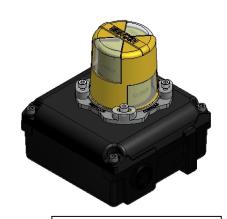
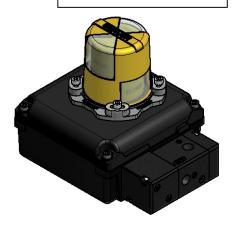
Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

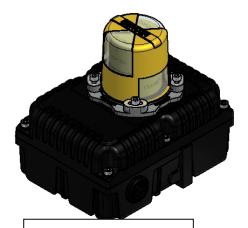
With Magnum Proximity Switches.



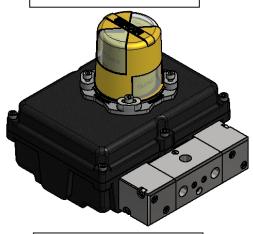
3400 Position Monitor



3700 Control Monitor



8400 Position Monitor



8700 Control Monitor

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Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

1.0 Introduction

The 3400, 3700, 8400 and 8700 series of Ex mb eb Position / Control Monitors are available in three materials, Grilamid TR90 UV (R), Aluminum A360.2 (A) or Stainless Steel CF8M / 316 (S) which provide end of travel indication by the means of either electrical switch or inductive sensors mounted within the enclosure. These are activated by cams / triggers mounted on the rotary shaft. The 3700 series has a special build option Ex mb e ib including two NJ2-V3-N inductive proximity sensors.

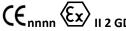
The enclosure construction comprises of a shaft passing through the enclosure housing and cover, when fitted with visual indicator, and has an integral gasket seal with up to two 'O'ring seals in the bearing areas.

The enclosure has the option of up to three entries in the 3400, upto two in the 3700, upto five in the 8400 and three or four in the 8700, dependent on the number of solenoid operating coils required. The following sizes M20 x 1.5p, M25 x 1.5p, 1/2"-14NPT, 3/4"-14NPT, Pg13.5 or any other suitable thread that can maintain IP6X ingress rating and be used to connect to an external power source.

2.0 Product Certification

 ϵ

Ex mb eb IIC T* Gb
Ex tb IIIC T*°C Db IP6X
Tamb -*°C TO +*°C
IECEX SIR 08.0129X



Ex mb eb IIC T* Gb Ex tb IIIC T*°C Db IP6X Tamb -*°C TO +*°C SIRA 08 ATEX 5348X

This equipment may be used in a CAT 2 or 3 Gas and Dust environments with apparatus groups covering IIA, IIB and IIC.

The products are certified to the following temperature classes;

```
3400 / 8400 - T1 through to T5 (T100°C) @ -40°C ≤ Ta ≤ +60°C or T6 (T85°C) @ -40°C ≤ Ta ≤ +45°C 3700 / 8700 - T1 through to T5 (T100°C) @ -40°C ≤ Ta ≤ +50°C or T6 (T85°C) @ -40°C ≤ Ta ≤ +45°C
```

¹When fitted with Weidmuller AKZ/AKE series terminals;

```
3400 / 8400 - T1 through to T5 (T100°C) @ -40°C \leq Ta \leq +45°C or T6 (T85°C) @ -40°C \leq Ta \leq +40°C 3700 / 8700 - T1 through to T5 (T100°C) @ -40°C \leq Ta \leq +45°C or T6 (T85°C) @ -40°C \leq Ta \leq +40°C
```

¹Note: For spacing or separation distance requirements see Table 1 of IEC 60079-7:2006.

The 3400, 3700, 8400 and 8700 Series monitors are certified to the following standards;

EN 60079-0	Explosive atmospheres - Equipment - General requirements
EN 60079-7	Explosive atmospheres - Equipment protection by Increased Safety "e"
EN 60079-18	Explosive atmospheres - Equipment protection by Encapsulation "m"
EN 60079-31	Explosive atmospheres - Equipment dust ignition protection by enclosure "t"
EN 60079-11	Explosive atmospheres - Equipment protection by intrinsic safety "I"
IEC 60079-0	Explosive atmospheres - Equipment - General requirements
IEC 60079-0 IEC 60079-7	Explosive atmospheres - Equipment - General requirements Explosive atmospheres - Equipment protection by Increased Safety "e"
IEC 60079-7	Explosive atmospheres - Equipment protection by Increased Safety "e"

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

3.0 Warnings.

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.

