SIEMENS

2105

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_P**	**k_v-value** [m^3/h] **1 - N**	**k_{vs}-value** [m^3/h] without actuator **N**
VDN110	VEN110	10	**X_P = 2**	0.072…0.43	0.63
			X_P = 1.5	0.057…0.33	
			X_P = 1	0.037…0.22	
VDN115	VEN115	15	**X_P = 2**	0.073…0.50	0.89
			X_P = 1.5	0.058…0.40	
			X_P = 1	0.038…0.27	
VDN120	VEN120	20	**X_P = 2**	0.22…0.70	1.41
			X_P = 1.5	0.17…0.55	
			X_P = 1	0.11…0.36	

Ordering

Example:

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

Delivery

Valves and accessories are packed separately.

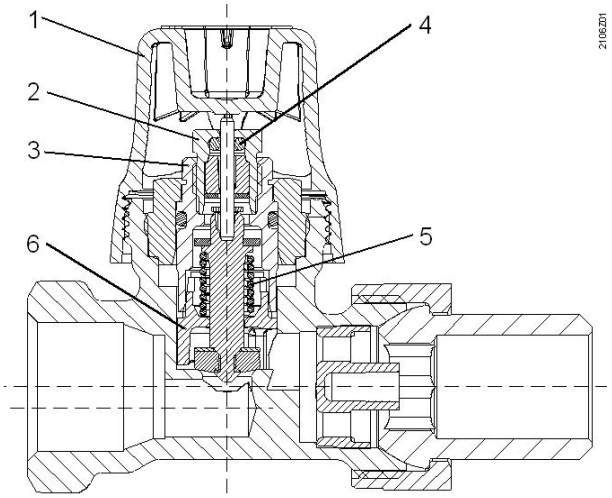
Equipment combinations

Actuators	**Product numbers**	**Data sheet**
Thermostatic actuators	RTN..	N2111
Electromotoric actuators	SSA131 / SSA331 / SSA161.05	A6V11858276
	SSA151.05HF / SSA161.05HF	A6V11858278
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

ATN2
Protection against dismantling

ATN4
Manual knob

AVN..
Compression fittings

The reference numbers for preadjustment are given in the table with the k_v-values (see page 5) and in the valve sizing charts (see pages 7 – 6).

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

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

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

2. Define the pressure drop Δp_{v100} across the fully open valve

   In most types of plant, a differential pressure Δp_{v100} of 0.05 to 0.2 bar is adequate.

3. Calculation of the nominal flow value k_v

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

Δp_{v100} = differential pressure across the valve [bar]

Example:

Heat demand	Q_{100}	= 1.2 kW
Temperature differential	ΔT	= 20 K
Water volume	$\dot{V}_{100} = \frac{1.2}{1.163 \times 20}$	= 0.052 m³/h = 52 l/h
Required differential pressure across the valve	Δp_{v100}	= 0.1 bar
Flow	$k_v = \frac{0.052}{\sqrt{0.1}}$	= 0.17 m³/h

Solution

According to the chart (refer to "Valve sizing charts", page 7 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^3/h at a pressure drop Δp_{v100} across the valve of 1 bar.

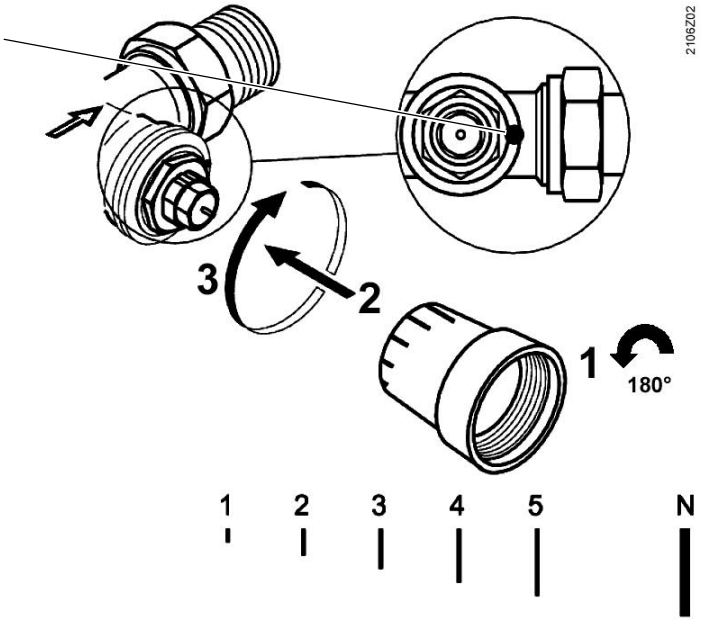
k_v-values [m^3/h] at the different preadjusted positions

