

OEM Flowsensor for Liquids

Nominal diameters 8 / 10 / 15 / 20 / 25 mm

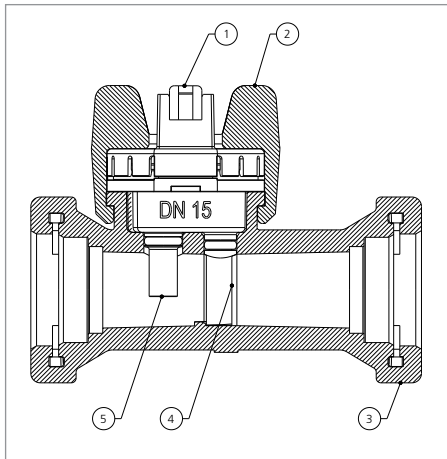


Huba Control

FEINE MESSIDEEN FÜR DRUCK UND STRÖMUNG
FOR FINE PRESSURE AND FLOW MEASUREMENT
LA FINESSE DES MESURES DE PRESSION ET DE DEBIT

Technical overview

The flow sensor of this range is based on the principle of Karman's vortex trail. The shedding of vortices on the damming body in the flow is directly proportional to the speed of the flow. A piezoelectric paddle detects the generated vortex and analyzes the values with the integrated electronic.



Legend to cross-section drawing

- 1 Electrical connection
- 2 Bracket
- 3 Connection
- 4 Damming body
- 5 Sensor paddle

The distinct advantages

- Low cost product with high levels of accuracy
- Temperature non-sensitive measuring principle
- Excellent media resistance (measuring element not in contact with the media)
- Excellent EMC characteristics
- Wide application temperature range
- Marginal loss of pressure
- Measuring element not sensitive to debris

Medium

Suitable for heating circuit water with the usual additives and for drinking water. (Other media on request)
For media with higher viscosity than 2 mPa•s the lower reaction point rises as the vortices are produced at a higher flow speed. Additional information to be found under point accuracy

Flow ranges

From 0.9 ... 146 litres per minute (DN 8 to DN 25)
Flow rates see order code selection table

Max. pressures and medium temperature

12 bar at 40 °C	(for lifetime)
6 bar at 100 °C	(for lifetime)
4 bar at 125 °C	(for 600 hours)
4 bar at 140 °C	(for 2 hours)

Max. test pressure

18 bar at 40 °C

Loss of pressure / cavitation

At 50% of the maximum flow the loss of pressure is approx. 35 mbar (incl. 5D running in and 2D running out distance)
The following conditions have to be fulfilled to prevent cavitation:

$$P_{\text{exit}} / P_{\text{difference}} > 5.5$$

Materials in contact with the medium

Sensor paddle: ETFE (Tefzel)
Case with damming body: PA6T/6I (Grivory 40%GF)
Sealing material: EPDM (perox.)

Temperature

Ambient	-15 ... +85 °C
In storage	-30 ... +85 °C

Power supply / Output

Power supply 5VDC (4.75 ... 5.25)
Output Square pulse frequency 0 / 5VDC (The signal frequency depends on the nominal diameter, see order code selection table)

Signal amplitude at $U_{IN}=5.0V$:
Load > 10kOhm against GND0... > 4.75V
Load > 10kOhm against IN < 0.1 ... 5.0V

Load

> 10kOhm / < 10nF

Current consumption

< 4 mA

Response time

A high accuracy of flow speed is detected within 100 ms.

Electrical connection

3-pole connector, RAST 2.5
Recommended: AMP DUOPLUG 2.5™

Polarity reversal protection

Mechanically protected

Protection class

IP00

Mounting position

In principle optional. In case of risk of precipitations, we recommend that the sensor is not mounted on the underside. No impurity in the measurement connection.

Tests / Admissions

All parts in contact with medium are FDA compliant

The product is designed exclusively for installation in equipment which complies with EU directives. The customer is responsible for CE conformity.

Weight

DN 8	approx. 47 g
DN 10	approx. 57 g
DN 15	approx. 68 g
DN 20	approx. 92 g
DN 25	approx. 100 g

Packaging

Multiple packaging:
DN 8, 10 and 15 Blister packs each containing 30 pcs
DN 20 and 25 Blister packs each containing 20 pcs

Accuracy

Accuracy specifications are valid for media with a viscosity ≤ 2 mPa·s:

