

BALANCING VALVES

The complete solution for hydraulic balancing in circulation systems


KEMPER
DRIVING PROGRESS

Hot water danger zone

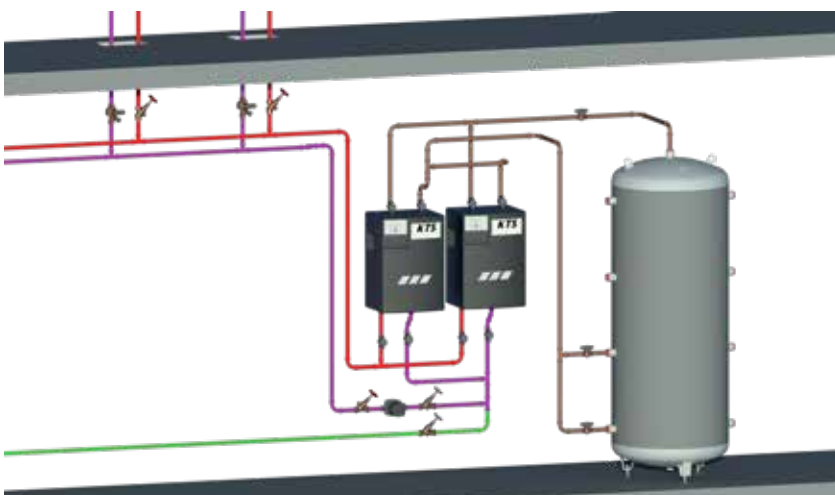
Protecting drinking water systems from Legionella bacteria



To reduce the growth of Legionella bacteria in drinking water installations, maintaining drinking water temperatures is of particular importance. For this reason, the required temperatures must be continuously maintained at the hot water heater outlet.

With the exception of floor pipes, which are subject to the 3-litre rule, the heat losses in the hot water network must be compensated by circulation systems when not in use. Hydraulic balancing in the circulation system is a prerequisite for a functioning hot water system. A correctly sized circulation system ensures that temperatures do not permanently fall below the required levels at any point in the supply system.

Drinking water hygiene must be taken into account when sizing hot water heating, distribution and circulation systems. Circulation systems must therefore be sized not only under consideration of functional and economic aspects, but also from the point of view of drinking water hygiene.

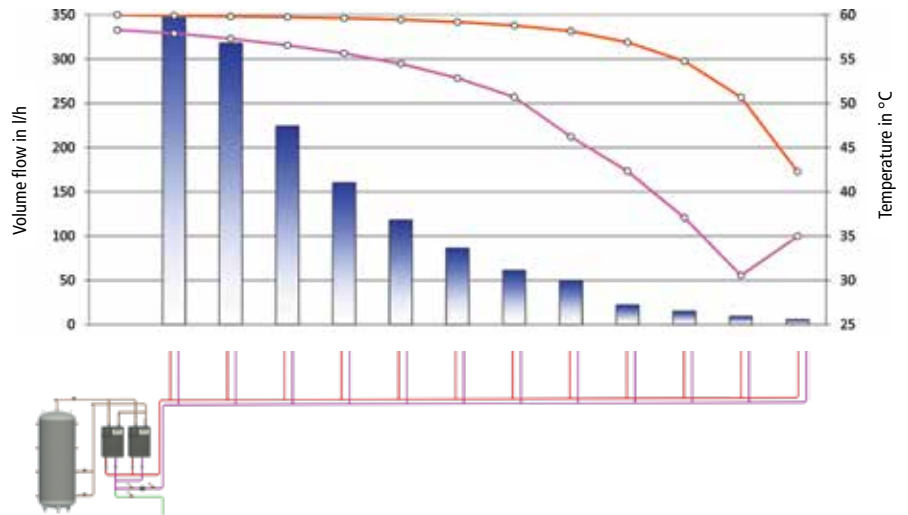


Schematic diagram of a circulation system (temperature conditions with hydraulic balancing)

