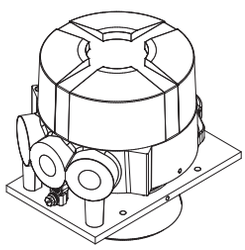
WESTLOCK CONTROLS

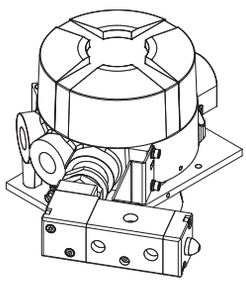
D460/D470 SERIES ATEX AND IEC Ex CERTIFIED

INSTALLATION AND OPERATING INSTRUCTIONS

Installation and operating instructions for Westlock Digital EPIC D460/D470 Series position transmitters



D460/D470 Transmitter



D460/D470 Transmitter with 5/2 way Solenoid Valve

CE 2809 Ex II 2 GD

IECEx ETL 17.0011X
Ex db IIC T* Gb Tamb -*°C to +*°C
Ex tb IIIC T* Db Tamb -*°C to +*°C IP6X
ITS 11 ATEX 17431X
Ex d IIC T* Gb Tamb -*°C to +*°C
Ex tb IIIC T* Db Tamb -*°C to +*°C IP6X
Ambient variation -60°C to +110°C (T4/T130°C); -60°C to +80°C (T5/T95°C); -60°C to +65°C (T6/T80°C)
Environmental parameters: 80 kPa (0.8 bar) to 110 kPa (1.1 bar). Air with normal oxygen content, typically 21%.

The Digital EPIC D460/D470 are microprocessor-based transmitters providing both 4-20 mA signal for position feedback and digital communications via the HART® protocol for data evaluation and diagnostics. Other protocol electronics can also be used within this enclosure for networks such as Foundation Fieldbus.

The enclosures are either aluminum (D460) or 316 stainless steel (D470) and comprise a housing with a screwed cover.
The enclosure can offer up to four M20 x 1.5p, M25 x 1.5p, ½"-14 NPT or ¾"-14 NPT cable entries for connection to an external power source via appropriate ATEX and IEC Ex certified cable glands or up to three with an integral solenoid coil.

With the non-contact feedback trigger positioned under the product, the position of the valves is visibly enhanced by the use of different colours and markings.

Note: Before installation of this product, please ensure that the product and its certification is suitable for the intended application.

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised.

Installation of any cable entry devices, conduit entry devices or blanking devices shall not compromise the degree of ingress protection level IP6X for use in the presence of combustible dusts.
The unit has an ingress protection of IP66/67 and therefore any conduit device fitted must maintain this.

Note: these products have been certified with a cable entry temperature rise of 4°C. Ensure that this is taken into consideration when selecting suitable cabling for the ambient temperature in which the product is to be used.

Note: these products are not intended to be assembled directly to process pipe work etc that is heated or cooled to temperatures outside of the range as indicated above.

STOP **WARNING**
Do not open when energized or when an explosive atmosphere is present.

STOP **WARNING**
Electrostatic hazard, clean only with damp cloth.

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1 MANUAL SCOPE

This manual contains installation, wiring, configurations and calibration instructions of the Digital EPIC D460/D470 in standard applications for both rotary and linear actuators.

2 MOUNTING INSTRUCTIONS

2.1 Mounting on a rotary actuator

Before installing the Digital EPIC transmitter, the direction of the process valve de-energizing stroke must be determined as this is very important.

Use Figures 1 and 2 below to determine the orientation of the inner beacon with reference to the conduit that has been machined into the middle conduit boss.

IMPORTANT
Condition 1 and condition 2 show the placement of the inner beacon with respect to the transmitter housing while the actuator is in the fail position.

2.2 Mounting on a linear actuator

2.2.1 To center the linear trigger:

2.2.1.1 Stroke the actuator to its upper limit and place a mark on the actuator's yoke that lines up with the red arrow on the magnet assembly.

2.2.1.2 Stroke the actuator to its lower limit and place a mark on the actuator's yoke that lines up with the red arrow on the magnet assembly.