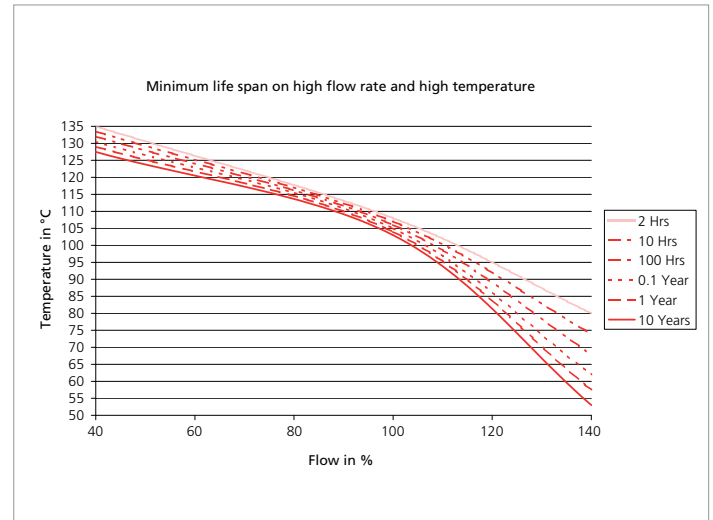
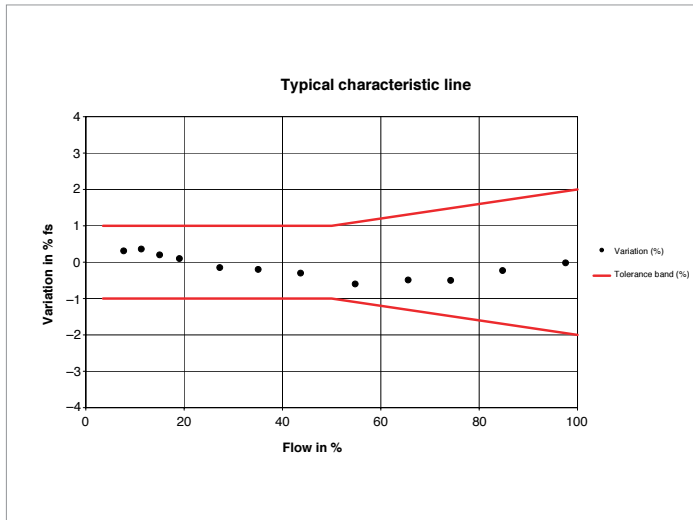
For water in temperature range +5...+100°C or for water with maximum 20% glycol at $\geq 25^\circ\text{C}$

Up to 50% fs:

From 50% fs:

Variation $\leq 1\%$ fs

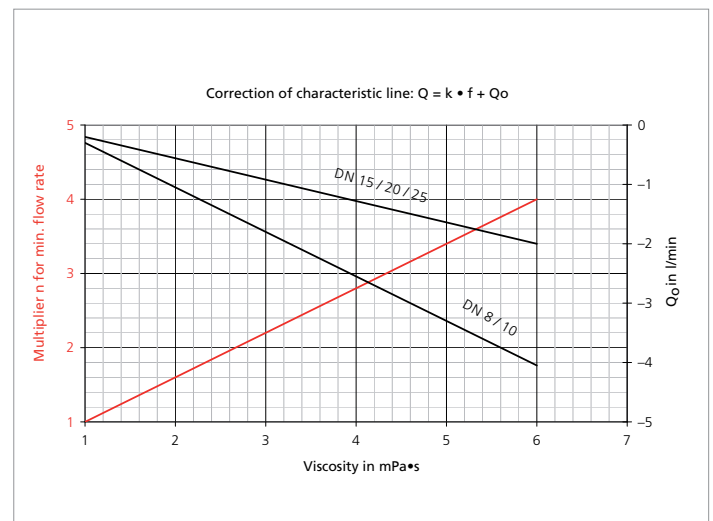
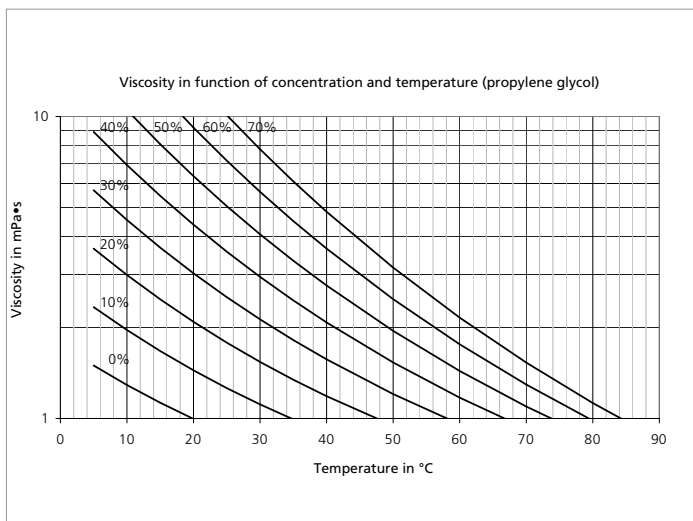
Variation $\leq 2\%$ of measured value



Influence of glycol

Adding glycol the Q_0 of the characteristic line formula « $Q = k \cdot f + Q_0$ » and the minimal measurable flow change Q_{\min} .

The diagram below helps to identify Q_0 and Q_{\min} .



$$Q = k \cdot f + Q_0$$

$$Q_{\min} = n \cdot Q_0$$

	k	Q_0 (water)	Q_{\min} (water)
DN 8:	0.035	-0.3	0.9l/min
DN 10:	0.0726	-0.3	1.8l/min
DN 15:	0.187	-0.2	3.5l/min
DN 20:	0.373	-0.3	5.0l/min
DN 25:	0.744	-0.2	9.0l/min

Example:

