BPV

Bypass valve

6-10-5

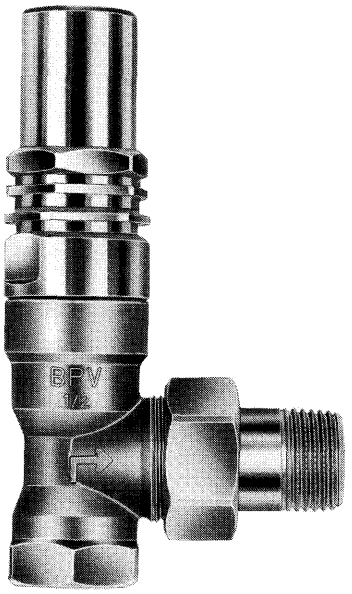
December 1984

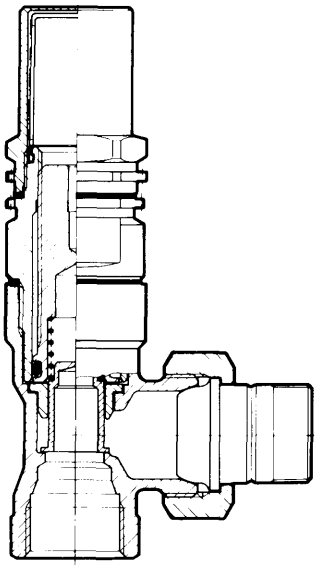
In order to obtain an even distribution of thermal energy, the flow of each radiator is limited to its nominal value based on a differential pressure of about 800 mm WG. Excessive pressure is handled by the balancing valves in main and branch piping.

However, in two-pipe systems equipped with thermostatic valves, the water flow of the feed-pipes is not constant.

Where additional heat derives from an internal or external source, thermostatic valves close entirely or in part. The subsequent reduction in water flow reduces the pressure losses in the pipes and the balancing valve of the specific branch-pipe. This will ultimately increase the pressure in the radiators on this branch-pipe, which will result in further closure of the thermostatic valves.

Since this additional closure of the thermostatic valves will finally produce an increase in the ambient temperature, this situation will lead to a waste of energy.





For this reason, mount a BPV valve on each branch, below the STA-D balancing valve. The essential function of the BPV valve is to maintain a constant differential pressure within the radiators.

At the same time, this BPV valve ensures a constant flow to the branch, thus safeguarding the general balance of the system.

The setting for the opening of the valve can be adjusted from 500 to 1 500 mm WG.

The valve is supplied closed.

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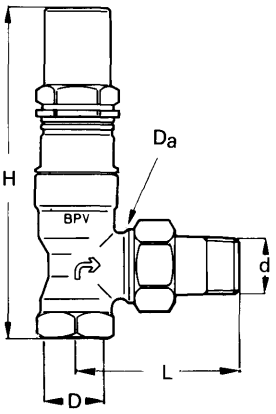


TA.No	DN	D	H	L	Da	d
52 194–015	15	G1/2	119	56	M26×1,5	KRK1/2
–020	20	G3/4	125	65	M34×1,5	KRK3/4

All types of BPV valves can be connected to smooth tubes by means of the KOMBI compression coupling. See table below.

Size Inches	DN	Piping (mm) 8	10	12	15	16	18	22
1/2	15	53 235–108	53 235–109	53 235–111	53 235–113	53 235–114		
3/4	20				–117	–119	53 235–121	53 235–123

KOMBI couplings must be ordered separately. When ordering, specify KOMBI article number (53 235-XXX)

