






## Proline Promass A

The lightweight champion with the highest accuracy for the lowest flow rates

In many applications within the process, food and life sciences industries, the smallest amounts of a substance must be measured with high accuracy, e.g. flavorings, active ingredients or corrosion-inhibiting substances. Promass A measures such substances drop-for-drop with a precision unmatched worldwide.

- Highest accuracy:
  - ±0.1% (at min. 8 g/min)
  - ±1% (at min. 0.8 g/min)
- Space-saving installation
- Self-drainable single-tube system
- Corrosion-resistant
- Full data access through fieldbuses or WLAN (web server)

 [Promass A – online](#)

# Promass A in process applications

When precise and robust measurement technology is essential

## Advantages

Click to navigate



### For maximum process reliability


- Various process connections: flanges, lap joint flanges, couplings or internal threads
- Optionally with non-destructive material testing, e.g. positive material identification testing (PMI) and weld seam testing according to ISO, ASME and NORSOK
- Optionally with built-in rupture disk
- Usable in safety-related applications (SIL)

### For maximum corrosion resistance

- Sensor housing: stainless steel (316L)
- Wetted parts:
  - Stainless steel (316/316L) or Alloy C22
  - Acc. to NACE MR0175/MR0103

### For optimal operational safety in hazardous areas

- Two-wire device (Promass A 200):
  - Ex ia (intrinsically safe)
- Four-wire devices (Promass A 300/500):
  - ATEX, IECEx, cCSAus, NEPSI, INMETRO, EAC, etc.

 [Link to movie](#)



## Promass A in process applications

When precise and robust measurement technology is essential

### Application examples

Click to navigate

#### Chemical injection

For the continuous or intermittent dosing/injecting of a precise amount of chemicals to protect the system from accelerated corrosion or to prevent formation of scale

#### Reactor feed

For accurate and repeatable feed of a required quantity into the reaction process

#### Oil and gas production

Injection of monoethylene glycol (MEG) to prevent hydrate build-up and blockages in pipelines



# Promass A in hygienic applications

When maximum product quality is key

## Advantages

Click to navigate



### For guaranteed hygiene (approvals/certificates)

- Food: 3-A, FDA, (EC) 1935/2004
- Pharmaceuticals: FDA, USP Class VI, TSE/BSE certificate
- IP69 (option), suitable for high-pressure cleaning
- Hygienic design with Tri-Clamp connections

### For guaranteed process quality and reliability

- Self-drainable measuring tube
- Low risk of clogging due to single-tube system (in comparison with dual-tube measuring systems of comparable flow capacity)

### For maximum compliance and product quality


- Wetted parts: stainless steel 1.4435 (316L) in pharmaceutical quality
- Polished surfaces (option):  
 $Ra_{max} \leq 0.38 \mu m$  (15  $\mu in$ )

### For maximum measuring performance

- Fast recovery after CIP or SIP cleaning
- Highest accuracy and repeatability

### For space-saving installation

- Compact sensor, e.g. for installation in skids

 [Link to movie](#)



## Promass A in hygienic applications

When maximum product quality is key

### Application examples

Click to navigate

#### Blending, dosing and mixing

Maintaining the correct ratio of ingredients in a process, e.g. flavoring agents, vitamins, coloring agents or fragrance additives

#### Pharmaceutical production

Precise dosing of valuable active ingredients

#### Pilot plants

Development and verification of processes on a pilot scale before implementation in a full-scale production plant



## Transmitters – Proline 200/300/500

For seamless system integration

Overview

Click to navigate

### Proline 200

Compact transmitter with loop-powered (two-wire) technology



- High operational safety in Ex areas due to intrinsically safe design (Ex ia)
- Display module with data backup and data transfer function
- Heartbeat Technology for device verification during operation

### Proline 300

Compact, easily accessible transmitter



- Multifunctional, four-wire transmitter
- Reduced complexity thanks to freely combinable I/Os
- Heartbeat Technology for device verification during operation

