

VSxC-2/-3/-4 SMALL LINEAR VALVES PN16 FOR MODULATING AND ON/OFF-CONTROL

PRODUCT DATA



VSxC-2

VSxC-3

VSxC-4

GENERAL

These small linear valves are used in combination with small electric linear valve actuators and thermoelectric actuators for the control of hot and/or chilled water for fan coil units and small reheaters/recoolers in electric/electronic temperature control systems.

FEATURES

- Small size allows installation where space is limited
- Long stroke results in a high quality characteristic
- Soft seat provides low leakage rate and high rangeability
- High close-off pressure
- Wide standardized range of k_{VS} values
- Reduced k_{VS} values in the bypass to facilitate hydronic balancing
- Range of fittings available for different connections (compression, soldered, threaded)
- Compatible with two-piece Conex compression fittings
- Dezincification-resistant yellow brass
- Models with integrated snap-on linkage for MT-series thermal actuators

SPECIFICATIONS

Models	Two-way VSxC-2 Three-way VSxC-3 Three-way with bypass VSxC-4
Operation	All models stem up to close, port A to B / AB
Nominal pressure rating	PN16
Capacity index (k_{VS})	see tables on page 2 and 3
Close-off pressures	see tables on page 2 and 3
Leakage rate	$\leq 0.02\%$ of k_{VS}
Port connection	conical sealing connections in standard sizes

Valve body

Material	Brass
Size	DN15 (1/2"), DN20 (3/4"), DN25 (1-1/4")

Trim

Stem	Stainless steel
Plug	Brass
Suitable medium	Water, with max. 50% glycol
Controlled water temp.	2...120 °C

Modulating valves

VSMC-xxx	
Stroke	6.5 mm
Dimensions	see Fig. 5, Fig. 6, and Fig. 7 on page 6 and Fig. 8, Fig. 9, and Fig. 10 on page 7
Characteristic	2-way: modified equal % 3-way: A-AB modified equal %; B-AB linear

ON/OFF valves

VSOC-xxx	
Stroke	2.5 mm
Dimensions	see Fig. 5, Fig. 6, and Fig. 7 on page 6 and Fig. 8, Fig. 9, and Fig. 10 on page 7

FLOW CAPACITIES AND CLOSE-OFF PRESSURE RATINGS

VSxC-2 Two-Way Valves with Conical Sealing

DN	Kvs A-B	type	snap-on feature*	stroke	order no.	close-off pressure		
						M6410C,L; M7410C,E (180 N)	MT8; M5410C1, L1 (90 N)	MT4; M7410A (90 N)
15	0.16	MOD	--	6.5	VSMC-215-0.16	600 kPa	600 kPa	--
15	0.25	MOD	--	6.5	VSMC-215-0.25	600 kPa	600 kPa	--
15	0.40	MOD	--	6.5	VSMC-215-0.4	600 kPa	600 kPa	--
15	0.63	MOD	--	6.5	VSMC-215-0.63	600 kPa	600 kPa	--
15	1.0	MOD	--	6.5	VSMC-215-1.0	600 kPa	600 kPa	--
15	1.6	MOD	--	6.5	VSMC-215-1.6	300 kPa	300 kPa	--
15	2.5	MOD	--	6.5	VSMC-215-2.5	100 kPa	100 kPa	--
20	2.5	MOD	--	6.5	VSMC-220-2.5	150 kPa	150 kPa	--
20	2.5	MOD	--	6.5	VSMC-220-2.5E	250 kPa	--	--
20	4.0	MOD	--	6.5	VSMC-220-4.0	50 kPa	50 kPa	--
20	4.0	MOD	--	6.5	VSMC-220-4.0E	250 kPa	--	--
25	6.3	MOD	--	6.5	VSMC-225-6.3P	250 kPa	250 kPa	--
25	8.0	MOD	--	6.5	VSMC-225-8.0P	250 kPa	250 kPa	--
15	1.0	ON-OFF	--	2.5	VSOC-215-1.0	600 kPa	600 kPa	600 kPa
15	1.0	ON-OFF	✓	2.5	VSOC-215-1.0S	600 kPa	600 kPa	600 kPa
15	1.6	ON-OFF	--	2.5	VSOC-215-1.6	300 kPa	300 kPa	300 kPa
15	1.6	ON-OFF	✓	2.5	VSOC-215-1.6S	300 kPa	300 kPa	300 kPa
15	2.5	ON-OFF	--	2.5	VSOC-215-2.5	150 kPa	150 kPa	150 kPa
15	2.5	ON-OFF	✓	2.5	VSOC-215-2.5S	150 kPa	150 kPa	150 kPa
20	2.5	ON-OFF	--	2.5	VSOC-220-2.5	200 kPa	200 kPa	200 kPa
20	2.5	ON-OFF	✓	2.5	VSOC-220-2.5S	200 kPa	200 kPa	200 kPa
20	4.0	ON-OFF	--	2.5	VSOC-220-4.0	100 kPa	100 kPa	100 kPa
20	4.0	ON-OFF	✓	2.5	VSOC-220-4.0S	100 kPa	100 kPa	100 kPa
25	4.0	ON-OFF	--	2.5	VSOC-225-4.0P	200 kPa	200 kPa	200 kPa
25	5.5	ON-OFF	--	2.5	VSOC-225-5.5P	200 kPa	200 kPa	200 kPa

