EN 215-1

Straight valves VDN2.. Angle valves VEN2.. Reverse angle valves VUN2..

ACVATIX^{TM}

Radiator valves

VDN2..
VEN2..
VUN2..

NF norm, for 2-pipe heating systems

- **Valve bodies made of brass, mat nickel-plated**
- **DN 10, DN 15 and DN 20 (VDN2.., VEN2..)**
- **Integrated preadjustment of 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.. and STS61.. thermal actuators SSA955 RF-controlled actuator**

Use

The radiator valves are used in hot water heating plant 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

Type reference straight	Type reference angle	Type reference reverse angle	DN	k_v-value [m³/h] setting range	k_v-value [m³/h] at a P-band of 2 K
VDN210	VEN210		10	0.09…0.63	0.43
		VUN210		0.14…0.60	
VDN215	VEN215		15	0.10…0.89	0.52
		VUN215		0.13…0.77	
VDN220	VEN220		20	0.31…1.41	0.71

Ordering

Example:

Product number	Stock number	Designation	Quantity
VDN220	VDN220	Straight Valves	2
ATN2	ATN2	Protection against dismantling	1

Delivery — Valves and accessories are packed separately.

Rev. no. — See overview, page 9.

Equipment combinations

Product	Product number	Data sheet
Thermostatic actuators	RTN..	N2111
Electromotoric actuators	SSA31.. / SSA61.. / SSA81..	N4893
RF-controlled electromotoric actuator	SSA955	N2700
Thermal actuators	STA21.. / STA71..	N4877
Thermal actuators	STA72E..	N4875
Thermal actuators	STS61..[1]	N4880

[1] Quasi-proportional control action, not recommended for parallel operation

Mechanical design / technical 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
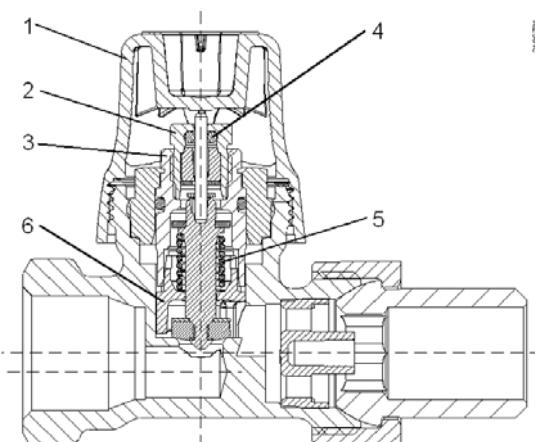
Features and benefits

- The valves conform to EN 215
- The sealing gland can be replaced while the plant is under pressure (no tools required)

Accessories

AVN1	**ATN2**	**ATN3**	**ATN4**	**AVN..**
Sealing gland	Protection against dismantling	Manual knob (RAL9016)	Manual knob	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 – 7).

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	$\dot{V}_{100} = \dfrac{1.2}{1.163 \times 20}$	= 0.052 m³/h = 52 l/h
Required differential pressure across the valve	Δp_{v100}	= 0.1 bar
Flow	$k_v = \dfrac{0.052}{\sqrt{0.1}}$	= 0.17 m³/h

Solution

According to the chart (refer to "Valve sizing charts", or table with k_v-values), the preadjustment required for a VDN210 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 preset positions

|	1	2	3	4	5	N	N[1]
Control range with actuators SSA.., STA.. and STS61..	✓	✓	✓	✓	✓	✓	
Control range of thermostatic actuators RTN..	✓	✓	✓	✓	✓		✓
Reference numbers for preadjustment	**1**	**2**	**3**	**4**	**5**	**N**	**N[1]**
VDN210 / VEN210	0.09	0.18	0.26	0.33	0.48	0.63	0.43
VDN215 / VEN215	0.10	0.20	0.31	0.45	0.69	0.89	0.52
VDN220 / VEN220	0.31	0.41	0.54	0.83	0.91	1.41	0.71
VUN210	0.14	0.28	0.38	0.49	0.53	0.60	0.43
VUN215	0.13	0.23	0.34	0.52	0.66	0.77	0.50

