1317-LSH-01	AD 1317-10-7000	FS-01	Low level switch	Magnatrol	D75-1B20-BNW		AD 1317-9401	2	IIA	T1		Not SAA Approved
AD-1317-PS-01A	AD 1317-10-7000	H-1A fuel gas supply line	Pressure switch	United Electric	J120-702		AD 1317-9401	2	IIA		Ex d IIB T5 IP 66	AUS Ex 542-2
AD-1317-PS-01A AD-1317-PS-02A	AD 1317-10-7001	÷		United Electric	J120-702		AD 1317-9401	_	IIA	T1	Ex d IIC T5 IP 66	AUS Ex 542-2
AD-1317-P3-02A AD-1317-SV-V4A / V5A	AD 1317-10-7001	H-1A fuel gas supply line Water bath heater H-1A	Pressure switch Solenoid valve	Herion	970806	852506 / 838998	AD 1317-9401 AD 1317-9401	2	IIA	T1		AUS Ex 198 DIP 118
AD-1317-I/P-03A				Masoneilan	8005 A		AD 1317-9401 AD 1317-9401	2	IIA	T1	Ex e, s IIC Ex ia IIC T5	AUS EX 198 DIP 118 AUS Ex 94
AD-1317-I/P-03A AD-1317-SV-9A	AD 1317-10-7001	H-1A fuel gas supply line	Pressure converter (posioner)		FA80035	080061-211 FAB8320A18	AD 1317-9401 AD 1317-9401	2	IIA		I/IIA&BT5	AU3 EX 94
AD-1317-SV-9A AD-1317-SV-10A	AD 1317-10-7001	Water bath heater H-1A	Solenoid valve	Asco		FAD032UA10		2		T1	1/ II A & D 15	
	AD 1317-10-7001	H-1A/B fuel gas supply line	Solenoid valve	Tyco	F79U		AD 1317-9401	2	IIA	T1		
AD-1317-PS-01B	AD 1317-10-7001	H-1B fuel gas supply line	Pressure switch	United Electric	J120-702		AD 1317-9401	2	IIA	T1	Ex d IIB T6 IP 66	AUS Ex 542-2
AD-1317-PS-02B	AD 1317-10-7001	H-1B fuel gas supply line	Pressure switch	United Electric	J120-702	0704/0004	AD 1317-9401	2	IIA	T1	Ex d IIB T6	AUS Ex 542-1x
AD-1317-SV-V4B / V5B	AD 1317-10-7001	Water bath heater H-1B	Solenoid valve	Lucifer	821003	8704 / 8604	AD 1317-9401	2	IIA	T1	Ex m, e IIC T5	AUS Ex 321-1
AD-1317-I/P-03B	AD 1317-10-7001	H-1B fuel gas supply line	Pressure converter (posioner)	Masoneilan	8005 A	080061-211	AD 1317-9401	2	IIA	T1	Ex ia IIC T5	AUS Ex 94
AD-1317-SV-8B	AD 1317-10-7001	Water bath heater H-1B	Solenoid valve	Asco	FA80033	56707A	AD 1317-9401	2	IIA	T1		
AD-1317-SV-9B	AD 1317-10-7001	Water bath heater H-1B	Solenoid valve	Asco			AD 1317-9401	2	IIA	T1		
AD-1317-JB		Meter Run	Junction box	Govan	F7		AD 1317-9401	2	IIA	T1	Ex d IIA IIB T6 IP 65	AUS Ex 401
AD-1317-PT-02	AD 1317-10-7002	FE-01	Pressure transmitter	Rosemount	3051	0459808	AD 1317-9401	2	IIA	T1	Ex ia IIC T5(40C) T4 (60C)	AUS Ex 122x
AD-1317-FT-01		FE-01	Flow transmitter	Rosemount	3051PD2A22A1AM5T7L4Q4	0459795	AD 1317-9401	2	IIA		Ex ia IIC T5 (40C) T4 (60C)	
AD-1317-FT-02	AD 1317-10-7002	FE-01	Flow transmitter	Rosemount	3051 DP*	0459794	AD 1317-9401	2	IIA		Ex ia IIC T5 (40C) T4 (60C)	
AD-1317-TIT-02	AD 1317-10-7002	FE-01	Temperature transmitter	Rosemount	3144PD2A1I7M5F5	01170770	AD 1317-9401	2	IIA	T1	Ex ia IIC T6(40C) T5 (70C) IP 66	AUS Ex 3794x
AD-1317-TT-03	AD 1317-10-7002	KO-02 outlet (DN80)	Temperature transmitter	Rosemount	444-RI2-U1-A1-I7		AD 1317-9401	2	IIA	T1	Ex ia IIC T6 (40C) T5 (70C)	AUS Ex 122x
AD-1317-PSH-07A/B	AD 1317-10-7002	KO-02 outlet (DN80)	High pressure switch	Allen-Bradley	BUL 836T-T256J		AD 1317-9401	2	IIA	T1	IP 66	Not SAA Approved
AD-1317-PT-04	AD 1317-10-7002	KO-02 outlet (DN80)	Pressure transmitter	Rosemount	3051IG3A2B21BB4K7M5TICI104S5	R50851678	AD 1317-9401	2	IIA	T1	Ex ia IIC T5(40C) T4 (60C) IP 65	AUS Ex 1249x
AD-1317-LSH-02	AD 1317-10-7003	Slop tank SD-1	High level switch	BESTOBELL	S-250 DA F104	8805	AD 1317-9401	2	IIA	T1	Ex d IIB T6 IP 66	SAA 186
				MOBREY								
AD-1317-LSL-01A/B	AD 1317-10-7001	H-1A/B	Low level switch	Danfoss	RS-113	1	AD 1317-9401	2	IIA	T1		
AD-1317-PS-03A/B	AD 1317-10-7001	H-1A/B fuel gas supply line	Pressure switch	United Electric	J120-702		AD 1317-9401	2	IIA	T1	İ	





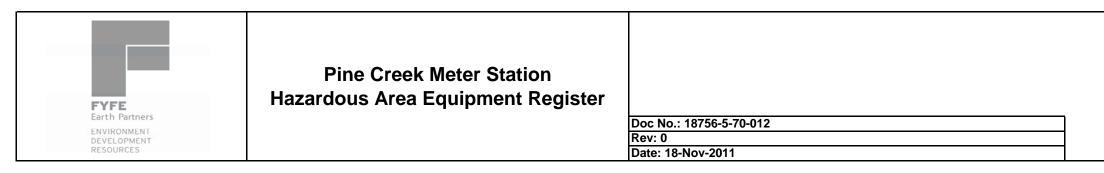
AD-1317-PS-05A/B AE	P&ID No.	Location	Instrument Type	Manufacturer	Model	Serial No.	Hazard Area					
AD-1317-PS-05A/B AE	D 1317-10-7001					Contai No.	Drawing No.			Temp.	Ex Protection	Certification
			Pressure switch	United Electric	J120-701		AD 1317-9401	2	IIA	T1		
AD-1317-PS-06A/B AI	D 1317-10-7001	H-1A/B burner 1 SV-V7A/B	Pressure switch	United Electric	J120-701		AD 1317-9401	2	IIA	T1		
	D 1317-10-7001	H-1A/B burner 2 SV-V6A/B	Pressure switch	United Electric	J120-701		AD 1317-9401	2	IIA	T1		
AD-1317-SVC-03A/B AE	D 1317-10-7000	SDV-03A/B	Solenoid valve (close)	Bettis	NA		AD 1317-9401	2	IIA	T1		
AD-1317-SV-V6A/B AE	D 1317-10-7001	H-1A/B fuel gas supply line	Solenoid valve	Тусо	F79U		AD 1317-9401	2	IIA	T1		
AD-1317-TSHH-02A/B AD		Water bath heater H-1A/B	Temperature switch		802 6BS		AD 1317-9401	2	IIA	T1		
AD-1317-TSLH-01A/B AD	D 1317-10-7001	Water bath heater H-1A/B	Temperature switch	United Electric	F100 6BS		AD 1317-9401	2	IIA	T1		
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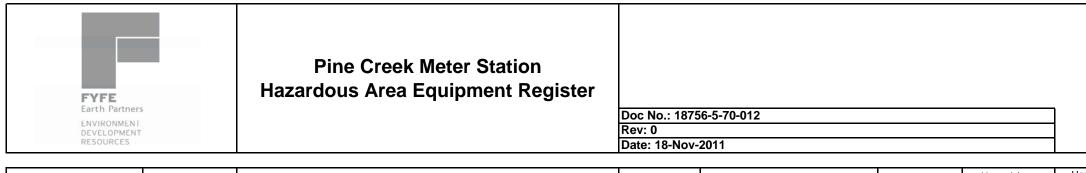
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APA Group



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APA Group



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APA Group

**EPEE Certificate: Ex 321** 

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EPEE Explosion Protection Electrical Equipment

HOME > EPEE > EX 321

# **EPEE Certificate: Ex 321**

Ex 321

SAI Global Assurance Services Ce

Certificate No.

Latest Issue 5 Issue Issue Date 17-09-1998

Expiry Date Certificate Holder 16-05-2004 Parker Hannifin (Australia) Pty Ltd

9 Carrington Road CASTLE HILL Sydney New South Wales 2154 Australia

Equipment Category Product Description Protection Type Marking Code Gas Group IP Rating IP 67 Manufacturer Test Report Number Issued By Standard

 t
 SOLENOIDS

 n
 Lucifer Explosion Proof Coil/ Housing Assemblies

 Type
 Type m Type e DIP

 Code
 \* see schedule | Class I | Class II | Zone 1

 p
 IIC IP 65

 urer
 Parker Lucifer

 LOSC 10601

Londonderry Occupational Safety Centre AS 2380.1-1989 AS 1939-1990 AS 2236-1994 AS 2380.6-1988 AS 2431-1981

NOTES

HOME > EPEE > EX 321

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## 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 95-1

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 Elactrical 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	Hazardous Location				
	Class I Zone 1				
"Bettiswitch" Switch Enclosures	Type of Protection				
Types: 3R and 4R	Ex d IIB T6				
This supplementary certificate relates to the change of address of Certificate Holder	Certificate Holder Bettis Actuators & Controls Ltd				
and Manufacturer.	Brunel Way, Fareham HAMPSHIRE PO15 5SA ENGLAND Manufacturer				
	Bettis Actuators & Control Ltd				
	Brunel Way, Fareham HAMPSEIRE P015 5SA ENGLAND				
· · · · · · · · · · · · · · · · · · ·	Test Report No(s)				
	N/A				
· · · · · · · · · · · · · · · · · · ·	Australian Standard(s)				
	N/A				
	SAA File Reference				
	Ref: P/3:84017				
	Effective Date				
	1984.02.14				
	Date of issue 1984-02-22				

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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

Incorporated by Royal Charter

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

### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 349

This certifles 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	Hazardous Location
"Govan Drewburn" Junction Box	Class I Zone 1
Cat No F150W	Type of Protection
	Ex d IIB 16 IP65
	Certificate Holder Govan Drewburn Pty Ltd 156 Bamfield Road WEST HEIDELBERG VIC 3081
	Manufacturer
Drawing No(s)	Govan Drewburn Pty Ltd
1373 Rev. 4-11-81; 2613 and 2614	156 Bamfield Road WEST HEIDELBERG VIC 3081
	Test Report No(s)
Certification Conditions	SCC TR No 56739
Continuation Continuits	Australian Standard(s) AS 2480-1981
	SAA File Reference
	P/3: 81216/M104
Remarks	Effective Date 1982-07-22
	Date of Issue 1982.08.11

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y JM. Director-Administration & Approvals Standards Association of Australia

# **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services

# Certificate of Conformity

Certificate No:	AUS Ex 1249X	Issue 0: Issue 5:	Original Issue 17/7/1991 30/05/2003 (Revalidation)	
Date of Expiry:	30/05/2013			
Certificate Holder:	Fisher-Rosemount Pty Ltd 471 Mountain Highway BAYSWATER Victoria	. *		en de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La companya de la comp
Electrical Equipment:		ional Fieldbus/I	nd Model 3001-series Hydrostat Profibus outputs, LCD indicator	
Type of Protection:	Ex ia Ex n			
Marking Code:	Ex ia IIC T4 ( $T_{amb} = 70$ °C Ex ia IIC T4 ( $T_{amb} = 60$ °C Ex n IIC T4( $T_{amb} = 70$ °C AUS Ex 1249X	)/T5 IP66 (for	r non-Fieldbus) Foundation Fieldbus/Profibus)	
Manufactured By:	Rosemount Inc 8200 Market Boulevard Chanhassen MN 55317	USA	Emerson Proces	
Issued by:			ORDER N Customer:	UMBERS 23
	919 Londonderry Re Phone: (02) 4724		02) 4724 4999 Accredital System of	JAS-ANZ JOSE ion by the Joint Accreditation (Australia and New Zealand, Acc No. Z2221100AS
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	Standards Australia Quality Assu	rance Services Ptv L	imited A.B.N. 67 050 611 642	Page 1 of

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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 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.

Issued by:



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



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



Page 2 of .....

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

# 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 Confi	guration
Ref.	Description	Drawing No.
Any one of t	he 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 LC	D 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 Lis	st below)

Issued by:



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



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



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

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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

#### Certified Equipment: (Continued)

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

	(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 LC	D 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 be	elow)

	(c) Analog/HART Transmitter Configuration	
Ref.	Description	Drawing No.
Any one of th	e 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 A	Assembly:	
Micro.c	Micro Brd 5, Coated & Spot Potted, 3051/3001 & Probar	03031-0584
Optional LCI	D Indicator assembly:	
Dis.b	Shrouded/Spot-Potted/Labelled LCD Board, 2 Line	03031-0591
Any one of th	e sensor boards can be used: (Refer to Sensor Board List belo	w)

	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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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

#### Variations Permitted By Issue 5:

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

ſ	(a)	Foundation Fieldbus/Profibus Transmitter Configuration	
	Entity Parameters	With or without transient protected T1 option	
ſ	Ui	30 V	· · · ·
	Ii	300 mA	1 A. 14
I	Pi	1.3 W	
I	Ci	0 μF	
	Li	0 µH	

, ,	(b) Low Power Transmitter Config	uration
Entity Parameters	Without transient protected T1 option	With transient protected T1 option
Ui	30 V	30 V
li	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 Confi	guration
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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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

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

#### 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  $Po \le (Uo \times Io)/4$ .
- 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<sup>2</sup> 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.
  - 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.

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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

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

Document No.	Document Fitle	Sheets	Issue	Date
00268-0031	Index of I.S. Barrier System for MOD.268 Smart Family	1 to 7	M	08/04/1993
00208-0031	Interface	1.007	141	9010-11999 9
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

### Drawings Relating to Variations Permitted by Issue 5

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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

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

### Drawings Relating to Variations Permitted by Issue 5 (Continued)

Document	Document Title	Sheets	Issue	Date
No.				10/00/2001
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,	1 to 4	AK	04/03/2002
	3051/3001 & Probar			10/11/100/
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	1 to 3	AF	19/06/2000
	Board, 2 Line			10/00/1007
03031-0604	Schematic Diagram 3051C Low Power Terminal Block	<u>1 of 1</u>	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.	1 to 3	AC	07/08/1997
	Block, 3051C			
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

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

### Drawings Relating to Variations Permitted by Issue 5 (Continued)

Document	Document Title	Sheets	Issue	Date
No. 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	С	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	1 to 6	AH	30/11/2000
	Safe			
03031-1022	Model 3051C/L/P/H, 3001C/S Intrinsically Safe and Type N	1 to 10	AG	28/05/2003
	Configuration, SAA			
03031-1026	SAA LS. 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	<u> </u>	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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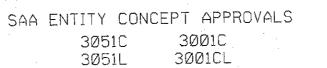
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	AA	UPDATE ENTITY PARAMETERS	RTC1002910	J.D.J.	12/2/97
	AB	ADD FIELDBUS AND	RTC1006448	J.D.J.	4/26/99
		PROFIBUS			<u> </u>



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

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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)

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This drawing forms part of

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TestSafe

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# OUTPUT CODE F /W (FIELDBUS, PROFIBUS)

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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 in IIC T5 CLASS I, ZONE 0 PROTECTION:

APPARATUS PARAMETER	BARRIER PARAMETER
Vmax = 30V Imax = 300mA Pmax = 1.3W	Voc IS LESS THAN OR EQUAL TO 30V Isc IS LESS THAN OR EQUAL TO 300mA Voc * Isc 4 IS LESS THAN OR EQUAL TO 1.3W
Ci = 0 μF Li = 0μH	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.

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A COLOR WITH	Total Sale	This drawing forms part documents under Certilic AUS Ex	ate Number
F	osemount Inc.	Amendments require Sup Certification	piementary
1	001 Technology Drive		CAD Maintained, (MICROSTATION)
DF	·	SIZE FSCM NO	DWG NO. Ø3Ø31-1Ø26
IS	SUED	SCALE N/A WT.	SHEET 4 OF 4

Electronic Master - PRINTED COPIES ARE ONCONTROLLED - Rosemount Proprietary

#### 35 TAN LATRAL ENGLEAD OFF. 0298047193 AUSTRALIA NO. 744 14 Incorporated by Royal Charter

STANDARDS HOUSE, 60 ARTHUR STREET, NORTH SYDNEY, N.S.W.

# SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 94-2

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 allered 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 of conditions under which this certificate was issued.

Description of Modification	Hazardous Location
"Masoneilan" Electro-Fneumatic Transducers	Class I Zone O
and Valve Positioners	Type of Protection
	Ex la IIC T6
This supplementary certificate relates to	Certificate Holder
the equipment certified under SAA Certificate No. Ex 94-1, which may also	Masoneilan Australia Pty Ltd
be used with a "YEW" Safety Barrier, Cat.	Suite 8 651 Pacific Highway
No. BARD-400*A/A	KILLARA N S W 2071
	Manufacturer
	Mamoneilan International Inc. Norwood
Drawing No(s)	MASSACHUSETTS 02062, U S A
RECEIVED	
ATTZO REV. C	Test Report No(s)
3 1 AUG 1903	
Ans'd	SCC TR No. 58035
	Australian Standard(s)
	• AS 1829-1981
	SAA File Reference
	P/3:83067/M111
	Effective Date
	1983.08.11
	Date of Issue
	1983-08-29

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Director-Administration & Approvals Standards Association of Australia

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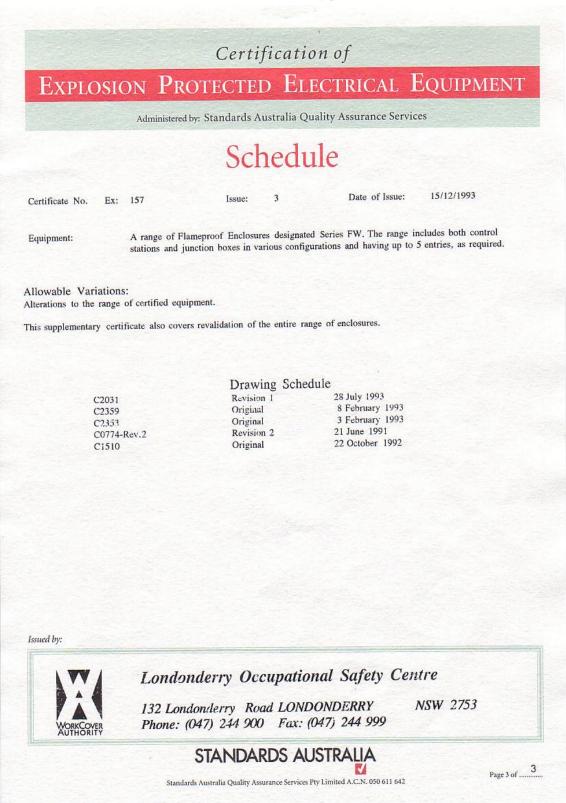
FW0001 (826x1165x16M jpeg)

Explosic	DN	PROTECTE	D EI	LEC	TRICAL	Equipment
		ninistered by: Standards		27-		
	Ce	ertificate	of (	Co	nform	nity
ertificate 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 Lt 156 Bamfield Road WEST HEIDELBERG	d Victoria	3081		
		WEDT HEIDEBBERG				
Electrical Equipment:		FW Range of Flameproc	f Enclosure	8		
ype of Protection and	Mark	ing Code:	Ex d III	B T6 I	P65 Class I Zone	1
Aanufactured By:		Govan Drewburn Pty Lt 156 Bamfield Road WEST HEIDELBERG	d Victoria	3081		
ued by:						
W/	L	ondonderry O	ccupati	ona	l Safety Co	entre
WORKCOVER		32 Londonderry R hone: (047) 244 90				NSW 2753

FW0002 (826x1165x16M jpeg)



FW0003 (826x1165x16M jpeg)



Home	Equipment Certification	Service Facility Certification	Certificate Database	Contacts

#### Certificate Database

Certificate Search

## AUSEx\_122X

	Search					
	Price: \$27.50 (incl 1		Advanced Search			
	Certificate #:	AUSEx_122X	Issue Date:	18/09/2002	Username	
	Issue #:	20	Expiry Date:	31/12/2005	Password	
			Status:	EXPIRED		
	Certificate Holder:	Rosemount Instruments Pty Ltd			Login Lost Password?	
Address:471 Mountain Highway BAYSWATER VICTORIA 3153 AUSTRALIAManufacturer:Rosemount Inc.					No account yet? Register	

Product Description:	Description:     LCD Indicator       Equipment     Transmitters       Category:     Transmitters	
Equipment		
Category: Protection Type:		
Gas Group:	IIC	Links
Marking Group:		IEC Ex Certificates
IP Rating:	IP 66	
Test Report #:	" 10070, 13521, TS20280 and TestSafe 23136 " Issued by: TestSafe Australia	
Standards:	AS 2380.1-1989 AS 1939-1990 AS 2380.7-1987	
Notes:	N/A	

Add to Cart

#### more categories

ANZEx Certificates

AUSEx Certificates

Vintage SAA Certs

Workshop Certificates

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

### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 198

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.

Hazardous Location **Description of Equipment** Class I Zone 1 'Herion' Solenoid Valve Coils 0270, 0271. 0272, 0273, Types: Type of Protection 0274, 0275, 0276 and. 0277 Ex s T5 Suitable for the following voltages Certificate Holder From 12 V to 250 V d.c. ór Frank Puddick Industries From 24 V to 380 V, 40 to 60 Hz 62, Amherst Street, CAMMERAY, NSW 2062 Manufacturer Drawing No(s) Herion Werke K.G., 02728, 02738 Postfach 1560, 7012, Fellbach, STUTTGART, GERMANY Test Report No(s) SCC TR Nos. 53035, 54057 and 54058 **Certification Conditions** Australian Standard(s) AS 1826-1976 SAA File Reference EL/29:78090/M93 Remarks Effective Date 1980-08-21 Date of Issue 1980-09-22

Pty. Ltd.,

Director 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 198-1

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 'HERION' SOLENOID VALVE COILS	Hazardous Location Class I Zone 1
This supplementary certificate is issued to cover the following types which are in addition to the types detailed in Certificate No. Ex 198.	Type of Protection Ex s T5
Types: 0770, 0771, 0772, 0773, 0780, 078 0782, 0783, 0870, 0871, 0872, 087 0880, 0881, 0882 and 0883 suitable for the following voltages	Certificate Holder 1, Frank Puddick Industries 3, Pty.Ltd., 62, Amherst Street, CAMMERAY, NSW 2062
	Manufacturer
From 12 V to 250 V d.c. or From 24 V to 380 V, 50 to 60 Hz	Herion Werke K.G., Postfach 1560, 7012, Fellbach, Stuttgart, GERMANY
	Test Report No(s)
	SCC TR No. 54880
	Australian Standard(s)
<u>Drawing Nos</u> . 0871S	AS 1826 - 1976
	SAA File Reference
	EL/29:80144/M94
	Effective Date 1980-11-06
[에 제품 문제] 공유 실험 전체 공유 이유 가격 가격 전체 전체 등 가격을 하는 것이다. [14] 이 사람 전에 가격 관계 관계 전체 전체 등 이 사람이 가격 전체 전체 전체	Date of Issue
	1980-11-25

Director

Standards Association of Australia

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

#### SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 198-2

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 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.

Descripti	on of Modification	Hazardous Location	
<u>"Herior</u>	" Solenoid Valve Coils	Class I Zone 1	
This su followi	applementary certificate relates to the ng items:	Type of Protection Ex s IIC T5	
(a) (b)	Addition of Apparatus Group IIC to the Type of Protection for equipment certified under SAA Certificate Nos. Ex 198 and Ex 198-1. Change in address of Certificate Holder.	Certificate Holder Frank Puddick Industries Pty Ltd 204 West Street CROWS NEST N S W 2065	
		Manufacturer	
		Herion Werke K.G. Postfach 1560 7012, Fellbach STUTTGART GERMANY	
		Test Report No(s)	
) 		N/A	
		Australian Standard(s)	
		N/A •	
		SAA File Reference	
		P/3: 83135/M111	
		Effective Date	
		1983.07.21	
		Date of Issue 1983.08.09	
his document	shall not be reproduced except in fuil.		

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

### SUPPLEMENTARY CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No.

#### Ex 198-3

Description of Modification	Hazardous Location
'Herion' Solenoid Valve Coils	Class I Zone 1
This supplementary certificate relates to the following items:	Type of Protection Ex s IIC T5
(a) Change of enclosure material to aluminium (GD-AlSil2)	Certificate Holder
<ul> <li>(b) Extension of SAA Certificate Ex 198-2 to include the following:</li> <li>'Herion' Solenoid Valve Coils Types:</li> </ul>	Frank Puddick Industries 204 West Street CROWS NEST NSW 2065
0278, 0279, 0788, 0789, 0790, 0791, 0792, 0793, 0794, 0795, 0796, 0797, 0888, 0889, 0890, 0891, 0892, 0893, 0894, 0895, 0896 and 0897.	Manufacturer Herion Werke K.G. Postfach 1560 7012 Fellbach WEST GERMANY.
Drawing No(s)	Test Report No(s)
0278S, 0585042 ZZ and 0585043 VB.	SCC letter: 1985-02-28
	Australian Standard(ş)
	N/A SAA File Reference
	P/3: 84125/M119
	Effective Date 1985-02-28
	Date of Issue 1985-03-03

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Ex 198-5

# Certificate of Compliance

This is to certify that Standards Australia Certificate Nos. Ex 198, Ex 198-1, Ex 198-2, Ex 198-3 and Ex 198-4 issued to:

Frank Puddick Industries Pty Ltd 242 Burns Bay Road Lance Cove NSW 2066

for the "Herion" Solenoid Valve Coils are hereby extended to include changes as detailed in the following schedule.

#### SCHEDULE

#### Description of Changes:

- Revalidation of Certificate. 1.
- Inclusion of increased safety in certification. z.
- Exclusion of valve coils which do not incorporate a safety fuse. 3.
- Addition of classification for degree of protection IP65. 4.

The following valve coil types are now covered by this certificate:

- Coils rated for supply voltage 12 to 250V, d.c: R § 0270, 0272, 0770, 0772, 0780, 0782, 0788, 0790 and 0792 all for armature dia. 13mm, 0870, 0872, 0880, 0882, 0888, 0890 and 0892, all for armature dia. 16m.
- Coils rated for supply voltage 24 to 380 V, 40 to 60 Hz: ъ 0271, 0273, 0771, 0773, 0781, 0783, 0789, 0791 and 0793, all for armature dia. 13mm, 0871, 0873, 0881, 0883, 0889, 0891 and 0893, all for armature dia. 16mm.

Drawings: 027.TD 0271 0278 0278 parts list Pages 1 & 2 0570027 0570219

Original Issue E Issue D Original Original Original

9 December 1983 22 July 1988 10 October 1985 13 November 1985 12 January 1983 13 January 1983

Page 1 of 2

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Signed for and on behalf of Standards Australia

Quality Assurance Service

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Continuation of SUPPLEMENTARY Cartificate No

Ex 198-5

# Certificate of Compliance

Drawings (Continued)		
0570406	Issue A	24 September 1975
0570537	Issue G	5 July 1989
0570600	Issue D	1 September 1988
0570606	Issue B	2 August 1988
0570641	Issue D	16 August 1988
0570896	Issue B	2 August 1988
0571103	Original	9 May 1977
0571623	Issue C	11 November 1988
0571635	Issue F	6 April 1987
0572003	Original	11 January 1982
0572076	Original	14 January 1983
0572102	Original	17 March 1983
0572325	Original	21 January 1983
0572327	Original	24 January 1983
0572328	Issue C	6 April 1987
0572352	Original	25 January 1983
0572405	Issue C	27 March 1991
0585026	Issue B	8 August 1989
058504222	Original	1 March 1983
0586697	Issue C	29 December 1988
0586807	Issue A	10 August 1988
0586811	Issue A	28 July 1988
0586819	Issue A	11 August 1988
0586820	Issue B	11 November 1988
0771SM	Issue A	8 October 1990
08715	Original	6 August 1970

TYPE OF PROTECTION: Ex e s IIC T5 IP65 Class I Zone 1

Test Report No: LOSC 4429 to AS 2380.1-1989, AS 2380.6-1988, AS 1826-1983 and AS 1939-1990.

File: P/3: 90006, M157

Date of Issue: 10 July 1991

Date of Expiry of Validity: 10 July 2001

Page 2 of 2

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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	Hazardous Location		
Controls, 120 Series.	Class I Zone 1		
	Type of Protection		
As detailed in Schedule 1	Ex d IIB T6 IP66		
	Certificate Holder		
	United Electric Controls (Aust) Pty Ltd 83 Murphy Street RICHMOND VIC 3121.		
Drawing No(s)	Manufacturer		
Refer Schedule 2	United Electric Controls Co 83 School Street Watertown MASSACHUSETTS USA		
	Test Report No(s)		
Certification Conditions	Londonderry Centre TR NO: 974		
Refer Schedule 1	Australian Standard(s)		
	AS 2480-1939 and AS 1939-1981		
	SAA File Reference P/3: 82153/M117		
Remarks			
	Effective Date		
	1984-10-29		
	Date of Issue 1984-10-30		

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

# CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 542 (St

(Sheet 2 of 3

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.
- 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

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

### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

	Continuation o	f Certificate No	Ex 542	(Sheet 3 of 3)
SCHEDULE 2	Drawing No(	s) <sup>`</sup> cont <sup>*</sup> d		
	E6296-185 E6296-186 E6296-187 E12259 E12260 E12261 E12262 E12263 E12264 E12265 E12266 E12266 E12267 E12267 E12198 E12200 D6201-167 D6201-203 D6201-204	Issue C Issue C Issue B Issue A Issue A Issue B Issue B Issue B Issue A Issue A Issue A Issue A Issue A Issue A Issue A Issue A		

Original

Revision 2

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UEA-1200G

UEA-1200L

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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 <u>120</u> series range of Pressure and Temperature controls, is hereby extended to include modifications as detailed in the following schedule.

Schedule

#### Description of Modifications

- 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 Tanua C
E-6296-278 Sheets 1 &	2, Issue B
E-6296-279 Issue B	-
E-12559 Sheet 1 Issue	В
E-12559 Sheet 2 Issue	D
B-12262 Sheet 1 Issue	C
E-12262 Sheet 2 Issue	D
E-12263 Issue A	
E-12264 Issue A	
E-12265 Sheet 1 Issue	В
E-12265 Sheet 2 Issue	С
UEA-1200G Issue B	
UEA-1201G Issue A	

Page 1 of 2

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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

<u>Type of Protection</u>: Ex d IIB T6 IP66 <u>Test Report</u>: LOSC 2010 to AS 2480-1986 and 1939-1986 <u>File</u>: P/3: 85015/M137 Date of Issue: 28 July 1987

Page 2 of 2



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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 <u>120 Series Temperature and Pressure Controls</u> are hereby extended to include modifications as detailed in the following schedule.

#### SCHEDULE

Description of modifications:

EXPLOSION PROTECTED

Change of gas group to IIC

Models in the range

Pressure controls

Pressure controls

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

(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

(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, S157B, 36, 37, 38, 39, 40, 183, 184, 185, 186, 188, 189, 612, 616, 50, 51, 52, 53, 54, 55

Page 1 of 2

General Manage Guality Assurance Services

Signed for and on behalf of Standards Australia

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Continuation of SUPPLEMENTARY Certificate No

Ex 542-2

# Certificate of Compliance

UIPMENT

#### Drawings:

EXPLOSION PROTECTED

E-6296-277 Sheet 1	Revision D	<b>28 January 1992</b>
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	<b>Revision</b> 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
	Revision D	12 February 1986
	Revision B	5 July 1985
	Revision A	8 July 1985
UEA-1200 L	Issue E	undated
E-12260	Revision B	<b>29 January 1992</b>
E-12261	Revision B	29 January 1992
E-12266	Revision B	29 January 1992
E-12267	Revision B	29 January 1992
N	ACVIDION D	73. Addingt) 7524

TYPE OF PROTECTION: Ex d HIC T6 HP66 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

Page 2 of 2

Seneral Manager Quality Assurance Services

Signed for and on behalf of Standards Australia

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

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

ELECTRICAL EQUIPMENTSUPPLEMENTARY

for the <u>120 series Temperature and Pressure Controls</u> 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

EXPLOSION PROMECTED

File: P/3: 92220

Date of Issue: 21 December 1992

Date of Expiry of Validity: 21 April 2002

Page 1 of 1

Signed for and on behalf of Standards Australia

General Manager Genety Assurance Services

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

### STANDARDS ASSOCIATION OF AUSTRALIA

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

#### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

#### No. Ex 401

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/S, Cartification 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	Hazardous Location
"Goven". Junction Box Cat. No. F?	Class I Zone 1 Type of Protection Ex d IIB T6 1P65
	Certificate Holder Govan Drewburn Pty Ltd 156 Bamfield Road WEST HEIDELBERG VIC 3081
Drawing No(s)	Manufacturer
3135; 1373 Rev. 4.11.81; 3214; 3076; 3137	Govan Drewburn Pty Ltd 156 Banfield Road WEST HEIDELBERG VIC 3081
Certification Conditions	Test Report No(s) SCC TR No. 56970
	Australian Standard(s)
	A8 2480-1981
	SAA File Reference
Remarks	P/3: 81243/M108
TTOTICK BY	Effective Date 1983-02-03
	Date of Issue 1983.05.13

This document shall not be reproduced except in full.

This certificate is not transferable and remains the property of the Standarda Association of Australia and must be returned to the Association in the event of it being revoked.

your. ill. Director-Administration & Approvals Standards Association of Australia

## **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services

# Certificate of Conformity

Certificate No:	AUS Ex 02.3794X	Issue 0:	Original Issue: 29/0	5/2002	
Date of Expiry:	29/05/2012				
Certificate Holder:	Fisher Rosemount Pty Ltd 471 Mountain Highway Bayswater Victoria 3153				· .
Electrical Equipment:	Model 3144P Smart Tempe and/or indicator	rature Transm	itter, with optional integ	gral temperature assen	nbly
Type of Protection:	Ex ia Ex n				
Marking Code:	Ex n IIC IP66 T5 (Tamb= - Ex ia IIC IP66 T5 (Tamb= - AUS Ex 02.3794X	60 °C to 75 °C 60 °C to 75 °C	), T6 (Tamb= -60 °C to C), T6 (Tamb= -60 °C to	50 °C) 50 °C)	
Manufactured By:	Rosemount, Inc. Minncapolis, Mn				
	U.S.A				
	· · · · · · · · · · · · · · · · · · ·				

Issued by:



 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

5 Page 1 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 Q<sup>2</sup>134) 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:

A\$ 2380.1:1989	Electrical equipment for explosive atmospheres - Part 1 - General requirements
AS 2380.9:1991	Electrical equipment for explosive atmospheres – Part 9 – Type of protection n – Non-sparking.
AS 1939:1990	Degrees of protection provided by enclosures for electrical equipment (IP Code)
AS/NZS 60079.0:2000	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements (including Amendment 1)
AS/NZS 60079.11:2000	Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety 'i' (including Amendment 1)

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 22328

File Reference: TestSafe 2002/001006

Signed for and on behalf of issuing authority Director TestSafe Australia

Position 29/05/2002

Date of issue

Ex 02.3794X

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Issued by:



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STANDARDS AUSTRALIA

Storehards Australia Quality Assurance Services Ptv Limited A.B.N. 67 050 614 612

## **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services.

# Schedule

Certificate No: AUS Ex 02.3794X

Issue: 0

Date of Issue: 2

29/05/2002

#### Certified Equipment:

The Model 3144P Smart Temperature Transmitter is designed to convert the input from a temperature sensor into a 4-20 mA signal for measurement purposes. It contains printed circuit boards housed in a cylindrical metallic enclosure with a central partition that forms two compartments, each fitted with screw-on covers. The electronics compartment contains a transition printed circuit board, a main printed circuit board which is completely encapsulated, and an optional meter/LCD board. External connections are made via a terminal assembly in the terminal compartment. The terminal assembly consists of terminals mounted on a printed circuit board. The board itself is potted in a plastic enclosure. An encapsulated transient protection block may be fitted as an option in the terminal compartment. The metallic enclosure is polyurethane coated aluminum alloy, or optionally stainless steel.

#### **Conditions of Certification:**

#### 1 Conditions of Safe Use

The following conditions shall be adhered to during installation:

- 1.1 For the option using the lightning protection board, the apparatus should be bonded to earth with a copper conductor of 4 mm<sup>2</sup> or greater.
- **1.2** For the label plate with more than one type of marking on it, on completion of commissioning the apparatus, the irrelevant marking code(s) shall be permanently scribed off.
- 1.3 Input/Output parameters for non-sparking protection model: Ex n

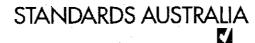
Input Parameters	Power / Loop Terminals J2B (Pins "+","-" & "T")
Maximum Input Voltage $U_n$	55 V
Maximum Input Power $P_n$	1.3 W

Issued by:



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



. Standards Australia Quality Assurance Services Pty Limited A  $\overline{\mathrm{B}}.\mathrm{N}/6^{+}.050$  (61) – (.

