

ACVATIX™

Pressure Independent Control Valves (PICV)

VPD..-135, VPE..-135, VPU..-135



Radiator valves featuring integrated differential pressure control for 2-pipe heating systems (radiators)

- Automatic dynamic balancing
- Simple design of the system
- No disturbing flow noise
- Integrated presetting for volume flow
- Available in DIN versions D and F, nominal widths DN 10, DN 15, and DN 20
- Valve bodies made of brass, mat nickel-plated
- Flow from 20...135 l/h
- Can be combined with RTN.., thermostatic STA..40.., STP..40.. and electromotoric SSA.. actuators

Use

These pressure independent control valves (PICV) are designed for use in 2-pipe heating systems (radiators) to provide individual room control.

PICVs with integrated differential pressure control ensure that the amount of heat emitted by the radiator is well defined regardless of operating conditions; line balancing valves normally used for hydraulic balancing are no longer required.

Due to integrated differential pressure control, PICVs are extremely well suited for new houses and buildings, or for upgrading plants impaired with hydraulic problems.

Type summary

Model	Type	Stock number	DN	Standard DIN 215	Thread [inch]	Δp_{\min} [bar]	Δp_{\max} [bar]	\dot{V}_{\max} [l/h]
2-port valves	VPD110A-135	S55264-V165	10	D	3/8"	0.1	0.6	135
	VPD115A-135	S55264-V166	15		1/2"			
	VPD120A-135	S55264-V167	20		3/4"			
	VPD210A-135	S55264-V173	10	F	3/8"			
	VPD215A-135	S55264-V174	15		1/2"			
	VPD220A-135	S55264-V175	20		3/4"			
Angle valves	VPE110A-135	S55264-V168	10	D	3/8"			
	VPE115A-135	S55264-V169	15		1/2"			
	VPE120A-135	S55264-V170	20		3/4"			
	VPE210A-135	S55264-V176	10	F	3/8"			
	VPE215A-135	S55264-V177	15		1/2"			
	VPE220A-135	S55264-V178	20		3/4"			
Axial valve	VPU110A-135	S55264-V171	10	D	3/8"			
	VPU115A-135	S55264-V172	15		1/2"			

Δp_{\min} = Minimum required differential pressure across the valve

Δp_{\max} = Maximum permissible differential pressure across the valve

\dot{V} = Volume flow range 20...135 l/h, see page 6

Ordering

Example

Type	Stock number	Designation	Number of pieces
VPD115A-135	S55264-V166	2-port valves	1


Delivery

Valves, actuators, and accessories are supplied in separate packages.

Rev. No.

Overview table, see page 12.

Accessories

Type	Stock number	Designation	Number of pieces	Picture
ATN6	S55264-V187	Manual adjuster (10 pcs per package)	1 (Package)	-
ALE10	BPZ:ALE10	Electronic Δp manometer, 7 bar	1	
ALE12	S55264-V188	Tool for measuring differential pressure, Adapter with tube	1	-

Equipment combinations

Product	Types	Data sheet
Electrothermal actuators	STA..40.., STP..40..	A6V14028280
Electric actuators	SUA21/3..	A6V10446174
Electric actuators	SSA118.09HKN	A6V11858280
Electric actuators	SSA131.., SSA331..	A6V11858276
Electric actuators	SSA151.., SSA161..	A6V11858278
Wireless actuator (battery powered)	SSA911.02ZB	A6V13722083
Electromotoric actuators	SFA../18	N4863
Thermostatic actuators	RTN..	N2111

NO valves

Valve is open without actuator (normally open) and the valve stem is extended.

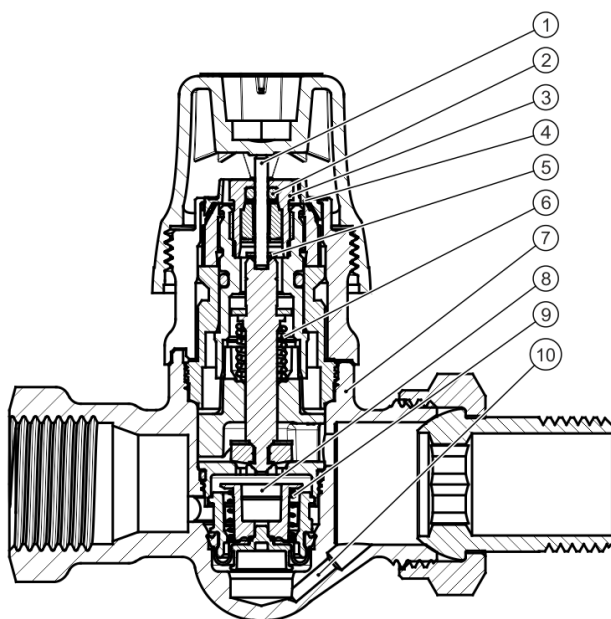
Technical and mechanical design

Functions

- Control valve for influencing the volume flow and pressure controller for automatic balancing
- Compensation of differential pressure variations with complete hydraulic decoupling of consumers
- Manual adjustment for shutoff and temporary operation of heating plant during the construction phase. A constant flow rate is also ensured in manual operation, independent of the differential pressure.

