



2-year warranty



Type overview	
Туре	DN
F7150-150SHP	150

# Technical data

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Valve size	6" [150]
Noise level, Motor	dB(A)
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	-22400°F [-30204°C]
Body Pressure Rating	ANSI Class 150
Close-off pressure Δps	285 psi
Flow characteristic	modified linear, unidirectional
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0%
Controllable flow range	quarter turn, mechanically limited
Cv	1103
Maximum Velocity	32 FPS
Lug threads	3/4-10 UNC
Valve body	Carbon steel full lug (ASME B16.34)

17-4 PH stainless steel

glass backed PTFE

316 stainless steel

ASME/ANSI class 150 flange

**RPTFE** 

TFE

SY4 PRB(X)

# Safety notes



Suitable actuators

Materials

Spindle

Bearing Disc

**Gland Seal** 

Non-Spring

Pipe connection

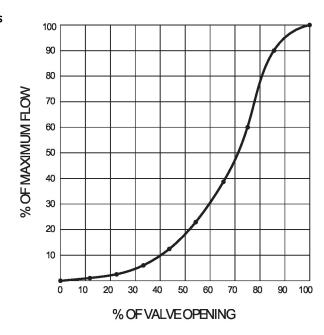
Seat

• WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

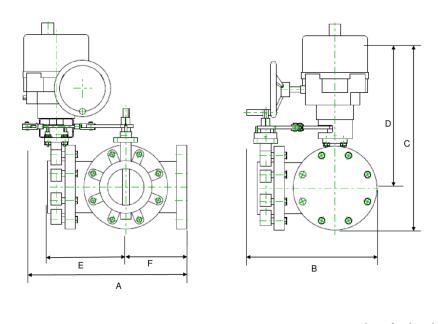


# **Product features**

# Flow/Mounting details



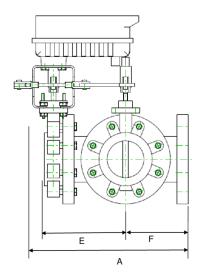
Dimensions	
Туре	DN
F7150-150SHP	150

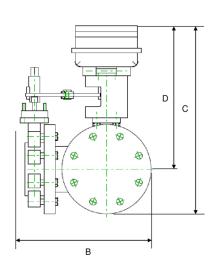


 A
 B
 C
 D
 E
 F
 Number of Bolt Holes

 21.5" [547]
 15.8" [401]
 27.6" [700]
 22.0" [559]
 10.4" [263]
 8.0" [203]
 8







Modulating, Non-Spring Return, 120 V, for DC 2...10 V or 4...20 mA





Tecl	nnic	al d	ata

Nominal voltage frequency  Transformer sizing  253 VA  Current consumption  2.1 A  Auxiliary switch  2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, 1 x 3° / 1 x 87°  Switching capacity auxiliary switch  3 A resistive (0.5 A inductive) @ AC 250 V  Electrical Connection  Terminal blocks  Overload Protection  Internal Humidty Control  resistive heating element			
Transformer sizing 253 VA  Current consumption 2.1 A  Auxiliary switch 2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, 1 x 3° / 1 x 87°  Switching capacity auxiliary switch 1 3 A resistive (0.5 A inductive) @ AC 250 V Electrical Connection 1 Terminal blocks  Overload Protection 1 thermally protected 135°C cut-out 1 resistive heating element  unctional data Operating range Y 210 V  Input Impedance 100 kΩ  Position feedback U 210 V  Position feedback U voriable VDC variable  Direction of motion motor selectable with switch 0/1  Manual override hand wheel  Angle of rotation 90°  Running Time (Motor) 24 s  Duty cycle value 75%  Noise level, motor 45 dB(A)  Position indication 1 1P66/67  Position indication 1 1P66/67  Degree of protection IEC/EN 1P66/67  Degree of protection NEMA/UL NEMA 4X  Enclosure UL Enclosure Type 4X  Agency Listing 1SO, CE, cCSAus  Quality Standard 1SO 9001  Ambient temperature -22149°F [-3065°C]  Storage temperature -40176°F [-4080°C]  Ambient humidity Max. 100% RH  Servicing maintenance-free	Electrical data	Nominal voltage	AC 120 V
Current consumption       2.1 A         Auxiliary switch       2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, 1 x 3° / 1 x 87°         Switching capacity auxiliary switch       3 A resistive (0.5 A inductive) @ AC 250 V         Electrical Connection       Terminal blocks         Overload Protection       thermally protected 135°C cut-out         Internal Humidty Control       resistive heating element         Unctional data       Operating range Y       210 V         Input Impedance       100 kΩ         Position feedback U       210 V         Position feedback U voriable       VDC variable         Direction of motion motor       selectable with switch 0/1         Manual override       hand wheel         Angle of rotation       90°         Running Time (Motor)       24 s         Duty cycle value       75%         Noise level, motor       45 dB(A)         Position indication       top mounted domed indicator         Safety data       Degree of protection IEC/EN       IP66/67         Degree of protection NEMA/UL       NEMA 4X         Enclosure       U. Enclosure Type 4X         Agency Listing       ISO, CE, CSAus         Quality Standard       ISO 9001         Ambient temperature		Nominal voltage frequency	50/60 Hz
Auxiliary switch  2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, 1 x 3° / 1 x 87°  Switching capacity auxiliary switch  Electrical Connection  Terminal blocks  Overload Protection thermally protected 135°C cut-out  Internal Humidty Control resistive heating element  Unctional data  Operating range Y  Input Impedance Position feedback U  Position feedback U ote Position feedback U variable Direction of motion motor Manual override Angle of rotation  Running Time (Motor)  Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection NEMA/UL Enclosure  UL Enclosure Type 4X  Agency Listing Quality Standard Ambient temperature Ambient humidity Amaul owerlide Ambient humidity Amau. 100% RH Mareials  Materials  Materials  Materials		Transformer sizing	253 VA
