

# OPTISONIC V6

Ultrasonic gas meter for non custody transfer



**KROHNE**

▶ *achieve more*

- ▶ 4-reflection parallel chords for high accuracy
- ▶ 2-reflection chords for extra diagnosis options
- ▶ Built-in redundancy through dynamic chord substitution
- ▶ Performance monitoring and fouling detection
- ▶ Swirl compensation in each measuring plane



## Achieve more with KROHNE.

Welcome to KROHNE. As a leading company in the area of process measuring technology, we're at home in a wide variety of sectors worldwide with our range of products and complete solutions.

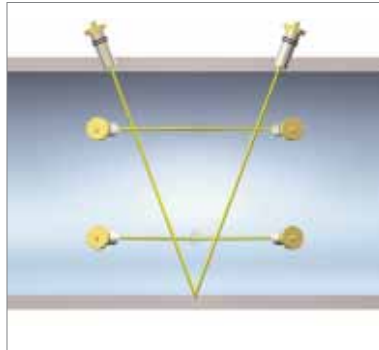
The name KROHNE has stood for innovative and reliable process measuring technology solutions since 1921. Our range of products now covers a large section of measuring technology, from measurements at single points to complete solutions for systems. Our portfolio is rounded out by comprehensive offerings for service and consulting.

Over 100 engineers work at KROHNE, applying their specialist knowledge and experience every day to develop new products. It's no wonder that our pioneering innovations have energized the market time and again.

In 1961 we developed and marketed the electromagnetic flow meter. In 1998, with the ALTOSONIC V, we introduced a highly precise, ultrasonic custody transfer measuring device for the oil and gas industry. The next revolution came in 2003, as the UFM 3030, the first three-beam ultrasonic flow meter for the process industry, rolled off our production line.

With the OPTISONIC V6, KROHNE combines the advantages of the parallel chord concept and the reflection technique, setting a new standard for ultrasonic gas meters.

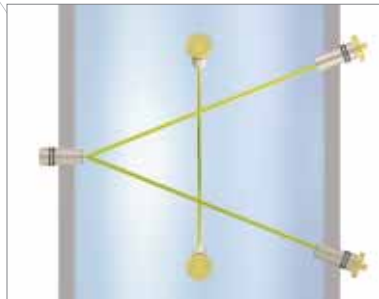
## The best of both worlds: The parallel chord concept and the reflection principle.



The quality of an ultrasonic meter can often only be seen after several years. But sometimes it is apparent after just a few seconds, just by having a look at the path configuration. Over the past two decades, both the parallel chord concept and the reflection principle have been established in the market.

Both concepts certainly have advantages, but they also have disadvantages. Although in theory a greater number of chords increases accuracy, in practice the number of chords is limited due to economic and practical concerns.

Our engineers in Dordrecht in the Netherlands have put both concepts under the microscope – and brought together the best of both worlds in a single device.



The result is the OPTISONIC V6: its 4-reflection parallel chords in two planes enable highly precise and reliable measurement, while its 2-reflection chord allows access to extra diagnostic functions.

This unique combination of the parallel chord concept and the reflection technique improves measurement quality for the operator – both in terms of cost-efficiency and in terms of precision and reliability.

Self-cleaning transducers also contribute to the finished concept. The key advantage of the OPTISONIC V6 is that all the transducers are arranged on one half of the meter housing. This feature means that you can activate the self-drainage function just by rotating the meter slightly – an indispensable advantage for ensuring smooth running of the ultrasonic transducer when the meter becomes dirty or there is damp gas.

And what if you need to unexpectedly change an ultrasonic transducer? It's simple thanks to the tool with integrated isolation valve, which lets you change transducers without stopping operation.

## More information, increased safety – thanks to performance monitoring

### Superior chord design – better diagnostics?

The unique chord arrangement of the OPTISONIC V6 enables it to generate diagnostic data for places where traditional ultrasonic meters gathered too little information or none at all: firstly at the pipe wall itself, scanning with reflection. Secondly, at the bottom of the pipe. This data is gathered using a separate diagnostic chord.

This extensive diagnostic data allows the OPTISONIC V6 to carry out self-monitoring, which sets the standard for other devices in terms of performance monitoring.

