

ALPHA Sanitary

DN15-DN20

Application

The ALPHA Sanitary is a balancing valve designed for domestic hot water systems with circulation.

The valves automatically balance the system irrespectively of water temperature and pressure fluctuations, securing quick access to hot water at every tapping point.

The valve has a cartridge for a desired flow in a range between 20 l/h to 800 l/h.

ALPHA Sanitary can be used in hot water installations with bacterial problems, e.g. Legionella. Here a procedure of raising the temperature of the water to between 70°C and 80°C is carried out to periodically pasteurise the system.

ALPHA Sanitary is constructed in stainless steel AISI 316 for all parts in connection with water, to secure the highest resistance against corrosion.



Benefits

Design

- Less time to define the necessary equipment for a hydraulically balanced system
- No impact if the calculated pressure in the installation is inaccurate
- Security that the specified circulated flow is also the real one
- Well proven technology
- Robust and corrosion resistant design

Installation

- Minimized commissioning time due to automatic balancing of the system
- No need for oversized pumps
- No requirements for straight pipes upstream and downstream of the valve
- Can be easily installed where space is limited

Operation

- Balancing of the system takes place automatically even under fluctuating pressure conditions
- Performance optimization
- Distribution/balancing optimization
- System balance regardless of water temperature
- Quick access to hot water at every tapping point

