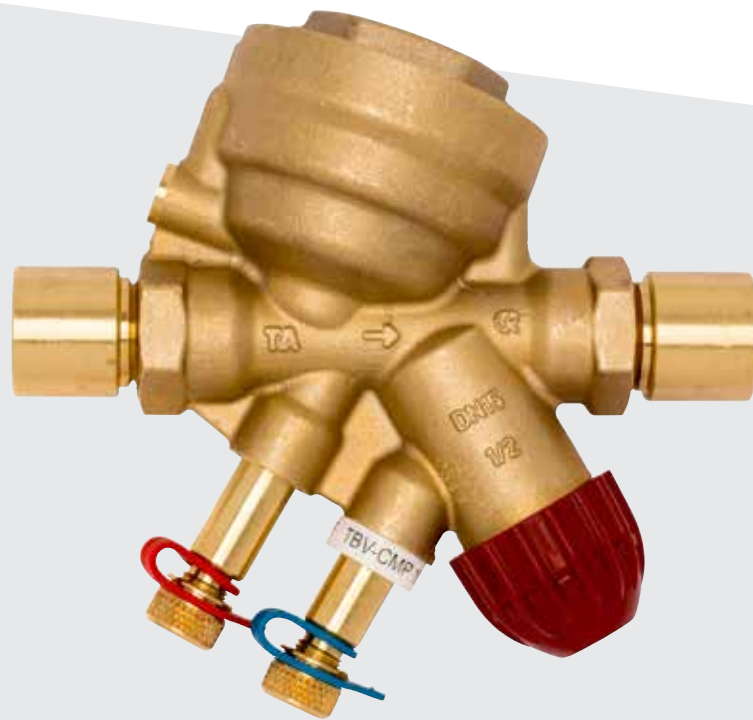


TBV-CMP



Combined control & balancing valves for small terminal units

Pressure independent balancing and control valve (PIBCV) –
NPT threads



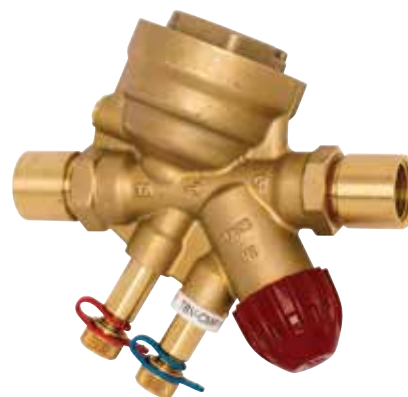
*Engineering
GREAT Solutions*

TBV-CMP

Designed for modulating control of terminal units in heating and cooling systems, the TBV-CMP ensures optimum performance over a long lifetime. Correct control characteristic contributes to a linear circuit characteristic for accurate hydronic control. The TBV-CMP together with our balancing instruments gives possibility for advanced measuring and diagnostic.

Key features

- > **Measuring of Δp_L and ΔH**
Ensures design flow and easy trouble shooting.
- > **Pre-setting tool**
For quick and accurate pre-setting of the design flow.
- > **Flushing**
Simple flushing procedure makes maintenance easy and speed up commissioning.



Technical description

Application:

Heating and cooling systems.

Functions:

Control
Pre-setting (of flow)
Differential pressure control
Measuring
Shut-off (for isolation during system maintenance)
Flushing

Dimensions:

DN 15-25

Pressure class:

PN 16

Differential pressure (Δp_V):

Max. differential pressure: 350 kPa (ΔH_{max})
Min. differential pressure: 15 kPa (ΔH_{min})
(Valid for position 10, fully open. Other positions will require lower differential pressure, check with the software TA-Select.)

Flow range:

The flow (q_{max}) can be pre-set within the range:

DN 15 LF: 18-142 l/h
DN 15 NF: 77-375 l/h
DN 20 NF: 160-660 l/h
DN 25 NF: 335-1330 l/h

Minimum controllable flow:

DN 15 LF: 3 l/h
DN 15 NF: 7 l/h
DN 20 NF: 10 l/h
DN 25 NF: 20 l/h

Temperature:

Max. working temperature: 120°C
Min. working temperature: -20°C

Lift:

4 mm

Characteristic:

See diagrams under "Valve characteristics".

