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XP & XT Series
Flame Proof 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)

Amendment Record

Issue	Date	Details of Amendment
A		First Issue

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, refer also to Section 7.0 & Annex A

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. Care must be taken to ensure selection of suitable cables connecting to these units. (See Special Conditions for safe Use in the Certified Annex for cable selection.)
6. 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.
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 label coding includes the lettering “op pr” after Ex d, denoting that the enclosure employs the type of protection
    for 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.
12. When batteries are fitted to electronic equipment they must be removed and are not to be replaced.

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.
Each of the end covers are fixed to the body by five (5), M6 x 12 stainless steel hex cap screws; where applicable, the cable entry covers are fixed using five M5 x 12-mm stainless steel hex cap screws, or the covers are welded in place. All fixings conform to the requirements of EN ICE 60079-0:2018/IEC 60079-0:2017. The weatherproof seal at the union between the enclosure and the 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, 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 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:

- 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 XP and XT units each have 2x M25 cable entry points into the fixed base section, with a large screw-fit flange that can be removed for wiring access.

The Series 'X' housings and 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'*

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 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, Smart IR illuminator and thermal units.
The range also includes options for standard analogue video and data, HD IP cameras, hybrid IP encoders, 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.

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 KIT
PX99902859	WIPER BLADE ASSEMBLY
PX99903785	LW PTZ WASHER NOZZLE KIT
PX99903786	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 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, should you need to return the unit for repair, or maintenance.
The protective plastic film should be removed from sunshields before they are fitted.

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 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)

3.2 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 can 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.

