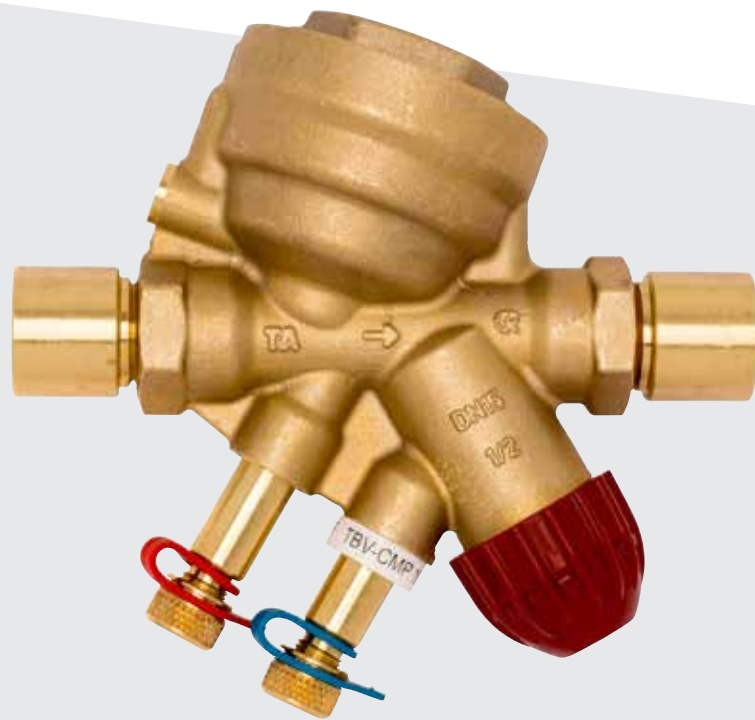


# TBV-CMP



## **Combined control & balancing valves for small terminal units**

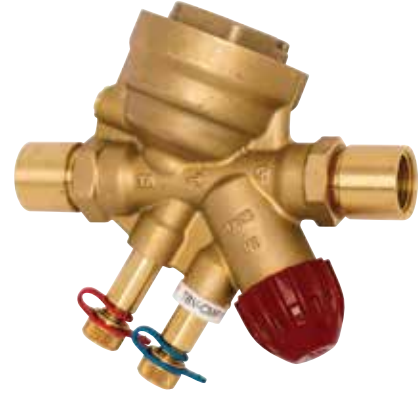
Pressure independent balancing and control valve (PIBCV) – NPT threads



*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  $\Delta p_L$  and  $\Delta H$**   
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 ( $\Delta pV$ ):

Max. differential pressure: 350 kPa ( $\Delta H_{max}$ )  
Min. differential pressure: 15 kPa ( $\Delta H_{min}$ )  
(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.

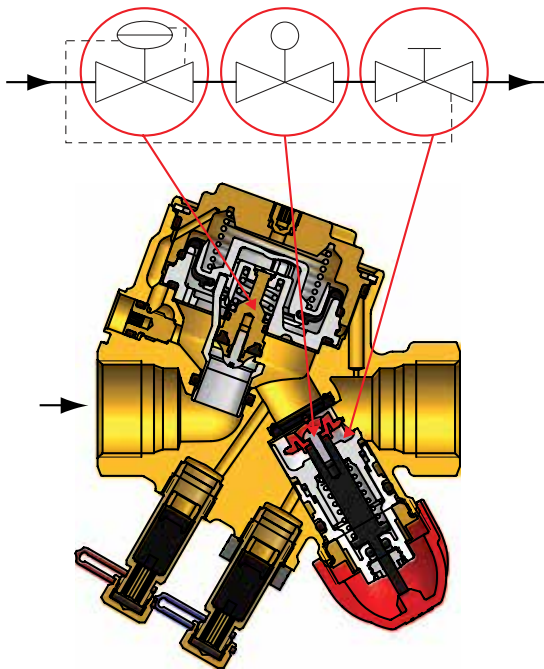
### Marking:

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:

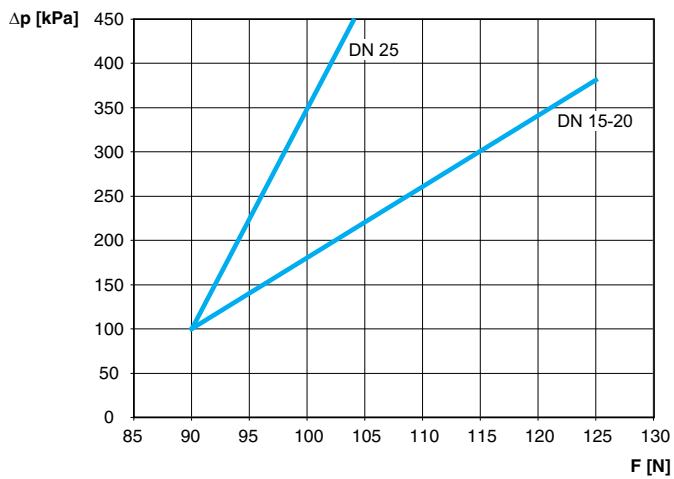
See separate information on EMO TM.

