Aquastrom T

Thermal circulation valves

For hydronic balancing in circulation pipes according to DVGW Code of Practice W 551/W 553. The Aquastrom T circulation valves are thermally controlled and are available with internal thread. Below the set temperature, the valve opens and automatically increases the hot water volume flow. The valve has a fixed residual volume flow and automatically recognises thermal disinfection.

The valves are made of silicon bronze. They can be equipped with a drain valve with hose connection and a thermometer. A temperature sensor for integration into the building management system can be retrofitted. An insulation shell made of EPP according to the German Building Energy Act GEG, building material class B2 according to DIN 4102 is available as accessory.

The Aquastrom T valves control the hydronic balancing and the temperature-controlled regulation of the of the volume flows in potable water circulation pipes. The temperature setpoint can be blocked and lead-sealed.

Features

- Automatic thermal volume flow control
- Automatic thermal disinfection support
- Blocking and lead-sealing of the temperature setpoint
- Integration into the building management system with optional sensor element

Technical Data

Nominal sizes	DN 15
Variants	With internal thread according to EN 10226
Operating temperature	0…90 °C
Max. operating pressure	16 bar
Medium	Potable water according to DVGW W 551 and W 553
Body material	Silicon bronze
O-ring material	EPDM
Insulation shell material	EPP according to German Building Energy Act GEG, building material class B2 according to DIN 4102
Kvs value	1.24

Product Details

Functions

The instantaneous provision of hot water at the draw-off points of a potable water pipe network is achieved by distributing the hot water from the potable water heater into one or more circulation pipelines. Each circulation pipeline carries the hot water to the draw-off points in a supply pipe connected to the main pipeline and back to the potable water heater in a return pipe.

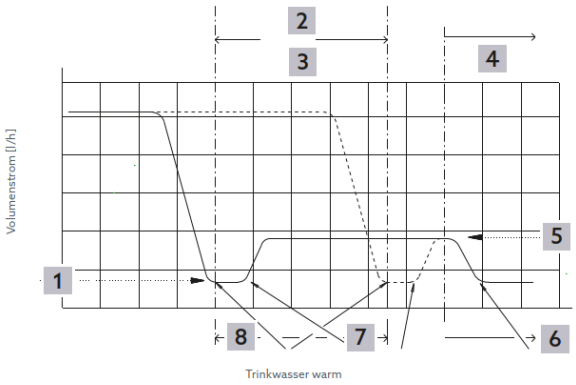
The design of such potable water pipe networks is the responsibility of the planner, who must take into account the hydraulics in these pipe networks so that a sufficiently high water temperature is maintained in all circulation pipelines. Conditions must be created in the pipe systems that prevent pathogens (especially legionella) from multiplying in such a way that is it hazardous to health. The calculation of a circulation system in accordance with the DVGW Code of Practice W 553 is available to the planner for this purpose.

The hydraulics are determined on the one hand by the flow losses in the pipework of the circulation pipelines and on the other hand by the heat losses that the hot water experiences when flowing through the circulation pipes. These heat losses depend on various parameters (pipe length and dimension, insulation, ambient and pipe temperature) and must be considered on a system-specific basis. In order to compensate for heat losses and keep the temperature high enough, a certain volume flow or heat flow must flow through the circulation pipe. A larger quantity of hot water must therefore flow in the circulation pipelines that are far away from the potable water heater than in the closer pipelines. This is achieved by throttling the volume flow in the closer circulation pipes by building up a corresponding differential pressure using the regulating valves.

The planner consults the DVGW Code of Practice W 553 to determine these differential pressures while maintaining specified temperature limits. The calculation of a circulation pipe within a service water system can be carried out approximately for stationary operation (without drawing off hot water). As the withdrawal quantities at the various points (bathroom, kitchen, etc.) vary during normal operation, the required circulation water quantity also changes constantly. The Aquastrom T thermostatic control valve automatically adapts optimally to these changing hydraulic operating conditions.

In order to ensure the hydronic balancing required by DVGW W 553 in a circulation system, the required volume flows of individual pipelines should be calculated. In large potable water circulation systems, large volume flows are required especially in the most remote sections. The control valves must be dimensioned accordingly. If necessary, several pipelines are combined into a group and balanced with each other using a potable water circulation valve as a group valve. In this way, small volume flows can be realised at high differential pressures in nearby pipelines and correspondingly large volume flows can be achieved in distant pipelines.

