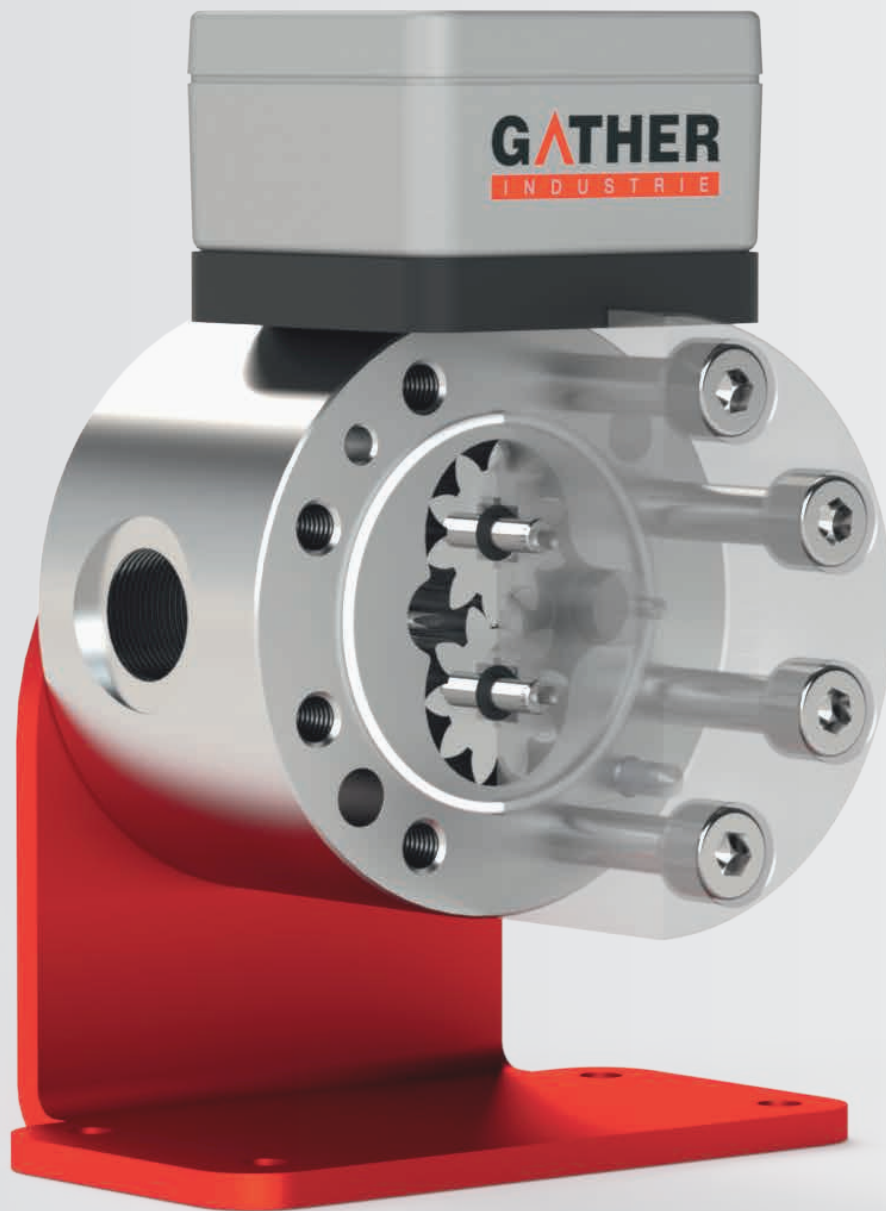


# GATHER Gear Flow Meter

High measuring technology



## GATHER Gear Flow Meter

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[www.gather-industrie.com](http://www.gather-industrie.com)

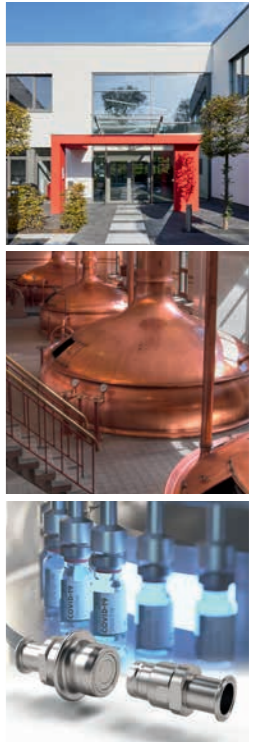
More than 50 years of experience

# In-depth knowledge, broadly diversified solutions

GATHER Industrie GmbH is a medium-sized family business based in Wülfrath, North Rhine-Westphalia – with more than 50 years of experience and a focus on quality and innovation.

