

## Pressure Independent Control Valves (PICV)

VPP46.., VPP46..Q, VPI46.., VPI46..Q



VPP46..



VPI46..



VPP46..Q



VPI46..Q



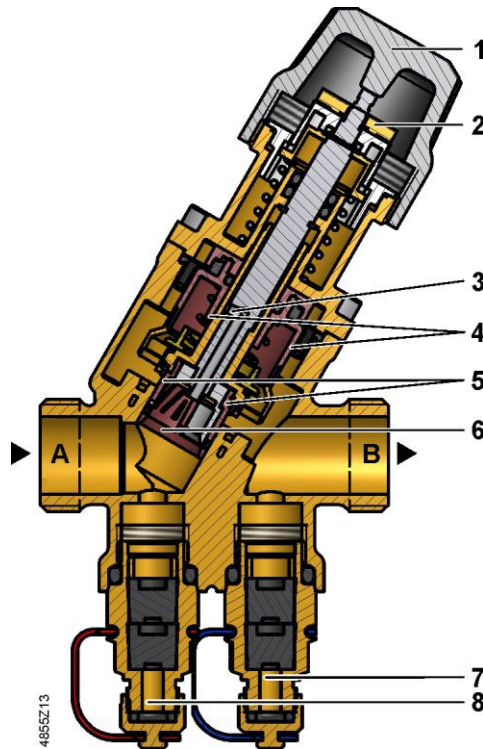
### For rooms, zones, ventilation and air-conditioning systems

- With integrated differential pressure controller
- DN 10...DN 32: Valve body made of dezincification resistant hot-pressed brass (DZR)
- DN 40...DN 50: Housing made of spheroidal graphite iron
- Volumetric flow 30...11500 l/h
- Differential pressure range 15...800 kPa
- Permissible medium temperature range 1...120° C
- Internally threaded Rp conforming to ISO 7-1
- Externally threaded G conforming to ISO 228-1
- Version with pressure test points for  $\Delta p$  measurement (optional)
- Can be equipped with electro thermal or electromotive actuator SSA..., SSD..., STA..65.. / STP..65.., SUA21/3P, SUE21P, SAY..1P03

## Use

- In ventilation and air conditioning plants for control on the water side and automatic hydraulic balancing of terminal units, such as fan coils, induction units, and in heat exchangers for heating or cooling
- In heating zones like self-contained heating systems, apartments, individual rooms, etc.
- For closed circuits

## Technical design

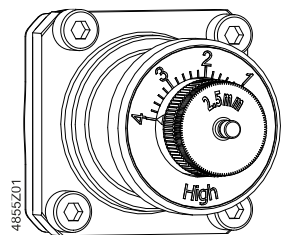


1. Manual control knob
  2. Ring with dial for presetting
  3. Aperture for differential pressure controller is linked with outlet port B
  4. Differential pressure controller
  5. Plug for presetting opening
  6. Flow control valve
  7. Pressure test point, blue ribbon, P-
  8. Pressure test point, red ribbon, P+
- A. Inlet port A  
B. Outlet port B

PICV VPP46..Q (shown here) are additionally equipped with pressure test points P/T

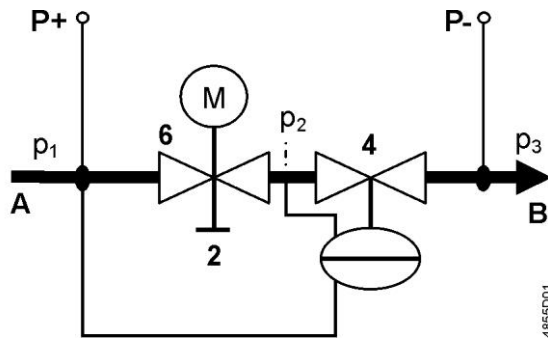
## Functional principle

The medium entering the valve (inlet port A) passes through the variable presetting opening (5) which is connected to the ring with the dial (2) for presetting the desired maximum volumetric flow. Then, the medium flows through the flow control valve (6) with a linear characteristic and a stroke of 2.5 mm, 5 mm or 5.5 mm.



The actuator (not shown here) opens and accurately positions the control valve (6). Before leaving the PICV, the medium passes through a built-in mechanical differential pressure controller (4). This differential pressure controller is the heart of the PICV and ensures that the selected volumetric flow is maintained across the whole working range and independent of the inlet pressure  $p_1$ .

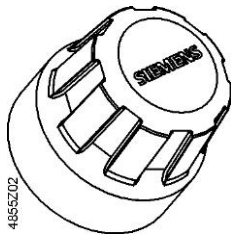
The PICV VP..46..Q are additionally equipped with two pressure test points (P+, P-), which allow measurement of the differential pressure across the PICV. For that purpose, the electronic manometer ALE10 can be used.



A	Inlet medium (inlet port)	B	Outlet medium (outlet port)
2	Ring with dial for presetting	4	Differential pressure controller maintains the pressure $p_1 - p_2$ constant across the flow control valve (6) and the presetting (2)
6	Control valve with mounted actuator	P-	P/T port, pressure test point with blue ribbon (7)
P+	P/T port, pressure test point with red ribbon (8)	p <sub>1</sub>	pressure at inlet of PICV
p <sub>2</sub>	pressure at outlet of flow control valve	p <sub>3</sub>	pressure at outlet of PICV

### Manual control DN 10...32

The manual control knob (1) is ready fitted to protect valve stem and preset mechanism and facilitates manual control of the PICV during commissioning.



#### Factory setting

The valve is open. The valve must be open to purge the system.  
To close the valve, turn the manual knob clockwise.

## Type summary

- VPP.. and VPI.. are without pressure test points P/T
- VPP..Q and VPI..Q are with pressure test points P/T

