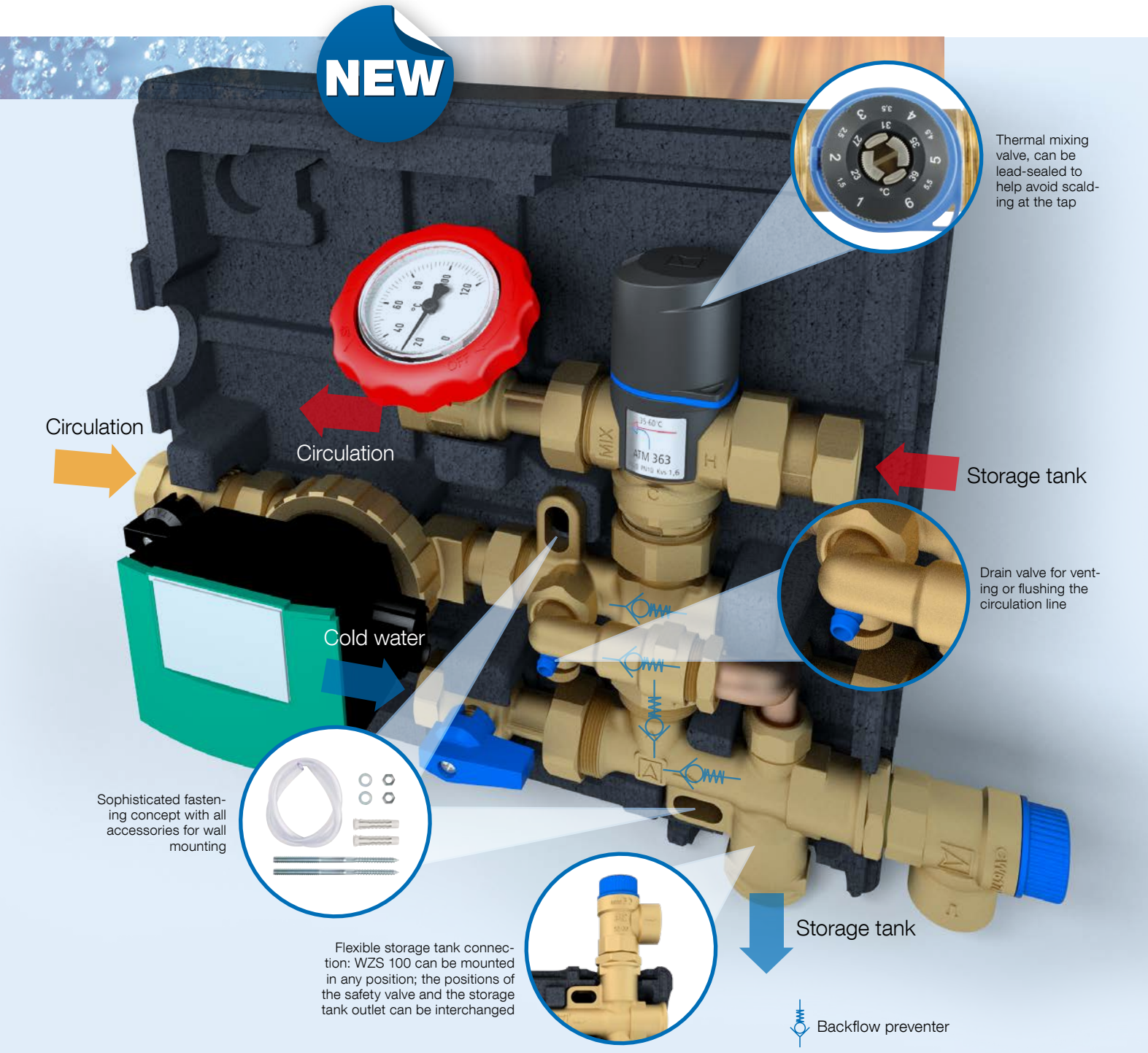
WZS series

Hot water circulation systems for energy storage tanks

AFRISO

Reliable function and efficient hot water treatment by intelligent circulation:

Hot water circulation system WZS 100



Hydraulic assembly WZS 100 for easy connection to solar, hot water, hygienic or combination storage tanks (with or without circulation connection at the storage tank)

- Hygienic, efficient water heating taking all possibilities of stratified storage systems to their full potential
- Reliable hydraulics
- Thermally controller hot water temperature (scald protection)
- Integrated safety: Safety group assembly and all relevant backflow preventers at the correct positions
- Time savings: Low mounting effort and fast commissioning
- Complete assembly facilitates logistics
- Less material required for project implementation

Application

Circulation system for professional implementation of a service water circulation connection to an energy storage tank (hot water tank/stratified storage tank) which is operated at temperatures higher than 60 °C either permanently or temporarily. Also suitable for stratified hygienic storage and bivalent service water tanks. If used with older existing systems (for example, hot water tanks with wood, gas or oil-fired burner), controlled circulation to meet actual demands results in high energy savings. The hot water circulation system is optimally suited for use with renewable energies, primarily in single and two family homes.

