

CONTROL VALVE

3 PORT SEAT VALVES/ EXTERNAL THREAD/ PN 16



Features and Properties:

- Body resistance to heat and shock from fluid
- Possibility of using valve as a transfer path, fluid mixer or 2 port electric valve
- With manual actuator to adjust when needed
- Permissible media: chilled water, zero-degree water, low temperature hot water, water with anti-freeze used in heat exchangers, air conditioners and some cooling equipment
- Industry standards:

PARAMETER	STANDARD
Nominal Pressure	EN 1333
Leak rate	DIN EN 1349
Valve body material	BS-EN-1982
External thread connections	ISO 228/1

PART LIST ACCORDING FIG.1

NO	DESCRIPTION	MATERIAL	SPECIFICATIONS
1	Body	Bronze	BS EN 1982
2	Bonnet	Brass	C36000-H02
3	Plug	Stainless steel	AISI S.S 316
4	Stem	Stainless steel	AISI S.S 316
5	Seat Ring	Brass	C36000-H02
6	Spring	Stainless steel	AISI S.S 316
7	O-ring	Viton	--
8	Handle	Poly-Amid	--


Technical data:

NO	CHARACTERISTICS	VALUE	UNIT
1	Nominal size	20 to 40	DN
2	Cavitation factor	0.4	
3	Nominal flow rate of water (Kvs)	6.3 to 25	m ³ /h
4	Permissible leakage rate	0...0.02% of Kvs	
5	PH flow	Min: 7 Max: 10	
6	Nominal pressure	16	bar
7	Minimum operating temperature	0	°C
8	Maximum operating temperature	120	°C
9	Maximum differential pressure in mixing mode	4	bar
10	Maximum differential pressure in diverting mode	0.75	bar
11	External thread size of fitting	G 1 1/2	Inch
12	External thread size of actuator connection	G 3/4	Inch

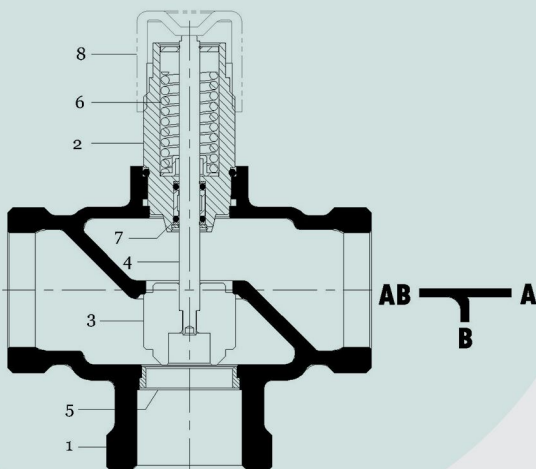


Fig 1.

TYPE REFERENCE	DN	KVS
VC 20-6.3	20	6.3
VC 25-10	25	10
VC 32-16	32	16
VC 40-25	40	25

DN: Nominal Size

Kvs: Nominal flow rate of cold water (5...30 °C) through the fully open valve (H100) by a differential pressure of 100 kPa (1 bar)

Dimensions:

DESIGNATION	DN	B (mm)	G (Inch)	L1 (mm)	L2 (mm)	L3 (mm)	H1 (mm)	H2 (mm)	H SQS	H SAS	WEIGHT (kg)
VC 20-6.3	20	9	G1 1/4	100	50	50	68	78	>364	>381	0.90
VC 25-10	25	11	G1 1/2	105	52.5	52.5	71	81	>382	>399	1.30
VC 32-16	32		G2				77.5	87.5	>389	>406	1.75
VC 40-25	40		G2 1/4	130	65	65	80.5	90.5	>392	>409	2.40

