



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.

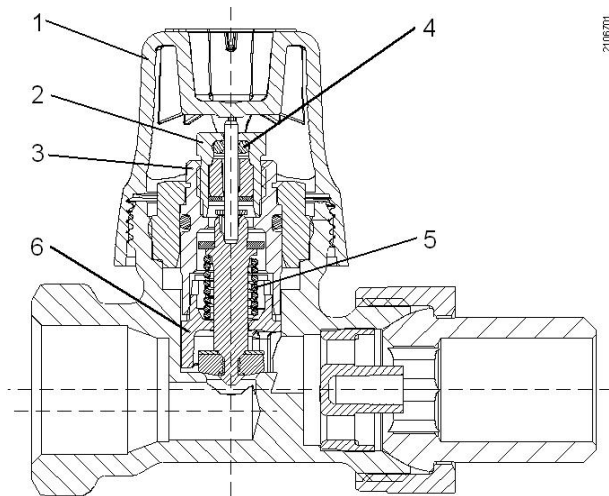
Equipment combinations

| Actuators | Product numbers | Data sheet |
|--|-----------------------------|------------|
| Thermostatic actuators | RTN.. | N2111 |
| Electromotoric actuators | 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



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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



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 m ³ /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 m ³ /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 m³/h at a pressure drop Δp_{v100} across the valve of 1 bar.

k_v-values [m³/h] at the different preadjusted positions

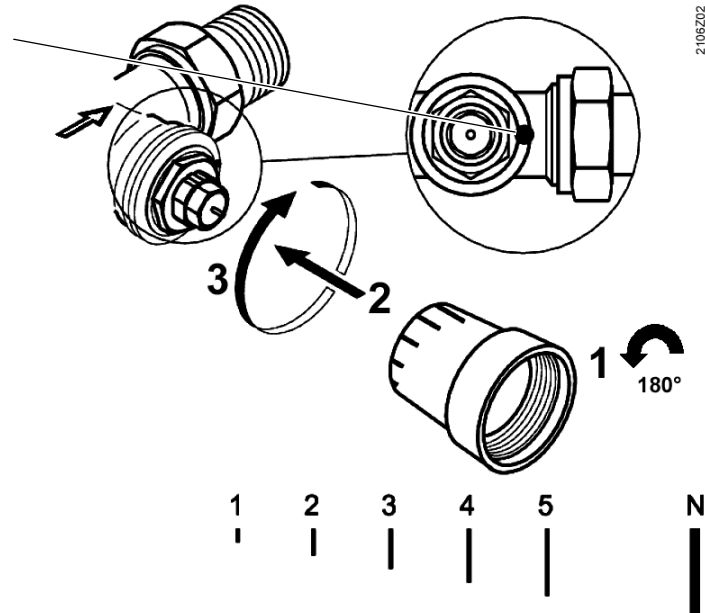
| | | | | | | | |
|---|----------|----------|----------|----------|----------|----------|--------------------------|
| Control range with actuators SSA.. and STA..3.. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Control range of thermostatic actuators RTN.. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Reference numbers for pre-adjustment | 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°.