Construction

2-port valves VPD..



- | | |
|----|---------------------|
| 1 | Pressure connection |
| 2 | O-ring seal |
| 3 | Sealing gland |
| 4 | Scale setting |
| 5 | Seal |
| 6 | Regulating spring |
| 7 | Valve body |
| 8 | Regulator |
| 9 | Spring |
| 10 | Pulse connection |

Engineering notes

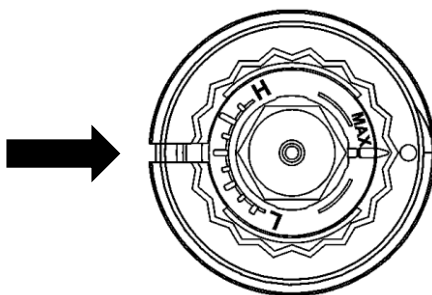
Pressure independent control valves (PICV) have presettings to select the required volume flow \dot{V} .

The set \dot{V} value represents the maximum flow rate. The integrated pressure controller maintains the volumetric flow at a constant level, even if the differential pressure varies between 0.1 and 2 bar. This eliminates the need for central precontrol and setting the valve's authority.

Water must be free of organic substances.

Example of sizing

Required heat output	700 W
Cooling (radiator)	$\Delta T \ 20^\circ \text{C}$
Flow (radiator)	$\dot{V} = \frac{700}{20 \times 1,16} = 30 \text{ l/h}$
Min. pressure for constant flow	0.1 bar
Valve setting	2



Volume flow

Volume flow \dot{V} K_v [l/h] for STA..40..., STP..40..., SUA21/3, SSA131..., SSA331..., SSA151..., SSA161..., SSA911.02ZB, SFA../18

Type		relating to the reference number for presetting											
-		[l/h]	K _v	[l/h]	K _v	[l/h]	K _v	[l/h]	K _v	[l/h]	K _v	[l/h]	K _v
VP...-135	3/8" (DN 10)	20	0.06	30	0.09	50	0.16	70	0.22	95	0.30	135	0.43
	1/2" (DN 15)												
	3/4" (DN 20)												
-													
Reference number		L		2		3		4		H		MAX	

Volume flow \dot{V} for RTN51..., RTN71..., und RTN81..

Type		relating to the reference number for presetting											
-		[l/h]		[l/h]		[l/h]		[l/h]		[l/h]		[l/h]	
		Xp1	XP2	Xp1	XP2	Xp1	XP2	Xp1	XP2	Xp1	XP2	Xp1	XP2
VP...-135	RTN51..	18	20	27	30	30	48	51	65	57	85	65	110
	RTN71												
	RTN81	19	20	28	30	40	49	53	66	60	88	70	115
-													
Reference number		L		2		3		4		H		MAX	

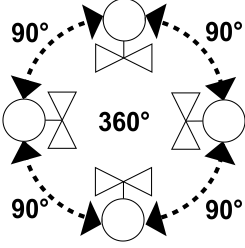
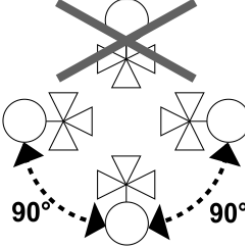
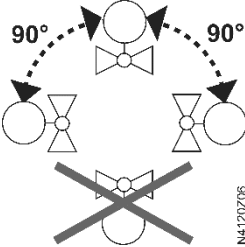
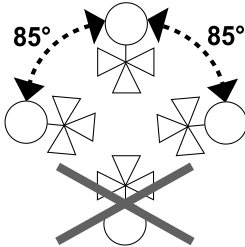
Setting

1. Loosen manual adjuster	2. Turn the manual adjuster 180°	3. Set the notch of the marking	4. Enter setting

Commissioning notes

Pressure independent control valves (PICV) must be open when flushing or pressure testing the system. Strong pressure impacts can damage closed PICV.

