

2400 & 1400 Series (XP, XT, XC & XF) Flame Proof Camera Housings & Pan Tilt Units

Class I Div 1 Group B,C,D
Class II Div 1 Groups E,F,G
Class I Zone 1 IIB +Hydrogen

File No E477542

Installation & Maintenance Instructions



This manual should be read 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
eg :- *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.

Amendment Record

<u>Issue</u>	<u>Date</u>	<u>Details of Amendment</u>
1.0		First Issue
2.0	15/11/2016	Updated drawings. Added amendment record
3.0	24/02/2017	Label type update

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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

1.1 Important Safeguards and Warnings



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit. Read, Keep and Follow all instructions.

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 a suitably qualified repair agent.
10. 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)
11. Systems can be fitted with integral Fibre Optic transmitters, this means that the fibre 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 units 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.

14. Illuminator "CAUTION Possibly hazardous optical radiation emitted from this product."

2.0 Description

The 2400 & 1400 series 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 or M110x1.5 screw on cover; all conforming to the requirements of UL 1203. 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 four system types that are made up from different combinations of the 2400 and 1400 series certified units; these are:

XF series, fixed camera housings.

XC series, P&T units with integral tilt shaft only.

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

XT series, P&T units with integral pan and tilt shafts and a fixed base section for cable connection, also a secondary housing for integrated 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 dependant).

The XC series comprise a camera housing fixed to a P&T unit via an integrated tilt shaft; there are 3 cable entries in the rear cover of the housing or 1 into the blank side of the T unit (model dependant).

The XP and XT units have dual cable entries into the fixed base section, this prevents any trailing cables.

The 2400 & 1400 series housings and integrated pan/tilt units have been designed and certified to UL1203, with the following rating:

Class I Div 1 Group B,C,D

Class II Div 1 Groups E,F,G

T4 T135°C IP66/67

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

*=T class

= Ambient Temperature range

2.0 Description (continued)



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 various camera configurations 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 Standard Analogue Video and Data, HD IP cameras, Hybrid IP encoders, Digital Fibre 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 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

2.4 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

2.5 Recommended Spares

For Maintenance purposes, we recommend the following spares:

- PTZ Seal Kit: O Ring seal kit, spare M6 x 16 & M3 x 6 screws PX99902901
- Wiper Assembly (for systems with integrated wiper) PX99902849
- XP40 Washer Nozzle (for systems with optional washer system) PX99902864
- XP26 Washer Nozzle (for systems with optional washer system) PX99902848
- XF Fixed Washer Nozzle (for systems with optional washer system) PX99902865

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 Unpacking and Handling

3.1.1 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 in case they are needed for returning the unit for repair or maintenance.

The protective white film should be removed from sunshields prior to fitting.

3.1.2 Handling



Due to the large weights of the products, correct handling is of great importance.

Lifting into position of P&T units should always be completed using suitable lifting equipment that is capable of supporting loads in excess of 65Kg. P&T systems should only be lifted using the T section of the P&T, with equal support on both sides; the camera housing section of the unit must not be used for lifting. To avoid causing damage to the unit do not rotate by hand. The units should not be handled having direct contact with ferrous metal equipment. (see section 4.1 for details)

3.2 Mounting



To prevent injury ensure the mounting surface and the selected mount can support four times the combined weight of the complete unit.

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

Due care must be taken to ensure sufficient clearance is allowed to permit full rotation of the unit with its associated equipment mounted and that the moving unit cannot make contact with personnel.

It is strongly suggested that where possible the Eaton range of mounting brackets are used

3.2.1 Mounting the XP & XT Series (Horizontal or Inverted Only)

The XP and XT pan/tilt/housing assembly may be mounted onto various structures such as bulkheads, walls or towers, it can be mounted in the Horizontal or inverted position but the inverted option 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 BPW6800 Wall mount bracket (Fig 2)

3.2.2 Mounting the XC Series

The XC 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 Pan shaft and this has four (4) No. M8 Threaded fixing points on an industry standard spacing PCD of 101.6mm (4”). (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. An alternative is to use the BFW5000 Wall mount

bracket (Fig 4) or one of the BFP**00 Column Spacers. (Fig 5)

Fig.1 XP26VW Example XP Series unit showing base mount fixing points

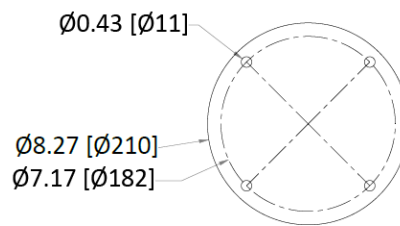
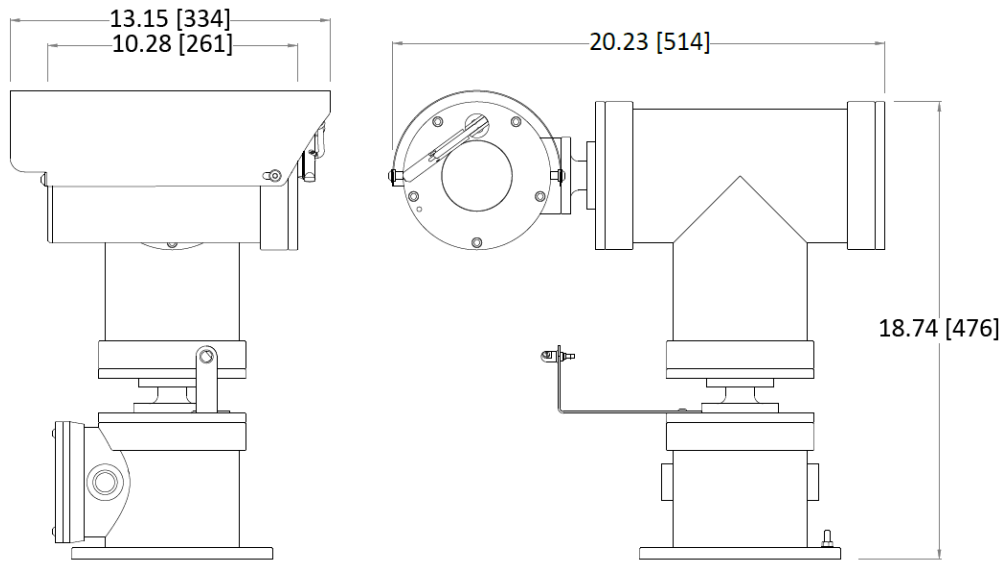