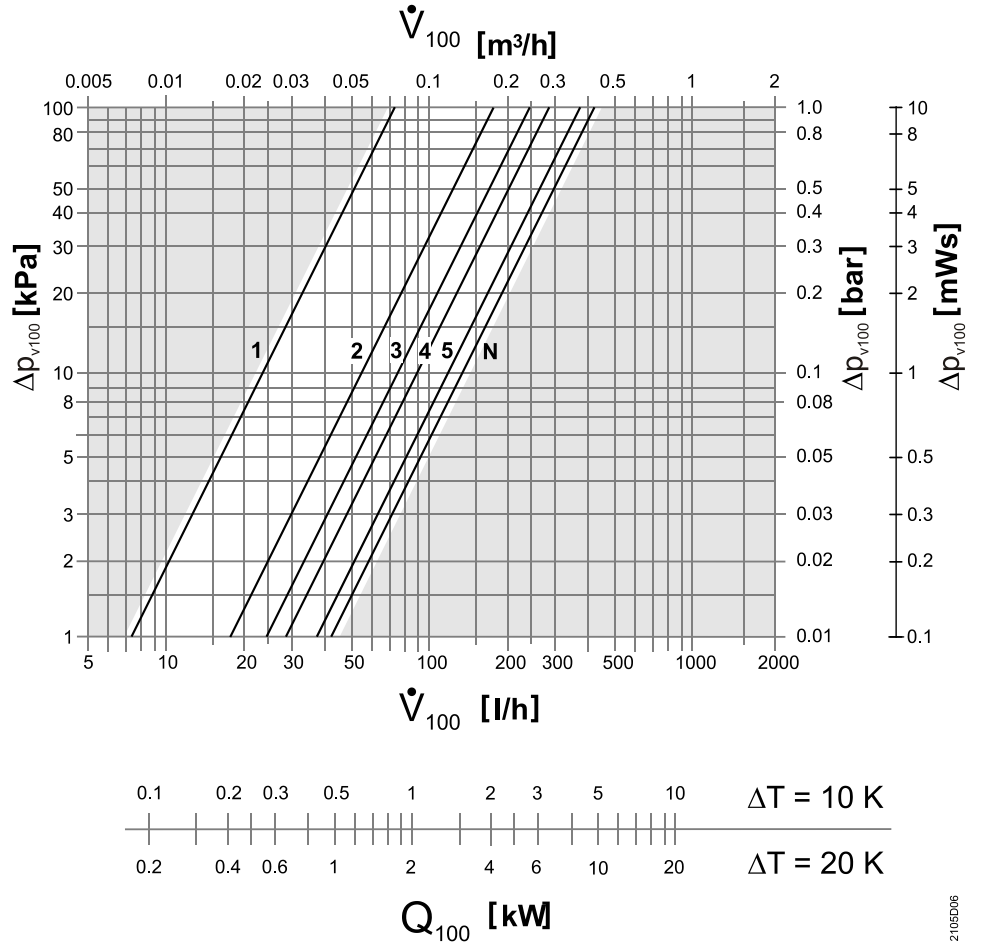


Observe marking on the valve's outlet side!



