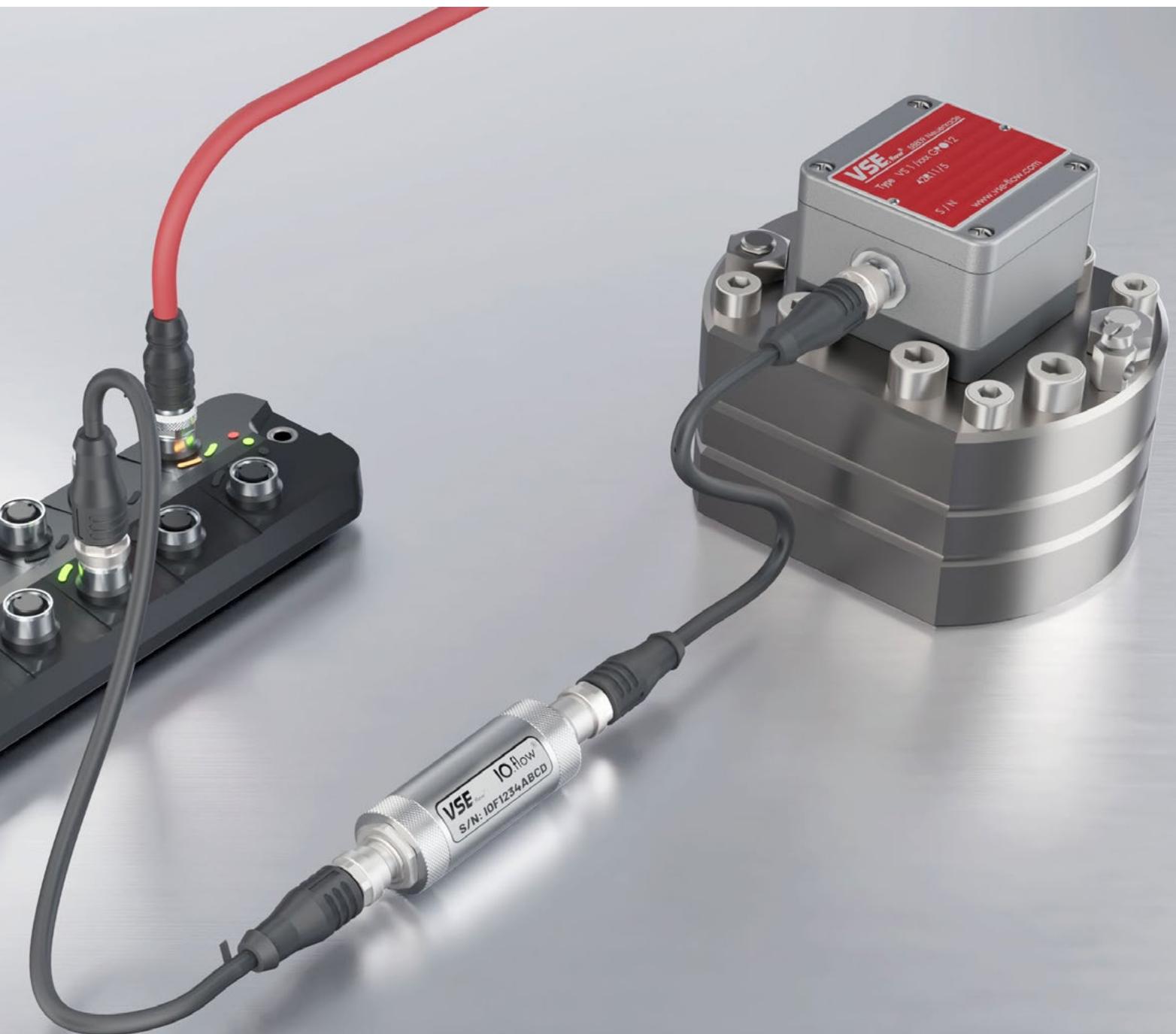


fluid  
technology  
solutions

**VSE**.flow®

# Flow measurement technology

## High precision flow meters and accessories



**VISE**.flow

# Product overview

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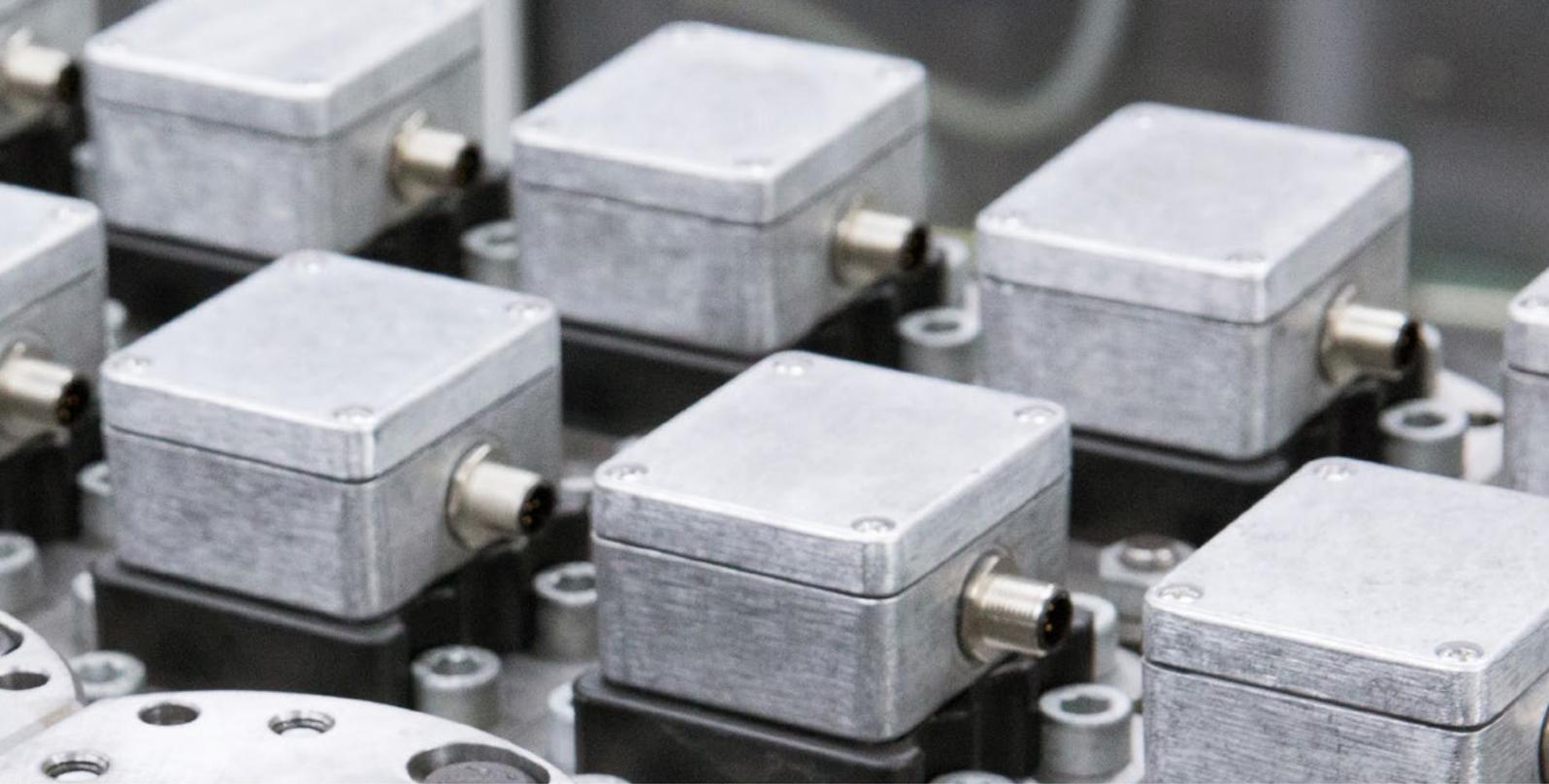
A close-up photograph of several industrial flowmeter components, including square metal housings and circular perforated plates, arranged in a row. The text 'Made in Germany' is overlaid in large white font.

# Made in Germany

## Precise. Reliable. Efficient.

VSE develops and produces flowmeters with maximum accuracy. Our flowmeters are individually designed in different sizes and versions. With our many years of application experience in various fields, we can offer you an optimal as well as customised solution.

Benefit from our knowledge in precise metering for demanding applications. Our flow meters are already being used successfully by numerous well-known international manufacturers.



## Customer requirements perfectly matched

In our inhouse development and construction department, we design technically sophisticated flowmeters and evaluation electronics. We see ourselves as an industrial manufacturer and can make use of modular systems that are adapted by means of technical specifications for each individual order. Even far beyond delivery, we support our customers with a comprehensive service.