Type	Order no.	DN	H <sub>100</sub> [mm]	External thread	v̇ <sub>min</sub> [l/h]	v̇ <sub>100</sub> [l/h]	Δp <sub>max</sub> [kPa]	SUA21/3P	SUE21P	ST..40..	ST..65..	SSA..	SSD..UT						
								Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>						
								[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]						
VPP46.10L0.2	S55264-V101	10	2.5	G ½ B	30	200	800	600	-	600	600	600	1380						
VPP46.10L0.4	S55264-V131		5		65	370		-	600	-									
VPP46.15L0.2	S55264-V102	15	2.5	G ¾ B	30	200		600	-	600				600	600	1380			
VPP46.15L0.4	S55264-V199		5		65	370		-	600	-									
VPP46.15L0.6	S55264-V103		2.5		100	575		600	-	600									
VPP46.15F1.4	S55264-V200		5		220	1330		-	600	-									
VPP46.20L0.6	S55264-V201	20	2.5	G 1 B	100	575		600	-	600				600	600	1380			
VPP46.20F1.4	S55264-V104		5		220	1330		-	600	-									
VPP46.20F1.8	S55264-V202		5.5		300	1800		-	600	-									
VPP46.25F1.8	S55264-V121	25	5	G 1¼ B	260	1670		-	600	-				-	-	-			
VPP46.25F3.6	S55264-V203		5.5		280	1800			-	600				600	600	1380			
			5		540	3284			-	600				-	-	-			
			5.5		600	3609			-	600				800	800	1380			
VPP46.32F4	S55264-V122	32	5	G 1½ B	510	3700		600	-	-				-	-				
		5.5	550		4001	-		600	800	800				-					
VPP46.10L0.2Q	S55264-V105	10	2.5	G ½ B	30	200		600	-	600				600	600	1380			
VPP46.10L0.4Q	S55264-V132		5		65	370		-	600	-									
VPP46.15L0.2Q	S55264-V106	15	2.5	G ¾ B	30	200		600	-	600							600	600	1380
VPP46.15L0.4Q	S55264-V189		5		65	370		-	600	-									
VPP46.15L0.6Q	S55264-V107		2.5		100	575		600	-	600									
VPP46.15F1.4Q	S55264-V190		5		220	1330	-	600	-										
VPP46.20L0.6Q	S55264-V191	20	2.5	G 1 B	100	575	600	-	600	600	600	1380							
VPP46.20F1.4Q	S55264-V108		5		220	1330	-	600	-										
VPP46.20F1.8Q	S55264-V192		5.5		300	1800	-	600	-										
VPP46.25F1.8Q	S55264-V123	25	5	G 1¼ B	260	1670	-	600	-	-	-	-							
			5.5		280	1800		-	600	600	600	1380							
VPP46.25F3.6Q	S55264-V193	25	5	G 1¼ B	540	3284	600	-	-	-	-	-							
			5.5		600	3609	-	600	800	800	1380								
VPP46.32F4Q	S55264-V124	32	5	G 1½ B	510	3700	600	-	-	-	-								
		5.5	550		4001	-	600	800	800	1380									

Type	Order no.	DN	H <sub>100</sub>	Internal thread	ṽ <sub>min</sub>	ṽ <sub>100</sub>	Δp <sub>max</sub>	SUA21/3P	SUE21P	ST..40..	ST..65..	SSA..	SSD..UT
								Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>	Δp <sub>s</sub>
								[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
VPI46.15L0.2	S55264-V109	15	2.5	Rp ½	30	200	800	600	-	600			
VPI46.15L0.4	S55264-V204		5		65	370		-	600	-			
VPI46.15L0.6	S55264-V110		2.5		100	575		600	-	600			
VPI46.15F1.4	S55264-V205		5		220	1330		-	600	-			
VPI46.20L0.6	S55264-V206	20	2.5	Rp ¾	100	575		600	-	600			
VPI46.20F1.4	S55264-V111		5		220	1330		600	-				
VPI46.20F1.8	S55264-V207		5.5		300	1800		-	-				
VPI46.25F1.8	S55264-V125	25	5	Rp 1	260	1670			600	-	-	-	-
			5.5		280	1800			-	-	600	600	1380
VPI46.25F3.6	S55264-V208		5		540	3284			-	-	-	-	
			5.5		600	3609			-	-	800	800	1380
VPI46.32F4	S55264-V126	32	5	Rp 1½	510	3700		600	-	-	-	-	
			5.5		550	4001		-	-	800	800	1380	
VPI46.15L0.2Q	S55264-V112	15	2.5	Rp ½	30	200		600	-	600			
VPI46.15L0.4Q	S55264-V194		5		65	370		-	600	-			
VPI46.15L0.6Q	S55264-V113		2.5		100	575		600	-	600			
VPI46.15F1.4Q	S55264-V195		5		220	1330	-	600	-	600			
VPI46.20L0.6Q	S55264-V196	20	2.5	Rp ¾	100	575	600	-	600				
VPI46.20F1.4Q	S55264-V114		5		220	1330	600	-					
VPI46.20F1.8Q	S55264-V197		5.5		300	1800	-	-					
VPI46.25F1.8Q	S55264-V127	25	5	Rp 1	260	1670		600	-	-	-	-	
			5.5		280	1800		-	-	600	600	1380	
VPI46.25F3.6Q	S55264-V198		5		540	3284		-	-	-	-		
			5.5		600	3609		-	-	800	800	1380	
VPI46.32F4Q	S55264-V128	32	5	Rp 1½	510	3700	600	-	-	-	-		
			5.5		550	4001	-	-	800	800	1380		

Type	Order no.	DN	H <sub>100</sub>	Intern thread	ṽ <sub>min</sub>	ṽ <sub>100</sub>	SAY..P..	
			[mm]	[Inch]	[l/h]	[l/h]	Δp <sub>min</sub> [kPa]	Δp <sub>max</sub> [kPa]
VPI46.40F9.5Q	S55264-V129	40	15	Rp 1½	1370	9500	25	600
VPI46.50F12Q	S55264-V130	50		Rp 2	1400	11500	36	

DN = nominal size

H<sub>100</sub> = nominal stroke

ṽ<sub>100</sub> = volumetric flow through fully open valve (H<sub>100</sub>)

ṽ<sub>min</sub> = smallest pre-settable volumetric flow through fully open valve (H<sub>100</sub>)




$\Delta p_{\max}$  = maximum permissible differential pressure across the valves control path, valid for the entire actuating range of the motorized valve

$\Delta p_s$  = maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)

$\Delta p_{\min}$  = minimum differential pressure required across the valve's control path, so that the difference pressure regulator works reliably

## Accessories

Type	Order no.		Description
ALE10	ALE10		<p>Electronic manometer excluding measuring lines and measuring tips. Measuring range 0-700 kPa. A differential pressure of more than 1000 kPa will destroy the pressure sensor. For measuring the differential pressure between P+ and P- of the PICV see Technical design [▶ 2].</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> <li>• Holding function</li> </ul>
ALE11	ALE11		<p>Measuring lines and straight measuring tips for use with Siemens PICV.</p> <p>Equipped with G 1/8" connection with 2 x 40 mm needles.</p>
ALP45	ALP45		<p>Spare nipples P/T port (set of 2)</p> <p>Set contains 1 piece each with a red and blue ribbon.</p> <p>Port: External threads G 1/8" to ISO 228</p> <p>Connection to valve body: G 1/4" to ISO 228, inclusive O-ring</p> <p>Length: 40 mm</p>
ALP46	S55264-V115		<p>Blanking plug for P/T ports</p> <p>Connection to valve body: G 1/4" to ISO 228, inclusive O-ring</p>
ALP47	S55264-V116		<p>Drain ball valve inclusive O-ring</p> <p>Port: External threads G 1/2" to ISO 228</p> <p>Connection to valve body: G 1/4" to ISO 228, inclusive O-ring</p> <p>Length: 48 mm</p>

Type	Order no.		Description
ALP48	S55264-V117		Combined P/T port and drain ball valve with red ribbon Port: External threads G 1/8" to ISO 228 Connection to valve body: G 1/4" to ISO 228, inclusive O-ring Length: 80 mm
ALP49	S55264-V118		Long P/T ports (set of 2 pieces) Set contains 1 piece each with a red and blue ribbon. Port: External threads G 1/8" to ISO 228 Connection to valve body: G 1/4" to ISO 228, inclusive O-ring Length: 120 mm
ALP50	S55264-V119		Spare black valve protection cap