Characteristic line DN 15 with water:

$$Q = 0.187 \cdot f - 0.2$$

$$Q_{\min} = 3.5/\text{min}$$

Characteristic line DN 15 with water with 30% glycol at 32°C :

$$Q = 0.187 \cdot f - 0.5$$

$$Q_{\min} = 1.6 \cdot 3.5 = 5.6/\text{min}$$

Order code selection table

200. X X X X X X X

Nominal size and flow ranges	DN 8 1/4" 0.9 ... 15 l/min. approx. 34 ... 437 Hz $Q = 0.035 \cdot f - 0.3$ ¹⁾ 0.56 ml/puls	9	0	8						
	DN 10 3/8" 1.8 ... 25 l/min. approx. 29 ... 348 Hz $Q = 0.0726 \cdot f - 0.3$ ¹⁾ 1.24 ml/puls	9	1	0						
	DN 15 1/2" 3.5 ... 50 l/min. approx. 19 ... 269 Hz $Q = 0.187 \cdot f - 0.2$ ¹⁾ 3.09 ml/puls	9	1	5						
	DN 20 3/4" 5.0 ... 85 l/min. approx. 14 ... 229 Hz $Q = 0.373 \cdot f - 0.3$ ¹⁾ 6.22 ml/puls	9	2	0						
	DN 25 1" 9.0 ... 146 l/min. approx. 12 ... 197 Hz $Q = 0.744 \cdot f - 0.2$ ¹⁾ 12.40 ml/puls	9	2	5						
Power supply and output	5 VDC	Frequency output 0 / 5 VDC (Square pulse frequency)						1		
Electrical connector	3-pole connector	RAST 2.5 mm							0	
Case / Sealing material	EPDM Ethylene propylene rubber (peroxidically cross-linked)									1
Tube connection	Plastic	PA6T / 6I	40% GF							N

Accessories

packed separately

Order number

Connection kit with copper tube ²⁾ DN 8 / DN 10					113775
Connection kit ²⁾ DN 8 / DN 10 with adapter Rp 3/8"	Stainless steel 1.4305/AISI 303				113776
Connection kit with copper tube ²⁾ DN 15					113777
Connection kit ²⁾ DN 15 with adapter Rp 1/2"	Stainless steel 1.4305/AISI 303				113778
Connection kit with copper tube ²⁾ DN 20					113779
Connection kit ²⁾ DN 20 with adapter Rp 3/4"	Stainless steel 1.4305/AISI 303				113780
AMP DUOPLUG 2.5™ plug with cable	30 cm				111668
AMP DUOPLUG 2.5™ plug with cable	110 cm				101817
Clip for DN 8 DN 10					112116
Clip for DN 15					110941
Clip for DN 20					112122
O-Ring	EPDM ø 13.95 x 2.62	for DN 8 und DN 10	Copper tube and adapter		112124
O-Ring	EPDM ø 17.86 x 2.62	for DN 15	Copper tube and adapter		112265
O-Ring	EPDM ø 21.89 x 2.62	for DN 20	Copper tube and adapter		112723
Connection copper tube	L=150mm	for DN 8 und DN 10			112121
Connection copper tube	L=150mm	for DN 15			112211
Connection copper tube	L=150mm	for DN 20			112306
Adapter Rp 3/8"	Stainless steel 1.4305/AISI 303	for DN 8 und DN 10			112655
Adapter Rp 1/2"	Stainless steel 1.4305/AISI 303	for DN 15			112660
Adapter Rp 3/4"	Stainless steel 1.4305/AISI 303	for DN 20			112661
AMP-Plug ³⁾	Manufacturers order number	Colour	for wire profile		
	3-829868-3	grey	0.12 – 0.35 mm ²		
	1-966194-3	beige	0.35 mm ²		

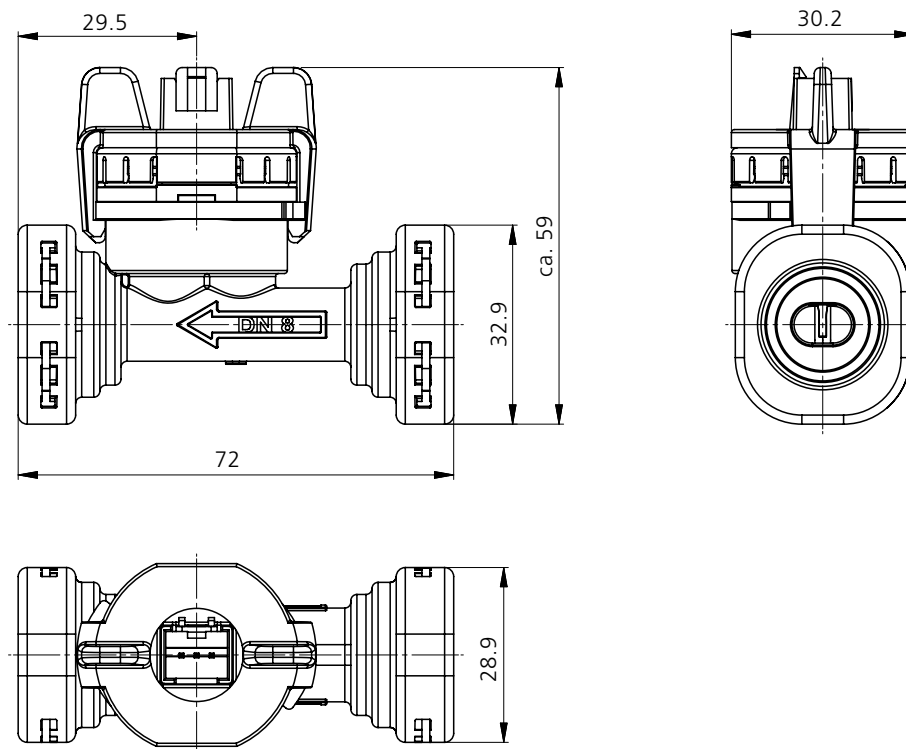
Electromagnetic compatibility

CE conformity (EMC) by application of harmonised standards: EN 61000-6-2, EN 61000-6-3 and EN 61326

