B6R: Three-way valve with female thread, PN 16

How energy efficiency is improved
Accurate control with high reliability.

Areas of application
Continuous control of cold and hot water or air in closed networks[1]. Water quality as per VDI 2035. Assembly with AVP 142 and AV43 actuators as a regulating unit.

Features
- Nominal pressure PN 16
- Nominal diameter DN15, DN25, DN40 and DN50 with reduction steps
- Basic characteristic equal percentage (F3 .), . or linear (F2 . .)
- Linear mixing passage characteristic
- Characteristic equal percentage or linear
- With the spindle retracted, the valve is closed
- Application as control valve or diverting valve

Technical description
- Valve with female thread DIN EN ISO 228-1 G
- Valve body and seat in gun metal
- Stainless steel spindle
- Plug made of stainless steel DN15 or brass from DN20
- Stuffing box made of brass with EPDM wiper ring and double O-ring seal

T04417

Y07545

B   B01134

Pressure-stroke curve
(with valve fitted)

Type	Nominal diameter DN	k_{VS} value m³/h	Valve plug material	Weight kg
B6R 15 F330	15	1	stainless steel	1.2
B6R 15 F320	15	1.6	stainless steel	1.2
B6R 15 F310	15	2.5	brass	1.2
B6R 15 F300	15	4	brass	1.2
B6R 25 F310	25	6.3	brass	1.6
B6R 25 F300	25	10	brass	1.6
B6R 40 F310	40	16	brass	3.4
B6R 40 F300	40	25	brass	3.4
B6R 50 F300	50	35	brass	4.6

AVP142 F001
AV43 P15

open

closed

0 Control pressure in bar 1,2
Full range

Operating temperature [1]	–15...130 °C	
Operating pressure	up to 120 °C 16 bar	
	up to 130 °C 13 bar	
Valve curve	equal percent	
Control ratio	50 (typical)	
Leakage rate		
Control flow A-AB	$\leq$ 0.05% of k_{vs} value	
Mixing flow B-AB	$\leq$ 1% of k_{vs} value	

Valve stroke	14 mm
Dimension drawing	7M100
Fitting instructions	MV 505574
AVP142 Complete regulating unit	MV 505766
AV43 Regulating unit	MV 43190
AV43 Montage	MV 40.136

F002   F003

open

AVP142

closed

0 Control pressure in bar 1,2
Sequence

B09804

Variants
F2 . .   With linear valve curve (available from DN 15 k_{vs} 4 m³/h onwards only), same price and pressure as **B6R..F3..**

——— As delivered ex works
— · — Fitting variant A

Accessories
0217268 . . .   Stuffing-box heating 15 W; specify when ordering: 24V = /001, 230V = /004, MV 505498

0360391 . . .   Union piece incl. asbestos-free seal, 3 pieces required; specify when ordering: DN 15 = /015, DN 25 = /025 etc.
       DN   15   25   40   50

0378034 001   Valve with stuffing box, silicone-free; synthetic lubricant; max. 130 °C
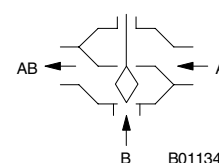
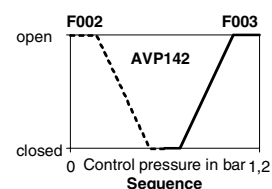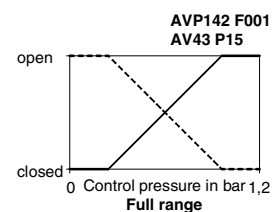[1]   At temperatures under 0 °C, use stuffing-box heater (accessory)

Combination: pneumatic actuator AVP142, AV43

Drive reversible max. pressure p_{stat} Operating time [1]	AVP142 F001 ≤ 16 bar 7 s			AVP142 F002, F003 ≤ 6 bar 7 s			AV43 P15 ≤ 16 bar 14 s		
Valve	Δp_{max}	Δp_s		Δp_{max} [2]	Δp_s		Δp_{max}	Δp_s	
B6R 15	4.0	22.3		4.0	16.0		4.0	16.0	
B6R 25	4.0	13.5		4.0	16.0		4.0	13.0	
B6R 40	2.4	3.1		1.0	7.3		2.9	2.9	
B6R 50	2.0	2.3		0.8	5.5		2.0	2.2	