3.2.1 Mounting the XP & XT Series

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

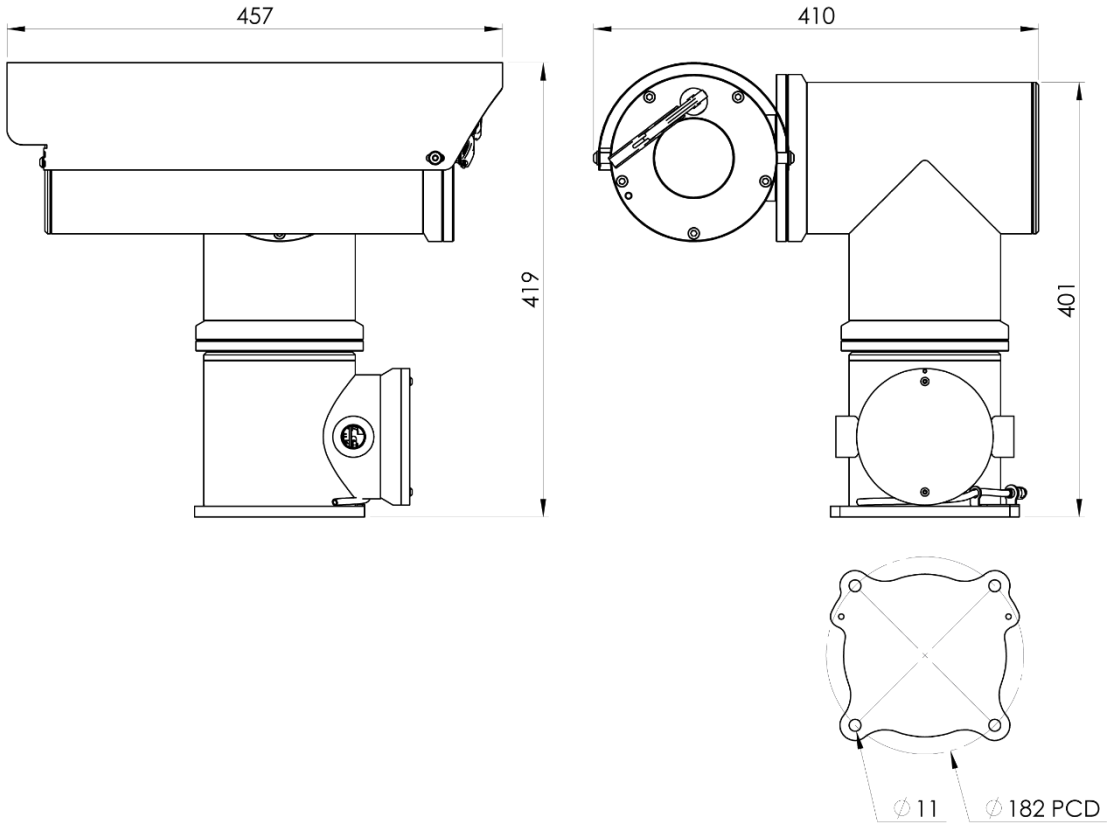


Fig.2 Example mounting bracket:
BPW6500 Wall Bracket

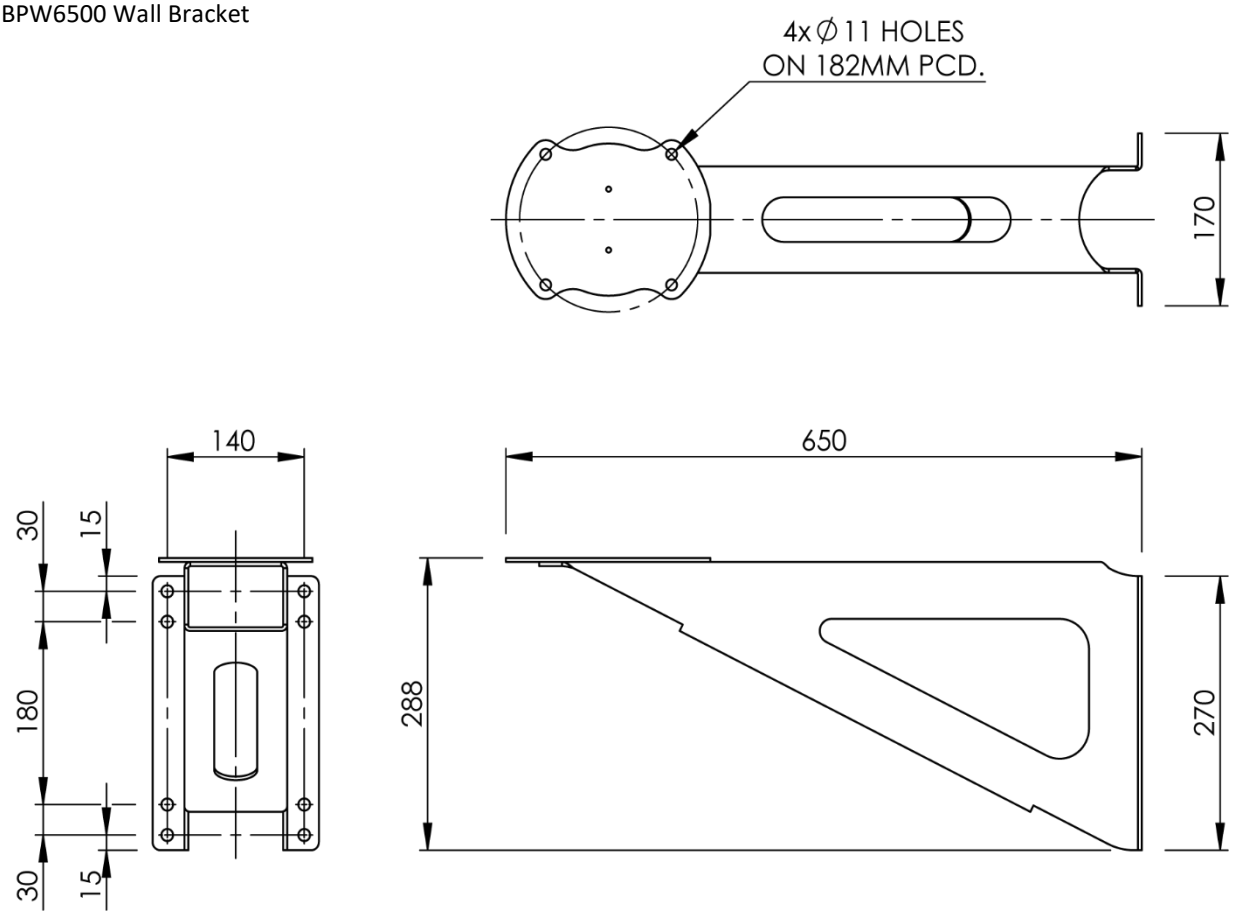


Fig.3 BFW5000 Wall Bracket

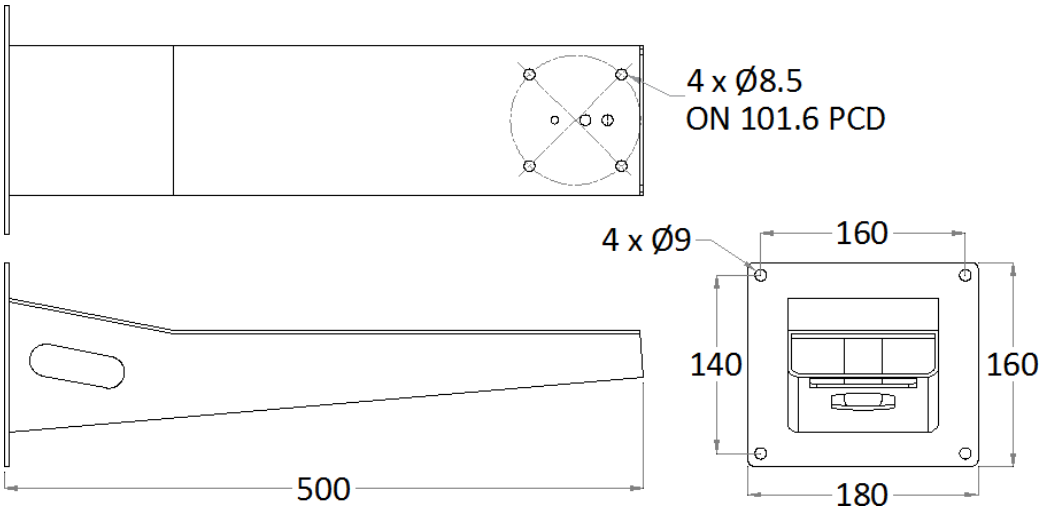
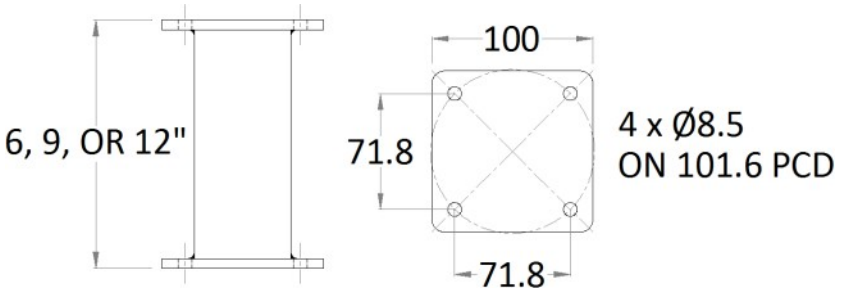


Fig.4 BFP0600/900/1200 Column Spacer



3.3 Accessory Installation

