

ACVATIX™

## 6-port pressure independent control ball valve (PICV)

VWPG51..



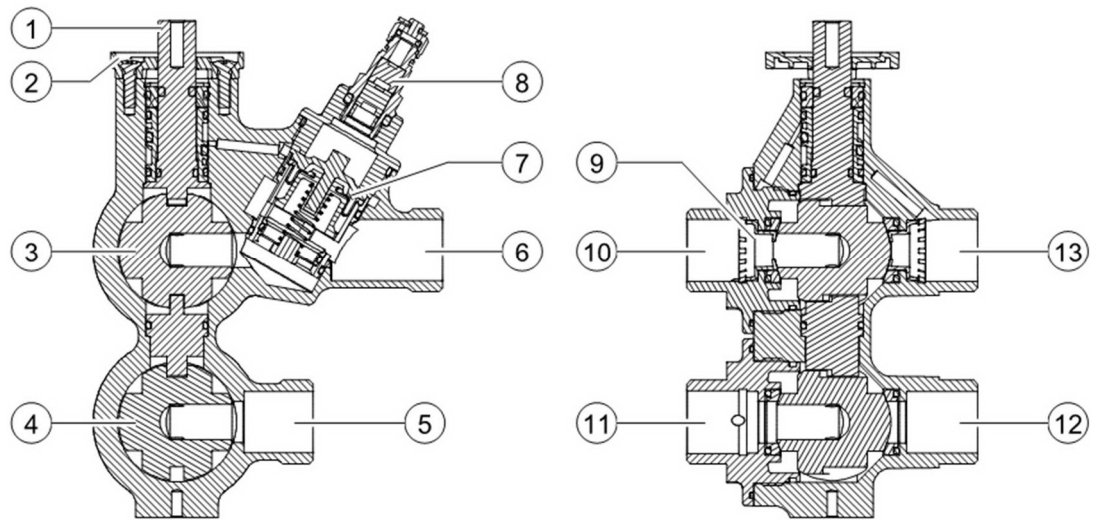
### 6-port pressure independent control ball valves, PN 25, with externally threaded connection

- With integrated differential pressure regulator (DP)
- DN15 and DN20: valve body made of dezincification resistant brass (DZR)
- Volumetric flow 35...4250 l/h
- Differential pressure range 4...400 kPa
- Externally threaded G per ISO 228-1
- Fitting sets ALN.. with external threading per ISO 228-1
- Insulation shells ALI.. made of EPE (Crosslinked Expanded Polyethylene)
- Version with pressure test point for  $\Delta p$  measurement (optional)
- Test point fitting sets ALP.. for  $\Delta p$  measurement (optional) with external threading per ISO 228-2
- Rotational angle 90°
- Can be combined with electromotoric rotary actuators:
  - GDB161.9../6P: 0/2-10 V with manual pre-setting by screws
  - GDB161.9../6W: 0/2-10 V
  - GDB161.9E/MO6P: Modbus RTU

## Use

- Used in heated/chilled ceilings and fan coils as control ball valve with automatic hydraulic balancing.
- For closed circuits.
- Cost competitiveness: Only one valve with actuator is needed to control a heated and chilled ceiling or fan coil.
- Flexibility: Various connections can be implemented thanks to external threading.

## Technical design



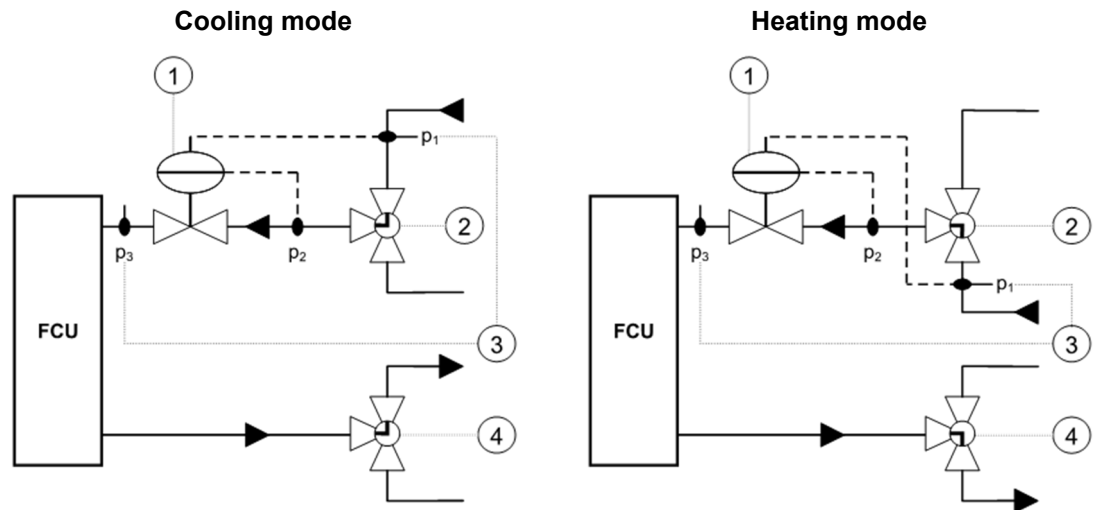
- |    |                                 |    |                            |
|----|---------------------------------|----|----------------------------|
| 1  | Stem for actuator               | 2  | Adapter plate for actuator |
| 3  | Ball for flow control           | 4  | Ball                       |
| 5  | Inlet from consumer             | 6  | Outlet to consumer         |
| 7  | Differential pressure regulator | 8  | P/T plug (optional)        |
| 9  | Low flow orifice                | 10 | Inlet                      |
| 11 | Outlet                          | 12 | Outlet                     |
| 13 | Inlet                           |    |                            |

## Functional principle

The differential pressure regulator within the 6-port PICV body maintains the differential pressure over the valve on the inlet side, for both cooling and heating flows.

When the 6-port PICV is shifting from cooling to heating, or vice versa, the inlet pressure  $P_1$  is transferred to the upper side of the differential pressure regulator by an internal capillary.

This capillary connection is changing from the cooling to the heating side, or vice versa, through a hole in the valve stem. This allows the differential pressure to be controlled on both cooling and heating sides with a single differential pressure regulator, hence providing full pressure independent flow control.