Control range with actuators SSA.. and STA..3..	✓	✓	✓	✓	✓	✓	✓
Control range of thermostatic actuators RTN..	✓	✓	✓	✓	✓	✓	
Reference numbers for pre-adjustment	**1**	**2**	**3**	**4**	**5**	**N**	**N(k_{vs})**
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	

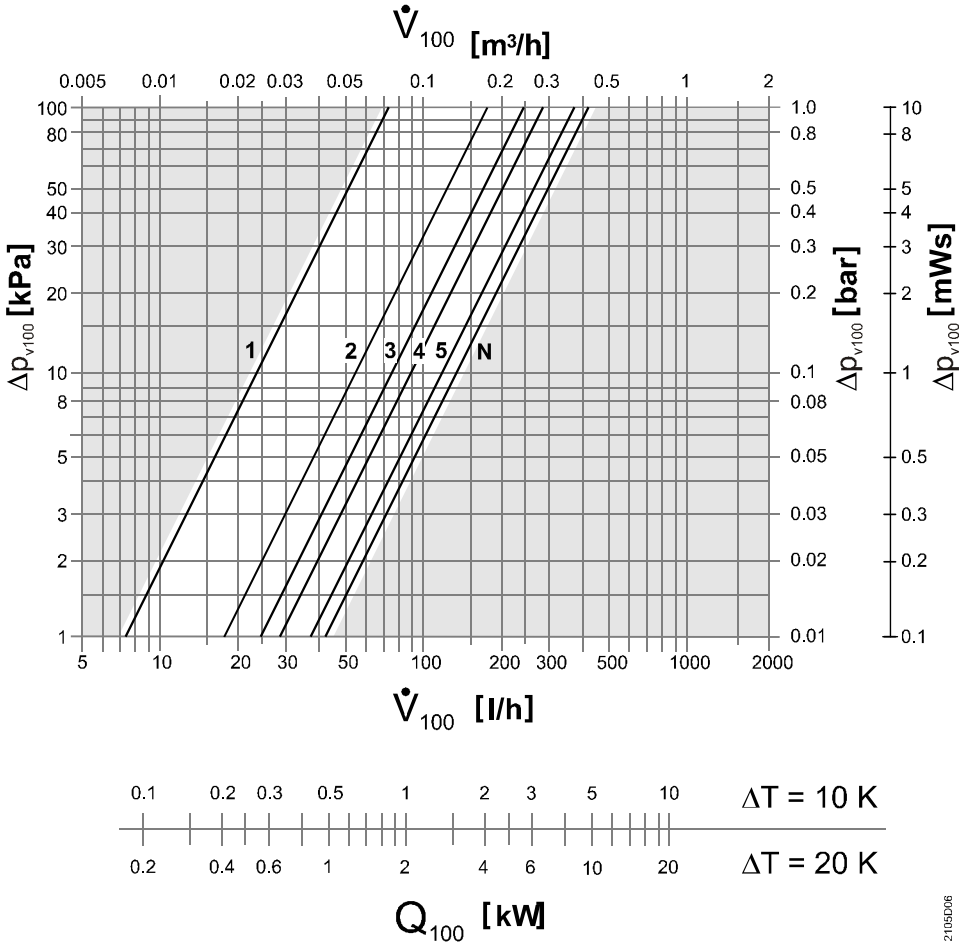
Setting the k_v-values

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°.

