Leakage management deals with precisely this point. As a group of recognized partners in water management, KROHNE Messtechnik, Phoenix Contact and VAG-Armaturen GmbH have taken on this task to provide the perfectly-tailored solution for each individual customer.

The major part of the losses is not caused by large pipe bursts but by the great number of minor leaks. According to experts’ estimates, about one third of the available drinking water resources is lost while the water is being transported to the end consumer. This results in enormous financial losses. Additionally, the scarcity of valuable drinking water becomes worse in dry regions. If world-wide losses could be halved, this alone would make the drinking water supply of an additional 90 million people possible.

Trying to detect and eliminate all leaks can usually neither be realised nor financed. And if, besides that, a part of the leaks is eliminated, the pressure exerted on the remaining ones rises and increases the loss there.

Water distribution and leakage minimization by means of leakage management.

KROHNE Messtechnik GmbH
headquartered in Duisburg. Development, production and sales of products in the field of flow, level, pressure, temperature, analytics and pressure measuring technology. KROHNE is one of the market leaders in industrial process measuring technology.

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Phoenix Contact Deutschland GmbH
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VAG-Armaturen GmbH
is a German company with more than 140 years of experience in the design and manufacturing of heavy-duty valves for all kinds of water applications. With more than 1,200 employees worldwide, the valve manufacturer is a globally active company and is setting new standards as a solution and system provider in water and wastewater technology.

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Process automation and control systems from Phoenix Contact

• Easy commissioning with the industry-specific water process library Waterworx
• Easy integration of measuring and control technology with pre-programmed function blocks
• Permanent system overview with integrated visualisation on-site and in the control room
• Reliable transmission of all relevant process data almost all communication networks such as mobile, public telephone network, wired systems, radio systems
• Support of all standard communication interfaces such as PROFINET®, PROFIBUS®, Modbus
• Reliable remote communication via standardised protocols such as IEC 60870-5-101/104 and ODP

Valve technology from VAG

VAG PICO® Pilot Operated Control Valve

• Pilot operated control valve for the regulation of pressure and flow rates in service areas without external power supply
• Adjustable control characteristic of the valve to the respective operating conditions
• High functional reliability due to a corrosion resistant coating system
• Compact valve design allows for quick and easy maintenance
• Valve is designed on the basis of the operating data, resulting in high cavitation resistance
• All materials including the complete valve can be used in drinking water applications
• Available nominal diameters: DN25-600 / 1”–24” with various designs to PN25

Measuring technology from KROHNE

• Battery-powered bidirectional water meter WATERFLUX 3070 C IP68 with integrated pressure and temperature sensor without the need for inlet and outlet sections (DN25-600 / 1”–24”)
• KSG42 datalogger and GSM module for remote data transfer via GPRS
• OPTIBAR 1010 C, pressure transmitter with recessed diaphragm for high overload and temperature stability, to obtain reliable pressure measurements for leak detection in networks
• OPTIFLEX 1100 C, cost-effective 2-wire level meter (guided radar) for storage applications or standard process applications
• OPTIWAVE 5200 C, 2-wire level meter (FMCGW radar) for liquid applications
• OPTISYS CL 1100, measuring system for free chlorine, chlorine dioxide or ozone with automatic sensor cleaning, ideally suited for reliable measurements in emergency chlorination
• Threaded resistance temperature assembly OPTITEMP TRA/TCA-S11 for general applications

WATERFLUX/uni00A03070 C IP68 with integrated pressure and temperature sensor without the need for inlet and outlet sections (DN25-600 / 1”–24”)

Battery-powered bidirectional water meter
The drinking water is fed into the network, for example, via a high-level tank. Installed level meters always ensure the safety to provide enough water at all times. The chlorine measuring system installed in the high-level tank also ensures that the legally prescribed limit value for free chlorine is maintained or not exceeded – even at the infeed point to the network. The water temperature is also measured, if required.

Manholes in the water supply are however often found in hard to reach and remote locations without the possibility of a power supply. Operators therefore face the challenge of building a leakage management system which requires no external power supply.

Battery-powered water meter with integrated pressure and temperature sensor by KROHNE, control valve controlled by the medium-conveyed by VAG and a battery-powered GPRS data transmission module enable the exchange of data from the field level to the control system with the control technology by Phoenix Contact.

Depending on customer requirements and the nature of the supply network, various solutions are available which can be operated through the interaction of the individual components by KROHNE, Phoenix Contact and VAG.

**Flow-based control**
The downstream pressure directly behind the control valve is regulated according to the current water consumption in the supply area.

**Constant control**
A constant downstream pressure is set behind the control valve regardless of flow fluctuations.

**Time-based control**
At least two different downstream pressure levels are stored, e.g. day and night (compensation of peak demand).

**Critical-point control**
The setting of the minimum supply pressure where typically the lowest pressure values occur in the supply network. The feed pressure can be reduced to the lowest realizable value without falling short of the required minimum pressure level (= critical point).

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**Advantages**
- Reduction of water losses and burst pipes through consumption-oriented pressure control in the distribution network
- Monitoring of the distribution network for the early detection of new pipe bursts based on the flow rate
- Increased life expectancy of the piping material and collection of condition-related information about the distribution network
- Reliable transmission of all important process data through standardised communication protocols
- Reliable leakage management thanks to proven complete solutions by KROHNE, Phoenix Contact and VAG
- Minimization of installation costs through battery-powered water meters and control valves
- Optimized water balance and reduced water losses through the use of the leakage management systems
- Simple engineering and easy commissioning thanks to coordinated drive, measuring and control technology

**Visualisation**
- Flowmeter
- Level meters
- Temperature assembly
- Chlorine measuring system
- Pilot operated control valve
- Flowmeter
- Control technology