The installer shall ensure compliance to the certificate conditions for each of the certified components installed:

i. The terminals shall only be fitted with wires that have cross sectional area falling within the following limitations:

MK 3 Range of Terminal Strips: Rigid: 0.5mm² to 2.5mm², Flexible: 0.5mm² to 1.5mm² AKZ 2.5 / AKE 2.5 Range of Terminal Strips: Rigid: 0.5mm² to 4.0mm², Flexible: 0.5mm² to 2.5mm² Type 262-*** Terminal strip: 0.2mm² to 4mm² (single-core, finely stranded, and stranded).

- ii. For MK 3 Range of Terminal Strips: Except when shown in a certificate as being internal wiring of apparatus, not more than one single or multiple strand lead shall be connected into either side of any terminal, unless multiple conductors have been joined in a suitable manner, e.g. two conductors into a single insulated crimped boot lace ferrule.
- iii. For MK 3 Range of Terminal Strips: Leads connected to the terminals shall be insulated for the appropriate voltage and this insulation shall extend to within 1mm of the metal of the terminal throat.
- iv. For MK 3 Range of Terminal Strips: All terminal screws, used and unused, shall be tightened down to between 0.4 Nm and 0.45 Nm,
- v. For MK 3 Range of Terminal Strips: MK 3/2 and MK 3/3 terminals shall be mounted in such a way as to prevent any rotation of the terminal strip during tightening or loosening of the terminal screws. All other larger terminals shall be mounted using at least two of the fixing holes to prevent rotation.
- vi. For MK 3 Range of Terminal Strips: Minimum creepage and clearance distances between the installed terminals and adjacent conductive, equipment, enclosure walls and covers shall be 5 mm, unless QB cross-connecting combs are used and are angled downwards, in which case these values are reduced to 3.2 mm in both cases.
- vii. For MK 3 Range of Terminal Strips: When QB cross-connecting combs are used with the angled black insulation inclined upwards, the maximum voltage rating at the terminal strips is unchanged, but when the comb is angled downwards the voltage rating is reduced to 175 V maximum see above point.
- viii. For MK 3 Range of Terminal Strips: Where the prong of an insulating comb is used in a terminal way, a further single conductor of 1.0 mm² minimum cross-sectional area may be connected to the same terminal way on top of the prong.
- ix. For MK 3 Range of Terminal Strips: The inside edge of the insulation of the combs cross-connecting arm shall be in contact with the terminal molding.
- x. For MK 3 Range of Terminal Strips: The terminals shall only be installed and wired with cable in an ambient temperature of -10°C to +80°C.
- xi. For MK 3 Range of Terminal Strips: The QB cross-connecting combs are limited to the same current rating as the terminal and shall not be used with currents in excess of this value.
- xii. Type 262-*** Terminal strip: Concerning the use of accessories the instructions of the manufacturer shall be considered.
- xiii. Type 262-*** Terminal strip: When feed-through terminals with earthing-conductor terminal blocks are mounted side by side, end cover plates or adaptor plates are to be provided.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

xiv. Terminal AKZ/AKE Series products are suitable for use in atmosphere with flammable gases or combustible dust. For flammable gases these enclosures must satisfy the requirements according to EN 60079-0 / IEC 60079-0 and EN 60079-7 / IEC 60079-7. For combustible dust the enclosure must satisfy the requirements according to EN 60079-0 / IEC 60079-0 and EN 60079-31 / IEC 60079-31.

Under normal operating conditions the temperature rise of the terminal blocks is maximum 40 K, measured at the maximum permitted rated current. Due to the above mentioned, the terminal blocks may be used in apparatus of temperature classes T6...T1 as long as the terminal block ambient temperature range is not exceeded. No part of terminal block must exceed 110°C under any condition in combination with AKE no part of terminal block must exceed 85°C under any condition.

The maximum dust layer shall be no greater than 5mm (T₅ 135°C).

For Valve Control Monitors 3700 / 8700 that use Pneumatrol coils the external electrical supply to the solenoid shall be protected at the rated current of the solenoid by a device that is suitable for the prospective short circuit current of 4000A

WARNING: Electrostatic hazard, clean only with damp cloth.

