

ACVATIX™

6-port Pressure Independent Control Ball Valve (PICV)

VWPG51..



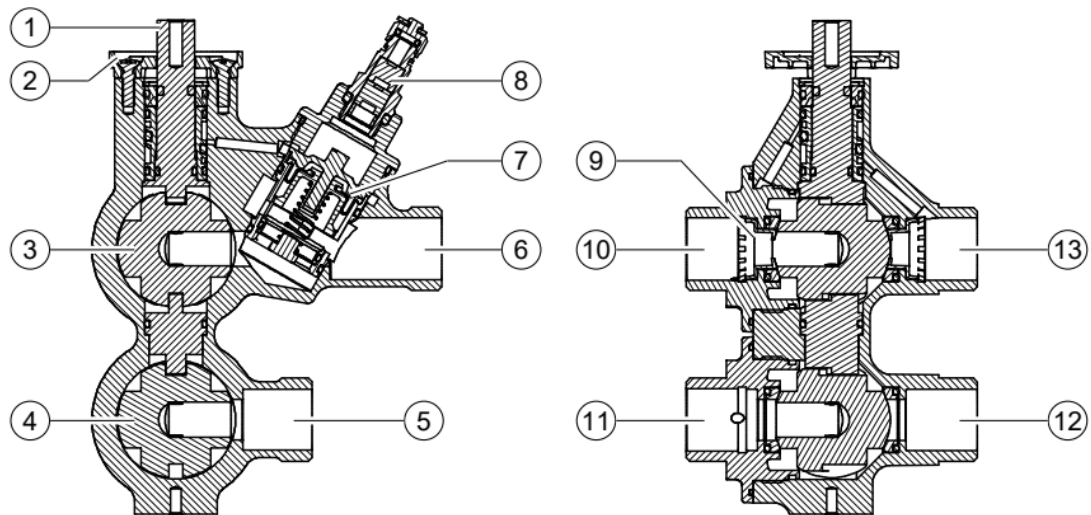
For rooms, zones, ventilation and air-conditioning systems

- 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 covers ALI.. made of EPE (Crosslinked Expanded Polyethylene)
- Version with pressure test point for Δp measurement (optional)
- Test point fitting sets ALP.. for Δp measurement (optional) with external threading per ISO 228-2
- Rotational angle 90°
- Can be combined with electromotoric rotary actuators:
GDB161.9../6P, GDB161.9../6W and GDB161.9E/MO6P

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

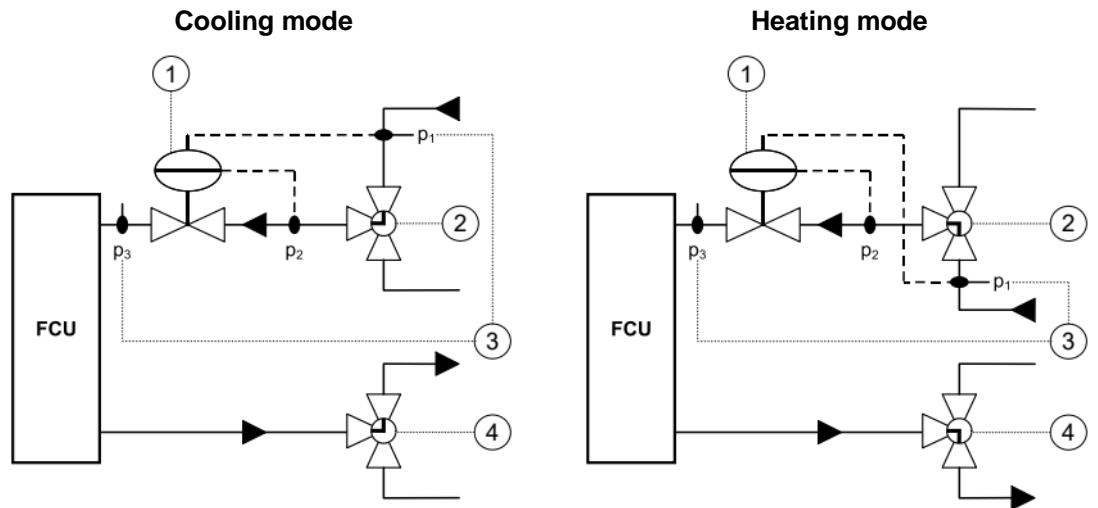


- | | |
|-----------------------------------|------------------------------|
| 1 Stem for actuator | 2 Adapter plate for actuator |
| 3 Ball for flow control | 4 Ball |
| 5 Inlet from consumer | 6 Outlet to consumer |
| 7 Differential pressure regulator | 8 P/T plug (optional) |
| 9 Low flow orifice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

