

Steam Valves with Rotary Actuators



Technical Databook

Version 4.0



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Steam Valve - Product overview



2-way Steam Valves
DN15...80

Equal-percentage characteristics for modulating control of cold water, hot water and steam



Applications

- Humidifier
- Heat exchanger
- District heating



Technical data

Flow medium	Cold water, hot water and steam
Temp. of medium	0...+175°C
Rated pressure	1600kPa
Flow characteristic	Equal percentage
Rangeability	100
Leakage rate	Max. 0.01% Kvs value (max. 0.06% kvs for DN15)
Pipe connector	ISO 7005-2
Close-off pressure ΔPs	DN 15...65 1000kPa DN 80 700kPa
Angle of rotation	90°
Installation position	Upright to horizontal (in relation to the stem)
Maintenance	Maintenance-free
Valve Material	
Body	Gray cast iron
Seat	Heat-resistant PTFE
Stem	Stainless steel
Gland packing	Inorganic fiber
Gasket	Non-asbestos joint sheet

Steam Valves and Rotary Actuators

	Flow characteristics of Steam Valves Characteristic: equal percentage		Rated pressure: 1600kPa (DN 15...80)

Connection	Flange PN16											
Kvs[m³/h]	0.86	1.4	2.2	3.5	5.2	8.6	13.8	21.6	34.5	56.0	81.9	108.0
DN[mm]	15	15	15	15	15	25	25	40	40	50	65	80
2-way	R610AS	R611AS	R612AS	R613AS	R614AS	R623AS	R624AS	R638AS	R639AS	R649AS	R664AS	R679AS

Suitable Mechanical Fail-Safe Rotary Actuators, Modulating, DC (0)2...10V

LFH24-SR-S AC/DC 24V	SRF24A-SR-5 AC/DC 24V
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Suitable Mechanical Fail-Safe Rotary Actuators, Open / Close

LFH24-S AC/DC 24V	SRFA-5 AC 24...240V / DC 24...125V
LFH230-S AC/DC 230V	SRFA-S2-5 AC 24...240V / DC 24...125V

* SRF..match with linkage WSRF.

Valve's Sizing

<p>1. When water is used as the flowing fluid Δpv100: Pressure difference with Ball Valve fully open [kPa] V̇100: Nominal flow rate at Δpv100[m³/h]</p>	$k_{vs} = \sqrt{\frac{\dot{V}_{100}}{\frac{\Delta p_{v100}}{100}}}$	
<p>2. When steam is used as the flowing fluid P1(abs): absolute pressure at primary side [kPa] P2(abs): absolute pressure at secondary side [kPa] Absolute pressure=Gauge pressure +100kPa W: Mass flow rate [kg/h] Δp=P1-P2 [kPa]</p>	<p>When ΔP < P1/2</p> $k_{vs} = \frac{W}{0.162 \sqrt{\Delta p(P_1+P_2)}}$	<p>When ΔP ≥ P1/2</p> $k_{vs} = \frac{W}{0.14 P_1}$

- Mechanical Fail-Safe Rotary Actuators for operation of:
- Torque:
- Modulating control:
- Open/Close control:

DN15...25 Steam Valve
4Nm
LFH24-SR-S (AC/DC 24V)
LFH24-S (AC/DC 24V)
LFH230-S (AC 230V)



Technical data

Basic technical data		
Connecting cable	Cable 1m, 0.75mm ²	
Torque	-motor	4Nm
	-spring return	4Nm
Angle of rotation	95°	
Sound power level	Motor:~ 50dB(A), spring return:~62dB(A)	
Position indicator	Mechanical	
Degree of protection	IP54	
EMC	CE according to 2004/108/EEC	
Ambient temp.	-30...+50°C	
Non-operation temp.	-40...+80°C	
Humidity	5...95% RH, non-condensing	
Manual override (LFH24-S / LFH230-S)	With hand crank, can be fixed in any position	
Maintenance	Maintenance-free	
Weight	1.55kg	
LFH24-SR-S		
Nominal voltage range	AC 19.2...28.8V / DC 21.6...28.8V	
Power consumption	-running	2.5W
	-holding	1W
For transformer sizing	5VA	
Control signal Y	DC 2(0)...10V @ input impedance 100kΩ	
Position feedback signal U	DC 2...10V	
Direction of rotation	CCW	
Auxiliary switch	SPDT, 0...100% adjustable, 3(0.5)A, AC 250V (2 switches on further requirement)	
Protection class	III (safety extra-low voltage)	
Running time	-motor	~150s
	-spring return	~20s @ -20..+50°C / max. 60 @ -30°C
Manual override	Further contact	
LFH24-S		
Nominal voltage range	AC 19.2...28.8V / DC 21.6...28.8V	
Power consumption	-running	5W
	-holding	2.5W
For transformer sizing	7VA	
Auxiliary switch	2xSPDT, 3(0.5)A, AC 250V One fixed at 10°, one fixed at 85°	
Direction of rotation	CCW	
Protection class	III (safety extra-low voltage)	
Running time	-motor	40...75s
	-spring return	~20s @ -20..+50°C / max. 60 @ -30°C
LFH230-S		
Nominal voltage range	AC 198...264V	
Power consumption	-running	5W
	-holding	3W
For transformer sizing	7VA	
Auxiliary switch	2xSPDT, 3(0.5)A, AC 250V One fixed at 10°, one fixed at 85°	
Direction of rotation	CCW	
Low voltage directive	CE according to 2006/95/EEC	
Protection class	II (Total insulated)	
Running time	-motor	40...75s
	-spring return	~20s @ -20..+50°C / max. 60 @ -30°C