As a premium manufacturer of magnetically coupled gear pumps, gear flow meters, metering systems and quick connect couplings for pipes and hoses, the company serves numerous industries and customers, e.g. the chemical, pharmaceutical, medical and food industries. With their expert knowledge in handling non-lubricating liquids, GATHER offers solutions which enable the customer to work with process reliability and durability.

From the “idea to series production”, GATHER Industrie develops not only standard products but also completely new technical solutions according to customer requirements. At the same time we succeed in managing the balancing act from single pieces to the production of small and large series for OEM customers.



**1965**  
Foundation

**50+**  
Employees

**30+**  
Countries

## The GATHER products



Metering and  
process pumps



Gear flow meter



Metering systems



Couplings

GATHER Gear flow meter

# Precise measurement technology for non-lubricating liquids

The **GATHER gear flow meter (ZDM)** is a volumetric flow meter based on the gearwheel meter principle for particularly **non-lubricating, low-viscosity and chemically aggressive liquids**. The movement of the gears is detected by a sensor via the individual gear teeth, in the form of pulses, contactless and hermetically decoupled. The GATHER ZDM is based on the same technology as the GATHER gear pumps which have seen decades of use in a wide variety of industries (including chemicals, pharmaceuticals, food, medicine, etc.).

## TECHNICAL DATA

Linearized measurement accuracy .....	up to ±0.3%
Repeatability .....	up to ±0.05%
Viscosities .....	0.6 to 2,000 cSt
Temperature range .....	-40 to +150 °C
Measuring volume .....	50 ml/min to 22 l/min



1. Measurement of non-lubricating liquids – GATHER materials expertise
2. High measuring accuracy
3. Large measuring range
4. Universal output signals
5. Robust design and long service life
6. CIP-capable

## At a glance

1

### Measurement of non-lubricating liquids – GATHER materials expertise

The combination of high-precision manufactured components and the use of chemically resistant materials is what makes volumetric flow measurement of non-lubricating, low-viscosity and chemically aggressive liquids possible in the first place. The housing and bearing pins are made of stainless steel, Hastelloy® or titanium.

2

### High measuring accuracy

The high precision of the components and the double-disc design in combination with narrow gap dimensions and the smallest tolerance fields lead to a high accuracy of the measuring instrument. The combination of the newly developed linearity compensation and the user-adjustable viscosity adaptation for low-viscosity liquids improve the measuring accuracy up to the highest level. The sum of these features leads to a previously unattained accuracy in the field of measuring non-lubricating and low-viscosity media in gear flowmeters.

3

### Large measuring range

One of the key advantages of this measuring system is, among other things, the large representable measuring range. For example, measuring spreads of up to 1:200 can be displayed. This makes the GATHER ZDM superior to many other flowmeters such as magnetic inductive flowmeters (MID) or Coriolis mass flowmeters (CFM). The low flow resistance,

especially in applications with low-viscosity liquids, is an additional advantage of this wide-range measuring system for highly dynamic measuring tasks.

4

### Universal output signals

In addition to a square wave signal output, the measuring instrument has standardized analogue outputs by default. The configuration settings can be easily made by the user. The calibration factor output is compensated and linearized by the software. This ensures a user-friendly integration into the user's PCT. On delivery - but also after any subsequent factory calibration - there is only one device-specific calibration factor, which does not need to be adjusted during operation and which is furthermore constant over the entire measuring range.

5

### Robust design and long service life

The high precision of the components as well as the double-disc design of the housing in combination with materials which have excellent tribological properties result in a very robust design and long service life.

