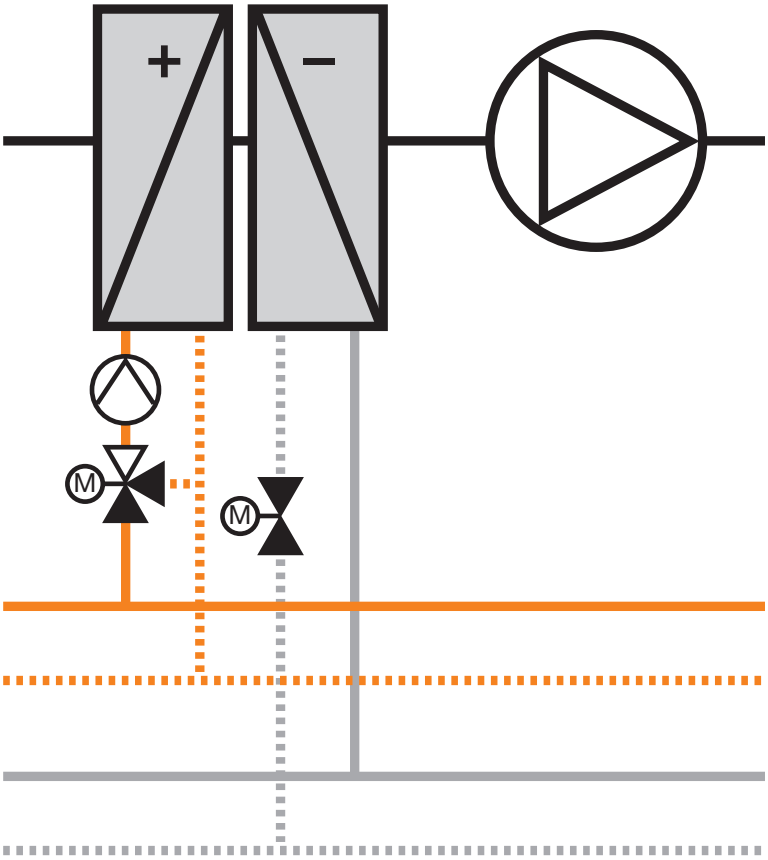
6. H-5

Product Information

Globe Valves with Linear Actuators



Control valves for every application

Characterized control valve with rotary actuator

2-way valve or mixing valve with either internal thread or flanged ends. Equal-percentage characteristic for controlling low to medium flow rates. Also available for Open/Close applications. Pipe connectors can be supplied as an option.

Pressure-independent control valve with rotary actuator

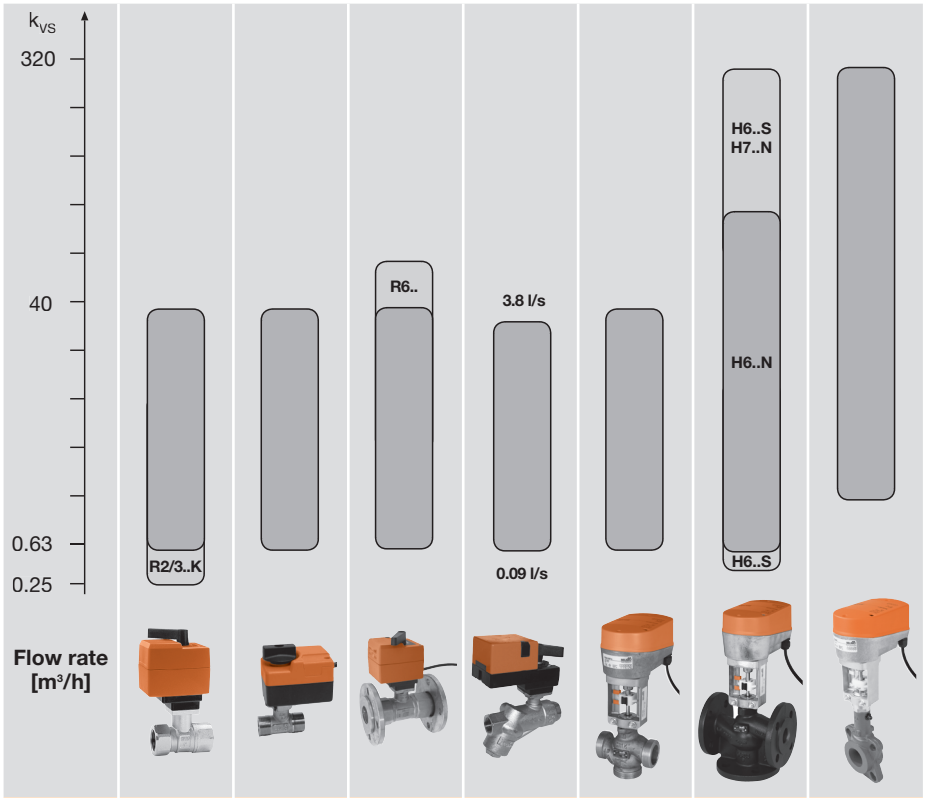
As a result of the consistent further development of the tried-and-tested Belimo characterized control valve, the valve design has been simplified with the new pressure-independent control valve R2..P. The flow rate is constant, even when the valve closes and the differential pressure increases. The valve authority is 1, even with overdimensional valve sizes.

Globe valve with linear actuator

Classic globe valve with equal-percentage characteristic for controlling low to high flow rates. Available as a 2-way valve or mixing valve with either flanged ends or external thread. Also suitable for Open/Close duty. Actuators with an emergency control function can be supplied.

SuperCompact control valve with linear actuator, flanged

With equal-percentage (standard) or linear (optional) characteristic for controlling low to high flow rates.
Designed as a 2-way valve in intermediate flange form. Also available for Open/Close applications.



	Characte-rized control valve	Characte-rized control valve	Characte-rized control valve	Pressure-independent control valve	Globe valve	Globe valve	SuperCom-pact control valve
	Internal thread	External thread	Flange	Internal thread	External thread	Flange	Flange
2-way	R2 R2..K	R4..	R6..R	R2..P	H4..B	H6..N H6..S	S6
3-way	R3 R3..K	R5	R7..R	–	H5..B	H7..N	–
DN	10…50	15…50	15…80	15…50	15…50	15…150 15…100 (H6..N)	20…150
P_s [kPa]	4140 / 2760*	4140 / 2760*	600	4140 / 2760*	1600	1600	1600
PN			6			16	6 / 10 / 16

* DN 10…20 / D N40…50

Control valves with bus-capable actuators. For new installations Belimo offers a selected range of control valves in all the usual nominal widths. The actuators that are used with them can satisfy all application requirements.

Converting and retro-fitting valves. Belimo offers a wide range of intelligent actuators for the motorizing and/or conversion and retro-fitting of the leading makes of valve. This also means, of course, that existing equipment can be upgraded to the latest state-of-the-art at minimum cost. Suitable brackets make mounting the actuators a very simple task requiring no special tools.

Important

Using Belimo control devices

The control devices described in this publication are intended for use in the closed water circuits of heating, ventilating and air-conditioning systems. Please ask for more information about using the control devices in conjunction with other liquid or gaseous fluids.

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General information - linear actuators

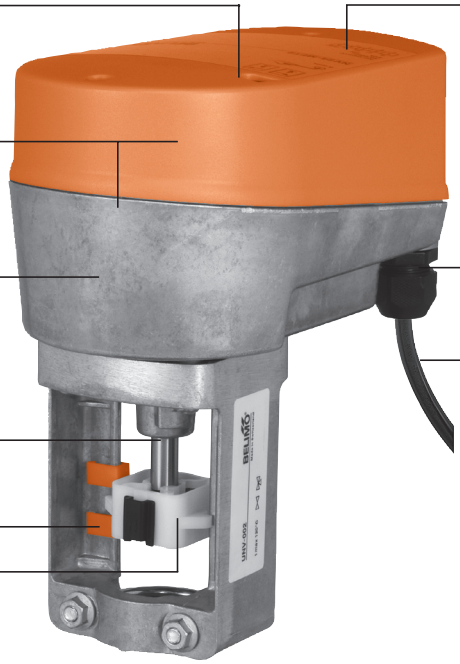
NV.. actuators for valve nominal widths DN 15 - DN 80

Cost-effective turnkey solution

Customers who choose Belimo motorized valves will be able to enjoy products that offer the same technically advanced standard and are as easy to use as the actuators for air control dampers for which the company has been famous for many years.

AV.. actuators for valve nominal widths DN 65 - DN 150

High-performance AV.. linear actuators are available for all nominal widths from DN 65. They can likewise be supplied with different methods of control and with Multi-Function Technology (MFT).



Manual operation for manual startup and emergency operation

Cover made of impact-resistant plastic. Housing and bracket made of robust die-cast aluminum

Also available on request with emergency control function (spring) in case of power failure

Self-adaptation of valve stroke thanks to actuator intelligence (MFT types)

Integrated position indication

Automatic mechanical coupling of the valve stem to the actuator spindle

3-point or modulating control, variable with MFT types

M20 union, IP54 guaranteed **IP54**

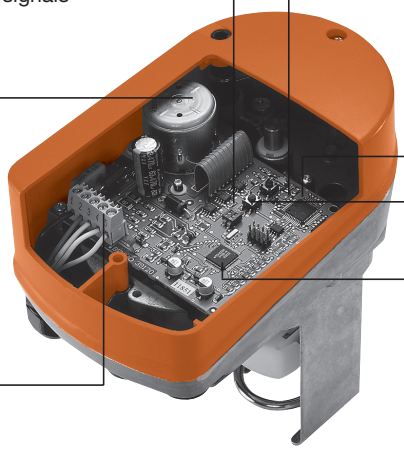
1 m preassembled connecting cable with integrated terminals

Available with Multi-Function Technology MFT® **MFT**

Complies with CE requirements **CE**

Multifunctionality

Electronic circuit of the NV24-MFT



Slide switch for selecting the closing point and inverting signals

Status indication for a preliminary diagnosis of the actuator condition

Microprocessor-controlled brushless actuator with MFT functionality; prolongs the service life and reduces the noise level and current consumption

Microprocessor

Pushbuttons for test and manual adaptation

ASIC

Practical connecting terminals

The modulating NV24-MFT and AV24-MFT linear actuators feature the unique Multi-Function Technology MFT® from Belimo. There are numerous advantages, including:

- The MFT electronics automatically detects the valve stroke and parameterizes the setpoints.
- The individual parameters, such as the control signal, running time, position feedback, operating status indication etc., can be individually adjusted and adapted precisely to suit the requirements of the system when the equipment is installed.
- The actuator monitors itself during operation and, on request, reports possible faults, such as a blocked stem or increased control path, directly to the supervisory control room.
- MFT integrates an anti-blocking function. Dirt particles which could cause the actuator to stick are automatically removed.

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Throttling valves and mixing valves

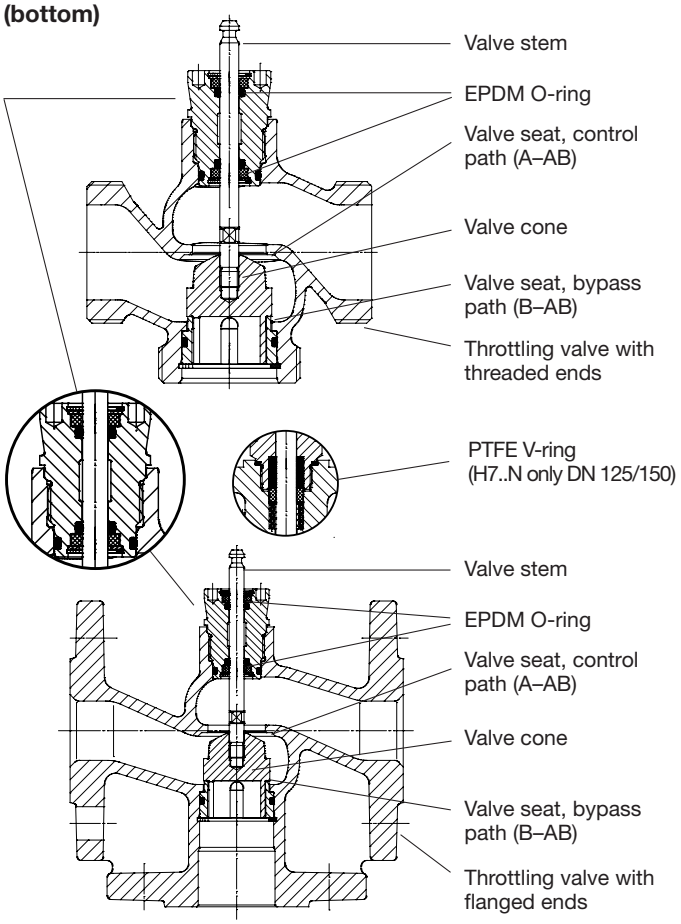
Belimo globe valves have been designed for a long service life in closed-loop circuits carrying cold, warm or hot water (due to its stainless steel valve seat/valve cone, the H6..S is suitable for duty in hot water circuits and steam applications). The capacity range from 1 kW to 3 MW is completely covered by DN 15 to DN 150.

Throttling and mixing versions of the valves are available with either external thread or flanged ends.

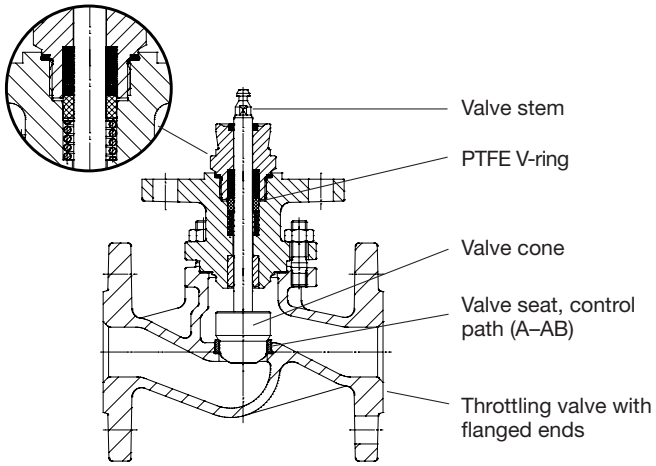
The design of Belimo globe valves has been greatly improved in several important ways. Various optimized features have been incorporated with the aim of increasing their service life and reducing maintenance costs.

The valves are always supplied as a turnkey functional solution, i.e. together with a suitable linear actuator. There are several alternative actuator types offering different actuating force ratings and emergency control functions.

Component parts of the globe valve: H5..B (top) and H7..N (bottom)



Component parts of the globe valve: H6..S



Design of Belimo H... globe valves

Type	Valve	Valve closing point	Closing point setting of linear actuator	Schematic diagram of valve
H4..B H6..N	⋈	Up	Δ	A AB
H5..B H7..N	⋈	Up	Δ	A AB B
H6..S	⋈	Down	∇	A AB

H4..B, H5..B, H6..N and H7..N series

The closing point of the globe valves in the Belimo H4..B, H5..B, H6..N and H7..N series is in the UP position. The valve stem is fully extended from the valve fitting. The flow rate through the control path is 0% (bypass path with 3-way valve: 100%). In the schematic diagram, the valve cone is pointing upwards and is shaped like a Δ.

H6..S series

The closing point of the globe valves in the Belimo H6..S series is in the DOWN position. The stem is fully retracted into the valve fitting. The flow rate through the control path is 0%. In the schematic diagram, the valve cone is pointing downwards and is shaped like a ∇.

