



EN 215



Straight valves VDN1..

Angle valves VEN1..

ACVATIX™

## Radiator valves

**VDN1..  
VEN1..**

DIN-norm, for 2-pipe heating systems

- Valve bodies made of brass, mat nickel-plated
- DN 10, DN 15 and DN 20
- Integrated presetting of the  $k_v$ -values
- Internally and externally threaded (Rp/R) conforming to ISO 7-1
- Manual knob / protective cover included in the delivery
- Can be combined with RTN.. thermostatic actuators, SSA.. electromotoric actuators, STA..3.. electrothermal actuators or SSA955 RF-controlled actuators

### Use

The radiator valves are used in hot water heating plants for individual room or zone temperature control and limitation. They are basically recommended in all rooms, especially where heat gains or different temperature levels occur.

## Type summary

Product number straight	Product number angle	DN	X <sub>P</sub>	k <sub>v</sub> -value [m <sup>3</sup> /h] 1 - N	k <sub>vs</sub> -value [m <sup>3</sup> /h] without actuator N
VDN110	VEN110	10	X <sub>P</sub> = 2	0.072...0.43	0.63
			X <sub>P</sub> = 1.5	0.057...0.33	
			X <sub>P</sub> = 1	0.037...0.22	
VDN115	VEN115	15	X <sub>P</sub> = 2	0.073...0.50	0.89
			X <sub>P</sub> = 1.5	0.058...0.40	
			X <sub>P</sub> = 1	0.038...0.27	
VDN120	VEN120	20	X <sub>P</sub> = 2	0.22...0.70	1.41
			X <sub>P</sub> = 1.5	0.17...0.55	
			X <sub>P</sub> = 1	0.11...0.36	

## Ordering

Example:

Product number	Stock number	Description	Quantity
VDN120	VDN120	straight valves	2
ATN2	ATN2	protection against dismantling	1

Delivery

Valves and accessories are packed separately.

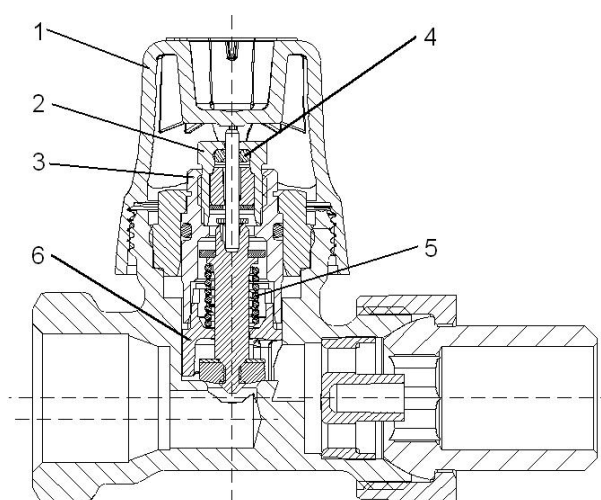
## Equipment combinations

Actuators	Product numbers	Data sheet
Thermostatic actuators	RTN..	N2111
Electromotoric actuators	SSA31.. / SSA61.. / SSA81..	N4893
RF-controlled electromotoric actuators	SSA955	N2700
Electrothermal actuators	STA..3..	N4884

## Function / mechanical design

The flow rate can be preadjusted with an orifice. Full stroke is ensured irrespective of the preadjustment, which is made with the help of the protective cover.

- 1 Manual knob / protective cover
- 2 Sealing gland
- 3 Valve insert
- 4 O-ring
- 5 Reset spring
- 6 Orifice



## Features and benefits

- The valves conform to EN 215

- The sealing gland can be replaced while the plant is under pressure (no tools required)

## Accessories

### AVN1

Sealing gland



### ATN2

Protection against dismantling



### ATN3

Manual knob (RAL9016)



### ATN4

Manual knob



### AVN..

Compression fittings



## Engineering notes

The reference numbers for preadjustment are given in the table with the  $k_v$ -values (see page 4) and in the valve sizing charts (see pages 5 – 6).

1. Calculate the volumetric water flow  $\dot{V}_{100}$

$$\dot{V}_{100} = \frac{Q_{100}}{1.163 \times \Delta T \times f_1} \quad [\text{m}^3/\text{h}]$$

$Q_{100}$  = heat demand [kW]  
 $\Delta T$  = temperature differential [K]  
 $1.163$  = constant of water  
 $f_1$  = correction factor = 1 for water

2. Define the pressure drop  $\Delta p_{v100}$  across the fully open valve

In most types of plant, a differential pressure  $\Delta p_{v100}$  of 0.05 to 0.2 bar is adequate.

3. Calculation of the nominal flow value  $k_v$

$$k_v = \frac{\dot{V}_{100}}{\sqrt{\Delta p_{v100}}} \quad [\text{m}^3/\text{h}]$$

$\Delta p_{v100}$  = differential pressure across the valve [bar]

Example:

Heat demand	$Q_{100}$	= 1.2 kW
Temperature differential	$\Delta T$	= 20 K
Water volume	$\dot{V}_{100} = \frac{1.2}{1.163 \times 20}$	= 0.052 m <sup>3</sup> /h = 52 l/h
Required differential pressure across the valve	$\Delta p_{v100}$	= 0.1 bar
Flow	$k_v = \frac{0.052}{\sqrt{0.1}}$	= 0.17 m <sup>3</sup> /h

### Solution

According to the chart (refer to "Valve sizing charts", page 5 or table with  $k_v$ -values), the preadjustment required by a VDN110 3/8" valve is 2.