Fig.2 BPW6800 Wall Bracket

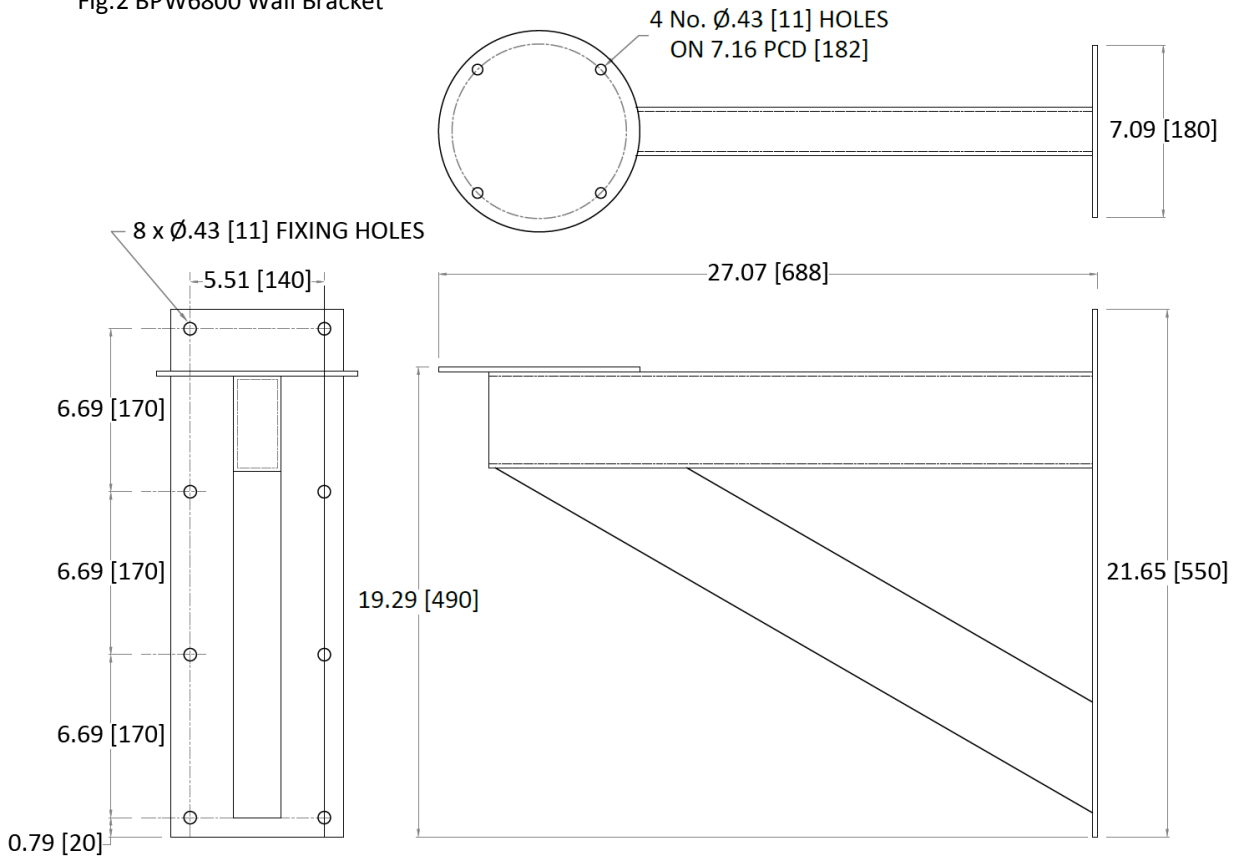


Fig.3 XC40VW Example XC Series unit showing shaft mount fixing points

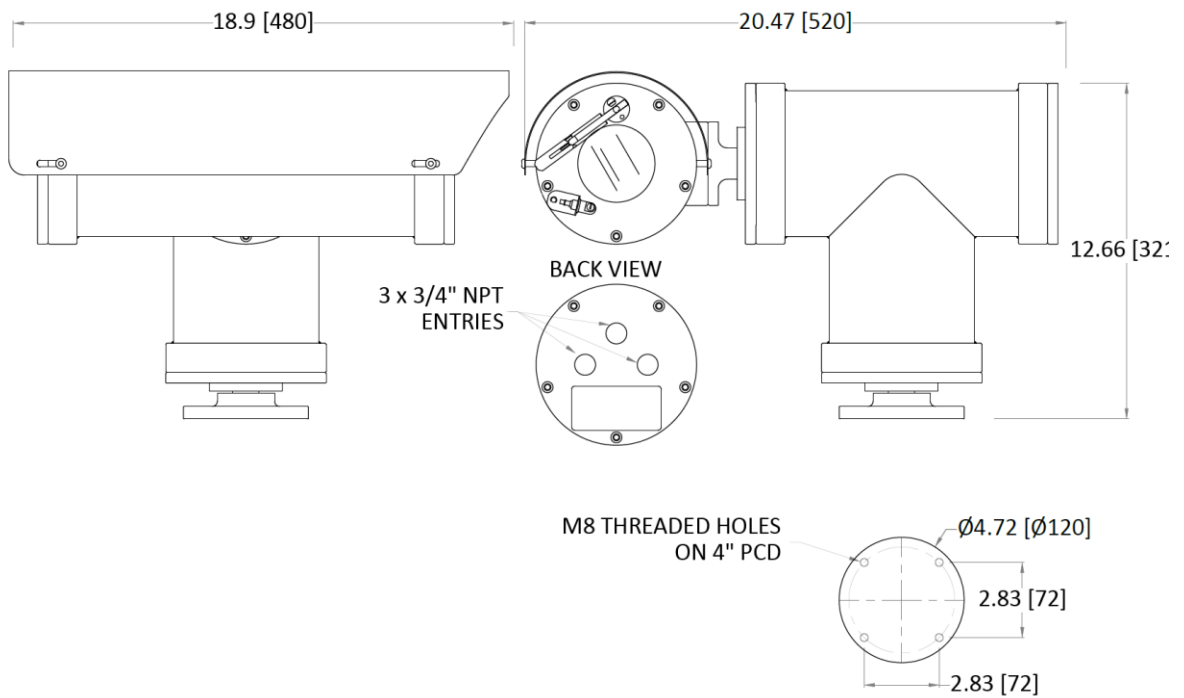


Fig.4 BFW5000 Wall Bracket

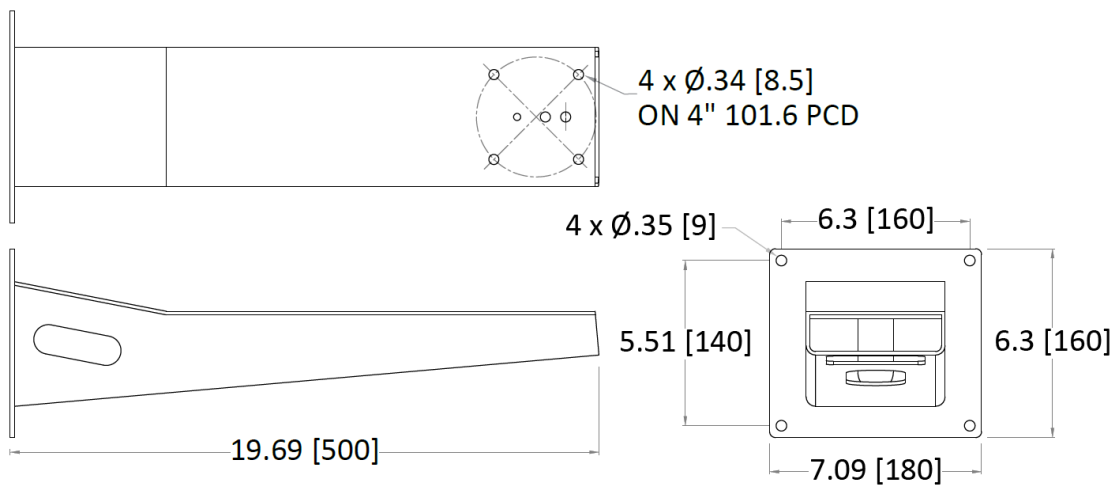
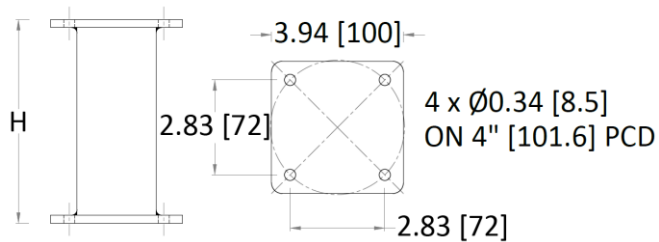


Fig.5 BFP0600/900/1200 Column Spacer

H= 6, 9 or 12 inch



3.2.3 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 6)

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 brackets is needed, these comprise of the BFP00SW Swivel joint (Fig 7), the BFW32SW (Fig 8) or a combination of the BFW5000 and BFP00SW. (Figs 4 & 7)

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.6 XF60VN Example XF Series unit showing mount plate fixing points