- Mechanical Fail-Safe Rotary Actuators for operation of:
- Torque:
- Modulating control:
- Open/Close control:

DN40...80 Steam Valves
20Nm
SRF24A-SR-5 (AC/DC 24V)
SRFA-5, SRFA-S2-5 (AC 24 ...240V)
(DC 24 ...125V)

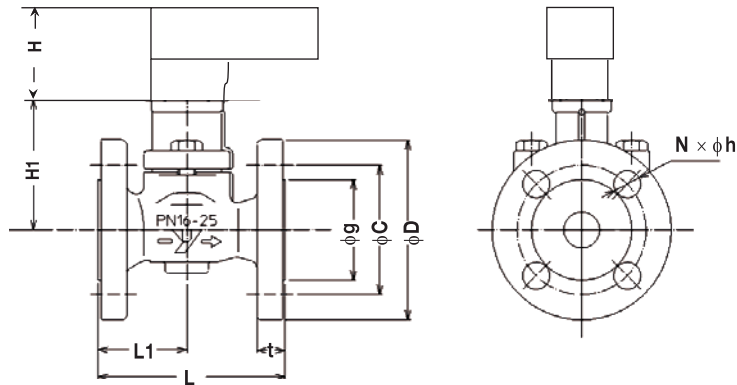


Technical data

Basic technical data		Torque	-motor	Min. 20Nm @ nominal voltage
			-spring return	Min. 20Nm
		Angle of rotation		90°
		Direction of rotation	-motor	Selected by mounting side of L/R
			-spring return	Selected by mounting side of L/R or reversing
		Sound power level		Motor:~ 45dB(A), spring return:~62dB(A)
		Position indicator		Mechanical
		Running time	-motor	~150s (SRF24A-SR-5); ~75s (SRFA-5, SRFA-S2-5)
			-spring return	~20s @ -20...+50°C
		Ambient temp.		-30...+50°C
		Non-operation temp.		-40...+80°C
		Humidity		5...95% RH, non-condensing
		Degree of protection		IP54
		EMC		CE according to 2004/108/EC
		Low voltage directive		CE according to 2006/95/EC
		Maintenance		Maintenance-free
SRF24A-SR-5		Nominal voltage		AC 24V 50/60Hz, DC 24V
		Nominal voltage range		AC 19.2...28.8V / DC 21.6...28.8V
		Power consumption	-running	5.5W
			-holding	3.0W
		For transformer sizing		8.5VA
		Connecting cable		Cable 1m, 4x0.75mm ²
		Control signal Y		DC (0)2...10V @ input impedance 100kΩ
		Position feedback signal U		DC 2...10V @ max. 0.5mA
		Position accuracy		±5%
		Manual override		With hand crank and interlocking switch
	Protection class		III (safety extra-low voltage)	
	Weight		~2kg	
SRFA-5		Nominal voltage		AC 24...240V 50/60Hz / DC 24...125V
		Nominal voltage range		AC 19.2...264V / DC 21.6...137.5V
		Power consumption	-running	7.0W
			-holding	3.5W
		For transformer sizing		18VA
		Connecting cable		Cable 1m, 2x0.75mm ²
		Manual override		With hand crank and interlocking switch
		Protection class		III (safety extra-low voltage)
		Weight		2.2kg
SRFA-S2-5		Nominal voltage		AC 24...240V 50/60Hz / DC 24...125V
		Nominal voltage range		AC 19.2...264V / DC 21.6...137.5V
		Power consumption	-running	7.0W
			-holding	3.5W
		For transformer sizing		18VA
		Auxiliary switch (-S2)		2xSPDT, 1mA...3(0.5)A, AC 250V One fixed at 10%, one adjustable 10...90%
		Connecting cable	-motor	Cable 1m, 2x0.75mm ²
			-S2	Cable 1m, 6x0.75mm ²
		Manual override		With hand crank and interlocking switch
		Protection class		II (Totally insulated)
	Weight		2.4kg	

