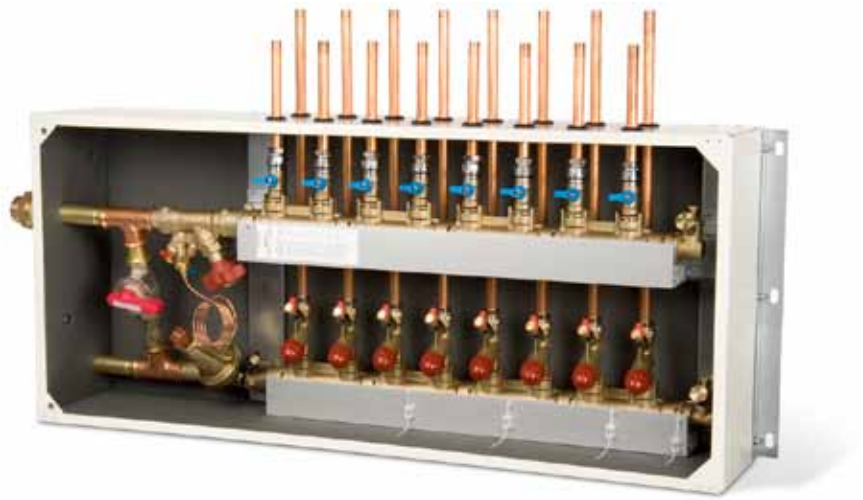
TA-H.U.B.®

Centralised balancing and control



TA

Pressurisation & Water Quality › Balancing & Control › Thermostatic Control

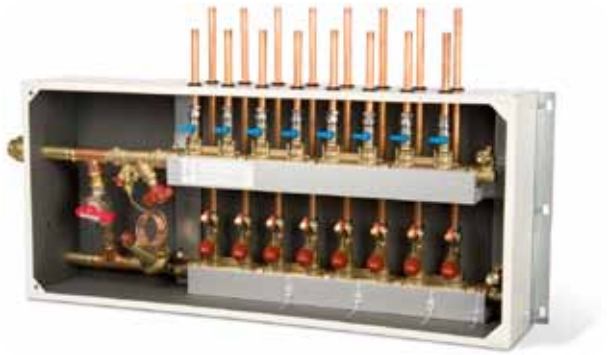
ENGINEERING ADVANTAGE

This customised balancing solution lets you balance up to eight terminal units from one location, delivering unparalleled convenience by enabling access to functions from outside restricted areas, shortening balancing time and ensuring easier troubleshooting and maintenance. A compact design allows for simple integration into walls and ceilings while common drain, air vent, flushing and measuring points simplify maintenance procedures. Balancing itself can be manual or dynamic, enhancing flexibility.

› Simple connections
Enables quick and easy valve replacement if and when required.

› Flushing
Reduced risk of clogging.

› Fast customisable specification
TA Select software allows engineers to specify the right valves quickly.



› Technical description

Application:
Heating and cooling systems

Functions:
Balancing
Pre-setting
Control
Measuring
Shut-off
Draining
Venting
Flushing

Pressure class:
PN 16

Max. differential pressure (ΔpV):
250 kPa (when using STAP)

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

Material:
Box: Galvanized steel, painted steel and aluminium.
Insulation: Fawolon PT 230 N86, 15 mm (grey).
Distributor: AMETAL®
Draining: AMETAL®
Press fittings: Copper
Valves: See separate catalogue leaflets.

AMETAL® is the dezincification resistant alloy of TA.

Marking:
TA, serial No, valve types and DN.
Customer specified marking: Flow and ID No per station, total flow and ID No for the complete TA-H.U.B.®.

› Technical description

TA-H.U.B. is a customisable balancing solution for up to eight terminal units. The balancing and control valves for each terminal are centralised into a single unit, which shortens both installation and balancing time.

TA-H.U.B. is designed for use where the total flow to all terminals is less than 4500 l/h. For an eight station TA-H.U.B. this means:
4500/8 = ~560 l/h
to each terminal (assuming same flow to each terminal).

