

Flow measurement

Selection guide



How to use this Selection Guide

Selecting the measuring principle (1–4)



“Measuring principles” selection table

Requirements		Fluids (examples)	Measuring principle					
			Electro-magnetic	Coriolis	Ultrasonic	Vortex	Thermal	Differential pressure
Liquids	Liquids in general	Water	■	■	■/▲	■		■
	Flow rates < 2 l/h	Additives, flavors	■	■				
	Non-conductive liquids	Oil, hydrocarbons		■	■/▲	■		■
	Viscous liquids > 500 mPa·s	Molasse, shower gel	■	■				
	Cryogenic fluids	Liquid O ₂ , Ar, N ₂		■		■		■
	Volume flow	Water, milk, solvents	■	■	■/▲	■		■
	Mass flow	Chemicals		■		■		■
	Measuring uncertainty ≤ 0.2% o.r.		■	■				
	Nominal pipe diameter DN > 500 (20")	Water	■		■/▲			■
	Operable flow range > 1:30		■	■	■/▲			
	Low pressure loss		■		■/▲			■
	Density, concentration, viscosity metering	Foods, shower gel		■				
	Process temperature > 200 °C			■		■		■
	Process pressure > 100 bar	Crude oil		■	▲	■		■
Gases	Gas flow in general	Natural gas, air		■	■	■	■	■
	Contaminated gas	Biogas, exhaust gas			■	■	(■)	■
	Volume flow	Exhaust gas			■	■		■
	Mass flow	CO ₂		■		■	■	■
	Measuring uncertainty ≤ 0.5% o.r.	Rare gas		■				
	Nominal pipe diameter DN > 300 (12")						■	■
	Operable flow range > 1:30			■			■	
	Low pressure loss	Air			■		■	■
	Process temperature > 200 °C	Exhaust gas				■		■
	Process pressure > 100 bar	Compressed natural gas (CNG)		■		■		■
Steam	Volume flow					■		■
	Mass flow			■		■		■
	Nominal pipe diameter DN > 300 (12")							■
	Operable flow range > 1:10			■		■		■
	Low pressure loss							■
	Process temperature > 300 °C	Superheated steam				■		■
	Process pressure > 100 bar	Superheated steam				■		■
Special applications	Hygienic applications (SIP/CIP)	Milk, beer	■	■	▲			
	Slurries, suspended solids	Thick sludge	■	■				
	Liquid/liquid mixtures	Oil/water, emulsions		■				
	Highly abrasive fluids (e.g. in mining)	Ore slurry	■					
	Bidirectional metering (forward/reverse)		■	■	■/▲			■
	Measurement from outside without process interruption/retrofitting/temporary metering				■/▲			
	Filling applications/Gas refueling applications		see Flow measurement OEM (inside)					
	Flow monitoring		see Flow monitoring (inside)					

i Ultrasonic: ■ Inline / ▲ Clamp on

Please note: The selection table above provides a general overview and is used for quick clarification of suitable measuring principles. The table is not exhaustive. If further clarification is required, feel free to contact Endress+Hauser any time. We'll be glad to be of assistance.

Selecting the flowmeter (5–9)

- 5 Open out this brochure completely. The overview contains all the measuring principles you selected under Point 4, as well as the corresponding Endress+Hauser flowmeters.

- Electromagnetic
- Ultrasonic
- Differential pressure

- 6 Now mark all sensors that – due to their available size – can be installed in the pipe of your choice (DN = 2200/88").

- Promag L
- Prosonic Flow W (clamp on)
- Prosonic Flow W (insertion)
- Prosonic Flow P
- Deltatop DP (Pitot tube)

- 7 Choose the sensors in question that meet the required accuracy (Uncertainty <0.3% o.r.)

- Promag L ($\pm 0.2\%$ o.r.)

- 8 Finally, select a corresponding transmitter for the sensor – in this case "Promag 400" that is suitable for water applications.

- Promag 400

- 9 You have found the right flowmeter for your measuring point.

