VH & VK: Small pneumatic through valve

Manipulating unit for continuous control facilities in air-conditioning convectors.
Valve body with male thread; plug with soft seal; stuffing box with O-ring seal; valve seat, body, plug and stuffing box of brass, spindle of stainless steel; drive housing of self-extinguishing plastic with membrane of silicon.
Compressed-air connection Rp ⅛, female thread. To be fitted in any position between vertical (upright) and horizontal.

Type Characteristic B	Type Characteristic A	Nominal diameter DN	k_{VS} m^3/h	Δp_{max} [1] bar	Weight kg
Full range, 0.3 - 0.9 bar					
VH18P 10 F322	**VK18P 10 F422**	10	0.25	3.5	0.5
VH18P 10 F312	**VK18P 10 F412**	10	0.5	3.5	0.5
VH18P 10 F302	**VK18P 10 F402**	10	1.0	3.5	0.5
VH18P 15 F312	**VK18P 15 F412**	15	1.6	3.0	0.6
VH18P 15 F302	**VK18P 15 F402**	15	2.5	3.0	0.6
Partial range, 0.2 - 0.5 bar (B), 0.7 - 1.0 bar (A)					
VH11P 10 F322	**VK15P 10 F422**	10	0.25	2.5	0.5
VH11P 10 F312	**VK15P 10 F412**	10	0.5	2.5	0.5
VH11P 10 F302	**VK15P 10 F402**	10	1.0	2.5	0.5
VH11P 15 F312	**VK15P 15 F412**	15	1.6	2.2	0.6
VH11P 15 F302	**VK15P 15 F402**	15	2.5	2.2	0.6

Valve:

Nominal pressure	PN 16
Max. operating pressure	16 bar
Perm. operating temp.	2...120 °C
Characteristic curve	equal percentage
Control ratio	20
Valve stroke	4 mm

Drive:

Max. control pressure [2]	1.5 bar
Effective membrane area	28 cm^2
Air consumption for 100% stroke	0.025 l_n
Running time [3]	2.5 s
Perm. ambient temp.	0...70 °C
Dimension drawing	M360506
Fitting instructions	MV 43168
Assembly	MV 40.160

Accessories

0360385 010* Serto union for connection to copper pipe dia. = 12 mm to DN10 (2 pcs required)
0360385 015* Serto union for connection to copper pipe dia. = 15 mm to DN15 (2 pcs required)
0360386 010* Solder-screw fitting for connection to copper pipe dia. = 12 mm to DN10 (2 pcs required)
0360386 015* Solder-screw fitting for connection to copper pipe dia = 15 mm to DN15 (2 pcs required)
0360388 010* Screw fitting for connection to female thread Rp ⅜ to DN10 (2 pcs required)
0360388 015* Screw fitting for connection to female thread Rp ½ to DN15 (2 pcs required)
0360389 010* Screw fitting for connection to steel pipes with male thread R ⅛ to DN10 (2 pcs required)
0360389 015* Screw fitting for connection to steel pipes with male thread R ⅜ to DN15 (2 pcs required)

*) Dimension drawing or wiring diagram are available under the same number

1) Δp_{max} = Max. pressure difference across the valve at which the drive can still firmly open and close the valve.
2) See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures.
3) Based on the Centair air capacity (400 l_n/h) and a line of 20 m in length and 4 mm diameter.


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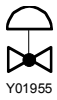
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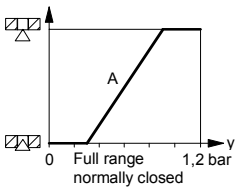
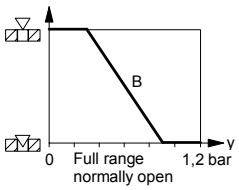
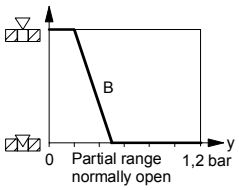
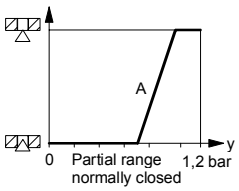
Pressure-stroke curve









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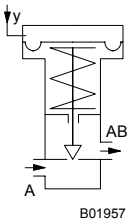

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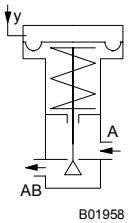
Characteristic B



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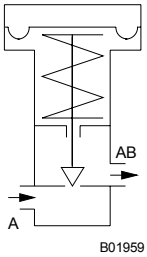
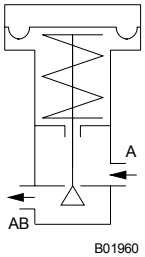
Characteristic A

Operation
As the control pressure rises, the valve spindle is pushed into the valve body. The pressure-stroke curve B is achieved with a valve that has a 'push-type' plug, while curve A has a 'hanging-type' plug. The direction of flow always given for passage A-AB assumes that the valve closes against the pressure. The action of closing with the pressure is not permissible for pneumatic drives since it causes pressure surges.