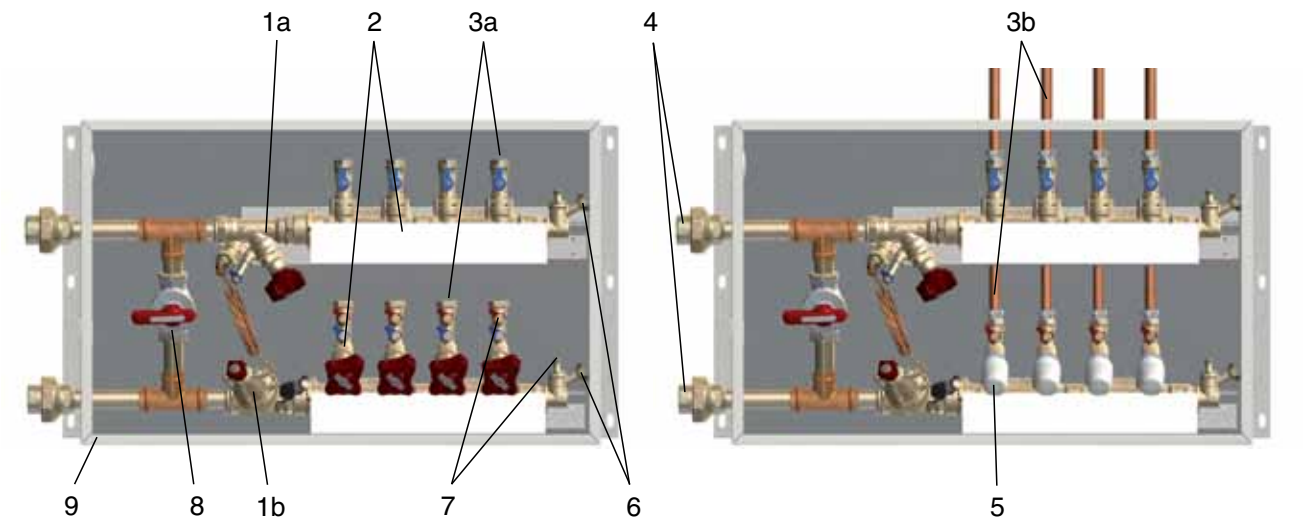
If higher flows are required to each terminal then a TA-H.U.B. with four or six stations could be used.
4 station: 4500/4 = ~1125 l/h
6 station: 4500/6 = ~750 l/h

Full dimensioning of a TA-H.U.B. is performed using TA-Select. The software recommends the most appropriate valve size and calculates the pre-setting values to achieve the desired flow to each terminal.

For more information about the characteristics and features of the valves within a TA-H.U.B. please turn to the relevant page in the catalogue.

To order a TA-H.U.B. a specification must be created using the software TA-Select. To obtain a copy of TA-Select contact the nearest TA office.

Product features



1. Valves on supply (a) / Partner valves (b)
The following valve options are available.
For more details about each valve, see separate catalogue leaflet.

DN 25	Kvs / Kv_m*	DN 32	Kvs / Kv_m*
STAD / STAP 10-60 kPa	8,7 / 5,5	STAD / STAP 20-80 kPa	14,2 / 8,5
-	-	STAD / STAP 10-40 kPa	14,2 / 8,5
TA 900 iSi / STAD	65 / 8,7	TA 900 iSi / STAD	90 / 14,2

*) Kv_m refers to STAP only.

2. Terminal valves
Up to eight terminal valves from the following selection can be combined within a TA-H.U.B. If an odd number of valves is chosen a blanking plug will be used. The plug can be removed to install a new loop. The minimum number of valves is two.
For more details about each valve, see separate catalogue leaflet.

Return

DN 15	Kvs	DN 20	Kvs
TBV-C NF	1,8	TBV-C NF	3,4
TBV-C LF	0,90	-	-
TBV-CM NF	1,0	TBV-CM NF	2,0
TBV-CM LF	0,40	-	-
TBV	1,8	TBV	3,6
STAD	2,5	STAD	5,7

Supply

DN 15	Kvs	DN 20	Kvs
TA 400	4,5	TA 400	4,5

3. Connections
Terminal valves, choose between:

Options	DN 15	DN 20
a) Female threads (no pipes)	G1/2	G3/4
b) Extension pipes (copper) for press fittings	Ø15	Ø22

4. Main connections
(Threads according to ISO 7)

Union connection set

	DN 25	DN 32
Female conical threads	Rc 1	Rc 1 1/4

5. Actuators
For more details about TSE (ON/OFF or PWM control) and TSE-M (modulating control), see separate catalogue leaflets.
If non-TA branded actuators are used with the TA-H.U.B., please take the following into consideration: the size of the actuator (see measures under "Dimensions"), the minimum stroke (3 mm) and the minimum closing force (120 Nm).