Switching capacity auxiliary switch Electrical Connection Dverload Protection Internal Humidty Control Internal Humidty Max. 100 KB Internal Humidity Max. 100 KB Industrial Industries (0.5 A inductive) @ AC 250 V Industries Heating December Internal Humidity Max. 100 KB Industries Industries (0.5 A inductive) @ AC 250 V Industries Heating Industries (0.5 A inductive) @ AC 250 V Industries Heating Industries (0.5 A inductive) @ AC 250 V Industries Heating Heating Industries (0.5 A industries Heating Heating Industries (0.5 A industries Heating Industries (0.5 A industries Heating Heating Industries (0.5 A industries Heating Industries (0.5 A industries Heating Industries (0.5 A industries (0.5 A industries Heating Industries (0.5 A industries Heating Industries (0.5 A Industries (0.5 A industries (0.5 A industries Heating Industries (0.5 A in		Current consumption	2.1 A
Electrical Connection Terminal blocks Overload Protection thermally protected 135°C cut-out Internal Humidty Control resistive heating element  Operating range Y 210 V Input Impedance 100 kΩ Position feedback U 210 V Position feedback U 100 Max. 0.5 mA Position for motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 24 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, CCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free  Materials Housing material die cast aluminium		Auxiliary switch	
Overload Protection     thermally protected 135°C cut-out       Internal Humidty Control     resistive heating element       unctional data     Operating range Y     210 V       Input Impedance     100 kΩ       Position feedback U     210 V       Position feedback U note     Max. 0.5 mA       Position feedback U variable     VDC variable       Direction of motion motor     selectable with switch 0/1       Manual override     hand wheel       Angle of rotation     90°       Running Time (Motor)     24 s       Duty cycle value     75%       Noise level, motor     45 dB(A)       Position indication     top mounted domed indicator       Safety data     Degree of protection IEC/EN       Degree of protection NEMA/UL     NEMA 4X       Enclosure     UL Enclosure Type 4X       Agency Listing     ISO, CE, CCSAus       Quality Standard     ISO 9001       Ambient temperature     -22149°F [-3065°C]       Storage temperature     -40176°F [-4080°C]       Ambient humidity     Max. 100% RH       Servicing     maintenance-free       Materials     Housing material		Switching capacity auxiliary switch	3 A resistive (0.5 A inductive) @ AC 250 V
Internal Humidty Control resistive heating element  Operating range Y Input Impedance Position feedback U Position feedback U Position feedback U note Position feedback U variable Direction of motion motor Manual override Angle of rotation Running Time (Motor) Duty cycle value Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient temperature Storage temperature Ambient humidity Max. 100% RH Servicing Materials  Materials  Materials  Materials  Operating range Y 210 V  Round V  S10 V  Round NE Amus. 100 KΩ  Position feedback U variable VDC variable VDC variable VDC variable Amax. 100 KA  Position feedback U variable VDC variable VD		Electrical Connection	Terminal blocks
Unctional data Operating range Y Input Impedance Operating V Operation V Operating V Operation V		Overload Protection	thermally protected 135°C cut-out
Input Impedance Position feedback U Position feedback U note Max. 0.5 mA Position feedback U variable Direction of motion motor Selectable with switch 0/1 Manual override Angle of rotation Position indication Duty cycle value Noise level, motor Position indication  Safety data  Servicing  Quality Standard Angency Listing Servicing  Materials  Materials  Input Impedance 100 kΩ  100 kα  1		Internal Humidty Control	resistive heating element
Position feedback U 210 V Position feedback U note Max. 0.5 mA  Position feedback U variable VDC variable Direction of motion motor selectable with switch 0/1 Manual override hand wheel Angle of rotation 90° Running Time (Motor) 24 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data  Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free	unctional data	Operating range Y	210 V
Position feedback U note Position feedback U variable Direction of motion motor Selectable with switch 0/1 Manual override Angle of rotation Running Time (Motor) Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient temperature Ambient humidity Servicing Max. 0.5 mA  NDC variable VDC variable VDC variable VDC variable VDC variable VDE value with switch 0/1 And wheel And (Motor) 24 s  Town Town Town Town Town Town Town Tow		Input Impedance	100 kΩ
Position feedback U variable Direction of motion motor Selectable with switch 0/1 Manual override Angle of rotation Running Time (Motor) Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient temperature Ambient humidity Servicing  Materials  VDC variable VDC va		Position feedback U	210 V
