Technical
Information
TI 026D/06/e
Nr. 50063741

Electromagnetic Flow Measuring System *promag 30*

Modular construction
- Providing cost-effective measurement for all applications

Operational security
- ISO 9001 manufacturer, quality assured
- High electromagnetic compatibility (EMC)
- High operating integrity through self-monitoring
- Data protection with EEPROM (without batteries) on power failure
- Auxilliary input for Positive Zero Return (PZR) and totalizer reset
- Empty pipe detection (EPD)

Easily configured
- All necessary parameters are setable using miniature switches
- Calibration can also be carried out without current flowing
- 8-character local display for flowrate and totalizer values, optional

Measure precisely
- Measuring error: ±0.5% or ±0.20%
- 1000:1 operable flow range
- Excellent repeatability

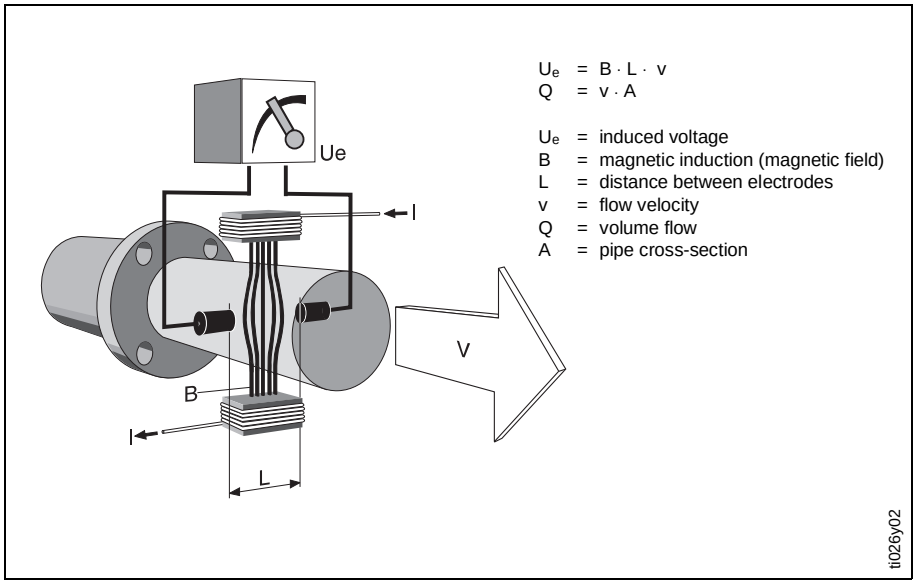
Install anywhere
- Robust, shock-resistant aluminium housing, resistant to acids and caustics
- IP 67 protection for compact and remote versions (optional IP 68 sensor)
- Wide size range DN 2...2000 ($^{1}/_{12}$...78")
- Flanged version with ISO meter lengths
- Modular, hygienic sensor for food and pharmaceutical applications
- Ex versions for use in Ex Zones 1 and 2

Endress+Hauser

Nothing beats know-how

Function

Measuring principle
According to Faraday's Law of Magnetic Induction, a voltage is induced into a conductor which moves in a magnetic field. With the electromagnetic measuring principle, the flowing fluid is the moving conductor. The induced voltage is proportionally related to the flow velocity and is fed to the measuring amplifier by a pair of electrodes. Using the pipe cross-sectional area, the flow volume is calculated.
The DC magnetic field is generated by a switched direct current of alternating polarity. Together with the patented "Integrated Autozero Circuit", this guarantees a stable zero point, and makes the measurement fluid-independent and insensitive to entrained solid particles.
Every meter is factory calibrated with the most modern calibration rigs, traceable to national standards. There is no need for it to be adapted to suit changing fluids.



Measuring Principle

Promag Measuring System

Fields of application
The Promag 30 measuring system makes cost-effective, precise electromagnetic flow measurement possible. All liquids with a minimum conductivity of 5 µS/cm can be measured:
- Acids, caustics, pastes, slurries, pulps
- Potable water, waste water, sewage
- Milk, beer, wine, mineral water, yoghurt, molasses

Ex Versions
Promag 30 is available in a number of Ex versions for use in Ex Zone 1 and 2. More information is given in the appropriate Ex documentation. Your E+ H representative will be pleased to help you.

Modular design
Mechanically and electronically, the Promag 30 measuring system is constructed in a modular fashion. Through the exchange of electronic boards, the measuring facility can be expanded at any time. In this way, the meter can be optimally equipped and modified.

The meter can be delivered as a compact or remote version:
- Compact version:
  Sensor and transmitter form one mechanical unit
- Remote version:
  The transmitter can be mounted separately from the sensor

Promag 30 measuring transmitter
- All inputs and outputs are galvanically isolated from the power supply, the measuring circuit and each other.
- Six parameters are settable using miniature switches in the electronics compartment.
- Easier and safer transmitter exchange, since the sensor data is archived in plugable DAT memory module.
- The local display allows to read off current flowrate and totalizer value. The Empty pipe detection (EPD) is activated using the display.

Promag A measuring sensor
Diameters: DN 2...25 ($^1/_{12}$...1")
Process connections:
- Internal thread
- External thread
- PVC sleeves
- Hose fittings
- Weld nipples
- Flanges DIN, ANSI, JIS
- Tri-Clamp

Liner: PFA Teflon®

Promag D sensor
Diameters: DN 25...100 (1…4")
Process connections: wafer mounting DIN, ANSI, AS, JIS
Liners: PTFE, soft rubber, hard rubber

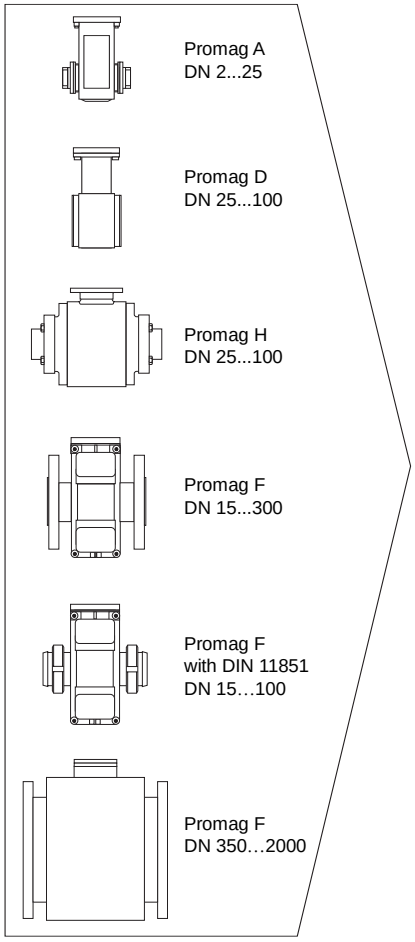
Promag H sensor
Diameters: DN 25...100 (1...4")
Process connections:
- Weld nipples for DIN 11850, OD tube, SMS, JIS and ISO tubes
- DIN 11851 thread
- ISO 2853 thread
- Tri-Clamp
- ISO 2852 clamp

Liner: PFA

Promag F sensor
Diameters: DN 15...2000 (1…78")
Process connections:
Flanges DIN, ANSI, JIS; DIN 11851 thread
Liners: PTFE, soft rubber, hard rubber

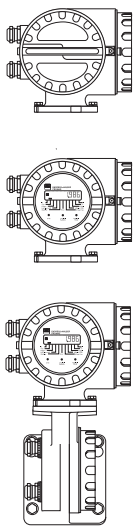
The Promag 31 F Measuring System
The Promag 30 F is approved as a hydraulic transmitter for thermal measurements to OMIL, R72/R75, and is available as the Promag 31 F. Please contact your E+ H representative for more information.

Measuring sensor



Equipment of the measuring transmitter

Promag 30



- Power supply board 85...260 V AC or
- Power supply board 20...55 V AC, 16...62 V DC

- Amplifier board with
  Pulse output
  Current output
  Status output
  Auxiliary input

- Local display (optional)

Note:
The Promag 33 measuring system expands the advantages of the Promag 30:
- E+H-Matrix driven operation
- Two-line, illuminated display
- Batching with integrated preset counter
- Communication ability
- Empty Pipe Detection

Please obtain information about the features of the "Promag 33 Measuring System" in the "Promag 33 Technical Information", TI No. 027D/06/e.

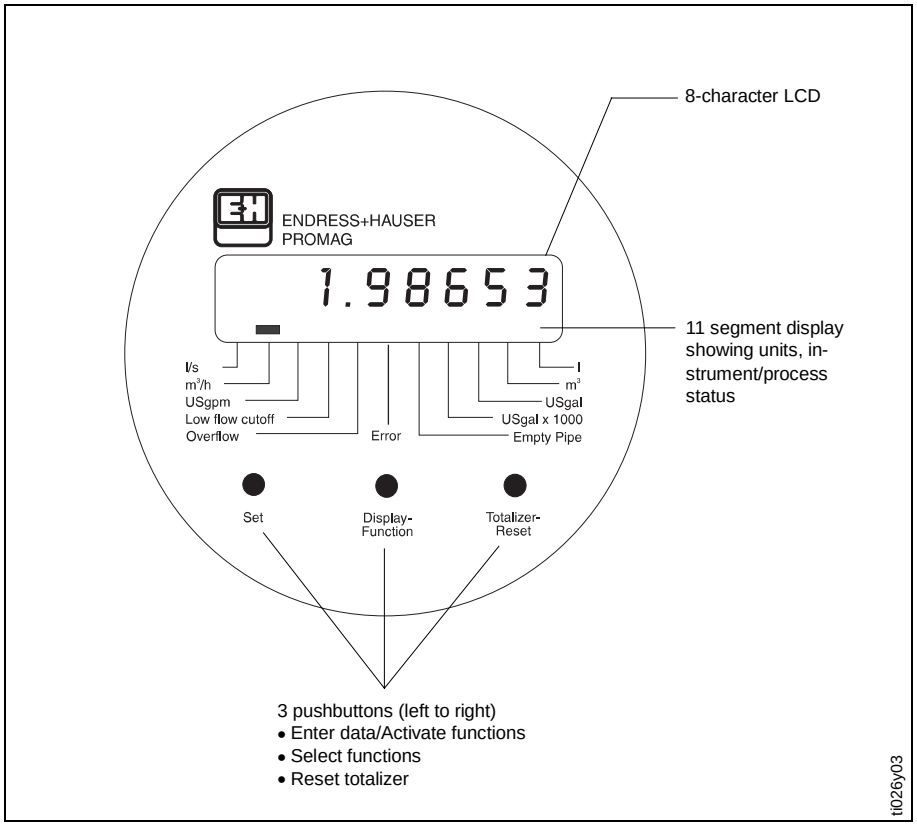
Operation

Local Display

Using the Promag 30 local display, important parameters can be read off and controlled at the measuring point directly:

- Flowrate and/or totalizer value
- Technical units (SI/US units)
- Process variables (e.g. creep rate, partial pipe filling)
- Error messages

Using the three operating keys, it is also possible to select and activate various functions. A small pin is used to press the keys down.