Functional principle

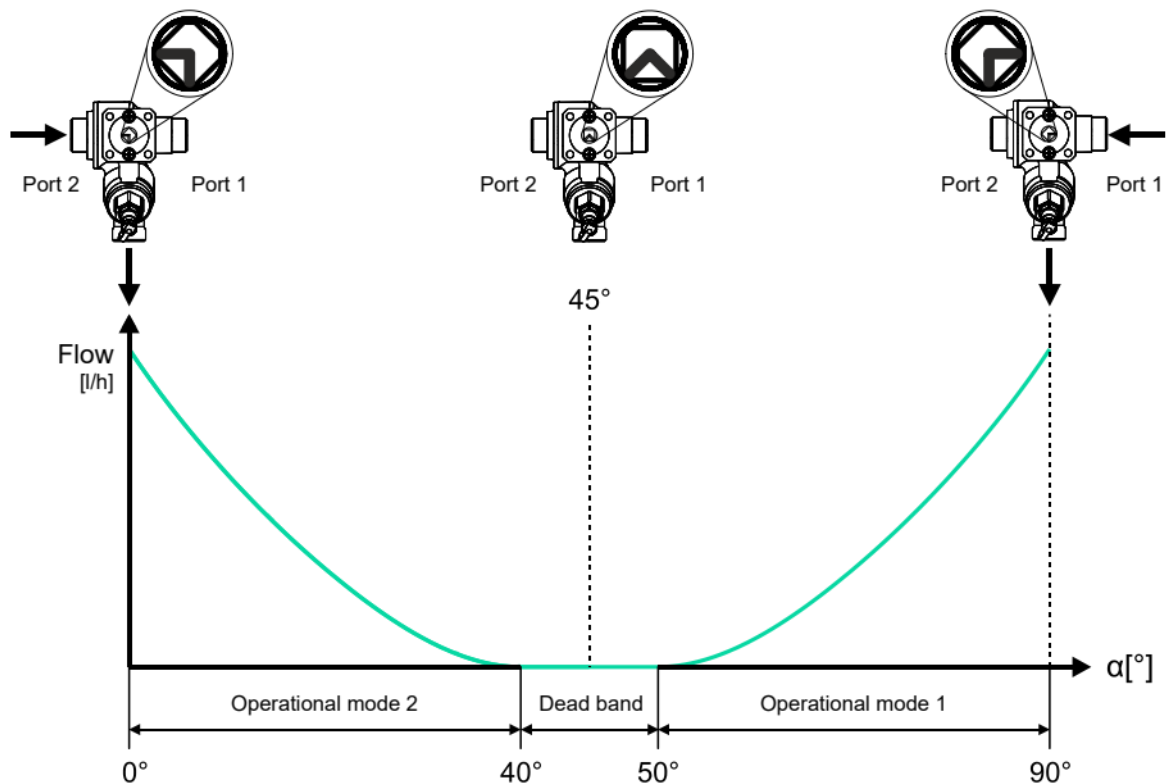
The differential pressure regulator within the 6-port PICV body maintains the differential pressure over the valve on the inlet side, for both cooling and heating flows.

When the 6-port PICV is shifting from cooling to heating, or vice versa, the inlet pressure P1 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.



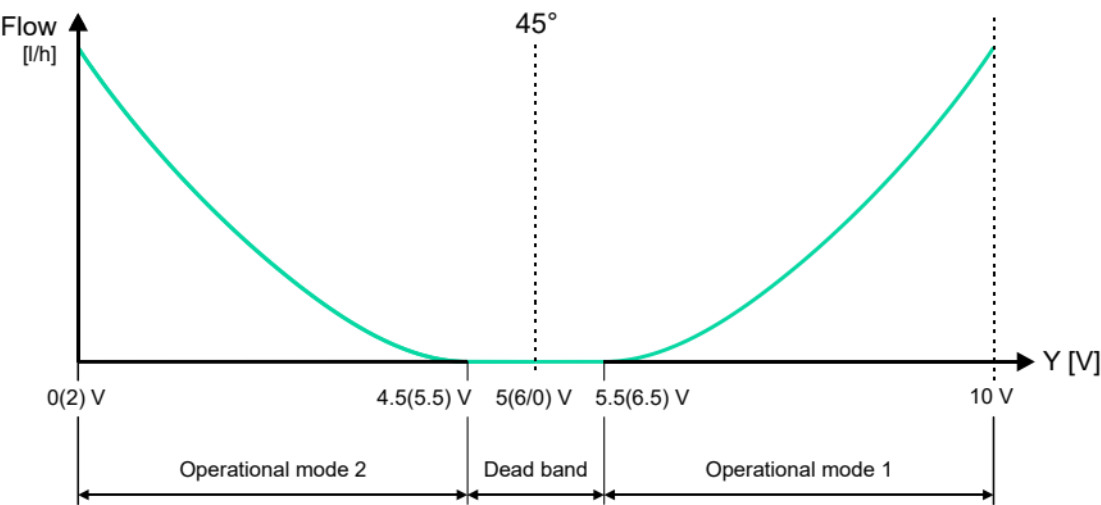
- | | | | |
|---|---------------------------------|---|---|
| 1 | Differential pressure regulator | 2 | Characterized ball valve designed for modulating control and switching between heating or cooling (inlet) |
| 3 | P/T plugs (optional) | 4 | Ball valve for switching between heating or cooling (outlet) |