Drinking water circulation systems

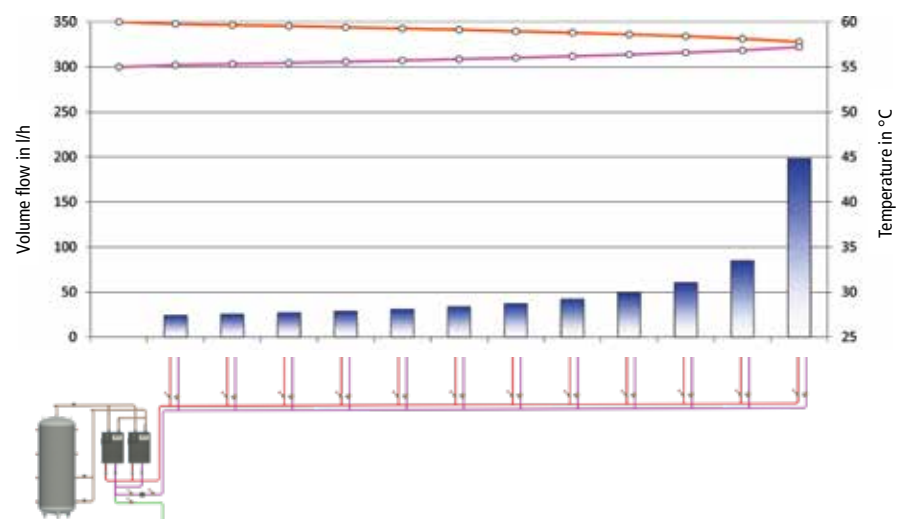
The need for hydraulic balancing

The circulation volume flow must be able to transport the quantity of heat that is lost through the surface of the pipework. This means that a specific preset water temperature can be maintained only if a state of equilibrium can be ensured at all points in the circulation system. This hydraulic