V2000FX

Low-flow Thermostatic Valve

Presettable thermostatic valve body with proportional characteristic for low flows

APPLICATION

The V2000FX is a range of thermostatic radiator valves with engineered proportional flow control characteristic for pumped two-pipe heating systems with low flow requirements.

The valve features a superior regulation performance in low-flow applications, providing a better comfort and energy efficiency to the end user.

The V2000FX valves have a quiet operation and are available in straight, angled, axial and double angle patterns in DN10 and DN15.

APPROVALS

- Keymark certified and tested to EN 215

SPECIAL FEATURES

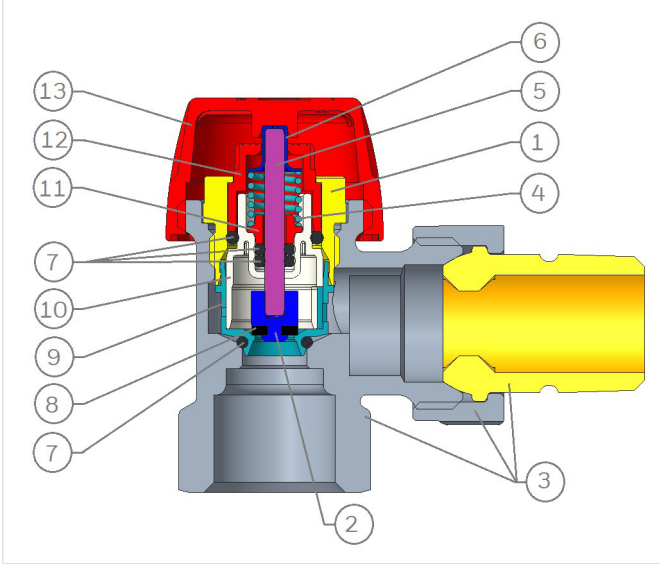
- Engineered to feature proportional characteristic in the thermostatic control of low flows
- Flow rates easily adjustable by a setting key (see 'Accessories')
- Maximum flow limited to max. 130 % of nominal flow to prevent misbalance during heating of cooled down rooms
- Quiet operation
- Strong restoring spring, which is not immersed in water, ensuring durability of the valve
- Double o-ring seal for maintenance-free operation
- Standard dimensions per EN215, complemented with an extended range of patterns
- Standard M30 x 1.5 thermostat connection
- Valves can be shut-off with the protection cap
- V2000FX valves are compatible with the following Honeywell Home actuators:
  - All radiator thermostats with M30 x 1.5 connection
  - HR types of Evohome and Roomtronic actuators
  - MT4 actuators
  - M5410 2-point actuators
  - M4410E/K and M7410E5001 modulating actuators
- The valve insert can be replaced while the system is operating and without draining using the service tool (see 'Accessories')
- Valve housing and insert fits to Honeywell Home AT-Concept design, ensuring housing and insert cross compatibility with MNG, Honeywell and Honeywell Home thermostatic valves produced by Resideo and its predecessors since 1974

TECHNICAL DATA

Media	
Medium:	Water or water-glycol mixture, quality to VDI 2035
pH-value:	8 - 9.5
Connections/Sizes	
Body-head connection:	M30 x 1.5
Sizes:	DN10, DN15, DN20
Operating temperatures	
Max. operating temperature:	120 °C
Min. operating temperature medium:	-10 °C non-freezing
Pressure values	
Max. operating pressure:	PN10, 10 bar (1000kPa)
Max. differential pressure:	1.0 bar (100 kPa)
Differential pressure recommended for quiet operation:	≤0.2 bar (20 kPa)
Flow rates	
Nominal flow range:	10 - 70 l/h
Max. nominal flow at 10 kPa (EN 215) – standard head:	70 l/h ± 10 %
Specifications	
Closing dimension:	11.5 mm
Factory setting:	position 6
Identification	
- Red colour protection cap with embossed 'FX' on the top	
- Red colour plastic dial on the top of valve insert	

CONSTRUCTION

Overview



	Components	Materials
1	Insert cartridge	
2	Plunger	Brass
3	Valve body, tailpiece, nut	
4	Return spring	
5	Spindle	Stainless steel
6	Spindle cap	
7	O-rings	EPDM 70
8	Plunger seal	EPDM 80
9	Orifice casing	PPS GF40
10	Setting screen	
11	Retaining bushing	PBT GF30
12	Setting dial	
13	Protection cap	PP GF10

METHOD OF OPERATION

The V2000FX valve is controlled by the radiator thermostat. Air from the room passing over the sensor of the radiator thermostat causes the sensor to expand when the temperature rises. The sensor pushes the valve spindle, closing the valve.