- Promag L 400

			Diameter	Measuring uncertainty ¹⁾ (best possible *accuracy)	Combinable with
Electromagnetic (EMF) Proline	Promag D Water/Waste water		DN 25 to 100 (1 to 4')	Liquids: ±0.5%	10 Basic Sensor D, L, W, P, H
	Promag L 7 Water/Waste water		DN 50 to 2400 (2 to 90') 6	Liquids: ±0.2% 7	50 Standard Sensor D, L, W, P, H
	Promag W Water/Waste water		DN 25 to 2000 (1 to 78')	Liquids: ±0.2%	51 Custody transfer Sensor W, P
	Promag P Chemical/Process applications		DN 15 to 600 (½ to 24')	Liquids: ±0.2%	53 High-end Sensor W, P, H
	Promag H Hygiene		DN 2 to 150 (⅛ to 6')	Liquids: ±0.2%	55 Special applications Sensor S, H
	Promag S Inhomogeneous fluids High solid content		DN 15 to 600 (½ to 24')	Liquids: ±0.2%	200 Two-wire Sensor P, H
Ultrasonic Proline	Prosonic Flow W Clamp-on sensor Standard applications		DN 15 to 4000 (½ to 156') 6	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)	91 Basic Sensor W
	Prosonic Flow W Insertion sensor Standard applications		DN 200 to 4000 (8 to 156')	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)	93 High-end Sensor W, P, C
	Prosonic Flow P Clamp-on sensor Process applications		DN 15 to 4000 (½ to 156')	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)	93 T Portable Sensor P
	Prosonic Flow F Inline sensor Chemical industry		DN 25 to 300 (1 to 12')	Liquids: ±0.5% (2 or 3 beams) ±0.3% (4 beams)	92 Inline Sensor F
	Prosonic Flow B Methane/Biogas measurement		DN 50 to 200 (2 to 8')	Gases: ±1.5% Methane content: ±2.0% o.f.s	200 Two-wire Sensor B
	Prosonic Flow C Inline sensor Water/Waste water		DN 300 to 2000 (12 to 78')	Liquids: ±0.5%	
Differential pressure	Deltatop DO Orifice plate		DN 10 to 1000 (¾ to 40') 6	Liquids, gases, steam: ±0.5 to 0.8% ²⁾	Deltabar S PMD 70/75 Deltatop
	Deltatop DP Pitot tube		DN 40 to 12 000 (1½ to 480')	Liquids, gases, steam: ±1.0% ²⁾	Deltabar M PMD 55 Deltatop
	Deltatop DN Nozzle		DN 50 to 500 (2 to 20')	Liquids, gases, steam: ±0.8 to 2.0% ²⁾	
	Deltatop DV Venturi tube		DN 50 to 2000 (2 to 78')	Liquids, gases, steam: ±0.7 to 1.5% ²⁾	



W@M – Life Cycle Management

Optimal business processes – lifelong

All through a production facility's long life span, data on actuators and sensors is constantly being generated. It starts with the sizing and procurement of components, goes on through installation and set-up, to continue uninterrupted throughout operation and maintenance. For this reason, information, complete and instantly available, is the key to success in operating any production plant. W@M from Endress+Hauser is an intelligent information platform designed to support you end-to-end throughout your facility's entire life cycle:

- W@M is an open information system based on intranet and internet technology
- W@M brings together software, products and services from Endress+Hauser
- W@M ensures the worldwide availability of equipment and plant data
- W@M puts an end to time-consuming searches for device information in archives



Plant Asset Management (PAM)

W@M

- Worldwide information system: spare parts, software versions, device data, device history, etc.

Device configuration and parameterization

- With FieldCare: Software for configuration and diagnosis
- With Field Xpert: Handheld control unit (field unit)

Calibration management

- CompuCal: Software for automated administration of maintenance and calibration tasks
- Fieldcheck for device verification in the field

Applicator

- Selecting and sizing of measuring devices
- Project documentation

Product Configurator

- Generation of order codes
- Customer-specific pre-parameterization of measuring devices
- Spare parts planning

Online shop

- Standard products, services and spare parts ordering
- Pricing information
- Delivery times
- Order status and shipping status



Documentation

In multiple languages downloadable:

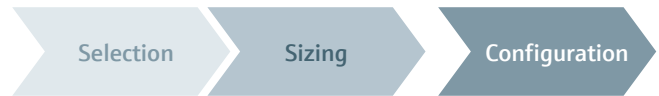
- Technical information
- Operating manuals
- Approvals
- Certificates, etc.