TSE, 24V AC/DC

Article No	EAN		Cable length
50 358-001	7318793963406	Normally open (NO)	2 m
50 358-002	7318793963208	Normally closed (NC)	2 m

TSE-M, 24V AC/DC

Article No	EAN		Cable length
50 359-002	7318793955500	Normally closed (NC)	2 m

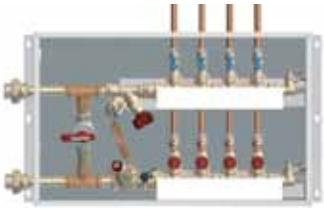
6. Draining / Venting
A drain and air vent with a G1/2 thread is provided on each manifold.

7. Measuring
a) Differential pressure between supply and return manifolds.
b) Total flow through partner valves.
c) Flow through each terminal valve and pressure drop across the valve.
d) Temperature of supply and return.

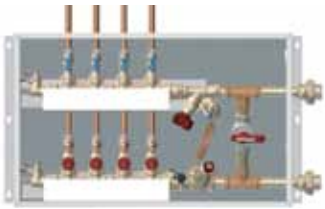
8. Bypass
For isolating the manifolds and partner valves during flushing or pipe cleaning.

9. Casing
The casing protects the valves from damage and dirt. It is insulated and sealed to prevent condensation build up in cooling applications.
The casing is available in three sizes to fit 4, 6 or 8 valves.
The TA-H.U.B. can be ordered left **(A)** or right **(B)** handed - see below.

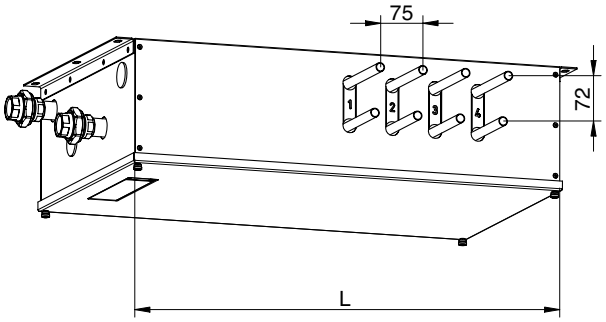
A



B

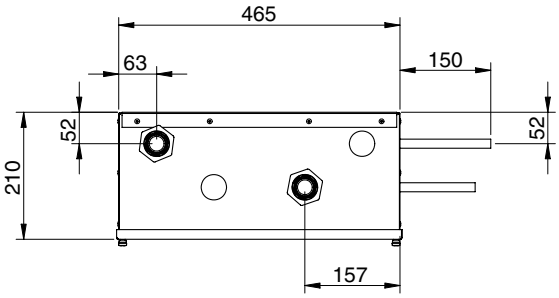


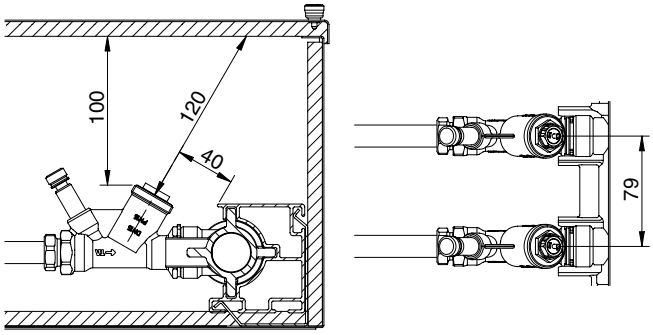
Dimensions



Stations	L	Weight*, with casing [Kg]
4	745	30
6	895	35
8	1045	40

*) Indication of maximum weight. Actual weight depends on configuration.