### Tips

- Noiseless operation is ensured by a pump that provides no more pressure than is needed to transport the required amount of water.
- To keep the valve free from dirt particles, it is recommended to install a strainer.

### $k_v$ -values

The  $k_v$  value gives the volumetric water flow  $\dot{V}_{100}$  in m<sup>3</sup>/h at a pressure drop  $\Delta p_{v100}$  across the valve of 1 bar.

### $k_v$ -values [m<sup>3</sup>/h] at the different preadjusted positions

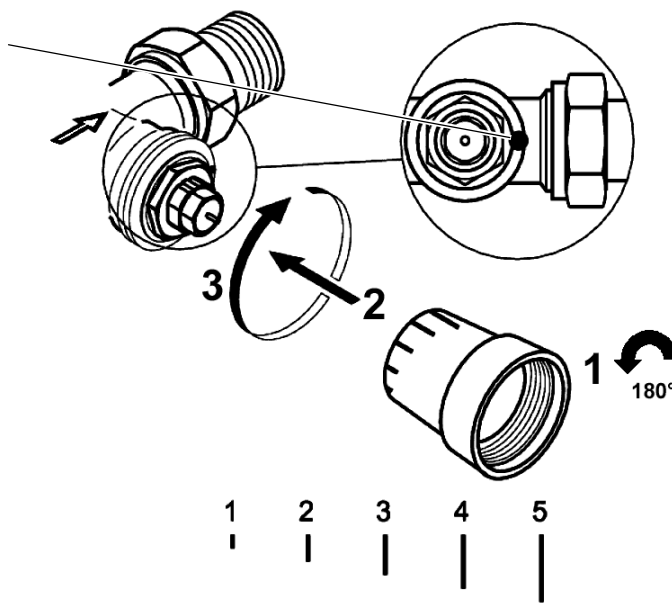
Control range with actuators SSA.. and STA..3..	✓	✓	✓	✓	✓	✓	✓
Control range of thermostatic actuators RTN..	✓	✓	✓	✓	✓	✓	
<b>Reference numbers for pre-adjustment</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>N</b>	<b>N(<math>k_{vs}</math>)</b>
VDN110 / VEN110 XP 2K	0.072	0.17	0.24	0.28	0.37	0.43	0.63
VDN110 / VEN110 XP 1.5K	0.057	0.135	0.19	0.23	0.29	0.33	
VDN110 / VEN110 XP 1K	0.037	0.089	0.13	0.145	0.19	0.22	
VDN115 / VEN115 XP 2K	0.07	0.17	0.28	0.36	0.45	0.50	0.89
VDN115 / VEN115 XP 1.5K	0.058	0.14	0.23	0.28	0.35	0.4	
VDN115 / VEN115 XP 1K	0.038	0.9	0.15	0.18	0.24	0.27	
VDN120 / VEN120 XP 2K	0.22	0.35	0.44	0.52	0.60	0.71	1.41
VDN120 / VEN120 XP 1.5K	0.17	0.27	0.35	0.42	0.46	0.55	
VDN120 / VEN120 XP 1K	0.11	0.18	0.23	0.28	0.31	0.36	

### Setting the $k_v$ -values

The  $k_v$ -values can be set on the valve's head in 5 steps + N (fully open) using the protective cover, which can be turned through 180°.



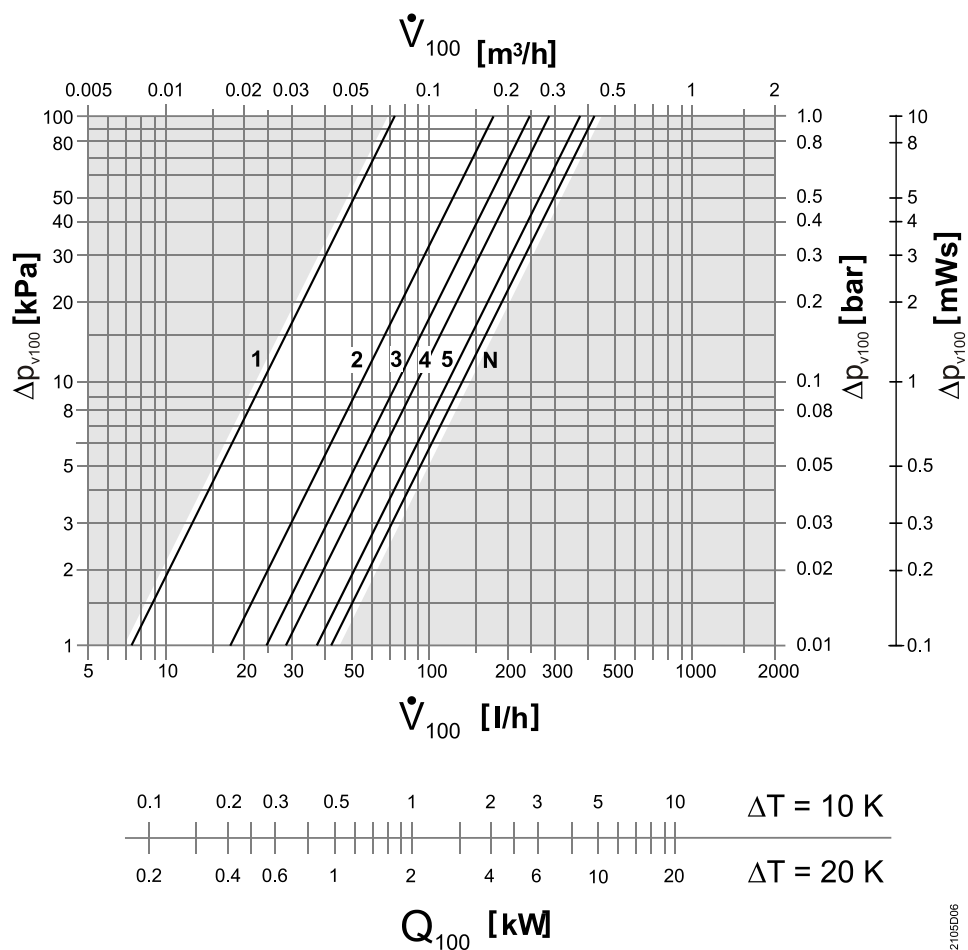
Observe marking on  
the valve's outlet side!