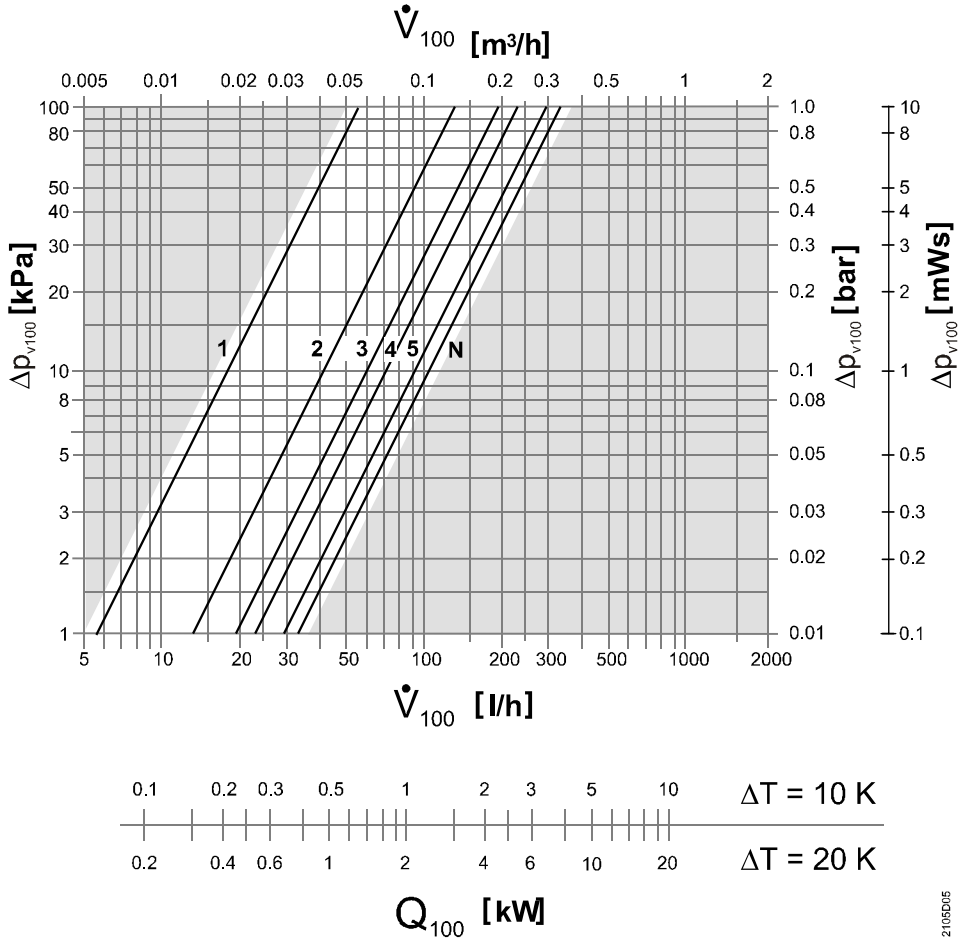
Observe marking on the valve's outlet side!