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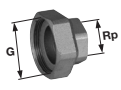
Overview of valves and accessories

Globe valves

			External thread		Flange PN 16		
			2-way	3-way	2-way	3-way	2-way
			H4..B	H5..B	H6..N	H7..N	H6..S
							
Only suitable as a mixing valve				•		•	
Nominal width [mm]			15...50	15...50	15...100	15...150	15...150
Pipe connection		External thread (ISO 228)	•	•			
		Flange PN 16 (ISO 7005)			•	•	•
Flow characteristic		A–AB equal-percentage (to VDI / VDE 2173); N(ep) = 3	•	•	•	•	•
		B–AB linear		•		•	
Temperature of medium		5…120 °C (-10 °C with stem heating on request)	•	•	•	•	
		5..150 °C					•
Leakage rate		Control path < 0.05 % kvs	•	•	•	•	•
		Bypass < 1 % kvs		•		•	
Areas of application		Cold and warm water	•	•	•	•	•
		Steam and hot water					•
		Closed water circuit with max. 50% volume of glycol	•	•	•	•	•
		Open water circuit (ph > 7)	•	•			
Material	**Housing**	Red casting brass Rg5	•	•			
		Cast iron GG25			•	•	•
		Cast iron GGG40.3 (H7..N DN 125/150)				•	
	Valve cone/valve stem	Yellow brass / stainless steel	•	•	•	•	
		Stainless steel / stainless steel (H7..N only DN 125/150)				•	•
	Valve seat/bypass seat	Red casting brass Rg5 / stainless steel	•	•			
		Cast iron GG25 / stainless steel			•	•	
		Stainless steel (H7..N only DN 125/150)				•	•
	Stem gland seal	EPDM O-ring	•	•	•	•	
		PTFE V-ring (H7..N only DN 125/150)/150)				•	•
Rated pressure [kPa]			1600	1600	1600	1600	1600

Unions, flanges

Pipe connector for H4/5..B globe valve as accessory



DN	G	Rp	Type	Material
15	G 1 1/8"	1/2"	**ZH4515**	Mall. cast iron, galv.
20	G 1 1/4"	3/4"	**ZH4520**	Mall. cast iron, galv.
25	G 1 1/2"	1"	**ZH4525**	Mall. cast iron, galv.
32	G 2"	1 1/4"	**ZH4532**	Mall. cast iron, galv.
40	G 2 1/4"	1 1/2"	**ZH4540**	Mall. cast iron, galv.
50	G 2 3/4"	2"	**ZH4550**	Mall. cast iron, galv.

Included in scope of delivery of ZR45..: female part, union nut, flat gasket

Blind screw fitting for H5..B globe valve as accessory (for sealing the bypass)

DN	G	Type	Material
15	G 1 1/8"	**ZH515**	Mall. cast iron, galv.
20	G 1 1/4"	**ZH520**	Mall. cast iron, galv.
25	G 1 1/2"	**ZH525**	Mall. cast iron, galv.
32	G 2"	**ZH532**	Mall. cast iron, galv.
40	G 2 1/4"	**ZH540**	Mall. cast iron, galv.
50	G 2 3/4"	**ZH550**	Mall. cast iron, galv.

Included in scope of delivery of ZH5..: blind spade, union nut, flat gasket

Blind flange for H7..N globe valve as accessory (for sealing the bypass)

DN	Type	Material
15	**ZH715**	Blind flange, coated
20	**ZH720**	Blind flange, coated
25	**ZH725**	Blind flange, coated
32	**ZH732**	Blind flange, coated
40	**ZH740**	Blind flange, coated
50	**ZH750**	Blind flange, coated
65	**ZH765**	Blind flange, coated
80	**ZH780**	Blind flange, coated
100	**ZH7100**	Blind flange, coated

Included in scope of delivery of ZH7..: blind flange, flat gasket, hexagon screws, nut

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NV / NVF linear actuators

		3-point		Modulating			Modulating emergency control function	
		AC / DC 24 V	AC 230 V	AC / DC 24 V			AC / DC 24 V	
Linear actuator 20 mm		NV24-3	NV230-3	NV24-MFT	NVY24-MFT	NVG24-MFT	NVF24-MFT	NVF24-MFT-E
Stroke		20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Actuating force		1000 N[1]	1000 N[1]	1000 N[1]	1000 N[1]	1600 N	800 N	800 N
Fast running function					•			
Actuating time	7.5 s/mm, 3.75 s/mm selectable	•	•					
Running time	150 s, (75...300 s) [2]			•		•	•	•
	35 s, (35...300 s) [2]				•			
Emergency actuating time	< 1.5 s/mm (spring)						•	•
	Emergency control function, pulling						•	
	Emergency control function, pushing							•
Control	3-point	•	•					
	DC 0...10 V, (0...32 V) [2]			•	•	•	•	•
Operating range	DC 0.5...10 V, (0.5…32 V) [2]				•			
	DC 2...10 V, (0.5…32 V) [2]			•		•	•	•
Position feedback	DC 0...10 V, (0.5…10 V) [2]				•			
	DC 2...10 V, (0.5…10 V) [2]			•		•	•	•
Valve functions	Selectable closing point	•	•	•	•	•	•	•
	Automatic stroke adaptation			•	•	•	•	•

1) Closing force 1000 N, inhibiting force 800 N
2) Control, operating range, feedback, running time and other functions can be parameterized with PC-Tool or the MFT-H adjuster

AV linear actuators

		3-point		Modulating, multifunctional	
		AC / DC 24 V	AC 230 V	AC / DC 24 V	
Linear actuator 40 mm		AV24-3	AV230-3	AV24-MFT	AVY24-MFT
Stroke		50 mm	50 mm	50 mm	50 mm
Actuating force		2000 N	2000 N	2000 N	2000 N
Fast running function					•
Actuating time	7.5 s/mm, 3.75 s/mm selectable	•	•		
Running time	150 s, (150…300 s) [1]			•	
	60 s, (60…300 s) [1]				•
Control	3-point	•	•		
	DC 0...10 V, (0...32 V) [1]			•	•
Operating range	DC 2...10 V, (0.5…32 V) [1]			•	
	DC 0.5...10 V [1]				•
Position feedback	DC 2...10 V, (0.5…10 V) [1]			•	
	DC 0.5...10 V [1]				•
Valve functions	Selectable closing point	•	•	•	•
	Automatic stroke adaptation			•	•

1) Control, operating range, feedback, running time and other functions can be parameterized with PC-Tool or the MFT-H adjuster

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Valve/actuator combinations

Maximum closing and differential pressures

	Fast running	Emergency control f.	24 V AC / DC	230 V AC	Control	20 mm 800 N NVF	20 mm 1000 N[2] NV..	20mm 1600 N NVG..	50 mm 2000 N AV..
									
3-point			•		3P		NV24-3		AV24-3
				•	3P		NV230-3		AV230-3
Modulating, multifunctional			•		0…10 V		NV24-MFT	NVG24-MFT	AV24-MFT
	•		•		0…10 V		NVY24-MFT		AVY24-MFT
		•	•		0…10 V	NVF24-MFT(-E)			

PN 16
External thread (ISO 228)
(–10°C)[1] +5°C...120°C


DN [mm]	k_{vs} [m³/h]	H4..B	H5..B	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
15	0,63	H411B	H511B	1600	400	1600	400	1600	400
15	1	H412B	H512B	1600	400	1600	400	1600	400
15	1.6	H413B	H513B	1600	400	1600	400	1600	400
15	2.5	H414B	H514B	1600	400	1600	400	1600	400
15	4	H415B	H515B	1600	400	1600	400	1600	400
20	6.3	H420B	H520B	1320	400	1600	400	1600	400
25	10	H425B	H525B	1080	400	1350	400	1600	400
32	16	H432B	H532B	800	400	1000	400	1600	400
40	25	H440B	H540B	440	400	550	400	980	400
50	40	H450B	H550B	280	280	350	350	600	400

PN 16
Flange (ISO 7005)
(–10°C)[1] +5°C...120°C


DN [mm]	k_{vs} [m³/h]	H6..N	H7..N	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
15	0.63	H611N	H711N	1600	400	1600	400	1600	400		
15	1,6	H613N	H713N	1600	400	1600	400	1600	400		
15	4	H615N	H715N	1600	400	1600	400	1600	400		
20	6.3	H620N	H720N	1320	400	1600	400	1600	400		
25	10	H625N	H725N	1080	400	1350	400	1600	400		
32	16	H632N	H732N	800	400	1000	400	1600	400		
40	25	H640N	H740N	440	400	550	400	980	400		
50	40	H650N	H750N	280	280	350	350	600	400		
65	58	H664N	H764N	160	160	200	200	320	320		
65	63	H665N	H765N							400	400
80	90	H679N	H779N	100	100	135	135	210	210		
80	100	H680N	H780N							270	270
100	145	H6100N	H7100N							160	160
125	220		H7125N							90	90
150	320		H7150N							60	60

PN 16
Flange (ISO 7005)
+5°C...150°C

DN [mm]	k_{vs} [m³/h]	H6..S	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
15	0.4	H610S	1600	1000	1600	1000	1600	1000		
15	0.63	H611S	1600	1000	1600	1000	1600	1000		
15	1	H612S	1600	1000	1600	1000	1600	1000		
15	1.6	H613S	1600	1000	1600	1000	1600	1000		
15	2.5	H614S	1600	1000	1600	1000	1600	1000		
15	4	H615S	1600	1000	1600	1000	1600	1000		
20	4	H619S	1320	1000	1600	1000	1600	1000		
20	6.3	H620S	1320	1000	1600	1000	1600	1000		
25	6.3	H624S	1080	1000	1350	1000	1600	1000		
25	10	H625S	1080	1000	1350	1000	1600	1000		
32	16	H632S	800	800	1000	1000	1600	1000		
40	25	H640S	440	440	550	550	980	980		
50	40	H650S	280	280	350	350	600	600		
65	58	H664S	150	150	200	200	320	320		
65	63	H665S							400	400
80	100	H680S							270	270
100	145	H6100S							160	160
125	220	H6125S							90	90
150	320	H6150S							50	50

[1] –10 °C with stem heating on request
[2] 1000 N closing force / 800 N inhibiting force

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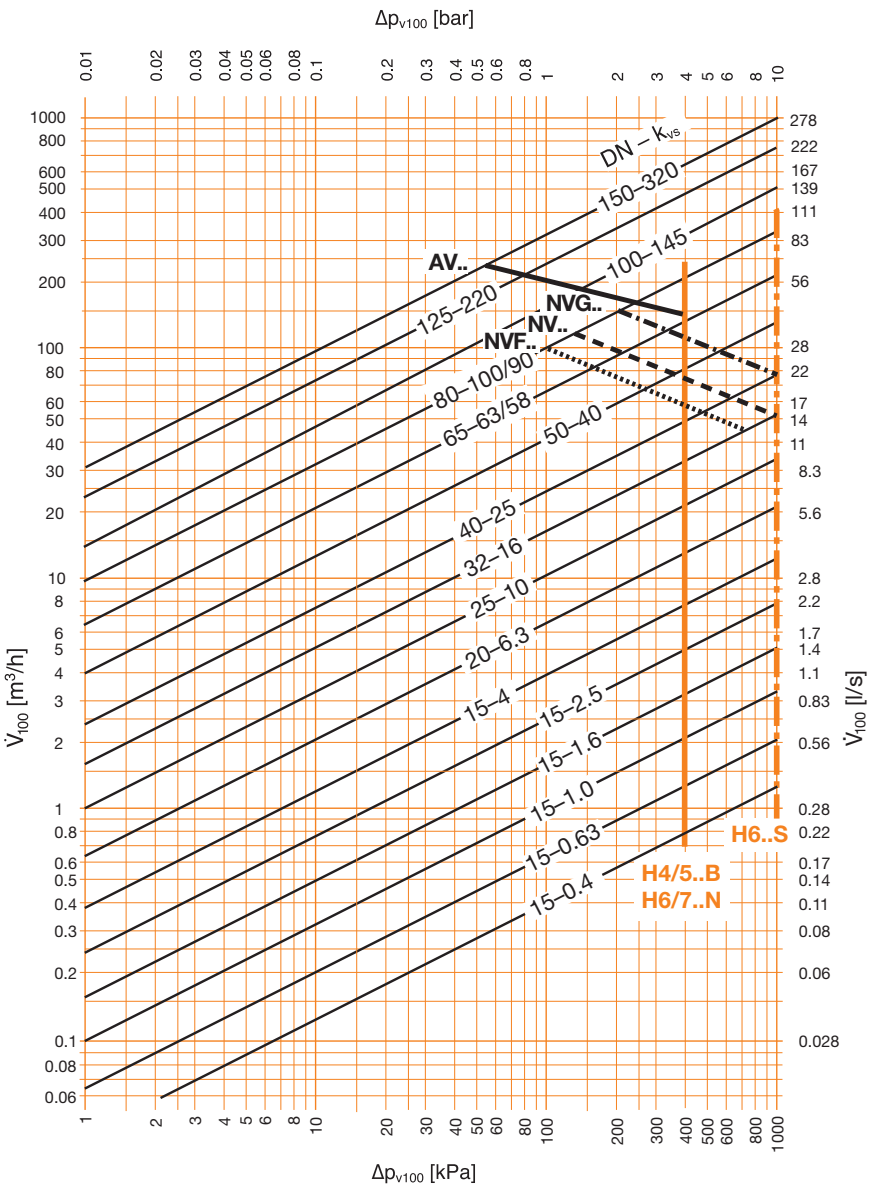
Sizing diagram for globe valves



Legend

ΔpMAX
Maximum permitted pressure difference for long service life across control path A–AB, referred to the whole range of opening.

Δpv100
Differential pressure with globe valve fully open

V̇100
Nominal flow rate for Δpv100

Formula for kvs

$$k_{vs} = \frac{\dot{V}_{100}}{\sqrt{\frac{\Delta p_{v100}}{100}}}$$

k_{VS}	[m³/h]
$\dot{V}_{100}$	[m³/h]
Δp_{v100}	[kPa]

Definition of Δps

Closing pressure at which the linear actuator can still seal the valve tightly allowing for the appropriate leakage rate.

Δpmax of valves

- H4..B / H5..B / H6..N / H7..N
- H6..S

Δps H4/5..B, H6/7..N, H6..S

- • • • • NVF.. linear actuators with an actuating force of 800 N
- — — NV.. linear actuators with an actuating force of 1000 N
- —·— NVG.. linear actuators with an actuating force of 1600 N
- ——— AV.. linear actuators with an actuating force of 2000 N

Selecting globe valves

Technical characteristics of globe valves for the modulating control of cold, warm and hot water

Charact.: equal-percentage | Rated pressure: 1600 kPa (PN16)

For more technical data, refer to pages 12–16

kvs [m³/h]	0.4	0.63	1	1.6	2.5	4	4	6.3	6.3	10	16	25	40	58	90	63	100	145	220	320
DN [mm]	15	15	15	15	15	15	20	20	25	25	32	40	50	65	80	65	80	100	125	150
Connection	External thread (ISO 228)																			
2-way	-	H411B	H412B	H413B	H414B	H415B	-	H420B	-	H425B	H432B	H440B	H450B							
3-way	-	H511B	H512B	H513B	H514B	H515B	-	H520B	-	H525B	H532B	H540B	H550B							
Connection	Flange (ISO 7005-2)															Flange (ISO 7005-2)				
2-way	-	H611N	–	H613N	–	H615N	–	H620N	–	H625N	H632N	H640N	H650N	H664N	H679N	H665N	H680N	H6100N		
3-way	-	H711N	–	H713N	–	H715N	–	H720N	–	H725N	H732N	H740N	H750N	H764N	H779N	H765N	H780N	H7100N	H7125N	H7150N
Connection	Flange (ISO 7005-2)															Flange (ISO 7005-2)				
2-way	H610S	H611S	H612S	H613S	H614S	H615S	H619S	H620S	H624S	H625S	H632S	H640S	H650S	H664S	–	H665S	H680S	H6100S	H6125S	H6150S

How to order motorized globe valves

Valve

The product range comprises 2-way and 3-way globe valves with external thread or flanged ends as well as the SuperCompact 2-way control valve PN 6/10/16.

Actuator types

Three rating classes (NV../NVG../AV..) that are suitable for different power supplies and methods of control for 3-point, multifunctional and communication-capable actuators, are available for motorizing globe valves and SuperCompact control valves. Running time and emergency control function selectable.

Assembling

The prices quoted are per individual combination unit (valve and actuator).
A successful order will need the following information:

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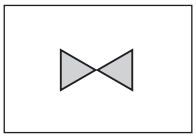
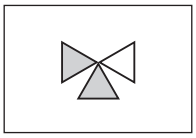
1) Valve



2-way



3-way

The price list is arranged as follows:
2-way and 3-way globe valves with external thread or flanged ends

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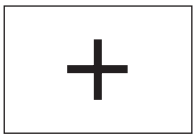
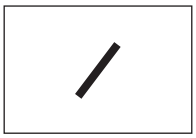
2) Assembling



Actuator fitted



Separately

The globe valves and actuators can be supplied as follows:
- Actuator fitted (+)
- Valve/actuator supplied separately (/)
- Different delivery dates for valves and actuators on request

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3) Actuator types

NV linear actuator

AV linear actuator

The following data must be provided:
- Modulating or 3-point control
- Nominal voltage AC / DC 24 V or AC 230 V
- With additional "fast running" or emergency control function

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UNV-002 bracket
Integrated in the actuator

The UNV-002 bracket is included in the scope of delivery of the NV.. models, providing the valve and the actuator are ordered together.