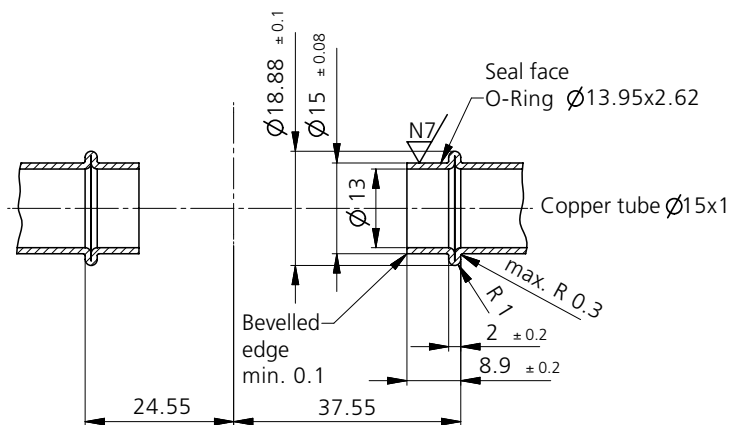
Interference stability	Test standard		Effect
Electrostatic discharge (ESD)	EN 61000-4-2	8kV air, 4 kV contact	Interference during impact possible
High-frequency electromagnetic radiation (HF)	EN 61000-4-3	10 V/m, 80 ... 1000 MHz	no effect
Fast transients (burst)	EN 61000-4-4	2 kV	Interference during impact possible
Conducted HF interference	EN 61000-4-6	10 V, 0.15 ... 80 MHz	no effect
Magnetic fields	EN 61000-4-8	30 A/m, 50 Hz	no effect
Interference emit	Test standard		Effect
Conducted interference	EN 55022 (CISPR 22)	0.15 ... 30 MHz	no emission
Radiation from housing		30 ... 1000 MHz, 10 m	no emission

¹⁾ Volume flow Q in l/min., f in Hz²⁾ Connection set includes: 1x AMP DUOPLUG 2.5™ plug with cable 110cm, 2x Clip, 2x Copper tube or Adapter and 2x O-Ring³⁾ To order separately directly at manufacturer. Find further information in the manufacturers specification no. 114 18049

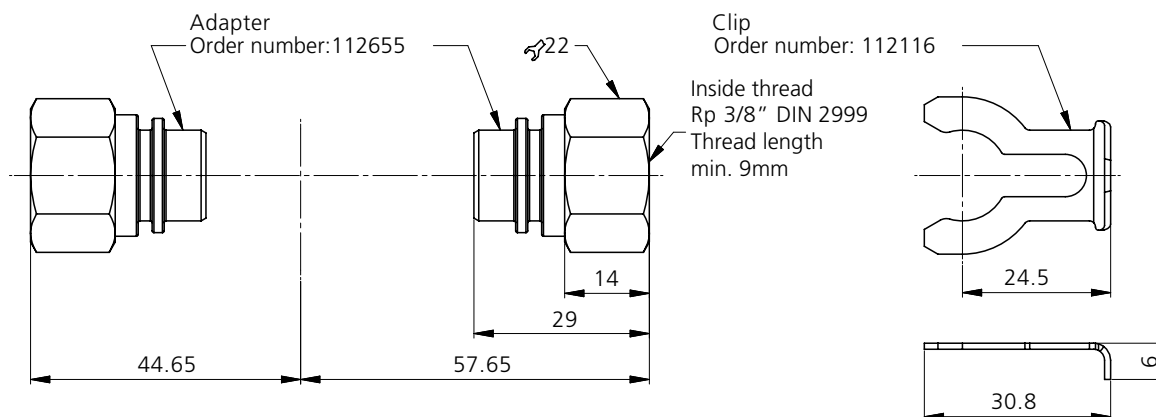
Dimension diagram DN 8



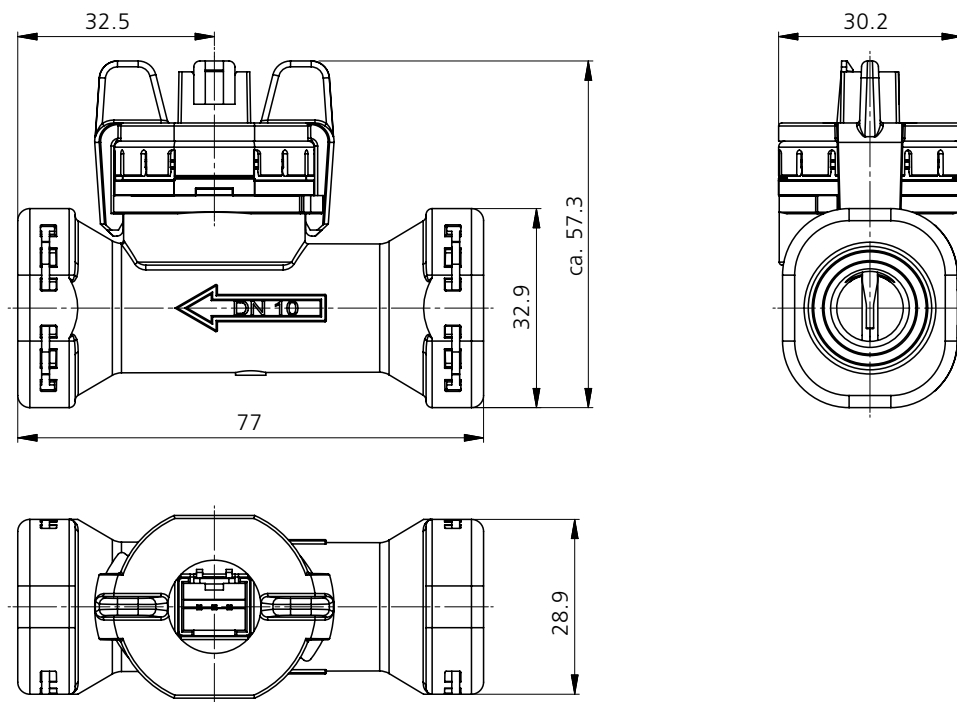
Geometry of customers connection tube DN 8