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



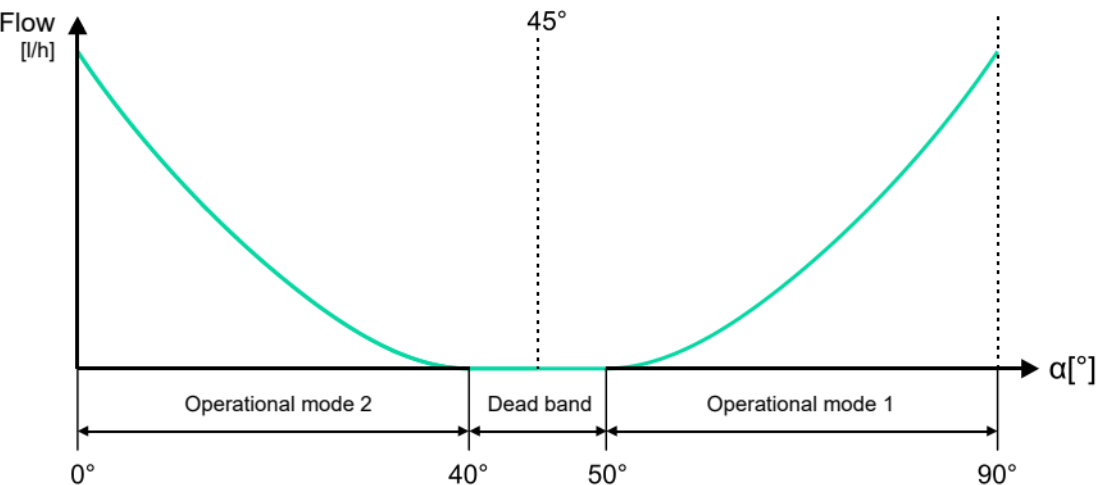
Note that the valve angle α [°] moves counter-clockwise (CCW). The GDB161.9../.6.. actuators' default rotation direction is CCW, therefore:

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).

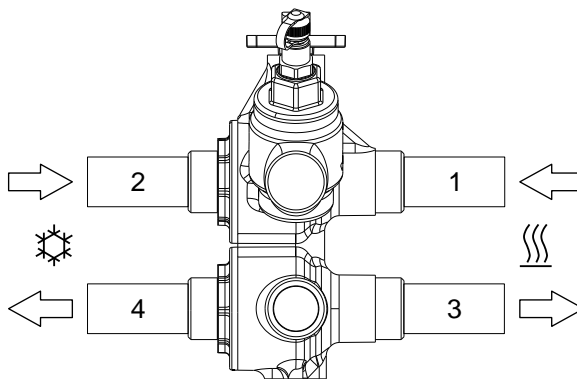
GDB161.9E/MO6P — a valve angle of 90° is achieved by an actuator position of 100 %, while a valve angle of 0° is achieved by an actuator position of 0 %.



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

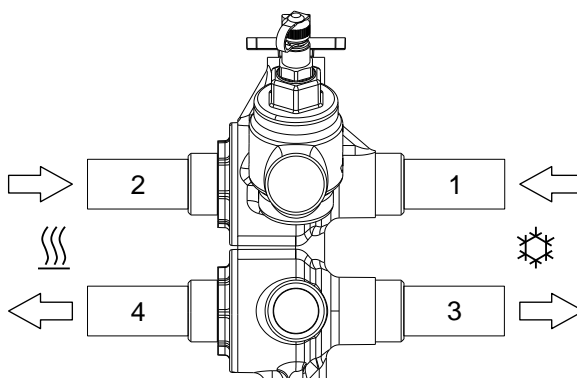


Where:

- 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



Type	Stock number	DN	Connections		Flow [l/h]		Test points
			[inch]		Min.	Max.	
VWPG51.15L0.9Q	S55264-V179	15	G ¾ "	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 Δp 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 PICV 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

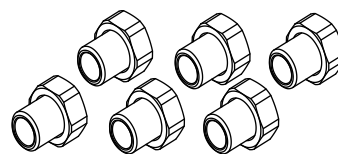
6-port pressure independent control valve (in a closed position – 45°), rotary actuator with mounting kits, individually packaged.

An M4 x 8 mm screw and a DIN 125 washer are required to attach the valve to the mounting bracket ALP61. The screw and washer are not included in the delivery.

Fittings ALN..

Fittings set made of DZR brass, consisting of:

- 6x cap nuts
- 6x cap nuts with sleeves and insert per ISO 228-1
- 6x flat seals

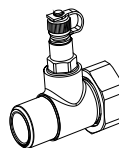


Type	Stock number	Connections	
		Valve	Coupling
ALN14.156B	S55846-Z170	G ¾ "	R ½ "
ALN14.206B	S55846-Z171	G ¾ "	R ¾ "
ALN15.206B/1	S55846-Z172	G 1 "	R ¾ "
ALN15.256B	S55846-Z173	G 1 "	R 1 "

Fittings ALP..

Fittings set made of DZR brass, consisting of:

- 1x cap nuts
- 1x P/T coupling with sleeves and insert per ISO 228-1
- 1x flat seal

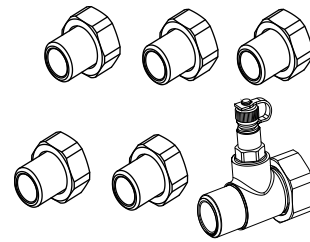


Type	Stock number	Connections	
		Valve	Coupling
ALP55	S55846-Z142	G ¾ "	G ½ "A
ALP56	S55846-Z143	G ¾ "	G ¾ "A
ALP57	S55846-Z144	G 1 "	G ¾ "A
ALP58	S55846-Z145	G 1 "	G 1 "A

Fittings ALN..ALP..