Curve B (Type VH)



Curve A (Type VK)

Engineering and fitting notes
In order to protect the valve from possible impediments in the water such as welding beads, rust particles etc., the installation of collective filters is recommended, e.g. for each floor or feed pipe. See VDI 2035 for required level of water quality. The ingress of condensate, dripping water etc., along the stem and into the drive is to be prevented (should not be fitted hanging downwards).
If the valves are fitted in occupied rooms, the cavitation noise may be excessive. For this reason, the pressure differences should be kept as low as possible, while the static pressures should be high.

Requirement for cavitation-free operation (approximation with z = 0.5 as per VDMA 24422):

- **for cold water:** $\Delta p < p_2+1$ Δp = current pressure difference across the valve [bar]
- **for hot water:** $\Delta p < p_2$ p_2 = static pressure after the valve [in bar over-pressure]

Further information
Stuffing box with O-ring of ethylene-propylene; valve plug with soft sealing of ethylene-propylene at the control passage.

Material numbers in accordance with DIN

	DIN material no.	DIN designation
Valve body	2.0401	Cu Zn 39 Pb 3
Valve seat	2.0401	Cu Zn 39 Pb 3
Spindle	1.4305	X 12 CrNi S 18 8
Plug	2.0402	Cu Zn 40 Pb 2
Stuffing box	2.0380	Cu Zn 39 Pb 2

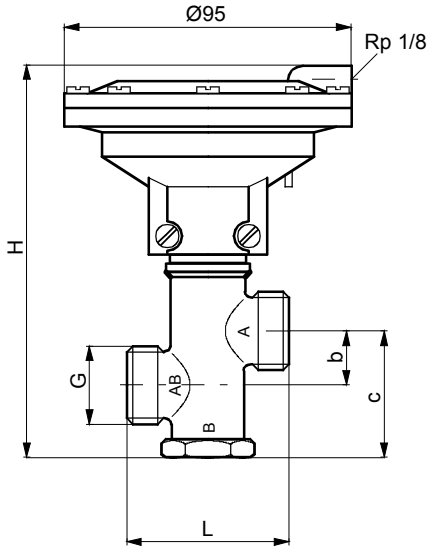
Technical information
See Technical Manual 7000477 001 *Manipulating units* (collection of technical information sheets).

Additional technical data

Nominal diameter DN	Δp_v bar	Max. leakage l/h
DN 10	3.5	0.6
DN 15	3.0	0.85

Δp_v = max. permissible pressure difference across the valve for any stroke position, limited by noise emission, and erosion (maximum values without being limited by the force of the drive).
Leakage: applies to Δp = 1 bar

Dimension drawing



DN	G (ISO 228/1)	b	c	L	H
10	G 1/2 A	15	33,5	50	113
15	G 3/4 A	19	43	54	128

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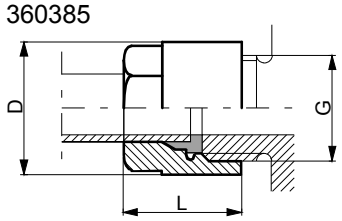
Accessories

360385



Nr. (DN)	G	L	D
360385 010	G 1/2	26	26
360385 015	G 3/4	30	32

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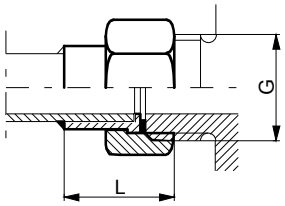
360386



Nr. (DN)	G	L
360386 010	G 1/2	~23,5
360386 015	G 3/4	~26,5

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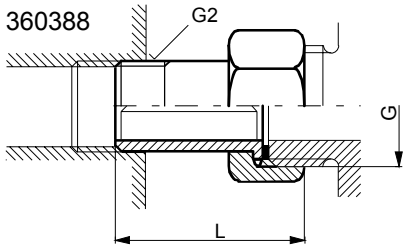
360388



Nr. (DN)	G	G2	L
360388 010	G 1/2	G 3/8 A	36,5
360388 015	G 3/4	R 1/2	38,5

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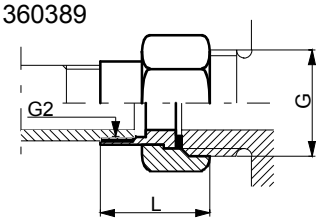
360389



Nr. (DN)	G	G2	L
360389 010	G 1/2	Rp 1/8	24,5
360389 015	G 3/4	Rp 3/8	29

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