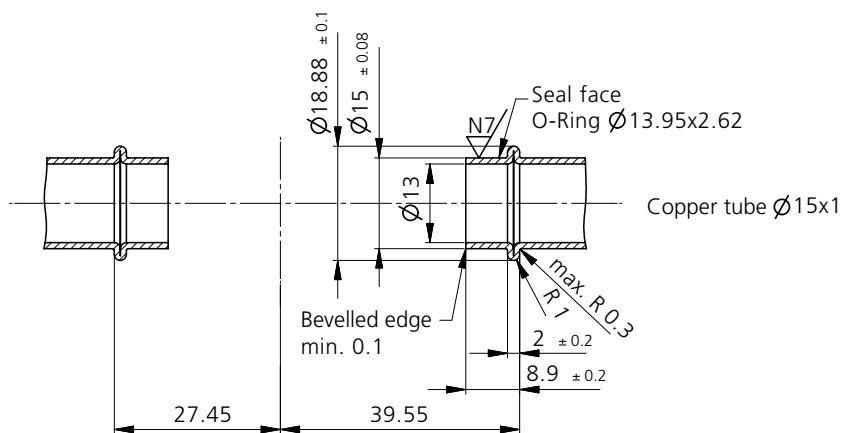
Accessories



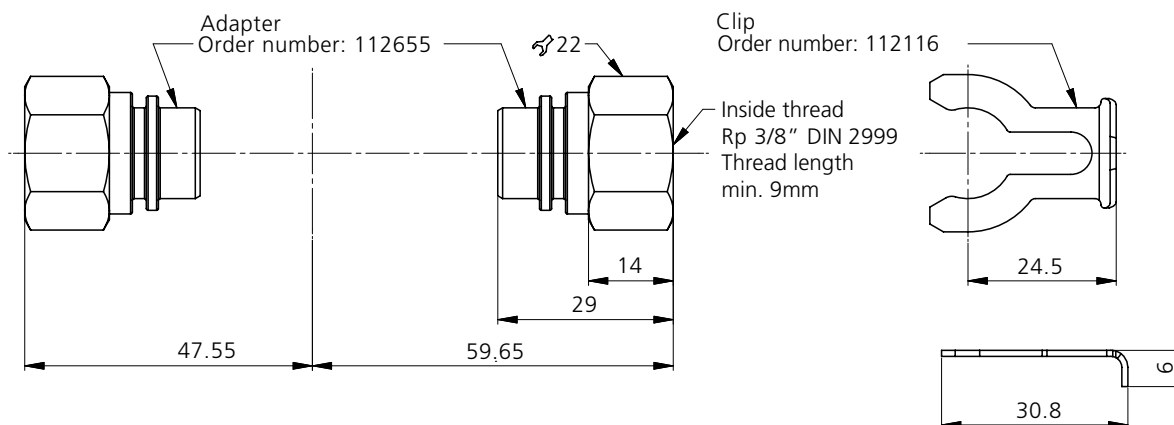
Dimension diagram DN 10



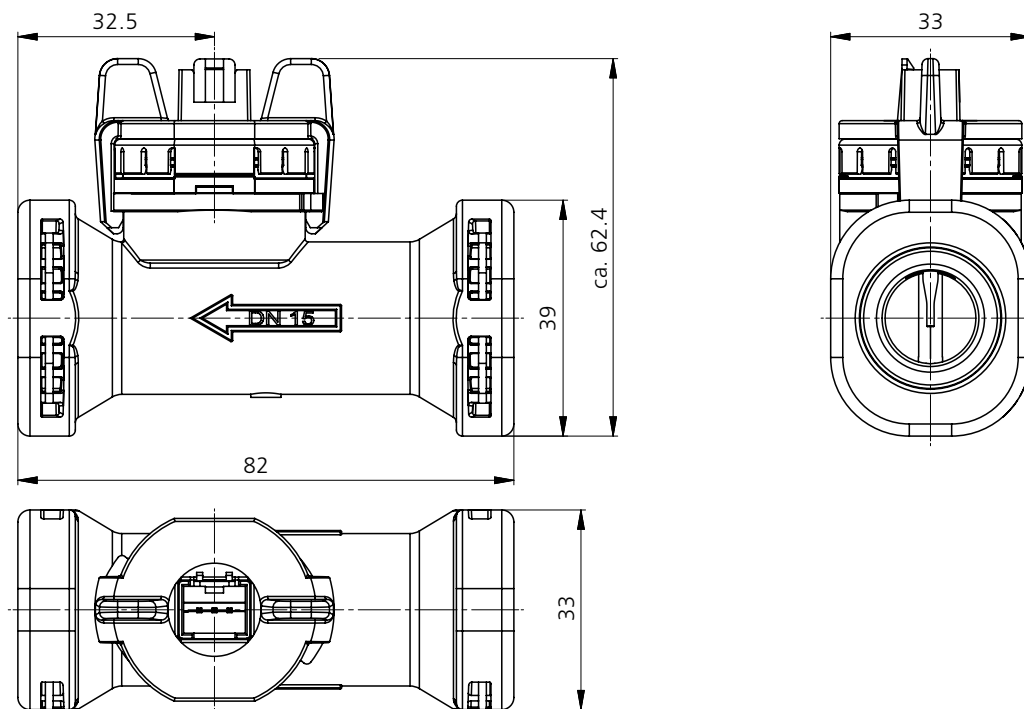
Geometry of customer's connection tube DN 10