TECHNICAL DESCRIPTION

Application:
Heating installations, two-pipe systems

Balancing range: 500–1 500 mm WG

Insulation provided: Yes

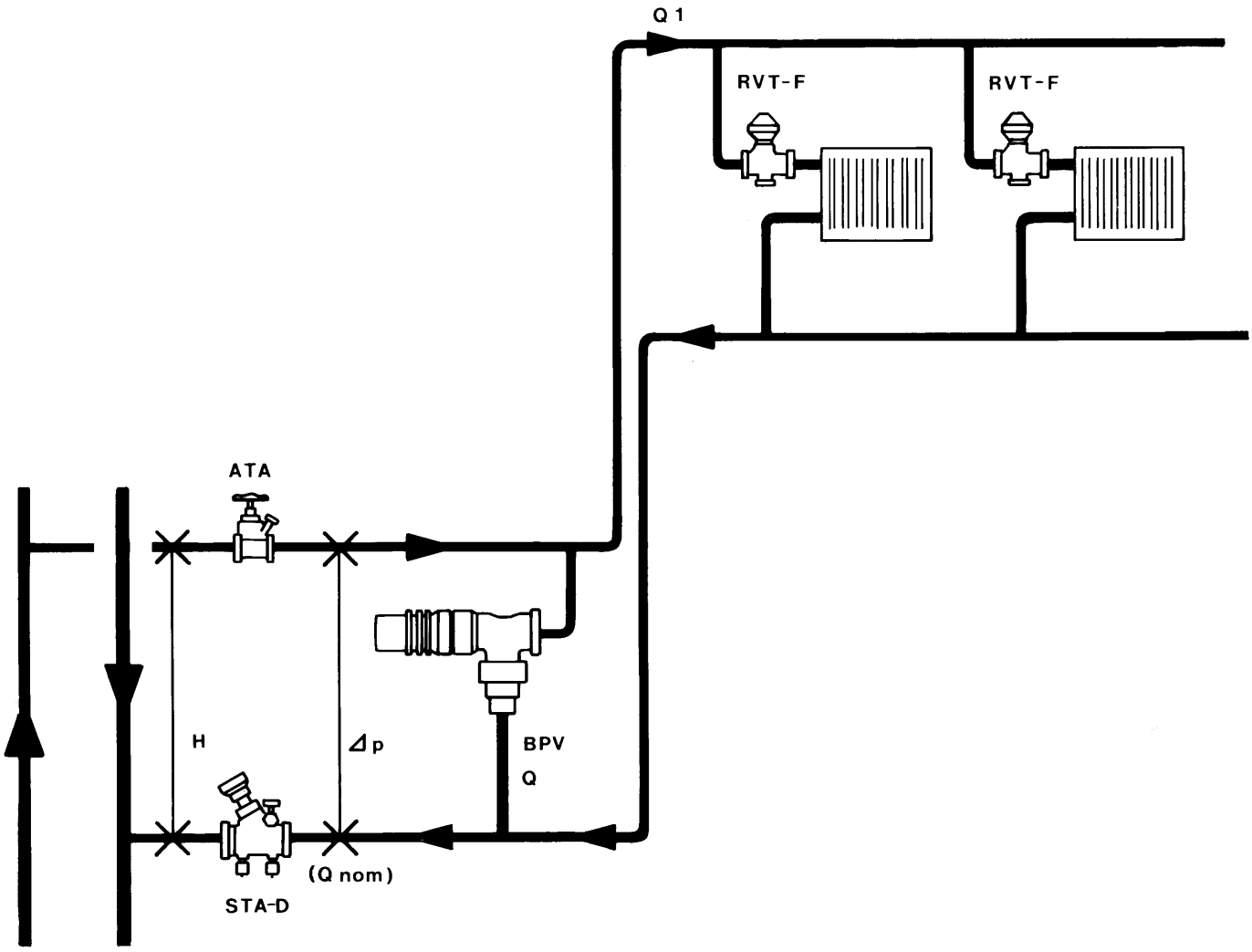
Nominal pressure: PN16–PN20

Max working pressure: 2.0 MPa = 20 bar

Max working temperature: 120°C (250°F)

Material: Valve body, cone, bonnet and stem: AMETAL® Coupling and cover plate: brass. Gaskets: Klingerit. Springs: stainless steel. O-rings: rubber EPDM. Stem guide: PTFE.

Testing: Each valve is individually tested prior to despatch.



First of all it is advisable to adjust the maximum flow of each radiator to its nominal value, for instance by means of the device built in to the RVT-F and RVT-F 2S thermostatic valves.

If we assume a nominal pressure of 800 mm WG, the adjustment is calculated by choosing an overall Kv value equivalent to the nominal power of the radiator in watts, divided by 6 600.

The STA-D balancing valve fitted in the branch will make it possible to obtain the total flow required, this ensuring that the pressure chosen (800 mm WG) is effectively applied to the radiators.