*integrated snap-on linkage for MT series actuators

VSxC-3 Three-Way Valves with Conical Sealing

DN	Kvs		type	snap-on feature*	order no.	appli- cation	stroke	close-off pressure		
	A-AB	B-AB						M6410C,L; M7410C,E (180 N)	MT8; M5410C1, L1 (90 N)	MT4; M7410A (90 N)
15	0.25	0.16	MOD	--	VSMC-315-0.25	MIX	6.5	600 kPa	600 kPa	--
15	0.40	0.25	MOD	--	VSMC-315-0.4	MIX	6.5	600 kPa	600 kPa	--
15	0.63	0.4	MOD	--	VSMC-315-0.63	MIX	6.5	600 kPa	600 kPa	--
15	1.0	0.63	MOD	--	VSMC-315-1.0	MIX	6.5	600 kPa	600 kPa	--
15	1.6	1.0	MOD	--	VSMC-315-1.6	MIX	6.5	300 kPa	300 kPa	--
15	2.5	1.6	MOD	--	VSMC-315-2.5	MIX	6.5	100 kPa	100 kPa	--
20	2.5	1.6	MOD	--	VSMC-320-2.5	MIX	6.5	150 kPa	150 kPa	--
20	2.5	1.6	MOD	--	VSMC-320-2.5E	MIX	6.5	250 kPa	--	--
20	4.0	2.5	MOD	--	VSMC-320-4.0	MIX	6.5	50 kPa	50 kPa	--
20	4.0	2.5	MOD	--	VSMC-320-4.0E†	MIX	6.5	250 kPa	--	--
25	6.3	4.0	MOD	--	VSMC-325-6.3P	MIX	6.5	250 kPa	250 kPa	--
25	8.0	5.5	MOD	--	VSMC-325-8.0P	MIX	2.5	250 kPa	250 kPa	--
15	1.0	0.63	ON-OFF	--	VSOC-315-1.0	MIX/DIV	2.5	600 / 200 kPa	600 / 200 kPa	600 / 200 kPa
15	1.0	0.63	ON-OFF	✓	VSOC-315-1.0S	MIX/DIV	2.5	600 / 200 kPa	600 / 200 kPa	600 / 200 kPa
15	1.6	1.0	ON-OFF	--	VSOC-315-1.6	MIX/DIV	2.5	300 / 200 kPa	300 / 200 kPa	300 / 200 kPa
15	1.6	1.0	ON-OFF	✓	VSOC-315-1.6S	MIX/DIV	2.5	300 / 200 kPa	300 / 200 kPa	300 / 200 kPa
15	2.5	1.6	ON-OFF	--	VSOC-315-2.5	MIX	2.5	150 kPa	150 kPa	150 kPa
15	2.5	1.6	ON-OFF	✓	VSOC-315-2.5S	MIX	2.5	150 kPa	150 kPa	150 kPa
20	2.5	1.6	ON-OFF	--	VSOC-320-2.5	MIX	2.5	200 kPa	200 kPa	200 kPa
20	2.5	1.6	ON-OFF	✓	VSOC-320-2.5S	MIX	2.5	200 kPa	200 kPa	200 kPa
20	4.0	2.5	ON-OFF	--	VSOC-320-4.0	MIX	2.5	100 kPa	100 kPa	100 kPa
20	4.0	2.5	ON-OFF	✓	VSOC-320-4.0S	MIX	2.5	100 kPa	100 kPa	100 kPa
25	4.0	2.5	ON-OFF	--	VSOC-325-4.0P	MIX	6.5	200 kPa	200 kPa	200 kPa
25	5.5	4.0	ON-OFF	--	VSOC-325-5.5P	MIX	6.5	200 kPa	200 kPa	200 kPa