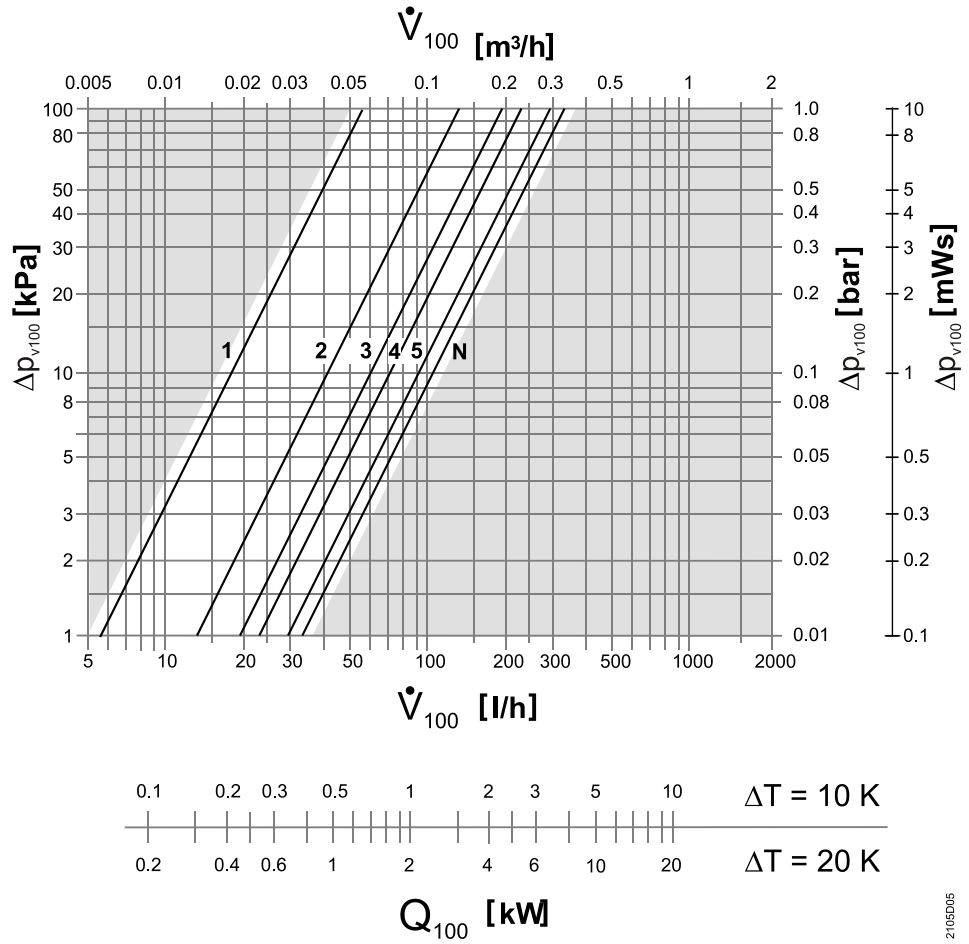
Valve sizing charts

VDN110
 VEN110
 Xp Band 2 K

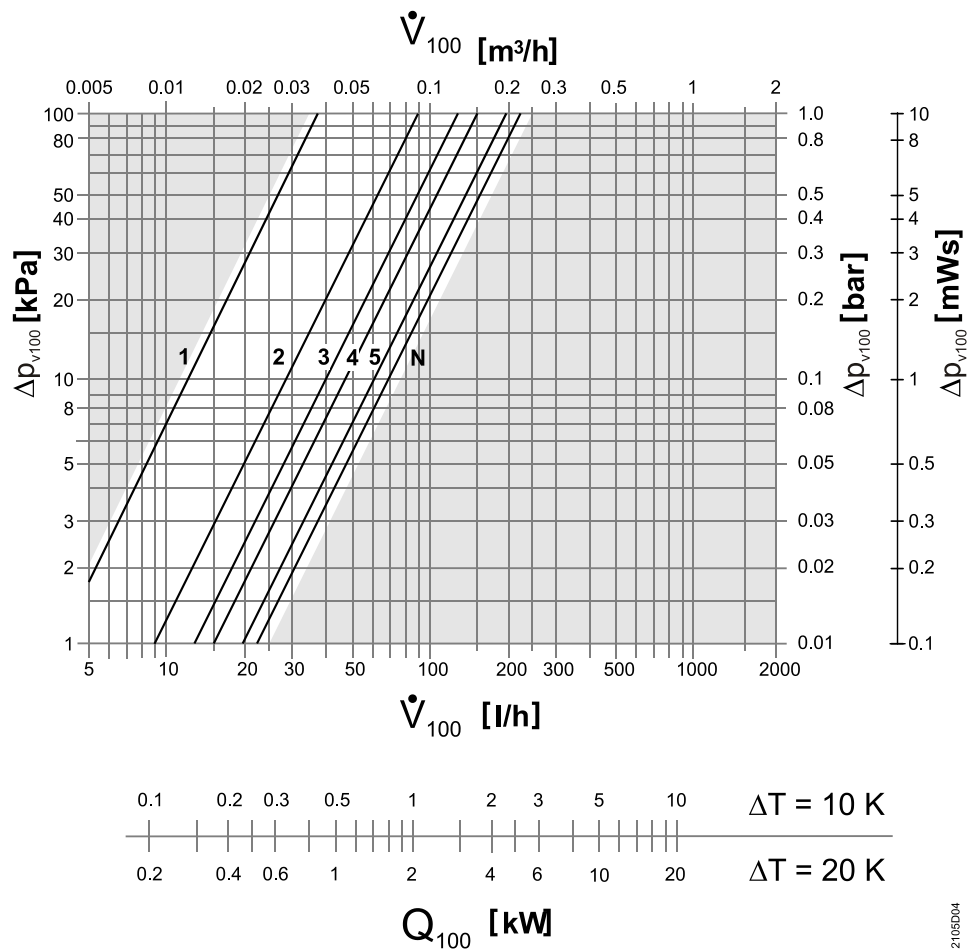