2.2.1.3 Place a third mark on the yoke centered between the upper and lower limit marks.

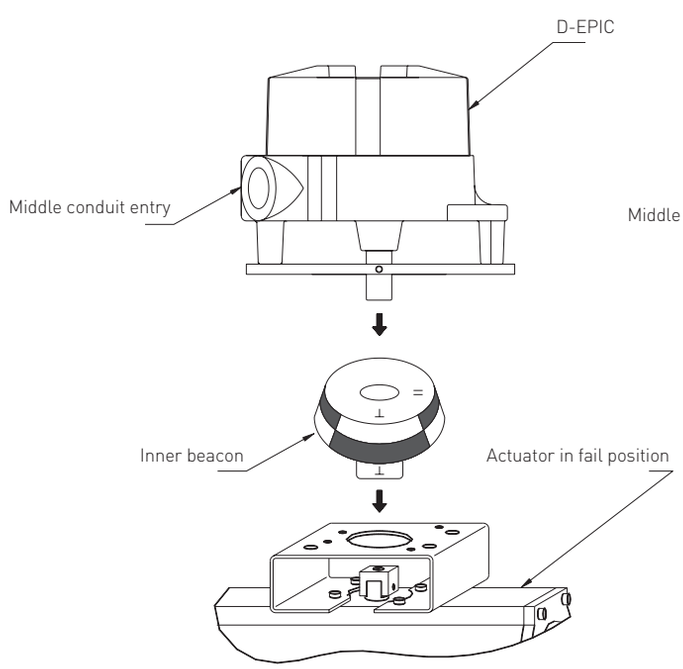
2.2.1.4 Lastly, mount the Digital EPIC to the bracket so that the middle conduit entry (at 9:00) faces away from the diaphragm or cylinder (at 12:00). See Figure 3.

2.2.1.5 The Digital EPIC requires the correct stroke length of linear trigger to function correctly.

Note: for Fisher actuators models 657 and 667 sizes 34 thru 70, Westlock Controls supplies a slotted mounting kit, to ease the mounting process. This will allow the user to easily center the position sensor between the limits of the magnet assembly's stroke.

FIGURE 1

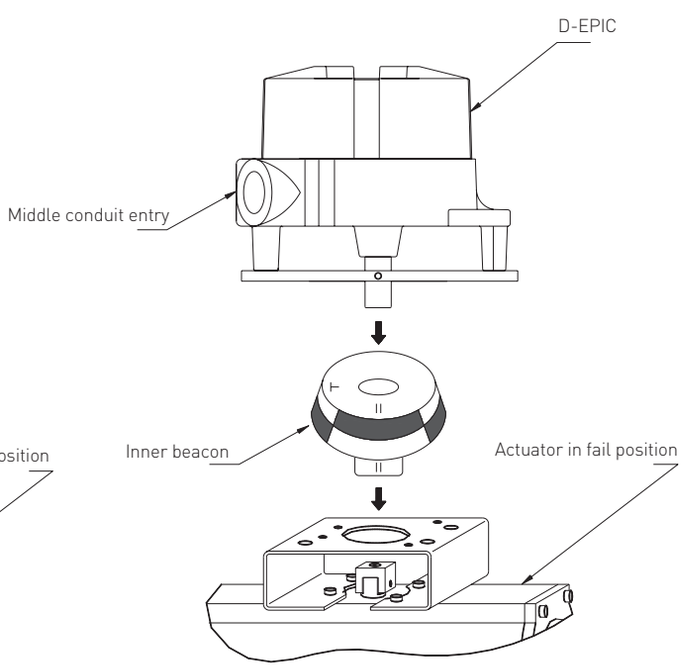
Condition 1 – Actuator fails in a clockwise direction.
⊥ Placed at 6:00
II Placed at 3:00



Important note: inner beacon '⊥' and unit orientation must be aligned as shown above

FIGURE 2

Condition 2 – Actuator fails in a counter-clockwise direction.
⊥ Placed at 9:00
II Placed at 6:00



Important note: inner beacon 'II' and unit orientation must be aligned as shown above