Fittings set made of DZR brass, consisting of:

- 6x cap nut
- 5x cap nuts with sleeves and insert per ISO 228-1
- 1x P/T coupling with sleeves and insert per ISO 228-1
- 6x flat seal


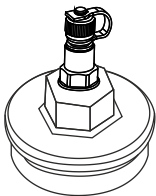




Type	Stock number	Connections	
		Valve	Coupling
ALN14.155B-ALP55	S55846-Z174	G ¾ "	R ½ " (ALN) G ½ "A (ALP)
ALN14.205B-ALP56	S55846-Z175	G ¾ "	R ¾ " (ALN) G ¾ "A (ALP)
ALN15.205B/1-ALP57	S55846-Z176	G 1 "	R ¾ " (ALN) G ¾ "A (ALP)
ALN15.255B-ALP58	S55846-Z177	G 1 "	R 1 " (ALN) G 1 "A (ALP)

Mounting bracket ALP61

Type	Stock number	Description
ALP61 	S55846-Z158	Mounting bracket made of stainless steel

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 excluding 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"> • Start/stop • Automatic zero position • Backlit display • Display: Out ► outside the measuring range <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 covers

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



When using the insulation covers ALI15VWPG51 and ALI20VWPG51 for comfort cooling applications, the insulation cover must be glued properly to the valve body, in order to minimize the risk of condensation between the valve and the insulation cover.

Type	Stock number	Torque	Operating voltage	Positioning		Cable length	Datasheet ¹⁾
				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						
GDB161.9G/6W	S55499-D829					3 m	
GDB161.9G/6P	S55499-D827						
GDB161.9H/6W	S55499-D830					5 m	
GDB161.9H/6P	S55499-D828						
GDB161.9H/6W100	S55499-D925					10 m	
GDB161.9H/6P100	S55499-D926						
GDB161.9E/MO6P	S55499-D802		AC/DC 24 V	Modbus RTU		0.9 m	

¹⁾ Documents can be downloaded at www.siemens.com/bt/download.

Application examples for the device combinations: See "Application examples [▶ 18]".

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

Notes

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. When the valve is in the closed position (45°) without heating or cooling demands, it provides pressure relief to the coil through the equalization function. In order for the heating and cooling circuits to be safely separated during operation, the system pressure in both circuits must have the same value.

It is recommended to use expansion vessel solutions in both circuits as a preventive measure to address the effects of mass displacement.

Safety

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

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

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.

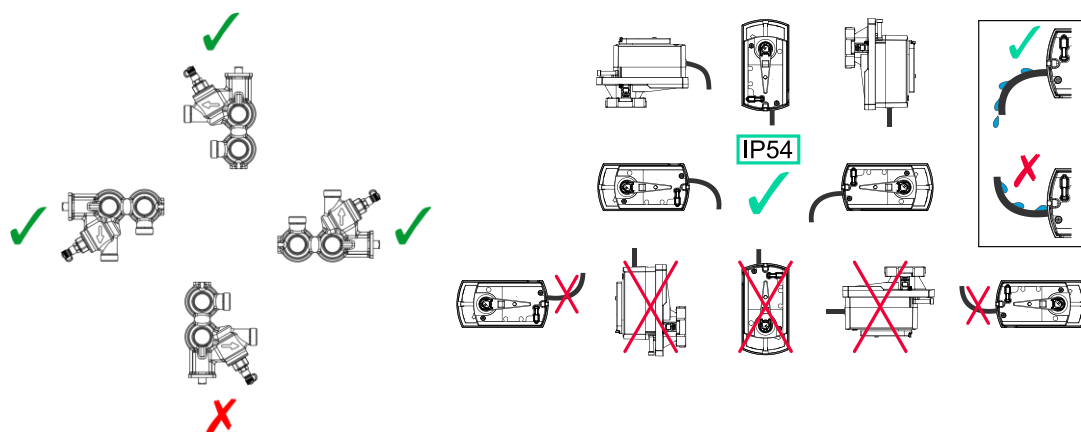
The 6-port PICV is delivered with mounting instructions A6V12814982.

An M4 x 8 mm screw and a DIN 125 washer are required to attach the valve to the mounting bracket ALP61. The screw and washer are not included in the delivery.

For additional information on applicable documentation, see "Product documentation [► 10]".

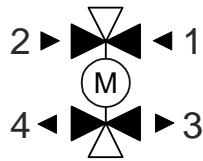
NOTICE	
	Conduct a function test before installing the device. Manually operate in full the device one time.

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 Δp_{\max} across the valve's control path is not allowed to exceed 400 kPa.