Description

Compact, pre-assembled and tightness-tested hot water circulation system in form-fit heat insulation part, consisting of thermal mixing valve with integrated scald protection, circulation pump with all necessary functional components such as shut-off valves, variable safety group assembly, backflow preventer and connection parts as per DIN 1988.

The hydraulic separation of the flow paths ensures correct operation of the circulation pump since it has to overcome only one backflow preventer in any operating condition and thus avoids mixing of the cold water inlet in the circulation path.

Technical specifications

System connections	G¾ female
Connection lance / bypass	G½ female
Operating temperature range	Medium: Max. 95 °C
Mixing temperature	35/60 °C
System pressure	Max. 10 bar
Flow coefficient Kvs	1.6 m³/h
Safety valve	Opening pressure: 6 bar
Material	Brass
Insulation	Polypropylene EPP
Dimensions	W x H x D: Approx. 320 x 300 x 146 mm

Technical specification circulation pump Wilo-Star-Z NOVA

Degree of protection	IP 42
Supply voltage	AC 230 V, 50 Hz
Power input	2–4.5 W

Unwanted, inefficient incorrect installations of stratified storage tanks

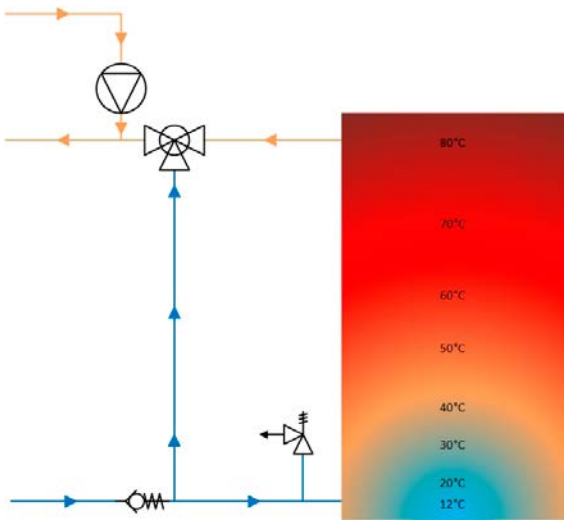
As a result of the increasing use of renewable energy in domestic technology applications, the number of hygienic stratified storage tanks with a temporary operating temperature of more than 60 °C is also on the rise. In order to connect such tanks in a more efficient way, to keep the thermal layers and to limit the outlet temperature of the hot water, the installation of the service water line involves several fittings and connection parts.

Optimum design of the circulation can often be a major challenge in terms of hydraulics and logistics. For example, the service water connections to the water heater have been made according to the old, inefficient logic or important parts have been "forgotten".

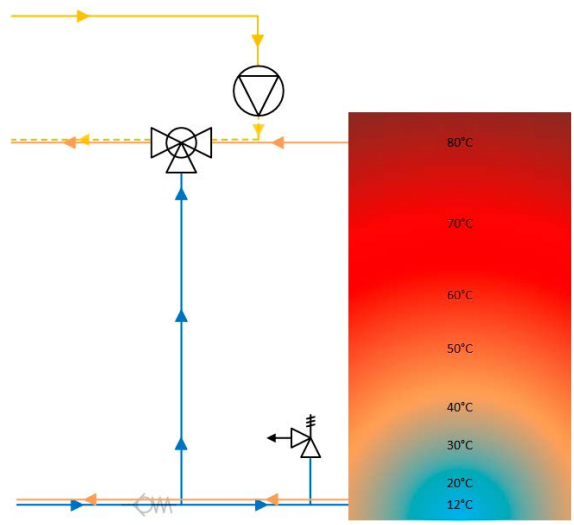
In most cases, the circulation of stratified storage tanks is connected to the cold water inlet of the hot water tank. This way, the hot circulation water of the return flows through the lower area of the stratified storage tank which is usually cooler. In the lower area, the returning circulation water is cooled - only to be heated up again in the upper thermal layers. The consequence: The storage medium is evenly heated – which destroys the important thermal layering. The high energy density in the upper thermal layers is lost. In the most adverse case, the function of a solar system is prevented or extremely limited in the transition period.

