VT15, VTL15

Trade Pack TRV

Thermostatic Radiator Valve and Lockshield

APPLICATION

Thermostatic Radiator Valves (TRVs) provide local control of room temperatures to maintain comfort and save energy.

TRVs sense the air temperature around them and control the flow of water through the radiator to which they are fitted.

Only the amount of water required to maintain the room temperature set on the radiator thermostat will flow into the radiator.

Research carried out on behalf of TACMA, the Controls Association within BEAMA, shows that, in a typical UK house, heating system energy consumption can be reduced by up to 40 % through the installation of TRVs in addition to a Room Thermostat or Programmable Room Thermostat and that installation costs could be recovered within a year.

These tests also showed that by providing local temperature control in every room, TRVs can significantly improve comfort for householders by providing better heat distribution around a dwelling.

APPROVALS

- Approved to EN 215 and listed for Keymark

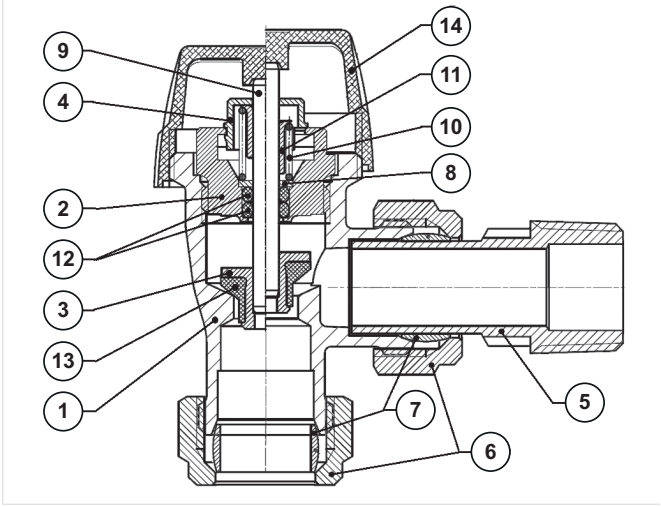
SPECIAL FEATURES

- Modern matt silver nickel plated valve bodies
- Bidirectional flow design
- Packed in convenient Trade Packs of 15 pcs, Trade Packs with Lockshield include 3 drain-of tailpieces per 15 sets
- Standard dimensions according to EN215 Series GB
- Temperature range limiting facility
- Balancing Lockshield with user friendly presetting by Allen key
- VT15 TRV valves are compatible with
  - Honeywell TRV heads with M30 x 1.5 connection
  - Honeywell MT4 actuators
  - Honeywell HR types of Home and Roomtronic actuators
- The valve insert can be replaced while the system is operating and without draining using the service tool

TECHNICAL DATA

Media	
Standard medium:	Water or water-glycol mixture, quality to VDI 2035
Connections/Sizes	
Body-head connection:	M30 x 1.5
Sizes:	Angled and straight, for 15 mm and 10 mm copper pipes
Operating temperatures	
Max. operating temperature medium:	130 °C
Min. operating temperature medium:	2 °C (35.6 °F)
Pressure values	
Max. operating pressure:	PN10, 10 bar (1000 kPa)
Max. differential pressure:	0.8 bar (80 kPa)
Min. differential pressure:	0.05 bar (5 kPa)
Flow rates	
Nominal flow at 10 kPa (EN215):	110 l/h
Flow accuracy:	15 %
k_{VS} value:	0.65 m^3/h
Specifications	
Closing dimension:	11.5 mm
Stroke:	2.5 mm

CONSTRUCTION

Overview		Components	Materials
	**1**	Valve housing	Brass
	2	Insert cartridge	
	3	Plunger	
	4	Stroke cap	
	5	Tailpiece	
	6	Coupling nut	
	7	Compression olive	
	8	Washer	
	9	Spindle	Stainless steel
	10	Return spring	
	11	Spring holder	Copper
	12	Double o-rings	EPDM
	13	Plunger seal	
	14	Protection cap	Polypropylene

METHOD OF OPERATION

Air from the room passing over the sensor of the radiator thermostat causes the sensor to expand as the temperature rises.

