

XP & XF

Flame Proof Smart IR Camera Housings & Pan Tilt Units



IECEX/ATEX Certified
II 2 G Ex db IIC
II 2 D Ex tb IIIC



Installation & Maintenance Instructions



This manual should be read before attempting to connect or operate the equipment
This equipment shall be installed in accordance with the latest local/national codes of practice, and standards
e.g.: BS EN 60079-14:2014 Explosive atmospheres – Part 14: Electrical installations design, selection and erection
(IEC 60079-14:2013)

Whilst every effort has been made to ensure that all information in this document is correct at the time of publication, due to our policy of continuous improvement, the company reserves the right to change any information contained herein without notice or reference.

With the exception to Annexe B which must be referred to the certification Body.

Amendment Record

<u>Issue</u>	<u>Date</u>	<u>Details of Amendment</u>
1.0	07/02/2024	First Issue
2.0	29/04/2025	Added password to cameras

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Before Installation of the equipment ensure that:

1. The installation instructions are read and understood
2. The correct tools are available for use when installing

1.0 General



Important Safeguards & Warnings

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

Prior to installation and use of this product, observe the following warnings.

1. Installation and servicing should only be carried out by qualified service personnel and in accordance with all local/national codes of practice and standards e.g. EN60079-14:2014 and IEC 60079-14:2013 no modification to the certified product allowed.
2. It is essential that provision is made for overload, short circuit and earth fault protection for this equipment. Therefore, we recommend that a double pole, mains rated, miniature circuit breaker rated to the max power consumption of the unit, must be incorporated in the electrical installation of the power supply to this product.
3. A readily accessible disconnection device shall be incorporated in the electrical installation wiring, to provide all pole isolation of the supply to the equipment.
4. Only use tools and replacement parts supplied or recommended by EATON. This unit does not contain any user serviceable parts.
5. The equipment is designed to satisfy the requirements of Clause 1.2.7 of the Essential Health and Safety Requirements ANNEX II of ATEX Directive 2014/34/EU.
6. Be aware that aggressive substances may require extra protection of the equipment to maintain its integrity and explosion protection.
7. The equipment may need additional means of protection if it is to be installed in locations where it may be exposed to excessive external stresses e.g. vibration, heat, impact and damage.
8. Any repairs or replacement parts must be done by the manufacturer or an approved repair agent.
9. Due to the large weight of the units, correct planning and equipment must be used when unpacking and installing also for the P&T units the correct lifting points must be adhered to (see section 3.1.2)
10. Systems can be fitted with integral Fiber Optic transmitters, the label coding includes the lettering "op pr" after Ex d, denoting that the enclosure employs the type of protection b) protected optical radiation, type of protection "op pr" according to clause 5.1 of EN60079-28:2015. Please refer to special conditions for safe use.
11. When batteries are fitted to electronic equipment they must be removed and are not to be replaced.
12. After installation, operatives must adhere to the following warning on the unit's label:
13. Class 1 Laser Product

**WARNING: DO NOT OPEN WHEN ENERGISED OR WHEN AN EXPLOSIVE
ATMOSPHERE IS PRESENT. CLEAN WITH DAMP CLOTH.**



This symbol indicates that dangerous voltage constituting a risk of electric shock may be present within this unit.

2.0 Description

The series 'X' camera assemblies have been developed to meet the rigorous requirements of Flame proof and dust-ignition-proof electrical equipment for installation and use in hazardous locations found in the onshore and offshore, oil & gas and Petro-chemical installations. The units may also be used in marine and industrial hazardous environments.

The housing body and all external parts are manufactured entirely of AISI 316L stainless steel for low maintenance and protection from corrosion.

Each of the main end covers is fixed to the body by five (5), M6 x 16-mm stainless steel hex cap screws, with the cable entry cover of the XP and XT systems using five M5 x 12-mm stainless steel hex cap screws. The weatherproof seal of the union between the body and end covers is maintained by use of 'O' ring seals fitted in purpose made grooves.

The camera housings feature an internal sliding camera mounting rail which is fitted with an internal heating element/de-mister, thermostatically controlled, to maintain operating temperature, and ensure clarity of vision through the window, together with the optional integral window wiper mechanism.



The viewing window is made with toughened glass, or in the case of the Thermal Imager and Dual Imager versions, is made from Infra-red transparent material and which is factory fitted with a mechanical window guard.

The mechanical thermal window guard **MUST** not be removed.

There are two system types that are made up from different combinations of the 'X' series certified units; these are:

XF series, fixed camera housings.

XP series, P&T units with integral pan and tilt shafts and a fixed base section for cable connection.

Each of the above contain an integrated smart illuminator.

The XF series fixed housings comprise a single tube section with either 3 cable entries in the rear cover or 1 in the side (model dependent).

The XP and XT units have a single cable entry into the fixed base section.

The 'X' series housings and integrated pan/tilt units have been designed and certified to the ATEX Directive 2014/34/EU and IECEX, with the ratings as detailed in:

Section 6.0 Specifications, Technical data & Special conditions for safe use.

Note: T class and ambient temperature, is dependent on the assembly configuration and maximum internal power dissipation.

The project requirements and unit certification label must be checked by the installer before installation, to confirm that the product supplied is suitable for the intended installation zone and environment.

Manufactured in accordance with CE & IEC norms

EN 60079-0, EN 60079-1, EN 60079-28 & EN 60079-31, IEC 60079-0,

IEC 60079-1: & IEC 60079-31.



2.1 Versions

There are various camera configurations available within the range; these include Day/Nightcameras with optional wiper, integral washer or external washer, Thermal Imager and Dual Camera Day/Night and Thermal units.

The range also includes options for Standard HD IP cameras, Digital Fiber optic convertors and Media convertors.

Due to the large variations of possible configurations, this manual only covers the standard installation of the units.

For detailed connection and configuration of units, the installer should refer to individual projectspecific drawings and information.

In addition to this manual there are various addendums available that cover the specific functionof electronics that can be included within the camera assemblies.



