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TECHNICAL DOCUMENTATION, OPERATION AND MAINTENANCE MANUAL

5230 Series FLP Enclosure

Exd I Mb

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1 Description and Technical Features of Flame-proof Enclosures

1.1 General

Model 5230 series flame-proof (FLP) enclosures with safe Ex subassemblies installed inside the enclosure provide safe operations of electrical devices. These devices are not autonomous and require additional certification after assembling. The FLP enclosures are intended for installation of approved types of flame-proof feed through Ex subassemblies. These are used for the input and output of cables to and from the internal equipment in the enclosure.

An enclosure can have one of the following optional covers:

- Solid Cover;
- Cover with lock;
- Cover with lock and/or hole(s) for round and/or rectangular sight glasses;
- Cover with hole(s) for round and/or rectangular sight glasses.

1.2 Operating and Storage Environments

The enclosures were designed for operation in the following conditions:

Ambient Temperatures:-

Models ME5230-2-99-060 to ME5230-2-99-079 which is not fitted with a window and can be used in ambient temperatures -20°C to +60°C.

Models ME5230-2-99-080 to ME5230-2-99-089 which is fitted with a round window NCO-F-75 (ATEX Certificate KDB08ATEX236U) and can be used in ambient temperatures 0°C to +40°C.

Models ME5230-2-99-090 to ME5230-2-99-099 which is fitted with a rectangular window NCO-P-7 (ATEX Certificate KDB13ATEX0121U) and can be used in ambient temperatures -20°C to +60°C.

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– RH	– Up to 95% @ 40°C
– Operating position	– Any (avoid installing feed-through oriented upwards)

The enclosures should be stored in enclosed environment, safeguarded against the weather, at a temperature not lower than 5°C. They must not be laid directly on the ground or stored in a corrosive atmospheres.

1.3 Operating Conditions

The enclosures are intended to provide safety in underground and surface mines with methane or coal dust explosion risk. The products provide high level of protection against explosions.

They are labelled as follows in accordance with IEC 60079-0:

Exd I Mb

See section "*Limitations on Use and Specific Instructions for Explosive Environments"* of this document for the limitations on use and specific instructions for explosive environments.

1.4 Standards and Recommendations

FLP Enclosures 5230 Series are manufactured according to the principles of good engineering practice regarding safety and the current state of the art as per the following standards:

- IEC 60079-0:2013,
- IEC 60079-1:2010.

1.5 Technical Specifications

1.5.1 IP rating

- The degree of protection rating of the enclosure is IP55

Or

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- IP66 when fitted with optional O-ring

Or

- IPXX being the lowest IP rating of any separately certified devices fitted to the enclosure

1.5.2 Cover and Hole arrangements

Cover type	Description	Size and number of threaded holes M__ x 1.5 - 6H	
		Bottom wall	Left and right walls
1	Solid Cover	M20 - max. 24 M25 - max. 21 M32 - max. 15 M40 - max. 12 And there combinations	M20 - max. 12 M25 - max. 9 M32 - max. 9 M40 - max. 6 Knob-operated switch actuator at M24x1.5 thread with a lock and their combinations
2	Cover with a knob-operated switch actuator with a lock		
3	Cover with a knob-operated switch actuator with a lock and sight-glass units.		
4	Cover with sight-glass units		