When the temperature falls, the sensor contracts and the spring-loaded valve spindle is opened. The TRV opens in proportion to the temperature of the sensor. Only the amount of water required to maintain the room temperature set on the radiator thermostat can flow into the radiator.

The V2000FX valves have the plunger surrounded by a casing with different orifices and a mating setting screen with one orifice. When the setting dial on top of the valve cartridge is rotated, an orifice in the setting screen aligns with the respective orifice in the casing. Thus, the orifice limiting the maximum flow through the valve is selected.

The V2000FX valves feature a reduced-diameter regulating plunger and valve seat, engineered to provide for a proportional regulation of low flow rates. The maximum flow is limited to less than 130 % of the nominal flow of the valve. This prevents an oversupply of the controlled radiator and a loss of the system balancing in cases when the radiator setting has been turned high in a cooled down room.

The V2000FX valves are suitable for system design with 1K to 2K p-band control range.

TRANSPORTATION AND STORAGE

Keep parts in their original packaging and unpack them shortly before use.

The following parameters apply during transportation and storage:

Parameter	Value
Environment:	clean, dry and dust free
Min. ambient temperature:	0 °C
Max. ambient temperature:	50 °C
Max. ambient relative humidity:	75 % *

*non condensing

INSTALLATION GUIDELINES

- The V2000FX valves are primarily designed for use in pumped 2-pipe heating systems with thermostatic flow control
- The V2000FX valves should be installed on the supply side of the radiator, so that the heating medium flows in the direction indicated by the arrow on the body
- It is recommended to install the V2400 series “Verafix” return valves at the return side of the radiator. The Verafix allows for shut-off and drain-down of the radiator. But it can also be throttled to dissipate excessive differential pressure across a radiator and hence reduce any noise that could otherwise occur
- It is recommended to effectuate valve presetting to achieve hydraulic balancing and improve comfort and energy efficiency, even in smaller systems. Static balancing has been shown to result in up to 5 % of energy savings
- In larger systems with static balancing, it is recommended to install V5032 pipeline balancing valves at the return of each branch or riser
- In large systems, hydraulic balancing with the V2000FX series valves works best in combination with the V5010 Kombi-3 or V5001P Kombi-Auto differential pressure control valves installed on each heating branch or riser. Dynamic balancing compensates for varying temperature setting and heat load conditions, and has been shown to result in up to 10 % of energy savings
- The V2000FX valve bodies can be used with all Honeywell Home thermostatic heads with M30x1.5 connection and with recommended Honeywell Home thermoelectric or motorized actuators (see section Recommended Actuators below). When using actuators from other manufacturers, make sure to select actuators with pressure force not exceeding 100N