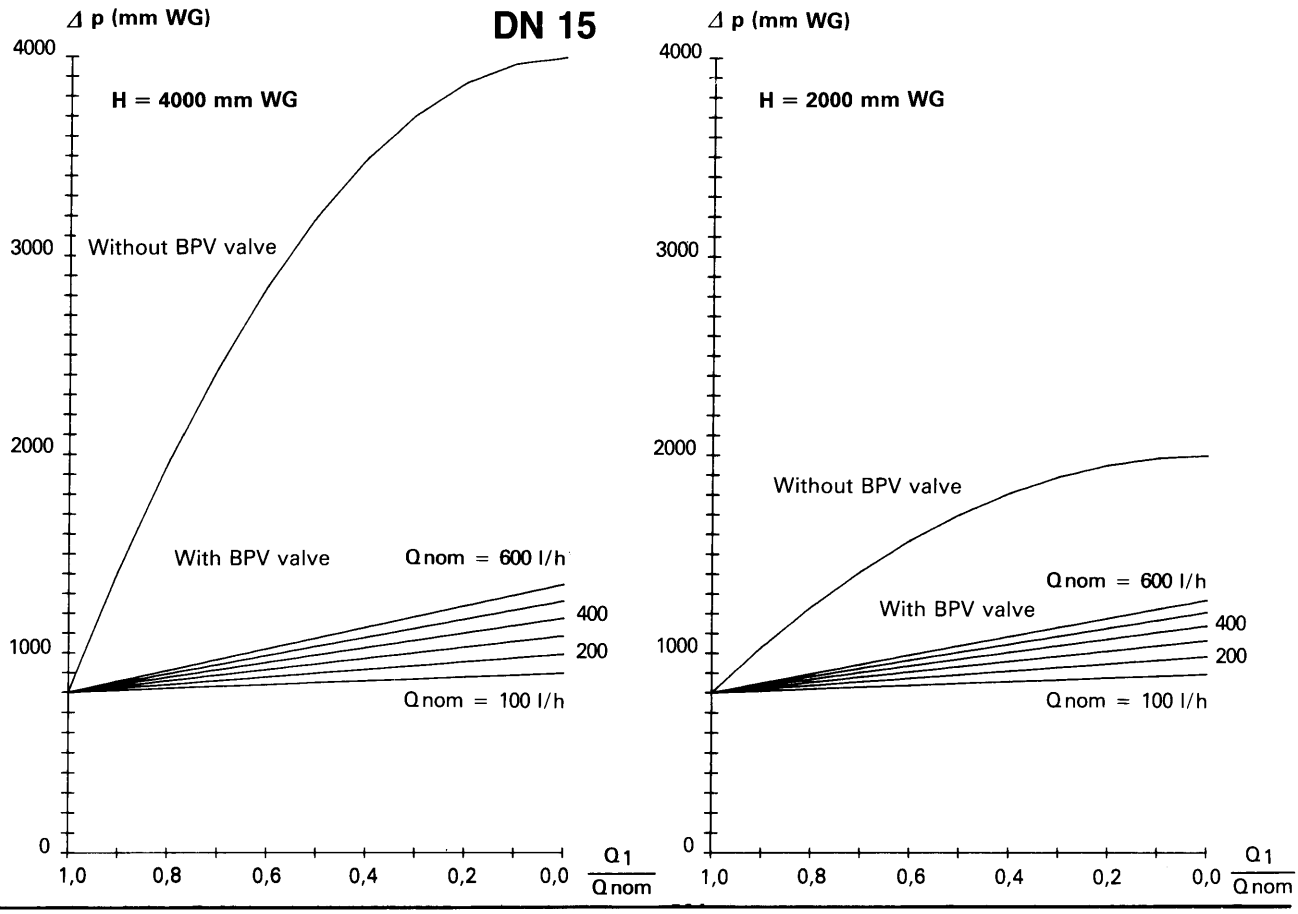
With a 3 mm Allen key, using the graded scales of the BPV valve as a reference, we adjust the discharge value at a value corresponding to the pressure referred to (800 mm WG) plus 100 mm; which in our example comes to 900 mm WG.