2.2 Supplied Equipment

Contained in the package are the following items:

- Camera system
- Installation/Technical Manual
- Optional Sunshield and Fixings
- Optional Washer Nozzle Kit

2.3 Recommended Tools

For installation and maintenance purposes, we recommend the following hand tools:

- Voltmeter/Ohmmeter
- Torque wrench kit Set to 7.5Nm, Hex Allen wrench bits of 5, 4 & 3mm
- Spanners 8mm, 10mm & 13mm A/F
- Screw drivers standard and Phillips head
- Pliers side cutting and long nose

2.4 Recommended Spares

For Maintenance purposes, we recommend the following spares:

PX99903784 LW PTZ FLANGE SEAL
PX99902859 WIPER BLADE ASSEMBLY
PX99903785 LW PTZ WASHER NOZZLE KIT
PX99903786 MK3 BASE ENTRY O-RING 111mm x2.5mm

3.0 Installation

In or In order to ensure proper wiring and system operation of all components, it is recommended that all units and all associated control equipment be tested at your Factory before field installation is attempted.

3.1 Unpacking

On receipt of the units ensure that the cartons are undamaged and that the contents are all correct and complete. After unpacking it is recommended that the packing materials are kept safe, should you need to return the unit for repair, or maintenance. The protective plastic film should be removed from sun-shields before they are fitted.

3.2 Handling

Due to the reinforced steel construction of the camera units, correct handling is of great importance.





Lifting and positioning XP and XT units should always be completed using suitable lifting equipment that is capable of supporting loads in excess of 65Kg. XP and XT units should only be lifted using the L-body/ T-Body, with equal support on both sides. The camera housings must not be used for lifting. To avoid damage to the unit DO NOT rotate the camera housings by hand. The units should not be handled using direct contact with ferrous metal equipment. (see section 4.1 for details)

3.3 Mounting

Ensure the desired mounting surface can support four times the combined weight of the complete unit.

Do not stand or place objects “directly under” the installed camera system.

Due care and attention must be taken to ensure enough clearance is allowed to allow full rotation of the unit with its associated equipment, and that the moving unit cannot strike, or make contact with personnel.

It is strongly suggested that the EATON range of mounting brackets are used



3.1 Mounting the XP Series

The XP pan/tilt/housing assembly may be mounted onto various structures such as bulkheads, walls or towers, it can be mounted in the inverted position, but this must be specified upon order.

The complete assembly is mounted to the support structure via its base mount which has 11mm clearance holes for four (4) No. M10 fixings. (Fig 1)

The type and size of these fixings to be supplied by the user/installer and must be suitable for the specific installation requirements.

An alternative is to use the BPW6500 Wall mount bracket (Fig 2)

Fig.1 XP40VE Smart IR - Example XP Series unit showing base mount fixing points

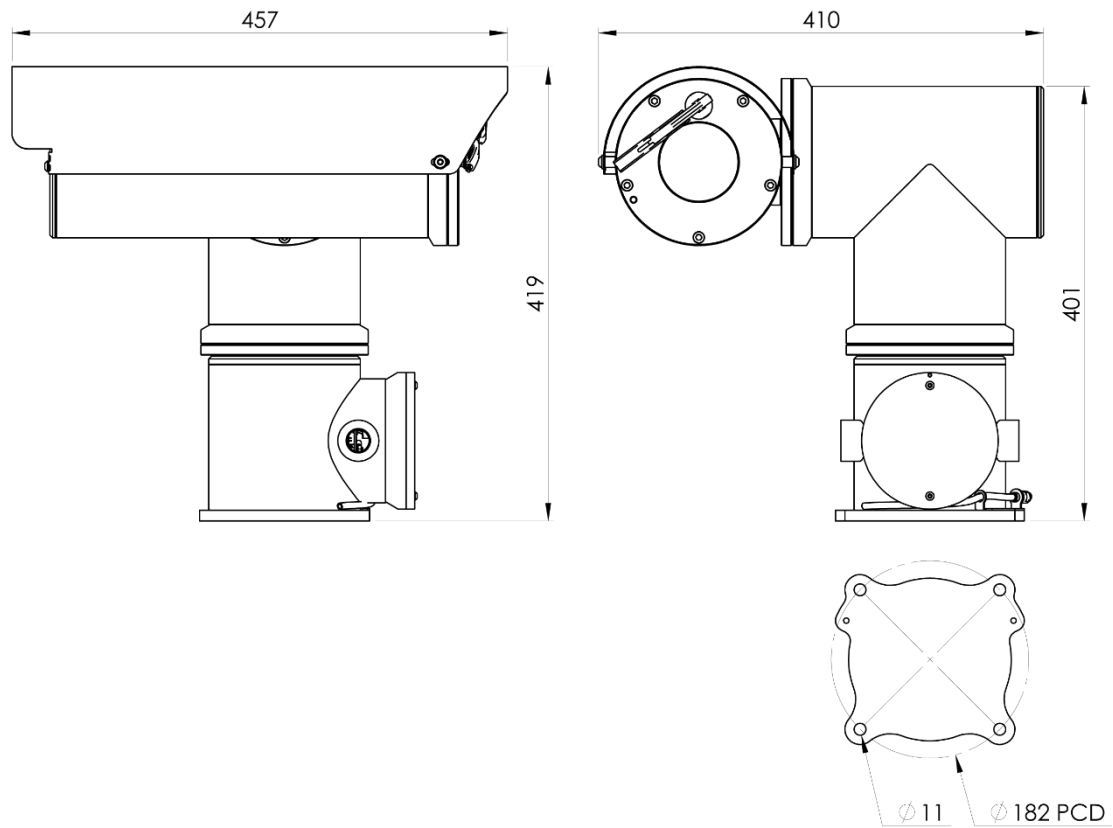
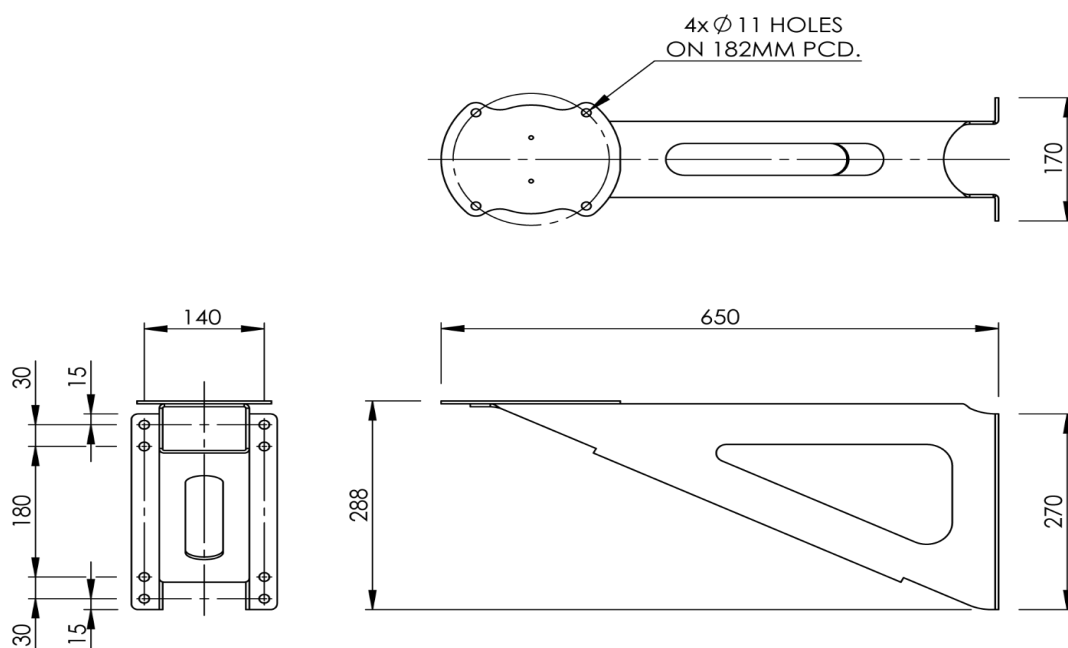