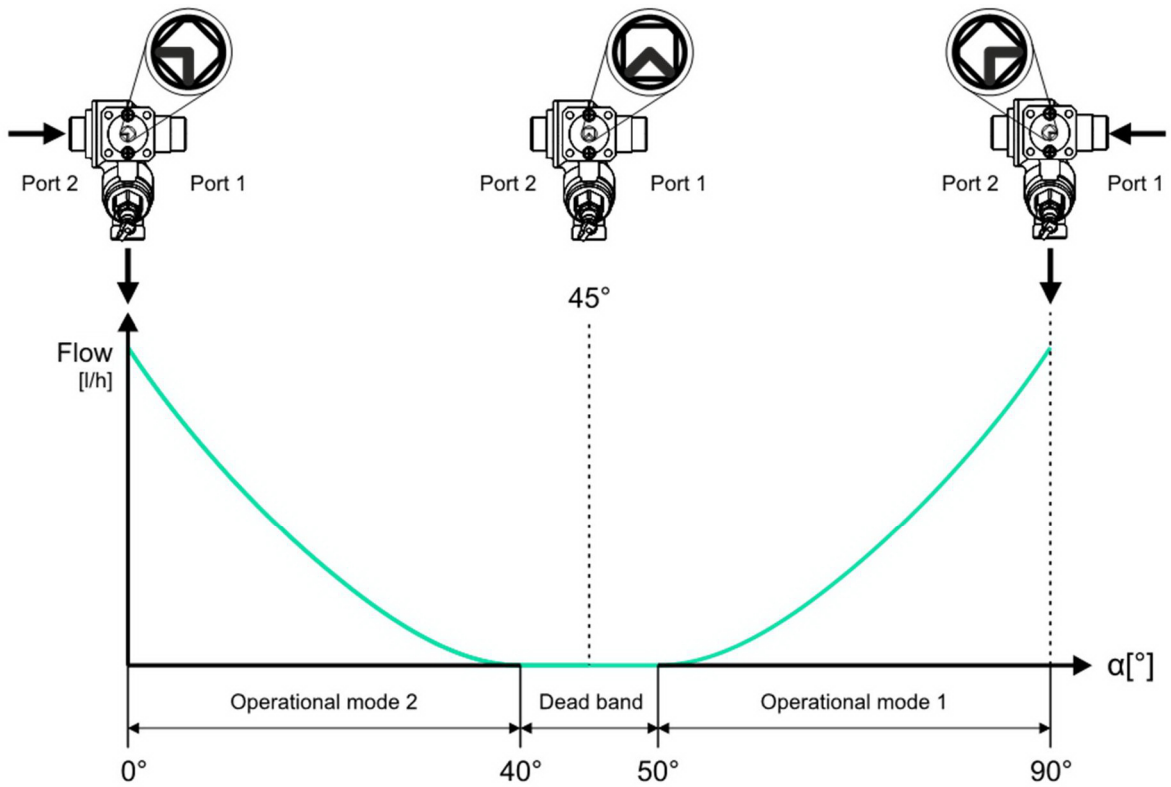
1 Differential pressure regulator

2 Characterized ball valve designed for modulating control and switching between heating or cooling (inlet)

3 P/T plugs (optional)

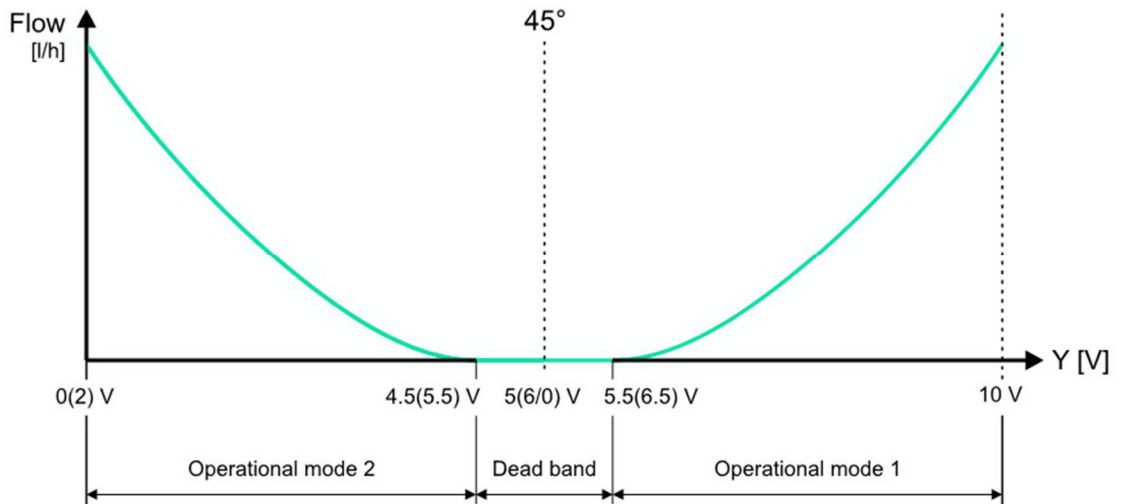
4 Ball valve for switching between heating or cooling (outlet)

The 6-port PICV enables control between two sources through positions 0° and 90° and it is closed at 45°.



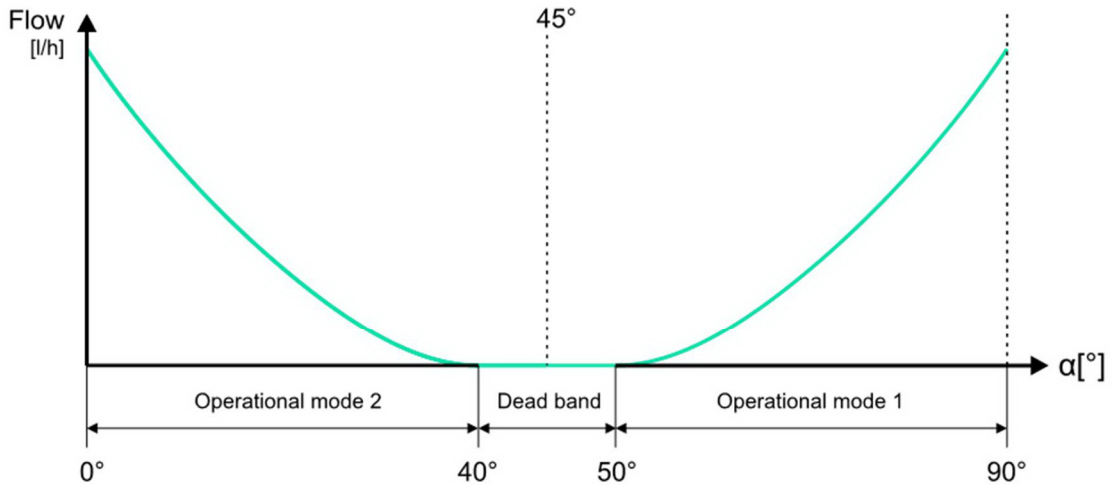
Note that the valve angle  $\alpha$  [°] moves counter-clockwise (CCW). The GDB161.9../.6.. actuators' default rotation direction is CCW, therefore:

- GDB161.9../.6P & GDB161.9../.6W** — a valve angle of 90° is achieved by a 10 V actuator control signal, while a valve angle of 0° is achieved by a 0(2) V actuator control signal. The dead band zone is fixed. The closed position is always achieved by a 5(6/0) V actuator control signal.