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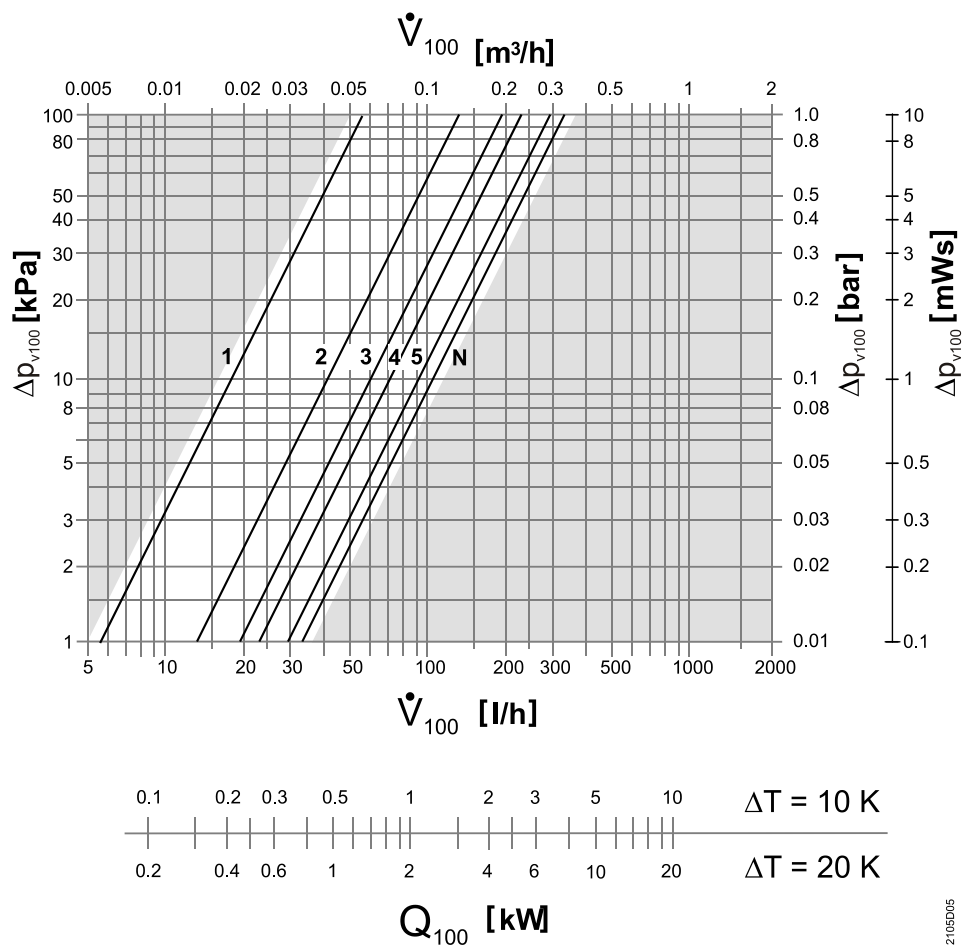
## Valve sizing charts