[1] k_V-value at a P-band of 2 K

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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Building Technologies
HVAC Products

Radiator valves

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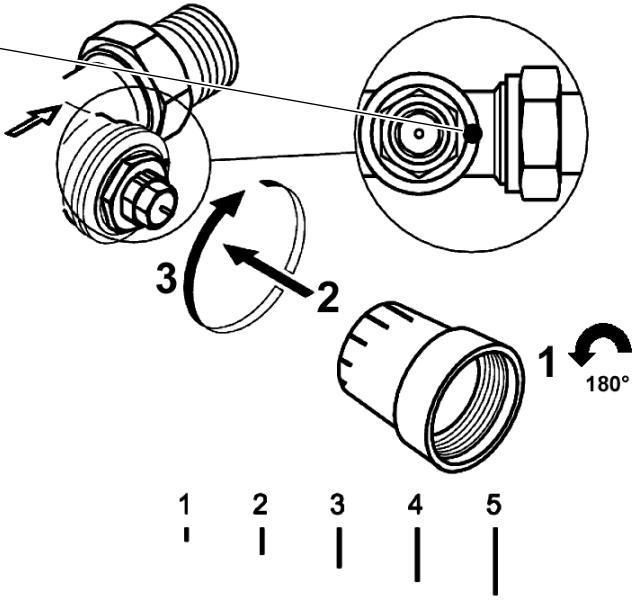
Valve sizing charts

VDN210
VEN210

$\dot{V}_{100}$ [m³/h]

Δp_{V100} [kPa] Δp_{V100} [bar] Δp_{V100} [mWs]

30 dB(A) *
25 dB(A) *

$\dot{V}_{100}$ [l/h]

| 0.1 | | 0.2 | 0.3 | | 0.5 | | 1 | | 2 | 3 | | 5 | | 10 | | $\Delta T = 10$ K |
| 0.2 | | 0.4 | 0.6 | | 1 | | 2 | | 4 | 6 | | 10 | | 20 | | $\Delta T = 20$ K |

Q_{100} [kW]

VDN215
VEN215

$\dot{V}_{100}$ [m³/h]

Δp_{V100} [kPa] Δp_{V100} [bar] Δp_{V100} [mWs]

30 dB(A) *
25 dB(A) *

$\dot{V}_{100}$ [l/h]

| 0.1 | | 0.2 | 0.3 | | 0.5 | | 1 | | 2 | 3 | | 5 | | 10 | | $\Delta T = 10$ K |
| 0.2 | | 0.4 | 0.6 | | 1 | | 2 | | 4 | 6 | | 10 | | 20 | | $\Delta T = 20$ K |

Q_{100} [kW]

