

### Application:

The thermostatic valve "AQ/RFQ" is a diaphragm controlled and differential pressure independent valve with infinitely adjustable presetting. It is used in central heating and cooling systems with closed circuits and circulation pump for automatic flow control (hydronic balancing) at terminal units, such as radiators, surface heating and cooling systems, floor convectors or similar heat exchangers. The required flow rate is set by turning the handwheel of the insert with the help of the enclosed presetting key.

Even where high differential pressure variations occur, for instance if sections of the system are activated or inactivated, the flow rate is kept at a constant level within the regulation tolerances. This allows for a quick and simple hydronic balancing of new and existing systems in which the layout of the pipework is known or unknown.

In combination with Oventrop thermostats and actuators (together with room thermostats), the "AQ/RFQ" valves can be used for room temperature control by modifying the flow rate of the heating or cooling water.

### Technical data:

Max. operating temperature  $t_s$ : 110 °C  
 Min. operating temperature  $t_s$ : 2 °C  
 Max. operating pressure  $p_s$ : 1000 kPa (10 bar)  
 Control range: 10-170 l/h

The set values can be read off the handwheel in l/h (2K P-deviation).

Control range:  $\Delta p$  max.: 150 kPa (1.5 bar)  
 $\Delta p$  min. (10 up to 130 l/h): 10 kPa (0.1 bar)  
 $\Delta p$  min. (>130 up to 170 l/h): 15 kPa (0.15 bar)

A normal thermostatic valve function is given below  $\Delta p$  min., only the flow rate is reduced compared to the nominal value.

Fluid: Water or suitable ethylene/propylene glycol water mixtures according to VDI 2035 (max. glycol proportion 50 %, ph value 6.5-10).  
 Not suitable for steam, oily, polluted and aggressive fluids.

The valve insert is replaceable by using the special tool "Demo-Bloc" without draining the system.

### Model:

Thermostatic valve "AQ"

Angle pattern valve

DN 10	1183063
DN 15	1183064
DN 20	1183066
DN 25	1183068

Straight pattern valve

DN 10	1183163
DN 15	1183164
DN 20	1183166
DN 25	1183168

Reversed angle pattern valve

DN 10	1183263
DN 15	1183264
DN 20	1183266

Double angle pattern valve

Right hand side connection	
DN 10	1183361
DN 15	1183363

Left hand side connection

DN 10	1183360
DN 15	1183362

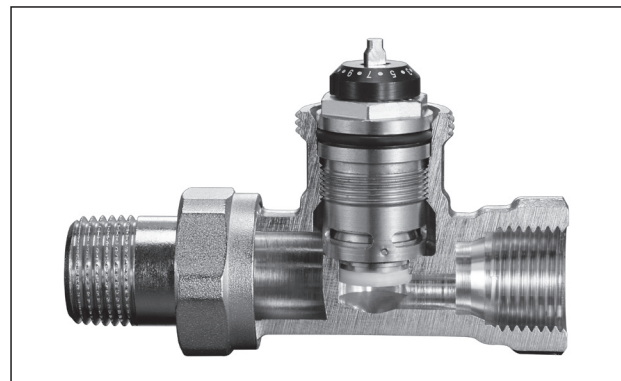
Thermostatic valve "RFQ", reduced dimensions compared with "AQ"

Angle pattern valve

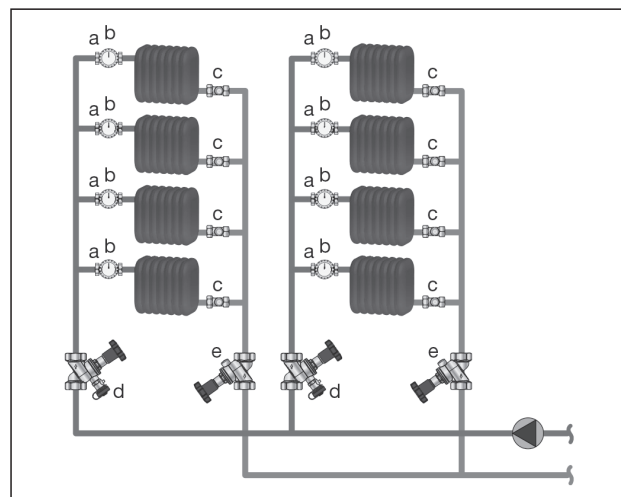
DN 10	1185503
DN 15	1185504
DN 20	1185506