6

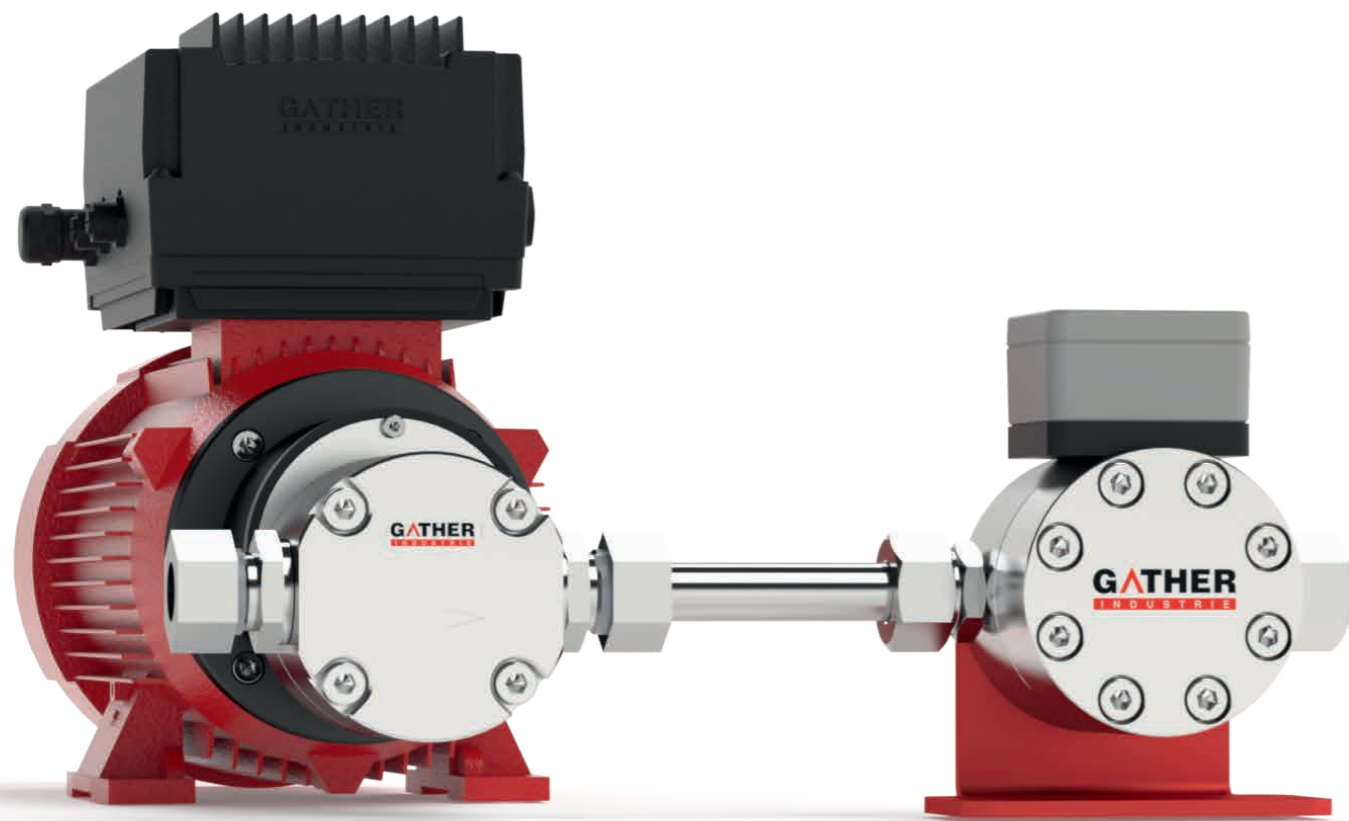
### CIP-capable

The unique design for this type of measuring tools enables CIP cleaning (CIP cleaning in place). Via the existing channels, rinsing processes can be carried out with suitable solvents and cleaning fluids in the installed state.

## GATHER Gear flow meter

# The high-precision measuring device

The **GATHER gear flow meter (ZDM)** is a high-precision measuring instrument for almost all applications where volume flows have to be measured with high accuracy and reproducibility. Its core expertise lies in the handling of non-lubricating, low-viscosity and chemically aggressive liquids. The **high-performance materials** used in the ZDM (housing, shafts, gear rims, seals), the implemented fluid mechanics, the **optimized tribology** (channeling, plain bearing technology, etc.) as well as the **precision of the components** are based on a technology that has been tested and proven in well over 1000 different applications. Thus GATHER ZDM - just like the GATHER gear pump - is a **robust and durable solution** for the customer.