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VDN220
VEN220

VUN210

VUN215

$\dot{V}_{100}$ **[m³/h]**

Δp_{V100} **[kPa]**

Δp_{V100} **[bar]**

Δp_{V100} **[mWs]**

$\dot{V}_{100}$ **[l/h]**

30 dB(A) *

25 dB(A) *

ΔT = 10 K

ΔT = 20 K

Q_{100} **[kW]**
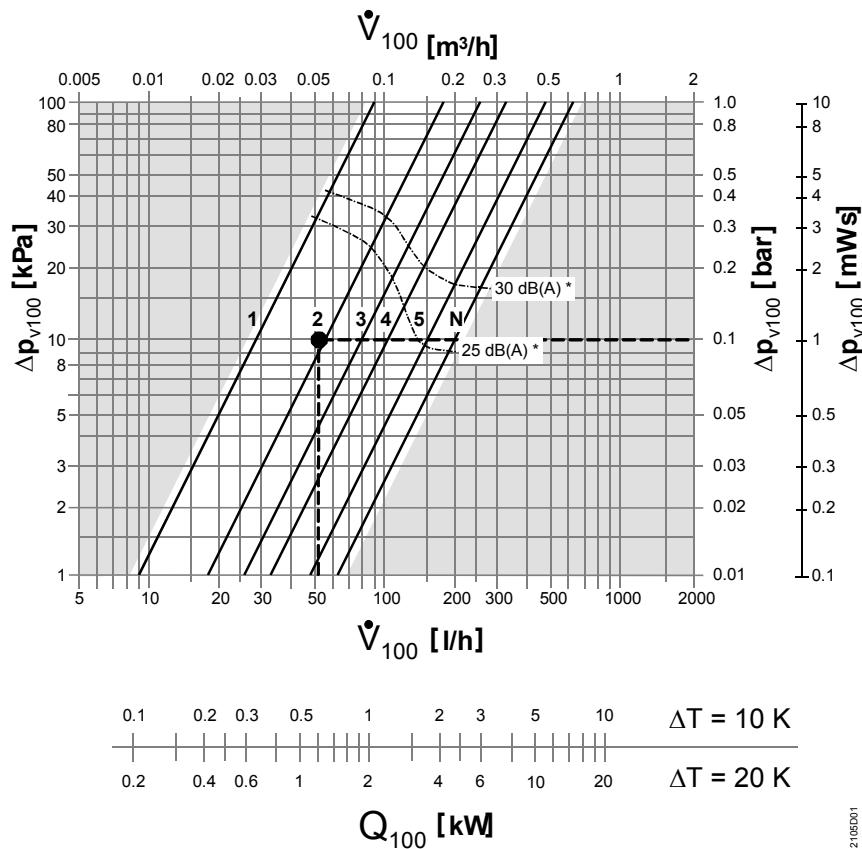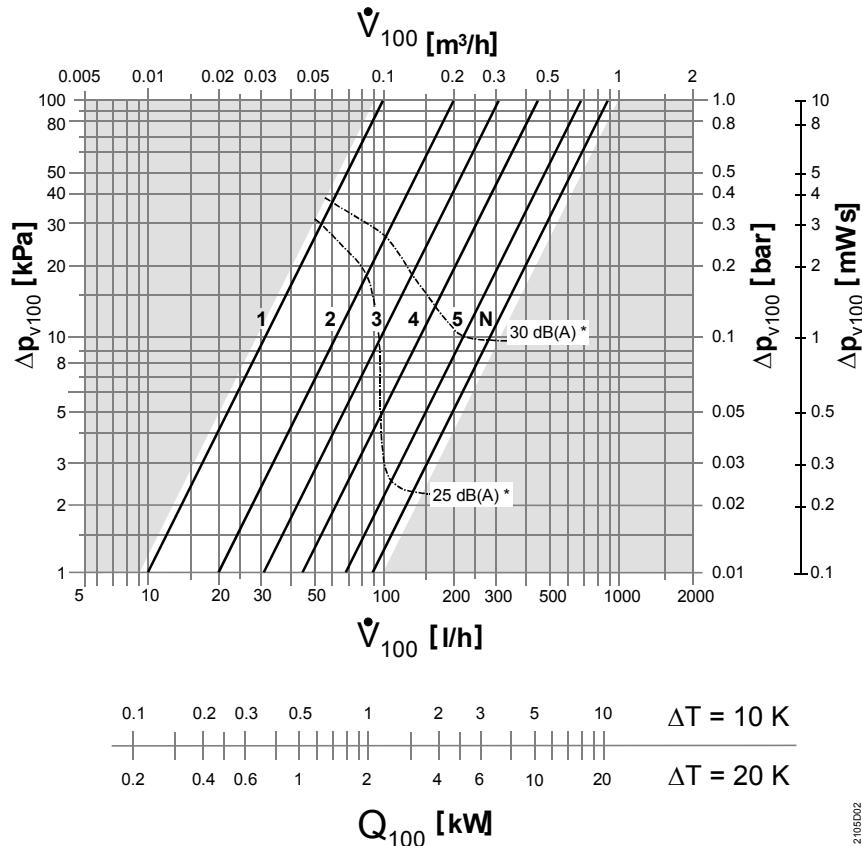