Applicator

Fast planning and dependable sizing

The first steps are always the most important when it comes to planning metering points. An optimally dimensioned meter at the right location will invariably save time and money in the long run. Applicator is a proven selection and sizing program from Endress+Hauser. Applicator is built around 25 years of industry experience and expert knowledge:

- Straightforward, dependable sizing of measuring points; no specialist skills necessary
- 600-plus meters selectable: flow, level, pressure, temperature, energy, etc.
- Menu-driven user interface with user information and warnings
- Language versions: English, German, French, Spanish, Russian, Chinese and Japanese
- Direct generation of order codes using the Product Configurator
- Cost-saving administration and documentation of plant projects with the Project Module



Selection and sizing

- Selective check of requirements: approvals and certificates (industry-specific); metering task, measured variables, type of fluid, process data, etc. (application-oriented); communication (interfaces)
- Automatic proposal of best-fit meters and solutions
- Display and computation of important parameters: optimum line size, pressure loss, accuracy, material load, compliance with Pressure Equipment Directive, corrosion resistance, etc.
- Viewing/printing of results in tabular or graph form
- Comprehensive databases that include more than 400 fluids

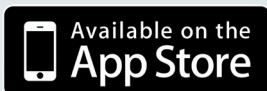


The Applicator program is also available online. Moreover, our Applicator newsletter with its reports on all the latest updates can be subscribed to:

<http://www.endress.com/applicator>

Endress+Hauser Operations App

The Operations App offers fast access to the latest product information bulletins and device details, including order codes, availability, spare parts, successor products and general product information – wherever you are, whenever you need the data. Just key in the serial number or scan the on-device data matrix code to download the related information.