Maintenance

The 6-port pressure independent control ball valve WPG51... 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



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
Differential pressure	Max.	400 kPa (4 bar)
	Min.	See "Flow pre-setting [► 15]"
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 Δp_{\min} to Δp_{\max} ± 10 % above 200 l/h from Δp_{\min} to Δp_{\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

Insulation covers	
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
Flammability	DIN 4102: B2

Material mounting bracket	
Material	Stainless steel

Dimensions / Weight	
W / D / H, weight	See "Dimensions [► 20]"
Connections with external threading	G per ISO 228-1

Standards, guidelines		
Pressure Equipment Directive Pressure accessories		DGR 2014/68/EU
	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) ¹⁾

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

¹⁾ Fittings for a product where PS x DN < 1000, do not require special testing and cannot have CE labeling.

²⁾ Documents can be downloaded at: www.siemens.com/bt/download.

Sizing

Basis of calculation

1. Determine energy demand Q [kW] for cooling and heating.
2. Determine temperature differential ΔT [K] for cooling and heating.
3. Calculate volumetric flow for cooling and heating.

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

4. Select suitable 6-port PICV model – with or without P/T ports.
5. Determine setting using:
 1. Volumetric flow/pre-setting scale, see the following section (manual pre-setting through screws on the GDB161.9../6P series actuators)
 2. Volumetric flow/voltage signal
 3. 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

$\rho_{\text{Water}} = 1000 \text{ kg/m}^3$

1. The valve shall have connections with external threads to ISO 228-1 and size DN15.
2. 6-port PICV selection: VWPG51.15L0.9 (externally threaded connections, no pressure test points P/T, nominal volumetric flow 820 l/h)
3. Determine setting using:
 1. Volumetric flow/pre-setting scale (manual pre-setting through screws on the GDB161.9../6P series actuators)
 - i. Flow cooling 346 l/h – pre-setting scale 2.6
 - ii. Flow heating 221 l/h – pre-setting scale 2.2
 2. Volumetric flow/voltage signal (GDB161.9../6P, GDB161.9../6W)
 - i. Flow cooling 346 l/h – 1.4 V (0...10 V) or 3.1 V (2...10 V) signal
 - ii. Flow heating 221 l/h – 8.2 V (0...10 V) or 8.5 V (2...10 V) signal
 3. Volumetric flow/bus parameter (GDB161.9E/MO6P)
 - i. Flow cooling 346 l/h – Modbus Max. Limit Cooling = 7115
 - ii. 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. Δp_{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			
\dot{V} [l/h]	35	43	58	73	86	99	117	142	166	221	276	346	432	518	628	738	820
Scale	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
Δp_{min} [kPa] (p1-p3)	4	5	8	10	11	11	12	13	14	14	14	14	15	15	16	18	19

Signal pre-setting								
Measured flow	0...10 V signal		2...10 V signal		Bus setting		$\Delta p_{min}^{1)}$ (p1-p3)	Total pressure loss ²⁾
[l/h]	Cooling	Heating	Cooling	Heating	Cooling	Heating	[kPa]	
820	0.0	10.0	2.0	10.0	10000		19	26
738	0.4	9.6	2.4	9.6	9578		18	25
628	0.7	9.3	2.6	9.4	8948		16	21
518	0.9	9.1	2.8	9.2	8298		15	19
432	1.1	8.9	2.9	9.1	7755		15	18
346	1.4	8.6	3.1	8.9	7115		14	16
276	1.6	8.4	3.3	8.7	6513		14	15
221	1.8	8.2	3.5	8.5	5918		14	15
166	2.1	7.9	3.7	8.3	5108		14	15
142	2.2	7.8	3.8	8.2	4593		13	14
117	2.4	7.6	3.9	8.1	3993		12	13
99	2.6	7.4	4.1	7.9	3483		11	12
86	2.9	7.1	4.3	7.7	2985		11	12
73	3.1	6.9	4.5	7.5	2413		10	11
58	3.4	6.6	4.7	7.3	1700		8	10
43	3.7	6.3	4.9	7.1	1113		5	10
35	3.8	6.2	5.1	6.9	730		4	10
10	4.5	5.5	5.5	6.5	270		4	10
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			
V [l/h]	210	260	320	380	430	490	550	610	700	810	910	1000	1090	1150	1170	1200
Scale	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
Δp_{min} [kPa] (p1-p3)	15	15	15	15	15	15	16	17	17	18	19	20	21	21	22	23

Signal pre-setting								
Measured flow	0...10 V signal		2...10 V signal		Bus setting		Δpmin ¹⁾ (p1-p3)	Total pressure loss ²⁾
[l/h]	Cooling	Heating	Cooling	Heating	Cooling	Heating	[kPa]	
1200	0.0	10.0	2.0	10.0	10000		23	36
1170	0.3	9.7	2.3	9.7	9673		22	34
1150	0.4	9.6	2.4	9.6	9575		21	32
1090	0.5	9.5	2.5	9.5	9228		21	31
1000	0.8	9.2	2.7	9.3	8620		20	29
910	1.0	9.0	2.8	9.2	8183		19	27
810	1.2	8.8	3.0	9.0	7680		18	25
700	1.5	8.5	3.2	8.8	7098		17	23
610	1.7	8.3	3.4	8.6	6470		17	21
550	2.0	8.0	3.6	8.4	5895		16	19
490	2.2	7.8	3.8	8.2	5225		15	17
430	2.4	7.6	4.0	8.0	4665		15	17
380	2.7	7.3	4.2	7.8	4118		15	16
320	2.9	7.1	4.3	7.7	3525		15	16
260	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			
V [l/h]	460	600	740	910	1110	1310	1540	1760	2020	2310	2600	3000	3400	3730	3990	4250
Scale	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
Δp_{min} [kPa] (p1-p3)	17	17	17	18	18	18	19	20	21	22	23	26	29	32	35	38