Installation Example

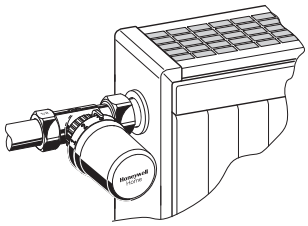


Fig. 1. Straight

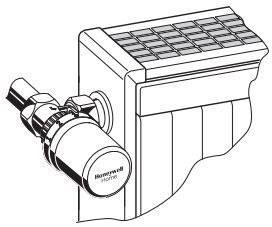


Fig. 2. Angled

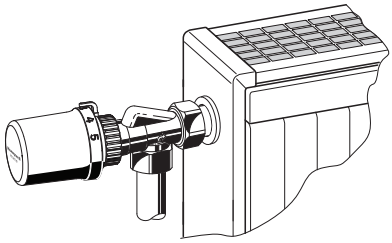


Fig. 3. Axial

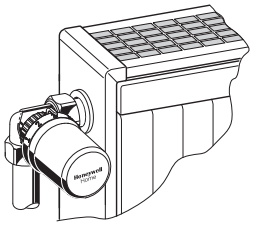


Fig. 5. Double angle (corner) left

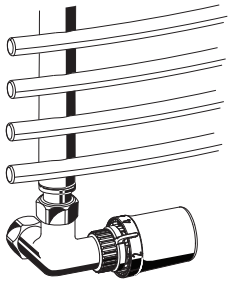


Fig. 6. Double angle (corner) left on a towel radiator

Setup requirements

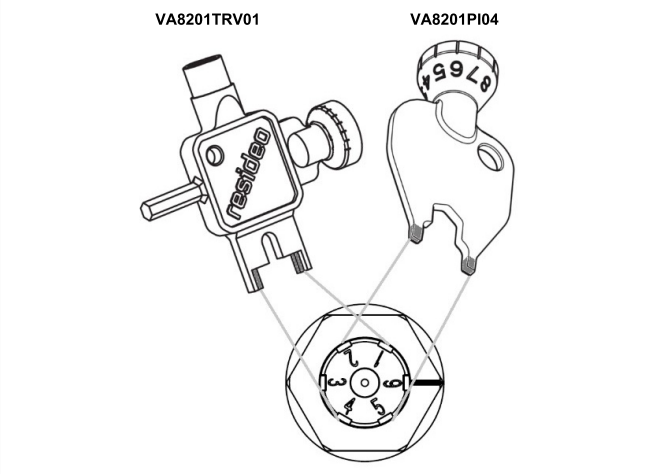
- To avoid stone deposit and corrosion the composition of the medium should conform with VDI-Guideline 2035
- All additives and lubricants used for heating medium treatment have to be suitable for EPDM seals to avoid their disintegration. Use of mineral oils should be avoided
- For industrial and long-distance energy systems please refer to applicable codes VdTÜV and 1466/AGFW FW 510
- Heavy polluted existing heating systems must be flushed thoroughly before replacing thermostatic valves
- The heating system must be fully deaerated
- Any complaints or costs resulting from non-compliance with above rules will not be accepted Resideo and its subsidiaries manufacturing the Honeywell Home products

Recommended actuators

- V2000FX flow characteristics are designed for control by thermostatic heads, which provide for proportional regulation within the 2K p-band stroke (0.45 mm). The valves are therefore best controlled by a mechanical or electronic thermostatic head
- All Honeywell Home thermostatic radiator heads with M30x1.5 connection fit the V2000FX valves
- Honeywell Home HR90, HR91 and HR92 electronic TRV heads are suitable for the V2000FX valves
- Honeywell Home MT4 thermoelectric actuators, and M5410 2-point actuators can be used for on/off control of the V2000FX valves
- Thermostatic radiator valves are intentionally designed such that they reach the design flow capacity at 2K p-band stroke (0.45 mm) and the max. flow rate exceeds the nominal flow rate by not more than 30 %. Thus, the modulating actuators used need to be able to provide for precise proportional flow control over a very small stroke range, because at higher strokes, the flow is limited by the presetting
- The M4410E/K and M7410E5001 modulating actuators are recommended

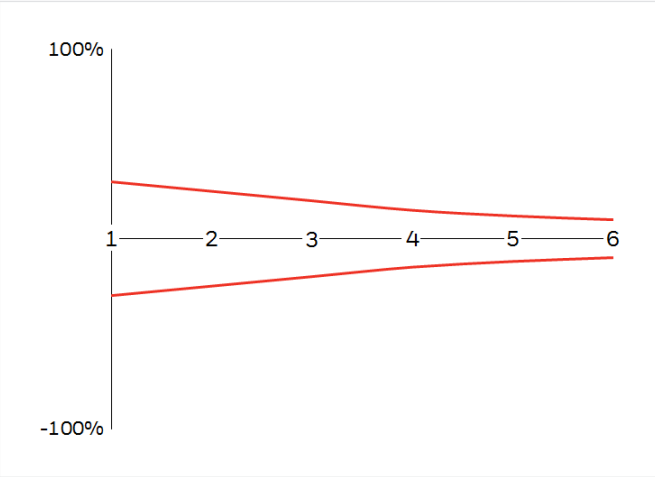
TECHNICAL CHARACTERISTICS

Presetting



- The flow rates can be adjusted to one of the 6 settings (10-70l/h)
- If the required maximum flow does not match exactly the setting value, use the closest higher setting
- The setting is changed using a special setting key
  - Slide the forked part of the setting key into two opposite grooves in the setting dial of the valve
  - Turn the setting key until the desired setting value is against the reference mark on the brass cartridge of the insert
  - The setting dial can be rotated in any direction
  - Do not use intermediate settings
- The default factory setting is position 6