## **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services

#### Conditions of Certification continued:

Ex 02.3794X Addendum to Certificate No.....

1.4 Input/Output parameters for intrinsically safe model: Ex ia

I.S. Inputs/Outputs Parameters	Power / Loop Terminals J2B Pins "+","-" and "T"	Sensor Terminals J1B Pins "1" to "5"
Maximum Input Voltage $U_i$	30 V	
Maximum Input Current I <sub>i</sub>	300 mA	
Maximum Input Power <i>P</i> <sub>i</sub>	1.0 W	
Maximum Internal Capacitance C <sub>i</sub>	0.005 μF	
Maximum Internal Inductance L <sub>i</sub>	20 µH	
Maximum Output Voltage U <sub>o</sub>	····	13.6 V
Maximum Output Current Io		100 mA
Maximum Output Power Po		80 mW
Maximum External Capacitance Co		0.66 µF
Maximum External Inductance L <sub>o</sub>		1.9 mH

Drawing Schedule								
Drawing No	Drawing Title	Sheets	Issue	Date				
00644-4250	Transformer	1 of 1	AB	11/02/2000				
00644-4253	Opto Coupler	1 to 5	AA	04/10/1999				
03144-0140	Label, Nameplate	1 to 2	AD	21/01/2002				
03144-0164	Label, Approvals for 3144P	l to 2	AC	22/05/2002				
03144-0308	Approval DWG. 3144P Hart/Analog SAA I.S. & Type n	1 to 3	AA	17/08/2001				
3144-2004	Schematic Diagram Transition Board	l of 1	B	10/04/1995				
03144-1015	Filter Plate Assembly	1 to 3	AC	14/01/2002				
03144-2005	PWB Drill Drawing Transition Board	1 to 2	D	03/05/1996				
3144-2006	Circuit Card Assembly 3144 Transition Board Uncoated	l of 1	В	05/1996				
03144-2007	Schematic Diagram 3144 Terminal Block	1 of 1	В	10/04/1995				
03144-2008	PWB Drill Drawing Terminal Block	1 to 2	E	04/11/1996				
03144-2009	Circuit Card Assembly 3144 Terminal Block	1 of 1	AA	10/04/1997				
03144-2017	Schematic, 3144/3244 Transient Protection Block, Hart	1 of 1	В	19/11/1996				

Issued by:



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. 67 050 611-612

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## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 02.3794X Addendum\_to Certificate\_No.....

Drawing Schedule continued:								
Drawing No	Drawing Title	Sheets	Issue	Date				
03144-2018	PWB, 3144/3244 Transient Protection Block, Hart	1 to 3	А	19/11/1996				
03144-2019	CCA, Transient	1 to 2	AA	16/01/1998				
03144-2108	Schematic, 3144P Electronics Board Fieldmount	1 to 3	AE	23/04/2002				
03144-2109	Printed Wiring Board, Electronics Field Mount	• 1 to 3	AC	24/04/2002				
03144-2110	CCA, Electronics Board Coated	1 to 2	AF	24/04/2002				
3144-2111	Schematic, 3144 LCD Adapter Board	1 of 1	AA	21/06/01				
3144-2112	PWB, Fabrication Drawing Interconnect Board	• 1 to 2	01 - 1	12/2000				
3144-2113	CCA Interconnect Board	l of l	01	07/2001				
03144-2354	Coated LCD/Meter Assembly 3144/3244	1 to 3	AE	19/07/2001				
03144-2357	Schematic Diagram FB/ADV Meter/LCD Board	1 of 1	AA	29/04/1999				
03144-2358	PWB FB/ADV Meter/LCD Board	.1 to 3	AA	29/04/1999				
03144-3040	Final Assy, Transient Protector	1 of 1	AB	16/06/1998				



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# STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pty Limited A.B.N. 67 050 611 042

5 5 Page ... of ... ..

## EXPLOSION PROTECTED DIECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

# Certificate of Conformity

		· ·	i		
Certificate No.	Ez: 186X	lssue 0:	Original Issue 13/1/19	31	
t .		Issue 3:	24/5/1995		
:			· ,	•	
Date of Expiry:	24/5/2005	· · · · · · · · · · · · · · · · · · ·		•	
Certificate Holder:	BEP Engineering Produ 25A South Street RYDALMERE NSY				
Electrical Equipment	1: Type S2 Switch Head				
·   1 · ·					
Type of Protection a	and Marking Code:	Ex d IIC To	5(T.,	l sau	
Manufactured By:	KDG Mobrey Limited 190/196 Bath Road				
	Slough Berkshire	SL1 4DN Unite	d Kingdom		
Issued by:		and a summer of the statements			18 ···
	Londonderry (	Occupation	al Safety Cent	re	• -
WORKCOVER	132 Londonderry Phone: (047) 244		CONDONDERRY 147) 244 999	NSW 2753	الم المحديد :
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## EXPLOSION PROTECTED EJECTRICAL DEDITEMENT

Administered by: Standards Australia Quality Assurance Services

This conficate is granted subject to the conditions as set out in Standards Australia Miscelloneous Publication MP 69 and the Procedures (Doc. Q7154) of the scheme.

The electrical equipment and any acceptable variation to it specified in the schedule to this cartificate 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 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 11637

File Reference:

Issued by:

LOSC 94/5922

alf of issuing authority

245

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.

MORKCOVER PI

Londonderry Occupational Safety Centre 132 Londonderry Road LONDONDERRY

NSW 2753

Phone: (047) 244 900 Fax: (047) 244 999

STANDARDS AUSTRAL

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## Certer to

Administered by: Standards Australia Quality Assurance Services

# Schedule

Issue:

186X Certificate No. Ex:

> The S2 Switch Head consists of a cast enclosure having a built-on main access cover which houses an externally actuated switch block having up to 6 contacts. Cable entry to the interior of the enclosure is provided by means of a separately certified cable gland.

Date of Issue:

24/5/1995

#### lowable Variations:

Equipment:

A change in the name of the Certificate Holder.

Re-validation of the certified equipment and variation to current standards.

Inclusion of the Type 52 Lovel Switch to the range of certified equipment!

22-20,1002

#### Conditions of Certification:

#824 L'08\TJ

It is a condition of safe use that the equipment be used with an appropriately certified cable gland and adaptor.

#### Drawing Schedule

;	Drawing No.	Drawing Tide	Revision	Drawn <sup>//</sup> Revision Date
	71097/790 71097/876	Mobrey Flameproof Switch Head Nameplate for \$250 Series Flameproof Level Switches	D . 1	19/10/92 7/12/94 4/1/95
	71097/8B0	Certification Plate	 1	

Issued by: Londonderry Occupational Safety Centre NSW 2753 LONDONDERRY 132 Londonderry Road Phone: (047) 244 900 Fax: (047) 244 999 STANDARDS AUSTRALIA **.** 3 Page 3 of -Standards Australia Quality Assurance Services Pre Limited A.C.N. 050611642 \$6:01 INT 'TOP'S งวง พกาษสุด หลากสุม -ON G RC EROM : PEGLER BEACON SA d HJX∃-α⊥7 SO1NUS; : OT

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Reference 94/5922

### WORKCOVER AUTHORITY

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ing Products			1		تنسب

BEP Instrument
(A Division of Beacon Engineering Products Pty Limited)
25A South Street
RYDALMERE NSW 2116

Attention: Mr John Shaw

18th January, 1995

Dear Sir,

#### RE: YOUR TYPE S2 FLAMEPROOF MAGNETIC LEVEL SWITCH

With reference to the above apparatus which was submitted for testing for certification purposes, our testing is now complete, and our Test Report No. 11637 is attached.

Yours faithfully,

G.J. Ruming Senior Technical Officer (Electrical) for Operations Manager, Londonderry Occupational Safety Centre

Encl.

95M170(

LONDONDERRY OCCUPATIONAL SAFETY CENTRE, 132 Londonderry Road Londonderry NSW 2753 Phone; 1047) 244 900 Toll Free (008) 02 4205 Fox (047) 244 999 New South Wales Government ST89 '0N YOF NOVES FITTED OCCUPATION

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### 94/5922 WORKCOVER AUTHORITY

The Manager, BEP Engineering Froducts Pty Ltd 25A South Street RYDALMERE NSW 2116

Attention:

Mr John Shaw

24 May, 1995

Dear Sir,

Reference

#### re: CERTIFICATION OF ELECTRICAL EQUIPMENT FOR HAZARDOUS AREAS

Apparatus:'Mobrey' Switch HeadType: 52Certificate No:Ex: 186X issue 3

I refer to your application dated 1/3/94 for re-validation of the above apparatus under the provisions of the Standards Australia Hazardous Area Certification Scheme.

Please find enclosed the relevant certification documents and drawings.

Yours faithfully,

K. J.

K.J. Fisher,

Coordinator, Approvals and Certification, for Operations Manager, <u>Londonderry Occupational Safety Centre</u> encl.

cc. (with copy of certification documents) The Manager, Quality Assurance Services, PO Box 1055, <u>STRATHFIELD NSW 2135 216</u> Attention: Mr Roy Jacobi

22-20°1002

 Ipf133 rev D August, 1993
 P481

 LONDONDERRY OCCUPATIONAL SAFETY CENTRE, 132 Londonderry Road Londonderry NSW 2753
 Phome: (047) 244 900 Toll Free (008) 02 4205 Fax (047) 244 999 New South Wales Government

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 New South Wales Government

page I of 1

PERCER BERCON SA

11/30°3 726#

21:01

PAGE 1 OF 3

TEST REPORT

TEST REPORT NO: 11637 FILE NO: 94/5922 DATE OF ISSUE: 18th January, 1995

#### WORKCOVER AUTHORITY OF N.S.W.

#### LONDONDERRY OCCUPATIONAL SAFETY CENTRE

#### 132 LONDONDERRY ROAD

#### LONDONDERRY NSW 2753

#### TEST OF ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES -

#### EXPLOSION-PROTECTION TECHNIQUES

#### GENERAL REQUIREMENTS

#### AND FLAMEPROOF ENCLOSURE d

#### TO AUSTRALIAN STANDARDS 2380.1-1989, 2380.2-1991

#### AND 1939-1990

APPARATUS

#### TYPE S2 FLAMEPROOF MAGNETIC LEVEL SWITCH

SUBMITTER.

BEP ENGINEERING 25A SOUTH STREET RYDALMERE NSW 2116

#### GROUP

IIC

T6 AT 60°C AMBIENT

TEMPERATURE **CLASSIFICATION** 

IP66

DEGREE OF PROTECTION

#### HAZARDOUS AREA

#### CLASS I ZONE 1

1. 1 11/60'3 726#

GIRG ON 22-20 1002 51:01

QC:CI IAA7 'YAF Y . EROM : REGLER BERCON SH

#### PAGE 2 OF 3

1.

2.

2.1

#### TEST REPORT NO. 11637

#### <u>GENERAL</u>

This report covers the supplementary application of BEP Instruments to include on Standards Australia Certificate No. Ex 186 a type S2 series Plameproof Magnetic Level Switch. Variations of this series are listed on Drawing 71097/790 Issue B. This application also includes the revalidation of the above certificate and the transfer of ownership of the certificate from Bestobell Mobrey Limited of the U.K. to BEP Instruments (a division of Beacon Engineering Products Pty. Limited) of 25A South Street, Rydalmere, NSW 2116.

#### TESTING

The equipment was tested to AS2380.1-1989 and AS2380.2-1991 for Group IIC and Temperature Classification T6 at 60° amb.

The following clauses of AS2380.1 were applied:

**2.1**, **2.3.2**, **2.4.1**, **2.8**, **2.9**, **2.10**, **2.11.1**, **3.2.6**, **4.1**, **4.2**, **4.4**, **4.7**, **5.1.2**, **5.1.3**, **5.2.1**, **5.2.3**, **5.3** and **5.5**.

The following tests were not considered necessary:

Clause 5.5 "Temperature Rise Test" due to the nature of the enclosed micro switch, negligible power would be dissipated within the enclosure thus a temperature classification of T6 with a 60° ambient is justified.

2.2

The following clauses of AS2380.2 were applied;

2.1. 2.2. 2.4. 2.10.1. 2.10.4. 2.11. 2.12.1. 2.12.3. 2.12.4. 3.1. 4.2.1. 4.2.3. 4.2.4. 4.2.5 and 4.3.1.

The following tests were not considered necessary:

Clause 4.2.3 "Determination of Explosion Pressure" and Clause 4.2.5 "Flameproof Test" as ERA Test Report File No. 5041/159 of May 1979 indicates compliance.

2.3

The equipment was also tested to AS1939-1990 for degree of protection IP66.

11/01'd 726#

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CIRC ON ST: DT 22-20'TOOS ACTOL INUL JUL 101 C AS NOORER RECOVER WORK

#### PAGE 3 OF 3

#### TEST REPORT NO. 11637

19 Oct 1992

07 Dec 1994

04 Jan 1995

#### RESULTS

The apparatus complied with the standards and requirements above.

#### CONDITIONS 4.

It is recommended the following conditions be included in the certificate for the equipment:

4.1

5.

5.1

5.2

3.

On installation a previously Standards Australia certified gland must be used and if necessary a previously Standards Australia certified thread adaptor.

#### ADDITIONAL INFORMATION

The marking was assessed on the basis of drawings only and included the Standards Australia Certificate No. AUS Ex 186X.

As the equipment passed a pressure test of 2640 KPa which was four times the reference pressure and the enclosure is not of welded construction, the equipment may be exempted from the routine pressure test of Clause 4.3 of AS2380.2-1991.

Issue B'

Issue 1

Issue 1

#### DRAWINGS

71097/790 71097/876 71097/880

G.J. Ruming Senior Technical Officer (Electrical)

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G.R. Sandlant Senior Technical Officer (Electrical)

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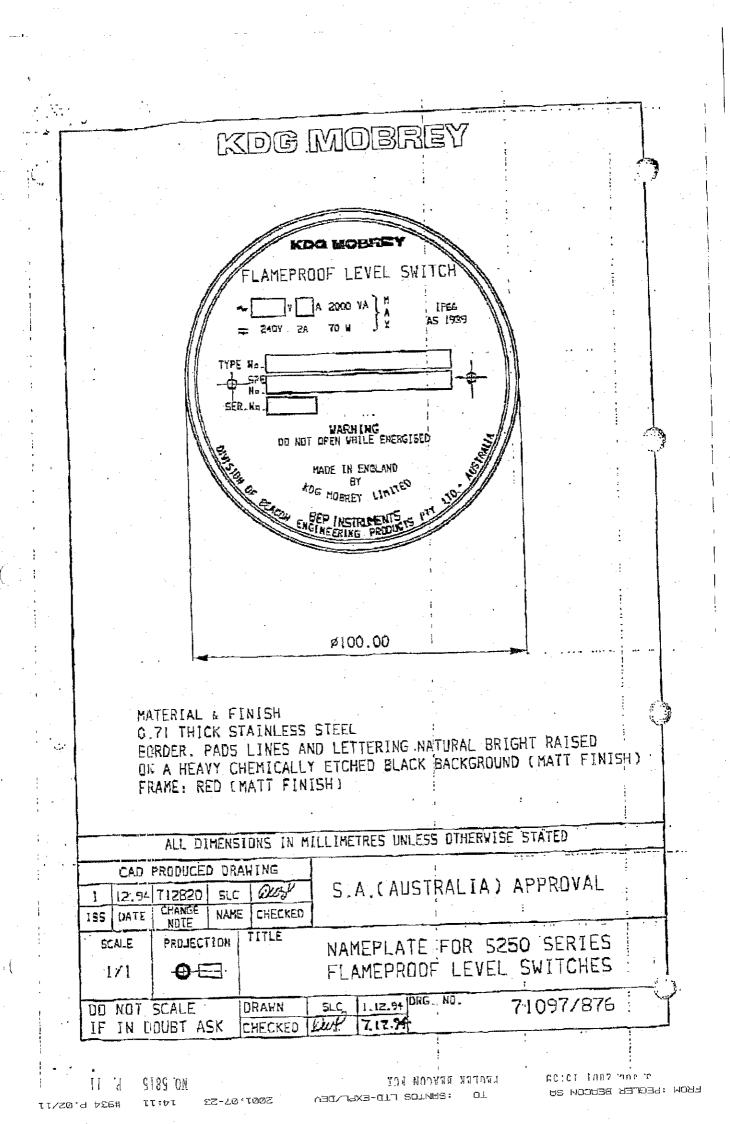
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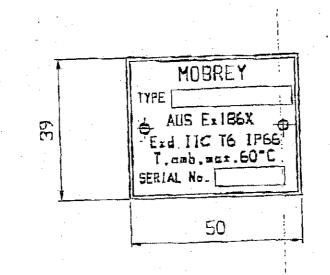
C10C 'AN 22-20'1002 ST:7T

VAJ MAAYIG ଅସଂশAକାଯ ABUTOS FID-GXEVES: OL

RG: G1 1002 'TOP 'P RECOM : PEGLER BERCON SR

б.





KDG MOBREY

NOTES:

MATERIAL: STAINLESS STEEL I\_B THICK

BORDER LETTERING AND FADS TO BE RAISED ON A HEAVY CHEMICALLY ETCHED BLACK BACKGROUND (MATT FINISH)

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QAS PROD CERT

### Explosion Protected Electrical Equipment

Administered by: Standards Australia Quality Assurance Services

# Certificate of Conformity

Certificate No.:

Fax sent by : 61 2 8286 6832

Ex 28

27 March 2006

issue 0: Issue 1-10: Issue 11: Issue 12: Issue 13:

See Schedule 1 27 March 1996 12 February 1997 11 November 1998 Original Issue

Revalidation Addition to Range Minor Modification

Pg: 2/19



03/86/02

88:27

Certificate Holder:

4 explry:

MM Industrial Products 127 - 131 Airds Road MINTO NSW 2566

electrical Equipment.

FWP Series (wire armoured/cross braided cable) and GWP Series (unarmoured cable) Cable Glands (See Tables 2, 3, 4 and 5 for details)

Type of Protection and Marking Code:

Ex d e p I/IIC IP## Class I Zone 1 DIP IP## Class II ## - FWP Series - IP66 GWP Series - IP66/68

AUS Ex 28

Manufactured by:

MM Industrial Products 127 - 131 Airds Road MINTO NSW 2566

Issued by:



Engineering, Testing and Certification Centre

STANDARDS AUSTRALIA

E.

2 Smith Street, REDBANK, QLD 4301, Australia Postal Address: PO Box 487, GOODNA, QLD 4300, Australia Phone: (07) 3810 6370 Fax: (617) 3810 6366



Page I of minimum

Quality System Certified to ASINZS ISO 9001 Certification No 6039

### 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 2380.2 - 1981	Electrical equipment for explosive atmospheres - Explosion-protection techniques - Part 2 ; Flameproof enclosure d (Amdt 1 - 13 July 1992)
AS 1828 - 1984	Electrical equipment for explosive atmospheres - Cable glands
AS 1939 - 1990	Degree of protection provided by enclosures for electrical equipment (IP Code)

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

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

Test Report No:	NM98/0001	
File Reference:	98/0204	(P80735)

Signed for and on behalf of issuing authority Senior Engineer - Certification Engineering, Testing and Cartification Centre

Position

11 November 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,

Certificate No.: Ex 28 Issu

lssue: 13

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 6370 Fax: (617) 3810 6366



7

Quality System Cartified to AS/NZS ISO 9001 Certification No 6039

STANDARDS AUSTRALIA

## PROTECTED ELECTRICAL

Administered by: Standards Australia Quality Assurance Services

# Schedule

#### Equipment:

The MM Cables "Surefit" Cable Glands consists of Series FWP and GWP as listed in Table 2, 3, 4 and 5. The cable glands are constructed of nickel plated brass alloy with metric or imperial entry threads. The GWP series cable glands are manufactured with the option of extended backnut. The gland bodies have an angled grommet shoulder.

This supplementary certificate covers the addition of the stainless steel types and a change in the bore size in the gland body and the backnut for the GWP glands listed in Table 1.

Table 1. Modified Glands				
		WHEN FITTED WITH F	XTENDED BACKNUT	
METRIC	IMPERIAL	METRIC	IMPERIAL	
GWPM3A	gwpja	GWPMEXJA	GWPEXJA	
GWPMJASS	GWP3ASS	GWPMEX3ASS	GWPEX3ASS	

Table 2 FWP SERIES GU FOR WIRE ARM	NDS CAT NOS	OF WIRE ARMOURED	NDS GAT NOS
<b>WETRIC</b>	IMPERIAL	METRIC	IMPERIAL
FWPMO	FWPO	FWPM4A	FWP4A
FWPM1	FWP1	FWPM5	FWP5
FWPM1A	FWP1A	FWPM5A	FWP5A
FWPM1B	FWP1B	FWPMSB	FWP5B
FWPM185S		FWPM6	FWP8
FWPM2	FWPZ	FWPMBA	PWP6A
<b>FWPM2A</b>	FWP2A	FWPM6B	FWP68
FVVPM2B	FWP2B	140°	FWP7
FWPM2BS8	The second second second second second second second second second second second second second second second se	*	FWP8
FWPM3	FWP3	· · ·	FWP9
FWPM3A	FWP3A	N.	FWP10
FWPMa	FWP4		

Certificate No.: Ex 28 Issue: 13 Date of Issue: 11 November 1998



### Engineering, Testing and Certification Centre

2 Smith Stront, REDBANK, QLD 4301, Australia Postal Address: PO Box 467, GOODNA, QLD 4300, Australia Fax: (617) 3810 5366 Phone: (07) 3810 6370



Quality System Certified to AS/NZS 130 9001 Certification No 6039



## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addendum to	Certificate No	: Ex 28
Issue:	13	
Date of Issue:	11 November	1998

#### Table 3 - FWP Series for Cross-Braided Cable

FWP SERIES GLANDS CAT NOS FOR CROSS BRAIDED CABLE	FWP SERIES GLANDS CAT NOS. FOR CROSS BRAIDED GABLE
MELRIC	METRIC
FWPMOX	FWPM3AX
<b>FWPW1X</b>	FWPM4X
FWPM1AX	FWPM4AX
FWPM1BX	FWPH5X
FWPI82X	FWPMSAX
FWPM2AX	FWPM5BX
FWFM2BX	FWPM6X
FWPMDX	FWPM8BX

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STANDARDS AUSTRALIA

А.

## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

GWP10C/1

GWP10D/1

#### GWP SERIES GLANDS CAT NOS. FOR UNARMOURED CABLE IMPERIAL IMPERIAL METRIC METRIC GWP0 **GWPM8A** GWPEA GWPMO **GWPM6B** GWP6E GWP1 GWPM1 GWP7A/1 **GWP1A** 10 GWPMIA GWPM18 GWP1B . GWP78/1 GWP7C/1 **GWPM1855** ÷ GWP8A/1 GMP5 GWPM2 GWP8B/1 GWP2A ... GWPM2A GWP8C/1 GWPM2ASS æ GWP3 GWP8D/1 ÷ GWPM3 GWP9A/1 **GWP3A** ..... **OWPM3A** GWP9B/1 **GWP3A85** 4 **GWPM3ASS** GWP9C/1 GWP4 . GWPM4 GWP9D/1 GWP4A . **GWPMAA** GWP10A/1 **OWPM5** GWP5 аř GWP5A . GWP10B/1 OWPMSA

#### Table 4 - GWP Series for Unarmoured Cable

Issued by:



OWPMAB

**GWPMB** 

, Engineering, Testing and Certification Centre

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-

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**GWP5B** 

**GWP**B



Quelity System Certified to AS/NZS ISO 3001 Contification No 6039



### Explosion Protected Electrical Equipment

Administered by: Standards Australia Quality Assurance Services

Addendum to C	ertificate NoEx 28
issue:	13
Date of Issue:	11 November 1998

#### Additional Information:

#### Schedule 1: Supplementary Applications

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Local Address	<u>*</u> 1	Additions to the range
	2	Additions to the range
	3	Additions to the range
	4	Additions/modifications
	อ้	Additions/Change of certificate holder
	8	Additions to the range
	7	Additions to the range
	8	Change of address/respecity cubic
	9	Change of project name/manufacture & certificate holder
-	10	Additions to the range

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# STANDARDS AUSTRALIA



## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Date of Issue: 11 November 1958

Table 5 - GWP Series for Unarmoured Cable with Extended Backnut Option

GWP SE	RIES GLANDS CAT NOS	FOR UNARMOURED CAB	ÚE -
METRIC	IMRERIAL	METRIC	MPERIAL
OWPMEXC-	GWPEX0	GWPMEX4	GYVPEZ4
GWPMEXT	GWPEX1	GWPHEXAA	GWPEX4A
GWPMEX1A	GWPEXIA	GWPMEXS	GWPEXS
GWPMEX18	GWPEX1B	GWPMEX5A	GYVPJEX6A
GWPMEX2	GWPEX2	GWPMEX68	GWPEX6B
GWPMEX2A	GWPEX2A	GWPMEX8	GWPEX6
GW/PMEX3	GWPEX3	GWPMEX6A	<b>SWPEX6A</b>
GWPMEXJA	бурехја	GWPMEX6B	GWPEX6B
GWPMEXBASS	GWPEX3ASS		GWPEX7

Drawings:

	DRAWING TITLE	REVISION	DRAWN
		No.	Start Constant Start Sta
GWPM-1	GLAND BODY GWPM/GWP	Ľ.	14/10'98.
OWPM-1SS	GWPMSS/GWPSS GLAND BODY	D	14/10198.
OWP-4	GWPMBS/GWPSS & GWPM/GWP BACK NUT	L	23/07'98.
GWP-4EX	OWPM2S/GWP35 & GWPM/GWP EXTENDED TAIL	ĸ	23/07*98,
GWP-2-3	GROMMET & FRICTION WASHER GWPM/GWP	L	14/10'98.

Issued by:



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Cartification No. 6939



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Page 11 of 29 for F	LPW glands		

	STANGAROS HOUSE, 80 ARTHUR STREE	T. NORTH SYDNEY, N.S.W. SHEET 11-12
	CERTIFICATE FOR EXPLOSION PROTECT	ed electrical equipment
	No. Ex	.591 (Sheet 1 of 2)
	This certilies that the arcitoment described hersunder has been exam	Intel statistics in anyonestrought, the contracts
	This certifies that the equipment described hereunder has been assant of the Australian startized excellent herein, and such equipment he This certificane may be withdrawn at any time if in the ophilon of SAA I for fiezardous Locations. The clarant standard has been started or considered subsidies for installation in the baserdous ionation stated, or or considered subsidies for installation in the baserdous ionation stated, or	as been lound to comply with these requirements. Committee PCS, Castification of Electrical Equipment existent to a degree that has aculation to no longer liths cartificate holder has broached by of the torms
	Description of Equipment	Hazardaus Location
	A range of Coble Glands; Type FLPW As detailed in Schedule 1	Class I Zone I TSPass Hallysions 1 & 2
· .		Ex IIC IPX8
		Certificate Holder
-		Reliance Manufacturing Co 160 Breakfast Creek Road NEWSTEAD O'LD 4006
	Drawing Note)	Manufacturer
	2-212 Rev B, 2-213 Rev B, 2-214 Rev A, 2-215 Rev B, 2-215 Rev B, 2-219 Rev B, 2-462, 2-463, R-554, 2-555, 2-700, 2-701	Rellance Manufacturing Go 160 Breakfast Creek Road NEWSTEAD O'LD 4006
·		
		Test Report Nots) SCC TR NOT 59360 and 60179
	Contineation Conditions	Austratian Standard(s)
·		As 1823-1924 and As 1939-1981
		SAA File Reference P/3: 84089/M122
	Remarks This certificate supersedes SAA Costificate Nos Ex 59 and DJP 91	Effective Date 1985-02-14
	a transformation and a start and a	Date of Issue
	This document shall not be moroduced except in full.	1 1935-02-19
	This cardiocate as not transference and encourt of the Marcards Association of Australia and investigation of property of the Standards Association of Australia and invested to the description of the Association in the event of it being mysted.	Director-Administration & Approvids Standards Association of Australia

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Page 12 of 29 for FLPW plands

#### STANDARDS ASSOCIATION OF AUSTRALIA incorporated by Royal Charter

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

SHEET 12-12

 $\tilde{\mathcal{C}}_{\mathcal{C}}$ 

#### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Cartificate No: Ex 591

ALCOVFLEW NICOTE PLATED CABLE GLANDIPODE

dif.

(Sheet 2 of 2)

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#### SCHEDULE I DESCRIPTION OF EQUIPMENT (cont'd)

124

643

A series of plated brazs cable glands, incorporating neoprene seais, intended for use withsingle steel wire armoured circular cables.

The series includes the following glands:

Gland Series	Nominal Mounting	Thread Dimensions	
	Diameter	Length	
	um)	mm	
FLPW202	20	15.8	
FLPW203	20	13.8	
FLPW204	20	15.8	
FLPW205	20	15.8	
PLPW206	20	15.8	
FLPW253	25	19.0	
FLPW254	- 25	19.0	
FLPW255	25	19.0	
FLPW236	25	19.0	
Flpw323	32	254	
PLPW324	32	25.4	
FLPW325	32	25,4	
FLF W325	\$2	25.4	
FLPW403	40	25.4	
FLPW404	40	25.4	
FL2 1405	40	25.4	

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Director-Administration & Approvals Standarda Association of Australia

page 12, Jul 6, 2000

Page 2 of 29 for FLPW glands

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FEB,2002

## Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

ALGO HLPW NICOTE PLACED CABLE GEAND PEG/68

Administered by Standards Australia Quality Assurance Services

# Certificate of Conformity

Certificate No: AUS Ex

Ex 591

Issue 0: Ori Issue 2: 10/

Original Issue 19/02/1985 10/10/1995

Date of Expiry:

10/10/2005

'ontificate Holder:

Reliance Manufacturing Company 40-42 Ross Street NEWSTBAD Queenshand 4006

Electrical Equipment:

Range of Cable Terminating Glands "Alco" Series PLPW 202 to FLPW 755

Type of Protection and Marking Code:

Ex MIC IP66/IP68 (30 metres) Class I Zone 1 and Class II

Manufactured By:

Reliance Manufacturing Company 40-42 Ross Street NEWSTEAD Qurensjand 4006

Issued by:



Londonderry Occupational Safety Centre

132 Londonderry Road LONDONDERRYNSW 2753 Phone: (047) 244 900 Fax: (047) 244 999

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Page 1 of marching

page 2, Jul 6, 2000

Page 3 of 29 for FLPW glands

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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 columns.

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 1828-1984 Electrical Equipment for Explosive Atmospheres - Cable Glands

AS 1939-1990 Degrees of Protection Provided by Enclosures of Electrical Equipment (IP Code)

ALCOVEL

SHEET

ND R66

The equipment litted has successfully must the examination and test requirements as recorded in

Test Report Noi LOSC 12689 File Reference: LOSC 94/6708

icitiii Constan 10.10.1996

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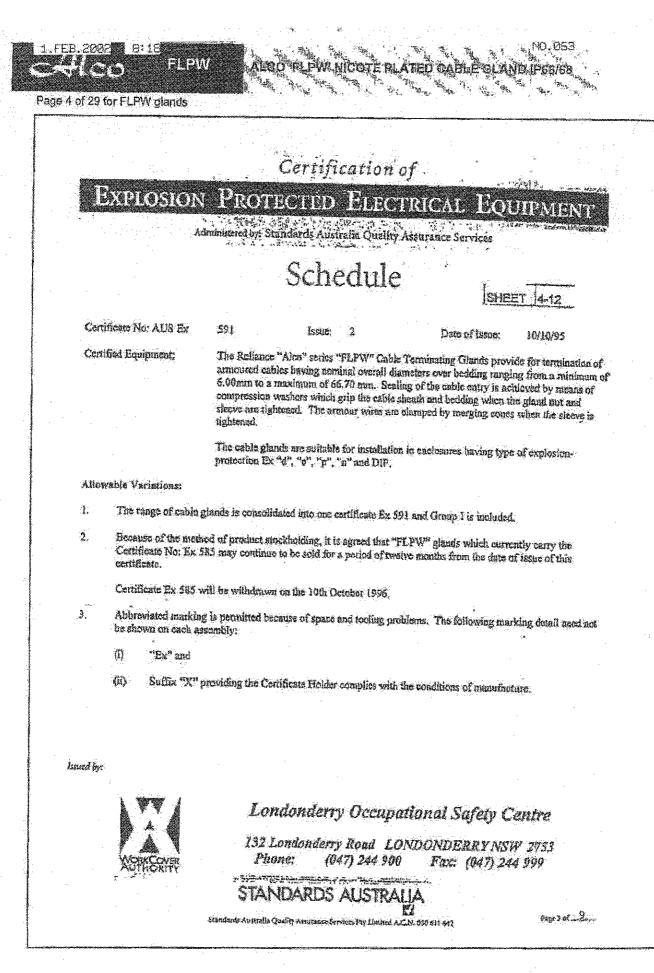
Date of inu

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Page 6 of 29 for FLPW glands

### Certification of

## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

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Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex: \$91-3

NO.063

E GLAND PREAB

Conditions of Certification:

1

It is a condition of manufacture that:

12 12 M

ALCO

SHEET 5-12

The manufacturer's instructions for the installation of the cable glands shall be made available for use by the installer.

Each gland shall be supplied with an impervious washer for the mounting thread as specified in the product catalogue to maintain the Degree of Protection IP68 at the point of entry to the enclosure when the installation so requires.

issued by:



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Page 6 of 29 for FLPW glands

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### Certification of

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## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Addentium to Certificate Mo. Ex: 591-2

LATED CABLE GLAND PEORS

#### SCREDULE

SHEET 6-12

#### BANGE OF "Alco" CABLE GLANDS FOR LISTING UNDER ONE CERTIFICATE NUMBER - AUS Es 593

GLAND Ref Not	MOUNTING TUREAD		OLAND	MOUNTING THREAT	
	dis.	Length mm	Ref. No.	dis. pm	Length
FLPW 202	20	15.8	FLPW S02	50	
FLPW 203	20	15,8	FLPW 503	50	28.6
FLPW 204	20	15.8	FLPW 504	30	28.6
FLPW 205	20	15.8	FLPW SOS	50	28.6
FLPW 206	20	15.8	**		
FLPW 253	25	19,0	FLPW 633	63	28.6
RLPW 254	2.5	19.0	FLPW 634	63	28.6
FLPW 255	25	19.0	FLPW 635	63	28.6
FLPW 256	25	19,0	FLPW 636	63	28.6
ULPW 323	32	25,4	÷		
J.PW 324	32	25.4	*		az 
LFW 325	32	25,4		·	***
T.PW 326	32	25.4		BSP	
LFW 403	• 40	25.4	FLPW 753	255"	28.6
LFW 404	40	25.4	FLPW 754	21/2" .	28.6
LPW 405	40	25.4	FLPW 755	21/20	-28.6
Original I	UA etapilitus	S Ex 591	Örig	inal Cortificate AU	S 12x 585

issued by:



Londonderry Occupational Safety Centre

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 LONDONDERRY NSW 2753

 Phone:
 (047) 244 900
 Fax:
 (047) 244 999

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Standards Australia Quality American Services Pay Limited A.C.N. 000 611 641

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Page 7 of 29 for FLPW glands

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### Certification of

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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Staudards Australia Quality Assurance Services

Addendum to Certificate No. 5x: 591-2

NO.063

GLANDIPEEIER

	Drawing Schedulo	Drawing Schedulo		
Drawing No	Drawing Title	Revision	Dilei	
FLPW 202-405 (Range)	**************************************	1. 400 and		
2-219	Gland Details	b	145- 1000	
2-212	Cland Details	Ď	14 Sep 1993	
2-213	Gland Details	b	14 Sep 1993	
2-214	Gland Details	č	14 Sep 1993	
2-215	Gland Details	ă	14 Sep 1993	
7-218	Gland Datails	lp.	14 Sep 1993	
462	Gland Denniks	B	14 Sep 1993	
2-463	diand Details	l 🖁	14 Sep 1993	
2-700	FLPW Cable Gland Schedule Min, Cable Diameters	4 22 2	14 Sep 1993	
2-701	FLPW Cable Gland Schedule Mis. Cable Diameters	Original	20 Nov 1984	
1-1202	Seal Dehill	Original D	20 Nov 1984	
1-1203	Seal Detail		24 May 1993	
1-1204	Seal Detail		24 May 1993	
1.1205	Seal Datail	ď	24 May 1993	
1-1206	Soal Detail	E	24 May 1993	
-1207	Seal Detail		24 Mey 1993	
-1208	Seal Detail		24 May 1993	
62-405	FLPW Seni Details		24 May 1993	
LPW 244-263	Mounting Thread Seal	1 ÷	25 May 1993	
LPW 202-405	Marking Dotails - FLPW Cable Gland	Initial	28 Jun 1993	
	I wantering available the W CHORD CHIRD	Initial	76 May 1995	
LPW \$02-755 (Rauge)			•	
LPW 502-755 Sheet 1 of 2	Marking Dotails - FLPW Cable Glands	Initial	15-May 1995	
"PW 502-755 Sheet 2 of 2	Cable Ginner	A	21 A 181 1923	
7LPW 59	Clamp	Å	31 Aug 1994	
		LM.	20 Oct 1991	

luned by:



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STANDARDS AUSTRALIA

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### Certification of

OO 'FLEW' NICOTE PLATED CABLE GLAND (P65/68 N.S.