## Operating function



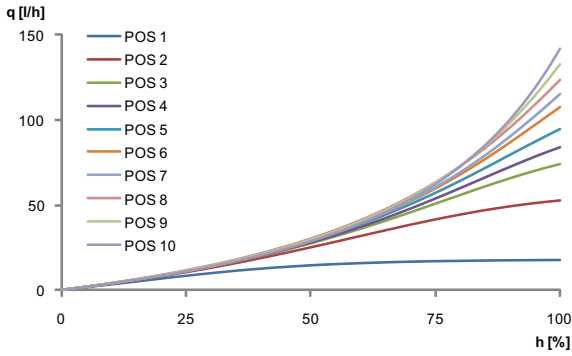
## Closing force

Necessary force ( $F$ ) to close the valve versus the differential pressure ( $\Delta p$ ).

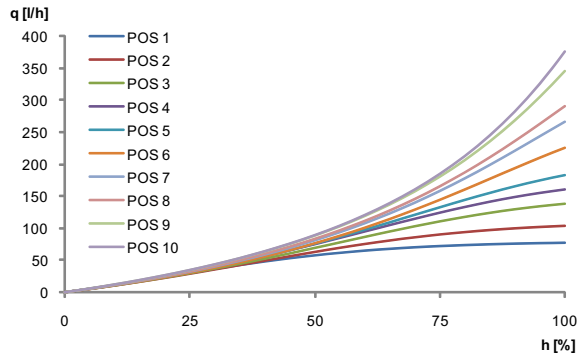


## Valve characteristics

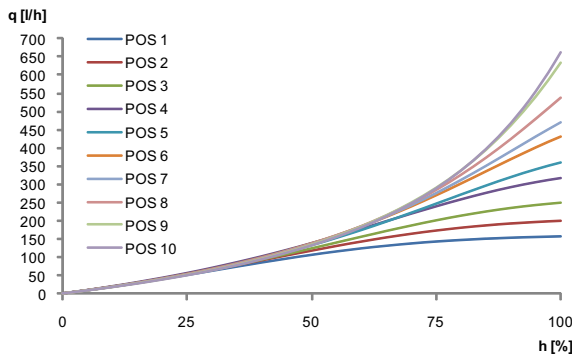
**TBV-CMP LF, DN 15**



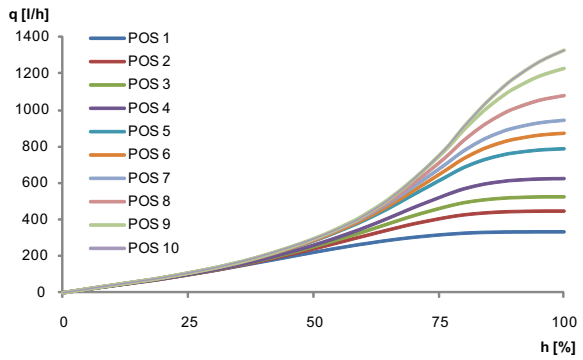
**TBV-CMP NF, DN 15**



**TBV-CMP NF, DN 20**

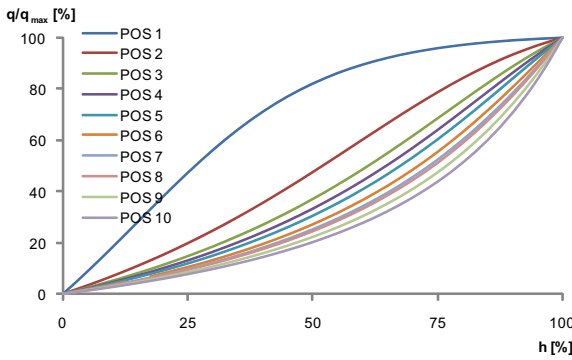


**TBV-CMP NF, DN 25**

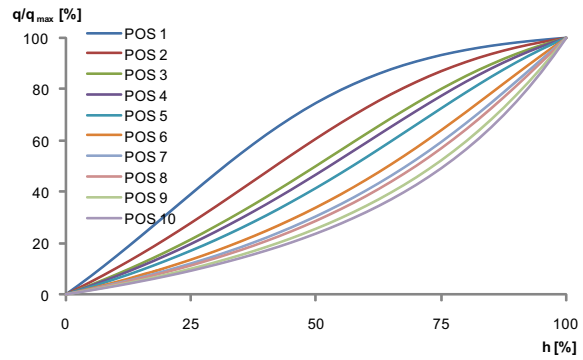