1.5.3 Enclosure dimensions:-

Mounting Dimensions: 470 x 147.5 x 147.5 - 6x ⌀16

External Dimensions: 385 x 500 x 321

Internal Dimensions: 330 X 382.5 x 261

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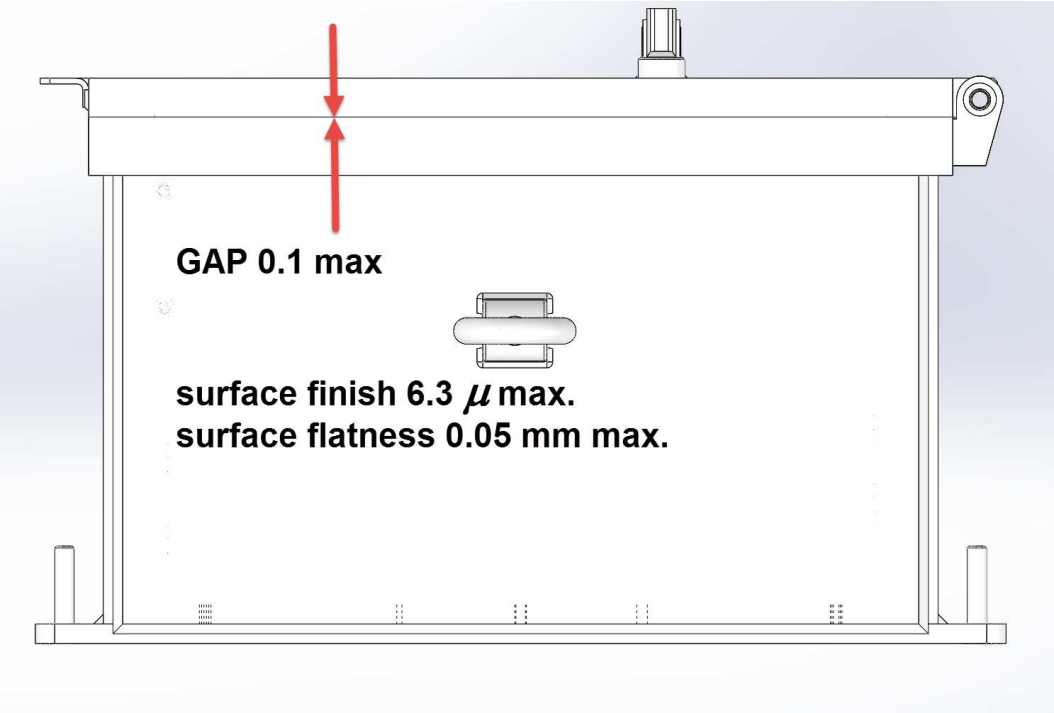
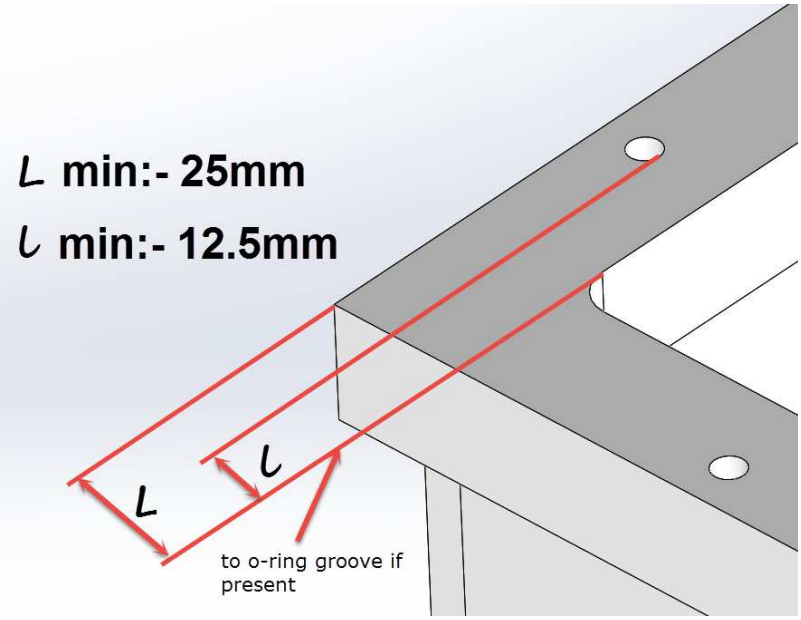
1.5.3 MEASUREMENTS





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2 Design

2.1 Safety Assurance

The enclosures were designed and manufactured to provide protection against risks typical of underground mines, such as methane or coal dust explosion

3 Description

3.1 The enclosures are made from steel plates.

3.2 An enclosure contains the following components:-

- Housing (Body) with outer and inner Earth terminals (number depending on the number of cable in-puts/outputs;
- Hinged cover with bolts.
- The following cover builds are available on demand:
    - Cover with a Knob-operated switch actuator with a lock;
    - Cover with round sight glasses;
    - Cover with rectangular sight glasses.

See the technical specifications for the number and size of threaded holes for in-put/output devices: penetrations, tubular glands, Ex caps, Ex thread adapters, plugs or controls that can be installed on the side walls of the body.

3.3 See Fig.1 for the dimensional drawing of the enclosures.

4 Product Testing

Each enclosure is tested for compliance with the requirements of IEC 60079-0 and IEC 60079-1 in accordance with the company standards.

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5 Installation

You can install your enclosure in any position but avoid orienting it with the feed-through facing up. Bolt or hook the enclosure to/on the support structure or wall.

6 Installation Instructions

6.1 General

The following work should be done by a skilled person licensed to install electric equipment in explosive environments, in conformity with the applicable codes.

The holes for the sight glasses have to be cut out and the sight glasses have to be installed in accordance with the technical and operating documentation and with the sight glass verification drawings.

Use socket wrenches conforming to ISO 2236 to install and remove the enclosure.