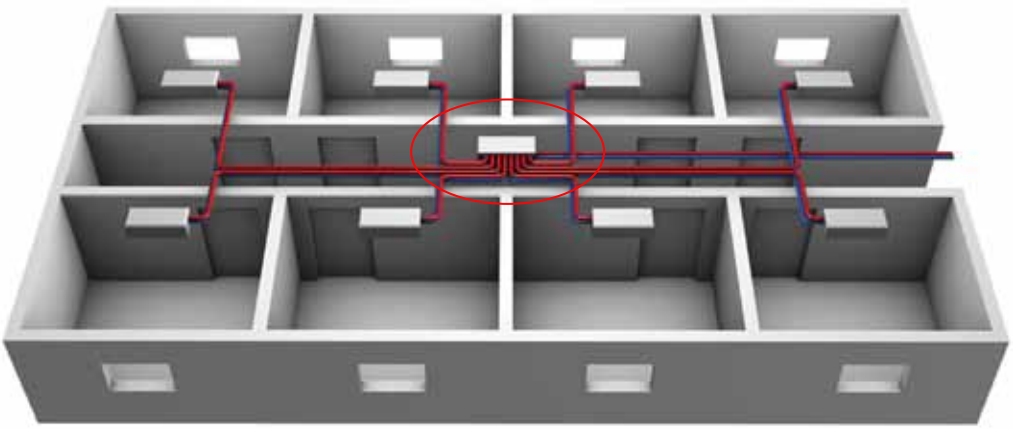




Installation

The unit can be mounted in the wall or ceiling. The casing includes mounting brackets with three slots for fixing bolts (not included).
Installation instructions are delivered with the product.

Installation example:



Setting

All the valves in the TA-H.U.B. are fully open at delivery. The design flow per terminal as specified in TA-Select, are printed on the labels inside and outside of the casing. The setting instructions are delivered with the product.

Product specification

Specification using TA Select
Simple and fast:
1. Select the number of terminal units.
2. Choose the partner valve.
3. Select each terminal valve, options include: STAD, STAV, TBV, TBV-C and TBV-CM.
4. Calculate valve size using flow and differential pressure details.
5. Generate the order specification.

To get a copy of TA-Select contact your closest TA office.

Diagrams

Diagrams can be found in the catalogue leaflet of each product.

The products, texts, photographs, graphics and diagrams in this document may be subject to alteration by TA Hydronics without prior notice or reasons being given.
For the most up to date information about our products and specifications, please visit www.tahydronics.com.

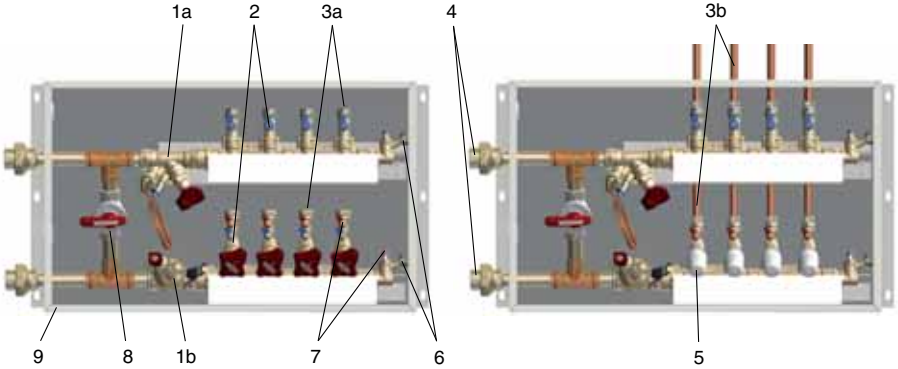
5-50-5 TA-H.U.B. 03.2011

310 145-01
2009.03

TA-H.U.B.®

we knowhow

Product description

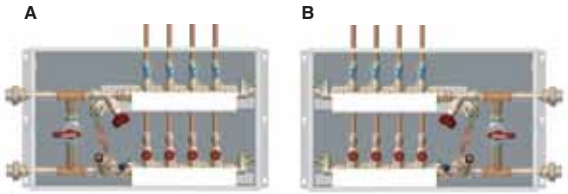


1a. Valve on supply
1b. Partner valve
2. Terminal valves
3a. Connection female threads
3b. Connection extension pipes (copper) for press fittings
4. Main connection femal union (threads according to ISO 7)
5. Actuator
6. Draining/Venting (rotateble)
7. Measuring
8. Bypass
9. Casing