WARNING: The 3700 Ex mb eb ib option may only be connected to barrier types 1,2 or 3 as per PTB00ATEX2032X /

IECEx PTB 11.0021X and must NOT be connected to a type 4 barrier due to the reduced ambient range.



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



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



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

Note

4 of 13

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

4.0 Mounting Instructions.

Required Tools: Only use spanners of the correct size or an adjustable spanner to fit hex head bolts in the mounting kit.

- 4.1 Obtain a mounting kit suited for the actuator/valve, commonly available through a local Westlock Controls distributor.
- 4.2 Attach the mounting bracket and coupler (if required) to the unit housing with the hardware provided. Typical actuator hardware is M5 (8mm A/F) and switchbox mounting M6 (10mm A/F) or M8 (13mm A/F).
- 4.3 Attach the unit and mounting system to the actuator. See Figure 1.
- 4.4 Ensure axial alignment between unit shaft, coupler and actuator shaft. Failure to correctly align could result in long-term stress-related failure of unit shaft in high cycle or high torque applications.



Before stroking the actuator to the fully closed position, please ensure that the process is safe to do so.

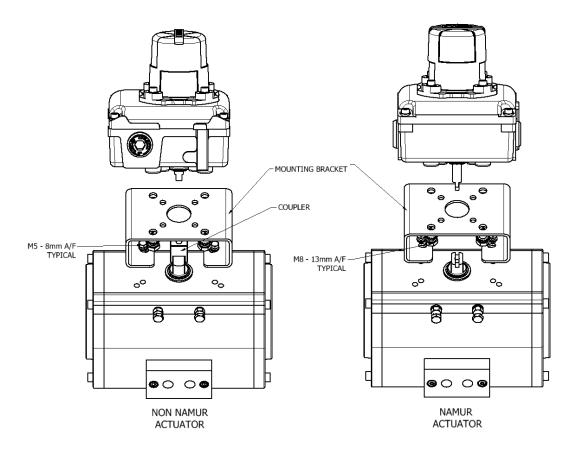


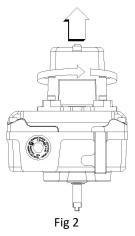
Fig 1

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

5.0 TouchSet Cam Settings.

5.1 To release the cover, loosen the cover retaining screws using a 4mm A/F Allen Key. Lift the cover and twist approx 45° and remove. See Figure 2 below.



To set switches, lift the bottom TouchSet cam and turn until the switch has activated and then release. The spring will push the TouchSet cam back onto the splined shaft. See figure 3.



Before stroking the actuator, please ensure that the process is safe to do so and that all hands are kept away from the moving shaft / cams.

5.3 Stroke the actuator to the opposite end of travel. Set the top TouchSet cam by pushing down and turning the TouchSet cam until the switch is activated. See figure 3.



Before stroking the actuator, please ensure that the process is safe to do so and that all hands are kept away from the moving shaft / cams.

5.4 Stroke the actuator from one end of stroke to the other several times to check the switch operation. If the switches require adjustment, repeat steps 5.2 to 5.3.

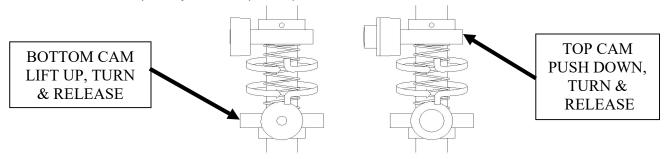


Fig 3

6 of 13

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

6.0 Field Wiring & Installation.



WARNING: The 3400, 3700, 8400 and 8700 series should always be handled with care when the cover is removed. Any damaged to the cover or housing flange / surfaces may affect the ingress protection approval.

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

- 6.1 Field wiring must be carried out in accordance with site, local and national electrical codes / requirements.

 This includes special attention to earth bond to the Aluminium or Stainless Steel enclosure using the internal and external earth points provided. Internal and external earth uses an 8mm A/F spanner / socket or a flat blade screwdriver.
- 6.2 Installation of this product shall be carried out by competent personnel in accordance with the applicable code of practice such as 60079-14.
- The 3400 series housing can offer upto three conduit entries whereas the 3700 series can offer upto two entries of the following thread sizes; M20 x 1.5p, M25 x 1.5p, ½"-14 NPT or ¾"-14 NPT. Other thread types / sizes are possible providing they can achieve the IP rating of the enclosure. The entries are detailed on the product ID label found on the product cover. Please see below the designated conduit location.