The sensor acts onto the valve spindle causing the valve to close. When the temperature falls, the sensor contracts and the spring-loaded valve spindle opens.

The TRV opens in proportion to the temperature of the sensor. The valve plunger has a characterized geometry designed to provide for a proportional increase of flow.

Thus, only the amount of water required to maintain the room temperature set on the radiator thermostat flows into the radiator.

The thermostatic valve is supplied with a protection cap which can be used to positively shut off the valve.

In combination with the lockshield, the VTL15 sets enable a swift commissioning of a balanced radiator installation.

The lockshield body has a user-friendly presetting device operated by standard 4 mm Allen key.

To balance the heating system, the lockshield of each radiator can be set to a flow opening giving the maximum design flow.

The setting is chosen for each heat load according to the table in the Flow Chart and Settings section.

This easy system balancing action limits oversupply of heating water to any radiator. This will not prolong the time to heat up the room.

Oversupply of heating water brings only a negligible increase of the heat coming from the radiator.

But uncooled return water puts the boiler out of the condensing mode and causes the boiler to switch on and off frequently.

Thus, balancing provides for more even heat distribution to all heated spaces and for increased efficiency by keeping the boiler in condensing mode for a longer period and preventing frequent boiler switching.

Lockshield presetting at the same time does not increase the system resistance, because under normal operating conditions, the TRV restricts the flow more than the preset lockshield. On the other hand, it saves pumping power by diverting the flow to the less favourable located radiators without the need to increase the pump speed.

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:	40 °C
Max. ambient relative humidity:	75 % *

*non condensing

INSTALLATION GUIDELINES

VT15, VTL15 TRVs are suitable for:

- Individual room temperature control
- Control of each radiator in a space heated by multiple radiators
- Any flow direction and orientation of the valve
- Fully pumped two-pipe heating systems
- Design flow up to 110 l/h
- Use in smaller quantities across different domestic installations
- Social and senior housing
- In energy-efficient renovations
- In combination with condensing gas boilers
- System balancing with calculated heat loads and pressure losses
- Rudimentary balancing of small heating circuits based on heat loads

VT15, VTL15 TRVs cannot be used for:

- Installations with extreme pump heads (above 0.8 bar), such as directly connected to central heating plants
- Applications requiring higher nominal flow than 110 l/h (calculated at 10 kPa differential pressure)