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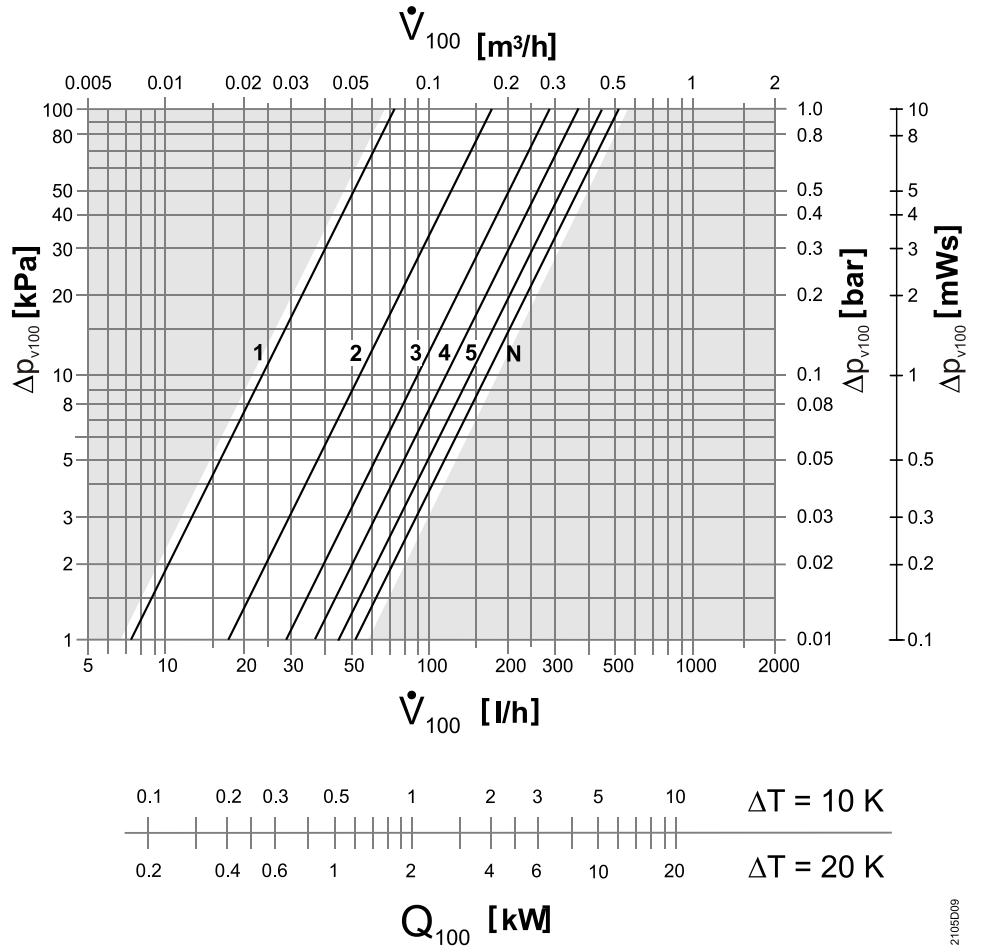
VDN110
VEN110
 Xp Band 1.5 K