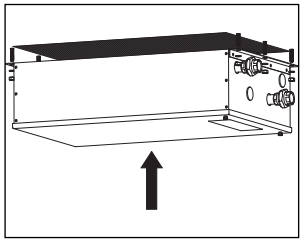
NOTE! The picture might not correspond to the delivered TA-H.U.B. The valve types vary depending on configuration.

Casing

The casing protects the valves from damage and dirt. It is insulated and sealed to prevent condensation build up in cooling applications.
The casing is available in three sizes to fit 4, 6 or 8 valves.
The TA-H.U.B. can be ordered left (A) or right (B) handed - see below.



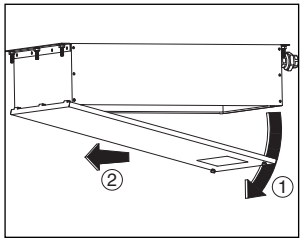
Installation



Can be mounted in the wall or ceiling. The casing includes mounting brackets with three slots for fixing bolts, max Ø10 mm (not included). To achieve the right distance between the bolt holes, use the attached template.

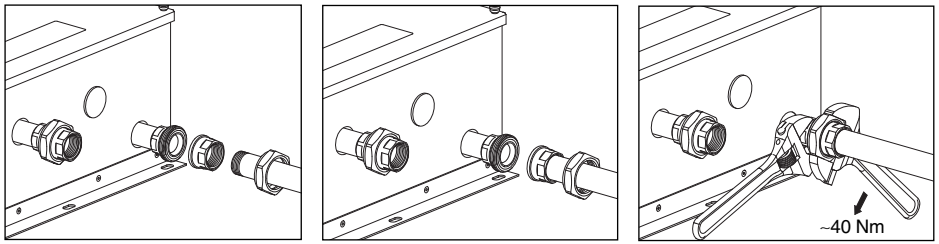
All included valves are **fully open** at delivery.

Opening and removal of the lid



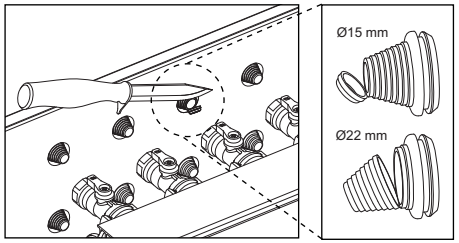
NOTE! The lid is not attached to the casing, after the screws are unscrewed (1).

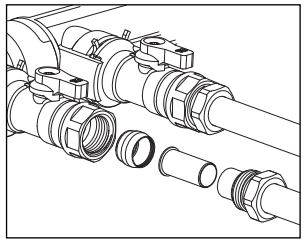
Connection of main supply and return



NOTE! Do not bend or twist the pipes. This can cause leakage.

Connection of terminal valves





Push the pipe into the coupling as far as it will go. Tighten the thrust screw by hand, then tighten with an adjustable wrench.

Recommended tightening:
KOMBI: 3/4 - 1 turns

Preparing the system

1. Fill up the main pipe system (the dirty system part):
- **NOTE!** Ensure that the valves on **supply and the partner valves in all TA-H.U.B.s in the system are closed** to prevent dirty water to enter the clean TA-H.U.B. and secondary pipes.
- Fill up the main pipe system. Open the bypass valve (do it successively in systems with several TA-H.U.B.'s) to allow water to enter both supply and return pipe. Close the bypass valves again.

2. Flushing the dirty part of the pipe system:
- Start up the normal flushing procedure.
- Open the bypass valve on TA-H.U.B. one by one to ensure velocity in the water high enough to flush the dirt through the pipes.
- Close the bypass valves after flushing.

3. Fill up TA-H.U.B. and terminals (the clean system part):
- Open the valves on supply and partner valves.
- Fill the total system and vent TA-H.U.B., terminals etc.

See also "Draining/Venting".