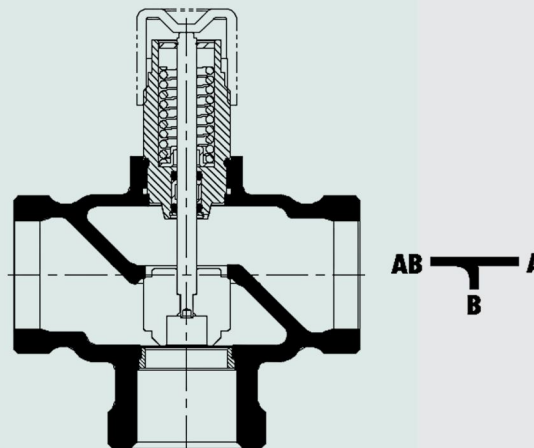
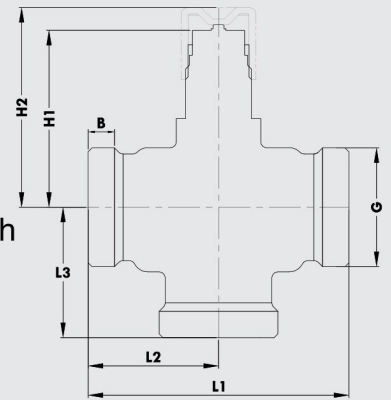
H: Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.

H1: Dimension from the pipe Centre to install the actuator

H2: Pipe Centre to upper edge of manual adjustment button, valve in «closed» position

Valve cross section:

- Parabolic plug is positioned from the body and guided up and down.
- The plug has two sealing positions: on the direct path and the bypass path
- Valve stem extends: Through-port A-AB opens, Bypass (port B) closes
- Valve stem extends: Through-port A-AB closes, Bypass (port B) opens



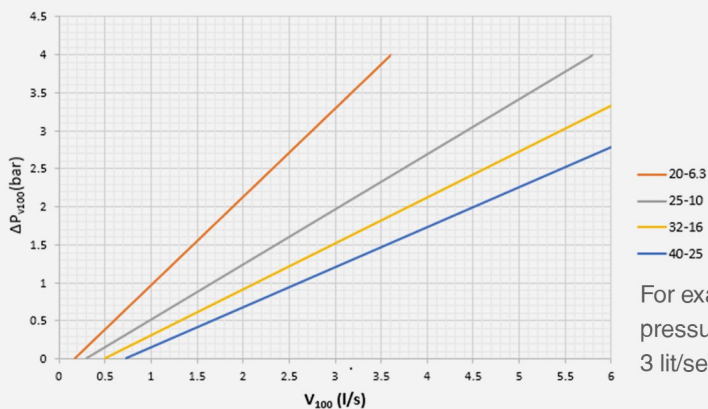
Flow diagram:

ΔP_{max} : Maximum permissible differential pressure across the valve (mixing: port A - AB, B - AB)

ΔP_{v100} : Differential pressure across the fully open valve and the valve's control path

A - AB, B - AB by a volume flow V_{100}

\dot{V}_{100} : Volume flow through the fully open valve



For example, if the valve is fully open and the differential pressure of 2 bar is in the mixing mode, the flow rate will be 3 lit/sec. (for DN 25)

Valve flow characteristic:

- In mixing mode:
Flow from ports A and B is as input to port AB as output
 - In diverting mode:
Flow from port AB can be controlled as input to ports A and B
- Port A: variable flow
Port B: Bypass
Port AB: constant flow
- Three-port valve is primarily as a mixing valve.