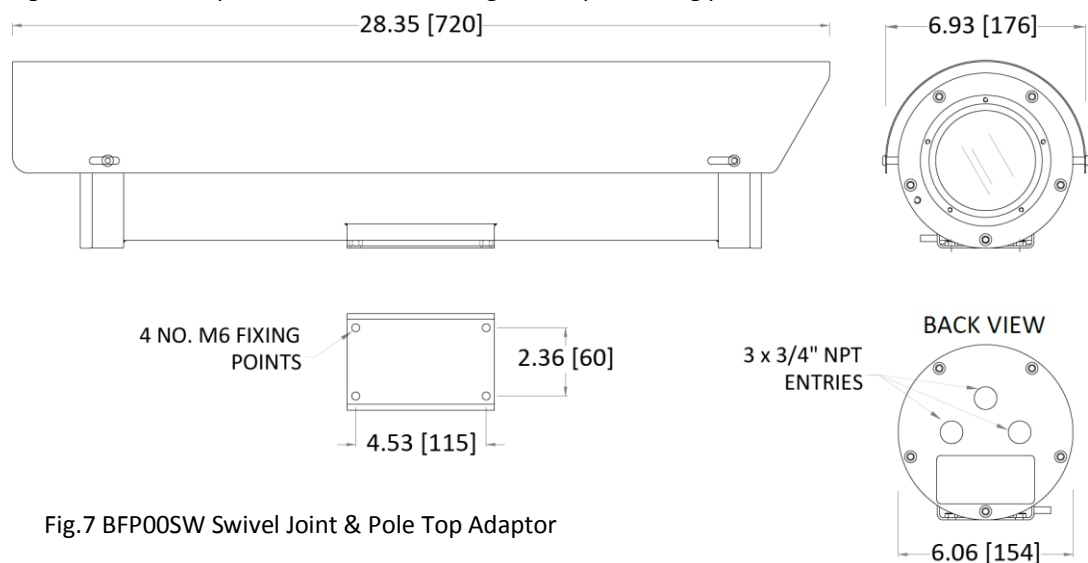


Fig.7 BFP00SW Swivel Joint & Pole Top Adaptor

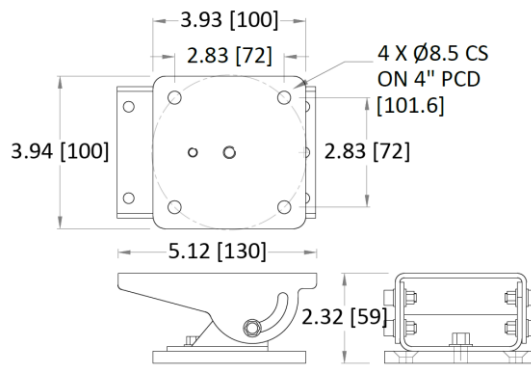
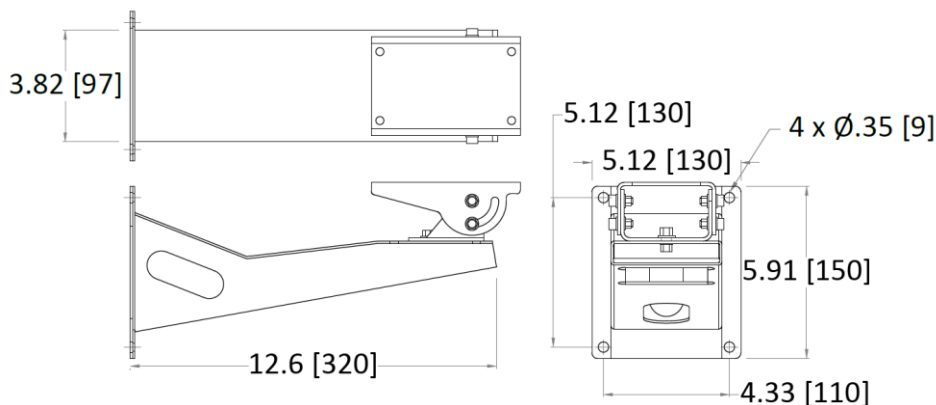


Fig.8 BFW32SW Swivel Joint & Pole Top Adaptor



3.3 Accessory Installation

3.3.1 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 fibre washer fitted before fixing the sunshield. (Fig 9 & 10)

Long and Medium sunshield have four equally sized fixings for each corner but the short sunshield has two fixing types, one for the front and shorter screws and nylon spacer at the rear. (Fig 10)

Fig.9 Mid and Long Housing Sunshield Installation

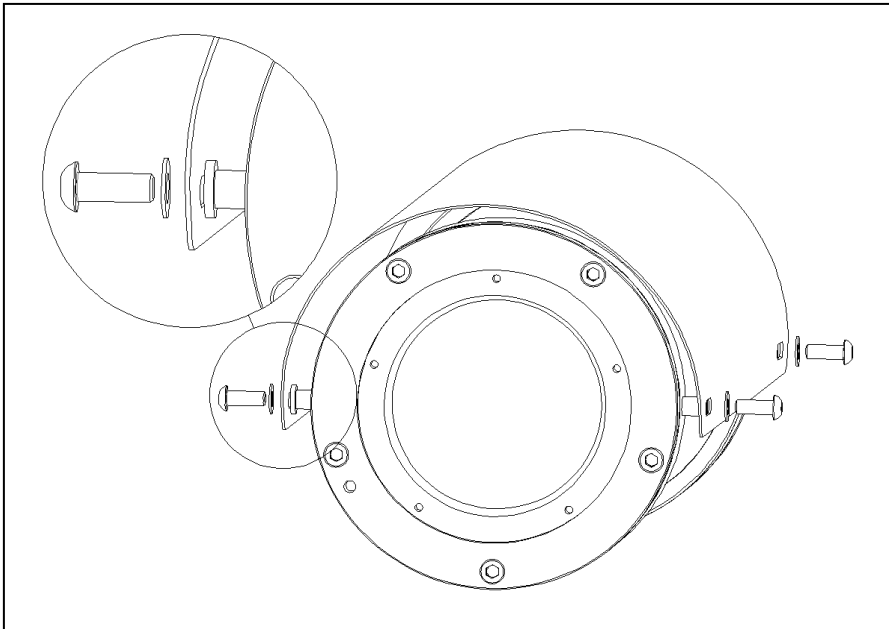
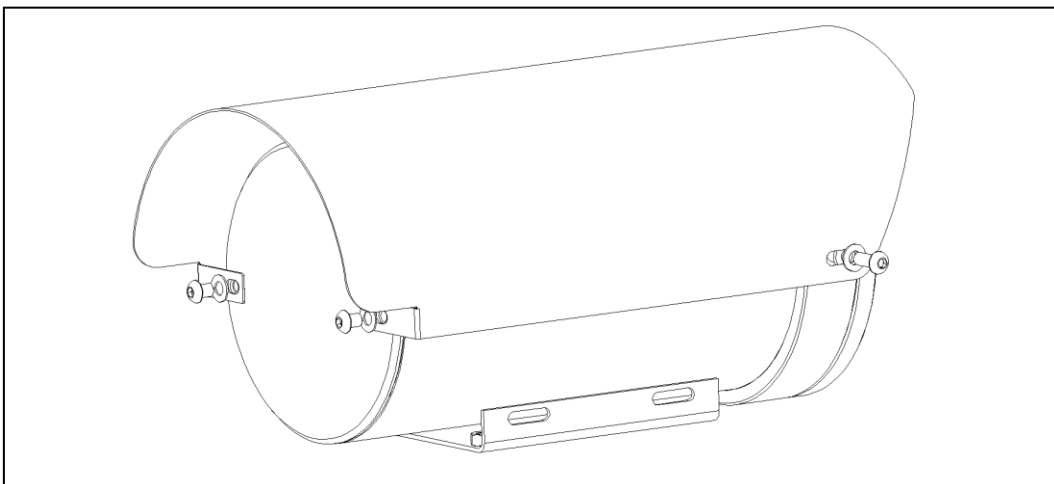