### Proline 500

Remote transmitter with up to 4 I/Os



- Functionality and operation as Proline 300
- Remote installation: up to 300 meters between sensor and transmitter
- Heartbeat Technology for device verification during operation

# Transmitters – Proline 200/300/500

For seamless system integration

Technical data – Proline 200

Click to navigate

Proline 200		Subject to modification
Display	<ul style="list-style-type: none"> <li>– 4-line display with push buttons or with touch control (operation from outside)</li> <li>– Option: backlit display</li> </ul>	
Operation	<ul style="list-style-type: none"> <li>– Via local display</li> <li>– Via operating tools (FieldCare, HART handheld, etc.)</li> </ul>	
Materials	<p><b>Transmitter</b> Aluminum, Stainless steel die-cast</p>	<p><b>Remote display</b> Aluminum, stainless steel die-cast</p>
Power supply	DC 12 to 35 V (two-wire technology)	
Ambient temperature	–40 to +60 °C (–40 to +140 °F)	
Degree of protection	IP66/67 (Type 4X enclosure)	
Outputs	<ul style="list-style-type: none"> <li>– Current output (4–20 mA, HART)</li> </ul>	
Inputs	<ul style="list-style-type: none"> <li>– 2nd output (option): current output (4–20 mA), pulse/frequency/switch output</li> </ul>	
Communication	<ul style="list-style-type: none"> <li>– Passive current input (option)</li> </ul> <p>Digital communication: PROFIBUS PA, FOUNDATION Fieldbus</p>	



# Transmitters – Proline 200/300/500

For seamless system integration

Technical data – Proline 300

Click to navigate

Proline 300		Subject to modification
Display	<b>Standard</b> 4-line backlit display with Touch Control (operation from outside)	<b>Option</b> With remote display
Operation	Via local display, web server, WLAN, WirelessHART, as well as various operating tools (FieldCare, HART handheld, etc.)	
Materials	<b>Transmitter</b> Aluminum, stainless steel 316L (hygienic)	<b>Remote display</b> Aluminum, stainless steel die-cast
Power supply	AC 100 to 230 V, DC 24 V (Zone 1, Div. 1); AC/DC 24 to 230 V (Zone 2, Div. 2)	
Ambient temperature	<b>Standard</b> -40 to +60 °C (-40 to +140 °F)	<b>Option</b> -50 to +60 °C (-58 to +140 °F)
Degree of protection	IP66/67 (Type 4X enclosure), option: IP69 (stainless steel, hygienic)	
Outputs	<b>Port 1</b> Current output (4–20 mA, HART)	<b>Port 2/3</b> Freely selectable I/O modules:
Inputs	or digital communication:	– Current output (4–20 mA)
Communication	PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET	– Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output – Current input (4–20 mA) – Status input

# Transmitters – Proline 200/300/500

For seamless system integration

Technical data – Proline 500

Click to navigate

## Proline 500 (remote)

Subject to modification

Display	4-line backlit display with Touch Control (operation from outside)		
Operation	Via local display, web server, WLAN, WirelessHART, as well as various operating tools (FieldCare, HART handheld, etc.)		
Materials	<b>Sensor connection housing</b> Aluminum, stainless steel die-cast, stainless steel 316L (hygienic)	<b>Proline 500 digital transmitter</b> Aluminum, polycarbonate	<b>Proline 500 transmitter</b> Aluminum, stainless steel die-cast
Power supply	AC 100 to 230 V, DC 24 V (Zone 1, Div. 1); AC/DC 24 to 230 V (Zone 2, Div. 2)		
Ambient temperature	<b>Standard</b> –40 to +60 °C (–40 to +140 °F)	<b>Option</b> –50 to +60 °C (–58 to +140 °F)	
Degree of protection	IP66/67 (Type 4X enclosure), option: IP69 (stainless steel, hygienic)		
Outputs	<b>Port 1</b> Current output (4–20 mA, HART)	<b>Port 2/3</b> (Proline 500) / <b>Port 2/3/4</b> (Proline 500 digital)	
Inputs	or digital communication: PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET	Freely selectable I/O modules: – Current output (4–20 mA) – Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output – Current input (4–20 mA) – Status input	
Communication			