## Worldwide service

We are represented by our own subsidiaries in Italy, France, Great Britain, USA, China and India. Additional service partners worldwide also provide customers in all major industrial countries with the necessary know-how and comprehensive application expertise. Our employees and partners are continuously trained to maintain our high quality standards.



Automotive



Aerospace



Battery & fuel cell  
production



Chemical &  
petrochemical



Electronics



Food



Hotmelt



Hydraulics



Marine



Oil and  
gas



Pharmaceutical/  
Biotechnology



Painting system



Process technology



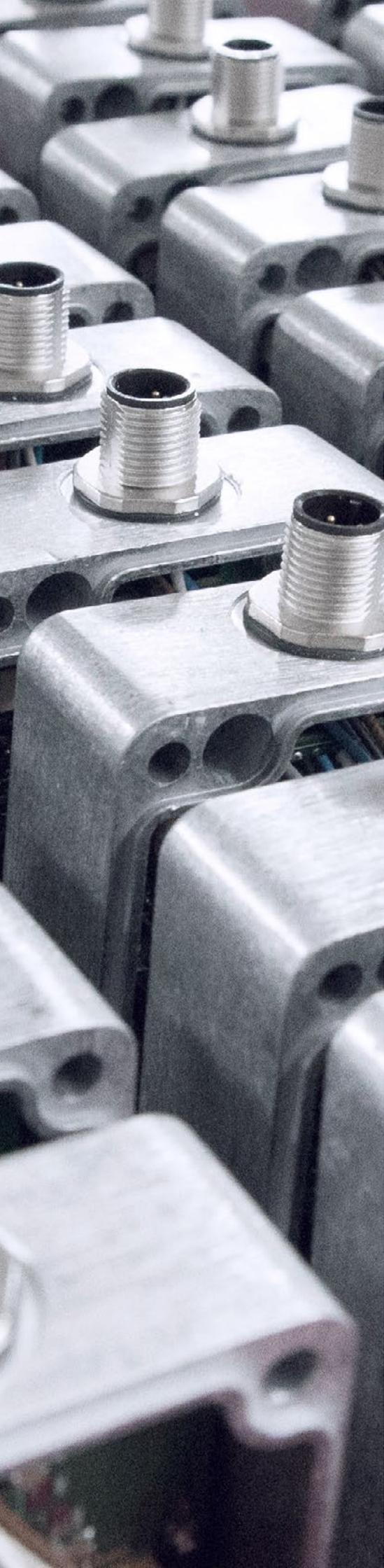
Renewable energy



Test &  
measurement



Water



## Applications

VSE flowmeters are used where the most precise measurement results are indispensable. Through our many years of experience in flow measurement technology, we have developed flowmeters with intelligent sensor technology, which are also specially designed for use with highly viscous and difficult media. We offer the right product for every industry. Whether as a standard version or as an individual customer project, our flowmeters are the ideal solution for your application.



**Unbeatable performance through innovative and exceptional interpolation electronics**

# Gear flowmeter VSI+

VSI+ flowmeters measure the volume flow of the medium according to the gearwheel principle. A gearwheel pair fitted very precisely in the housing forms the measuring unit. The rotation of the measuring unit is recorded contact-free by a signal pick-up system and converted into digital pulses.

The integrated electronics of the VSI produces greatly improved signal quality with harmonic pulse widths. This means that more consistent and vibration-free measurements can be achieved.