Signal pre-setting								
Measured flow	0...10 V signal		2...10 V signal		Bus setting		Δpmin ¹⁾ (p1-p3)	Total pressure loss ²⁾
[l/h]	Cooling	Heating	Cooling	Heating	Cooling	Heating	[kPa]	
4250	0.0	10.0	2.0	10.0	10000		38	56
3990	0.3	9.7	2.3	9.7	9773		35	51
3730	0.4	9.6	2.4	9.6	9665		32	46
3400	0.6	9.4	2.5	9.5	9360		29	40
3000	0.8	9.2	2.7	9.3	8838		26	35
2600	1.1	8.9	2.9	9.1	8180		23	30
2310	1.3	8.7	3.1	8.9	7565		22	28
2020	1.5	8.5	3.3	8.7	6945		21	26
1760	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
1110	2.4	7.6	4.0	8.0	4723		18	19
910	2.6	7.4	4.1	7.9	4165		18	19
740	2.9	7.1	4.3	7.7	3565		17	18
600	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

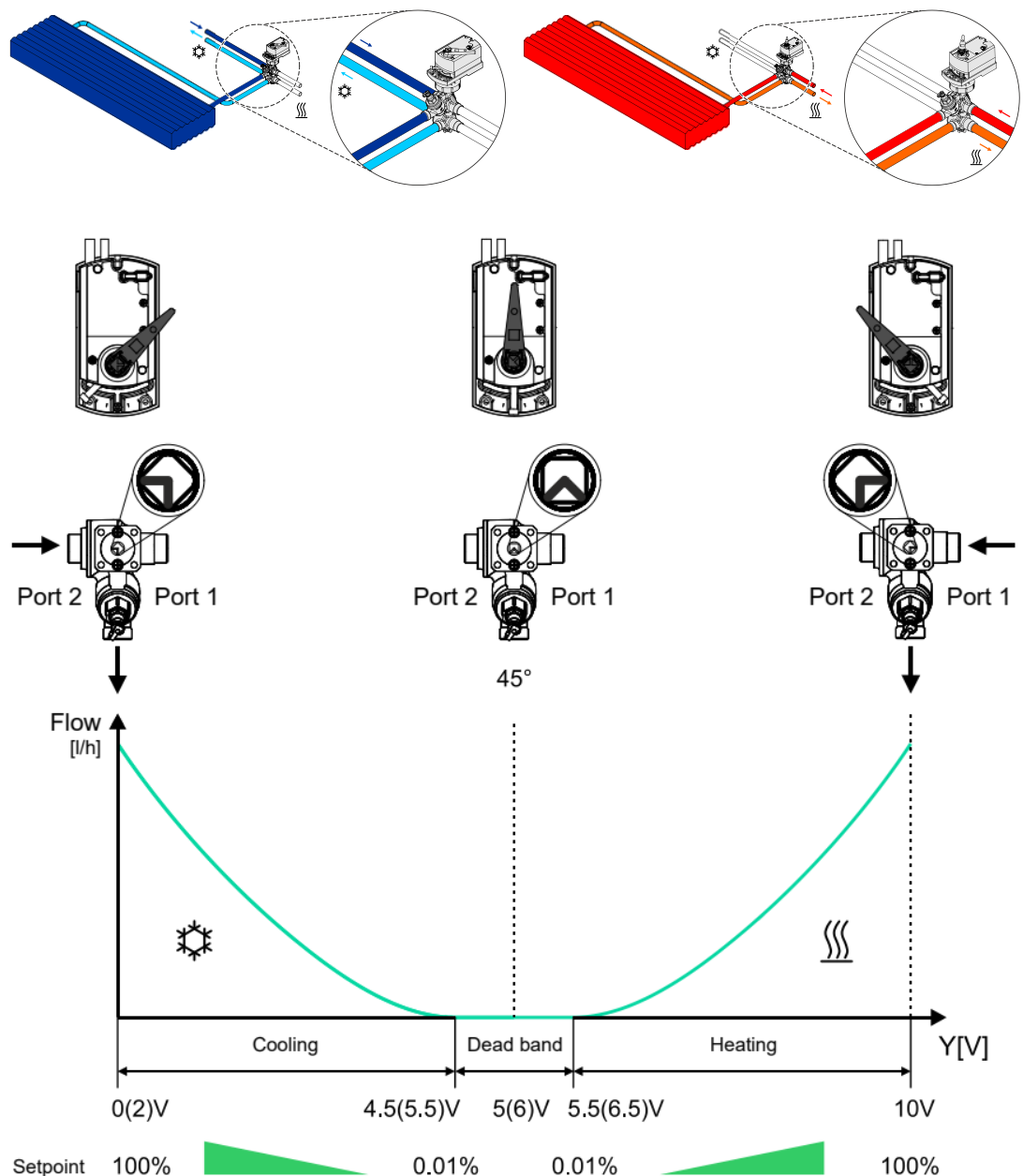
Application examples

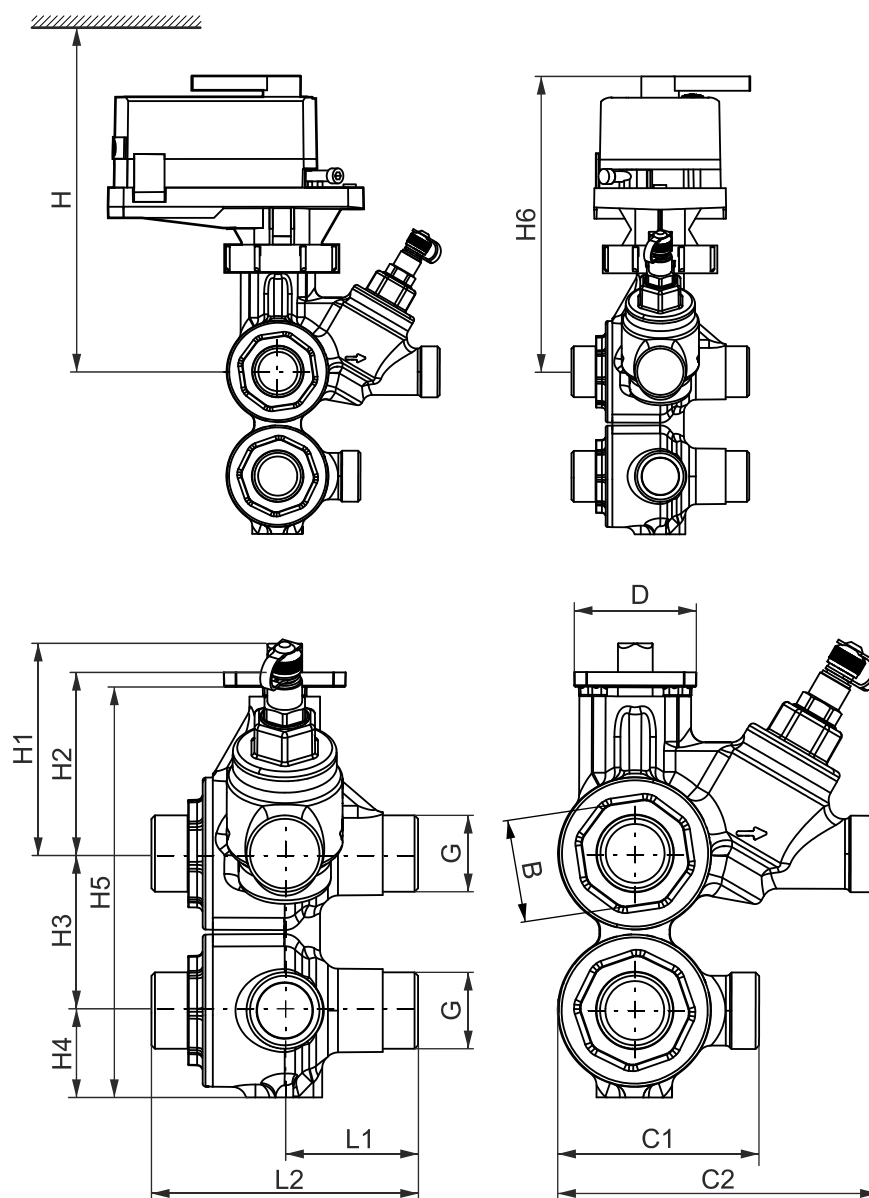