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4) Pipe connectors (optional) supplied separately

Separately

The globe valves are available with external thread or flanged ends, depending on the type of system and the application.
Types H4..B / H5..B can be supplied with separate pipe connectors as an option (/Z).

Ordering example

Technical data:

Designation:	**H532B+NV24-3/Z**
	1) 2) 3) 4)
1) Globe valve type:	
Design	3-way globe valve PN 16
Size	External thread G 2”, DN 32
Flow coefficient	k_{vs} 16
2) Assembling:	Valve and actuator fitted
3) Actuator:	
Nominal voltage	Linear actuator AC / DC 24 V
Control type	3-point
4) Pipe connectors (optional):	3 x ZH4532 supplied separately

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H4..B globe valves, 2-way, with external thread

Selection: H4..B

k_{vs} [m³/h]	DN [mm]	2-way	Suitable linear actuator, 3-point	Suitable linear actuator, modulating DC 0 ... 10 V	Suitable linear actuator, modulating DC 0 ... 10 V with emergency control function
0.63	15	**H411B**	**NV24-3** AC / DC 24 V **NV230-3** AC 230 V	**NV24-MFT** AC / DC 24 V **NVY24-MFT** AC / DC 24 V **NVG24-MFT** [1] AC / DC 24 V	**NVF24-MFT** AC / DC 24 V Emergency control function, pulling [2] **NVF24-MFT-E** AC / DC 24 V Emergency control function, pushing [3]
1	15	**H412B**			
1.6	15	**H413B**			
2.5	15	**H414B**			
4	15	**H415B**			
6.3	20	**H420B**			
10	25	**H425B**			
16	32	**H432B**			
25	40	**H440B**			
40	50	**H450B**			

1) Recommended for DN 32 – DN 50 and high closing pressures
2) Valve closed when deenergized
3) Valve open when deenergized

Technical data	H4..B
Flow media	Cold and warm water, water with max. 50% volume of glycol
Temperature of medium	(–10°C) +5°C...+120°C (–10°C on request)
Rated pressure ps	1600 kPa (PN 16)
Flow characteristic	Control path A–AB: equal-percentage (to VDI/VDE 2173) n(ep) = 3, optimized in opening range
Rangeability	DN 15 Sv > 50 DN 20...50 Sv > 100
Leakage rate	Control path A–AB: max. 0.05 % of k_{vs} value
Pipe connection	External thread to ISO 228
Differential pressure Δpmax	400 kPa
Closing pressure Δps	See table on page 8
Stroke	15 mm
Valve closing point	Up (Δ)
Installation position	Vertical to horizontal
Maintenance	Maintenance-free
Materials	
Fitting	Red casting brass Rg5
Valve cone	Brass
Valve seat	Red casting brass Rg5
Valve stem	Stainless steel
Stem gland seal	EPDM O-ring

2-way globe valves with external thread DN 15...50

For the modulating control of cold and warm water

Applications

- Water-side control of air handling units
- Water-side control in heating systems

Mode of operation

The globe valve is operated by a NV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the throttling device, to the opening position dictated by the control signal.

Product features

Equal-percentage characteristic
Produced by the profiling of the valve cone.

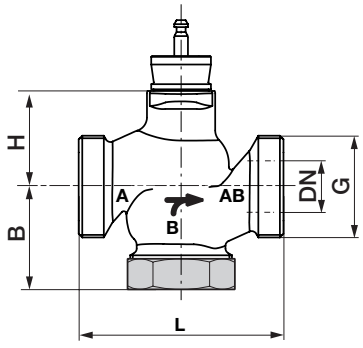
Manual operation with NV actuator
Using a hexagonal key to turn the actuator.

- **For installation instructions, refer to pages 30/31**
- **For closing pressure / differential pressure, refer to page 8**
- **Sizing diagram for globe valves, refer to page 9**
- **The information provided on pages 33/34 regarding operation, installation, project design, commissioning and maintenance must be strictly observed.**
- **For pipe connectors as accessories, refer to page 6**

Dimensions: H4..B

DN	Stroke	Dimensions [mm]			External thread	Weight
[mm]	[mm]	L	B	H	G	kg
15	15	80	65	46	G 1 1/8"	1.2
20	15	90	65	46	G 1 1/4"	1.3
25	15	110	66	52	G 1 1/2"	1.6
32	15	120	67	56	G 2"	2.2
40	15	130	72	65	G 2 1/4"	2.8
50	15	150	75	65	G 2 3/4"	3.9

A 2-way valve can be converted to a 3-way valve by removing the blind plug in port B.



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Selection: H5..B

k_{vs} [m³/h]	DN [mm]	3-way	Suitable linear actuator, 3-point	Suitable linear actuator, modulating DC 0 ... 10 V	Suitable linear actuator, modulating DC 0 ... 10 V with emergency control function
0.63	15	**H511B**	**NV24-3** AC / DC 24 V **NV230-3** AC 230 V	**NV24-MFT** AC / DC 24 V **NVY24-MFT** AC / DC 24 V **NVG24-MFT** [1] AC / DC 24 V	**NVF24-MFT** AC / DC 24 V Emergency control function, pulling [2] **NVF24-MFT-E** AC / DC 24 V Emergency control function, pushing [3]
1	15	**H512B**			
1.6	15	**H513B**			
2.5	15	**H514B**			
4	15	**H515B**			
6.3	20	**H520B**			
10	25	**H525B**			
16	32	**H532B**			
25	40	**H540B**			
40	50	**H550B**			

1) Recommended for DN 32 – DN 50 and high closing pressures
2) Valve closed when deenergized
3) Valve open when deenergized

Technical data	H5..B
Flow media	Cold and warm water, water with max. 50% volume of glycol
Temperature of medium	(–10°C) +5°C...+120°C (–10°C on request)
Rated pressure ps	1600 kPa (PN 16)
Flow characteristic	Control path A–AB: equal-percentage (to VDI/VDE 2173) n(ep) = 3, optimized in opening range Bypass B–AB linear (to VDI/VDE 2173)
Rangeability	DN 15 Sv > 50 DN 20...50 Sv > 100
Leakage rate	Control path A–AB: max. 0.05 % of k_{vs} value Bypass B–AB: max. 1 % of k_{vs} value
Pipe connection	External thread to ISO 228
Differential pressure Δpmax	400 kPa
Closing pressure Δps	See table on page 8
Stroke	15 mm
Valve closing point	Up (Δ)
Installation position	Vertical to horizontal
Maintenance	Maintenance-free
Materials	
Fitting	Red casting brass Rg5
Valve cone	Brass
Valve seat	Red casting brass Rg5
Valve stem	Stainless steel
Stem gland seal	EPDM O-ring

3-way globe valves with external thread DN 15...50

For the modulating control of cold and warm water

Applications

- Water-side control of air handling units
- Water-side control in heating systems

Mode of operation

The globe valve is operated by an NV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the mixing device, to the opening position dictated by the control signal.

Product features

Equal-percentage characteristic
Produced by the profiling of the valve cone. The bypass has a linear characteristic.

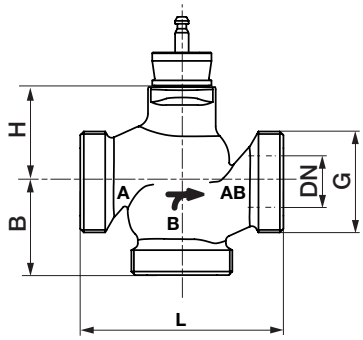
Manual operation with NV actuator
Using a hexagonal key to turn the actuator.

- **For installation instructions, refer to pages 30/31**
- **For closing pressure / differential pressure, refer to page 8**
- **Sizing diagram for globe valves, refer to page 9**
- **The information provided on pages 33/34 regarding operation, installation, project design, commissioning and maintenance must be strictly observed.**
- **For pipe connectors as accessories, refer to page 6**

Dimensions: H5..B

DN	Stroke	Dimensions [mm]			External thread	Weight
[mm]	[mm]	L	B	H	G	kg
15	15	80	55	46	G 1 1/8"	1.1
20	15	90	55	46	G 1 1/4"	1.2
25	15	110	55	52	G 1 1/2"	1.4
32	15	120	55	56	G 2"	2.0
40	15	130	60	65	G 2 1/4"	2.5
50	15	150	65	65	G 2 3/4"	3.5

A 3-way valve can be converted to a 2-way valve by sealing port B with a blind plug.



H6..N globe valves, 2-way, with flanged ends

Selection: H6..N

k_{vs} [m³/h]	DN [mm]	2-way	Suitable linear actuator, 3-point	Suitable linear actuator, modulating DC 0 ... 10 V	Suitable linear actuator, modulating DC 0 ... 10 V with emergency control function
0.63	15	**H611N**	**NV24-3** AC / DC 24 V **NV230-3** AC 230 V	**NV24-MFT** AC / DC 24 V **NVY24-MFT** AC / DC 24 V **NVG24-MFT** [1] AC / DC 24 V	**NVF24-MFT** AC / DC 24 V Emergency control function, pulling [2] **NVF24-MFT-E** AC / DC 24 V Emergency control function, pushing [3]
1.6	15	**H613N**			
4	15	**H615N**			
6.3	20	**H620N**			
10	25	**H625N**			
16	32	**H632N**			
25	40	**H640N**			
40	50	**H650N**			
58	65	**H664N**			
90	80	**H679N**			
63	65	**H665N**	**AV24-3** AC / DC 24 V **AV230-3** AC 230 V	**AV24-MFT** AC / DC 24 V **AVY24-MFT** AC / DC 24 V	
100	80	**H680N**			
145	100	**H6100N**			

1) Recommended for DN 32 – DN 50 and high closing pressures
2) Valve closed when deenergized
3) Valve open when deenergized

Technical data	H6..N
Flow media	Cold and warm water, water with max. 50% volume of glycol
Temperature of medium	(–10°C) +5°C...+120°C (–10°C on request)
Rated pressure ps	1600 kPa (PN 16)
Flow characteristic	Control path A–AB: equal-percentage (to VDI/VDE 2173) n(ep) = 3, optimized in opening range
Rangeability	DN 15 Sv > 50 DN 20...100 Sv > 100
Leakage rate	Control path A–AB: max. 0.05 % of k_{vs} value
Pipe connection	Flange to ISO 7005-2 (PN 16)
Differential pressure Δpmax	400 kPa (with large DN: Δps < Δpmax)
Closing pressure Δps	See table on page 8
Stroke	See Dimensions table
Valve closing point	Up (Δ)
Installation position	Vertical to horizontal
Maintenance	Maintenance-free
Materials	
Fitting	Cast iron GG25
Valve cone	Brass
Valve seat	Cast iron GG25
Valve stem	Stainless steel
Stem gland seal	EPDM O-ring

2-way globe valves with flange DN 15...100

For the modulating control of cold and warm water

Applications

- Water-side control of air handling units
- Water-side control in heating systems

Mode of operation

The globe valve is operated by an NV or AV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the throttling device, to the opening position dictated by the control signal.

Product features

Equal-percentage characteristic
Produced by the profiling of the valve cone.

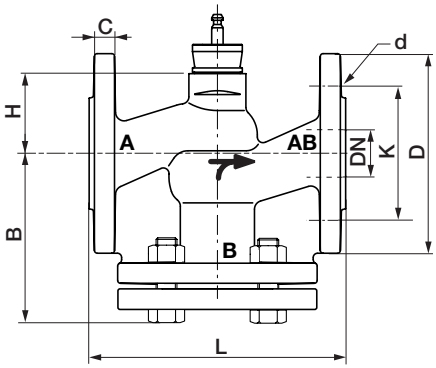
Manual operation with NV / AV actuator
Using a hexagonal key to turn the actuator.

- **For installation instructions, refer to pages 30…32**
- **For closing pressure / differential pressure, refer to page 8**
- **Sizing diagram for globe valves, refer to page 9**
- **The information provided on pages 33/34 regarding operation, installation, project design, commissioning and maintenance must be strictly observed.**

Dimensions: H6..N

DN	Stroke	Actuator	Dimensions [mm]			Flange				Weight
[mm]	[mm]	Type	L	B	H	D	K	d	C	kg
15	15	NV..	130	81	46	95	65	4x14	14	4.8
20	15		150	88	46	105	75	4x14	16	5.0
25	15		160	93	52	115	85	4x14	16	6.3
32	15		180	113	56	140	100	4x18	18	9.6
40	15		200	118	64	150	110	4x18	18	11.9
50	15		230	120	64	165	125	4x18	20	15.9
65	18		290	140	100	185	145	4x18	20	23.8
80	18		310	152	110	200	160	8x18	22	30.2
65	30	AV..	290	140	100	185	145	4x18	20	23.8
80	30		310	152	110	200	160	8x18	22	30.2
100	30		350	172	125	220	180	8x18	24	41.3

A 3-way valve can be converted to a 2-way valve by removing the blind plug in port B.



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Selection: H7..N

k_{vs} [m³/h]	DN [mm]	3-way	Suitable linear actuator, 3-point	Suitable linear actuator, modulating DC 0 ... 10 V	Suitable lin. act., modul. DC 0 ... 10 V with emergency control function
0.63	15	**H711N**	**NV24-3** AC / DC 24 V **NV230-3** AC 230 V	**NV24-MFT** AC / DC 24 V **NVY24-MFT** AC / DC 24 V **NVG24-MFT** [1] AC / DC 24 V	**NVF24-MFT** AC / DC 24 V Emergency control function, pulling [2] **NVF24-MFT-E** AC / DC 24 V Emergency control function, pushing [3]
1.6	15	**H713N**			
4	15	**H715N**			
6.3	20	**H720N**			
10	25	**H725N**			
16	32	**H732N**			
25	40	**H740N**			
40	50	**H750N**			
58	65	**H764N**			
90	80	**H779N**			
63	65	**H765N**	**AV24-3** AC / DC 24 V **AV230-3** AC 230 V	**AV24-MFT** AC / DC 24 V **AVY24-MFT** AC / DC 24 V	
100	80	**H780N**			
145	100	**H7100N**			
220	125	**H7125N**			
320	150	**H7150N**			

1) Recommended for DN 32 – DN 50 and high closing pressures
2) Valve closed when deenergized
3) Valve open when deenergized

Technical data	H7..N
Flow media	Cold and warm water, water with max. 50% volume of glycol
Temperature of medium	(–10°C) +5°C...+120°C (–10°C on request)
Rated pressure ps	1600 kPa (PN 16)
Flow characteristic	Control path A–AB: equal-percentage (to VDI/VDE 2173) n(ep) = 3, optimized in opening range Bypass B–AB linear (to VDI/VDE 2173)
Rangeability	DN 15 Sv > 50 DN 20...150 Sv > 100
Leakage rate	Control path A–AB: max. 0.05 % of k_{vs} value Bypass B–AB: max. 1% of k_{vs} value
Pipe connection	Flange to ISO 7005-2 (PN 16)
Differential pressure Δpmax	400 kPa (with large DN: Δps < Δpmax)
Closing pressure Δps	See table on page 8
Stroke	See Dimensions table
Valve closing point	Up (Δ)
Installation position	Vertical to horizontal
Maintenance	Maintenance-free
Materials	
Fitting	DN 15…100 Cast iron GG25 DN 125…150 Cast iron GGG40.3
Valve cone	DN 15…100 brass, DN 125/150 stainless steel
Valve seat	Cast iron GG25
Valve stem	Stainless steel
Stem gland seal	DN 15…100 EPDM O-ring, DN 125/150 PTFE V-ring

Dimensions: H7..N

DN	Stroke	Actuator	Dimensions [mm]			Flange				Weight
[mm]	[mm]	Type	L	B	H	D	K	d	C	kg
15	15	NV..	130	65	46	95	65	4x14	14	2.8
20	15		150	70	46	105	75	4x14	16	3.7
25	15		160	75	52	115	85	4x14	16	4.7
32	15		180	95	56	140	100	4x18	18	7.2
40	15		200	100	64	150	110	4x18	18	9.2
50	15		230	100	64	165	125	4x18	20	12.2
65	18		290	120	100	185	145	4x18	20	19.0
80	18		310	130	110	200	160	8x18	22	24.0
65	30	AV..	290	120	100	185	145	4x18	20	19.0
80	30		310	130	110	200	160	8x18	22	24.0
100	30		350	150	125	220	180	8x18	24	34.0
125	40		400	200	281	250	210	8x18	26	67.4
150	40		480	210	343	285	240	8x22	26	93.8

A 3-way valve can be converted to a 2-way valve by sealing port B with a blind flange.