Leakage rate:

Tight sealing

Material:

Valve body: AMETAL®
Valve plug: PPS (polyphenylsulphide)
Seat seal: EPDM/Stainless steel (DN 15-20). EPDM/AMETAL® (DN 25).
Spindle seal: EPDM O-ring
Valve insert: AMETAL®, PPS (polyphenylsulphide)
Spring: Stainless steel
Spindle: Nedox® coated AMETAL®
Membrane: HNBR

AMETAL® is the dezincification resistant alloy of IMI Hydronic Engineering.

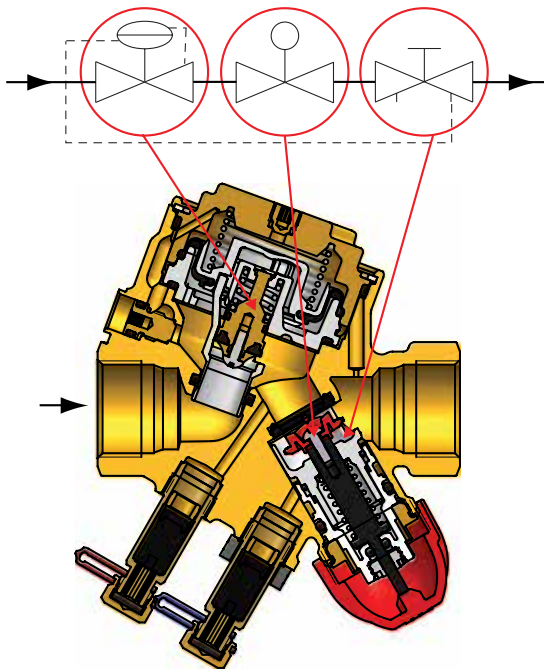
Marking:

Body: TA, PN 16, DN, inch size and flow direction arrow.
Identification ring on measuring point:
White = Low flow (LF)
Black = Normal flow (NF)

Actuators:

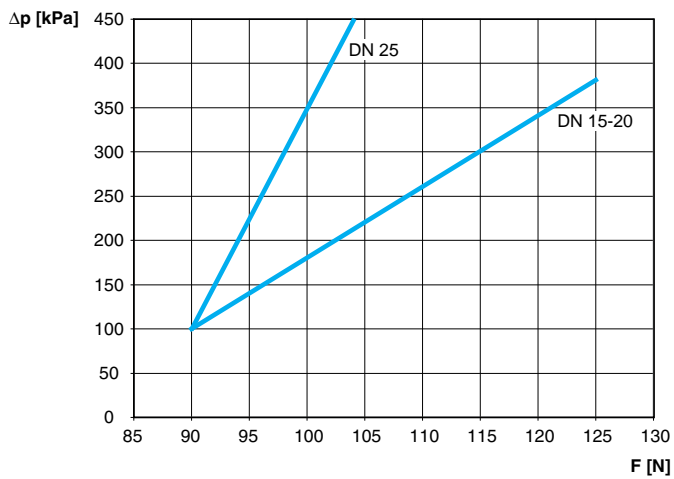
See separate information on EMO TM.

Operating function



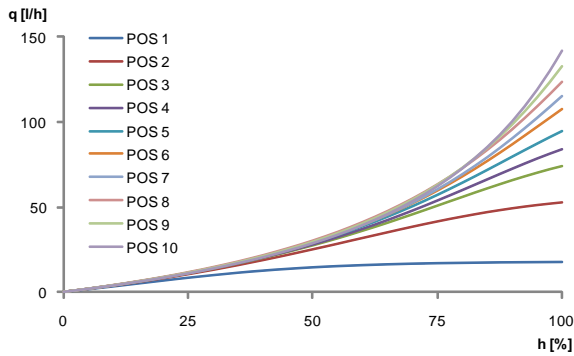
Closing force

Necessary force (F) to close the valve versus the differential pressure (Δp).