Note: Values in brackets refer to a 2...10 V control signal, e.g. 0(2).  
 (6/0) – with a 2...10 V control signal, the actuator drives the valve to the closed position (45°) for open Y signal input (0 V).

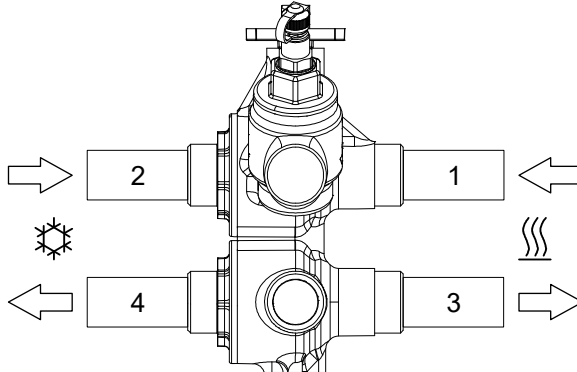
- **GDB161.9E/MO6P** — a valve angle of 90° is achieved by an actuator position of 100 %, while a valve angle of 0° is achieved by an actuator position of 0 %.



Actuator position	0%	45%	50%	55%	100%
Setpoint mode 2	100%	0.01%	0%	0%	0%
Setpoint mode 1	0%	0%	0%	0.01%	100%

Cooling and heating allocation is freely selectable. However, Siemens suggests an equal allocation for all valves during installation for safety reason as below:

- Operational mode 2 (ports 2-4) = cooling
- Operational mode 1 (ports 1-3) = heating

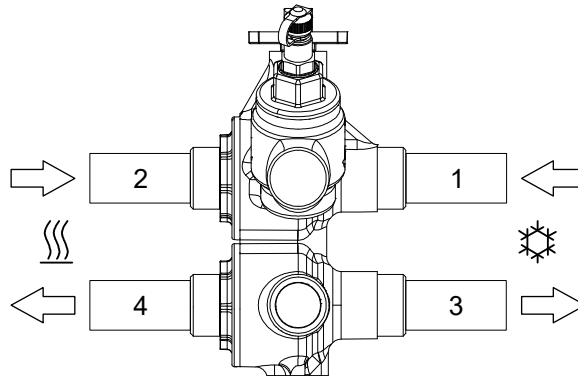


Where:

- Max. position heating corresponds to 100 % actuator position (GDB161.9E/MO6P)
- Max. position heating correspond to 10 V (GDB161.9../6P & GDB161.9../6W)

CCW is considered the default rotation direction for the GDB161.9../.6.. series actuators. By changing rotation direction to CW, the heating and cooling sides are swapped and the conditions below come into play:

- Operational mode 2 (ports 2-4) = heating
- Operational mode 1 (ports 1-3) = cooling



**Basis of calculation:**

- Determine energy demand Q [kW] for cooling and heating.
- Determine temperature differential  $\Delta T$  [K] for cooling and heating.
- Calculate volumetric flow for cooling and heating.

$$\dot{v} = \frac{Q[\text{kW}] \cdot 1000}{1.163 \cdot \Delta T[\text{K}]} \left[ \frac{\text{l}}{\text{h}} \right]$$

- Select suitable 6-port PICV model – with or without P/T ports.
- Determine setting using:
  - Volumetric flow/pre-setting scale, see the following section (manual pre-setting through screws on the GDB161.9../6P series actuators)
  - Volumetric flow/voltage signal
  - Volumetric flow/bus parameter (Modbus)

## Example of sizing:

Design	Determining volumetric flow	Volumetric flow
$Q_H = 3.1 \text{ kW}$ $\Delta T_H = 12 \text{ K}$	$v_H = \frac{Q_H}{\Delta T \cdot c \cdot \rho} = \frac{3100 \text{ W} \cdot \text{kg} \cdot \text{K} \cdot \text{m}^3}{12 \text{ K} \cdot 1.163 \text{ Wh} \cdot 1000 \text{ kg}} = 0.222 \frac{\text{m}^3}{\text{h}} = 222.13 \frac{\text{l}}{\text{h}}$	Heating: 222.13 l/h
$Q_C = 2.4 \text{ kW}$ $\Delta T_C = 6 \text{ K}$	$v_C = \frac{Q_C}{\Delta T \cdot c \cdot \rho} = \frac{2400 \text{ W} \cdot \text{kg} \cdot \text{K} \cdot \text{m}^3}{6 \text{ K} \cdot 1.163 \text{ Wh} \cdot 1000 \text{ kg}} = 0.344 \frac{\text{m}^3}{\text{h}} = 343.94 \frac{\text{l}}{\text{h}}$	Cooling: 343.94 l/h
$\rho_{\text{Water}} = 1000 \text{ kg/m}^3$		

- The valve shall have connections with external threads to ISO 228-1 and size DN15.
- 6-port PICV selection: VWPG51.15L0.9 (externally threaded connections, no pressure test points P/T, nominal volumetric flow 820 l/h)
- Determine setting using:
  - Volumetric flow/pre-setting scale (manual pre-setting through screws on the GDB161.9../6P series actuators)
    - Flow cooling 346 l/h – pre-setting scale 2.6
    - Flow heating 221 l/h – pre-setting scale 2.2
  - Volumetric flow/voltage signal (GDB161.9../6P, GDB161.9../6W)
    - Flow cooling 346 l/h – 1.4 V (0...10 V) or 3.1 V (2...10 V) signal
    - Flow heating 221 l/h – 8.2 V (0...10 V) or 8.5 V (2...10 V) signal
  - Volumetric flow/bus parameter (GDB161.9E/MO6P)
    - Flow cooling 346 l/h – Modbus Max. Limit Cooling = 7115
    - Flow heating 221 l/h – Modbus Max. Limit Heating = 5918

## Flow pre-setting

Below, tables are listed to determine the position setting for a desired flow.

$\Delta p_{\text{min}}$  [kPa] values are based on flow; interpolate missing values.

Manual pre-setting can only be done using the screws on the GDB161.9../6P types.

Refer to the datasheet A6V12986395 for more information regarding the pre-setting options for the other GDB161.9../6.. types.



The pre-setting tables indicate the expected nominal flow. During commissioning, check whether current pre-settings correspond to the planned design. Further adjustment of the pre-settings may be required to achieve the needed flow.