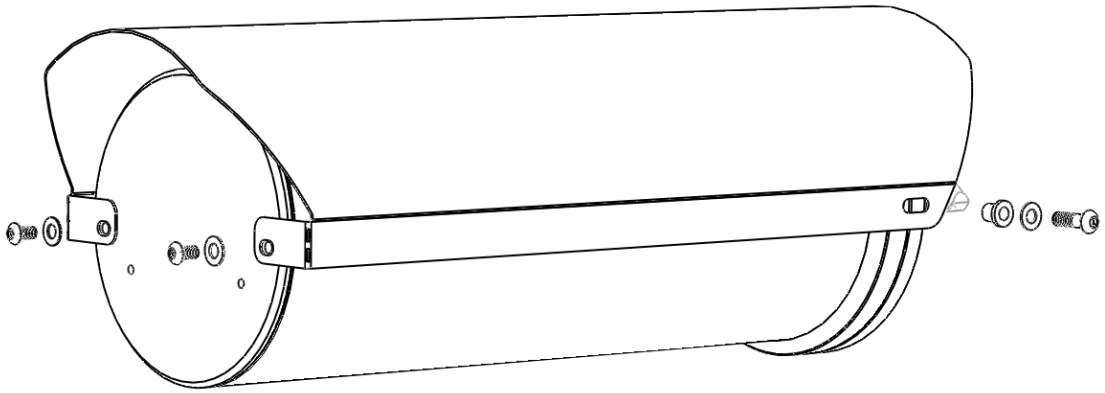
3.3.1 Sunshield Installation

Depending on the model required, sunshields are sometimes 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.10)

Sunshields have two corner and two ‘tab’ fixing types, one for the front of the housing and shorter screws at the rear. (Fig.10)

Fig.10 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. 11)

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. 12)