3400 Series 3700 Series Conduit Conduit В В 0 0 (\bigcirc) 0 0 0 0 0 Conduit Conduit 0 0 Α (0)(0)O Internal Conduit Coil C Position

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

The 8400 series housing can offer upto five conduit entries. Please see detailed below the number of conduit entries the 8700 series can offer dependent on the valve configuration.

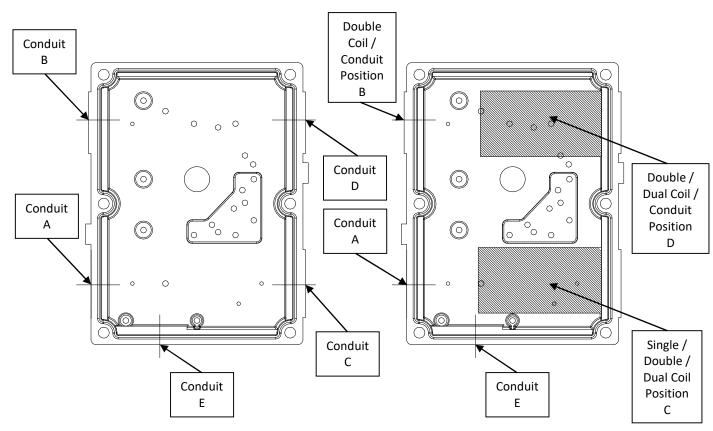
8700 series with a single coil / valve can offer upto four conduits entries.

8700 series with double or dual coil / valve can offer upto three conduit entries

The following thread sizes; M20 x 1.5p, M25 x 1.5p, $\frac{1}{2}$ -14 NPT or $\frac{3}{4}$ -14 NPT. Other thread types / sizes are possible providing they can achieve the IP rating of the enclosure.

The entries are detailed on the product ID label found on the product cover. Please see below the designated conduit location.

8400 Series 8700 Series



- The certification applies to equipment without cable glands. When mounting the enclosure in the hazardous area, only suitably rated IP 66 / 67 ATEX / IECEx (dependent on scheme) certified glands <u>must be used</u>.
- 6.6 All unused cable entries <u>must</u> be plugged with a suitably rated IP 66 / 67 ATEX / IECEx (dependent on scheme) certified blanking devices.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

6.7 The first two digits of the Westlock nomenclature signifies the series with the third digit defining whether the product has a visual beacon or not. The fourth digit identifies the Magnum switch. The fifth digit details the enclosure material; R = Plastic, A = Aluminium, S = St.St.

The table below details the applicable ambient ranges;

Series Code	Cover Type	T Class	Ambient Range	Ambient Range when fitted w/ AKZ/AKE series terminals
3449*	Beacon	T6 / T85°C	-40°C to +45°C	-40°C to +40°C
3449*	Beacon	T5 / T100°C	-40°C to +60°C	-40°C to +45°C
3469*	Flat Cover	T6 / T85°C	-40°C to +45°C	-40°C to +40°C
3469*	Flat Cover	T5 / T100°C	-40°C to +60°C	-40°C to +45°C

6.8 The maximum electrical rating of the Magnum proximity switches are;

MAGNUM RATINGS: 3A/120 VAC, 1.5A/240 VAC OR 2A/24 VDC.

- 6.9 The 3700 Ex mb eb ib maximum electrical ratings will be determined by the barrier type used. The constant capacitance and Inductance are stated on the product cover;
 NJ2-V3-N (ELECTRICAL PARAMETERS Ci=40nF,Li=50μH (BARRIER TYPE 1,2 & 3 ONLY)
- 6.10 Before replacing the enclosure cover, ensure that both the housing and cover sealing surfaces are clean and undamaged. Tighten the cover screws evenly to a hand tight feel using a 4mm A/F Allen key.