# Heartbeat Technology

For increased plant availability and safe operation



## Diagnostics

Permanent process / device diagnostics

- Permanent self-diagnostics around the clock
- Developed acc. to IEC 61508 (SIL)
- Clear diagnostic messages acc. to NAMUR NE107 with remedy instructions

## Verification

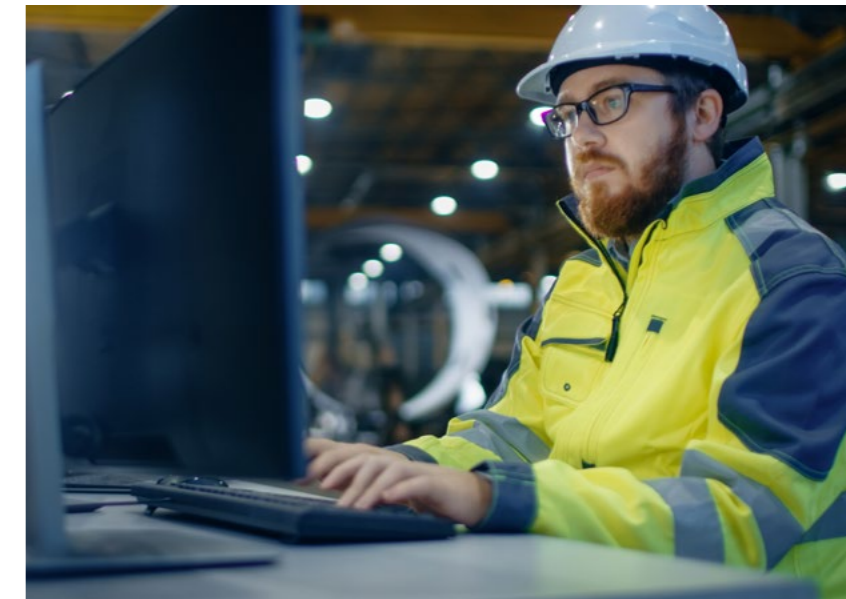
Documented verification without process interruption

- Metrologically traceable verification results (ISO 9001, TÜV attested)
- Reduced verification effort: verification can be triggered at any time on the device or via higher level systems (no field presence required)

## Monitoring

Additional information for predictive maintenance

- Process optimization and maintenance planning
- Early recognition of disturbances in the process, e.g. entrained gas, coating, abrasion, corrosion, etc.



# Unique and innovative sensor concept

For first-rate measuring results, even under varying ambient and process conditions

## Sensor concept


Click to navigate

### Sensor concept

The measuring tube geometry of Promass A is centrosymmetrical in relation to the exciter. Furthermore, the measuring tube is excited to oscillate at a significantly higher frequency than usual.

The oscillation geometry generated is also symmetrical and perfectly balances the measuring tube movement.

As a result, even the smallest flow rates of just a few grams per minute can be measured with previously unreached zero point stability and accuracy.