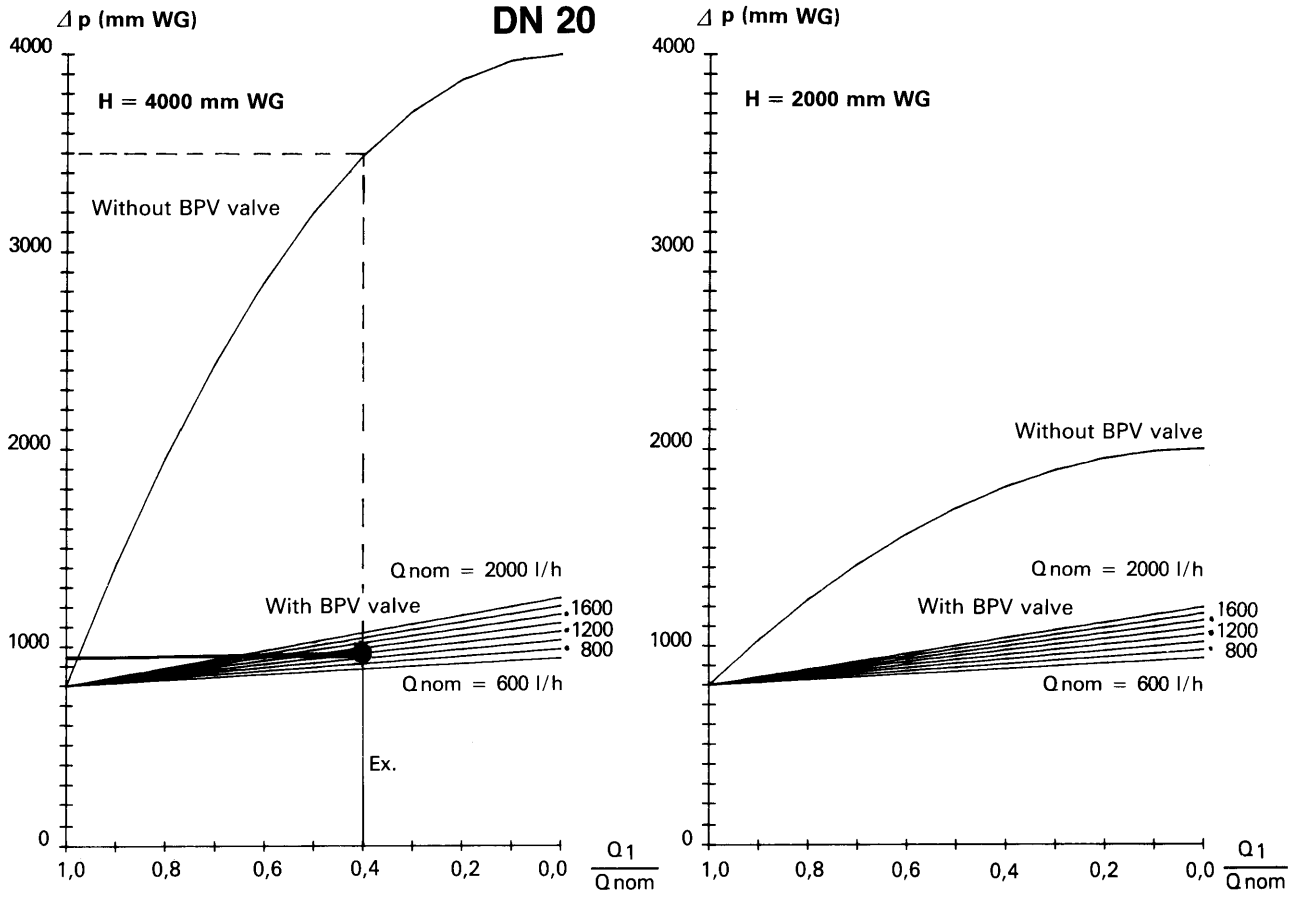
When the water flow of the branch decreases, which leads to a pressure increase in excess of the set value, the BPV valve opens to discharge the water.

In this way a constant differential pressure and a constant overall flow within the branch is guaranteed.

The graphs on the opposite page make it possible to compare the performance of the circuit in question with or without a BPV valve.

