Product Overview
The Falcon solenoid, employed in the line of Quantum Control Monitors, is a unique design which helps ease maintenance by allowing rapid coil replacement and enhances safety by isolating the coil from operating personnel. The Quantum enclosure integrates position sensors and low power solenoid valves into a single unit meeting the specific standards set by international approval agencies.

Low Power Control and Position Monitoring
The Westlock™ Falcon Series of solenoid valves is specifically engineered to address low power valve actuation requirements. When interfaced with computer-based process control systems requiring low power energy supplies, the utilization of Falcon solenoids translates into immediate economic benefits. Required power levels for actuation control are efficiently reduced to 5% of the energy required for operation of conventional valves. Integrated within the Quantum housing and capable of operating in any position, Falcon solenoids are available in General Purpose, Division 2 (non-incendive) and Division 1 & 2 (explosionproof and intrinsically safe) configurations. Both 3-way for single acting and 4-way for double acting actuators carry standard C_v ratings of 0.5, 1.2 and 3.5.
Special Features

N – 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. (1.2 Cv valves only)

M – Momentary Override
Spring return momentary push-type, must hold in to actuate.

R – No-Voltage Release (Non-Latching)
With the coil first energized, the palm button is then manually moved. The inward movement of the palm button causes the valve to shift. When the coil is de-energized, the valve automatically returns to its original position. (1.2 Cv valves only)

L – Manual Locking Override
Manually depress palm button and rotate clockwise for maintained condition, must manually disengage to return to original position. (1.2 Cv valves only)

E – External Pilot
The 1/8” NPT external pilot connection requires a separate auxiliary pressure line to the valve. This feature should be used when the controlled pressure is below the minimum 45 psi operating pressure.

D/C – Dual Coil Option
Four way valves are available with a coil/pilot valve on each end of the Falcon 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 de-energized and coil “B” is energized. The process is the same for coil “B.”

V – Non-Venting
Pilot exhaust is internally channelled to solenoid valve’s exhaust port to contain dangerous process gases or prevent intrusion of unwanted moisture and chemicals.

I – Same as “V”
Without an indicator on the main valve body.

Specifications
Operating Pressure: 45 - 120 psig
Operating Temperature: -4°F to +149°F (I.S. only)
-4°F to +180°F
Operating Media: Non-lubricated filtered air to 20 microns

Pneumatic Diagrams

Air Line Designation
1/4” NPT air ports for inlet, outlet, and exhaust (3.5 Cv valve has 1/2” NPT air ports)

Spring Return Valve
3-Way
Description of Operation:
Solenoid De-energized – air flow from Outlet Port 2 to Exhaust Port 3.
Solenoid Energized – air flows from Inlet Port 1 to Outlet Port 2.

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 Port 5.
Coil A Energized – air flows from Inlet Port 1 to Outlet Port 4 and exhausts from Port 2 to Port 3.

Spring Return Valve
4-Way
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.
Falcon II Control Monitors
- Optimized porting location provides ease of piping and minimizes weather intrusion.
- Offers speed control to meet lower Cv requirements where necessary.
- Durable impact resistant spool movement indicator.
- Offers a fully non-venting valve as standard.
- The unit, is fitted to existing coil bases and therefore is backward compatible with previous Falcon units.

Falcon II Standard Product Line

**Materials:**
- Anodized Aluminum, Nickel Plated Brass, 316 Stainless Steel.
- 303 Stainless Steel is not offered in this range due to the competitive costs offered on the 316 Stainless Steel, rendering this material redundant.

**Valve Flow Rates:**
- Falcon II - Standard (without speed control) 1.1 Cv
- Falcon - High flow applications, 3.5 Cv

**Valve Port Tapping:**
- NPT and BSP thread tapping for the standard valve to meet European and American standards.
- All threads are 1/4" size to industry standards with any External Pilot options being offered with 1/8" size tapping. The tapping machined into any valve body (or pilot end) will be marked (machined) into the body (or pilot end) marked as either NPT (or ‘N’) or BSP (or ‘B’).

**Internal Venting:**
- The Falcon II range of pneumatic valves is designed with all venting to be done within the valve and exhausted by the standard exhaust port. This means that all pilot exhaust, pilot piston exhaust, and indicator chamber relief is sealed and ported to port 3 below the fitting level.

Optional
- Existing manual override version as supplied on Falcon – momentary, maintained latching, no voltage release latching and non-latching, allen key latching.
- External pilot.
- Optional seals for high or low temperature applications.
- ETS (exhaust to springs) – See page 4 for explanation.
- 3/2 Normally open.
- 5/3 Way variants/Choice of all Ports open or all ports closed in unenergized state.

**Falcon II Material Specifications**

<table>
<thead>
<tr>
<th>Components</th>
<th>Aluminum Valve Body</th>
<th>316 SS Valve Body</th>
<th>Ni-plated Brass Valve Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Body</td>
<td>Black Anodized Aluminum</td>
<td>Passivated 316 SS</td>
<td>Ni-plated Brass</td>
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<tr>
<td>Pilot Piston End Cap</td>
<td>Black Anodized Aluminum</td>
<td>Passivated 316 SS</td>
<td>Ni-plated Brass</td>
</tr>
<tr>
<td>Spring End Cap</td>
<td>Black Anodized Aluminum</td>
<td>Passivated 316 SS</td>
<td>Ni-plated Brass</td>
</tr>
<tr>
<td>Spool</td>
<td>PTFE Impregnated, hard anodized aluminum</td>
<td>303 SS</td>
<td>PTFE Impregnated hard anodized aluminum</td>
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<tr>
<td>Seals (Std. operating temp.)</td>
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<td>Nitrile</td>
<td>Nitrile</td>
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<tr>
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<td>Brass</td>
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<tr>
<td>Spring</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
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</tbody>
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The Operation and Benefits of Exhaust to Spring (ETS)

The conventional operation of a spring return actuator would be through the use of a 3/2 valve controlling the air supply to the pressure side of the actuator. But the spring side is left to breathe atmospheric air and potentially contamination during each cycle.

By internal connections within the solenoid valve, Westlock™ is now able to provide the functionality of ETS in the Falcon II range of solenoid valves, as illustrated below.

The air drawn into the spring space of the actuator is at atmospheric pressure, but is of the same quality as the compressed air supply feeding the pressure side of the actuator.

The ETS port is internally connected within the valve to exhaust port 3.

Internal Venting

In Falcon II exhaust points are eliminated, as these areas of the solenoid valve all vent into the exhaust ports of the main spool valve.

Note: 1.2 Cv version of Falcon has 2 exhaust points to atmosphere either side of outlet ports. These are eliminated within Falcon II design.