Falcon® II Integral Solenoid Valves

WESTLOCK CONTROLS

The Falcon II solenoid valve is an integral part of Westlock Quantum control monitors and is engineered specifically to address low power valve actuation requirements. It is available for single-acting or dual-acting actuators.

Features

- Power levels for actuation control 5% that of conventional valves.
- Rapid and safe coil replacement for easy maintenance.
- Operates in any position.
- Approved for Weatherproof, Intrinsically-Safe, Increased Safety & Encapsulation and Explosionproof applications when integrated in Quantum housing.
- Optimized port positions for easy piping and minimized weather intrusion.
- Offers speed control to meet lower C_v requirements where necessary.
- Durable impact-resistant spool movement indicator.
- A fully non-venting valve as standard.
- ETS (exhaust to spring) option eliminates potential actuator contamination.
- Compatible with previous Falcon units.
- Increased safety and encapsulation.

Technical Data	
Operating pressure	3.1 - 8.3 bar (45 - 120 psi)
Operating temperature	-20°C to +65°C (-4°F to +149°F) - IS only -20°C to +82°C (-4°F to +180°F)
Operating medium	Filtered air to 20 microns
Standard specification	
Materials	Anodized aluminum, nickel plated brass, stainless steel
Valve flow rates	Standard (without speed control) 1.1 C_v
Coil voltages	24; 48; 90-120; 220-240 V DC 24; 48; 90-120; 220-240 V AC
Valve port tapping	NPT and BSP
	All threads are ¼" size to industry standards with any external pilot options being offered with ⅛" size tapping

Pneumatic operation

Air line designation

¼" NPT or ¼" BSP air ports for inlet, outlet and exhaust.

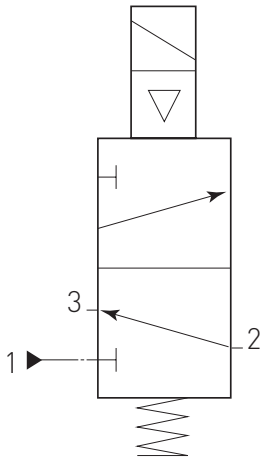

Fig. 1 Spring return valve 3/2 way

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

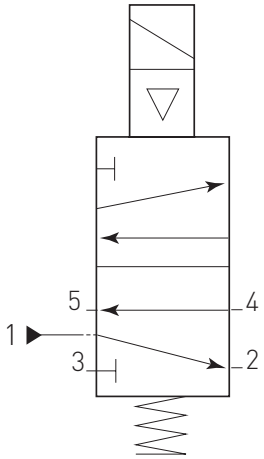

Fig. 2 Spring return valve 5/2 way

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.

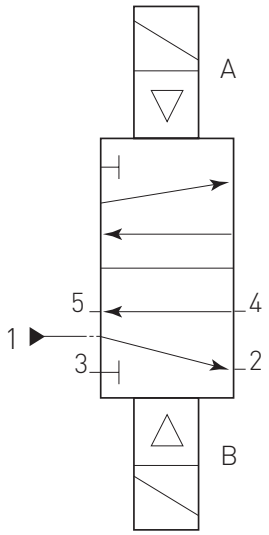

Fig. 3 Dual coil valve

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.

Internal venting:

The Falcon II range of pneumatic valves is designed with all venting to be performed 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.

Falcon II material specifications

Components	Aluminium valve body	316 stainless steel valve body	Ni-plated brass valve body
Valve body	Black anodized aluminium	Passivated 316 SS	Ni-plated brass
Pilot piston end cap	Black anodized aluminium	Passivated 316 SS	Ni-plated brass
Spring end cap	Black anodized aluminium	Passivated 316 SS	Ni-plated brass
Spool	PTFE impregnated hard anodized aluminium	303 SS	PTFE impregnated hard anodized aluminium
Seals (Std. operating temp)	Nitrile	Nitrile	Nitrile
Bushes	Brass	Brass	Brass
Spring	Stainless steel	Stainless steel	Stainless steel

Falcon® II Integral Solenoid Valves

The standard range of Falcon II valve options is shown below. Please consult individual control monitor product datasheets for availability as applicable.

Falcon II valve options				
Code	**Mode**	**Entry**	**C_v**	**Description**
K	3/2 way	¼" BSP	1.1	Fail closed
L	3/2 way	¼" BSP	1.1	Fail open
M	3/2 way	¼" BSP	1.1	ETS and fail closed
N	3/2 way	¼" BSP	1.1	ETS and fail open
O	3/2 way	¼" BSP	1.1	ETS and speed controllers fail closed
P	3/2 way	¼" BSP	1.1	FETS and speed controllers fail open
Q	5/2 way	¼" BSP	1.1	Fail closed
R	5/2 way	¼" BSP	1.1	Fail closed and speed control
S	5/2 way	¼" BSP	1.1	Dual coil fail last
T	5/2 way	¼" BSP	1.1	Dual coil fail last and speed controllers
U	3/2 way	¼" NPT	1.1	Fail closed
V	3/2 way	¼" NPT	1.1	Fail open
W	3/2 way	¼" NPT	1.1	ETS and fail closed
X	3/2 way	¼" NPT	1.1	ETS and fail open
Y	3/2 way	¼" NPT	1.1	ETS and speed controllers fail closed
Z	3/2 way	¼" NPT	1.1	ETS and speed controllers fail open
1	5/2 way	¼" NPT	1.1	Fail closed
2	5/2 way	¼" NPT	1.1	Fail closed and speed control
3	5/2 way	¼" NPT	1.1	Dual coil fail last
4	5/2 way	¼" NPT	1.1	Dual coil fail last and speed controllers
5	5/2 way	¼" NPT	1.1	ETS and fail closed
6	5/2 way	¼" NPT	1.1	ETS and fail open

Options

- Manual override versions: No-voltage release latching and non-latching; momentary; maintained latching; allen key latching.
- ETS (exhaust to springs): The conventional operation of a spring return actuator would be through the use of a 3/2 valve controlling the air supply to its pressure side. However, the spring side is left to breathe atmospheric air and, potentially, contamination during each cycle.
  Internal connections within the Falcon II solenoid valve mean that 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 connected internally within the valve to its exhaust port.
- External pilot.
- Optional seals for high or low temperature applications.
- 3/2 normally open.
- 5/3 way variants/choice of all ports open or all ports closed in un-energized state.

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Manual Override Options

N – No-voltage release (latching)
With the coil first energized, the palm button is pushed in 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 tripped automatically, allowing the valve to return to its original position.

N – No-voltage release (latching)

M – Momentary override
Spring return momentary push type. Must be held in to actuate.

R – No-voltage release (non-latching)
With the coil first energized, the palm button is pushed in. 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.

L – Manual locking override
The palm button is pushed in and rotated clockwise to lock in position. It must be disengaged manually to return to its original position.

M – Momentary override

H - Hex. drive maintained override
When the coil is de-energised, an allen key is inserted to rotate a hexagonal head screw to operate the valve. The valve will stay put until the screw is rotated back to its original position.

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 3.1 bar operating pressure.

D/C – Dual coil option
5/2 way valves are available with a coil/pilot valve on each end of the Falcon valve. When one of these coils is energized, the valve will shift. If this coil is then de-energized, the valve will remain in this position. The valve will not return to its original state until this coil is de-energized and the coil on the other end of the valve is energized.

L – Manual locking override

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