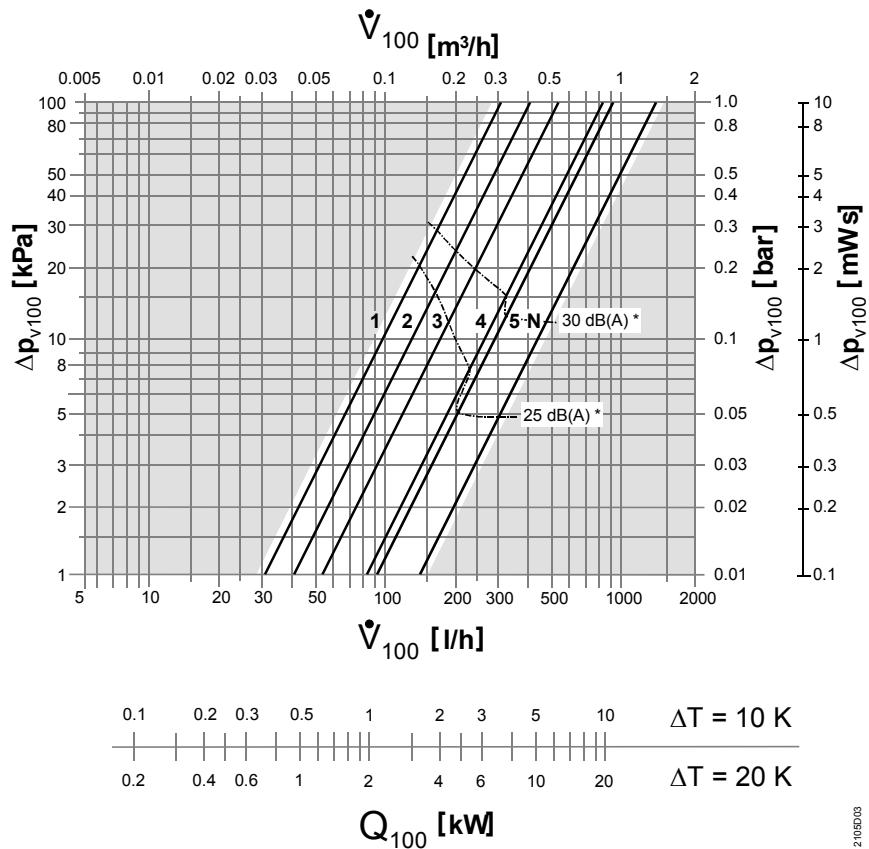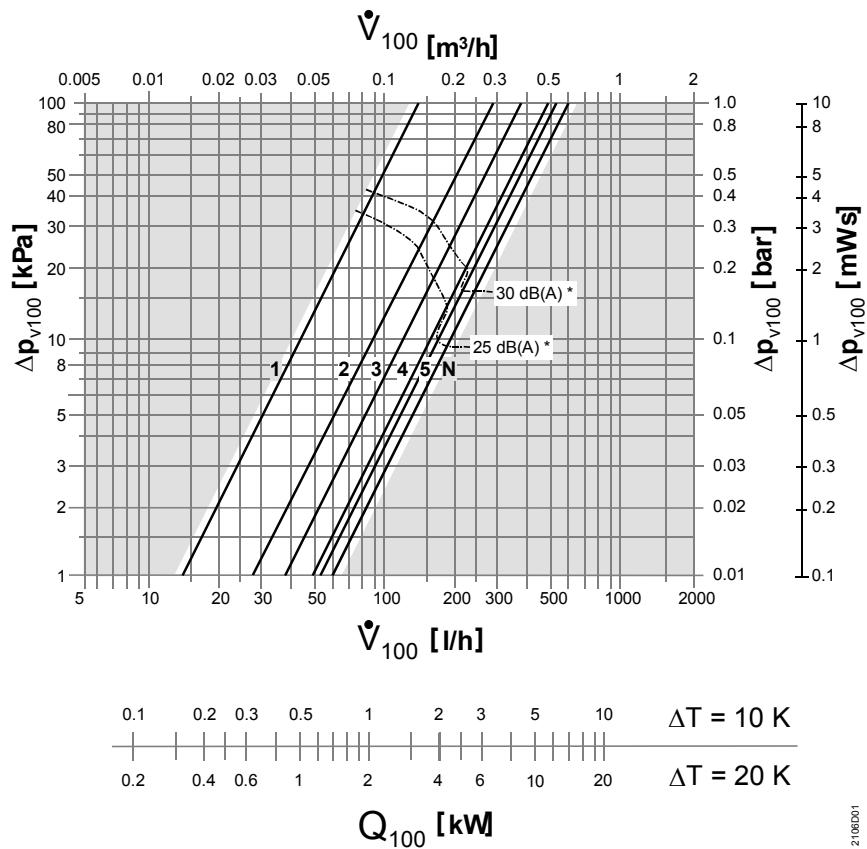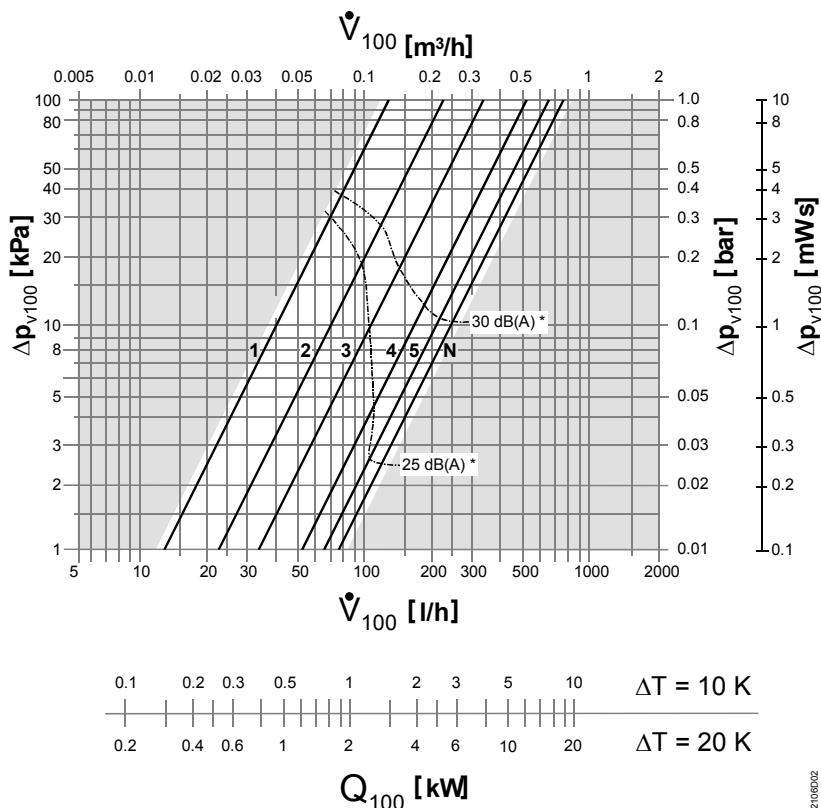
*) A-weighting specified in EN 60651