4. Pre-setting and flow audit in TA-H.U.B.:
- Use calculated settings (from TA Select) on valves on supply, partner and terminal valves.
- Measure individual terminal flow (with TA'S measuring or balancing instruments).
- Measure total flow in the partner valve.

See also "Setting".

5. Balancing of flow in TA-H.U.B.:
- Use TA Balance in TA's balancing instruments TA-CBI or TA-Scope to calculate settings in terminal valves.
- Adjust total flow in the partner valve.

See also "Setting".

Setting

1a. Valve on supply / 1b. Partner valve

STAD – Balancing valve

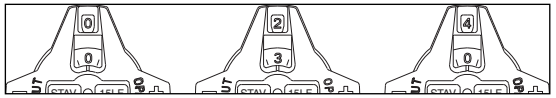


Fig. 1. Valve closed (0.0).
Fig. 2. Opened 2.3 turns.
Fig. 3. Fully open valve (4.0).

Presetting
The presetting of a valve for a certain pressure drop (e.g. corresponding to the presetting position 2.3) should be carried out as follows:
1. Close the valve fully (Fig. 1).
2. Open the valve 2.3 turns (Fig. 2).
3. Using a 3 mm Allen key, turn the inner spindle clockwise to its end position.
4. The valve is now preset.

A pressure drop diagram is available for each valve size, showing the pressure drop curves for various settings and flows.

STAV – Fixed orifice double regulating valve

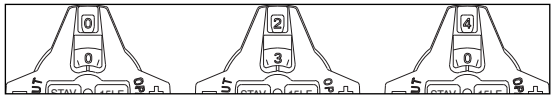


Fig. 1. Valve closed (0.0).
Fig. 2. Opened 2.3 turns.
Fig. 3. Fully open valve (4.0).

Setting
Flow regulation is achieved by adjusting the valve setting until the required flow rate is obtained. The handwheel will indicate the valve setting. For maximum limit of the valve, use a 3 mm Allen key, turn the inner spindle clockwise to its end position.

Valve setting indicator
The valves operate from closed to fully open with 4 complete turns of the handwheel. The handwheel indicates the valve setting by means of digits appearing in outer (black) and inner (red) windows. The digit in the outer window indicates the number of full turns. The digit in the inner window indicates tenths of a turn.

STAP – Differential pressure controller

NOTE! When pressure-testing the system, the maximum test static pressure is 1,6 MPa (16 bar)

Balancing procedure with pre-settable valves

1. Fully open all control valves.
2. Adjust all terminals to give the design flow.
3. De-aerate the system and de-aerate also the v pipe by opening (5) or (6) (depending on which is uppermost) until only water emerges.
4. Measure the flow using TA's balancing instrument connected between (2) and (3). Close the STAD by as many turns that is required to make the flow measurement reliable (at least 3 kPa is recommended).
   Measure and note the flow on the label fitted to the valve (e.g. q = 150 l/h, Δp_L = 10 kPa).
   Re-open the valve after measuring to avoid an unnecessary pressure drop.
5. If the design flow cannot be achieved, it may be due to:
   a) Blockages in the system. Find and rectify the fault and measure again.
   b) The circuit requires higher Δp_L than delivery setting. Adjust the differential pressure using a 3 mm allen key in the shut off handwheel. The variation of the differential pressure according to the number of turns, see table. Measure the flow again, as above, or measure Δp_L between (2) and (4). Wait 2 – 3 minutes before reading the value.

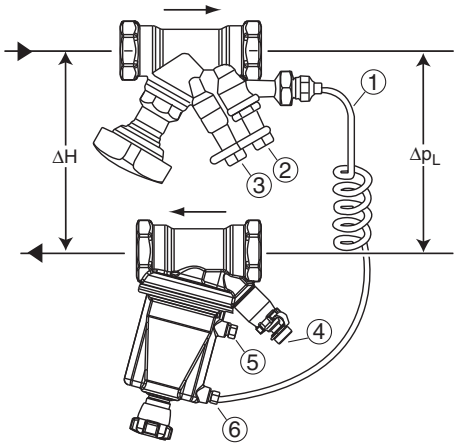
Locking of set Δp_L

If desired, Δp_L can be locked on set value by turning the shut off handwheel anticlockwise.