Typical implementation issues:

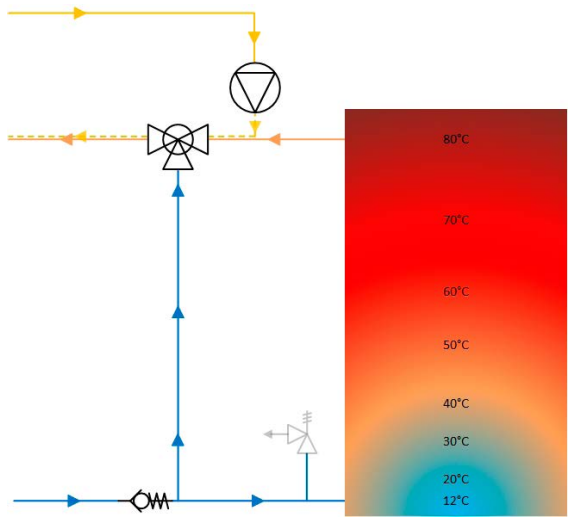
Incorrectly installed circulation pump



Incorrectly installed circulation pump and "forgotten" backflow preventer



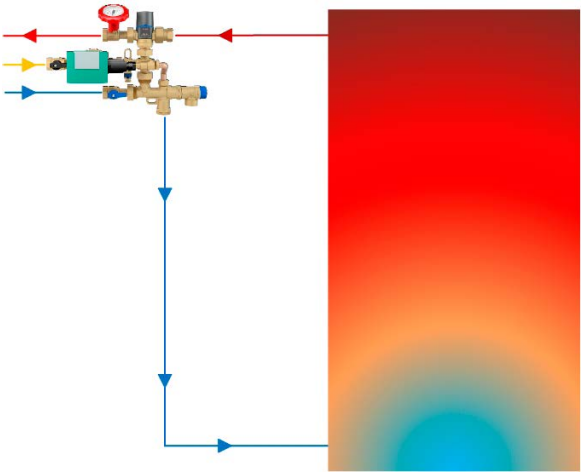
Incorrectly installed circulation pump and "forgotten" safety-related equipment

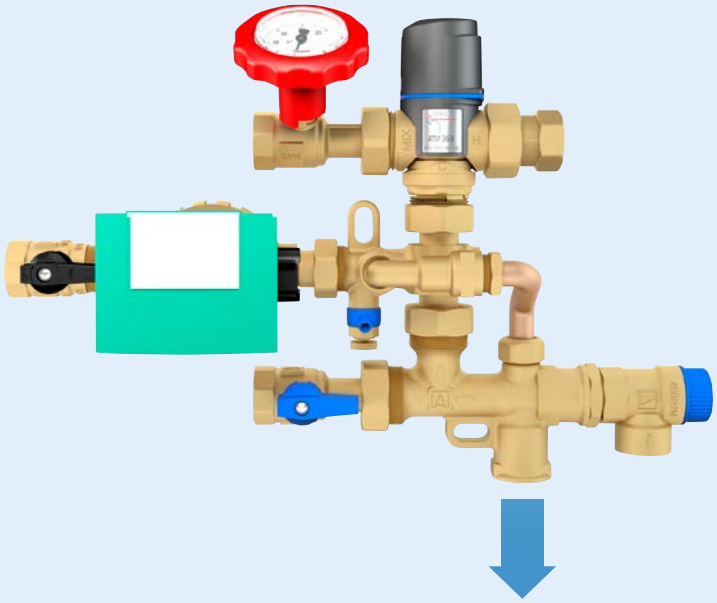


WZS 100 ensures reliable function and efficient operation

With the use of WZS 100, the return part of the circulation line has a direct connection to the cold water inlet of the thermal mixing valve. Depending on the water temperatures at the inlets of the mixing valve, they will open or close the hot water inlet and the cold water inlet to a higher or less high degree. A partial volume of the returning circulation water flows directly to the cold water connection of the mixing valve. Depending on the mounting situation (internal/external circulation), the other partial volume can be resupplied upstream of the tank.