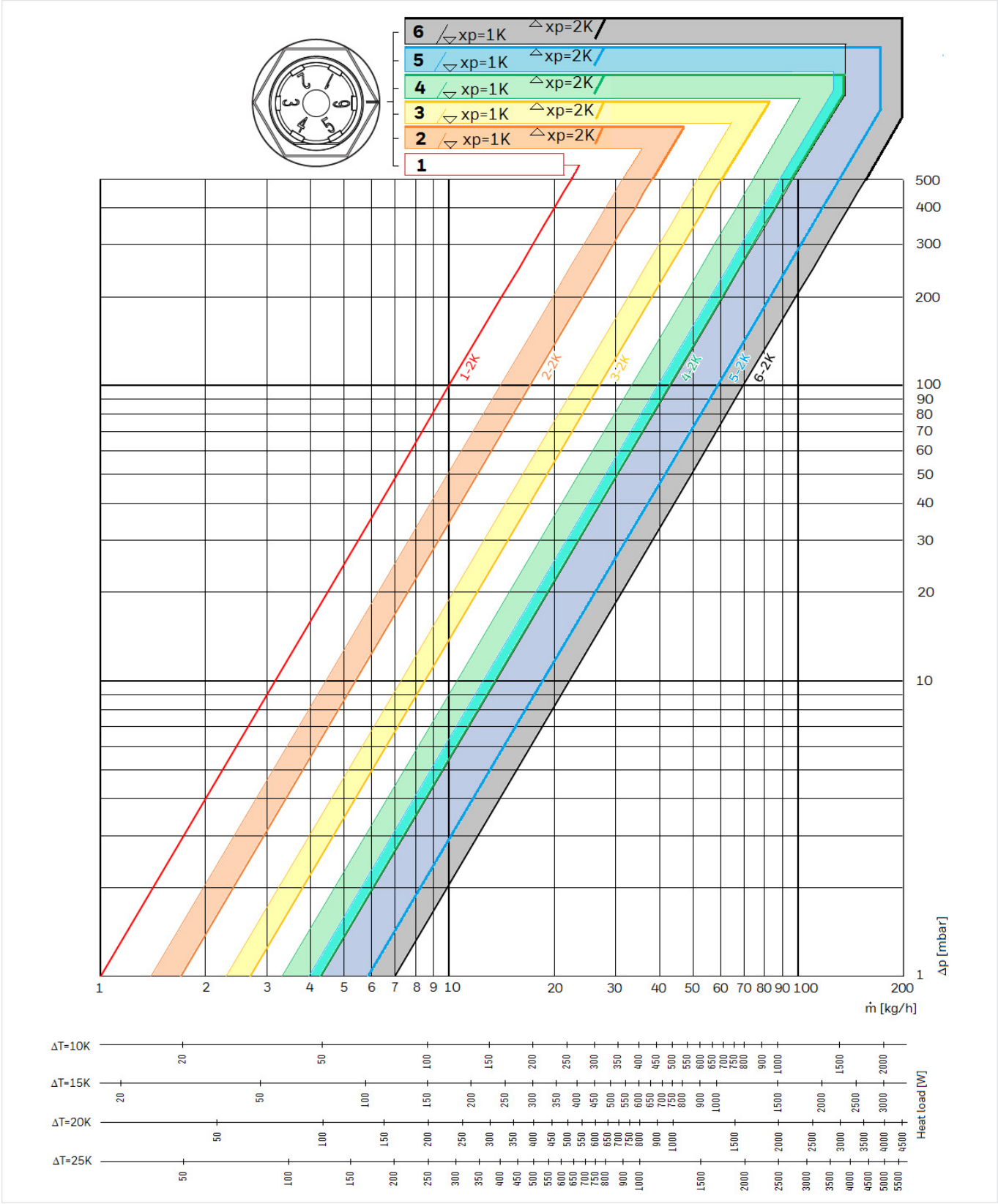
Flow tolerances



Design example

- Heat load: Q=1000 W
- Supply vs. return temperature difference: ΔT=15K
- Calculated mass flow: $\dot{m} = Q/(c \times \Delta T)$= 1000/(1.163x15) = 57 l/h
- Control within: 2K p-band
- Available differential pressure: Δp = 100 mbar (10 kPa)
- Valve setting from chart on next page (use next higher setting): 4

Flow Rate



Presetting	1	2	3	4	5	6
kv-value, 1K p-band	0.032	0.044	0.073	0.105	0.125	0.135
kv-value, 2K p-band	**0.032**	**0.054**	**0.085**	**0.135**	**0.185**	**0.220**
kvs	0.032	0.060	0.095	0.152	0.212	0.285