Fig.11 Housing washer nozzle

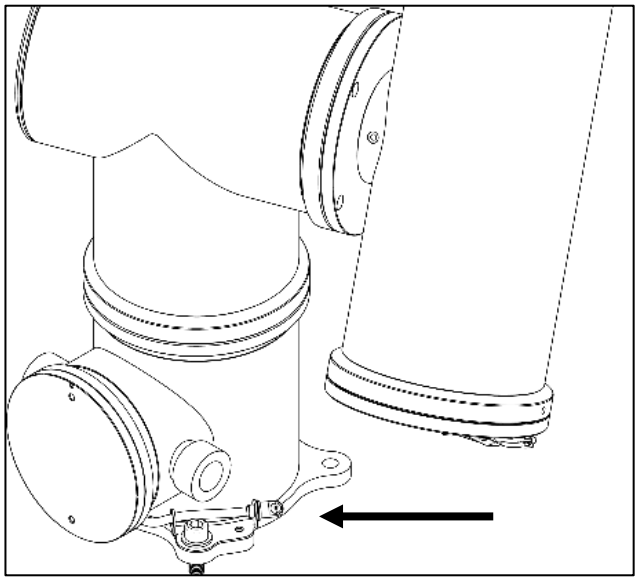
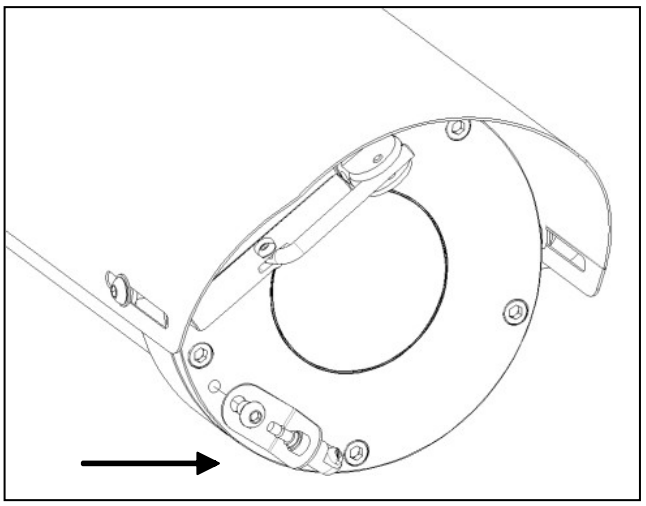


Fig.12 Non-continuous Rotation P&Ts and Fixed housings washer nozzle



3.4 Electrical Installation

Electrical installation and servicing should only be carried out by qualified 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 ±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

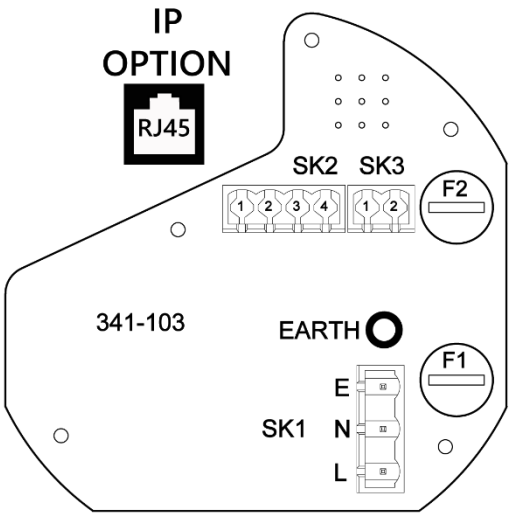
3.4.1 Electrical Installation XP & XT Integrated Pan, Tilt, housing assembly

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

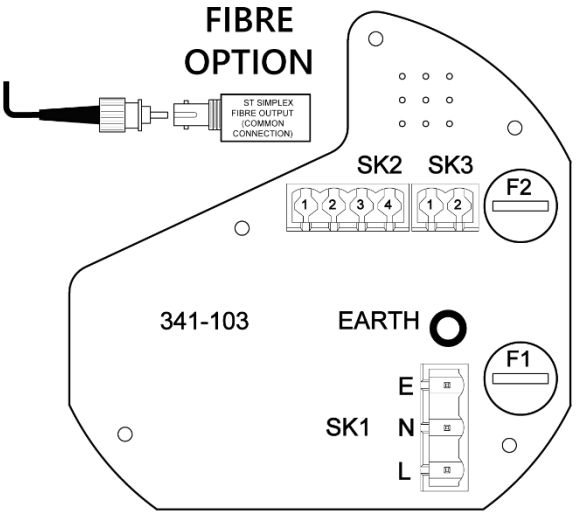
CAUTION SHOULD BE TAKEN WHEN REMOVING AND INSERTING ANY ENTRY COVERS/ FLANGES/ CABLE GLANDS TO AVOID INTERNAL CABLES BECOMING SNAGGED OR STRETCHED ON INTERNAL OBJECTS AND FITTINGS.
WARNING - THE BASE ENTRY COVER AND GLANDS SHOULD NEVER BE REMOVED WHEN THE UNIT IS ENERGISED. WAIT 5 MINUTES AFTER DE-ENERGISING.