## VWPG51.15L0.9Q, VWPG51.15L0.9

Manual pre-setting (screws on GDB161.9../6P actuator)														820 l/h nominal			
<b>V̇</b> [l/h]	35	43	58	73	86	99	117	142	166	221	276	346	432	518	628	738	820
<b>Scale</b>	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	4.0
<b>Δp<sub>min</sub></b> [kPa] (p1-p3)	4	4	5	6	7	8	8	9	10	11	11	12	12	13	15	17	18

Signal pre-setting								
Measured flow [l/h]	0...10 V signal		2...10 V signal		Bus setting		Δp <sub>min</sub> <sup>1)</sup> (p1-p3) [kPa]	Total pressure loss <sup>2)</sup>
	Cooling	Heating	Cooling	Heating	Cooling	Heating		
820	0.0	10.0	2.0	10.0	10000		18	24
738	0.4	9.6	2.4	9.6	9578		17	22
628	0.7	9.3	2.6	9.4	8948		15	19
518	0.9	9.1	2.8	9.2	8298		13	16
432	1.1	8.9	2.9	9.1	7755		12	15
346	1.4	8.6	3.1	8.9	7115		12	14
276	1.6	8.4	3.3	8.7	6513		11	12
221	1.8	8.2	3.5	8.5	5918		11	11
166	2.1	7.9	3.7	8.3	5108		10	10
142	2.2	7.8	3.8	8.2	4593		9	9
117	2.4	7.6	3.9	8.1	3993		8	8
99	2.6	7.4	4.1	7.9	3483		8	8
86	2.9	7.1	4.3	7.7	2985		7	7
73	3.1	6.9	4.5	7.5	2413		6	6
58	3.4	6.6	4.7	7.3	1700		5	5
43	3.7	6.3	4.9	7.1	1113		4	4
35	3.8	6.2	5.1	6.9	730		4	4
10	4.5	5.5	5.5	6.5	270		4	4
0	5.0		6.0		0		0	

1) For flow verification

2) For pump calculation



## VWPG51.15F1.2Q, VWPG51.15F1.2

Manual pre-setting (screws on GDB161.9../6P actuator)													1200 l/h nominal			
<b>V̇</b> [l/h]	210	268	327	383	438	493	556	619	704	811	919	1007	1096	1152	1176	1200
<b>Scale</b>	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
<b>Δp<sub>min</sub></b> [kPa] (p1-p3)	15	15	15	15	15	15	16	17	17	18	19	20	21	21	22	23

Signal pre-setting								
Measured flow [l/h]	0...10 V signal		2...10 V signal		Bus setting		Δp <sub>min</sub> <sup>1)</sup> (p1-p3) [kPa]	Total pressure loss <sup>2)</sup>
	Cooling	Heating	Cooling	Heating	Cooling	Heating		
1200	0.0	10.0	2.0	10.0	10000		23	36
1176	0.3	9.7	2.3	9.7	9673		22	34
1152	0.4	9.6	2.4	9.6	9575		21	32
1096	0.5	9.5	2.5	9.5	9228		21	31
1007	0.8	9.2	2.7	9.3	8620		20	29
919	1.0	9.0	2.8	9.2	8183		19	27
811	1.2	8.8	3.0	9.0	7680		18	25
704	1.5	8.5	3.2	8.8	7098		17	23
619	1.7	8.3	3.4	8.6	6470		17	21
556	2.0	8.0	3.6	8.4	5895		16	19
493	2.2	7.8	3.8	8.2	5225		15	17
438	2.4	7.6	4.0	8.0	4665		15	17
383	2.7	7.3	4.2	7.8	4118		15	16
327	2.9	7.1	4.3	7.7	3525		15	16
268	3.1	6.9	4.5	7.5	2940		15	15
210	3.3	6.7	4.7	7.3	2368		15	15
175	3.6	6.4	4.9	7.1	2028		15	15
129	3.9	6.1	5.1	6.9	1530		15	15
53	4.2	5.8	5.3	6.7	768		15	15
10	4.4	5.6	5.5	6.5	350		15	15
0	5.0		6.0		0		0	

1) For flow verification

2) For pump calculation

VWPG51.20F4.3Q, VWPG51.20F4.3

Manual pre-setting (screws on GDB161.9../6P actuator)													4250 l/h nominal			
<b>V [l/h]</b>	460	604	749	919	1114	1310	1540	1769	2029	2318	2608	3007	3406	3734	3992	4250
<b>Scale</b>	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
<b>Δp<sub>min</sub> [kPa] (p<sub>1</sub>-p<sub>3</sub>)</b>	17	17	17	18	18	18	19	20	21	22	23	26	29	32	35	38

Signal pre-setting								
Measured flow [l/h]	0...10 V signal		2...10 V signal		Bus setting		Δp <sub>min</sub> <sup>1)</sup> (p <sub>1</sub> -p <sub>3</sub> ) [kPa]	Total pressure loss <sup>2)</sup>
	Cooling	Heating	Cooling	Heating	Cooling	Heating		
4250	0.0	10.0	2.0	10.0	10000		38	56
3992	0.3	9.7	2.3	9.7	9773		35	51
3734	0.4	9.6	2.4	9.6	9665		32	46
3406	0.6	9.4	2.5	9.5	9360		29	40
3007	0.8	9.2	2.7	9.3	8838		26	35
2608	1.1	8.9	2.9	9.1	8180		23	30
2318	1.3	8.7	3.1	8.9	7565		22	28
2029	1.5	8.5	3.3	8.7	6945		21	26
1769	1.7	8.3	3.4	8.6	6403		20	24
1540	2.0	8.0	3.6	8.4	5843		19	22
1310	2.2	7.8	3.8	8.2	5255		18	20
1114	2.4	7.6	4.0	8.0	4723		18	19
919	2.6	7.4	4.1	7.9	4165		18	19
749	2.9	7.1	4.3	7.7	3565		17	18
604	3.1	6.9	4.5	7.5	2965		17	18
460	3.3	6.7	4.7	7.3	2350		17	17
265	3.6	6.4	4.9	7.1	1468		17	17
180	3.9	6.1	5.1	6.9	1065		17	17
95	4.2	5.8	5.3	6.7	575		17	17
10	4.5	5.5	5.5	6.5	158		17	17
0	5.0		6.0		0		0	

- 1) For flow verification
- 2) For pump calculation

## Type summary

Type	Stock number	DN	Connections		Flow [l/h]		Test points
			[inch]		Min.	Max.	
VWPG51.15L0.9Q	S55264-V179	15	G 3/4 "	externally threaded	35	820	P/T port
VWPG51.15L0.9	S55264-V180						-
VWPG51.15F1.2Q	S55264-V181				210	1200	P/T port
VWPG51.15F1.2	S55264-V182						-
VWPG51.20F4.3Q	S55264-V185	20	G 1 "		460	4250	P/T port
VWPG51.20F4.3	S55264-V186						-



For  $\Delta p$  measurement, VWPG51..Q and ALP.. test point fittings are needed. ALP.. must be ordered separately.