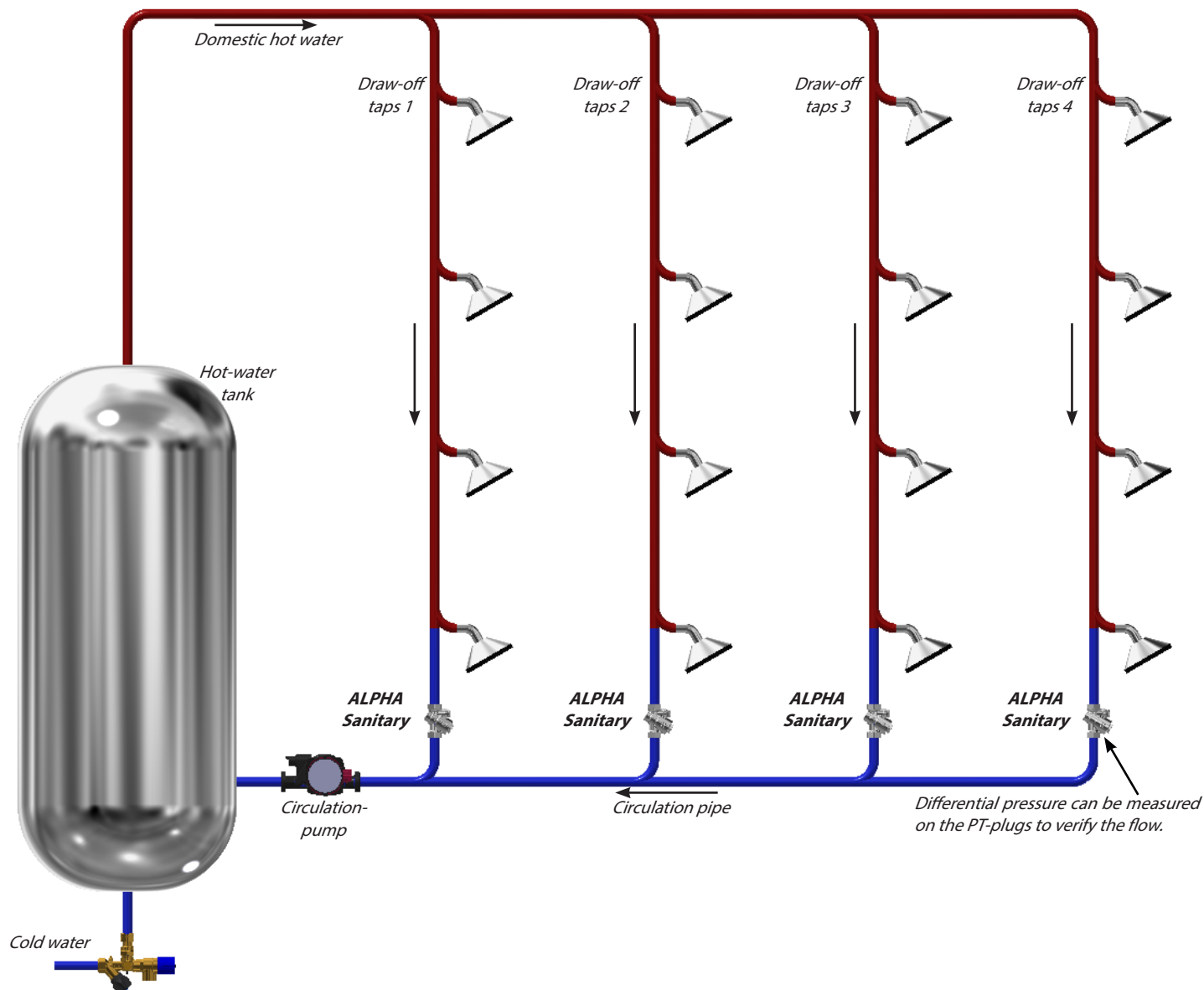
Features

- Valve housing manufactured in AISI 316 for domestic hot water applications
- P/T plugs for differential pressure verification.
- Modifications & extensions of the system do not affect the hydraulic balance in the other parts of the system
- Tamper resistant cartridge independent of flow regulation errors during commissioning and operation of the system
- Self-cleaning cartridge does not allow dirt to compromise the accuracy of the valve
- Resistant diaphragm between the moving parts of the cartridge eliminates friction, noise and impact from water hammer
- Easy maintenance with removable cartridge for descaling
- Easy to install – no straight piping required before or after the valve
- Compact - can be installed in narrow/restricted space
- Interchangeable orifices
- Cartridge program covers a wide flow range
- Pressure test according to EN12266

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ALPHA Sanitary · Application Example



ALPHA Sanitary · Dimensioning example

ALPHA Sanitary is dimensioned on the basis of the thermal loss in the circuit. An example of dimensioning ALPHA Sanitary and the overall quantity of water for the circulating pump is described in the following.

In an installation with 4 floors and basement a circulation line is dimensioned.

The following parameters should be known for the calculation of the flow rate.

Length of pipe: 40 meters

Total length of the pipe controlled by each ALPHA Sanitary valve.

Thermal loss: 9 W/meter pipe

Thermal loss in an external 27 mm pipe with 30 mm insulation and a difference of 40°C between room temperature and temperature of the fluid.

Differential temperature: 5°C

Temperature in hot-water tank 55°C. Required circulation temperature is 50°C. The flow rate calculated from the following formula:

$$Q = \frac{(40\text{m} \times 9\text{W/m}) \times 0.86}{5^\circ\text{C}} = 62 \text{ l/h}$$

The selected cartridge will be 47-20190 with a nominal flow rate of 60 l/h

The total quantity of water from 4 risers to the circulating pump is 240 l/h (4 x 60 l/h).

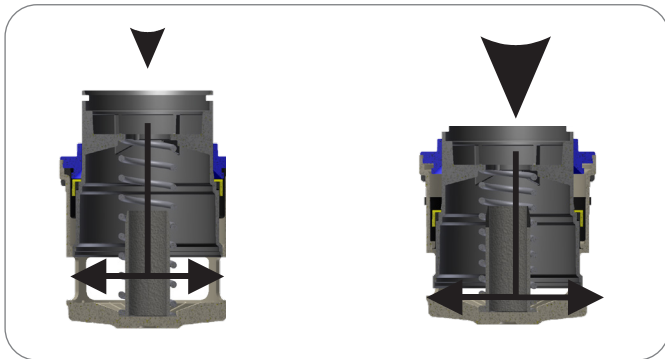
The minimum differential pressure for the ALPHA Sanitary cartridge is 12 kPa according to the table on page 5.

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ALPHA Sanitary · Cartridge Operation

When the pressure increases the spring will be compressed and thereby the piston will reduce the outlet area and vice versa. The result is a constant flow rate through the valve, independent of pressure fluctuations.