6.2 Preparing the Enclosure for Electric Equipment

Open the enclosure and:

* Undo the bolts securing the front cover;
* Tilt the front cover, taking care not to damage the flame-proof surfaces;
* Install the electric equipment.

6.3 Closing the Enclosure

Before closing the enclosure:

- Check that the connections of the equipment and wires in the terminals are correct and secure;
- Clean the surfaces of the flame-proof joints and lubricate them with acid-free Vaseline;
- Close the cover and tighten the bolts as far as they go.

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7 Maintenance

An inspection and maintenance program should be implemented on site as per the requirements of AS NZS 2290.1 Electrical Equipment for Coal Mines – Introduction, Inspection and Maintenance and AS NZS 3800 Electrical Equipment for Explosive Atmospheres – Repair and Overhaul, (or equivalent standards).

Perform regular maintenance with frequency depending on the environment: at least every 3 months and after each failure. This work should be done by a qualified person.

Maintenance of the enclosure itself consists of cleaning the flame-proof surfaces of old lubricant residues and re-applying acid-free Vaseline.

The instruction for maintenance of the enclosure together with the inbuilt electric equipment should be written by the manufacturer or contractor.

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8 Limitations on Use and Specific Instructions for Explosive Environments

8.1 Limitations on Use in Explosive Environments

The product can be used in methane-releasing sections of mines and in headings at risk of coal dust explosion

8.2 Specific Instructions for Explosive Environments

8.2.1 The enclosure with electrical equipment fitted inside should undergo the required tests

8.2.2 Rotary machines and other devices generating vibrations should not be encased.

8.2.3 Fluids cannot be used if there is a risk that they may produce explosive mixture during their decomposition or if there is a possibility of oxygen release.

8.2.4 Primary and secondary cells or batteries can only be used in compliance with the requirements of E attachment to IEC 60079-1.Enclosures consisting of capacitors or heated elements, for which it is required to specify discharge or cooling time, have to be marked in accordance with Section 6.2 of IEC 60079-0. Circuit-breakers and contactors filled with oil are not allowed.

8.2.5 All input elements and locks shall be mounted in accordance with Chapter 5 of IEC 60079-1.

8.2.6 Equipment mounted in the enclosure may be encased in any way, provided that there is at least 20% of unrestrained area in any cross-section of the enclosure, which provides unrestrained gas flow and thus unrestrained explosion flow. In order to achieve the above result, you can add up respective free spaces, provided that each spatial dimension in any direction amounts to 12.5 mm.

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8.2.7 For connection of fire resistant shield components of distribution box, at least 8.8 mechanical class screws shall be used.

8.2.8 Input devices: inlets, pipe sealing equipment, Ex dummy plugs, Ex threaded adapters and feed-through, and control elements must have certificates for compliance with IEC 60079-1 and create fire resistant connections of L-minimum 8 mm in length and minimum 5 complete turns at least medium tolerance quality of the thread.