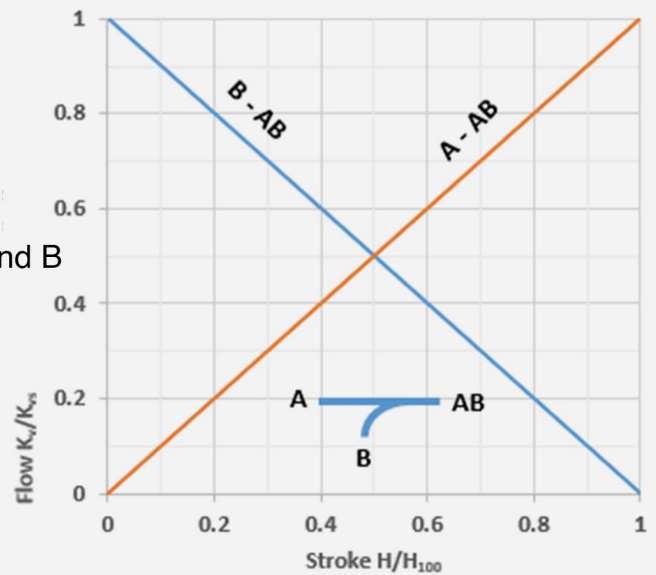


Fig 2.

Instructions and putting modes:

The valve should only be used for closed circuits and should be clean and free of contamination before putting into operation. The presence of any exterior objects in the valve lanes and paths will damage the sealing location and cause internal leakage, for this purpose, it is recommended to put a single filter valve at the inlet locations of the valve.

1. MIXING MODE:

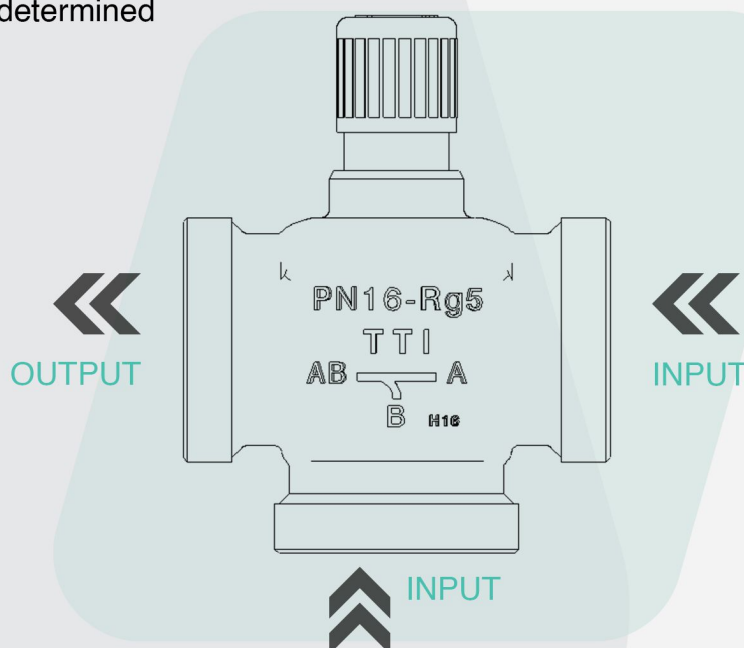
Mixing from A / B to AB: Mix the two fluids (even at different temperatures) according to the Figure 2

Port A: Input flow from port A

Port B: Input flow from port B

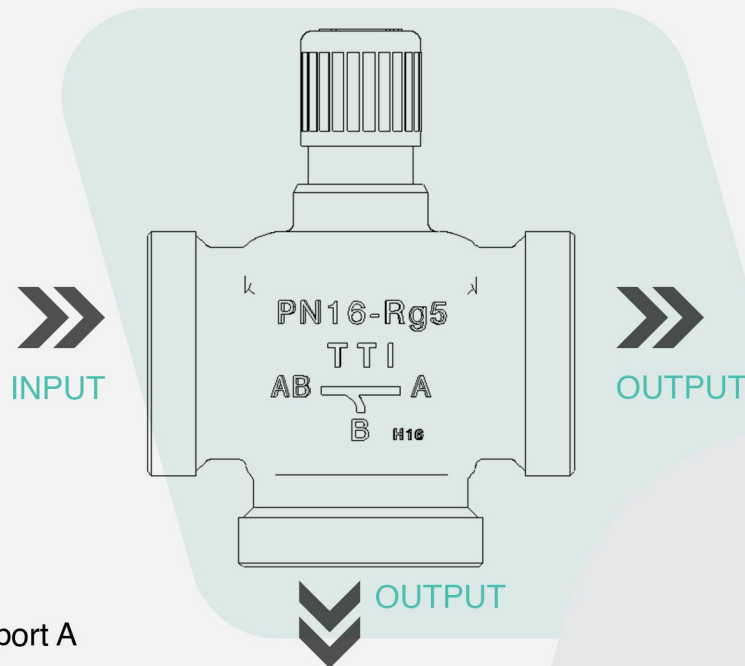
Port AB: Outputs from flow mixes (port A and B)