Mounting position

RTN71..., RTN81..., SSA118.. SSA151..., SSA161..., SSA..31..., SSA911.02ZB, STA..40..., STP..40..	RTN51..
	
SUA21/3..	SFA../18
	

Product documentation

Product	Types	Data sheet
Mounting instructions	Pressure independent control valves (PICV) VPD...-135, VPE...-135, VPU...-135	A6V13089945
Mounting instructions	Tool for measuring differential pressure, ALE12	A6V13414524

Maintenance notes

PICVs are maintenance-free.

Repair The valves cannot be repaired, they must be replaced as complete units.

Disposal

- Do not dispose of the device as part of domestic waste.
- Special handling of individual components may be required by law or make ecological sense.
 - Adhere to all local and currently applicable laws and regulations.

Warranty

The technical data relating to specific applications are valid only in conjunction with the actuators listed under "Device combinations" on page 2 of this data sheet.
Unauthorized manipulations or opening of PICVs void any warranty.
The user must ensure proper operation when using valves with third-party actuators.

Functional data	
PN class	PN 10
Permissible media	Cold or low-temperature hot water Recommendation: Water treatment to VDI 2035
Medium temperature	2...95 °C
Permissible operational pressure	Max. 1000 kPa (10 bar)
Maximum differential pressure Δp_{\max}	Max. 60 kPa (0.6 bar)
Minimum differential pressure Δp_{\min}	Min. 10 kPa (0.1 bar)
Test pressure	1600 kPa (16 bar)
Spring force at the closing point	35 N
Nominal stroke	2.5 mm
Closing dimension	11.5 mm

Materials	
Valve body	Brass, nickel plated.
Protective cover	Polypropylene
Diaphragm and seals	EPDM

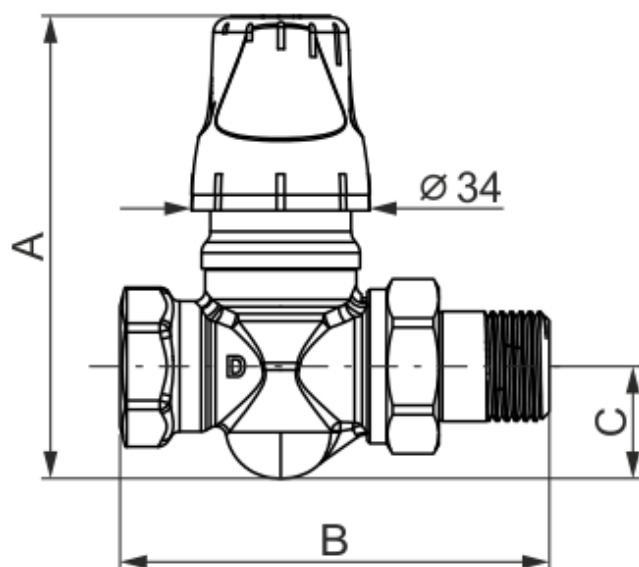
Dimensions / Weight		
See "Dimensions" on page 9		
Mounting length	EN 215	
Threaded	Rp internally threaded	to ISO 7-1
	R externally threaded	to ISO 7-1
	G-thread	to ISO 228-1
Actuator fixing	M30 x 1.5	

Standards, directives and approvals	
Pressure Equipment Directive	PED 2014/68/EU
Pressure Accessories	Scope: Article 1, section 1 Definitions: Article 2, section 5
Fluid group 2	without CE-marking as per article 4, section 3 (sound engineering practice) ¹⁾
Environmental compatibility	The product environmental declarations ²⁾ A6V13089948 (DIN 215 row D) und A6V13527513 (DIN 215 row F) contain data on environmentally compatible product design and assessments (RoHS compliance, material composition, packaging, environmental benefit, and disposal).

¹⁾ Valves where PS x DN < 1000, do not require special testing and cannot carry the CE label.

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

VPD..