### Ordering

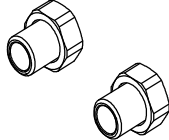
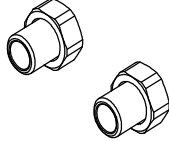
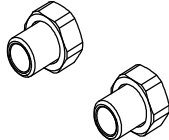
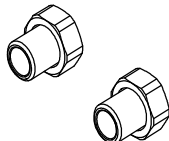
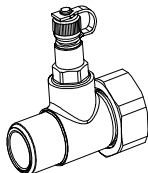
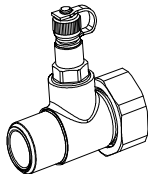
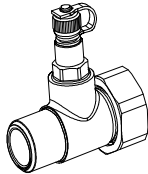
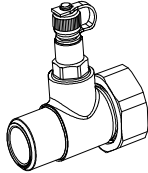
Indicate type, stock number, order text and quantity when ordering. Example:

Type	Stock number	Order text	Quantity
VWPG51.15L0.9Q	S55264-V179	6-port mPICV DN15	1
GDB161.9E/6P	S55499-D801	6-port actuator, modulating	1
ALP55	S55846-Z142	P/T coupling DN15 G 3/4" - G 1/2"A	1


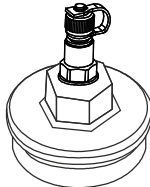


### Delivery

6-port pressure independent control valve (in a closed position – 45°), rotary actuator with mounting kits, individually packaged.

Fittings

Type	Stock number	Connections		Description
		Valve	Coupling	
 <p>ALN14.152B</p>	S55846-Z150	G ¼ "	R ½ "	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 2x cap nuts</li> <li>• 2x cap nuts with sleeves and insert per ISO 228-1</li> <li>• 2x flat seals</li> </ul>
 <p>ALN14.202B</p>	S55846-Z151	G ¼ "	R ¾ "	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 2x cap nuts</li> <li>• 2x cap nuts with sleeves and insert per ISO 228-1</li> <li>• 2x flat seals</li> </ul>
 <p>ALN15.202B/1</p>	S55846-Z152	G 1 "	R ¾ "	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 2x cap nuts</li> <li>• 2x cap nuts with sleeves and insert per ISO 228-1</li> <li>• 2x flat seals</li> </ul>
 <p>ALN15.252B</p>	S55846-Z153	G 1 "	R 1 "	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 2x cap nuts</li> <li>• 2x cap nuts with sleeves and insert per ISO 228-1</li> <li>• 2x flat seals</li> </ul>
 <p>ALP55</p>	S55846-Z142	G ¼ "	G ½ "A	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 1x cap nut</li> <li>• 1x P/T coupling with sleeves and insert per ISO 228-1</li> <li>• 1x flat seal</li> </ul>
 <p>ALP56</p>	S55846-Z143	G ¼ "	G ¾ "A	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 1x cap nut</li> <li>• 1x P/T coupling with sleeves and insert per ISO 228-1</li> <li>• 1x flat seal</li> </ul>
 <p>ALP57</p>	S55846-Z144	G 1 "	G ¾ "A	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 1x cap nut</li> <li>• 1x P/T coupling with sleeves and insert per ISO 228-1</li> <li>• 1x flat seal</li> </ul>
 <p>ALP58</p>	S55846-Z145	G 1 "	G 1 "A	Fittings set made of DZR brass, consisting of: <ul style="list-style-type: none"> <li>• 1x cap nut</li> <li>• 1x P/T coupling with sleeves and insert per ISO 228-1</li> <li>• 1x flat seal</li> </ul>

## Pressure test points P/T accessories

Type	Stock number	Description
ALP59 	S55846-Z148	Spare nipple P/T port for VWPG51.15L0.9.. and VWPG51.15F1.2.. (DN15 models)
ALP60 	S55846-Z149	Spare nipple P/T port for VWPG51.20.. (DN20 model)
ALE10 	ALE10	<p>Electronic manometer <b>excluding</b> measuring lines and measuring tips. Measuring range 0...700 kPa.</p> <p>A differential pressure of more than 1000 kPa will destroy the pressure sensor.</p> <p>For measuring the differential pressure between P1 and P3 of the valves (refer to diagram under "Functional principle").</p> <p>Functions of the manometer:</p> <ul style="list-style-type: none"> <li>• Start/stop</li> <li>• Automatic zero position</li> <li>• Backlit display</li> <li>• Display: Out ► outside the measuring range</li> </ul> <p>Holding function</p>
ALE11 	ALE11	Measuring lines and straight measuring tips for use with Siemens PICVs. Equipped with G 1/8" connection with 2 x 40 mm needles.

## Insulation shells

Type	Stock number	Description
ALI15VWPG51	S55846-Z146	Insulation shell for VWPG51.15..
ALI20VWPG51	S55846-Z147	Insulation shell for VWPG51.20..



The insulation shells ALI15VWPG51 and ALI20VWPG51 may only be used for heating applications.

Overview of rotary actuators for the 6-port control ball valves

Type	Stock number	Torque	Operating voltage	Positioning		Cable length	Datasheet <sup>1)</sup>
				Signal	Time		
GDB161.9E/6W	S55499-D784	5 Nm	AC 24 V / DC 24...48 V	DC 0/2...10 V	150	0.9 m	A6V12986395
GDB161.9E/6P	S55499-D801					3 m	
GDB161.9G/6W	S55499-D829					5 m	
GDB161.9G/6P	S55499-D827					0.9 m	
GDB161.9H/6W	S55499-D830						
GDB161.9H/6P	S55499-D828						
GDB161.9E/MO6P	S55499-D802		AC/DC 24 V	Modbus RTU			

<sup>1)</sup> Documents can be downloaded at [www.siemens.com/bt/download](http://www.siemens.com/bt/download).

Application examples for the device combinations: See Application examples [► 20].

Product documentation

Topic	Title	Document ID
Mounting	Mounting instructions 6-port pressure independent control ball valve (PICV) VWPG51..	A6V12814982
Datasheet: Technical information	Rotary actuators for 6-port ball valves GDB161.9../.6..	A6V12986395
Mounting	Mounting instructions rotary actuator GDB161.9E/..6..	A6V12815008

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

[www.siemens.com/bt/download](http://www.siemens.com/bt/download)

**Note the following when servicing a ball valve/rotary actuator:**



- Switch off both pump and operating voltage.
- Close shutoff valves.
- Release pressure in the pipes and allow them to cool down completely.
- Disconnect electrical connections from the terminals as needed.
- The rotary actuator must be properly installed prior to recommissioning the ball valve.
- Ensure that there is no cavitation.
- Install filter to increase functional security.