Fig.10 Short Housing Sunshield Installation



3.3.2 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. 11 & 12)

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. 13)

Fig.11 260mm Housing washer nozzle

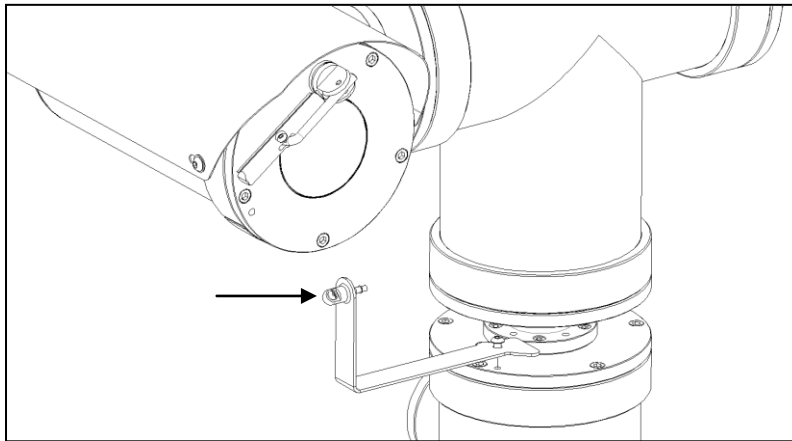


Fig.12 400mm Housing washer nozzle

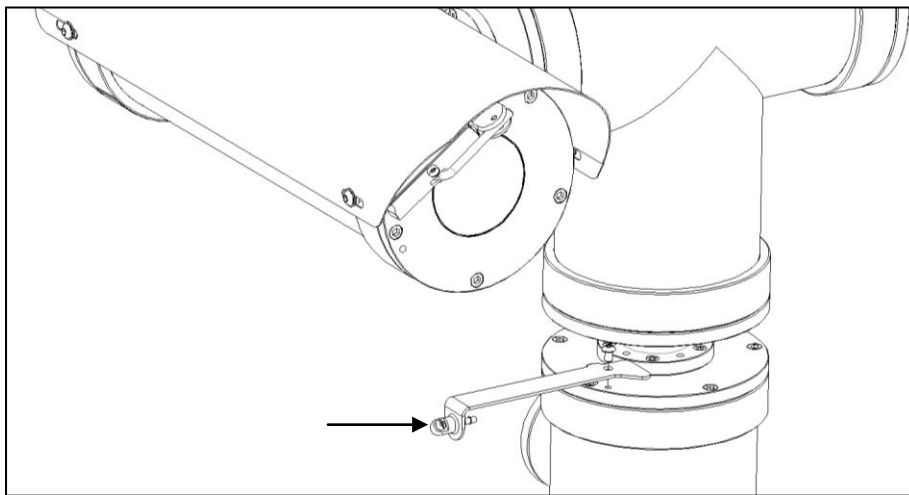
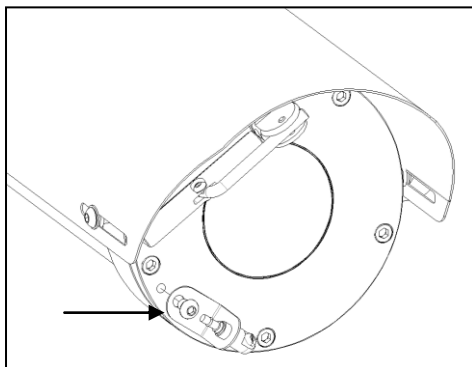


Fig.13 Non-continuous Rotation P&Ts and Fixed housings washer nozzle



3.4 Electrical Installation



Electrical installation and servicing should only be carried out by qualified skilled personnel the class of wiring shall be marked adjacent to the mains terminals 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 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 project specific drawings and information.

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



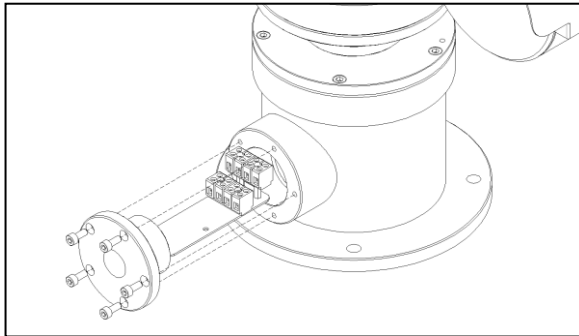
Warning : **Irreparable damage to the unit will result from the application of incorrect Power Supply Voltage**

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

1. Always use colour-coded conductors or other identification of conductors for ease of wiring and identification of function at a later date.
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 mount of the pan tilt. (Fig 14A to 14E)
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 entry to the unit is either two or one $\frac{3}{4}$ " NPT thread (model dependant), or $\frac{1}{2}$ " NPT using a suitably certified reducer, dependent on what was specified at 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, to maintain the weatherproof rating of the equipment.
8. For maintenance purposes, consult separately supplied additional wiring drawings specific to the purchase order, for as built wiring and connection details of the unit.
9. The Dual entry option has an accessible input fuse (f1). Check that the input fuse matches the voltage requirement – 24VAC – 6.3A ≥ 110 – 2A



Fig.14 Gaining access to the XP and XT Base junction box (single entry design)



Caution should be taken when removing and inserting the cable entry flange to avoid internal cable becoming snagged on corners or screws. THE CABLE ENTRY FLANGE SHOULD NEVER BE REMOVED WHEN THE UNIT IS ENERGISED

Fig.15 Gaining access to the XP and XT Base junction box (dual entry design)

Loosen M3 grub screw using 1.5mm Allen Key

M5 button head

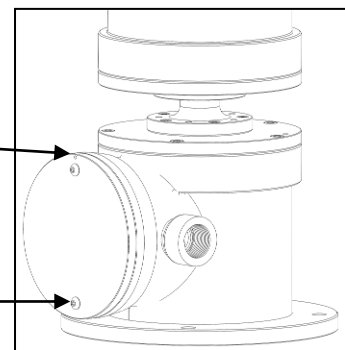


Fig.16, 17 & 18 Unscrew entry chamber lid, the two M5 button head screws and threaded holes can be used to assist in rotating the chamber lid.