Complete type designation: Valve and drive each with F-variant
Valve: F-variant, technical data and accessories, see valve type table
Drive: F-variant, technical data, accessories and fitting position, see Section 71
Example: B6R 15 F300 / AVP142 F001
Valve control passage A-AB is closed when actuator is pressureless = factory setting
Valve control passage A-AB is open when actuator is pressureless = on request

Δp_{max} [bar]= Max. permissible pressure difference across the valve at which the drive can still safely open and close the valve.

Δp_s [bar]= Max. permissible pressure difference across the valve during malfunction at which the drive can close the valve.

p_{stat} [bar]= Dormant pressure at valve when pump is inactive. Takes into account the fluidic level of the plant and the pressure increase caused by the pressure tank or the steam pressure.

[1] Based on the Centair air capacity (400 l_n/h) and a line of 20 m in length and 4 mm in diameter
[2] When used with an XSP 31 positioner, the Δp_{max} values are seven times bigger; observe the Δp_v value (see additional technical details).

Operation

Using a pneumatic drive, the valve can be moved to any position. When the spindle is extracted, control passage A-AB is closed. Where pneumatic drives are used, the valves should not close with the pressure, otherwise pressure surges ensue.

Used as a control valve

B01134
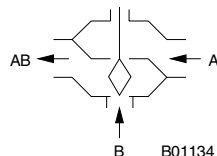
Engineering and fitting notes

Can be fitted in any position except facing downwards.
The ingress of condensate, dripping water etc., along the stem and into the drive should be prevented.
When fitting the drive to the valve, care must be taken not to turn the valve plug on the two stops (seat), thus damaging the seal.
The drive can be equipped with the XSP 31 or XSP 31G positioner should any of the following be demanded: a split range; an improvement in the setting accuracy; an increase in positional speed or air capacity; reversible direction of action (see Section 79).

Additional technical details

Type	Δp_v
B6R 15 F . 30	4
B6R 15 F . 20	4
B6R 15 F . 10	4
B6R 15 F . 00	4
B6R 25 F . 10	4
B6R 25 F . 00	4
B6R 40 F . 10	3
B6R 40 F . 00	3
B6R 50 F . 00	2

Δp_v in bar = max. pressure difference across the valve in any stroke position, limited by the noise level and erosion (max. values without being limited by the force of the drive).

Sauter Components

Additional details on accessories

0217268/ . . .   Heating for stuffing box 15 W; housing of light metal; connecting cable 3×0.75 mm^2, earth connection, 1 m in length, cable end sleeves; degree of protection IP 54.

Additional details on model types

Valve body with female thread. Flat seal of copper at the body. Stuffing box with O-ring of ethylene-propylene.

Material numbers as per DIN

	Material no.	Description	DIN norm
Valve body	2.1096.01	G-Cu Sn 5 Zn Pb (Rg 5)	1705
Valve seat	2.1096.01	G-Cu Sn 5 Zn Pb (Rg 5)	1705
Spindle	1.4305	X 8 CrNiS 18 9	EN 10088-3
Plug	2.0402.26	Cu Zn 40 Pb 2 F43	17 672
Plug B6R 15 F. 20...F. 30	1.4305	X 8 CrNiS 18 9	EN 10088-3
Stuffing box	2.0401.10	Cu Zn 39 Pb 3 F36	17 672

Explanation of terms used

Δp_v:

Maximum permissible pressure difference across the valve in any stroke position, limited by the noise level and erosion.

The valve as a traversed element is defined by this parameter specifically in its hydraulic behaviour. By monitoring cavitation, erosion and the noise thus produced, improvements can be achieved in both life expectancy and durability.

