

## VAG LeakMonitoring 4.0

with VAG LeakControl and VAG LeakFinder





### The online net monitoring solution: VAG LeakMonitoring 4.0

Recognising leaks in water supply networks early on has many positive effects – a more hygienic network, ecological benefits, and above all cost savings. This is why it's important for municipalities and water utilities to install efficient control mechanisms to locate leaks as quickly as possible and to reduce losses to a minimum.



Operating principle of VAG LeakMonitoring

### Keeping an eye on leaks

VAG uses innovative technologies to offer you optimised, fully automatic monitoring for your supply network. The system immediately recognizes flow pattern changes that indicate pipe damage, allowing you to react immediately. Long, costly lead times for leak detection and searches for broken pipes are finally a thing of the past.

The monitoring system is installed by our experts and handed over ready for operation. Training for your employees and reliable support are also included in our comprehensive service package.

### The hard-/software: VAG LeakControl

Due to many years of experience with the issue of network management, VAG offers an integrated concept for network monitoring, tailored to your requirements. It includes the components measurement technology, metering point positioning, measurement data analysis, and softwaresupported leak perimeter determination.

Correctly arranging metering points in your supply system is the basis for efficient monitoring. The LeakPositioner software uses a hydraulic computing network model to arrange flow metering points in the optimal positions in complex urban networks. Sensors monitor night time flows relevant for leak detection fully automatically and then send the measurement data to a web server over cell phone networks. Your data is password protected and can be accessed over the internet.

Alternatively, the data can also be transferred to a control room through your own infrastructure (e.g. telecommunication cable or SCADA system).

Already available metering points can be integrated into the overall monitoring concept. 24-hour monitoring is also easy to realise.

### Effective and simple to use

A leak can cause different changes in the flow pattern at different metering points. VAG LeakControl shows the actual flow pattern changes, evaluates these and generates clear daily value curves

These so-called hydrographs can be used to immediately detect even the smallest leaks, can be evaluated based on the quantity of water lost and be allocated to a defined area of the network. The leak search can then be limited to the network area affected, minimising the effort for the actual location process.



Operating principle of VAG LeakControl

LeakControl significantly reduces lead times for leak detection, making the repair and location of even minor leaks an economical choice.

The communication between the web server and the local measurement unit allows you to control the system remotely from your office. On the one hand, new measurement times for each individual measurement device can be determined without travelling to the location in question.

On the other, any damage (power supply or sensor cable cut) can be reported to a smartphone or tablet through the web server, so that short-term measures can be initiated.

### Operating principle of VAG LeakControl

In the event of a leak, several ultrasonic flowmeters located in an area detect different increases of the flow rate. These differential measurements are compared and evaluated using the calibrated hydraulic model.

# Ultrasonic flow metering: sound-transit time differential measurement principle

This measurement principle uses two ultrasound sensors both of which serve as a sender and a receiver. If the flow velocity is the same, the transit time of the ultrasonic pulses propagating in flow direction is shorter than that of the ultrasonic pulses propagating against flow direction.





### The software: VAG LeakFinder

To make the detection of the size of a leak and its geographic localisation even more efficient, VAG offers the suitable tool with the LeakFinder software. Based on a calibrated hydraulic computing network model and the use of mathematical algorithms, the behaviour of the network is analysed statistically.



The area monitored: LeakControl Area

LeakFinder Area, reduces the leak detection area by up to 90%

### Web-based software: Access at any time, from anywhere

VAG's LeakFinder software is the right tool for mapping the sizes and geographic localisation of leaks even more efficiently.

The VAG LeakFinder is a web-based software tool allowing the fast and precise detection of leaks in the water supply network and their localisation with a very high level of accuracy.

Network conditions are statistically analysed based on a calibrated hydraulic computing network model. If an event in the network (leak, construction works ...) causes a change in flow patterns, VAG LeakControl measures this data and analyses it using a big data approach, then alarms the user.

The cloud-based software displays the associated location and calculated quantity of water lost. The geographic location of the leak is shown clearly using Google Earth, to make approximate locating even simpler. This reduces the effort of pinpointing leaks with the correlator to a minimum.



Cloud-based access to report





With the VAG LeakFinder software, leaks can be located accurately within a few metres.



minor change of the flow rate

considerable change of the flow rate

Leak point suggested by VAG LeakFinder

### Benefits of the VAG LeakFinder

- Suitable for large DMAs
- Ideal for large non-discrete zones
- Detection of small leaks
- Reduction of leak location time
- Accurate leak localisation
- · Accurate leak sizing
- Suitable for every pipe material
- Analysis based on exact flow metering
- Compatible with virtual DMAs
- User-friendly web-based tool
- Data access and control via PC, tablet or smartphone
- Highly economic method
- Considerable time savings



The sensors monitor night time flows relevant for leak detection fully automatically and then send the measurement data to a web server over cell phone networks. Your data is password protected and can be accessed over the internet.



### **Comparison with conventional methods**

Unlike conventional water loss monitoring methods (picture on left), VAG LeakControl (picture on right) does not work with the complicated and time-consuming DMA structure, but measures the influence of a leak on its environment with the aid of high-precision flow sensors. Virtual DMAs are generated automatically during the measuring process.



Conventional water loss monitoring with strict DMA structure

### Comparison of loss monitoring with conventional methods and with VAG LeakFinder

Conventional loss monitoring	Loss monitoring with VAG LeakControl
Stationary measuring of inflow rates from networks, district networks (DMA) with periodic or case-by-case use of loggers and correlators	Online water loss monitoring for the sustainable reduction of leakage duration
Monitoring of all inflow pipelines in hydraulically separated zones or district metering areas (DMA)	Monitoring of selected pipelines within a virtual zone
Expensive and time-consuming installation of flow metering devices	Installation of ultrasonic flow meters during operation (clamp-on technology)
Hydraulically separated network structure – influence on hydraulic efficiency due to closed gate valves, possible stagnation	Open network structure – no reduction of hydraulic efficiency as a result of closed gate valves and dead-end sections
Extensive leak detection activities when the night inflow rate rises; leakage often persists for a long time in case of periodic monitoring	Online feedback when leak is detected with quantification of the amount of leakage and geographic localization of the leakage point



Water loss monitoring with VAG LeakControl without DMA (virtual DMA)

### Effective immediately and sustainable

Your network knowledge and our know-how are the key factors for developing an economical monitoring concept. Investments quickly pay off thanks to lower operating costs and the immediate benefits of approximate localisation and loss minimisation.

As an added bonus, LeakControl brings a lot of light into the darkness of your pipe network. And this is why you too can benefit from the advantages of this future-oriented water loss monitoring system!

### Inexpensive installation

The LeakControl ultrasonic sensors can be easily installed on any pipe in a short time and without operation interruption – no matter the pipe diameter or material. Sensors can be installed in available shafts or underground.