Setup requirements

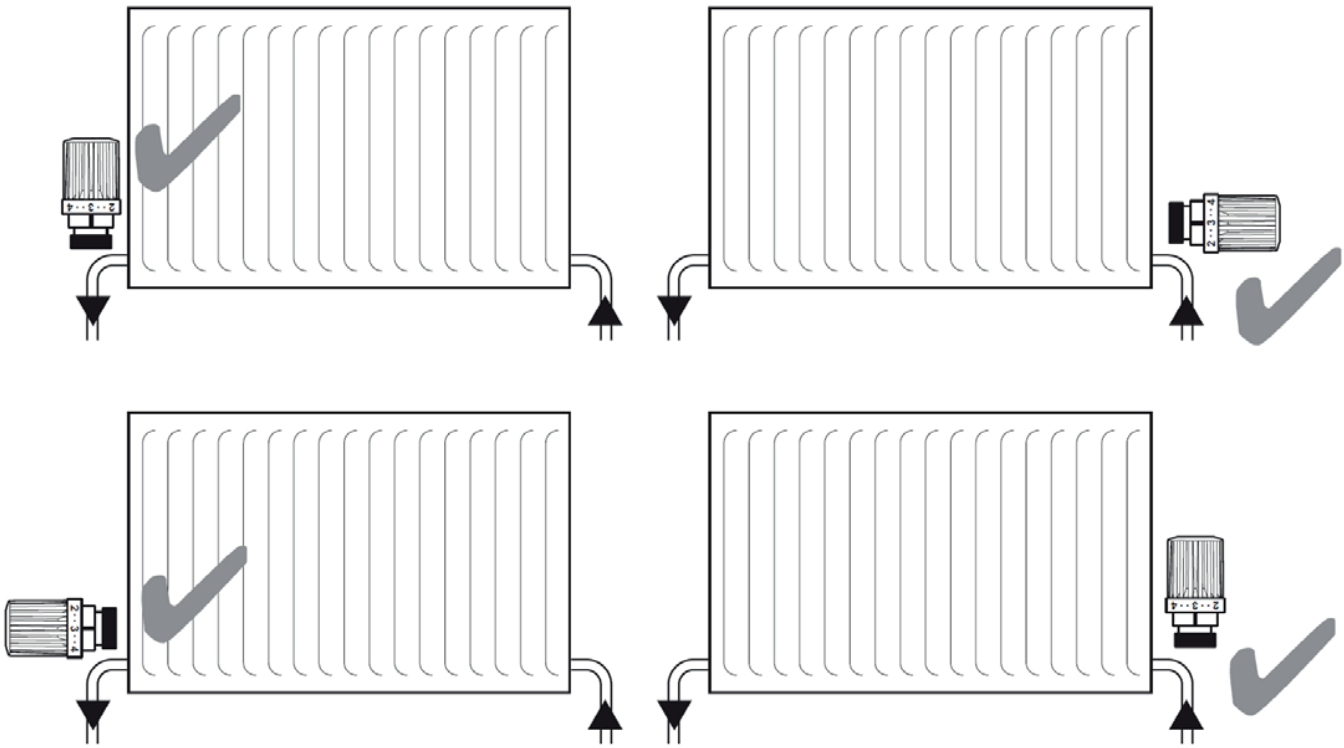
- To avoid stone deposit and corrosion the composition of the medium should conform with VDI-Guideline 2035
- All additives and lubricants used for heating medium treatment have to be suitable for EPDM seals to avoid their disintegration. Use of mineral oils should be avoided
- Heavily polluted existing heating systems must be flushed thoroughly before installation of the valves
- The heating system must be fully deaerated
- Any complaints or costs resulting from non-compliance with above rules will not be accepted by Honeywell

Installation Example

In order to function adequately, the TRV should not be installed in direct sunlight, or obscured by furniture, curtains etc.

TRV should not be fitted to a radiator in a room where there is a room thermostat.

The TRV head may be mounted vertically or horizontally by swapping the tailpiece and pipe fittings.



The VT15 valve body has a removable insert that can be removed and replaced without the need to drain the system. This requires the use of the VA8200A001 insert replacement tool.

TECHNICAL CHARACTERISTICS

Thermostatic Head T9002W0GB

EN215 Parameter	Value
Hysteresis:	0.9 K
Influence of differential pressure:	0.4 K
Influence of heating medium:	0.4 K
Response time:	33 min