Dimensions

Valve Type	Size	L (mm)	L1 (mm)	H (mm)	H1 (mm)	φD (mm)	φC (mm)	φg (mm)	t (mm)	φh (mm)	N	Weight (kg)
R610AS-R614AS	DN 15	108	50	147	75	95	65	46	16	14	4	3.0
R623AS-R624AS	DN 25	127	60	147	90	115	85	65	18	14	4	4.9
R638AS-R639AS	DN 40	165	82.5	162	103	150	110	84	20	19	4	9.0
R649AS	DN 50	178	89	162	107	165	125	99	20	19	4	11.0
R664AS	DN 65	190	90	162	124	185	145	118	22	19	4	15.6
R679AS	DN 80	203	100	162	125	200	160	132	22	19	8	18.4



Precaution for installation

<p>⚠ Caution</p> <ul style="list-style-type: none"> A strainer with 80 or more meshes should be installed on the inflow side. 	<p>Fig. 1</p>	<p>Fig. 2</p>
<p>⚠ Caution (avoid cavitation)</p> <ul style="list-style-type: none"> Avoid small degree (0...5%) control Do not install the valve close to pump Do not pipe at 90° 		

Caution:

1. Avoid using the valve in an atmosphere containing oxidising or explosive gas since it may corrode the actuator, valve or their components.
2. Do not expose the valve to any chemical and organic solvent or their vapor. Top and terminal covers of the actuator might corrode with such substances.
3. Do not install the valve in a location adjacent to a steam coil. High temperature radiation may result in an actuator malfunction.
4. Do not mount the valve on a pipe where water hammer occurs or where slug may accumulate.
5. Install the valve in a position allowing easy access for inspection.
6. Install a bypass pipe and gate valves on the inflow, outflow and bypass pipe.
7. Do not apply heat insulation to the actuator or linkage. Apply heat insulation only to the area boxed with dashed lines shown in Fig.2.
8. Before the installation, check the model number on the label. The controlled fluid should flow in the correct direction indicated by arrow on the valve body.
9. The valve should be installed with its actuator vertically positioned above the valve body or above the horizontal line (see Fig.1).

Inspection and maintenance

CAUTION

- Avoid touching the installed valve (valve body, yoke, joint). It reaches high temperature and may cause burn injury.