Thermal control behaviour



1	Residual volume flow according to DIN 35861
2	Adjustable control range 50 °C – 65 °C
3	Recommended control range 55 °C – 60 °C
4	Disinfection range >70 °C
5	Disinfection volume flow
6	Valve throttles back to residual volume flow from approx. 73 °C
7	Valve opens approx. 6 °C after the minimum residual volume flow is reached
8	At the set temperature setpoint, the valve throttles the volume flow down to a residual volume flow

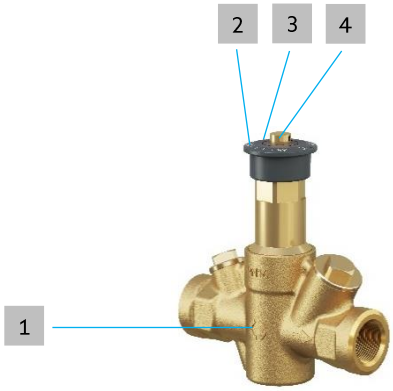
The thermal control behaviour of the circulation valve is described in the illustrated chart. In normal operation (temperature range up to 60 °C), the circulation valve throttles the volume flow to a residual volume flow at the set temperature setpoint.

The Oventrop Aquastrom T valve installed in a circulation pipeline automatically regulates from a minimum volume flow to a higher flow rate value during the disinfection phase when the water temperature rises from approx. 6 K above the set control temperature. This increased flow rate is throttled back to the minimum volume flow from a temperature of approx. 73 °C. This builds up a higher differential pressure in the corresponding pipeline, which accelerates thermal disinfection in the downstream pipelines.

These pipes therefore reach the required disinfection temperature more quickly than pipes that are not hydraulically supported during the disinfection phase. This hydraulic support can therefore shorten the disinfection phase in a circulation system, which in turn can lead to energy savings.

Once disinfection is complete, the Aquastrom T returns to normal operation to the preset temperature setpoint when the temperature drops.

Design

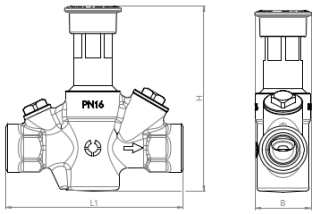


1	Body
2	Temperature setting scale
3	Temperature setting mark
4	Opening in the setting scale (for temperature setting) with sealing plug

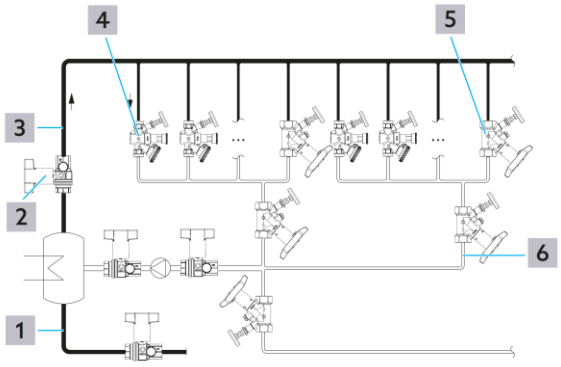
Dimensions

Aquastrom T

Nominal size	L1 [mm]	B [mm]	H [mm]
DN 15	110	53	115



Applications



1	Potable water cold
2	Shutoff ball valve (e.g. Optibal TW)
3	Potable water hot
4	Potable water circulation valve (e.g. Aquastrom TV)
5	Double regulating valve (e.g. Aquastrom C)
6	Potable water circulation