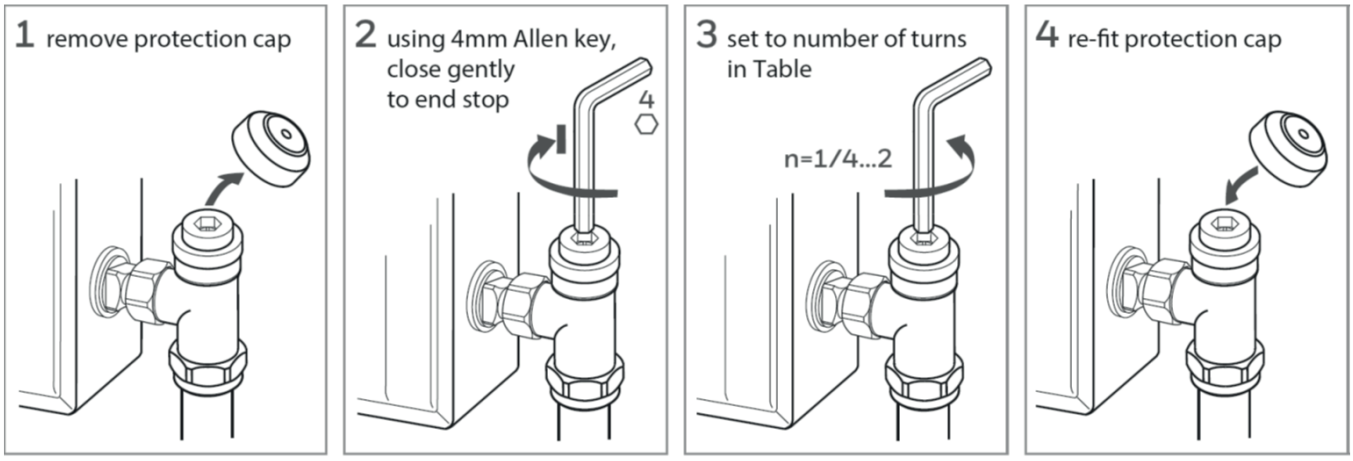
TRV Head Settings

closed	6 °C	10 °C	15 °C	20 °C	23 °C	26 °C
0	❄	1	2	3	4	5

Note: Values approximate. Heating can freeze when radiator thermostats are set to positon '0'. Zero-position is also thermostatically controlled – when temperature falls, the TRV may open.

Flow chart and settings

Presetting of maximum flow for system balancing is carried out for each radiator on the VTL15 lockshield using a standard 4 mm Allen key.



In smaller heating systems, the installer may perform a quick balancing of the system by setting the VTL15 lockshield for each required heat load and the pump head delivered by the pump (usually around 100 to 150 mbar for modern heating pumps).

Radiator Heat Load [W]													
Radiator		300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Δt [K]	**Δp [mbar]**	**number of turns from closed position**												
10	50	1/2	1/2	1	1	1	1	1 1/2	1 1/2	1 1/2	2	2	-	-
	100	1/4	1/2	1/2	1/2	1	1	1	1	1 1/2	1 1/2	1 1/2	1 1/2	2
	200	1/4	1/4	1/4	1/4	1/2	1/2	1	1	1	1	1	1 1/2	1 1/2
15	50	1/4	1/2	1/2	1/2	1	1	1	1	1	1 1/2	1/2	1 1/2	2
	100	1/4	1/4	1/4	1/2	1/2	1/2	1	1	1	1	1	1 1/2	1 1/2
	200	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2	1	1	1	1
20	50	1/4	1/4	1/2	1/2	1/2	1/2	1	1	1	1	1	1 1/2	1 1/2
	100	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2	1	1	1	1	1
	200	1/4	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2	1/2	1	1