Products

Solutions

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Applicator

Local W@M Toolset

For product selection, sizing and project documentation



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CP00001D/06/EN/14.13

Flow measurement

Sensors

			Diameter	Measuring range	Pressure	Temperature (process)	Materials (wetted parts)	Process connection	Protection	Approval/Certification	Measuring uncertainty ¹⁾ (best possible "accuracy")
Electromagnetic (EMF) Proline	Promag D		DN 25 to 100 (1 to 4")	0 to 10 m/s 0 to 660 m³/h	PN 16 Cl 150 JIS 10K	0 to +60 °C	Polyamid liner	Wafer: EN (DIN), ASME, JIS	IP67 (Type 4X)	Drinking water	Liquids: ±0.5%
	Promag L		DN 50 to 2400 (2 to 90")	0 to 10 m/s 0 to 162000 m³/h	PN 10 to 16 Cl 150 AS Table E, PN 16	-20 to +90 °C	Polyurethane liner PTFE liner Hard rubber liner	Lap-joint flange (DN ≤ 300): EN (DIN), ASME, Welded flange (DN ≥ 350): EN (DIN), ASME, AWWA, AS	IP67/IP68 (Type 4X/6P)	Drinking water; custody transfer	Liquids: ±0.2%
	Promag W		DN 25 to 2000 (1 to 78")	0 to 10 m/s 0 to 110000 m³/h	PN 6 to 40, Cl 150 to 300 JIS 10 to 20K, AWWA Class D AS Table E, PN 16	-20 to +80 °C	Hard rubber liner Polyurethane liner	Flange: EN (DIN), ASME, JIS, AWWA, AS	IP67/IP68 (Type 4X/6P)	Drinking water; custody transfer; marine approvals; PED, CRN; certified corrosion resistance (EN ISO 12944)	Liquids: ±0.2%
	Promag P		DN 15 to 600 (½ to 24")	0 to 10 m/s 0 to 9600 m³/h	PN 10 to 40, Cl 150 to 300 JIS 10 to 20K AS Table E, PN 16	-40 to +180 °C	PFA liner PTFE liner	Flange: EN (DIN), ASME, JIS, AS	IP67/IP68 (Type 4X/6P)	Drinking water; custody transfer; marine approvals; PED, CRN	Liquids: ±0.2%
	Promag H		DN 2 to 150 (⅜ to 6")	0 to 10 m/s 0 to 282 m³/h	PN 16 to 40, Cl 150 JIS 10 to 20K	-20 to +150 °C	PFA liner	Flange: EN (DIN), ASME, JIS, external thread, internal thread, weld connection, clamp connection, couplings	IP67 (Type 4X)	3-A, EHEDG, FDA; marine approvals; PED, CRN	Liquids: ±0.2%
Coriolis Proline	Promass S		DN 15 to 600 (½ to 24")	0 to 10 m/s 0 to 9600 m³/h	PN 10 to 40, Cl 150 to 300 JIS 10 to 20K AS Table E, PN 16	-40 to +180 °C	PTFE, PFA, Polyurethane liner Natural rubber liner Hard rubber liner	Flange: EN (DIN), ASME, JIS, AS	IP67/IP68 (Type 4X/6P)	PED, CRN	Liquids: ±0.2%
	Promass F		DN 8 to 250 (½ to 10") DN 25, 50, 80 (HT)	0 to 220000 kg/h	PN 16 to 100 Cl 150 to 600 JIS 10 to 63K	-50 to +200 °C -50 to +350 °C (HT)	Measuring tube: 904L (1.4539), 316/316L (1.4404), Alloy C-22 (2.4602); Connection: 316/316L (1.4404), Alloy C-22 (2.4602)	Flange: EN (DIN), ASME, JIS Tri-Clamp, couplings, VCO	IP67 (Type 4X)	SIL 2/3; 3-A, EHEDG; PED, CRN, AD 2000; marine approvals	Liquids: ±0.10% (±0.05% PremiumCal) Gases: ±0.35%
	Promass A		DN 1 to 4 (⅛ to ¼")	0 to 450 kg/h	PN 16 to 400 Cl 150 to 600 JIS 10 to 63K	-50 to +200 °C	Measuring tube: 904L (1.4539), Alloy C-22 (2.4602); Connection: 904L (1.4539), Alloy C-22 (2.4602), 316/316L (1.4404)	Tri-Clamp, VCO	IP67 (Type 4X)	SIL 2; 3-A, EHEDG; PED, CRN	Liquids: ±0.10% Gases: ±0.30%