## Fittings

Type	Order no.	Designation
ALG..2	ALG..2	Set of 2 fittings with threaded connections for 2-port valves, consisting of 2 union nuts, 2 discs and 2 flat seals
ALG..2B	S55846-Z1..	Set of 2 brass fittings for medium temperatures up to 100° C, consisting of 2 union nuts, 2 discs and 2 flat seals

## Insulation covers

Type	Order no.	Designation
ALI20VPI46/VPP46	S55846-Z168	Insulation cover for VPP46.10.., VPI46.15.., VPP46.15.., VPI46.20.. and VPP46.20..
ALI25VPI46/VPP46	S55846-Z169	Insulation cover for VPI46.25F1.8.. and VPP46.25F1.8..
ALI32VPI46/VPP46	S55846-Z165	Insulation cover for VPI46.25F3.6.., VPP46.25F3.6.., VPI46.32.. and VPP46.32..
ALI50VPI46/VPP46	S55846-Z166	Insulation cover for VPI46.40.., VPP46.40, VPI46.50 and VPP46.50..



When using the insulation covers ALI..VPI46/VPP46 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.

## Delivery

Pressure independent control valves (PICV), actuators and accessories are packed and supplied separately.

## Ordering Example

Type	Order no.	Designation
VPP46.15L0.2	S55264-V102	PICV, PN 25, externally threaded
SSA331	S55180-A105	Actuator

## Compatible actuators DN 15...32

Actuators	Operating voltage	Positioning		Actuators (no power) <sup>1)</sup>	Fail-safe	Stroke	Connecting cable	Datasheet				
		signal	force									
SSA131	AC 24 V	3-position	100 N	-	-	6.5 mm	1.5 m	A6V11858276				
SSA331	AC 230 V											
SSA161.05	AC/DC 24 V	DC 0...10 V										
SSA151.05HF		DC 4...20 mA										
SSA161.05HF		DC 0...10 V										
SSA161E.05HF												
SSA118.09HKN	DC 24 V	KNX S-Mode KNX PL-Link						A6V11858280				
SSD131.09UT	AC 24 V	3-position	300 N	-	-	M16x1.5 threaded integrated conduit adapter cover, no cable	-					
SSD131.29UT					Yes							
SSD161S.05DUT	AC/DC 24 V	DC 0...10 V			-							
SSD161S.25DUT					Yes							
SUA21/3P	AC 230V	3-wire on/off (SPST)	100N	-		2.5 mm	0.8 m	A6V11780780				
SUE21P	AC 230V					5 mm		A6V11780777				
STA121.65L10	AC/DC 24 V	2-position	125 N	NC	-	6,5 mm	1 m	A6V14028280				
STA121.65L20							2 m					
STA121.65H20							2 m halogen-free					
STA121.65/00							-					
STA321.65L10	AC 230 V										1 m	
STA321.65L20						2 m						
STA321.65H20						2 m halogen-free						
STA321.65/00						-						
STP121.65L10	AC/DC 24 V										1 m	
STP121.65L20						2 m						
STP121.65/00						-						
STP321.65L10	AC 230 V										1 m	
STP321.65L20		2 m										
STP321.65/00		-										
STA161.65L10	AC 24 V	DC 0...10 V		NC		1 m						
STA162.65L10												
STP161.65L10	AC/DC 24 V			NO								



Actuators	Operating voltage	Positioning		Actuators (no power) <sup>1)</sup>	Fail-safe	Stroke	Connecting cable	Datasheet	
		signal	force						
STP162.65L10									
STA121.40L10	AC/DC 24 V	2-position	100 N	NC		4 mm	1 m		
STP121.40L10				NO					
STA321.40L10	AC 230 V			NC					
STP321.40L10				NO					
STA126.40L10	AC/DC 24 V			DC 0...10 V					NC
STA326.40L10	AC 230 V								
STA161.40L10	AC 24 V			DC 0...10 V					NO
STP161.40L10									

<sup>1)</sup> NC = Normally Closed = VPP46../VPI46.. powerless closed. NO = Normally Open = VPP46../VPI46.. powerless open.

The valve is fully opened without an actuator.

### Compatible actuators DN 40...50

Type	Order no.	Stroke	Pos. force	Operating voltage	Positioning signal	Spring return	Spring return direction	Pos. time	LED	Manual adjustment	Auxiliary functions
SAY31P03	S55150-A132	15 mm	200 N	AC 230 V	3-position	-	-	30 s	-	Press and fix in place	<sup>1)</sup>
SAY61P03	S55150-A133			AC/DC 24 V	DC 0...10 V DC 4...20 mA 0...1000 Ω				+		<sup>2), 3)</sup>
SAY81P03	S55150-A134			3-position	-				<sup>1)</sup>		

<sup>1)</sup> Optional accessories: Auxiliary switch ASC10.51

<sup>2)</sup> Positioning feedback, forced control, characteristic curve changeover

<sup>3)</sup> Optional accessories: Auxiliary switch ASC10.51, sequence control, control action changeover AZX61.1

### Fittings

PICV		Set of fittings			
Externally threaded		Malleable cast iron		Brass	
Type	Order no.	Type / Order no.	Order no.	Type	Order no.
VPP46.10L0.2	S55264-V101	-	-	ALG132 <sup>1)</sup>	BPZ:ALG132
VPP46.10L0.4	S55264-V131	-	-	ALG132 <sup>1)</sup>	BPZ:ALG132
VPP46.15L0.2	S55264-V102	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15L0.4	S55264-V199	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15L0.6	S55264-V103	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15F1.4	S55264-V200	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.20L0.6	S55264-V201	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.20F1.4	S55264-V104	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.20F1.8	S55264-V202	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.25F1.8	S55264-V121	ALG202	BPZ:ALG202	ALG202B <sup>2)</sup>	S55846-Z102

PICV		Set of fittings			
Externally threaded		Malleable cast iron		Brass	
Type	Order no.	Type / Order no.	Order no.	Type	Order no.
VPP46.25F3.6	S55264-V203	ALG202	BPZ:ALG202	ALG202B <sup>2)</sup>	S55846-Z102
VPP46.32F4	S55264-V122	ALG252	BPZ:ALG252	ALG252B <sup>2)</sup>	S55846-Z104
VPP46.10L0.2Q	S55264-V105	-	-	ALG132 <sup>1)</sup>	BPZ:ALG132
VPP46.10L0.4Q	S55264-V132	-	-	ALG132 <sup>1)</sup>	BPZ:ALG132
VPP46.15L0.2Q	S55264-V106	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15L0.4Q	S55264-V189	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15L0.6Q	S55264-V107	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.15F1.4Q	S55264-V190	-	-	ALG142 <sup>1)</sup>	BPZ:ALG142
VPP46.20L0.6Q	S55264-V191	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.20F1.4Q	S55264-V108	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.20F1.8Q	S55264-V192	ALG152	BPZ:ALG152	ALG152B <sup>2)</sup>	S55846-Z100
VPP46.25F1.8Q	S55264-V123	ALG202	BPZ:ALG202	ALG202B <sup>2)</sup>	S55846-Z102
VPP46.25F3.6Q	S55264-V193	ALG202	BPZ:ALG202	ALG202B <sup>2)</sup>	S55846-Z102
VPP46.32F4Q	S55264-V124	ALG252	BPZ:ALG252	ALG252B <sup>2)</sup>	S55846-Z104

<sup>1)</sup> Connecting thread pipe side: Internally threaded

<sup>2)</sup> Usable up to maximum medium temperature of 100 °C

## Safety

**⚠ CAUTION****National safety regulations**

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.