## Relative valve characteristic

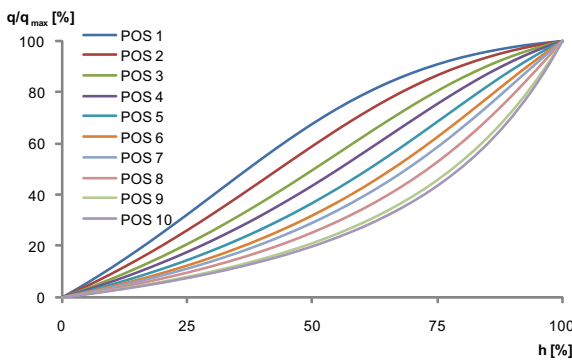
**TBV-CMP LF, DN 15**



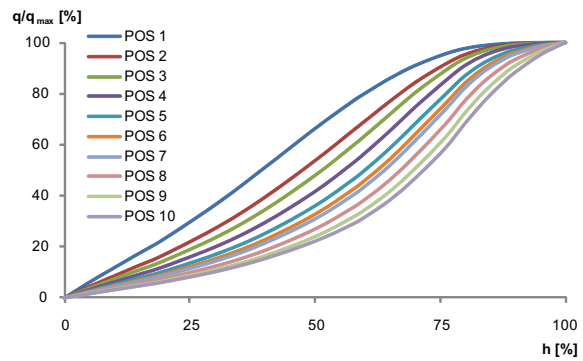
**TBV-CMP NF, DN 15**



**TBV-CMP NF, DN 20**



**TBV-CMP NF, DN 25**



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

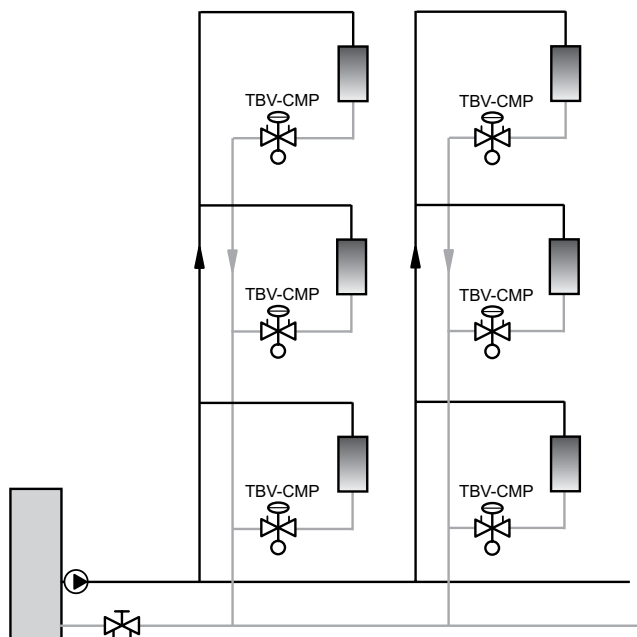
## Sizing

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.

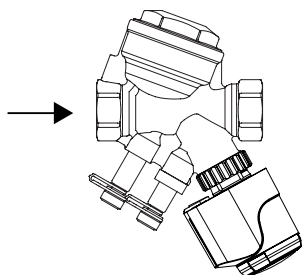
Recommended setting position 3-10.