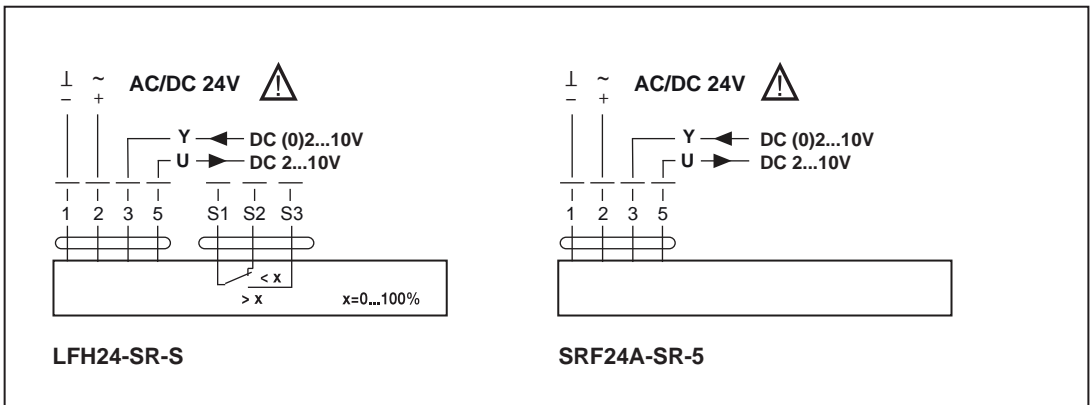
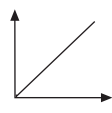
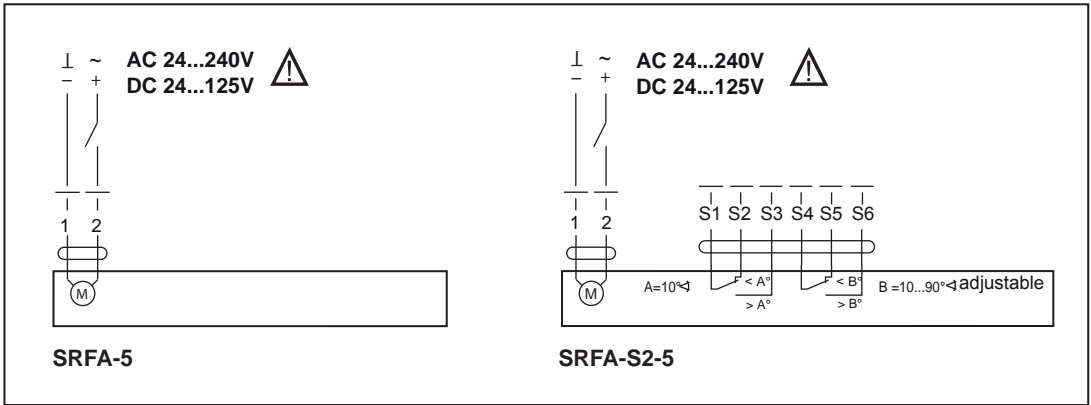
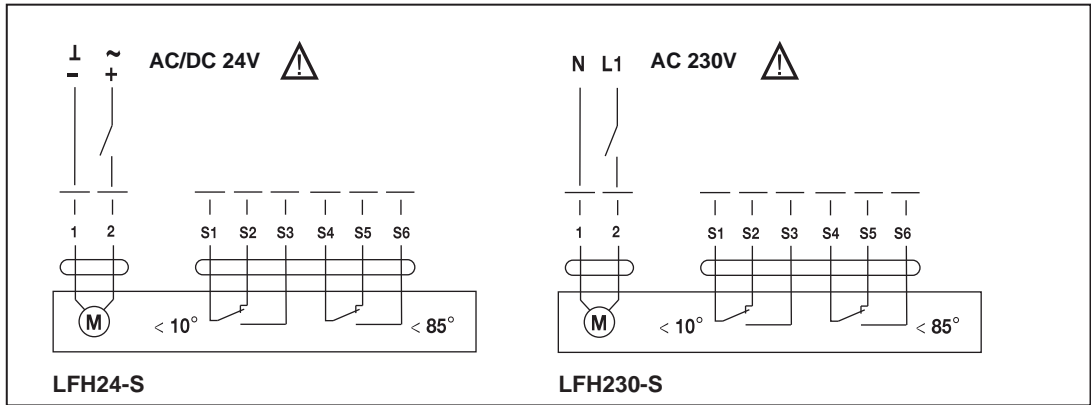
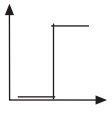
Inspection items and details

