

XF, XP & XT Series

Flame Proof Camera Housings & Pan Tilt Units

Class I Division 1 Group B, C, D
Class II Division 1 Group E, F, G
Class I Zone 1 IIB + Hydrogen
-60°C to +70°C

Class I Division 1 Group A, B, C, D
Class II Division 1 Group E, F, G
Class I Zone 1 IIC
-20°C to +70°C

File No. E477542



Installation & Maintenance Instructions

The contents of this manual should be read and understood before attempting to connect or operate the equipment. This manual should be kept for future reference.

This equipment shall be installed in accordance with the latest local/national codes of practice, and standards e.g. UL 1203 Edn.5, CSA22.2 No30-M1986 Edn1 reaffirmed 2012, CSA C22.2 No25-1966 reaffirmed 2014, CSA C22.2 No 60065-03 Edn.1, UL60065 Edn.7

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.

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Before installation of the equipment ensure that:

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

Amendment Record

Issue	Date	Details of Amendment
A	20/05/2021	First Issue

1.0 General

Important Safeguards and 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. UL1203 Edn.5, NFPA 70 - 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. Care must be taken to ensure selection of suitable cables connecting to these units, when installed in operating temperatures above +70°C.
6. The equipment is designed to satisfy the requirements of UL60065 7th Edition 2013/07/24. CSA C22.2 No. 60065-03 2012/08/01 Safety Requirements ANNEX II of ATEX directive 94/9/EC.
7. Be aware that aggressive substances may require extra protection of the equipment to maintain its integrity and explosion protection.
8. 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.
9. Any repairs or replacement parts must be done by the manufacturer or an approved repair agent.
10. Due to the weight of the units, correct planning and equipment must be used when unpacking and installing. When handling the XP and XT units, the correct lifting points must be adhered to (see section 3.1.2 for safe lifting points.)
11. For systems fitted with integral Fiber Optic transmitters, the fiber optic cabling used has additional protective measures to ensure that the optical radiation is confined within the cabling, by the use of a robust conduit covering externally, and Kevlar braided cable inside the conduit and the enclosure. NFPA 70 500.8 (F)
12. When batteries are fitted to electronic equipment they must be removed and are not to be replaced.
13. After installation, operatives must adhere to the following warning on the unit's label:

**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 petrochemical installations. The units may also be used in marine and industrial hazardous environments.

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

Removable end covers are fixed to the body by five (5) M6 x 12 stainless steel hex cap screws. Cable entry cover is an M110 x 1.5 screw-fit cover. All fixings conform to the requirements of UL 1203. The weatherproof seal at the union between enclosures and covers is maintained using 'O' ring seals.

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. There is an 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 Infrared transparent material, which is factory fitted with a mechanical window guard.



THE MECHANICAL THERMAL WINDOW GUARD MUST NOT BE REMOVED.

There are three system types in the 'Series X' certified units; these are:

- XF: Fixed camera housings.
- XP: Pan & Tilt units with integral base section for cable connections.
- XT: Pan & Tilt units with integral base section for cable connection, and a secondary linked housing for an integrated illuminator.

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

The XP and XT units have a single cable entry into the fixed base section, this prevents any trailing cables.

The Series 'X' housings and pan/tilt units have been designed and certified to the UL 1203 Directive, with the following ratings:

Class I Div 1 Groups B, C, D
 Class II Div 1 Groups E, F, G
 Class I Zone 1 IIB + Hydrogen
 -60°C to +70°C
 T4 T135°C IP66/67

Class I Div 1 Groups A, B, C, D
 Class II Div 1 Groups E, F, G
 Class I Zone 1 IIC
 -20°C to +70°C

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

*=T class T4A, T5, T6



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

UL 1203 Edn.5, CSA22.2 No30-M1986 Edn1 reaffirmed 2012, CSA C22.2 No25-1966 reaffirmed 2014, CSA C22.2 No 60065-03 Edn.1, UL60065 Edn.7.

2.1 Versions

There are different camera options available within the range; these include Day/Night cameras with optional wiper, integral washer or external washer, thermal imager and dual camera day/night and thermal units.

The range also includes options for HD IP cameras, digital fiber optic convertors and media convertors.

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.**

In addition to this manual there are various addendums available that cover the specific function of 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, 3, & 1.5mm
- Spanners 5.5mm, 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:

OX10-00188	EX Base Cable Entry Seal Kit (50.8x3.53 O-ring + 5x M5x16 A4 socket head screws)
OX10-00190	EX Main Flange Seal Kit (117.07x3.53 O-ring + 5x M6x12 A4 socket head screws)
OX10-00008	WIPPER BLADE ASSEMBLY
OX10-00062	HOUSING WASHER NOZZLE ASSEMBLY
OX10-00063	XP26 CONTINUOUS ROTATION WASHER NOZZLE ASSEMBLY
OX10-00134	XP40 CONTINUOUS ROTATION WASHER NOZZLE ASSEMBLY
OX10-00340	LW PTZ WASHER NOZZLE KIT
OX20-00285	MK3 BASE ENTRY O-RING 111mm x2.5mm

3.0 Installation

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 Unboxing & Handling

3.1.1 Unboxing

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.

If not already fitted, the protective plastic film should be removed from sunshields prior to fitting.

3.1.2 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 units should be lifted using a strap between the camera housing and the L-body section. The XT unit should be lifted with 2 straps, equally supporting either side of the T-body.

The camera housings must not be used for lifting. To avoid damage to the unit **DO NOT ATTEMPT to 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)

3.2 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 permit full rotation of the unit with its associated equipment; and that the moving unit cannot strike or make contact with personnel.

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

3.2.1 Mounting the XP & XT series

The XP and XT pan/tilt/housing assembly should be mounted horizontally, onto various structures such as bulkheads, walls or towers. It can also be mounted upside down, in the inverted position.

The complete assembly is mounted to the support structure via its base part, which has 11mm clearance holes for four (4) M10 fixings. (Fig 1)

The type and size of any fixing brackets to be supplied by the user/installer must be suitable for the installation requirements outlined in this manual.