	Promass I		DN 8 to 80 (⅜ to 3")	0 to 180000 kg/h	PN 40 to 100 Cl 150 to 300 JIS 10 to 63K	-50 to +150 °C	Measuring tube: Titanium grade 2 Connection: Titanium grade 2	Flange: EN (DIN), ASME, JIS Tri-Clamp, couplings	IP67 (Type 4X)	SIL 2; 3-A, EHEDG; PED, CRN	Liquids: ±0.10% Gases: ±0.50%
	Promass H		DN 8 to 50 (⅜ to 2")	0 to 70000 kg/h	PN 40 Cl 150 to 300 JIS 10 to 20K	-50 to +200 °C (Z) -50 to +150 °C (Ta)	Measuring tube: Zirconium 702/R 60702, Tantalum 2.5W; Connection: Tantalum, Zirconium 702/R 60702	Flange: EN (DIN), ASME, JIS	IP67 (Type 4X)	SIL 2; PED, CRN	Liquids: ±0.10% Gases: ±0.50%
Ultrasonic Proline	Promass E		DN 8 to 80 (⅜ to 3")	0 to 180000 kg/h	PN 40 to 100 Cl 150 to 300 JIS 10 to 63K	-40 to +140 °C	Measuring tube: 904L (1.4539) Connection: 316/316L (1.4404)	Flange: EN (DIN), ASME, JIS Tri-Clamp, couplings, VCO	IP67 (Type 4X)	SIL 2; 3-A, PED, CRN; marine approvals	Liquids: ±0.15% (Optional: ±0.10%) Gases: ±0.75%
	Promass S		DN 8 to 50 (⅜ to 2")	0 to 70000 kg/h	PN 40 to 63 Cl 150 to 300 JIS 10 to 40K	-50 to +150 °C	Measuring tube: 904L (1.4539) Connection: 316L (1.4435), 316/316L (1.4404)	Flange: EN (DIN), ASME, JIS Tri-Clamp, couplings	IP67 (Type 4X)	SIL 2; 3-A, EHEDG, FDA; PED, CRN	Liquids: ±0.10% Gases: ±0.50%
	Promass P		DN 8 to 50 (⅜ to 2")	0 to 70000 kg/h	PN 40 to 63 Cl 150 to 300 JIS 20 to 40K	-50 to +200 °C	Measuring tube: 316L (1.4435) Connection: 316L (1.4435), 316/316L (1.4404)	Flange: EN (DIN), ASME, JIS Hygienic clamps, couplings and flanges	IP67 (Type 4X)	3-A, EHEDG, FDA; ASME BPE, ISPE; SIL 2; PED, CRN	Liquids: ±0.10% Gases: ±0.50%
	Promass O		DN 80 to 150 (3 to 6")	0 to 800000 kg/h	PN 160, PN 150 Cl 900, Cl 1500	-40 to +200 °C	Measuring tube: 25Cr duplex (1.4410) Connection: 25Cr duplex (1.4410)	Flange: EN (DIN), ASME	IP67 (Type 4X)	Custody transfer: SIL 2; PED, CRN, AD 2000; Materials conforms to NORSOK M-630, NACE MR175/MR103	Liquids: ±0.10% (±0.05% PremiumCal) Gases: ±0.35%
	Promass X		DN 300 to 400 (12 to 16")	0 to 410000 kg/h	PN 10 to 100 Cl 150 to 600	-50 to +180 °C	Measuring tube: 316/316L (1.4404) Connection: 316/316L (1.4404)	Flange: EN (DIN), ASME	IP67 (Type 4X)	Custody transfer; marine approvals; PED, CRN; Materials conforms to NORSOK M-630, NACE MR175/MR103	Liquids: ±0.10% (±0.05% PremiumCal) Gases: ±0.35%
Vortex Proline	Cubemass		DN 1, DN 2, DN 4, DN 6 (⅛", ¼", ½", ¾", 1")	0 to 1000 kg/h	160/400 bar	-50 to +200 °C	Measuring tube: 904L (1.4539) Connection: 904L (1.4539), 316/316L (1.4404)	VCO	IP67 (Type 4X)	SIL 2; PED, CRN	±0.1%
	Cubemass DCI		DN 1, DN 2, DN 4, DN 6 (⅛", ¼", ½", ¾", 1")	0 to 1000 kg/h	160/400 bar	-50 to +200 °C	Measuring tube: 904L (1.4539) Connection: 904L (1.4539), 316/316L (1.4404)	VCO	IP67 (Type 4X)	SIL 2; PED, CRN	±0.1%
	Prosonic Flow W		DN 15 to 4000 (½ to 156")	0 to 15 m/s 0 to 678550 m³/h	No limit Non-invasive	-20 to +80 °C Optional: 0 to 130 °C	Not wetted (Clamp-on sensor)	Clamp-on sensor	IP67/IP68 (Type 4X/6P)	Marine approvals	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)
	Prosonic Flow W		DN 200 to 4000 (8 to 156")	0 to 15 m/s 0 to 678550 m³/h	PN 16	-20 to +80 °C	316L (1.4404)	Welding connector	IP68 (Type 6P)	-	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)