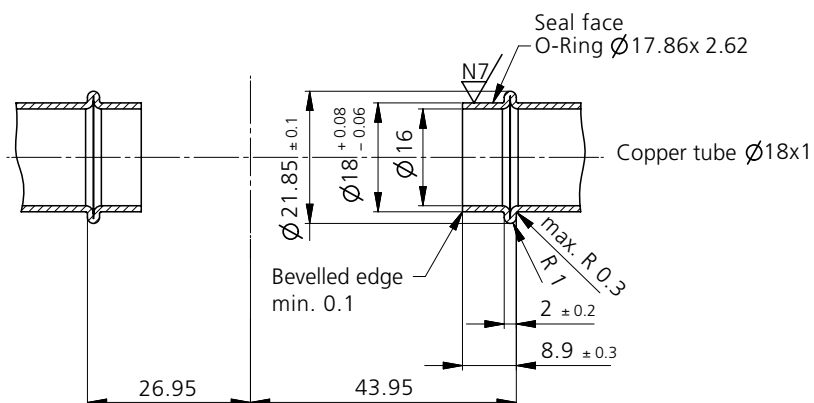
Accessories



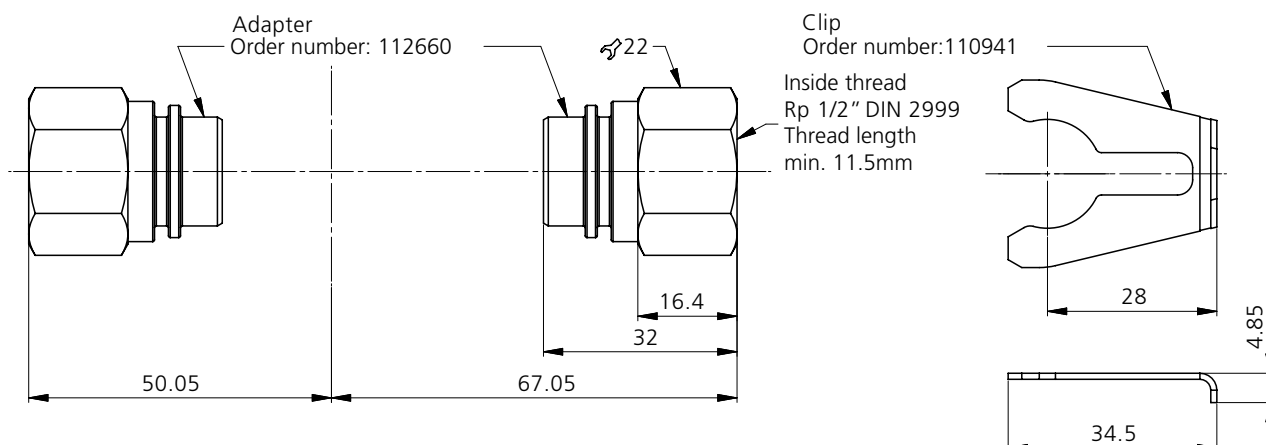
Dimension diagram DN 15



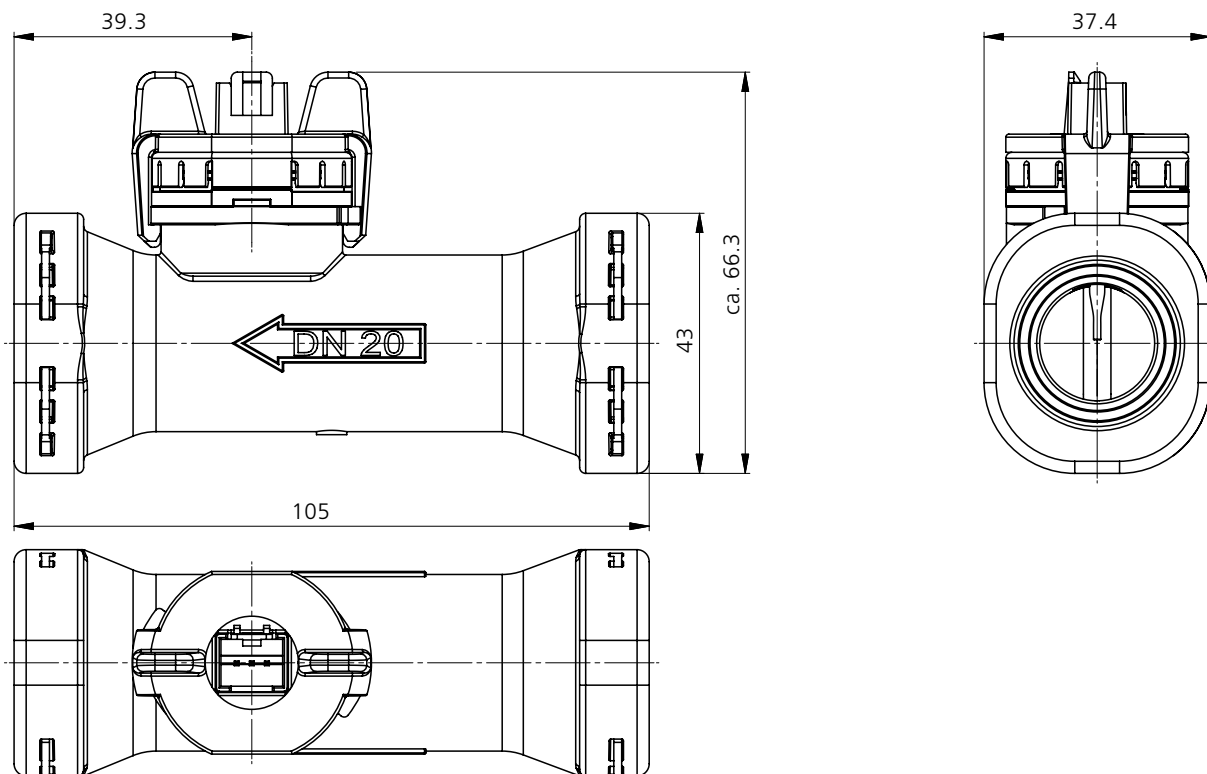
Geometry of customers connection tube DN 15