**Flow rate**

0,002 to 525 l/min

**Pressure**

up to 450 bar

**Temperature**

-40°C to +210°C

**Frequency**

up to 1.666,7 Hz

**Viscosity**

1 to 1.000.000 cSt

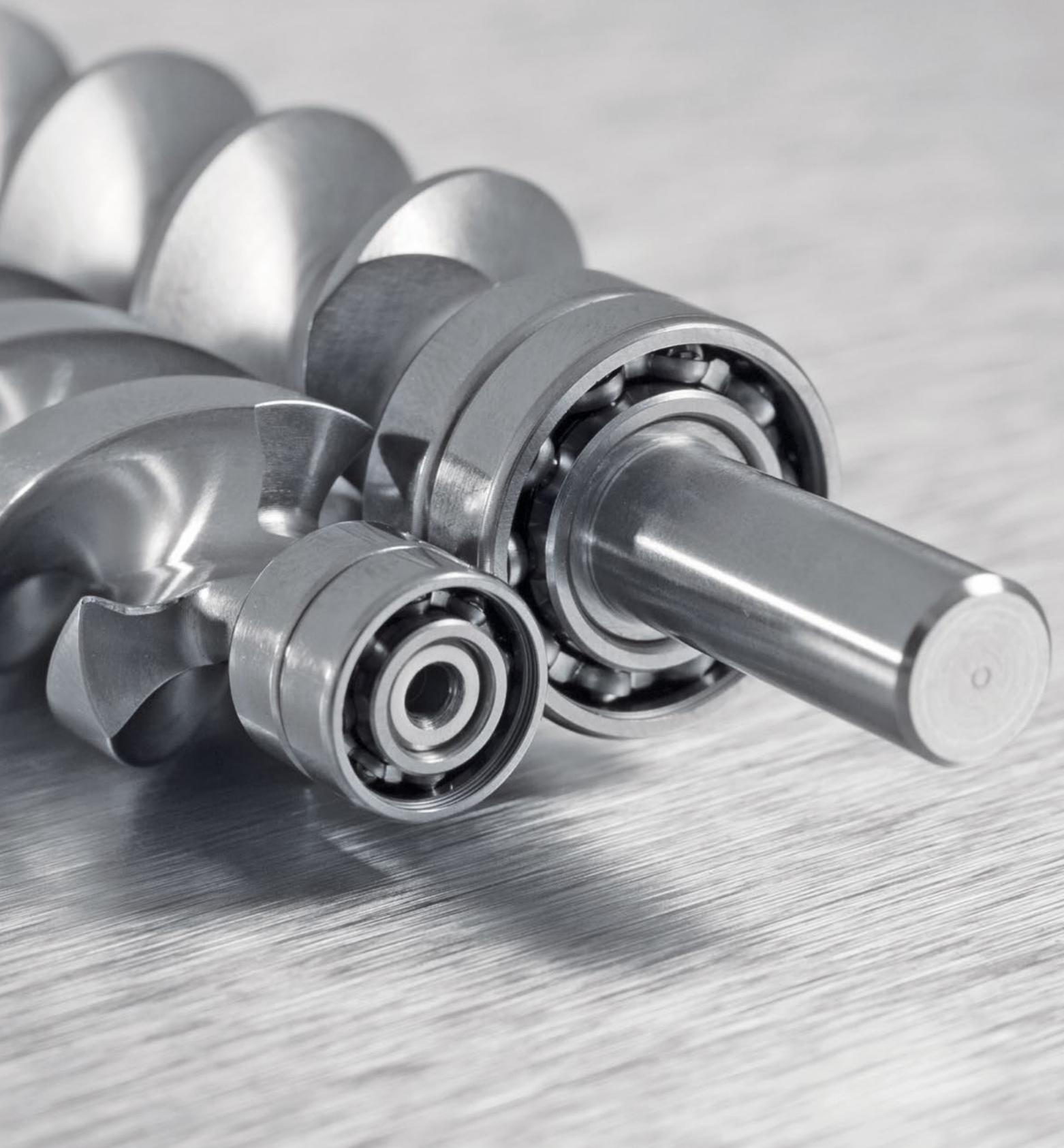
**Measuring accuracy**

± 0,3 % of the measured value  
at viscosity > 20 cSt

## Advantages

- Highest accuracy and linearity
- Short response times
- Large variety (different bearings and materials, EX-protection)
- Digital signal processing of the sensors

**Measurement of the fluid  
with minimal shear,  
and low pressure losses**



# Helical screw flowmeter RS

The helical screw flowmeter RS convinces by a highly precise measurement of the fluid with lowest pressure losses and highest functionality by intelligent sensor technology.

Due to different bearings, tolerances, materials, coatings, electronics and resolution, the RS can be adapted to the respective customer requirements and applications. With the optional high temperature transducer system, use in extreme temperature ranges is also possible.



## Flow rate

0 to 3.000 l/min

## Pressure

up to 450 bar

## Temperature

-30°C to +120°C

-40°C to +210°C with high temperature (HT) sensor system

## Frequency

up to 100 kHz

## Viscosity

1 to 1.000.000 cSt

## Measuring accuracy

± 0,5 % of the measured value  
at viscosity > 21 cSt

## Advantages

- High and virtually viscosity-independent accuracy
- Pulsation-free and precision measurement with minimal shear
- Lowest pressure losses
- Highest functionality due to intelligent sensor technology
- Low response time due to reduced rotating masses



**Ideally suited for  
abrasive and poorly  
lubricating media**

# Gear flowmeter VHM

The VHM series was developed in particular for the highly accurate measurement of abrasive and poorly lubricating media.