GATHER Gear pump

GATHER Gear flow meter

## Operating data

CHARACTERISTIC	PROPERTY
Materials	Stainless steel, Hastelloy®, titanium and special alloys
Liquids	Non-lubricating and lubricating liquids
Viscosities	0.6 to 2,000 cSt
<b>Measuring ranges</b>	
ZDM 01	0.05 up to 10 l/min
ZDM 02	0.1 up to 16 l/min
ZDM 03	0.15 up to 22 l/min
Temperature	T = -40 to +150 °C
Cleaning	Cleaning in Place (CIP)
Explosion classes	Zones 1, 2 inside , Zones 1, 2 outside T1 ... T4

The possibility of metrological recording of non-lubricating liquids in the **viscosity range 0.6. to 2,000 cSt** is achieved, among other things, by using various high-precision materials. The housing parts and the gear shafts are made of stainless steel, Hastelloy® or titanium. The gear and plain bearing materials all have **excellent tribological** properties. In analogy to the proven flow control of the gear pump, internal flushing channels and holes ensure the formation of a sliding film on the plain bearing, which guarantees long-lasting and robust operation. If aqueous liquids are conveyed, there are no dead zones in the measuring device. This effect can be utilized for **cleaning in place (CIP)** with a solvent or cleaning agent.

With the right design in terms of materials selection, we find the solution that enables our customers to work with process reliability. This also includes the design as a complete system with the corresponding control circuit and accessories in accordance with the customer specifications. Special solutions are our specialty. This also includes the use in potentially explosive atmospheres in **compliance with ATEX directives**.





GATHER Gear flow meter

# Software functionalities

The GATHER ZDM has variably adjustable software functions for simple and precise use. A great **unique feature** is the calibration factor because the latter remains the same over the entire measuring range and thus delivers highly accurate results. This also applies in the event of exchange for a replacement device or after a recalibration. **The calibration factor always remains constant!** This functionality ensures a user-friendly and simple process integration.

## At a glance

1. Linearity compensation
2. Viscosity adjustment
3. Pulse multiplication
4. Filter functionality

### Advantages

- + high measurement accuracy
- + high repeatability
- + constant c-factor
- + universal detection of non-lubricating media
- + output signals individually customizable

1

### Linearity compensation

Linearity, measurement accuracy and repeatability are the decisive factors for a **highly accurate measuring device**. The linearity compensation implemented in electronics – unique on the market – enables the customer to operate the gear flow meter in the process with a **linear and constant calibration factor** characteristic curve – i.e. only one calibration factor over the entire measuring range. This is achieved by calculating the measurement signals determined during operation back in real time to the reference values corresponding to the factory calibration and thus compensating for them. The referenced measured values of the factory calibration are determined on the test bench using a calibrated high-precision measuring device and stored in the electronics. This reference measuring device is traceable to a national standard. The resulting calibration factor characteristic curve is therefore virtually ideal and has the same value at every potential measuring point. This makes operation very **user-friendly** in practice.

2

### Viscosity adjustment

The volumetric measurement of low-viscosity media using a measuring device based on the positive displacement principle requires special measures. Especially in the range of very low viscosities, the corresponding medium has an increased influence on the volume flow to be measured and thus on the calibration characteristic. It may therefore be advisable to adjust the viscosity for certain applications in order to **achieve maximum accuracy**. GATHER gear flow meters offer the customer the option of carrying out the **viscosity adjustment independently** during the process. The different viscosity characteristics are determined during factory calibration and are stored on each device by default. The stored constant calibration factor is identical for each viscosity characteristic curve (internal conversion). This means that the customer does not have to adjust the calibration factor in the PCS if the viscosity characteristic curve is changed.

3

### Pulse multiplication

Precise and accurate volume flow measurements require the highest possible resolution. With the customer's **individually selectable multi-stage signal multiplication**, the maximum output frequency of the measuring device can be optimally adapted to the respective PCS. The maximum output frequency of the measuring device is 100 kHz. This functionality offers advantages for measuring, controlling and regulating in the lower flow range and therefore for metering small volumes.