Shut-off

Shut-off STAP using the handwheel.

Δp_L	Turns from fully open (Δp_{Lmin})		
kPa	10-40 kPa (DN 32)	10-60 kPa (DN 25)	20-80 kPa DN 32
5	-	-	-
10	5*	5*	-
15	17	13	-
20	26	19	5*
25	33	23	11
30	39	27	17
35	43	30	22
40	47	33	26
45	-	35	30
50	-	37	33
55	-	39	36
60	-	41	39
65	-	-	41
70	-	-	43
75	-	-	45
80	-	-	47



*) Delivery setting.

TA 900 iSi – Ball valve

Shut-off function only.

2. Terminal valves

TBV-C NF/LF – Terminal valve (on/off control together with actuator TSE)

There is a diagram for every valve size that shows the flow for different pressure drops and settings.

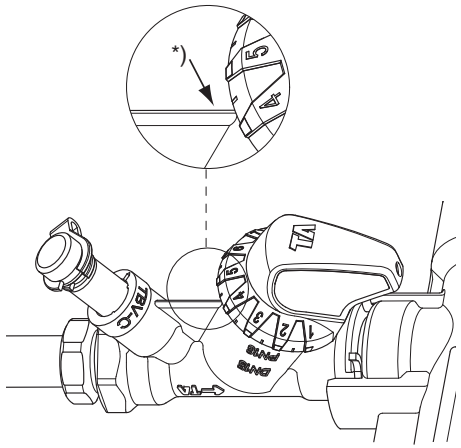
Setting

TBV-C is delivered with the pre-setting fully open. Setting of a valve for a given pressure drop, e.g. corresponding to position 5 is done as follows:

1. Unscrew the protective cap and place the adjustment tool, TA No 52 133-100, at the valve.
2. Turn the adjustment tool so that position 5 is pointing at the index* of the valve body.
3. Remove the adjustment tool. The valve is now set.

Shut-off

When isolating the valve, the supplied protective cap TA No 52 143-100 must be used.



Position	Kv		
	TBV-C LF DN 15	TBV-C NF DN 15	TBV-C NF DN 20
1	0,05	0,22	0,40
2	0,15	0,33	0,53
3	0,22	0,45	0,67
4	0,26	0,50	0,82
5	0,31	0,60	1,03
6	0,41	0,82	1,29
7	0,53	0,99	1,72
8	0,68	1,11	2,40
9	0,74	1,43	2,96
10	0,90	1,80	3,40

Recommended area: Position 3-10

TBV-CM NF/LF – Terminal valve (modulating control together with actuator TSE-M)

There is a diagram for every valve size that shows the flow for different pressure drops and settings.

Setting

TBV-CM is delivered with the pre-setting fully open. Pre-setting of a valve for a given Kv_{max} value, e.g. corresponding to position 5, is done as follows:

1. Unscrew the protective cap and place the adjustment tool, TA No 52 133-100, at the valve.
2. Turn the adjustment tool so that position 5 is pointing at the index* (see above) of the valve body.
3. Remove the adjustment tool. The valve is now pre-set.

Position	Kv_{max}		
	TBV-CM LF DN 15	TBV-CM NF DN 15	TBV-CM NF DN 20
1	0,05	0,23	0,38
2	0,16	0,32	0,47
3	0,21	0,42	0,63
4	0,23	0,45	0,75
5	0,25	0,55	0,93
6	0,29	0,63	1,1
7	0,31	0,72	1,2
8	0,33	0,78	1,5
9	0,35	0,89	1,9
10	0,40	1,0	2,0

Kv_{max} = m^3/h at a pressure drop of 1 bar at each pre-setting and fully open valve plug.

Shut-off

When isolating the valve, the supplied protective cap TA No 52 143-100 must be used.

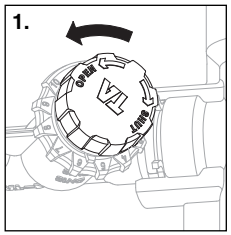
TBV – Terminal valve

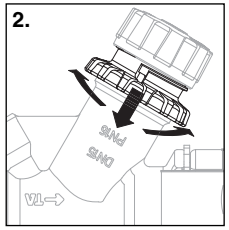
There is a diagram for every valve size that shows the flow for different pressure drops and settings.