DIAGRAM





Example

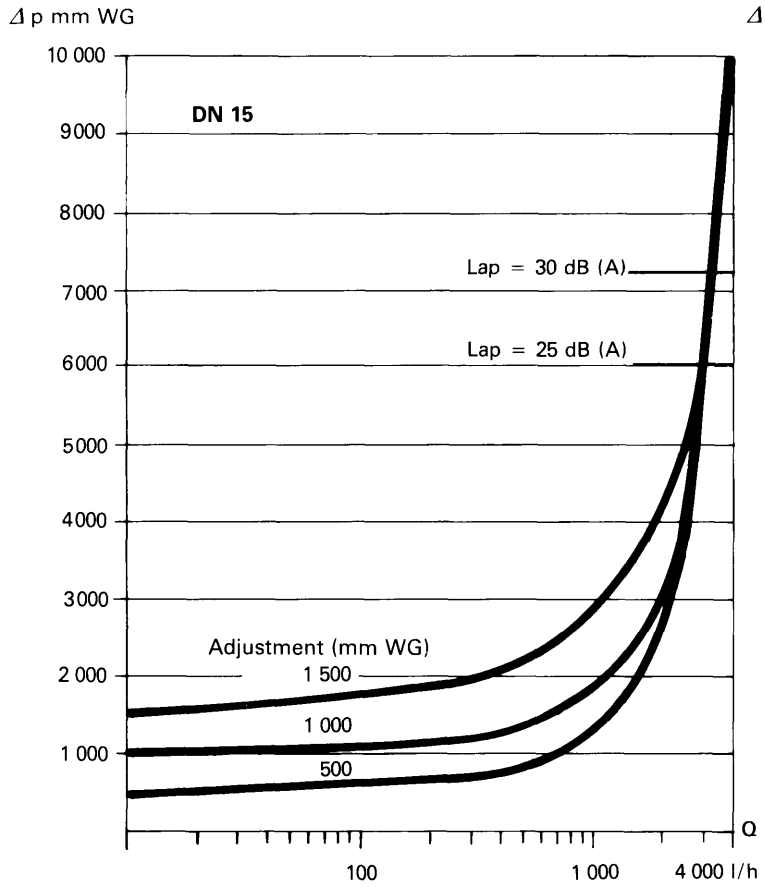
DN 20 H=4 000 mm WG Q nom = 1200 l/h

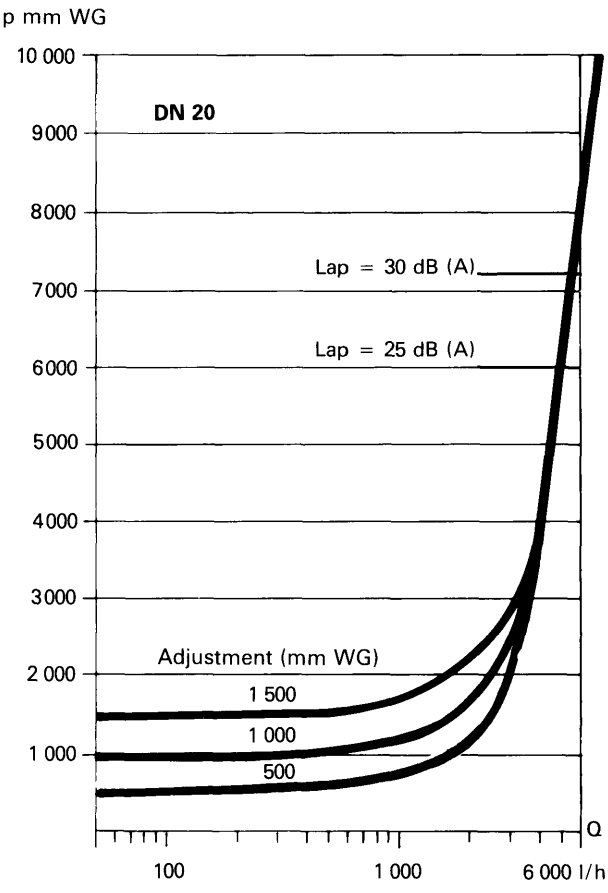
Let us assume that the flow of the radiators is reduced to 40 % of the nominal value.

In the example chosen, the pressure applied to the radiators will rise from 800 to 3 500 mm WG without the BPV valve. With a BPV valve, at a set value of 800 mm WG, and under the conditions specified, the pressure increase is limited to 150 mm WG (rising from 800 mm WG to 950 mm WG).

"Q nom" is the nominal flow of the branch in question, i. e. the flow obtained under normal operating conditions.

TECHNICAL FUNCTION





The set value can be adjusted from 500 to 1 500 mm WG (5–15 KPa).

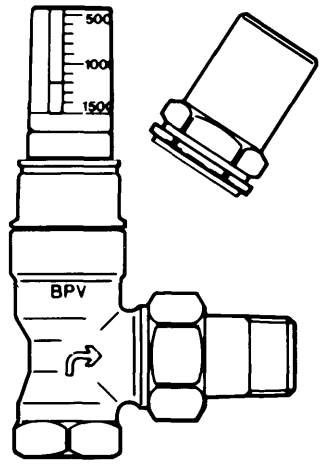
According to the set value selected, the flow develops as indicated by the above graph.

The acoustic level is also indicated.

Example
The maximum power of a branch is 20 kW.
Where there is a nominal drop of 20°C in the hot water temperature, the nominal flow is $\frac{0.86 \times 20\,000}{20} = 860$ l/h

We estimate maximum variation of the flow Q in the heating circuit to be 50 %, which means that the BPV valve will have to bypass a maximum flow of 430 l/h.

This flow is within the application ranges of the DN 15 and DN 20 valves. The use of a DN 15 valve with a set value of 1 000 mm offers a stabilized pressure of from 1 000 to 1 250 mm. If we choose a DN 20 valve, pressure can be maintained from 1 000 to 1 060 mm.



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