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



Fig.1 XP40VE Example XP Series unit showing base mount fixing points for an L-Body PTZ unit.

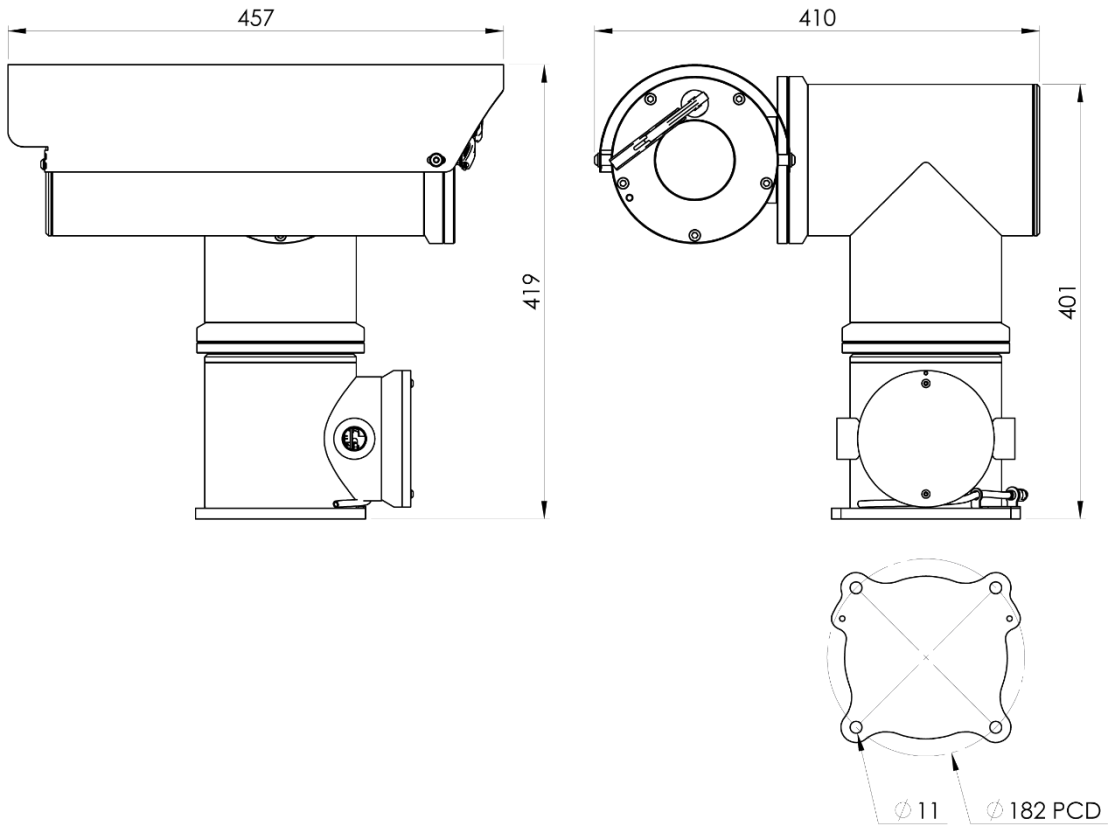


Fig.2 BPW6500 Wall Mounting Bracket

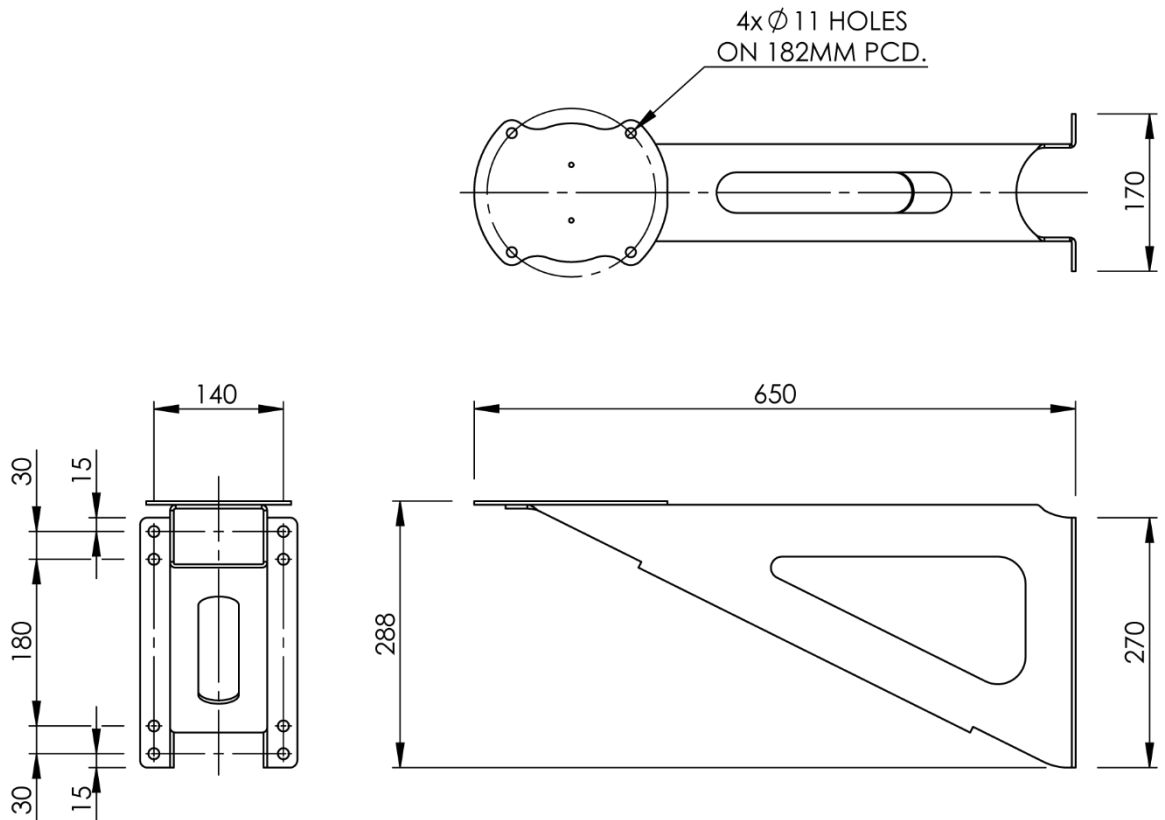


Fig.3 BFW5000 Wall Bracket

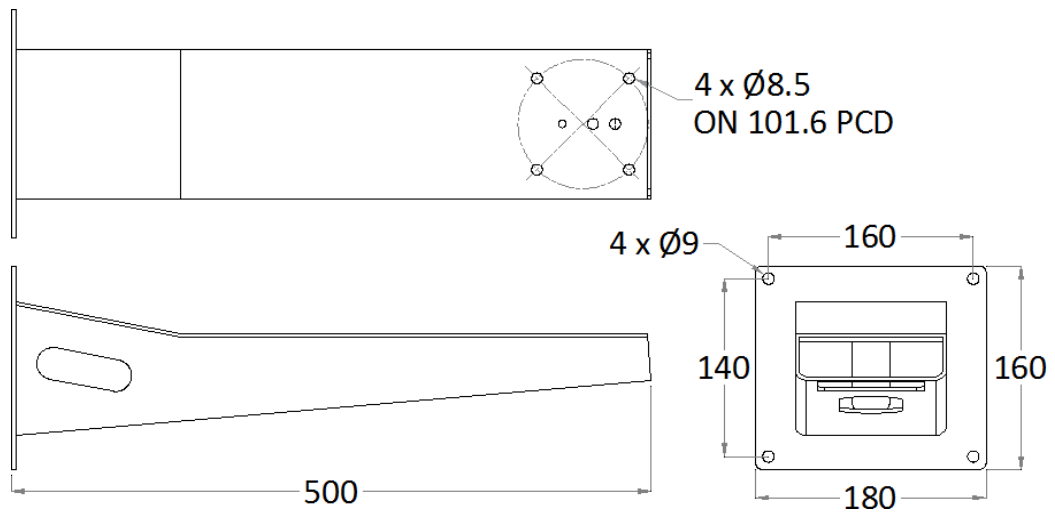
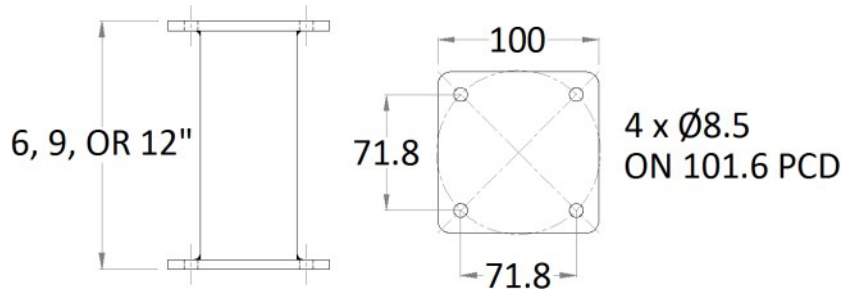


Fig.4 BFP0600/900/1200 Column Spacer



3.2.2 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) M6 Threaded fixing points. (Fig 5)

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 range of fixing brackets is needed. These comprise of the BFP00SW Swivel joint (Fig 6), the BFW32SW (Fig 7) or a combination of the BFW5000 and BFP00SW. (Figs 3 & 6)