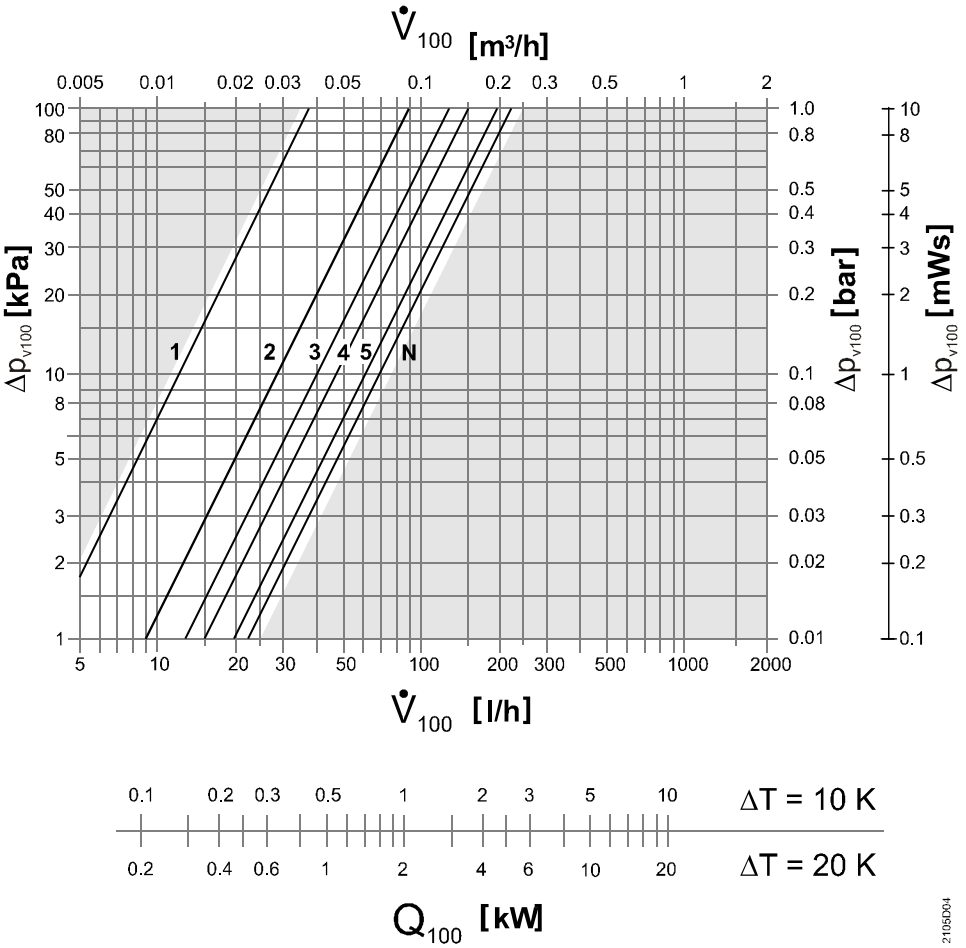
VDN110
VEN110
Xp Band 2 K



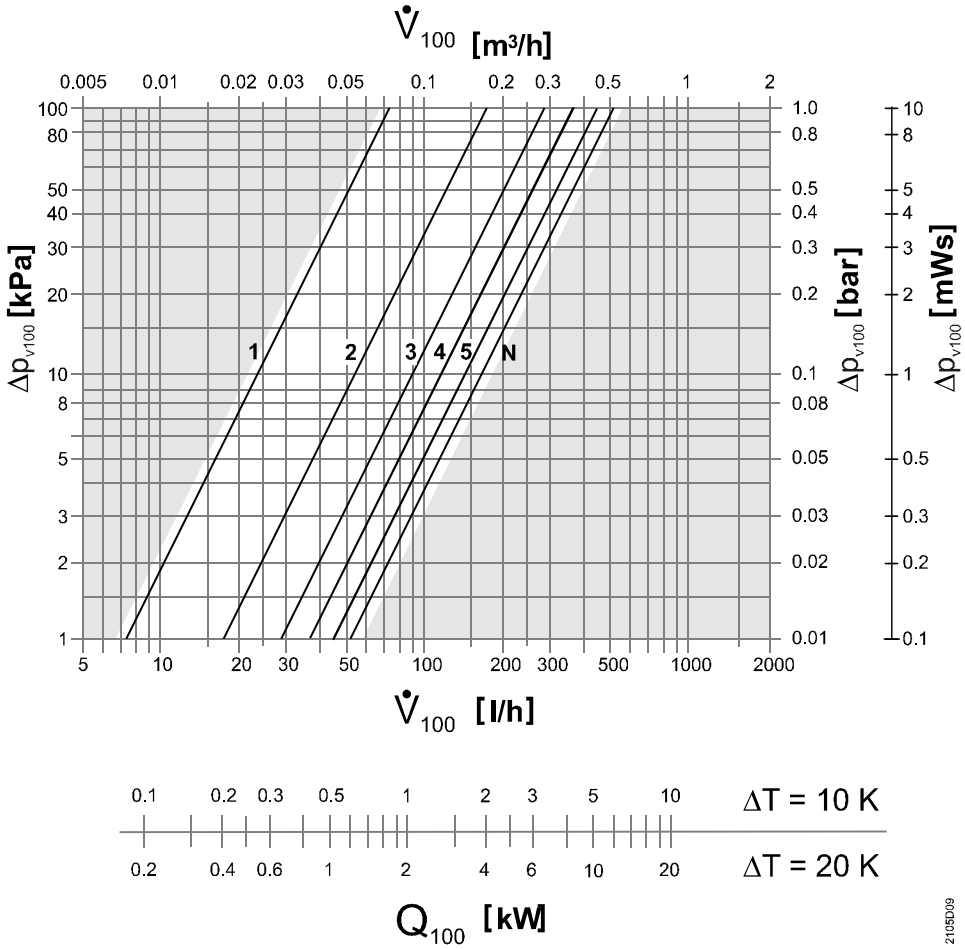
VDN110
VEN110
Xp Band 1.5 K



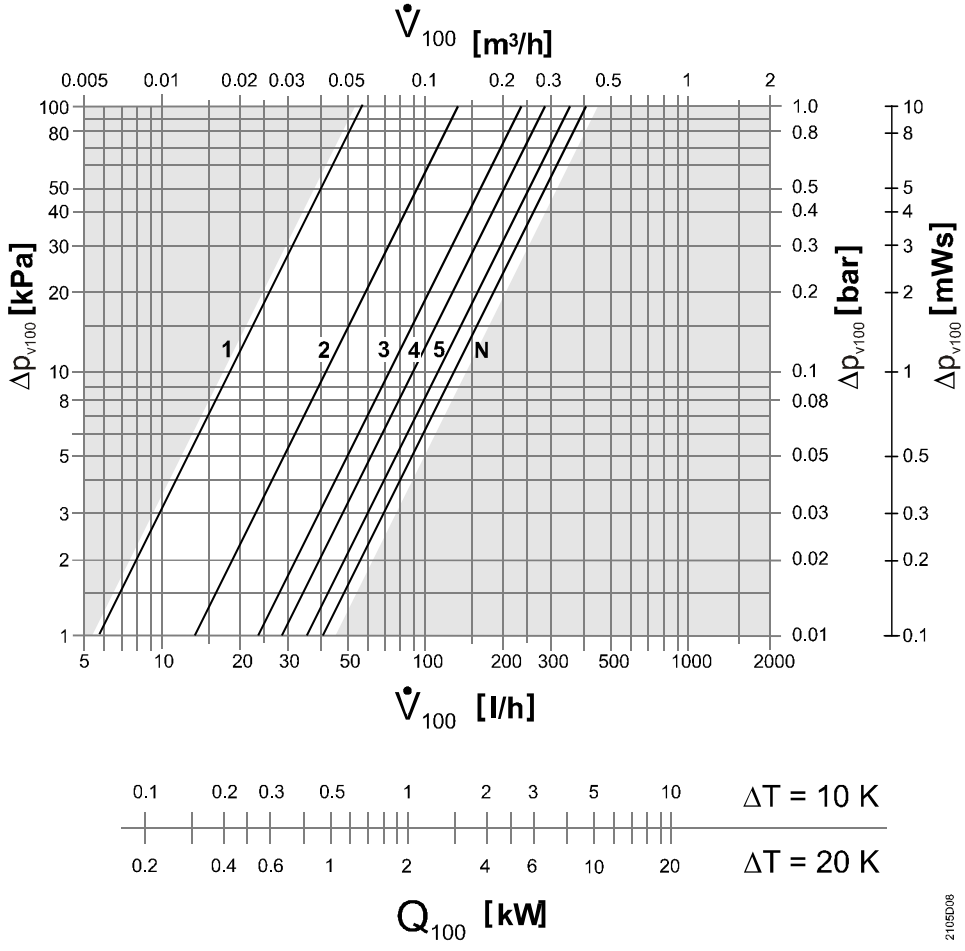
VDN110
VEN110
Xp Band 1 K



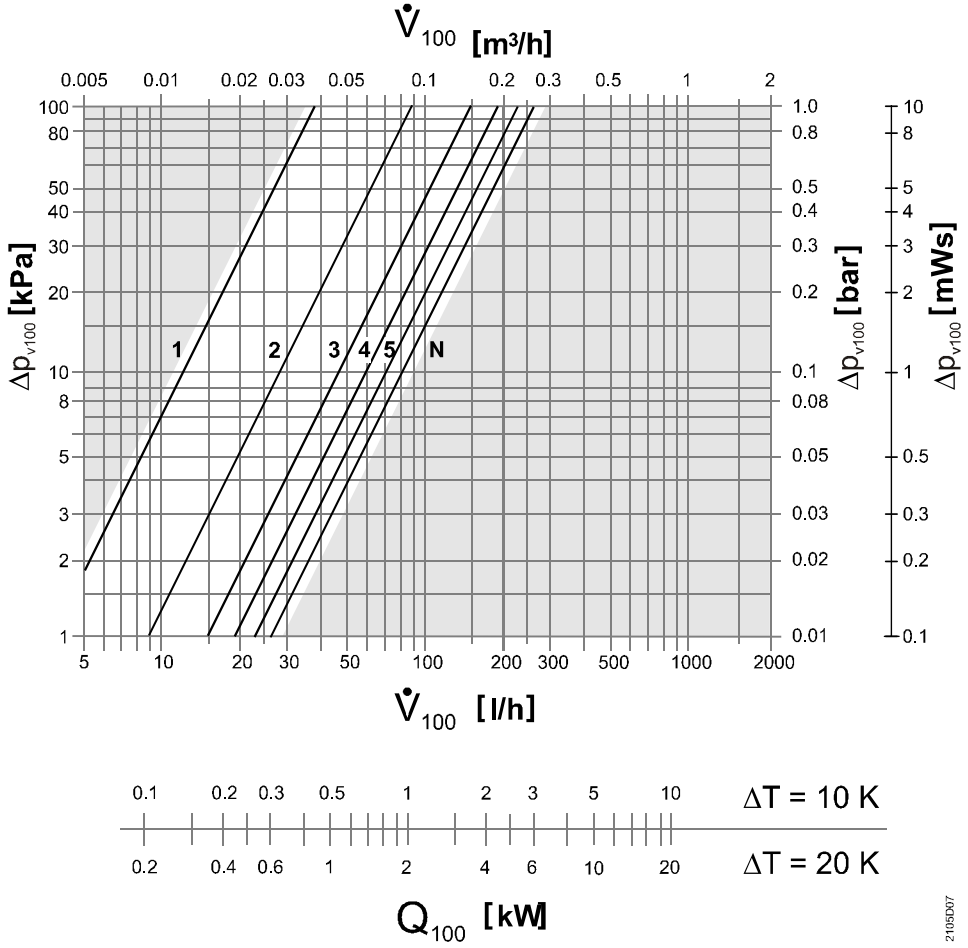
VDN115
VEN115
Xp Band 2 K



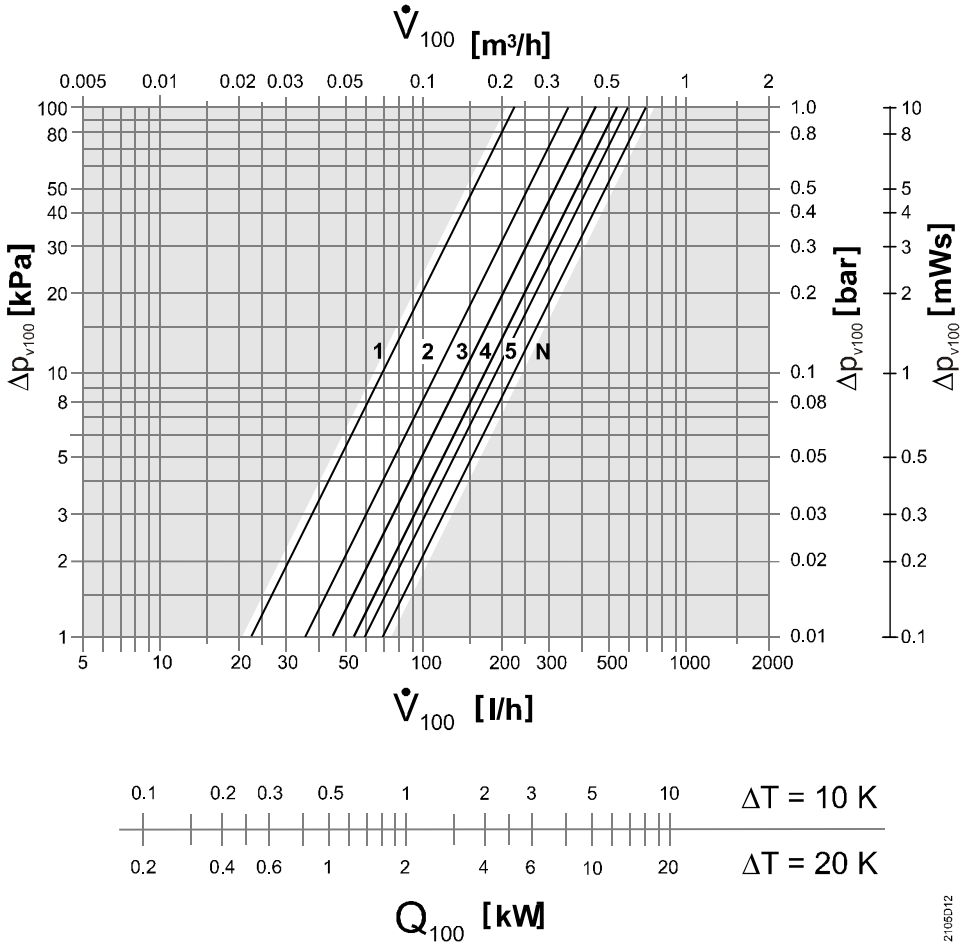
VDN115
VEN115
Xp Band 1.5 K



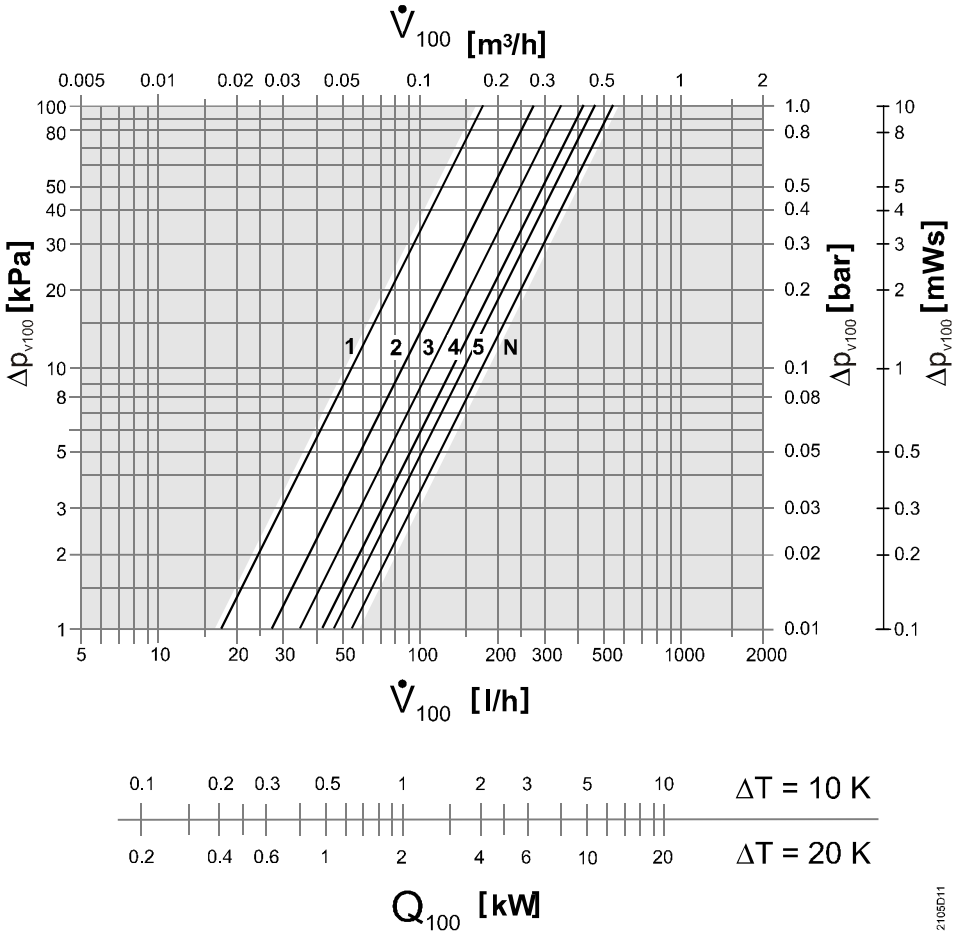
VDN115
VEN115
Xp Band 1 K



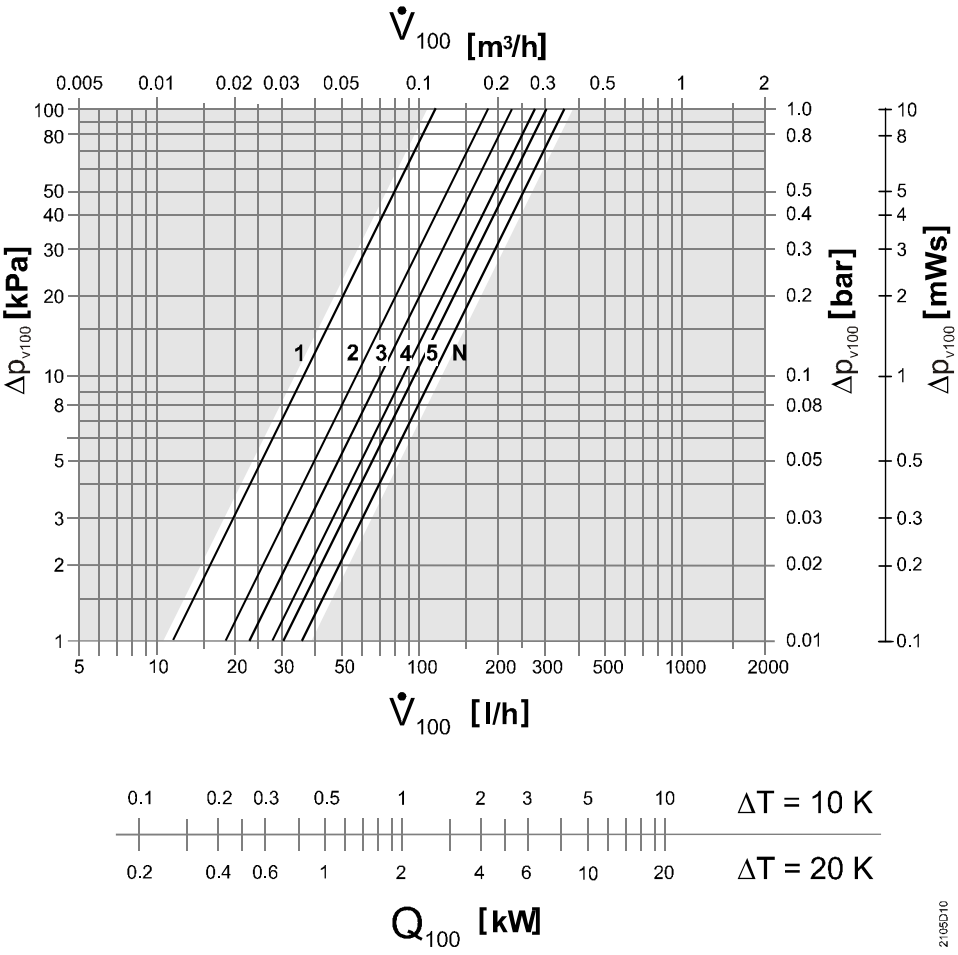
VDN120
VEN120
Xp Band 2 K



VDN120
VEN120
Xp Band 1.5 K



VDN120
VEN120
Xp Band 1 K



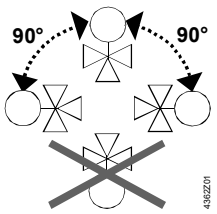
Notes

Mounting