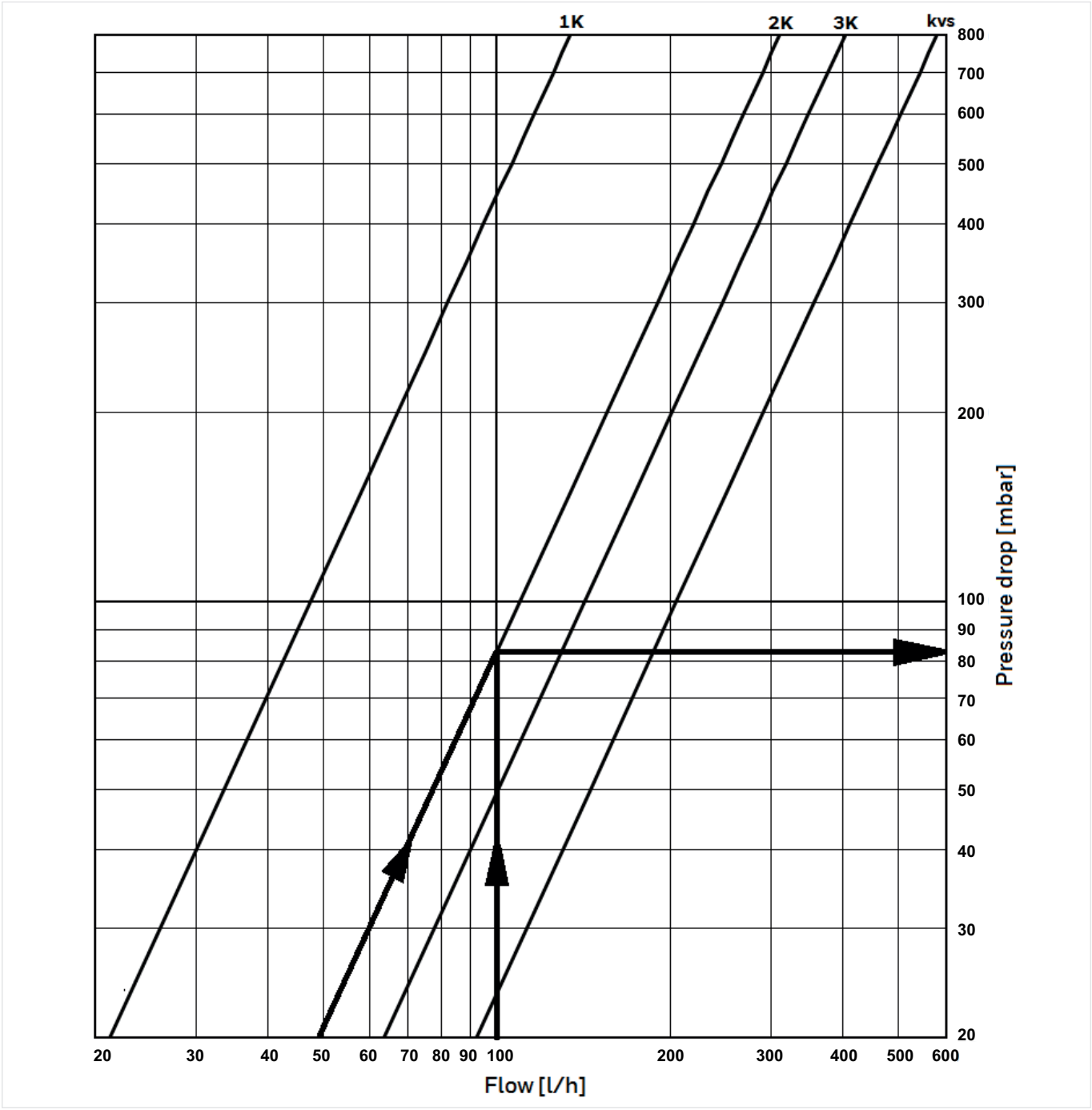
Radiator Heat Load [W]													
Radiator		2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	4500	5000
Δt [K]	**Δp [mbar]**	**number of turns from closed position**											
10	50	-	-	-	-	-	-	-	-	-	-	-	-
	100	2	2	-	-	-	-	-	-	-	-	-	-
	200	1 1/2	1 1/2	2	2	2	2	2	-	-	-	-	-
15	50	2	2	2 1/2	-	-	-	-	-	-	-	-	-
	100	1 1/2	1 1/2	1 1/2	2	2	2	2	2 1/2	-	-	-	-
	200	1	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2
20	50	1 1/2	1 1/2	2	2	2	2	2	-	-	-	-	-
	100	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2		2	2	2	-
	200	1	1	1	1	1	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

Design Example

- Type 22 radiator 600x1200 mm
- Required heat: 2000 W
- Radiator ΔT= 15 °C
- Δp= 100 mbar
- Lockshield setting: 1 1/2 turns

Especially for larger systems, the balancing should be calculated considering all pressure losses in the system and using the below flow charts for the thermostatic valve and the lockshield.