*integrated snap-on linkage for MT-series actuators

†leakage rate B-AB port ≤ 0.5%

VSxC-4 Four-Way Valves with Conical Sealing

DN	Kvs		type	snap-on feature*	order no.	appli- cation	stroke	close-off pressure		
	A-AB	B-AB						M6410C,L; M7410C,E (180 N)	MT8; M5410C1, L1 (90 N)	MT4; M7410A (90 N)
15	0.25	0.16	MOD	--	VSMC-415-0.25	MIX	6.5	600 kPa	600 kPa	--
15	0.40	0.25	MOD	--	VSMC-415-0.4	MIX	6.5	600 kPa	600 kPa	--
15	0.63	0.4	MOD	--	VSMC-415-0.63	MIX	6.5	600 kPa	600 kPa	--
15	1.0	0.63	MOD	--	VSMC-415-1.0	MIX	6.5	600 kPa	600 kPa	--
15	1.6	1.0	MOD	--	VSMC-415-1.6	MIX	6.5	300 kPa	300 kPa	--
15	2.5	1.6	MOD	--	VSMC-415-2.5	MIX	6.5	100 kPa	100 kPa	--
20	2.5	1.6	MOD	--	VSMC-420-2.5	MIX	6.5	150 kPa	150 kPa	--
20	2.5	1.6	MOD	--	VSMC-420-2.5E	MIX	6.5	250 kPa	--	--
20	4.0	2.5	MOD	--	VSMC-420-4.0	MIX	6.5	50 kPa	50 kPa	--
20	4.0	2.5	MOD	--	VSMC-420-4.0E†	MIX	6.5	250 kPa	--	--
25	6.3	4.0	MOD	--	VSMC-425-6.3P	MIX	6.5	250 kPa	250 kPa	--
25	8.0	5.5	MOD	--	VSMC-425-8.0P	MIX	2.5	250 kPa	250 kPa	--
15	1.0	0.63	ON-OFF	--	VSOC-415-1.0	MIX/DIV	2.5	600 / 200 kPa	600 / 200 kPa	600 / 200 kPa
15	1.0	0.63	ON-OFF	✓	VSOC-415-1.0S	MIX/DIV	2.5	600 / 200 kPa	600 / 200 kPa	600 / 200 kPa
15	1.6	1.0	ON-OFF	--	VSOC-415-1.6	MIX/DIV	2.5	300 / 200 kPa	300 / 200 kPa	300 / 200 kPa
15	1.6	1.0	ON-OFF	✓	VSOC-415-1.6S	MIX/DIV	2.5	300 / 200 kPa	300 / 200 kPa	300 / 200 kPa
15	2.5	1.6	ON-OFF	--	VSOC-415-2.5	MIX	2.5	150 kPa	150 kPa	150 kPa
15	2.5	1.6	ON-OFF	✓	VSOC-415-2.5S	MIX	2.5	150 kPa	150 kPa	150 kPa
20	2.5	1.6	ON-OFF	--	VSOC-420-2.5	MIX	2.5	200 kPa	200 kPa	200 kPa
20	2.5	1.6	ON-OFF	✓	VSOC-420-2.5S	MIX	2.5	200 kPa	200 kPa	200 kPa
20	4.0	2.5	ON-OFF	--	VSOC-420-4.0	MIX	2.5	100 kPa	100 kPa	100 kPa
20	4.0	2.5	ON-OFF	✓	VSOC-420-4.0S	MIX	2.5	100 kPa	100 kPa	100 kPa
25	4.0	2.5	ON-OFF	--	VSOC-425-4.0P	MIX	6.5	200 kPa	200 kPa	200 kPa
25	5.5	4.0	ON-OFF	--	VSOC-425-5.5P	MIX	6.5	200 kPa	200 kPa	200 kPa

*integrated snap-on linkage for MT-series actuators

†leakage rate B-AB port ≤ 0.5%

OPERATION

In the case of the two-way valve, the three-way valve, and the three-way valve with bypass, the built-in spring produces a closing force on the A-B / A-AB ports.