Δp_{max}:

Maximum permissible pressure difference across the valve at which the drive can firmly open and close the valve.

Static pressure and fluidic influences are taken into account. This value helps to maintain smooth stroke action and valve sealing. In doing so, the valve's Δp_v value is not exceeded.

Δp_s:

Maximum permissible pressure difference across the valve in the event of a malfunction (e.g. power failure) at which the drive can firmly close the valve and, if necessary, hold the full operating pressure against atmospheric pressure. Since this is a safety function with 'fast' stroke, Δp_s can be larger than Δp_{max} or, respectively, Δp_v. The resultant fluidic disturbances are soon overcome and play a minor rôle here.

On the three-way valves, the values apply only for the control passage.

Δp_{stat}:

Line pressure across the valve. This corresponds largely to the dead pressure when the pump is switched off, e.g. due to the level of liquid in the plant, an increase in pressure via the pressure store, steam pressure etc.

Where the valves close with the pressure, the static pressure plus the pump pressure should be used.

Technical information

- Pressure and temperature specifications   DIN 2401
- Flow parameters   VDI/VDE 2173
- Sauter slide rule for valve sizing   7 090011 003
- Slide rule manual   7 000129 003
- 'Valvedim' PC program for Sauter valve sizing   7 000675 003
- Technical manual 'Manipulating units':   7 000477 003
  Parameters, Notes on installation, Control,
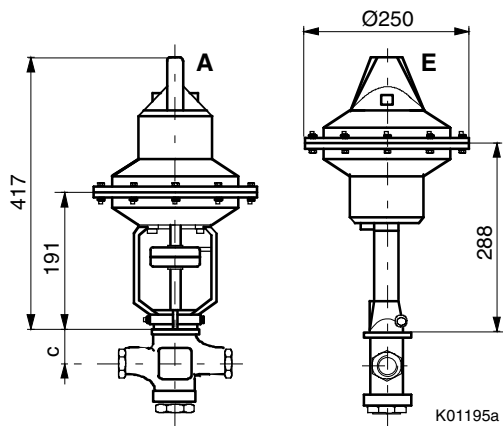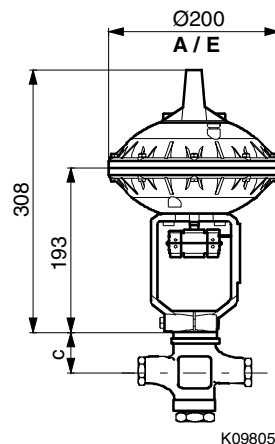 Pneumatic regulating units, General information

Sauter Components

Dimension drawings 7M100

B6R
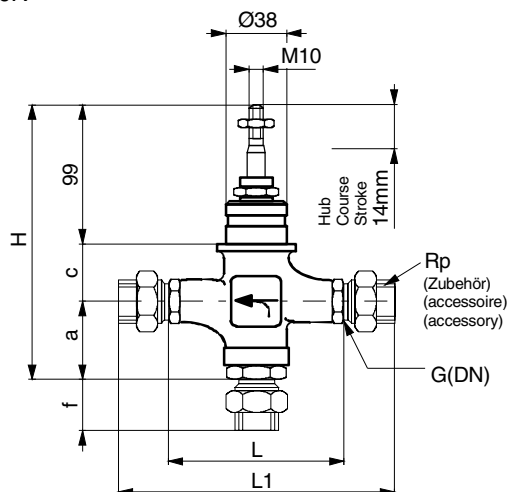
DN		a	c	f	H	L	L1	G	Rp
15	1/2"	59	29	37	187	85	159	1/2	1/2
25	1"	69	33	43	201	110	196	1	1
40	1 1/2"	76	47	53	222	150	256	1 1/2	1 1/2
50	2"	98	57	57	254	180	294	2	2

M361065a

AV43

K01195a

AVP142

K09805

E: No pressure: CLOSED (as delivered ex works),
A: No pressure OPEN (fitting variant)
Take measurement 'c' from valve dimension drawing

Sauter Components