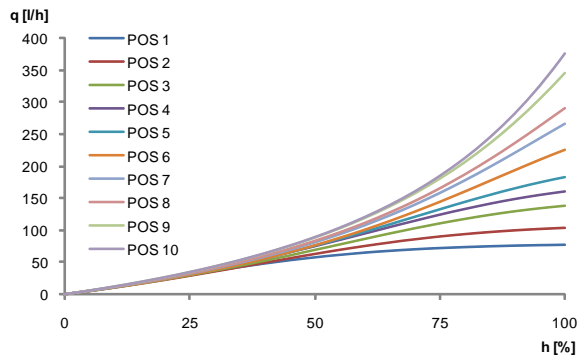


Valve characteristics

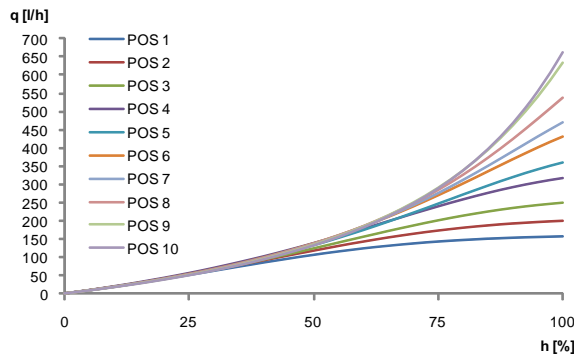
TBV-CMP LF, DN 15



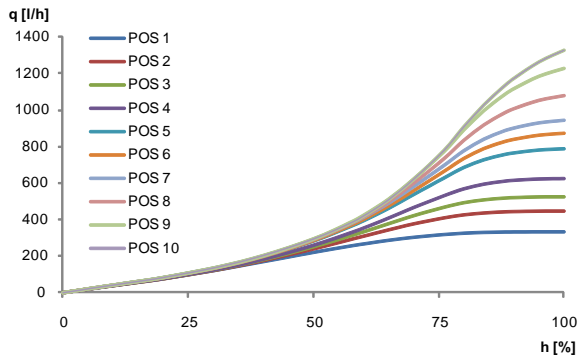
TBV-CMP NF, DN 15



TBV-CMP NF, DN 20

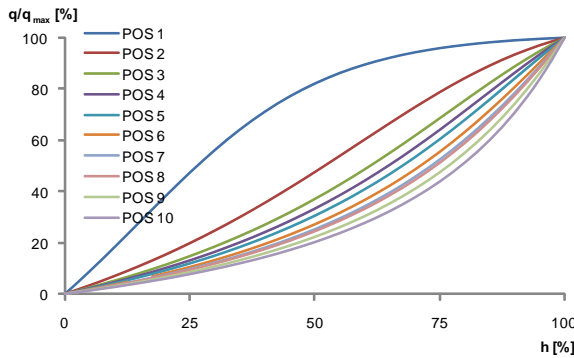


TBV-CMP NF, DN 25

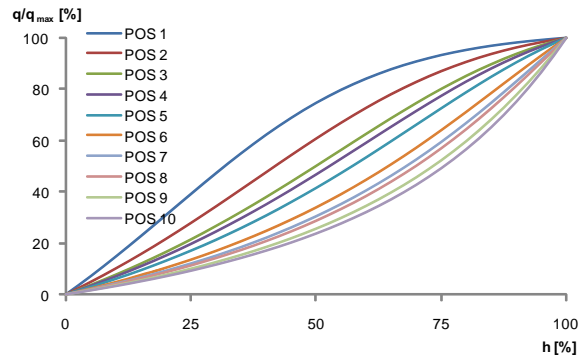


Relative valve characteristic

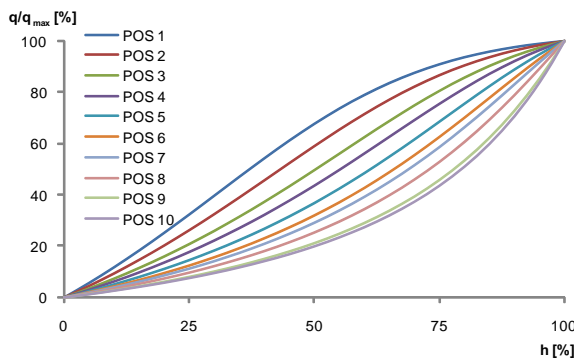
TBV-CMP LF, DN 15



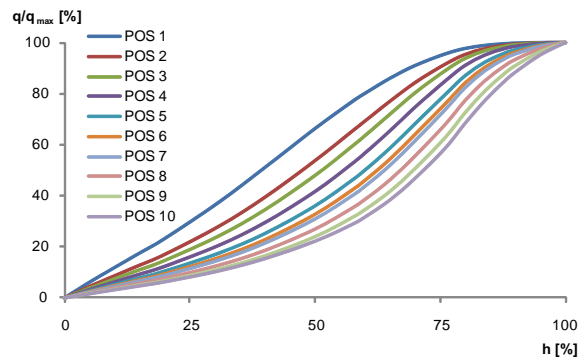
TBV-CMP NF, DN 15



TBV-CMP NF, DN 20



TBV-CMP NF, DN 25



$q_{max} = l/h$ at each setting and fully open valve plug.
 $h =$ lift

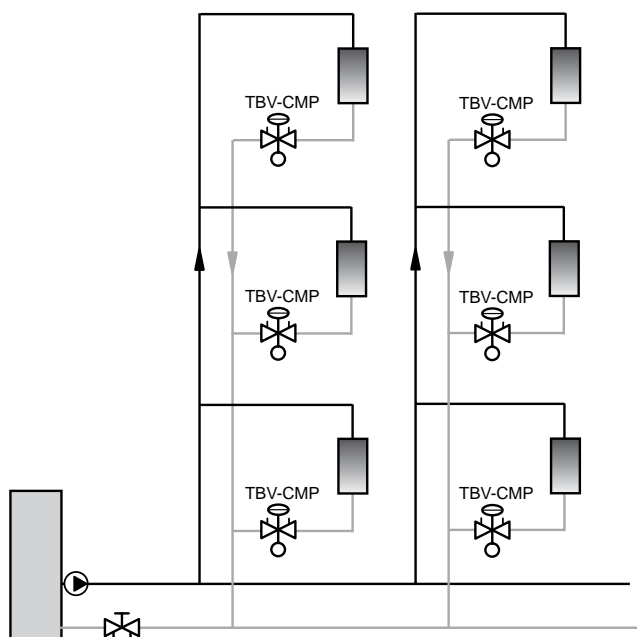
Sizing

Choose the smallest possible valve size that can obtain the design flow. The pre-setting should be as open as possible to get the optimal circuit characteristics. Ensure that the available differential pressure is between 15-350 kPa.