The valves are supplied with a screwed-on adjustment cap for manual operation and for protection of the stem. At modulating valves with 6.5mm stroke the adjustment cap allows A-B / A-AB to be fully closed and A-B / A-AB to be opened by ~50% (B-port closed by 50%). This allows the stem to be set up for filling or initial heating/cooling during the building construction phase without the use of a controller or actuator.

The small electric valve actuators as well as the thermo-electric actuators provide automatic control over the opening and closing movement of the valve stem.

Typical Operation

All types of valves should be mounted in the return flow. If the Δp -values exceed 300 kPa, attention should be paid to the development of noise.

Two-Way Valves

Direction of flow always from port A to port B

Port B: Outlet

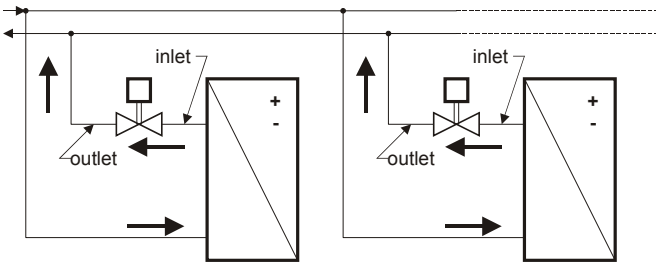


Fig. 1. Two-way valve operation

Three-Way Valves

These valves are preferably used as mixing valves, this means:

- Port AB: Total flow outlet
- Port A: Controlled flow inlet
- Port B: Bypass inlet

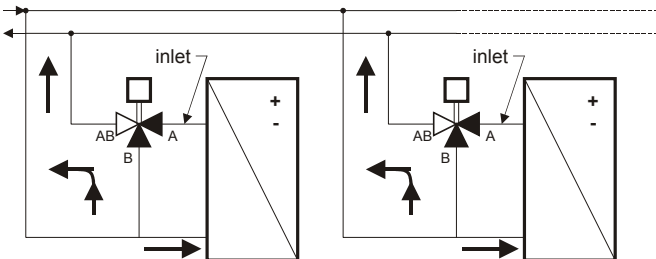


Fig. 2. Three-way valve operation

Three-Way Valves with Bypass

These valves simplify the installation, which is depending on the layout of the pipework, as the bypass pipe is part of the valve. The information for the normal three-way valves is also valid for this type.

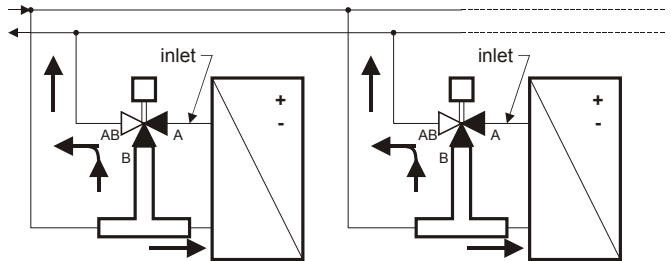


Fig. 3. Three-way valve with bypass

MOUNTING

When installing the valve care must be taken that the flow direction is correct (see section "Typical Operation"). The valve must not be mounted with the stem pointing downward. The adjustment cap must be removed from the valve only when the actuator is fitted. The valve should be installed as stress-free as possible with a tightening torque of 25 to 30 Nm.

The valve is supplied complete with mounting instructions. The water quality must meet VDI 2035 requirements.

Snap-On Linkage for MT-Series Actuators

The ON-OFF models can also be ordered with a special integrated snap-on linkage for MT-series Smart-T actuators to facilitate assembly. These models are indicated by an "S" at the end of the order numbers, e.g.