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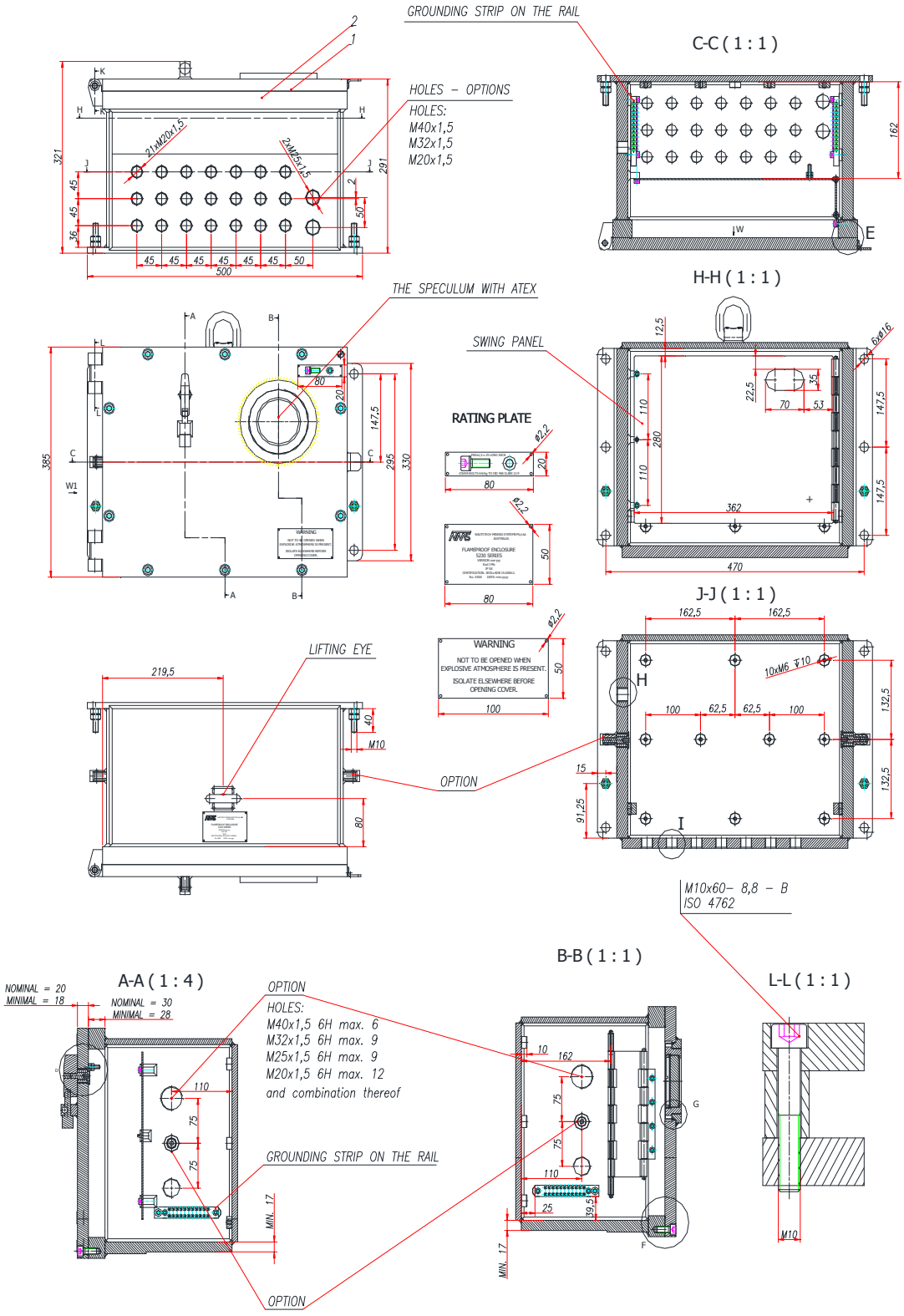

Fig. 1: Dimensional drawing

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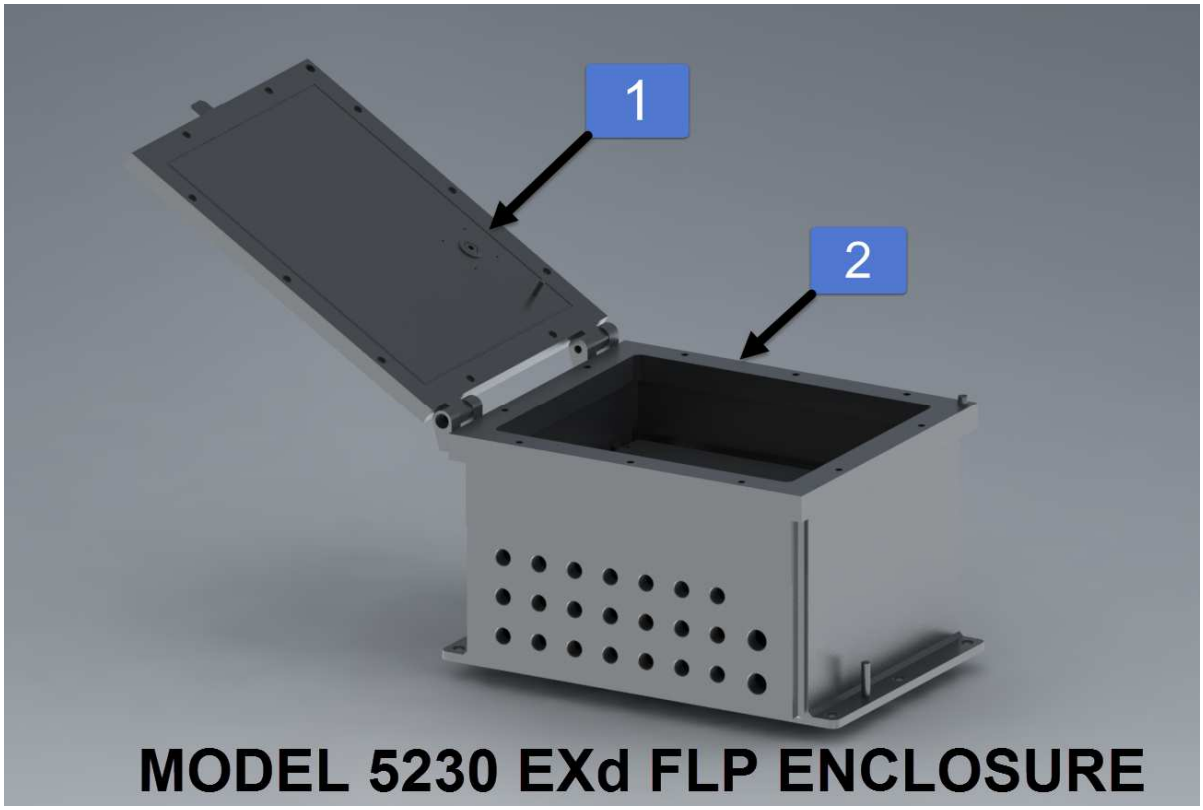