Fig.2 Example mounting bracket: BPW6500 Wall Bracket



3.3.2 Mounting the XF Series

The XF Series fixed housing assemblies may be mounted onto various structures such as bulkheads, walls or towers. The units have a mounting plate on the bottom of the housing tube that have four (4) No. M6 Threaded fixing points. (Fig 3)

The type and size of these fixings to be supplied by the user/installer and must be suitable for the specific installation requirements.

To gain flexibility of the cameras view direction one of the EATON is needed, these comprise of the BFP00SW Swivel joint (Fig 4), the BFW32SW (Fig 5) a combination of the BFW5000 and BFP00SW.

Depending on Housing length, some wall brackets do not allow for the camera to view directly away from the Wall and must be rotated or tilted to allow room for gland entry.



Fig.3 XF60VN Example XF Series unit showing mount plate fixing points

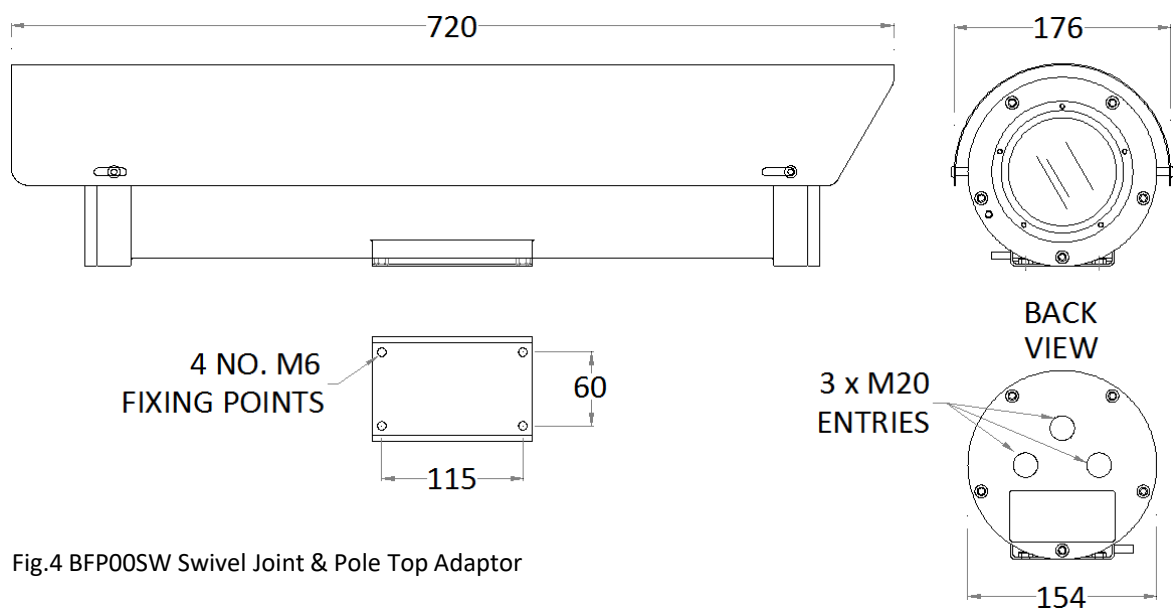


Fig.4 BFP00SW Swivel Joint & Pole Top Adaptor

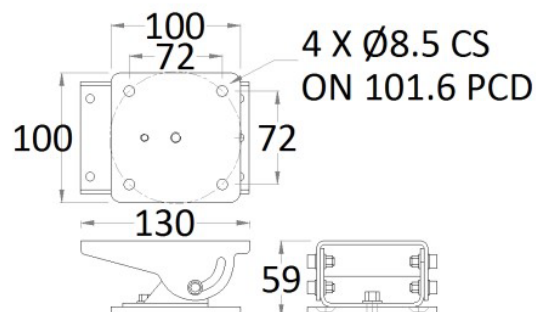
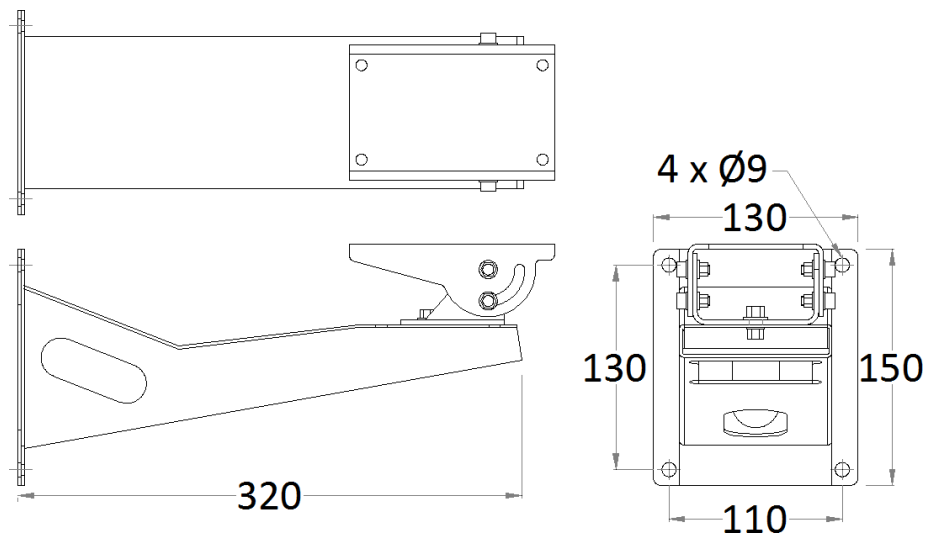