Function

The following applies to all flow balancing valves:

$$Q = K_v \cdot \sqrt{\Delta p}$$

Q = Flow (m³/h)

K_v = Opening area

Δp = Differential pressure (Bar)

The ALPHA Sanitary cartridge reacts to pressure fluctuations in the system ensuring that the differential pressure across the pre-adjustment unit is kept constant. This ensures that the maximum flow limit is achieved in accordance with the design.

Flow Calculation

The flow through the valve can be identified by measuring the differential pressure (Δp) across the valve:

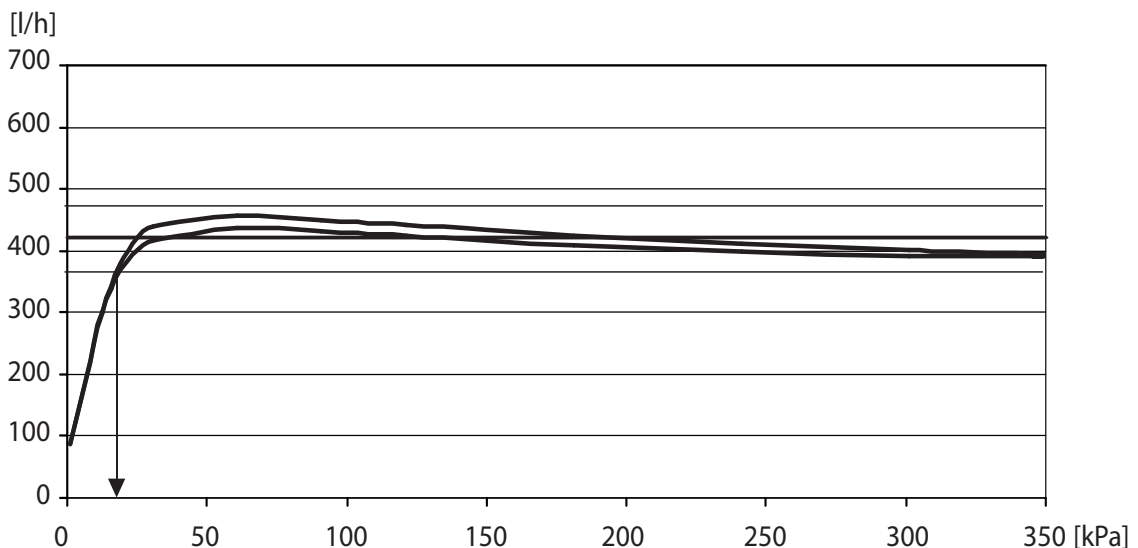
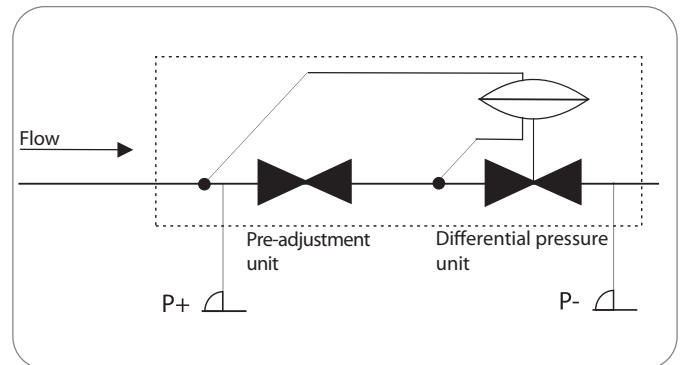
If the measured differential pressure is above the minimum Δp, the flow is the one stated for the cartridge.

If the measured differential pressure is below the minimum Δp, the flow can be found by using the formulas below.

Flow Calculation

$Q = K_v \cdot \sqrt{\Delta p}$	Q = m ³ /h Δp = Bar
$Q = K_v \cdot 100 \cdot \sqrt{\Delta p}$	Q = l/h Δp = kPa
$Q = \frac{K_v}{36} \cdot \sqrt{\Delta p}$	Q = l/s Δp = kPa

Simplified Outline



Schematic view of the flow characteristic for cartridge type Frese no. 47-20460. Nominal flow 410 l/h. The cartridge enters the pressure range at 15 kPa and maintains the flow at a constant level to 350 kPa.