3-way globe valves with flange DN 15...150

For the modulating control of cold and warm water

Applications

- Water-side control of air handling units
- Water-side control in heating systems

Mode of operation

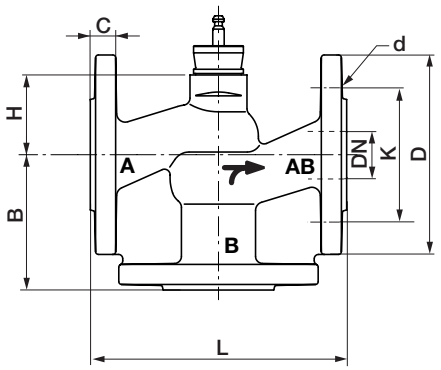
The globe valve is operated by an NV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the mixing device, to the opening position dictated by the control signal.

Product features

Equal-percentage characteristic
Produced by the profiling of the valve cone. The bypass has a linear characteristic.

Manual operation with NV actuator
Using a hexagonal key to turn the actuator.

- **For installation instructions, refer to pages 30…32**
- **For closing pressure / differential pressure, refer to page 8**
- **Sizing diagram for globe valves, refer to page 9**
- **The information provided on pages 33/34 regarding operation, installation, project design, commissioning and maintenance must be strictly observed.**



H6..S globe valves, 2-way, with flanged ends

Selection: H6..S

k_{vs} [m³/h]	DN [mm]	2-way	Suitable linear actuator 3-point	Suitable linear actuator, modulating DC 0 ... 10 V	Suitable linear actuator, modulating DC 0 ... 10 V with emergency control function
0.4	15	**H610S**	**NV24-3** AC / DC 24 V **NV230-3** AC 230 V	**NV24-MFT** AC / DC 24 V **NVY24-MFT** AC / DC 24 V **NVG24-MFT** [1] AC / DC 24 V	**NVF24-MFT(2)** AC / DC 24 V Emergency control function, pulling [3] **NVF24-MFT(2)-E** AC / DC 24 V Emergency control function, pushing [2]
0.63	15	**H611S**			
1	15	**H612S**			
1.6	15	**H613S**			
2.5	15	**H614S**			
4	15	**H615S**			
4	20	**H619S**			
6.3	20	**H620S**			
6.3	25	**H624S**			
10	25	**H625S**			
16	32	**H632S**			
25	40	**H640S**			
40	50	**H650S**			
58	65	**H664S**			
63	65	**H665S**	**AV24-3** AC 24 V **AV230-3** AC 230 V	**AV24-MFT** AC / DC 24 V **AVY24-MFT** AC / DC 24 V	
100	80	**H680S**			
145	100	**H6100S**			
220	125	**H6125S**			
320	150	**H6150S**			

1) Recommended for DN 32 – DN 50 and high closing pressures
2) Valve closed when deenergized
3) Valve open when deenergized

Technical data	H6..S
Flow media	Hot water, steam, water with max. 50% volume of glycol
Temperature of medium	+5°C...+150°C (higher temperatures on request)
Rated pressure ps	1600 kPa (PN 16)
Flow characteristic	Control path A–AB: equal-percentage (to VDI/VDE 2173) n(ep) = 3, optimized in opening range
Rangeability	DN 15 Sv > 50 DN 20...150 Sv > 100
Leakage rate	Control path A–AB: max. 0.05 % of k_{vs} value
Pipe connector	Flange to ISO 7005-2 (PN 16)
Differential pressure Δpmax	1000 kPa (with large DN: Δps < Δpmax)
Closing pressure Δps	See table on page 8
Stroke	See Dimensions table
Valve closing point	Down (▽)
Installation position	Vertical to horizontal
Maintenance	Maintenance-free
Materials	
Fitting	Cast iron GG25
Valve cone	Stainless steel
Valve seat	Stainless steel
Valve stem	Stainless steel
Stem gland seal	EPDM O-ring

Dimensions: H6..S

DN	Stroke	Actuator	Dimens. [mm]		Flange				Weight
[mm]	[mm]	Type	L	H	D	K	d	C	kg
15	15	NV..	130	118	95	65	4x14	14	3.6
20	15		150	118	105	75	4x14	16	4.3
25	15		160	126	115	85	4x14	16	5.2
32	15		180	126	140	100	4x18	18	6.8
40	15		200	133	150	110	4x18	18	8.7
50	15		230	139	165	125	4x18	20	11.6
65	18		290	100	185	145	4x18	20	16.7
65	30	AV..	290	155	185	145	4x18	20	16.7
80	30		310	170	200	160	8x18	22	22.4
100	30		350	190	220	180	8x18	24	32.5
125	40		400	228	250	210	8x18	26	44.0
150	40		480	288	285	240	8x22	26	61.0

2-way globe valves with flange DN 15...150

For the modulating control of hot water and steam

Applications

- Water-side control of air handling units
- Water-side control in heating systems

Mode of operation

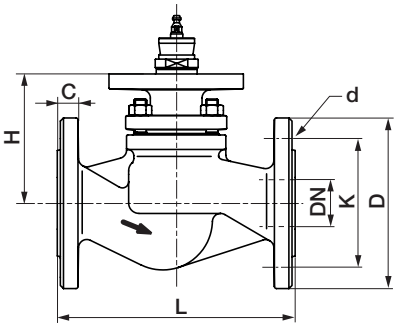
The globe valve is operated by an NV or AV series linear actuator. The linear actuators are controlled by a standard modulating or 3-point control system and move the cone of the valve, the throttling device, to the opening position dictated by the control signal.

Product features

Equal-percentage characteristic
Produced by the profiling of the valve cone.

Manual operation with NV / AV actuator
Using a hexagonal key to turn the actuator.

- **For installation instructions, refer to pages 30…32**
- **For closing pressure / differential pressure, refer to page 8**
- **Sizing diagram for globe valves, refer to page 9**
- **The information provided on pages 33/34 regarding operation, installation, project design, commissioning and maintenance must be strictly observed.**



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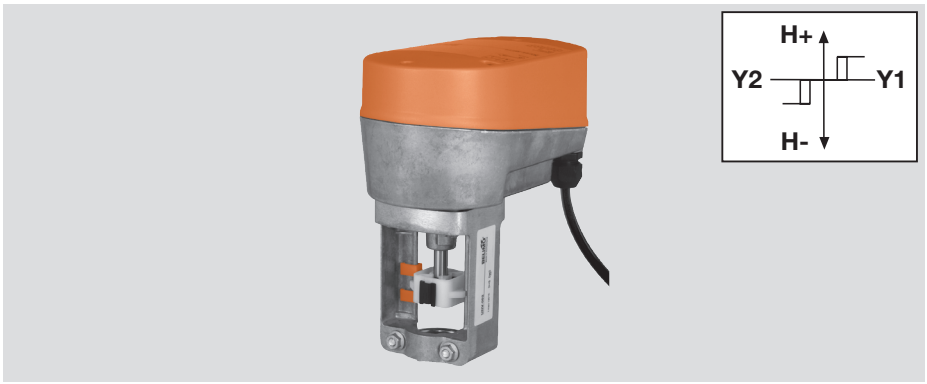
NV24-3, NV230-3 linear actuators for globe valves



Linear actuators for 2-way and 3-way globe valves DN 15...80

3-point actuators

NV24-3 AC/DC 24 V
NV230-3 AC 230 V

Applications

Operation of globe valves.

Mode of operation

Control is effected by means of a 3-point signal.

Product features

Simple attachment to the neck of the valve by means of a clamping strap. Semiautomatic coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the linear spindle to extend from the actuator housing (pushing).
Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes first priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the indicator adjusts itself automatically.

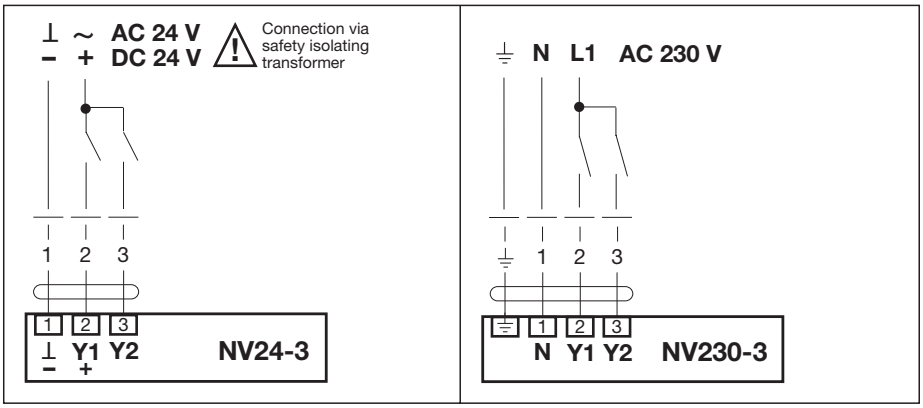
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

The UNV-002 bracket is included in the scope of delivery, providing the valve and the actuator are ordered together.

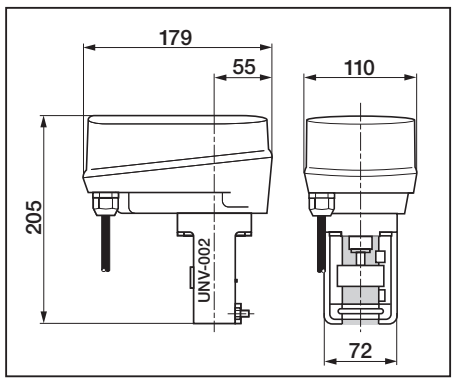
Wiring diagrams



Technical data	NV24-3	NV230-3
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	AC 230 V 50/60 Hz
Nominal voltage range	AC 19.2…28.8 V DC 21.6…28.8 V	AC 198…264 V
For wire sizing	5 VA	7 VA
Power consumption	3 W	6 W
Connecting cable	1 m, 3 x 0.75 mm²	1 m, 4 x 0.75 mm²
Nominal stroke	20 mm	
Actuating force	[1] 1000 N / [2] 800 N	
Manual operation	Hexagonal key, self-resetting	
Actuating time	7.5 s/mm, 3.75 s/mm selectable	
Sound power level	Max. 35 dB (A)	
Position indication	Mechanical 10…20 mm stroke	
Protection class	**III** (safety extra-low voltage)	**I** (with PE conductor)
Degree of protection	IP54	
Ambient temperature range	0°…+ 50° C	
Non-operating temperature	–40°…+ 80° C	
Humidity test	To EN 60730-1	
EMC	CE according to 89/336/EEC	
LV Directive	CE according to 73/23/EEC	
Mode of operation	Type 1 to EN 60730-1	
Maintenance	Maintenance-free	
Weight	1.5 kg incl. UNV-002 bracket (without valve)	

[1] **Closing force**
[2] **Inhibiting force**

Dimensions (incl. UNV-002)



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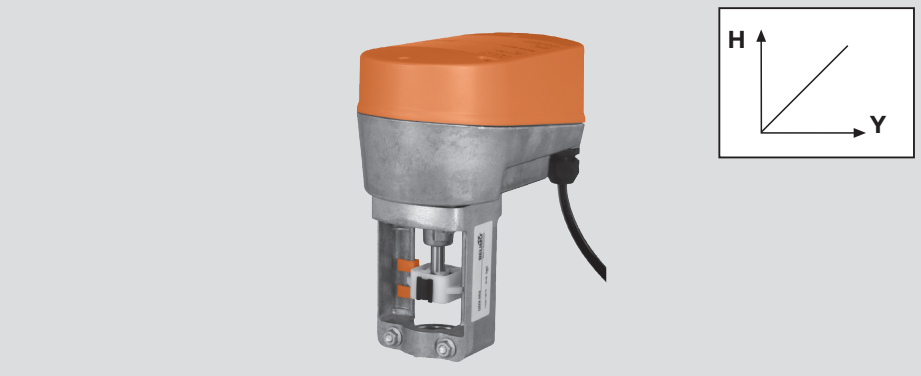


Linear actuators for 2-way and 3-way globe valves DN 15...80

Modulating actuator (AC/DC 24 V)
Control DC 0...10 V

Applications

Operation of globe valves.

Mode of operation

Modulating control is effected by means of a standard 0…10 V control signal.

Product features

Simple attachment to the neck of the valve by means of a clamping strap. Semiautomatic coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal. The stroke is adapted automatically and is also overload-proof.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the actuator spindle to extend from the actuator housing (pushing).
Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes first priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the maximum stroke adjusts itself automatically. There is a twin-color LED status indicator under the cover of the housing.

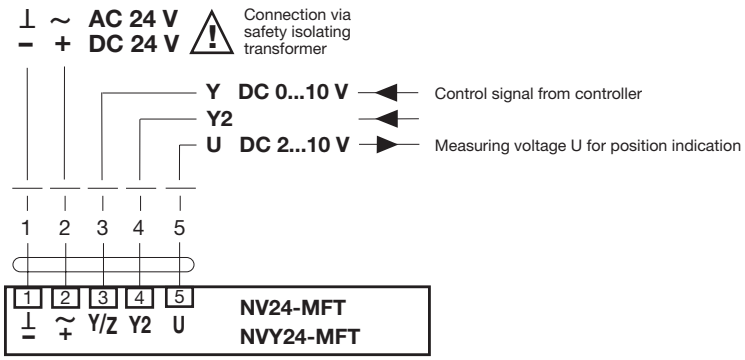
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

The UNV-002 bracket is included in the scope of delivery, providing the valve and the actuator are ordered together.

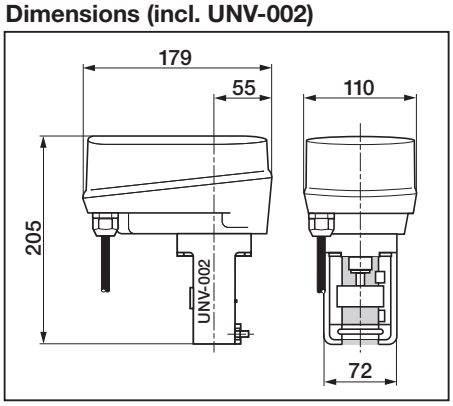
Wiring diagram



Technical data	NV24-MFT	NVY24-MFT
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
Nominal voltage range	AC 19.2…28.8 V, DC 21.6…28.8 V	
For wire sizing	5 VA	
Power consumption	3 W	
Connecting cable	1 m, 5 x 0.75 mm²	
Control	DC 0…10 V @ 100 kΩ	
Operating range	DC 2…10 V	DC 0.5…10 V für 0…100 % stroke
Position feedback	DC 2…10 V (0.5 mA)	DC 0.5…10 V @ 0.5 mA
Uni-rotation	±5 %	
Nominal stroke	20 mm	
Actuating force	[1] 1000 N / [2] 800 N	
Manual operation	Hexagonal key, self-resetting	
Fast running function		•
Running time	150 s	35 s
Sound power level	Max. 35 dB (A)	Max. 45 dB (A)
Position indication	Mechanical 10…20 mm stroke	
Protection class	**III** (safety extra-low voltage)	
Degree of protection	IP54	
Ambient temperature range	0°…+ 50° C	
Non-operating temperature	–40°…+ 80° C	
Humidity test	To EN 60730-1	
EMC	CE according to 89/336/EEC	
Software class A	To EN 60730-1	
Mode of operation	Type 1 to EN 60730-1	
Maintenance	Maintenance-free	
Weight	1.5 kg incl. UNV-002 bracket (without valve)	

[1] **Closing force**
[2] **Inhibiting force**

Dimensions (incl. UNV-002)



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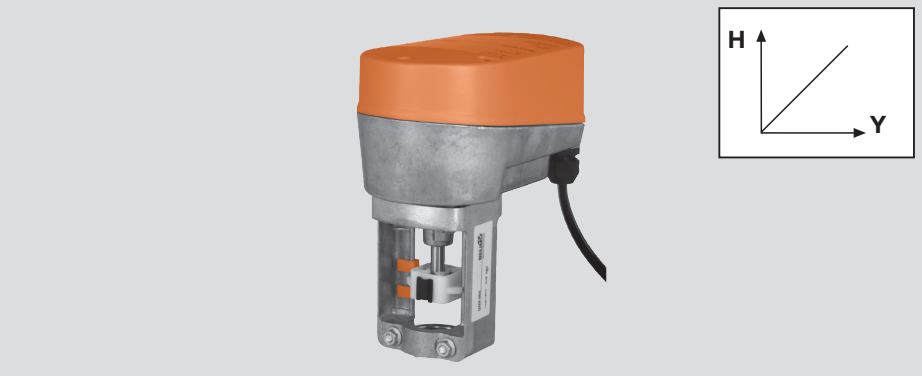
NVG24-MFT linear actuators for globe valves



Linear actuators for 2-way and 3-way globe valves DN 15...80

Modulating actuator (AC/DC 24 V)
Control DC 0...10 V

Applications

Operation of globe valves.