Straight pattern valve

DN 10	1185603
DN 15	1185604
DN 20	1185606

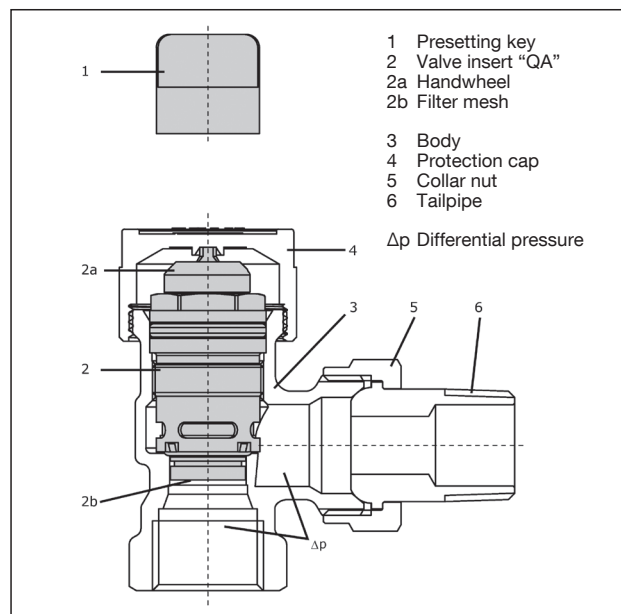


Thermostatic valve "AQ" – Sectional view of a straight pattern valve



Example of a radiator installation

- a Thermostatic valve "AQ/RFQ"
- b Thermostat "Uni LH"
- c Radiator lockshield valve "Combi 2/3/4"
- d Bronze oblique pattern valve PN 25 with draining facility
- e Bronze oblique pattern valve PN 25 without draining facility



Construction thermostatic valve "AQ"

**Data for actuator connection:**

Connection thread: M 30 x 1.5  
Piston stroke: 1.8 mm  
Closing dimension: 11.8 mm  
Closing pressure (actuator): 90-150 N

**Valve authority:**

The diaphragm controlled flow control unit integrated in the valve insert of the "AQ/RFQ" valves, maintains the differential pressure at a constant level via the presetting and regulating cross-section of the valve.

This way, the valve authority of the thermostatic valves "AQ/RFQ" amounts to 100% ( $a = 1$ ). Even during part load operation with steady control (for instance in combination with thermostats for room temperature control), the valve authority of the thermostatic valve "AQ/RFQ" amounts to 100% ( $a = 1$ ) within the effective valve lift.

**Noise behaviour:**

For a silent operation in combination with an installation which is sensitive to noise (e.g. radiators), the maximum differential pressure across the valve should not exceed 600 mbar.

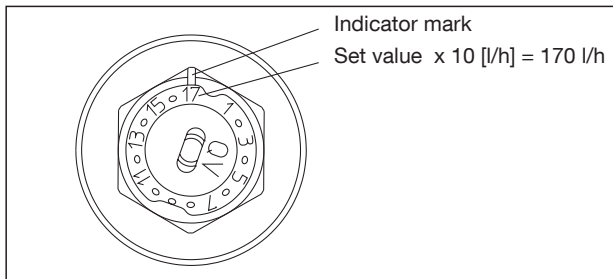
**Materials:**

Body made of nickel plated brass; seals made of EPDM or PTFE; valve stem made of stainless steel.

**Setting of the flow rate:**

Setting is carried out with the presetting key which is mounted onto the handwheel. This will protect the setting against unauthorised tampering.

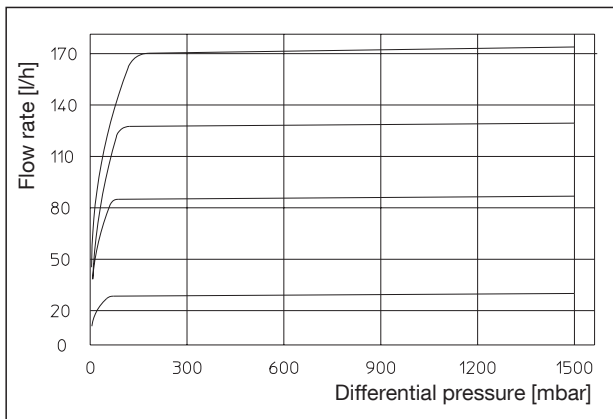
The valve is infinitely adjustable. The setting can be modified whilst the system is in operation.



Setting of the flow rate

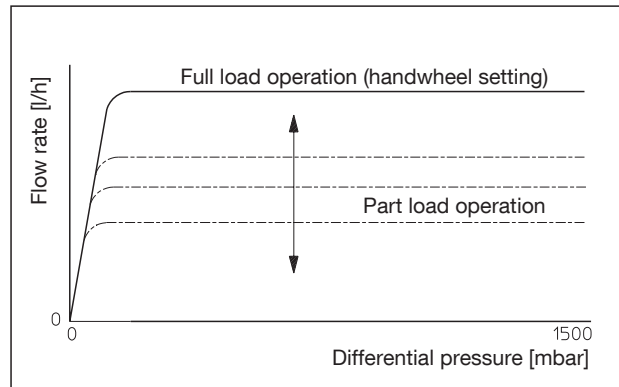
When using mixtures of water and glycol, the correction factors of the manufacturers of the antifreeze liquid have to be considered when setting the flow rate.