Operational security

- Extensive measuring system self-monitoring ensures the greatest operational security. Resulting error messages are annunciated at the status output.
- All data of the measuring system is safely stored (without batteries) in the EEPROM.
- The Promag 30 measuring system fulfils the general requirements for electromagnetic compatibility (EMC) according to EN 50081 Part 1 and 2 / EN 50082 Part 1 and 2 as well as the NAMUR recommendations.
- For CIP processes, the output signal can be suppressed by an external voltage applied to the auxiliary input.
- A partially filled pipe can be detected and indicated by the Empty Pipe Detection (EPD) feature.
- A special circuit for electrode cleaning ensures a correct measurement even if there is conductive deposit (e.g. magnetite) in the pipe.

1000:1 operable flow range

The Promag 30 amplifier has very high measuring dynamics of over 1000:1 which enables it to measure the velocity of a fluid from below 10 mm/s to greater than 10 m/s with the specified accuracy. With pulsating flows, even peak flows of up to 12.5 m/s will not overload the system above the set final value. There is then no falsification of the measured value, provided the outputs are not overdriven.

Setting Functions

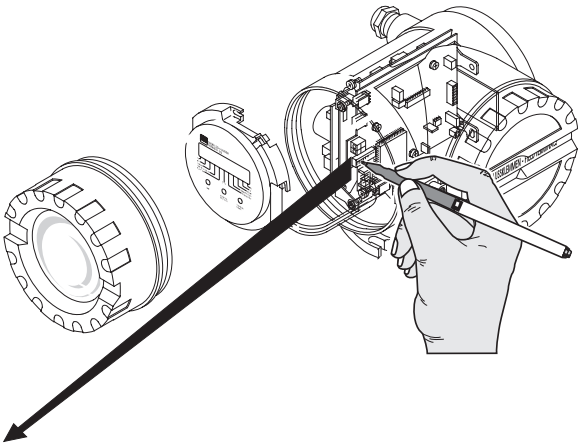
Operation

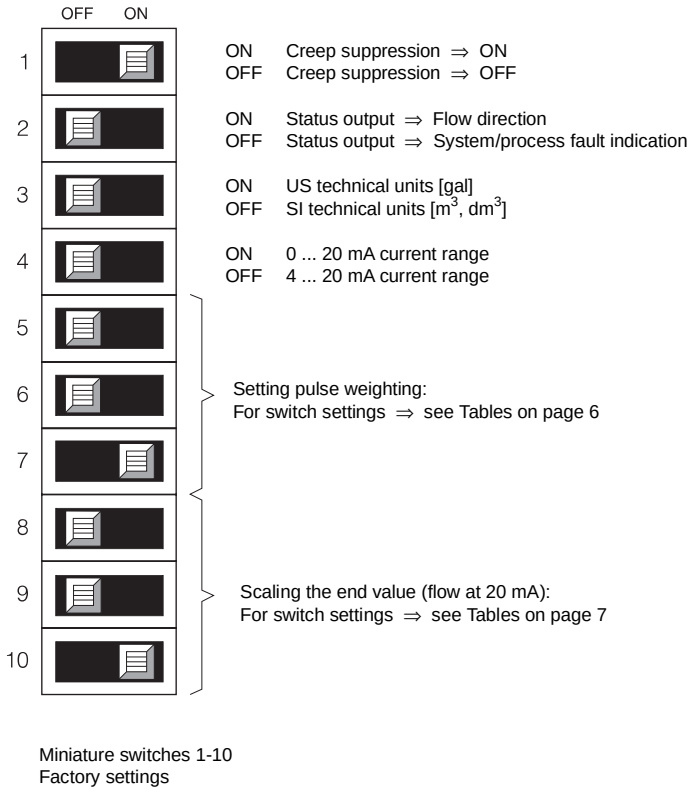
The transmitter houses miniature switches which allow the following six parameters to be set:

- 0...20 mA or 4...20 mA current range
- Current end value scaling (volume/time), 8 levels
- Pulse weighting in decade steps (volume/pulse), 8 levels
- Technical units
- Setting of status output (signalling system/process errors or flow direction recognition)
- Creep suppression (on/off)

The switches are accessible from the front by unscrewing the electronics cover or by removing the local display.

Note:
On request, Promag 30 measuring instruments are also available with customised parameterisation.

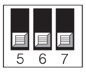


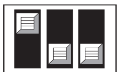
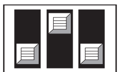
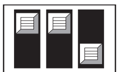
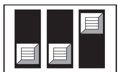
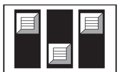
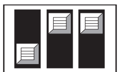
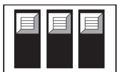


Miniature switches 1-10
Factory settings

ti026y19

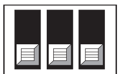
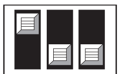
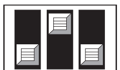
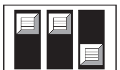
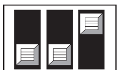
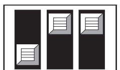
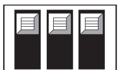
Pulse value ⇒ SI units [dm^3/Impuls, m^3/Impuls]

ON
OFF

5 6 7

DN [mm]	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7
								(fmax = 400 Hz at v = 10 m/s)
2	0.0001 dm^3	0.001 dm^3	0.01 dm^3	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	0.000079 dm^3
4	0.001 dm^3	0.01 dm^3	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	0.000314 dm^3
8	0.01 dm^3	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	0.001257 dm^3
15	0.01 dm^3	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	0.004418 dm^3
25	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	0.012272 dm^3
32	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	0.020106 dm^3
40	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	0.031416 dm^3
50	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	0.049087 dm^3
65	0.1 dm^3	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	0.082958 dm^3
80	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	0.125664 dm^3
100	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	0.196350 dm^3
125	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	0.306796 dm^3
150	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	0.441786 dm^3
200	1 dm^3	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	0.785398 dm^3
250	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	1.22718 dm^3
300	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	1.76715 dm^3
350	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	2.40528 dm^3
400	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	3.14159 dm^3
450	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	3.97608 dm^3
500	10 dm^3	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	4.90874 dm^3
600	10 dm^3	100 m^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	7.06858 dm^3
700	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	9.62113 dm^3
800	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	12.5664 dm^3
900	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	15.9043 dm^3
1000	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	19.6350 dm^3
1200	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	28.2743 dm^3
1400	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	38.4845 dm^3
1600	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	50.2655 dm^3
1800	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	63.6173 dm^3
2000	100 dm^3	1 m^3	10 m^3	100 m^3	1000 m^3	10000 m^3	100000 m^3	78.5398 dm^3

⚠ Caution!
Work with this table only when you have turned switch No. 3 to "OFF" (SI units).

Pulse value ⇒ US units [gal/Impuls]

DN [mm]	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7	 5 6 7
								(fmax = 400 Hz at v = 33 ft/sec)
2	0.0001 gal	0.001 gal	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	0.00002087 gal
4	0.0001 gal	0.001 gal	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	0.00008348 gal
8	0.001 gal	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	1000 gal	0.0003339 gal
15	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	0.001174 gal
25	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	0.003261 gal
32	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	0.005343 gal
40	0.01 gal	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	0.008348 gal
50	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	0.01304 gal
65	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	0.02204 gal
80	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	0.03339 gal
100	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	0.05217 gal
125	0.1 gal	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	0.08152 gal
150	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.1174 gal
200	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.2087 gal
250	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.3261 gal
300	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.4696 gal
350	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.6391 gal
400	1 gal	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	0.8348 gal
450	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	1.057 gal
500	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	1.304 gal
600	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	1.878 gal
700	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	2.556 gal
800	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	3.339 gal
900	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	4.226 gal
1000	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	5.217 gal
1200	10 gal	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	7.513 gal
1400	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	100000000 gal	10.23 gal
1600	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	100000000 gal	13.36 gal
1800	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	100000000 gal	16.90 gal
2000	100 gal	1000 gal	10000 gal	100000 gal	1000000 gal	10000000 gal	100000000 gal	20.87 gal

⚠ Caution!
Work with this table only when you have turned switch No. 3 to "ON" (US units).

Full scale value setting ⇒ SI units [m^3/h]