V15 Thermostatic Valve Flow Chart

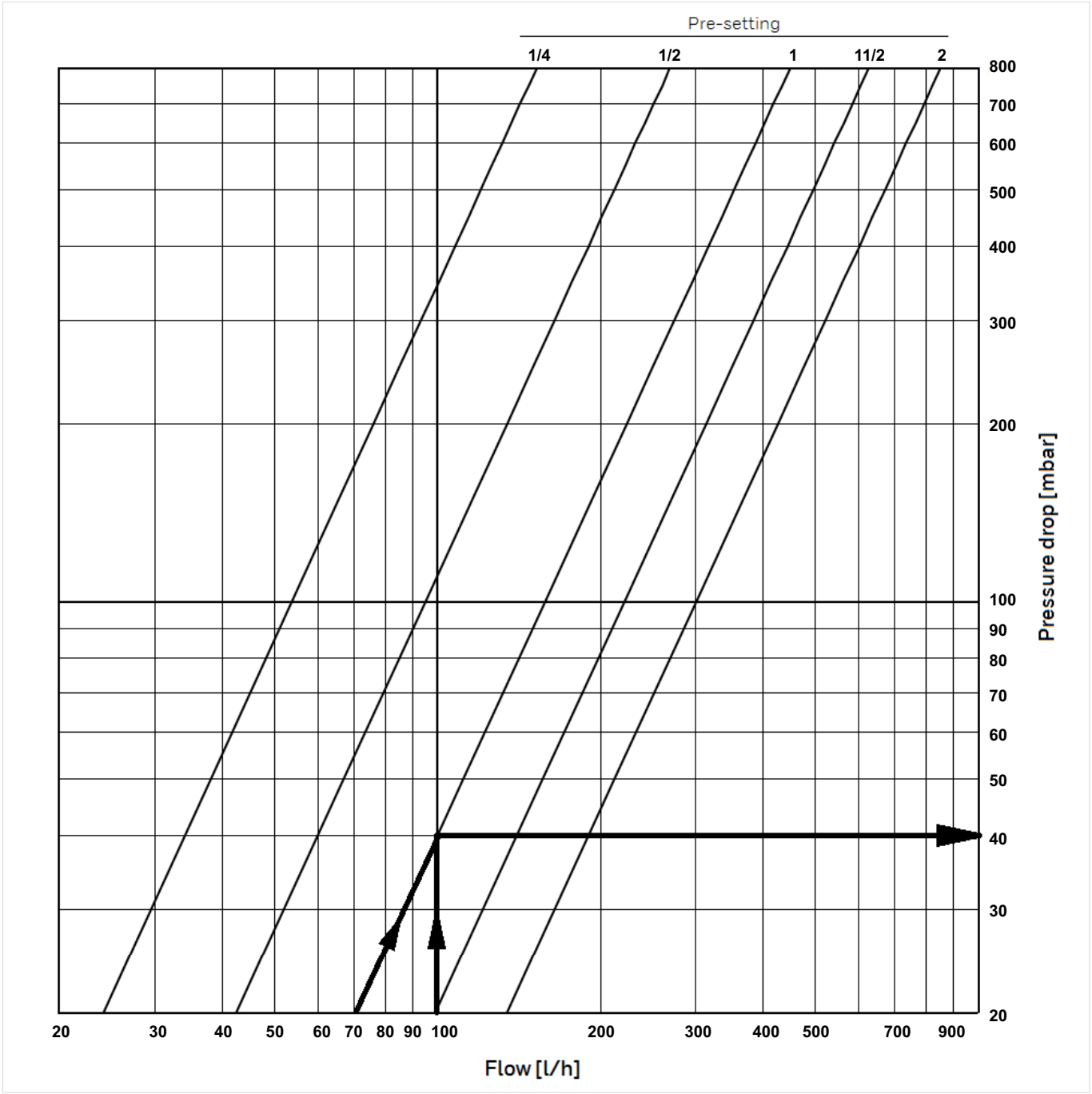


p-band	1 K	2 K	3 K	open = k_{vs}
k_v-value	0.15	0.35	0.45	0.65

Design Example

- Given: Flow rate 100 l/h
- Required: Pressure loss Δp with a p-band of 2 K
- Solution: The required pressure loss is found at the intersection of the vertical flow line with the diagonal line of the 2 K proportional regulation band
- Result: Δp= 83 mbar = 8.3 kPa

L15 Lockshield Flow Chart



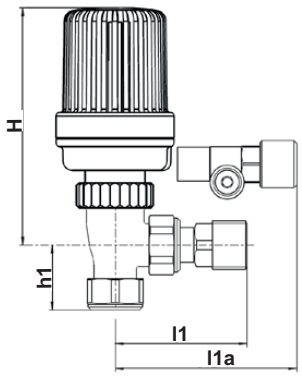
Presetting [turns from closed position]	1/4	1/2	1	1 1/2	2
k_v-value	0.17	0.30	0.50	0.70	0.95