Mode of operation

Modulating control is effected by means of a standard 0…10 V control signal.

Product features

Simple attachment to the neck of the valve by means of a clamping strap. Semiautomatic coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal. The stroke is adapted automatically and is also overload-proof.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the actuator spindle to extend from the actuator housing (pushing).
Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes first priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the maximum stroke adjusts itself automatically. There is a twin-color LED status indicator under the cover of the housing.

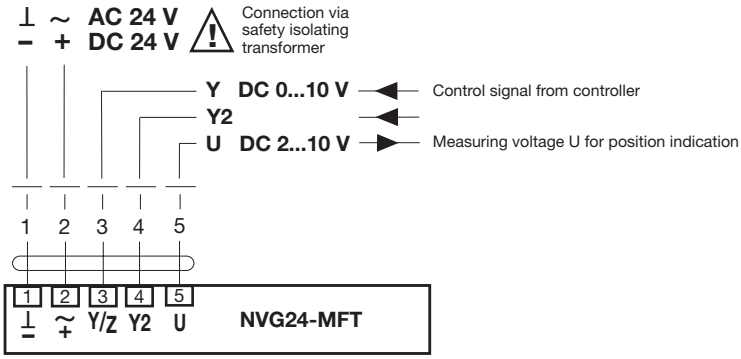
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

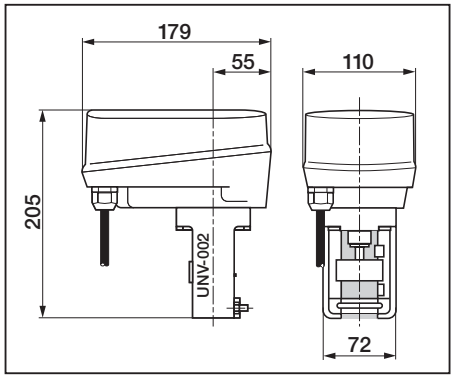
The UNV-002 bracket is included in the scope of delivery, providing the valve and the actuator are ordered together.

Wiring diagram



Technical data	NVG24-MFT
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC 19.2…28.8 V, DC 21.6…28.8 V
For wire sizing	5 VA
Power consumption	3 W
Connecting cable	1 m, 5 x 0.75 mm²
Control	DC 0…10 V @ 100 kΩ
Operating range	DC 2…10 V for 0…100 % stroke
Position feedback	DC 2…10 V @ 0.5 mA
Uni-rotation	±5 %
Nominal stroke	20 mm
Actuating force	1600 N
Manual operation	Hexagonal key, self-resetting
Running time	150 s
Sound power level	Max. 35 dB (A)
Position indication	Mechanical 10…20 mm stroke
Protection class	**III** (safety extra-low voltage)
Degree of protection	IP54
Ambient temperature range	0°…+ 50° C
Non-operating temperature	–40°…+ 80° C
Humidity test	To EN 60730-1
EMC	CE according to 89/336/EEC
Software class A Mode of operation	To EN 60730-1 Type 1 to EN 60730-1
Maintenance	Maintenance-free
Weight	1.5 kg incl. UNV-002 bracket (without valve)

Dimensions (incl. UNV-002)



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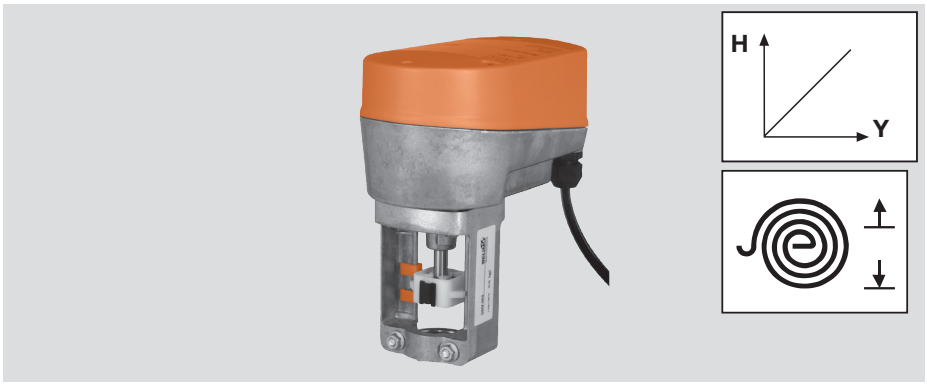


Linear actuators for 2-way and 3-way globe valves DN 15...80

Modulating actuator (AC/DC 24 V) with emergency control function
Control DC 0...10 V

Applications

Operation of globe valves.

Mode of operation

Modulating control is effected by means of a standard 0…10 V control signal. When the actuator is deenergized, the actuator spindle of the NVF.. type retracts and that of the NVF..E type extends.

Product features

Simple attachment to the neck of the valve by means of a clamping strap. Semiautomatic coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal. The stroke is adapted automatically and is also overload-proof.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the actuator spindle to extend from the actuator housing (pushing). Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes fiorst priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the maximum stroke adjusts itself automatically. There is a twin-color LED status indicator under the cover of the housing.

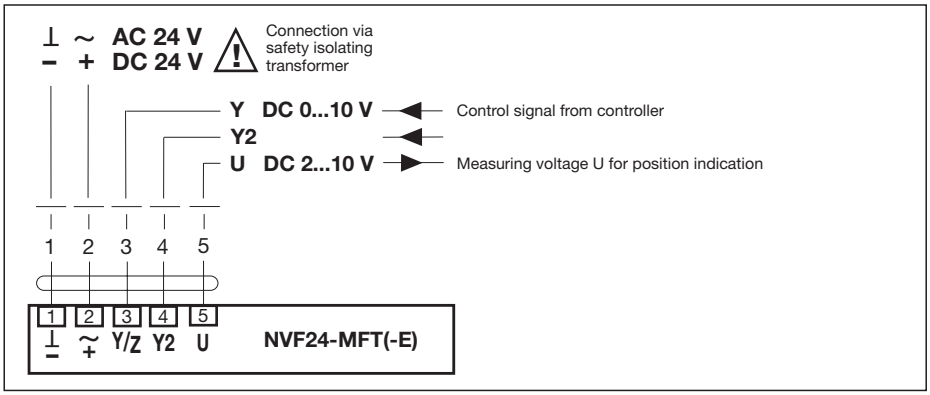
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

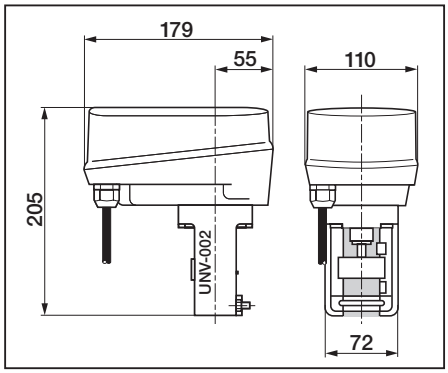
The UNV-002 bracket is included in the scope of delivery, providing the valve and the actuator are ordered together.

Wiring diagram



Technical data	NVF24-MFT	NVF24-MFT-E
Emergency control function	Pulling	Pushing
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
Nominal voltage range	AC 19.2…28.8 V, DC 21.6…28.8 V	
For wire sizing	10 VA	
Power consumption	5.5 W	
Connecting cable	1 m, 5 x 0.75 mm²	
Control	DC 0…10 V @ 100 kΩ	
Operating range	DC 2…10 V for 0…100 % stroke	
Position feedback	DC 2…10 V @ 0.5 mA	
Uni-rotation	±5 %	
Nominal stroke	20 mm	
Actuating force	800 N	
Manual operation	Hexagonal key, self-resetting	
Running time	150 s	
Emergency actuating time	< 1.5 s/mm	
Sound power level	Max. 35 dB (A) or max. 50 dB (A) in emergency operation (spring)	
Position indication	Mechanical 10…20 mm stroke	
Protection class	**III** (safety extra-low voltage)	
Degree of protection	IP54	
Ambient temperature range	0°…+ 50° C	
Non-operating temperature	–40°…+ 80° C	
Humidity test	To EN 60730-1	
EMC	CE according to 89/336/EEC	
Software class A	To EN 60730-1	
Mode of operation	Type 1 to EN 60730-1	
Maintenance	Maintenance-free	
Weight	1.8 kg incl. UNV-002 bracket (without valve)	

Dimensions (incl. UNV-002)



AV24-3, AV230-3 linear actuators for globe valves

Linear actuators for 2-way and 3-way globe valves DN 65...150

3-point actuators

AV24-3 AC/DC 24 V
AV230-3 AC 230 V

Applications

Operation of globe valves.

Mode of operation

Control is effected by means of a 3-point signal.

Product features

Simple attachment to the neck of the valve by means of a clamping flange. Form-fit coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the actuator spindle to extend from the actuator housing (pushing). Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes first priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the indicator adjusts itself automatically.

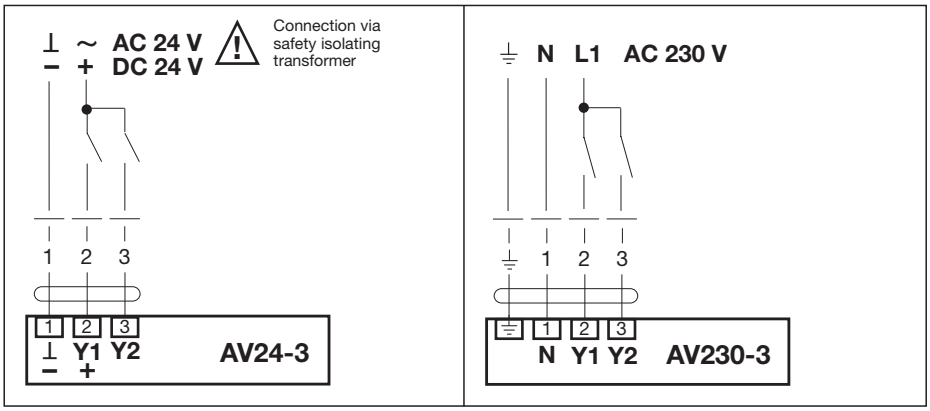
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

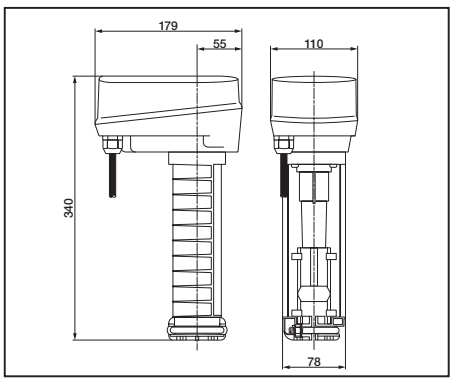
The bracket is part of the actuator.

Wiring diagram



Technical data	AV24-3	AV230-3
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	AC 230 V 50/60 Hz
Nominal voltage range	AC 19.2…28.8 V DC 21.6…28.8 V	AC 198…264 V
For wire sizing	5 VA	5.5 VA
Power consumption	4 W	4 W
Connecting cable	1 m, 3 x 0.75 mm²	1 m, 4 x 0.75 mm²
Nominal stroke	50 mm	
Actuating force	2000 N	
Manual operation	Hexagonal key, self-resetting	
Actuating time	7.5 s/mm, 3.75 s/mm selectable	
Sound power level	Max. 35 dB (A)	
Position indication	Mechanical 8…50 mm stroke	
Protection class	**III** (safety extra-low voltage)	I (with PE conductor)
Degree of protection	IP54	
Ambient temperature range	0°…+ 50° C	
Non-operating temperature	–40°…+ 80° C	
Humidity test	To EN 60730-1	
EMC	CE according to 89/336/EEC	
LV Directive	CE according to 73/23/EEC	
Mode of operation	Type 1 to EN 60730-1	
Maintenance	Maintenance-free	
Weight	2.9 kg (without globe valve)	

Dimensions



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Linear actuators for 2-way and 3-way globe valves DN 65...150

Modulating actuator (AC/DC 24 V)
Control DC 0...10 V

Applications

Operation of globe valves.

Mode of operation

Modulating control is effected by means of a standard 0…10 V control signal.

Product features

Simple attachment to the neck of the valve by means of a clamping flange. Form-fit coupling of the valve stem to the actuator spindle. The actuator can be rotated through 360° on the neck of the valve.

Functional reliability

The actuator is short-circuit-proof and protected against polarity reversal. The stroke is adapted automatically and is also overload-proof.

Manual operation

Inserting a 5 mm hexagonal key and turning it clockwise causes the actuator spindle to extend from the actuator housing (pushing).
Together with the action of the valve, this causes the flow of water to increase. The actuator spindle retains its position until the power supply is energized (the controller takes first priority).

Position indication

The stroke of the valve is indicated mechanically on the bracket; the maximum stroke adjusts itself automatically. There is a twin-color LED status indicator under the cover of the housing.

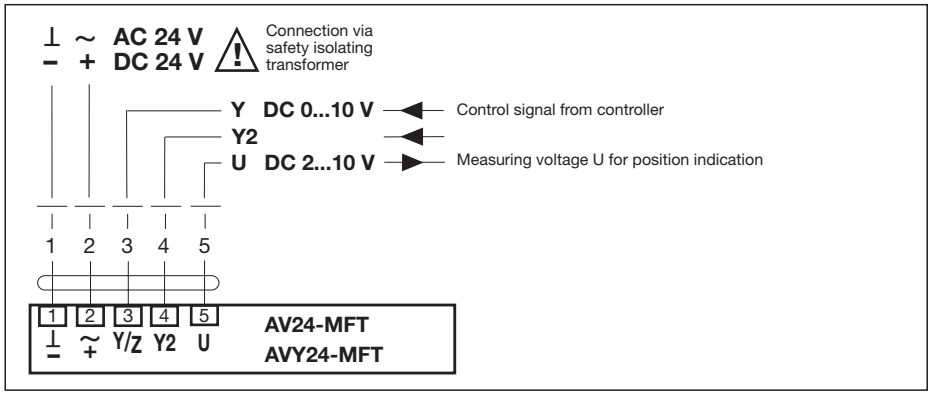
Safety note

The linear actuator contains no components which can be replaced or repaired by the user.

Note on delivery

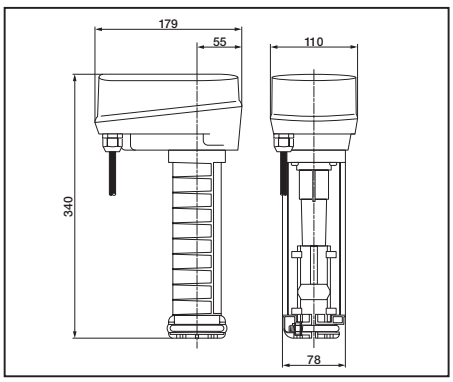
The bracket is part of the actuator.