**Technical design/mechanical design**

The Siemens 6-port pressure independent control ball valve has an internal pressure equalization function that ensures the safe operation of heated and chilled ceilings and fan coils in a closed valve state (45° position). Changes to media temperature in the heated and chilled ceiling or fan coil can result in over- or underpressure in a closed state and may, under certain circumstances even damage part of the heated and chilled terminal unit.

The safety function only acts in the closed valve position (45°). The heating and cooling circuits are safely separated while operating.

**Safety**

 <b>CAUTION</b>	
	<p><b>National safety regulations</b></p> <p>Failure to comply with national safety regulations may result in personal injury and property damage.</p> <ul style="list-style-type: none"> <li>• Observe national provisions and comply with the appropriate safety regulations.</li> </ul>

<b>NOTICE</b>	
	<p><b>Use of rotary actuator</b></p> <p>Commission the 6-port pressure independent control ball valve only after it is correctly coupled with the rotary actuator.</p>

## Mounting

It is easy to assemble the ball valve and rotary actuator; it can be done at the construction site. No special tools or settings required.

The 6-port PICV is delivered with mounting instructions A6V12814982.

For additional information on applicable documentation, see Product documentation [► 14].

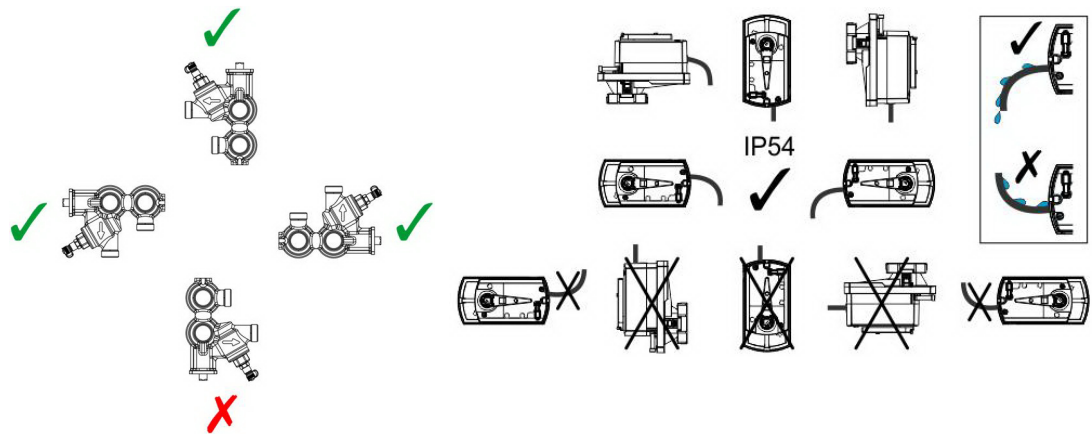
### NOTICE



**Conduct a function test before installing the device.**

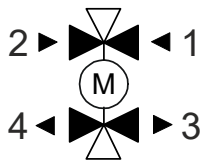
Manually operate in full the device one time.

### Mounting position



### Flow direction

Make sure that the valve is mounted in the proper flow direction. Flow direction is indicated on the ball valve body by the symbol on the type label:



## Commissioning

The 6-port PICV is delivered in closed position (middle position, 45°).

The rotary actuator must be properly mounted before commissioning the 6-port PICV.

The 6-port PICV has to be open when flushing or pressure testing the system. Flush only in correct flow direction. Strong pressure impacts can damage closed 6-port PICVs.

Differential pressure  $\Delta p_{max}$  across the valve's control path is not allowed to exceed 400 kPa.



## Maintenance

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The 6-port pressure independent control ball valve VWPG51... is maintenance free without cartridge.

Valve plug, stem, diaphragm etc. may not be disassembled when performing service work on the valve and / or actuator:

- Switch off the pump and disconnect power supply.
- Close the shut-off valves in the piping network.
- Fully reduce pressure in the piping network and allow the pipes to cool down completely.
- Remove the electrical connections only if necessary.

The stem sealing gland cannot be exchanged. Should leakage occur, the whole valve must be replaced.

## Disposal

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The valve is considered an electronic device for disposal in accordance with European guidelines and may not be disposed of as domestic waste.

- Dispose of the valve through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

## Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Functional data		
PN class		PN 25
Operating pressure		400 kPa (4 bar)
Differential pressure	Max.	400 kPa (4 bar)
	Min.	See Flow pre-setting [▶ 7]
Leakage rate		Class IV (0...0.01 % of volumetric flow $V_{100}$ ) to EN 1349
Permissible media		Chilled water, hot water, water with anti-freeze (max. 50 % glycol) Recommendation: Water treatment per VDI 2035
Medium temperature		0...90 °C
Rotational angle		90° Valve closed at 45°
Average flow accuracy		± 20 l/h below 200 l/h from $\Delta p_{min}$ to $\Delta p_{max}$ ± 10 % above 200 l/h from $\Delta p_{min}$ to $\Delta p_{max}$

Materials		
Ball valve body		Dezincification resistant brass (DZR), CW602N
Ball		Dezincification resistant brass (DZR), nickel plated
Gasket		PTFE, glass and carbon fiber reinforced
DP	Regulator	PPS 40 % glass
	Spring	Stainless steel
	Diaphragm	HNBR
	Rotator	PPO
O-rings		EPDM
Stem		Stainless steel
Actuator mounting plate		PPS GF40

Material insulation shells		
Material		EPE (Crosslinked Expanded Polyethylene)
Water absorption		< 1 vol% at 20 °C
Temperature range		up to 90 °C
Insulating property	Lambda	0.041 W/mk
Density		30 g/l
Fire resistant	according to	DIN 4102: B2

Dimensions / Weight	
W / D / H, weight	See Dimensions [▶ 21]
Connections with external threading	G per ISO 228-1

Standards, guidelines	
Pressure Equipment Directive	DGR 2014/68/EU
Pressure accessories	Range Article 1, para. 1
	Definition Article 2, para. 5
Fluid group 2	Without CE certification as per article 4, para. 3 (generally applicable engineering practice) <sup>1)</sup>

Environmental compatibility
The product environmental declaration A6V13199575 <sup>2)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

<sup>1)</sup> Fittings for a product where  $PS \times DN < 1000$ , do not require special testing and cannot have CE labeling.

<sup>2)</sup> Documents can be downloaded at: [www.siemens.com/bt/download](http://www.siemens.com/bt/download).