Design Example

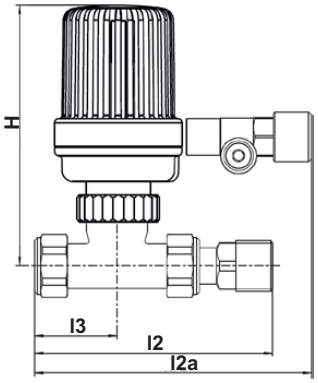
- Given: Flow rate 100 l/h
- Required: Pressure loss Δp at setting 1
- Solution: The required pressure loss is found at the intersection of the vertical flow line with the diagonal line of for presetting 1
- Result: Δp= 40 mbar = 4 kPa

DIMENSIONS

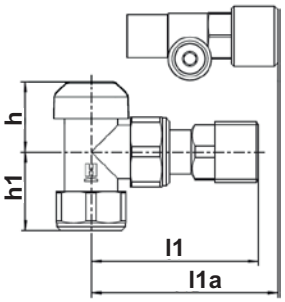
Overview



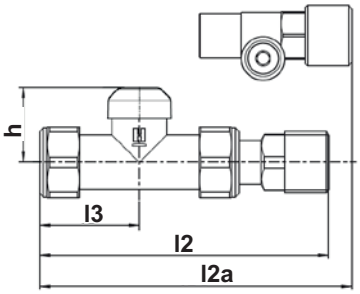
TRV Angled



TRV Straight



Lockshield Angled



Lockshield Straight

Body type	EN 215 certified	l1	l1a	l2	l2a	l3	h1	H	h	OS-No.
TRV Angled to EN215 GB series	•	58	69	-	-	-	32	141	-	V15-15A
TRV Angled to EN215 GB series	•	-	-	103	116	39	-	110	-	V15-15S
Lockshield Angle		58	69	-	-	-	32	-	26	-
Lockshield Straight		-	-	103	116	39	-	-	27	-

Note: All dimensions in mm unless stated otherwise.

ORDERING INFORMATION

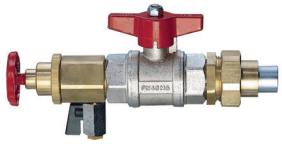
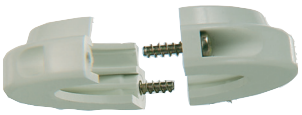
The following tables contain all the information you need to make an order of an item of your choice. When ordering, please always state the type, the ordering or the part number.

Options

Type:	Pattern:	Pipe connection:	Packaging:	Drain-off tailpiece:	OS-No.:
TRV only	Angled	15 mm copper	Pack of 15 pcs	none	VT15-15A/B
		10 mm copper			VT15-10A/B
TRV and Lockshield	Angled	15 mm copper		3 pcs per pack of 15	VTL15-15A/B
		10 mm copper			VTL15-10A/B
	Straight	15 mm copper			VTL15-15S/B

Accessories

	Description		Dimension	Part No.
	**VA15-D0**	**Drain-of tailpiece** Drain-off tailpiece with appearance matching to the VT15 TRV and VTL15 lockshields.		
		Bulk pack of 15 pcs	$^1/_2$"	VA15-DO/B
	**T9002**	**White TRV upgrade head** May be used to upgrade compatible manual valves to convert them to a TRV or to replace an old thermostatic head..		
		Fits Honeywell VT15 valves; VHL120, VT117, VTL120 valves since 2015; as well as some competitor valves	M30x1.5	T9002W0GB

	**VA8200A**	**Service tool to replace valve insert** Can be used to replace the insert without draining down the heating system		
		For all Honeywell TRV valves since 2015 and for all VT15 TRV		VA8200A001
	**VS1200**	**Replacement valve insert** For all Honeywell TRV valves since 2015 and for all VT15 TRV		
		Non-presettable, with characterized plunger cone		VS1200BB1
	**TA6900A**	**Theft - protection ring**		
		white (RAL9016)		TA6900A001
	VA15-L	**Spare lockshield cap**		
		White, multipack of 20 pcss		VA15-L-CAP20

UK Head Office
ADEMCO 1 LIMITED
Honeywell House
Skimped Hill Lane
Bracknell
Berkshire
RG12 1EM
www.honeywelluk.com

Manufactured for and on behalf of the
PITTWAY SARL,
Z.A. La Pièce 16, 1180 Rolle, Switzerland
EN0H-2041GE23 R0918
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