balancing of a circulation system is therefore a fundamental prerequisite for its correct functioning. If hydraulic balancing is not effected, the volume flows and thus also the temperatures of the currently calculated case cannot be achieved in the plant in question.



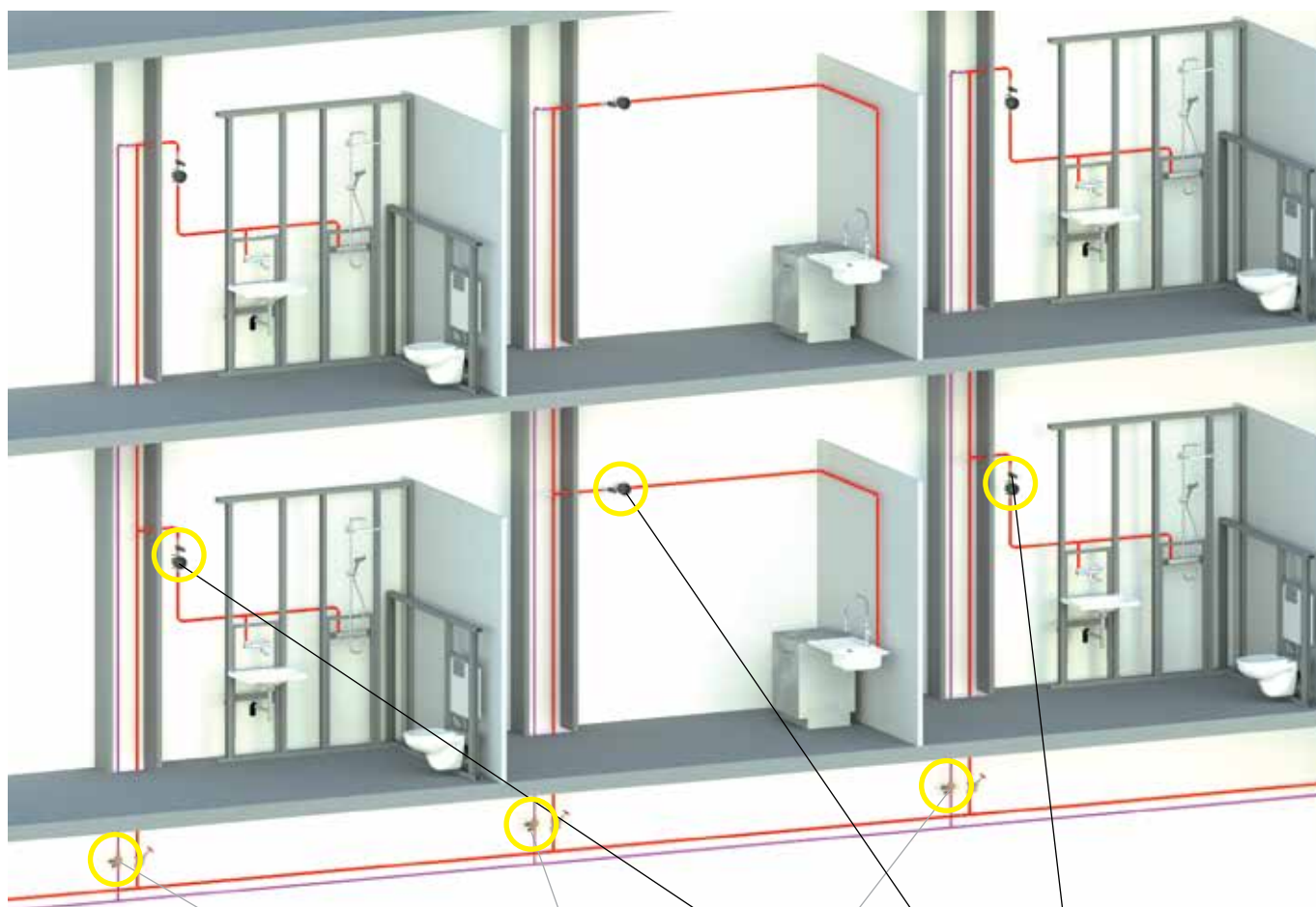
Volume flow distribution and temperature curve in a circulation system without regulation