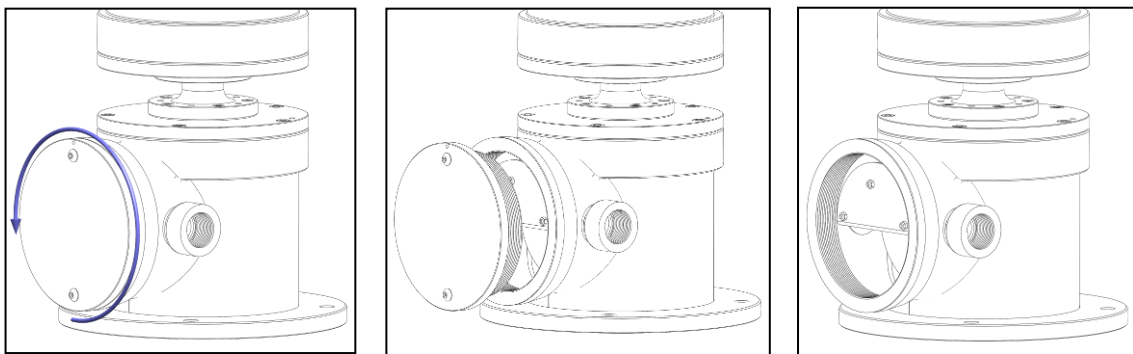
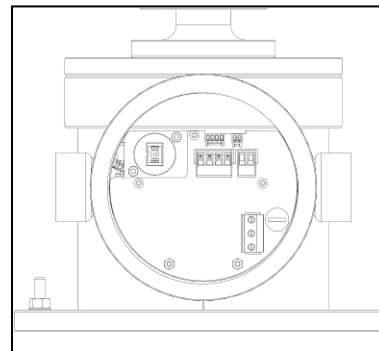
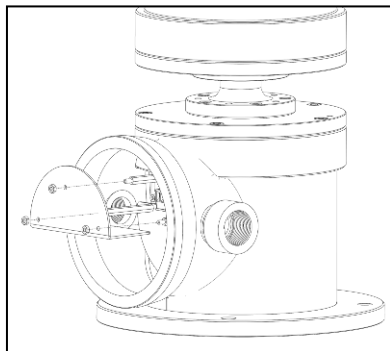


Fig.19 & 20 Remove connection cover to reveal all connections.



3.4.2 XP & XT Common Connection Examples

Always refer to project specific drawings and information

Fig.21 Common connection PCB for single entry design

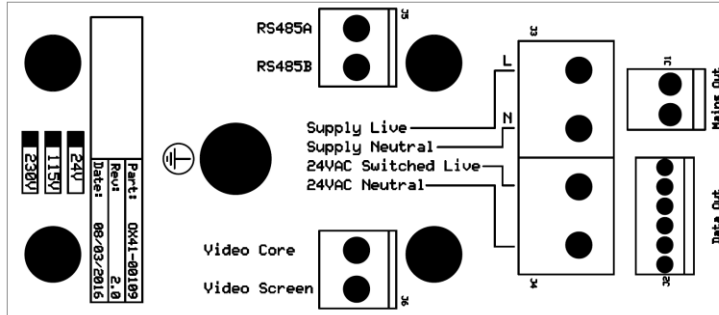
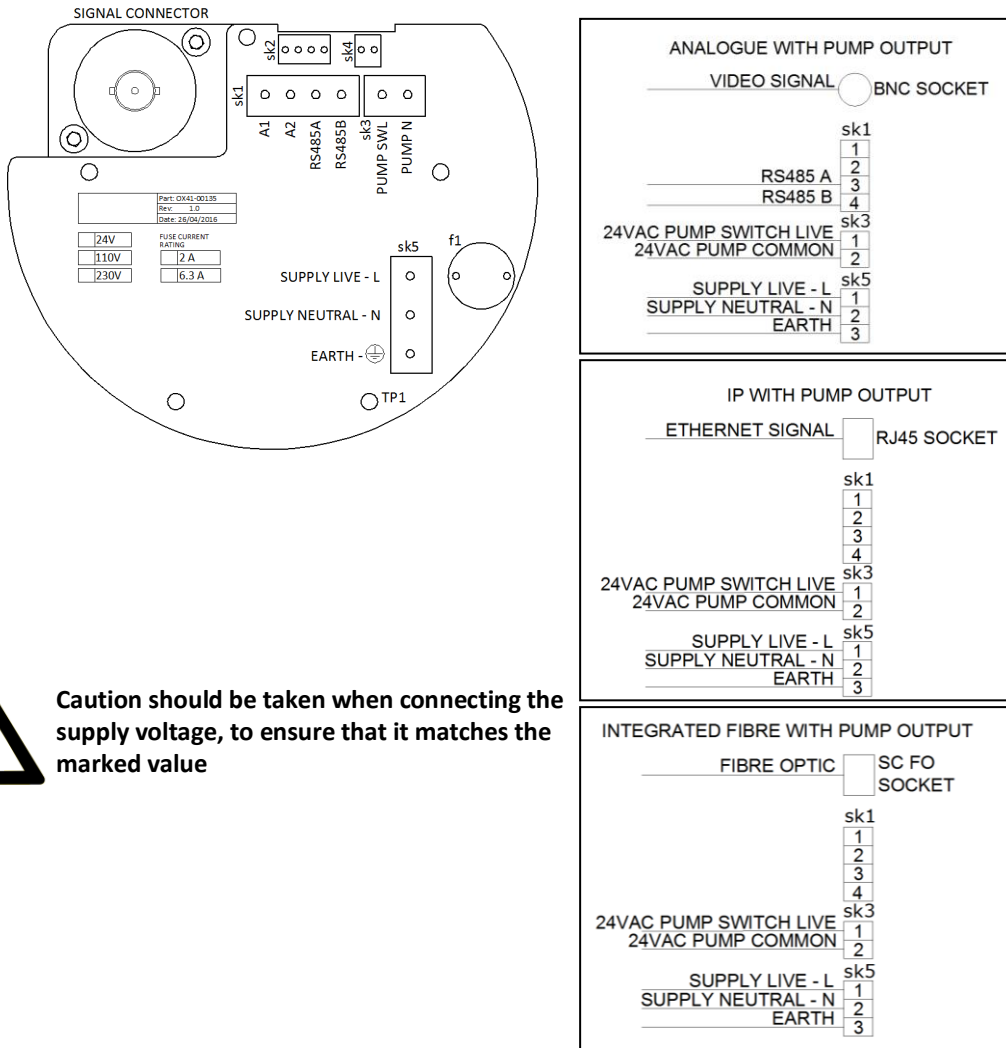