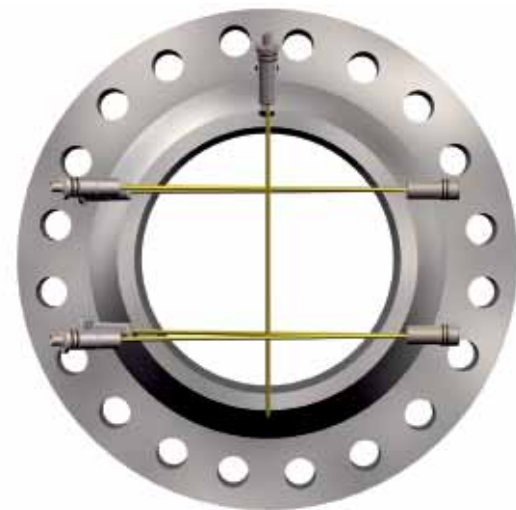
### Analysis of current data and trends in a system

The performance monitoring data is verified twice: once for current data and once for trend analysis. For the current data analysis, error analysis is carried out in 1 second cycles in the ultrasonic meter itself. Trend analysis is carried out in 24-hour cycles in the KROHNE Care™ system. This analysis recognizes long-term process changes, such as accumulated dirt, and it investigates whether possible contamination is affecting accuracy.

In addition to the trend data, OPTISONIC V6 also stores important event data. This includes information about the factory inspection, the pressure calibration, commissioning, as well as periodical meter checks.

The advantages of performance monitoring are clear. It allows maintenance at regular intervals to be replaced by maintenance determined by the condition of the equipment. This means that the interval between periodical high pressure calibrations can be systematically increased. This saves time, stress and staff. It is also a big plus on the balance sheet.

As times change, so do the requirements for ultrasonic meters. Today it is assumed that an ultrasonic device measures accurately and precisely, but what about long-term reliability? After all, this depends on more than just the ultrasonic meter itself. Process conditions may change in the measuring section and dirt, which may collect on the meter over time, can also have a negative effect.

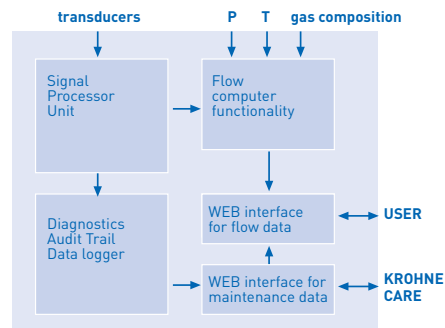


# Vision is nothing without control: KROHNE Care™

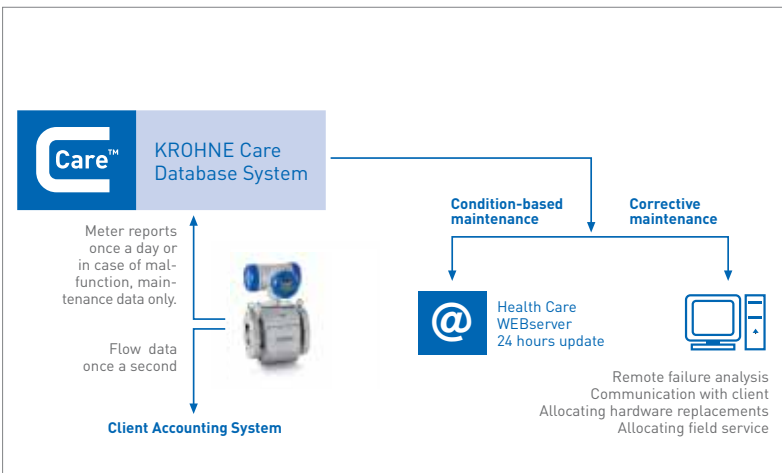
We know from our many years of market research that many of our customers want a system that defuses critical situations before they become problematic. Another aspect is that the rapid progress of technology makes it difficult to keep the service level of maintenance staff constantly up to date.

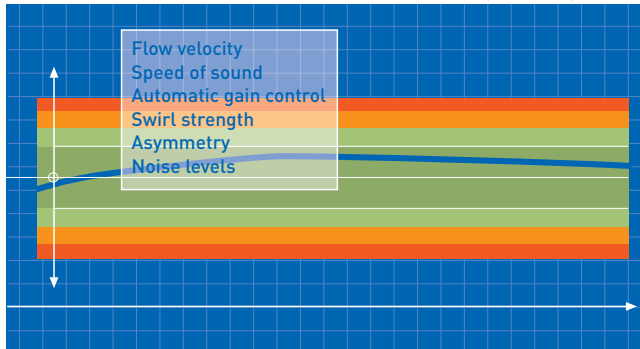
The unique architecture of the OPTISONIC V6 allows us to offer for the first time a service concept that fully meets both requirements – KROHNE Care™.