The gearwheel flowmeters operate according to the positive displacement principle and are available with different signal resolutions. The flowmeters are also deadspace optimised for (flush-friendly) use in the painting industry. Due to the ATEX and FM certification, the VHM can also be installed in hazardous areas.



## Flow rate

0,01 to 20 l/min

## Pressure

up to 250 bar

## Temperature

-20°C to +120°C

## Frequency

up to 1.000 Hz

## Viscosity

1 to 20.000 cSt

## Measuring accuracy

± 0,5 % of the measured value  
at viscosity > 10 cSt  
± 1 % of the measured value  
at viscosity < 10 cSt

## Advantages

- In particular for abrasive and poorly lubricating media
- Various signal resolutions (single, double, quad)
- Deadspace optimised for use in painting industry
- Best surface finish for flushability
- ATEX and FM certified

A close-up photograph of a precision metal in-line device. The device is made of brushed metal and features a threaded port on the left side. A black sensor probe with a copper-colored band is attached to the right side. The probe has a textured grip and a small square logo with the number '788' inside. The background is a plain, light gray.

**Precise measurement  
as an in-line device**

# Gear flowmeter VSE EF ecoflow

As an economical and lightweight alternative to the VSI+ flowmeter, we have launched the VSE EF ecoflow. The series measures viscous media as an in-line device.

The flowmeters combine the excellent gear and bearing characteristics of the VSI+ series with a simpler two-piece aluminum housing, offering an ideal balance between cost and performance. The VSE EF ecoflow is suitable as the basis for customised versions, as well as for everyday test and production applications. The flowmeters are ideal for low pressure hydraulics, lubrication systems, spray coatings and with high temperature option also for hot melt.

**Flow rate**

0,05 to 150 l/min

**Pressure**

up to 200 bar

**Temperature**

0°C to +80°C

**Frequency**

up to 1.666,7 Hz

**Viscosity**

1 to 10.000 cSt

**Measuring accuracy**

± 2 % of the measured value

at viscosity 21 cSt

## Advantages

- Good reproducibility with sufficient linearity
- Basis of many OEM applications and customised special solutions
- Suitable for everyday test and production applications
- Cost efficient with high performance



**Individually calibrated  
flowmeters for the most difficult  
application conditions**

# Turbine flowmeter VTR

For applications in the most challenging conditions in the oil, petrochemical and chemical industries, we have developed our VTR series turbine flowmeters.

The basic system of the flowmeters consists of a rotor, the housing body and a measurement pick-up. Thanks to the specific inner diameter, the speed of the turbine is directly proportional to the flow. All VTR flowmeters are individually calibrated.

**Flow rate**

110 l/h to 4.500 m<sup>3</sup>/h

**Pressure**

up to 250 bar

**Temperature**

-40°C to +120°C

**Frequency**

up to 1.300 Hz

**Viscosity**

1 to 5 cSt

**Measuring accuracy**

± 0,5%

## Advantages

- For a wide range of applications also in challenging conditions
- Individual calibration of each flowmeter
- Large selection of nominal sizes between DN 50 and DN 100
- Full stainless steel design
- Large temperature and pressure range

**Highest precision  
for flow monitoring  
and evaluation**



# Display devices

With the display units from VSE, the output pulses of the connected flowmeters are evaluated precisely and highly dynamically. The multi-functional units allow accurate monitoring and evaluation of the flow measured values, as well as the volume flowed through. Calculations such as ratio, sum or difference of two flow measuring systems are also realized with the units.

Just like the converters, the display units also have the additional functions of linearisation, filter and limit values to cover any customer-specific requirement. Additional analogue outputs enable precise control or the control of external evaluation units.

## Advantages

- Modes of operation frequency measurement and/or pulse counting
- Calculations A/B, A+B, A-B
- Input frequency up to 250 kHz
- Additional analogue outputs with short conversion times
- 14-16 bit analogue output, configurable for voltage or current operation ( $\pm 10$  V, 0/4 ... 20 mA)
- Linearisation with 16-24 interpolation points
- Switchable filter functions
- Control inputs and fast control outputs (limit values)
- Auxiliary voltage output 5 and 24 VDC for encoder supply
- Graphic display with different colour variants or LED display (6 decades)



**Customised conversion  
of pulse frequencies**

# Converter

Signal converters from VSE convert the pulse frequencies of the volumetric sensors precisely and almost without delay into standardised analogue signals (V, mA). These can be set to the desired frequency or flow range.