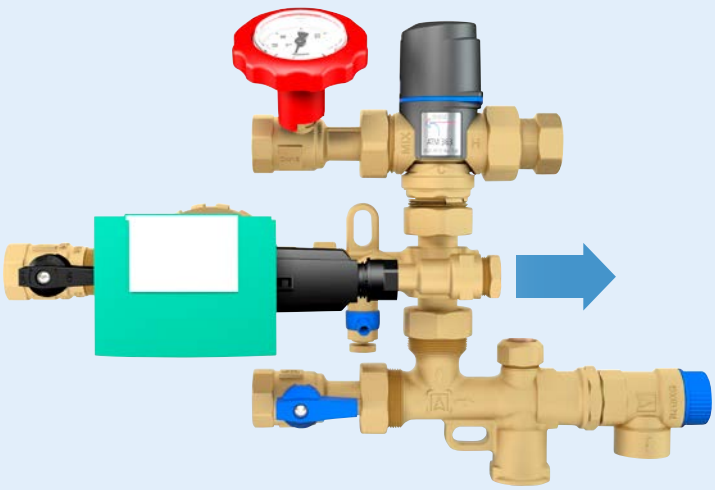
WZS 100 thus allows for intelligent circulation distribution without back-circulation and without "mixing" of the temperatures in the stratified storage tank. With minimum installation effort, all possibilities of advanced stratified storage systems for efficient heating of water can used to their full potential.





Internal circulation
(as delivered with "bypass")

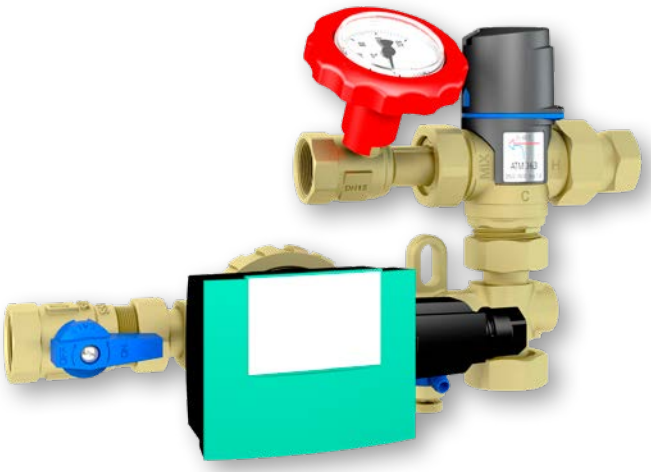
In the case of internal circulation, a partial volume is supplied to the cold water inlet of the hot water storage tank via the bypass of the circulation unit.
In the thermal mixing valve, the two partial flows are mixed together again to the adjusted reference temperature. This saves energy since only the amount of heating energy really required to ensure the desired water temperature is actually used.



External circulation
(WZS 100 with circulation lance)

In the case of external circulation, a partial volume is supplied to the stratified storage tank via the circulation connection and reheated in the upper area of the tank via the circulation lance.
In the thermal mixing valve, the two partial flows are mixed together again to the adjusted reference temperature. Since only a part of the circulating water is heated directly in the top thermal layer of the tank, a mixing of the thermal layers is excluded. This results in two benefits: In addition to high energy savings, there is always enough hot water available to immediately supply the fittings without annoying waiting time.

Great number of versions:
Assemblies suitable for any situation



Hot water circulation system WZS 75

Compact, tightness-tested hydraulic assembly consisting of adjustable thermostat mixing valve, circulation pump, thermometer and all necessary adapter unions and connection materials.

- For storage tanks with existing safety-related equipment or for retrofitting of systems
- Thermally controlled hot water temperature with scald protection
- Returning circulation water is stratified
- Circulation lance can be connected
- Laborious planning for integration of circulation line is not necessary
- Considerable time savings during mounting

Water safety group assembly WSG 150

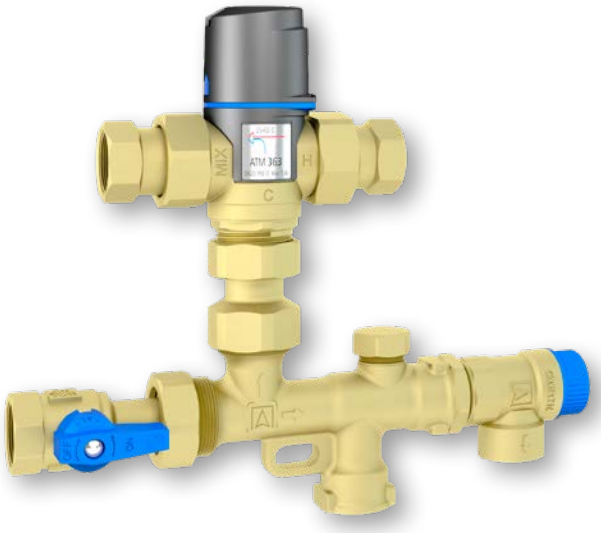
Compact, tightness-tested storage tank connection kit with integrated backflow preventers, shut-off valve and safety valve for installation in sealed heating systems.