Direction of motion motor  Manual override Angle of rotation Running Time (Motor) Duty cycle value Noise level, motor Position indication  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient temperature Ambient humidity Servicing  Materials  Materials  Direction of motion motor And wheel And BAG(A) Pos' Abb(A) Top mounted domed indicator  TP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient humidity Amax. 100% RH Servicing Materials  Materials  Materials		Position feedback U note	Max. 0.5 mA
Manual override Angle of rotation 90° Running Time (Motor) 24 s Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature Ambient humidity Max. 100% RH Servicing Materials Materials Materials Materials Materials Mind wheel hand wheel		Position feedback U variable	VDC variable
Angle of rotation 90° Running Time (Motor) 24 s  Duty cycle value 75% Noise level, motor 45 dB(A) Position indication top mounted domed indicator  Safety data Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free		Direction of motion motor	selectable with switch 0/1
Running Time (Motor)  Duty cycle value  75%  Noise level, motor  Position indication  Top mounted domed indicator  Safety data  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  Agency Listing  ISO, CE, cCSAus  Quality Standard  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]  Ambient humidity  Max. 100% RH  Servicing  Materials  Housing material  die cast aluminium		Manual override	hand wheel
Duty cycle value  Noise level, motor  Position indication  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  Agency Listing  Quality Standard  Ambient temperature  Ambient humidity  Servicing  Materials  Degree of protection NEMA/UL  IP66/67  NEMA 4X  IP66/67  Degree of protection NEMA/UL  NEMA 4X  ISO, CE, cCSAus  UL Enclosure Type 4X  Agency Listing  ISO, CE, cCSAus  22149°F [-3065°C]  Max. 100% RH  Servicing  Materials  Housing material  die cast aluminium		Angle of rotation	90°
Noise level, motor Position indication  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure Agency Listing Quality Standard Ambient temperature Ambient humidity Servicing Materials  Noise level, motor At de dB(A)  1P66/67  IP66/67  NEMA 4X  NEMA 4X  ISO, CE, cCSAus  ISO, CE, cCSAus  ISO 9001  -22149°F [-3065°C]  Max. 100% RH  Servicing Max. 100% RH  die cast aluminium		Running Time (Motor)	24 s
Position indication top mounted domed indicator  Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature Ambient humidity Max. 100% RH Servicing  Materials  Materials  Housing material  top mounted domed indicator  IP66/67  Degree of protection IEC/EN IP66/67  NEMA 4X  ISO, CE, cCSAus  ISO 9001  Ambient temperature -40176°F [-4080°C]  Max. 100% RH  Gervicing Materials  die cast aluminium		Duty cycle value	75%
Safety data  Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free  Materials  Housing material  die cast aluminium		Noise level, motor	45 dB(A)
Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X Agency Listing ISO, CE, cCSAus Quality Standard ISO 9001 Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free  Materials Housing material  Microsoft		Position indication	top mounted domed indicator
Enclosure  UL Enclosure Type 4X  Agency Listing  ISO, CE, cCSAus  Quality Standard  ISO 9001  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]  Ambient humidity  Max. 100% RH  Servicing  maintenance-free  Materials  Housing material  die cast aluminium	Safety data	Degree of protection IEC/EN	IP66/67
Agency Listing Quality Standard ISO 9001 Ambient temperature Storage temperature Ambient humidity Servicing  Materials  Agency Listing ISO, CE, cCSAus ISO 9001 Ambient -22149°F [-3065°C] Ambient -22149°F [-3065°C] Ambient humidity Max. 100% RH Servicing Materials  Materials		Degree of protection NEMA/UL	NEMA 4X
Quality Standard  Ambient temperature  -22149°F [-3065°C]  Storage temperature  -40176°F [-4080°C]  Ambient humidity  Max. 100% RH  Servicing  maintenance-free  Materials  Housing material  die cast aluminium		Enclosure	UL Enclosure Type 4X
Ambient temperature -22149°F [-3065°C] Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free  Materials Housing material die cast aluminium		Agency Listing	ISO, CE, cCSAus
Storage temperature -40176°F [-4080°C] Ambient humidity Max. 100% RH Servicing maintenance-free  Materials Housing material die cast aluminium		Quality Standard	ISO 9001
Ambient humidity  Servicing  Max. 100% RH  maintenance-free  Materials  Housing material  die cast aluminium		Ambient temperature	-22149°F [-3065°C]
Servicing maintenance-free  Materials Housing material die cast aluminium		Storage temperature	-40176°F [-4080°C]
Materials Housing material die cast aluminium		Ambient humidity	Max. 100% RH
		Servicing	maintenance-free
Gear train high alloy steel gear sets, self locking	Materials	Housing material	die cast aluminium
		Gear train	high alloy steel gear sets, self locking



