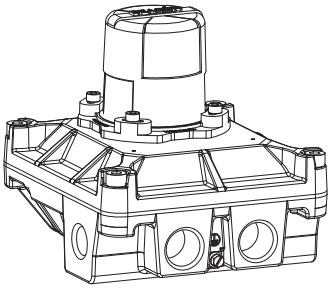
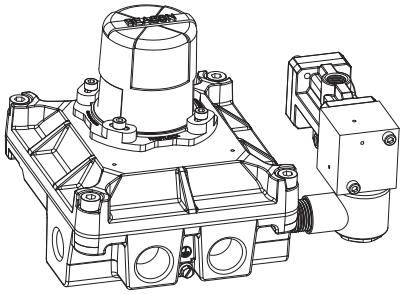
2200 SERIES ATEX, IEC Ex CERTIFIED AND UK CA CERTIFIED INSTALLATION AND OPERATING INSTRUCTIONS

Installation and operating instructions for Westlock 2200 series valve position (AccuTrak) and control (Quantum) monitors with mechanical switches, inductive proximity sensors or Magnum proximity switches

AccuTrak 2200 position monitor



Quantum 2200 control monitor



Warning
Do not open when energized or when an explosive atmosphere is present.

Warning
Electrostatic hazard, clean only with damp cloth.

CE 2809 Ex II 2GD

UK CA

ITS21UKEX0361X
IEC Ex ETL 17.0008X
ETL21ATEX0055X
Ex db IIB+H_2 T* Gb
Ex tb IIIC T* °C Db IP 6X
Tamb: -*°C ≤ Ta ≤ +*°C
Flat Cover: -20°C to +110°C (T4/130°C); -20°C to +75°C (T5/95°C); -20°C to +60°C (T6/80°C)
Beacon Cover: -30°C to +110°C (T4/130°C); -30°C to +75°C (T5/95°C); -30°C to +60°C (T6/80°C)
Stainless Steel: -60°C to +110°C (T4/130°C); -60°C to +75°C (T5/95°C); -60°C to +60°C (T6/80°C)
*When fitted with a coil, see certificate ambient temperature for details
Environmental parameters: 11.6 psi (0.8 bar) to 15.9 psi (1.1 bar)
Air with normal oxygen content, typically 21%.

1 PRODUCT DESCRIPTION

The 2200 series valve position/control monitor provides two methods of end of travel indication by the means of mechanical switches, inductive proximity sensors or proximity switches and an external visual indicator.
For applications that require position feed back, ancillary components such as a 4-20 mA current signal transmitter or a resistive signal feed back can be installed. To allow this product to be used with network communication bus protocols, the 2200 series enclosure can house various network modules.

The 2200 series enclosure is available in both aluminum or stainless steel and comprises two parts, a cover and housing. The cover has three variations, flat cover, standard beacon cover or a high cover to suit different applications.

The housing can offer a nipple mounted solenoid coil and up to four (without coils) of the following conduit entries; M20 x 1.5p, 1/2 - 14 NPT, or 3/4 - 14 NPT cable entries for connection to an external power source via appropriate ATEX and IEC Ex certified cable glands.

Note
Before installation of this product, please ensure that the product and its certification is suitable for the intended application. This product uses various O-ring materials and an Eastar copolyester visual indicator as standard.

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.

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2 MOUNTING INSTRUCTIONS

2.1 Attach the mounting bracket and adaptor (if required) to the unit housing and shaft with the fasteners provided with the mounting kit.

2.2 To ensure that the 2200 series unit is mounted correctly, it may necessary to stroke the actuator to the fully closed position.

Warning
Before stroking the actuator in any step of this mounting procedure, please ensure that the process is safe to do so and that all hands are kept away from moving parts.

2.3 With the actuator in the correct position, attach the 2200 series unit / bracket to the actuator using the hardware provided in the mounting kit.

2.4 To release the cover, loosen the cover retaining screws. Twist the cover approx 45° and lift up. See Figure 1.

2.5 To set the switches, lift the bottom cam and turn until the switch has activated and then release. The spring will push the cam back onto the splined shaft. See Figure 2.

2.6 Stroke the actuator to the opposite end of travel. Set the top cam by pushing down and turning the cam until the switch is activated. See Figure 2.

2.7 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 2.5 to 2.7.