4

### Filter functionality

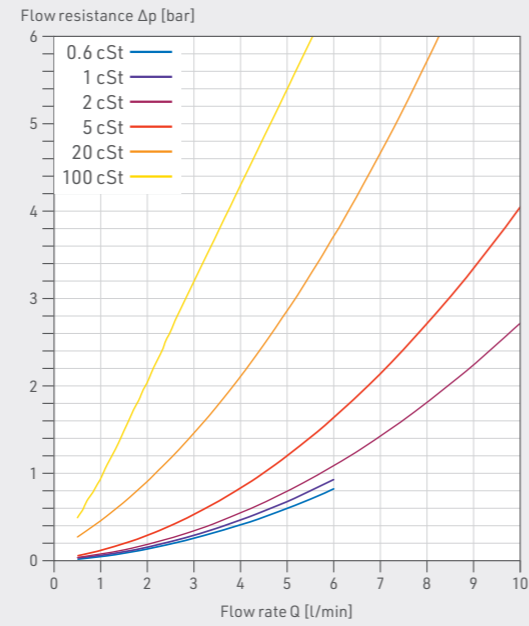
Fluid systems are subject to vibrations within a process. These vibrations are caused, for example, by pressure generators, body vibrations or fluid dynamic instabilities. The GATHER gear flow meter offers the possibility of damping these process-related vibrations by means of a filter functionality. The filter functionality can be activated or deactivated independently by the customer in the field. The filter functionality can have a **positive influence on the control system behaviour**, especially for demanding metering and control tasks.

Flow resistance characteristics

# ZDM 01



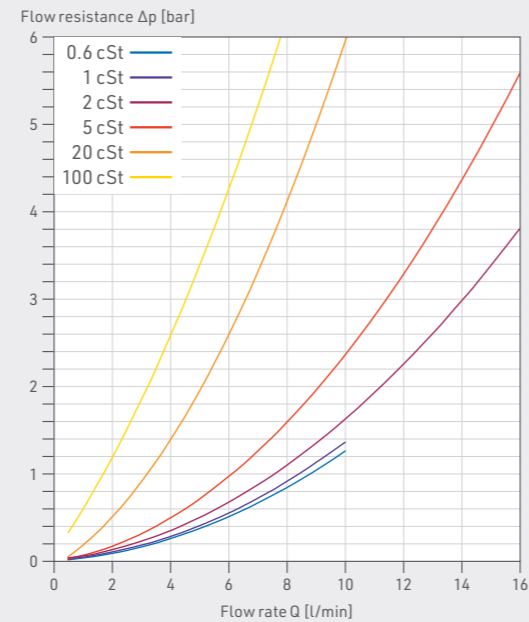
## ZDM 01



# ZDM 02



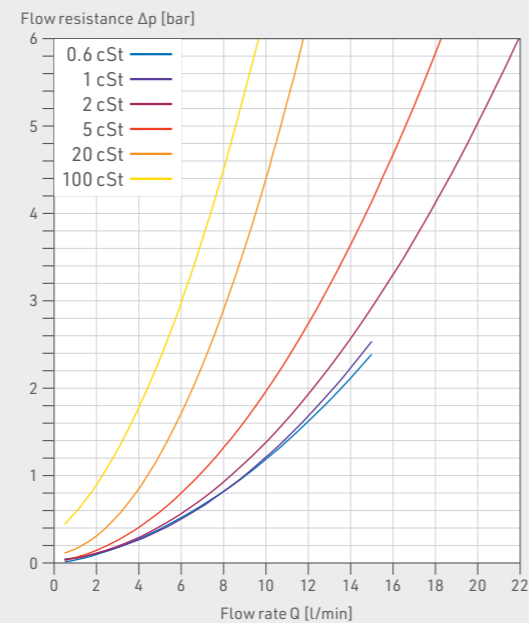
## ZDM 02



# ZDM 03



## ZDM 03



GATHER metering box and GATHER ZDM

# The universal controller for all pump and control circuits

With the **metering box 5000**, GATHER supplies the appropriate evaluation electronics for the gear flow meter. By combining it with GATHER's own universal controller, a control circuit can be set up with any suitable, pulsation-free pump, which can be integrated into any PCT. The metering box with integrated, universal PLC enables precise conveying, metering or filling at the touch of a button. The simple interface operation enables a **quick activation** of a wide variety of metering and measuring tasks. After entering a few parameters of the measuring sensor, the controller parameters are identified automatically within a few seconds.

