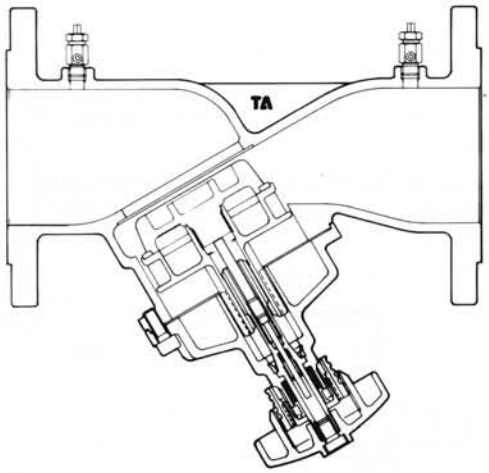
BALANCING VALVE STA-F

STA-F is a flanged balancing valve available in sizes DN 65—DN 150 (2½"—6"), and has been designed with an oblique seat in order to give low resistance and large flows when the valve is fully open. There are eight turns of the handwheel between completely open and closed position; this together with a carefully designed valve cone gives a large and exact preset balancing range.



- **Isolating feature**
  PTFE seat ring for positive shut-off
- **Balancing feature**
  Balancing and regulation of the water flow.
- **Pressure test point**
  Pressure test points for measuring the water volume. By measuring the pressure drop over the valve the flow through the valve can be determined from the graphs.
- The presetting value is readable on the nonius scale. Number of turns 1—8 is read on the indication collar and parts of turn 0—9 are read on the handwheel.
- Concealed presetting with an Allen key.

Description	Type	TA-No
STA-F	Flange PN 16	52 180

TECHNICAL DESCRIPTION

Application: For the balancing of hot and cold water distribution networks in heating and airconditioning installations.

Nominal pressure: PN 16.

Max working pressure: 1,6 MPa = 16 bar = 232 psi

Max working temperature: Valve +150°C, seals in the P/T points stands 120°C. (On special request +150°C).

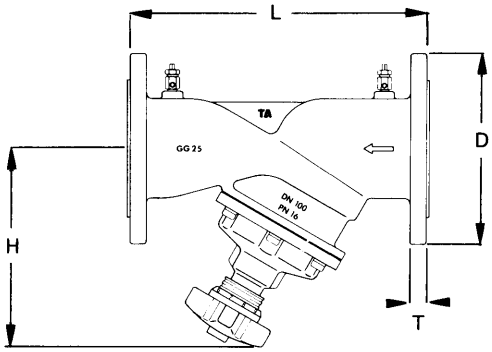
Material: Valve body of cast iron BS 1452:1956, 65.260; bonnet, valve cone and spindle of AMETAL®; bonnet bolts of stainless steel; valves provided with aluminium handwheel (red).

Flanges: Conform to ISO 2084 and fit BS 4504:1969 table 16.

Fittings: The pressure test points besides the metal seal also have stem seal of the O-ring type of EPDM-rubber. Changeable in servie if the pressure test points are closed. O-rings of fluorine rubber can be ordered for plants with continuous working temperature above 120°C.

Testing: Each valve is individually tested before delivery, both for seat sealing and overall leak-tightness.

52 180 STA-F



TA-No	Size DN	Number of bolt holes	L	H	D	T	K_{VS}*)	Weight kg
52 180—065	65	4	290	200	185	20	85	13,0
—080	80	8	310	215	200	22	120	17,5
—090	100	8	350	230	220	22	190	22,5
—091	125	8	400	265	250	24	300	33,5
—092	150	8	480	285	285	24	420	46,0

Fittings

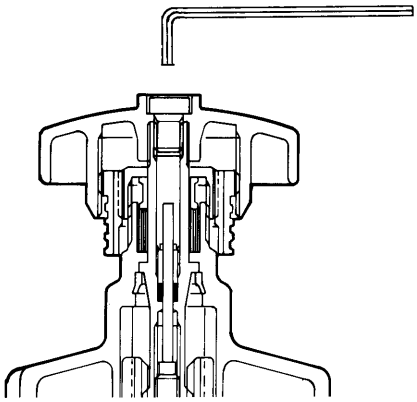
2 pcs O-rings of fluorine rubber (Viton) in a plastic bag TA ref No 303 134—60

*)K_{VS} = m^3/h at a pressure drop of 1 bar and fully open valve.

Presetting STA-F

Initial setting of a valve for a particular pressure drop, eg corresponding to 4,5 turns on the graph, is carried out as follows.

1. Close the valve fully (Fig. 1)
2. Open the valve to the preset value 4,5 turns (Fig. 2)
3. Remove the handwheel screw without changing the setting, by means of an Allen key (3 mm).