- Standard valve with thread connection VSOC-415-1.6
- Valve with integrated snap-on linkage VSOC-415-1.6S

Modulating valves with this special integrated snap-on linkage may be available, upon request.

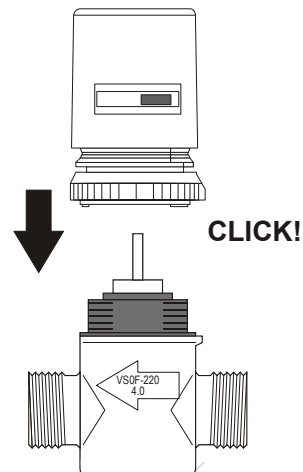
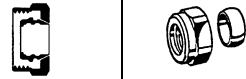

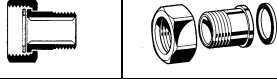
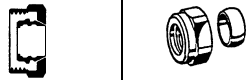


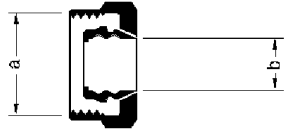
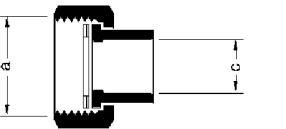
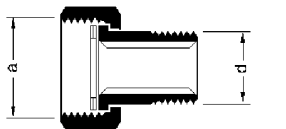
Fig. 4. Integrated snap-on linkage

ACCESSORIES

Valves VSxC-2 need two connection sets, valves VSxC-3 need three connection sets, and valves VSxC-4 need four connection sets.

connection	pipe size	DN	order number	connection set		description
compression	15 mm 22 mm	15 20	ACN-15C ACN-20C			Consisting of 1 union nut and 1 ferrule
soldering	12 mm 15 mm	15 20	AC-15FS AC-20FS			Consisting of 1 union nut, 1 solder bush, and 1 gasket
external thread	R3/8" R1/2" R1"	15 20 25	AC-15FT AC-20FT ACN-25T			Consisting of 1 union nut, 1 tailpiece, and 1 gasket
compression (Conex)	15 mm 22 mm	15 20	63* 65*			Capnut and compression ring

*Cannot be purchased from Honeywell

dimensions of connection sets					order number
	a	b	c	d	
	G1/2" 1-1/8" x 14 BS 84	15 mm 22 mm	--	--	ACN-15C ACN-20C
	G1/2" 1-1/8" x 14 BS 84	--	12 mm 15 mm	--	ACN-15S ACN-20S
	G1/2" 1-1/8" x 14 BS 84 G1 1/4"	--	--	R3/8" R1/2" R1"	ACN-15T ACN-20T ACN-25T

SPARE PARTS

TBD.

DIMENSIONS

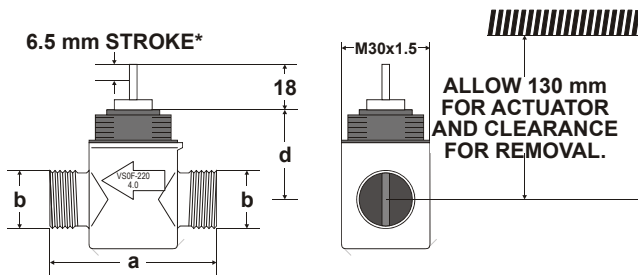


Fig. 5. Two-way valves, dimensions

*NOTE: In the case of modulating valves, the stroke amounts to 6.5 mm, and the closure distance to 18 mm. In the case of ON/OFF valves, the stroke amounts to 2.5 mm, and the closure distance to 14 mm.

Table 1. Two-way valves, dimensions (mm)

	A	B	D
DN15	56	G 1/2 A	32
DN20	66	1-1/8 x 14 BS84	34
DN25	76	G 1 1/4 A	48

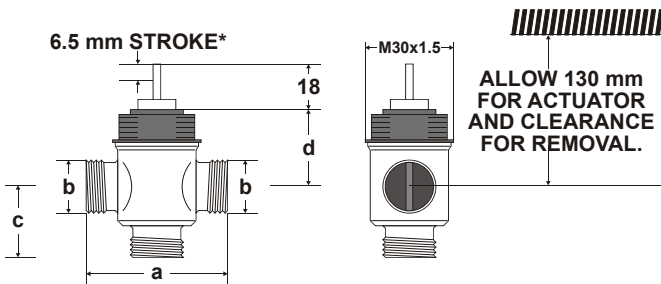


Fig. 6. Three-way valves, dimensions (mm)

*NOTE: In the case of modulating valves, the stroke amounts to 6.5 mm, and the closure distance to 18 mm. In the case of ON/OFF valves, the stroke amounts to 2.5 mm, and the closure distance to 14 mm.