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PROTECTED ELECTRICAL EQUIPMENT DAN DAMAN

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex: 591-2 SHEET 8-12 all Indiana No. Statuting Tatle Revision/ C. Dine of the FLPW 502-755 (Range) continued RLPW 60 Body Å 16 Oct 1991 FLPW 61 Conc ٨ 20 Oct 1991 FLFW 63/67/502/503 Sleove 23 Oct 1991 À WG 502-WG 755 Scal Details B 26 May 1993 Seal Details FLPW 502-635 DCAACA 25 May 1993 FLFW 62 Nut. 05 Jan 1990 Body 16 Oct 1991 FLPW 65 Cone 20 Oct (99) FLPW 66 Nut 05 Jan 1990 FLPW 68 Clamp 20 Oct 1991 XLPW 69 A. As Body 16 Oct 1991 FLPW 70 Conc 20 Oct 1991 FLPW 71 Mut CAB 05 Jan 1990 FLPW 72/76/504/505 Sleeve 27 Oct 1991 FLPW UPPIA-UPPS Scal Details 26 May 1993 FLPW 73 Body A 16 Oct 1991 ELPW 74 Cons A 20 Oct 1991 FLPW 75 Nut C 05 Jan 1990 FLPW 77 Body A 27 Oct 1991 FLPW 78 Clamp 15 Feb 1994 ્ર્યુ

Israed by:



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Page 9 of 29 for FLPW glands

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EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administened by: Standards Australia Quality Assarance Services

Addendum to Certificate No., Ex: 591-2 SHEET 8-12 Drawing Joil Revision FLPW 502-755 (Range) continued FLPW 79 Cóne Á 29 Nov 1991 FLPW SO Nut P 05 Jan 1990 FLPW 81 Sleeve A 16 Feb 1994 FLPW 82 Body Å 27 Oct 1991 FLPW 83 Clamp 15 Peb 1994 A FLPW 84 Cone A B 29 Nov 1991 PLPW 85 Nut 05 Jan 1990 LPW 86 Sleeve A 16 Peb 1994 FLPW 87 Body A 27 Oct 1991 FLPW 98 Clamp Å 15 Feb 1994 FLPW 89 Cone A C 29 Nov 1991 **FLPW 90** Nut 28 Feb 1994 FLPW 91 Sleeve A 16 Feb 1994 FLPW 92 Body A 27 Oct 1991 RLPW 93 ACA Cone 29 Noy 1991 FLPW 94 Mint 28 Feb 1994 FLPW 95 Sloeve 16 Feb 1994 FLPW 97 Clamp Å. 15 Feb 1994 FLPW 99 Nuc B 05 Jan 1990 FLPW 100 Sleeve á 16 Feb 1994

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Page 10 of 29 for FLPW glands

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### Certification of

### EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

ALCO FLOW MCOTE PLATED ONBLE GLAND

Administered by: Standards Australia Quality Assurance Services

	Ac	ldendvin to Certific	ste No Bx- 59
*	м 	[SHE	<u>et (10-12</u> ]
Drawing No.	Drawing Title	Ecosion/	
FLPW 502-755 (Range) -			
continued			a an an an an an an an an an an an an an
Flpw 102	Ciamp	<u>A</u>	LS Pob 1994
FLPW 104	Nut	B	05 Jan 1990
FLPW 105	Sloeve	A	16 Feb 1994
FLFW 107	Clamp	A	15 Feb 1994
PLPW 109	Nut	8	05 Jan 1990
FLPW 110	Sieava	A.	16 Feb 1994
1422	Body	Originat	08 Jun 1979
1-1423	Conc	Original	11 Jun 1979
SW.FLPW 8/95	Table - ALCO "FLPW" Cable Glands	No	Aug 1995
د. موجد باز مرتوست از مرتوست المرتوسية المرتو	And Market and Area research and Analysis and	reference	t to the clinic
SW.FLPW 8/95,A.	Appendix II - FLPW Fining Instructions	No	Aug 1995
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Issued by,



### Londonderry Occupational Safety Centre

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#### STANDARDS AUSTRALIA

Standards Australia Quality Assurance Services Pay Limited ACON, Q59 611 043

NO.063

P66/68

# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

**AUSEx Scheme** 

# **Certificate of Conformity**

Certificate No:	AUS Ex 03.3904	Issue 0: Issue 1:	21/11/2003 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	i.	
Type of Protection:	Ex d I/IIC Ex e I/II DIP		
Marking Code:	Ex d I/IIC Ex e I/II DIP A21 AUS Ex 03.3904	IP66/IP68 (3	30 m)
Manufactured By:	Chi An Industrial Co Ltd Changhwaa Taiwan ROC		

Issued by:



919 Londonderry Road Londonderry NSW 2753 Australia



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

Certification of

### **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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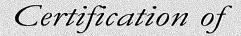
Issued by:



919 Londonderry Road Londonderry NSW 2753 Australia



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



**AUSEx Scheme** 

## Schedule

Certificate No: AUS Ex	03.3904	Issue: 1	Date of Issue:	12/04/2005
<b>Certified Equipment:</b>	Ŷ	f cable glands is suitable for inse	U	

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.

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Certification of

### **AUSEx Scheme**

Addendum to Certificate No. AUS Ex 03.3904-1

#### **Certified Equipment continued:**

Gland Code Number	Mounting Thread	Tightening Torque	SWA Cable Diameter (mm)			m)				
	Dia x					Over B	edding		Over Cable	
	Length		(m	m)	Inner	Seal B	Inner	Seal A	Sea	ıl A
	(mm)	(Nm)	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

#### Alco HAW Range of Cable Glands (Compression Configuration)

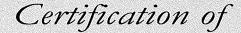
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### **AUSEx Scheme**

Addendum to Certificate No. AUS Ex 03.3904-1

#### **Certified Equipment continued:**

	<u>_</u>	of Cable Glai	<u>`</u>			
Gland Code Number	Mounting Thread Dia x Length	Tightening Torque	Max Dia Over Cable Cores	Max No. of Cores in Compound /	Dian	VA 1eter m)
	(mm)	(Nm)	(mm)	Core CSA (mm <sup>2</sup> )	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

#### Alco HAW Range of Cable Glands (Barrier Configuration)

\* For conductors greater than 16 mm<sup>2</sup> 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.

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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

### **AUSEx Scheme**

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	Hagemeyer Australia Alco Glands	1.0	18/11/03		
Pages 1 & 2	HAW Series Glands – Fitting Instructions				
ALCHAWFLMPTH	Hagemeyer Australia Alco Glands	1.0	09/09/03		
	HAW Range Flameproof Joint Data				
ALCHAWSPEC	Hagemeyer Australia Alco Glands	1.0	17/09/03		
	HAW Range Specification				
ALCHAWBARLIM	Alco - HAW Range – Barrier Glands	1/0	17/09/03		
ALCHAWSCHDRG	Alco Glands – Schedule of Drawings	1.0	30/09/03		
	HAW Range – Hazardous Area, Armoured Weatherproof				

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Certification of

### **AUSEx Scheme**

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			SWA Diameter				Ca	ble Dian	neter (m	m)	
	Dia x	•				Over B	Bedding		Over	Cable		
	Length		(mm)		Inner Seal B		eal B Inner Seal A		Seal A			
	(mm)	(Nm)	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	Tightening Torque	Max Dia Over Cable	Max No. of Cores in Compound	SV Dian	VA neter
	Length		Cores	1	(m	.m)
	(mm)	(Nm)	(mm)	Core CSA* (mm <sup>2</sup> )	Min	Max
ALCHAW20SB	M20 x 16	26	10.0	10 / 0.5	0.8	1.25

\*For conductors greater than 16 mm<sup>2</sup> the largest number of cores permitted is four plus any required earth core(s).

#### Conditions relating to issue 1

All previous conditions still apply.



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# EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

### **AUSEx Scheme**

Addendum to Certificate No. AUS Ex 03.3904-1

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	Elmako Pty Ltd - Alco Glands	1.5	16/03/05
Pages 1 & 2	HAW Series Glands – Fitting Instructions		
ALCHAWSPEC	Elmako Pty Ltd Alco Glands	1.1	01/12/04
	HAW Range Specifications		
ALCHAWBARLIM	Alco - HAW Range – Barrier Glands	1.1	19/03/04
ALCHAWSCHDRG	Alco Glands – Schedule of Drawings	1.2	02/06/04
	HAW Range – Hazardous Area, Armoured Weatherproof		
ALCHAWFLMPTH	Elmako Pty Ltd Alco Glands	1.1	19/03/04
	HAW Range Flameproof Joint Data		

Drawings relating to issue 1

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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 2236-1985 - Electrical equipment for explosive atmospheres - Dust-excluding ignition-proof (DIP) enclosure

AS 2380.1-1994 - Electrical equipment for explosive atmospheres - Explosion protection techniques. Part 1: General Requirements

AS 2380.2-1991 - Electrical equipment for explosive atmospheres - Explosion protection techniques. Part 2: Flameproof enclosure d

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

est Report No: SCC 58569, ITACS 676A File Reference: TT354

Signed for and on behalf of issuing authority

General Manager

Position

4 October 1994

Date of issue

Certificate No: Ex 1498U Issue: 0

.....

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' Page 2 of .....

### **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services

# Schedule

#### Equipment:

This certificate covers the following flameproof conduit accessories:

SERIES	DESCRIPTION			
FCP	Flameproof conduit plugs 16-63 mm series			
FR	Flameproof metric reducers			
FN	Flameproof hexagon nipples			
FCL	Flameproof couplings			
FA (BSP)	Flameproof adaptors (BSP male thread to metric conduit female thread)			
FA (NPT)	Flameproof adaptors (NPT male thread to metric conduit female thread)			
DCP	Dust-Excluding Ignition - Proof (DIP) Plugs			

#### Variations to Original Issue:

- 1. Inclusion of the new DCP range of DIP Plugs
  - Modifications to certified conduit accessories covered by Issue 0

Issued by:

Certificate No: Ex 1498U

Issue: 1

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Page 3 of .....4

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TO: GIPL NUDGEE

### Certification of

## EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

Ex 1498U

Addendum to Certificate No.....

Issue: 0

DRAWING NO	DRAWING TITLE	REVISION NO	DRAWN/ REVISION DATE
W-514	Flameproof conduit plugs 16-63 mm series	A	8 August 1994
W-515	Flameproof metric reducers	A	8 August 1994
W-516	Flameproof hexagon nipples	A	8 August 1994
W-517	Flameproof couplings	А	8 August 1994
W-518	Flameproof adaptors (BSP male thread to metric conduit female thread)	A	8 August 1994
W-519	Flameproof adaptors (NPT male thread to metric conduit female thread)	A	8 August 1994

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Page 4 of 4

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

# Certificate of Conformity

Certificate No.:

Ex 1498U

Issue: 0 (original) Issue: 1 Date of Issue: Date of Issue: 4 October 1994 30 September 1997

Date of Expiry:

4 October 2004

Certificate Holder:

GERARD INDUSTRIES PTY LTD 12 Park Terrace Bowden SA 5007

Electrical Equipment:

"Clipsal/Wilco' explosion protected conduit accessories (Refer schedule for type of accessory and identification)

Type of Protection and Marking Code:

Ex d/IIC, Class I, Zone 1 { DIP T6 IP66 Class II { Fo Aus Ex 1498U {

{ For Exd/DIP Product

{ For DIP only Product

DIP T6 IP66 Class II Aus Ex 1498U

Manufactured by:

Issued by:

Clipsal Stahl Ex Pty Ltd

### VERIFIED COPY OF ORIGINAL CERTIFICATE

VERIFIED COPY OF ORIGINAL CERTIFICATE Date 20:3.03 Issued By

### Quality Assurance Services

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### RICAL LOU

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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 2236-1994 - Electrical equipment for explosive atmospheres - Dust-excluding ignition-proof (DIP) enclosure

AS 2380.1-1989 - Electrical equipment for explosive atmospheres - Explosion protection techniques. Part 1: General Requirements

S 2380.2-1991 Inc Amdt No 1 - Electrical equipment for explosive atmospheres - Explosion protection techniques. Part 2: Flameproof enclosure d

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

SCC 58569, ITACS 676A, ITACS 1185 Test Report No: File Reference: TT354

nd on behalf of issuing authority Signed for

Technical Manager - Certification Position

30 September 1997

Issue: 1

Date of issue

Certificate No: Ex 1498U

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### STANDARDS AUSTRALIA 7

\_~-97 16:11

FROM:CLIPSAL STAHL EX PTY 0297905949

TO: GIPL NUDGEE

### Certification of

### EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Administered by: Standards Australia Quality Assurance Services

# Schedule

#### Equipment:

This certificate covers the following flameproof conduit accessories:

SERIES	DESCRIPTION
FCP	Flameproof conduit plugs 16-63 mm series
FR	Flameproof metric reducers
FN	Flameproof hexagon nipples
FCL	Flameproof couplings
FA (BSP)	Flameproof adaptors (BSP male thread to metric conduit female thread)
FA (NPT)	Flameproof adaptors (NPT male thread to metric conduit female thread)

onditions of Certification:

- The fittings shall be used in accordance with AS 2381 Electrical equipment for explosive atmospheres -Selection, installation and maintenance.
- 2. The fittings shall be installed so as the required IP rating to AS 1939 Degrees of protection provided by enclosures of electrical equipment, is maintained for the equipment concerned.

Issued by:

Certificate No: Ex 1498U

Issue: 0

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# **EXPLOSION PROTECTED ELECTRICAL EQUIPMENT**

Administered by: Standards Australia Quality Assurance Services

Addendum to Certificate No. Ex 1498U

Issue: 1

DRAWING NO.	DRAWING TITLE	REVISION NO.	DRAWN/ REVISION DATE
W-514	Flameproof conduit plugs 16-63 mm series	A	8 August 1994
W-515	Flameproof metric reducers	A	8 August 1994
W-516	Flameproof hexagon nipples	A	8 August 1994
W-517	Flameproof couplings	A	8 August 1994
W-518	Flameproof adaptors (BSP male thread to metric conduit female thread)	A	8 August 1994
W-519	Flameproof adaptors (NPT male thread to metric conduit female thread)	A	8 August 1994
W-515	Flameproof metric reducers	В	17 March 1997
W-516	Flameproof hexagon nipples	В	16 May 1997
W-518	Flameproof adaptors (BSP male thread to metric conduit female thread)	В	16 May 1997
W-519	Flameproof adaptors (NPT male thread to metric conduit female thread)	В	16 May 1997
W-646	DIP Metric threaded conduit plugs	A	8 July 1997

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TD:61893162516

No.4500 P. E

### STANDARDS ASSOCIATION OF AUSTRALIA

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

### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

No. Ex 492 (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(a) 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 herein stated, or if the certificate holder has breached any of the terms or conditions under which this certificate was issued.

Hazardous Location
Class I. Zone O
Type of Protection
A REAL PROPERTY AND A REAL
Refer Schedule 1
Certificate Holder
Gerard Industries Pty Ltd
12 Park Terrace
BOWDEN S.A. 5007
Manufacturer
Gonard Tada to Jan A
Gerard Industries Pty Ltd 12 Park Terrace
BOWDEN S.A. 5007
Test Basses March
Test Report No(s)
SCC TR Nos: 58568 & 58570
Australian Standard(s)
AS 2480-1981
SAA File Reference
P/31 83115/M113
Effective Date
1984.01.20
1984.01.27

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### CERTIFICATE FOR EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

Continuation of Certificate No: Ex 492 (Sheet 2 of 2)

SCHEDULE 1 Description of Equipment and Type of Protection (Continued)

A range of "Clipsal" Threaded Brass Conduit Accessories.

	Equipment	Thread Description	Range	Typo
Fistos.	Plug	Metric Conduit Thread	16 mm to 63 mm	Ex d IIC T6
FIREZ	Coupling	Matric Conduit Thread	16 mm to 63 mm	Ex d IIC T6
FILUZLO	Long - Screw Union	Metric Conduit Thread	16 mm to 63 mm	Ex d IIC T6
£ : 1,43	Screwed Nipple	Metric Conduit Thread	16 mm to 63 mm	Ex d IIC T6
F12034	Hexagon Nipple	Metric Conduit Thread	16 mm to 63 mm	Ex d IIC T6
r : - e - t-)	Barrel Union (Type IIC) Consisting of: One - Large Cap One - Small Cap One - Barrel Nut	Metric Conduit Thread and B.S.P. Thread Metric Conduit Thread B.S.P. Thread	16 mm to 53 mm %" to 2 %" 16 mm to 63 mm %" to 2%"	Ex d IIC T6
	Barrel Union (Type IIB) Consisting of: One - Large Cap One - Small Cap One - Barrel Nut	Metric Conduit Thread and B.S.P. Thread Metric Conduit Thread B.S.P. Thread	16 mm to 63 mm 髪'' to 2%'' 16 mm to 63 nm 発'' to 2%''	Ex d IIB T6
Fil <b>ss</b> wît	Adaptors	N.P.T. Thread Metric Female Conduit Thread	1/2", %", 1" to 20 mm %", 1" to 25 mm 1" to 32 mm 114", 11/3" to 40 mm 11/4", 11/2", 2" to 50 mm	Ex d IIC T6
112593		Metric Conduit Thread	16, 20, 25, 32, 40, 50 and 63 mm	Ex d IIC T6
C 1764M	Reducers	Metric Conduit Thread	16 mm to 20 mm 20 mm to 25 mm 25 mm to 32 mm 32 mm to 40 mm 40 mm to 50 mm 50 mm to 63 mm	Ex d IIC TE

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Director-Administration & Approvala Standards Association of Australia

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

### EXPLOSION PROTECTED ELECTRICAL EQUIPMENT CERTIFICATE OF COMPLIANCE

Supplementary Certificate Number: Ex 4920-1

This is to certify that SAA Certificate No. Ex 492 issued to:

Gerard Industries Pty Ltd 12 Park Terrace BOWDEN SA 5007

for the <u>Range of "Clipsal" Threaded Brass Conduit Accessories</u> is hereby extended to include modifications as detailed in the following schedule.

#### SCHEDULE

#### Description of Modifications:

- 1. Alternative trade name "Wilco" in lieu of "Clipsal".
- 2. Modified method of marking for 16, 20 and 25mm conduit plugs.
- Decrease size of heragonal hole to allow readily available allan keys to be used.
- 4. Reference to thread detail updated.
- 5. Overall length of plugs changed to provide "stops" for threads.
- 6. Plugs Plated.

#### Drawings:

F1220616 Ser		
	Inque 7	23 January 1991
F1220516-2	Issue 3	23 January 1991
F12Z0SZ0-2	Issue 5	23 January 1991
F1220525-2	Issue 4	23 January 1991
F1220532 Ser	Tesue 9	23 January 1991

TYPE OF PROTECTION: Refer to original certificate.

Test Report No: N/A

File: P/3: 90176.M159

Date of Issue: 25 March 1991

Date of Expiry of Validity : 20 January 1994

Page 1 of 1

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Director-Administration & Approvals Standards Association of Australia

P. 7

# 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:

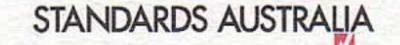
Govan Drewburn Pty Ltd 156 Bamfield Road WEST HEIDELBERG Victoria 3081

Issued by:

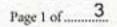


# Londonderry Occupational Safety Centre

132 Londonderry Road LONDONDERRY Phone: (047) 244 900 Fax: (047) 244 999



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



NSW 2753

# 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

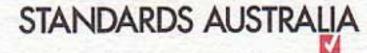
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Standards Australia Quality Assurance Services Pty Limited A.C.N. 050 611 642



# 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.

C2031 C2359 C2353 C0774-Rev.2 C1510 Drawing Schedule

Revision 1	28 July 1993
Original	8 February 1993
Original	3 February 1993
Revision 2	21 June 1991
Original	22 October 1992

Issued by:



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# **AECTRICAL EQUIPMENT**

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AUDRIANS CONTINUES A CONTRACT OF A CORP. DUST STRATES CORD. MANUFACTURED BY AND Factory 22 Al Bennett Store

DANDERSONG STREET, STREET, ST

and manufactured by: Coordust Discurios Hamufacturing Bry Ltd

This electrical equipment and any acceptable variation therato is specified in the Schedule or Schedules stuached hereto and in the documents referred to therein

This certifies that the equipment described has been found to comply with AS 2236-1983, AS 2430-1986 and AS 1939-1990

TYPE OF PROTECTION Ex d CICLOPSS Class 1 Zone 1 DIP 1765 Class 17

This cectificant is granted subject for the conditions as set out in Standards Australia Miscallangous Fuclication MP62 and any additional conditions as may be prescribed by Standards Australia.

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Description of Equipment: The Bange of Brass Conduit filtings is listed in Schedule 1 and Covers the TADAY of matric and imperial conduit thread, MFT, as7 and Fg thread sizes:

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7/71 1 1			(合われ)の 非常
P/92			2月20月11日
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AMON OF BRANS CONDUCT FITTINGS 1. Metric Stops Part No. SN1, SN2, SN3, SN5, SM5, SM5, SM5, Sixe: 20 mm to 63 mm.

- 2. Imperial Stops Part No. 511 S12, 513; 514, 513, 818 Size, 3/4 Luch to 2.3 Inch.
- 3. BSF Hale to Metric Fomale Adaptors fart no. ADM 1-1 ADM 2-2: ADM 1-3 ADM x-4: ADM 1-3. ADM, 5-8 Size: 374 Inch 858/2000 to 2 Inch 869/63003.
- Metric Reducere Fart No. 20011-0. RNM 2-1, RNM 5-2, RNM 4-3, RNM 3-4 RNM 6-0.
   Stee, 2008/16008-10-65 mm/50mm.

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# HECHNICAL EQUIPHENT

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PS 17957143

## Certificate of Compliance:

Reputric the Crony Durds

- 5: Metric Bipples Part No. Mil, Mil, Mil, Mil, Mil, Bige: 20 Mm to 50 mm.
- 8. Netric Couplings Part No. GRI. CM2, CM3, CM3, CM5, CM5, Size 20mm to 63mm.
- Metric Male to BDP Penale Adaptors Part No. Ada 1-1: Add 2-2: Add 3-3; Add 4-4, Add 5-3; Add 4-6 Size, 20 mm/1/2 inch SSP to 63mm/21nch BSP
- BSP Male to Matric Female Laducers
   Part No. IBM 2-1. EM S-1. BBM 3-2. EM a-3. EMH-5-a. EMH 5-3.
   Birs. 3/4 inch. BSP/20mm. to 2 inch 898/30mm.
- 9. RPT Male to Hetric Female Reducate Fart No. RMM 2-1, RMM 1-1, RMM 3-2, RMM 4-3, RMM 5-4 RMM: 8-5 Blac: 3/A inch NFT/20mm to 2 inch NFT/30mm.
- 10. NPT Male to Mattic Female Adaptors Fact No. ANN 1-1. ANN 2-2. ANN 3-3. ANN 4-4. ANN 5-3. ANN 6-5. Size 1/2 Inch MPT/2000 to 2 Inch NPT/6300.
- 11. Matric Male to NPT Penals Adaptors
   Farc No: ANN 1-1, ANN 2-2, ANN 3-3, ANN 4-4, ANN 3-5, ANN 6-4
   Sixe, 20em/1/2 inch NPT to 25em/2 inch NPT.
- 14. Pg Hale to Metric Penale Adaptors Part No. APM 0-1, APM 1-1, APM 2-2, APM 1-3, APM 4-4, APM 3-5 Sits. Pg 13/20mm to Fg A2/30mm.
- 15 Metric Male to Imperial Primete Maptors Fact to ANT 1-1. ANT 2-1, ANT 5-5 ANT 4-6. ANT 5-5 sites to mark/s inch Imperial to 50 marks inch Imperial
- 14. Imperial Mais to Matric Penale Adaptors Part No. AIM 0-1. AIM 1-1. AIM 2-2. AIM 3-3. AIM 4-4. AIM 5-3. Size 5/8 inch Imperial/20mm to 2 inch Imperial/30mm.

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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:		
Н. /	A. Drawing No.	:			Gas Group:		
			-		Temperature Class:		
Repeater	Power Supply / Bar	rier			Se	nsor	
Cable Screens shall be							
connected to		\				<b>-</b>	
intrinsically safe earth						-	
at the Intrinsically Safe Barrier end.	I.S. Earth	/	Ca	ole 1	· · · · · · · · · · · · · · · · · · ·	-	
Sule Burrer chui	•	•	(	01	>	i	
I.S. Device details (Hazardous Ar	rea) [Note 2]						
				T	Man Valta an U		V
Tag: Type of instrument:				-	Max Voltage Um:		V V
				_	O/C Voltage Uo:		•
Manufacturer:				-	S/C Current lo:		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:		1			
Capacitance:	uF/m	Capacitance:		uF/m	Capacitance:		uF
Inductance:	mH/m	Inductance:		mH/m	Inductance:		mH
L/R <sub>c</sub> :	mH/Ohm	L/R <sub>c</sub> :		mH/Ohm	Max L/Rc		mH/Ohm
Length(D1):	m	Length(D2):		m	-		
I.S. Apparatus Parameters (Haza	rdous Aros)						
i.S. Apparatus Parameters (naza	iluous Alea).						
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:							
Chasks							
Checks:		1 Uo <= Ui	<	=	PASS/FAIL/NA		
		2 lo <= li		=			
		3 Po <= Pi		=			
			1				
	4	4 Ci+C <sub>Cable</sub> <= Co	<	=			
	(	6 Li+L <sub>Cable</sub> <= Lo		=			
		OR	1		1		
	-	7 L/R <sub>Cable</sub> < L/Ro		<			
Conclusion: The circuit IS Loc	op 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  $(U_0)$ .
  - (ii) Maximum output current  $(I_0)$ .
  - (iii) Maximum external capacitance  $(C_0)$ .
  - (iv) Maximum external inductance  $(L_0)$ .

(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)  $C = 0.11 \, \mu F/km$ .
- (b) L = 0.8 mH/km.
- (c)  $L/R = 56 \ \mu H/\Omega$ .

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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

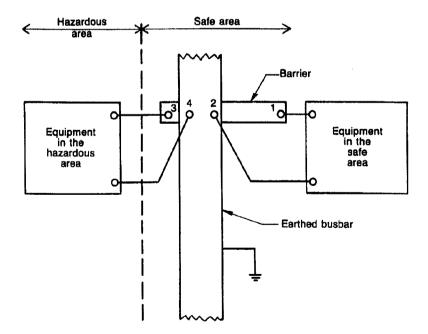
#### EXTERNAL PARAMETERS MAXIMUM VALUES FOR GROUP IIC (HYDROGEN)\*

Barrier type	Permissible configuration	Max. permissible capacitance µF	Max. permissible inductance mH	Max. permissible <i>L/R</i> ratio μΗ/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.

 $\dagger$  The *L/R* ratio of the cable is defined as follows:

L/R ratio =  $\frac{\text{Inductance per unit length (µH)}}{\text{Resistance per unit length (}\Omega\text{)}}$ 



NOTE: Barrier can be either positive or negative.

### FIGURE A1 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH SINGLE BARRIER

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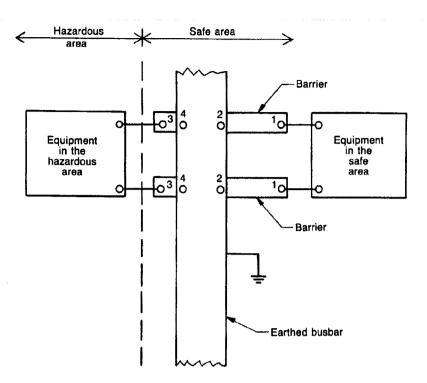


FIGURE A2 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH TWO BARRIERS OF LIKE POLARITY

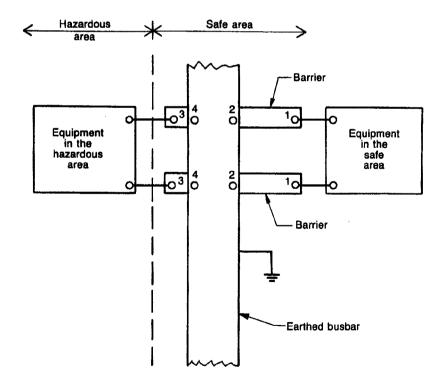


FIGURE A3 INSTALLATION CONFIGURATION 2-WIRE SYSTEM WITH TWO BARRIERS OF OPPOSITE POLARITY

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#### TABLE A2

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#### 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 <sup>2</sup> )	7/0.5 mm (1.5 mm <sup>2</sup> )		
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 <sup>2</sup> )	1
Conductor resistance single core ( $\Omega$ /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
<i>L/R</i> ratio (µH/ohm)	20

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#### APPENDIX C

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#### SELECTION OF Ex e COMPONENTS

#### (Normative)

**GENERAL** Each enclosure is allocated a permissible maximum dissipating power, C1 expressed in watts, taking into account-

- the dissipation per component for a given cable conductor size; (a)
- the size of each cable used and the resistance of its length, equal to the diagonal of (b) 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)  
 $P = I^2[R_t + R_s]$  .... E(2)

$$P = P[R_{t} + R_{d}] \qquad \dots \quad E(2)$$

where

Р = power dissipation, in watts

- I = current through terminal (max. allowable or limited by cable size)
- $R_1$ = internal resistance of terminal, in ohms
- = cable resistance per metre, in ohms  $R_{c}$
- 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
- $R_{\rm d}$ = 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:

$$MDP = aP_1 + bP_2 + cP_3 \dots + zP_n$$
 .... 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<sup>2</sup> cable = 0.092 W
- $P_2$  12 amps 1.0 mm<sup>2</sup> cable = 0.763 W
- $P_3$  15 amps 2.5 mm<sup>2</sup> cable = 0.530 W

#### B. *P* (TBK16) for

 $P_4$  47 amps 16 mm<sup>2</sup> cable = 0.790 W Maximum number of allowable terminals:

$$P_{1} \text{ only } = \frac{15.0}{0.092} = 163; \text{ or}$$

$$P_{2} \text{ only } = \frac{15.0}{0.763} = 19; \text{ or}$$

$$P_{3} \text{ only } = \frac{15.0}{0.530} = 28; \text{ or}$$

$$P_{4} \text{ only } = \frac{47.0}{0.790} = 59;$$

Now assume the following combination of terminals-

 $(60 \times P_1) + (6 \times P_2) + (3 \times P_3) + (3 \times P_4)$ (60 × 0.092) + (6 × 0.763) + (3 × 0.530) + (3 × 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  $50^{\circ}$ 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.

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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 <sup>2</sup>	Enclosure types No. 1 No. 2 No. 3 No. 4 No. 5
0.5	
1.0	
2.5	ohms/1000 m $\times$ L
4.0	1000
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

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Ex	e compoi	nent	Cable	Total
Туре	Qty	Load or rating A	mm <sup>2</sup>	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
		Enclosu	re 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.

Earth Partners ENVIRONMENT			MAINTENANCE REGISTER					_ APA Group		
DEVELOPMEN RESOURCES	0			Site:						
							DOSSIER	UPDATE AS REQU	JIRED (YES / NO / I	NA)
DATE	DESCRIPTION	ASSOCIATED TAGS	P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY	INSTALLATION CHECK LIST	REPAIR & EXAMINATION REPORT	HA CLASSIFICATION	HA DRAWIN
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ING	REMARKS

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DATE	DESCRIPTION	ASSOCIATED TAGS	P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY	INSTALLATION CHECK LIST	REPAIR & EXAMINATION REPORT	HA CLASSIFICATION	HA DRAWIN
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ING	REMARKS

FYFE Earth Partne ENVIRONMEN DEVELOPMEN RESOURCES	NT	MAINTENANCE REGISTER		MAINTENANCE							APA Group
										I	
							DOSSIER	UPDATE AS REQU	JIRED (YES / NO / I	NA)	
DATE	DESCRIPTION	ASSOCIATED TAGS	P&ID	DATASHEET	HA EQUIPMENT REGISTER	CERTIFICATE OF CONFORMITY			HA CLASSIFICATION		
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ING	REMARKS



# **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 7 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.



Ref: I:\data\sitzler\contracts\darwin\sbsj12\fyf1 fyfe pty Itd hazardous areas reporting award 28.07.11\fyf3 fyfe northern end pipline\reports\pine creek\electrical equipment for hazardous area summary report - pine creek 20.09.11.docx

20 September 2011

A

FYFE PTY LTD Level 3, 80 Flinders St Adelaide SA 5000

Attention: Tony Bird

Dear Tony,

# **RE: AMADEUS PIPELINE – PINE CREEK METER 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 8<sup>th</sup> 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.

Darwin 100 Pruen Road, Berrimah, NT 0828, PO Box 39062 Winnellie NT 0821 tel: +61 8 8922 4000 fax: +61 8 8922 4044 email: admin@sitzler.com.au www.sitzler.com.au



A compilation of the inspection findings/actions across the installation is provided as follows:

- 1. Re-termination of cabling at equipment with exposed cable armour.
- 2. Verification of compound filled barrier style cable glands to prevent transmission of flammable gases.
- 3. Terminate exposed cabling appropriately and earth or completely remove where located within and/or passing through hazardous classified areas.
- 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 installation & design techniques with respect to uncertified equipment and installation adjacent to intrinsically safe installations.
- 10. Replacement of equipment impending failure due to the age and poor condition.

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,

D.Coren

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



, · .

others

х.

Ref: I/data/sitzler/company operations/darwin/lenders/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

Model:

•	Device ID or tag:	CV0-01	SV2-02	Asset:	GAS	CONO'S	SKID.	ESV-DI
	Circuit ID:			Physica	location:	PINE	CI	REEK
	Area classification :			Environ	ment: (hot?)			

## Data from Label

Apparatus type: (light, JB, Motor) SOLSNOTD	Type of protection: (d,e, i, n, p etc)
Manufacturer: RETTESLUCIFER	Gas group: (IIA/B/C)
Full model number:	Temp class: (T1-T6) 75
Serial number: \$21003/ -	Certificate number: AUS Ex 321
IP Class	Test authority: (BAS, PTB, SAA etc)
Number of cables: 2	

PAINTED . 2. gland 1 gland 2 For each cable entry Gland manufacturer: -7,

#### Gland type of protection: (d,e) 5 Inspection

Insp	ection		Circle as	s checked	1
	press downey by discharts pressed		$\mathcal{D} = \bigoplus_{i=1}^{n} \mathcal{D}_{i} (i)$		
	A Equipment	protection type:	Internal	External	1
1	Equipment (incl group and temp class) is appropriate for area classification	all	, X ,	<u>×</u>	
2	Equipment ID or circuit ID is correct	all	X	Ø	ID - CAPUS
3	Enclosure, sealing gaskets or compounds are satisfactory	all - 1	X	K	1 -EQUID
4	There are no damage or evidence of unauthorised modifications	ail	X	Co	
5	Bolts, cable entries and blanking elements are correct and tight in an and the second se	all	X	Ø	La porisido
6	Flange facings are clean and undamaged	d	Х		GASKET.
7	Lamp rating, type and position correct	alter all	(·X·)		
8	Electrical connections are tight	all	ΓX		
9	Hermetically sealed devices are undamaged	n z , s	, X;		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n .	X	1	
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	Х	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	x	Х	
14	Entity calculation/documentation is available	i	Х	X	

4.1

**B** Installation

	D Installation				
1	Type of cable is appropriate, cables are undamaged	all	X		-UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	$\otimes$	- CRAULE
3	Stopper boxes or barrier glands are properly filled	ď	X		GLAND
4	Integrity of conduit system and interface with mixed system is maintained	all	X		Houses
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	x	$\otimes$	
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	Х	X	
12	Ducts, pipes and enclosures are in good condition	р	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		

Amadeus Pipeline Electrical Inspections



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits		Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	ŀ	х	

	C Enatonment				
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	8	UV
2	No undue accumulation of dust or dirt	all	×	8	-
3	Electrical insulation is clean and dry	all	Х		

Faults found? (circle as appropriate)

No: Yes List action required 1 1 1 4 4 1 Contractor (write): Inspector Supervisor Client (write): Inspector . . -Date: 3/9/1 Date:

Act	tion required to make device compliant:
	- Equipment + cable ID required
	- UV damage to shealth, remediation required.
	- Replace sdenoid howling worked @ gland entry.
	- Replace galkets perishished at solenoid cable
•	tormination
•	- haveral condition is poor.
	- Verify Ex valings of glands which one illegillo.

Date: utela

 $\lambda^{\frac{1}{2}} \lambda^{\frac{1}{2}} =$ .7.

20

Date:

Comments:			
All action items now completed:			
Job closed:	H		
000 0100001			
Device now fully compliant, spreadshe	of register has been	Indated	

#### Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SI other Ex devices Based on AS/NZS 60079 part 17

Ref: L:\data\sitzler\company operations\darwin\tenders\sbsj11\y/1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d, ex-e, ex-i, ex-o, and other ex devices.doc

#### **Specifications**

#### General

Device ID or tag: 2 S C - 0 )	Asset: GAS GNOY SILLO. ESV-01
Circuit ID:	Physical location: PINS CREEK
Area classification :	Environment: (hot?)

## Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p etc) E × O
Manufacturer: BETTIS	Gas group: (IIA/B/C)
Full model number: 3R - 321 AFC	Temp class: (T1-T6)
Serial number:	Certificate number: SAA? Ex. 95?
IP Class	Test authority: (BAS, PTB, SAA etc)
Number of cables:	]

For each cable entry	gland 1		 gland 2		others	NO Z PORADIOR
Gland manufacturer:	CMA	1	2		I	1
Model:	FWPM	- No.	5 k	. Bar	1	the state
Gland type of protection: (d,e)						
nspection	1993 - ARIA	-33	 - 11 <b>6</b> 1	is n		Circle as checked

#### Inspection -

		'Applicable to	and a '	24	
	A Equipment	protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	Х	X	
2	Equipment ID or circuit ID is correct	all	X	8	TO - CABING - EQUID
3	Enclosure, sealing gaskets or compounds are satisfactory	all	Х	(X)	- EQUIP
4	There are no damage or evidence of unauthorised modifications	all	Х	8	
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	R	
6	Flange facings are clean and undamaged	d	Х		
7	Lamp rating, type and position correct	all	Х		
8	Electrical connections are tight	alt	Х		
9	Hermetically sealed devices are undamaged	n	, X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Х		
11	Motor fans have sufficient clearance	motors only	Х		
12	Installation clearly labelled	i	Х	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	х	х	
14	Entity calculation/documentation is available	i	X	X	

#### **B** Installation

	Binstallation				2
1	Type of cable is appropriate, cables are undamaged	all	X	$\otimes$	UV
2	Sealing of ducts and/or conduits is satisfactory	ali	X	Ø	1.2
3	Stopper boxes or barrier glands are properly filled	d	X		1
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	×	8	
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	all	X		
	permitted limits		│ ^		
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	р	X	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	
14	Protective gas flow/pressure is adequate	р	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X		
16	Pre-energising purge period is adequate	р	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		

Amadeus Pipeline Electrical Inspections

ZLER



Cables are installed and screens are earthed in accordance with the documentatio0n	i	x	
The circuit is isolated from earth or earthed at one point only	i	X	
Separation is maintained with non-IS circuits	i	X	
As applicable, short circuit protection of the power supply is in accordance with the documentation	i	×	
	documentatio0n The circuit is isolated from earth or earthed at one point only Separation is maintained with non-IS circuits As applicable, short circuit protection of the power supply is in accordance with	documentatio0n       i         The circuit is isolated from earth or earthed at one point only       i         Separation is maintained with non-IS circuits       i         As applicable, short circuit protection of the power supply is in accordance with       i	documentatio0n     X       The circuit is isolated from earth or earthed at one point only     i       X     Separation is maintained with non-IS circuits       As applicable, short circuit protection of the power supply is in accordance with

	C Ellanonment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	alí	Х	\$
2	No undue accumulation of dust or dirt	all	Х	XS
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

List action required

 Contractor (write): Inspector
 Supervisor
 Client (write): Inspector

 Date:
 2/9/11
 Date:

Device ID or tag

Action required to make device compliant: - Equipment + coble J.O regul - Verify equipment + assessories dotails to confirm AUSEX compliance for flameproof installation: - UV damaged cabling in poor conditions.

Reviewed by: N. LRCE ~ Date: 9/9/4 Priority:

Comments:		
All action items now completed:		
Job closed:		

#### 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



Ref: 1:\data\sitzler\company operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheat for ex-d,ex-e,ex-i,ex-n,ex-p and other ex devices.doc

#### **Specifications**

#### General

Device ID or tag:	250-01	Asset: GAS	PNDITING	SICID . BSV-DI
Circuit ID:	1	Physical location:	PINE	CREEK
Area classification :		Environment: (hot?)		

Data	from Label 🗧	14EGBLG						
Appa Moto	aratus type: (light, JB, r)		Type of protection: (c etc)	d,e, i, n, p Ex d				
Мал	ufacturer: B	ETTIS	Gas group: (IIA/B/C)					
Full	model number: 3	R-321 AFC	Temp class: (T1-T6)	T6				
Seria	I number:	-	Certificate number:	X3 SAA2	95	?		
IP CI	ass	-	Test authority: (BAS, SAA etc)	PTB,				
Num	ber of cables:	Τ	]	8 incontra	" A			
For	each cable entry	gland 1	gland 2	PLUS G. others	ADAPI	on	_	
Glan	d manufacturer:	CMA	3		ulsal.	2		
Mode	el:	CALL FWPM	1	N	135?	1. C.		
Glan	d type of protection: (a	1,e)	1. A.	1987 X 1015	Section Section			
Inspe	ction 🚣	10 - 11 X		Applicable to	n an de series e	s checked		
	A Equipment	والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع وال	K and the	protection type:	Internal	External		
1 [		p and temp class) is appropriate for area	a classification	all	X	X		
2	Equipment ID or circ			all	X		ID	- CABLE
						N		- EGUIP

1	Equipment (incl group and temp class) is appropriate for area classification	all	Ň	~	-
2	Equipment ID or circuit ID is correct	all	Х	8	10
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	(X)	1
4	There are no damage or evidence of unauthorised modifications	all	X	8	1
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	8	T
6	Flange facings are clean and undamaged	d	Х		7
7	Lamp rating, type and position correct	all	Х		7
8	Electrical connections are tight	all	Х		7
9	Hermetically sealed devices are undamaged	n in the second	X		1
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Χ.ι		7
11	Motor fans have sufficient clearance	motors only	Х		
12	Installation clearly labelled	i	Х	Х	7
13	Safety barriers/isolators installed as per certification and securely earthed where	i	v	v	7
	required		^	~	
14	Entity calculation/documentation is available	i	X	X	

**B** Installation XXX 1 Type of cable is appropriate, cables are undamaged all Х UV Sealing of ducts and/or conduits is satisfactory 2 all Х 3 Stopper boxes or barrier glands are properly filled d Х 4 Integrity of conduit system and interface with mixed system is maintained Х all 5 Earthing and bonding connections are tight, in good condition and of sufficient all 8 Х cross section 6 Fault loop impedance is satisfactory power outlets X 7 Insulation resistance is satisfactory (check only during initial inspection) Х all 8 Automatic electrical protective devices are set correctly and operate within all Х permitted limits 9 Special certification conditions U,X or B have been complied with Х ail 10 Cables/spare cores are terminated satisfactorily all X 11 No obstructions adjacent to flameproof flanged joint X d X 12 Ducts, pipes and enclosures are in good condition Х p 13 Protective gas is substantially free from contaminants (water, oil, dirt) р Х Х 14 Protective gas flow/pressure is adequate X р 15 Pressure and/or flow indicators, alarms and interlocks function correctly Х р 16 Pre-energising purge period is adequate р Х 17 Condition of spark/particle barriers of ducts exhausting the gas into hazardous р х area are satisfactory

Amadeus Pipeline Electrical Inspections



8	Cables are installed and screens are earthed in accordance with the documentatio0n	í	x	
9	The circuit is isolated from earth or earthed at one point only	i	X	
0	Separation is maintained with non-IS circuits	i	X	
1	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	
	C Environment			

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	X	$\overline{\mathbf{w}}$
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

\* +1. A ....

. -

No:				
Yes	List action required			
	·		· · · · ·	
Contra	ctor (write): Inspector	Supervisor	Client (write): Inspector	
Date:	8/9/11		Date:	

Device ID or tag

. ,

Action required to make device compliant: calle I.P. required AUSEX equip dug details to confirm compliance for Marion. cabling in poor condition - Egmpnent adaptor, eproof inStalla da

Reviewed by: N, LREEN Date: S/9/11 Priority:

Comments:	
Comments.	
r	
Alt antion items wave a smalleteril	
All action items now completed:	
Job closed:	

# Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and other Ex devices



Ref: I:\data\sitzler\company operations\darwin\lenders\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: - (JB?)	Asset: GAS CONDITIONING SILVO
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

# Data from Label

Apparatus type: (light, JB, Motor) JUNCTION BOX	Type of protection: (d,e, i, n, p etc)
Manufacturer: GOVAN	Gas group: (IIA/B/C)
Full model number: F 150	Temp class: (T1-T6)
Serial number:	Certificate number: AUS Ex 349
IP Class 65	Test authority: (BAS, PTB, SAA etc)
Number of cables: 32	

For each cable entry	gland 1 x 30	gland 2 × 2	others PLUGS x 2 Tor
Gland manufacturer:	CMA	ALCO	· ·
Model:	EWPM	PLPW 223	Participant and the
Gland type of protection: (d,e)	JAX6D INC EXd	IC A	2
nspection	AUS Ex 28	AUS Ex 591	Circle as checked
nspection -		and have been and	

	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	6	ID - CARLE - EGU.P
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	8	- EGUIP
4	There are no damage or evidence of unauthorised modifications	al source in	A XVV	8	
5	Bolts, cable entries and blanking elements are correct and tight	all	X .·	X	- 3× NUL BUNGS.
6	Flange facings are clean and undamaged	d	X		ALLEN CODE
7	Lamp rating, type and position correct	, all	X ·		- MAIN CABLE
8	Electrical connections are tight	alí	· X		EXPOSED ARMAN
9	Hermetically sealed devices are undamaged	i 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	í	X	X	I.S cets?
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

	B installation				
1	Type of cable is appropriate, cables are undamaged	all	X	00	- 01
2	Sealing of ducts and/or conduits is satisfactory	all	X		
3	Stopper boxes or barrier glands are properly filled	ď	X		
4	Integrity of conduit system and interface with mixed system is maintained	all	Х		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	ail	x	8	
6	Fault loop impedance is satisfactory	power outlets	X		
7	Insulation resistance is satisfactory (check only during initial inspection)	alt	X		
8	Automatic electrical protective devices are set correctly and operate within permitted limits	ali	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		X	8	
12	Ducts, pipes and enclosures are in good condition	р	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	х		

SITZLER



18	Cables are installed and screens are earthed in accordance with the	i	Y	
	documentatioOn		^	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	~	
	the documentation		^	
	C Environment			

_	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	8
2	No undue accumulation of dust or dirt	alí	Х	
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

.

No:

Yes: List action required

Contractor (	write): Inspector	Supervisor	Client (write): Inspector
	N. GREEN	-	
	, /		
Date: 2	9/11		Date:

Device ID or tag

Action required to make device compliant:
- Equipment ID required, some cable IO' required Corprox. 10 cables).
- Replace uncertified plugs.
- provide certified plugs x3 to bottom of enclosure LD High Priority IT
- UV domage to several cables required remodiation - Exposed amour at main control cable required re-termination
- Verity J.S. circuits within 513 and evaluate at required.
Reviewed by: N. GREEN Date: 19911

Priority:

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Comments:		
All action items now completed:		
Job closed:		
	—	

# 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

Ref. 1:\data\sit2ler\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: - (PIT OI)	Asset: GAS CONO'S, SKID INLET
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Pressure Transmitter	Type of protection: (d,e, i, n, p etc)	
Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C)	-
Full model number: 305) TG4A2821 BE4MSTI	Temp class: (T1-T6)	-
Serial number: PS0754039	Certificate number:	-
IP Class 66/17	Test authority: (BAS, PTB, SAA etc)	~

Number of cables:

1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	ALCO		REPAPT
Model:	ALCHA WZO MZO	``	M20
Gland type of protection: (d,e)	d IInc, P VIN		GBx of 11C
f	4092, ZOX, Z904		BAS # 8312180
nspection			Circle as checked

Inspection	
------------	--

	_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	8	ID-CASUE
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	*	-tove
4	There are no damage or evidence of unauthorised modifications	all	X	8	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	$\otimes$	1
6	Flange facings are clean and undamaged	d	X		1
7	Lamp rating, type and position correct	all	X		1
8	Electrical connections are tight	all	X		1
9	Hermetically sealed devices are undamaged	n	X		1
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		1
11	Motor fans have sufficient clearance	motors only	X		(a) (a)
12	Installation clearly labelled	i	X	8	RUDE
13	Safety barriers/isolators installed as per certification and securely earthed where required	í	x	8	
14	Entity calculation/documentation is available	i	X	X	1
	B Installation				-
1	Type of cable is appropriate, cables are undamaged	all	X	0	7
2	Sealing of ducts and/or conduits is satisfactory	all	X	Ø	1
					-1

3	Stopper boxes or barrier glands are properly filled	d	X		1
4,	Integrity of conduit system and interface with mixed system is maintained	all	X		1
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	8	1
6	Fault loop impedance is satisfactory	power outlets	x		-
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		1
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		1
9	Special certification conditions U,X or B have been complied with	all	Х		1
10	Cables/spare cores are terminated satisfactorily	all	X	Lange tra	10 🐹
11	No obstructions adjacent to flameproof flanged joint	d	X	$\otimes$	NA
12	Ducts, pipes and enclosures are in good condition	p	Х	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	1
14	Protective gas flow/pressure is adequate	р	X		1
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		1
16	Pre-energising purge period is adequate	P	X		1
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	P	x		1

Amadeus Pipeline Electrical Inspections



		and the second se		a state of the second second
18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	Х	
1 <b>9</b>	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	$\otimes$
2	No undue accumulation of dust or dirt	all	Х	X
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

No:

Ves.

List action required

Client (write): Inspector
Date:
-

Device ID or tag

Action r	required to r	nake device	compliant:				
-	Cable	+ cyn.	pment IO.	lequired.			
-			shearn ag			1	
-	Naz.	Alea.	cerdition	label required	on	device.	
							_
							_

Reviewed by: N.GREN Date: 8/9/11 Priority:

Comments:			
All action items now completed:			
Job closed:	_		
Device now fully compliant, spreadshee	et 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

Ref: 1:\data\sitzlencompany operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d, ex-e, ex-1, ex-n, ex-p and other ex devices.doc

#### Specifications

#### General

Device ID or tag: - (DPIT OI)	Asset: 445 CONDITIONING SKID. FS- 1
Circuit ID:	Physical location: Pluse CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Motor) PRESSURE TOAN/MATER	Type of protection: (d,e, i, n, p etc)
Manufacturer: No SEMO UNK	Gas group: (IIA/B/C)
Full model number: 3051 CD4A01A1BM5171155	Temp class: (T1-T6) T5 (46° c)
Serial number: RSOS 17285	Certificate number: AUS Ex 1244X
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	GMA		REDAPT
Model:	FWPM		MZB
Gland type of protection: (d,e)	Ex		BAS GRY & NC
			BAS & 312180
nspection			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	- Equip
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	Ø	- Equip
4	There are no damage or evidence of unauthorised modifications	all	Х	(X)	
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 í	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	(X)	BUNE
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	$\bigotimes$	
14	Entity calculation/documentation is available	i	X	X	]

#### B Installation

	Difiction			
1	Type of cable is appropriate, cables are undamaged	all	X	6
2	Sealing of ducts and/or conduits is satisfactory	all	X	X
3	Stopper boxes or barrier glands are properly filled	d	X	0
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	all	X	N)
	cross section			
6	Fault loop impedance is satisfactory	power outlets	X	
7	Insulation resistance is satisfactory (check only during initial inspection)	alí	X	
8	Automatic electrical protective devices are set correctly and operate within	all	X	
	permitted limits			
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	6
12	Ducts, pipes and enclosures are in good condition	р	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
14	Protective gas flow/pressure is adequate	р	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X	
16	Pre-energising purge period is adequate	р	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	×	

SITZLER



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	Х	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	Y	
	the documentation			

	C Environment			_
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	$\bigotimes$
2	No undue accumulation of dust or dirt	all	X	$\bigotimes$
3	Electrical insulation is clean and dry	all	X	

# Faults found? (circle as appropriate)

No:

Yes:	List action required		
Contra	actor (write): Inspector Supervisor	Client (write): Inspector	
	N.GROED		
Date:	8/9/ 11	Date:	

Device ID or tag

Action required to make dev			
		I.D. required.	
- Blue calle	Reath	seguined -	

Reviewed by: N, GREEN Date: 8/9/11 Priority:

Comments:				
All action items now completed:				
	님			
Job closed:				
Device now fully compliant, spreadsheet r	agistor has he	an undated		
Device now runy compliant, spreadsheet r	egister nas be	en upualeu		
Supervisor (write):				
Date:				

Amadeus Pipeline Electrical Inspections:

# 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



Ref: 1:/data/sitzlencompany operations/darwin/lenders/sbsj11/lyf1 - 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:-(2 SC - 02 AL)	Asset: GAS CONP. SKID TCV-07A	_
Circuit ID:	Physical location: PINS CREEK	
Area classification :	Environment: (hot?)	

# Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p CLA65 L
Manufacturer: MASONETLAN	Gas group: (IIA/B/C) (POUP B.C. D
Full model number 4001 9 6 - 411	Temp class: (T1-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	5	
Gland manufacturer:								
Model:		a men be	· · ·		2 Branci	,	ł	
Gland type of protection: (d,e)	-	-						

 $h_{i} \sim$ 

#### Inspection -

	and from the second sec	Applicable to"	14	le 🖡	
	A Equipment	protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	• • X	· , X	(A) A C
2	Equipment ID or circuit ID is correct	all	X		- Goldens
3	Enclosure, sealing gaskets or compounds are satisfactory	all	. Χ.	. 60	- Gaune
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	8	
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	х	
14	Entity calculation/documentation is available	i	X	X	

**B** Installation

	Binstandion				
1	Type of cable is appropriate, cables are undamaged	all	X	Ø	·UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	0	- CAS
3	Stopper boxes or barrier glands are properly filled	d	X		PIP
4	Integrity of conduit system and interface with mixed system is maintained	all	X		
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	0	
	Fault loop impedance is satisfactory	power outlets	X		
	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		
	Special certification conditions U,X or B have been complied with	all	X		
	Cables/spare cores are terminated satisfactorily	all	X		
	No obstructions adjacent to flameproof flanged joint	d	X		
	Ducts, pipes and enclosures are in good condition	р	X	X	
	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	Х	
	Protective gas flow/pressure is adequate	p	X		
	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
	Pre-energising purge period is adequate	p	Х		
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	x		

Amadeus Pipeline Electrical Inspections

3

Circle as checked



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	~	
	the documentation		^	

	o chanoninent			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	00
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:			
List ac	tion required		
			T
Contractor (w	rite): Inspector Supervisor	Client (write): Inspector	
Date: 8/9	lu	Date:	

Device ID or tag

. '

,

	n required t								
1	Equipm	ent	+	cuble	J.O.	require	ed.		
-	UV o	damag	ed	cuble	sequir	es re	modiatio	~ ·	
-	Cable	rest	ing	on	process	pipe	requires	supporting adaptors	
1	N:L	AUS	cen	+ m.	mailable	for	dance t	adaptors	10
,	erdu	ute.							

Reviewed by: D.G.RCEN Date: S/9/11 Priority:

Comments:			
,			
All action items now completed:			
All double from the state of th			
Job closed:			

#### 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



Ref: I:\data\sitzle/company operations\darwin\lenders\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:	[I/P -02A]=	Asset: GAS
Circuit ID:		Physical location

General	
Device ID or tag: . (I/P - 02A)	Asset: GAS CONDO'S SKID TCV-OLA
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)
Data from Labal	

## Data from Label

Apparatus type: (light, JB, Motor) PRESSURE	Type of protection: (d,e, i, n, p etc) Fx ) A
Manufacturer: MASONETLAN	Gas group: (IIA/B/C)
Full model number: 8012-20	Temp class: (T1-T6) T6
Serial number: X34555-1-88-8	Certificate number: SAA Ex 94
IP Class	Test authority: (BAS, PTB, SAA etc)
Number of cables:	

For each cable entry	gland 1	 gland 2	CONNECTED TO
Gland manufacturer:	2	7	GOVAN
Model:	1 Same	1 年前,	EN 4W
Gland type of protection: (d,e)	2	3	d
nspection	n teshni - S		Circle as checked

Inspection	
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1 2 3 4 5 6 7	A Equipment Equipment (incl group and temp class) is appropriate for area classification Equipment ID or circuit ID is correct Enclosure, sealing gaskets or compounds are satisfactory There are no damage or evidence of unauthorised modifications Bolts, cable entries and blanking elements are correct and tight Flange facings are clean and undamaged Lamp rating, type and position correct	Applicable to protection type: all all all all d all	Internal X X X X X X X	External X X X X X X X	- EQ - CQ
8	Electrical connections are tight	all	X		1
9	Hermetically sealed devices are undamaged	n	. <b>.</b> X		]
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		]
11	Motor fans have sufficient clearance	motors only	X	3	
12	Installation clearly labelled	i	X	00	Curi
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	x	*>	
14	Entity calculation/documentation is available	i	Х	X	]

B Installation

	Difisialiation			
1	Type of cable is appropriate, cables are undamaged	ali	Х	8
2	Sealing of ducts and/or conduits is satisfactory	all	Х	8
3	Stopper boxes or barrier glands are properly filled	d	X	
4	Integrity of conduit system and interface with mixed system is maintained	all	Х	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	$\bigotimes$
6	Fault loop impedance is satisfactory	power outlets	Х	
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	ali	Х	
9	Special certification conditions U,X or B have been complied with	all	X	
10	Cables/spare cores are terminated satisfactorily	all	Х	
11	No obstructions adjacent to flameproof flanged joint	d	Х	X
12	Ducts, pipes and enclosures are in good condition	p	Х	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	р	Х	Х
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	Х	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	ρ	Х	

bv



				100000000
18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	í	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	×	
	the documentation		^	
	C Environment			

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	(X)
2	No undue accumulation of dust or dirt	all	Х	Ø
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

 No:

 Ist action required

 Contractor (write): Inspector

 Supervisor

 N, LR CEN

 Date:

Date:

Device ID or tag \*

Action required to	make device compli	ant:		
-Equi	prient +	cuble I.O.	required	
- Plou	ide blue a	able sheath	/ J.S. labelling	to I/P TR.
. ·				

Reviewed by: N. GREEN Date: 3/9/11 Priority:

Comments:		
All action items now completed:		
Job closed:		

# 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

Ref: I:/data/sitzlen/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: - JBS	Asset: TCV-02A (1/P JBOX)
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

# Data from Label

Apparatus type: (light, JB, Motor) JUNCTTON ROXES	Type of protection: (d,e, i, n, P etc)
Manufacturer: GOVAN	Gas group: (IIA/B/C)
Full model number: FW 4W	Temp class: (T1-T6)
Serial number:	Certificate number: AVS Ex 157
IP Class 65	Test authority: (BAS, PTB, SAA etc)
Number of cables:	

140		aures.	<u> </u>		
	_				

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	1		
Model:	N. 1. 1	· · · · ·	and the second sec
Gland type of protection: (d,e)	1	,	
	a the store of		
Inspection	·	· ·	Circle as checked

#### Inspection -

	_A Equipment	Applicable to protection type:		External	_
1	Equipment (incl group and temp class) is appropriate for area classification	all	Х	X	115
2	Equipment ID or circuit ID is correct	all	Х		- CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	No.	- 60
4	There are no damage or evidence of unauthorised modifications	all	Х	\$	
5	Bolts, cable entries and blanking elements are correct and tight	all	Х		]
6	Flange facings are clean and undamaged	d	Х		[
7	Lamp rating, type and position correct	all	× _		
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	1. L.A.	]
<b>1</b> 1	Motor fans have sufficient clearance	motors only	Х		
12	Installation clearly labelled	ì	×	$\otimes$	FLuis.
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	Х	3	
14	Entity calculation/documentation is available	i	Х	X	

#### B Installation

	Difisialiation				
1	Type of cable is appropriate, cables are undamaged	all	Х	8	OV
2	Sealing of ducts and/or conduits is satisfactory	all	X	8	ľ
3	Stopper boxes or barrier glands are properly filled	d	X		]
4	Integrity of conduit system and interface with mixed system is maintained	all	Х		7
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	8	]
6	Fault loop impedance is satisfactory	power outlets	X		1
7	Insulation resistance is satisfactory (check only during initial inspection)	all	Х		1
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	Х		
9	Special certification conditions U,X or B have been complied with	all	Х		1
10	Cables/spare cores are terminated satisfactorily	all	X		1
11	No obstructions adjacent to flameproof flanged joint	d	Х	X	1
12	Ducts, pipes and enclosures are in good condition	р	X	X	]
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	]
14	Protective gas flow/pressure is adequate	p	Х		]
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х		]
16	Pre-energising purge period is adequate	р	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	×		]

Amadeus Pipeline Electrical Inspections



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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	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	
	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all .	Х	ØR
2	No undue accumulation of dust or dirt	all .	X	

2	No undue accumulation of dust or dirt	

3 Electrical insulation is clean and dry

Faults found? (circle as appropriate)

No:	
Ves: List action required	
Contractor (write): Inspector Supervisor	Client (write): inspector
Date: 8/4/11	Date:

Device ID or tag

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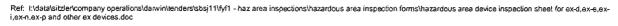
. .

	required to m	ake devid	e complia	nt:				
-	Equip	ert +	cabi	le J.D rey	in ed		-	
-	Provide	she	cable	shouth / T.S.	labelling	to	J.B.	

Reviewed by: Date: \$9/11. Priority:	N. CREEP	

Comments:		
	-	
All action items now completed: Job closed:	H	
000 00000		

# 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



#### Specifications

General	
Device ID or tag: - T - 01 A	Asset: GAS CORDITIONING SILLO
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

# Data from Label

Apparatus type: (light, JB, Motor) TEP/PERATURE	Type of protection: (d,e, i, n, p etc) <u>Ex</u> )u		li,
Manufacturer: ROSE MOUNT	Gas group: (IIA/B/C)		ILLEGIBLE
Full model number: 444 - R12 -UT - A1-17	Temp class: (T1-T6) T6 (40'C)	T.F (70'()	TELENINCE
Serial number: (444 RIZU1A1I7)	Certificate number: AUS Ex	122×	
IP Class AL12445	Test authority: (BAS, PTB, SAA etc)	· · ·	•

Number of cables:

For each cable entry	gland 1	gland 2	others Abhoire
Gland manufacturer:	CMA	CUPJAL.	CHIPSAL.
Model:		the second second second second second second second second second second second second second second second s	FI235 UPTI
Gland type of protection: (d,e)			Grd

Inspection Circle as checked

	A Equipment	Applicable to	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	1.000 ST 200
2	Equipment ID or circuit ID is correct	all	X	Ø	- 64
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	
4	There are no damage or evidence of unauthorised modifications	all	X	X	-CCT Axes
5	Bolts, cable entries and blanking elements are correct and tight	all	X	X	TO PIPE.
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 .		1011
12	Installation clearly labelled	i	X	8	JAGATH
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	0	
14	Entity calculation/documentation is available	i	Х	X	

B Installation

Binstallation				
Type of cable is appropriate, cables are undamaged	all	X	K	
Sealing of ducts and/or conduits is satisfactory	all	X	X	
Stopper boxes or barrier glands are properly filled	d	X		
Integrity of conduit system and interface with mixed system is maintained	all	X		
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	X	
Fault loop impedance is satisfactory	power outlets	X		1
Insulation resistance is satisfactory (check only during initial inspection)	all	X		
Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		
Special certification conditions U,X or B have been complied with	all	X		1
Cables/spare cores are terminated satisfactorily	all	X		
No obstructions adjacent to flameproof flanged joint	d	X	Х	
Ducts, pipes and enclosures are in good condition	p	X	X	1
Protective gas is substantially free from contaminants (water, oil, dirt)	p	X –	X	
Protective gas flow/pressure is adequate	p	X		1
Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		1
Pre-energising purge period is adequate	p	X		1
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	×		1

Amadeus Pipeline Electrical Inspections



	-		and a second second second second second second second second second second second second second second second
Cables are installed and screens are earthed in accordance with the documentatio0n	í	Х	
The circuit is isolated from earth or earthed at one point only	i	X	
Separation is maintained with non-IS circuits	i	X	
As applicable, short circuit protection of the power supply is in accordance with the documentation	i	x	

No:

	C ENARONIMENT			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	(X)
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

 List action required

 Contractor (write): Inspector

 Supervisor

 Client (write): Inspector

 Date:

 Date:

Device ID or tag Action required to make device compliant: - Equipment + calle I.D. required - Re-route celling and support not Sixed to proced piping. - Provide the outer sheath to cable.

Reviewed by: Date: 89/8 Priority:

-		
Comments:		
•		
All action items now completed:		
Job closed:		

# Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SITZLER other Ex devices Based on AS/NZS 60079 part 17



Ref: I:\data\sitzien\company operations\darvin\lenders\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
---------

General	
Device ID or tag: - (PT -0) A)	Asset:
Circuit ID:	Physical location: PINS CREEK
Area classification :	Environment: (hot?)

Data	from	Label	

Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, * * *	Exja	
Manufacturer: ROSS MOUNT	Gas group: (IIA/B/C)	11 6	FADED
Full model number	Temp class: (T1-T6) T5 C40'C)	T4 (60°C)	panercano
Serial number: RS0523853	Certificate number: AVS Ex	1249×	
IP Class D 305 1 CG SA22 ALABET 7M5	Test authority: (BAS, PTB, SAA etc)	139.48	
		5	

Number of cables:

l

For	each cable entry	gland 1	gland 2	others	ADAPT	on	
Glar	nd manufacturer:	CMA					7
Mod	tel:	FWPM		FAU	NM		1
Glar	nd type of protection: (d,e)					1	1
Insp	ection	<b>N</b>		لامته	Gircie a	o is checked	1
				Applicable to			
	A Equipment			protection type:	Internal	External	
1	Equipment (incl group and	t temp class) is appropriate for are	a classification	all	X	X	Constant Constant of
2	Equipment ID or circuit ID	is correct		all	X	8	- CASE
3	Enclosure, sealing gasket	s or compounds are satisfactory		all	X	20	E EUID,
4	There are no damage or evidence of unauthorised modifications			all	X	4-	
5	Bolts, cable entries and bi	anking elements are correct and tig	ght	all	X	8	
6	Flange facings are clean a	and undamaged		d	X		1
7	Lamp rating, type and pos	ition correct		all	X		
8	Electrical connections are	tight		all	X		
9	Hermetically sealed device	es are undamaged		n	X		
10	Restricted breathing enclo	sure is satisfactory to enclosure an	nd/or covers	n . –	X		
11	Motor fans have sufficient	clearance		motors only	X	12 V	I make the later
12	Installation clearly labelled	1		i	X	X	Runz
13	Safety barriers/isolators in required	stalled as per certification and sec	urely earthed where	i	x	<b>6</b> 5	
14	Entity calculation/documer	ntation is available		i	X	ex	NO
	· ·						Concernence of

#### **B** Installation

129

b installation			
Type of cable is appropriate, cables are undamaged	all	X	6
Sealing of ducts and/or conduits is satisfactory	all	X	8
Stopper boxes or barrier glands are properly filled	d	x –	
Integrity of conduit system and interface with mixed system is maintained	all	X	
Earthing and bonding connections are tight, in good condition and of sufficient cross section	ail	х	\$
Fault loop impedance is satisfactory	power outlets	X	
Insulation resistance is satisfactory (check only during initial inspection)	all	X	
Automatic electrical protective devices are set correctly and operate within permitted limits	all	Х	
Special certification conditions U,X or B have been complied with	all	Х	
Cables/spare cores are terminated satisfactorily	all	Х	
No obstructions adjacent to flameproof flanged joint	d	Х	
Ducts, pipes and enclosures are in good condition	ρ	X	X
Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
Protective gas flow/pressure is adequate	р	Х	
Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х	
Pre-energising purge period is adequate	p	X	
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	P	х	



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	×	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-JS circuits	i	X	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	×	
	C Environment			

	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	<b>\$</b>
2	No undue accumulation of dust or dirt	. all	Х	$\otimes$
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

No:		
Yest	List action required	
	actor (write): Inspector Supervisor	Client (write): inspector
Date:	8/4/11	Date:

Device ID or tag			
Action required to make device con	npliant:	,	
- Canian eat + c	cable J.D.	required	5 - 5 L K - 3
- Japanese			
- Equipment + c - Blue "Sheath	to calling	required.	
- Replace faded	to namepl	late.	

Reviewed by:	12 GROUND	
rid rid mod ay.	N. ARCEI	
Date: 8/9/u Priority:		
Date. 3/9/11		
Priority (		
Filoney.		

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Comments:			
·			
All action items now completed:			
Job closed:			

#### Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SITZLER other Ex devices Based on AS/NZS 60079 part 17

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: - (2 SC 25003 A)	Asset: GAS CADDITIODADG SKID SPV-03A
ŗ.	Circuit ID:	Physical location: PINE CREEK
	Area classification :	Environment: (hot?)

# Data from Label

Apparatus type: (light, JB,	Type of protection: (d,e, i, n, p
Motor) VALVE LIMIT SWITCH	eic) <u>FX 0</u>
Manufacturer: BETTIS	Gas group: (IIA/B/C)
Full model number: 38 -021 AFC	Temp class: (T1-T6) <b>T6</b>
Serial number:	Certificate number: SAA? Ex. 95?
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1	gland 2 PLUG?	others APAPTOL
Gland manufacturer:	CMA	1	CLIPSAL
Model:	EWPM	1. A. A. A. A. A. A. A. A. A. A. A. A. A.	E1235
Gland type of protection: (d,e)		7	
	19	A state of the sta	it is a second

Insp	ection		Circle a	s checked	ł
	A Equipment	Applicable to protection type:	fnternál ·	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	5.000
2	Equipment ID or circuit ID is correct	all	X	10	-CLT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	8	- 29
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	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	ń., 1	·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	×	Х	
14	Entity calculation/documentation is available	i	X	X	]

[	Type of cable is appropriate, cables are undamaged	all	X	L &	-PAW T
	Sealing of ducts and/or conduits is satisfactory	all	X	Ø.	
	Stopper boxes or barrier glands are properly filled	d	Х		
[	Integrity of conduit system and interface with mixed system is maintained	all	X		
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	$\otimes$	
[	Fault loop impedance is satisfactory	power outlets	X		
Ì	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	×		
	Special certification conditions U.X or B have been complied with	all	Х		
	Cables/spare cores are terminated satisfactorily	all	X		
	No obstructions adjacent to flameproof flanged joint	d	Х	Ø	
	Ducts, pipes and enclosures are in good condition	p	X	X	
	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	x	_
Í	Protective gas flow/pressure is adequate	р	X		
ĺ	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X		
[	Pre-energising purge period is adequate	ρ	X		
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		

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1	Apparatus adequately protected from corrosion, weather, vibration, other	all "	X	8
2	No undue accumulation of dust or dirt	all	X	3
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 N. GREEN 8/9/11

Date:

Device ID or tag	
------------------	--

Date:

- Verify equipment + cable I.O. required, - Verify equipment + accessory details to condirm Austix compliance for flampproof installation. - UN damaged cabling requireing remediation Action required to make device compliant:

Reviewed by: N. GREEN Date: 8/9/11 Priority:

Comments:			
	_		
All action items now completed: Job closed:			

#### Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SITZLER other Ex devices Based on AS/NZS 60079 part 17

Ref: 1\data\sitzler\company operations\darwin\lenders\sbsj11\/yf1 - 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: - (SV 0/SVC03 A)	Asset: GAS COMOLITION ING SKID SOV-03A
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

Data from Label - ILLEGIRLE - INFO BAIED	UPON PREVIOUS MES SOULNDEDS.	
Apparatus type: (light, JB, SOLENOID VALVE	Type of protection: (d,e, i, n, p (Ex e, s)	7
Manufacturer: BETTES(HERION)	Gas group: (IIA/B/C)	LEGIBU
Full model number:	Temp class: (T1-T6)	To I SO
Serial number:	Certificate number: AUS Ex195	ONLY ( OSB.
IP Class (65)	Test authority: (BAS, PTB, SAA etc)	])
- /		

Number of cables: 2

For each cable entry		gland 1			gland 2	others	
Gland manufacturer:		2,		_			
Model:		2			•	1 A	
Gland type of protection: (d,e)		2	· [				
	· · · · · · · · · · · · · · · · · · ·			÷ 4 ,	·	A starte	

Inspection

	A Equipment	Applicable to protection type:	Internal	External	
4	Equipment (incl group and temp class) is appropriate for area classification		- X		1
1		al			- 665
2	Equipment ID or circuit ID is correct	all	X		- EQUIP.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	8	
4	There are no damage or evidence of unauthorised modifications	all	X	8	· PANTOD
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	8	
6	Flange facings are clean and undamaged	d	Х		1
7	Lamp rating, type and position correct	ail	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	Χ.,	•	
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	Х	X	
13	Safety barriers/isolators installed as per certification and securely earthed where	i	х	х	
	required		^	~	
14	Entity calculation/documentation is available	i	X	Х	J

B Installation

	D Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	8	· PAINT
2	Sealing of ducts and/or conduits is satisfactory	all	X	$\otimes$	
1	Stopper boxes or barrier glands are properly filled	d	X		1
	Integrity of conduit system and interface with mixed system is maintained	alí	X		1
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	$\otimes$	
	Fault loop impedance is satisfactory	power outlets	X		1
	Insulation resistance is satisfactory (check only during initial inspection)	all	X		1
	Automatic electrical protective devices are set correctly and operate within permitted limits	ail	х		1
	Special certification conditions U,X or B have been complied with	all	X		1
)	Cables/spare cores are terminated satisfactorily	all	X	11.000	1
I	No obstructions adjacent to flameproof flanged joint	d	Х	$\otimes$	1
2	Ducts, pipes and enclosures are in good condition	p	X	X	1
3	Protective gas is substantially free from contaminants (water, oil, dirt)	p	Х	X	1
Ļ	Protective gas flow/pressure is adequate	p	Х		1
5	Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х		1
5	Pre-energising purge period is adequate	p	Х		1
7	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X		

Circle as checked



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	

	o Entri oliment			
1 ·	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	8
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	Х	

#### Faults found? (circle as appropriate)

No:

List action required

Contractor (write): Inspector Supervisor Client (write): Inspector					
N. GREEN	Contracto	or (write): Inspector		Client (write): Inspector	
		N. GREE	N		
		1.1			
Date: <b>S(9/1</b> ) Date:	Date:	8(9/11		Date:	

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Device ID or tag

Action req	uired to make device compliant:	
-	Equipment + cct I.D. required.	
	Equipment painted heavily hence illegible.	
-	En cert <sup>in</sup> expired 2001, due to age/condition suggest replacement.	