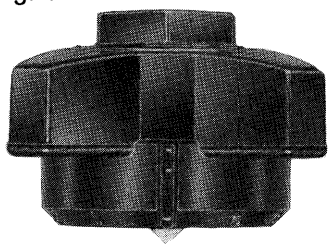


4. Turn the inner stem clockwise until the stop is reached with the same Allen key (long end), and refit the handwheel screw.
5. The valve is now preset.

To check the presetting of a valve, open it to the stop position; the indicator then shows the presetting number, in this case 4,5 (Fig. 2).

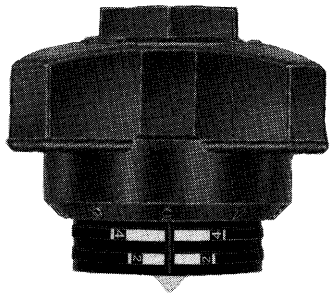
As a guide in determining the correct valve size and setting (pressure drop) there are graphs for each size of valve showing the pressure drop at different settings and water volumes.

Fig. 1



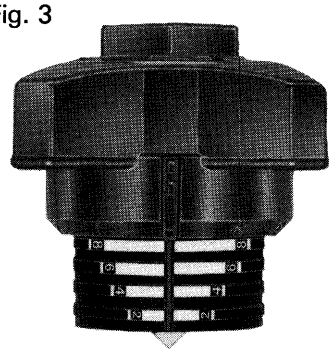
Valve closed

Fig. 2



The valve is preset 4,5

Fig. 3



Valve open

Regulation of water flows

The actual pressure drops in water distribution pipework are difficult to establish by calculation. Meaning that the water flow and thereby also the caloric distribution, is often incorrect in practice, but with the STA-F valve it is easy to regulate the desired water flow. By measuring the pressure drop across the valve at a particular presetting value, the water flow for the size of valve concerned can be read off from the appropriate pressure drop graph.

Preparations for measuring

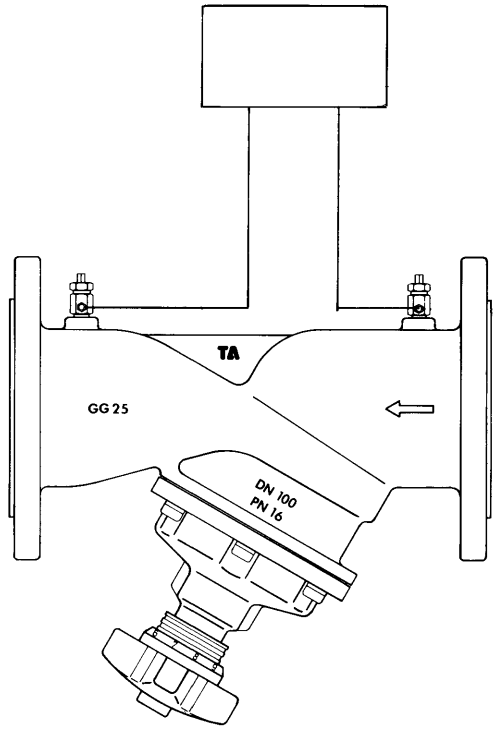
Valve

Open the valve to the desired presetting value, eg 4,5 by turning the handwheel until its indicator comes opposite 4,5 on the nonius scale.

Differential pressure gauge

1. Use a suitable range manometer or differential pressure gauge (eg TA-DTM) mercury manometer or TA-DTM-1 electronic pattern.
2. Bleed air from the measuring line.
3. Note differential pressure reading.

Differential pressure gauge.



Measuring

Checking water flow at specified presetting

If a particular presetting value has been specified, eg 4,5 turn the knob 4,5 turns. Measure the pressure drop as described above and read off the water flow through the valve at setting 4,5 on the pressure drop graph.

If the water flow does not conform with the specified, select another valve setting and repeat the measuring procedure until the correct water flow has been obtained.

Where no presetting is specified

Select a suitable valve opening, measure the pressure drop and determine the water flow. If this water flow does not conform with that specified, reset the valve and repeat the measuring procedure until the correct water flow has been obtained.

Pocket computer

In order to get a fast and correct flow as well as valve presetting TA has worked out a programme for the pocket computer Texas TI 59 (Programme E1). By giving the flow from two different presettings the pocket computer will present the K_V-value for the final setting.

THE PROPORTIONAL METHOD

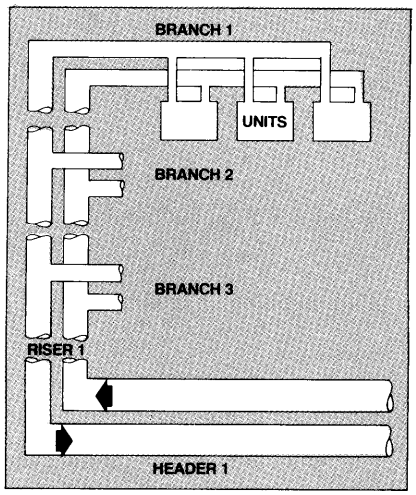
Before starting to balance an installation, detailed knowledge about the design of the installation is essential. For example drawings with connecting diagrams, flow information and pump data, are required.