In the pressure-loss calculation, the available pressure difference of the pump must be "consumed" as far as possible in each of the plant's circulation circuits, taking into account minimum internal diameters and maximum speeds. The difference remaining in the pressure-loss calculation between the available pump pressure and the calculated plant pressure losses must be throttled. Static or thermostatic circulation balancing valves are used for this.



Volume flow distribution and temperature curve in a circulation system with static regulation

Hydraulic balancing for circulation in the riser



Schematic diagram of a circulation system with circulation in the riser



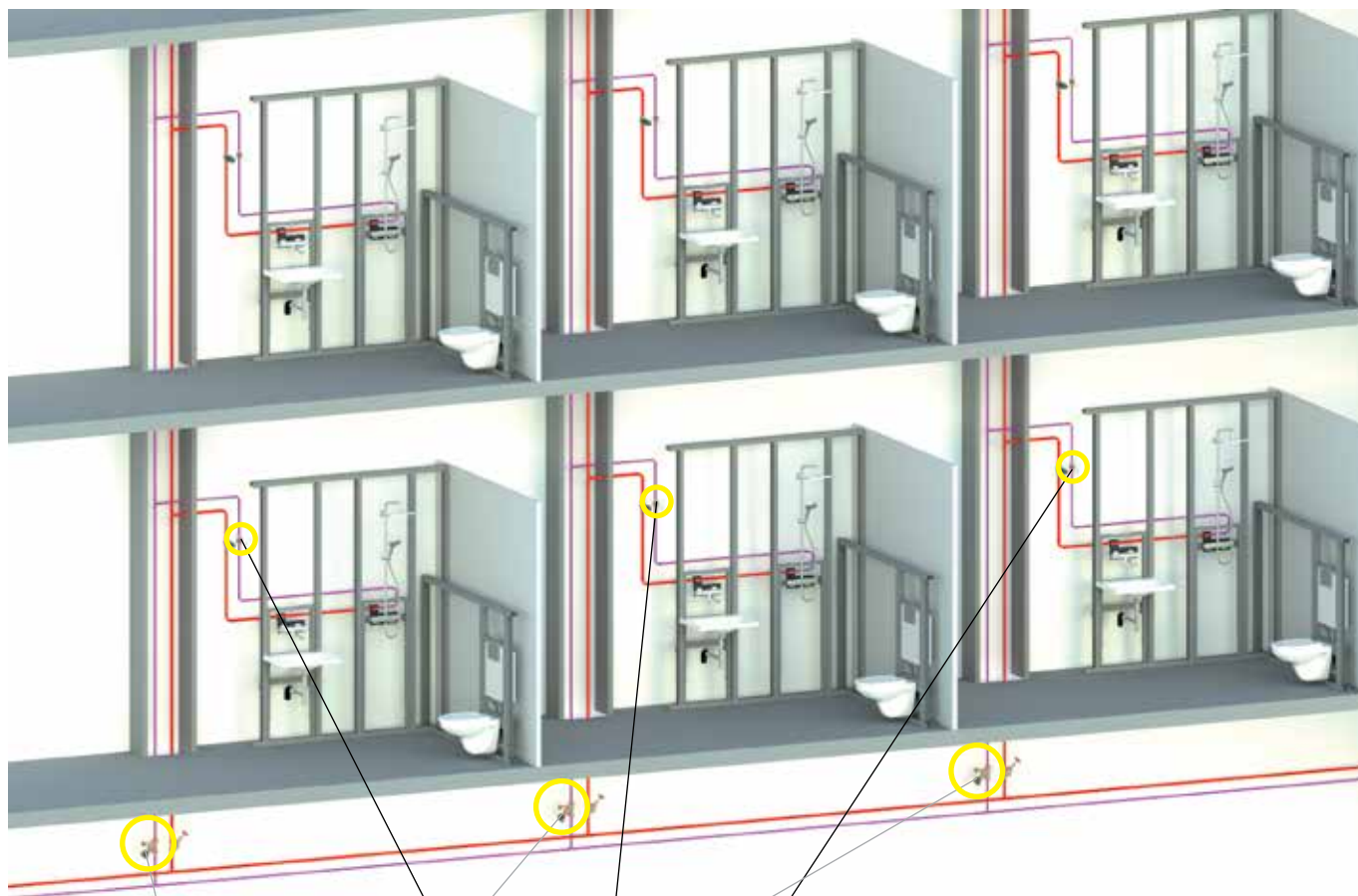
01 MULTI-THERM automatic circulation balancing valve, Figure 141 0G



CLASSIC water meter combination body, G2 coax., Figure 855 27 020

- 01 MULTI-THERM (page 6)
- 02 ETA-THERM (page 8)
- 03 MULTI-FIX-PLUS (page 10)

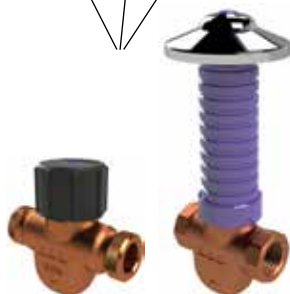
Hydraulic balancing for circulation to the bathroom



Schematic diagram of a circulation system with circulation as far as the tapping points with two-stage adjustment



03 MULTI-FIX-PLUS manual circulation balancing valve, Figure 151 06



02 ETA-THERM automatic circulation balancing valve, Figure 130 or Figure 540

Combination of static and thermal
With multi-stage adjustment, it is important to note that there is always only one thermostatically controlled valve in the circulation circuit. In order to maintain valve authority, only the first valve in the circulation circuit may be a thermostatic valve.

01

MULTI-THERM automatic circulation balancing valve

The all-rounder for hydraulic balancing in the riser



Figure 141 0G
(dial thermometer and drain valve
available as optional accessories)

The use of automatic circulation balancing valves can significantly reduce the amount of work involved in adjustment measures. With the MULTI-THERM automatic circulation balancing valve, hydraulic balancing can easily be implemented in a "classic" two-pipe circulation system in the riser.