Pressure independent valves in HVAC systems combined with variable speed pumps provide even higher energy efficiency. When sizing the pump, it must be made certain that the most critical branch or consumer in the system – usually the remotest from the pump – gets enough pressure (pump head). Thus, it 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)





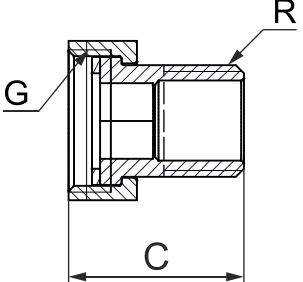
D = Normal size

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

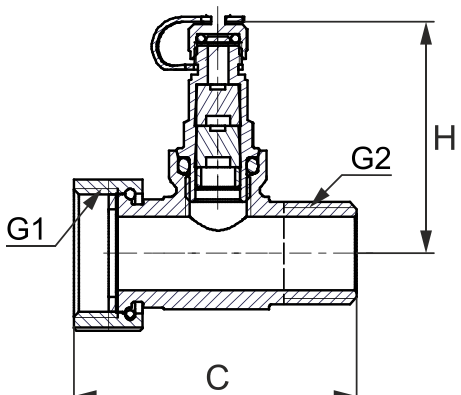
H1 = Dimension from the pipe to the center to install actuator (upper edge)

Type	DN	G	H	H1	H2	H3	H4	H5	H6	L1	L2	B	C1	C2	D	Weight
		[inch]	[mm]													[kg]
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		3.4
VWPG51.20F4.3																3.2