	Prosonic Flow P		DN 15 to 4000 (½ to 156")	0 to 15 m/s 0 to 678550 m³/h	No limit Non-invasive	-40 to +80 °C Optional: 0 to 170 °C	Not wetted (Clamp-on sensor)	Clamp-on sensor	IP67/IP68 (Type 4X/6P)	Marine approvals	Liquids: <2.0% (onsite) ±0.5% (under reference conditions)
Thermal Proline	Prosonic Flow F		DN 25 to 300 (1 to 12")	0 to 10 m/s 0 to 2400 m³/h	PN 40 Cl 300	-40 to +150 °C Optional: -40 to +200 °C	CF3M/316/316L Al10S/A106/316/316L	Flange: EN (DIN), ASME, JIS	IP67/IP68 (Type 4X/6P)	Marine approvals; PED, CRN, AD 2000; NACE MR175/MR103	Liquids: ±0.5% (2 or 3 beams) ±0.3% (4-beams)
	Prosonic Flow B		DN 50 to 200 (2 to 8")	0 to 30 m/s 9 to 3925 m³/h	PN 10	0 to 80 °C	316L (1.4404)	Flange: EN (DIN), ASME	IP66/67 (Type 4X)	PED	Gases: ±1.5% Methane content: ±2.0% o.f.s.
	Prosonic Flow C		DN 300 to 2000 (12 to 78")	0 to 10 m/s 0 to 110000 m³/h	PN 16 Cl 150	-20 to +60 °C	Carbon steel, epoxy coated	Flange: EN (DIN), ASME, AWWA	IP68 (Type 6P)	Drinking water	Liquids: ±0.5%
	Prowirl F		DN 15 to 300 (½ to 12")	Liquids: 0.16 to 2360 m³/h Gases: 3 to 19700 m³/h	PN 10 to 250 Cl 150 to 1500 JIS 10 to 40K	-200 to +400 °C Optional: -200 to +450 °C	Meter body: CF3M (1.4404), Alloy C-22 (2.4602) DSC sensor: 316L (1.4435), Inconel 718, Alloy C-22 (2.4602), Titanium Gr. 5	Flange: EN (DIN), ASME, JIS Optional: with integrated line size reduction	IP67 (Type 4X)	Marine approvals; PED, CRN; SIL 1 (Prowirl 73), SIL 2 (Prowirl 72); degraded acc. to BS-IEC-60877:1999	Liquids: ±0.75% Vol. Gases/steam: ±1.0% Vol.
	Prowirl W		DN 15 to 150 (½ to 6")	Liquids: 0.19 to 625 m³/h Gases: 4 to 5210 m³/h	PN 10 to 40 Cl 150 to 300 JIS 10 to 20K	-200 to +400 °C Optional: -200 to +450 °C	Meter body: CF3M (1.4404) DSC sensor: 316L (1.4435), Alloy C-22 (2.4602)	Wafer: EN (DIN), ASME, JIS	IP67 (Type 4X)	Marine approvals; PED, CRN, AD 2000; SIL 1 (Prowirl 73), SIL 2 (Prowirl 72); degraded acc. to BS-IEC-60877:1999	Liquids: ±0.75% Vol., ±1% Mass Gases/steam: ±1.0% Vol., ±1.7% Mass
Differential pressure	t-mass A		DN 15 to 50 (½ to 2")	0.5 to 1365 kg/h	-0.5 to 40 barg	-40 to +100 °C	316L (1.4404)	Lap-joint flange, Flange: EN (DIN), ASME Rexternal thread (EN) NP/External thread (ASME)	IP66 and IP67 (Type 4X)	PED	Gases: ±3% o.r. (15 to 100% o.f.s.) ±0.45% o.f.s. (1 to 15% o.f.s.)
	t-mass B		DN 80 to 1500 (3 to 60")	20 to 1080000 kg/h	-0.5 to 20 barg	-40 to +100 °C	316L (1.4404)	Thread: G1A, G1A 1"NPT, ¾"NPT	IP66 and IP67 (Type 4X)	PED	Gases: ±3% o.r. (15 to 100% o.f.s.) ±0.45% o.f.s. (1 to 15% o.f.s.)
	t-mass F		DN 15 to 100 (½ to 4")	0 to 120 m/s 0.5 to 3750 kg/h	PN 16 to 40 Cl 150 to 300	-40 to +100 °C	316L (1.4404) Alloy C-22	Flange: EN (DIN), ASME, JIS	IP67 (Type 4X)	PED, CRN; degraded acc. to 0000-N-5-430-00-01 (BOC) and BS-IEC-60877:1999	Gases: ±1.5% o.r. (10 to 100% o.f.s.) ±0.15% o.f.s. (1 to 10% o.f.s.)
	t-mass I		DN 80 to 1500 (3 to 60")	0 to 120 m/s 20 to 720000 kg/h	290 psi g 20 bar rel.	-40 to +130 °C	316L (1.4404) Alloy C-22	Thread: 1"NPT, G1A	IP67 (Type 4X)	PED, CRN; degraded acc. to 0000-N-5-430-00-01 (BOC) and BS-IEC-60877:1999	Gases: ±1.5% o.r. (10 to 100% o.f.s.) ±0.15% o.f.s. (1 to 10% o.f.s.)