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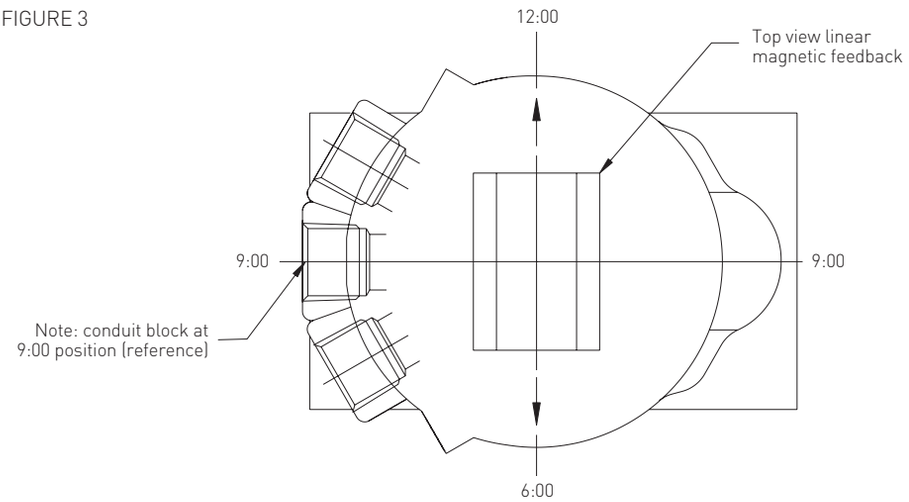
FIGURE 3



3 WIRING INSTRUCTIONS

WARNING
The D460/D470 Digital EPIC should always be handled with care when the cover is removed and wired to electrical power source. To remove disengage cover lock screw before attempting to remove cover by turning clockwise. Re-engage cover lock after replacing cover as explained in Sec. 5.3.5.

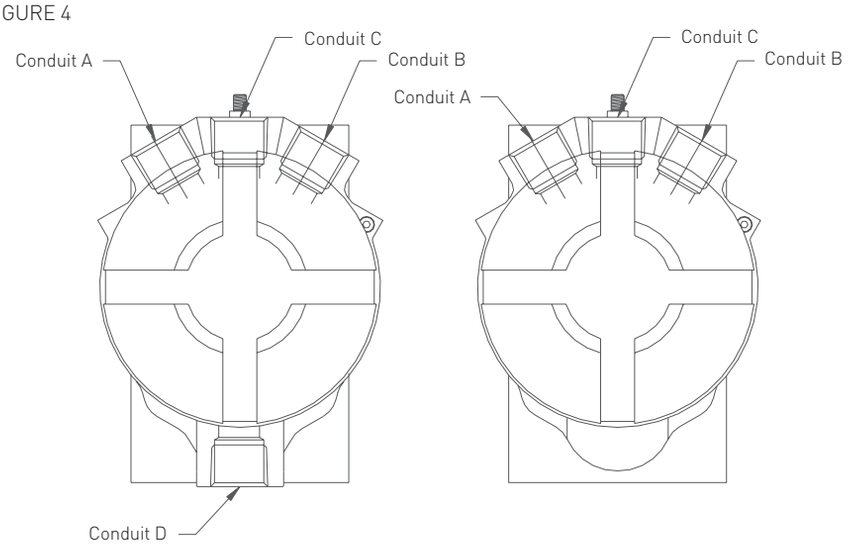
Note: Before electrical installation, please read and follow the wiring diagram located inside the cover. The electrical ratings can be found on the product identification label.

3.1 Field wiring must be carried out in accordance with site, local and national electrical codes / requirements. This includes special attention to earth bonding with the aluminum enclosure using the internal and external earth points provided.

3.2 Installation of this product shall be carried out by competent personnel in accordance with the applicable code of practice such as EN 60079-14 or IEC 60079-14.

3.3 The D460/D470 Digital EPIC housing can offer up to four of the following conduit entries: M20 x 1.5p, M25 x 1.5p, ½"-14 NPT or ¾"-14 NPT. These entries are detailed on the product identification label found on the product housing. Please see Figure 4 for conduit positions.

FIGURE 4



4 conduit enclosure **3 conduit enclosure**

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3.4 The certification applies to equipment without cable glands. When mounting the flameproof enclosure in the hazardous area, only suitably rated IP66/67 ATEX and IEC Ex certified flameproof glands must be used.