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



Fig.5 XF60VN Example XF Series unit showing mount plate fixing points

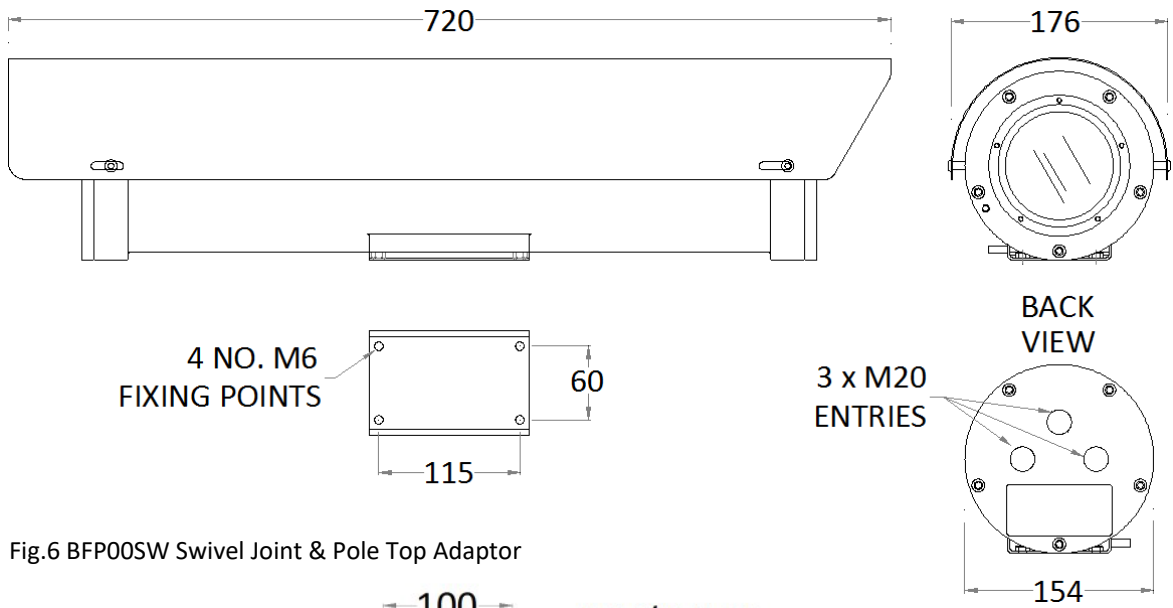


Fig.6 BFP00SW Swivel Joint & Pole Top Adaptor

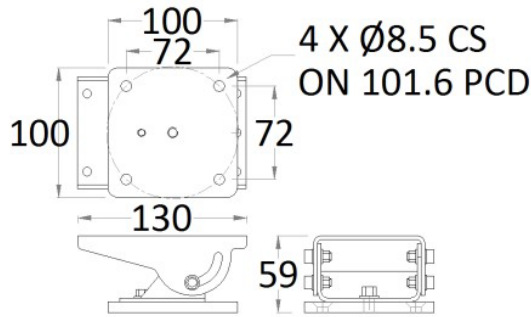
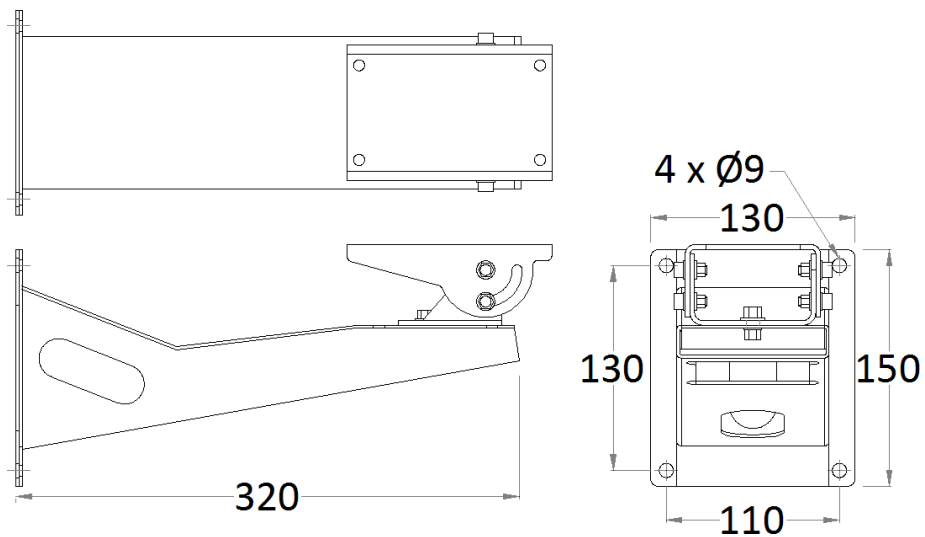


Fig.7 BFW32SW Swivel Joint & Pole Top Adaptor



3.3 Accessory Installation

3.3.1 Sunshield Installation

Depending on the model required, sunshields can be supplied uninstalled to prevent damage during shipping and unpacking. There is a protective plastic 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 M5 A4 Button head screws supplied must have the red fiber washer fitted before fixing the sunshield. (Fig 8 & 9)

Sunshields can have four equally sized fixings at each corner (Fig.8) or, have two corner and two 'tab' fixing types, one for the front of the housing and shorter screws at the rear. (Fig.9)

Fig.8 Type A Sunshield Installation

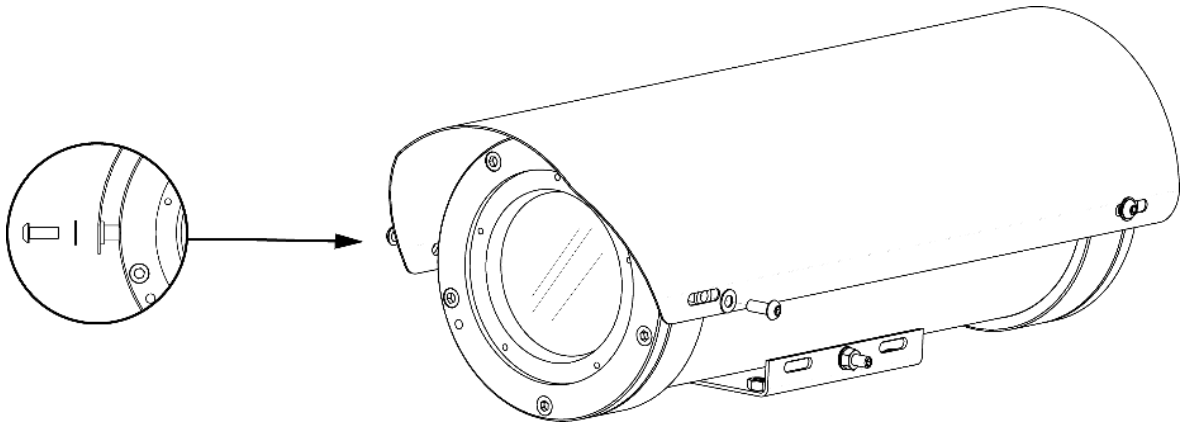
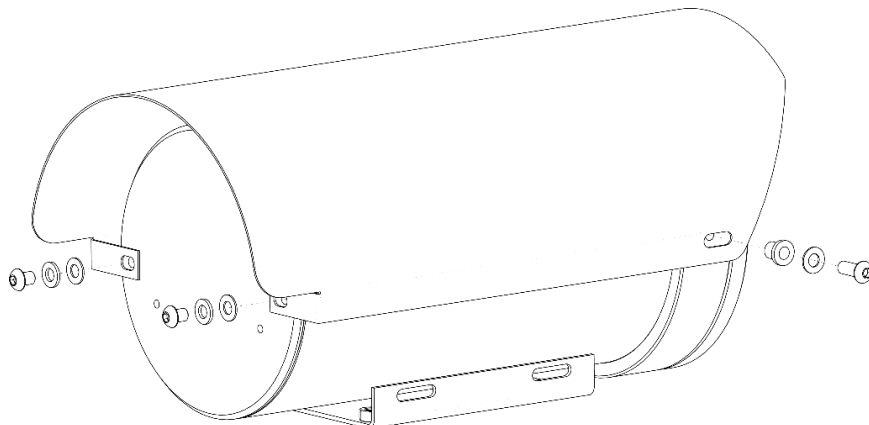