	Deltatop DO		DN 10 to 1000 (½ to 40")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	C22.8 316L (1.4404) 15Mo3 (1.5415)	Wafer (corner tapping) Flange (flange tapping) Pipe unit (meter run)	IP68 (Type 6P)	SIL; PED; Materials (NACE)	Liquids, gases, steam: ±0.5 to 0.8% ²⁾
Thermal Proline	Deltatop DP		DN 40 to 12000 (1½ to 480")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	C22.8 316L (1.4404)	Cutting ring, flange, flow tap	IP68 (Type 6P)	PED; Materials (NACE)	Liquids, gases, steam: ±1.0% ²⁾
	Deltatop DN		DN 50 to 500 (2 to 20")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	e.g. C22.8, 316L (1.4404) 15Mo3 (1.5415) 13CrMo45	Flange: EN (DIN), ASME, JIS Wafer: EN (DIN), ASME, JIS Butt-weld version	IP68 (Type 6P)	SIL; PED; Materials (NACE)	Liquids, gases, steam: ±0.8 to 2.0% ²⁾
	Deltatop DV		DN 50 to 2000 (2 to 78")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	e.g. C22.8, 316L (1.4404) 15Mo3 (1.5415) 13CrMo45	Flange: EN (DIN), ASME, JIS Wafer: EN (DIN), ASME, JIS Butt-weld version	IP68 (Type 6P)	SIL; PED; Materials (NACE)	Liquids, gases, steam: ±0.7 to 1.5% ²⁾
	Deltatop DO		DN 10 to 1000 (½ to 40")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	C22.8 316L (1.4404) 15Mo3 (1.5415)	Wafer (corner tapping) Flange (flange tapping) Pipe unit (meter run)	IP68 (Type 6P)	SIL; PED; Materials (NACE)	Liquids, gases, steam: ±0.5 to 0.8% ²⁾
	Deltatop DP		DN 40 to 12000 (1½ to 480")	Liquids: 0 to 12 m/s Gases: 0 to 65 m/s Steam: 0 to 65 m/s	PN 6 to 420 Cl 150 to 2500	-200 to +1000 °C	C22.8 316L (1.4404)	Cutting ring, flange, flow tap	IP68 (Type 6P)	PED; Materials (NACE)	Liquids, gases, steam: ±1.0% ²⁾
Coriolis	CNGmass		DN 8, DN 15, DN 25 (⅜", ½", 1")	0 to 150 kg/min	350 bar	-50 to +125 °C	316L (1.4404) 316L (1.4435)	Internal thread: G1½" (DN 8), G1½" (DN 15) G1" (DN 25)	IP67 (Type 4X)	Custody transfer; PED, CRN	Liquids: ±0.5% (per fill cycle)
	CNGmass DCI		DN 8, DN 15, DN 25 (⅜", ½", 1")	0 to 150 kg/min	350 bar	-50 to +150 °C	316L (1.4404) 316L (1.4435)	Internal thread: G1½" (DN 8), G1½" (DN 15) G1" (DN 25)	IP67 (Type 4X)	Custody transfer; PED, CRN	Liquids: ±0.5% (per fill cycle)
	LPGmass		DN 8, DN 15, DN 25, DN 40 (⅜", ½", 1", 1½")	0 to 45000 kg/h	PN 40 Cl 150 to 300 JIS 10 to 63K	-40 to +125 °C	904L (1.4539) 316L (1.4404)	Flange: EN (DIN), ASME, JIS; VCO	IP67 (Type 4X)	Suitable for system approval acc. to OIML R117-1 (2004/22/EG (MID), Appendix MI-QS5); PED	±0.2%
	CNGmass		DN 8, DN 15, DN 25 (⅜", ½", 1")	0 to 150 kg/min	350 bar	-50 to +125 °C	316L (1.4404) 316L (1.4435)	Internal thread: G1½" (DN 8), G1½" (DN 15) G1" (DN 25)	IP67 (Type 4X)	Custody transfer; PED, CRN	Liquids: ±0.5% (per fill cycle)
	LPGmass		DN 8, DN 15, DN 25, DN 40 (⅜", ½", 1", 1½")	0 to 45000 kg/h	PN 40 Cl 150 to 300 JIS 10 to 63K	-40 to +125 °C	904L (1.4539) 316L (1.4404)	Flange: EN (DIN), ASME, JIS; VCO	IP67 (Type 4X)	Suitable for system approval acc. to OIML R117-1 (2004/22/EG (MID), Appendix MI-QS5); PED	±0.2%