Wiring diagrams



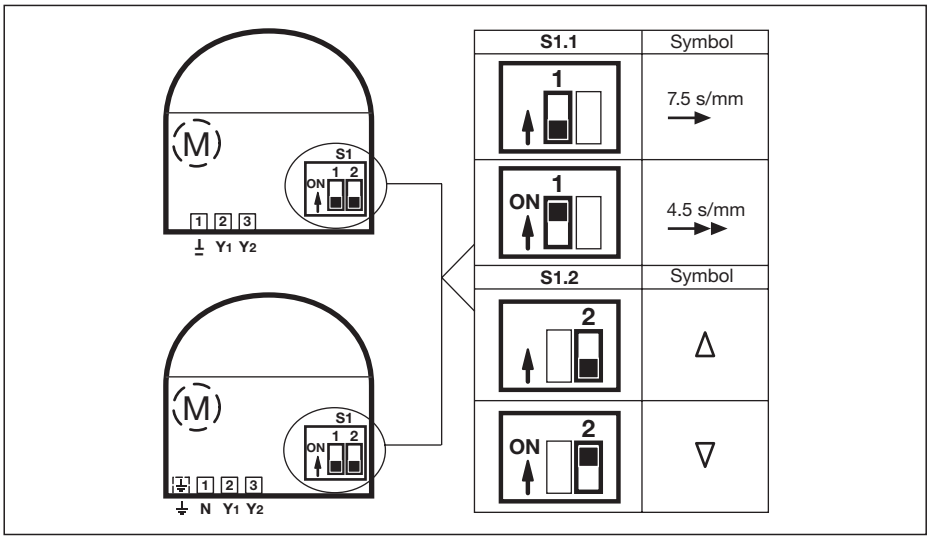
Technical data	AV24-MFT	AVY24-MFT
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
Nominal voltage range	AC 19.2…28.8 V, DC 21.6…28.8 V	
For wire sizing	10 VA	
Power consumption	6 W	
Connecting cable	1 m, 5 x 0.75 mm²	
Control	DC 0…10 V @ 100 kΩ	
Operating range	DC 2…10 V for 0…100 % stroke	DC 0.5…10 V for 0…100 % stroke
Position feedback	DC 2…10 V @ 0.5 mA	DC 0.5…10 V @ 0.5 mA
Uni-rotation	±5 %	
Nominal stroke	50 mm	
Actuating force	2000 N	
Manual operation	Hexagonal key, self-resetting	
Fast running function		•
Running time	150 s	60 s
Sound power level	Max. 35 dB (A)	Max. 45 dB (A)
Position indication	Mechanical 20…50 mm stroke	
Protection class	**III** (safety extra-low voltage)	
Degree of protection	IP54	
Ambient temperature range	0°…+ 50° C	
Non-operating temperature	–40°…+ 80° C	
Humidity test	To EN 60730-1	
EMC	CE according to 89/336/EEC	
Software class A	To EN 60730-1	
Mode of operation	Type 1 to EN 60730-1	
Maintenance	Maintenance-free	
Weight	2.9 kg (without globe valve)	

Dimensions



Arrangement of the operating controls, functional description

Arrangement of the operating controls on the NV..-3, AV..-3



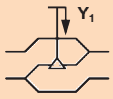
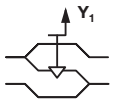
Under the cover of the actuator are the terminals for connecting the lead and the S1 control device.

The actuating time set in the factory is 7.5 s/mm. The actuating time can be approximately halved by adjusting the slide switch S1.1 to the "ON" position.

Slide switch S1.2 determines the valve closing point. In the factory setting, the closing point is up. When a Y1 signal is present, the actuator spindle extends and the valve opens (if the closing point is in the upper position).

The direction of the spindle travel can also be reversed by inverting the Y1 and Y2 wires.

Functional description

Function	Description	Switch	Symbol	Bold type in the table means standard factory setting.
Actuating time	The running time for full stroke varies as a function of the nominal stroke. (The running time for a 20 mm stroke and the standard actuating time is 150 s.)	S1.1		
Standard	**Actuating time 7.5 s/mm**	**OFF**	**7.5 s/mm**	
Fast	Actuating time 3.75 s/mm	ON	3.75 s/mm	
Valve closing point	Closing point with actuator spindle retracted or extended. The valve control path has zero flow (V = 0%).	S1.2	Symbol	Consequence
Up	**The actuator spindle is retracted into the actuator and the valve stem is extended from the fitting.**	**OFF**	Δ	
Down	The actuator spindle is extended from the actuator and the valve stem isretracted into the fitting.	ON	∇	

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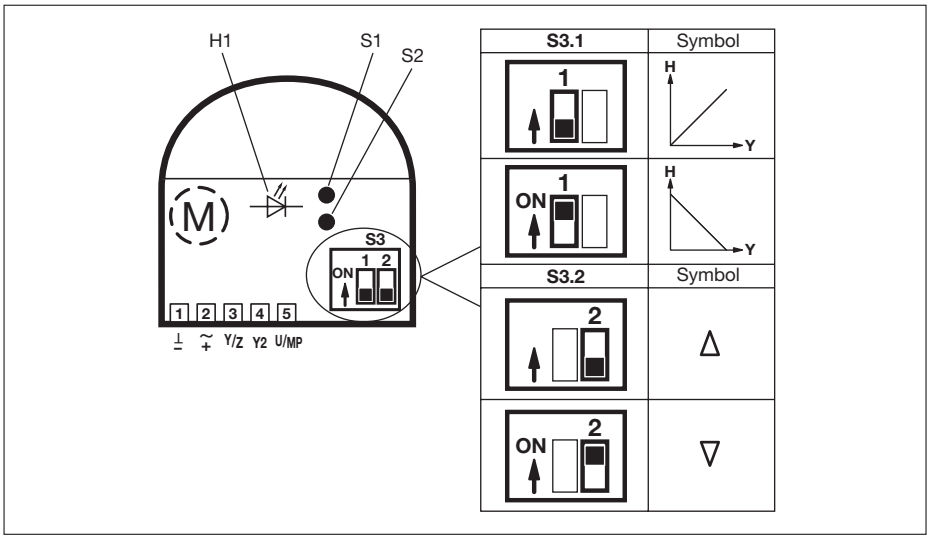
Arrangement of the operating controls on the NV../AV.. multifunctional



Under the cover of the actuator are the terminals for connecting the lead, the S1, S2 and S3 control devices and the H1 LED indicator.

By setting slide switch S3 or pressing pushbuttons S1 and S2, it is possible to configure the actuator very simply on site to suit actual requirements if changes are necessary from the factory settings.

Functional description

Function	Description	Switch	Symbol	Bold type in the table means standard factory setting (valve-specific).
Test	The valve effects full stroke with maximum running time and checks the adapted stroke to determine whether the two end-points (H = 0% and H = 100%) are reached.	Press S1		
Init (adaptation)	The possible stroke effected (between the two mechanical end stops of the valve) is detected as 100% stroke and stored in the microprocessor. The control signal and the running time are then matched to this 100% stroke.	Press S2		
Dir. of stroke	Direction of stroke relative to the control signal	S3.1	Symbol	Consequence
Direct	**0% control signal corresponds to 0% position feedback. (The actuator spindle is extended or retracted according to the selected closing point.)**	**OFF**	H Y	U_5 Y
Inverted	0% control signal corresponds to 100% position feedback. (The actuator spindle is extended or retracted according to the selected closing point.)	ON	H Y	U_5 Y
Valve closing point	Closing point with actuator spindle extended or retracted. The valve control path has zero flow.	S3.2	Symbol	Consequence
Up	**The actuator spindle is retracted into the actuator and the valve stem is extended from the fitting. The position feedback indicates 0% if the stroke direction is "direct". Default setting for H4..B-, H5..B-, H6..N- and H7..N valves.**	**OFF**	Δ	1) U_5 0% U_5 100%
Down	**The actuator spindle is extended from the actuator and the valve stem is retracted into the fitting. The position feedback indicates 0% if the stroke direction is "direct". Default setting for H6..S valves.**	**ON**	∇	1) U_5 = 100% U_5 = 0%

Only authorized and trained persons are allowed to change the settings of slide switch S3 and pushbutton S2.

1) The electrical closing point is either identical to the deenergized position of the actuator spindle or the opposite of this position, depending on the selected emergency control function type (NVF24-MFT-T or NVF24-MFT-E-T). The actuator type is selected according to the valve design and the required NO (valve open when deenergized) or NC (valve closed when deenergized) function.

LED indicator H1

Green steady light	Actuator working properly
Green flashing light	Test run or adaptation with synchronization in progress
Red steady light	Fault [1]
Red flashing light	After power interruption (> 2 s). The valve is automatically synchronized at the selected closing point the next time it closes. The LED indicator changes from a red flashing light to a green steady light.
Alternating red / green flashing light	Addressing via the control system and operation of the adaptation pushbutton S2 in progress

The actuator is maintenance-free. The twin-color LED indicator shows the actual actuator status.

It also allows simple commissioning if the factory settings need to be changed.

[1] Possible causes: Actuator installed incorrectly; valve stem blocked; no valve installed. The adaptation must be repeated by pressing pushbutton S2 after all the above causes have been checked and rectified.

Actuating/running times, wiring diagrams of NV..-3/AV..-3

Stroke-dependent actuating and running times

Valve types					DN			
H4..B H5..B					DN15-50	–	–	–
H6..N H7..N					DN15-50	DN65-80	DN65-100	DN125/150
H6..S					DN15-50	–	DN65-100	DN125/150

Actuator type		Control [1]	Emergency control function	Fast running	Running or actuating time preconfigured	Minimum adjustable running or actuating time [s] [1] 15 mm stroke	18 mm stroke	30 mm stroke	40 mm stroke
NV									
	**NV230-3**	3P			7.5 s/mm	3.75 s/mm	3.75 s/mm		
	NV24-3	3P			7.5 s/mm	3.75 s/mm	3.75 s/mm		
	NV24-MFT	0…10 V			150 s	60 s	70 s		
	NVG24-MFT	0…10 V			150 s	60 s	70 s		
	NVY24-MFT (Fast running function)	0…10 V		•	35 s	27 s	32 s		
	NVF24-MFT(-E)	0…10 V	•		150 s [2]	60 s [2]	70 s [2]		
AV									
	**AV230-3**	3P			7.5 s/mm			3.75 s/mm	3.75 s/mm
	AV24-3	3P			7.5 s/mm			3.75 s/mm	3.75 s/mm
	AV24-MFT	0…10 V			150 s			112 s	140 s
	AVY24-MFT (Fast running function)	0…10 V		•	60 s			45 s	60 s

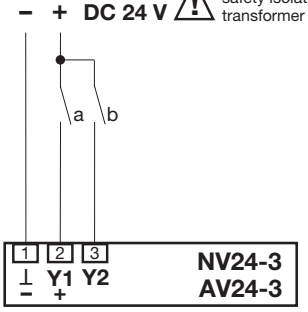
[1] MFT types: running time and other functions can be parameterized with PC-Tool or the MFT-H adjuster
[2] Emergency actuating time < 1.5 s/mm

Wiring diagrams NV..-3/AV..-3

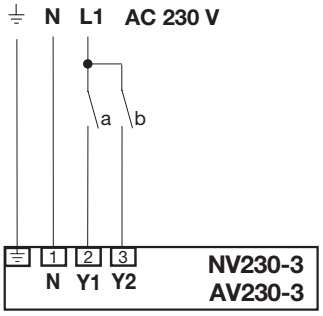
3-point

⊥ ~ **AC 24 V**
– + **DC 24 V**

Connection via safety isolating transformer



⏚ **N L1 AC 230 V**



Symbols: Actuating time	Valve closing point	"Standard" act. time	"Fast" act. time	Closing point "up"	Closing point "down"	Relay contact a (Y1)	Relay contact b (Y2)	Actuator spindle moves: ccw NV	Actuator spindle moves: cw NV
		S1.1		S1.2		0	0	stops	stops
7.5 s/mm →	Δ	OFF		OFF		1	0		EXTENDING
						0	1	RETRACTING	
	∇	OFF			ON	1	0	RETRACTING	
						0	1		EXTENDING
3.75 s/mm [1] →	Δ		ON	OFF		1	0	RETRACTING	
						0	1		EXTENDING
	∇		ON		ON	1	0		EXTENDING
						0	1	RETRACTING	

The actuating time of the classic 3-point actuator (NV..-3(-T) or AV..-3-R) can be reduced from 7.5 s/mm to 3.75 s/mm by adjusting slide switch 1.1 to the "ON" position. The closing point is down with fewer than 20% of the valves that are used and slide switch S1.2 can be set to the "ON" position.

[1] Only possible with NV actuators.

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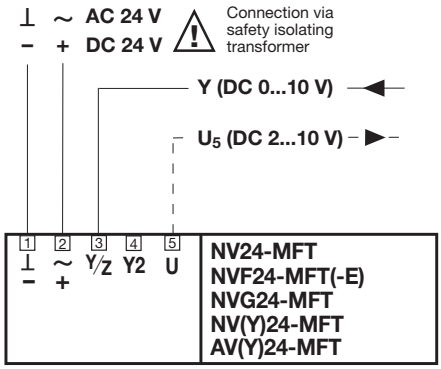
Wiring diagrams of NV../AV.. multifunctional

Modulating (optional with feedback)

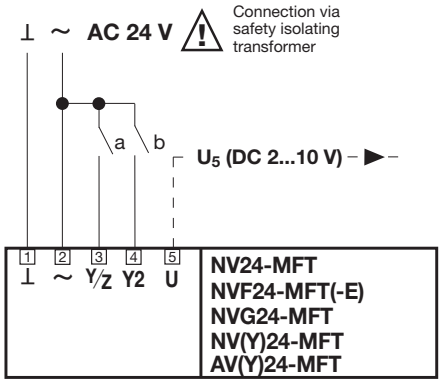


Symbols: Direction of stroke	Symbols: Valve closing point	"Direct" signal	"Inverted" signal	Closing point "up"	Closing point "down"	Control signal min. (e.g. Y = 2 V)	Control signal max. (e.g. Y = 10 V)	Meas. signal min. (e.g. U = 2 V)	Meas. signal max. (e.g. U = 10 V)	Actuator spindle moves	
		S3.1		S3.2							
H, Y	Δ	OFF		OFF		x		x		RETRACTING	
							x		x		EXTENDING
	∇	OFF			ON	x		x			EXTENDING
							x		x		RETRACTING
H, Y	Δ		ON[1]	OFF		x			x		EXTENDING
							x	x		RETRACTING	
	∇		ON[1]		ON		x			x	RETRACTING
							x	x			EXTENDING

1) If the controller generates a negative signal (< 0.15 V), slide switch S3.1 must not be set to "ON" if the operating range of the actuator is set to 2…10 V (exception: start point in the parameterized operating range = 0.5 V).

The control signal can be inverted by adjusting slide switch S3.1 to the "ON" position, and the valve closes as the control signal increases. This is a simple way of matching the sequences in the actuator. The closing point is down with fewer than 20% of the valves that are used and slide switch S3.2 must be set to the "ON" position. The position feedback U5 is likewise matched to the closing point.

MFT actuator parameterized with 3-point control (optional with feedback)

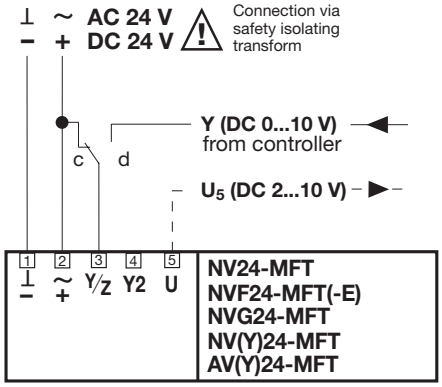


Symbols: "3-point" stroke direction	Symbols: Valve closing point	"Direct" signal	"Inverted" signal	Closing point "up"	Closing point "down"	Relay contact a (Y1)	Relay contact b (Y2)	Meas. signal min. (e.g. U = 2 V)	Meas. signal max. (e.g. U = 10 V)	Actuator spindle moves	
		S3.1		S3.2		0	0	*)	*)	stops	stops
H+, Y2, Y1, H-	Δ	OFF		OFF		1	0		m		EXTENDING
						0	1	m		RETRACTING	
	∇	OFF			ON	1		0	m	RETRACTING	
						0	1	m			EXTENDING
H+, Y2, Y1, H-	Δ		ON	OFF		1	0	m		RETRACTING	
						0	1		m		EXTENDING
	∇		ON		ON	1	0	m			EXTENDING
						0	1		m	RETRACTING	

*) Measuring signal U_5 according to position
m: If relay contact a or b is in switch position 1 for longer than the running time (150 s)

The NV..-MFT.. linear actuator with MFT can also be used for 3-point control. The actuator must, however, be parameterized for 3-point control and provided with a 4-wire connection. **Note:** Only works with a nominal voltage of **AC 24 V**!