## Installation

### Application example

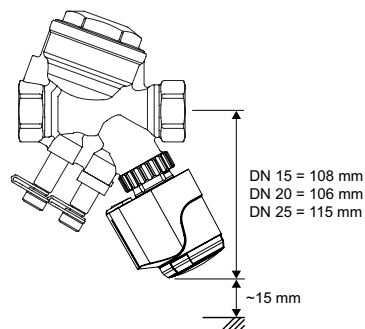


### Flow direction

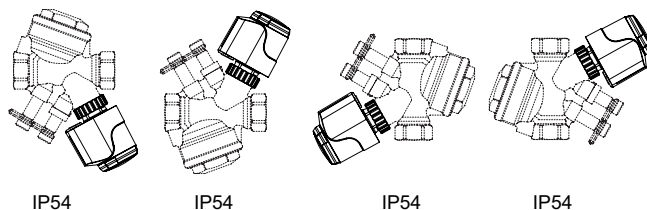


### Installation of actuator EMO T

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



### TBV-CMP + EMO TM

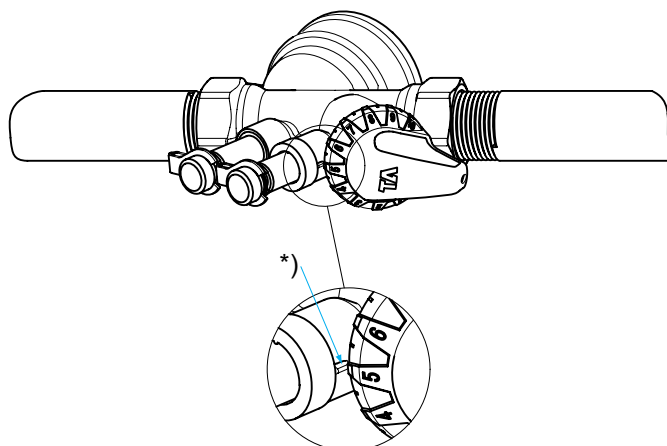


## Setting

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.



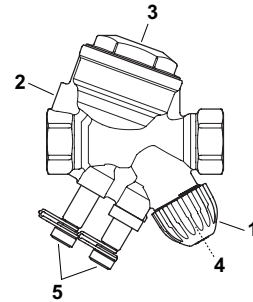
## Measuring

### 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 $\Delta H$

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).

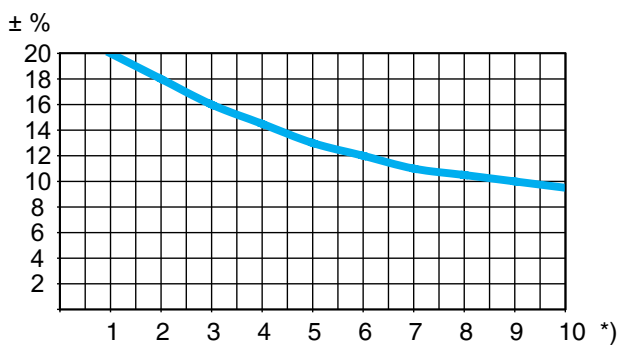
## Noise

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

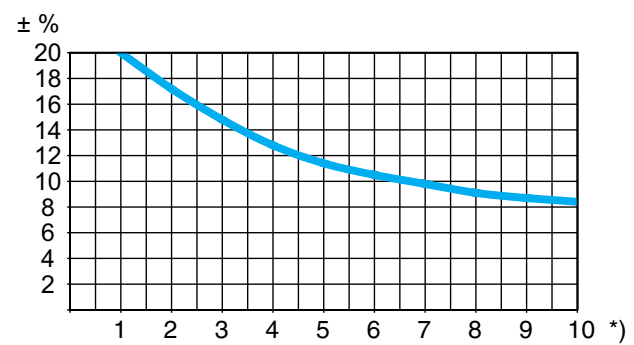
## Measuring accuracy

### 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 ( $\leq 20$  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

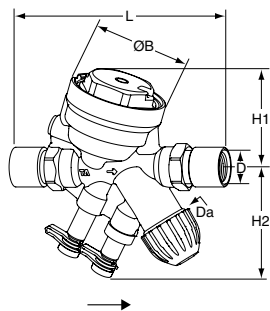
| Position   | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| $q_{\max}$ | 160 | 195 | 250 | 320 | 360 | 435 | 465 | 540 | 635 | 660 |

### 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



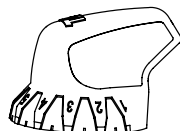
### Female thread

| DN                             | Size | D       | Da*     | L   | H1 | H2 | B  | Kg   | EAN           | Article No |
|--------------------------------|------|---------|---------|-----|----|----|----|------|---------------|------------|
| <b>TBV-CMP LF, low flow</b>    |      |         |         |     |    |    |    |      |               |            |
| 15                             | 1/2" | 1/2 NPT | M30x1,5 | 140 | 62 | 71 | 62 | 0,97 | 7318794018600 | 52 153-515 |
| <b>TBV-CMP NF, normal flow</b> |      |         |         |     |    |    |    |      |               |            |
| 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.