ON / OFF — 8 9 10

DN [mm]	0.5 m/s	1 m/s	1.5 m/s	2 m/s	2.5 m/s	5 m/s	8 m/s	10 m/s
2	0.005 m^3/h	0.01 m^3/h	0.015 m^3/h	0.02 m^3/h	0.025 m^3/h	0.05 m^3/h	0.08 m^3/h	0.1 m^3/h
4	0.02 m^3/h	0.04 m^3/h	0.06 m^3/h	0.08 m^3/h	0.1 m^3/h	0.2 m^3/h	0.32 m^3/h	0.4 m^3/h
8	0.1 m^3/h	0.2 m^3/h	0.3 m^3/h	0.4 m^3/h	0.5 m^3/h	1 m^3/h	1.6 m^3/h	2 m^3/h
15	0.3 m^3/h	0.6 m^3/h	0.9 m^3/h	1.2 m^3/h	1.5 m^3/h	3 m^3/h	4.8 m^3/h	6 m^3/h
25	1 m^3/h	2 m^3/h	3 m^3/h	4 m^3/h	5 m^3/h	10 m^3/h	16 m^3/h	20 m^3/h
32	1.5 m^3/h	3 m^3/h	4.5 m^3/h	6 m^3/h	7.5 m^3/h	15 m^3/h	24 m^3/h	30 m^3/h
40	2 m^3/h	4 m^3/h	6 m^3/h	8 m^3/h	10 m^3/h	20 m^3/h	32 m^3/h	40 m^3/h
50	4 m^3/h	8 m^3/h	12 m^3/h	16 m^3/h	20 m^3/h	40 m^3/h	64 m^3/h	80 m^3/h
65	6 m^3/h	12 m^3/h	18 m^3/h	24 m^3/h	30 m^3/h	60 m^3/h	96 m^3/h	120 m^3/h
80	10 m^3/h	20 m^3/h	30 m^3/h	40 m^3/h	50 m^3/h	100 m^3/h	160 m^3/h	200 m^3/h
100	15 m^3/h	30 m^3/h	45 m^3/h	60 m^3/h	75 m^3/h	150 m^3/h	240 m^3/h	300 m^3/h
125	20 m^3/h	40 m^3/h	60 m^3/h	80 m^3/h	100 m^3/h	200 m^3/h	320 m^3/h	400 m^3/h
150	30 m^3/h	60 m^3/h	90 m^3/h	120 m^3/h	150 m^3/h	300 m^3/h	480 m^3/h	600 m^3/h
200	50 m^3/h	100 m^3/h	150 m^3/h	200 m^3/h	250 m^3/h	500 m^3/h	800 m^3/h	1000 m^3/h
250	100 m^3/h	200 m^3/h	300 m^3/h	400 m^3/h	500 m^3/h	1000 m^3/h	1600 m^3/h	2000 m^3/h
300	150 m^3/h	300 m^3/h	450 m^3/h	600 m^3/h	750 m^3/h	1500 m^3/h	2400 m^3/h	3000 m^3/h
350	200 m^3/h	400 m^3/h	600 m^3/h	800 m^3/h	1000 m^3/h	2000 m^3/h	3200 m^3/h	4000 m^3/h
400	200 m^3/h	400 m^3/h	600 m^3/h	800 m^3/h	1000 m^3/h	2000 m^3/h	3200 m^3/h	4000 m^3/h
450	300 m^3/h	600 m^3/h	900 m^3/h	1200 m^3/h	1500 m^3/h	3000 m^3/h	4800 m^3/h	6000 m^3/h
500	400 m^3/h	800 m^3/h	1200 m^3/h	1600 m^3/h	2000 m^3/h	4000 m^3/h	6400 m^3/h	8000 m^3/h
600	600 m^3/h	1200 m^3/h	1800 m^3/h	2400 m^3/h	3000 m^3/h	6000 m^3/h	9600 m^3/h	12000 m^3/h
700	800 m^3/h	1600 m^3/h	2400 m^3/h	3200 m^3/h	4000 m^3/h	8000 m^3/h	12800 m^3/h	16000 m^3/h
800	1000 m^3/h	2000 m^3/h	3000 m^3/h	4000 m^3/h	5000 m^3/h	10000 m^3/h	16000 m^3/h	20000 m^3/h
900	1000 m^3/h	2000 m^3/h	3000 m^3/h	4000 m^3/h	5000 m^3/h	10000 m^3/h	16000 m^3/h	20000 m^3/h
1000	1500 m^3/h	3000 m^3/h	4500 m^3/h	6000 m^3/h	7500 m^3/h	15000 m^3/h	24000 m^3/h	30000 m^3/h
1200	2000 m^3/h	4000 m^3/h	6000 m^3/h	8000 m^3/h	10000 m^3/h	20000 m^3/h	32000 m^3/h	40000 m^3/h
1400	3000 m^3/h	6000 m^3/h	9000 m^3/h	12000 m^3/h	15000 m^3/h	30000 m^3/h	48000 m^3/h	60000 m^3/h
1600	4000 m^3/h	8000 m^3/h	12000 m^3/h	16000 m^3/h	20000 m^3/h	40000 m^3/h	64000 m^3/h	80000 m^3/h
1800	5000 m^3/h	10000 m^3/h	15000 m^3/h	20000 m^3/h	25000 m^3/h	50000 m^3/h	80000 m^3/h	100000 m^3/h
2000	5000 m^3/h	10000 m^3/h	15000 m^3/h	20000 m^3/h	25000 m^3/h	50000 m^3/h	80000 m^3/h	100000 m^3/h

⚠ Caution!
Work with this table only when you have turned switch No. 3 to “OFF” (SI units).

Full-scale value settings ⇒ US units [gal/min]

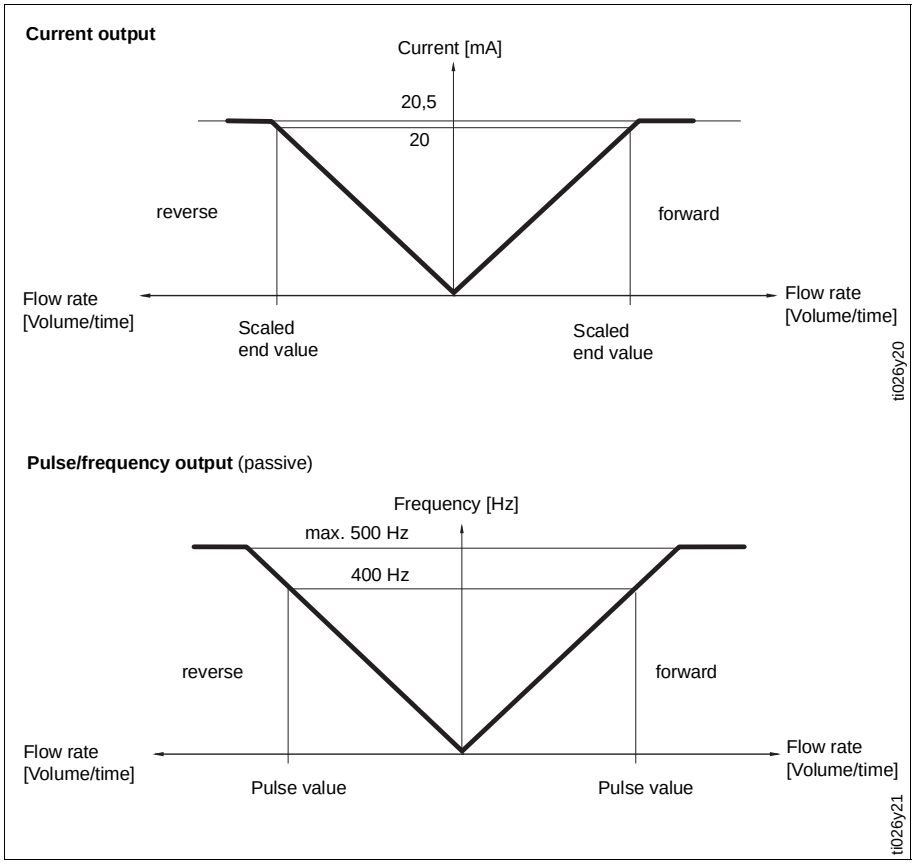
DN [mm]	0.5 m/s	1 m/s	1.5 m/s	2 m/s	2.5 m/s	5 m/s	8 m/s	10 m/s
2	0.02 gal/min	0.05 gal/min	0.075gal/min	0.1 gal/min	0.125gal/min	0.25 gal/min	0.4 gal/min	0.5 gal/min
4	0.1 gal/min	0.2 gal/min	0.3 gal/min	0.4 gal/min	0.5 gal/min	1 gal/min	1.6 gal/min	2 gal/min
8	0.5 gal/min	1 gal/min	1.5 gal/min	2 gal/min	2.5 gal/min	5 gal/min	8 gal/min	10 gal/min
15	1.5 gal/min	3 gal/min	4.5 gal/min	6 gal/min	7.5 gal/min	15 gal/min	24 gal/min	30 gal/min
25	5 gal/min	10 gal/min	15 gal/min	20 gal/min	25 gal/min	50 gal/min	80 gal/min	100 gal/min
32	7.5 gal/min	15 gal/min	22.5 gal/min	30 gal/min	37.5 gal/min	75 gal/min	120 gal/min	150 gal/min
40	10 gal/min	20 gal/min	30 gal/min	40 gal/min	50 gal/min	100 gal/min	160 gal/min	200 gal/min
50	20 gal/min	40 gal/min	60 gal/min	80 gal/min	100 gal/min	200 gal/min	320 gal/min	400 gal/min
65	30 gal/min	60 gal/min	90 gal/min	120 gal/min	150 gal/min	300 gal/min	480 gal/min	600 gal/min
80	50 gal/min	100 gal/min	150 gal/min	200 gal/min	250 gal/min	500 gal/min	800 gal/min	1000 gal/min
100	75 gal/min	150 gal/min	225 gal/min	300 gal/min	375 gal/min	750 gal/min	1200 gal/min	1500 gal/min
125	100 gal/min	200 gal/min	300 gal/min	400 gal/min	500 gal/min	1000 gal/min	1600 gal/min	2000 gal/min
150	150 gal/min	300 gal/min	450 gal/min	600 gal/min	750 gal/min	1500 gal/min	2400 gal/min	3000 gal/min
200	250 gal/min	500 gal/min	750 gal/min	1000 gal/min	1250 gal/min	2500 gal/min	4000 gal/min	5000 gal/min
250	500 gal/min	1000 gal/min	1500 gal/min	2000 gal/min	2500 gal/min	5000 gal/min	8000 gal/min	10000 gal/min
300	750 gal/min	1500 gal/min	2250 gal/min	3000 gal/min	3750 gal/min	7500 gal/min	12000 gal/min	15000 gal/min
350	1000 gal/min	2000 gal/min	3000 gal/min	4000 gal/min	5000 gal/min	10000 gal/min	16000 gal/min	20000 gal/min
400	1000 gal/min	2000 gal/min	3000 gal/min	4000 gal/min	5000 gal/min	10000 gal/min	16000 gal/min	20000 gal/min
450	1500 gal/min	3000 gal/min	4500 gal/min	6000 gal/min	7500 gal/min	15000 gal/min	24000 gal/min	30000 gal/min
500	2000 gal/min	4000 gal/min	6000 gal/min	8000 gal/min	10000 gal/min	20000 gal/min	32000 gal/min	40000 gal/min
600	3000 gal/min	6000 gal/min	9000 gal/min	12000 gal/min	15000 gal/min	30000 gal/min	48000 gal/min	60000 gal/min
700	4000 gal/min	8000 gal/min	12000 gal/min	16000 gal/min	20000 gal/min	40000 gal/min	64000 gal/min	80000 gal/min
800	5000 gal/min	10000 gal/min	15000 gal/min	20000 gal/min	25000 gal/min	50000 gal/min	80000 gal/min	100000 gal/min
900	5000 gal/min	10000 gal/min	15000 gal/min	20000 gal/min	25000 gal/min	50000 gal/min	80000 gal/min	100000 gal/min
1000	7500 gal/min	15000 gal/min	22500 gal/min	30000 gal/min	37500 gal/min	75000 gal/min	120000 gal/min	150000 gal/min
1200	10000 gal/min	20000 gal/min	30000 gal/min	40000 gal/min	50000 gal/min	100000 gal/min	160000 gal/min	200000 gal/min
1400	15000 gal/min	30000 gal/min	45000 gal/min	60000 gal/min	75000 gal/min	150000 gal/min	240000 gal/min	300000 gal/min
1600	20000 gal/min	40000 gal/min	60000 gal/min	80000 gal/min	100000 gal/min	200000 gal/min	320000 gal/min	400000 gal/min
1800	25000 gal/min	50000 gal/min	75000 gal/min	100000 gal/min	125000 gal/min	250000 gal/min	400000 gal/min	500000 gal/min
2000	25000 gal/min	50000 gal/min	75000 gal/min	100000 gal/min	125000 gal/min	250000 gal/min	400000 gal/min	500000 gal/min

⚠ Caution!
Work with this table only when you have turned switch No. 3 to “ON” (US units).