## Separation of maintenance data and flow data



Functional scheme OPTISONIC V6





### Separation of diagnostic and flow data

The automatic remote monitoring system is based on the separation of diagnostic parameters and flow data in the OPTISONIC V6. This means a higher measure of security for our customers in both senses of the term, as only the diagnostic data is read (read only). However, access to flow data is limited to the client. To put it simply, only you, as the client, have access to the complete data set from the meter.

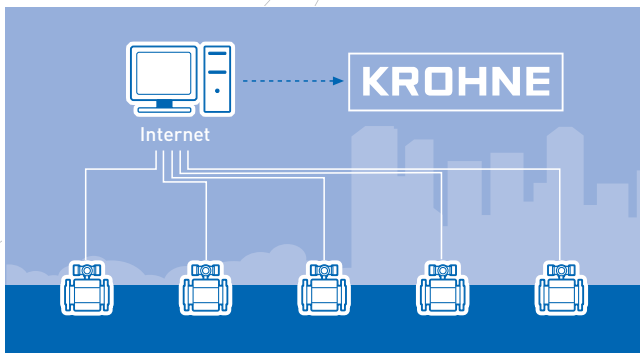
### In focus: Absolute, chronological and trend data

The diagnostic data is made up of absolute data, such as the serial number of the ultrasonic flow meter, the hardware, software and configuration data. The system also gathers chronological data, such as the parameters at the factory inspection, commissioning and other service events.

All significant data is submitted to trend analysis in a 24-hour cycle. This means that any important processes in the pipe or at the bottom can be better analyzed, and problems can be resolved before they arise or reach a critical level.

In such cases, the KROHNE Care™ monitoring generates an error message. The client is informed immediately, so that the problem can be resolved as quickly as possible. They have the option of providing the relevant IP address for servicing, and a technician would not need to visit the site to analyze the problem.

And when everything is running smoothly? You can print out a current health check certificate at any time from the WEblog for the meter for forwarding to your quality control department.





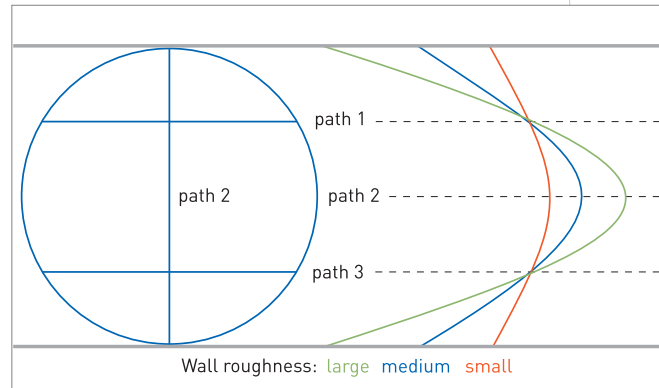
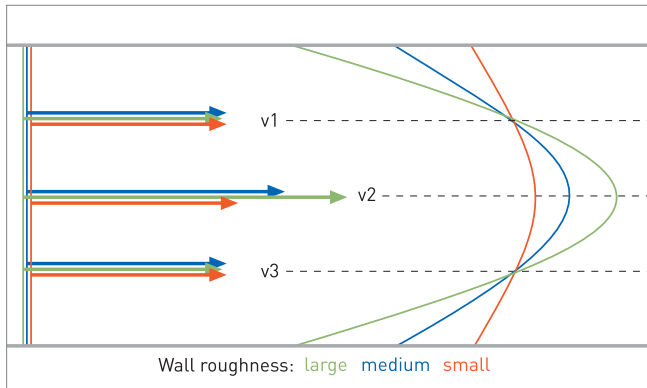
## Just in case: Dynamic chord substitution



- Another safety plus for our customers is the built-in
- redundancy through dynamic chord substitution. If an
- acoustic chord unexpectedly fails, the system accesses
- the ratio of the three individual chord speeds stored in
- the memory before the failure to reconstruct the gas
- speed of the chord that failed.

- This all happens in a tiny fraction of a second, and
- running operations are not affected in the slightest.
- If the failure of the affected chord continues, an alarm
- message is generated. A KROHNE Care™ worker con-
- tacts you immediately to resolve the problem quickly
- and reliably.