Fig.9 Type B Sunshield Installation



3.3.2 Washer Nozzle Installation

A continuous rotation pan and tilt unit, if supplied with an external washer unit, is supplied with a washer nozzle and mounting bracket. If not already fitted, these should be fitted during installation with the supplied fixings and positioned to allow the cleaning fluid to reach the camera window when the wash command is sent. The supplied washer nozzle brackets are specific to housing type and are delivered pre-aligned for effective use. (Fig.10)

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

For non-continuous rotation pan and tilt units and fixed housings, the washer nozzle is installed on the front window cover. (Fig.11)

Fig.10 Housing washer nozzle

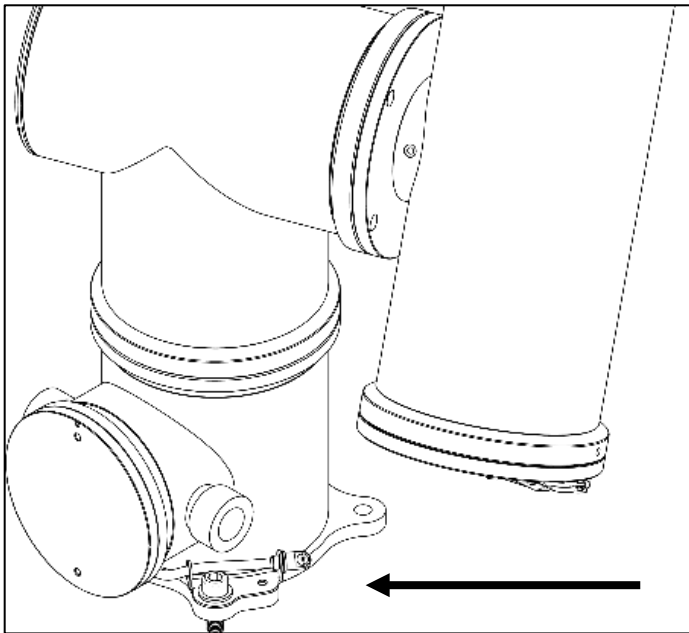
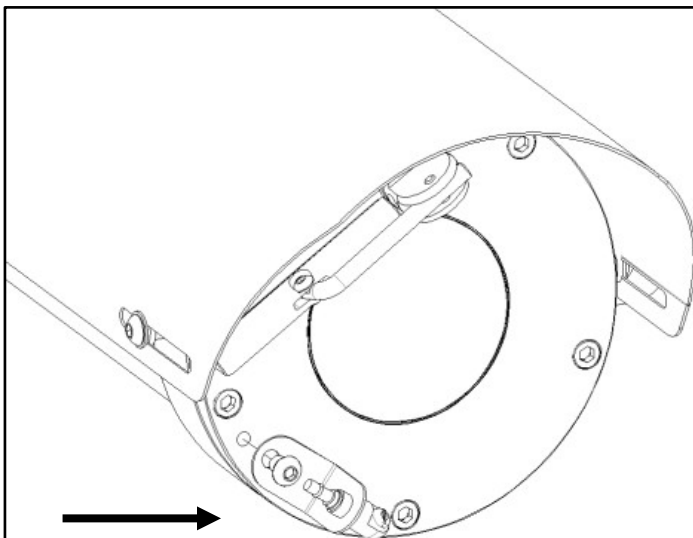


Fig.11 Non-Continuous Rotation P&T + Fixed housing washer nozzle





3.4 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. UL 1203 Edn. 5, CSA22.2 No30-M1986 reaffirmed 2014, CSA C22.2 No25-1966 reaffirmed 2014, CSA C22.2 No 60065-03 Edn. 1, UL60065 Edn. 7.

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 24V AC or DC, 110V AC or 230V AC Supply; ($\pm 10\%$). The units should only be powered from the specified voltage, no allowance is made for varying voltage supply.



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

3.4.1 Electrical Installation XP & XT Integrated Pan, Tilt, housing assembly

For safe access to electrical connections with the XP and XT series cameras, 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.

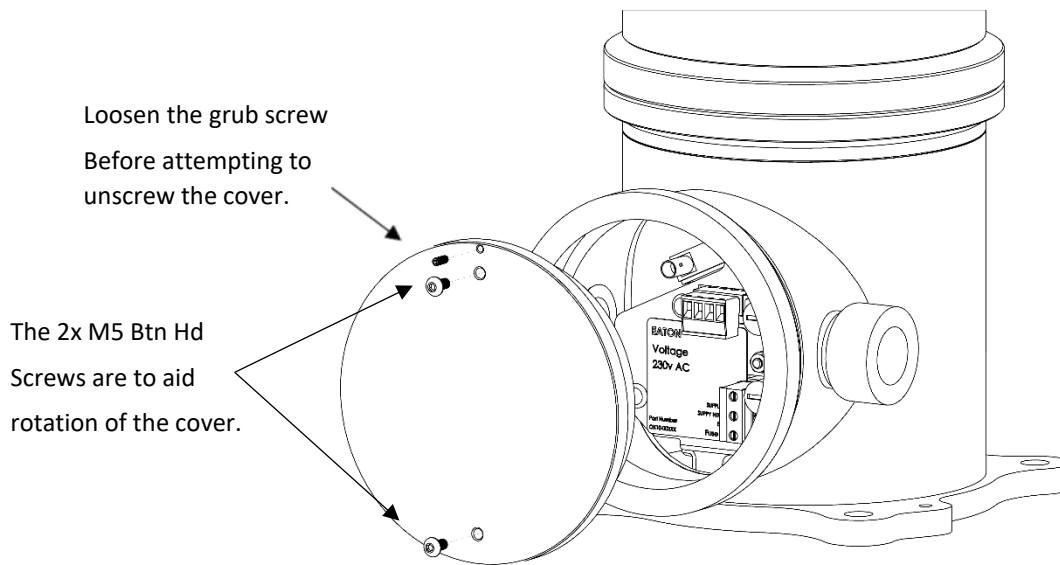
1. Always use colour-coded conductors or other identification of conductors for ease of wiring and identification of function later.
2. Keep a wiring diagram with the system for later use and reference.
3. Provision is made for one or two cable entries, at the Base Enclosure of the pan tilt. (Fig.12)

To maintain the certification requirements of the unit all cables/conduits must be fitted at the entry, with certified Class/ Div Flameproof, compound filled barrier glands, or conduit sealing fittings within 2" or 50mm of the enclosure.