 [Link to movie](#)



# Unique and innovative sensor concept

For first-rate measuring results, even under varying ambient and process conditions

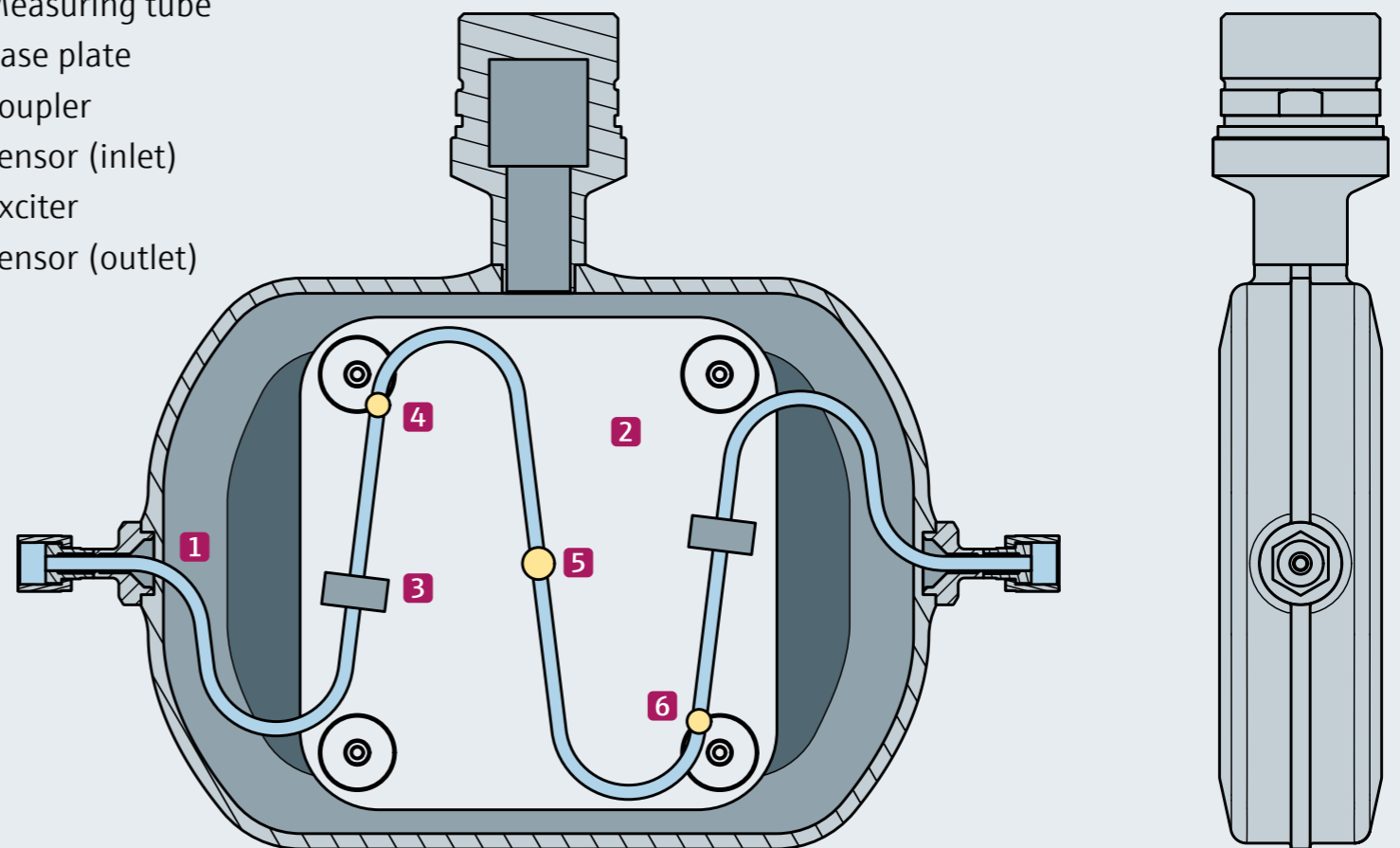
## Measuring principle

[Click to navigate](#)

### Measuring principle

The interior of Promass A contains a measuring tube **1**, which an exciter **5** causes to constantly oscillate. As soon as the fluid inside the measuring tube begins to flow, the geometry of the pipe oscillation changes due to the inertia of the flowing fluid and the resulting Coriolis forces. This change is picked up in terms of time and space at the inlet and outlet by two sensors **4**, **6** and is directly proportional to the mass flow. In addition, the fluid density can be determined from the oscillation frequency of the measuring tube.