7.0 Operating and Maintenance Instructions for Falcon II Solenoid Valve.

7.1 General Description

7.1.1 The Falcon II solenoid valve incorporates elastomer static seals through which a shaped spool moves and are manufactured for 3 or 5 way operation. 3/2 way is normally used for pilot control of the other relay valves or for the operation of single acting cylinders. 5/2 way is normally used to control the action of double acting cylinders. The seal spacer assembly forms individual annular chambers opposite each valve port and the grooved spool either closes or allows flow between adjacent chambers, hence the position of the spool determines which ports are open or closed.

The spool is moved by way of a manually or mechanically operated mechanism normally against a return spring. Operation may be by application or removal of a pilot air supply acting as a pilot piston. This form of control is utilized for electrical actuation where integral solenoid valves control the pilot air supply.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

7.1.2 Optional Features.

No-Voltage Release (Latching)

With the coil first energized, the palm button is then manually moved and latched. The inward movement of the palm button causes the valve to shift. When the coil is de-energized, the palm button and latching mechanism are automatically tripped, allowing the valve to return to its original position. See Fig. 1

Manual Locking Override

Manually depress palm button and rotate clockwise for maintained condition, must manually disengage to return to original position. See Fig. 2

Momentary Override

Spring return momentary push type, must hold in to actuate. See Fig. 3

Hex Drive Maintained Override

Insert allen key in hex head screw and rotate clockwise (4-5 turns) to shift spool. Valve will stay put until hex head screw is rotated counter clockwise (4-5 turns) back to original position. See Fig. 4

D/C - Dual Coil Option

Five way valves are available with a coil/pilot valve on each end of the Falcon II valve, coil "A" and coil "B".

When coil "A" is energized the valve will shift. If coil "A" is then de-energized, the valve will remain in this position.

The valve will not return to the original state until coil "A" is deenergized and coil "B" is energized.

The process is the same for coil "B".

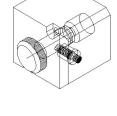


Fig 3

Fig 1



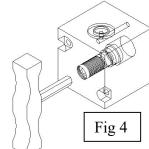


Fig 2

NOTE - For Dual Coil Valves

The valve may be in either position upon installation. Refer to the Air Flow Diagrams and energize the appropriate coil (with air) to reset valve to the desired position.

Dual coil valves require both an electrical signal and air pressure to operate. See Air Flow Diagram for air pressure requirements.

If either or both inputs are lost the valve will remain in its current position.

Both coils should never be energized simultaneously.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

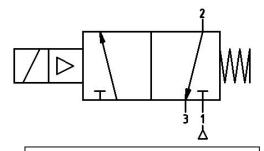
With Magnum Proximity Switches.

7.2 Specifications

Operating Pressure: 45-140 PSIG

Operating Media: Non Lubricated Filtered Air to 20 Microns

7.3 Pneumatic Porting Configurations



3/2 Spring Return Valve.

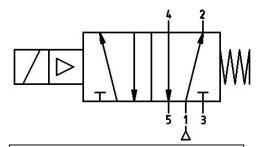
Description of Operation:

Solenoid De-Energised -

Air flows from Outlet Port 2 to Exhaust Port 3.

Solenoid Energised -

Air flows from Inlet Port 1 to Outlet Port 2.



5/2 Spring Return Valve.

Description of Operation:

Solenoid De-Energised -

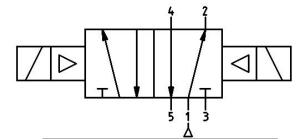
Air flows from Inlet Port 1 to Outlet Port 2 and

exhausts from Port 4 to 5.

Solenoid Energised -

Air flows from Inlet Port 1 to Outlet Port 4 and

exhausts from Port 2 to 3.



Dual Coil Valve.

Description of Operation:

Coil B De-Energized -

Air flows from Inlet Port 1 to Outlet Port 2 and

exhausts from Port 4 to 5.

Coil 'A' Energized -

Air flows from Inlet Port 1 to Outlet Port 4 and

exhausts from Port 2 to 3.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

7.4 (Air Line) Installation Considerations.

Air Mains and lines should be large enough to avoid excessive pressure loss under conditions of maximum flow. Air lines should be installed with as few restrictions as possible if the cost of compressed air is to be kept to a minimum. Sharp turns in piping should be avoided for more efficient air flow and economical air power. It is advisable to pitch the mains in the direction of air flow so that both gravity and air flow will carry the water to traps or water legs located at frequent intervals.