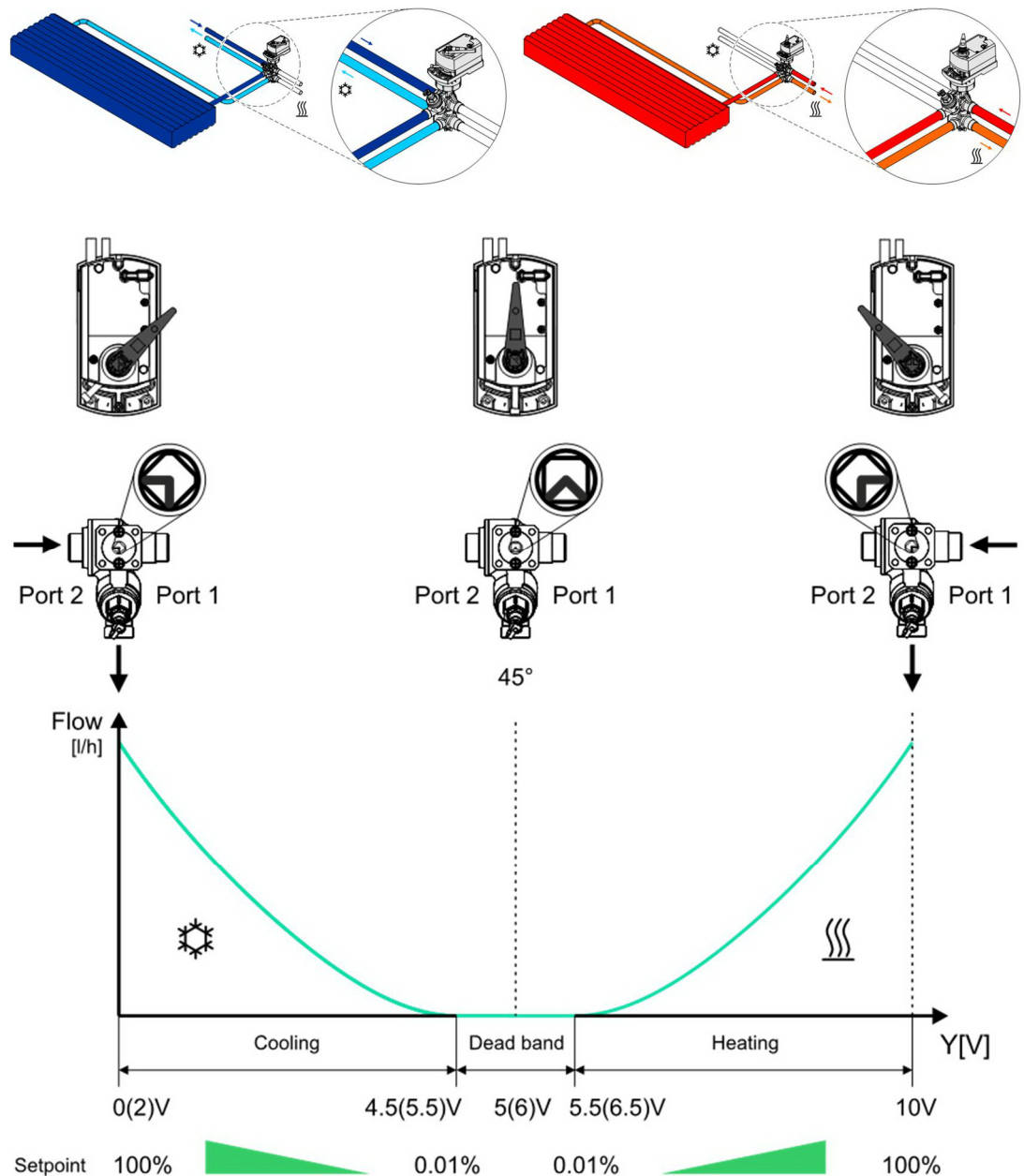
## Application examples

Pressure independent valves in HVAC systems combined with variable speed pumps provide even higher energy efficiency. When sizing the pump, it must be made certain that the most critical branch or consumer in the system – usually the remotest from the pump – gets enough pressure (pump head). Thus, it is recommended to use a variable speed pump in constant-pressure mode with end-point feedback, to maintain a minimum differential pressure across the critical valve.

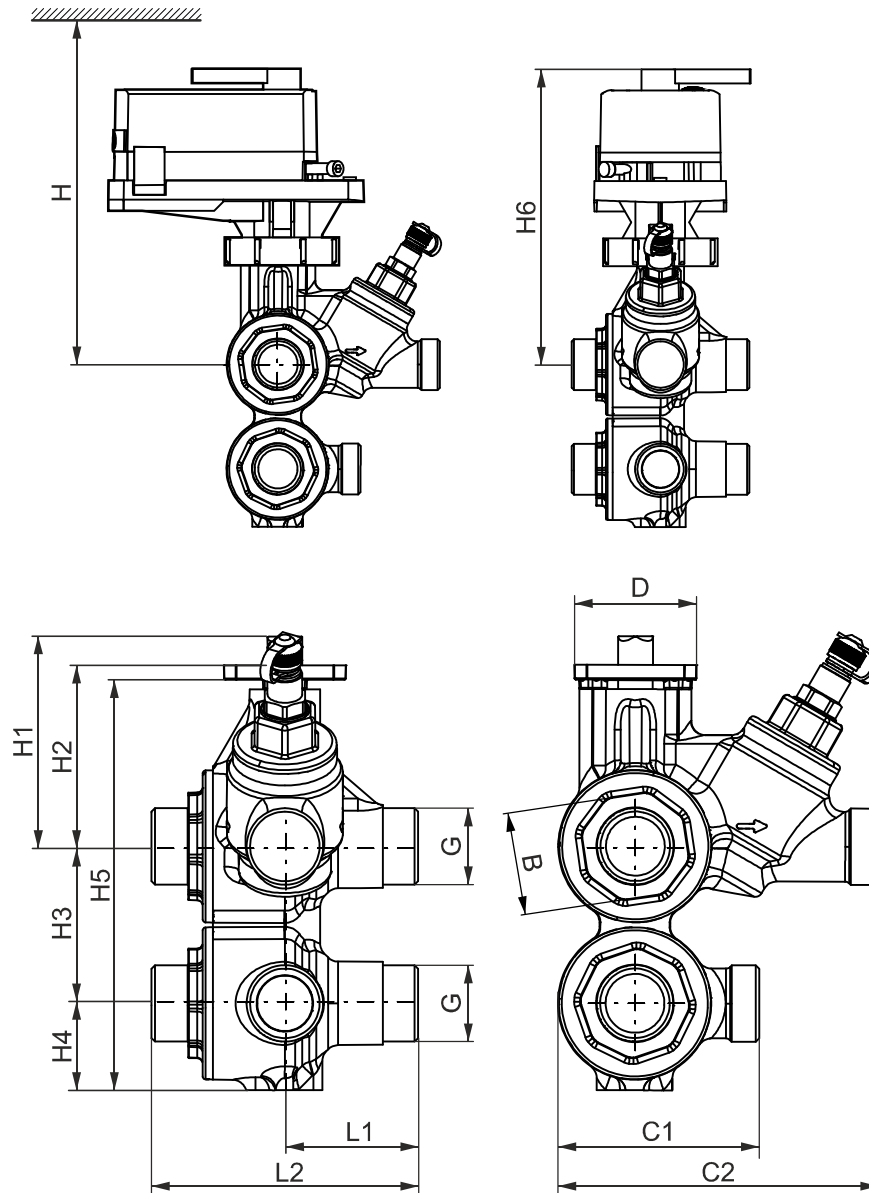
### Dynamic hydraulically balanced solution

In this application, the 6-port pressure independent ball valve controls the primary flow for the application and shifts from cooling to heating, or vice versa.