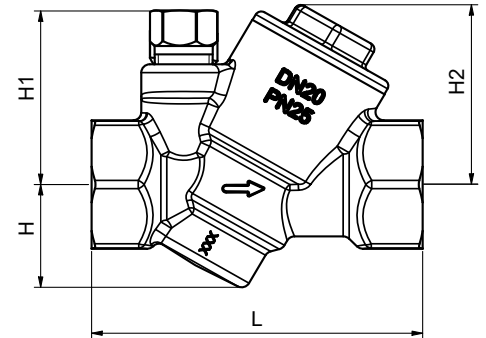
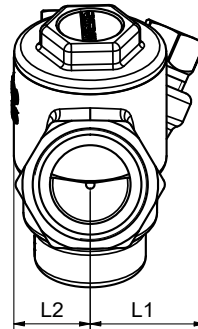
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ALPHA Sanitary Valve Housing

Technical Data

Valve housing:	AISI316 (EN 1.4408)
P/T plugs:	AISI316 (EN 1.4408)
Plug:	AISI316 (EN 1.4408)
Pressure class:	PN25
Temperature:	-20°C to +120°C
Flow range:	Refer to cartridge programme
Thread:	ISO 228



Product Programme

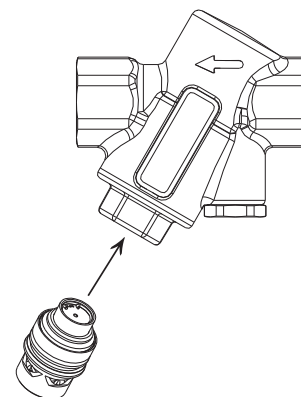
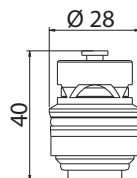
	Dimension & Version	Frese no.	L [mm]	L1 [mm]	L2 [mm]	H [mm]	H1 [mm]	H2 [mm]	Weight [kg]
	ALPHA Sanitary DN15 P/T	58-9001M	69	32	18	25	62	44	0.35
	ALPHA Sanitary DN15 P/T w. cartridge	58-9001M-01	69	32	18	25	62	44	0.42
	ALPHA Sanitary DN15 Plugs	58-9006M	69	27	18	25	37	44	0.35
	ALPHA Sanitary DN15 Plugs w. cartridge	58-9006M-01	69	27	18	25	37	44	0.42
	ALPHA Sanitary DN20 P/T	58-9011M	78	32	18	25	62	44	0.39
	ALPHA Sanitary DN20 P/T w. cartridge	58-9011M-01	78	32	18	25	62	44	0.46
	ALPHA Sanitary DN20 Plugs	58-9016M	78	27	18	25	37	44	0.39
	ALPHA Sanitary DN20 Plugs w. cartridge	58-9016M-01	78	27	18	25	37	44	0.46

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ALPHA Sanitary Cartridge

Cartridge material:	AISI316 (EN 1.4408)
O-rings:	EPDM 281
Spring:	Stainless steel
Diaphragm:	HNBR
Medium temperature:	-20°C to +120°C
Diff. pressure range:	9-350 kPa
For Valve Housing:	DN15-DN20



Product Programme

Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
47-20120	20	0.006	0.09	9	0.07
47-20170	40	0.011	0.18	9	0.13
47-20200	60	0.017	0.26	12	0.17
47-20230	80	0.022	0.35	13	0.22
47-20260	105	0.029	0.46	14	0.28
47-20300	135	0.038	0.59	14	0.36
47-20350	180	0.050	0.79	14	0.48
47-20400	240	0.067	1.06	14	0.64
47-20460	310	0.086	1.36	14	0.83
47-20510	410	0.114	1.81	15	1.06
47-20530	450	0.125	1.98	16	1.13
47-20570	500	0.139	2.20	17	1.21
47-20590	550	0.153	2.42	18	1.30
47-20620	600	0.167	2.64	19	1.38
47-20680	700	0.194	3.08	20	1.57
47-20740	800	0.222	3.52	20	1.79

Accessory

	Frese no.	Type
	48-0043	PT-Plugs 2 pcs (Red & Blue) AISI316

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