VDN110
VEN110
 Xp Band 1 K

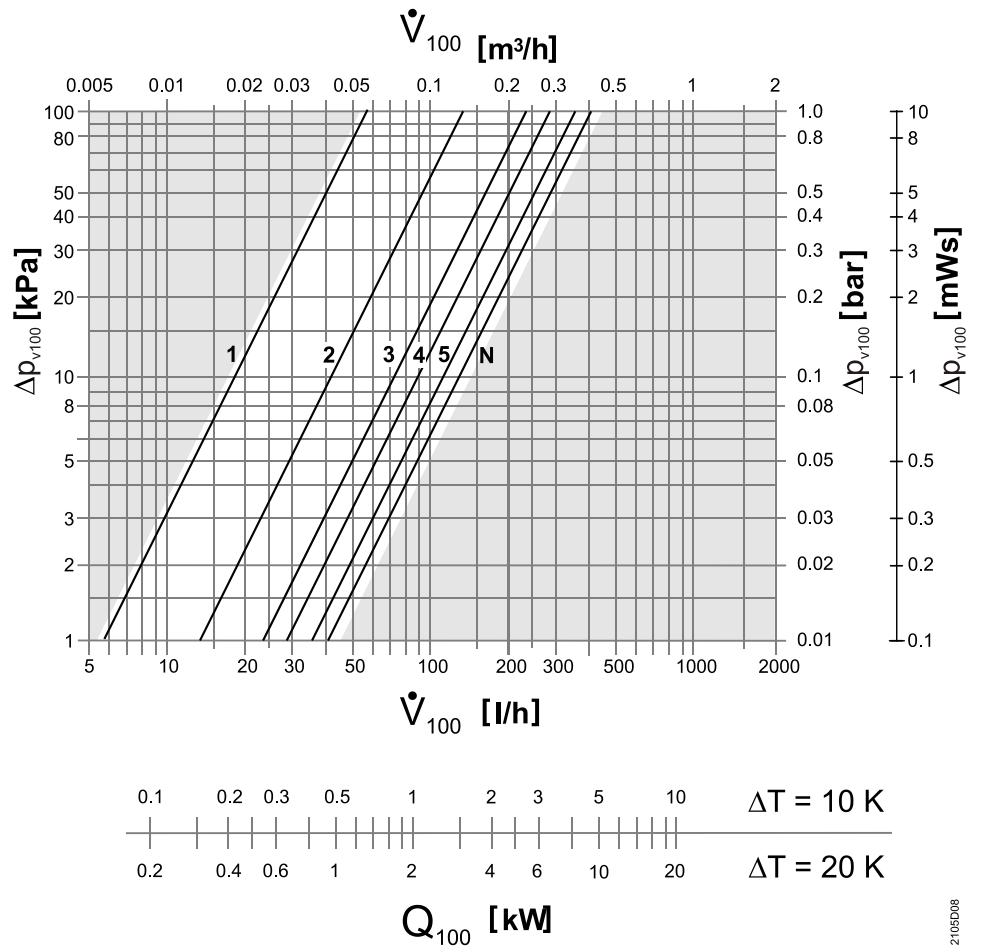


VDN115
VEN115
 Xp Band 2 K



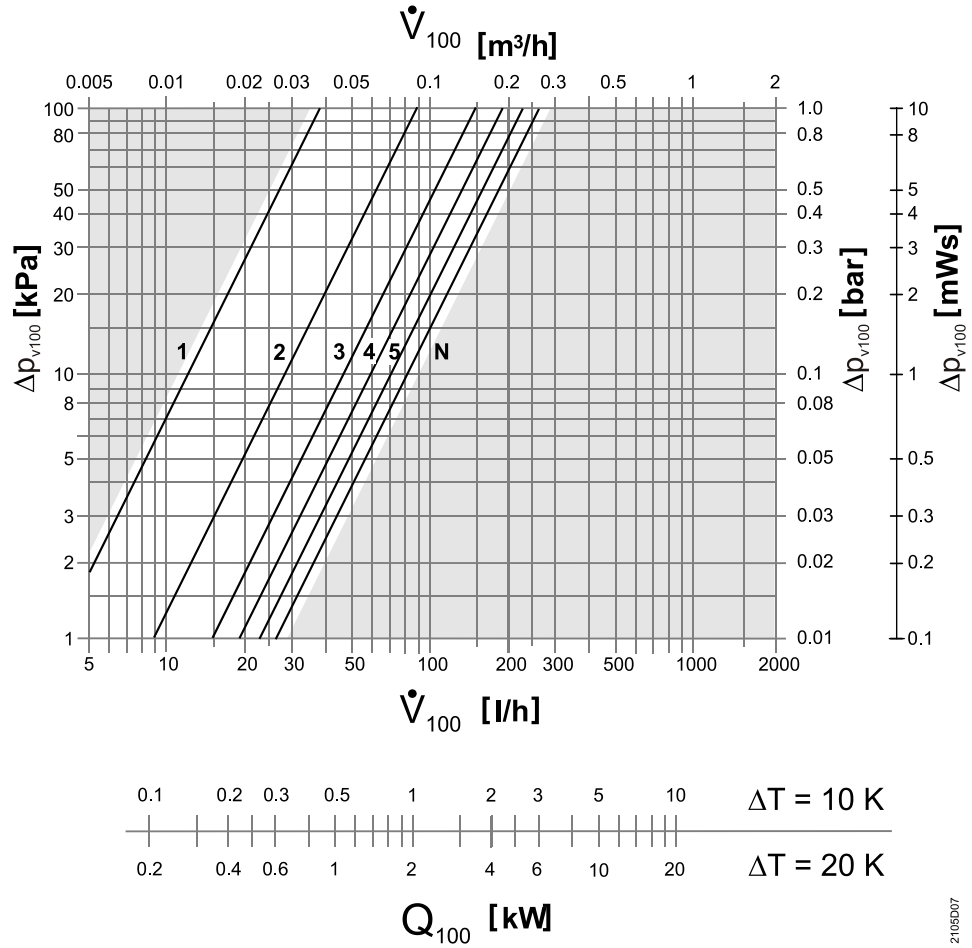
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VDN115
VEN115
 Xp Band 1.5 K