FIGURE 1

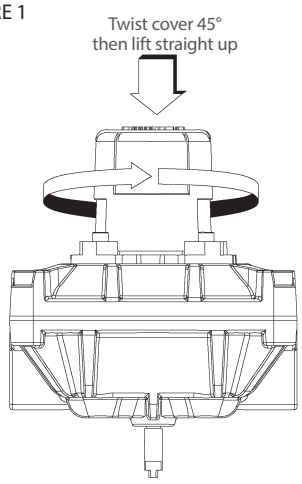
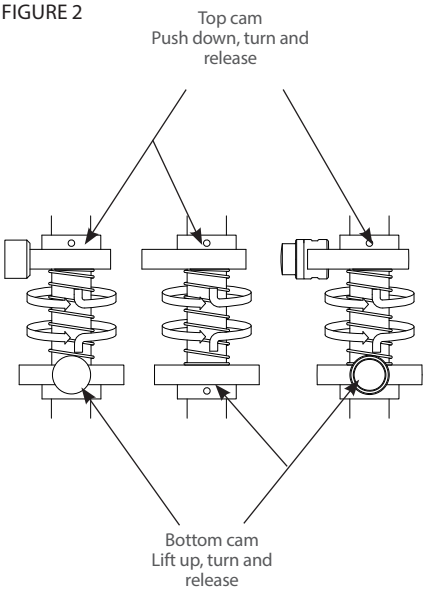


FIGURE 2



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3 FIELD WIRING AND INSTALLATION

Warning

The 2200 series should always be handled with care when the cover is removed and wired to electrical power source.

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 bond to the 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.

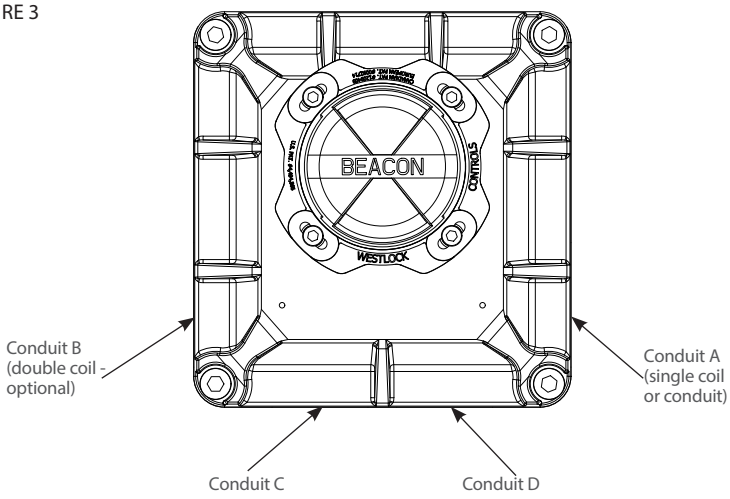
3.3 The 2200 position monitor can offer up to four of the following conduit entries: 2 x M20, 2 x 3/4 - 14 NPT, 4 x M20, 4 x 3/4 - 14 NPT and 2 x 1/2 - 14 NPT + 2 x 3/4 - 14 NPT (Front).

3.4 These entries are detailed on the product identification label found on the product cover. Please see Figure 3 for conduit positions.

3.5 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.

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

FIGURE 3



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3.6 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.

3.7 The fourth digit designates the switch / sensor type. The following table details the most common switch / sensor types together with their electrical ratings.

3.8 The fifth digit indicates the material of the enclosure, either A (aluminum) or S (stainless steel).

Series code/Switch designation	Electrical rating
22*3	GO switch 4 A - 120 V AC; 3 A - 24 V DC; 0.5 A - 125 V DC
22*5	Mechanical (SPDT) 15 A - 125 or 250 V AC; 6 A - 24 V DC
22*6	Mechanical (DPDT) 10 A - 125 or 250 V AC; 10 A - 28 V DC; 0.2 A - 125 V DC
22*7	Inductive proximity sensors
22*9	Magnum ratings 3 A - 120 V AC; 2 A - 24 V DC

Note: The series code signifies the maximum electrical rating of the product, suitable overloading protection must be provided to prevent these values being exceeded.

3.9 The 2200 series valve position monitor has the option for position feedback by the means of a resistive signal (RS) or digital signal (DS).

The RS transmitter electrical ratings are - 1 K Ohms (standard) or 5 K Ohms (optional).

The DS transmitter electrical ratings are - current loop 4-20 mA at 9 to 30 V DC.
See separate installation and operating instructions TECH-541.

3.10 The 2200 series valve control monitor has the ability to connect to bus networks via NetPAC modules. With the network options it may be possible to assemble other switches within the enclosure (depending on enclosure cover variation).

3.10.1 NetPAC options.

NetPAC option	I.O.M.
AS-I Actuator Sensor Interface	TECH-316
Device Net	TECH-309
Modbus	TECH-214
Profibus DP	TECH-488
Foundation Fieldbus*	TECH-482

* Note that Foundation Fieldbus is not available with solenoid valve.