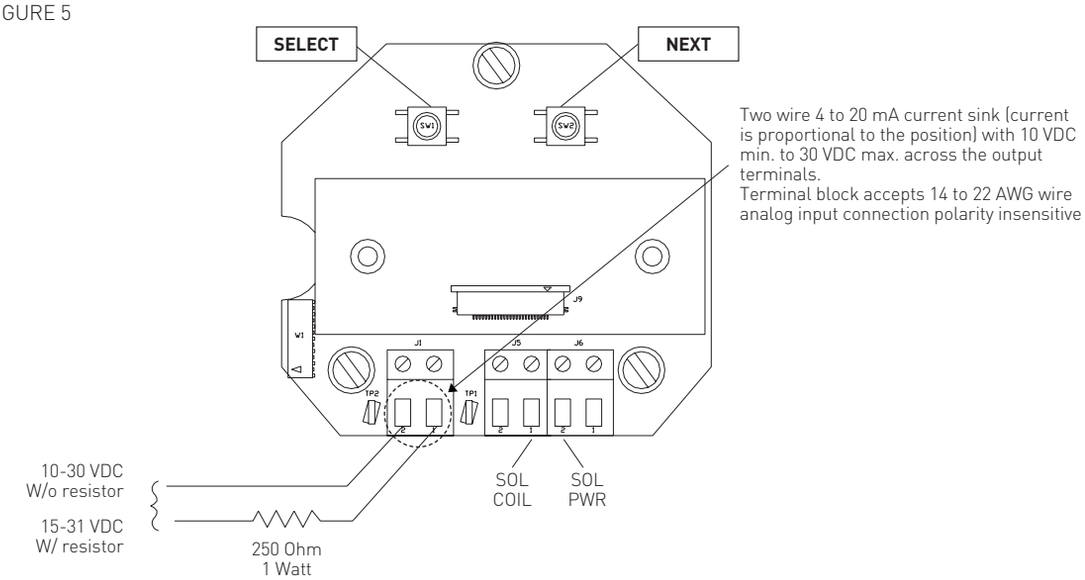
3.5 All unused cable entries must be plugged with a suitably rated IP66/67 ATEX and IEC Ex certified blanking devices.

3.6 The table below details the applicable ambient ranges:

Series code	T class	Ambient range
D460	T6	-60°C to +65°C
D460	T5	-60°C to +80°C
D460	T4	-60°C to +110°C*
D470	T6	-60°C to +65°C
D470	T5	-60°C to +80°C
D470	T4	-60°C to +110°C*

WARNING
*The ambient temperatures marked with an * indicate certified upper ambient for the Digital EPIC without solenoid valve. The T4 certified temperature is -60°C to +85°C.*

FIGURE 5



NOTE
For HART applications the auxiliary resistance is necessary only if unit is energized without an analog input card or with any device with negligible impedance. HART hand held needs to be connected down stream of the optional resistance.

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4 CONFIGURATION INSTRUCTIONS

The configuration menu (Cnfg) has two parameter menus. 'Cnfg' is displayed in LCD upper right side. Each of the following selections will appear in LCD lower right side until selected where it then moves to LCD upper right side.

4.1 Type

This allows the user to select the valve type, rotary (Rot) or linear (Lin).
The factory default is rotary.
'Type' appears in upper right side and the possible selections appear in LCD lower right side.

Flop

This allows the user to select how the current valve position is displayed in LCD sector 1, either as percent open (OFF) or as percent closed (ON). The factory default is percent open (OFF). 'Flop' appears in LCD upper right side and the possible selections appear in LCD lower right side.
Follow the keypad menu flow diagram for the standard.

5 CALIBRATION INSTRUCTION

5.1 Pushbutton procedure

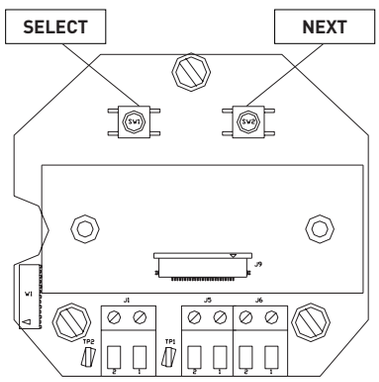
Utilize the Select and Next push buttons on the PCB assembly (Figure 6) in the enclosure to calibrate the D-EPIC.