**VDN110**  
**VEN110**  
Xp Band 2 K



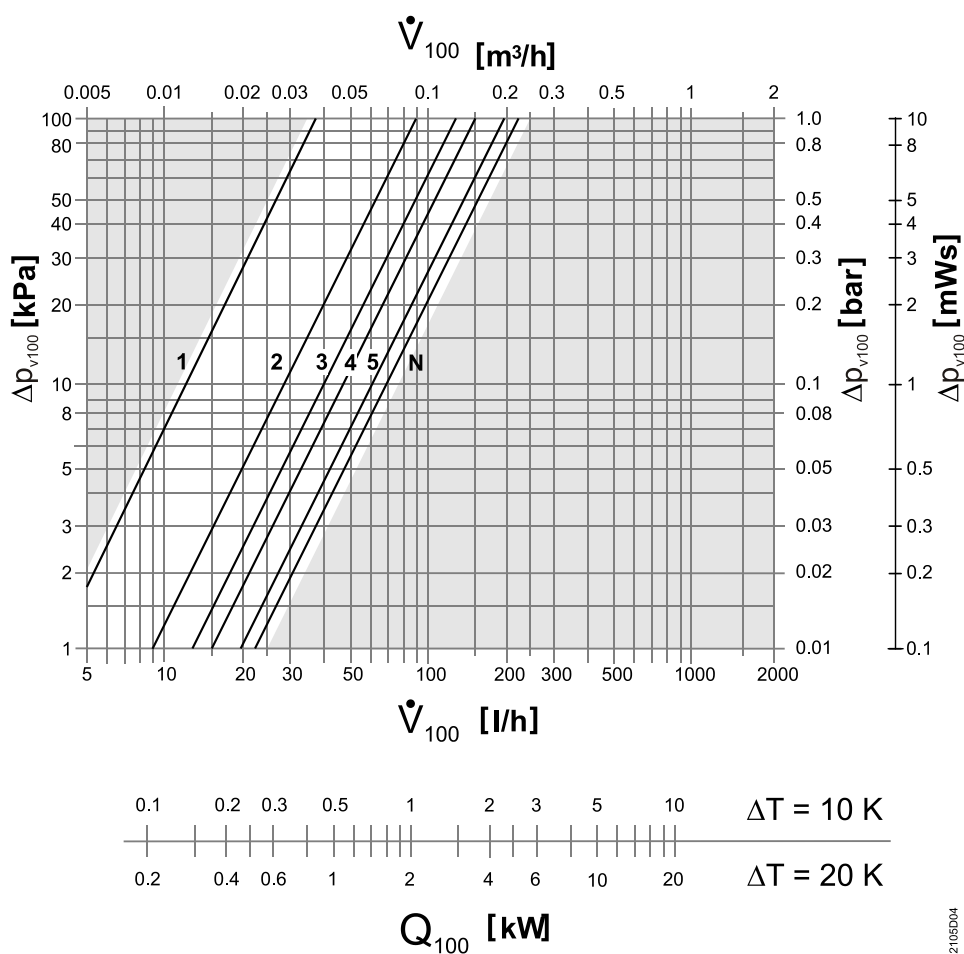
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**VDN110**  
**VEN110**  
 Xp Band 1.5 K



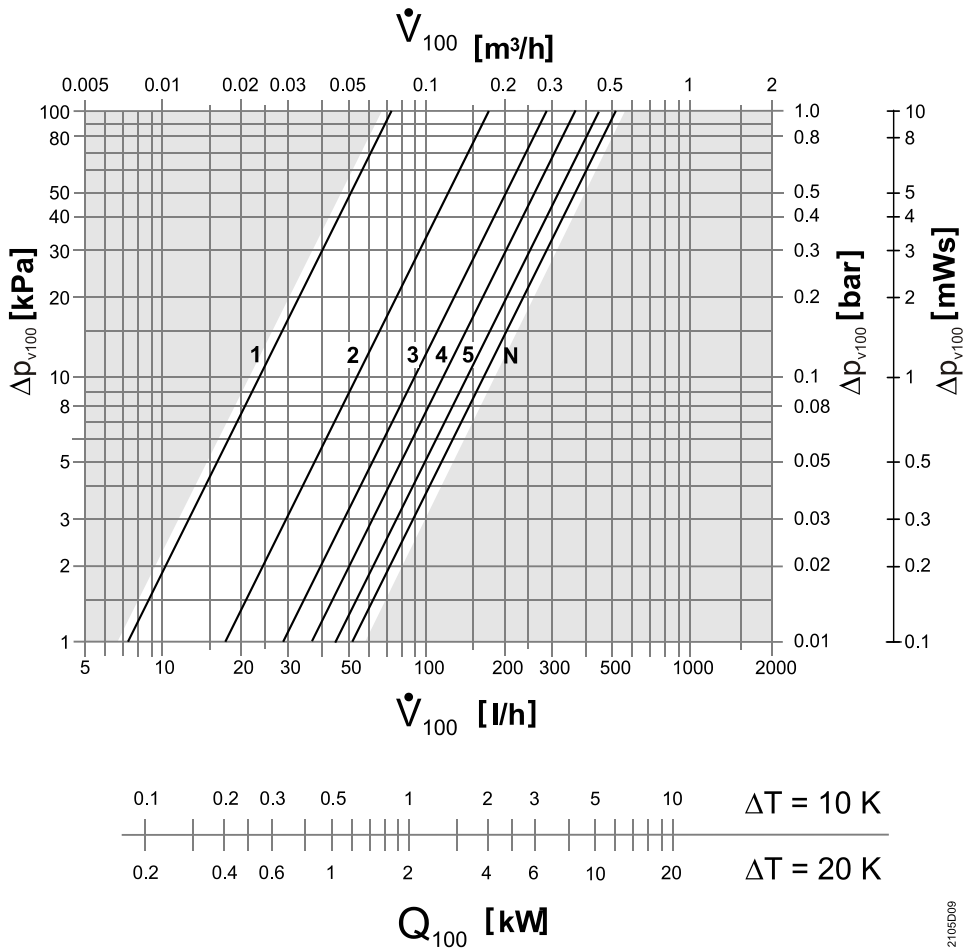
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**VDN110**  
**VEN110**  
 Xp Band 1 K