## Engineering

Valve	Symbols / Direction of flow		Flow in control mode	Valve stem	
	VP..46..	VP..46..Q		retracts	extends
VPP46..			variable	closes	opens
VPI46..			variable	closes	opens

**⚠ WARNING****The direction of flow indicated (arrow on the valve body) is mandatory!**

The valves should preferably be mounted in the return pipe where temperatures are lower and where the sealing gland is less affected by strain.

Symbol used in catalogs and application descriptions	Symbol used in diagrams
	There are no standard symbols for PICV in diagrams.

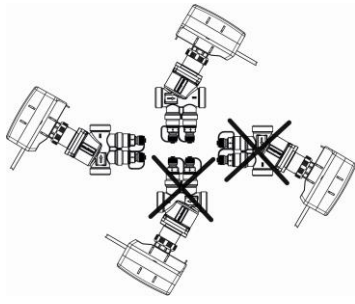
**Recommendation**

A strainer or dirt trap should be fitted upstream of the valve to enhance reliability. Remove dirt, welding beads etc. from valves and pipes. Do not insulate the actuator bracket, as air circulation must be ensured!

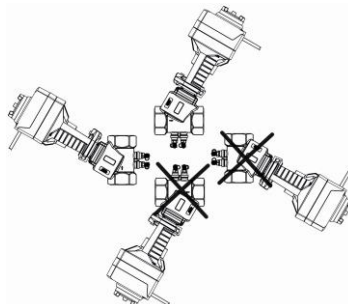
## Mounting

PICV and actuator can be straightforwardly assembled on site. Special tools or adjustments are not required. Prior to mounting the actuator, the required volumetric flow must be set. The valve is supplied complete with Mounting Instructions (74 319 0649 0).

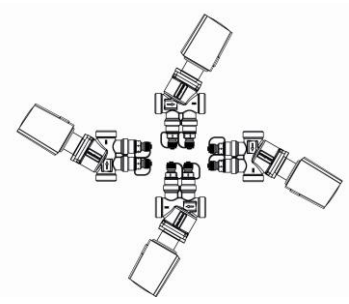
## Mounting positions



SUA21/3P, SUE21P

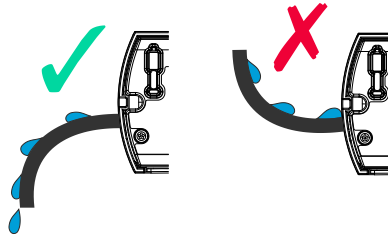


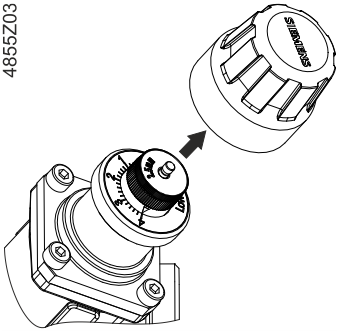
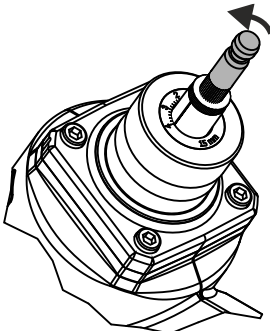
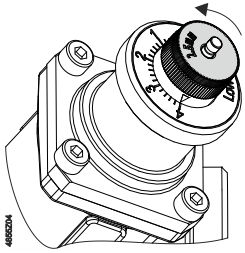
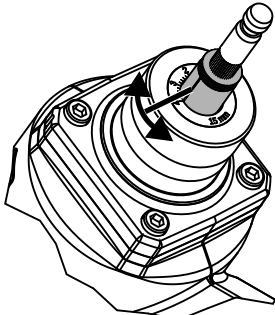
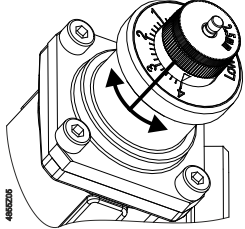
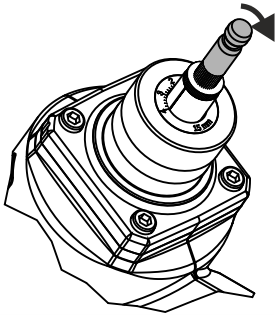
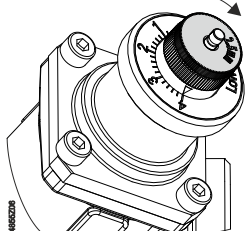
SAY.. indoor, SSD..UT




STA..65..., STP..65..., SSA..

Actuators STA..65..., STP..65.. and SSA.. may be installed in any position. Actuators SUA21/3P, SUE21P must be installed horizontally up to 90° and not hanging. Actuators SSD..UT and SAY.. cannot be installed upside down. In case actuators SSD..UT and SAY.. are installed horizontally and hanging, the cable must always be installed pointing downwards. Otherwise, the IP protection is not guaranteed, as water running down the cable might enter the actuator.



Presetting DN 10...32:	Presetting DN 40...50:
<p>1. Remove control knob from PICV.</p>  <p>4855Z03</p>	<p>1. Loosen spindle head</p> 
<p>2. Loosen knurled nut.</p>  <p>4855Z04</p>	<p>2. Adjust the desired dial setting with the white knob.</p> 
<p>3. Adjust the desired dial setting with the white knob.</p>  <p>4855Z05</p>	<p>3. Retighten spindle head - by hand only</p> 
<p>4. Retighten knurled nut by hand.</p>  <p>4855Z06</p>	

Commissioning

<b>⚠ WARNING</b>	
	<p><b>The valves must be commissioned with the manual control knob or actuator correctly fitted.</b></p> <p>Strong pressure impacts can damage closed PICV.</p>

## ⚠ WARNING



**The PICV have to be open when flushing or pressure testing the system.**  
Flush only in correct flow direction. Strong pressure impacts can damage closed PICV.

## ⚠ WARNING



**Differential pressure  $\Delta p_{\max}$  across the valve's control path is not allowed to exceed 800 kPa.**

### Manual control

When turning the manual control knob in counter-clockwise direction or manually operating the actuator, the valve opens. The actuator closes the valve. The valves are supplied fully open. The manual knob is not designed for permanent manual operation.

### Maintenance

- The VP..46.. PICV valves are maintenance-free without cartridge.
- Valve plug, stem, presetting, 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.

### Sealing gland

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

### Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.  
For additional details, refer to [Siemens information on disposal](#).