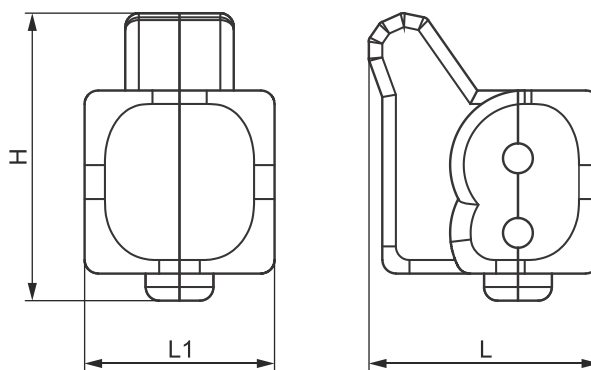
Accessories ALN..

	Type	Stock number	Valve type	G	R	C	Weight
				[inch]		[mm]	[kg]
	ALN14.156B	S55846-Z170	VWPG51.15..	G 3/4 "	R 1/2 "	28.5	0.149
	ALN14.206B	S55846-Z171	VWPG51.15..	G 3/4 "	R 3/4 "	27.5	0.180
	ALN15.206B/1	S55846-Z172	VWPG51.20..	G 1 "	R 3/4 "	30.5	0.242
	ALN15.256B	S55846-Z173	VWPG51.20..	G 1 "	R 1 "	42.5	0.296

Accessories ALP..

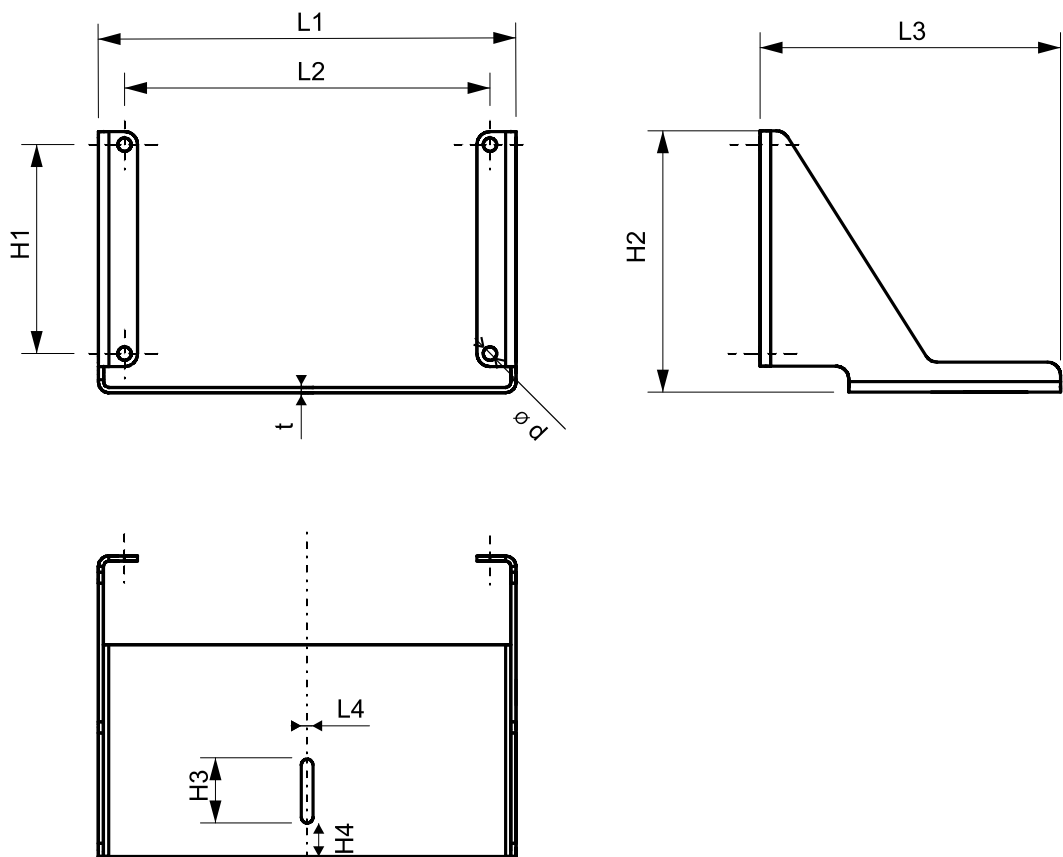
	Type	Stock number	Valve type	G1	G2	C	H	Weight
				[inch]		[mm]		[kg]
	ALP55	S55846-Z142	VWPG51.15..	G 3/4 "	G 1/2 " A	51	50	0.160
	ALP56	S55846-Z143	VWPG51.15..	G 3/4 "	G 3/4 " A	54	50	0.175
	ALP57	S55846-Z144	VWPG51.20..	G 1 "	G 3/4 " A	54.5	54	0.198
	ALP58	S55846-Z145	VWPG51.20..	G 1 "	G 1 " A	57.5	54	0.228

Insulation covers



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

Mounting bracket ALP61



Type	L1	L2	L3	L4	H1	H2	H3	H4	t	d
	[mm]									
ALP61	160	140	150	4.5	80	100	24.5	12.75	2	0.52

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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