**Characteristic lines:**

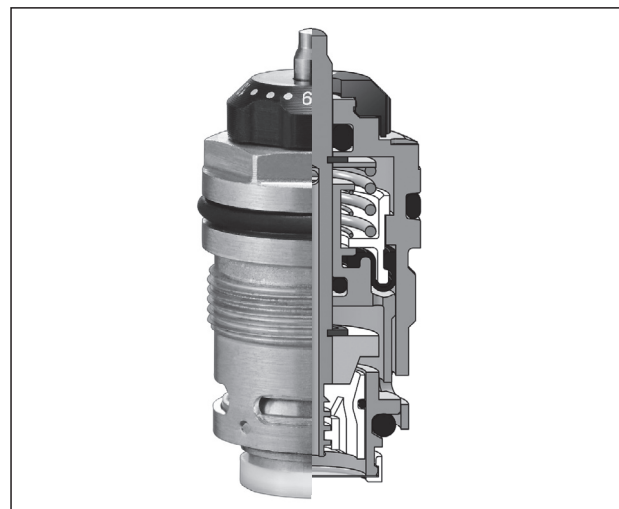


Valve characteristic lines for different handwheel settings during full load operation

The maximum required flow rate (full load operation) of the valve is set with the help of the handwheel. It cannot be exceeded. During part load operation, regulation of the flow rate up to the set maximum value can be carried out with the help of a thermostat or an actuator which is screwed onto the valve.



Valve characteristic lines during part load operation



Simplified illustration of the valve insert with "Q-Tech"

**Advantages of "Q-Tech"**

- no special body design required, the valve insert "QA" fits all standard Oventrop valve bodies manufactured since 1999 (M30 x 1.5)
- valve insert replaceable by using the special tool "Demo-Bloc" without draining the system
- ideal for upgrading and refurbishment
- wide adjustable flow range (10 up to 170 l/h)
- wide differential pressure control range (max. 1.5 bar)
- silent in operation even with high differential pressures
- the set flow rates are kept at a constant level
- differential pressure independent mode of operation to a large extent
- constant, high valve authority ( $a=1$ )
- infinitely adjustable presetting
- fine graduated setting scale in l/h
- set values visible from outside (without table)
- easy setting by use of a presetting key which prevents tampering to a large extent
- valve insert with replaceable strainer

**Accessories:**

Valve insert "QA"	Item no.: 1187065
Special tool "Demo-Bloc"	1188051
Coupling set for replacement of the valve insert "QA"	1188094
Differential pressure measuring stem	1188093

**Differential pressure measurement:**

The available differential pressure can be measured with the Oventrop measuring systems “OV-DMC 3”, “OV-DMC 2” or “OV-DMPC” together with the special tool “Demo-Bloc” (item no. 1188051) and the differential pressure measuring stem (item no. 1188093). This will confirm if the differential pressure is high enough for an automatic flow control of the valve. The pump setting may also be optimised by measuring the differential pressure.

For this purpose, the pump head is reduced until just the minimum required differential pressure is available at the hydraulically most underprivileged valves.

With a measuring system connected, the differential pressure at the thermostatic valve body is measured. To do so, the valve insert is unscrewed with the help of the “Demo-Bloc” and the differential pressure is measured using the differential pressure measuring stem. As soon as the measured differential pressure has reached or exceeded the differential pressure  $\Delta p$  min., the differential pressure is high enough for an automatic flow control of the valve. Screw the valve insert into the valve body again (19 mm spanner / max. 15 Nm) and check all installation points for leaks.

**Installation:**

- The valve can be installed in any position (when using actuators, the permissible installation position must be observed).
- The direction of flow has to conform to the direction of the arrow on the valve body.
- If a presettable radiator lockshield valve is installed in the return of the radiator, it must be fully open during operation.
- Any tension which could be transferred through the pipework must be avoided.
- Do not use any greasing agents or oil during installation as these can destroy the seals.
- Any dirt particles or grease or oil residues must be flushed out of the pipework before the thermostatic valve is installed.
- When choosing the operating fluid, the latest technical status has to be considered (e.g. VDI 2035 - Avoidance of damage to hot water heating systems).
- A strainer must be installed in the supply pipe to avoid contaminated operating fluids (see VDI 2035).
- The correction factors of the manufacturers of the antifreeze liquid have to be considered when setting the flow rate.
- After installation, check all installation points for leaks.

**Protection cap:**

The thermostatic valve is supplied with a light grey plastic protection cap. It protects the valve stem and can be used for manual setting of the valve lift during the construction period.

1. Turn the protection cap clockwise to close the thermostatic valve and to reduce the heat supply.
2. Turn the protection cap anticlockwise to open the thermostatic valve and to increase the heat supply.

The protection cap must not be used for permanent shut-off of the valve against system pressure (e.g. while radiator is removed). The high restoring force of the valve stem will damage the protection cap and water will escape from the valve!

**Maintenance / Replacement of the valve insert:**

In case of malfunctions, the valve has to be serviced. The valve should be easily accessible.

The valve insert is replaceable by using the special tool “Demo-Bloc” without draining the system (item no. 1188051, see catalogue “Products”).

Malfunctions (radiator does not get sufficiently warm for instance) can be caused by a contaminated filter mesh.

In this case, unscrew the valve insert from the valve body with the help of the “Demo-Bloc” and replace it (or clean or replace the filter mesh).

The valve insert is tightened with a torque of 15 Nm. Use a 19 mm spanner for mounting or dismantling the valve insert.