Override control 100% (optional with feedback)

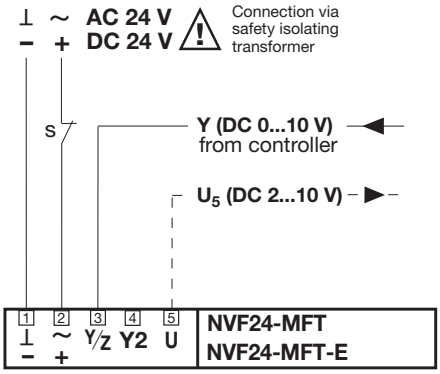


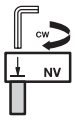
Symbols: "Override" stroke direction	Symbols: Valve closing point	"Direct" signal	"Inverted" signal	Closing point "up"	Closing point "down"	Relay contact c	Relay contact d	Meas. signal min. (e.g. U = 2 V)	Meas. signal max. (e.g. U = 10 V)	Actuator spindle moves	
		S3.1		S3.2							
H, Y	Δ	OFF		OFF		1	0		x		EXTRACTING
			ON			1		0	x	RETRACTING	
	∇	OFF			ON	1	0		x	RETRACTING	
			ON			1	0	x			EXTRACTING

A typical use for "100%" override control is in a frost protection circuit. Whether or not the frost thermostat has to interrupt the signal conductor to the controller "d" depends on the make of controller being used (not necessary if the signal output at the controller is short-circuit-proof and protected against polarity reversal).

Wiring diagram of NVF24-MFT, NVF24-MFT-E

Emergency control function (optional with feedback U_5)

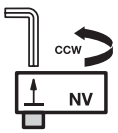
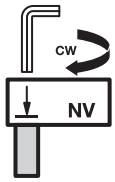
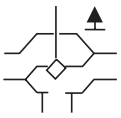
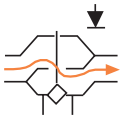


Symbols									Actuator spindle moves	
"Override" stroke direction	Valve closing point	"Direct" signal	"Inverted" signal	Closing point "up"	Closing point "down"	Relay contact s	Meas. signal min. (e.g. U = 2 V)	Meas. signal max. (e.g. U = 10 V)		
		S3.1		S3.2					NVF24-MFT(2)-T	NVF24-MFT(2)-E-T
	1)	1)		1)		0	k	k	RETRACTING	
	1)	1)		1)		0	k	k		EXTENDING

1) The position of the slide switch has no influence on the emergency control direction
k) No measuring voltages can be determined in the deenergized state

The actuator spindle moves to the end stop if the power supply is interrupted. In the case of the NVF24-MFT(2)-T type, the actuator spindle retracts into the actuator housing (pulling). In the case of the NVF24-MFT(2)-T type, the actuator spindle extends from the actuator housing (pushing). The valve has either an NO (open when deenergized) or NC (closed when deenergized) function depending on its design (closing point up or down).

Influence of the actuator spindle on different valves (closing point selection)

Valve	Valve closing point	Closing point setting of linear actuator	Actuator spindle retracts 	Actuator spindle extends 
	Up	Δ	 Valve control path closing (0% flow)	 Valve control path opening (100% flow)
	Down	∇	 Valve control path opening (100% flow)	 Valve control path closing (0% flow)
	Up	Δ	 Valve control path closing (0% flow), bypass 100% open	 Valve control path opening (100% flow), bypass 0% closed

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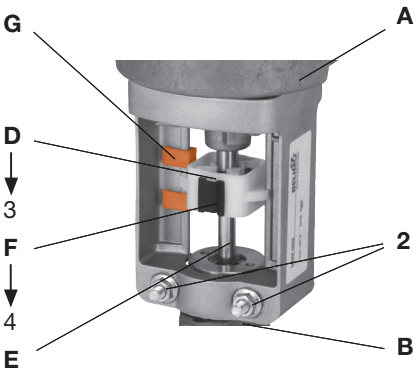
Mounting: NV.. linear actuator on H.. globe valve



The neck of the valve (B) must be cleaned before the linear actuator (A) is fitted onto it.

Care must be taken to ensure that the bracket, which is an integral part of the linear actuator, is pushed down until it is in firm contact with the neck of the valve. The bracket must then be secured firmly to the neck of the valve by tightening the two fixing nuts (2) (with a torque of at least 10 Nm) with a 10 mm open-jaw or ring spanner. Next, use the manual operating mechanism to move the position indicator (D) to the position (3) of the valve stem (E) and latch it there.

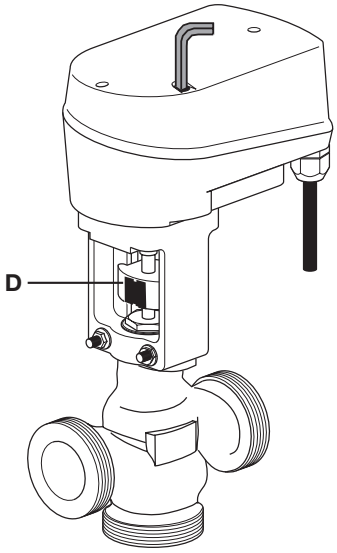
The black locking device (F) is then pushed down so that it is flush with the position indicator (4). The stem coupling is now secured and cannot unlatch accidentally.

The followers (G) are automatically moved to the maximum traveled stroke by the position indicator.

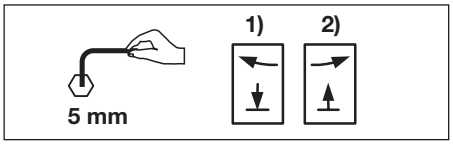
When dismantling, first release the fixing nuts of the bracket. Then move the stem coupling to the middle of the stroke with the manual operating mechanism. Next, push the locking device (black sliding part) up. The actuator can now be detached from the spindle by pressing in the meanwhile released pushbuttons on the stem coupling.

Manual operation of the NV.. linear actuator

When a linear actuator is supplied separately but together with a valve, the actuator spindle is extended to approximately the 3/4 position. The spindle can be operated with a hexagonal key (the 5 mm or 3/16" hexagonal key is not included with the actuator).
The manual operating mechanism is overload-proof. The actuator spindle remains in the manual setting either until its power supply is energized or until it moves to whichever end stroke position has been selected the next time the power supply is interrupted.

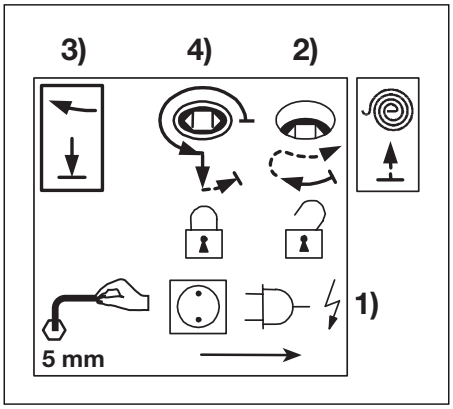


Manual operation of:
- NV24-3
- NV230-3
- NV24-MFT
- NVY24-MFT
- NVG24-MFT



Turning the hexagonal key clockwise 1) causes the actuator spindle to extend; turning it counterclockwise 2) causes it to retract.

Manual operation of NVF24-MFT



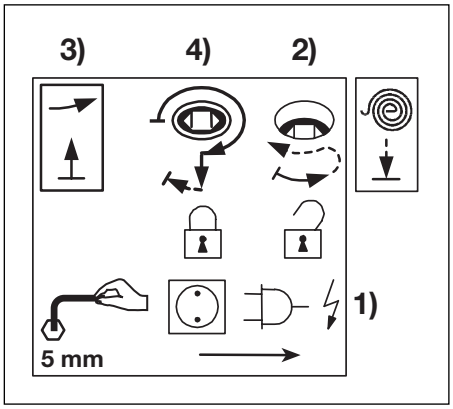
1) Isolate the actuator from the power supply!

2) Disengaging manual operation of the NVF24-MFT.
Turn the hexagonal key clockwise approximately 45° until resistance is encountered. Then lift the key (approx. 7 mm) until the black socket provided for it is level with the top of the housing cover. The spring mechanism now rotates the key counterclockwise and the actuator spindle retracts.

3) Manual operation of the NVF24-MFT.
Turning the hexagonal key clockwise causes the actuator spindle to extend; it must be held in the required stroke position.

4) Locking manual operation of the NVF24-MFT.
Turn the hexagonal key back 3/4 of a turn counterclockwise and then press it down into the cover of the housing (the black socket moves inwards approximately 7 mm). Slight counterclockwise rotation of the key then locks the manual operating mechanism in position.

Manual operation of NVF24-MFT-E



1) Isolate the actuator from the power supply!

2) Disengaging manual operation of the NVF24-MFT-E.
Turn the hexagonal key counterclockwise approximately 45° until resistance is encountered. Then lift the key (approx. 7 mm) until the black socket provided for it is level with the top of the housing cover. The spring mechanism now rotates the key clockwise. The actuator spindle extends fully, the position indicator (D) moves down and the valve can be coupled.

3) Manual operation of the NVF24-MFT-E. Turning the hexagonal key counterclockwise causes the actuator spindle to retract; it must be held in the required stroke position.

4) Locking manual operation of the NVF24-MFT-E.
Turn the hexagonal key back 3/4 of a turn clockwise and then press it down into the cover of the housing (the black socket moves inwards approximately 7 mm). Slight clockwise rotation of the key then locks the manual operating mechanism in position.

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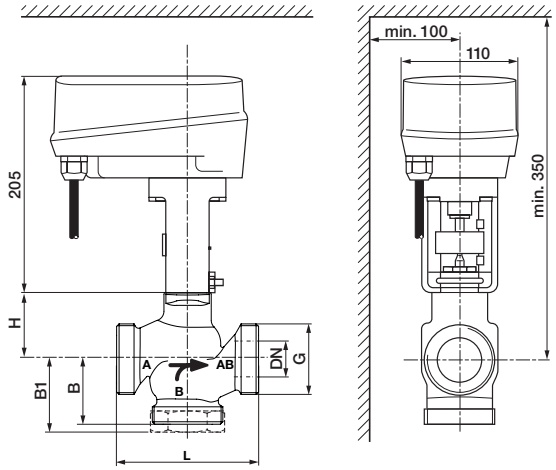
Assembled unit, NV.. with H4..B / H5..B, DN 15 to 50

Globe valve with external thread

DN	External thread	Dimensions [mm]		2-way			3-way		
				B1	Weight		B	Weight	
[mm]	G	L	H	[mm]	[kg]*	[kg]**	[mm]	[kg]*	[kg]**
15	G1 1/8"	80	46	65	2.7	3	55	2.6	2.9
20	G1 1/4"	90	46	65	2.8	3.1	55	2.7	3
25	G1 1/2"	110	52	66	3.1	3.4	55	2.9	3.2
32	G2"	120	56	67	3.7	4	55	3.5	3.8
40	G2 1/4"	130	65	72	4.3	4.6	60	4	4.3
50	G2 3/4"	150	65	75	5.4	5.7	65	5	5.3

* Weight includes NV.. linear actuator
** Weight includes NVF.. linear actuator

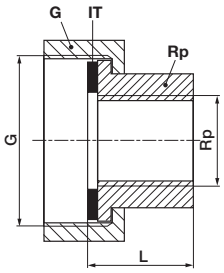


Accessories

Pipe connector for H4..B and H5..B valves with external thread

Type	ZR4515	ZR4520	ZR4525	ZR4532	ZR4540	ZR4550
DN [mm]	15	20	25	32	40	50
G	1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 3/4"
Rp	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Weight [kg]	0.14	0.18	0.22	0.32	0.46	0.66
L approx. [mm]	23	25	28	32	34	37

Included in scope of delivery of ZR45..: Union nut* (G thread), female part* (Rp thread), flat gasket (IT)
* Material: Malleable cast iron, galvanized

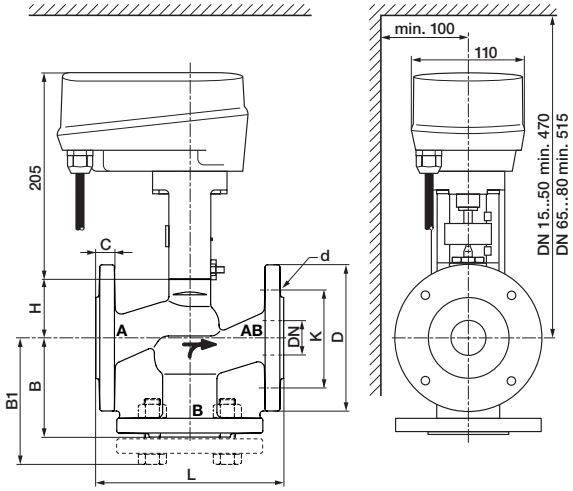


Assembled unit, NV.. with H6..N / H7..N, DN 15 to 80

Globe valve with flanged ends

DN	Dimensions [mm]						2-way			3-way		
							B1	Weight		B	Weight	
[mm]	L	H	D	K	d	C	[mm]	[kg]*	[kg]**	[mm]	[kg]*	[kg]**
15	130	46	95	65	4x14	14	81	6.3	6.6	65	4.3	4.6
20	150	46	105	75	4x14	16	88	6.5	6.8	70	5.2	5.5
25	160	52	115	85	4x14	16	93	7.8	8.1	75	6.2	6.5
32	180	56	140	100	4x18	18	113	11.1	11.4	95	8.7	9
40	200	64	150	110	4x18	18	118	13.4	13.7	100	10.7	11
50	230	64	165	125	4x18	20	120	17.4	17.7	100	13.7	14
65[1)]	290	100	185	145	4x18	20	140	25.3	25.6	120	20.5	20.8
80[2)]	310	110	200	160	8x18	22	152	31.7	32	130	25.5	25.8

* Weight includes NV.. linear actuator
** Weight includes NVF.. linear actuator
[1)] Type H664N/H764N
[2)] Type H679N/H779N

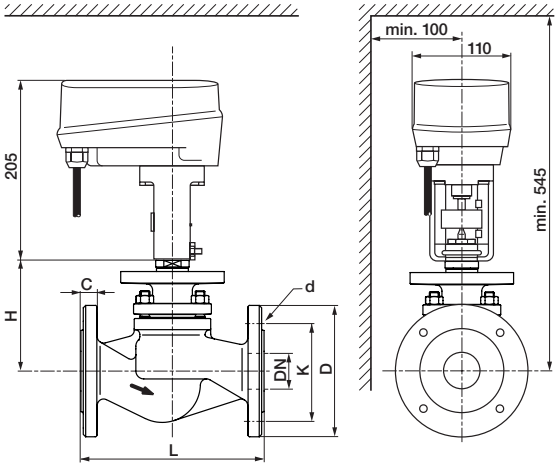


Assembled unit, NV.. with H6..S, DN 15 to 65

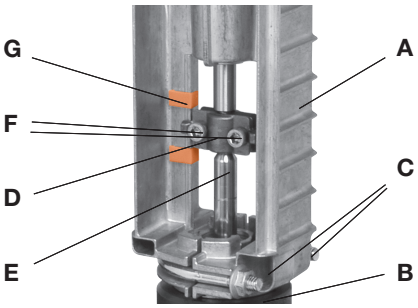
Globe valve with flanged ends

DN	Dimensions [mm]						Weight	
[mm]	L	H	D	K	d	C	[kg]*	[kg]**
15	130	118	95	65	4x14	14	5.1	5.4
20	150	118	105	75	4x14	16	5.8	6.1
25	160	126	115	85	4x14	16	6.7	7
32	180	126	140	100	4x18	18	8.3	9.8
40	200	133	150	110	4x18	18	10.2	10.5
50	230	139	165	125	4x18	20	13.1	13.4
65[3)]	290	100	185	145	4x18	20	18.2	18.5

* Weight includes NV.. linear actuator
** Weight includes NVF.. linear actuator
[3)] Type H664S

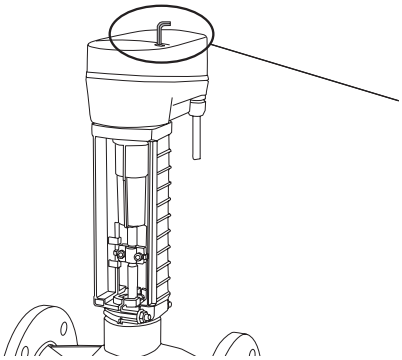


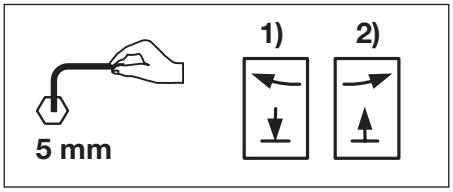
Mounting: AV.. linear actuator on H.. globe valve



The neck of the valve (B) must be cleaned before the linear actuator (A) is fitted onto it.
Care must be taken to ensure that the bracket, which is an integral part of the linear actuator, is pushed down until it is in firm contact with the neck of the valve. The bracket must then be secured firmly to the neck of the valve by tightening the two fixing nuts (C) (with a torque of at least 20 Nm) with a 13 mm open-jaw or ring spanner. Next, use the manual operating mechanism to move the stem coupling (D) to the position of the valve stem (E) and latch it there.
The two hexagon screws (F) can now be tightened by hand with the 5 mm hexagonal key. The followers (G) are automatically moved to the maximum traveled stroke by the position indicator.
When dismantling, release the stem coupling first.