- 1** Measuring tube
- 2** Base plate
- 3** Coupler
- 4** Sensor (inlet)
- 5** Exciter
- 6** Sensor (outlet)



# Unique and innovative sensor concept

For first-rate measuring results, even under varying ambient and process conditions

Technical data

Click to navigate

## Promass A (sensor)

Subject to modification

Nominal diameter	DN 1 (1/24"), DN 2 (1/12"), DN 4 (1/8")	
Max. flow rate	20 to 450 kg/h (dependent on nominal diameter)	
Process connections	Flanges and lap joint flanges: EN, ASME, JIS; Tri-Clamp; 4-VCO-4 couplings; internal threads (G1/4", NPT1/4")	
Process pressure	Max. 430.9 bar (6250 psi)	
Process temperature	-50 to +205 °C (-58 to +401 °F)	
Max. measured error	<ul style="list-style-type: none"> <li>Mass flow, volume flow (liquids): ±0.10% o.r.</li> <li>Mass flow (gases): ±0.35% o.r.</li> </ul>	<ul style="list-style-type: none"> <li>Density:                             <ul style="list-style-type: none"> <li>Reference operating conditions: ±0.0005 g/cm<sup>3</sup></li> <li>Wide-range density specification: ±0.002 g/cm<sup>3</sup></li> </ul> </li> </ul>
Measuring dynamic	Over 1000:1	
Degree of protection	IP66/67 (Type 4X enclosure); option: IP69 (stainless steel, hygienic)	
Materials	<ul style="list-style-type: none"> <li>Measuring tube/process connections: stainless steel (316/316L), Alloy C22</li> </ul>	<ul style="list-style-type: none"> <li>Sensor housing: stainless steel (316L)</li> </ul>
Approvals	<ul style="list-style-type: none"> <li>Food: 3-A, FDA, Food Contact Materials Regulation (EC) 1935/2004</li> <li>Pharmaceuticals: FDA, USP Class VI, TSE/BSE certificate of suitability</li> </ul>	<ul style="list-style-type: none"> <li>Radio approval</li> <li>ATEX, IECEx, cCSAus, NEPSI, INMETRO, EAC, etc.</li> <li>Functional safety: Use for flow monitoring up to SIL 2 (single-channel architecture) or SIL 3 (multi-channel architecture with homogeneous redundancy)</li> </ul>

## Process connections

Promass A is available with various process connections for process, food and life science applications

### Flanges

Click to navigate

#### Flanges

- Size: DN 15 (1/2")
- Materials:
  - Flanges: stainless steel 316/316L or Alloy C22
  - Lap joint flanges: stainless steel 1.4301 (304) with Alloy C22 wetted parts
- Max. nominal pressure:
  - Flanges: PN 400 / Cl. 2500 / 63K
  - Lap joint flanges: PN 40 / Cl. 600 / 20K