Input and Output Functions

The current and pulse output
The current and pulse output are scaled within the range of v = 0.4...10 m/s (max. 12.5 m/s).
The end value scaling enables the user to assign a selectable maximum flowrate to the 20 mA current and to the pulse frequency of f = 400 Hz a selectable maximum pulse weighting. The measuring facility is capable of measuring in both flow directions, i.e. bidirectional.
Current and pulse output values are always positive (= unipolar).

Up to the set end value (0/4...20 mA or 0...400 Hz), strict linearity predominates. A maximum peak of 20.5 mA (acc. to NAMUR) is possible, with a pulse/ frequency output up to 500 Hz. The factory calibration is standard and carried out in one direction (forward); optional for both directions.
The configurable status output annunciates the corresponding flow direction.



Status output (Open Collector)
The status output can be selectively configured for:
- Error messages
  - ⇒ System errors (fault)
  - ⇒ Process errors (alarm)
  - ⇒ Power supply failure
  - ⇒ Exceeding measuring range when: v ≥12.5 m/s
- Flow direction recognition

The status output operates with a quiescent current, i.e. during normal error-free operation, the output is closed (transistor conducting).

Auxiliary input
- *Measured value suppression:*
  With the use of an external voltage (3...30 V DC), the auxiliary input controls the behaviour of the current and pulse outputs. As long as the voltage is present, the current output is set to 0/4 mA and the pulse output to the initial value (transistor not conducting).
  Application example: Interruption of the measuring operation during pipeline cleaning.

- *Totaliser reset:*
  The auxiliary input can be reconfigured as an external reset for the totalizer using a jumper (with local display option only).
  With an external voltage (3...30 V DC) the totalizer value can be reset to “0”.

Diameter Selection

Diameter selection
As a rule, the pipeline diameter determines the sensor nominal diameter.

A necessary increase in velocity can be achieved through a reduction of the sensor diameter. The higher installation expense is normally balanced by the lower sensor cost.

The flow velocity (v) is also to be determined by the fluid's physical properties:
- v < 2 m/s: with abrasive fluids, e.g. potter's clay, lime milk, ore slurry
- v > 2 m/s: with fluids causing build up, e.g. wastewater slurry etc.

The table below summarizes the minimum and maximum end values (incl. factory setting) which can be set by miniature switches in Promag 30 (see page 5, 7).

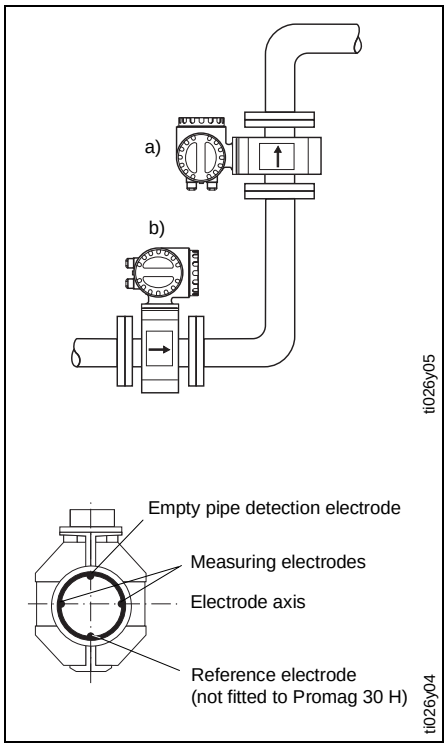
DN		Minimum full-scale value	Factory setting full-scale value	Maximum full-scale value
[mm]	[inch]	(Scaling at v ~ 0.5 m/s)	(Scaling at v ~ 2.5 m/s)	(Scaling at v ~ 10 m/s)
2	1/12"	0.005 m³/h	0.025 m³/h	0.1 m³/h
4	5/32"	0.02 m³/h	0.1 m³/h	0.4 m³/h
8	5/16"	0.1 m³/h	0.5 m³/h	2 m³/h
15	1/2"	0.3 m³/h	1.5 m³/h	6 m³/h
25	1"	1 m³/h	5 m³/h	20 m³/h
32	1 1/4"	1.5 m³/h	7.5 m³/h	30 m³/h
40	1 1/2"	2 m³/h	10 m³/h	40 m³/h
50	2"	4 m³/h	20 m³/h	80 m³/h
65	2 1/2"	6 m³/h	30 m³/h	120 m³/h
80	3"	10 m³/h	50 m³/h	200 m³/h
100	4"	15 m³/h	75 m³/h	300 m³/h
125	5"	20 m³/h	100 m³/h	400 m³/h
150	6"	30 m³/h	150 m³/h	600 m³/h
200	8"	50 m³/h	250 m³/h	1000 m³/h
250	10"	100 m³/h	500 m³/h	2000 m³/h
300	12"	150 m³/h	750 m³/h	3000 m³/h
350	14"	200 m³/h	1000 m³/h	4000 m³/h
400	16"	200 m³/h	1000 m³/h	4000 m³/h
450	18"	300 m³/h	1500 m³/h	6000 m³/h
500	20"	400 m³/h	2000 m³/h	8000 m³/h
600	24"	600 m³/h	3000 m³/h	12000 m³/h
700	28"	800 m³/h	4000 m³/h	16000 m³/h
800	32"	1000 m³/h	5000 m³/h	20000 m³/h
900	36"	1000 m³/h	5000 m³/h	20000 m³/h
1000	40"	1500 m³/h	7500 m³/h	30000 m³/h
1200	48"	2000 m³/h	10000 m³/h	40000 m³/h
1400	56"	3000 m³/h	15000 m³/h	60000 m³/h
1600	64"	4000 m³/h	20000 m³/h	80000 m³/h
1800	72"	5000 m³/h	25000 m³/h	100000 m³/h
2000	78"	5000 m³/h	25000 m³/h	100000 m³/h

1 m³ = 1000 litres

Diameter and full-scale value

Installation

In order to measure correctly and to prevent damage, please observe the following installation instructions.

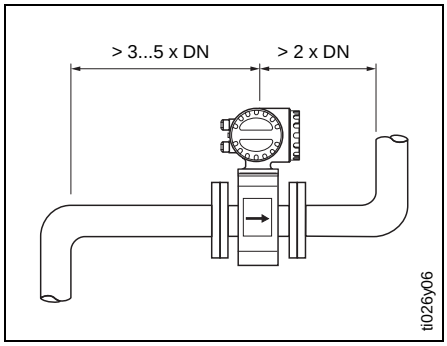


Orientation

a) Vertical orientation:
Optimum, with flow direction upward. At no flow, heavier entrained solids sink downward and lighter fatty contents rise away from the electrode area.

b) Horizontal orientation:
Electrode axis must lie horizontal. This prevents short term insulation of the electrodes as a result of entrained air bubbles.

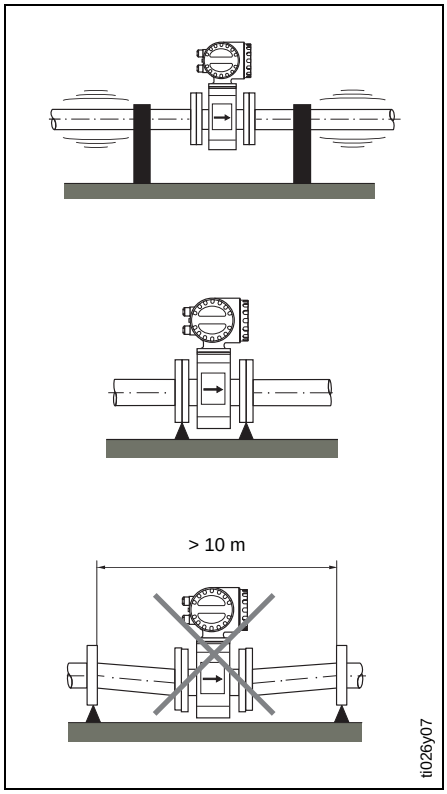
Position ot the electrode axis:
The Promag 30 electrode axis plane is identical for sensors A, D, H and F.



Inlet and outlet runs

The sensor should be mounted away from turbulence-generating components (eg. valves, elbows, t-sections) whenever possible.

Inlet lengths: > 3...5 x DN
Outlet lengths: > 2 x DN
DN = Pipe diameter

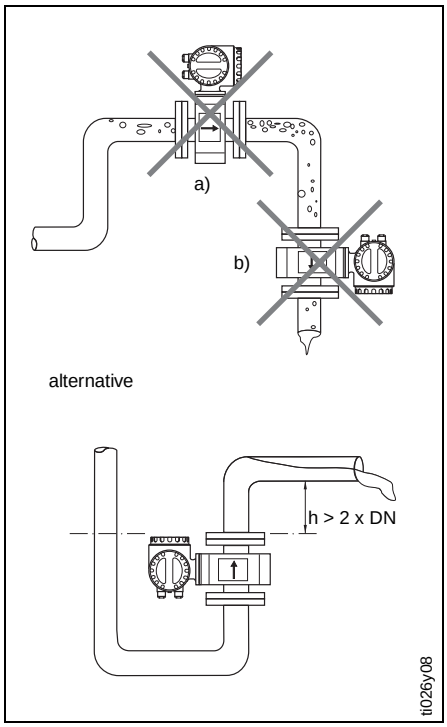


Vibration

- Fasten the piping before and after the sensor.

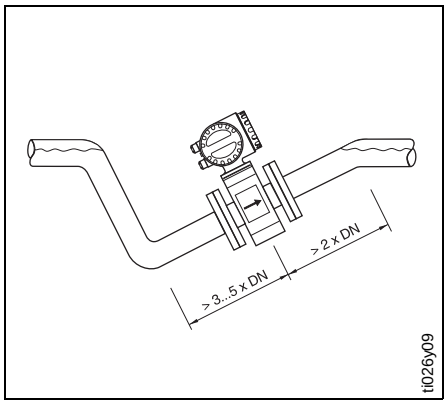
  Caution:
  Excessive vibration necessitates separate mounting of sensor and transmitter (see page 12).

- With free runs of piping over 10 m long, mechanical supports are recommended to minimise external forces.



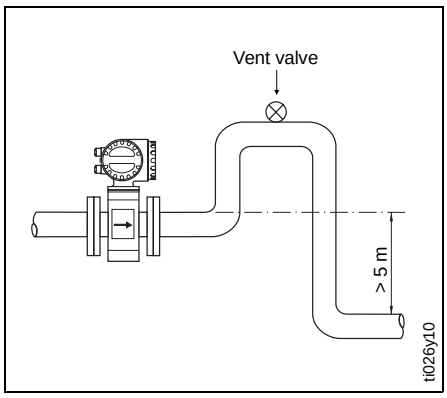
Mounting location
Correct measurement is only possible with a full pipe. For this reason the following locations are to be avoided:

a) No installation at the highest point (air accumulation).
b) No installation immediately before an open pipe outlet in a downward line. The alternate installation suggestion nevertheless makes such an application possible.