Table 2. Three-way valves, dimensions (mm)

	A	B	C	D
DN15	56	G 1/2 A	24.5	32
DN20	66	1-1/8 x 14 BS84	33	34
DN25	76	G 1 1/4 A	38	48

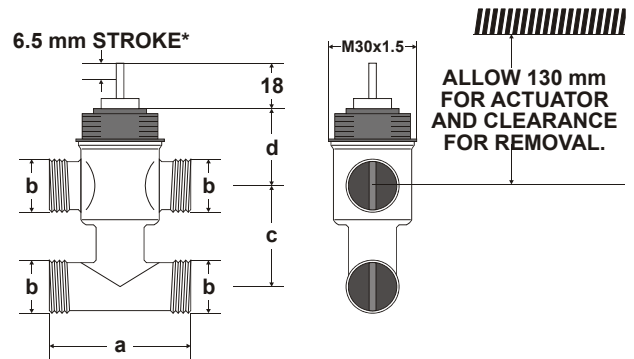


Fig. 7. Three-way valves with bypass, dimensions

*NOTE: In the case of modulating valves, the stroke amounts to 6.5 mm, and the closure distance to 18 mm. In the case of ON/OFF valves, the stroke amounts to 2.5 mm, and the closure distance to 14 mm.

Table 3. Three-way valves with bypass, dimensions (mm)

	A	B	C	D
DN15	56	G 1/2 A	40	32
DN20	66	1-1/8 x 14 BS84	40	34
DN25	76	G 1 1/4 A	62.5	48

DIMENSIONS WITH SNAP-ON

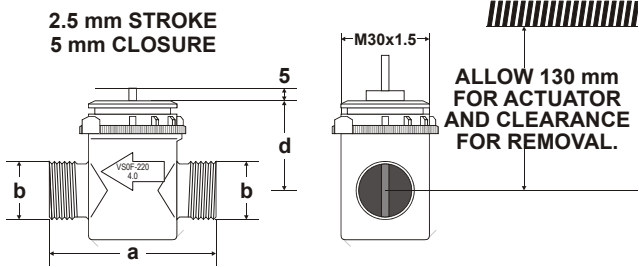


Fig. 8. Two-way valves, dimensions

Table 4. Two-way valves, dimensions (mm)

	A	B	D
DN15	56	G ½ A	34.5
DN20	66	1-1/8 x 14 BS84	36.6

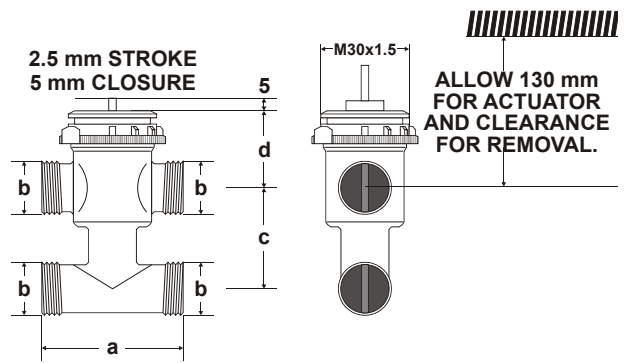


Fig. 10. Three-way valves with bypass, dimensions

Table 6. Three-way valves with bypass, dimensions (mm)