Manual operation of the AV.. linear actuator





Turning the hexagonal key clockwise 1) causes the actuator spindle to extend; turning it counterclockwise 2) causes it to retract.

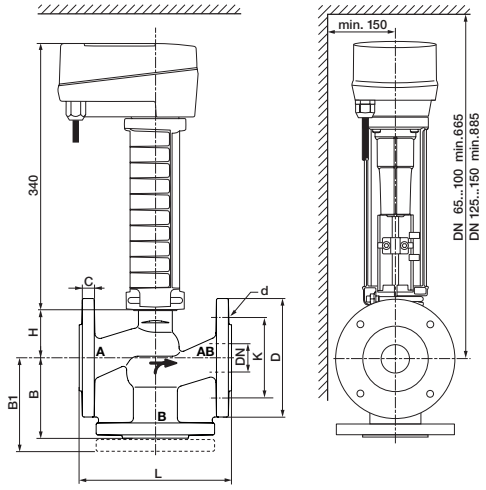
When a linear actuator is supplied separately but together with a valve, the actuator spindle is extended to approximately the 3/4 position. The spindle can be operated with a hexagonal key (the 5 mm or 3/16" hexagonal key is not included with the actuator).
The manual operating mechanism is overload-proof. The actuator spindle remains in the manual setting either until its power supply is energized or until it moves to whichever end stroke position has been selected the next time the power supply is interrupted.

Dimensions: Assembled unit, AV.. with H6..N / H7..N, DN 65 to 150

Globe valve with flanged ends

DN	Dimensions [mm]						2-way		3-way	
							B1	Weight	B	Weight
[mm]	L	H	D	K	d	C	[mm]	[kg]*	[mm]	[kg]*
65	290	100	185	145	4x18	20	140	26.8	120	22
80	310	110	200	160	8x18	22	152	33.2	130	27
100	350	125	220	180	8x18	24	172	44.3	150	37
125	400	281	250	210	8x18	26	–	–	200	70.4
150	480	343	285	240	8x22	26	–	–	210	96.8

* Weight includes AV.. linear actuator

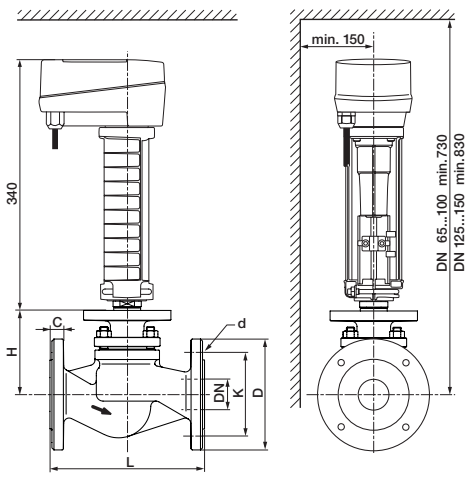


Dimensions: Assembled unit, AV.. with H6..S, DN 65 to 150

Globe valve with flanged ends

DN	Dimensions [mm]						Weight
[mm]	L	H	D	K	d	C	[kg]*
65	290	155	185	145	4x18	20	19.7
80	310	170	200	160	8x18	22	25.4
100	350	190	220	180	8x18	24	35.5
125	400	228	250	210	8x18	26	47
150	480	288	285	240	8x22	26	64

* Weight includes AV.. linear actuator



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Installation, mounting position and commissioning

Separate delivery

If the globe valve is delivered separately from the linear actuator, they can be assembled directly on site.

Permissible insulation limit

The permissible insulation limit on the bracket must not exceed:

– X < 30 mm for NV
– X < 70 mm for AV.

Recommended mounting position

The globe valves may be mounted either vertically (Fig. 1) or horizontally (Fig. 2). However, mounting the valves with the stem pointing downwards, i.e. upside down, is not recommended (Fig. 3).

No special tools are needed for the installation. Full instructions are supplied with the valves and actuators.

Commissioning

Commissioning must not be carried out until the globe valve and linear actuator have been assembled in accordance with the instructions. If NV...-MFT actuator types are enclosed separately (e.g. H415B+NV24-MFT), make sure that the actuator is correctly mounted on the valve before the power supply is energized for the first time. Adaptation is only effected once automatically the first time the power supply is energized. If a valve is not mounted, the actuator reports a fault (the red LED is lit steadily).

Fig. 1

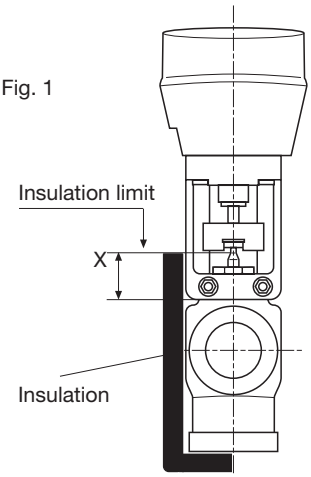


Fig. 2

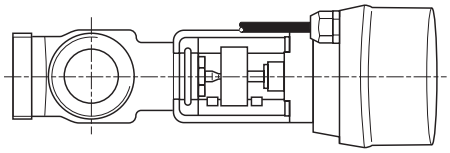
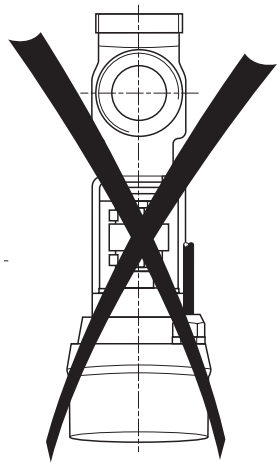
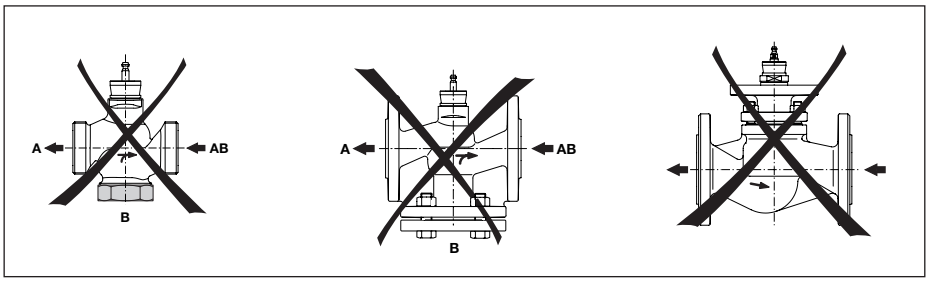


Fig. 3

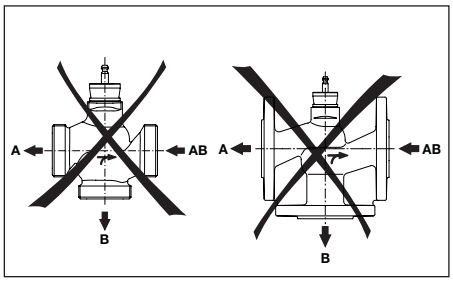


Direction of flow

The prescribed directions of flow for specific applications must be adhered to.



This direction of flow not allowed, 2-way



This direction of flow not allowed, 3-way

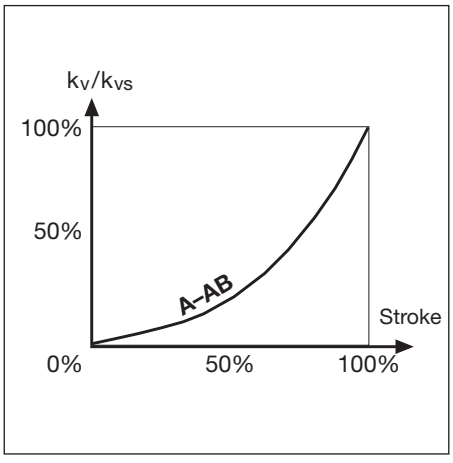
Flow characteristics of globe valves

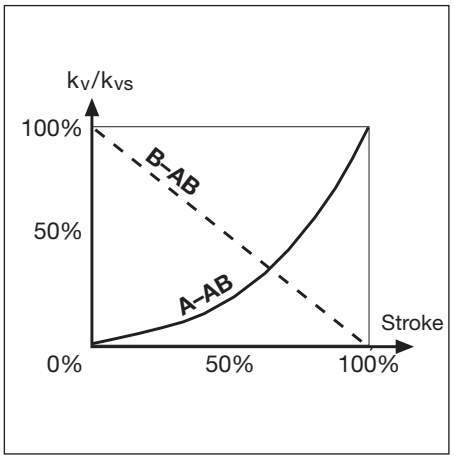
2-way

The flow characteristic is equal percentage, with a characteristic factor of n(ep) = 3. This ensures stable control behavior in the elevated part-load range. In the lower part of the opening range between 0 and 30% stroke the characteristic is linear. This ensures excellent control characteristics in the lower part of the load range as well (Fig. 1).

3-way

The characteristic of control path A–AB is the same as that for 2-way globe valves. The bypass B–AB has the same kvs value as the control path. The bypass has a linear characteristic (Fig. 2).





Notes on project design and maintenance

Maintenance

- The globe valves and linear actuators are maintenance-free.
- Before any kind of service work is carried out on control devices of this type, it is essential to isolate the linear actuator from the power supply (by unplugging the power lead). Any pumps in the particular part of the piping system concerned must also be switched off and the appropriate isolating fittings closed (also allow everything to cool down first if necessary and reduce the pressure in the system to atmospheric).
- The system must not be returned to service until the globe valve and the linear actuator have been properly reinstalled and connected, and the pipework has been refilled in the proper manner.

Disposal

When a control device (globe valve and linear actuator) has come to the end of its service life, the two parts must be dismantled and segregated into different materials before being disposed of.

Project design

Installing H4..B, H6..N and H6..S globe valves, 2-way

The valves are throttling devices and must therefore be installed in the return line of the system in order to ensure minimum thermal stress on the seals in the fitting. The specified direction of flow must be adhered to.

Installing H5..B and H7..N globe valves, 3-way

The valves are mixing devices. The prescribed directions of flow for specific applications must be adhered to. Whether they are installed in the supply or the return of a system depends on the type of hydraulic circuit that is employed. In the case of a diverter circuit, a balancing valve can be installed in the bypass line.

Water quality requirements

The water quality requirements specified in VDI 2035 must be adhered to.

Strainers

Globe valves are relatively sensitive control devices. In order to ensure a long service life, it is advisable to fit strainers.

Sufficient isolating valves

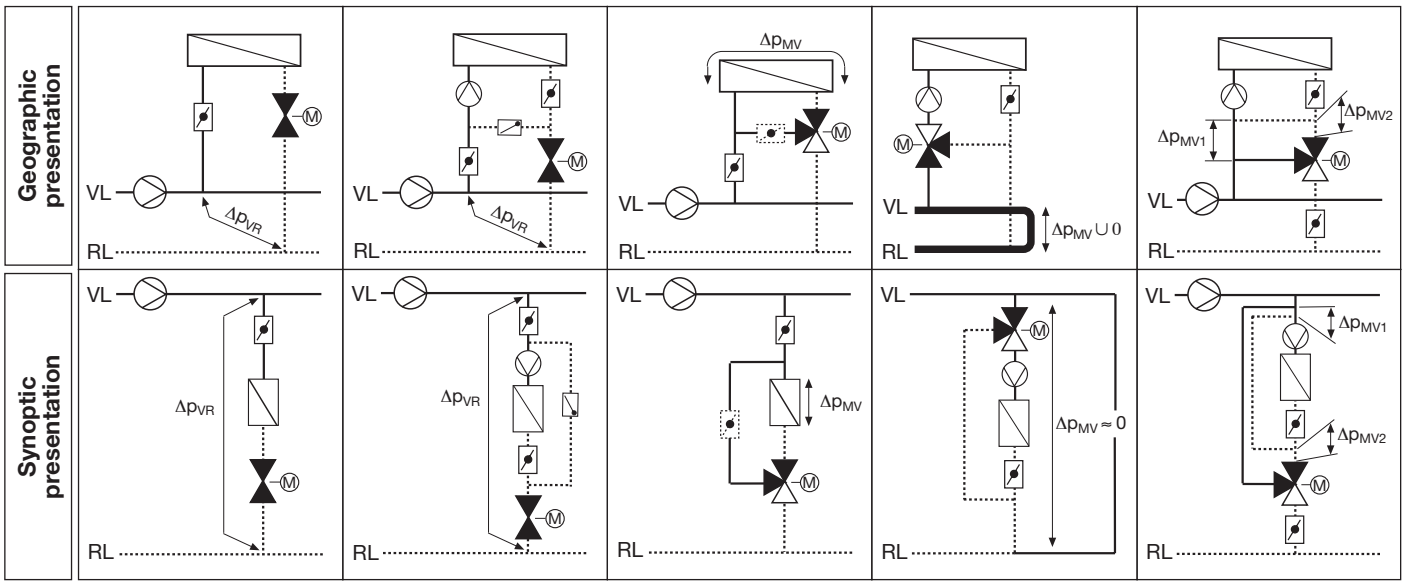
It is essential to ensure that sufficient isolating valves are provided.

Correct valve selection and sizing

In order to ensure that the control device (globe valve and linear actuator) achieves a long service life, it is essential for the valve to be rated for the correct differential pressure Δp_{v100}, i.e. with adequate valve authority (Pv > 0.5). The differential pressure pHv depends on the type of hydraulic circuit in which the valve is used.

Differential pressures Δp_{v100} with globe valves fully open

Circuit type	H4..B/H6..N/H6..S globe valve, 2-way		H5..B/H7..N globe valve, 3-way		
	Throttling circuit	**Injection circuit with throttling device**	**Diverter circuit**	**Mixing circuit**	**Injection circuit with 3-way valve**
	$\Delta p_{v100} > \Delta p_{VR}/2$	$\Delta p_{v100} > \Delta p_{VR}/2$	$\Delta p_{v100} > \Delta p_{MV}$	$\Delta p_{v100} > \Delta p_{MV}$	$\Delta p_{v100} > \Delta p_{MV1} + \Delta p_{MV2} \approx 0$ bar
	Typical values 15 kPa $< \Delta p_{v100} <$ 200 kPa	Typical values 10 kPa $< \Delta p_{v100} <$ 150 kPa	Typical values 5 kPa $< \Delta p_{v100} >$ 50 kPa	Typical values Δp_{v100} >3 kPa (unpressurized manifold) For other mixing circuits 3 kPa $< \Delta p_{v100} >$ 30 kPa	Typical values Δp_{v100} >3 kPa



Legend

Globe valve, 2-way with linear actuator	Globe valve, 3-way with linear actuator	Pump	Non-return valve	Balancing valve	VL — Supply RL … Return

Δp_{VR}	Differential pressure across specified section at rated load	Δp_{MV}	Differential pressure across variable-flow section at rated load (e.g. heat exchanger)

Note: Stainers and isolating valves are not shown

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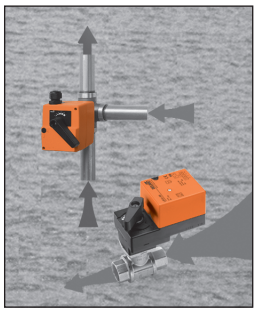
Air applications

Standard actuators and spring-return actuators for air control dampers in HVAC systems

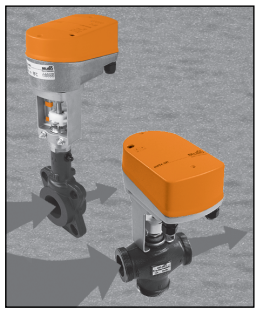
Safety actuators for motorizing fire and smoke extraction dampers

VAV systems for individual room air control

Water applications



Mixing actuators and motorized ball valves for HVAC water circuits



Globe valves and intelligent linear actuators – also for leading makes of valve

Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators

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