- As overpressure device of water heaters and (electrical boilers)
- Extremely compact design – ideal if space is limited
- Easy mounting – even directly to a water heater
- Extensible with the thermal mixing valve ATM 363
- Safety valve can be replaced without sealing material

Thermal mixing valve ATM 363 WMG

Compact, tightness-tested assembly, consisting of an adjustable thermostat mixing valve with flow distributor, lance connection, insulation and all necessary adapter unions and connection materials.

- For storage tanks with existing safety group assembly and pump
- Thermally controlled hot water temperature with scald protection
- Easy mounting without considerable insulation work
- Extremely time-saving as compared to installation consisting of many individual parts



Thermal mixing valve ATM 363 WSG

Compact, tightness-tested assembly consisting of mixing valve, safety group assembly with integrated backflow preventers, shut-off valve and safety valve.

- For solar-heated drinking water heaters and hot water storage tanks with hot water heating according to flow principle
- Advisable if circulation is not necessary or if the water heater already has a circulation connection
- All relevant backflow preventers at the correct positions
- Thermally controlled hot water temperature with scald protection
- Extremely time-saving as compared to installation consisting of many individual parts

Accessories

Circulation lance ZL 2

The circulation lance is a hydraulic connection assembly for tanks with drinking water flow heating to allow circulation mode. A part of the circulation return volume is resupplied to the tank via the lateral circulation connection of ZL 2, heated up by means of the counter flow method and removed via the hot water connection of ZL 2. This is done via the circulation hose located in the heat exchanger pipe of the tank. This ensures that the layers in the stratified storage tank remain intact by returning the circulated water.

- Integrated lance valve, design with no dead space
- Easy connection of stratified combination storage tanks without circulation connection
- Increased convenience due to shorter lead time

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Circulation control
Circulation can be controlled via the circulation controller EC 1 and the circulation switch ZS 2, a timer switch or a button with a relay. Circulation control can be programmed or triggered via the circulation switch. If a circulation switch is used, circulation is activated via brief opening of the hot water tap.

Circulation controller EC 1

Circulation control adapted to actual demand the circulation controller monitors water withdrawal via the circulation switch. After short opening of a tap, the circulation pump is switched on and stopped after an adjustable additional running time has elapsed. Unnecessary periods of operation and energy costs can be reduced.

- Demand-controlled pump control for hot water circulation
- Menu-guided controller adjustment
- Legionellae protection function
- High energy savings due to intelligent pump control

	Part no.
Hot water circulation system WZS 100	**68405**
Hot water circulation system WZS 75	**68416**
Water safety group assembly WSG 150	**68412**
Thermal mixing valve ATM 363 WMG	**68417**
Thermal mixing valve ATM 363 WSG	**68419**
Accessories	
Thermal mixing valve ATM 363, G1 AG, 35/60 °C, without adapter unions	**78244**
Circulation lance ZL 2	**68406**
Circulation controller EC 1	**68407**
Circulation switch in pipe piece ZS 2	**68408**

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The company

AFRISO, founded by Adalbert Fritz in Schmiedefeld, Germany in 1869, is an innovative, medium-sized company with a total staff of over 1,000 worldwide, over 550 of which are employed at the four German sites.

Traditionally, we manufacture measuring and control devices for temperature and pressure. For more than 50 years now, we have also been manufacturing measuring, control and monitoring devices and systems for environmental protection:

- Level indicators
- Overfill prevention systems
- Leak detectors
- Fittings for heating systems
- Flue gas analysers

Headquarters in Güglingen (Germany)

Our leading-edge, market-oriented products and innovations result from our comprehensive know-how, a highly motivated and qualified staff and the fact that we understand what the market needs.

Our portfolio covers everything from a comprehensive range of standardised, proven off-the-shelf products all the way to high-grade customised solutions.

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- Highest quality levels
- National and international approvals

AFRISO stands for leading-edge brand products to meet your requirements.

Environmental management as per ISO 14001 is a matter of course for AFRISO.

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Technology for Environmental Protection
Measuring. Controlling. Monitoring.

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