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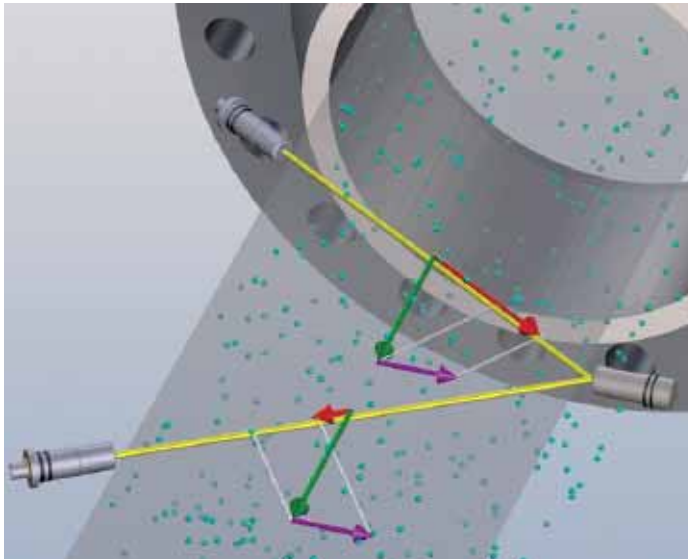
## The better concept wins

The challenge was to produce a meter for non custody transfer applications with extra diagnostic functions. Being a pioneer in ultrasonic flow measurement KROHNE utilised their know-how of their ultrasonic liquid flow meters into the OPTISONIC V6. The OPTISONIC V6 takes advantage of a proven concept by having two double chords at the mid radius position.

The OPTISONIC V6 is now setting new standards, as it is equipped with three measuring planes with reflecting chords. This enables independent swirl compensation in each plane. Measuring errors are thus kept to an absolute minimum. Also: the doubled chord length due to reflection means that timing is even more exact than previously.

An added plus: the mid radius chord velocities remain extremely stable under changing wall roughness conditions while the center chord velocity changes accordingly. This means that when the pipe wall becomes rougher, the speed measured by the two mid radius chords doesn't change while the speed of the center chord will increase and indicate an increased wall roughness. The operator receives reliable, reproducible and superior quality measurements, in the long term as well as the short term.

## Open to new things: User-friendly systems



For installation, commissioning, operation, communications or compatibility, user-friendliness has always been an important consideration at KROHNE. The OPTISONIC V6 carries on this tradition.

In the case of compatibility, for example, you may already have a standardized infrastructure in your measuring stations, but you still want to take full advantage of the benefits of our latest innovation. That's easy to do, because the OPTISONIC V6 is compatible with the installation lengths and data protocols of earlier leading ultrasonic meter manufacturers.

Another example is commissioning. After installation, the Plug & Play electronics automatically run a self-test. Each OPTISONIC V6 is supplied with user friendly software to enable a laptop to communicate with the meter. With the right authorization it will be possible to monitor the meter and log data.

Wired-in safety mechanisms and coded signal transfer rule out misuse from the start.

## Operating conditions

	<b>OPTISONIC V6</b>
<b>Process conditions</b>	Natural gas, LM < 0.3
<b>Ambient temperature</b>	-40°C ...+65°C / -40°F ...+150°F
<b>Process temperature</b>	-50°C ...+80°C / -58°F ...+175°F
<b>Process pressure</b>	PN4 – PN150 (ANSI900), optionally to PN450 (ANSI2500)
<b>Measuring range</b>	≤ 30m/s / ≤ 90 ft/s
<b>Accuracy</b>	≤ ±1%
<b>Repeatability</b>	≤ 0.1%
<b>Inlet run</b>	10D
<b>Outlet run</b>	3D

## Technical data

	Technical data
<b>Sensor housing</b>	DN100 – DN600, 4"…24", other diameters on request 3D body length
<b>Converter</b>	Field version, stainless steel housing with HMI (Human Machine Interface)
<b>Input/output</b>	2x RS485 (MODBUS), 4x frequency output, 1x USB, In preparation: 4-20mA analog, 1x Ethernet

	Approvals
<b>Hazardous area</b>	ATEX: II 2 G Ex d ma IIB T5 resp. Ex de ma IIB T5; zone 0 FM: class1; division 1; group D (pending)
<b>Custody transfer</b>	not applicable



## KROHNE Product Overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Temperature measuring instruments
- Pressure measuring instruments
- Analysis
- Oil and Gas Solutions



[www.krohne.com](http://www.krohne.com)

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