Reviewed by:	N. GREEN
Date: 29/11	
Priority	

۰.

Comments:		
•		
All action items now completed:		
Job closed:		

# 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



Ref: I:\data\sizter\company operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,exi,ex-n.ex-p and other ex devices.doc

#### Specifications

#### General

Device ID or tag:-(35C-02BL)	Asset: GAS CONDITIONING 5KD TOV-028
Circuit ID:	Physical location: PUSE CREEK
Area classification :	Environment: (hot?)

Data from Label	ILLEGISLE
Apparatus type: (light, JB, VALVE CUMIT SWITCH	Type of protection: (d,e, i, n, p etc)
Manufacturer: MASONELLAN	Gas group: (IIA/B/C)
Full model number: 406496-911	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 🤨	gland 2	others
Gland manufacturer:	-		
Model:			
Gland type of protection: (d,e)	•		

Insp	ection		Circle a	as chepke	d
	A Equipment	Applicable to protection type:	Jnternal	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)	-CCF
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X	- eq
4	There are no damage or evidence of unauthorised modifications	all	X	The	1
5	Bolts, cable entries and blanking elements are correct and tight	all	X	05	1
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	ת	X		
11	Motor fans have sufficient clearance	motors only	X		
12	Installation clearly labelled	i	X	Х	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	X	
14	Entity calculation/documentation is available	Í	X	Х	
	B Installation				
1	Type of cable is appropriate, cables are undamaged	all	X	Ö	
2	Sealing of ducts and/or conduits is satisfactory	all	X	A	1000

1	Type of cable is appropriate, cables are undamaged	all	X	Ø	
2	Sealing of ducts and/or conduits is satisfactory	all	X		UV
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	Х		
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		7
9	Special certification conditions U,X or B have been complied with	all	X		1
10	Cables/spare cores are terminated satisfactorily	all	X	6.20	7
11	No obstructions adjacent to flameproof flanged joint	d	X	8	1
12	Ducts, pipes and enclosures are in good condition	p	X	X	7
13	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	
14	Protective gas flow/pressure is adequate	Р	X		
15	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
16	Pre-energising purge period is adequate	р	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	q	х		) ×
					_



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	

No:

	C Environment				
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	$\otimes$	
2	No undue accumulation of dust or dirt	all	Х	8	
3	Electrical insulation is clean and dry	all	Х		

Faults found? (circle as appropriate)

Yes.	List action required			
Contra	ctor (write): Inspector	Supervisor	Client (write): Inspector	
Date:	2/9/11		Date:	

Actio	Equipm	ent +	ice compliant: cable J.O. Jod (UV) regni			
			certification		evaluate.	

Reviewed by: N. G. Reet. Date: 9/9/11 Priority:

Comments:				
All action items now completed:				
Job closed:				
Job closed:				_
Device now fully compliant, spreadshe	et register has b	een updated		
Supervisor (write):	5	•		
Date:				
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



Ref: I:\data\sitzlencompany operations\darwin\lenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d, ex-e, exi, ex-n.ex-p and other ex devices.doc

#### Specifications

#### General

Device ID or tag: (T/P-02B)	Asset: GAS CONDITIONING SKID TCV-028
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, T/P TRANDUCER Motor)	Type of protection: (d,e, i, n, p etc)
Manufacturer: MASONELLAN	Gas group: (IIA/B/C)
Full model number: 8012-20	Temp class: (T1-T6)
Serial number: X34555 -1-88-3	Certificate number: SAA Ex 94
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1	gland 2	others CONNELLOD TO
Gland manufacturer:	2	<b>`</b>	Reter GOVAN
Model:	1	N	FW 4W
Gland type of protection: (d,e)	1	?	a

Insp	ection		Circle a	is checked	ł
	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	8	- 60
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	×	.cer
4	There are no damage or evidence of unauthorised modifications	all	X	8	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	×	1
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	8	isult
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	$\bigotimes$	
14	Entity calculation/documentation is available	í	Х	X	]
	B Installation				
1	Type of cable is appropriate cables are undamaged	all	X	R	1 OV

1	Type of cable is appropriate, cables are undamaged	all	X	Ø	01
2	Sealing of ducts and/or conduits is satisfactory	all	X _	8	
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	×	8	
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	×		
9	Special certification conditions U,X or B have been complied with	all	X		1
10	Cables/spare cores are terminated satisfactorily	all	X		
11	No obstructions adjacent to flameproof flanged joint	d	X	Х	
12	Ducts, pipes and enclosures are in good condition	р	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	р	X		
16	Pre-energising purge period is adequate	р	X		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		



18	Cables are installed and screens are earthed in accordance with the documentatio0n	í	х	_
19	The circuit is isolated from earth or earthed at one point only	í	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	×	

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	\$
2	No undue accumulation of dust or dirt	all	Х	$\overline{\mathcal{N}}$
3	Electrical insulation is clean and dry	all	Х	

#### Faults found? (circle as appropriate)

No:		
List action required		
Contractor (write): Inspector Supervisor	Client (write): Inspector	
Date: 3/9/11	Date:	

Device ID or tag

Act	ion	required to ma	ake device	compliant:							
	-	Equipme	A +	cable	J.O.	10	enino	d.			
		Provide	blue	cable	sheath	t	Is.	labelling	+0	J/P-J8	

Reviewed by: N. CREEN Date: 8/9/11 Priority:

Comments:			
*			
	_		
All action items now completed:			
Job closed:			
Device now fully compliant, spreadsheet re	gister has been updated	-	
Supervisor (write):			
Date:			

#### Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SITZLER other Ex devices Based on AS/NZS 60079 part 17

Ref: 1:/data/sitzlen/company operations/darwin/landers/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 GAS CONDITIONING				
Device ID or tag: - (J B)	Asset: TCV-O2B (11P JBOX)			
Circuit ID:	Physical location: PINE CREEK			
Area classification :	Environment: (hot?)			

### Data from Label

Apparatus type: (light, JB, Motor) <u>SUNCTION</u> <u>ROXES</u>	Type of protection: (d,e, i, n, p etc)
Manufacturer: GOVAN	Gas group: (IIA/B/C)
Full model number: FW 4W	Temp class: (T1-T6)
Serial number:	Certificate number: AUSEX, 157
IP Class 65	Test authority: (BAS, PTB, SAA etc)
<u> </u>	SAA etc)

Number of cables: 1

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	2		
Model:	· · · ·		v 1 .
Gland type of protection: (d,e)	<b>`</b>	-	· · · · ·
Increation	as a bar	Para di Star	Circle on the body
Inspection			Circle as checked

#### Inspection -

map				is cherked	
	They are the second sec	A THE LARD -	A. 185 .		
		Applicable to	· · • •	+	
	A Equipment	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	Х	0	.ccr
3	Enclosure, sealing gaskets or compounds are satisfactory	all	Х	8	-2Q
4	There are no damage or evidence of unauthorised modifications	all	X	(X)	1
5	Bolts, cable entries and blanking elements are correct and tight	all	X	K	1
6	Flange facings are clean and undamaged	d	X		1
7	Lamp rating, type and position correct	alí	X		1
8	Electrical connections are tight	all	X		1
9	Hermetically sealed devices are undamaged	Π	X		1
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Х	Selection and	
11	Motor fans have sufficient clearance	motors only	X	a	
12	Installation clearly labelled	i	X	8	J. 0
13	Safety barriers/isolators installed as per certification and securely earthed where	î	х	$\otimes$	
	required				
14	Entity calculation/documentation is available	i	Х	X	

#### B Installation

	Binstallation				_
	Type of cable is appropriate, cables are undamaged	all	X		-VV
	Sealing of ducts and/or conduits is satisfactory	all	Х	Ø	- COT RESTIN
	Stopper boxes or barrier glands are properly filled	d	X –		- COT RESTIN
	Integrity of conduit system and interface with mixed system is maintained	ail	Х		1 to the tempt to the
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	alì	х	Ø	]
	Fault loop impedance is satisfactory	power outlets	Х		1
	Insulation resistance is satisfactory (check only during initial inspection)	all	Х		1
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х		]
	Special certification conditions U,X or B have been complied with	all	X	1	1
	Cables/spare cores are terminated satisfactorily	all	Х		]
	No obstructions adjacent to flameproof flanged joint	d	Х	X	1
2	Ducts, pipes and enclosures are in good condition	р	X	X	1
	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	1
ŀ	Protective gas flow/pressure is adequate	р	X		1
5	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X	1	1
õ	Pre-energising purge period is adequate	р	Х		1
7	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	Х		1



18	Cables are installed and screens are earthed in accordance with the	i	X	
	documentatio0n			
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	i	V	
	the documentation		X	
	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all ,	X	$\otimes$
2	No undue accumulation of dust or dirt	all	X	$\otimes$
3	Electrical insulation is clean and dry	all	X	

No:				
Yes	List action required		<u></u>	
Contra	actor (write): Inspector N. GREEN	Supervisor	Client (write): Inspector	
Date:	2/9/11		Date:	

Device ID or tag	
Action required to make device compliant:	_
- Equipment + cable I.O. reymined.	
- provide blue cable sheath + I.S. labelling to I/P-IS.	
- Rerroute + support cable resting on process pipe.	

Reviewed by:	N. LREGN	
Date: 8/9/11 Priority:		

N 81 -			
1. 1. 1. 1. The second s			
an tain an an tain an			
All action	items now completed:		
Job close	d:		

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



CLF - EQ

BLUG

Ref. 1:\data\sitzle/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

Genera	al

Device ID or tag: PT-018	Asset: GAS CONDITIONS SKID
Circuit ID:	Physical location: PUSE CREEK
Area classification :	Environment: (hot?)
	ILIEC. RIE

Data from Label	(Luchisce
Apparatus type: (light, JB, Motor) PLOISUNE TRANSMITTER	Type of protection: (d,e, i, n, p
Manufacturer: NOSE MOSME	Gas group: (IIA/B/C)
Full model number: JOSICGSA22A1AB417M5	Temp class: (T1-T6) (TS (40°c))
Serial number: 0957563	Certificate number: (A US Gx (249X)
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1	gland 2 pwg	others DOAPTOL	
Gland manufacturer:	7.	NIL	1	_
Model:	7		. 2	_
Gland type of protection: (d,e)			2	_

Insp	ection	>	Circle a	is checked
	A Equipment	Applicable to	↓ Internet	↓ Fitterst
	A Equipment	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	$\mathbf{x}$
4	There are no damage or evidence of unauthorised modifications	alí	X	
5	Bolts, cable entries and blanking elements are correct and tight	all	X	$\otimes$
6	Flange facings are clean and undamaged	d	X	
7	Lamp rating, type and position correct	all	X	
8	Electrical connections are tight	all	Х	
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	$\bigotimes$
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	Two of coble is appropriate, cobles are undergood		V	

1	Type of cable is appropriate, cables are undamaged	all	X	\$	- 01
2	Sealing of ducts and/or conduits is satisfactory	all	X	0	
3	Stopper boxes or barrier glands are properly filled	d	X		1
4	Integrity of conduit system and interface with mixed system is maintained	all	X		7
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	R	
6	Fault loop impedance is satisfactory	power outlets	X		1
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		1
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	X		<b> </b> .
9	Special certification conditions U,X or B have been complied with	all	X		1
10	Cables/spare cores are terminated satisfactorily	all	X		1
11	No obstructions adjacent to flameproof flanged joint	d	X	X	1
12	Ducts, pipes and enclosures are in good condition	p	- x	X	1
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	1
14	Protective gas flow/pressure is adequate	p	X		1
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X		1
16	Pre-energising purge period is adequate	p	X		1
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		1



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	Ì	х	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	
2	No undue accumulation of dust or dirt	all	X	8
3	Electrical insulation is clean and dry	all	X	

#### Faults found? (circle as appropriate)

No: Tes: List action required Contractor (write): Inspector Supervisor N.G.REEN Date: State Date:

Device ID or tag

Action r	equired to make device compliant: Equipment + calle label required			
-	Equipment + curie is of the	. 14	11	
-	Cuble sheath damaged (ov), remediate sheath.	with	ome	
-	Ropduce existing Ex label (iney.ble).			

Reviewed by: N. GREEN Date: 2/9/11 Priority:

Comments:		
		[
		[
	_	
All action items now completed:		
Job closed:		
Device now fully compliant, spreadsheet regis	ster has been updated	
Supervisor (write):	-	
Date:		



Circle as checked

Based on AS/NZS 60079 part 17

Ref: 1:\data\sitzlencompany 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: - (TT-013)	Asset: WAS CONDITIONING SKID
Circuit ID:	Physical location: PIPE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, TEMP TX, Motor)	Type of protection: (d,e, i, n, p (Ca)	<u>_</u>
Manufacturer: LOSEMOWNT	Gas group: (IIA/B/C)	
Full model number: 444 RIZUIAI 57	Temp class: (T1-T6) (TC 46°C)	LILLEGIBLE
Serial number: AL(2446	Certificate number:	
IP Class	Test authority: (BAS, PTB, SAA etc)	J

For each cable entry	gland 1	gtand 2	others ADAPTOR
Gland manufacturer:	CMA	LUPSAL	CLUPSAL
Model:	-		FILSS NPTI
Gland type of protection: (d,e)			Cxd

#### Inspection -

	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	1.110
2	Equipment ID or circuit ID is correct	all	X	8	-CCT
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	0	- 20
4	There are no damage or evidence of unauthorised modifications	all	X	8	1
5	Bolts, cable entries and blanking elements are correct and tight	all	X	*	1
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	X		1
8	Electrical connections are tight	all	X		1
9	Hermetically sealed devices are undamaged	n	X		1
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		1
11	Motor fans have sufficient clearance	motors only	X		1
12	Installation clearly labelled	i	Х	\$	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	1

#### B Installation

	Dinstandion			-
1	Type of cable is appropriate, cables are undamaged	all	X	E I
	Sealing of ducts and/or conduits is satisfactory	ali	Х	8
	Stopper boxes or barrier glands are properly filled	d	Х	
	Integrity of conduit system and interface with mixed system is maintained	all	Х	
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	8
	Fault loop impedance is satisfactory	power outlets	Х	
	Insulation resistance is satisfactory (check only during initial inspection)	all	Х	
	Automatic electrical protective devices are set correctly and operate within permitted limits	alí	х	
	Special certification conditions U,X or B have been complied with	all	Х	
	Cables/spare cores are terminated satisfactorily	all	Х	
	No obstructions adjacent to flameproof flanged joint	d	X	X
	Ducts, pipes and enclosures are in good condition	р	X	X
	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
	Protective gas flow/pressure is adequate	p	X	
	Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х	
	Pre-energising purge period is adequate	p	Х	
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	Х	



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	. í	Х	
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	j	х	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	8
2	No undue accumulation of dust or dirt	all	Х	3
3	Electrical insulation is clean and dry	all	X	

No:				
Yes	List action required			_
Contra	actor (write): Inspector	Supervisor	Client (write): Inspector	
Date:	8/9/11	_	Date:	

Device ID or tag

Action	required to ma	ke device	compliant:				
-	Equipmen	A +	cable.	J.D. required. Sheat frenediate UV	damaged	cable	
-	Plou.de	que	0	anco y	Jee		

Reviewed by:	N.GREEN
Date: 8/9	In
Priority:	

Comments:			
All action items now completed:			
Job closed:			
Device	we winted a base based	- 4	
Device now fully compliant, spreadsheet	register has been upd	ated	
Supervisor (write):			
Date:			

#### Based on AS/NZS 60079 part 17

Ref: I:\data\sizter/company operations\darwin\tenders\sbsj11\vj1 - 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: - (2.50/256-03B)	Asset: GAS CONDITIONING SKID SOV-DIB
Circuit ID:	Physical location: PIDE CREEK
Area classification :	Environment: (hot?)

### Data from Label

Apparatus type: (light, JB, Motor) VALVE LIMIT SWITCH	Type of protection: (d,e, i, n, p etc)
Manufacturer: BETTIS	Gas group: (IIA/B/C)
Full model number: 3 R - 021 AFC	Temp class: (T1-T6)
Serial number:	Certificate number: SAA? Ex, 95 ?
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1			gland 2	puch	others APAPTOR
Gland manufacturer:	CMA	1		3		CLOPSAL
Model:	PWPM	No mar 1	10.0		1. 1. 1.	F1275
Gland type of protection: (d,e)		12		2		

#### Inspection —

Insp	ection		Circle a	s checked	1
	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	8	- 54
4	There are no damage or evidence of unauthorised modifications	all	X	R	
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	Q	
6	Flange facings are clean and undamaged	d	X		1
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	×		
11	Motor fans have sufficient clearance	motors only	X	•	
12	Installation clearly labelled	i	X	Х	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	х	
14	Entity calculation/documentation is available	i	X	X	

**B** Installation

-UV NTED

SITZLER

	Binstallation			
1	Type of cable is appropriate, cables are undamaged	all	X	R
	Sealing of ducts and/or conduits is satisfactory	all	Х	R
	Stopper boxes or barrier glands are properly filled	d	Х	
	Integrity of conduit system and interface with mixed system is maintained	all	Х	
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	$\otimes$
	Fault loop impedance is satisfactory	power outlets	Х	
	Insulation resistance is satisfactory (check only during initial inspection)	all	Х	
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х	
	Special certification conditions U,X or B have been complied with	all	X	
	Cables/spare cores are terminated satisfactorily	all	Х	
	No obstructions adjacent to flameproof flanged joint	d	Х	$\sim$
	Ducts, pipes and enclosures are in good condition	ρ	X	X
	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
	Protective gas flow/pressure is adequate	р	X	
	Pressure and/or flow indicators, alarms and interlocks function correctly	р	×	
	Pre-energising purge period is adequate	p	×	
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	X	

Amadeus Pipeline Electrical Inspections



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	Х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	ì	~	
	the documentation		~	
	C Environment			

A Manuary to a standard from a standard from a standard to a standard the standard to all V	
Apparatus adequately protected from corrosion, weather, vibration, other all X	X
2. No undue accumulation of dust or dirt all X	K
3 Electrical insulation is clean and dry all X	

No: Kes: List action required

		1	
Contractor (write): Inspector	Supervisor	Client (write): Inspector	
N.GREEN			
1 P. TREED			
Date: \$ 9/11		Date:	
Date. 01111		Date,	

Device ID or tag

- Equipment + colle I.D. required - Varity equipment + colle J.D. required AUS Ex compliance for flame proof in Stallordian. - UV damaged cabling requiring remediation. Action required to make device compliant:

Reviewed by: N. LREEN Date: 3/9/4 Priority:

Comments:			
<b>;</b>			
All action items now completed:			
Job closed:	<u> </u>		

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



Based on AS/NZS 60079 part 17

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#### Specifications

Device ID or tag: - (SV0/SVC - 03.8)       Asset: GAU Constructions(2), Existing Subversions         Circuit ID:       - (SV0/SVC - 03.8)       Physical location:       Environment: (har)         Vexa dassilication:       Environment: (har)       Interview (har)       Interview (har)         Avad cassilication:       Environment: (har)       Interview (har)       Interview (har)         Avad cassilication:       Environment: (har)       Interview (har)       Interview (har)         Avad cassilication:       Sole_Cobe,O       Value/E       Interview (har)       Interview (har)         Avad cassilication:       Sole_Cobe,O       Value/E       Interview (har)       Interview (har)         Ful model number:       Sole_Cobe,O       Value/E       Interview (har)       Interview (har)         Ful model number:       Correl cass (11-18)       Sole_Cobe,O       Interview (har)       Interview (har)         Iver Class       Interview (last, III)       Interview (last, IIII)       Interview (last, IIII)<	Gen	eral			_		
Circuit D:	Dev	ice ID or tag: $-(SVO/SVC - OBB)$	Asset: GAS CON	DITIONONOL SK	ID ZDV-	028	
Litter device and the set of the se	Circ		Physical location:	PINE CREE	K		
Data from Label       - ©ASGO 0.5 (FEV):0.1 Art 51 (December 1)         Apparatus type: (Inh, UB, Harding Apparatus type: (Inh, UB, UR, UR, UR, UR, UR, UR, UR, UR, UR, UR	Area	a classification :	Environment: (hot?)				
Apparatus type: (light. JB., model number:       Type of protection: (d,e, i, n, p. (ex, e, s.)         Manufacturer:       (HoR_10.5)       Gas group: (IIA/BIC)       (i, c.)         Full model number:       Temp class: (TI-T6)       Serial number:       Certificate number:       Apps: 1, 9, 9         IP Class       (6.5)       Test authority: (BAS, PTB, SAA etc)       Image: 1, 9, 9       Image: 1, 9, 9         IP Class       (6.5)       Test authority: (BAS, PTB, SAA etc)       Image: 1, 1, 1, 1       Image: 1, 1, 1       <			ATTES / SOLE	LODIOL			
Manufacturer:       (HDR00)       (ILC)         Full model number:       Temp class: (TI-T6)         Serial number:       Certificate number:       ABS 5 1 48         IP Class       (65)       Test authority: (BAS, PTB, SAA etc)         Number of cables:       2         For each cable entry       gland 1       gland 2         Gland manufacturer:       4         Model:       7         Inspection       Circle as checked         A Equipment (Ind group and temp class) is appropriate for area classification       all       X         2       Equipment (ID or crutil ID is correct)       all       X       Circle as checked         3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       Circle as checked         4       There are no damage or evidence of unauthorised modifications       all       X       Circle as checked         5       Enclosure, sealing gaskets or compounds are satisfactory       all       X       Circle as checked         1       Lamp rating, type and position correct       all       X       Circle as checked         4       There are no damage or evidence of unauthorised modifications       all       X       Circle         5       Bolis, cable size are condamaged	App	aratus type: (light, JB,		d,e, i, n, p (Ex e	(2)		]
Serial number:       Certificate number:       ABS 5x 198         IP Class       (55)       Test authority: (BAS, PTB, SAA etc)         Number of cables:       2         Control cable entry       gland 1       gland 2         Others       Circle as chepked         Modei:       2         Cland manufacturer:       3         Applicable to       protection type:         Inspection       Circle as chepked         Applicable to       protection type:         There are no damage or evidence of unauthorised modifications       all       X         Bolts entries and banking elements are correct.       all       X       Circle         Peringe finding the mathing element are correct.       all       X       Circle         Participa and the mathing element are correct.       all       X       Circle         Participa and the mathing element are correct.       all       X       Circle         Participa and the mathing element are correct.       all       X       Circle       -correct.         Participa and the mathing element are correct.       all       X       Circle       -correct.         Participa and the mathing element are correct.       all       X       Circle       -correct. <t< td=""><td>Man</td><td>ufacturer: (HERION)</td><td>Gas group: (IIA/B/C</td><td></td><td></td><td></td><td>]</td></t<>	Man	ufacturer: (HERION)	Gas group: (IIA/B/C				]
IP Class       Ist authority: (BAS, PTB, SAA etc)         Number of cables:       2         For each cable entry       cland 1         Gland manufacturer:       1         Model:       2         Inspection       Circle as chepked         A Equipment       Applicable to protection (d,e)       2         Inspection       Circle as chepked         A Equipment (incl group and temp class) is appropriate for area classification       all       X         1       Equipment (D oricruit ID is correct.       all       X         2       Equipment (D oricruit ID is correct.       all       X       -circle.         3       Botts, cable entries and banking elements are correct and tight       all       X       -circle.         4       There are no damage or evidence of unauthorised modifications       all       X       -circle.         6       Flange facings are clean and undamaged       dl       X       -circle.         7       Motor fans have sufficient clearance       motosonity       X       -circle.         1       Installation clearity labelled       i       X       X       -circle.         1       Installation clearity labelled.       all       X       X       -circle.	Ful≹	Full model number: Temp class: (T1-T6)			]		
In Unions       SAA etc)         Number of cables:       2         For each cable entry       gland 1       gland 2       others         Gland manufacturer:       1	Seria	al number:	Certificate number:	ADS Ex 1	98		
For each cable entry       gland 1       gland 2       others         Giand type of protection: (d,e)       2	IP C	lass (65)		, PTB,			
Gland manufacturer:       1         Model:       1         Gland type of protection: (d, e)       2         Inspection       Circle as chepked         A Equipment       Applicable to protection type:       Internal       External         1       Equipment (ind group and temp class) is appropriate for area classification       all       X       X         2       Equipment ID or circuit ID is correct       all       X       X       -cccr         3       Enclosure, sealing gaskets or comoounds are satisfactory.       all       X       X       -cccr         4       There are no damage or evidence of unsubrised modifications       all       X       X       -cccr         5       Bolts, cable entries and blanking elements are correct and tight       all       X       X       -cccr         6       Flange facings are clean and undranaged       all       X       X       -cccr       -cccr         1       Lamp rating, type and position correct       all       X       X       -cccr       -ccccr       -cccr       -ccccccr	Nurr	ber of cables: 2	]				
Model:       1       1         Gland type of protection: (d, e)       2         Inspection       Applicable to protection type: Internal       Circle as checked         1       Equipment (D or circuit ID is correct.       all       X         2       Equipment (D or circuit ID is correct.       all       X         3       Enclosure, sealing gaskets or compounds are salisfactory       all       X         4       There are no damage or evidence of unauthorised modifications       all       X       Correct:         5       Bolts, cable entries and blanking elements are correct and tight       all       X       Correct:       -cce.         1       Lamp rating, type and position correct       all       X       Correct:       -pawn         10       Restricted breating enclosure is satisfactory to enclosure and/or covers       n       X       X         11       Installation clearly labelied       i       X       X       X         12       Installation distance/corrections are tight       all       X       X         13       Safety Damieers/loolation is available       i       X       X         14       Entity calculation/documentation is available       all       X       X         15			gland 2	others	<u>.</u>		_
Gland type of protection: (d,e)       q         Inspection       Circle as checked         A Equipment       Applicable to protection type: Internal External Equipment [incl group and temp class] is appropriate for area classification       all       X         1       Equipment [incl group and temp class] is appropriate for area classification       all       X       -CCF         2       Equipment [incl group and temp class] is appropriate for area classification       all       X       -CCF         3       Enclosure, sealing gastets or compounds are satisfactory       all       X       -CCF         4       There are no damage or evidence of unauthorised modifications       all       X       -cce.         6       Flange facings are clean and undamaged       d       X       -pawn         6       Flange facings are clean and undamaged       all       X       -pawn         7       Lamp rating, type and position correct       all       X       -pawn         8       Electrical connections are tight       all       X       X       -         1       Installation clean's labelled       i       X       X       -       -       -       -       -       -       -       -       -       -       -       -       -       -<							
Inspection       Applicable to protection type:       Internal       External         1       Equipment (incl group and temp class) is appropriate for area classification       all       X       X         2       Equipment Do arcicuit D is correct       all       X       X       -ccc         3       Endosure, sealing gaskets or compounds are satisfactory       all       X       X       -ccc         4       There are no damage or evidence of unauthorised modifications       all       X       X       -ccc         8       Bols, cable entries and bianking elements are correct and light       all       X       X       -ccc       -pairon         6       Flange facings are clean and undamaged       d       X       -pairon       -pairon         10       Restricted breathing enclosure is satisfactory to enclosure and/or covers       n       X       -       -pairon         11       Motor frams have sufficient clearance       in       X       -       -pairon         12       Installation clearly labelled       i       - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
A Equipment       Applicable to protection type:       Internal       External         1       Equipment (In cl group and temp class) is appropriate for area classification       all       X       X         3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       X	0.00						]
A Equipment       protection type:       Internal       External         2       Equipment (Ind group and temp class) is appropriate for area classification       all       X       X         3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       X       -::::::::::::::::::::::::::::::::::::	Inspe	ection		>	Circle a	s checked	
A Equipment       protection type:       Internal       External         2       Equipment (Ind group and temp class) is appropriate for area classification       all       X       X         3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       X       -::::::::::::::::::::::::::::::::::::							
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       Correct         4       There are no damage or evidence of unauthorised modifications       all       X       Correct       -ccc         4       There are no damage or evidence of unauthorised modifications       all       X       Correct       -ccc         6       Flange facings are clean and undamaged       d       X       Correct       all       X       Correct       -pawn         6       Flange facings are clean and undamaged       d       X       Correct       all       X       Correct       -pawn         7       Lamp rating, type and position correct       all       X		A Equipment			↓ Interne)	<b>↓</b>	
2       Equipment ID or circuit ID is correct       all       X       CCC         3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       CCC         4       There are no damage or evidence of unauthorised modifications       all       X       CCC         5       Boits, cable entries and blanking elements are correct and tight       all       X       CCC         6       Flange facings are clean and undamaged       d       X       CCC         7       Lamp rating, type and position correct       all       X       CCC         8       Electrical connections are tight       all       X       CCC         9       Hermetically sealed devices are undamaged       n       X       X         10       Restricted breathing enclosure is satisfactory to enclosure and/or covers       n       X       X         11       Installation clearly labelled       i       X       X       X         12       Installation       i       X       X       X         13       Safety barriers/isolators installed as per certification and securely earthed where i       i       X       X         14       Entity calculation/documentation is available       i       X       X       X	1		a classification	T			
3       Enclosure, sealing gaskets or compounds are satisfactory       all       X       X       -cxe.         4       There are no damage or evidence of unauthorised modifications       all       X       X       -cxe.         8       Boits, cable entries and blanking elements are correct and tight       all       X       X       -cxe.         6       Flange facings are clean and undamaged       d       X       X       -cxe.       -cxe.         7       Lamp rating, type and position correct       all       X       X       -cxe.       -cxe.         8       Electrical connections are tight       all       X       -cxe.       -cxe.       -cxe.         9       Hermetically sealed devices are undamaged       n       X       -cxe.       -cxe.       -cxe.         11       Motor fans have sufficient clearance       motors only       X       -cxe.						<b>x</b>	-CCT
4       There are no damage or evidence of unauthorised modifications       all       X       X         5       Bolts, cable entries and blanking elements are correct and light       all       X       X         6       Flange facings are clean and undamaged       d       X       X         7       Lamp rating, type and position correct       all       X       X         8       Electrical connections are tight       all       X       X         9       Hermetically sealed devices are undamaged       n       X       X         10       Restricted breathing enclosure is satisfactory to enclosure and/or covers       n       X       X         11       Motor fans have sufficient clearance       motors only       X       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         15       Safety barriers/isolators installed as per certification and securely earthed where required       all       X       X         14       Entitig and bonding connections are tight in good condition and of sufficient all       <							- 130.
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 bariners/isolators installed as per certification and securely earthed where required       i       X       X         14       Entity calculation/documentation is available       i       X       X         14       Entity calculation/documentation is available       i       X       X         15       Bealing of ducts and/or conduits is satisfactory       all       X       X         2       Stopper toxes or barine glands are properly filed       d       X       X         3       Stopper toxes or barine glands factory       power outlets       X       X <t< td=""><td>4</td><td>There are no damage or evidence of unauthorised modificati</td><td>ons</td><td>all</td><td></td><td></td><td></td></t<>	4	There are no damage or evidence of unauthorised modificati	ons	all			
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         14       Entity calculation/documentation is available       i       X       X         14       Entity calculation/documentation is available       all       X       X         15       Sealing of ducts and/or conduits is satisfactory       all       X       X         2       Sealing of ducts and/or conduits system and interface with mixed system is maintained       all       X       X         2       Sealing of ducts and/or conduits system and interface with mixed system is maintained       all       X       X         3       Stopper boxes or bar	5			all	Х	$\overline{\otimes}$	
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       i       X       X         14       Entity calculation/documentation is available       i       X       X         14       Entity calculation/documentation is available       i       X       X         14       Entity calculation/documentation is available       iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	6	Flange facings are clean and undamaged		d	Х		
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         15       Binstallation       i       X       X         16       Type of cable is appropriate, cables are undamaged       all       X       X         17       Type of cable is appropriate, cables are undamaged       all       X       X         2       Sealing of ducts and/or conduits is satisfactory       all       X       X         2       Stepper boxes or barrier glands are properly filled       d <td>7</td> <td>Lamp rating, type and position correct</td> <td></td> <td>all</td> <td>Х</td> <td></td> <td></td>	7	Lamp rating, type and position correct		all	Х		
10       Restricted breathing enclosure is satisfactory to enclosure and/or covers       n       X         11       Motor fans have sufficient clearance       motors only       X         11       Installation clearly labelled       i       X       X         13       Safety barriers/isolators installed as per certification and securely earthed where       i       X       X         14       Entity calculation/documentation is available       i       X       X         15       Binstallation       i       X       X         16       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       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       X         5       Fault loop impedance is satisfa				all	Х		
Motor fans have sufficient clearance       motors only       X         Installation clearly labelled       i       X       X         Safety barriers/isolators installed as per certification and securely earthed where required       i       X       X         Installation       i       X       X         Binstallation       i       X       X         Sealing of ducts and/or conduits is satisfactory       all       X       X         Stopper boxes or barrier glands are properly filled       d       X       X         Integrity of conduit system and interface with mixed system is maintained       all       X       X         Earthing and bonding connections are tight, in good condition and of sufficient cross section       all       X       X         Automatic electrical protective devices are set correctly and operate within       all       X       X         Special certification conditions U,X or B have been complied with       all       X       X         Special certification conditions u,X or B have been complied with       all       X       X         Protective gas is substantially free from contaminants (water, oil, dirt)       p       X       X         Protective gas flow/pressure is adequate       p       X       X         Preseure and/or flow indicators, alarms	9			n	X		
12       Installation clearly labelled       i       X       X         13       Safety barriers/isolators installed as per certification and securely earthed where       i       X       X         14       Entity calculation/documentation is available       i       X       X         15       Sealing of ducts and/or conduits is satisfactory       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       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       X         6       Fault loop impedance is satisfactory       power outlets       X       X         1			nd/or covers	n			
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         15       Earthing and bonding connections are properly filled       d       X       X         2       Sealing of ducts and/or conduits system and interface with mixed system is maintained       all       X       X         2       Earthing and bonding connections are tight, in good condition and of sufficient       all       X       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       X         5       Earthing and bonding connections are tight, in good condition and of sufficient       all       X       X         6       Fault loop imped				motors only			
required       X       X         Entity calculation/documentation is available       i       X       X         B Installation       i       X       X         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       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       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       X         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       X         8       Automatic electrical protective devices are set correctly and operate within all       X       X       X         9       Special certification conditions U.X or B have been complied with       all       X       X         11       No obstructions adjacent to flameproof flanged joint       d       X       X         12       Ducts, pip				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         2       Sealing of ducts and/or conduits is satisfactory       all       X       X         2       Stopper boxes or barrier glands are properly filled       d       X       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       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 (check only during initial inspection)       all       X       X         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       X         8       Automatic electrical protective devices are set correctly and operate within all       X       X       Y         9       Special certification conditions U,X or B have been complied with       all       X       X         10       Cables/spare cores are terminated satisfactorily       all       X       X         11       No obstructions adjacent to flameproof flanged joint       d       X <td></td> <td>required</td> <td>urely earthed where</td> <td>i</td> <td></td> <td></td> <td></td>		required	urely earthed where	i			
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       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       X         5       Earthing and bonding connections are light, in good condition and of sufficient cross section       all       X       X         6       Fault loop impedance is satisfactory (check only during initial inspection)       all       X       X         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       X         9       Special certification conditions U,X or B have been complied with       all       X       X         10       Cables/spare cores are terminated satisfactorily       all       X       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 flow/pressure is adequate       p       X       X         14       Protective gas flow/p	14	Entity calculation/documentation is available		i	X	X	
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       X         4       Integrity of conduit system and interface with mixed system is maintained       all       X       X         5       Earthing and bonding connections are light, in good condition and of sufficient cross section       all       X       X         6       Fault loop impedance is satisfactory (check only during initial inspection)       all       X       X         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       X         9       Special certification conditions U,X or B have been complied with       all       X       X         10       Cables/spare cores are terminated satisfactorily       all       X       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 flow/pressure is adequate       p       X       X         14       Protective gas flow/p		<b>B</b> Installation					
1       Type of date: a phytophilate; date differentinged       all       A       A         2       Sealing of ducts and/or conduits is satisfactory       all       X       A         3       Stopper boxes or barrier glands are properly filled       d       X       A         4       Integrity of conduit system and interface with mixed system is maintained       all       X       A         5       Earthing and bonding connections are tight, in good condition and of sufficient cross section       all       X       P         6       Fault loop impedance is satisfactory       power outlets       X       Insulation resistance is satisfactory (check only during initial inspection)       all       X       P         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       Insulation resistance is satisfactory (check only during initial inspection)       all       X       P         9       Special certification conditions U,X or B have been complied with       all       X       Insulation conditions U,X or B have been complied with       all       X       Insulation contains and jacent to flameproof flanged joint       d       X       X         10       Cables/spare cores are terminated satisfactorily       all       X       X       Insulation contecits are in good condition       p	1		_	وال			Pm 7
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       P         16       Pre-energising purge period is adequate       p       X       P							
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       X         10       Cables/spare cores are terminated satisfactorily       all       X       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       X         16       Pre-energising purge period is adequate       p       X       X         17       Condition of spark/particle barriers of ducts exhausting the gas into hazardous	- 1						
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       X         7       Insulation resistance is satisfactory (check only during initial inspection)       all       X       X         8       Automatic electrical protective devices are set correctly and operate within permitted limits       all       X       X         9       Special certification conditions U,X or B have been complied with       all       X       X         10       Cables/spare cores are terminated satisfactorily       all       X       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       Pressure and/or flow indicators, alarms and interlocks function correctly       p       X       X         16       Pre-energising purge period is adequate       p       X       X         17       Condition of spark/particle barriers of ducts exhausting the gas into hazardous       p       X			s maintained				1
Cross section       power outlets       X         6       Fault loop impedance is satisfactory (check only during initial inspection)       all       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       X         15       Pressure and/or flow indicators, alarms and interlocks function correctly       p       X       X         16       Pre-energising purge period is adequate       p       X       X         17       Condition of spark/particle barriers of ducts exhausting the gas into hazardous       p       y		Earthing and bonding connections are tight, in good condition				100	
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       X         15       Presure 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       p       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       X         15       Presure and/or flow indicators, alarms and interlocks function correctly       p       X       X         16       Pre-energising purge period is adequate       p       X       X         17       Condition of spark/particle barriers of ducts exhausting the gas into hazardous       p       y       y							
permitted limitsX9Special certification conditions U,X or B have been complied withallX10Cables/spare cores are terminated satisfactorilyallX11No obstructions adjacent to flameproof flanged jointdXX12Ducts, pipes and enclosures are in good conditionpXX13Protective gas is substantially free from contaminants (water, oil, dirt)pXX14Protective gas flow/pressure is adequatepXX15Pre-energising purge period is adequatepX116Pre-energising purge period is adequatepX117Condition of spark/particle barriers of ducts exhausting the gas into hazardouspyy					<u> </u>		
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       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       p       y		permitted limits	•		х		
11No obstructions adjacent to flameproof flanged jointdXX12Ducts, pipes and enclosures are in good conditionpXX13Protective gas is substantially free from contaminants (water, oil, dirt)pXX14Protective gas flow/pressure is adequatepXX15Pressure and/or flow indicators, alarms and interlocks function correctlypXX16Pre-energising purge period is adequatepXI17Condition of spark/particle barriers of ducts exhausting the gas into hazardouspyy			with		Х		
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       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       p       y							
13       Protective gas is substantially free from contaminants (water, oil, dirt)       p       X       X         14       Protective gas flow/pressure is adequate       p       X       X         15       Pressure and/or flow indicators, alarms and interlocks function correctly       p       X       X         16       Pre-energising purge period is adequate       p       X       X         17       Condition of spark/particle barriers of ducts exhausting the gas into hazardous       p       X				d	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     p     X							
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       p       X			oil, dirt)			X	
16     Pre-energising purge period is adequate     p     X       17     Condition of spark/particle barriers of ducts exhausting the gas into hazardous     p     X	,	Protective gas flow/pressure is adequate					
17 Condition of spark/particle barriers of ducts exhausting the gas into hazardous p	,		in correctly			<u> </u>	
	,				×		
	17		as into nazardous	р	X		