4. The cable entries to the unit can be either $\frac{3}{4}$ " NPT thread, or $\frac{1}{2}$ " NPT using a suitably certified reducer, depending on order.
5. A minimum of 5 fully engaged threads must be maintained for all glands.
6. All unused threaded openings shall be closed by suitably approved threaded plugs, recommended EBNV/7 approved.
7. All glands/reducers must be ingress protected to IP67 or better, maintaining the weatherproof rating of the equipment.
8. For maintenance purposes, consult the separately supplied (additional) wiring drawings, specific to the purchase order, for as built wiring/ connection details of the unit.
9. The base unit has accessible input fuses (F1 & F2 see sections 3.4.2 & 3.4.4). Check that the input fuse matches the voltage requirement:

Fuse 1:	6.3A (24V AC & DC)	2A (≥ 110)
Fuse 2:	1A	

Fig.12 Gaining access to the XP & XT Base Unit Junction Box (Dual cable entry)

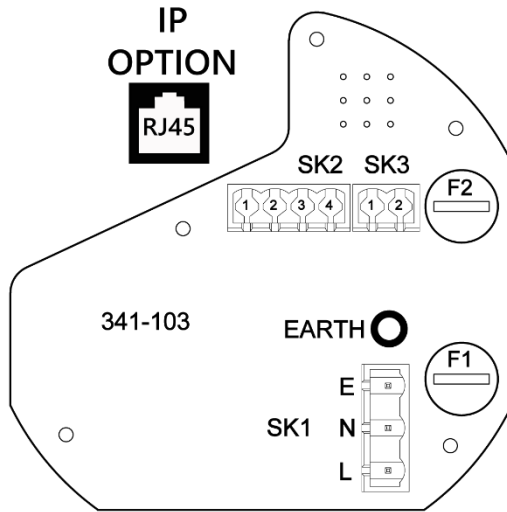


Caution should be taken when removing and replacing the base cover to avoid trapping internal cables.

WARNING: THE CABLE ENTRY FLANGE SHOULD NEVER BE REMOVED WHEN THE UNIT IS ENERGISED

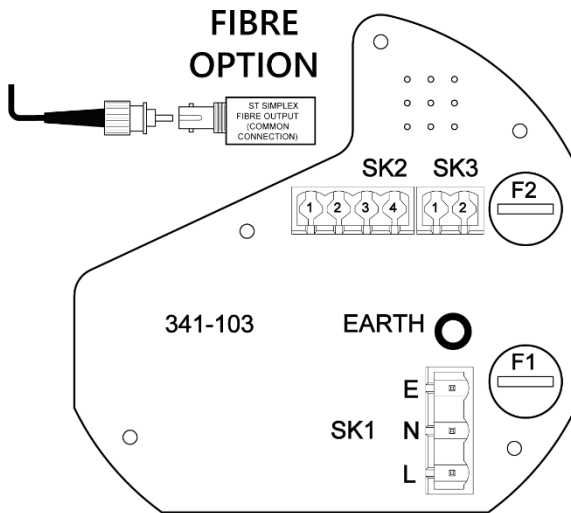
3.4.2 XP & XT Common Connection Examples

Always refer to project specific drawings and information



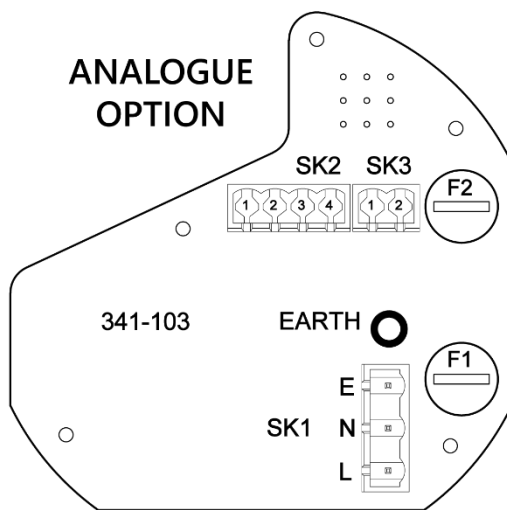
IP Connections:

- RJ45
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC
- F1 Fuse 1
- F2 Fuse 2



Fibre Connections:

- Fibre Connectors can vary
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC
- F1 Fuse 1
- F2 Fuse 2



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
- F1 Fuse 1
- F2 Fuse 2

3.4.3 Electrical Installation XF Series Units

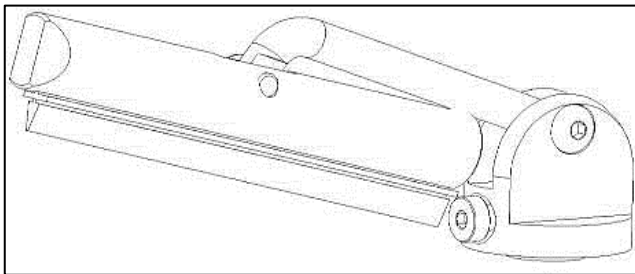
1. Cable entry type to the housing is via one 1/2" NPT entry at the side adaptor of the housing, or optionally via the three 3/4" NPT cable entry end cover on the rear of the housing, solely for connection of power and signal wiring, no internal user wiring is allowed in this unit.
2. Keep a wiring diagram with the system for later use and reference.
3. For maintenance purposes, consult the separately supplied additional wiring drawings specific to the purchase order, for as built wiring and connection details of the unit.



WARNING: HOUSING COVERS SHOULD NOT BE REMOVED UNTIL AT LEAST 5 MINUTES AFTER THE DISCONNECTION OF POWER SOURCE.