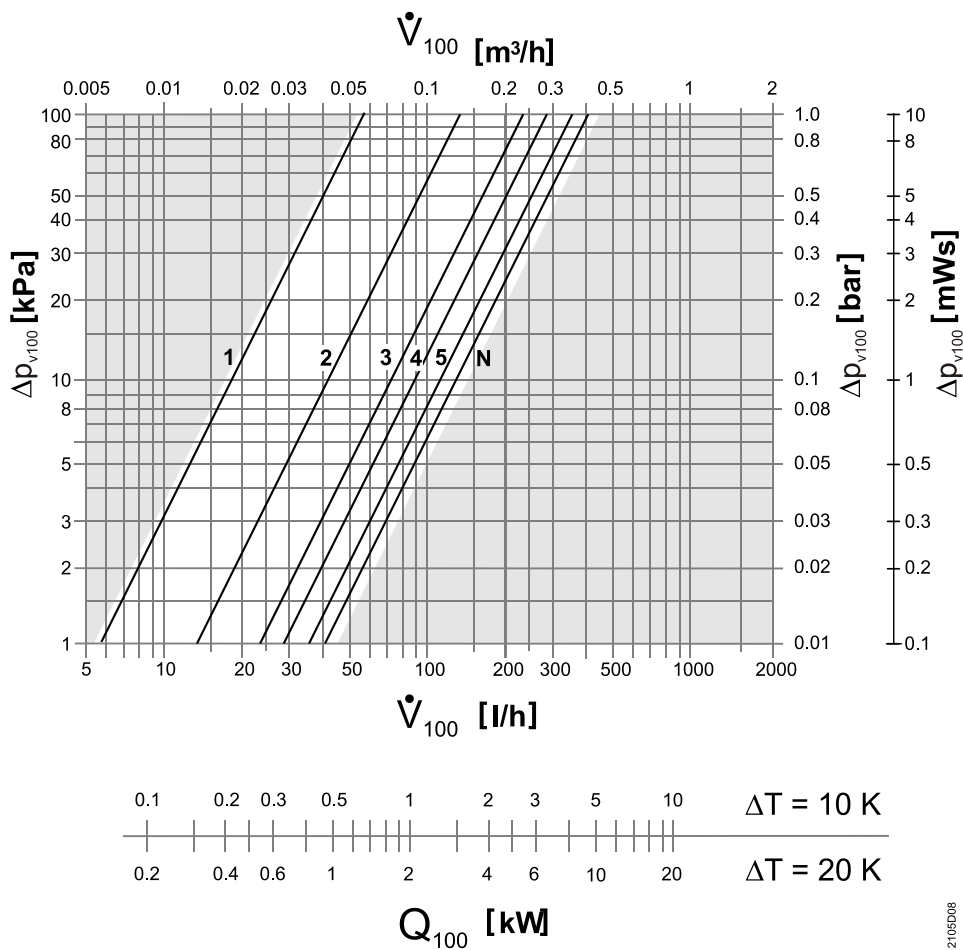
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VDN115  
VEN115  
Xp Band 2 K



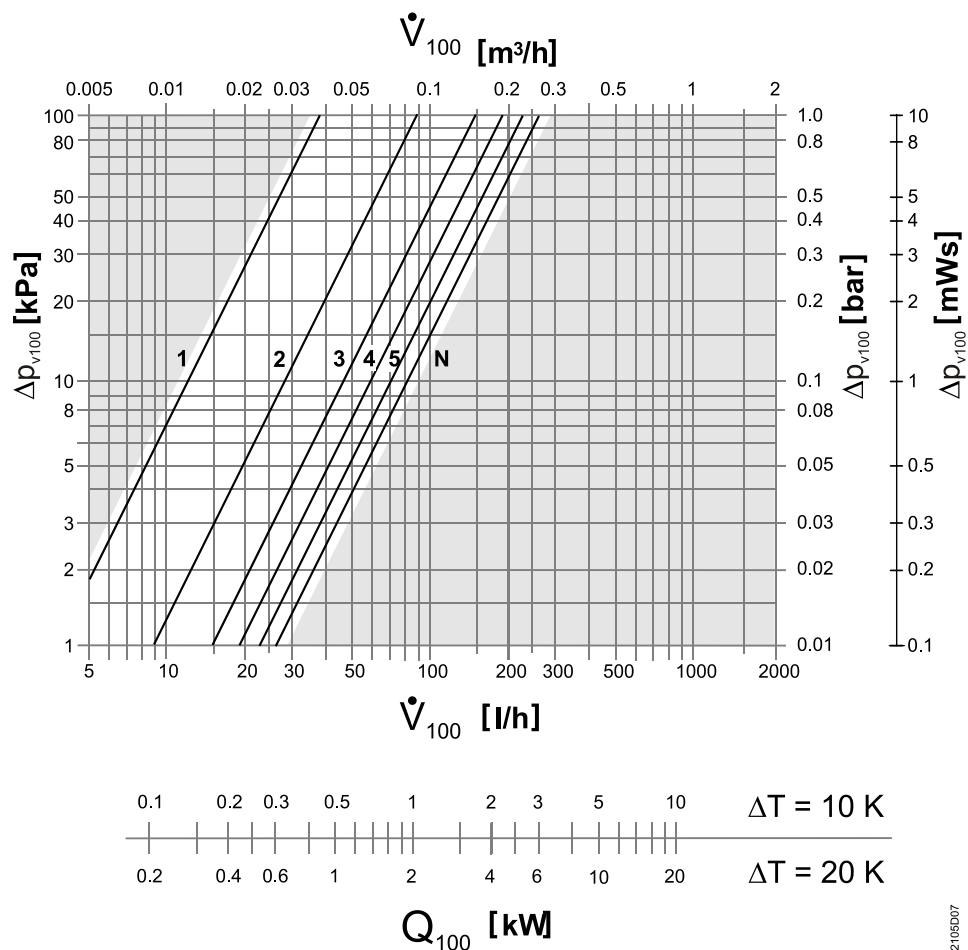
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VDN115  
VEN115  
Xp Band 1.5 K