3.4.2 XP & XT Common Connection Examples

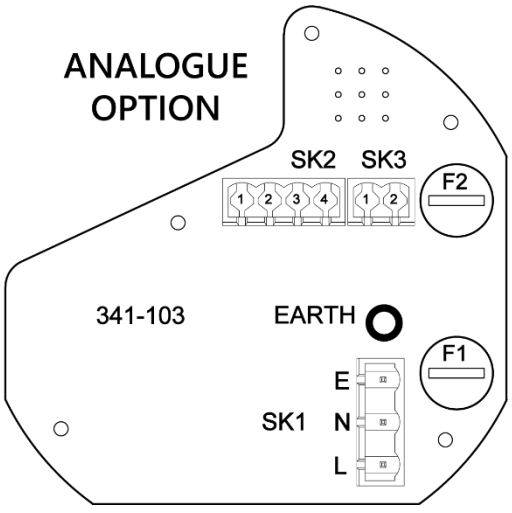
Always refer to project specific drawings and information



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



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

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

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 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

The certification & 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.

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

Refer to controlled Annex at the end of this manual for full label marking details.

6.0 Specifications, Technical Data

Construction:	Stainless Steel AISI 316L
Ingress Protection rating: *Pan & Tilt with housing:*	IP 66/7 Max Weight: 33-62Kg depending on model
Mounting: *Pan & Tilt with housing:*	 4-x M10 fixings on 182mm PCD
Supply voltage:	24VAC, 50/60Hz or 100 to 230VAC with integral transformer
Power consumption:	Max 120 Watts depending on model
Cable Entry	M25 x1.5 ISO thread, or M20 using an Ex d certified reducer, dependent on specification at order.

M20 x 1.5 / M25 x 1.5 ISO threads
dependent on specification at order.

7.0 Special Conditions for Safe Use.

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 project specific documents.

See **Annex** for further special conditions for certified safe use.

A. Ex ANNEX – Controlled ATEX Document

Title:	**Series X (XF, XP & XT) flame proof camera units – Installation & Maintenance Instructions**
Document:	**IMI +70 – XF – XP – XT**
Revision:	**9.0**
Date:	**13/07/2020**

This is a certified Annex and must not be changed without authorization

Specific Conditions for Safe Use.

1. No modification 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.
9. Dual Imager Housing variants only: Housings must only be installed in areas where there is a low risk of mechanical impact.

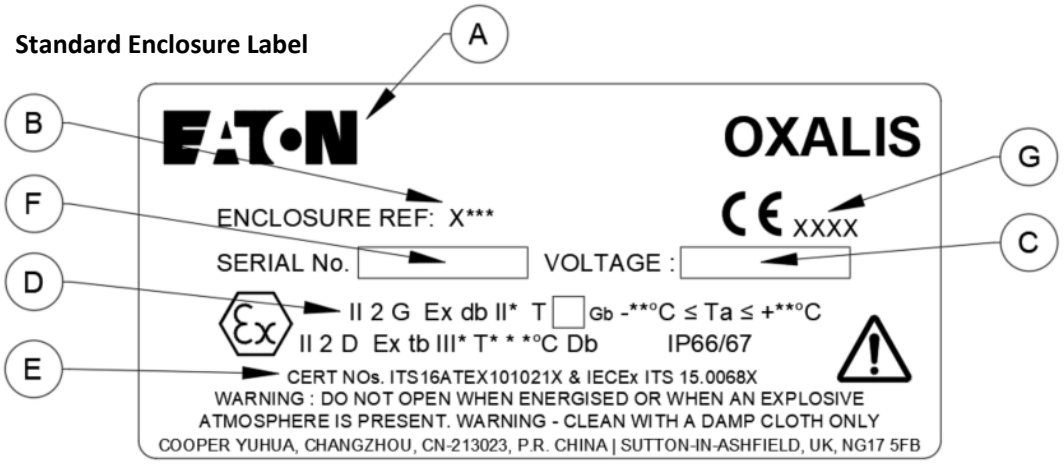
LABELLING & MARKING

The certification & 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.