1 – Cover; 2. Housing (Body)

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9.1 Other Nautitech Products

Description	Image
Basic Methane Master Monitoring Shutdown System (known as MMS) is a Ex d ia device for detecting Methane Gas (CH4) and for the safe handling of connected equipment in the presence of detected CH4 gas above a pre-set threshold. The MMS is installed in underground machines to activate alarms and shut down if methane gas is detected preventing fire and/or explosion. The MMS is typically used in underground coal mines, but it can be used in any situation where the potential presence of CH4 gas is a concern.	

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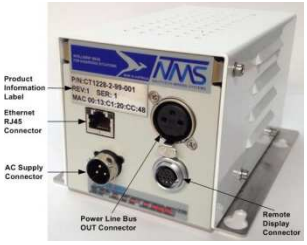
Description	Image
Juganaut Methane Master Monitoring Shutdown System (known as JMM) is a Ex d ia device for detecting Methane Gas (CH4), monitoring operating temperatures of engine components and for the safe handling of connected equipment in the presence of detected CH4 gas and high operating temperatures. The JMM is installed in underground machines to activate alarms and shut down if methane gas is detected preventing fire and/or explosion. The JMM is typically used in underground coal mines, but it can be used in any situation where the potential presence of CH4 gas is a concern	 
The Nautitech Spitfire system transparently connects physically separate Ethernet devices or networks by transmitting network packets over the power lines that run between them. The system is designed to work in harsh industrial environments, such as underground coal mines.	
The Nautitech 5060 Series Flameproof Enclosure is designed to comply with the requirements of the IECEx scheme. It has multi-purpose applications by accommodating the various lights, cameras, displays and other equipment through the use of different Covers.	

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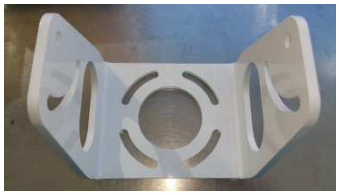
Description	Image
Nautitech Video Cameras HD and HD Brite Video Camera can be used in multiple applications with numerous setups and can be fitted with wide selections of lenses. The HD Brite has 4 built-in LED globes for direct illumination of the area in front of the video camera. Thermal & Thermal IP Cameras capture the relative heat signature of the visible scene. The camera core is a state of the art, Tau 320 camera core from FLIR, who is the market leader in IR imagery. The Thermal IP The camera video output is NTSC video converted to a differential video signal to suit the long cable runs. This has to be connected to a video server through a video balun or ExD 3.5" Colour LCD Display Assembly.	 
Nautitech Lights Built to withstand heavy vibration and impact with Long lasting LED globes. The Nautitech light series come in different configurations including view angle, coverage and light colour. **Housed in the** *Robust 316 S/S enclosure with IP66 (Ingress Protection rating)* **with** *Multiple rear and side gland entries.*	
Nautitech Displays Large display (Non Ex) 10" / 25cm (diagonal) HD display (13.5cm x 21.5cm) and Medium display (Non Ex) 7" / 18.2cm (diagonal) HD display (10cm x 15.5cm) both have Up to 8 IP camera inputs and Up to 4 simultaneous splits (4-way split screen). Standard display (Ex d) has a 3.5" / 8.9cm (diagonal) display (7.3cm x 5.6cm) and Up to 2 analogue inputs. All display enclosures can be sold with or without their colour video display and or our recommended cable	  
Nautitech Universal Mounting Bracket is used to mount the Nautitech 5060 series flame proof enclosure. It is designed to minimise cross loading on the enclosure and can be fixed onto a shielding plate if required.	

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Description	Image
Bambach Cable is recommended for use with Nautitech Display enclosure applications such as lights & cameras.	
Cable Gland (part Number CM002182) is recommended to be used with Bambach cable and enclosure applications.