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
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	Х	B
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

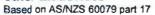
List action required		
Contractor (write): Inspector Supervisor	Client (write): Inspector	
Date: 3/9/11	Date:	

Device ID or tag

Action required to make devic		1	
- Equipment	+ cct J.D regni pointed hew.ly exported 2001, du	hence Megille.	Suggelt

Reviewed by: N.GREEN Date: ela(in Priority:

		_	_	
Comments:				
All action items now completed:				
Job closed:				
Device now fully compliant, spreadshee	t register has be	en updated		
Supervisor (write):				
Date:				
Date:				



Ref: I\/data\sitzlencompany operations\/darwin\/lenders\/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: ~ (LS 14 ~ 01)	Asset: GAS CONDITIONING SKID FL-1
Circuit ID: GC15	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Motor) LOW LEVEL SWITCH	Type of protection: (d,e, i, n, p etc)	?
Manufacturer: MAGNATROL	Gas group: (IIA/B/C)	j
Full model number: D 75-13 20-BNW	Temp class: (T1-T6)	1
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 Auguan Tx /
Gland manufacturer:	4 -		-
Model:	-	· · · ·	<ul> <li>A state of the sta</li></ul>
Gland type of protection: (d,e)			
a Vager Store			Sardi

Inspection -

	A Equipment	Applicable to protection type:		External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	Х	X	00.0
2	Equipment ID or circuit ID is correct	all	X	8	- PANTEDI
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	8	- PALATEDI
4	There are no damage or evidence of unauthorised modifications	all	Х	8	
5	Bolts, cable entries and blanking elements are correct and tight	alf	Х	8	J
6	Flange facings are clean and undamaged	d	Х		
7	Lamp rating, type and position correct	all	Х		
8	Electrical connections are tight	all	Х		
9	Hermetically sealed devices are undamaged	n 🖄 🖓	×X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Х,		
11	Motor fans have sufficient clearance	motors only	Х		
12	Installation clearly labelled	i	Х	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	Х	X	
14	Entity calculation/documentation is available	i	Х	Х	

B Installation

	Type of cable is appropriate, cables are undamaged	all	X	8	PAINA P
	Sealing of ducts and/or conduits is satisfactory	al	X	X	1
	Stopper boxes or barrier glands are properly filled	d	Х		7
	Integrity of conduit system and interface with mixed system is maintained	all	Х		1
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	8	
	Fault loop impedance is satisfactory	power outlets	Х		1
	Insulation resistance is satisfactory (check only during initial inspection)	all	Х		
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	Х		]
	Special certification conditions U,X or B have been complied with	all	Х	1.1.1	]
	Cables/spare cores are terminated satisfactorily	all	X		
	No obstructions adjacent to flameproof flanged joint	d	X	$\otimes$	
	Ducts, pipes and enclosures are in good condition	p	Х	X	
	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	
	Protective gas flow/pressure is adequate	p	Х		
	Pressure and/or flow indicators, alarms and interlocks function correctly	р	Х		
i	Pre-energising purge period is adequate	р	X		]
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	р	х		

Amadeus Pipeline Electrical Inspections

SITZLER

→ Circle as checked



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18	Cables are installed and screens are earthed in accordance with the	1	X	
	documentatio0n			
19	The circuit is isolated from earth or earthed at one point only	i	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	х	
	the documentation		^	
	C Environment			

_	C Environment			
1 [	Apparatus adequately protected from corrosion, weather, vibration, other	ali	Х	
2 [	No undue accumulation of dust or dirt	all	X	$\otimes$
3 [	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:		
Tes?	List action required	
	•	•
Contra	ctor (write): Inspector	Client (write): Inspector
Date:	slali	Date:

1 1				minted p	otentially	compromos	ing method
-		protectio AUS.		ation d	Acil ava	iable to e	valuate.
	P:(	AUS.	(0/	witten a	aron ara	indie 40 e	ounder (

Reviewed by: Date: 8 9 10	N. GREEN
Priority:	

Γ	Comments:			
1				
'n,				
	alle -			
	All action items now completed:	-		
	Job closed:	H		
L	Job closed:		 	

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



Based on AS/NZS 60079 part 17

Ref: 1:\data\sizter\company operations\darwin\lenders\sbsj11\/yf1 - 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 (D or tag:	PS -02	AB (PS-	OIA)	Asset: WEN A	
Circuit ID:	H37A		/	Physical location: PINE	CREEK
Area classification :				Environment: (hot?)	

#### Data from Label

Apparatus type: (light, JB, Motor) PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc) Ex O
Manufacturer: UNITED ELECTRIC	Gas group: (IIA/B/C)
Full model number: J 120 - 702	Temp class: (T1-T6)
Serial number:	Certificate number: AUS Ex 542-2
IP Class 66	Test authority: (BAS, PTB, SAA etc)
Number of cables:	

For	each cable entr	у	gland 1	glan	d 2	others	- ADAR	TOR	
Glan	d manufacturer:		CMA				CUIPIA		٦
Mod	el:	2000	& FWPM	6/5 (	) · · ·	She is	FILTS		1
Glan	d type of protection	n: (d,e)	•				1 1		1
Inspe	ection		and in a pas	the strong	all o	1613		s checked	- 1
	A Equipment	N	to shell we		S	able to tion type:	Internal	External	
1	Equipment (incl g	roup and temp	class) is appropriate for	or area classification	100	all	X	X	
2	Equipment ID or o	circuit ID is corr	rect	14.1	17	all	X	Ø	6
3	Enclosure, sealing	g gaskets or co	mpounds are satisfacto	ory		all	Х	8	1

4	There are no damage or evidence of unauthorised modifications	ail	Х	8
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	ð
6	Flange facings are clean and undamaged	d	Х	
7	Lamp rating, type and position correct	all	Х	
8	Electrical connections are tight	all	Х	
9	Hermetically sealed devices are undamaged	n 🦏	Х	
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers		Х	
11	Motor fans have sufficient clearance	motors only	X.	
12	Installation clearly labelled	i	Х	Х
13	Safety barriers/isolators installed as per certification and securely earthed where	i	X	×
	required		^	^
14	Entity calculation/documentation is available	i	X	X

B Installation

Binstallation				
Type of cable is appropriate, cables are undamaged	all	X	0	] (
Sealing of ducts and/or conduits is satisfactory	all	X	8	1
Stopper boxes or barrier glands are properly filled	d	X	and the second second	1
Integrity of conduit system and interface with mixed system is maintained	all	X		1
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	$\otimes$	
Fault loop impedance is satisfactory	power outlets	X		1
Insulation resistance is satisfactory (check only during initial inspection)	all	X		1
Automatic electrical protective devices are set correctly and operate within permitted limits	alì	х		
Special certification conditions U,X or 8 have been complied with	all	X		1
Cables/spare cores are terminated satisfactorily	all	X		1
No obstructions adjacent to flameproof flanged joint	d	X	$\otimes$	1
Ducts, pipes and enclosures are in good condition	p	X	X	1
Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	Х	1
Protective gas flow/pressure is adequate	ρ	Х		1
Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		1
Pre-energising purge period is adequate	ρ	X		1
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	р	х		



		1		
18	Cables are installed and screens are earthed in accordance with the documentatio0n	ì	x	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	Í	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	v	
	the documentation		^	
	C Environment	•		

	C Evaluation			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	8
2	No undue accumulation of dust or dirt	, all , .	• . X	Ø
3	Electrical insulation is clean and dry	ali	Х	

No:

Yes?

List action required

Contractor (write): Inspector Supervisor	Client (write): Inspector
N.GREEN	
Date: % 9/ 4	Date:

Device ID or tag
------------------

Action required to make device compliant: Equipment enscribed incorrectly. Provide equipment
Equipment enscribed incorrectly. Provide equipment
J.D (PSOIA) and remove existing scribe (PSOLA).
UV damaged calle sheath required remediation
Verify compound fixed barian type gland is
i-Stalled to calling.

Reviewed by: No -CREZN Date: S(9) L( Priority:

Comments:		
All pation items new completed		
All action items now completed:		
Job closed:		
000 0100001		

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



Based on AS/NZS 60079 part 17

Ref: (:\data\sitzler\company operations\darwin\tenders\sbsj11\fy/1 - 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

General	
Device ID or tag: - PS - 01 A	Asset: NBU IA
Circuit ID: USOA	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Motor) PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc)
Manufacturer: UNTTED SLECTRIC	Gas group: (IIA/B/C)
Full model number: J 120 - 702	Temp class: (T1-T6)
Serial number:	Certificate number: AUS Ex 54-2 - 1
IP Class 66	Test authority: (BAS, PTB, SAA etc)

Number of cables: 1.

For each cabl	e entry	gland 1	gland 2	others APAPP
Gland manufactu	irer:	(MA		CHIPSAL
Model:		FWPM	· · · ·	DESCRIPTION D
Gland type of pro	otection: (d,e)	·		
Inanation	11211-4			Ox 49220
Inspection —	Martin		1	Circle as checked

	more a la serie a del	Applicable to		Ļ	
	A Equipment	protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	Contra
2	Equipment ID or circuit ID is correct	all	Х	$\otimes$	- GQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	Х	(X)	
4	There are no damage or evidence of unauthorised modifications	all	Х	8	
5	Bolts, cable entries and blanking elements are correct and tight	all	Х	Ø	
6	Flange facings are clean and undamaged	d	X		
7	Lamp rating, type and position correct	all	Х		
8	Electrical connections are tight	all	Х		
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	Х	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	i.	×	×	
14	Entity calculation/documentation is available	i	Х	X	]

**B** Installation

1	Type of cable is appropriate, cables are undamaged	all	Х	Ø
2	Sealing of ducts and/or conduits is satisfactory	all	X	Ø
3	Stopper boxes or barrier glands are properly filled	ď	Х	
4	Integrity of conduit system and interface with mixed system is maintained	all	Х	
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	$\bigotimes$
6	Fault loop impedance is satisfactory	power outlets	Х	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	Х	
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х	
9	Special certification conditions U.X or B have been complied with	all	Х	
10	Cables/spare cores are terminated satisfactorily	all	Х	
11	No obstructions adjacent to flameproof flanged joint	d	Х	X
12	Ducts, pipes and enclosures are in good condition	р	X	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	р	Х	X
14	Protective gas flow/pressure is adequate	p	X	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	Х	
16	Pre-energising purge period is adequate	p	Х	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х	

Amadeus Pipeline Electrical Inspections

UV



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	Í	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	ì	x	
	C Environment		_	

- 1 [	Apparetus adaguately protocted from corregion whether vibration other		V	(V)
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	<u> </u>	×
2	No undue accumulation of dust or dirt	all	• X	$\bigotimes$
3 [	Electrical insulation is clean and dry	all	X	

No:

Yes> List action required

Contractor (write): Inspector	Supervisor	Client (write): Inspector
N. GREEN		
11 10.91-001		
Date: 2/9/1		Date:

00110010	V
Action red	guired to make device compliant:
-	Equipment TO required.
-	OV damayed cable shealth requires venediation.
-	Veiling compound Garrier type gland is installed
	to cabling.

Reviewed by: N. GAZER Date: 8/9/11 Priority:

Comments:		
All action items now completed:		
Job closed:		

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:

Based on AS/NZS 60079 part 17

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#### Specifications

#### General

General	1	
Device ID or tag: 🜌	(SV-V4A/SV-V5A)_	Asset: WEN . IA - Pilot GAS VALVES.
Circuit ID: #34A	(H35A (H36A/435A)	Physical location: PINE QL.
Area classification :		Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Sousno, o VALVES	Type of protection: (d,e, i, n, p
Manufacturer: HERION	Gas group: (IIA/B/C) ? (IIC)
Full model number: 970806	Temp class: (T1-T6)
Serial number: 852506/838998	Certificate number: AUSELIGS OLP 118
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables: 2

For each cable entry	gland 1	gland 2	others poror
Gland manufacturer:	CMA		-
Model:	FUPM		-
Gland type of protection: (d,e)			

Inspection -

		Applicable to	+		
	Equipment	protection type:	Internal	External	_
Ec	quipment (incl group and temp class) is appropriate for area classification	all	X	X	
Ec	quipment ID or circuit ID is correct	all	X	8	EQ.
	nclosure, sealing gaskets or compounds are satisfactory	all	X	8	30 500,
T۲	here are no damage or evidence of unauthorised modifications	all	Х	*	install of
Bc	olts, cable entries and blanking elements are correct and tight	all	Х	R	install of
	lange facings are clean and undamaged	d	X		
La	amp rating, type and position correct	all	Х		
El	lectrical connections are tight	all	X		
He	ermetically sealed devices are undamaged	ก	X		
Re	estricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		
M	lotor fans have sufficient clearance	motors only	X		
Inf	stallation clearly labelled	i	X	X	
	afety barriers/isolators installed as per certification and securely earthed where equired	i	X	×	
Ēε	ntity calculation/documentation is available	i	X	X	1

в	Insta	Ilatior	٦
Tu	in a of	appla	ic

1	Type of cable is appropriate, cables are undamaged	all	Х	$\bigotimes$	UV
2	Sealing of ducts and/or conduits is satisfactory	all	Х	×	1.00
3	Stopper boxes or barrier glands are properly filled	d	X	<u> </u>	1
4	Integrity of conduit system and interface with mixed system is maintained	all	Х		
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	8	
6	Fault loop impedance is satisfactory	power outlets	Х		1
7	Insulation resistance is satisfactory (check only during initial inspection)	all	Х		7
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х		]
9	Special certification conditions U,X or B have been complied with	all	Х	-	1
10	Cables/spare cores are terminated satisfactorily	all	Х		7
11	No obstructions adjacent to flameproof flanged joint	d	Х	Х	7
12	Ducts, pipes and enclosures are in good condition	р	X	Х	
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	Х	
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	р	Х		
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		

SITZLER

Circle as checked



i	х	
ì	Х	
i	X	
i	х	
	i i	i X

	C Environment				TOP
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	$\otimes$	GLMO
2	No undue accumulation of dust or dirt	all	X	$\otimes$	enny.
3	Electrical insulation is clean and dry	all	X		

List action required	
Contractor (write): Inspector Supervisor	Client (write): Inspector
Date: 8/9/4	Date:

Device ID or tag

Date:

No:

Action required to make device compliant:	
- Equipment labors required poto	
- Cable I.O seem incoured, review as per PRID.	
- Top entry cable gland installation not recommanded. suggest to rotate 180° vertically for bottom entry.	
.1	

Reviewed by: D. GREEN Date: 8 9 4

Comments:				
All action items now completed:				
Job closed:				
				_
Device now fully compliant, spreadsheet	register has be	on undated	 	
Supervises (write)	register nas be	en upuareu		
Supervisor (write):				



Based on AS/NZS 60079 part 17

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#### Specifications

General					
Device ID or tag:	TP	-03 A 18	Asset:	HEATER	IA
Circuít ID:		144	Physical location:	PINE	CREEK
Area classification	:		Environment: (hot	?) OUTDOOR	-

#### Data from Label

~			_				
	tor)	URE CONVERTER	Type of protection: ( etc)	d,e, i, n, p	SI Div +	۔ ،ٌنز	BARRIEL ?
Ma	nufacturer: MA.S	ONETLAN ,	Gas group: (IIA/B/C	) ঈহ্রেট	IC		Yese BMS Parel.
Full	I model number: 🗴 🖉	05 A 1	Temp class: (T1-T6	) —	rs –		parec.
Ser		61-211	Certificate number:	NOT SAA	APPA	OVED	Ex 94
IP (	Class		Test authority: (BAS SAA etc)	, PTB, FM		•	]
	the station of		1				-
Nur	mber of cables:		NDAPTO	bou			
	r each cable entry	ADAPTOR gland 1	-gland 2	othe	TS CLANP	70 780	×.
Gla	nd manufacturer:	RRASS / CS-RUSTED	GOV		CMA		-
	nd type of protection: (d.e)	312/435 7 23 - 20 5125	Grad HR T	5 7465	ewen		-
Oia	ind type of protection. (u,e)						]
Insp	ection		ANJ BAIS	1	, Circle a	s checked	4
шэр			C128		Circle a	S CHERKEL	1
-	No	•	S. 1.	Applicable to	· 1	1	
	A Equipment		1.25N	protection type:	Internal	External	
1	Equipment (incl group an	nd temp class) is appropriate for area	a classification	· all .	,Х	Х	
2	Equipment ID or circuit IC	D is correct		all	X		EQ.
3		ets or compounds are satisfactory	1.5	i all ·	• <u>X</u>	8	
4	There are no damage or	evidence of unauthorised modificati	ions	all	X	8	
5	Bolts, cable entries and b	planking elements are correct and tig	ght	all	X	N.	
6	Flange facings are clean			d	X –		1
7	Lamp rating, type and po			ali	X		
8	Electrical connections are			all	X		
9	Hermetically sealed devi			n	• ·X		
10		losure is satisfactory to enclosure ar	nd/or covers	n	X		
11	Motor fans have sufficien			motors only	X		R11.63
12	Installation clearly labelle			i	X	8	-13606.
13	1 -	installed as per certification and sec	urely earthed where	i i	X	*	- BLUE? - ULARANACI
14	required Entity calculation/docume	ntation is available			X	X	- LARELS etc.
14						_X	I
	B Installation						
1		ate, cables are undamaged		all	X		OV
2	Sealing of ducts and/or c			all	X	8	
3	Stopper boxes or barrier			d	X	/	1
4	Integrity of conduit syster	m and interface with mixed system is	s maintained	all	X		1
5	Earthing and bonding cor	nnections are tight, in good condition	n and of sufficient	all	x	8	1
	cross section				^	0	] .
6	Fault foop impedance is a			power outlets	X		
7		atisfactory (check only during initial i		all	X		· ·
8	Automatic electrical prote permitted limits	ective devices are set correctly and o	operate within	all	X		
9		itions U,X or B have been complied	with	all	X		
10	Cables/spare cores are to			all	X		-
11		to flameproof flanged joint		d	X	<u>X</u>	1
12	Ducts, pipes and enclosu			p	X	X	4
13		tially free from contaminants (water,	, oii, dirt)	р	X	X	4
14	Protective gas flow/press			p	X		1
15 16	Pre-energising purge per	cators, alarms and interlocks functio	correctly	p	X		4
10		e barriers of ducts exhausting the ga	as into bazardovo	p			1
	area are satisfactory	c carriers of oucla childranity life ya		р	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	Х	
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	8
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	Х	

No:

Yes! List action required

Contractor (write): Inspector Supervisor Client (write): Inspector					
N. GREEN	3				
- Isla		- ·			
Date: 2 (9/1)		Date:			
Date: Site					

Device ID or tag
Action required to make device compliant:
- Equipment label required
- J.S. circuit installation
- Required blue cable sleath, labelling, sequegation from
- I.S. Elitante instanting Reath, labelling, sequegation from Requires the cable steath, labelling, sequegation from non-I.S., panel labelled I.S. where barrier installed
with ~ H1A-CP-001.
- UV damaged cable requies remodiation

Reviewed I	oy:		N.	creep
Date: 8	9	11		
Priority:	14			

• •

,

Comments:					
. K					
Job closed:					
All action items now completed: Job closed:					

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



Based on AS/NZS 60079 part 17

Ref: 1:\data\sitzlencompany operations\darwin\lenders\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

	oonora				
Device ID or tag: SV 9 A		SV 9 A	Asset: W.B. HEATGR 1A		
	Circuit ID:	H 46 🍕	Physical location: PINECREEK		
	Area classification :		Environment: (hot?) OUT DOOR		

#### Data from Label

Apparatus type: (light, JB, Sac Noi) Motor)	Type of protection: (d,e, i, n, p etc)
Manufacturer: ASC O	Gas group: (11A/B/C) ( / / ( A & B
Full model number: FA 8003 €	Temp class: (T1-T6)
Serial number: FAB5320A18)	Certificate number:
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:

For each cable entry	gland 1 (36)	gland 2	others J?
Gland manufacturer:	LMA	CLIPSAL	GOUAN
Model:	FWPM		FW 4W
Gland type of protection: (d,e)	Ered	EYD	EXC ADSEX 157
			ILB TO IPG5
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	$\otimes$	- 60
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	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	R	
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	×	×	
14	Entity calculation/documentation is available	i	Х	Х	]

#### **B** Installation

1	Type of cable is appropriate, cables are undamaged	all	Х	
2	Sealing of ducts and/or conduits is satisfactory	ali	X	
	Stopper boxes or barrier glands are properly filled	d	Х	
	Integrity of conduit system and interface with mixed system is maintained	all	X	
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	8
	Fault loop impedance is satisfactory	power outlets	Х	
	Insulation resistance is satisfactory (check only during initial inspection)	all	Х	
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х	
	Special certification conditions U,X or B have been complied with	all	Х	
)	Cables/spare cores are terminated satisfactorily	all	Х	
	No obstructions adjacent to flameproof flanged joint	d	X	X
2	Ducts, pipes and enclosures are in good condition	р	X	Х
3	Protective gas is substantially free from contaminants (water, oil, dirt)	p	Х	Х
1	Protective gas flow/pressure is adequate	p	X	
5	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
5	Pre-energising purge period is adequate	p	Х	
7	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	q	X	



18	Cables are installed and screens are earthed in accordance with the documentatio0n	ì	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	х	

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	$\bigotimes$
2	No undue accumulation of dust or dirt	all	Х	X
3	Electrical insulation is clean and dry	ali	Х	

## Faults found? (circle as appropriate)

Fes:	List action required		
Contra	ctor (write): Inspector Supervisor	Client (write): Inspector	
Date:	2/9/11	Date:	

Device ID or tag

No:

- 1

Action I	required to make device compliant:
-	Equipment label required
-	Cable sheath required remediation due to UV damage.
	N:1 AUS. Ex certification dotail available. Suggest veplacement due to age and condition. Cable ID to be verified with cable schedule.
-	Cable ID to be varilied with came schutz.

Reviewed by: Date:	N.	GREEN	
Date: 🥰 🔍	L		
Priority:			

Comments:			
All action items now completed:			
Job closed:	П		
	<u> </u>		
Device now fully compliant, spreadsheet	register has been	updated	
Supervisor (write):			
Date:			



Based on AS/NZS 60079 part 17

Ref: I:\data\sitzler\company operations\darwin\tenders\sbsj11\tyl1 - haz area inspections\hazardous area inspection forms\hazardous area device inspecton sheet for ex-d.ex-e.ex-i,ex-n.ex-p and other ex devices.doc

#### Specifications

Gen	eral							_
Dev	vice ID or tag: $(SV)$	10A) SV8A ?	Asset: W. 8, HE		$_{IA}$			
Circuit ID: F-1 45			Physical location:		-	2EEK		
Are	a classification :		Environment: (hot?)	OL	TDO	DR		
Data	a from Label							
Арр	aratus type: (light, JB,	OLENOID	Type of protection: (	d,e, i, n, p				7
Mot	or)			<u></u>				-
			Gas group: (IIA/B/C	,				-
	model number:	-	Temp class: (T1-T6)					-
Ser	ial number:		Certificate number:	DTD				
IP C	Class		Test authority: (BAS SAA etc)	, РТВ, _				
Nun	nber of cables:	)					_	-
	each cable entry	gland 1 (IB)	gland 2 C し PSAL		others	835		-
Gla Mod	nd manufacturer:	FW PM	CLIPSAL			OVAN 4V		-
	nd type of protection: (d,e)	EFD	EKD			> AUSES	6 157	-
						B TS In		
Inen	ection					Circlon	s checked	
шэр						Circle a	s checked	1
				Applicable (	-			
	A Equipment			protection t		Internal	External	
1		temp class) is appropriate for an	ea classification	all	ype.	X	X	1
2	Equipment ID or circuit ID		ca classification	all		X	Ô	GQ
3		s or compounds are satisfactory		all		X	- <del>\overlapha</del> -	
4	There are no damage or a	evidence of unauthorised modifica	tions	all		X	- 20-	
5		anking elements are correct and		all		X		
6	Flange facings are clean a			d d		X		
7	Lamp rating, type and pos			all		X		
8	Electrical connections are			all		X		
9	Hermetically sealed devic			n n		X		
10		osure is satisfactory to enclosure a	and/or covers			X	<u> </u>	
11	Motor fans have sufficient			motors	vlnc	X		
12	Installation clearly labelled			i	Jing	X	X	
13		stalled as per certification and se	curely earthed where					
	required					X	X	
14	Entity calculation/docume	ntation is available		i		Х	X	
	B Installation							
1	Type of cable is appropria	te, cables are undamaged		all		Х	8	100
2	Sealing of ducts and/or co			all		X	Ø	
3	Stopper boxes or barrier g			d		X		1
4		and interface with mixed system	is maintained	all		X	1	1
5		nections are tight, in good condition		all				1
	cross section					Х	N N	
6	Fault loop impedance is satisfactory power outlets X							1
7	Insulation resistance is satisfactory (check only during initial inspection) all X						1	
8	Automatic electrical protective devices are set correctly and operate within all						1	
	permitted limits							
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					Х	X	
12	Ducts, pipes and enclosures are in good condition					Х	X	
13	Protective gas is substantially free from contaminants (water, oil, dirt) p					Х	X	
14	Protective gas flow/pressu	Р		Х				
15	15 Pressure and/or flow indicators, alarms and interlocks function correctly p X							
16	Pre-energising purge perio			р		X		
17		barriers of ducts exhausting the	gas into hazardous	р		X		
	area are satisfactory							



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
40	The signification of the second sec		X	
19	The circuit is isolated from earth or earthed at one point only	1	X	
20	Separation is maintained with non-IS circuits	j	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	X	
	the documentation		X	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(X)
2	No undue accumulation of dust or dirt	all	Х	X
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

No:

Yes

List action required

Contractor (write): Inspector	Supervisor	Client (write): Inspector	
N.GREE.	0		
Date: 3/9/14		Date:	
Date.		Date:	

Device ID or tag

Action n	equired to make dev	ice complia	nt:			
-	Egmpment	label	sequired			
					uv damage	
-	N:1 AUS seplacemen	Ex cer t day	e to a	detail ge and	condition.	

Reviewed by: D. GREEN Date: 8/9/N Priority:

Comments:		
All action items now completed:		
Job closed:		
JOB CIUSEU.		 
Device now fully compliant, spreadsheet re	egister has been updated	
Supervisor (write):		
Date:		



Circle as checked

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Based on AS/NZS 60079 part 17

Ref: 1/data/sitzler/company operations/darwin/tenders/sbsj11/tyf1 - 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

Device ID or tag: N/A	Asset: WBH 1A
Circuit ID:	Physical location: PINE GREEK.
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, CABLES Motor)	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: 2		

For each cable entry	gland 1	gland 2	others
Gland manufacturer:			
Model:			
Gland type of protection: (d,e)			

#### Inspection -

		Applicable to	Ļ	Ļ
	A Equipment	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	Х
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	X
4	There are no damage or evidence of unauthorised modifications	all	X	Х
5	Bolts, cable entries and blanking elements are correct and tight	all	X	Х
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	х
14	Entity calculation/documentation is available	i	X	X

B Installation
----------------

Type of cable is appropriate, cables are undamaged	all			Exposed
		<u> </u>	<u> </u>	- not ten
Sealing of ducts and/or conduits is satisfactory	all	Х	X	
Stopper boxes or barrier glands are properly filled	d	Х		
Integrity of conduit system and interface with mixed system is maintained	all	Х		7
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	Х	х	]
Fault loop impedance is satisfactory	power outlets	Х		1
Insulation resistance is satisfactory (check only during initial inspection)	all	Х		1
Automatic electrical protective devices are set correctly and operate within permitted limits	all	х		1
Special certification conditions U,X or B have been complied with	all	Х		1
Cables/spare cores are terminated satisfactorily	all	Х		1
No obstructions adjacent to flameproof flanged joint	d	X	X	1
Ducts, pipes and enclosures are in good condition	p	X	X	1
Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	1
Protective gas flow/pressure is adequate	p	X		1
Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х		1
Pre-energising purge period is adequate	p	Х		1
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		1



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	Х	
19	The circuit is isolated from earth or earthed at one point only	j	X	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	

	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:

List action required	
Contractor (write): Inspector Supervisor	Client (write): Inspector
Date: 8/9/n	Date:

Device ID or tag
------------------

Action re	equired to make device compliant:	
1	Unterminated cabling (x2 dekoron) exists within cable tray above fuel gus likes. Termitate/earth cables within suitably rated endosure or remove completely.	

Reviewed by: D. CREEN Date: 8 11 Priority:

Comments:		
All action items now completed:		
Job closed:		
Device now fully compliant, spreadsheet r	register has been updated	
Supervisor (write):		
Date:		
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

Ref: 1:\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,exi,ex-n,ex-p and other ex devices.doc

#### Specifications

General	OIB			
Device ID or tag:~	PS- CARAB	Asset:	WBN IG	
Circuit ID:		Physical location:	PINE	EREEK
Area classification :		Environment: (hot	?)	

#### Data from Label

Apparatus type: (light, JB, Motor) PRESSURE SWITCH	Type of protection: (d,e, i, n, p etc) Ex of
Manufacturer: UNITED ELECTRIC	Gas group: (IIA/B/C)
Full model number: J 120 - 702	Temp class: (T1-T6)
Serial number:	Certificate number: AUS. Ex 542-2
IP Class 66	Test authority: (BAS, PTB, SAA etc)
	7

Number of cables:

For	each cable entry	gland 1	gland 2	-othe	S ADAPT	60	
Glar	nd manufacturer:	CMA			CORI	n 2	
Moc	el:	FWPM	- 15	No. 2	Les mart		
Glar	nd type of protection: (d,e)				d .		
		and the second second		AU AU	Ex 124	50	
Insp	ection ———	elliptically dant were as			Circle a	s checked	d
-	. •	14 14					
				Applicable to	<b>↓</b>	. ↓	
	A Equipment			protection type:	Internal	External	_
1	Equipment (incl group and	temp class) is appropriate for area	classification /	alì	X	· X	
2 Equipment ID or circuit ID is correct		alí	X	B	-EQ		
3			all	X	X	- 00	
4	There are no damage or evidence of unauthorised modifications		all	<u> </u>	X		
5	Bolts, cable entries and blanking elements are correct and tight		all	X	X		
3	Flange facings are clean and undamaged		d	X			
7	Lamp rating, type and position correct			all	X		
3	Electrical connections are tight			all	X		
3	Hermetically sealed devices are undamaged			n ·	X		
10				n	X	1	
11	Motor fans have sufficient clearance			motors only	X		2
12	Installation clearly labelled			ì	<u> </u>	X	
13	Safety barriers/isolators in required	istalled as per certification and secu	rely earthed where	i i	x	x	

14 Entity calculation/documentation is available

**B** Installation

_ D Installation				_
Type of cable is appropriate, cables are undamaged	all	X	8	
Sealing of ducts and/or conduits is satisfactory	all	X	X	
Stopper boxes or barrier glands are properly filled	d	X		
Integrity of conduit system and interface with mixed system is maintained	all	X		7
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	x	X	
Fault loop impedance is satisfactory	power outlets	X		
Insulation resistance is satisfactory (check only during initial inspection)	all	X		
Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		
Special certification conditions U,X or B have been complied with	all	X		
Cables/spare cores are terminated satisfactorily	all	X		
No obstructions adjacent to flameproof flanged joint	d	X	X	
Ducts, pipes and enclosures are in good condition	p	X	X	1
Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	
Protective gas flow/pressure is adequate	p	X		1
Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		1
Pre-energising purge period is adequate	p	X		1
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		

Х

X



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	х	
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	ť	×	
	C Environment	. '		
1	Apparatus adequately protected from corrosion, weather, vibration, other	aíl	X	8
2	No undue accumulation of dust or dirt	ali	X	N
3	Electrical insulation is clean and dry	all	X	

No:		
Yes: List action required		
Contractor (write): Inspector S	Supervisor	Client (write): Inspector
Date: 8/9/11		Date:

Device ID or tag

Action required to make device compliant: - Equipment + coble ID required.	
- UV daninged cuble requires remediation.	
- Verify compound filled barier type gland is installed to cabling.	t

Reviewed by: N. GREEN Date: 8/9/11 Priority:

Comments:		
All action items now completed: Job closed:		

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



Based on AS/NZS 60079 part 17

Ref: I:\/data\sitzlencompany operations\/darwin\/lenders\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**

00.101.01
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General	
Device ID or tag:~ (PS - OB AB)	Asset: WBH - IB
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

Apparatus type: (light, JB, Motor) PRESSURE SUITCH	Type of protection: (d,e, i, n, p
Manufacturer: UNITED ELECTRIC	Gas group: (IIA/B/C)
Full model number: J 120 - 782	Temp class: (T1-T6) 76
Serial number:	Certificate number: Au J 6x542-1x
IP Class	Test authority: (BAS, PTB, SAA etc)
	NA DI

Number of cables: 

For each cable entry	gland 1	gland 2	others COMPANDL
Gland manufacturer:	CMA		CLOPIAL
Model:	FWPM	· · · · · · · · · · · · · · · · · · ·	1 21235
Gland type of protection: (d,e)			
Inspection	$\mathbf{r} = \mathbf{v}^{-1} + \cdots + \mathbf{v}_{-1} + \cdots$	while shouth	Circle as checked

## Inspection \_\_\_\_\_

Insp	ection	the start of	Circle a	s checked	f
	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	r X	
2	Equipment ID or circuit ID is correct	all	X	(X)	
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	K)	- 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	Х	×	
6	Flange facings are clean and undamaged	d	Х		
7	Lamp rating, type and position correct	all	Х		
8	Electrical connections are tight	all	X		
9	Hermetically sealed devices are undamaged	n <sup>.</sup>	· · X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	1.5.2	
11	Motor fans have sufficient clearance	motors only	Х.	100	
12	Installation clearly labelled	í	Х	X	
13	Safety barriers/isolators installed as per certification and securely earthed where required	í	х	х	
14	Entity calculation/documentation is available	i	Х	Х	

**B** Installation

Difistaliation			
Type of cable is appropriate, cables are undamaged	alf	X	
Sealing of ducts and/or conduits is satisfactory	all	X	$\sim$
Stopper boxes or barrier glands are properly filled	d	X	
Integrity of conduit system and interface with mixed system is maintained	all	X	
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	
Fault loop impedance is satisfactory	power outlets	X	
Insulation resistance is satisfactory (check only during initial inspection)	all	X	
Automatic electrical protective devices are set correctly and operate within permitted limits	all	x	
Special certification conditions U,X or B have been complied with	all	X	
Cables/spare cores are terminated satisfactorily	all	X	
No obstructions adjacent to flameproof flanged joint	d	X	X
Ducts, pipes and enclosures are in good condition	р	X –	X
Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X
Protective gas flow/pressure is adequate	p	Х	
Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
Pre-energising purge period is adequate	p	X	
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х	



18	Cables are installed and screens are earthed in accordance with the documentatio0n	j	Х	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	×	
		1	1	

	C LITHIGHTIGHT			
1	Apparatus adequately protected from corrosion, weather, vibration, other	, ali	Х	(A)
2	No undue accumulation of dust or dirt	all	×	Ø
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

No:			
Yes	List action required		
	4		
Contra	nctor (write): Inspector Supervisor N. GREEN	Client (write): Inspector	
Date:	8/9/11	Date:	

Device ID or tag

Action re	equired to make device con	•				
-	Equipment +	coble :	T.D. ley	mod .	3	
-	UV damaged	cuble sh	eath n	equies	remediation,	
-	Verity compon- instaked to	I barrier	filled	type	gland is	

Reviewed by: N, CAEEN Date: 8/9/11 Priority:

Comments:		
_		
•		
All action items now completed:		
Job closed:		

Device now fully compliant, spreadsheet register has been updated Supervisor (write): Date:



PIP

Based on AS/NZS 60079 part 17

Ref: I/data/sitzlencompany operations/darwin/lenders/sbsj11/fyf1 - haz area inspections/hazardous area inspection forms/hazardous area device inspection sheet for ex-d, ex-e, exi,ex-n,ex-p and other ex devices.doc

#### Specifications

#### General

Concia	
Device ID or tag: - (SV-V58 / SV-V48)	Asset: WBN 18
Circuit ID: HJSB/H36B	Physical location: PINE UREEK,
Area classification :	Environment: (hot?)