MULTI-THERM is so versatile!

MULTI-THERM combines several functions in one valve: monitoring the temperature and finely balancing, shutting off and draining the volume flow using thermal control. In addition to the normal working range, MULTI-THERM automatically supports thermal disinfection at temperatures $> 70\text{ }^{\circ}\text{C}$.

Benefits at a glance

- // Shutoff and temperature monitoring in one bonnet
- // Automatic control range adjustment with thermal disinfection
- // In proven gunmetal quality, resistant to aggressive water – alternatively in stainless steel
- // Free from dead spots
- // Can be optionally fitted with electronic temperature sensor for building management systems

Balancing

MULTI-THERM circulation balancing valves automatically adjust the hydraulic balance of the circulation lines with respect to each other based on the temperature in the hot water return line – dynamically and temperature dependent!

Circulation balancing valves must allow hot water to circulate. When a set-point temperature is reached, water must therefore still be able to flow, otherwise the circulation is interrupted. Particularly for thermal disinfection, the water must be able to circulate continuously at a high

temperature so that the circulation pump does not work against closed valves. MULTI-THERM meets the technical requirements of circulation systems. With a preset temperature of 58 °C, for instance, the valve is fully open up to a valve temperature of 53 °C. Above 53 °C, the valve starts throttling based on temperature. When the set-point temperature is reached, the maximum possible valve throttle position is reached whereby a minimum volume constantly flows in the circulation system. If the hot water tank temperature is further increased to > 70 °C, the valve moves to

the disinfection flow position and remains there at a constant throttle position. In this throttle position, the valve's sizing enables disinfecting temperatures to be maintained throughout the system, even in larger systems.

Shutting off, measuring and draining

An immersion sleeve is integrated in the bonnet of the stop valve. As an alternative to the attached handle, a Pt 1000 temperature sensor (Fig. 1) or a plug-in thermometer (Fig. 2) can be used here. Temperature data can thus also be transmitted via the building

management system or via the CONTROL-PLUS hand-held measuring device. Furthermore, a drain valve (Fig. 3) can be installed on the MULTI-THERM to drain the circulation line.



Fig. 1



Fig. 2



Fig. 3

Figure	Article designation
141 0G	MULTI-THERM, made of gunmetal, male thread, DN 15-25
143 00	MULTI-THERM, made of gunmetal, female thread, DN 15-25
143 22	MULTI-THERM, made of gunmetal, MAPRESS press connection, DN 15-20
041 0G	SST MULTI-THERM, made of stainless steel, male thread, DN 15

02

ETA-THERM automatic circulation balancing valve

Hydraulic balancing to the bathroom



Figure 130 0G

If it is necessary to draw off hot water immediately after opening a tap, whether because of increased hygiene requirements or for reasons of comfort, an automatic balancing valve is required to hydraulically balance the bathroom circulation system (see illustration on page 5).

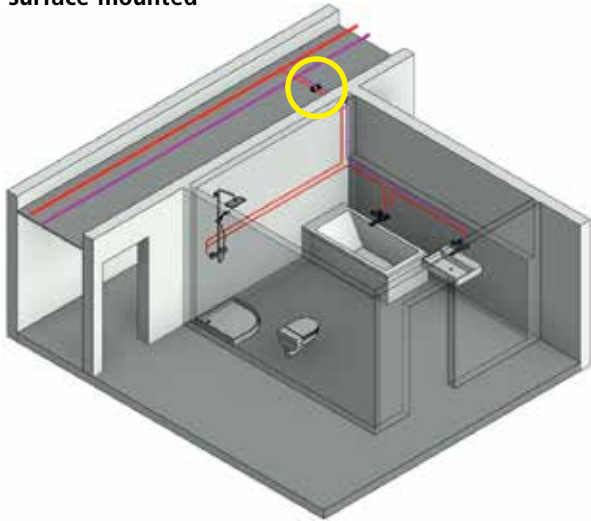
As very low volume flows are required to maintain the temperature in the bathrooms on account of reduced heat-dissipating surfaces, KEMPER has developed the ETA-THERM specifically for this case. Its k_v value ($k_{v\min} = 0.05$, $k_{v\max} = 0.4$) is specially tailored to meet the needs of the bathrooms.