Quick calibration:

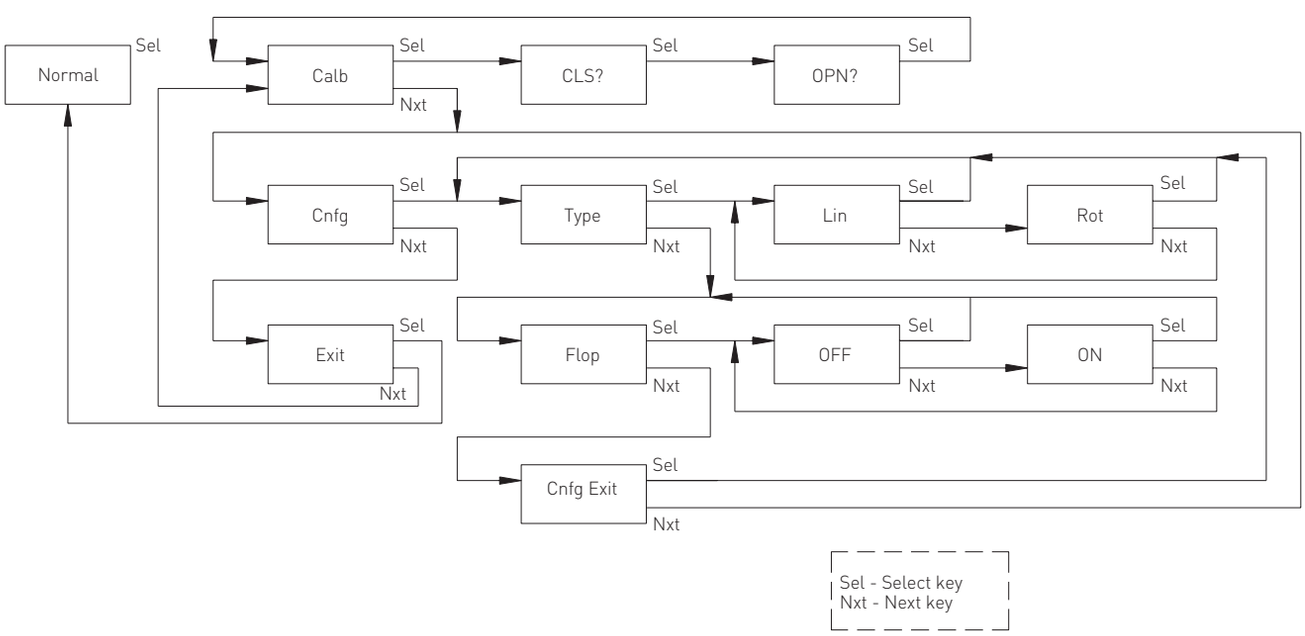
5.1.1 Press the 'select' key until 'Calb' is displayed.
5.1.2 Press the 'select' key until 'CLS?' is displayed.
5.1.3 Stroke the valve to the de-energized position (typically valve close).
5.1.4 Once the de-energized position is achieved press 'select' to calibrate this position.
5.1.5 The display now shows 'OPN?'.
5.1.6 Before continuing, stroke the valve to the energized position (typically valve open).
5.1.7 Once the energized position is achieved press 'select' to calibrate this position.
5.1.8 The display now shows 'Calb Pass' as soon as calibration is completed.
5.1.9 Press the 'Next' key until 'Exit' is displayed on the LCD.
5.1.10 Once exit is displayed press the 'Select' key to exit calibration.

Note: if for any reason the Digital EPIC does not calibrate correctly there will be a calibration fault code displayed on the LCD. Please contact the office for further assistance.

FIGURE 6



KEYPAD MENU FLOW DIAGRAM



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5.2 HART Rosemount procedure

Note: the images below are of the Rosemount 275 hand held which was the base design. Although the appearance and options of the 375 and 475 have expanded, the menu structure for the Digital EPIC has not changed.

5.2.1 Connect Digital EPIC to HART handheld 275.
5.2.2 Select 'Main Menu' by pressing → key. See Figure 7.
5.2.3 Select 'D-EPIC Cal' by pressing → key. See Figure 8.
5.2.4 Once D-EPIC option has been selected, either the:
5.2.4.1 Calibration process can be aborted by pressing F3 key.
5.2.4.2 Calibration process can be continued by pressing F4 key. See Figure 9.

FIGURE 7

FIGURE 8

FIGURE 9

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5.2.5 Stroke the valve to the de-energized position (typically valve close).
5.2.5.1 Calibration process can be aborted by pressing F3 key.
5.2.5.2 Calibration process can be continued by pressing F4 key. See Figure 10.
5.2.6 Stroke the valve to the energized position (typically valve open).
5.2.6.1 Calibration process can be aborted by pressing F3 key.
5.2.6.2 Calibration process can be continued by pressing F4 key. See Figure 11.
5.2.7 Finish and accept the new calibrated value.
5.2.7.1 To reject new calibrated value, and set back old value, select 'Abort' by pressing F3 key.
5.2.7.2 To accept new calibrated value, select 'OK' by pressing F4 key. See Figure 12.
Note: wait 5 seconds before doing this operation.
5.2.8 Return to online menu to read current output values by pressing the '←' key once. This screen may view any calibration error flag.