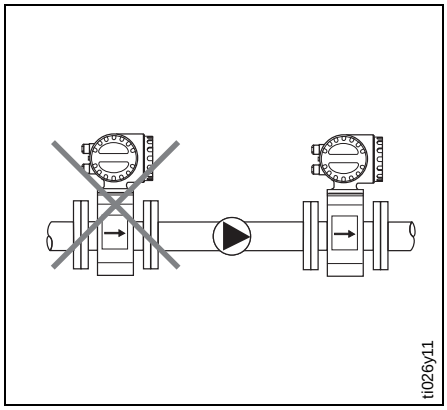


Partially full pipes
For inclines, a mounting similar to a drain should be planned. Do not mount at the lowest point (danger of solids accumulation).
In this case, additional safety is offered by the Empty Pipe Detection. This option includes an additional electrode in the pipe (standard with Promag F sensor).

Note:
Inlet and outlet lengths should also be maintained here.

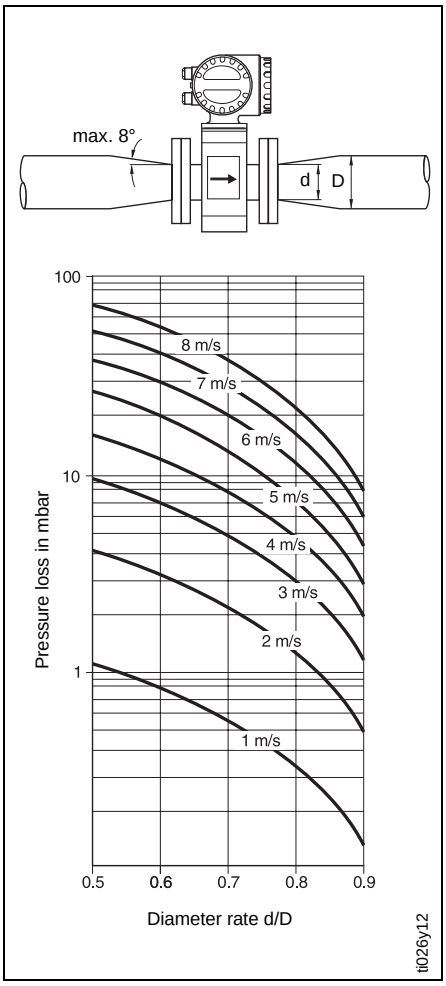


Downward pipe
With the installation suggestion opposite (siphon, vent valve after the sensor), no partial vacuum exists, even in downward pipe > 5 m.



Pump installation
Danger of vacuum!
If possible avoid mounting the sensor on the pump suction side.

Installation

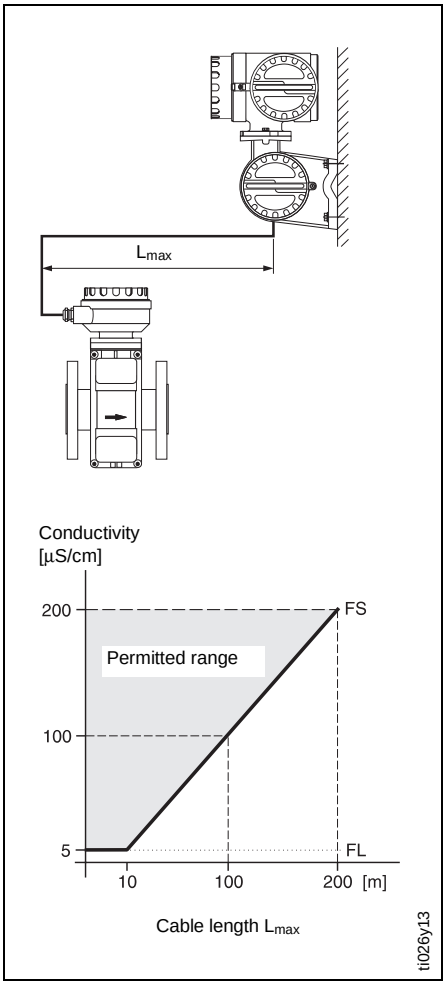


Adaptor pieces
With the help of the appropriate adaptor pieces (DIN 28545 reducers and expanders) the sensor can be mounted in a pipeline of a larger diameter. For slowly flowing fluids, the resulting higher velocity increases the measuring accuracy.

The nomogram opposite serves to determine the approximate pressure loss.

Procedure:
1. Determine the d/D diameter ratio
2. From the nomogram, read the pressure loss depending on the flow velocity and the d/D ratio.

Note:
The nomogram is valid for liquids whose viscosities are similar to water.



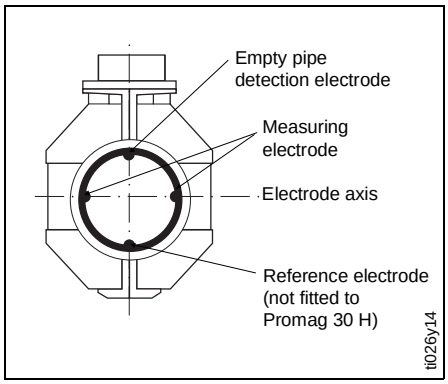
Mounting of remote version
Necessary where there is:
- Poor access
- Lack of space
- Extreme fluid and ambient temperatures (see page 25f)
- Excessive vibration (> 2g/2 h per day, 10...100 Hz)

Note:
- For distances between sensor and transmitter of ≥10 m, the permitted cable length (L_{max}) is determined by the fluid conductivity (FS version).
- Fix the cable run or lay it in conduit. When the conductivity of the medium is low, cable movements can cause changes in cable capacitance and thereby affect the measuring signal.
- Do not lay cable in the vicinity of electrical machinery or switchgear. The relevant cable specifications are listed on page 15.
- Ensure potential equalisation between sensor and transmitter.

Grounding

Potential equalisation

The sensor and the fluid must be at approximately the same electrical potential, so that the measurement is accurate and that no galvanic corrosion of the electrodes takes place. In most cases, the sensor's built-in reference electrode or the metallic pipeline ensures the required potential equalisation. For this reason, with a fitted reference electrode and a fluid in metallic, grounded pipelines, it is sufficient to connect the Promag 30's ground terminal to local earth.
For the remote version, this connection takes place via the ground terminal in the sensor wiring compartment.
Promag A, D and F are always fitted with a reference electrode. There is no reference electrode with Promag H as there is always a metallic connection to the product.
The following describes potential equalisation in special cases:



Potential equalisation in lined pipelines with cathodic protection

When the fluid cannot be grounded for operational reasons, the meter must be installed with isolation from pipework and ground. Please observe the local electrical regulations for such an installation.
Take care with the mounting materials used to ensure that no electrical path to the meter exists and that the material can withstand the torques.

Equalisation current in metallic ungrounded pipelines

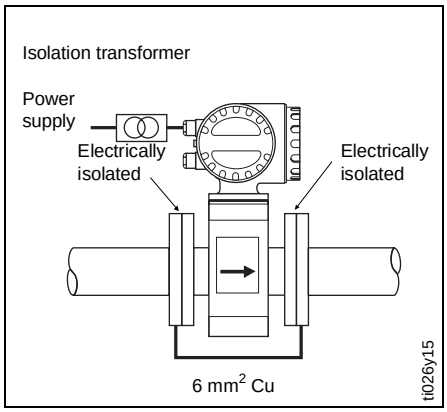
The fluid can be grounded. Ensure an electrical connection from flange to flange and to the meter.

Plastic or lined pipeline

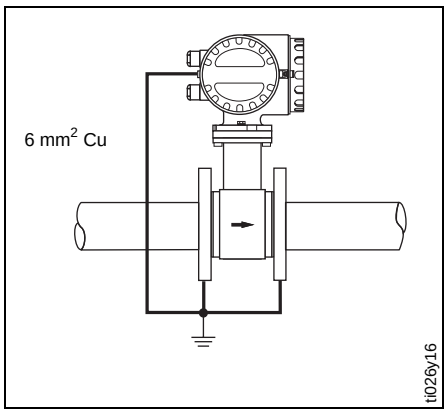
This wiring will be necessary if no reference electrode is present or if the fluid must be grounded due to potential equalisation currents.
Pay attention to the corrosion resistance of the grounding rings!

Grounding in areas with strong electrical interference

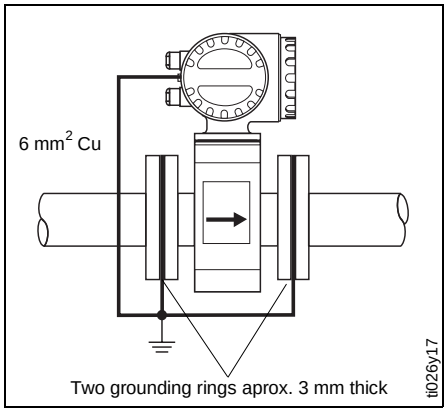
To ensure full electromagnetic compatibility, it is advisable to provide two flange-to-flange links and to connect them jointly with the transmitter housing to earth potential.



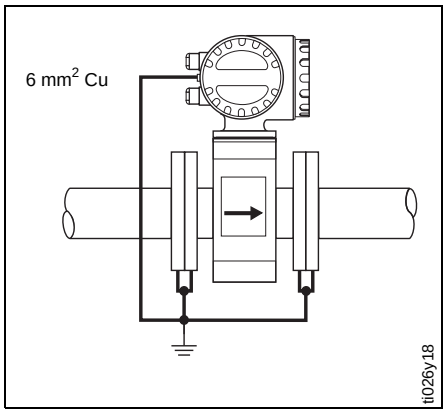
Potential equalisation in lined pipelines with cathodic protection