#### Data from Label Apparatus type: (light, JB, Type of protection: (d,e, i, n, p SOLTNOID VALVE Zx m.e Motor) etc) Manufacturer: UKIFER Gas group: (IIA/B/C) 116 TS Full model number: 821003 Temp class: (T1-T6) Serial number: le. 18604 Certificate number: Ex 321-1 8704 AUS Test authority: (BAS, PTB, IP Class SAA etc) Number of cables: l others (262 For each cable entry gland 1 gland 2 CMA Gland manufacturer: ADAPTOR Model: EWPM

spe	ction		Circle a	is checke	
	A Equipment	Applicable to protection type:	Internal	External	
Г	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	1
ŀ	Equipment ID or circuit ID is correct	all	X	X	EO
F	Enclosure, sealing gaskets or compounds are satisfactory	all	X	Ø	JP 6.
F	There are no damage or evidence of unauthorised modifications	all	X	X	
	Bolts, cable entries and blanking elements are correct and tight	all	X	X	ventical p
Γ	Flange facings are clean and undamaged	d	X		in the f
Γ	Lamp rating, type and position correct	all	X		1
Γ	Electrical connections are tight	all	X		1
	Hermetically sealed devices are undamaged	n	X		1
	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		1
Ľ	Motor fans have sufficient clearance	motors only	X		]
	Installation clearly labelled	i	X	X	]
	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	×	]
	Entity calculation/documentation is available	i	X	X	1

**B** Installation

Gland type of protection: (d,e)

1	Type of cable is appropriate, cables are undamaged	all	X	$\otimes$	1 01
2	Sealing of ducts and/or conduits is satisfactory	all	X	X	1
3	Stopper boxes or barrier glands are properly filled	d	X		1
4	Integrity of conduit system and interface with mixed system is maintained	all	X		1
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		1
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		1
8	Automatic electrical protective devices are set correctly and operate within permitted limits	ali	х		1
9	Special certification conditions U,X or B have been complied with	all	X		1
10	Cables/spare cores are terminated satisfactorily	all	X		1
11	No obstructions adjacent to flameproof flanged joint	d	X	X	1
12	Ducts, pipes and enclosures are in good condition	p	X	X	1
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	1
14	Protective gas flow/pressure is adequate	q	X		1
15	Pressure and/or flow indicators, alarms and interlocks function correctly	q	X		1
6	Pre-energising purge period is adequate	p	X		1
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	x		1



18	Cables are installed and screens are earthed in accordance with the documentatio0n	Í	х	
19	The circuit is isolated from earth or earthed at one point only	i	×	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	Х	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	<b>\$</b>
2	No undue accumulation of dust or dirt	all	X	8
3	Electrical insulation is clean and dry	all	X	

Faults found? (circle as appropriate)

No:

**Ces:** List action required

				_
Contract	or (write): Inspector	Supervisor	Client (write): Inspector	
	N.GREE	د	, , .	·
	11			
Date:	8/9/11		Date:	

Device ID or tag

Action required to make device compliant: - Equipment labels required. - Top eatry for cable gland not recommended. suggest 180° rotation. - SV-V4B (cable H36B) has DIP adaptar botween calle gland + solenoid housing. Remove if adaptar is not consistend with cable installation mothod of protection

Reviewed by: N. GREEN Date: 2/9/4 Priority:			
	Reviewed by: Date: 29 u Priority:	N. GREEN	

Comments:		
1		
All action items now completed:		
Job closed:		
Device now fully compliant, spreadsheet re	gister has been updated	
Supervisor (write):		
Date:		



Circle as checked

Based on AS/NZS 60079 part 17

Ref. I:/data/sit/zie/company operations/darwin/tenders/sbsj11/fy/1 - 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

001101	
Device ID or tag: $I/P O3B$	Asset: HEATER IB
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?) OUT DODR

#### Data from Label

Apparatus type: (light, JB, PRESSURE CONVERTER	Type of protection: (d,e, i, n, p etc)
Manufacturer: MASONEILIAN	Gas group: (IIA/B/C)
Full model number: 8005	Temp class: (T1-T6) 75
Serial number: 80061 - 211	Certificate number: Ex 94
IP Class	Test authority: (BAS, PTB, SAA SAA etc)
<i>~</i>	

Number of cables:

	Dapporter 50	
-gland 1 ADA DTO 2	-gland 2-	others GLAND TD TR
NOT LEGIBLE	consper	CMA
BRASS + RUSTYCS.	FWWW	FNPM
	Exd INS TE JOGS	
	ANS GALSS ,	
-	NOT LEGIBLE	BRASS + RUSTY CS. FWHY BRASS + RUSTY CS. FWHY BRASS + RUSTY CS.

#### Inspection -

·	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	8	JE LABEL.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	as	
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	Х	Ø	
6	Flange facings are clean and undamaged	d	X	0	]
7	Lamp rating, type and position correct	all	X		
8	Electrical connections are tight	all	X		]
9	Hermetically sealed devices are undamaged	п	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X		]
11	Motor fans have sufficient clearance	motors only	X		77
12	Installation clearly labelled	i	X	$\otimes$	I.1.
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	8	
14	Entity calculation/documentation is available	i	Х	X	]
	B Installation	·	·		
1	Type of cable is appropriate, cables are undamaged	all	X	$\otimes$	OU
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	all	X		

5	Latting and bolding connections are tight, in good condition and of sumeent	an	X	
	cross section		~	U U
6	Fault loop impedance is satisfactory	power outlets	Х	
7	Insulation resistance is satisfactory (check only during initial inspection)	all	Х	
8	Automatic electrical protective devices are set correctly and operate within	all	х	
	permitted limits		^	
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	Х	X
13	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X –
14	Protective gas flow/pressure is adequate	р	Х	
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X	
16	Pre-energising purge period is adequate	p	X	
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous	p	х	
	area are satisfactory		^	



			~	
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	Х	
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	×	
	C Environment			

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	8
2	No undue accumulation of dust or dirt	all	X	(X)
3	Electrical insulation is clean and dry	all	X	

No:

Yes:	List action required	_		
Contra	actor (write): Inspector	Supervisor	Client (write): Inspector	
Date:	8/9/11	(en	Date:	

Device ID or tag

	ired to make device compliant:
	JB label required.
-	J.S. INSTALLATION REQUIRES FELLOWING.
	· BLUE CABLE SWEATH
	· LABBLING TO JB + MAIN LONTOL MANEL HIS-CP-DOI
	· SCAREGATION + MECHANICAL PROTECTION ROOM MON-J.S. COTS.
-	Remediate UV damaged cuble.

Reviewed by: N.L.Rean Date: Elalin Priority:	
--	--

Comments:				
	_			
All action items now completed:				
Job closed:			-	
Device now fully compliant, spreadsheet r	register has been up	ndated		
Supervisor (write):	egister nas been u	Julieu		
Date:				

Amadeus Pipeline Electrical Inspections

#### 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



CAACKED

APAPTOR.

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: ~ (SV ~ VS # B)	Asset: N.B. HEATER IB
Circuit ID: H46B	Physical location: PINE CREEK
Area classification : 20NE 2	Environment: (hot?) OUT DOOR

## Data from Label

Apparatus type: (light, JB, Motor) SOLENOID	Type of protection: (d,e, i, n, p etc)
Manufacturer: TYCO ASCO	Gas group: (IIA/B/C) 11 2 C D
Full model number: FA 800	33 Temp class: (T1-T6)
Serial number: 56707A	Certificate number: NOT SAA APPROVED
IP Class	Test authority: (BAS, PTB, SAA etc)

Number of cables:			
For each cable entry	gland 1 (->s)	gland 2	others JB
Gland manufacturer:	CMA	CLIPSAL	38 GOVAN
Model:		NEPI Starte	FW4W
Gland type of protection: (d,e)		d	G×d
· · · · · · · · · · · · · · · · · · ·		Section and the second	EX 157 Excl ITR

Inspe	ection	· · · ·				. '		and the second second			IS7 6 Circle	≂cd <u>∏</u> B as checked	T6 I IPES
	A Equi	ipment		Sugar	.~ 10 ∧	led a	<b>.</b>	e stado	Applicable protection	to '	Internal	External	
1	Equipm	nent (incl gr	roup and	temp class) is a	appropriate	for area	classification		all		X.	X	
2	Equipm	nent ID or c	ircuit ID i	s correct					all		X	$\otimes$	EQ
3	Enclos	ure, sealing	g gaskets	or compounds	are satisfa	ctory	•		' all'		· · · X	0	
4	There a	are no dam	age or ev	idence of unau	ithorised mo	odification	ns		all		X	8	CAPCEG DPAPT
5	Bolts, c	cable entrie	s and bla	nking elements	s are correc	t and tigh	nt		all		X	(X)	DAPAPT
6	Flange	facings are	e clean ar	nd undamaged					b		X		
7	Lamp r	ating, type	and posit	ion correct					all		X		1
8	Electric	cal connect	ions are t	ight					all		X		1
9	Hermel	tically seale	ed devices	s are undamag	eď				n.		X		1
10	Restric	ted breathing	ng enclos	ure is satisfact	ory to enclo	sure and	l/or covers		n	-	X		1
11		ans have s							motors	only	Х		1
12	Installa	ition clearly	labelled						i		X	X	1
13	Safety	barriers/iso	lators ins	talled as per ce	ertification a	nd secur	ely earthed v	vhere	i		X	X	1

B Installation

Entity calculation/documentation is available

required

14

	Binstallation				
1	Type of cable is appropriate, cables are undamaged	all	X		UN
2	Sealing of ducts and/or conduits is satisfactory	all	X	8	
	Stopper boxes or barrier glands are properly filled	d	X		
	Integrity of conduit system and interface with mixed system is maintained	all	X		
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	Ø	
	Fault loop impedance is satisfactory	power outlets	X		
í	Insulation resistance is satisfactory (check only during initial inspection)	all	X		
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		
	Special certification conditions U,X or B have been complied with	all	X		
)	Cables/spare cores are terminated satisfactorily	all	X		
	No obstructions adjacent to flameproof flanged joint	d	X	X	
2	Ducts, pipes and enclosures are in good condition	p	X	X	
;	Protective gas is substantially free from contaminants (water, oil, dirt)	p	X	X	
Ļ	Protective gas flow/pressure is adequate	p p	X		
5	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X		
;	Pre-energising purge period is adequate	p	Х		
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		

Ì

Х

Х

Х

Х



	-		
Cables are installed and screens are earthed in accordance with the documentatio0n	i	X	
The circuit is isolated from earth or earthed at one point only	i	Х	
Separation is maintained with non-IS circuits	i i	Х	
As applicable, short circuit protection of the power supply is in accordance with	ì	~	
the documentation			
C Environment	0		
	documentatio0n The circuit is isolated from earth or earthed at one point only Separation is maintained with non-IS circuits As applicable, short circuit protection of the power supply is in accordance with the documentation	documentatio0n       i         The circuit is isolated from earth or earthed at one point only       i         Separation is maintained with non-IS circuits       i         As applicable, short circuit protection of the power supply is in accordance with the documentation       i	Cables are installed and screens are earthed in accordance with the documentatio0n       i       X         The circuit is isolated from earth or earthed at one point only       i       X         Separation is maintained with non-IS circuits       i       X         As applicable, short circuit protection of the power supply is in accordance with the documentation       i       X

1	Apparatus adequately protected from corrosion, weather, vibration, other	🔪 all	Х	3
2	No undue accumulation of dust or dirt	😁 all	Х	$\infty$
3	Electrical insulation is clean and dry	ail	Х	

No:

Yes: List action required

Contracto	or (write): Inspector	Supervisor	Client (write): Inspector
	N.GREE	N	
Date:	8/9/11		Date:

Device ID or tag

Action required to make device compliant: - Equipment label required. - Equipment label required. - UV damaged cable sheath required remediation. - N:1 AUS Excertification detail available. Suggett replacement due to age and undition. - Replace cracked adapter at solenoid.

Reviewed by: D. CREEN Date: 99/10 Priority:

Comments:			
All action items now completed:			
Joh alaaadi	H		
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

Ref: I:\data\siztencompany operations\danvin\tenders\sbsj11\fyf? - 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

.

Gen	eral 🧧	(M.)						
	rice ID or tag: - CV -	-VOB EIR	Asset: W.B. HE	ATGR	IR			]
		45 B	Physical location:	PIN		,	K	1
Are		VEZ TI	Environment: (hot?)	1 1 1 1 1 1 1				-
				00	TDOC			]
Data	a from Label						/	
App Mot	aratus type: (light, JB, _S C	LENOID	Type of protection: ( etc)	d,e, i, n, p F	×C	/	/	
Mar	nufacturer: TY	- Asco.	Gas group: (IIA/B/C)		2	16 1	D	UNKNOWN
Full	model number:	794	Temp class: (T1-T6)	)	/			
Seri	al number:		Certificate number:		SAA	APPA	OVED	
IP C	Class		Test authority: (BAS SAA etc)	, PTB,			22	
Nur	nber of cables:		7	,				
1400								
	each cable entry	gland 1	gland 2	(20)	others			
	nd manufacturer:	CLIPSAL	CMA		6	OUAN		
Mod		NEPI	L'enny	To be as		40	-	4
Glar	nd type of protection: (d,e)	620	Gra			4 D		1
	21-0	NOTE CRAIKED + GRASS V	(3) 247 Kg	3 Bach	116		°65-	
Insp	ection		the second second second second		<b>→</b> `	Circle a	s checked	I
	11 P 11 P	19 STATE AND A LODGE	A sugar	1. S	-			
				Applicable	o	í <b>↓</b> ssí	+	
	A Equipment	market water and the		protection t	ype:	Internal	, External	
1	Equipment (incl group and	temp class) is appropriate for are	a classification	alt	.,	X X	X	
2	Equipment ID or circuit ID			all		Х	65	EQ.
3	Enclosure, sealing gaskets	s or compounds are satisfactory		all	-	× ×	00	APAPTOR
4	There are no damage or e	vidence of unauthorised modificat	ions	all		Х	R	
5	Bolts, cable entries and bla	anking elements are correct and ti	aht	all		X	¥2	
6	Flange facings are clean a			d		X	'	
7	Lamp rating, type and posi			lfe		X		
8	Electrical connections are			all		X	<u> </u>	
9	Hermetically sealed device				<u> </u>	· X		
10		sure is satisfactory to enclosure a	ndlor covers			X		
11	Motor fans have sufficient			motors	ooly	X	· ·	
12	Installation clearly labelled				JIIIY	x	x	
12		stalled as per certification and sec	uraly anothed where	i i		~		
15	required	stalled as per certification and sec	urery earlined where	1		Х	X	
14	Entity calculation/documen	tation is available		i		Х	X	
	B Installation							
1	Type of cable is appropriat	e. cables are undamaged		all		Х	0	UV
2	Sealing of ducts and/or cor			all		X	Ø	
3	Stopper boxes or barrier gl	-		d		X		0
4		and interface with mixed system i	e maintained	all		X		
5		ections are tight, in good conditio		all				
cross section								
6	Fault loop impedance is sa		(	power ou	otlets	X		
7       Insulation resistance is satisfactory (check only during initial inspection)       all       X         8       Automatic electrical protective devices are set correctly and operate within       all       X			6					
permitted limits								
9	Special certification conditi	ons U,X or B have been complied	with	alì		Х		Jrh
10 Cables/spare cores are terminated satisfactorily		all		Х				
11	No obstructions adjacent to			d		Х	Х	
12	Ducts, pipes and enclosure	es are in good condition		р		Х	Х	
13		ally free from contaminants (water	, oil, dirt)	p		X	X	
14	Protective gas flow/pressur			P		X		
15		ators, alarms and interlocks function	on correctly	p		X		
16	Pre-energising purge perio			p		X		
17		barriers of ducts exhausting the g	as into hazardous	p				
	area are satisfactory			P		X		

SITZLER



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	×	
19	The circuit is isolated from earth or earthed at one point only	i	Х	
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	×	
	C Environment			

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	8
2	No undue accumulation of dust or dirt	' alí	Х	
3	Electrical insulation is clean and dry	all	×	

No:	
Ves List action required	
Contractor (write): Inspector Supervi	isor Client (write): Inspector
Date: 8/9/11	Date:

Device ID or tag

Action required to make device compliant: = Equipment label required - Remediate cable sheath due to UV damage. - Nil Aus Ex certification detail available. Suggest replacement due to age and condition. - Replace cracked adaptor at solenoid.

Reviewed by: Date: 3/9/4 Priority:	N. GREEN	

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



Circle as checked

Based on AS/NZS 60079 part 17

Ref. I:\data\sitzlencompany operations\darwin\tenders\sbsj11\fy1 - 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: WRN 18
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

# Data from Label

Apparatus type: (light, JB, Motor)	CABLE S	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:	2	

Number of cables:

For each cable entry	gland 1	gland 2	others
Gland manufacturer:			
Model:			
Gland type of protection: (d,e)			

Inspection -

-					
		Applicable to	¥	¥	
	A Equipment	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	ail	Х	$\otimes$	?
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	Х		
9	Hermetically sealed devices are undamaged	n	X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Х		
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	×	×	
14	Entity calculation/documentation is available	i	X	X	

B Installation

	Type of cable is appropriate, cables are undamaged	all	X	8	Capoo
	Sealing of ducts and/or conduits is satisfactory	all	X	X	cable
	Stopper boxes or barrier glands are properly filled	d	X		1
	Integrity of conduit system and interface with mixed system is maintained	all	X –		
	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	X	х	
	Fault loop impedance is satisfactory	power outlets	X		7
	Insulation resistance is satisfactory (check only during initial inspection)	all	X		7
	Automatic electrical protective devices are set correctly and operate within permitted limits	all	x		]
	Special certification conditions U,X or B have been complied with	all	X _		
)	Cables/spare cores are terminated satisfactorily	all	X		
	No obstructions adjacent to flameproof flanged joint	d	X	X	]
2	Ducts, pipes and enclosures are in good condition	р	X	X	
	Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X	
	Protective gas flow/pressure is adequate	р	X		
	Pressure and/or flow indicators, alarms and interlocks function correctly	р	X		
	Pre-energising purge period is adequate	р	× _		
,	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	×		]



18	Cables are installed and screens are earthed in accordance with the documentatio0n	Ì	х	
19	The circuit is isolated from earth or earthed at one point only	i	x	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	х	

C Environment

	C FUALOUMENC			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	Х
2	No undue accumulation of dust or dirt	all	X	Х
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	
N.GREEN			
Date: 3/9/11		Date:	

required to make dev					
Unterminated					
tray above	fud gad	lines. Te	minate / e	with calle	.5
within suito					

Reviewed by: N. CREEN Date: 2/9/11 Priority:

Comments:	
All action items now completed:	
Job closed:	
Device now fully compliant, spreadsheet register has been	undated
Supervisor (write):	apudicu
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

Ref: I:\data\sitzlencompany operations\danvin\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: - CJB	Asset: METER RUN
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

### Data from Label

Type of protection: (d,e, i, n, p $E \times \partial$
Gas group: (IIA/B/C)
Temp class: (T1-T6) T6
Certificate number: AVS Ex 401
Test authority: (BAS, PTB, SAA etc)

Number of cables: 12 TUGLY B

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	CMA NETA		
Model:	FWPM DEVIPX80	1	a 1
Gland type of protection: (d,e)			1
	a Det hank and the	and his marche	l renaul.
nspection			Circle as checked

-	dos en la regime i destruction de	Applicable to			
	A Equipment	protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all i all	Х	Ύ.Υ	60
2	Equipment ID or circuit ID is correct	all	X –	$\otimes$	- Ea
3	Enclosure, sealing gaskets or compounds are satisfactory	all	Х	Ø	- 447
4	There are no damage or evidence of unauthorised modifications	all	Х	X	]
5	Bolts, cable entries and blanking elements are correct and tight	all	X	$\otimes$	]
6	Flange facings are clean and undamaged	d	Х		]
7	Lamp rating, type and position correct	all	X		1
8	Electrical connections are tight	all	Х		]
9	Hermetically sealed devices are undamaged	n	. , <sup>.</sup> X		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	X	2	1
11	Motor fans have sufficient clearance	motors only	Х		
12	Installation clearly labelled	i	X	X	CT C
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	х	x	1
14	Entity calculation/documentation is available	i	Х	X	

B Installation

.

	nstanation			
T	ype of cable is appropriate, cables are undamaged	all	X	3
S	Sealing of ducts and/or conduits is satisfactory	all	X	6
S	Stopper boxes or barrier glands are properly filled	d	X	
I	ntegrity of conduit system and interface with mixed system is maintained	all	X	
	Earthing and bonding connections are tight, in good condition and of sufficient ross section	all	x	B
F	ault loop impedance is satisfactory	power outlets	X	
1	nsulation resistance is satisfactory (check only during initial inspection)	all	X	
	Automatic electrical protective devices are set correctly and operate within ermitted limits	all	х	
S	pecial certification conditions U,X or B have been complied with	all	Х	
C	Cables/spare cores are terminated satisfactorily	all	X	
N	to obstructions adjacent to flameproof flanged joint	d	Х	$\otimes$
	Ducts, pipes and enclosures are in good condition	p	X	X
F	Protective gas is substantially free from contaminants (water, oil, dirt)	p	Х	X
P	Protective gas flow/pressure is adequate	p	Х	
P	Pressure and/or flow indicators, alarms and interlocks function correctly	p	Х	
P	Pre-energising purge period is adequate	p	Х	
	Condition of spark/particle barriers of ducts exhausting the gas into hazardous rea are satisfactory	ρ	х	

Amadeus Pipeline Electrical Inspections



18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	Х	
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	х	
	C Environment			

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	(M)
2	No undue accumulation of dust or dirt	all	X	8
3	Electrical insulation is clean and dry	all	X	

No:		
Yes	List action required	
Contra	ctor (write): Inspector Supervisor	Client (write): Inspector
Date:	8/9/11	Date:

Device ID or tag

	on required to make device compliant:	
-	Equipment + circuit I.O. required .	
1	UV damaged cabling require remediation.	
-	I.S. circumts connected to IR requires identification	
	via the sheath, labels, segregation etc	

Reviewed by: Date: 2/9/11 Priority: N. GREEN

·		
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 SITZLER other Ex devices Based on AS/NZS 60079 part 17



Ref: I:/data/sitzter/company operations/darwin/tenders/sbsj11/tyf1 - 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- PT- 02	Asset: METER SKID
Circuit ID: Gem SD	Physical location: PINE CREEK
Area classification :	Environment: (hot?) OUTDOOR

### Data from Label

	Apparatus type: (light, JB, Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc) Ex ici
	Manufacturer: ROSEMOUNT	Gas group: (IIA/B/C)
3051	Full model number: 1144-9-1200- 422-17	Temp class: (T1-T6) T5 (40'C) T4 (60'C) READ BLE
	Serial number: 0459808	Certificate number: AUS Ex 122x
	IP Class	Test authority: (BAS, PTB, SAA etc)
		MODEL # 3051 PG SA 22 AIAMS 17 L404
	Number of cables:	WORK and the second of all the results of the fail

For each cable entry	gland 1	gland 2	others
Gland manufacturer:	NA	ADAPTAFLEY	PLUC
Model:	NO MARKING PAWI	a substant of the	1. S
Gland type of protection: (d,e)	,		
		· · ·	(Šie

Insp	ection		Circle a	s checked	ł
	A Equipment	Applicable to protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	1
2	Equipment ID or circuit ID is correct	all	X	$\otimes$	EQ.
3	Enclosure, sealing gaskets or compounds are satisfactory	all	Х	8	
4	There are no damage or evidence of unauthorised modifications	all	Х	0	1
5	Bolts, cable entries and blanking elements are correct and tight	alí	Х	N	1
6	Flange facings are clean and undamaged	d	Х		1
7	Lamp rating, type and position correct	all	Х		
8	Electrical connections are tight	all	Х		]
9	Hermetically sealed devices are undamaged	n í 🕐	x —		
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n	Х		
11	Motor fans have sufficient clearance	motors only	Х.,		.01.1.5
12	Installation clearly labelled	i	Х	Q	Blue
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	х	$\bigotimes$	
14	Entity calculation/documentation is available	i	X	Х	

**B** Installation

Billoundton			
Type of cable is appropriate, cables are undamaged	all	X	$\overline{\mathbf{w}}$
Sealing of ducts and/or conduits is satisfactory	all	X	X
Stopper boxes or barrier glands are properly filled	d	X	
Integrity of conduit system and interface with mixed system is maintained	all	X	
Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	x	⊗
Fault loop impedance is satisfactory	power outlets	X	
Insulation resistance is satisfactory (check only during initial inspection)	all	X	
Automatic electrical protective devices are set correctly and operate within permitted limits	all	Х	
Special certification conditions U,X or B have been complied with	all	X	
Cables/spare cores are terminated satisfactorily	all	X	
No obstructions adjacent to flameproof flanged joint	d	X	Х
Ducts, pipes and enclosures are in good condition	p	X	X
Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X
Protective gas flow/pressure is adequate	p	X	
Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
Pre-energising purge period is adequate	p	X	
Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	q	x	

Amadeus Pipeline Electrical Inspections



				o on o hero
18	Cables are installed and screens are earthed in accordance with the documentatio0n	i	x	
9	The circuit is isolated from earth or earthed at one point only	i	X	
0	Separation is maintained with non-IS circuits	i –	X	
1	As applicable, short circuit protection of the power supply is in accordance with the documentation	i	×	
	C. Environment			

_	C Environment			~
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	X
2	No undue accumulation of dust or dirt	all	Х	X
3	Electrical insulation is clean and dry	all	Х	

No:		
(es)	List action required	
Contra	actor (write): Inspector Supervisor	Client (write): Inspector
Date:		Date:

Device ID or tag

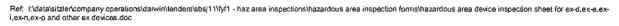
Action required to r	nake device compli	iant:			
- Equipr	nert IO	require	ed .		
- Blue	cable sh	eath r	equied.		
- <i>U</i> V	damaged	cabling	sequires	remediation.	
:					

Reviewed by: D. CREEN Date: 8 9 11 Priority:

Comments:			
All action items now completed:			
Job closed:			
la			

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



#### Specifications

General
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Device ID or tag: $-(FT-0)$	Asset: METER RUN
Circuit ID: GM52	Physical location: PINE CREEK
Area classification :	Environment: (hot?) OUT DOOR

## Data from Label

Apparatus type: (light, JB, Motor) FLOW TRANSMITTER	Type of protection: (d,e, i, n, p etc)	is
Manufacturer: ROSE MOUNT	Gas group: (IIA/B/C)	22 - 20 -
Full model number: 3051 PDZAZZAIAMST7	Temp class: (T1-T6) TS(40C) T4 (60°C	
Serial number: 0459795 2494	Certificate number: AUS Ex MARDA 1249	
IP Class	Test authority: (BAS, PTB, SAA etc)	PHOTO
Number of cables:	]	
For each cable entry APAPTAL gland 1	(LAwn) gland 2 others	

For each cable entry	All Artic gland 1	ELIM) gland 2	others
Gland manufacturer:	(	CMA	PLUG
Model:		1CX 6D, PWPM	
Gland type of protection: (d,e)	Ex 492× - EXO	EYD	

Insp	ection —	· · · · · · · · · · · · · · · · · · ·		is checked	I
		Applicable to	- • 🚽 - '	° ↓	
	A Equipment	protection type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classification	all	X	X	201203
2	Equipment ID or circuit ID is correct	all	X –	8	EQ
3	Enclosure, sealing gaskets or compounds are satisfactory	all	X	1	
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	8	
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	4	
11	Motor fans have sufficient clearance	motors only	X	· •	
12	Installation clearly labelled	i	X	8	Brine
13	Safety barriers/isolators installed as per certification and securely earthed where	i	x	60	
	reguired				I
14	Entity calculation/documentation is available	i	X	X	

B Installation

	Binstanation			
1	Type of cable is appropriate, cables are undamaged	all	X	8
2	Sealing of ducts and/or conduits is satisfactory	all	X	D
3	Stopper boxes or barrier glands are properly filled	d	Х	0
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	Х	8
5	Fault loop impedance is satisfactory	power outlets	Х	
,	Insulation resistance is satisfactory (check only during initial inspection)	all	X	
3	Automatic electrical protective devices are set correctly and operate within permitted limits	all	х	
)	Special certification conditions U,X or B have been complied with	all	Х	
0	Cables/spare cores are terminated satisfactorily	all	Х	
1	No obstructions adjacent to flameproof flanged joint	d	x —	X
2	Ducts, pipes and enclosures are in good condition	p	Х	X
3	Protective gas is substantially free from contaminants (water, oil, dirt)	p	Х	Х
4	Protective gas flow/pressure is adequate	p	X	
5	Pressure and/or flow indicators, alarms and interlocks function correctly	p	X	
6	Pre-energising purge period is adequate	P	Х	
7	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	q	Х	

Amadeus: Pipeline Electrical Inspections

UV

SITZLER



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	×	
	C Environment	-		

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	Х	$\otimes$
2	No undue accumulation of dust or dirt	ali	Х	(X)
3	Electrical insulation is clean and dry	all	Х	

No:			
(es;	List action required		
Contra	ctor (write): Inspector Supervisor	Client (write): Inspector	
Date:	8/9/11	Date:	

Device ID or tag

Action required to make device compliant:	
- Equipment J.D. required. - Elve cable sheath required.	
- UV damaged calling requires remediation.	

Reviewed by: N-GREEN Date: 8 9/11 Priority:

Ľ

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 SITZLER

Based on AS/NZS 60079 part 17

Ref: I:\data\situencompany operations\darwin\lenders\sbsj11\lyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d,ex-e,exi,ex-n,ex-p and other ex devices.doc

#### Specifications

#### General

Device ID or tag:	FT-02	Asset: METER RUN
Circuit JD:	GM53	Physical location: PINE CREEK
Area classification :		Environment: (hot?) OUTDOOR

## Data from Label

Apparatus type: (light, JB, Motor) FLOW TRA	NSMITTER	Type of protection: ( etc)	d,e, i, n, p,	Ex	ia	i.
Manufacturer: ROSE MO	UNT	Gas group: (IIA/B/C)			110	
Full model number: 30,51	DP * .	Temp class: (T1-T6)	TS CHO	() TH	(60°C)	)
Serial number: 0459	794	Certificate number:	AUS E	× 122	-× 124	ax
IP Class		Test authority: (BAS SAA etc)	, РТВ,	<u>11</u>		
Number of cables:		FMODEL #	JOSI PDZA Z	ZAIAMSIT	1404	
For each cable entry	OAPT An grand 1 ,	gland 2	o	thers		
Gland manufacturer:	CLIPS/AL J	CMA		PLUG		
Model:		FWPM	1.1	1.		
Gland type of protection: (d,e)				~		
	n A	<u>لم</u> د د د د			as checke	d
A Equipment		3	Applicable to protection type	e: Internal	, External	d
A Equipment	o class) is appropriate for a	3	protection type all	e: Internal X	, External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor	o class) is appropriate for a rrect	area classification	protection type all all	e: Internal X X		d EQ
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co	o class) is appropriate for a rrect ompounds are satisfactory	area classification	protection type all all all	e: Internal X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie	area classification	protection type all all all all	e: Internal X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie g elements are correct and	area classification	protection type all all all all all all	e: Internal X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie g elements are correct and indamaged	area classification	protection type all all all all all all d	e: Internal X X X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un Lamp rating, type and position co	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie g elements are correct and indamaged	area classification	protection type all all all all all all	e: Internal X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un	o class) is appropriate for a rrect ompounds are satisfactory to co funauthorised modifie g elements are correct and indamaged correct	area classification	protection type all all all all all d all d all	e: Internal X X X X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or ci There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un Lamp rating, type and position of Electrical connections are tight Hermetically sealed devices are	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modific g elements are correct and indamaged correct e undamaged	area classification	protection type all all all all all d all all all all	e: Internal X X X X X X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un Lamp rating, type and position of Electrical connections are tight Hermetically sealed devices are Restricted breathing enclosure i Motor fans have sufficient cleara	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modific g elements are correct and idamaged correct undamaged is satisfactory to enclosure	area classification	protection type all all all all d all all all all n	e: Internal X X X X X X X X X X X X X X X X X	External	
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un Lamp rating, type and position or Electrical connections are tight Hermetically sealed devices are Restricted breathing enclosure i Motor fans have sufficient cleara Installation clearly labelled	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie g elements are correct and idamaged correct a undamaged is satisfactory to enclosure ance	area classification	protection type all all all all d all all all n n	e: Internal X X X X X X X X X X X X X X X X X		
A Equipment Equipment (incl group and temp Equipment ID or circuit ID is cor Enclosure, sealing gaskets or co There are no damage or eviden Bolts, cable entries and blanking Flange facings are clean and un Lamp rating, type and position or Electrical connections are tight Hermetically sealed devices are Restricted breathing enclosure in Motor fans have sufficient cleara	o class) is appropriate for a rrect ompounds are satisfactory ice of unauthorised modifie g elements are correct and idamaged correct a undamaged is satisfactory to enclosure ance	area classification	protection type all all all all d all all all n n	e: Internal X X X X X X X X X X X X X X X X X X X	External	

1	Type of cable is appropriate, cables are undamaged	all	Х	8	UV
2	Sealing of ducts and/or conduits is satisfactory	all	X	8	
3	Stopper boxes or barrier glands are properly filled	d	Х	_	1
4	Integrity of conduit system and interface with mixed system is maintained	all	X		1
5	Earthing and bonding connections are tight, in good condition and of sufficient cross section	all	х	K	
6	Fault loop impedance is satisfactory	power outlets	X		-
7	Insulation resistance is satisfactory (check only during initial inspection)	all	X		7
8	Automatic electrical protective devices are set correctly and operate within permitted limits	all	Х		]
9	Special certification conditions U,X or B have been complied with	all	Х		1
10	Cables/spare cores are terminated satisfactorily		Х		1
11	No obstructions adjacent to flameproof flanged joint	d	Х	X	1
12	Ducts, pipes and enclosures are in good condition	р	Х	x X	1
13	Protective gas is substantially free from contaminants (water, oil, dirt)	р	Х	X	1
14	Protective gas flow/pressure is adequate	p	Х		1
15	Pressure and/or flow indicators, alarms and interlocks function correctly	р	Х		1
16	Pre-energising purge period is adequate	p	Х		1
17	Condition of spark/particle barriers of ducts exhausting the gas into hazardous area are satisfactory	p	х		



18	Cables are installed and screens are earthed in accordance with the documentatio0n	í	х	
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	i	~	
	the documentation		^	
	C Environment			

	C EITAI OITTIBIT			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	8
2	No undue accumulation of dust or dirt	all	X	8
3	Electrical insulation is clean and dry	all	Х	

No:				
Yes	List action required		<u>_</u> _	
Contra	ctor (write): Inspector N. GREEN	Supervisor	Client (write): Inspector	
Date:	8/9/11		Date:	

Device ID or tag

.

Action requi	uired to make device compliant:	
- Eq	quipment J.O. required.	·
- 12	Rlue cable sheath required	
- U	UV damaged cabling requires remediat	tion
•		

Comments:			
		4	
x			
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

Ref: I:\data\sizter/company operations\darwin\lenders\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
---------

o o no na n	
Device ID or tag: TTT-02	Asset: METER RUN
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?)