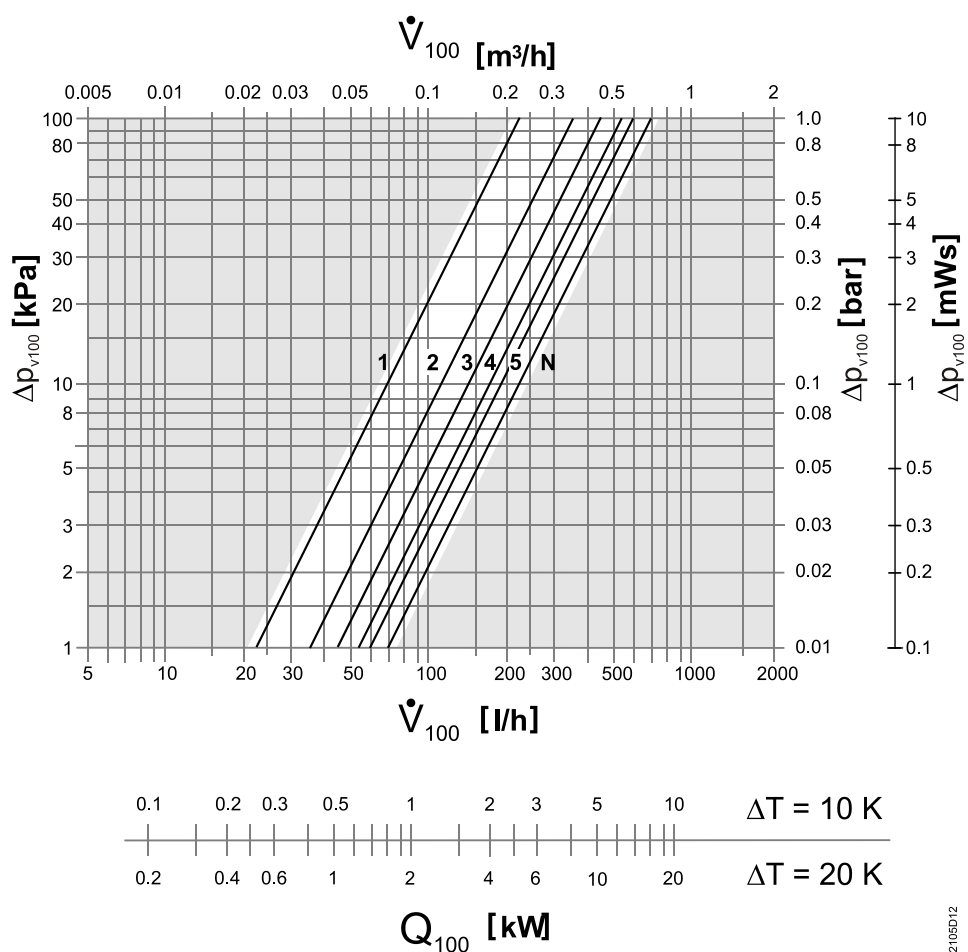


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**VDN115**  
**VEN115**  
 Xp Band 1 K