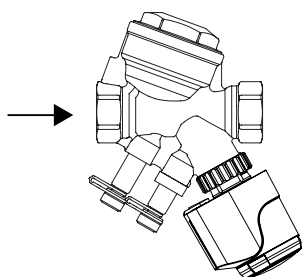
Recommended setting position 3-10.

Installation

Application example

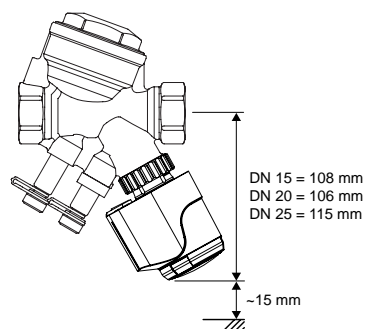


Flow direction

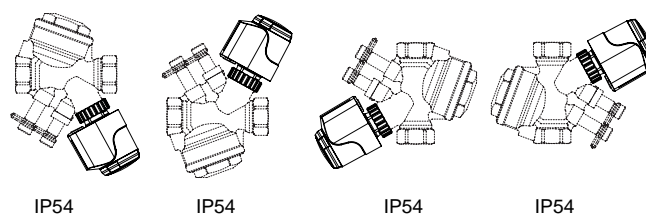


Installation of actuator EMO T

Approx. 15 mm of free space is required above the actuator.



TBV-CMP + EMO TM

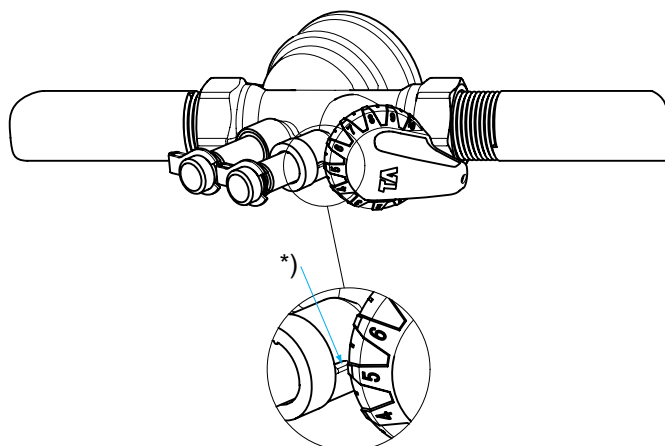


Setting

TBV-CMP is delivered with a red protective cap, Article No 52 143-100, which must be used when isolating the valve. TBV-CMP is delivered with the pre-setting fully open. Pre-setting of a valve for a given q_{max} value, e.g. corresponding to position 5, is done as follows:

1. Place the presetting tool, Article No 52 133-100, at the valve.
2. Turn the presetting tool so that position 5 is pointing at the index* of the valve body.
3. Remove the presetting tool. The valve is now pre-set.

There is a table for every valve size that shows the maximum flow for all settings.



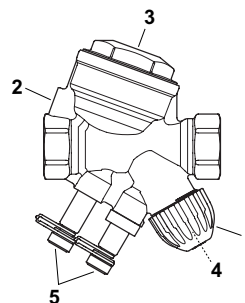
Measuring

Measuring at setting

Connect our balancing or measuring instruments to the measuring points (5). Give the instrument the actual valve, size, type (LF/NF) and pre-setting and the actual flow is displayed.

Measuring ΔH

Connect our balancing or measuring instruments to the measuring points (5). Close the valve with the protective cap (1) and open the flushing spindle (2).



Flushing

To flush/clean the valve throughput

Remove the actuator and open the pre-setting (4) fully (position 10). Then open the flushing spindle (2) fully.

To flush/clean the internal impulse duct

Close the valve with the protective cap (1) and open the flushing spindle (2) fully.

Venting

To vent the membrane chamber, open venting screw (3).

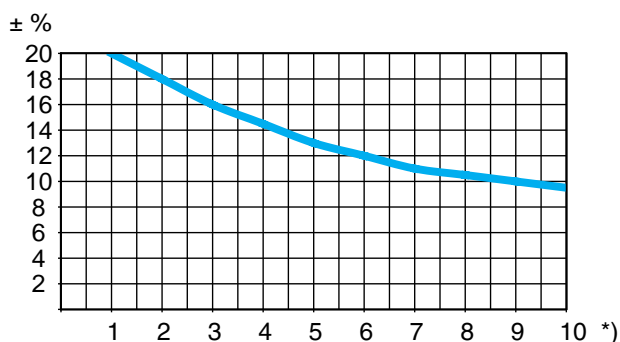
Noise

In order to avoid noise in the installation the valve must be correctly installed and the water de-aerated.

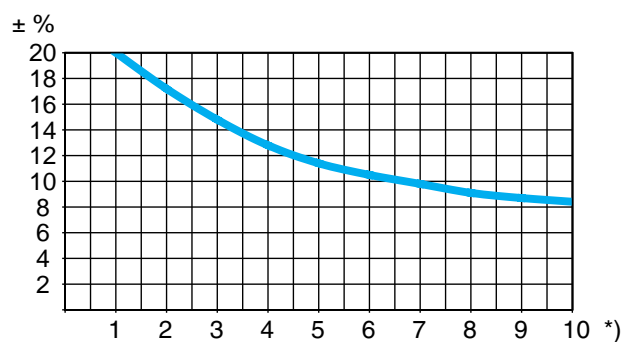
Measuring accuracy

Maximum flow deviation at different settings

TBV-CMP LF



TBV-CMP NF



*) Position

Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approximately the same viscosity as water (≤ 20 cSt = $3^\circ\text{E}=100\text{S.U.}$), it is only necessary to compensate for the specific density. However, at low temperatures, the viscosity increases and laminar flow may occur in the valves. This causes

a flow deviation that increases with small valves, low settings and low differential pressures. Correction for this deviation can be made with the software TA Select or directly in our balancing instruments.