### 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.

<b>Functional data</b>	
PN class	PN 25 as per EN 1333
Permissible operating pressure	2.500 kPa (25 bar) as per ISO 7628 / EN 1333 Max. differential pressure: 800 kPa Min. differential pressure: See Volumetric flow/dial presetting [▶ 17]
Valve characteristic	Linear as per VDI/VDE 2173
Leakage rate	General: Class IV (0...0.01% of volumetric flow V <sub>100</sub> ) to EN 1349 DN 25...32 with STA..3..: Class III (0...0,1% of volumetric flow V <sub>100</sub> ) per EN 1349
Average flow accuracy	+/- 10% from $\Delta p_{\min}$ to $2.5 \times \Delta p_{\min}$ +/- 5% from $2.5 \times \Delta p_{\min}$ to 800 kPa
Permissible media	Low-temperature hot water, chilled water, water with antifreeze Recommendation: Water treatment to VDI 2035
Medium temperature	1...120 °C for valve with actuator 1...110 °C with SUA21/3P, SUE21P actuators
Permissible ambient temperature	1...50 °C
Nominal stroke	DN 10L0.2, DN 15L0.2, DN 15L0.6: 2.5mm DN 10L0.4 / DN 20: 5mm DN 25...32: 5.5 mm DN 40...50: 15 mm

<b>Materials</b>	
Valve body, port, seat, sealing gland and test points	Dezincification resistant hot-pressed brass (DZR), CW602N Valve body DN 40...50: Nodular cast iron
Stem, spring	Stainless steel
Presetting element	PTFE, PPO, POM C and ABS
Regulator	PPS
Seals	EPDM 281 (O-ring)

<b>Insulation covers</b>	<b>ALI20VPI46/VPP46, ALI25VPI46/VPP46, ALI32VPI46/VPP46</b>	<b>ALI50VPI46/VPP46</b>
Materials	EPP (Expanded Polypropylene)	EPE (Crosslinked Expanded Polyethylene)
Water absorption	< 2.5 vol% at 20° C	< 1 vol% at 20° C
Temperature range	Up to 120° C	Up to 90° C
Insulating property (Lambda )	0.039 W/mK	0.041 W/mK
Density	30 g/l	30 g/l
Flammability	DIN 4102: B2	DIN 4102: B2

Connections	
Threaded connections	VPP46...: G..B to ISO 228-1 (externally threaded) VPI46...: Rp to ISO 7-1 (internally threaded)
Actuator connection	DN 10...32: M30 x 1.5 mm DN 40...50: Siemens large stroke connector
Pressure test points (P/T-ports)	G 1/4" (connection valve body) 2 mm x 40 mm (needles)

For dimensions and weight refer to Dimensions [▶ 20].

Standards, directives and approvals	
EU conformity (CE)	See EU declaration of conformity. The documents can be downloaded at <a href="http://www.siemens.com/bt/download">http://www.siemens.com/bt/download</a>
EAC conformity	Eurasian conformity
Pressure Equipment Directive	
Directive	PED 2014/68/EU
Pressure accessories	Scope: Article 1, section 1 Definitions: Article 2, section 5
Fluid group 2	DN 10..40: Without CE-marking as per article 4, section 3 (sound engineering practice) DN 50: Category I, Module A, with CE-marking as per article 14, section 2
Environmental compatibility	The product environmental declaration CE1E4855en <sup>1)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

## Sizing

### Engineering Basis of calculation

1. Determine energy demand Q [kW]
2. Determine temperature differential  $\Delta T$  [K]
3. Calculate volumetric flow

$$\dot{v} = \frac{Q[\text{kW}] \cdot 1000}{1,163 \cdot \Delta T[\text{K}]} \left[ \frac{\text{l}}{\text{h}} \right]$$

4. Select suitable PICV  
pipe connections (internally or externally threaded)  
with or without P/T ports
5. Determine dial setting using volumetric flow/dial presetting table, see the following page

### Example

1. Given is a heat exchanger with Q = 1.9 kW
2. Temperature differential (supply - return)  $\Delta T = 6$  K
3. Volumetric flow

$$\dot{v} = \frac{1,9\text{kW} \cdot 1000}{1,163 \cdot 6\text{K}} = 272,28 \text{ l/h}$$

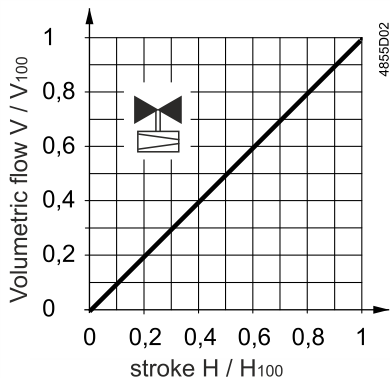
Hint: You can also determine the volumetric flow using the valve slide rule.

4. The valve shall have connections with external threads to ISO 228-1 and size DN 15.



5. PICV selection:  
Ideally, PICV should be selected such that they operate at about 80% of their maximum flow, enabling them to deliver spare capacity, if required. VPP46.15L0.6 (externally threaded connections, no pressure test points P/T, nominal volumetric flow 600 l/h)
6. Determine dial setting using volumetric flow/dial presetting table below:  
Volumetric flow 270 l/h  
Dial setting 1.8

### Valve characteristic VP..46., VP..46..Q



### Volumetric flow/dial presetting

- Tables to determine the dial setting for a desired volumetric flow.
- $\Delta p_{\min}$  [kPa] based on volumetric flow; interpolate missing values.



The presetting tables indicate the expected nominal volumetric 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 volumetric flow.

Presetting range linear to VDI/VDE 2173

Presetting range linear

Presetting range not permitted

### VPP46.10L0.2, VPP46.10L0.2Q, VPP46.15L0.2, VPP46.15L0.2Q, VPI46.15L0.2, VPI46.15L0.2Q

200 l/h nominal <sup>1)</sup>																				
[l/h]																				
Dial	Min	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		14.3	14.3	14.3	14.5	14.6	14.6	14.7	14.8	14.9	15	15.1	15.2	15.3	15.4	15.5	15.5	15.6	15.7	15.8

### VPP46.10L0.4, VPP46.10L0.4Q, VPP46.15L0.4, VPP46.15L0.4Q, VPI46.15L0.4, VPI46.15L0.4Q

370 l/h nominal <sup>2)</sup>																			
[l/h]																			
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		14.6	14.8	14.9	15.1	15.3	15.4	15.6	15.7	15.9	16	16.2	16.3	16.5	16.6	16.7	16.9	17	17.2

**VPP46.15L0.6, VPP46.15L0.6Q, VPI46.15L0.6, VPI46.15L0.6Q, VPP46.20L0.6, VPP46.20L0.6Q, VPI46.20L0.6, VPI46.20L0.6Q**

600 l/h nominal <sup>1)</sup>																				
[l/h]	█	100	115	130	160	180	210	240	270	300	320	350	380	410	440	460	490	520	550	575
Dial	Min	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		14.9	15.2	15.5	15.6	15.9	16.1	16.4	16.6	16.8	17	17.2	17.5	17.6	17.8	18	18.2	18.4	18.6	18.9