FIGURE 10

FIGURE 11

FIGURE 12

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5.3 HART Rosemount 275 and loop calibrator procedure

Note: the following procedure describes the use of a typical loop calibrator together with the 275 hand held.

5.3.1 Disconnect both input wires from the D-EPIC transmitter.

5.3.2 Select the 'source and mA' function on the loop calibrator. Short the output leads together then adjust the loop calibrator until the display shows full-scale output (usually 24.0 mA).

5.3.3 Connect the black lead (-) to one pin of the D-EPIC transmitter input connector (J1). Connect the red lead (+) to a 250-Ohm ¼ W resistor. Connect the other end of the 250-Ohm resistor to other pin of the D-EPIC transmitter input connector (J1).

5.3.4 Connect the leads of the HART 275 communicator to TP1 and TP2 of the D-EPIC transmitter. See Figure 13.

Note: the Loop calibrator does not control the D-EPIC it only supplies current for it to operate. The D-EPIC will draw (sink) current in proportion to the valve position (usually 4.0 mA with the valve Closed and 20.0 mA with the valve Open) for the D-EPIC to operate.

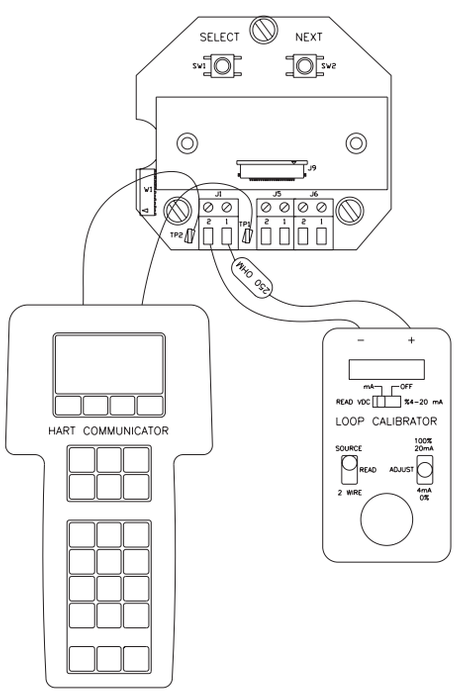
5.3.5 Thread the cover back onto the housing ensuring that the cover is fully tightened. This will ensure correct sealing gasket compression and correct flamepath engagement. Secure the cover in position by turning the M4 screw (counter clockwise) against the cover.

5.4 Product repair and service

5.4.1 In the event of any repairs that may be required such tasks must be carried out by suitably trained / competent personnel in accordance with the applicable code of practice such as EN 60079-19 or IEC 60079-19.

5.4.2 The certification of this product has been approved based on the material of construction as per the drawings listed in the schedule within this certificate. Any replacement parts that are not made in accordance to the listed drawing will invalidate the approval / certification. Replacement parts must be purchased through Westlock Controls or via an approved Westlock Controls distributor.

FIGURE 13



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Engineering document reference
These installation and operating instructions are based on the latest engineering update, reference ECN#13629, and form part of the certification for the D460/D470 series. To ensure you have the most recent version of this IOM, please check the document library on our website (westlockcontrols.com) to ensure this document has the latest ECN number.

Translations
Where translated the copy is taken from the original English document VCIOM-05084-EN as checked by the relevant notified certification body and therefore the original English document will prevail. No rights or liability can be derived from any translation.

Previous documents
VCIOM-05084 replaces all previous installation and operating instructions for the D460/D470 series including VCIOM-04108/04120 and TECHUK-39/40.

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WARNING
This symbol warns the user of possible danger. Failure to observe this warning may lead to personal injury or death and/or severe damage to equipment.

ATTENTION
This symbol identifies information about operating the equipment in a particular manner that may damage it or result in a system failure. Failure to observe this warning can lead to total failure of the equipment or any other connected equipment.

NOTE
This symbol draws attention to information that is essential for understanding the operation and/or features of the equipment.

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