ETA-THERM is available in two versions. Installation is possible in the area of the individual shutoff in bathrooms as a flush-mounted or surface-mounted balancing valve.

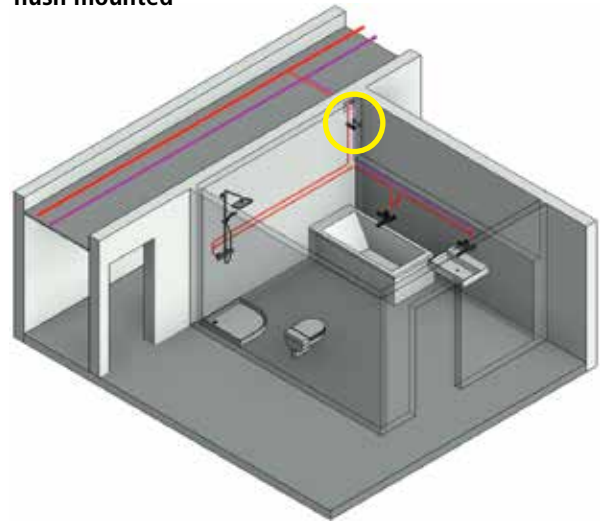
Benefits at a glance

- // Multifunctional shutoff and balancing bonnet
- // In case of flush mounting, "blind" valve preset possible with ratchet mechanism
- // Built-in cleaning function
- // Wetted parts made of gunmetal
- // Free from dead spots

Installation situation:
surface-mounted



Installation situation:
flush mounted



with male thread,
Figure 130 0G



with sleeve connection,
Figure 131 00



with sleeve connection,
Figure 540 02



with MAPRESS press connection,
Figure 542 02

Figure	Article designation
130 0G	ETA-THERM, control range 56 °C–58 °C, surface-mounted version, male thread, DN 15
131 00	ETA-THERM, control range 56 °C–58 °C, surface-mounted version, female thread, DN 15
134 0G	ETA-THERM, control range 62 °C–64 °C, surface-mounted version, male thread, DN 15
136 00	ETA-THERM, control range 62 °C–64 °C, surface-mounted version, female thread, DN 15

Figure	Article designation
544 02	UP-ETA-THERM, control range 56 °C–58 °C, flush-mounted version, SANPRESS/PROFIPRESS press connection, DN 15
540 02	UP-ETA-THERM, control range 56 °C–58 °C, flush-mounted version, female thread, DN 15
542 02	UP-ETA-THERM, control range 56 °C–58 °C, flush-mounted version, MAPRESS press connection, DN 15
540 62	UP-ETA-THERM, control range 62 °C–64 °C, flush-mounted version, female thread, DN 15

03

MULTI-FIX-PLUS manual circulation balancing valve

The manual, static addition



Figure 151 06

In circulation circuits, only the first balancing valve may be thermostatically controlled. For plants with several hydraulic levels, therefore, additional static balancing valves are required (see illustration on page 5).

MULTI-FIX-PLUS manual circulation balancing valves enable the manual setting of fine volume flows based on defined valve-setting values.

Benefits at a glance

- // Maintenance cut-off without changing the throttle preset
- // Made entirely of gunmetal, resistant to aggressive water
- // Free from dead spots
- // Can be optionally fitted with temperature sensor, sampling valve and drain valve

Figure	Article designation
150 6G	MULTI-FIX-PLUS, with thermometer and plugged drain port, male thread, DN 15–50
151 06	MULTI-FIX-PLUS, with thermometer and plugged drain port, female thread, DN 15–50

KEMPER measurement technology

Effective tool for control and regulation of circulation systems

Drinking water temperature control is another application that can be realised using KEMPER measurement technology.

For further information, please visit our website at www.kemper-olpe.de or use the QR code opposite.