DIMENSIONS AND ORDERING INFORMATION

Fig. 7. D- Straight

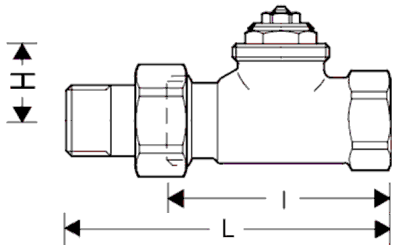


Fig. 8. E - Angled

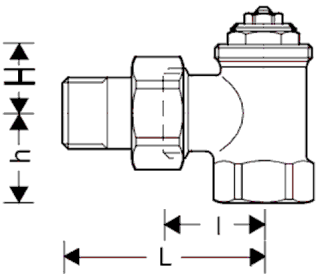


Fig. 9. A - Axial

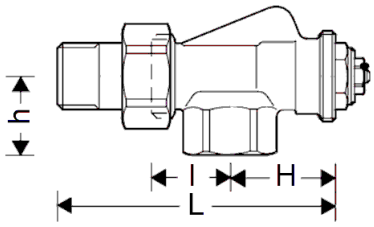


Fig. 11. L – double angle (corner) left

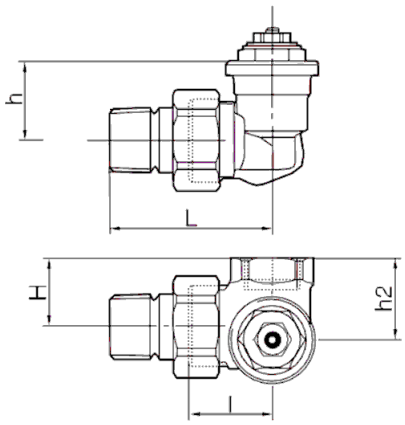
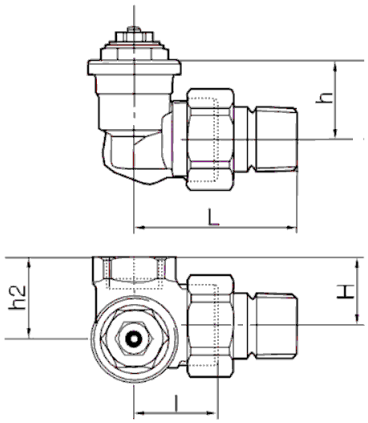


Fig. 12. R – double angle (corner) right

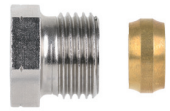
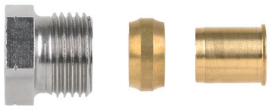


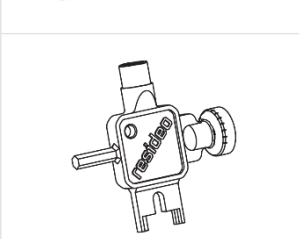
Note: All dimensions in mm unless stated otherwise.

Tab. 1 V2000/V2020: Bodies with internal threads and metal-to-metal sealing radiator tailpieces

Body type	DN	EN 215 certified	Q_{nom} range with std. head	Pipe connection	l	L	h	H	h_2	OS-No.
E - Angled per EN 215 **D**-Series	10	•	10-70 kg/h	Rp 3/8"	26	52	22	20	-	V2000EFX10
	15	•	10-70 kg/h	Rp 1/2"	29	58	26	20	-	V2000EFX15
D - Straight per EN215 **D**-Series	10	•	10-70 kg/h	Rp 3/8"	59	85	-	25	-	V2000DFX10
	15	•	10-70 kg/h	Rp 1/2"	66	95	-	25	-	V2000DFX15
E - Angled per EN 215 **F**-Series	10	•	10-70 kg/h	Rp 3/8"	24	49	20	21	-	V2020EFX10
	15	•	10-70 kg/h	Rp 1/2"	26	53	23	22	-	V2020EFX15
D - Straight per EN 215 **F**-Series	10	•	10-70 kg/h	Rp 3/8"	50	75	-	26	-	V2020DFX10
	15	•	10-70 kg/h	Rp 1/2"	55	82	-	26	-	V2020DFX15
A - Axial	10		10-70 kg/h	Rp 3/8"	24	50	22	33	-	V2000AFX10
	15		10-70 kg/h	Rp 1/2"	26	54	26	35	-	V2000AFX15
L – Double Angle (Corner) **Left**	10		10-70 kg/h	Rp 3/8"	24	53	26	22	26.5	V2020LFX10
	15		10-70 kg/h	Rp 1/2"	24	53	26	26	30.5	V2020LFX15
R - Double Angle (Corner) **Right**	10		10-70 kg/h	Rp 3/8"	24	53	26	26	26.5	V2020RFX10
	15		10-70 kg/h	Rp 1/2"	24	53	26	26	30.5	V2020RFX15