Equalisation current in metallic ungrounded pipelines

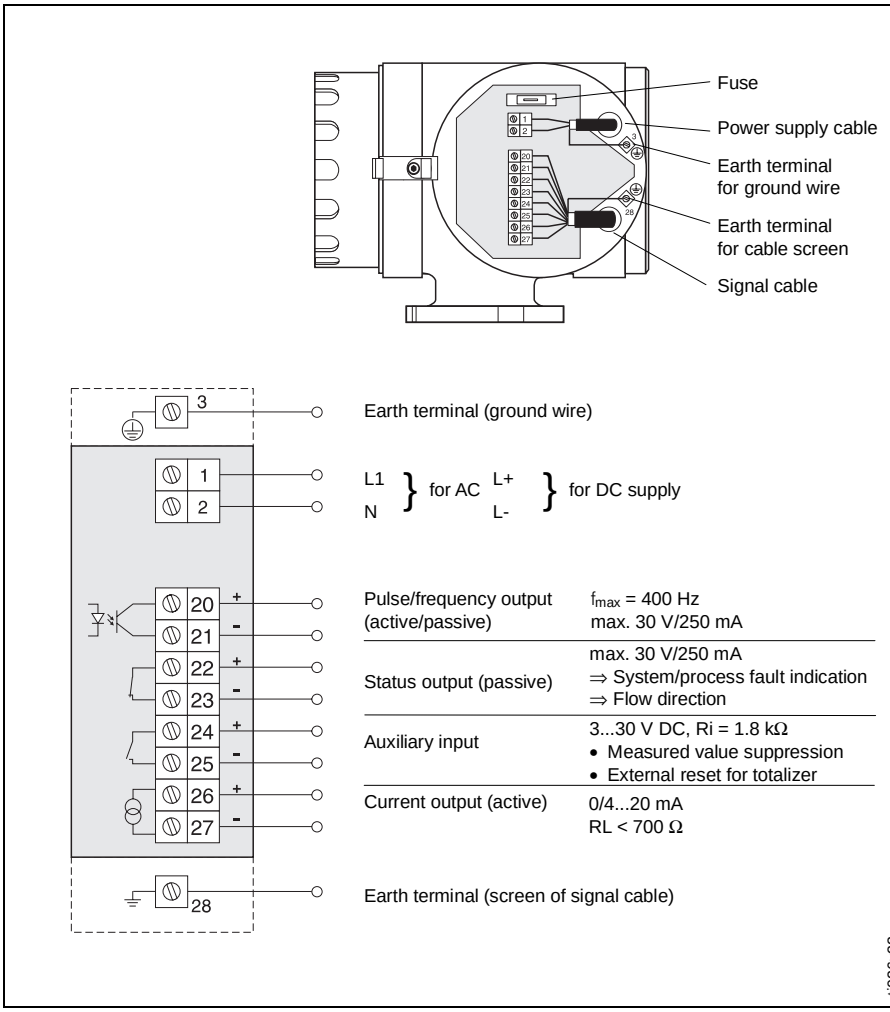


➤
Grounding of plastic or lined pipelines



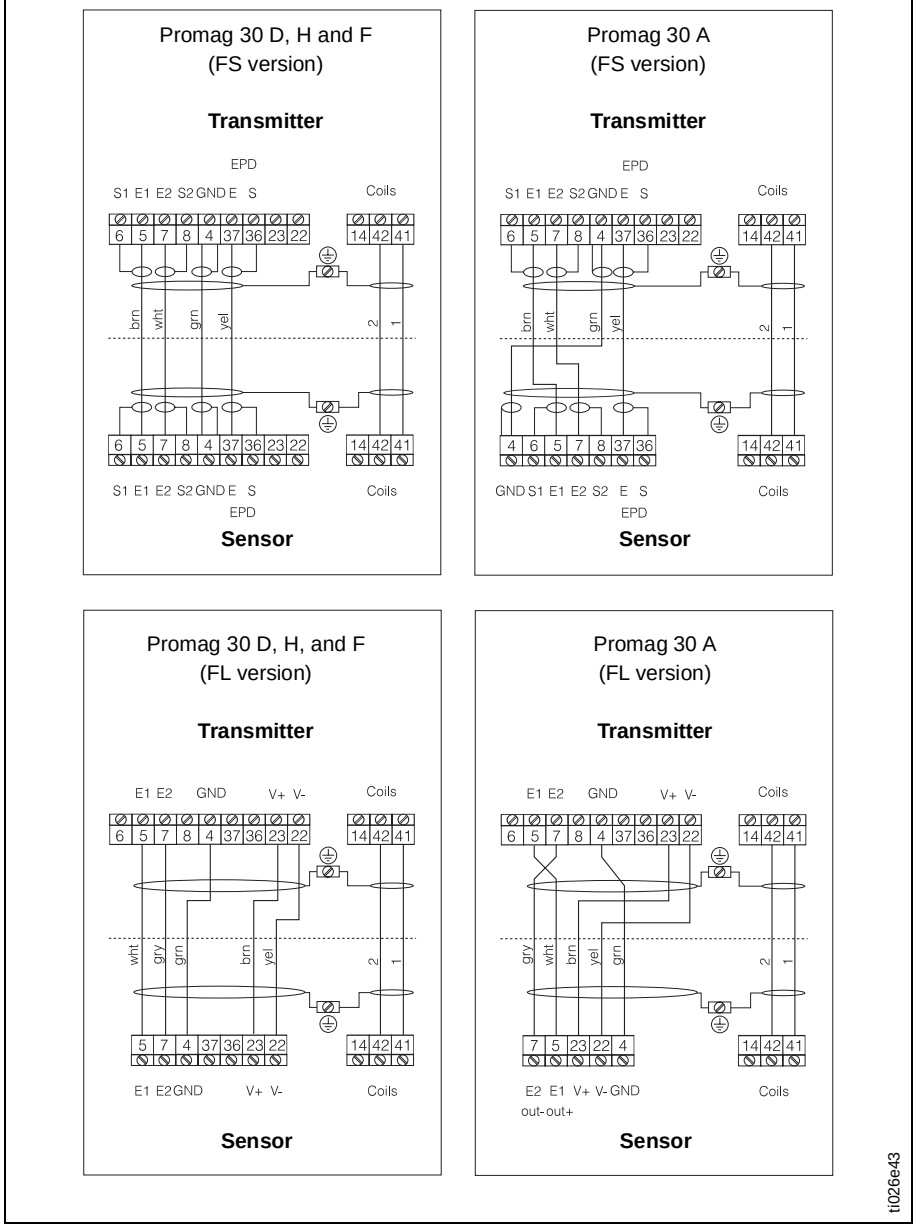
➤➤
Equalisation current in metallic ungrounded pipelines.
Grounding in areas with strong electrical interference.

Electrical Connection



Electrical connection of power supply, input and outputs

Electrical Connection Remote Version



Cable Specifications

Cable specification for remote-mounted version (FS)

Coil cable: 2 x 0.75 mm² PVC cable with overall shield
Resistance: ≤37 Ω/km
Capacitance: core/core, grounded shield ≤120 pF/m
Permanent operating temperature: –20...+ 70 °C

Signal cable: 3 x 0.38 mm² PVC cable with overall shield and individually shielded cores.
With EPD (Empty pipe detection): 4 x 0.38 mm² PVC cable
Resistance: ≤50 Ω/km
Capacitance: core/shield ≤420 pF/m
Permanent operating temperature: –20...+ 70 °C

Cable specification for remote-mounted version (FL)

Coil cable: 2 x 0.75 mm² PVC cable with common screen
Conductor resistance: ≤37 Ω/km
Capacitance: core/core, screen earthed ≤120 pF/m
Permanent operating temperature: –20...+ 70 °C

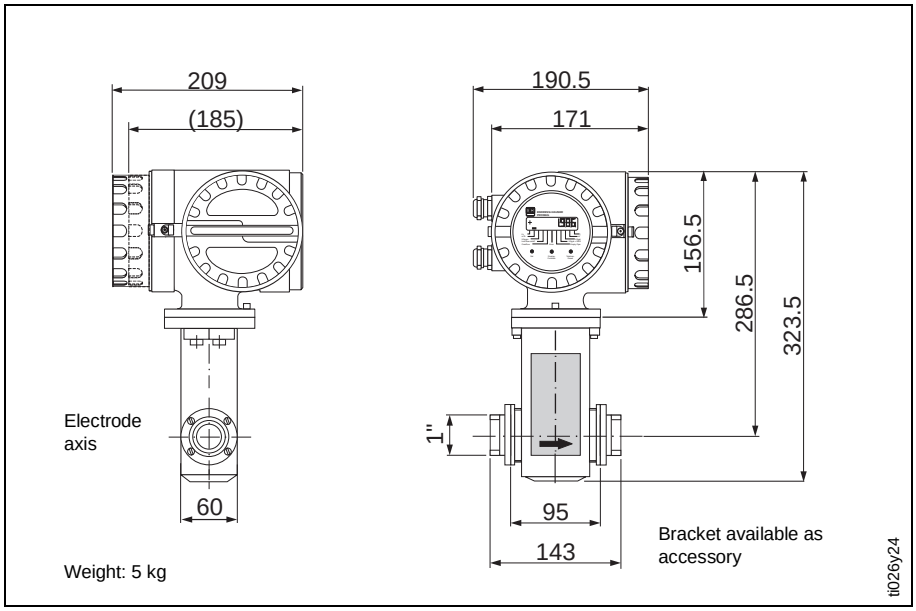
Signal cable: 5 x 0.5 mm² PVC cable with common screen
Conductor resistance: ≤37 Ω/km
Capacitance: core/core, screen earthed ≤120 pF/m
Permanent operating temperature: –20...+ 70 °C

Note:
The cable must be resistant to an ambient temperature of max. + 80 °C if the Promag H is operated at a process temperature of + 150 °C.

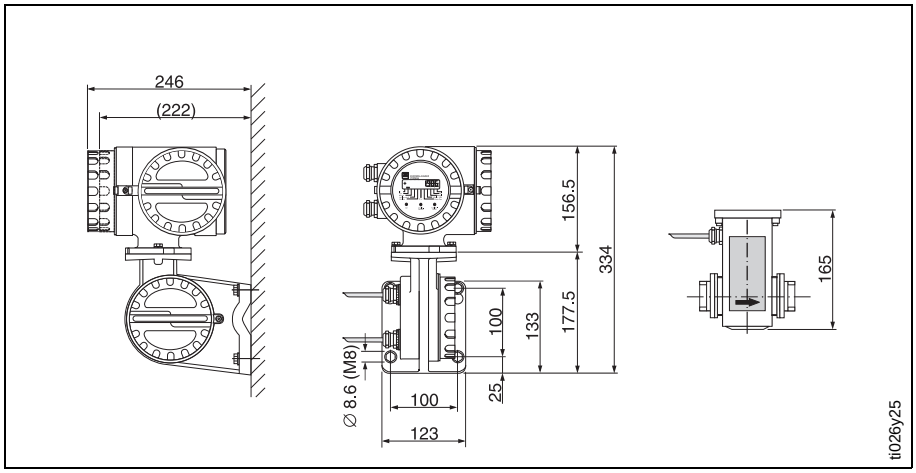
Dimensions

Promag 30 A
DN 2…25

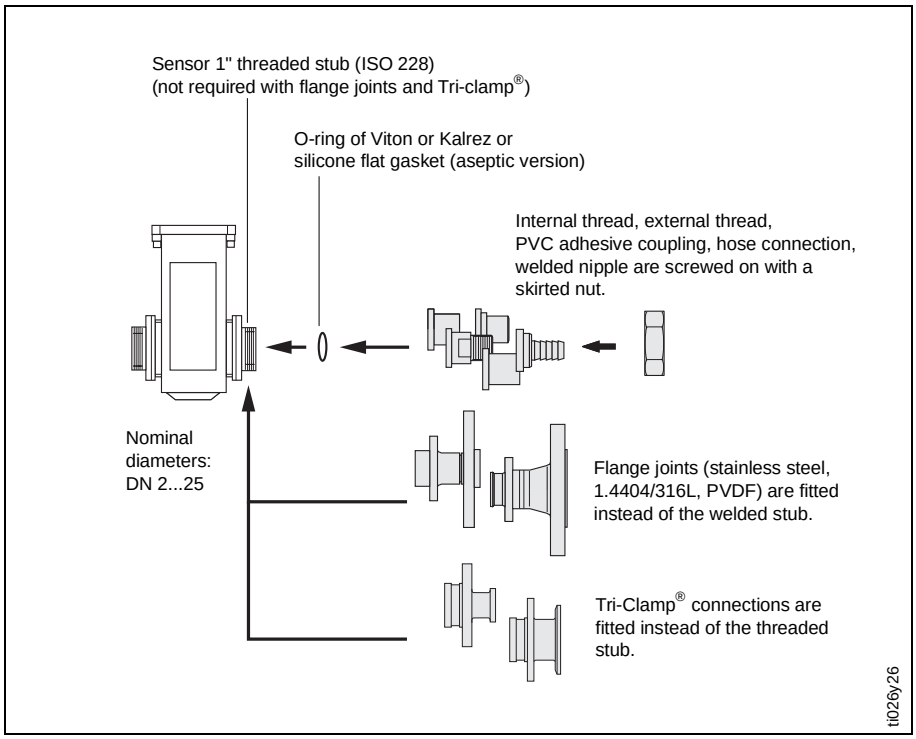
The dimension and weights of Ex versions can differ from those stated here. Please refer to the Ex documentation. Your E+ H representative will be pleased to help you.