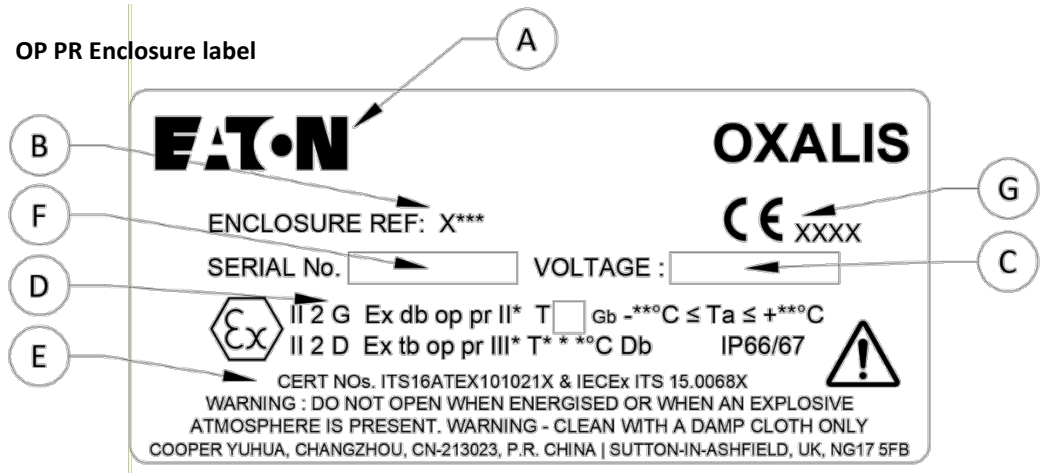
The label shows:

A - Name of Manufacturer
B – Model Type
C - Operating Voltage
D - EX ratings,
E - ATEX Certificate & IECEX certificate numbers
F - Serial Number,
G - Notified Body Number