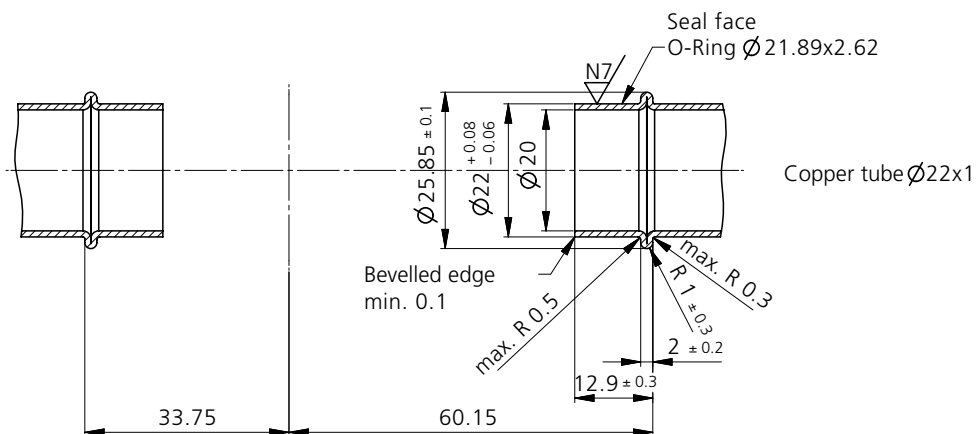
Accessories



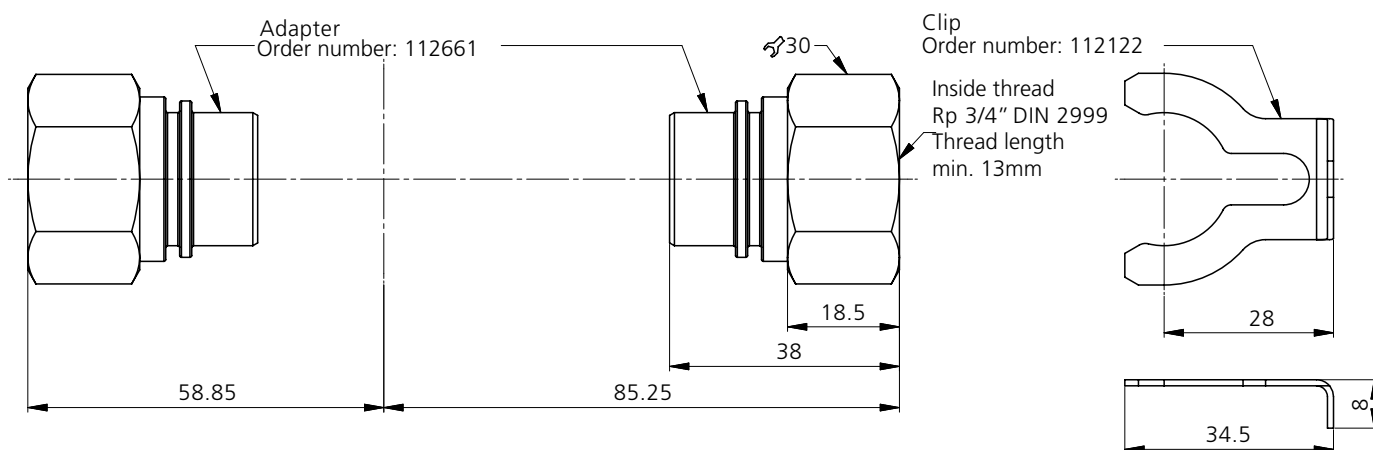
Dimension diagram DN 20



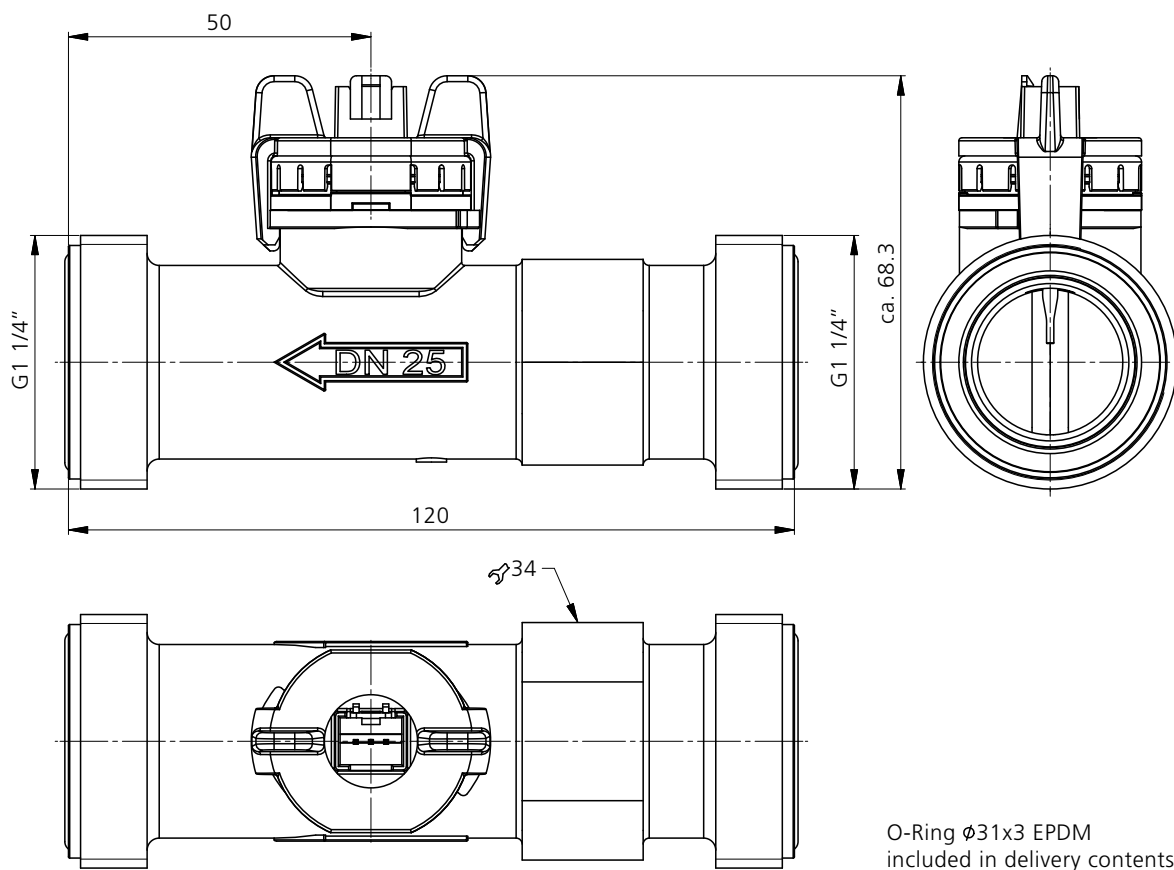
Geometry of customer's connection tube DN 20



Accessories



Dimension diagram DN 25



Tube mounting instructions

Please follow these instructions to assure the correct function of the sensor:

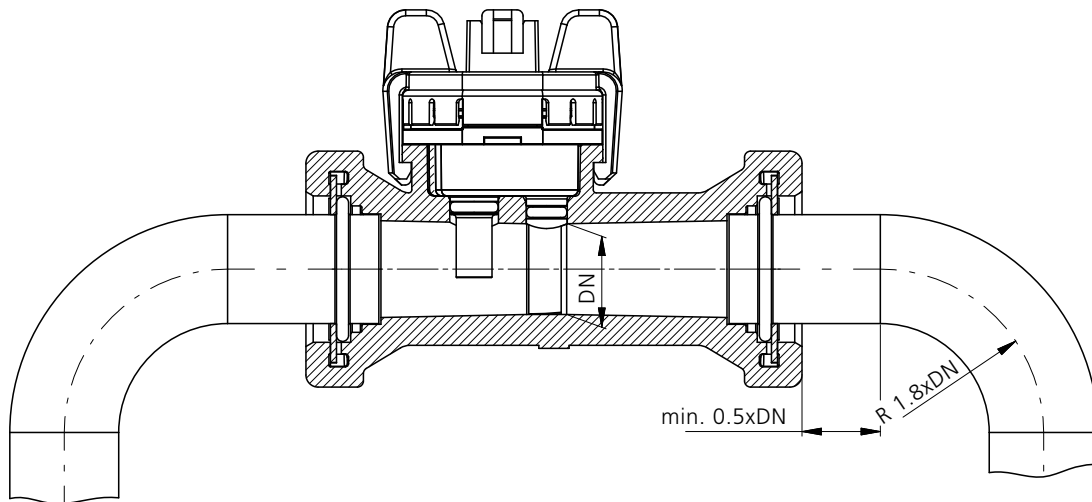
Inlet side:

- Avoid bends within a length of 5x tube diameters measured from damming body. Plane tube wall before damming body.
- Only large to small diameter changes
- Avoid bends which are not on the same level (twist).

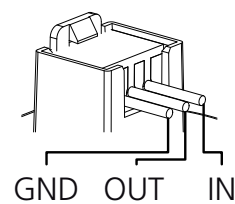
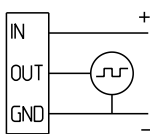
Outlet side:

- The connection diameter must not be smaller than the diameter near the sensor.

Minimum fitting dimensions for a ideal 90° elbow according to the drawing



Electrical connections



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