Flow tables

TBV-CMP LF, DN 15

Position	1	2	3	4	5	6	7	8	9	10
q_{\max}	18	53	75	84	94	108	116	124	133	142

TBV-CMP NF, DN 15

Position	1	2	3	4	5	6	7	8	9	10
q_{\max}	77	103	138	160	180	225	265	290	345	375

TBV-CMP NF, DN 20

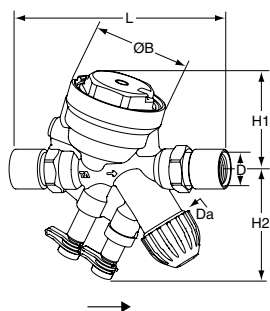
Position	1	2	3	4	5	6	7	8	9	10
q_{\max}	160	195	250	320	360	435	465	540	635	660

TBV-CMP NF, DN 25

Position	1	2	3	4	5	6	7	8	9	10
q_{\max}	335	445	525	625	785	875	945	1075	1225	1330

q_{\max} = l/h at each setting and fully open valve plug.
Recommended setting: Position 3-10

Articles



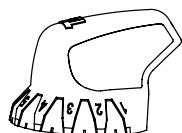
Female thread

DN	Size	D	Da*	L	H1	H2	B	Kg	EAN	Article No
TBV-CMP LF, low flow										
15	1/2"	1/2 NPT	M30x1,5	140	62	71	62	0,97	7318794018600	52 153-515
TBV-CMP NF, normal flow										
15	1/2"	1/2 NPT	M30x1,5	140	62	71	62	0,97	7318794018709	52 154-515
20	3/4"	3/4 NPT	M30x1,5	147	62	71	62	1,1	7318794018808	52 154-520
20	3/4"	1/2 NPT	M30x1,5	121	62	71	62	1,0	7318794019003	52 155-515
25	1"	1 NPT	M30x1,5	178	66	77	62	1,5	7318794018907	52 154-525
25	1"	3/4 NPT	M30x1,5	168	66	77	62	1,5	7318794019102	52 155-520
25	1"	1/2 NPT	M30x1,5	167	66	77	62	1,5	7318794019003	52 156-515

*) Connection to actuator.

→ = Flow direction

Accessories



Presetting tool

For TBV-C, TBV-CM, TBV-CMP,
KTCM 512

EAN

Article No

7318793886002

52 133-100

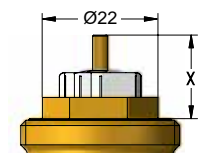
Actuator EMO TM

For more details of EMO TM, see separate catalogue leaflet.

TBV-CMP is developed to work together with actuator EMO TM. Actuators of other brands require a working range of:

X = 11,50 - 15,80 (closed - fully open)

IMI Hydronic Engineering will not be held responsible for the control function if actuators other brand than IMI TA are used.



TBV-C/-CM/-CMP

(TBV-C after/efter 07.2009)

- EN** Exchange of O-ring
SV Byte av O-ring

1. Remove any actuator and “exercise” the spindle three to four times.
NOTE: Make sure that the spindle is in the outer position (fully open). Now the valve is self-sealed by the system pressure and the O-ring can be exchanged.
2. Remove the stuffing box screw at the spindle by using the special tool delivered with the spare part kit.
3. Release the O-ring with a quick press inwards on the spindle.
NOTE: Some liquid/media will leak, use a towel or similar to avoid surface damage. When pressing the spindle inwards the system pressure helps to release the O-ring, which results in some leakage until the spindle is in outer position once again.
4. Use an e.g. paper clip to remove the old O-ring.
5. Place the new O-ring and a new stuffing box screw. Tighten 1 Nm (= very light torque) with the special tool.
NOTE: The insert can crack if it is tighten with too much torque.
6. Mount the actuator.

-
1. Ta av eventuellt ställdon och ”motionera” spindeln tre till fyra gånger.
OBS: Säkerställ att spindeln är i ytterläge (fullt öppen). I detta läge självtätas ventilen av systemtrycket och byte av O-ring kan göras.
 2. Skruva loss packboxskruven vid spindeln med hjälp av det medleverade specialverktyget.
 3. Gör ett snabbt tryck inåt på spindeln för att få loss O-ringen. **OBS:** Ett lätt läckage uppstår – ha en trasa i beredskap. När spindeln trycks inåt hjälper systemtrycket att frigöra O-ringen från dess läge, vilket betyder att ett visst läckage till spindel åter är i ytterläge.
 4. Tag hjälp av t ex ett gem för att få bort den gamla O-ringen.
 5. Montera den nya O-ringen och den nya packboxskruven. Dra åt med specialverktyget med 1 Nm (= mycket måttlig kraft). **OBS:** Insatsen kan spricka om man drar åt för hårt.
 6. Sätt på eventuellt ställdon igen.