Type	DN	Dimensions [mm]			Thread [inches]		Weight ²⁾ [kg]
		A	B ¹⁾	C	Rp	R	
VPD110A-135	10	88	83	21	3/8	3/8	0.25
VPD115A-135	15		95		1/2	1/2	0.30
VPD120A-135	20		107		3/4	3/4	0.41
VPD210A-135	10		75		3/8	3/8	0.23
VPD215A-135	15		82		1/2	1/2	0.28
VPD220A-135	20		97		3/4	3/4	0.39

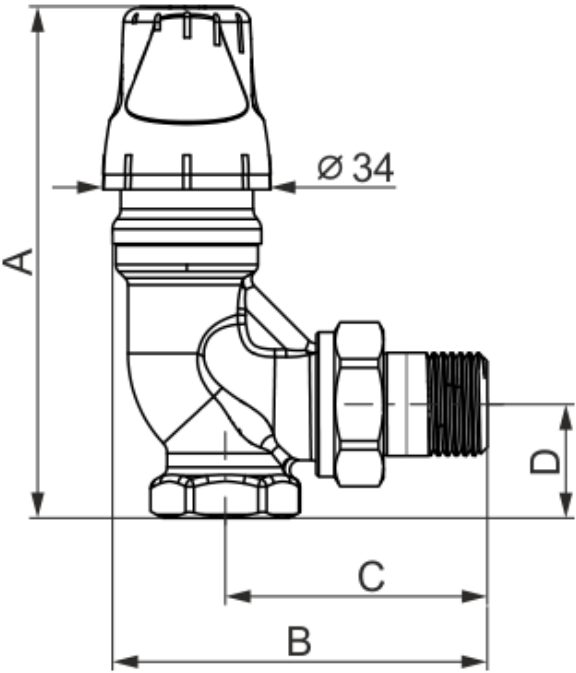
R = Externally threaded to ISO 7-1

¹⁾ ± 2 mm

G = Threaded to ISO 228-1

²⁾ Weight (with packaging)

VPE..



Typ	DN	Dimensions [mm]				Thread [inches]		Weight ²⁾ [kg]
		A	B	C ¹⁾	D ¹⁾	Rp	R	
VPE110A-135	10	101	76	52	22	3/8	3/8	0.26
VPE115A-135	15	108	83	58	26	1/2	1/2	0.31
VPE120A-135	20	110	92	66	29	3/4	3/4	0.42
VPE210A-135	10	88	75	49	20	3/8	3/8	0.26
VPE215A-135	15	88	82	53	23	1/2	1/2	0.30
VPE220A-135	20	88	97	63	26	3/4	3/4	0.40

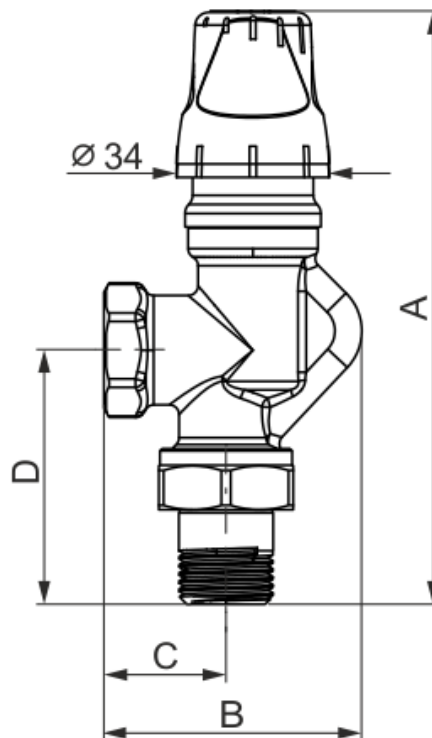
R = Externally threaded to ISO 7-1

¹⁾ ± 2 mm

G = Threaded to ISO 228-1

²⁾ Weight (with packaging)

VPU..



Typ	DN	Abmessungen [mm]				Gewinde [Zoll]		Gewicht ²⁾ [kg]
		A	B	C ¹⁾	D ¹⁾	Rp	R	
VPU110A-135	10	127	51	22	52	3/8	3/8	0.27
VPU115A-135	15	133	58	26	58	1/2	1/2	0.32

R = Externally threaded to ISO 7-1

¹⁾ ± 2 mm

G = Threaded to ISO 228-1

²⁾ Weight (with packaging)

Spare parts

Type	Stock number	Designation	Number of pieces
ATN6	S55264-V187	Manual adjuster (10 pcs per package)	1 (Package)

Revision numbers

Type		
DIN series	Stock number	Valid as of revision
VPD110A-135	S55264-V165	B
VPD115A-135	S55264-V166	B
VPD120A-135	S55264-V167	B
VPD210A-135	S55264-V173	B
VPD215A-135	S55264-V174	B
VPD220A-135	S55264-V175	B
VPE110A-135	S55264-V168	B
VPE115A-135	S55264-V169	B
VPE120A-135	S55264-V170	B
VPE210A-135	S55264-V176	B
VPE215A-135	S55264-V177	B
VPE220A-135	S55264-V178	B
VPU110A-135	S55264-V171	B
VPU115A-135	S55264-V172	B

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