Percentage and rate of mixing: depending on the position of the stem and according to Figure 2, the mixture of two fluids is determined



2. DIVERTING MODE:

Diverting from AB to A / B: depending on the position of the stem, is capable of transferring the incoming fluid to either of the A or B paths. This case is more commonly used to control the temperature of the equipment.



Port A: Output flow from port A

Port B: Output flow from port B

Port AB: The main entrance to move to one of the port A or B

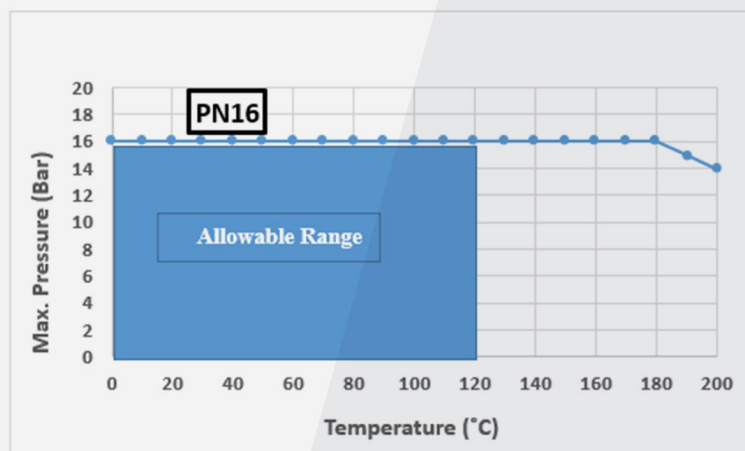
Note: In this mode and in the case of using manual actuator, the stem must be fully closed or fully open.

3. TWO PORT CONTROL VALVE:

It's possible by blocking port B. In this mode, port A is used as input and port AB is output.

It is noteworthy that other items and charts are useful as before.

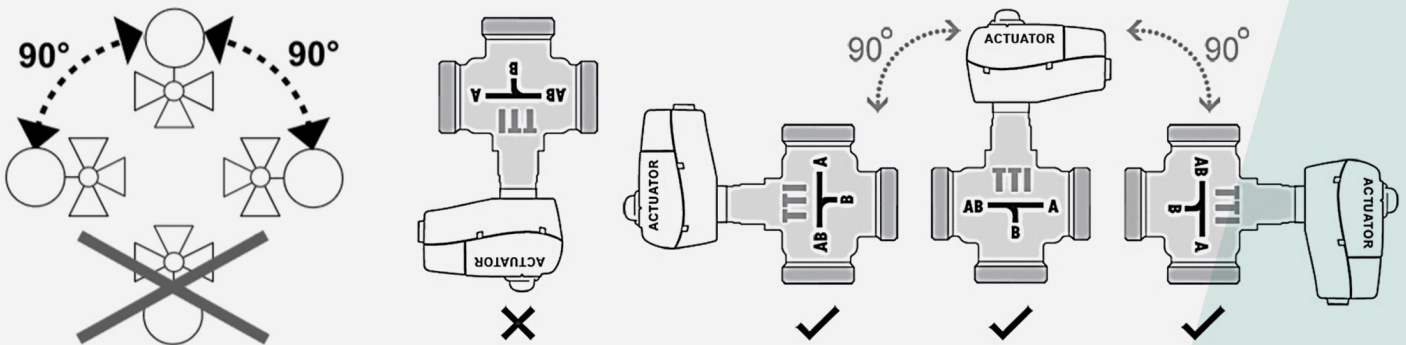
WORKING PRESSURE AND TEMPERATURE DIAGRAM