Compact version



Remote version
(FS and FL version)

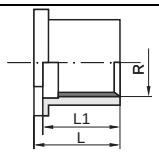


Process connections
Promag A

Dimensions

Promag A
Process Connections

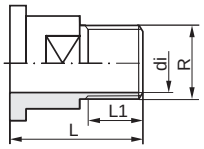
Internal thread



DN	L	L1	R
2...15	20	18	1/2"
25	45	22	1"

(thread norm ISO 228/DIN 2999)

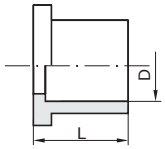
External thread



DN	L	L1	di	R
2...15	35	13.2	16.1	1/2"
25	50	16.8	22.0	1"

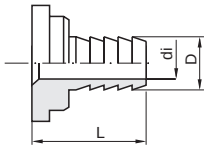
(thread norm ISO 228/DIN 2999)

PVC-adhesive sleeve



DN	L	D
2...15	19	20
25	66	25
25	69	32

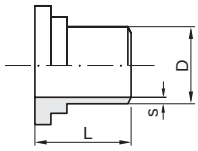
Hose fitting



DN	L	D	di	LW
2...15	30	14.5	8.9	13
2...15	30	17.5	12.6	16
2...15	30	21.0	16.1	19

(LW = hose inner diameter)

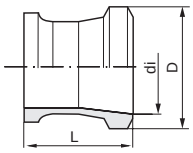
Weld nipple DN 2...15



DN	L	D	s
2...15	20	21.3	2.6

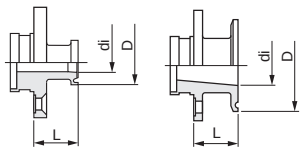
(dimensions for sanitary version are identical)

Weld nipple DN 25



DN	L	D	di
25	30	33.7	26

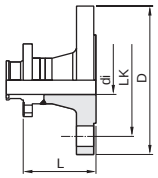
Tri-Clamp®
1.4404/316L
stainless steel



DN		L	D	di
2...8	1/2"	24	25	9.5
15	3/4"	24	25	16
2...8	1"	24	50.4	22.1
15	1"	24	50.4	22.1
25	1"	24	50.4	22.1

Flange
1.4404/316L stainless steel
with DIN 2501/ANSI B16.5/
JIS B 2210 dimensions

DN 2...15:
with DN 15 or 1/2" flanges
DN 25:
with DN 25 or 1" flanges



Flange as per DIN 2501, PN 40				
DN	L	D	di	LK
2...15	52.5	95	17.3	65
25	52.5	115	28.5	85

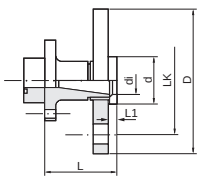
Flange as per ANSI B 16.5								
DN	Class 150				Class 300			
	L	D	LK	di	L	D	LK	
2...15	62.5	88.9	60.5	15.7	6.0	95.2	66.5	
25	68.3	108.0	79.2	26.7	74.7	123.9	88.9	

Flange as per JIS B 2210				
DN	L	D	di	LK
2...15	62.5	95	16	70
25	62.5	115	25	90

Face-to-Face length (DIN) as per DVGW (200 mm)

Flange
PVDF with DIN 2501/ ANSI B16.5/
JIS B2210 dimensions

DN 2...15:
with DN 15 or
1/2" flanges
DN 25:
with DN 25 or
1" flanges



Flange as per DIN 2501/ANSI B 16.5/JIS B 2210 PN 16/Class 150/10K									
DN	L	L1	D	d	di	LK DIN	LK ANSI	LK JIS	LK D
2...15	52.5	6	95	34	16.2	65	60	70	95
25	52.5	7	115	50	27.2	85	79	90	125

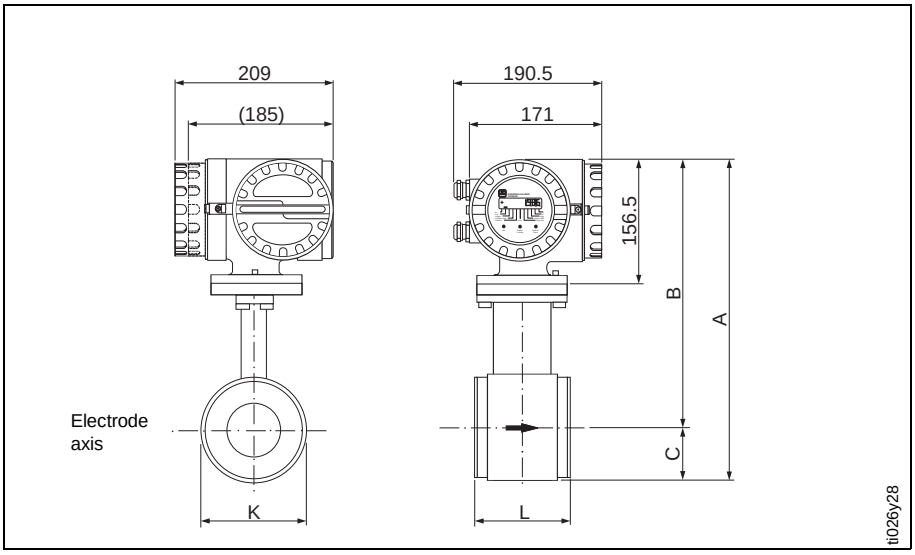
Face-to-Face length (DIN) as per DVGW (200 mm)

Length
2 x L + 143 mm
2 x L + 95 mm (for flanged
and Tri-Clamp® version)

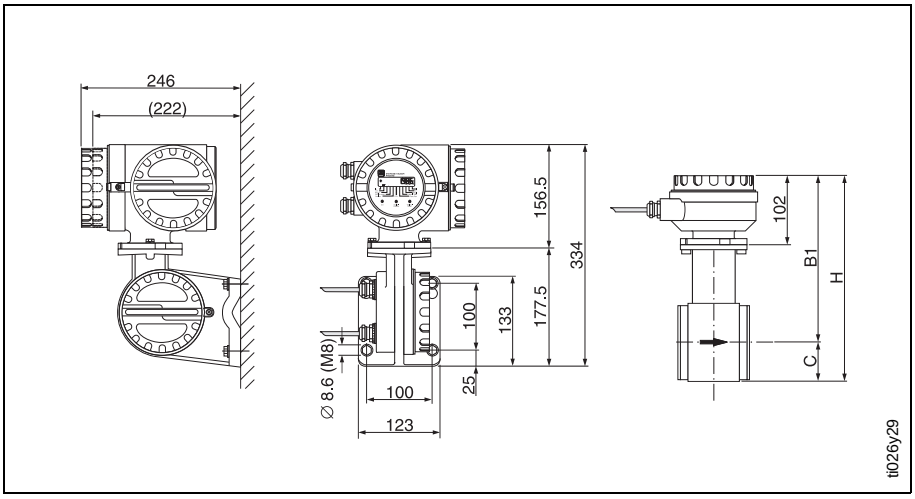
(all dimensions in mm)

Dimensions

Promag 30 D
DN 25…100



Compact version



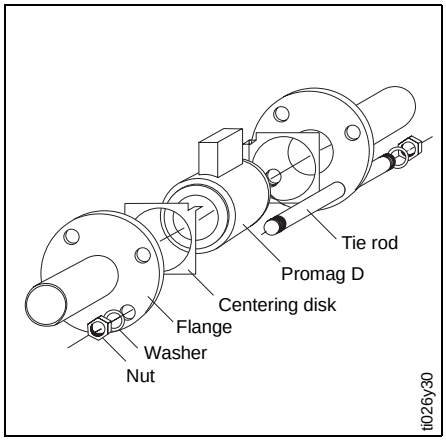
Remote version
(FS and FL version)

DN [mm]	DN [inch]	PN [bar]	L [mm]	K [mm]	A [mm]	B [mm]	B1 [mm]	C [mm]	H [mm]	Weight* [kg]
25	1"	40	100	70	345.5	310.5	256.0	35.0	291.0	4.0
32/40	$1^1/_4$", $1^1/_2$"	40	100	85	360.5	318.0	263.5	42.5	306.0	5.0
50	2"	40	100	100	375.5	325.5	271.0	50.0	321.0	5.0
65/80	$2^1/_2$", 3"	40	150	130	405.5	340.5	286.0	65.0	351.0	7.5
100	4"	40	150	160	435.5	355.5	301.0	80.0	381.0	10.0

* Weights for compact version

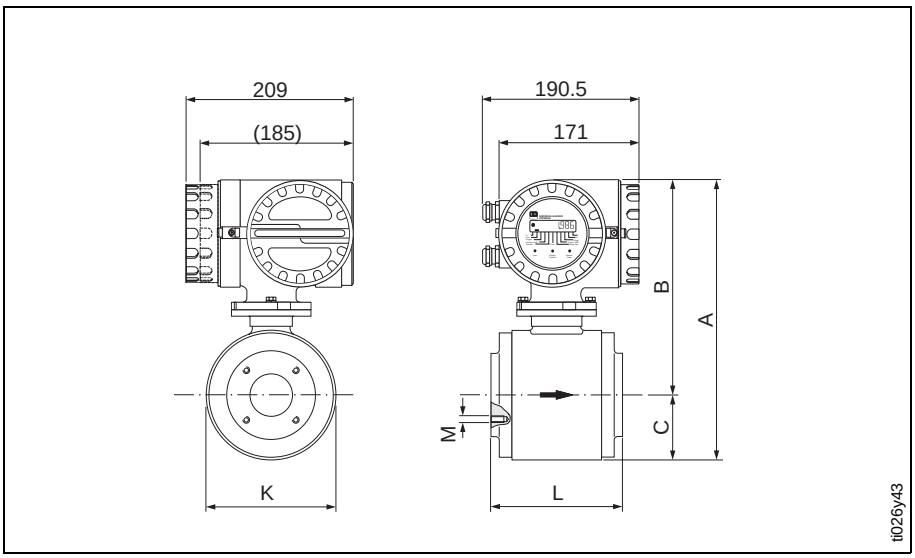
Process connection concept
Wafer mounting is achieved with the help of a mounting set.
The mounting set consists of:
- Tie rods
- Centering disks
  (not necessary for DN 32 and 65)
- Nuts
- Washers

Additional flat gaskets must be used with hard rubber lining.