You should also have one or two differential pressure gauges. (TA provides equipment of this type, for example a DTM gauge of the mercury type but also a convenient electronic model DTM-1). An assistant using a walkie-talkie can also facilitate the work.

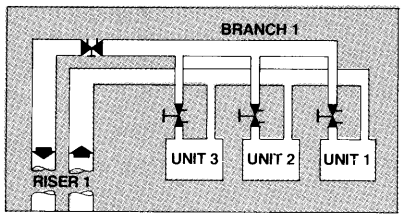
Start by opening all the valves. This is particularly important in the case of thermostat radiator valves and two-way motor valves. These types of valves operate with varying flow and the valves must be open while balancing work is being carried out.

The procedure is now to measure the pressure drop, read off the diagram and determine the flow. By applying the proportional method, the installation is balanced by working from one main line to another. Here is the procedure:

1. Set all the radiator and balancing valves according to the drawing or open them completely if no values are available.
2. First choose a branch that are rather cloose to the pump which can be expected to provide a high flow in proportion to the specified flow (to get high readings).



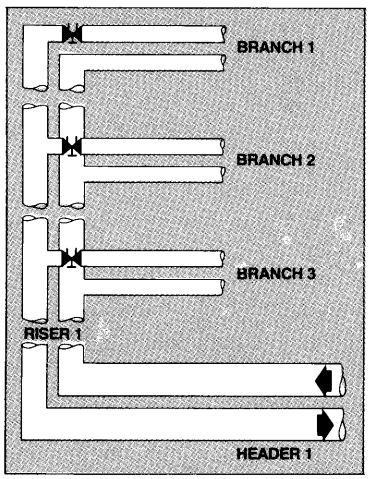
3. Measure the flow in each unit on this branch line and calculate the flow quota of each unit, that is to say the relationship between the flow concerned and the specified flow. For example if the flow concerned is 4,5 l/s and the specified flow is 3 l/s, then the flow quota is 1.5:1.
4. The unit with the lowest flow quota noted is now the reference unit for this branch. Remember that the quota for the lowest unit can increase slightly during balancing work and should therefore be checked now and then. If you have two pressure gauges, you should therefore leave one of them here as the reference unit. Never balance the lowest unit since this can cause extra high pump pressure throughout the system.



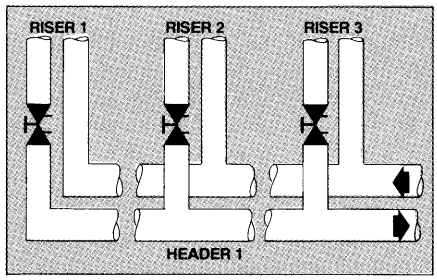
5. Now balance unit 2 in the figure to the same quota as the reference unit. You may discover that the reference unit has increased slightly in value. Check back and, if this is the case, adjust unit 2 until you obtain the same value on both units. Finally, pre-set the valve for unit 2.

(At this stage, it can be an advantage to have an assistant with a walkie-talkie to give you the correct values of the reference unit while you balance the others).

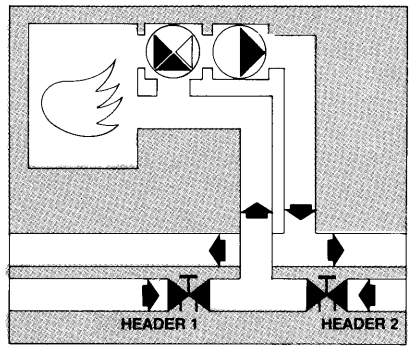
6. Now continue to balance units, 3, 4 and 5 in stages in the same way until the complete branch line is ready. When you have finished, the complete branch is balanced to the same proportional flow between all the units.



7. Continue balancing the branch lines on the risers. The working procedure and measuring methods are the same.
   - Find the branch line with the lowest flow quota.
   - Adjust the branch line with the second smallest flow quota to the same quota as the lowest flow quota measured.
   - Then continue with the other branch lines.
8. Now use the same procedure on the other risers. You can balance them in whichever order you choose.



9. Finally the headers if more than one, should be balanced using the same procedure as above.



10. When you have finished, the entire system has been proportionally balanced. The last thing to be done is to check the pump. If it provides too large a volume of water, it can be restricted with the aid of a regulating valve. If large differences occur then the pump specification should be examined with a view to adjustment of the unit or replacement.
11. All the STA valves are now balanced and preset. Finally all the values should be noted in a balancing report.

TA-A 561-01 GB Björsell, Bordås