3.11 Digit 10 of the Westlock nomenclature signifies the coil voltage with the following voltage and type available, 24 V DC or 120, 240 V AC or V DC except when NetPAC options are specified, restricting coil voltage to 24 V DC only.

3.12 Before replacing the enclosure cover, ensure that both of the housing and cover flange surfaces are clean and undamaged. Tighten the cover screws hand tight using a standard 6 mm A/F Allen key ensuring there are no gaps.

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4 PRODUCT REPAIR AND SERVICE

4.1 Inspection of this product shall be carried out by suitably trained personnel in accordance with the applicable code of practice such as EN 60079-17 or IEC 60079-17.

4.2 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.

4.3 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.

4.4 Replacement parts must be purchased through Westlock Controls or via an approved Westlock Controls distributor.

5 OPERATING AND MAINTENANCE INSTRUCTIONS FOR FALCON SOLENOID VALVES (QUANTUM CONTROL MONITORS ONLY)

5.1 General description

5.1.1 The FalconV solenoid valve is an air piloted, solenoid - operated directional control valve incporporating a shaped spool packed with elastomeric seals and moving through a gated body. Valves are manufactured for 3- or 4-way operation. 3-way is normally used for pilot control of the other relay valves or for the operation of single acting cylinders. Valves are available with flow rating of 1.4 C_V in aluminum and 316 stainless steel., as well as with a flow rating of 4.3 C_V in aluminum. In a typical, normally closed, spring-return FalconV valve, the spool controllling the direction of air flow is moved by pressurized pilot air acting on a piston when the coil is energized. The spool is returned to the normally closed position by a spring when the coil is de-energized, and the piston is vented internally to the body of the exhaust port(s).

The spool may be manually moved to control air flow direction with override options. The pilot air supply is normally tapped internally from the air supplied to Inlet port 1 and power is supplied separately to coils. External pilot options allow a separate source of pilot air to be plumbed directly to the valve pilot end cap for applications in which the process is supplied to port 1 is below the minimum pilot pressure required by the FalconV valve.

5.1.2 Optional features - Falcon

5.1.2.1 Manual locking override
Manually depress palm button and rotate clockwise for maintained condition, must manually disengage to return to original position.

5.1.2.2 Momentary override
Spring return momentary push type, must hold in to actuate.

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5.1.3 Specifications

Operating pressure: 30 - 120 psig for single coil valves; 20 - 120 psgi for dual coil valves. Operating media: Lubricated or dry air, filtered to 40 microns. Iff air line lubricators are used, please see Appendix for information on lubricating oils and suggested brands.

5.1.4 Field wiring

Complete the electrical wiring in accordance with national and local electrical requirements.

The ground wire should be secure under the ground screw. Check all screws for tightness.

5.1.5 (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.

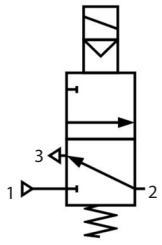
To help in preventing condensed moisture from reaching the point of usage, down pipes should never be taken directly from the bottom of air pipes or mains. Connection should be made at the top of the main and a long radius return bend used.

5.1.6 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.

FIGURE 5

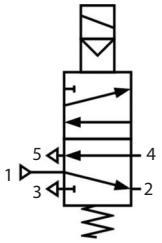
Air line designation, 1/4 NPT or BSP air ports for inlet, outlet and exhaust on 1.4 C_v valves. The 4.3 C_v valve (optional) has 1/2 NPT or BSP ports.



Spring return valve
Description of operation:

Solenoid de-energized - air flows from Outlet Port 2 to Exhaust Port 3.

Solenoid energized - air flows from Inlet Port 1 to Outlet Port 2.



Spring return valve
Description of operation:

Solenoid de-energized - air flows from Inlet Port 1 to Outlet Port 2 and exhausts from Port 4 to Port 5.

Solenoid energized - air flows from Inlet Port 1 to Outlet Port 4 and exhausts from Port 2 to Port 3.

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5.1.7 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 air line filters, pressure regulators and lubricants in the installation.

5.1.8 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 PTFE 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.

Maintenance

Routine maintenance is usually confined to the periodic replenishment of Dow Corning III lubricant or equivalent to spool and spring.

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Engineering document reference
These installation and operating instructions are based on the latest engineering update, reference ECN# 13537 and EWR# 24042, and form part of the certification for the 2200 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 EWR number.

Translations
Where translated the copy is taken from the original English document TECH-552-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
TECH-552 replaces all previous installation and operating instructions for the 2200 series including VCIOM-05080/02692/02676/04121/04122 and TECHUK-01/01Q/42/42Q.

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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