Promass A 200 with flanges

## Process connections

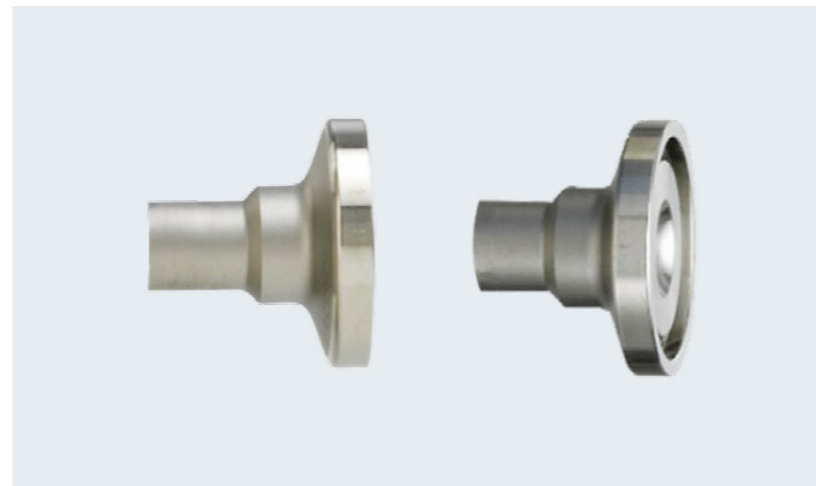
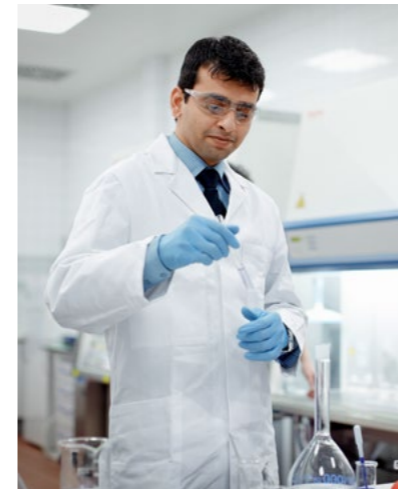
Promass A is available with various process connections for process, food and life science applications

### Tri-Clamp

Click to navigate

#### Tri-Clamp

- Size: 15 mm (1/2")
- Material: stainless steel 1.4435 (316L)
- Max. nominal pressure: 40 bar (580 psi)



Promass A 500 with Tri-Clamps



## Process connections

Promass A is available with various process connections for process, food and life science applications

### Couplings

Click to navigate

#### Couplings / internal threads

- Size: 4-VCO-4, G $\frac{1}{4}$ ", NPT $\frac{1}{4}$ "
- Materials: stainless steel 1.4404 (316/316L) and Alloy C22
- Max. nominal pressure:
  - With stainless steel
    - DN 1 ( $\frac{1}{24}$ " ): 160 bar (2320 psi)
    - DN 2 to 4 ( $\frac{1}{12}$  to  $\frac{1}{8}$ " ): 100 bar (1450 psi)
  - With Alloy C22
    - DN 1 to 4 ( $\frac{1}{24}$  to  $\frac{1}{8}$ " ): 430.9 bar (6250 psi)