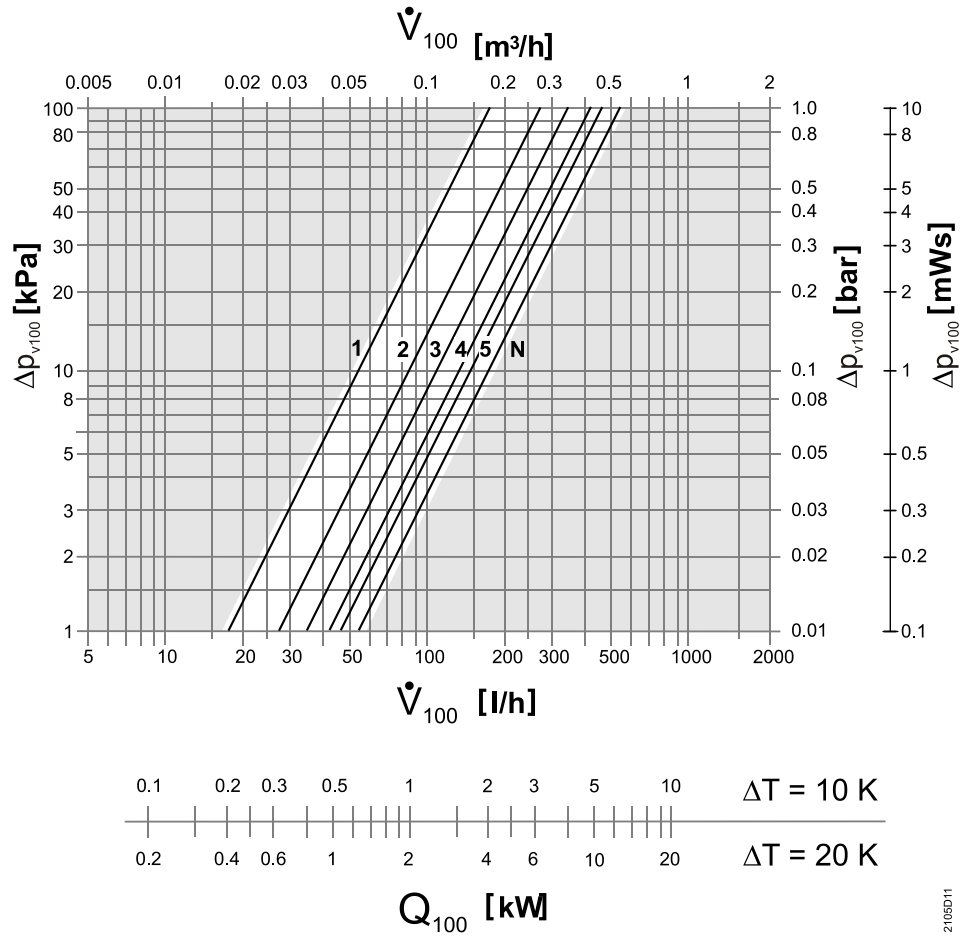


**VDN120**  
**VEN120**  
 Xp Band 2 K



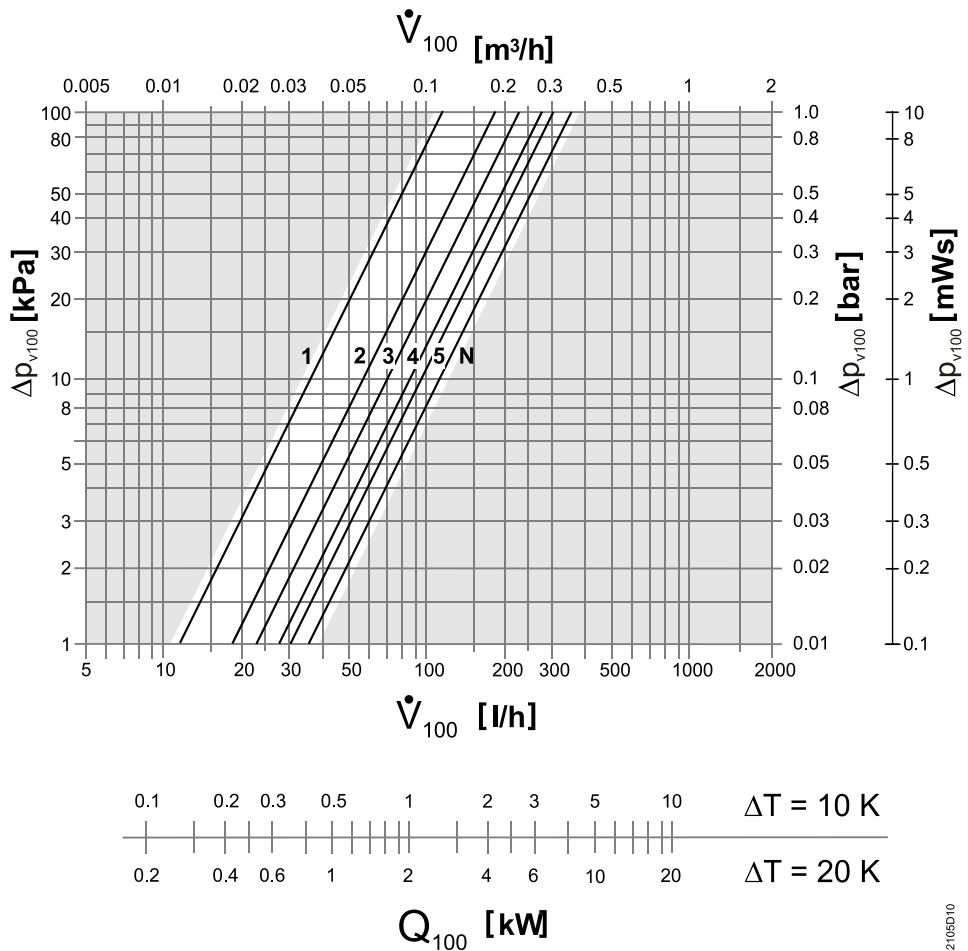


VDN120  
VEN120  
Xp Band 1.5 K



2105D11

VDN120  
VEN120  
Xp Band 1 K

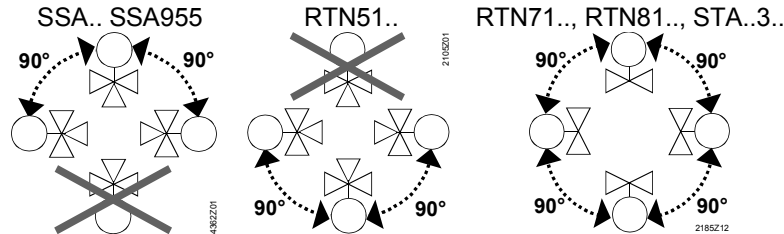


2105D10

### Mounting

- Mounting Instructions are printed on the package. Mounting orientation depends on selected actuator.
- The valves are supplied preadjusted to N (fully open)
- To ensure correct functioning of the thermostatic heads and electronic actuators, observe the available mounting choices and mounting conditions

### Orientation



### Maintenance

The valves are maintenance-free.