**VPP46.15F1.4, VPP46.15F1.4Q, VPI46.15F1.4, VPI46.15F1.4Q, VPP46.20F1.4, VPP46.20F1.4Q, VPI46.20F1.4, VPI46.20F1.4Q**

1400 l/h nominal <sup>2)</sup>																			
[l/h]	█	220	290	350	420	480	550	610	680	740	810	870	940	1000	1070	1130	1200	1260	1330
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		16	16.5	17	17.5	17.9	18.4	18.8	19.2	19.5	19.9	20.2	20.4	20.7	20.9	21.1	21.3	21.4	21.6

**VPP46.20F1.8, VPP46.20F1.8Q, VPI46.20F1.8, VPI46.20F1.8Q, VPP46.25F1.8, VPP46.25F1.8Q, VPI46.25F1.8, VPI46.25F1.8Q**

1800 l/h nominal <sup>2)</sup>																			
[l/h]	█	280	356	430	502	574	647	722	800	881	967	1057	1151	1250	1353	1460	1571	1685	1800
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		15.3	15.8	16.1	16.4	16.7	17	17.5	18	18.7	19.7	20.9	22.3	24.2	26.4	28.9	32.0	35.4	39.4

**VPP46.25F3.6, VPP46.25F3.6Q, VPI46.25F3.6, VPI46.25F3.6Q**

3600 l/h nominal <sup>2)</sup>																			
[l/h]	█	600	777	954	1131	1308	1485	1662	1839	2016	2193	2370	2547	2724	2901	3078	3255	3432	3609
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		17	17	17	18	18	18	18	18	18	18	19	19	20	20	21	21	22	23

**VPP46.32F4, VPP46.32F4Q, VPI46.32F4, VPI46.32F4Q**

4000 l/h nominal <sup>2)</sup>																			
[l/h]	█	550	800	910	1110	1320	1520	1720	1930	2130	2330	2530	2740	2940	3140	3350	3550	3750	4001
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		17.9	18	18.1	18.2	18.3	18.5	18.7	18.9	19.2	19.6	20.1	20.7	21.4	22.3	23.4	24.6	26	28

**VPI46.40F9.5Q**

9500 l/h nominal <sup>2)</sup>																			
[l/h]	█	1370	1600	1950	2250	2650	3000	3400	3800	4250	4750	5250	5800	6350	6950	7550	8200	8800	9500
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}^{3)}$		10	10	10	10	10	10	10	11	11	12	13	15	16	18	20	22	24	25

## VPI46.50F12Q

		11500 l/h nominal <sup>2)</sup>																	
[l/h]	█	1400	1650	2000	2350	2700	3150	3550	4050	4600	5150	5800	6500	7300	8150	9000	9800	10600	11500
Dial	Min	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	Max
$\Delta p_{\min}$ <sup>3)</sup>		10	10	11	11	11	12	12	13	14	15	17	19	21	24	27	30	33	36

<sup>1)</sup> The presetting range for 0.2 and 0.4 is not permitted.

<sup>2)</sup> The presetting range for 0.2, 0.4 and 0.5 is not permitted.

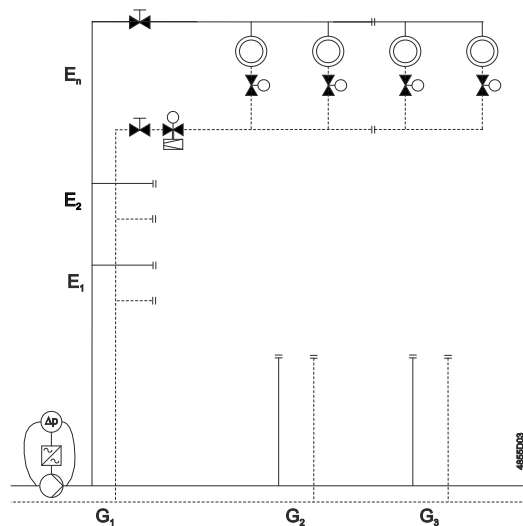
<sup>3)</sup>  $\Delta p_{\min}$  in [kPa]

### Application examples

PICV 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.

#### Residential buildings

Residential buildings with for example self-contained flat heating systems:

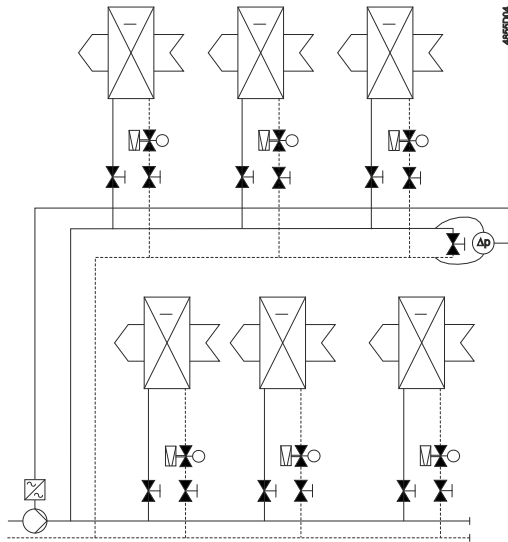


E = Floor

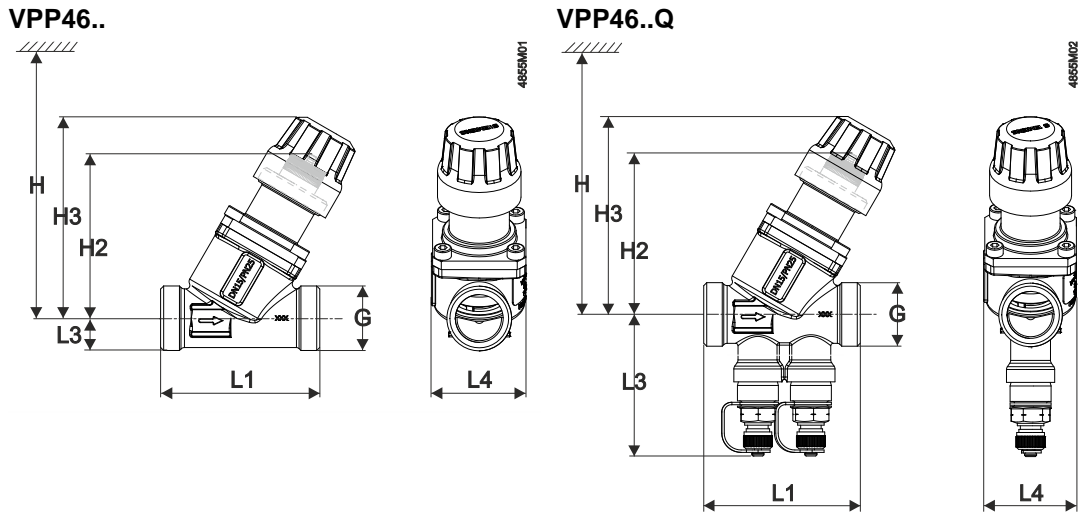
G = Group or zone

#### Non-residential buildings

Commercial buildings with for example Fan Coil Units or heat exchangers for heating or cooling:



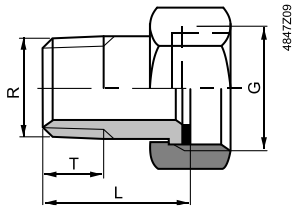
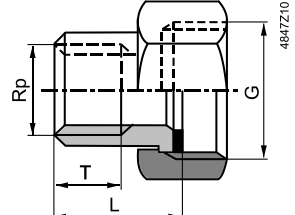
## Dimensions



Valves	DN	G	L1	L3	L4	H2	H3	H <sup>1)</sup>						Weight	
								SSA..	STA..40.. / STP..40..	STA..65.. / STP..65..	SUA21/3P	SUE21P	SSD..UT		
								[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
		[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]		
VPP46.10L0.2	10	½	65	10.5	38	68.5	83.5	170	160	160	134	134	371	0.314	
VPP46.10L0.4															-
VPP46.15L0.2	15	¾	65	13.2	38	67.3	82.2	170	160	160	135	135	374	0.333	
VPP46.15L0.4															-
VPP46.15L0.6															160
VPP46.15F1.4															-
VPP46.20L0.6	20	1	70	13.6	38	67.5	82.5	170	160	160	135	135	374	0.371	
VPP46.20F1.4															-
VPP46.20F1.8															-
VPP46.25F1.8	25	1¼	78	22	38	70	85	170	160	160	138	138	385	0.497	

Valves	DN	G	L1	L3	L4	H2	H3	H <sup>1)</sup>						Weight
								SSA..	STA..40.. / STP..40..	STA..65.. / STP..65..	SUA21/3P	SUE21P	SSD..UT	
								[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
	[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]		
VPP46.25F3.6			104		63	85	100	185		175	155	155	391	1.02
VPP46.32F4	32	1½		26										1.22
VPP46.10L0.2Q	10	½	65	54.8	38	68.5	83.5	170	160	160	134	134	371	0.402
VPP46.10L0.4Q									-					0.302
VPP46.15L0.2Q	15	¾	65	55.5	38	67.3	82.2	170	160	160	135	135	374	0.422
VPP46.15L0.4Q									-					
VPP46.15L0.6Q									160					
VPP46.15F1.4Q									-					
VPP46.20L0.6Q	20	1	70	57.3	38	67.5	82.5	170	160	160	135	135	374	0.459
VPP46.20F1.4Q									-					
VPP46.20F1.8Q									-					
VPP46.25F1.8Q	25	1¼	78	59		70	85		-		138	138	385	0.59
VPP46.25F3.6Q			104	63										
VPP46.32F4Q	32	1½	104	68	63	85	100	185		175	155	155	391	1.317

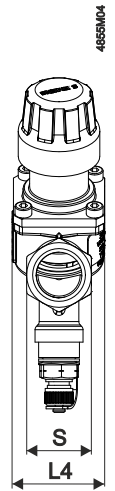
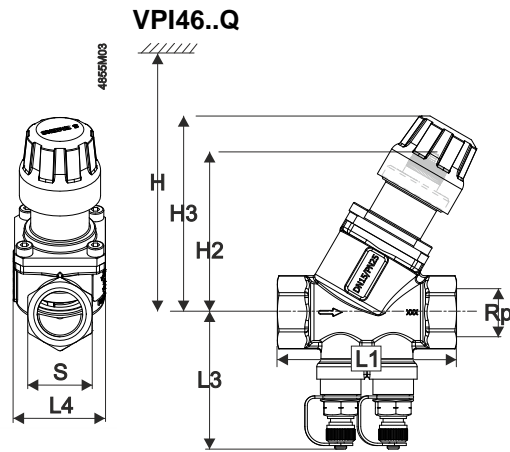
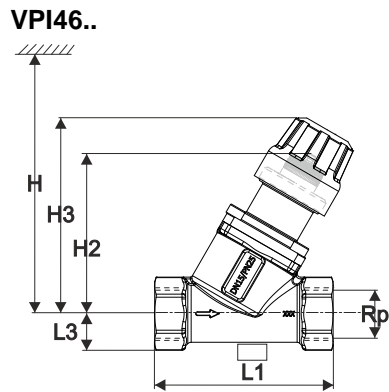
<sup>1)</sup> Total height including actuator

Sets of threaded fittings with flat seal ALG..2: set of 2 threaded fittings	ALG132 ALG142	Pipe side with external R threads	
	ALG152 ALG152B ALG202 ALG202B ALG252 ALG252B	Pipe side with internal Rp threads	

Type ALG..	For valve type		DN	G	R	Rp	L	T
Malleable cast iron	Brass			w	[Inch]	[Inch]	[mm]	[mm]
-	ALG132	VPP46.10..	10	G ½ B	R ¾	-	≈ 24	≈ 9
-	ALG142	VPP46.15..	15	G ¾ B	R ½	-	≈ 29.5	≈ 12
ALG152	ALG152B	VPP46.20..	20	G 1 B	-	Rp ½	≈ 23	≈ 13
ALG202	ALG202B	VPP46.25..	25	G 1¼ B	-	Rp ¾	-	-
ALG252	ALG252B	VPP46.32..	32	G 1½ B	-	Rp 1	-	-

<sup>1)</sup> Maximum medium temperature 100 °C

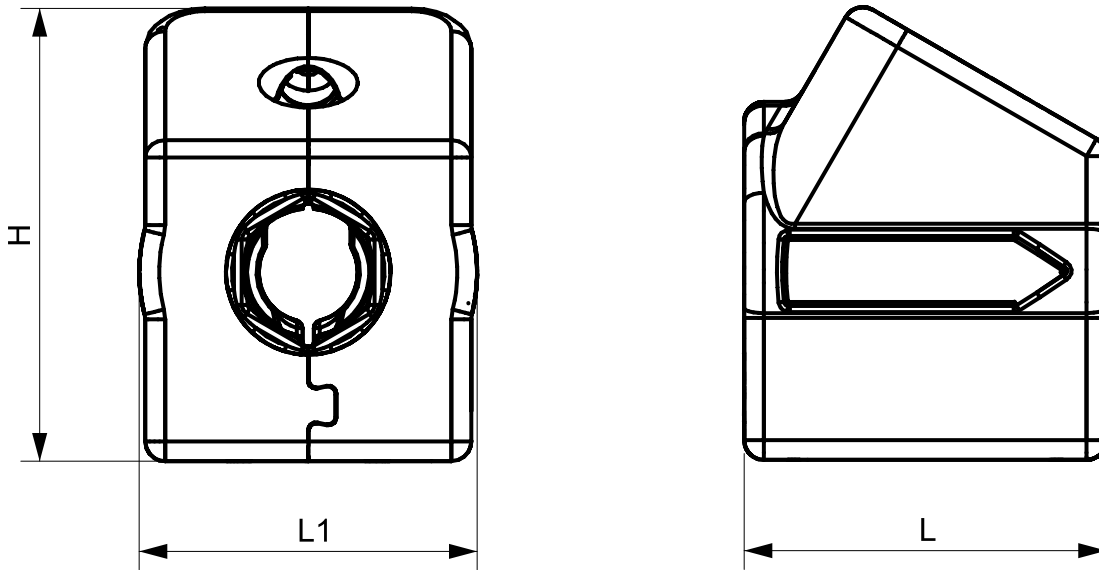
On valve side: cylindrical thread to ISO 228-1, on pipe side: with cylindrical thread to ISO 7-1