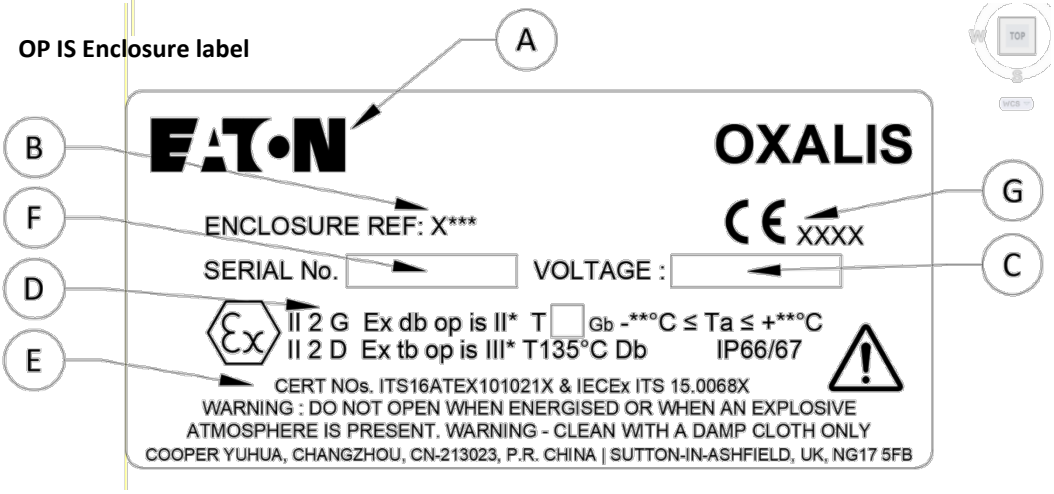
Standard Enclosure Label



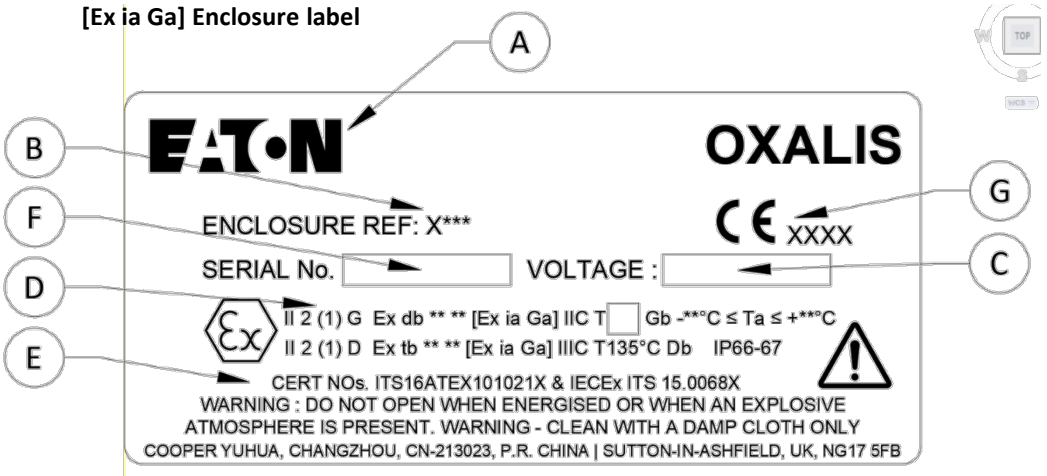
OP PR Enclosure label



OP IS Enclosure label



[Ex ia Ga] Enclosure label



Coding

IECEx & ATEX	II 2 G Ex db IIC T6-3*Gb -##°C ≤ Ta ≤ +##°C
	II 2 D Ex tb IIIC T135°C Db IP66/67
Illuminator	II 2 G Ex db op is IIC T4/3 Gb -##°C ≤ Ta ≤+##°C
	II 2 D Ex tb op is IIIC T135°C Db IP66/67
Fibre Optic	II 2 G Ex db 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

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

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

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

1. Always use colour-coded conductors, or other identification of conductors for ease of wiring, and identification of function in the future.

2. Keep a wiring diagram with the system for later use and reference.

3. Provision is made for two cable entries, at the base of the pan and tilt unit. (Fig A1) To maintain the certification requirements of the unit all cables/conduits must be fitted at the entry, with certified Ex d Flameproof, compound filled barrier glands, either brass, nickel plated or stainless steel.

4. The cable entries to the unit are M25 x1.5-6H ISO thread, or M20 using an Ex d certified reducer, dependent on what was specified at order.

5. A minimum of 10 mm depth of engagement must be maintained for all glands.

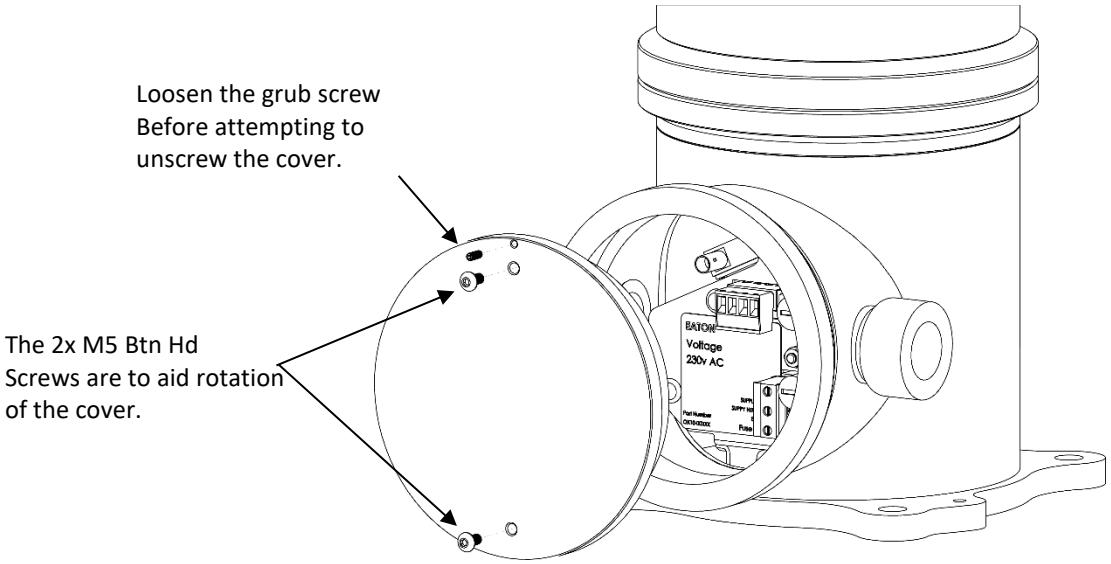
6. All glands/reducers must be ingress protected to IP67 or better, to maintain the weatherproof rating of the equipment.