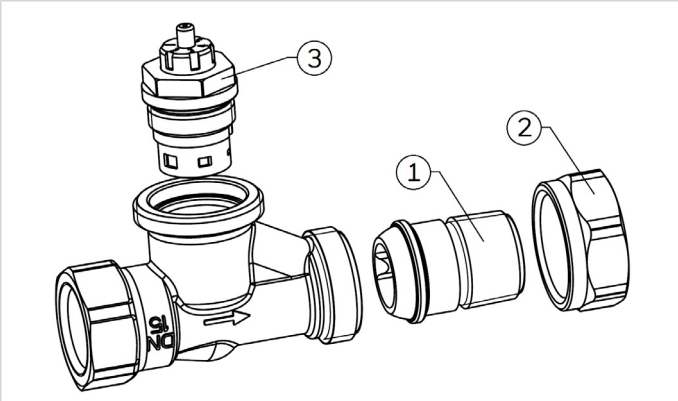
ACCESSORIES

	Description		Dimension	Part No.
	**FIG1/2CS**	**Compression fitting for COPPER and STEEL pipe** Consisting of compression nut and compression ring. For valves with internal thread.		
		3/8", DN10	10 mm	FIG3/8CS10
		3/8", DN10	12 mm	FIG3/8CS12
		1/2", DN15	10 mm	FIG1/2CS10
		1/2", DN15	12 mm	FIG1/2CS12
		1/2", DN15	14 mm	FIG1/2CS14
		1/2", DN15	15 mm	FIG1/2CS15
		1/2", DN15	16 mm	FIG1/2CS16
	**FIG1/2CSS**	**Compression fitting for COPPER and STEEL pipe** Consisting of compression nut and compression ring and support insert. For valves with internal thread. Note: Support inserts have to be used for copper or soft steel pipe with 1.0 mm wall thickness..		
		3/8", DN10	12 mm	FIG3/8CSS12
		1/2", DN15	12 mm	FIG1/2CSS12
		1/2", DN15	14 mm	FIG1/2CSS14
		1/2", DN15	15 mm	FIG1/2CSS15
		1/2", DN15	16 mm	FIG1/2CSS16
		1/2", DN15	18 mm	FIG1/2CSS18
	**FIG1/2M**	**Compression fitting for MULTILAYER pipe** Consisting of compression nut, compression ring and support insert. For valves with internal thread.		
		1/2", DN15	16 mm	FIG1/2M16X2
	**VA6290**	**Reduction piece**		
		1" pipe > 1/2" valve		VA6290A260
		1 1/4" pipe > 1/2" valve		VA6290A280
	**VA5201A**	**Radiator tailpiece with thread up to collar**		
		3/8", DN10		VA5201A010
		1/2", DN15		VA5201A015
	**VA5204B**	**Extended radiator tailpiece, nickel-plated, to be shortened as required**		
		3/8" x 70 mm (for DN10) thread approx. 50 mm		VA5204B010
		1/2" x 76 mm (for DN15) thread approx. 65 mm		VA5204B015
	**VA2202A**	**Pressure cap – for shutting off valves on radiator outlet**		
		G 5/8" internal thread - for DN10 valves		VA2202A010
		G 3/4" internal thread - for DN15 valves		VA2202A015
	**VA5090**	**Sealing ring for pressure cap**		
		for VA2202A010		VA5090A010
		for VA2202A015		VA5090A015

	**VA8200A**	**Service tool to replace valve insert**		
		for all V2000 types: SX, FX, LX, BB, UB and for legacy types: Kx, SL, SLGB, Mira		VA8200A001
	**VA8201**	**Metallic presetting key with chrome plating**		
		for PI, SX, FX and LX type valves		VA8201PI04
	**VA8201**	**Plastic presetting key**		
		for PI, SX, FX and LX type valves and Verafix lockshields		VA8201TRV01

SPARE PARTS

Overview



	Description	Dimension	Part No.
1	**Metal-to-metal sealing radiator tailpiece**		
		$^{3}/_{8}$", DN10	VA5200B010
		$^{1}/_{2}$", DN15	VA5200B015
2	**Coupling nut**		
		DN10, nut with G $^{5}/_{8}$" internal thread	VA5000B010
		DN15, nut with G $^{3}/_{4}$" internal thread	VA5000B015
3	**Replacement valve insert**		
	FX type		VS1200FX01

For more information

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