The Maximum permissible fluid temperature up to pressure of 16 bar is 120°C

Other tips:

- Thermal insulation is recommended for protect against freezing.
- Avoid applying heat and flame directly to the valve body.
- When putting the valve into operation, pay attention to the direction of the flow symbol that imprinted on the valve.
- Both valve and actuator can easily be assembled at the mounting location. Neither special tools nor adjustments are required.
- The valve orientation is as follow and the valve should not be positioned upstream of port B.



Maintenance:

When doing service work on the valve / actuator:

- Deactivate the pump and turn off the power supply
- Close the shut-off valves
- Fully reduce the pressure in the piping system
- Allow pipes to completely cool down if necessary
- Disconnect the electrical wires

Before putting the valve into operation again, make certain the actuator is correctly.

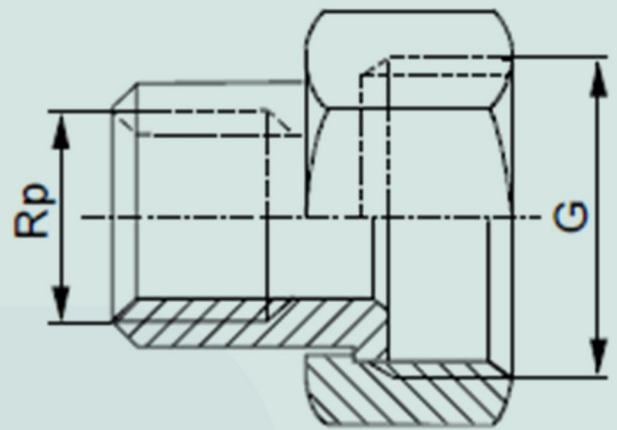
Fittings:

All fittings and equipment needed for putting the valve into operation are individually packaged and available.

1. Connection Adaptor:

TYPE/STOCK NO.	VALVE TYPE	INPUT THREAD	OUTPUT THREAD
FVC20-6.3	VC 20-6.3	G1 1/4"	RP 3/4
FVC25-10	VC 25-10	G1 1/2"	Rp1"
FVC32-16	VC 32-16	G2"	Rp 1 1/4
FVC40-25	VC 40-25	G2 1/4	Rp 1 1/2

- On valve side: cylindrical thread to ISO 228/1
- On pipe side: with cylindrical thread to ISO 7/1



2. Actuator:

VALVE TYPE	SQS TYPE ACTUATORS		ACTUATOR TYPE (SIEMENS REFERENCE)
	ΔP_{\max} mixing [kPa]	ΔP_{\max} diverting [kPa]	
VC 20-6.3	400	100	ALG203
VC 25-10		75	ALG253
VC 32-16	250	50	ALG323
VC 40-25	125	35	ALG403

ΔP_{\max} : Maximum permissible differential pressure across valve's control path, valid for the entire actuating range of the motorized valve

Table of Siemens SQS actuators specifications can put on the valve:

TYPE REFERENCE	OPERATING VOLTAGE	POSITIONING SIGNAL		POSITIONING TIME	SPRING RETURN	SPRING RETURN TIME
SQS35.00	AC 230 V	3 position		150 s	no	---
SQS35.03				35 s		
SQS35.50				150 s	yes	
SQS35.53				35 s		
SQS65.5	AC 24 V	DC	0...1000 Ω	35 s	yes	8S
SQS65		0...10 V			no	
SQS65.2		DC				
SQS85.00		0...10 V				
SQS85.03		3 position			150 s	no
			35 s			

Disposal:

Before disposal the valve must be dismantled and separated into its various constituent materials. Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.

Current local legislation must be observed.