7. For maintenance purposes, consult separately supplied additional project wiring drawings specific to the purchase order, for as-built wiring and connection details of the unit

8. 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:	24VAC – 6.3A	≥110 – 2A
Fuse 2:	1A	

(Fig A1) Gaining access to the XP and XT Base junction box



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

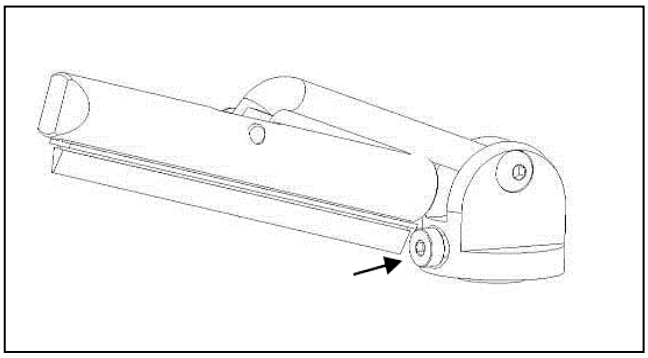
Electrical Installation XF Series units

1. Cable entry type to the housing is via one M20 x 1.5 ISO entry at the side adaptor of the housing, or optionally, via the three 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.

2. Keep a wiring diagram with the system for later use and reference.

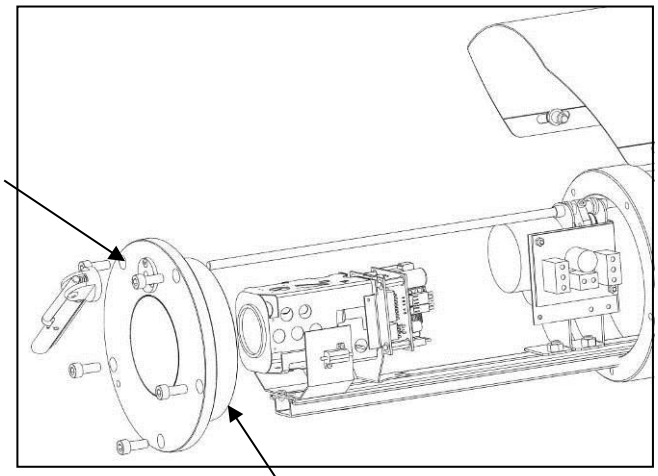
3. For maintenance purposes, consult separately supplied additional wiring drawings specific to the purchase order, for as built wiring and connection details of the unit.

(Fig A2) 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.

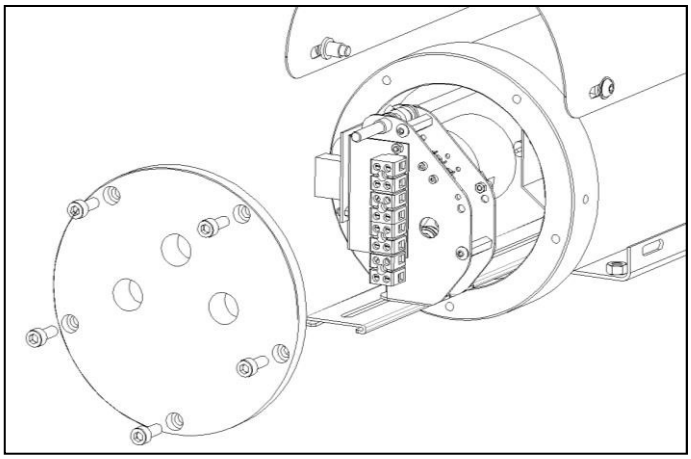
(Fig A3) Removing the Front Window cover



Remove the front window cover by first removing the 5 x M6 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.

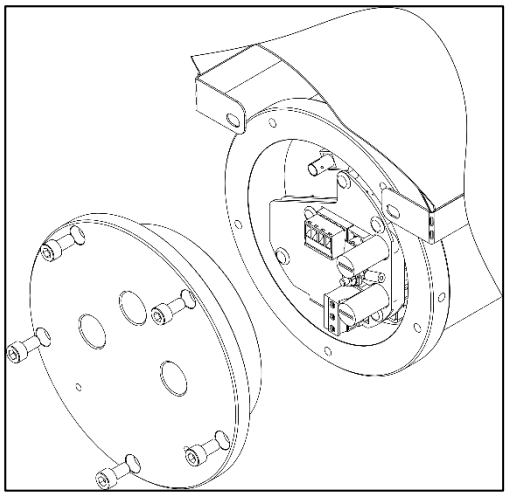
Next slide out the internal camera rail, if required.

(Fig A4) Removing the rear cover (Only models with removable rear cover)



Remove the rear cover by first removing the 5 x M6 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 mounting rail to reveal the incoming cable connection terminals.



(Fig 4b) View of lightweight Fixed Housing with alternate input connections.

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

Maintenance

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.