Fig.5 BFW32SW Swivel Joint & Pole Adaptor



3.4 Accessory Installation

3.4.1 Sunshield Installation

Sunshields are supplied uninstalled to prevent damage during shipping and unpacking. They are supplied with a protective white film that must be removed prior to installation. The correct sunshield fixings, for each model, are supplied with the camera system and should be positioned as detailed below.

To mount the sunshields, first they must be positioned correctly and fixed with a Nylon spacer between the sunshield and the camera housing, the M6 A4 Button head screws supplied must have the red fiber washer fitted before fixing the sunshield. (Fig 6 & 7)

Long and Medium sunshield have four equally sized fixings for each corner, but the short sunshield has two fixing types. (See Fig 7)

Fig.6 Type A Sunshield Installation

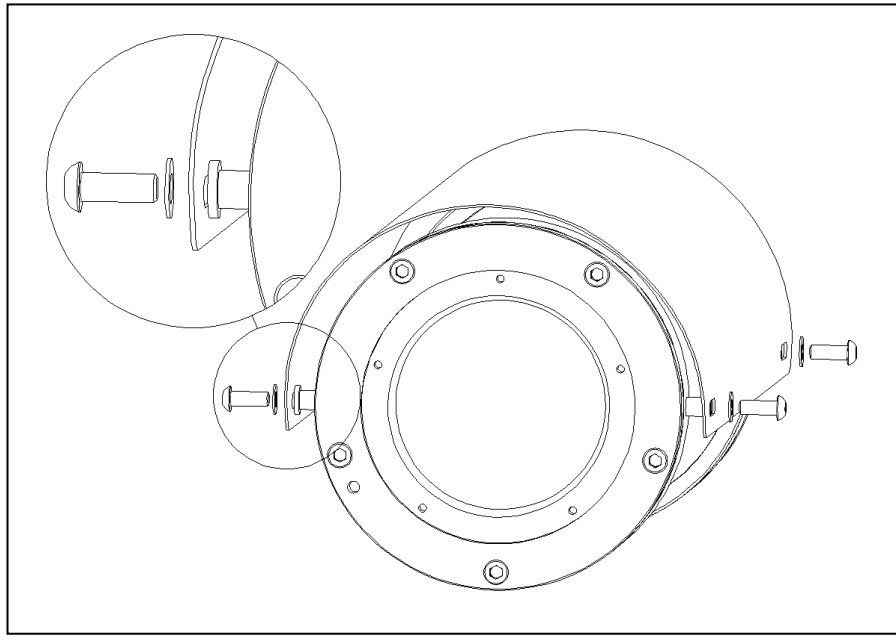
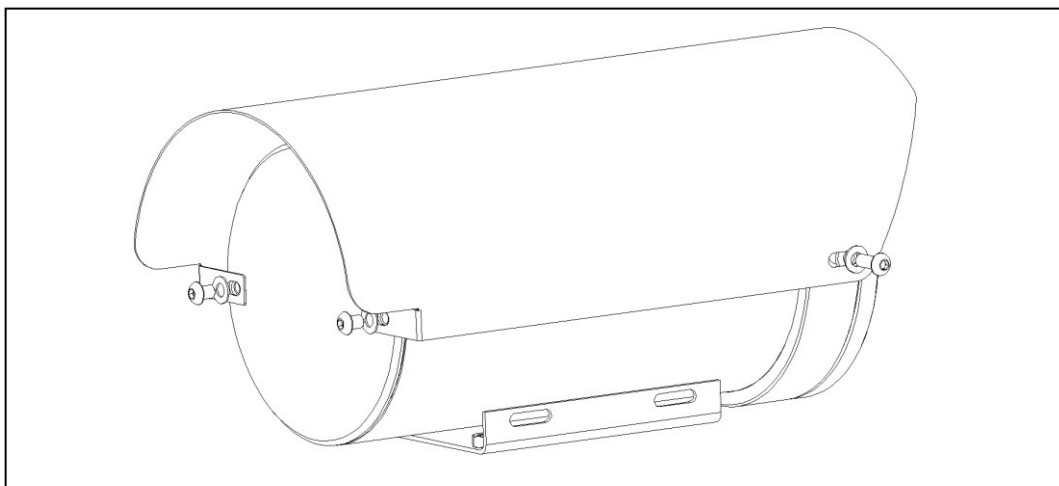


Fig.7 Type B Sunshield Installation



3.4.2 Washer Nozzle Installation

A continuous rotation P&T system, if supplied with an external washer unit, is supplied with a suitable washer nozzle and mounting bracket. These should be fitted during installation with the supplied fixing and positioned to allow cleaning fluid to reach the camera housing window when the wash command is sent. The supplied washer nozzle brackets are specific to housing type and are delivered pre-aligned for use. (Fig. 8)

When a wash command is sent to the camera, the unit will move to the factory set position to allow for the screen to be washed.