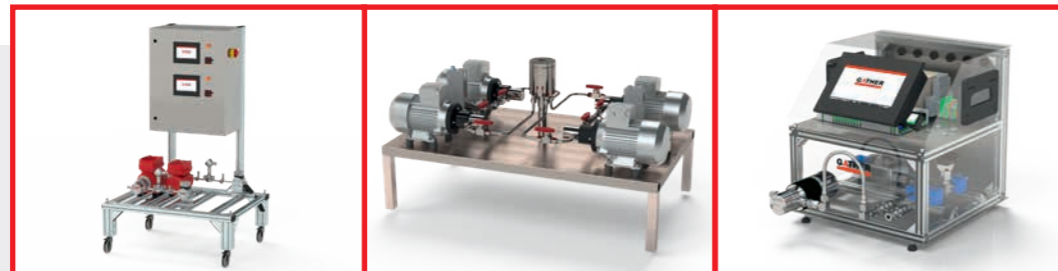
Process line with GATHER components and control via the Metering Box 5000



GATHER Metering systems

# Complete metering systems from a single source

Conveying, measuring, controlling and regulating are elementary components of today's process technology. GATHER also supplies **complete metering systems** as solution according to ATEX for zone 1 and 2. This includes the conceptual design and selection of all components of the pump control loop according to customer specifications.



Possible conceptual designs

- + both "stand-alone systems" and integration into existing process systems
- + control electronics in pressure-capsulated design according to EN 60079-1
- + ATEX zone 1 and 2
- + integration of safety monitoring, e.g. dry-running, overpressure, overheating, etc.
- + Universal controller (GATHER Metering box 5000) for continuous metering or batch filling
- + compact Metering station GDS ("Plug and Play")
- + modular rack design according to customer specifications
- + engineering advice on site



GATHER Metering station GDS

## Pump, controlling, sensor technology – All in one station

Proven pump technology, integrated controlling and regulation as well as flow and pressure measurement in one station. This is what GATHER delivers in the new compact **GDS metering station**. All components are integrated in a stainless steel housing to save space. As a "plug-and-play solution", the lightweight and mobile metering station is suitable for many applications. With the integrated control software and the user-friendly interface, any metering and conveying task can be implemented quickly and easily.



Modular rack design

## Development, assembly and manufacturing from a single source

With decades of experience in the chemical, pharmaceutical, medical and food industries, we can offer complete system solutions from a single source and supply individually modular systems. These solutions include transfer, measuring and monitoring as well as process control with our GATHER Metering box 5000.

- + development, assembly and manufacturing from a single source
- + grooved profile systems in stainless steel or aluminium
- + modularly expandable
- + customized welded constructions in stainless steel design
- + engineering advice on site





## GATHER Accessories

# Accessories for the GATHER Gear Flow Meter

GATHER supplies the appropriate accessories for your entire process. The filter and valve components can be integrated into the process line for the gear pump and the gear flow meter. Our process technicians and sales engineers provide support in the design and selection of accessories.



## GATHER Accessories

## Inline filter “Mini”



The GATHER filter with drain plug is an universal filter designed even for extreme process conditions. Operating temperatures of up to 350°C at system pressures of up to 500 bar are possible. The stainless steel and Hastelloy® versions qualify this filter for use with aggressive liquids. Through using “pleated” filter elements, a compact design with a large filter surface is created, which causes only low pressure losses. The filter is optimally suited for use as a pre-filter in suction lines.

## Overflow and non-return valves



The GATHER overflow valves for liquids, gases and vapours are simply designed and compact pressure limiters which offer accurate inlet pressure adjustment with easy installation and maintenance. In operation, the inlet pressure is in balance with the spring-loaded valve as soon as the preset opening pressure (in the pipeline) is reached and exceeded. The preload of the valve spring – and thus the opening pressure – can easily be adjusted from the outside. As connections, standard pipe fittings or individual connections according to customer specifications are available.



GATHER Non-return valves for liquids, gases and vapours

The proven accessories for our magnetically coupled pumps

- + ensure constant flow resistance
- + used under vacuum in pump applications
- + available in stainless steel or Hastelloy®



Industries & Applications

# Use in all sectors of industry – GATHER has the solution!

GATHER products are used in almost all sectors of industry. Wherever precise delivering, measuring, dosing or coupling of fluids matters. Whether lubricating or non-lubricating, whether low-viscosity or viscous, whether pump, flow meter, complete system or coupling.