#### Data from Label

App	aratus type: (light, JB, INDICATOR Type of pro or) TEMPERATURE TRANSMITTER etc)	otection: (	d,e, i, n, p Exia			i
	iufacturer: ROSEMOUNT Gas group:	(IIA/B/C)				
Full	model number: 444 - RL2-UT AT-TA Temp class	s: (T1-T6)	T6(40C)	T.C.	70°C)	1
	al number: 0110770 Certificate	number:		2195	- 279	4×
IP C	lass IP 66 Test author SAA etc)	rity: (BAS	, РТВ,		<u>x 011</u>	
Nurr	nber of cables: (*) + 3144-	p 02	ALIZMSFS			
For	each cable entry ADART gland-1	gland 2	, others	5		
Glar	nd manufacturer: ROSEMOUNT ALCO					1
Mod	et: 004440282	203	1	· · · ·		]
Glar	nd type of protection: (d,e)	399				1
	and the here is the second	1 -12	L. James		,	-
Inspe	ection	1		Circle a	s chepked	1
		,	AND ROLL	Sec. Sec.		
	5 CONVERT		Applicable to	. ↓	. ↓	
	A Equipment		protection-type:	Internal	External	
1	Equipment (incl group and temp class) is appropriate for area classificatio	n	áll	X	<u>×</u>	417
2	Equipment ID or circuit ID is correct		all	X	<u>C</u>	- 007
3	Enclosure, sealing gaskets or compounds are satisfactory		all	X	8	- 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	X	
6	Flange facings are clean and undamaged		d	X		
7			all	X		
	Lamp rating, type and position correct					
8	Electrical connections are tight		all	X		
9	Hermetically sealed devices are undamaged		n	X	10	4
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers		n	Χ.,.	121	
11	Motor fans have sufficient clearance		motors only	X		
12	Installation clearly labelled		i	X	Ø	BLOG
13	Safety barriers/isolators installed as per certification and securely earthed required	where	i	X	Ø	13-0-0
14	Entity calculation/documentation is available		i	X	X	
	B Installation					(N) 0
1	Type of cable is appropriate, cables are undamaged		all	X	<u> </u>	-UV PANAR
2	Sealing of ducts and/or conduits is satisfactory		all	Х	X	-EXPOSED
3	Stopper boxes or barrier glands are properly filled		ď	X		Armoun.
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 suffic	cient	all		0	1
-	cross section			X	$\otimes$	
6	Fault loop impedance is satisfactory		power outlets	X		1
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	1	all	Х		
9	Special certification conditions U,X or B have been complied with		all	Х		
10	Cables/spare cores are terminated satisfactorily		all	Х		
11	No obstructions adjacent to flameproof flanged joint		d	Х	X	
12	Ducts, pipes and enclosures are in good condition		р	Х	X	]
13	Protective gas is substantially free from contaminants (water, oil, dirt)		р	X	X	1
14	Protective gas flow/pressure is adequate		p	X		1
15	Pressure and/or flow indicators, alarms and interlocks function correctly		p	X		1
16	Pre-energising purge period is adequate			X		1
17	Condition of spark/particle barriers of ducts exhausting the gas into hazard	loue	<u>р</u>			1
	area are satisfactory	1005	р 	X		

SITZLER



18	Cables are installed and screens are earthed in accordance with the documentatio0n	į	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	i	~	
	the documentation		^	
	C Environment			

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	x	$\langle X \rangle$
2	No undue accumulation of dust or dirt	ali	X	
3	Electrical insulation is clean and dry	all	Х	

No:			
Yes	List action required		
Contra	ctor (write): Inspector Supervisor N. GREEN	Client (write): Inspector	
Date:	N.GREEN 8/9/11	Date:	

Device ID or tag

ĩ

Action required to make device compliant: - Circuit I.D. required, Equipment I.D. required. - UV damaged calling requires remediation, lue sheathing required. - Reterminate calling for exposed armour @ gland.

Reviewed by: Date: 8/9/1 N. GREEN Priority:

Comments:			
1 × ×			
2 · · · · · · · · · · · · · · · · · · ·			
All action items now completed:			
Job closed;			
000 0.00001	<u> </u>		

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

Ref: I:(data\sitzlencompany operations\darwin\tenders\sbsj11\fyf1 - haz area inspections\hazardous area inspection forms\hazardous area device inspection sheet for ex-d, ex-e, exi, ex-n, ex-p and other ex devices. doc

## Specifications

General
---------

Device ID or tag: TT- U-3	Asset: SEP	ARATOR OUT	LET
Circuit ID: NIA	Physical location:	PINE	CREEK
Area classification :	Environment: (hot?)	OUTDOOR	

#### Data from Label

App Mot	baratus type: (light, JB, tor) <u>TEMPERAT</u>	URE TRANSMITTE	Type of protection: ( etc)	d,e, i, n, p Fx ) C	Ś		N's
		NOUNT	Gas group: (IIA/B/C	) 114	/		FADED
Full		- RL2 - UI - AI - I7	Temp class: (T1-T6	T6(40	() TS	(70'()	TLASEL.
Ser	ial number:		Certificate number:			2x?	
IP C	Class		Test authority: (BAS SAA etc)				7)
Nur	nber of cables:		7	NOL	ABELS		-
		ADAPTE gland 1	_				
	r each cable entry	gianu	gland 2		others		-
Mod	nd manufacturer:	CLIPSAL M235 NPTI	CMA				-
	nd type of protection: (d,e)		FWPN	· ·		1 .	4
Gia	na type of protection: (d,e)						
Insp	ection ———	AUSEX 432X			-> Circ	le as checked	t
	A Equipment	Contra-	A St. L . L	Applicable to	e: Intern	al Estimat	
1		d temp class) is appropriate for are	and a second sec	ali	X X	al External X	1
2	Equipment ID or circuit ID		a Glassification	all	x	Ô	CCT.
3		s or compounds are satisfactory		all		8	
4		evidence of unauthorised modifical	lions	all	X	8	1
5		lanking elements are correct and the				R	1
6	Flange facings are clean		gn	d d	- Â	~	-
7	Lamp rating, type and pos			all	<del>^</del> <del>x</del>		-
8	Electrical connections are		1.5	atl	$-\hat{\mathbf{x}}$		1
9				n (	x x		
10		netically sealed devices are undamaged ricted breathing enclosure is satisfactory to enclosure and/or covers		n	X	e	1
11	Motor fans have sufficient	clearance		motors or			•
12	Installation clearly labelled			i		(8)	BLUE.
13		stalled as per certification and sec	curely earthed where	i	X	Ø	120000,
14	Entity calculation/docume	ntation is available		i	X	X	
1	B Installation	te, cables are undamaged		all	X	8	· SUPPORT
2	Sealing of ducts and/or co			all	X	8	
3	Stopper boxes or barrier of			i d	- Â	<u>e</u>	-
4		and interface with mixed system i	is maintained	all	X		-
5		nections are tight, in good conditio		all			-
-	cross section			2	X	$\otimes$	
6	Fault loop impedance is s	atisfactory		power outle	ets X		1
7		tisfactory (check only during initial	inspection)	all	X		-
8		ctive devices are set correctly and		all	X		
9		tions U,X or B have been complied	1	all	X		- Tank
							-
10 11	Cables/spare cores are te No obstructions adjacent			alld		X	4
12	Ducts, pipes and enclosur				X X		4
13		ially free from contaminants (water	coil did)	<u> </u>	X	X	1
14	Protective gas flow/pressu			p p	X		4
15		ators, alarms and interlocks function	on correctly	p	X		1
16	Pre-energising purge perio			<u>р</u>	X		1
17	Condition of spark/particle	barriers of ducts exhausting the g	as into hazardous	p P	x		1
	area are satisfactory						1



18	Cables are installed and screens are earthed in accordance with the documentatio0n	ì	Х	
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	х	

C Environment

	C Environment			-
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X _	Ň
2	No undue accumulation of dust or dirt	all	Х	$\bigotimes$
3	Electrical insulation is clean and dry	all	Х	

Faults found? (circle as appropriate)

No:	
Yes List action required	]
Contractor (valte): Increator	
Contractor (write): Inspector Supervisor	Client (write): Inspector
Date: 8/9/1	Date:

Device ID or tag

2

. -

Action required to make device compliant:	
- Circuit J.D. required.	
- Blue calle sheath required.	
- Cable support required.	
- UV damaged colling required remediation.	

Reviewed by: Date: <u>99</u> 11 Priority:	N. GPERN	

	Comments:		
۰.	• ** **		
	All action items now completed: Job closed:		

Supervisor (write): Date:

# Hazardous area device inspection sheet for Ex-d, Ex-e, Ex-i, Ex-n, Ex-p and SITZLER other Ex devices



Based on AS/NZS 60079 part 17

Ref: |:/data/sitztencompany operations/darwin/lenders/sbsj11/lyf1 - 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

Specifications	PSH-A, PSH-B		
General	1201 - 1120 - 5		
Device ID or tag:	(PSH - 07 A/B)	Asset: MERER SILIO	
Circuit ID:	NIA NIA	Physical location: PINE CREEK	
Area classification :		Environment: (hot?)	

# Data from Label

App Mot	aratus type: (light, JB, or) HIGH PRESSURE SWITCH	Type of protection: ( etc)	d,e, i, n, p			7
Mar	NUFACTURET: ALLEN BRADLEY	Gas group: (IIA/B/C)				
Full	model number: BVL- 836T- T256J	Temp class: (T1-T6)				]
Seri	al number: N/A	Certificate number:	NOT SAI	A APPRO	Q3VC	is?
IP C	lass 18 66	Test authority: (BAS SAA etc)	, PTB,	۰ ،		
Nur	nber of cables:	1				
	PSH OT B	PSHOT A				
	each cable entry gland 1	gland 2		ners		_
-	nd manufacturer:	NETH CMA	r			4
Mod		FWPMO	12.			4
Glar	nd type of protection: (d,e)					
		· .		1		
Insp	ection			Circle a:	s chepke	d
		A.	· · · · · · · ·			
	5 m		Applicable to	· · · · · · ↓		
	A Equipment		protection type:		External	1
1	Equipment (incl group and temp class) is appropriate for area	a classification		X		- 50
2	Equipment ID or circuit ID is correct		all	X		- COT
3	Enclosure, sealing gaskets or compounds are satisfactory		all	<u> </u>		
4	There are no damage or evidence of unauthorised modification		all	X	(A)	4
5	Bolts, cable entries and blanking elements are correct and tig	int	all	X	10	-
6	Flange facings are clean and undamaged		d	<u> </u>		-
7	Lamp rating, type and position correct		all	<u> </u>		-
8	Electrical connections are tight		all	x		-
9	Hermetically sealed devices are undamaged		<u>,</u> n.	X		-
10	Restricted breathing enclosure is satisfactory to enclosure an	id/or covers	n	X . «		4
11	Motor fans have sufficient clearance		motors only		X	
12 13	Installation clearly labelled		i	X	Х	F. S. 7
13	Safety barriers/isolators installed as per certification and secu required	arene artified where	1	X	Х	
14	Entity calculation/documentation is available		i	X	X	1
			1	^	^	]
	B Installation					
1	Type of cable is appropriate, cables are undamaged		all	X	8	UV
2	Sealing of ducts and/or conduits is satisfactory		all	X	0	
3	Stopper boxes or barrier glands are properly filled		d	X		-l'
4	Integrity of conduit system and interface with mixed system is	maintained	all	X		-
5	Earthing and bonding connections are tight, in good condition		all		9	ſ
	cross section		-	X	Ø	
6	Fault loop impedance is satisfactory		power outlets	s X		1
7	Insulation resistance is satisfactory (check only during initial in	nspection)	all	X		1
8	Automatic electrical protective devices are set correctly and o	perate within	all	X		7
	permitted limits			^		
9	Special certification conditions U,X or B have been complied	with	all	X		
10	Cables/spare cores are terminated satisfactorily		all	X		1
11	No obstructions adjacent to flameproof flanged joint		d	X	X	1
12	Ducts, pipes and enclosures are in good condition		р	X	Х	4
13	Protective gas is substantially free from contaminants (water,	oil, dirt)	р	X	Х	4
14	Protective gas flow/pressure is adequate		р	X		4
15	Pressure and/or flow indicators, alarms and interlocks function	n correctly	р	X		4
16	Pre-energising purge period is adequate		р	X		4
17	Condition of spark/particle barriers of ducts exhausting the ga area are satisfactory	as into hazardous	р	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	Х	
20	Separation is maintained with non-IS circuits	i	Х	
21	As applicable, short circuit protection of the power supply is in accordance with	i	×	
	the documentation		^	
		· · · ·		
	C Environment			

1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	8
2	No undue accumulation of dust or dirt	all	Х	8
3	Electrical insulation is clean and dry	all	Х	

No:

List action required

Contractor (write): Inspector	Supervisor	Client (write): Inspector	
N.CA	EEN		
11			
Date: 8/9/11		Date:	

Device ID or tag

Action required to make device compliant:	11
- Equipment I.O. (PSU-A, PSU-B) incorrect requires alle	ration
- Circuit I.D. required.	
- UV damaged calle sheath requires remediation.	

Reviewed by: Date: 89/11 Priority:

Commonter.		 
Comments:		
All action items now completed:		
An addon 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 SI other Ex devices Based on AS/NZS 60079 part 17

Ref: It/data/sitzler/company operations/darwin/tenders/sbsj11/lyf1 - 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

General	
Device ID or tag: (PT - 04)	Asset: SEPARATOR OUT
Circuit ID:	Physical location: PINE CREEK
Area classification :	Environment: (hot?) OUT DOOR

#### Data from Label

Apparatus type: (light, JB) Motor) PRESSURE TRANSMITTER	Type of protection: (d,e, i, n, p etc)
Manufacturer: PROSEMOUNT	Gas group: (IIA/B/C)
Full model number: 1194-9-1200-4772-17	Temp class: (T1-T6) $T5(40^{\circ}C)$ $T4(60^{\circ}C)$
Serial number: RS0851678	Certificate number: AUS Ex HOX 1249X
IP Class IP 65	Test authority: (BAS, PTB, SAA etc)
Number of cables:	3051 163A2B21 BB& K7M5TIC1 10455

		gland 2	others
Gland manufacturer:	ALCO .	10	PLUG
Model:	FLPW ZOZ	· · · · · ·	The most of the first of the first
Gland type of protection: (d,e)			- 1 ;

1. A. 1. 1. 1.

Insp	ection	<u>( ()</u>	· Circle a	s checked	4
	A Equipment	Applicable to protection type:		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	(X)	- EQ
4	There are no damage or evidence of unauthorised modifications	all	X		cu.
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 1		]
9	Hermetically sealed devices are undamaged	n .	X	200	]
10	Restricted breathing enclosure is satisfactory to enclosure and/or covers	n ,	X .	,	]
11	Motor fans have sufficient clearance	motors only	X		0.001
12	Installation clearly labelled	i	X	Ø	I N.C
13	Safety barriers/isolators installed as per certification and securely earthed where required	i	×	$\bigotimes$	2 NiL 2 Cherice
14	Entity calculation/documentation is available	i	X	X	]

**B** Installation

Type of apple is appropriate achieve any updays and			
Type of cable is appropriate, cables are undamaged	all	X	$\otimes$
Sealing of ducts and/or conduits is satisfactory	all	X	$\otimes$
Stopper boxes or barrier glands are properly filled	d	X	
Integrity of conduit system and interface with mixed system is maintained	all	Х	_
Earthing and bonding connections are tight, in good condition and of sufficient	all	X	8
Fault loop impedance is satisfactory	power outlets	X	
Insulation resistance is satisfactory (check only during initial inspection)	all	X	
Automatic electrical protective devices are set correctly and operate within permitted limits	all	x	
Special certification conditions U,X or B have been complied with	all	X	
Cables/spare cores are terminated satisfactorily	all	X	
No obstructions adjacent to flameproof flanged joint	d	X	X
Ducts, pipes and enclosures are in good condition	р	X	X
Protective gas is substantially free from contaminants (water, oil, dirt)	р	X	X
Protective gas flow/pressure is adequate	ρ	X	
Pressure and/or flow indicators, alarms and interlocks function correctly	р	X	
Pre-energising purge period is adequate	р	X	
Condition of spark/particle barriers of ducts exhausling the gas into hazardous area are satisfactory	P	x	
	Stopper boxes or barrier glands are properly filled Integrity of conduit system and interface with mixed system is maintained Earthing and bonding connections are tight, in good condition and of sufficient cross section Fault loop impedance is satisfactory Insulation resistance is satisfactory (check only during initial inspection) Automatic electrical protective devices are set correctly and operate within permitted limits Special certification conditions U,X or B have been complied with Cables/spare cores are terminated satisfactorily No obstructions adjacent to flameproof flanged joint Ducts, pipes and enclosures are in good condition Protective gas is substantially free from contaminants (water, oil, dirt) Preseure and/or flow indicators, alarms and interlocks function correctly Pre-energising purge period is adequate Condition of spark/particle barriers of ducts exhausting the gas into hazardous	Stopper boxes or barrier glands are properly filled       d         Integrity of conduit system and interface with mixed system is maintained       all         Earthing and bonding connections are tight, in good condition and of sufficient cross section       all         Fault loop impedance is satisfactory       power outlets         Insulation resistance is satisfactory (check only during initial inspection)       all         Automatic electrical protective devices are set correctly and operate within permitted limits       all         Special certification conditions U,X or B have been complied with       all         Cables/spare cores are terminated satisfactorily       all         No obstructions adjacent to flameproof flanged joint       d         Ducts, pipes and enclosures are in good condition       p         Protective gas is substantially free from contaminants (water, oil, dirt)       p         Pressure and/or flow indicators, alarms and interlocks function correctly       p         Pre-energising purge period is adequate       p         Condition of spark/particle barriers of ducts exhausting the gas into hazardous       p	Stopper boxes or barrier glands are properly filled       d       X         Integrity of conduit system and interface with mixed system is maintained       all       X         Earthing and bonding connections are tight, in good condition and of sufficient cross section       all       X         Fault loop impedance is satisfactory       power outlets       X         Insulation resistance is satisfactory (check only during initial inspection)       all       X         Automatic electrical protective devices are set correctly and operate within permitted limits       X         Special certification conditions U,X or B have been complied with       all       X         Cables/spare cores are terminated satisfactorily       all       X         No obstructions adjacent to flameproof flanged joint       d       X         Ducts, pipes and enclosures are in good condition       p       X         Protective gas is substantially free from contaminants (water, oil, dirt)       p       X         Pressure and/or flow indicators, alarms and interlocks function correctly       p       X         Preserve and/or flow indicators, alarms and interlocks function correctly       p       X         Pre-energising purge period is adequate       p       X         Pre-energising purge period is adequate       p       X

Amadeus Pipeline Electrical Inspections

ZLER



X X

all

all

X

18	Cables are installed and screens are earthed in accordance with the	i	x	
	documentatio0n			
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	j		
	the documentation		<u> </u>	
	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	all	X	(2)

#### Apparatus adequately protected from corrosion, weather, vibration, other No undue accumulation of dust or dirt 1 2

3 Electrical insulation is clean and dry

Faults found? (circle as appropriate)

No:			
Yes:	List action required		
		x	
Contra	ctor (write): Inspector Supervisor	Client (write): Inspector	
Date:	slalu	Date:	

Device ID or tag

DCVICC ID	
Action red	quired to make device compliant:
-	Equipment + Cable I.D. required.
	N:1 evidence of I.S. barrier Establed , have
	flameproof installation likely.
T.	Replace uncertified day.

Reviewed by: N. CREEN Date: 8/9/11 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 SITZLER other Ex devices



Based on AS/NZS 60079 part 17

Ref: 1/data/sitzler/company operations/darwin/tenders/sosj11/lyf1 - 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 - 02	Asset: SLOPS TANK
Circuit ID:	Physical location: PINE CREEK
Area classification : T_3	Environment: (hot?) OUT DOOR

Data	a from Label							
	aratus type: (light, JB,		Type of protection: (	d,e, i, n, p	€×	đ		]
Mot	or) HIGH	LEVEL SWITCH	etc)					-
Man	nufacturer: <u>BESTOB</u>	ELL MOBREY	Gas group: (IIA/B/C)	)	11.			_
Full	model number: <u>S</u> - S	250 DATFIOU	Temp class: (T1-T6)		Ť	>		
Seri	al number: 🛛 🕉 🕏	05	Certificate number:	NOT S	CAA	APPS	OYED	186
IP C	lass	66	Test authority: (BAS SAA etc)	, PTB,	SA		KL05	1
Num	ther of cables:							
For	each cable entry	gland 1	gland 2		others			
	id manufacturer:	PATNIED CMA	gianu z		Others			1
Mod		DUER FUPN	A	5 A		3 Section		1
	nd type of protection: (d,e)	d de la com		· ·		4.8.161	•	1
Olai								1
Inon	action		. Pri - 1		· · ·	Civala	• • • • • • • • • •	
msp	ection		A sheet of the second		Less		is chepked	
			and a series of the first of the			S		
				Applicable		🖤		
	A Equipment		<u> </u>	protection t	ype:	Internal	External	
1		temp class) is appropriate for area	a classification	all		<u>Х</u>	X	
2	Equipment ID or circuit ID			, ali		X	<u> </u>	CCY.
3		s or compounds are satisfactory		all		X	10	
4		vidence of unauthorised modification		all		Х	8	
5		anking elements are correct and tig	ht	all		Х	$\bigotimes$	
6	Flange facings are clean a			đ		Х		
7	Lamp rating, type and pos		all		Х			
8	Electrical connections are		ail		Х			
9	Hermetically sealed devices are undamaged			n	1. S. C. A.	Х		
10	Restricted breathing enclo	sure is satisfactory to enclosure an	d/or covers	n		Х		
11	Motor fans have sufficient	clearance		motors	oniy	X		
12	Installation clearly labelled			i		Х	X	
13	Safety barriers/isolators in required	stalled as per certification and secu	rely earthed where	i		х	x	
14	Entity calculation/documer	ntation is available	,	i		X	X	
	B Installation							
1	Type of cable is appropriate	te cables are undamaged		all		Х	0	Inte ) PALLET
2	Sealing of ducts and/or co			all		X	X	-OV / Marker.
3	Stopper boxes or barrier g			d		X	~	
4		and interface with mixed system is	maintained	all		X	-	cuble
5		nections are tight, in good condition		all		~	-	
5	cross section	rections are agint, in good condition	and or sumclent	all		х	Ø	
6	Fault loop impedance is sa			power ou	tlata	Х		
7		tisfactory (check only during initial in	nenaction)	all	10813	<u>x</u>		
8	Automatic clostrical protoc	tive devices are set correctly and o	napection)				<u> </u>	
-	permitted limits	_	-	all		Х		
9		ions U,X or B have been complied	with	all		Х		
10	Cables/spare cores are ter			all		Χ		
11	No obstructions adjacent to			d		Х	X	
12	Ducts, pipes and enclosure			р		Х	X	
13		ally free from contaminants (water,	oil, dirt)	р		Х	X	
14	Protective gas flow/pressu			р		Х		
15	Pressure and/or flow indication	ators, alarms and interlocks function	n correctly	р		Х		
16	Pre-energising purge perio			P		Х		
17		barriers of ducts exhausting the ga	is into hazardous	p		х		
	area are satisfactory							



Cables are installed and screens are earthed in accordance with the	i	~	
documentatio0n		^	
The circuit is isolated from earth or earthed at one point only	i	Х	
Separation is maintained with non-IS circuits	j	Х	
As applicable, short circuit protection of the power supply is in accordance with	ì	V	
the documentation		^	

	C Environment			
1	Apparatus adequately protected from corrosion, weather, vibration, other	, all	X	
2	No undue accumulation of dust or dirt	all	X	ð
3	Electrical insulation is clean and dry	alt	Х	

No:	
Yes: List action required	
· · · · · · · · · · · · · · · · · · ·	
Contractor (write): Inspector Supervisor	Client (write): Inspector
N. GREEN	
Date: 2/9/11	Date:

Device ID or tag

Action required to make device compliant: - Circuit 7.0 required. - Cable support required. patentially - Flameproof double substantially painted a compromising flamepaths. Further isportion required. - UV damaged cable shealt requires remodiction.

**Reviewed by:** N. GREEN Date: 8/9/11 **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/IDI	ENTIFICATI	ION						DESC	CRIPTIC	DN		
Area Classification	n - Zone O	1 2 20 21	22 Non	Hazardous - Group	I IIA	IIB	IIC - T	emp	T1 T2	2 T3 <sup>-</sup>	T4 T5 T	6
Record Name Plat												ameplate information that may be
Manufacturer					Vin		Chin	I		need	u other r	relevant
Serial No.					Lin		Lin					
Model												
Certificate no.					Т		IP					
Certifying authorit	v					1						
Inspection Type Pe	,	I=Initial, P=Pe	eriodic, S=S	ample)				I	Р	S		
Inspection Grade I				-				D	с	v	De	tailed requires de-energization
Equipment Y=OK,	N=Not Acc	ceptable, N/A=	=Not Appli	cable, N/C=Not Che	ecked				8		Inspect Grade	Remarks
Equipment is Austr	ralian or IF	C Certified					Y	N	N/A	N/C	DCV	
EX markings are su							Y	N	N/A	N/C	DCV	
-			onriate tag/	identification detai	ls		Y	N	N/A	N/C	DCV	
Enclosure is not da	•		• •				Y	N	N/A	N/C	DCV	
Terminations are t	-						Y	N	N/A	N/C	DCV	
All unused conduct	-	nated					Y	N	N/A	N/C	DC	
Bolts, bungs, plugs			nd tight				Ŷ	N	N/A	N/C	DCV	
Fuses and lamps a							Ý	N	N/A	N/C	DCV	
No unautorised mo		_					Ŷ	N	N/A	N/C	DCV	
Installation											Grade	Remarks
Cable type is as pe			foringtalla	tion			Y	N	N/A	N/C N/C	D D	
IS Entity and cable The device is secur	-			ltion			Y Y	N N	N/A N/A	N/C	DC	
Cables/conduits in							r Y	N	N/A	N/C	DC	
Cables/conduit ent	-		nd tight				Y	N	N/A	N/C	DCV	
		-	-					N	N/A	N/C	DCV	
Segregation betwe	-	-		use conductors to work loose (Y=OK)				N	N/A	N/C	DCV	
Segregation betwe			-				Y Y	N	N/A	N/C	DCV	
Earthing and equip							Ý	N	N/A	N/C	D	
Insulation resistant		_		GGFR testing HA)			Ŷ	N	N/A	N/C	D	
Cable screens eart			-	-			Y	N	N/A	N/C	D	
				/ //							1	
Barriers Record Safety Barriers manufacturer and model no. (available on device = Y)											Grade	Remarks
							Y	N	N/A	N/C	DC	
				ation details in 'Rer	narks')		Y	N	N/A	N/C	DCV	
Record Safety Barr			-				Y	N	N/A	N/C	DC	
Safety Barriers are				-			Y	N	N/A	N/C	DC	<u> </u>
Safety Barriers are			ne earth ba	1			Y	N	N/A	N/C	DCV	
Barrier/Isolator ter		-	orrige/!!	toric 240V			Y	N	N/A	N/C	DCV	
Maximum voltage IS circuits are all fro							Y Y	N	N/A	N/C	DCV	<u> </u>
No energy storing		•					Y Y	N N	N/A N/A	N/C N/C	DCV DC	
Relays acting as sa					Y Y	N	N/A	N/C	DC			
			ansformer neutral point is <10hm					N	N/A	N/C	DCV	Check one connection at a time
· · ·							Y	<u> </u>	.,	., •	<u> </u>	
Environment							Y				Grade	Remarks
		-	corrosion, weather, vibration, etc e are within acceptable limit					N	N/A	N/C	DCV	
Dust and dirt on th	ie equipme	ent and cable a	are within a	acceptable limit			Y	Ν	N/A	N/C	DCV	l
Special conditions							_	Grade	Remarks			
Special conditions	on certifica	ate are satisfie	ed				Y	Ν	N/A	N/C	D	
Notes:												

Checked:

Date:

Inspected:

Date:



# **INSPECTION CHECK SHEET - Increased Safety Ex e**

TAG/IDENTIFICATION		DESCRIPTION									
Area Classification - Zone 0 1 2 Non Ha	azardous	- Group	I IIA IIB IIC -	Temp	T1	T2	Т3	T4 T5	Т6		
Record Name Plate Details		1					Reco	rd other nar	neplate information that may		
Manufacturer		KW		FLC	FLC					be relevant	
Serial No.		Volts		RPI	М						
Model		1									
Certificate No.		Т		IP	)						
Certifying authority											
Inspection type performed (I=Initial, P=Pe	riodic, S=	Sample)				T	Р	S			
Inspection Grade Performed (D=Detailed,						D	С	v	Detaile	d requires de-energization	
Equipment Y=OK, N=Not Acceptable, N/A	=Not App	licable,	N/C=Not Checked	1					Inspect	Remarks	
				Y	Ν	N	/A	N/C	Grade DCV		
Equipment is Australian or IEC Certified				Y	N		/A /A	N/C	DCV		
EX markings are suitable for the area		/:		Y			/A /A	N/C	DCV		
Equipment is clearly marked and has appro				N							
Enclosure is not damaged and maintains its		proofing	g (min IP54)	Y	N		/A	N/C	DCV		
Enclosure gaskets are in a satisfactory cond				Y	N		/A /A	N/C	D		
Bolts, bungs, plugs/blank plates installed an	nd tight			Y	N		/A	N/C	DCV		
Terminals are sized correctly for the rating				Y	N		/A /^	N/C	D		
Conductors > 0.5mm2 for multistranded an				Y	N		/A /^	N/C	D		
No chafing parts that may cause local hot s	pots (mo	tor fans)	(Y=OK)	Y	N		/A	N/C	D		
Guards are correctly fitted				Y	N		/A	N/C	D		
No unautorised modifications (Y=OK)				Y	N		/A	N/C	DCV		
Lamp rating, type and position are correct				Y	Ν	N	/A	N/C	D		
Installation					1	<u> </u>			Grade	Remarks	
Equipment carries correct circuit identificat isolator	tion at sw	/itchboai	d and local	Y	Ν	N	/A	N/C	D		
Effective means of isolation of all live condu	uctors (in	cluding r	neutral)	Y	N	N	/A	N/C	D		
Installation is in compliance with document				Y	N		/A	N/C	DC		
Cable type is as per the documentation	cution -			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, an	d tight (F	xd or Fx	e glands used)	Y	N	N	/A	N/C	DCV		
Exd glands have additional weatherproofin			8.0	Y	N		/A	N/C	DCV		
Electrical connections are tight	0			Y	N	N	/A	N/C	D		
Creapage and clearance distance are maint	ained			Y	N	N	/A	N/C	D		
All unused conductors terminated in Exe te				Y	N		, /A	N/C	D		
Earthing and equipotential bonding satisfact				Y	N		, /A	N/C	DCV		
Insulation resistance is satisfactory (NB Dar		FGGER t	esting HA)	Y	N		/A	N/C	D		
Motor parameters (la/ln and te) and TOLs of	0		<b>o</b> ,	Y	N		/A	N/C	D		
Cable Glands and adaptors									Grade	Remarks	
Cable glands details available, record (avail	able=Y. n	ot recor	ded=N/C)	Y	Ν	N	/A	N/C	DCV		
Cable glands certificate details available, record (avail											
recorded=N/C)				Y	N	IN	/A	N/C	DCV		
Adaptors and plugs details available, record	d (availab	le=Y, not	t recorded=N/C)	Y	Ν	N	/A	N/C	DC		
Glands and adaptors Ex markings are suitab	ole for ar	ea		Y	Ν	N	/A	N/C	DCV		
Environment				·		1			Grade	Remarks	
Equipment adequately protected against co	orrosion,	weather	, vibration, etc	Y	Ν	N	/A	N/C	DCV		
Dust and dirt on the equipment and cable a	are withir	n accepta	able limit	Y	Ν	N	/A	N/C	DCV		
Special conditions							,		Grade	Remarks	
Special conditions on certificate are satisfie	d			Y	Ν	N	/A	N/C	D		
Notes:											
Inspected: D	ate:		Checked:						Date:		

# Hazardous Area Check Sheet Flameproof Ex d



TAG/IDENTIFICATION		DESCRIPTION								
Area Classification - Zone 0 1 2 Not	Hazardous - Group I IIA IIB	IIC - Te	emp T1	L T2 T	ГЗ Т4	L T5	Т6			
Record Name Plate Details							Record other nameplate information that may			
Manufacturer	cturer KW								be relevant	
Serial No.		Volts		RPM						
Model										
Certificate No.		Т		IP						
Certifying authority				•						
Inspection Type Performed (I=Initial, P	Periodic, S=Sample)				I	Р	S			
Inspection Grade Performed (D=Detail	d, C=Close, V=Visual)				D	С	v	Deta	ailed requires de-energization	
Equipment Y=OK, N=Not Acceptable, N	/A=Not Applicable, N/C=Not Che	ecked						Inspect		
								Grade	Remarks	
Equipment is Australian or IEC Certified				Y	Ν	N/A	N/C	DCV		
EX markings are suitable for the area				Y	Ν	N/A	N/C	DCV		
Equipment is clearly marked and has ap	propriate tag/identification detai	ls		Y	N	N/A	N/C	DCV		
Enclosure is not damaged and maintain	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 operation				Y	Ν	N/A	N/C	DC		
Bolts, bungs, plugs/blank plates installe				Y	N	N/A	N/C	DCV		
Sealing gaskets and components in acce				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 (min	mum dimensions 40mm)			Y	N	N/A	N/C	DCV		
No chafing parts that may cause local h				Y	N	N/A	N/C	D		
Guards are correctly fitted				Y	N	N/A	N/C	D		
Lamp rating, type and position are corre	ct			Y	N	, N/A	N/C	D		
Installation								Grade	Remarks	
Equipment carries correct circuit identif		solator		Y	N	N/A	N/C	D		
Effective means of isolation of all live co	nductors (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				Y	N	N/A	N/C	DCV		
Sealing of conduits, ducts or other conn				Y	N	N/A	N/C	D		
Integrity of conduit system and mixed s				Y	N	N/A	N/C	D		
Earthing and equipotential bonding sati				Y	N	N/A	N/C	DCV		
Insulation resistance is satisfactory (NB				Y	N	N/A	N/C	D		
Protection devices (Limit sws, phase rot	TOLs) operate correctly			Y	Ν	N/A	N/C	D		
Cable Glands and adaptors								Grade	Remarks	
Cable glands details available, record (a	vailable=Y, not recorded=N/C)			Y	Ν	N/A	N/C	DCV		
Cable glands certificate details available		ed=N/C)		Y	N	, N/A	N/C	DCV		
Adaptors and plugs details available, re-				Y	N	, N/A	N/C	D		
Adaptors and plugs have sufficient enga				Y	N	N/A	N/C	DCV		
Glands and adaptors Ex markings are su	-			Y	Ν	, N/A	N/C	DCV		
				-	•	-	-		- ·	
Environment					- /		• • • • -	Grade	Remarks	
Equipment adequately protected agains		etC		Y	N	N/A	N/C	DCV		
Dust and dirt on the equipment and cat	ie are within acceptable limit			Y	Ν	N/A	N/C	DCV		
Special conditions								Grade	Remarks	
Special conditions on certificate are sat	sfied			Y	Ν	N/A	N/C	D		
Notor										
Notes:										

Inspected:

Date:\_

Checked:

# 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')



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:
Old repair label details: Reported fault (if any):	
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	

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')



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 inspe	ection - Yes / No		
Covers and fasteners:		Base of enclosure:	
Threaded holes:		External corrosion:	
Surface coating:		Gland entries and glane	ds:
General external condition:			
Enclosure dismantled:		Degree of protection: IF	
Internal Condition - Dust/Liquids:		Corrosion:	Heat:
Missing parts:	_	T	
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')



Gene	ral			
Tag n	0.:	Site:		
P&ID:		Area Classifica	ition:	
Equip	oment Details			
Equip	ment type:	Gas group (IIA	/B/C):	
Manut	facturer:	Temp class (T	1-T6):	
Model	no.:	Certificate no .:		
Serial	no.:	Test authority:		
Opera	ator			
Name	:	Identification n	0.:	
Comp	any:	Company regis	stration:	
Equip	oment 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			
(I)	Overcurrent, overload and earth-fault devices			
(m)	Earth-fault trip devices			
(n)	Timing devices			
(0)	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:.	ΜΩ	
Primary winding to earth:	ΜΩ	
Secondary winding to earth:	ΜΩ	
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


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 n		Site:	
P&ID:		Area Classification:	
Equi	pment Details	-	
Equip	ment type:	Gas group (IIA/B/C):	
Manu	facturer:	Temp class (T1-T6):	
Mode	l no.:	Certificate no.:	
Serial	no.:	Test authority:	
Oper	ator		
Name	:	Identification no.:	
Comp	pany:	Company registration:	
Equi	pment 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		

	•
1.	Max. out of plane of box flanges:
	Max. out of plane of cover:
	Max. flameproof gap when bolted up:
	Max. diametral clearance of spindles:
5.	Max. diametral clearance of gland to gland apertures:
	Static pressure test – pressure:
	Water jacket – pressure test:Capacity:
Certific	cation drawing no(s).:
Rema	ks:

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:...../...../.....

Based on AS/NZS 3800:2005 "Uncontrolled" Form HAD 1.3 Rev\_0



# 12 Schedule of Equipment and Conditions Requiring Compliance Status Attention

Тад	P&ID No.	Location	Reason for non-compliance
AD 1317-SVO- 01/02	AD 1317-10-7000	ESV-01	Solenoid housing cracked at gland entry.
AD 1317-JB		Gas Conditioning Skid	Nil certification available for plugs.
AD 1317-PIT-01		Gas Conditioning Skid	Nil hazardous area certification available.
AD 1317-ZSC- 02AL	AD 1317-10-7000	TCV-02A/B	Nil hazardous area certification available.
AD 1317- SVO/SVC-03A AD 1317- SVO/SVC-03B	AD 1317-10-7000	SDV-03A	Replace the equipment due to age and condition.
AD 1317-ZSC- 02BL	AD 1317-10-7000	TCV-02A/B	Nil hazardous area certification available.
AD 1317-LSH-01	AD 1317-10-7000	FS-01	Replace the equipment due to age and condition.
AD 1317-SV-9A	AD 1317-10-7001	Water bath heater H-1A	Nil hazardous area certification available.
AD 1317-SV-10A	AD 1317-10-7001	H-1A/B fuel gas supply line	Nil hazardous area certification available.
AD 1317-SV-8B AD 1317-SV-9B	AD 1317-10-7001	Water bath heater H-1B	Nil hazardous area certification available.
AD 1317-PT-04	AD 1317-10-7002	KO-02 outlet (DN80)	Nil certification available for plugs.
AD 1317-LSH-02	AD 1317-10-7003	Slop tank SD-1	Flameproof device substantially painted and potentially compromising flame paths.