## Sensor accessories

For special mounting and/or application requirements

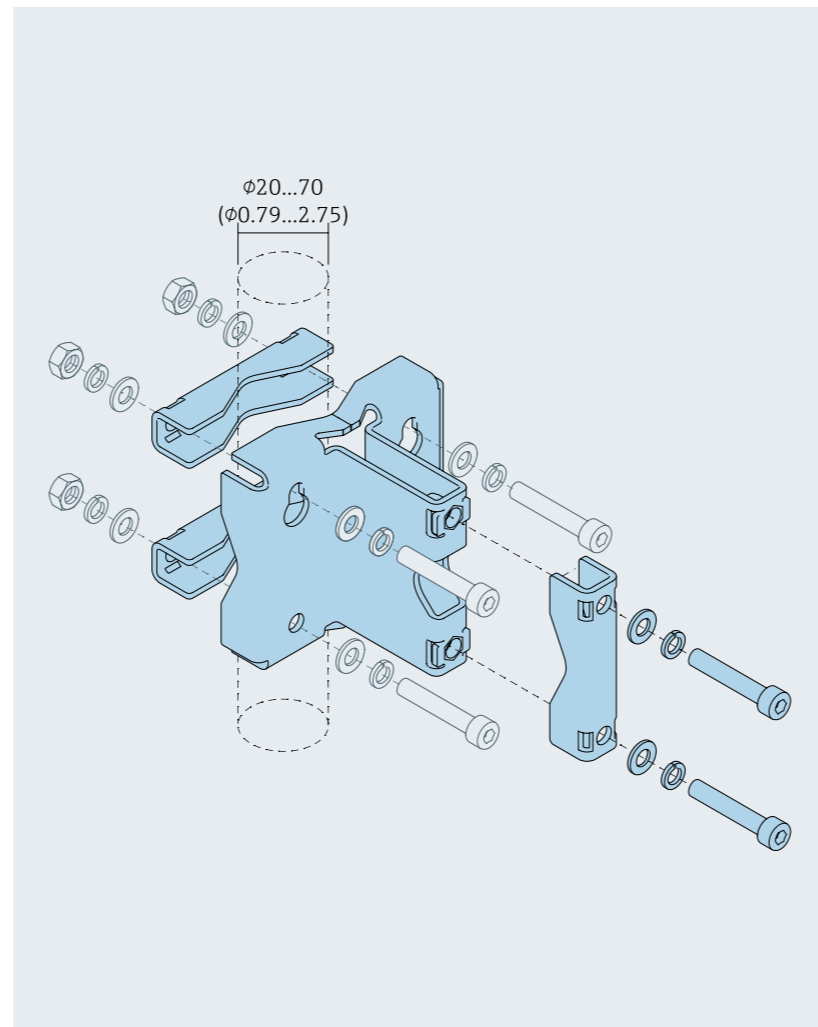
### Sensor holder

#### Sensor holder

A sensor holder for Promass A is recommended when there are concerns about the mechanical strength of the piping or the rotational stability of the installation.

Three main mounting modes are possible:

- Wall mounting
- Tabletop mounting
- Pipe mounting



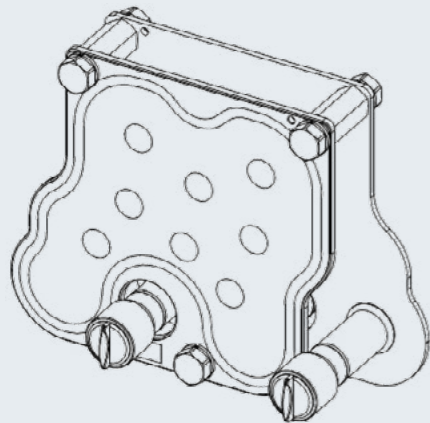
## Sensor accessories

For special mounting and/or application requirements

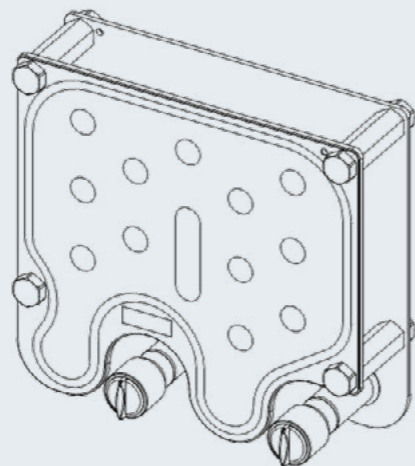
Heating jacket

### Heating jacket

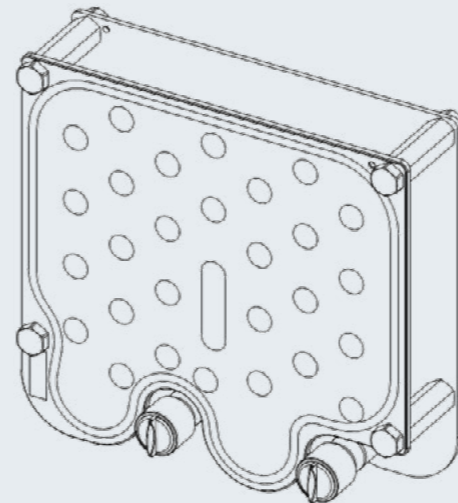
Heating jackets are used for applications where keeping a constant process temperature is important.



DN 1 (1/24")



DN 2 (1/12")



DN 4 (1/8")