### Repair

In the event of leakage, the valve's sealing gland can be replaced.  
The valves cannot be repaired; the complete unit must be replaced.

### Disposal



The valve must not be disposed of together with domestic waste.  
Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.  
**Current local legislation must be observed.**

### Warranty

Application-related technical data are only warranted when used in connection with the Siemens controllers and actuators listed under "Equipment combinations", page 2.

**When using the valves with actuators of other manufacture proper functioning must be ensured by the user. Any warranty by Siemens Switzerland Ltd / HVAC Products becomes void.**

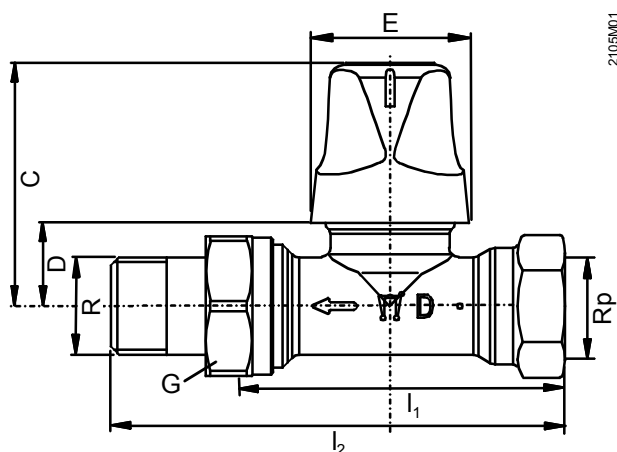
## Technical data

Functional data	PN class	PN 10		
	Suitable media <sup>1)</sup>	cold and low-temperature hot water, water with propylene-glycol, water with ethylene-glycol < 30%; recommendation: water treatment to VDI 2035		
	Medium temperature	1...120 °C		
	Perm. operating pressure	1000 kPa (10 bar)		
	Differential pressure Δp <sub>max</sub>	max. 60 kPa (0.6 bar)		
	Differential pressure Δp <sub>v100</sub>	5...20 kPa (0.05...0.2 bar): recommended range		
	Stroke	min 1.2 mm		
Standards	Environmental compatibility	ISO 14001 (Environment)		
		ISO 9001 (Quality)		
		SN 36350 (Environmentally compatible products)		
		RL 2002/95/EG (RoHS)		
Materials	Valve body	brass, mat nickel-plated		
	Fitting	brass, mat nickel-plated		
	Protective cover	polypropylene		
	O-ring	EPDM, NBR		
Dimensions / weight	refer to "Dimensions", page 12			
	Mounting length	EN 215		
	Thread	Rp internally threaded	to ISO 7-1	
		R externally threaded	to ISO 7-1	
		G-thread	to ISO 228-1	

<sup>1)</sup> Prefer propylene-glycol for environment protection reasons.

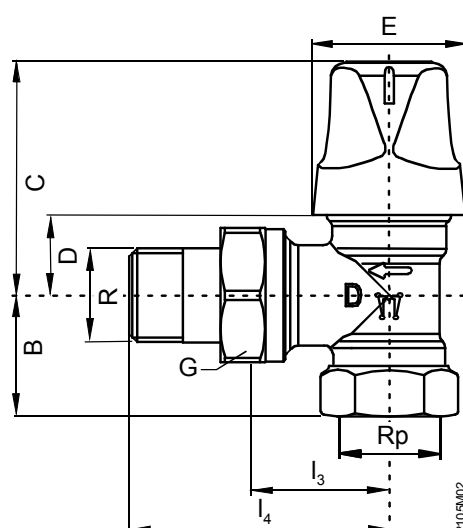
## Dimensions

VDN1..



2105M01

VEN1..



2105M02

Prod. no.	DN	Dimensions [mm]								Thread [inch]			Weight [kg]
		I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	B	C	D	E	Rp	R	G	
VDN110	10	59	85				53	18	35	$\frac{3}{8}$	$\frac{3}{8}B$	$\frac{5}{8}$	0.240
VDN115	15	66	95				53	18	35	$\frac{1}{2}$	$\frac{1}{2}B$	$\frac{3}{4}$	0.285
VDN120	20	74	107				53	18	35	$\frac{3}{4}$	$\frac{3}{4}B$	1	0.410
VEN110	10			26	52	22	53	18	35	$\frac{3}{8}$	$\frac{3}{8}B$	$\frac{5}{8}$	0.225
VEN115	15			29	58	26	53	18	35	$\frac{1}{2}$	$\frac{1}{2}B$	$\frac{3}{4}$	0.270
VEN120	20			34	66	29	53	18	35	$\frac{3}{4}$	$\frac{3}{4}B$	1	0.375

Prod. no.	DN	Compression fittings					
		for copper and soft steel pipes			for plastic pipes with aluminum foil		
		Prod. no.	Connection valve side	Connection pipe side	Prod. no.	Connection valve side	Connection pipe side
			[Inch]	pipe Ø [mm]		[Inch]	pipe Ø [mm]
VDN110	10						
VDN115	15	AVN15-15	$\frac{1}{2}$	15	AVN15-A16	$\frac{1}{2}$	16 x 2
VDN120	20						

VEN110	10						
VEN115	15	AVN15-15	$\frac{1}{2}$	15	AVN15-A16	$\frac{1}{2}$	16 x 2
VEN120	20						