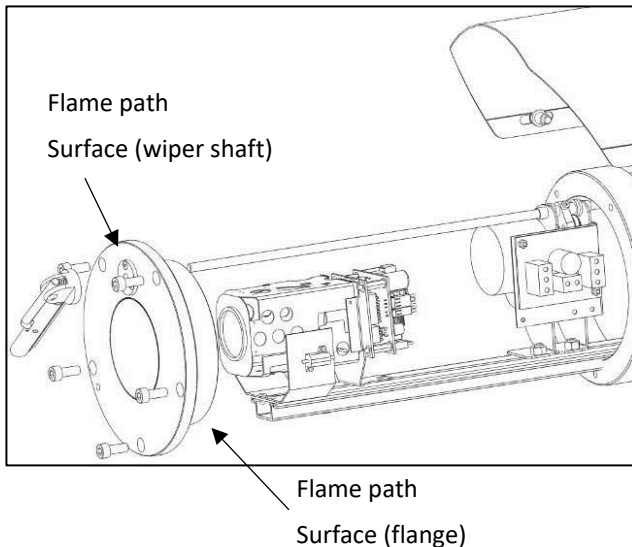
Fig.13 Removing the Wiper Arm

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 with the sunshield removed.

Fig.14 Removing the Front Window Cover

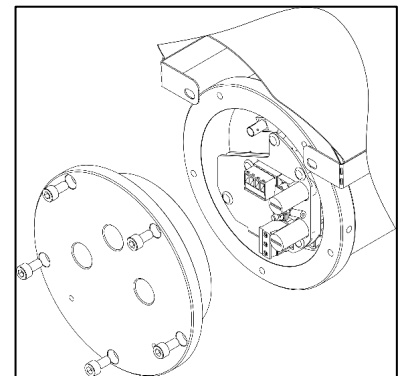


Remove the front window cover by first removing the 5 x M6 Cap Head screws and then carefully extracting the cover. Special care must be taken not to damage the flame path surface on the flange of the cover or the wiper shaft.

Next slide out the internal camera rail, if required

Fig.15 Removing the rear cover (Only models with removable rear cover.)

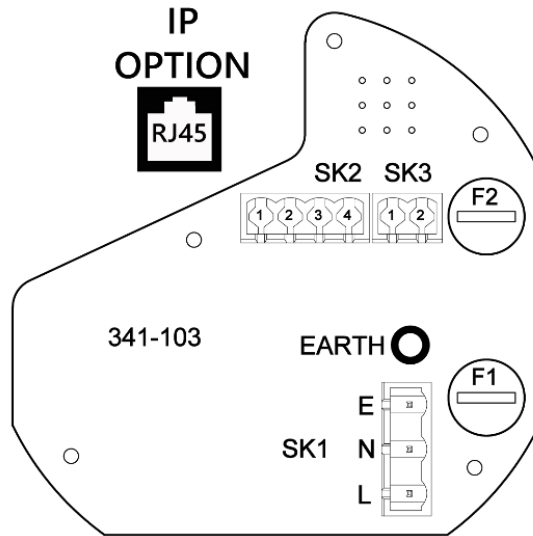
Remove the rear cover by first removing the 5 x M6 Cap Head screws and then carefully extracting the cover. Special care must be taken not to damage the flame path surface on the flange of the cover. Next, slide out the camera rail to reveal the incoming cable connection terminals.



WARNING: THIS COVER MUST NOT BE REMOVED UNDER ANY CIRCUMSTANCES, UNTIL AT LEAST 5 MINUTES AFTER THE POWER SOURCE IS DISCONNECTED

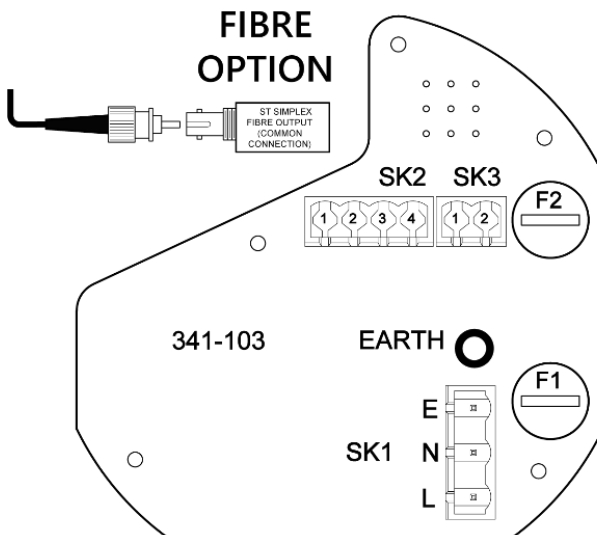
3.4.4 XF Series Common Connection Examples

Always refer to project specific drawings and information



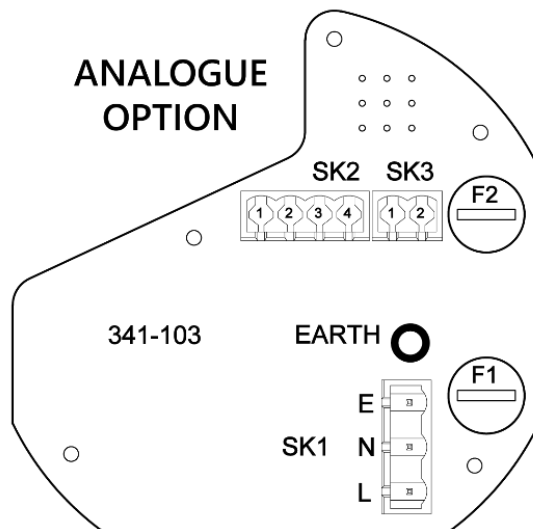
IP Connections:

- RJ45
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC
- F1 Fuse 1
- F2 Fuse 2



Fibre Connections:

- Fibre Connectors can vary
- SK1 E, N & L
- SK3 For optional pump
 - 1= Pump Live 24VAC
 - 2= Pump Neutral 24VAC
- F1 Fuse 1
- F2 Fuse 2



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
- F1 Fuse 1
- F2 Fuse 2

4.0 Maintenance

Please read and be familiar with the instructions in this manual before servicing 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. Recommended inspection interval: 6 Months.