- Stem rotates counter-clockwise (CCW) ► Heating sequence opens
- Stem rotates clock-wise (CW) ► Cooling sequence opens
- GDB161.9../.6.. actuator rotation direction ► counter-clockwise (CCW)



## Dimensions



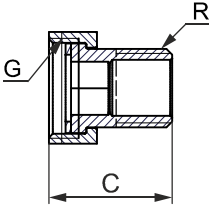
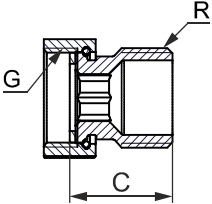
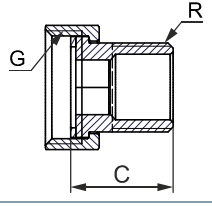
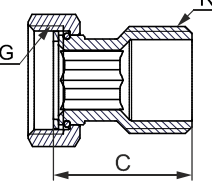
D = Normal size

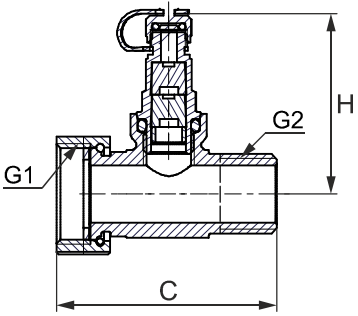
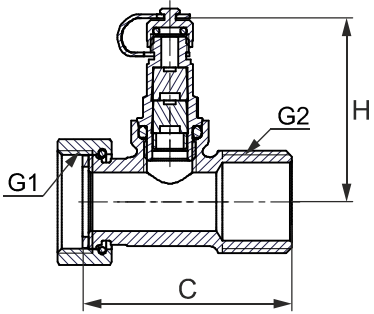
H = Total height including actuator to wall or ceiling, for mounting, connection, operation, maintenance, etc.

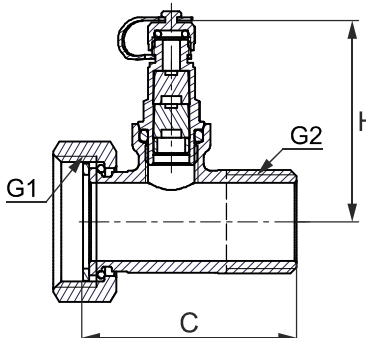
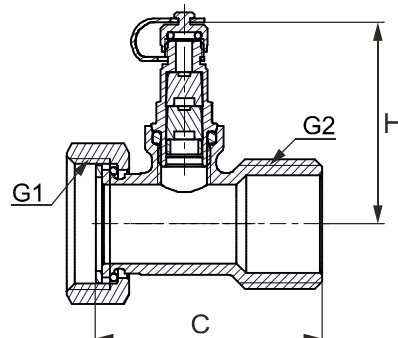
H1 = Dimension from the pipe to the center to install actuator (upper edge)

Type	DN	G	H	H1	H2	H3	H4	H5	H6	L1	L2	B	C1	C2	D	Weight
		[inch]	[mm]													
VWPG51.15L0.9Q	15	G ¾"	>200	73	63	54	30	142	164	46	92	36	70	111	42	1.9
VWPG51.15L0.9																1.7
VWPG51.15F1.2Q																1.9
VWPG51.15F1.2																1.7
VWPG51.20F4.3Q	20	G 1"	>230	80	70	69	38	172	171	55	110	50	84	154	42	3.4
VWPG51.20F4.3																3.2

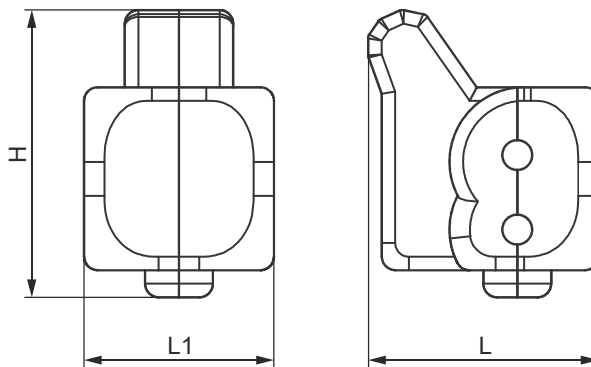
## Accessories

	Type	Stock number	Valve type	G	R	C	Weight
				[inch]		[mm]	[kg]
	ALN14.152B	S55846-Z150	VWPG51.15..	G 3/4 "	R 1/2 "	28.5	0.149
	ALN14.202B	S55846-Z151	VWPG51.15..	G 3/4 "	R 3/4 "	27.5	0.180
	ALN15.202B/1	S55846-Z152	VWPG51.20..	G 1 "	R 3/4 "	30.5	0.242
	ALN15.252B	S55846-Z153	VWPG51.20..	G 1 "	R 1 "	42.5	0.296

	Type	Stock number	Valve type	G1	G2	C	H	Weight
				[inch]		[mm]		[kg]
	ALP55	S55846-Z142	VWPG51.15..	G 3/4 "	G 1/2 " A	51	50	0.160
	ALP56	S55846-Z143	VWPG51.15..	G 3/4 "	G 3/4 " A	54	50	0.175

	Type	Stock number	Valve type	G1	G2	C	H	Weight
				[inch]		[mm]	[mm]	[kg]
	ALP57	S55846-Z144	VWPG51.20..	G 1 "	G 3/4 " A	54.5	54	0.198
	ALP58	S55846-Z145	VWPG51.20..	G 1 "	G 1 " A	57.5	54	0.228

**Insulation shells**



Type	Valve type	L	L1	H	Weight
		[mm]			[kg]
ALI15VWPG51	VWPG51.15..	170	140	212	0.114
ALI20VWPG51	VWPG51.20..	195	155	233	0.172

## Revision numbers

Type	Valid from rev. no.
VWPG51.15L0.9Q	..A
VWPG51.15L0.9	..A
VWPG51.15F1.2Q	..A
VWPG51.15F1.2	..A
VWPG51.20F4.3Q	..A
VWPG51.20F4.3	..A





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