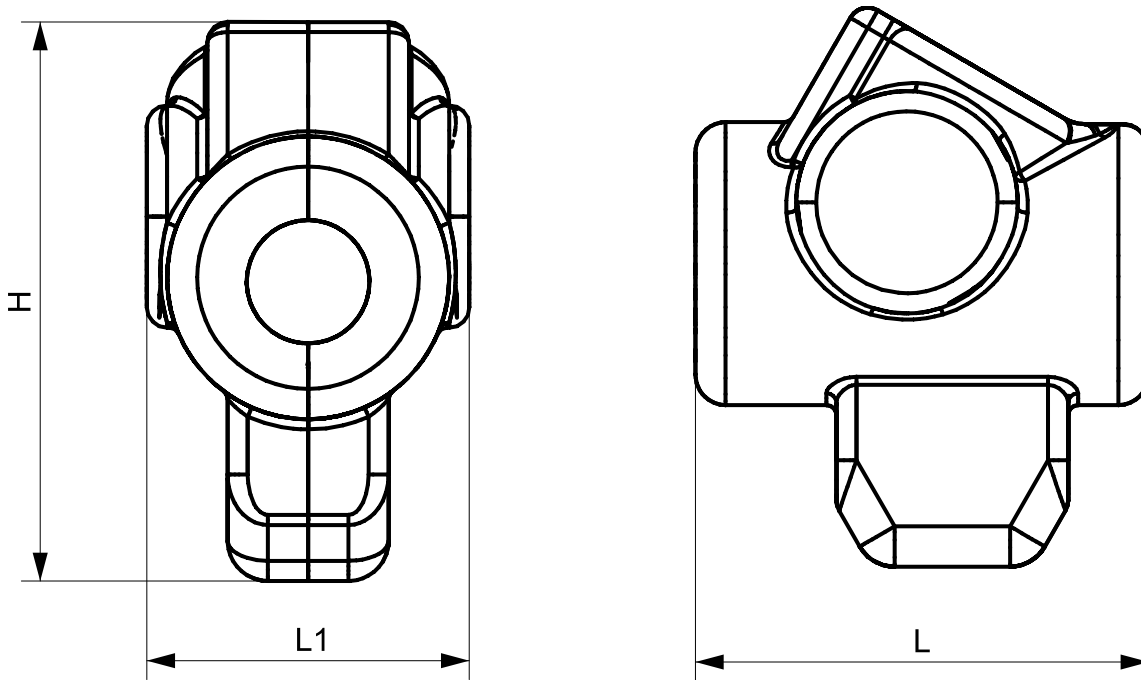
Valves	DN	Rp	S	L1	L3	L4	H2	H3	H <sup>1)</sup>						kg	
									SSA..	STA..40.. / STP..40..	STA..65.. / STP..65..	SAY..	SUA21/ 3P	SUE21P		SSD..UT
									mm	mm	mm	mm	mm	mm	mm	mm
VPI46.15L0.2	15	½	27	75	15.2	38	67.3	82.4	170	160	160	135	135	374	0.377	
VPI46.15L0.4																-
VPI46.15L0.6																160
VPI46.15F1.4																-
VPI46.20L0.6	20	¾	32	79	17.9	63	67.5	82.5	170	160	160	135	135	374	0.418	
VPI46.20F1.4																-
VPI46.20F1.8																-
VPI46.25F1.8	25	1	39	83	22	63	70	85	170	160	160	138	138	385	0.533	
VPI46.25F3.6				100												
VPI46.32F4	32	1¼	46	104	26	63	85	100	185	175	175	155	155	391	1.219	
VPI46.15L0.2Q	15	½	27	75	60.2	38	67.3	82.4	170	160	160	135	135	374	0.477	
VPI46.15L0.4Q																-
VPI46.15L0.6Q																160
VPI46.15F1.4Q																-
VPI46.20L0.6Q	20	¾	32	79	62.9	63	67.5	82.5	170	160	160	135	135	374	0.506	
VPI46.20F1.4Q																-
VPI46.20F1.8Q																-
VPI46.25F1.8Q	25	1	39	83	59	63	70	85	170	160	160	138	138	385	0.625	
VPI46.25F3.6Q				100												
VPI46.32F4Q	32	1¼	46	104	68	63	85	100	185	175	175	155	155	391	1.316	
VPI46.40F9.5Q	40	1½	56	138	71	90	161	-	-	-	500	-	-	-	3.253	
VPI46.50F12Q	50	2	70		77											77

<sup>1)</sup> Total height including actuator

ALI20VPI46/VPP46, ALI25VPI46/VPP46 and ALI32VPI46/VPP46



ALI50VPI46/VPP46



Type	Valve type	L	L1	H	Weight
			mm		kg
ALI20VPI46/VPP46	VP..46.10, VP..46.15.. VP..46.20	91	85	114	0.034
ALI25VPI46/VPP46	VP..46.25F1.8	102	119	134	0.056
ALI32VPI46/VPP46	VP..46.25F3.6, VP..46.32..	115	131	165	0.083
ALI50VPI46/VPP46	VP..46.40.., VP..46.50..	225	160	280	0.185

**Revision numbers**

Type	Valid from rev. no.	Type	Valid from rev. no.
VPP46.10L0.2	..A	VPP46.10L0.2Q	..A
VPP46.10L0.4	..B	VPP46.10L0.4Q	..B
VPP46.15L0.2	..A	VPP46.15L0.2Q	..A
VPP46.15L0.6	..A	VPP46.15L0.6Q	..A
VPP46.20F1.4	..A	VPP46.20F1.4Q	..A
VPP46.25F1.8	..A	VPP46.25F1.8Q	..A
VPP46.32F4	..A	VPP46.32F4Q	..A
VPI46.15L0.2	..A	VPI46.15L0.2Q	..A
VPI46.15L0.6	..A	VPI46.15L0.6Q	..A
VPI46.20F1.4	..A	VPI46.20F1.4Q	..A
VPI46.25F1.8	..A	VPI46.25F1.8Q	..A
VPI46.32F4	..A	VPI46.32F4Q	..A
-	-	VPI46.40F9.5Q	..A
-	-	VPI46.50F12Q	..A

**Documentation form**

Installed location	Valve type	Actuator Type	Valve Size	Planned Pre-setting	Required $\Delta p_{min}$ (kPa)	Verified $\Delta p$ (kPa)	Flow <sup>1)</sup> (l/h)

<sup>1)</sup> Flow = If Verified  $\Delta p_{min}$  > Required  $\Delta p_{min}$ , then Flow is as per presetting in datasheet, otherwise check.





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