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

SSA.. SSA955

STA.., STS61..

RTN51..

RTN71.., RTN81..
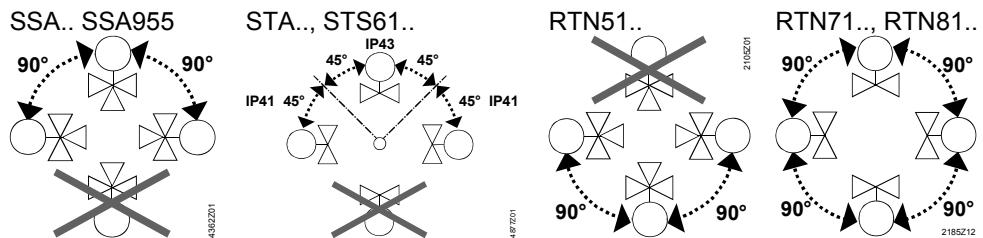
Maintenance
The valves are maintenance-free.

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 [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
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 9	
	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

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

Dimensions
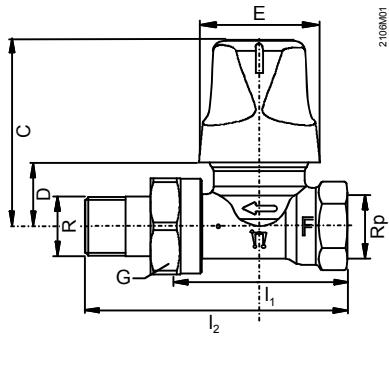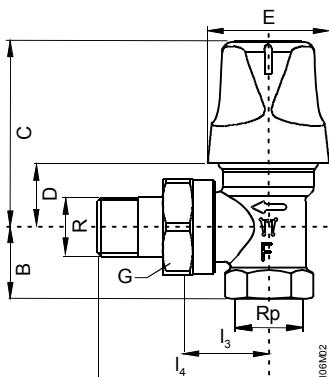
VDN2.. VEN2.. VUN2..
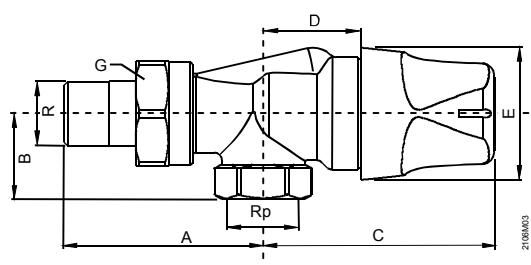
Prod. no.	DN	Dimensions [mm]									Thread [inch]			Weight
		l₁	l₂	l₃	l₄	A	B	C	D	E	Rp	R	G	[kg]
VDN210	10	50	75					53	18	35	⅜	⅜B	⅝	0.220
VDN215	15	55	82					53	18	35	½	½B	¾	0.265
VDN220	20	65	98					53	18	35	¾	¾B	1	0.385
VEN210	10			24	49		20	53	18	35	⅜	⅜B	⅝	0.215
VEN215	15			26	53		23	53	18	35	½	½B	¾	0.260
VEN220	20			30	63		26	53	18	35	¾	¾B	1	0.360
VUN210	10					51	22	60	25	35	⅜	⅜B	⅝	0.285
VUN215	15					57	27	61	26	35	½	½B	¾	0.330

Prod. no.	DN	Compression fittings					
		for copper and soft steel pipes			for plastic pipes with aluminum foil		
		Type	Connection valve side	Connection pipe side	Type	Connection valve side	Connection pipe side
			[Inch]	pipe Ø [mm]		[Inch]	pipe Ø [mm]
VDN210	10						
VDN215	15	AVN15-15	½	15	AVN15-A16	½	16 x 2
VDN220	20						
VEN210	10						
VEN215	15	AVN15-15	½	15	AVN15-A16	½	16 x 2
VEN220	20						
VUN210	10						
VUN215	15	AVN15-15	½	15	AVN15-A16	½	16 x 2

Revision numbers

Product number	Valid from rev. no.	Product number	Valid from rev. no.	Product number	Valid from rev. no.
VDN210	..	VEN210	..	VUN210	..
VDN215	..	VEN215	..	VUN215	..
VDN220	..	VEN220	..		