Selection

Item Numbers

Aquastrom T with internal thread

	Nominal size	Anschluss	Kvs	Item no.
	DN 15	Rp ½	1.24	4202904

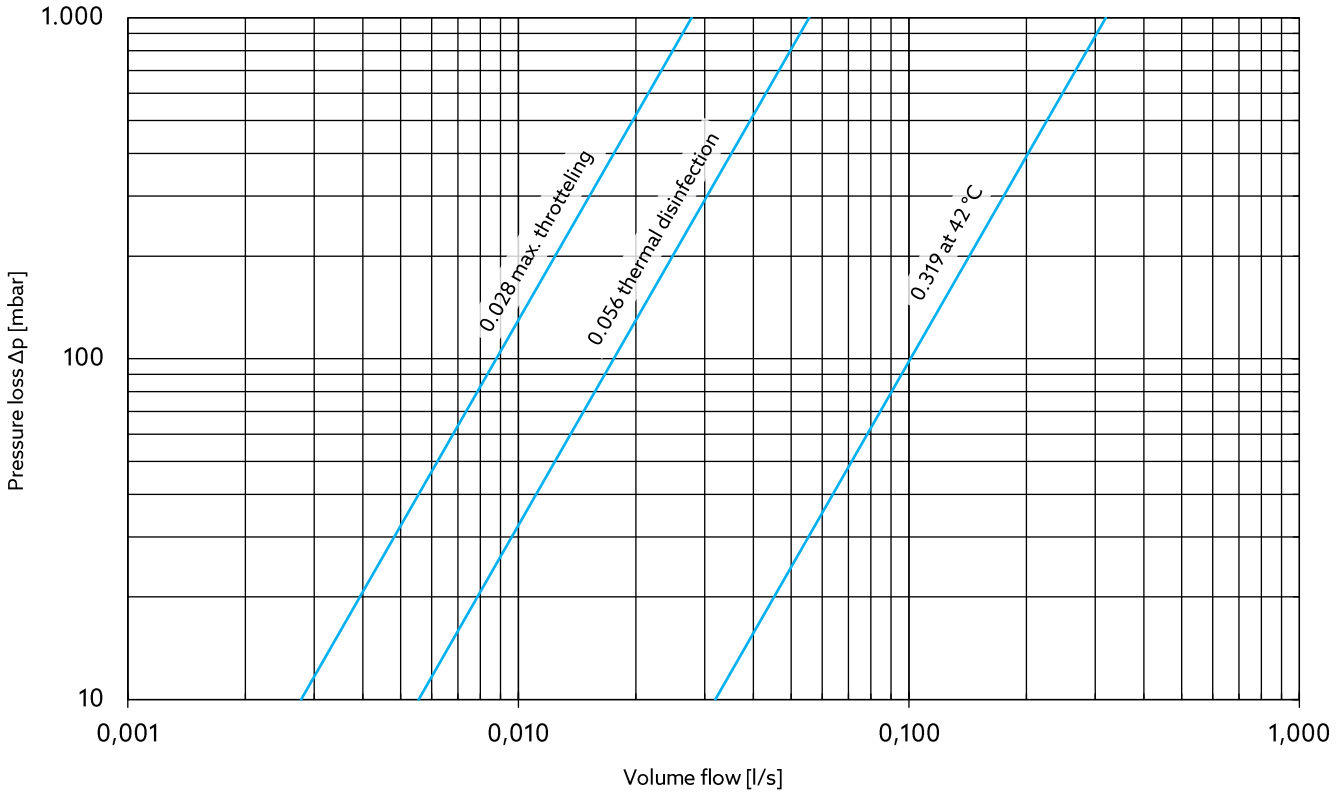
Accessories

Selected accessories for Aquastrom T valves. For a complete overview, see the product catalogue.

Description	Item no.
Insulation shells for valves DN 15 and DN 20	4209610
Drain valve for hose connection DN 8, G ¼ ET	4205593
Dial thermometer	4205591
Wire seal kit	4208091
Sensor LW TQ sensor element PT 1000 for remote monitoring of the pipeline temperature	1150090
Sensor LW TQ insertion sensor element PT 1000 for remote monitoring of the pipeline temperature	4205592
Aquastrom P water sampling valve DN 8, G ¼ ET	4209102
Drain valve DN 8, G ¼ ET	4209602
Drain ball valve DN 8, G ¼ ET	4200191

Design chart

Volume flow thermal control Aquastrom T DN 15



Kv values

The Aquastrom T circulation valves enable thermal presetting. For the design, it is recommended to take into account the Kv values at a proportional deviation (P-deviation) of 2 Kelvin.

For adaptation to lower volume flows, this can be achieved by reducing the proportional deviation. To achieve higher volume flows and reach the setpoint, a larger thermal value (proportional deviation) can be used.

Aquastrom T DN 15

P-deviation											
0 K	1 K	2 K	3 K	4 K	5 K	6 K	7 K	8 K	9 K	10 K	Kvs
0.10	**0.30**	**0.50**	**0.64**	**0.74**	**0.84**	**0.93**	**1.00**	**1.07**	**1.13**	**1.21**	**1.24**

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