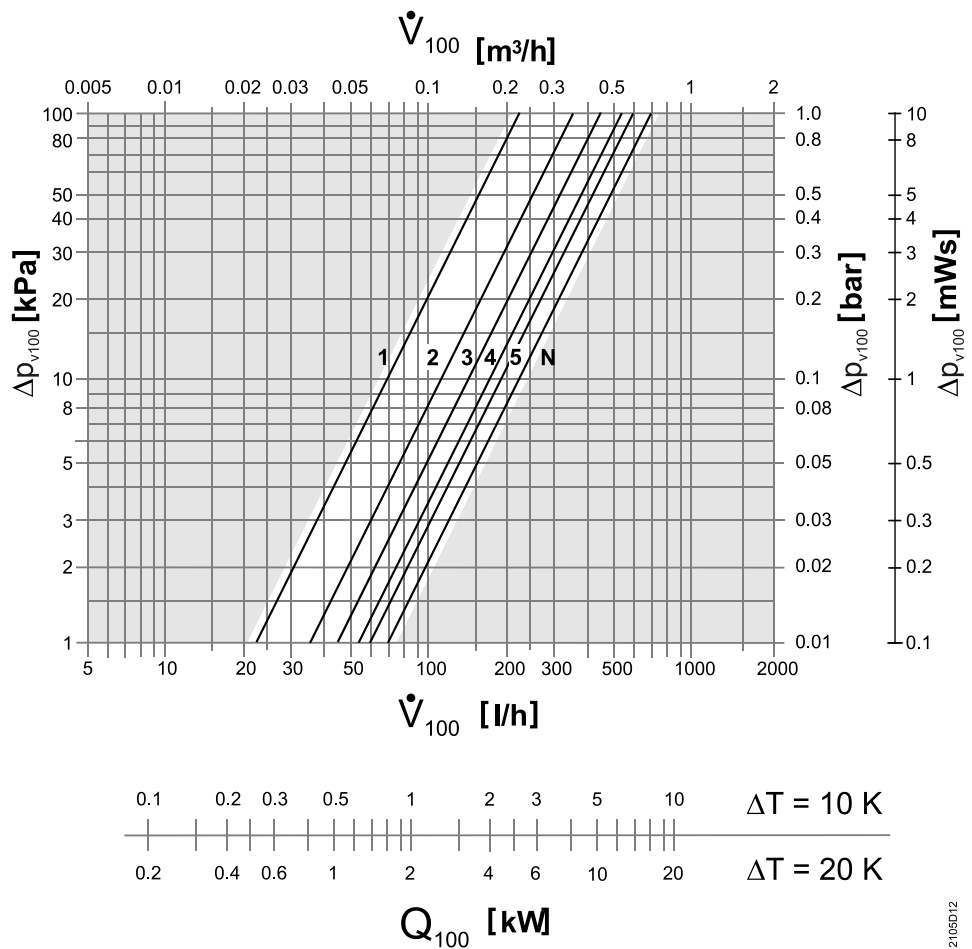
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VDN115
VEN115
 Xp Band 1 K



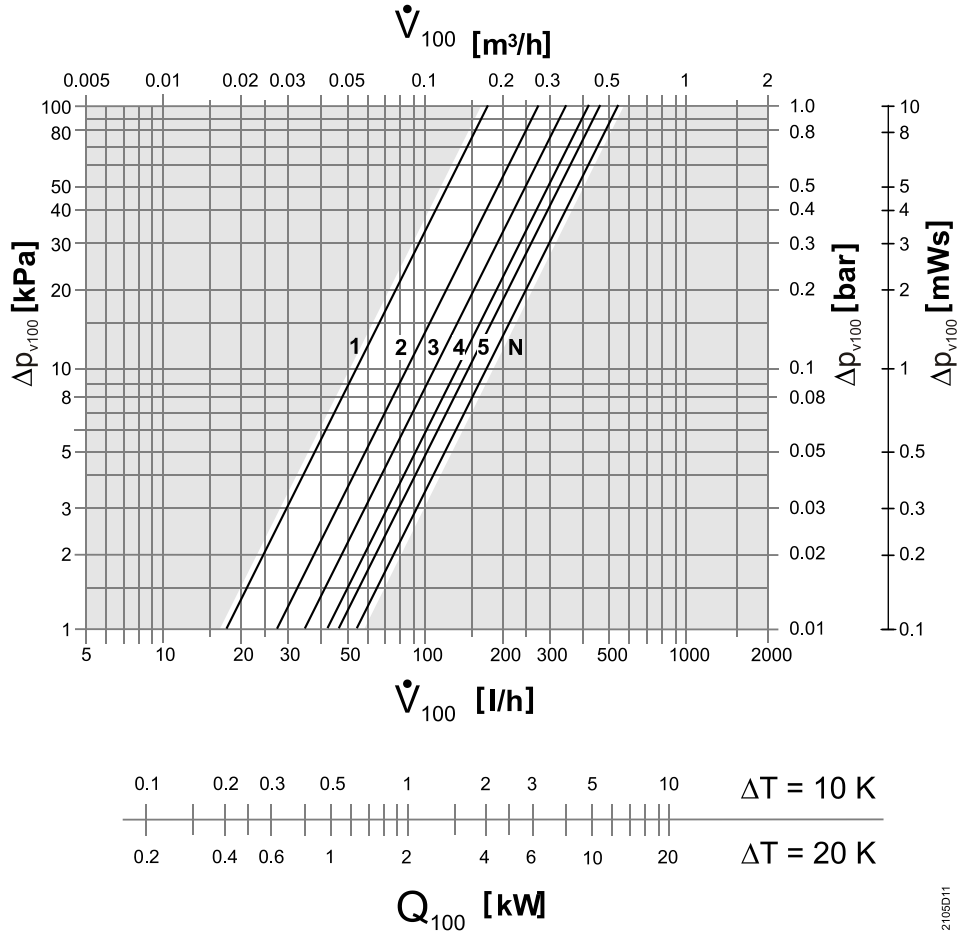
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VDN120
VEN120
 Xp Band 2 K