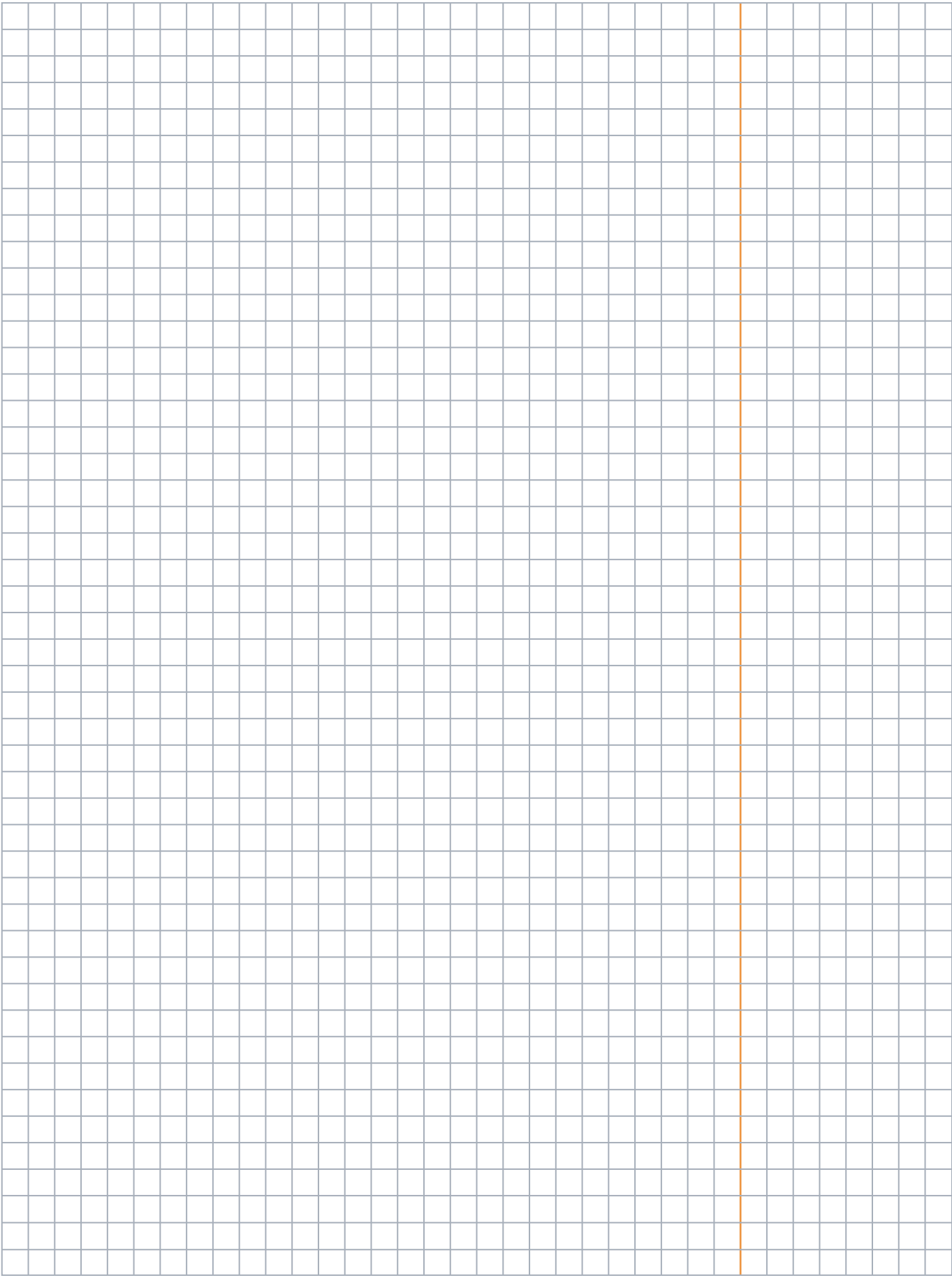
Inspection item	Inspection interval	Inspection detail
Visual inspection	Semiannual	<ul style="list-style-type: none"> • Fluid leakage from the gland and the flange face • Loosened bolts • Valve and actuator damages
Operating status	Semiannual	<ul style="list-style-type: none"> • Unstable Open / Close operation • Abnormal noise and vibration • Incomplete closing operation of the spring return despite the power disconnected • Improper operating time of the spring return (out of the approximately 20 second rang)
Routine inspection	Any time	<ul style="list-style-type: none"> • Fluid leakage to the outside • Abnormal noise and vibration • Unstable Open / Close operation • Valve hunting

Troubleshooting

Problem	Part to check	Action
<ul style="list-style-type: none"> • Fluid leaks from the flange face 	Loosened bolts Gasket on the flange face Misaligned piping	Tighten the flange bolts Replace the gasket Redo piping
<ul style="list-style-type: none"> • Fluid leaks from the gland part 	-----	Consult with Belimo sales / service personnel
<ul style="list-style-type: none"> • Fluid leaks from the bonnet 	Loosened bolts	Tighten the bolts
<ul style="list-style-type: none"> • Valve do not operate smoothly • Valve stops halfway • Valve does not operate at all 	Conditions of the power applied and of the input signal applied Loosened terminals Wiring condition / disconnected wires	Check the power supply and the controller connected to Tighten the terminals Check the wiring
<ul style="list-style-type: none"> • Fluid leaks to the outside of the valve when the valve is in fully closed position 	Actuator pointer pointing to fully closed position despite the valve not fully closed	Fully close the valve
<ul style="list-style-type: none"> • The valve vibrates or produces an abnormal noise 	Primary pressure condition Differential pressure condition	Adjust the mounting position and installation location
<ul style="list-style-type: none"> • The auxiliary switch does not operate 	Wiring condition / disconnected wires	Check the wiring
<ul style="list-style-type: none"> • Valve hunting occurs 	Secondary pressure condition Differential pressure condition Control stability	Adjust the mounting position and installation location Correct the control parameter setting of controller
<ul style="list-style-type: none"> • Spring return operating time is too short 	Wiring condition of the brake motor	Consult with Belimo sales / service personnel
<ul style="list-style-type: none"> • Spring return operating time is too long • Spring return does not operate 	Valve operating torque	Consult with Belimo sales / service personnel
<ul style="list-style-type: none"> • Actuator does not fully close the valve 	-----	Consult with Belimo sales / service personnel

Wiring diagrams





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