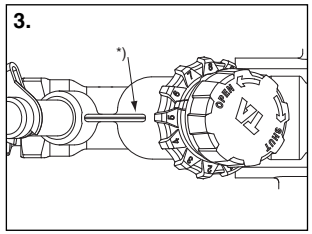
Setting TBV

Setting of a valve for a given pressure drop, eg corresponding to position 5 is done as follows:

1. Check that the handwheel is fully opened (fig 1).
2. Push scale downwards and turn the scale (fig 2) so that position 5 is pointing at the index* of the valve body (fig 3).
3. Release the scale. The valve is now set.







STAD – Balancing valve

See section “Valves on supply / Partner valves”

STAV – Fixed orifice double regulating valve

See section “Valves on supply / Partner valves”

Draining/Venting

A drain and air vent with a G1/2 thread is provided on each manifold. See “Product description”.

1. Connect the hose.
2. Open the measuring point with 5 mm Allen key 8-14 turns.

Bypass

Bypass is used when flushing and pipe cleaning.

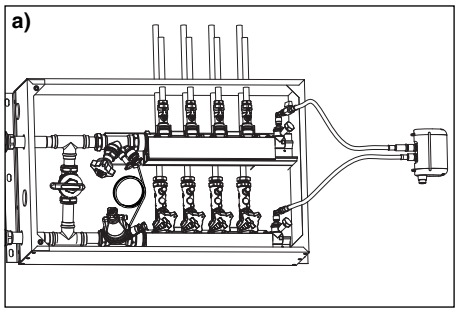
1. Close the valve on supply and partner valve.
2. Open bypass and flush.
3. Close bypass and reopen the valve on supply and partner valve.

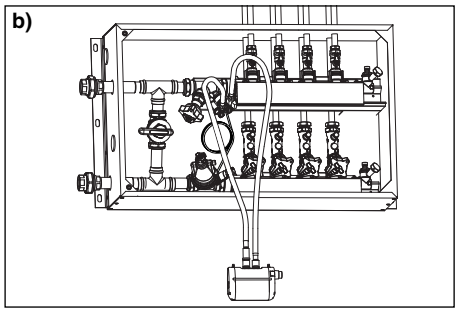
Measuring

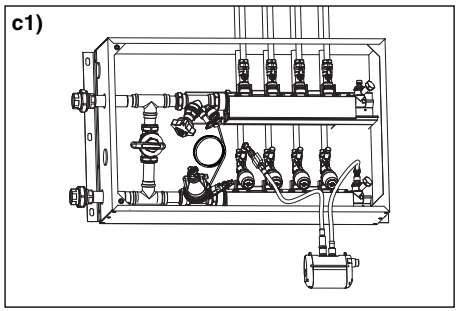
With TA’s balancing or measuring instruments it is possible to make the following measurements:

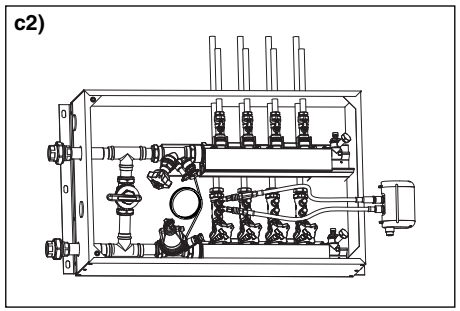
a) Differential pressure between supply and return manifolds.
b) Total flow through the valve on supply and partner valve.
c) Flow through each terminal valve and pressure drop across the valve.
  1. When STAD, TBV-C, TBV-CM or TBV are used.
  The pressure downstream the terminal valves is the same in the complete manifold, that is the reason why only one measuring point is available on these valves.
  2. When STAV is used.

It is also possible to measure temperature of supply and return.









Service

The valves are maintenance free under the condition that they are used within their normal applications area.

Add terminal valve / Replacement of valve

1. Close all valves in the TA-H.U.B.
2. Drain the manifold - see “Draining/Venting”.
3. Add or replace the valve, see figures below.