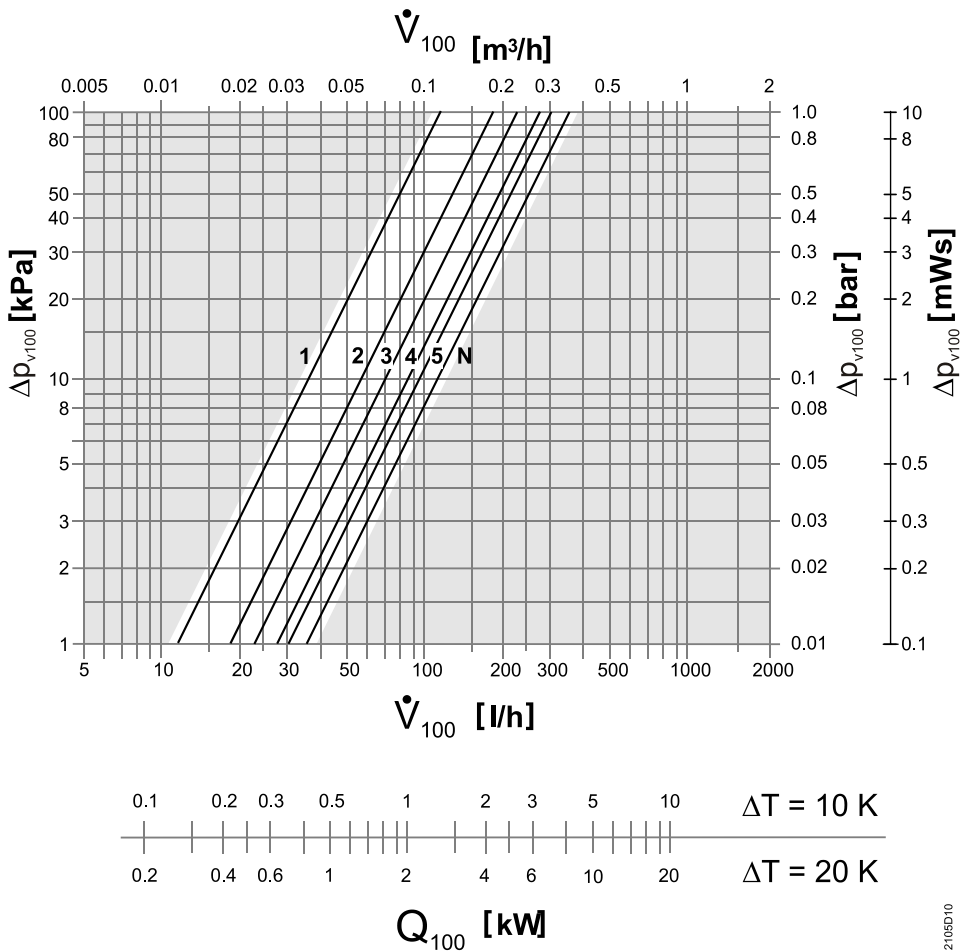
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VDN120
VEN120
 Xp Band 1.5 K