Fig.22 Common connection for Dual entry design



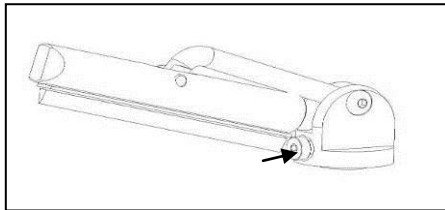
Caution should be taken when connecting the supply voltage, to ensure that it matches the marked value

3.4.3 Electrical Installation XF & XC Series units



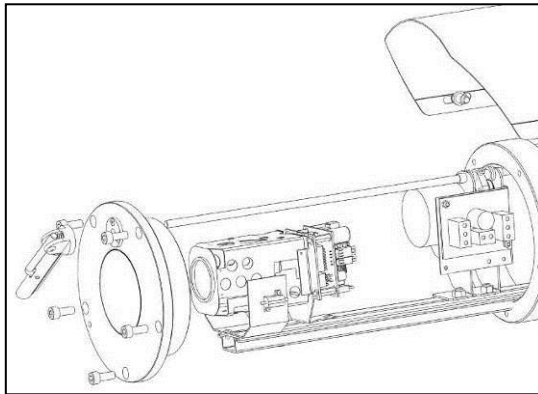
1. Cable entry type to the housing is via 1 x ½”NPT entry at the side adaptor of the housing, or for some version via the triple ¾”NPT cable entry end cover on the rear of the housing, solely for connection of power and signal wiring, no internal user wiring is allowed in this unit.(Fig 15, 16 & 17)
2. Keep a wiring diagram with the system for later use and 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.23 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.

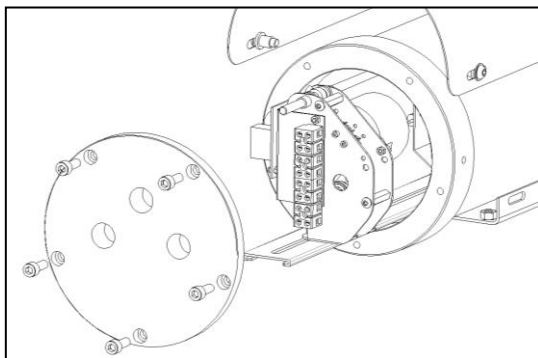
Fig.24 Removing the Front Window flange



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

Next slide out the camera mounting rail, if required.

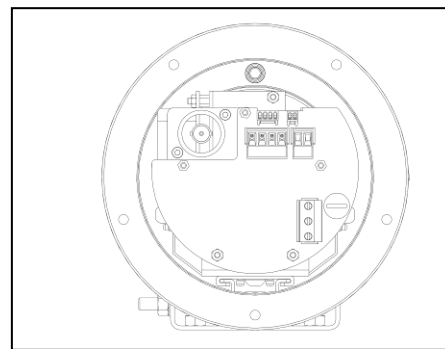
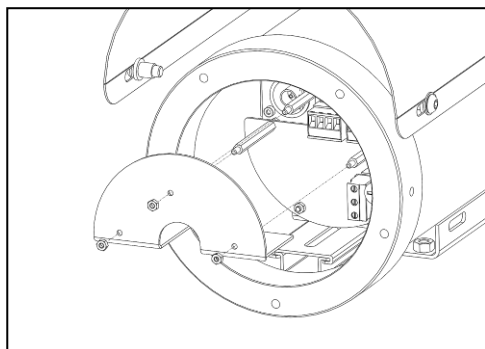
Fig.25 Removing the rear flange



Remove the rear flange 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.