	A	B	C	D
DN15	56	G ½ A	40	34.5
DN20	66	1-1/8 x 14 BS84	40	36.6

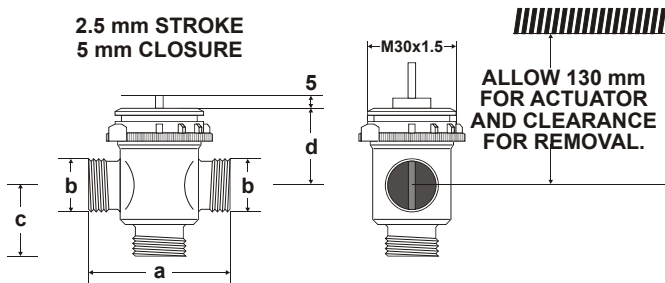


Fig. 9. Three-way valves, dimensions (mm)

Table 5. Three-way valves, dimensions (mm)

	A	B	C	D
DN15	56	G ½ A	24.5	34.5
DN20	66	1-1/8 x 14 BS84	33	36.6

VALVE ACTION WITH MT-SERIES SMART-T THERMAL ACTUATORS

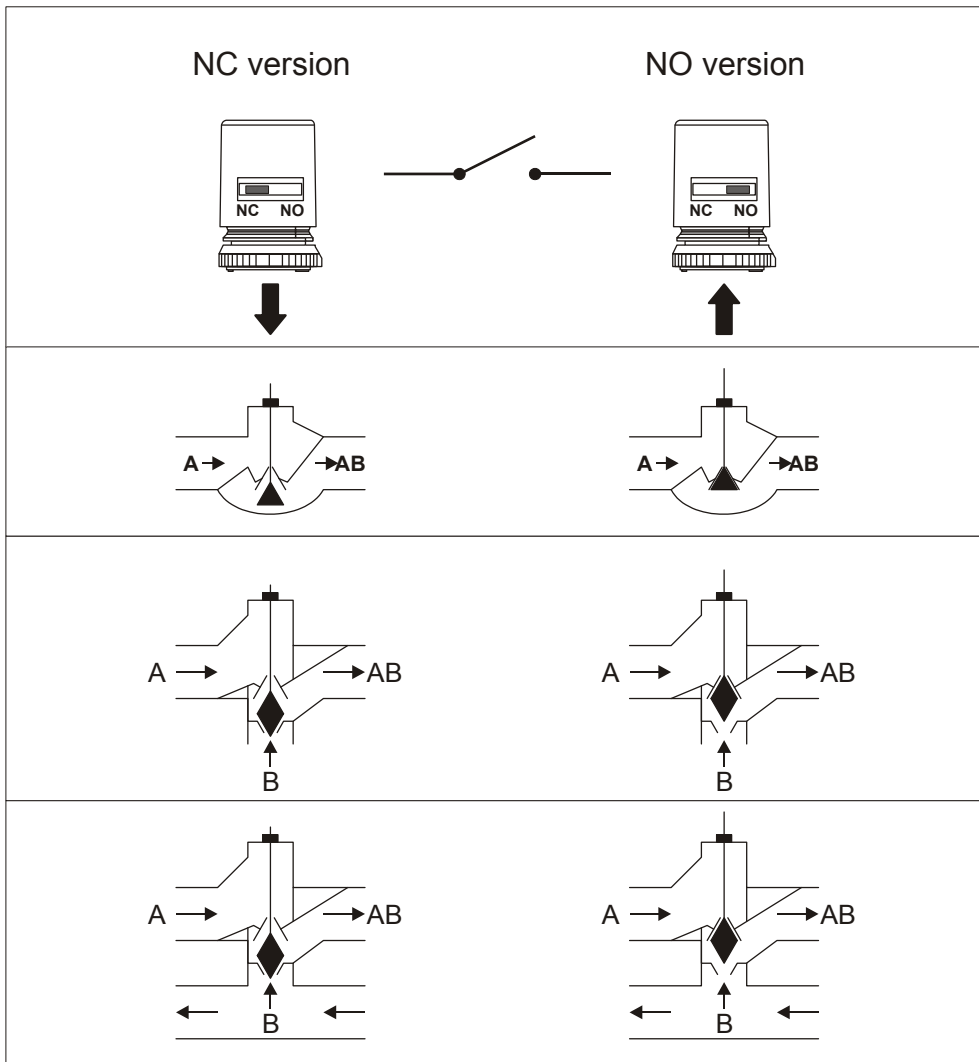


Fig. 11. Valve action with MT-series Smart-T Thermal Actuators

Honeywell

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