2105D11

VDN120
VEN120
 Xp Band 1 K



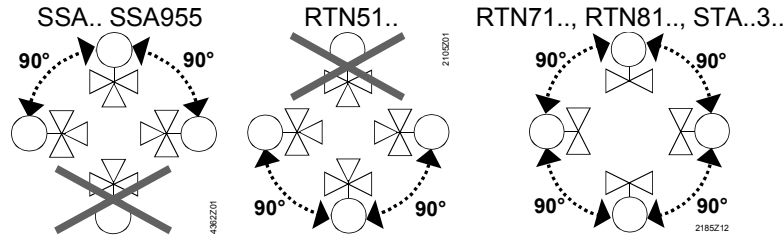
2105D10

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



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

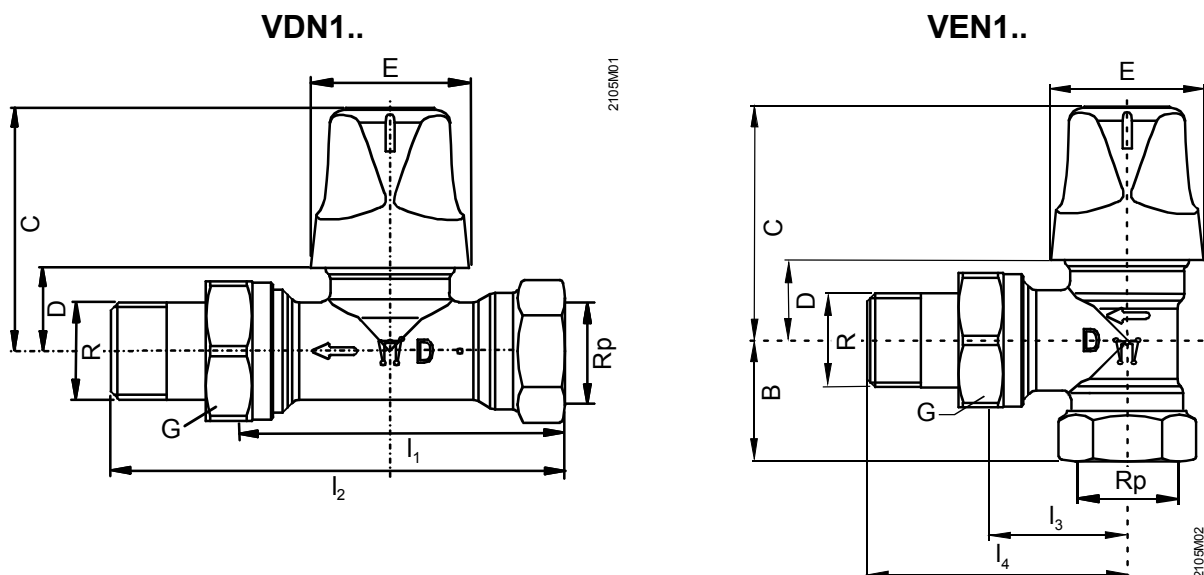
| | | | |
|--|---|---|---|
| Functional data | PN class | PN 10 | |
| | Suitable media ¹⁾ | cold and low-temperature hot water, water with propylene-glycol, water with ethylene-glycol < 30%; recommendation: water treatment to VDI 2035 | |
| | Medium temperature | 1...120 °C | |
| | Perm. operating pressure | 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 | |
| Materials | Stroke | min 1.2 mm | |
| | Valve body | brass, mat nickel-plated | |
| | Fitting | brass, mat nickel-plated | |
| | Protective cover | polypropylene | |
| Dimensions / weight | O-ring | EPDM, NBR | |
| | 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 $PS \times DN < 1000$, do not require special testing and cannot carry the CE label.

³⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Dimensions



| Prod. no. | DN | Dimensions [mm] | | | | | | | Thread [inch] | | | Weight [kg] | |
|-----------|----|-----------------|----------------|----------------|----------------|----|----|----|---------------|-----|------|-------------|-------|
| | | I ₁ | I ₂ | I ₃ | I ₄ | B | C | D | E | Rp | R | | G |
| VDN110 | 10 | 59 | 85 | | | | 53 | 18 | 35 | 3/8 | 3/8B | 5/8 | 0.240 |
| VDN115 | 15 | 66 | 95 | | | | 53 | 18 | 35 | 1/2 | 1/2B | 3/4 | 0.285 |
| VDN120 | 20 | 74 | 107 | | | | 53 | 18 | 35 | 3/4 | 3/4B | 1 | 0.410 |
| VEN110 | 10 | | | 26 | 52 | 22 | 53 | 18 | 35 | 3/8 | 3/8B | 5/8 | 0.225 |
| VEN115 | 15 | | | 29 | 58 | 26 | 53 | 18 | 35 | 1/2 | 1/2B | 3/4 | 0.270 |
| VEN120 | 20 | | | 34 | 66 | 29 | 53 | 18 | 35 | 3/4 | 3/4B | 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 | 1/2 | 15 | AVN15-A16 | 1/2 | 16 x 2 |
| VDN120 | 20 | | | | | | |

| | | | | | | | |
|--------|----|----------|-----|----|-----------|-----|--------|
| VEN110 | 10 | | | | | | |
| VEN115 | 15 | AVN15-15 | 1/2 | 15 | AVN15-A16 | 1/2 | 16 x 2 |
| VEN120 | 20 | | | | | | |

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 Building Technologies Division
 International Headquarters
 Gubelstrasse 22
 6301 Zug
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 Tel. +41 41-724 24 24
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