To help in preventing condensed moisture from reaching the point of usage, down pipes should never be taken directly from the bottom of air pipes or mains. Connection should be made at the top of the main and a long radius return bend used.

7.5 Air Flow.

Pipe sizes are normally determined on semi empirical lines, basis for selection being an acceptable pressure drop e.g. not more than 10% of the applied pressure. In sizing pipes, consideration should be given to likely future demands, as a system will be inefficient if the demand outgrows the supply. It is always better to over size mains as this will reduce air velocity and make water separation more effective.

7.6 **Air Service Equipment.**

The importance of proper filtration (20 Micron) and lubrication of the air supply to pneumatic equipment can never be over-emphasized as a means of decreasing friction and preventing corrosion and wear due to moisture and abrasive solids being present in the air supply.

At higher pressures than recommended, pneumatic equipment can wear excessively with no significant increase in output and compressed air is consequently wasted.

There is much to be gained, therefore, from providing pneumatic equipment with serviced air by including suitable airline filters, pressure regulators and lubricants in the installation.

7.7 Tubes and Fittings.

The use of copper, stainless steel, nylon or polyethylene tube is recommended for piping up air circuits and equipment. As a general rule, pipe threaded fittings should not be assembled to a specific torque because the torque required for a reliable joint varies with thread quality, port and fitting materials, sealant used, and other factors. The suggested method of assembling pipe threaded connections is to assemble them finger tight and then wrench tighten further to a specified number of turns from finger tight.

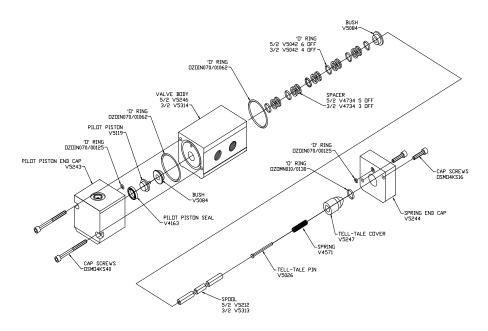
The assembly procedure given below is for reference only, the fitting should not be over tightened for this will lead to distortion and most likely, complete valve failure.

- 1. Inspect port and connectors to ensure that the threads on both are free of dirt, burrs and excessive nicks.
- 2. Apply sealant/lubricant or Teflon tape to the male pipe threads. With any sealant tape, the first one or two threads should be left uncovered to avoid system contamination.
- 3. Screw the connector into the port to the finger tight position.
- 4. Wrench tighten the connector approximately 1 2 turns (to seal) from finger tight. again this is only reference the fitting should NOT be over tightened.

Westlock 3400, 3700, 8400 & 8700 Ex mb e Position & Control Monitors (Incl. 3700 Ex mb eb ib) – ATEX / IECEx Certified.

With Magnum Proximity Switches.

EXPLODED ASSEMBLY OF 3 & 5 WAY 1.1 Cv FALCON II



8.0 Product Repair & Service.

- 8.1 It is recommended that a periodic visual and operation evaluation is carried out on the Positioner / Control Monitor at least once a year or every 1 million cycles. If the shaft requires lubrication then a suitable (NLGI 2) rated grease such as Rocol Sapphire Lo Temp 2 should be used. Please note that if any other lubricant other than Rocol Sapphire Lo Temp 2 then is shall be compatible with the shaft 'O'ring material.
- 8.2 For Control Monitors ONLY It is recommended that a periodic visual and operation evaluation is carried of the Control Monitor Falcon solenoid valve at least once a year or every 1 million cycles. If the spool & seals require lubrication then use Molykote 55 grease.
- 8.3 Inspection of this product shall be carried out periodically by suitably trained personnel, in accordance with the applicable code of practice such as 60079-17, to ensure that it is maintained in a satisfactory condition.
- The equipment is not intended to be repaired by the user. The repair of this equipment is to be carried out by the manufacturer, or their approved agents, in accordance with the applicable code of practice such as 60079-19.
- 8.5 The equipment contained within this product can be replaced with like for like parts / assemblies ONLY.
- 8.6 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.
- 8.7 Replacement parts must be purchased through Westlock Controls or via an approved Westlock Controls distributor.