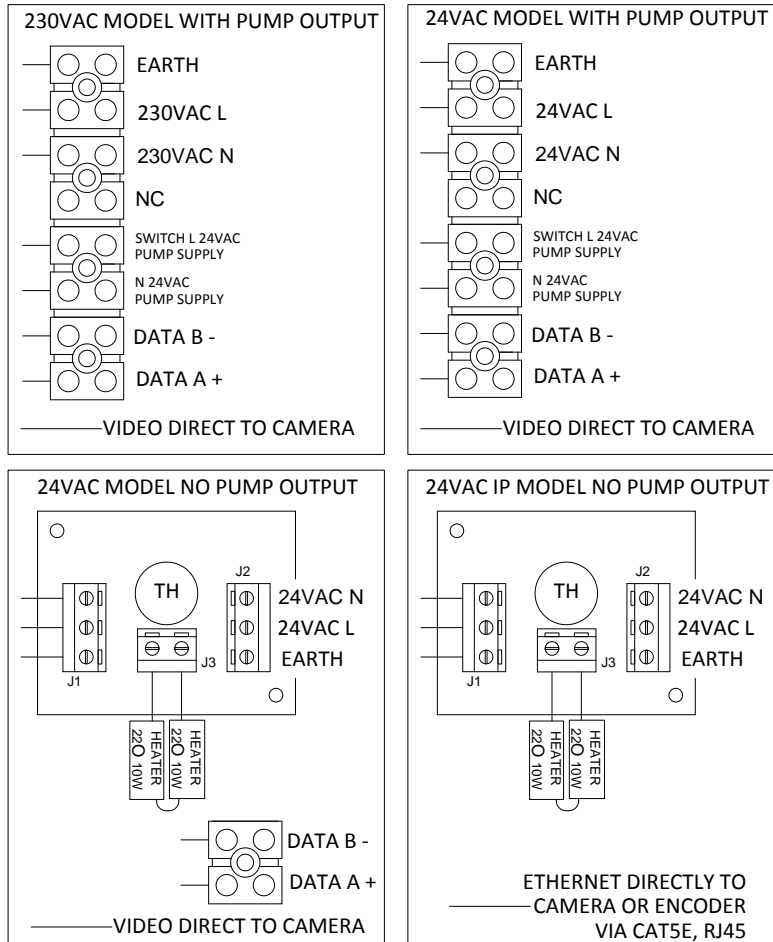
Fig.26 & 27 Removing the connection cover to reveal all connections for high voltage options



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

3.3.4 XC & XF Common Connection Examples

Always refer to project specific drawings and information
 Also refer to figure 22 for common input examples when input connection PCB is installed.



4.0 Maintenance

Recommended inspection interval: 6 Months.

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

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

However when the unit is exposed to extreme weather conditions the 'O' ring weather seals may need replacement approximately 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.

At every Inspection carry out the following:

- Clean 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.

Please read and be familiar with the instructions before servicing the Pan/Tilt or housing.

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)



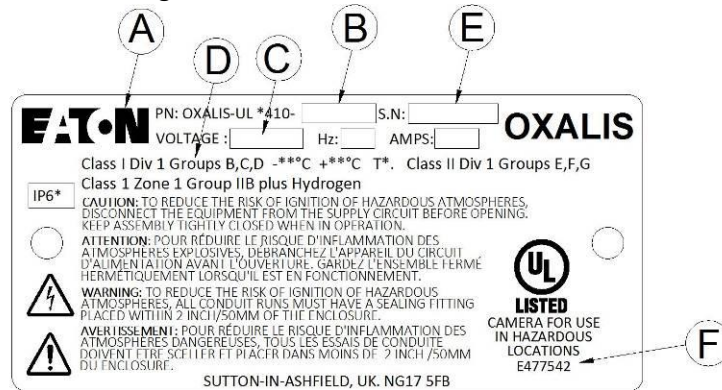
EATON takes no responsibility for oxidisation due to failure in correctly following cleaning procedures.

5.0 Labelling

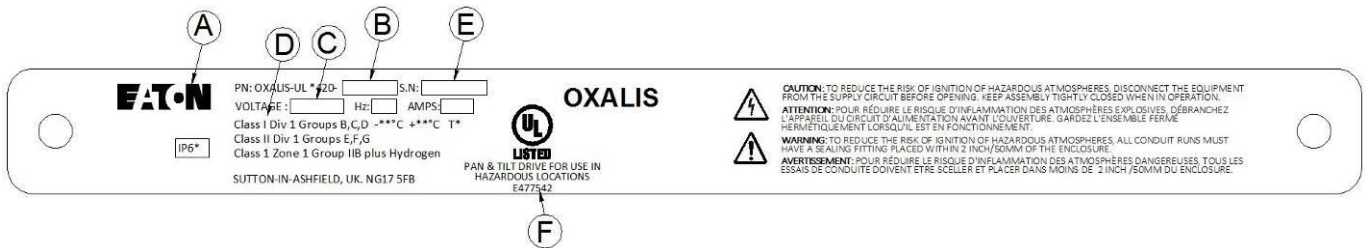
The Labels are made from stainless steel and affixed product using rivets.
The contents of the label will be in ENGLISH.

The label shows: A - Name of Manufacturer, B - Model/Type and Reference
 C - Operating Voltage, D - Area Classification
 E - Serial Number, Year/Month/SN, F - UL File Number

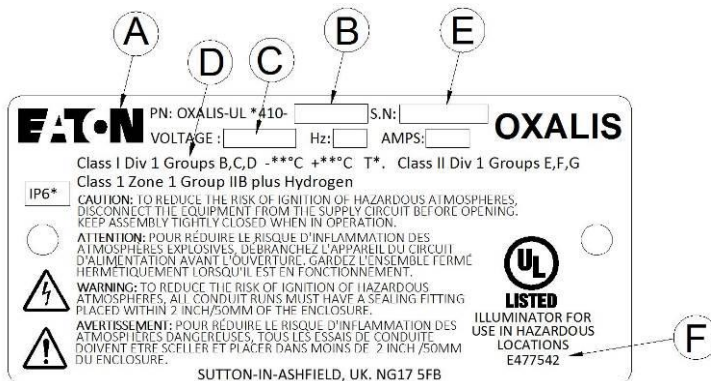
5.1 Camera Housing label



5.2 Pan Tilt unit label



5.3 Illuminator unit label



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

Coding	Class I Div 1 Group B,C,D Class II Div 1 Groups E,F,G T135°C IP67 T Class ## = Ambient Temperature range
Construction:	Stainless Steel AISI 316L
Ingress Protection rating:	IP 67
Max Weight:	
<i>Integrated Pan Tilt with housing :</i>	40-62Kg depending on model
<i>Standalone housing:</i>	12-22Kg depending on model
Mounting:	
<i>Integrated Pan Tilt with housing :</i>	4-x M10 fixings on 182mm pcd
<i>Standalone housing:</i>	Depending on mounting brackets
Supply voltage:	24VAC, 50/60Hz or 100 to 230VAC~ with integral transformer
Power consumption:	Max 120 Watts depending on model