For non-continuous rotation P&Ts and fixed housings the washer nozzle is installed on the front window flange. (Fig. 9)

Fig.8 400mm Housing washer nozzle

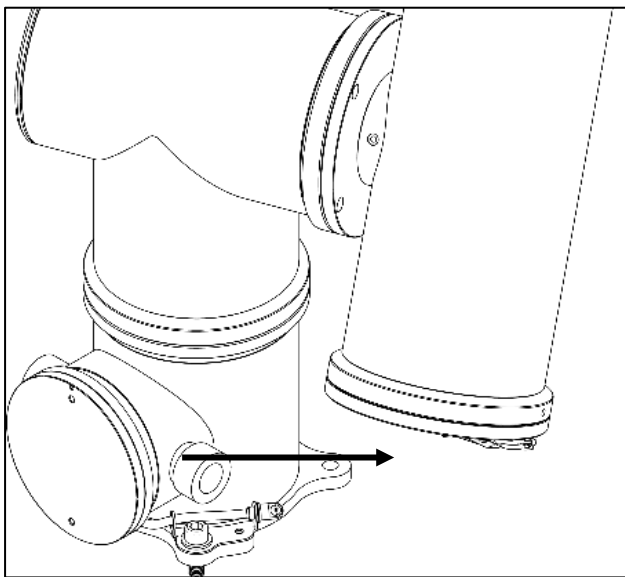
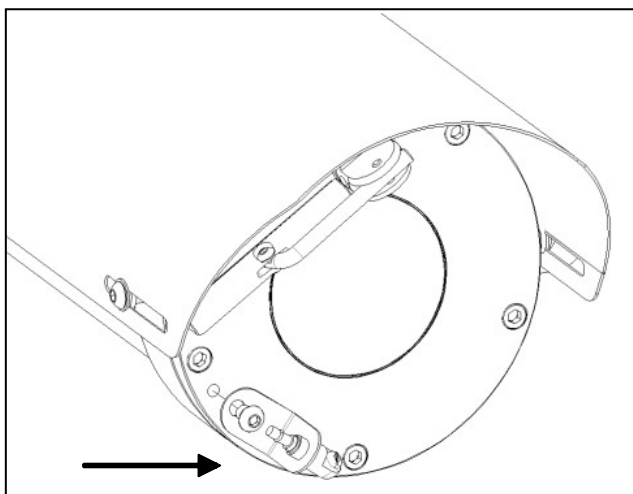


Fig.9 Non-continuous Rotation P&Ts and Fixed housings washer nozzle



3.5 Electrical Installation



Electrical installation and servicing should only be carried out by qualified service personnel and in accordance with all local/national codes of practice and standards e.g. EN 60079- 14:2014 and IEC 60079-14:2013.

Due to the large number of possible configurations, this manual only covers the standard installation of the units.

For detailed connection and configuration of units, the installer should refer to individual project specific drawings and information.



Units can be supplied, as required, with either AC or DC 24V, 110V or 230V Supply; all $\pm 10\%$ The units should only be powered from the specified voltage, no allowance is made for varying voltage supply.

**WARNING: IRREPARABLE DAMAGE TO THE UNIT WILL RESULT FROM AN
INCORRECT POWER SUPPLY VOLTAGE**

3.5.1 Electrical Installation XP Integrated Pan, Tilt, housing assembly

For safe access to electrical connections with the XP and XT series cameras, refer to ATEX controlled certified ANNEX to this manual.

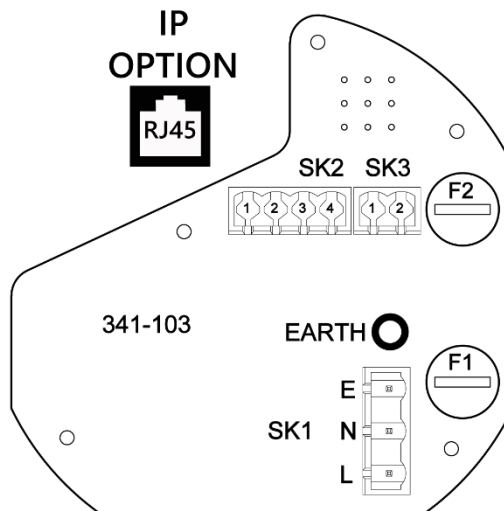


**CAUTION SHOULD BE TAKEN WHEN REMOVING AND INSERTING ANY ENTRY COVERS/ FLANGES/
CABLE GLANDS TO AVOID INTERNAL CABLES BECOMING SNAGGED OR STRETCHED
ON INTERNAL OBJECTS AND FITTINGS.**

**WARNING - THE BASE ENTRY COVER AND GLANDS SHOULD NEVER BE REMOVED WHEN THE UNIT IS
ENERGISED. WAIT 5 MINUTES AFTER DE-ENERGISING.**

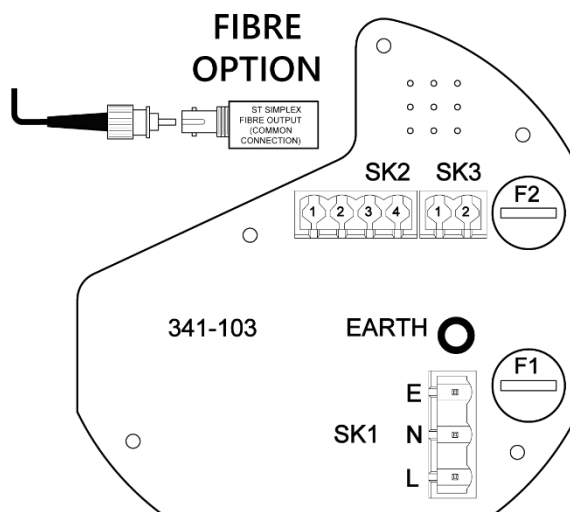
3.5.2 XP Common Connection Examples

Always refer to project specific drawings and information



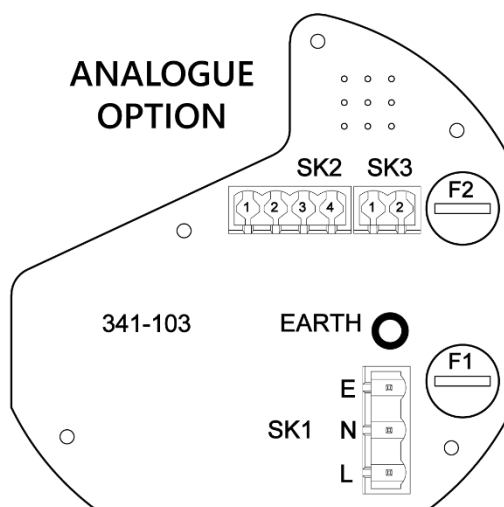
IP Connections:

- RJ45
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC



Fibre Connections:

- Fibre Connectors can vary
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC



Analogue Connections:

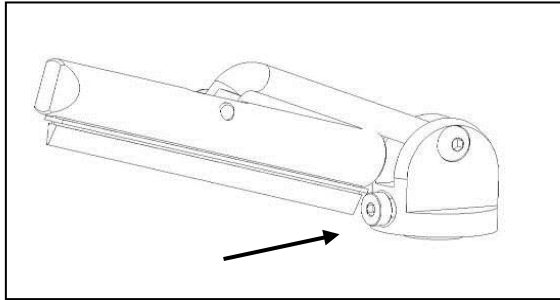
- SK1 E, N & L
- SK2 1= Video Signal
 - 2= Video Screen
 - 3= Data A+
 - 4= data B-
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC

3.5.3 Electrical Installation XF Series Units



1. Cable entry type to the housing will be via 1 x M20 x 1.5 ISO entry at the side adaptor of the housing, or via the 3x M20 cable entry end cover on the rear of the housing, solely for connection of power and signal wiring, no internal user wiring is allowed in this unit.(Fig 11, 12 & 13)
2. Keep a wiring diagram with the system for use and later reference.
3. For maintenance purposes, consult separately supplied additional wiring drawings specific to the purchase order, for as-built wiring and connection details of the unit.

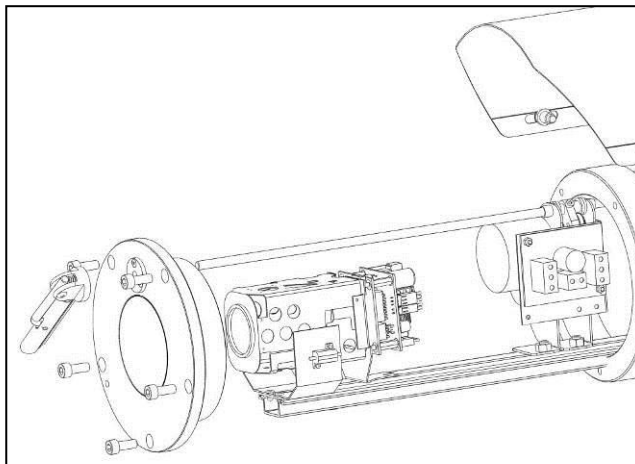
Fig.11 Removing the Wiper Arm



To gain access to the internal camera rail, first the rail will need to be slid out to allow connections to be made.

If a wiper is fitted, first take note of the parked position of the wiper arm and then remove it by loosening the M4 cap head screw that clamps to the wiper shaft. Keep the wiper and nylon washer safe for refitting. This is best done without the sunshield fitted.

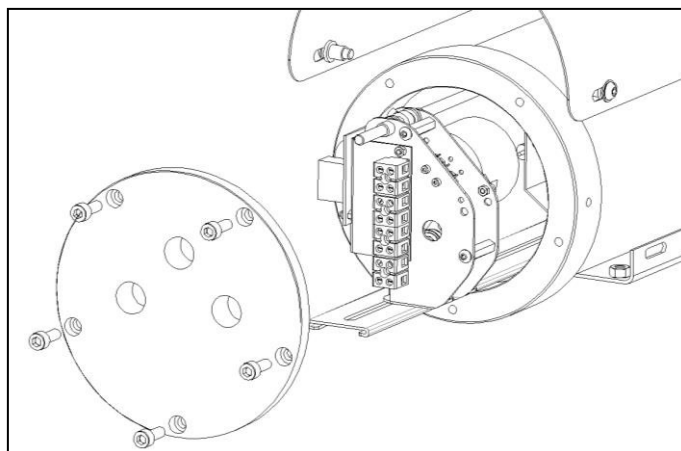
Fig.12 Removing the Window Cover



Remove the front window flange by first removing the 5 x M6 screws and then carefully extracting the window cover.

Next slide out the camera mounting rail, if required.

Fig.17 Removing the rear Cable Entry Cover



Remove the rear cover by first removing the 5 x M6 screws and then carefully extracting the flange.

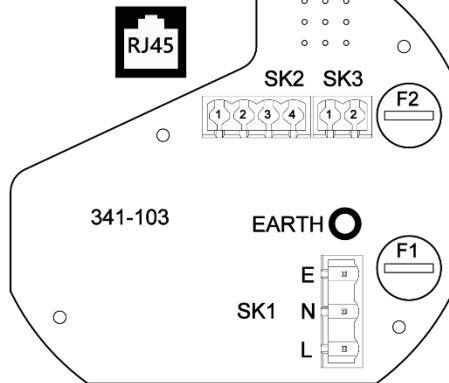
Next slide out the camera mounting rail to reveal the incoming cable connection terminals.



Warning: This cover must not under any circumstances be removed until at least 5 minutes after the disconnection of power source.

3.5.4 XF Common Connection Examples

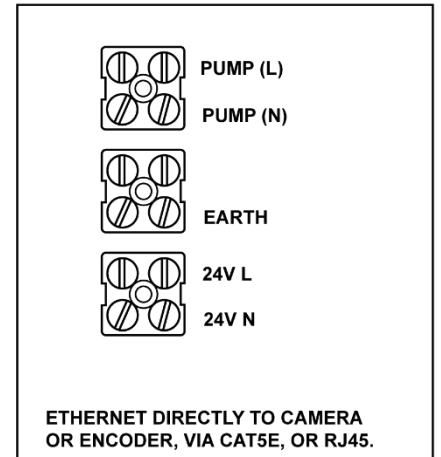
IP OPTION



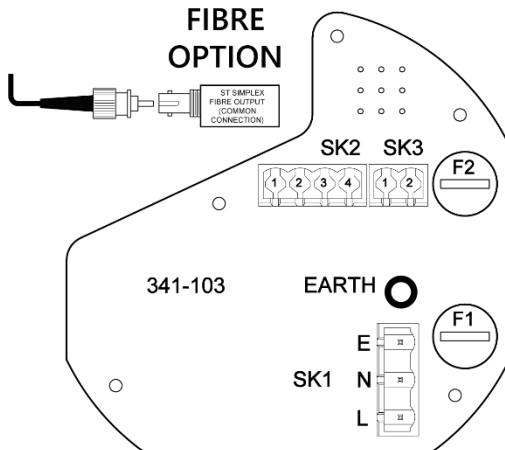
IP Connections:

- RJ45
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC

24V IP MODEL, WITH PUMP OUTPUT



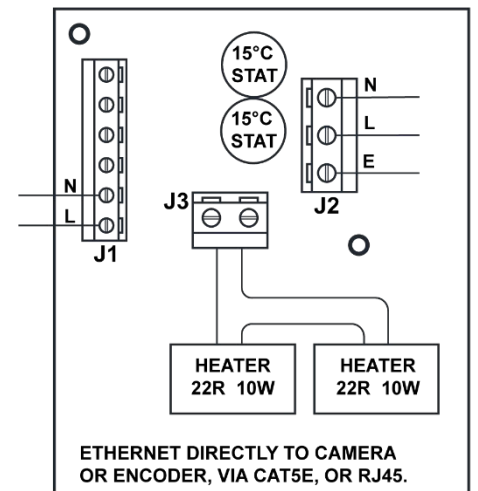
FIBRE OPTION



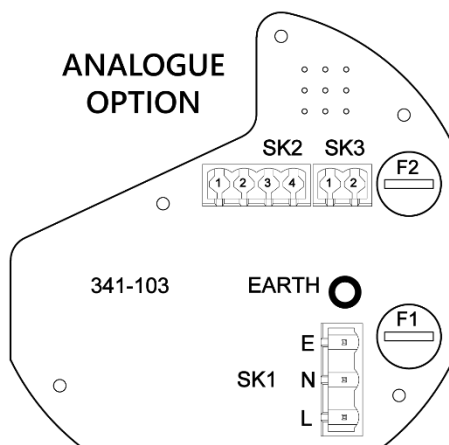
Fibre Connections:

- Fibre Connectors can vary
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC

24V IP MODEL, NO PUMP OUTPUT



ANALOGUE OPTION



Analogue Connections:

- SK1 E, N & L
- SK2 1= Video Signal
2= Video Screen
3= Data A+
4= data B-
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC

(Above) Example of Alternate
FIXED camera common
connections for 24 V Models.

4.0 Maintenance

Please read and be familiar with the instructions in this manual before servicing the any parts of these camera units.

Regular maintenance to the X Series of camera units is important to safeguard their use in harsh and hazardous environments. Please refer to the maintenance recommendations in the ANNEX to this manual.

4.1 Corrosion Protection

Although all external metal components are produced from 316L Stainless Steel, if the units are not correctly maintained, handled and cleaned there is the possibility of mild discolouration due to Oxidation.

If ferrous metal equipment is used when handling the units, small ferrous deposits could be left on the stainless steel or if ferrous metal particles come to rest upon the units from nearby works, this can cause accelerated corrosion of the ferrous deposits and discolour the units due to oxidation. In the event of ferrous deposits, the units should be cleaned immediately following EATON guidelines.

In atmospheres that are high in corrosive particles the units should be cleaned every 3 to 4 months using only EATON recommended cleaning products and procedures. (contact EATON for details)

EATON takes no responsibility for oxidisation due to failure in correctly following cleaning procedures.

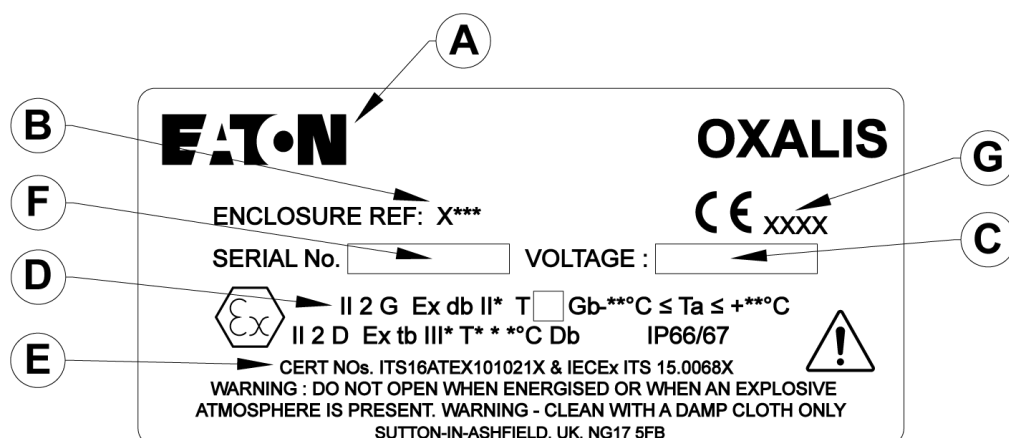


5.0 Labelling

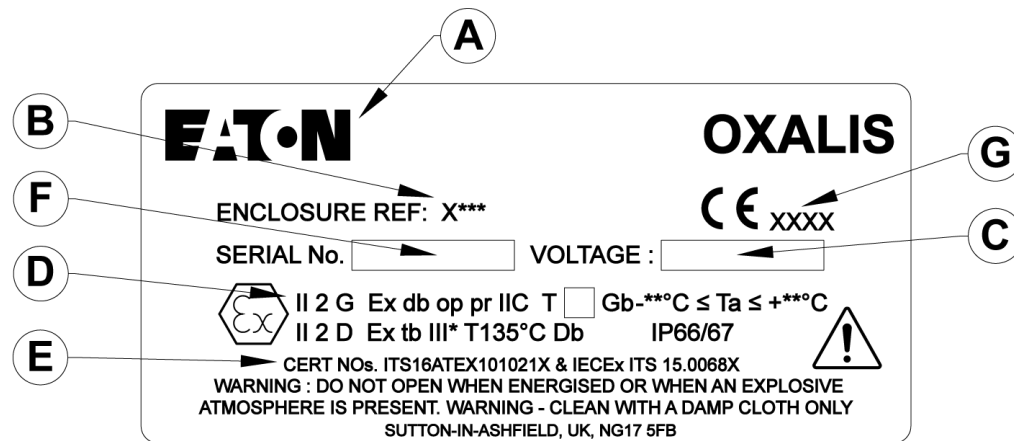
The Labels are printed on self-adhesive metalized vinyl and affixed product. The contents of the label will be in ENGLISH.