¹⁾ Depending on the transmitter (see ordering options)
²⁾ Measurement uncertainty for design/installation acc. to ISO 5167 (without calibration)

Transmitter

	Combinable with	Housing	Display/Operation	Temperature (Ambient)	Power supply	Galvanic isolation	Inputs	Outputs	Communication	Ex approvals	Protection
10 Basic	Sensor D, L, W, P, H	Compact Alu Remote Alu	Two-line LCD/ Push buttons Operation via FieldCare	-20 to +60 °C	AC 85 to 250 V (45 to 65 Hz) AC 20 to 28 V (45 to 65 Hz) DC 11 to 40 V	Inputs/Outputs/ Power supply	-	4-20 mA, pulse/switch output	HART	FM, CSA Div. 2	IP67 (Type 4X)
50 Standard	Sensor D, L, W, P, H	Compact SS Compact Alu Remote Alu	Two-line, backlit LCD/ Push buttons Operation via FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, pulse/frequency (1 kHz passive), switch output	HART, PROFIBUS DP, PROFIBUS PA	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
51 Custody transfer	Sensor W, P	Compact Alu Remote Alu	Two-line, backlit LCD/ Push buttons Operation via FieldCare	-20 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, pulse/frequency (1 kHz passive), switch output	HART	ATEX, IECEx	IP67 (Type 4X)
53 High-end	Sensor W, P, H	Compact SS Compact Alu Remote Alu	Four-line, backlit LCD/ Touch control Operation via FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input, current input 4-20 mA	0/4-20 mA, status (10 kHz, active/passive), relays, switch output	HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
55 Special applications	Sensor S, H	Compact SS Compact Alu Remote Alu	Four-line, backlit LCD/ Touch control Operation via FieldCare	-20 to +50 °C Optional: -40 to +50 °C	AC 20 to 260 V (45 to 65 Hz) DC 20 to 64 V	Inputs/Outputs/ Power supply	Status input, current input 4-20 mA	0/4-20 mA, pulse/frequency (10 kHz, active/passive), relays, switch output	HART, PROFIBUS DP, FOUNDATION Fieldbus	FM, CSA Div. 2, IECEx Zone 2	IP67 (Type 4X)
200 Two-wire	Sensor P, H	Compact Alu	Four-line LCD/ Push buttons or Touch control Operation via FieldCare	-40 to +60 °C	Two-wire DC 18 to 30 V	Inputs/Outputs	-	4-20 mA, pulse/frequency/ switch output	HART	ATEX, IECEx, cCSAus	IP66 and IP67 (Type 4X)
400 Water Waste water	Sensor D, L, W	Compact/Remote Polycarbonate	Four-line, backlit LCD/ Touch control Operation via FieldCare or webbrowser	-20 to +50 °C	AC 90 to 264 V (47 to 63 Hz) AC 18 to 30 V (44 to 66 Hz) DC 18 to 30 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, pulse/frequency/ switch output	HART, integrated webserver and service interface via RJ45 Ethernet in preparation: EtherNet/IP, PROFIBUS DP	cCSAus (Cl. I Div. 2)	IP66 and IP67 (Type 4X)
800 Battery-powered	Sensor L, W	Compact/Remote Polycarbonate	Eight-line LCD/ Push buttons Operation via Config: S800 or GSM and GPRS	-20 to +60 °C	Battery operation: DC 3-6 V Mains: AC 100 to 240 V (44 to 66 Hz), DC 12 to 60 V	Inputs/Outputs/ Power supply	Status input	Pulse/switch output	4-band GSM/GPRS modem for data transmission via e-mail or SMS	-	IP67 (Type 4X)
40 Basic	Sensor E	Compact Alu	Two-line, backlit LCD Operation via HART or FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, frequency/switch output	HART	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
80 Standard	Sensor F, A, L, H, E, S, P	Compact SS Compact Alu Remote Alu	Two-line, backlit LCD/ Push buttons Operation via FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, pulse/frequency (10 kHz passive), switch output	HART, PROFIBUS PA	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
83 High-end	Sensor F, A, L, H, E, S, P, O, X	Compact SS Compact Alu Remote Alu	Four-line, backlit LCD/ Touch Control Operation via FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input, current input 4-20 mA	0/4-20 mA, pulse/frequency (10 kHz, active/passive), relays, switch output	HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
84 Custody transfer	Sensor F, A, O, X, Cabmess DCI	Compact SS Compact Alu Remote Alu	Four-line, backlit LCD/ Touch Control Operation via FieldCare	-20 to +60 °C Optional: -40 to +60 °C	AC 85 to 260 V (45 to 65 Hz) AC 20 to 55 V (45 to 65 Hz) DC 16 to 62 V	Inputs/Outputs/ Power supply	Status input	0/4-20 mA, pulse/frequency (10 kHz, active/passive), 2 × pulse (90°/180°), relays, switch output	HART Modbus RS485	ATEX, IECEx, FM, CSA, TIS, NEPSI	IP67 (Type 4X)
100 Compact design	Sensor F, I, E, S, P, Cabmess	Compact SS Compact Alu Ultra compact SS	No Display Operation via webbrowser, FieldCare or HART	-40 to +60 °C	DC 20 to 30 V	Inputs/Outputs/ Power supply	-	4-20 mA, pulse/frequency/ switch output	HART, PROFIBUS DP, Modbus RS485, EtherNet/IP	ATEX, IECEx, cCSAus (Modbus only)	IP66 and IP67 (Type 4X) Optional: IP69K (exceeds Type 4X PW12)
200 Two-wire	Sensor E, F	Compact Alu Compact SS	Four-line LCD/ Push buttons or Touch control Operation via FieldCare	-40 to +60 °C	Two-wire DC 18 to 30 V	Inputs/Outputs	-	4-20 mA, pulse/frequency/ switch output	HART, PROFIBUS PA	ATEX, IECEx, cCSAus	IP66 and IP67 (Type 4X)