#### **Product features**

#### Application

SY Series actuators are fractional horsepower devices, and utilize full-wave power supplies. Observe wire sizing and transformer sizing requirements. Proportional models CANNOT be connected to Belimo direct coupled (AF, AM, GM...etc) actuator power supplies or any type of half-wave device. You MUST use a separate, dedicated transformer or power supply to power the SY actuator. Please do not connect other automation equipment to the dedicated SY supply source. You MUST use four wires (plus a ground) to control a proportional control SY actuator (See SY Wiring Section).

#### **Accessories**

Gateways	Description	Туре
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD
	Gateway MP to LonWorks	UK24LON
Electrical accessories	Description	Туре
	Battery backup system for SY46 series actuator, AC 120 V, on/off Local electric disconnect for SY412 series actuator, AC 120 V, MFT Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	EXT-NSV-B03-120 HOA-120VMFT ZTH US
Service tools	Description	Туре
	Connection cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection	ZK4-GEN
	Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

### **Electrical installation**



### > INSTALLATION NOTES

Do not change sensitivity or dip switch setting with power applied.

A Power supply Common/Neutral and Control Signal "-"wiring to a common is prohibited. Terminals 4 and 6 need to be wired separately.



舷 Isolation relays must be used in parallel connection of multiple actuators using a common control signal inputs. The relays should be DPDT.



🔬 Isolation relays are required in parallel applications. The reason parallel applications need isolation relays is that the motor uses two sets of windings, one for each direction. When one is energized to turn the actuator in a specific direction a voltage is generated in the other due to the magnetic field created from the first. It's called back EMF. This is not an issue with one actuator because the voltage generated in the second winding isn't connected to anything so there is no flow. On parallel applications without isolation, this EMF voltage energizes the winding it is connected to on the other actuators in the system, the actuators are tying to turn in both directions at once. The EMF voltage is always less than the supply voltage due to the resistance of the windings, so while the actuator still turns in the commanded direction, the drag from the other reduces the torque output and causes overheating.

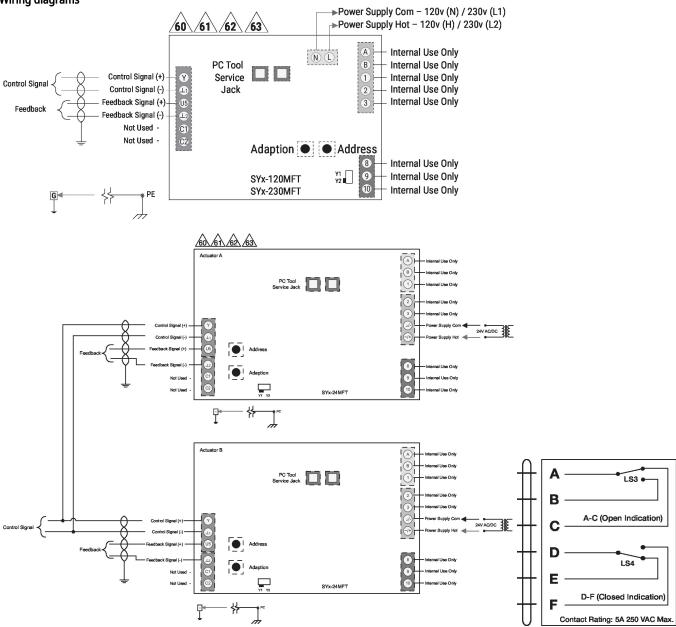


#### Warning! Live electrical components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



#### Wiring diagrams



## **Installation notes**

Negative torque Weathershield for VS/VSS (LM/NM/LF)

## **Dimensions**