With programmable additional functions such as linearisation, filter settings, limit values, etc., customer-specific adaptations for the corresponding requirement are made possible. Conversion of pulse count or volumetric quantity can also be realised. In addition, the measured values are displayed via a serial output interface.

## Advantages

- Operating modes as frequency converter or pulse counter
- Input frequency up to 250 kHz
- 16-bit analogue output, configurable for voltage or current operation ( $\pm 10$  V, 0/4 ... 20 mA)
- Extremely short conversion times
- Linearisation with 24 interpolation points
- Switchable filter functions
- Control inputs and fast control outputs (limit values)
- Serial interface for reading out current measured values
- Auxiliary voltage output 5 and 24 VDC for encoder supply



**Easy parameterisation  
through own software**

# VSE EasyLoader parameterisation software

The VSE EasyLoader was developed to simplify the parameterisation of flow indicators and signal converters. The parameterisation process usually involves many different calculations and expertise for the optimal setting of the devices.

With EasyLoader, the customer gets an easy-to-use tool to program the evaluation unit to the connected flowmeter. Additional options, such as the setting of the analogue output, the filter stages and the linearisation can also be easily changed via the software.

## Advantages

- Simple Windows tool for connection to the VSE evaluation units.
- Specially developed for VSE flowmeters due to integrated flowmeter database
- Simple configuration of settings with only a few input fields
- Integrated formulas and calculations for all units
- New register editor for advanced users  
(with search and filter functions)
- Copy-paste input of calibration data
- Integrated connection diagrams and operating instructions
- Live readout of current readings
- Upload/download of \*.xml files (backups)



**Smart module for  
integrating flowmeters  
in IO-Link systems**

# IO.flow<sup>®</sup> Converter

The IO.flow<sup>®</sup> module enables easy integration of all VSE flowmeters into IO-Link systems. The pulse signals of the preamplifier are measured with high precision by the module and converted into flow and volume values. This data is forwarded to the automation system by the IO-Link master.

The module is available either as a complete system or can be integrated into existing systems as an upgrade/add-on and offers numerous statistical and diagnostic data.



## Advantages

- Accurate and simultaneous measurement of flow and volume
- Compact cartridge module with M12 connectors
- Aluminium housing suitable for oily environments
- High communication rate: COM3 (230.4 kBit/s)
- Integrated linearization function (flow/volume)
- Configurable signal filters (dynamic/smooth), pulse filter
- Statistical functions (operating hours, total volume)
- Events (limit values with optional teach function)
- Easy exchange of devices via data storage

### Oleotec Pressure Monitoring

Oleotec offers a comprehensive range of test couplings, hydraulic hoses and pressure gauges for the safe and reliable measurement of pressure in hydraulic systems.

### DST Permanent Magnetic Coupling

DST's high-performance permanent magnetic couplings, enable contactless power transmission from the motor to the pump. Leakage-free, wear-free and environmentally compliant.



### HBE Hydraulic Component

Whether bellhousings rigid or damped, foot flanges and damping rods – HBE offers a wide range of hydraulic accessories.

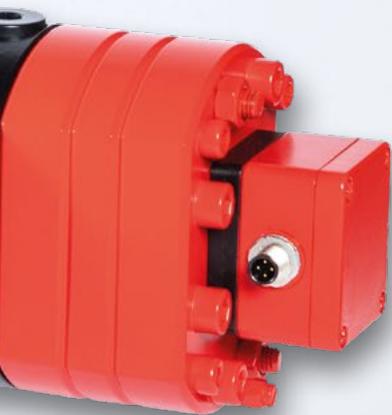
# System solutions

## Customer-specific units

With five production companies, the Echterhage Holding is one of the leading specialists worldwide in fluid technology.

The Echterhage Group combines technical expertise for various products and industries. As part of this group of companies, VSE develops customer-specific complete units for your application from a single source together with Beinlich Pumpen GmbH, DST Dauermagnet-SystemTechnik GmbH, HBE GmbH and Oleotec S.r.l..

Through close cooperation within our company group, customers benefit from system solutions that can be flexibly adapted to the respective application requirements.



### VSE Flowmeter

VSE's high-precision flowmeters are used in a customer- and application-optimised manner for precise volume and flow measurement of almost all pumpable media.

### Beinlich External Gear Pump

Beinlich's versatile external gear pumps are suitable for low-pulsation and exact dosing for applications with the highest precision requirements.

**VSE**.flow®

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