Inspect the unit regularly every six months to ensure trouble free operation and extended product life.

Due to the rugged construction of the unit, little or no maintenance should be required.

It is recommended that, where the unit is exposed to regularly extreme weather conditions, the 'O' ring weather seals in the removable window covers, removable enclosure covers, and base junction box are replaced every five years.

Fixings and fastenings should be checked for tightness and integrity at regular intervals.

All cable entries and cables should be checked for integrity at regular intervals.

Extremely harsh environments may require more frequent inspection and maintenance checks.

Therefore, the end user or installer shall ensure that this equipment is protected against external influences which could adversely affect the explosion protection or contact the manufacturer if in doubt of the suitability of this equipment in the environment in which it is to be installed.

At every inspection carry out the following:

- Clean the exterior of the unit.
- Check the 'O' ring weather seals and replace if necessary.
- Check, and if necessary, replace the washer nozzle.
- Check, and if necessary, replace the window wiper blade assembly.
- Use only Eaton approved spare parts.

4.1 Corrosion Protection

All external metal components are produced from 316L Stainless Steel, however, if the units are not correctly maintained, handled and cleaned there is the possibility of mild discolouration due to normal 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 by normal oxidation. In the event of ferrous deposits, the units should be cleaned immediately following EATON guidelines.

In atmospheres that have high levels of 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 A FAILURE TO COMPLY
WITH THE CORRECT CLEANING PROCEDURES.**

5.0 Labelling & Marking

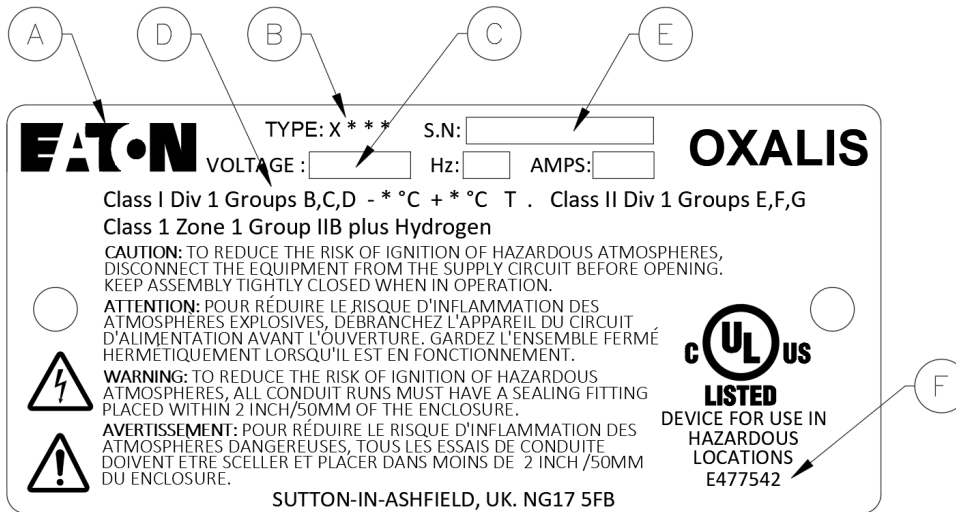
The certification and rating labels are etched on 316 stainless steel and fixed to the units using stainless steel rivets. The contents of the label will be in ENGLISH. (And FRENCH for CSA).

The label shows:

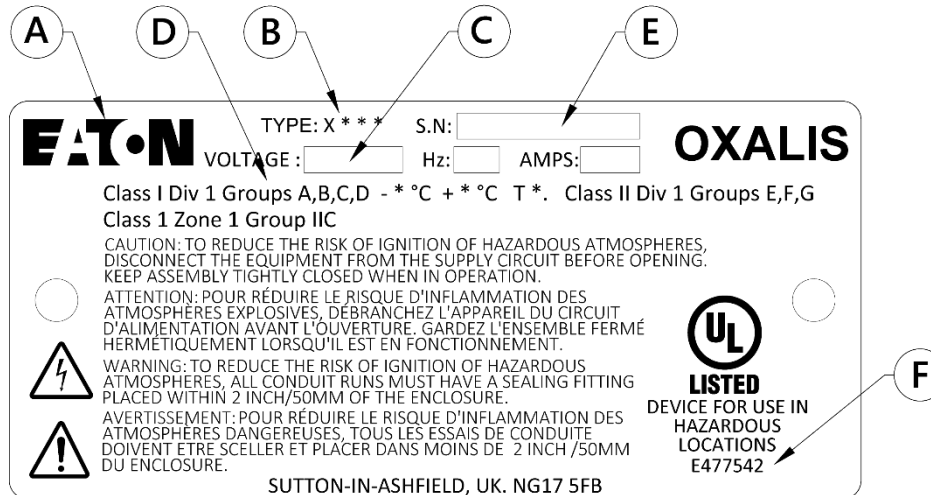
- A. Name of Manufacturer
- B. Model Type
- C. Operating Voltage
- D. Area Classification
- E. Serial Number,
- F. UL File Number



Certification label IIB + Hydrogen



Certification Label IIC



Coding

Class I Div 1 Group B, C, D
 Class II Div 1 Groups E, F, G
 T135°C
 IP67
 T Class T4, T5, T6

6.0 Specifications, Technical Data

Construction:	Stainless Steel AISI 316L
Ingress Protection rating:	IP 66/7
Max Weight:	
Pan Tilt with housing:	33-45Kg depending on model
Stand-alone housing:	12-22Kg depending on model
Mounting:	
Pan Tilt with housing:	4 x M10 Cap Head screws on 182mm PCD
Standalone housing:	Depending on mounting brackets
Supply voltage:	24VAC, 50/60Hz or 100 to 230VAC with integral transformer
Power consumption:	Max 120 Watts depending on model
Cable Entry Options	¾" NPT thread or ½" NPT thread using a suitably certified reducer, and dependent on specification at order.