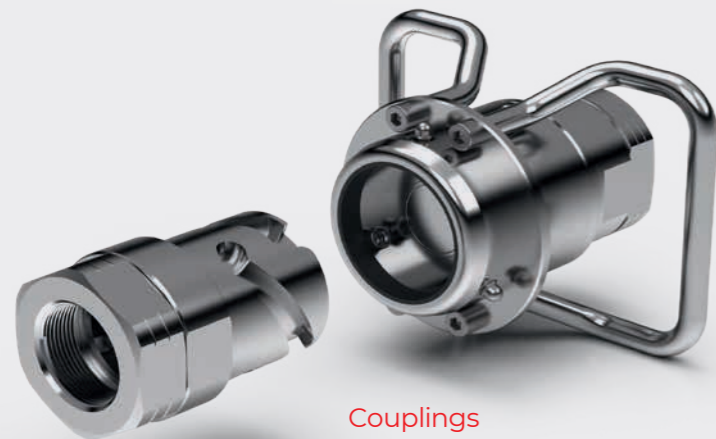
Our engineering is your solution!



Flow meter



Metering systems



Couplings



Metering and process pumps

# Liquids for every industry and application



## Chemical and Process Engineering

- + Water
- + Saline Solutions
- + Caustic Soda
- + Sulfuric Acid
- + Hydrochlorid Acid
- + Formic Acid
- + Nitric Acid
- + Phosphoric Acid
- + Alcohols (Methanol, Ethanol, Toluene, Xylene, etc.)
- + Tetrahydrofuran (THF)
- + Resins
- + Hydrocarbons
- + Barrier fluids for Double-Action Mech. Seals GLRD



## Pharmaceutical and Cosmetics Industry

- + Nutrient solutions
- + Dyes
- + Perfumes
- + Hydrogen peroxide/H<sub>2</sub>O<sub>2</sub>
- + Vinegar essence
- + Enzymes
- + Various alkalis and acids
- + Cell fluids
- + Silicone oil



## Medical Technology

- + Water
- + Active ingredients
- + Vaccines
- + Adhesives



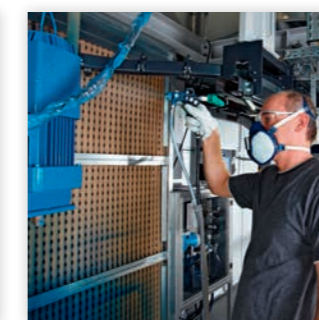
## Food Industry

- + Vegetable oils
- + Cooking fats
- + Yeast solutions
- + Fish oils
- + Nitric acid
- + Citric acid
- + Caustic sodas
- + Sulfuric acid
- + Tetrahop
- + Isohop
- + Caramel
- + Essences



## Water Management

- + Caustic Soda
- + Sodium hypochlorite
- + Hydrochloric acid
- + Iron (II)Chloride
- + Iron (III)Chloride



## Automotive Industry

- + Paints and varnishes
- + Petrol
- + Diesel
- + Kerosene
- + Additives for fuels
- + Cooling liquids



## Steel Industry and Power Plants

- + Ammonia water
- + Urea (Adblue)
- + Cooling liquids
- + Water



## Oil Industry

- + Crude oil
- + Petrols
- + Kerosene
- + Diesel
- + Solvent Yellow 124
- + Thermal oil
- + Various additives

## **GATHER Industrie GmbH**

Lise-Meitner-Straße 4  
42489 Wülfrath  
GERMANY  
Phone +49 2058 89381-0

### **Pump Technology**

#### **Filters and Valves**

Phone +49 2058 89381-23  
Fax +49 2058 89381-50  
pump@gather-industrie.com

### **Coupling Technology**

Phone +49 2058 89381-23  
Fax +49 2058 89381-50  
coupling@gather-industrie.com

### **Measurement and Control Technology**

Phone +49 2058 89381-23  
Fax +49 2058 89381-50  
measurementtechnology@  
gather-industrie.com



[www.gather-industrie.com](http://www.gather-industrie.com)

## **Why GATHER ZDM?**

Demanding measuring tasks require special and innovative solutions. With the right design and the selection of materials and seals according to the measuring liquid and application, we offer reliable and durable solutions to our customers. The housing parts of the GATHER gear flow meter and the shafts are made of stainless steel, Hastelloy® or titanium. The high precision of the components and the two-disc design of the housing in combination with materials which have excellent tribological properties result in a very robust design and a long service life.

GATHER is not only a component manufacturer, but also a solution provider for design as a complete system according to customer specifications with the corresponding control loop and accessories. Special solutions are our speciality as well. This also includes the use in potentially explosive atmospheres in compliance with the ATEX directives. Our sales engineers and partners have extensive expertise and application knowledge and are your contacts. Either on-site at your premises or at our head office in Wülfrath.

Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action

on the basis of a decision  
by the German Bundestag