The label shows: A - Name of Manufacturer, B - Model/Type and reference, C - Operating Voltage, D - EX ratings, E - ATEX Certificate & IECEX certificate numbers, F - Serial Number, G - Notified Body Number

5.1 Standard Enclosure Label



5.2 OP PR Enclosure Label



6.0 Specifications, Technical data & Special conditions for safe use.

Coding IECEX & ATEX_____	II 2 G Exdb IIC T6-3*Gb -##°C ≤ Ta ≤ +##°C
	II 2 D Ex tb IIIC T135°C Db IP66/67
Fibre Optic_____	II 2 G Exdb op pr IIC T6...3*Gb -##°C ≤ Ta ≤ +##°C
	II 2 D Ex tb op pr IIIC T135°C Db IP66/67
Wireless_____	II 2 G Ex db ???[Ex ia Ga] IIC T6...T5 Gb -##°C ≤ Ta ≤ +##°C
	II 2 D Ex tb ???[Ex ia Ga] IIIC T135°C Db IP66/67

??? = Optional op pr/op is coding

Note: T class and ambient temperature, is dependent on the assembly configuration and maximum internal power dissipation.

*=T class, Gas Group

= Ambient Temperature range

Construction:	Stainless Steel AISI 316L
Ingress Protection rating:	IP 66/7 Max Weight:
Integrated Pan Tilt with housing :	40-62Kg depending on model
Standalone housing:	12-22Kg depending on model

Mounting:	
Integrated Pan Tilt with housing :	4-x M10 fixings on 182mm pcd
Standalone housing:	Depending on mounting brackets

Supply voltage:	24VAC, 50/60Hz or 100 to 230VAC with integral transformer
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Power consumption:	Max 120 Watts depending on model
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7.0 Special Conditions for Safe Use.

1. No modifications must be made to the flame paths of the unit without consultation of the drawings listed on the schedule.
2. Temperatures could exceed 70°C at the cable gland or 80°C at the branching point, suitably rated cable must be selected.
3. Use only hex socket head fasteners with property class of A4-70 for securing end covers & shafts to housings.
4. No electromagnetic or ultrasonic energy radiating equipment shall be fitted within the enclosures other than armored/protected fiber optic cables (op pr) or the IR illuminator as specified in the documents.
5. When fitted the optical fiber output from the camera housing must always be terminated within a suitably certified enclosure or safe area.
6. Only armored cable or conduit is to be utilized when fitted with a fiber optic output in order to protect the fiber optic cable.
7. Precautions must be taken to avoid dust from forming layers on the equipment.

8.0 Default IP addresses and passwords

Eaton Camera	192.168.10.10	admin/Eaton123!
Hanwha Camera	192.168.1.100	admin/XNZ-6320
Thermal Camera	192.168.1.108	admin/Eaton123!

A Ex Annex

Special Conditions of Certification

(a) Specific Conditions for Safe Use.

1. No modifications must be made to the flame paths of the unit without consultation of the drawings listed on the schedule.
2. Temperatures could exceed 70°C at the cable gland or 80°C at the branching point, suitably rated cable must be selected.
3. Use only hex socket head fasteners with property class of A4-70 for securing end covers & shafts to housings.
4. When fitted, the optical fiber output from the camera must always be terminated within a suitably certified enclosures or safe area.
5. Only armored cable or conduit is to be utilized when fitted with a fiber optic output in order to protect the fiber optic cable.
6. Precautions must be taken to avoid dust from forming layers on the equipment.
7. Antennas used with the equipment shall be passive with nominal impedance of 50Ω and have a minimum degree of protection IP6X. If the antenna utilizes a wire conductor the minimum diameter shall be 0.1mm. Alternatively if a track antenna is used, the tracking shall have a minimum width of 0.4mm
8. The antenna circuit does not meet the dielectric strength requirements of Clause 6.3.13. Refer to manufacturers' instruction manual for further details.

Labelling Details.

II 2 G Exdb II* T6-3*Gb -##°C ≤ Ta ≤ +##°C
 II 2 D Ex tb III* T135°C Db IP66/67
 II 2 G Exdb op is II* T4/3 Gb -##°C ≤ Ta ≤ +##°C _____ (Illuminator)
 II 2 D Ex tb op is III* T135°C Db IP66/67
 II 2 G Exdb op pr II* T6...3*Gb -##°C ≤ Ta ≤ +##°C _____ (Fiber Optic)
 II 2 D Ex tb op pr III* T135°C Db IP66/67
 II 2 G Ex db ???[Ex ia Ga] IIC T6...T5 Gb -##°C ≤ Ta ≤ +##°C _____ (Wireless IS)
 II 2 D Ex tb ???[Ex ia Ga] IIIC T135°C Db IP66/67

Note: T class, Gas Group and ambient temperature, is dependent on the assembly configuration and maximum internal power dissipation.

??? = Optional op pr/op is coding

*=T class, Gas Group

= Ambient Temperature range

Marked Ambient range can be any of the following: -40°C to +40°C, -60°C to +40°C, -40°C to +50°C, -40°C to +55°C, -40°C to +70°C, -60°C to +70°C

Wireless Ex ia: _____ T6: -40°C ≤ Tamb ≤ +40°C,
 T5: -40°C ≤ Tamb ≤ +50°C, or
 T5: -40°C ≤ Tamb ≤ +55°C

(b) Conditions of Manufacture, Routine tests

A routine overpressure test in accordance with IEC 60079-1:2014 Clause 16.1 shall be carried out on all enclosures, including all cemented window assemblies, at a pressure of 30.12bar for a period of between 10 and 60 seconds, details must be recorded and records maintained.

There shall be no deformation or damage to the enclosures and no leakage through the cement of any of the window assembly's integrity of the welded construction shall also be verified during routine overpressure testing.

Empty enclosures may be tested.

The individual parts of a flameproof enclosure (for example, cover and base) can be tested separately.

The test conditions shall be such that the stresses are comparable to those to which these parts are exposed in the complete enclosure.

If required during the construction, thread inserts needs to withstand the routine overpressure test also.

Details must be recorded, and records maintained.



**WARNING: DO NOT OPEN WHEN ENERGISED OR WHEN AN EXPLOSIVE
ATMOSPHERE IS PRESENT. CLEAN WITH DAMP CLOTH.**