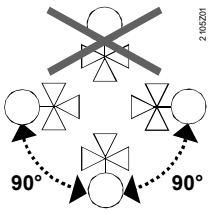
- Mounting Instructions are printed on the package. Mounting orientation depends on selected actuator.
- The valves are supplied preadjusted to N (fully open)
- To ensure correct functioning of the thermostatic heads and electronic actuators, observe the available mounting choices and mounting conditions

Orientation

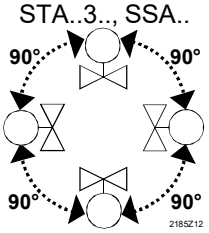
SSA955



RTN51..



RTN71.., RTN81.., STA..3.., SSA..



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

Do not dispose of the device as household waste.

- Special handling of individual components may be mandated by law or make ecological sense.
- Observe all local and currently applicable laws and regulations.

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 becomes void.

Technical data

Functional data	PN class	PN 10	
	Suitable media [1]	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_{max}	max. 60 kPa (0.6 bar)	
	Differential pressure Δp_{v100}	5…20 kPa (0.05…0.2 bar): recommended range	
	Stroke	min 1.2 mm	
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 14		
	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
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: ≤ DN 40	without CE-marking as per article 4, section 3 (sound engineering practice) [2]	
	EAC Conformity	Eurasia Conformity	
	Environmental compatibility	The product environmental declaration CE1E2105en [3] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
	EU conformity (CE)	CE1T2100[3]	

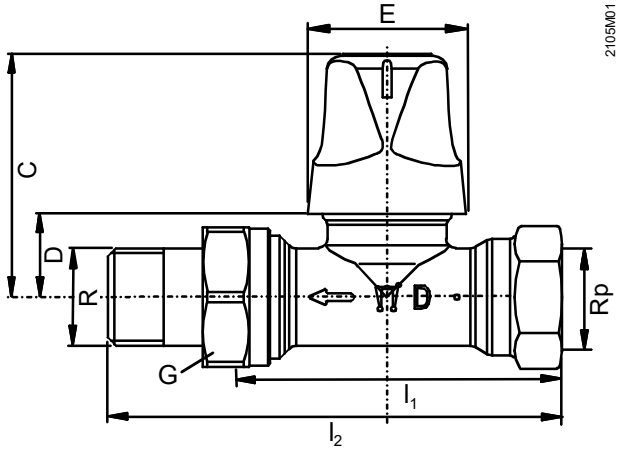
[1] Prefer propylene-glycol for environment protection reasons.

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

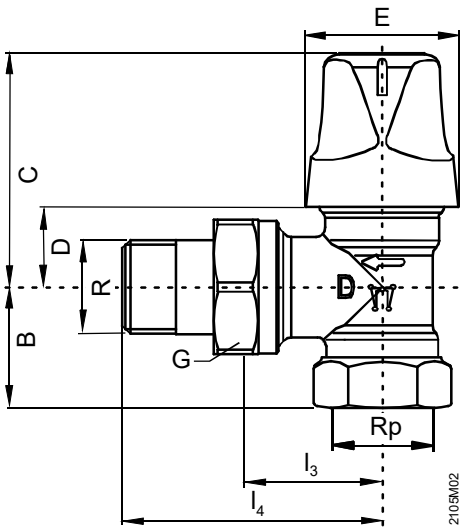
[3] The documents can be downloaded from http://siemens.com/bt/download.

Dimensions

VDN1..



VEN1..



		Dimensions [mm]								Thread [inch]			Weight
Prod. no.	**DN**	**l_1**	**l_2**	**l_3**	**l_4**	**B**	**C**	**D**	**E**	**Rp**	**R**	**G**	[kg]
VDN110	10	59	85				53	18	35	⅜	⅜B	⅝	0.240
VDN115	15	66	95				53	18	35	½	½B	¾	0.285
VDN120	20	74	107				53	18	35	¾	¾B	1	0.410
VEN110	10			26	52	22	53	18	35	⅜	⅜B	⅝	0.225
VEN115	15			29	58	26	53	18	35	½	½B	¾	0.270
VEN120	20			34	66	29	53	18	35	¾	¾B	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	½	15	AVN15-A16	½	16 x 2
VDN120	20						
VEN110	10						
VEN115	15	AVN15-15	½	15	AVN15-A16	½	16 x 2
VEN120	20						

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