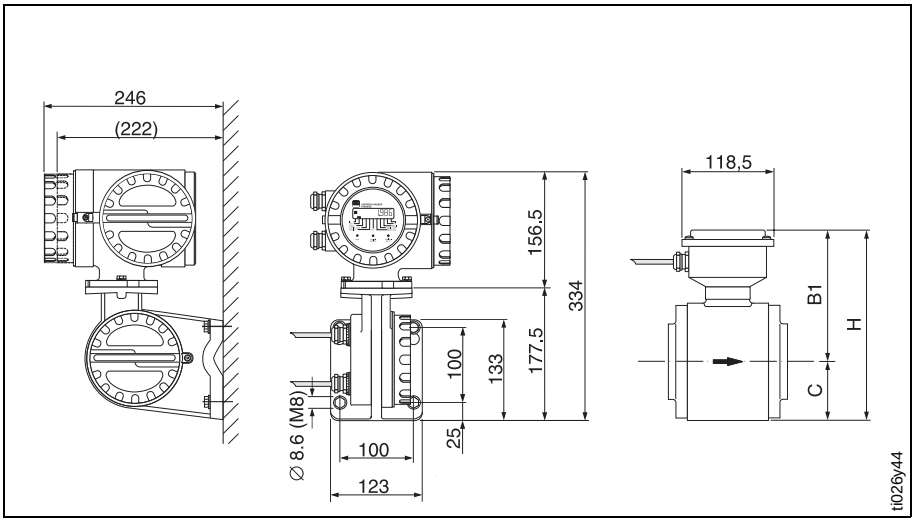


Dimensions

Promag 30 H
DN 25...100



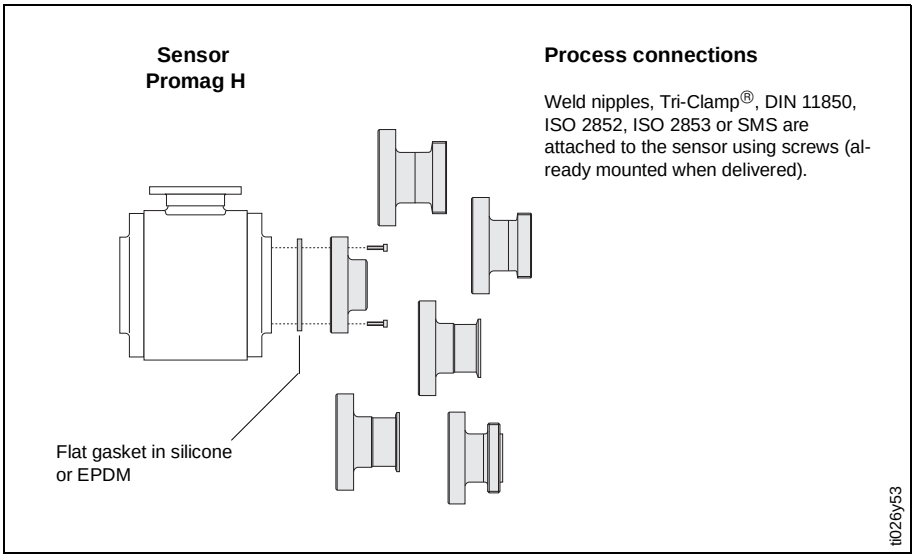
Compact version



Remote version
(FS and FL version)

DN		PN	L	A	B	B1	C	K	H	M x X	Weight*
[mm]	[inch]	DIN [bar]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
25	1"	16	140	318	254	158.5	64	128	222.5	M 6 x4	9.0
40	1½"	16	140	318	254	158.5	64	128	222.5	M 6 x4	9.5
50	2"	16	140	343	266.5	171	76.5	153	247.5	M 8 x4	12.0
65	–	16	140	343	266.5	171	76.5	153	247.5	M 8 x4	12.0
80	3"	16	200	393	291.5	196	101.5	203	297.5	M 12 x4	22.0
100	4"	16	200	393	291.5	196	101.5	203	297.5	M 12 x6	21.5

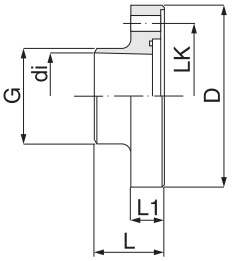
* Weights of compact version



Process connections
Promag H

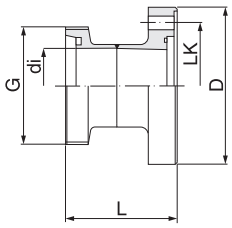
Process Connections
Promag H

weld nippels



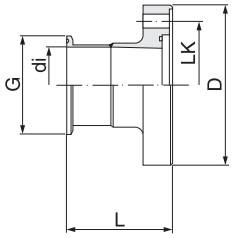
DN	D	G	di	L	L1	LK
25	75	27	22.6	42	19	56
25 DIN	79	31	26	42	19	60
40	92	40	35.3	42	19	71
40 DIN	92	43	38	42	19	71
50	105	55	48.1	42	19	83.5
50 DIN	105	55	50	42	19	83.5
65	121	66	59.9	42	21	100
65 DIN	121	72	66	42	21	100
80	147	79	72.6	42	24	121
80 DIN	147	87	81	42	24	121
100	168	104	97.5	42	24	141.5
100 DIN	168	106	100	42	24	141.5

DIN 11851



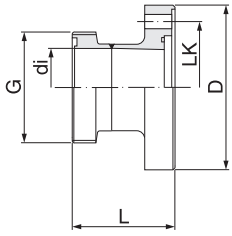
DN	di	G	D	L	LK
25	26.0	52 x 1/6"	79.0	68	60
40	38.0	65 x 1/6"	92.0	72	71
50	50.0	78 x 1/6"	105.0	74	83.5
65	66.0	95 x 1/6"	121.0	78	100
80	81.0	110 x 1/4"	147.0	83	121
100	100.0	130 x 1/4"	168.0	92	141.5

Tri-Clamp®



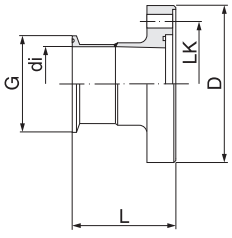
DN	di	G	D	L	LK
25	22.1	50.4	75.0	68.6	56
40	34.8	50.4	92.0	68.6	71
50	47.5	63.9	105.0	68.6	83.5
65	60.2	77.4	121.0	68.6	100
80	72.9	90.9	147.0	68.6	121
100	97.4	118.9	168.0	68.6	141.5

SMS 1145



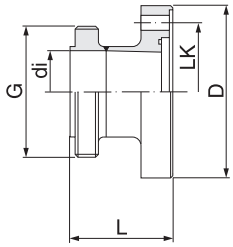
DN	di	G	D	L	LK
25	22.5	40 x 1/6"	75.0	60	56
40	35.5	60 x 1/6"	92.0	63	71
50	48.5	70 x 1/6"	105.0	65	83.5
65	60.5	85 x 1/6"	121.0	70	100
80	72.0	98 x 1/6"	147.0	75	121
100	97.6	132 x 1/6"	168.0	70	141.5

ISO 2852



DN	di	G	D	L	LK
25	22.6	50.5	75.0	68.50	56
40	35.6	50.5	92.0	68.50	71
50	48.6	64.0	105.0	68.50	83.5
65	60.3	77.5	121.0	68.50	100
80	72.9	91.0	147.0	68.50	122
100	97.6	119.0	168.0	68.50	141.5

ISO 2853



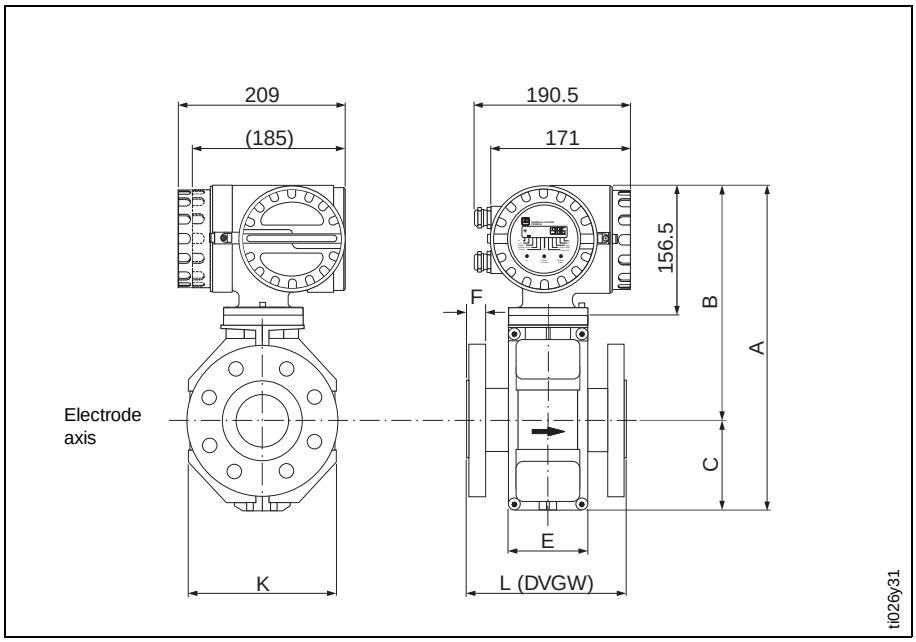
DN	di	G	D	L
25	22.6	52 x 1/6"	75.0	61.50
40	35.6	65 x 1/6"	92.0	61.50
50	48.6	78 x 1/6"	105.0	61.50
65	60.3	95 x 1/6"	121.0	61.50
80	72.9	110 x 1/4"	147.0	61.50
100	97.6	130 x 1/4"	168.0	61.50

Face-to-face lengths: DN 25... 65 → 2 x L + 136 mm
DN 80...100 → 2 x L + 196 mm

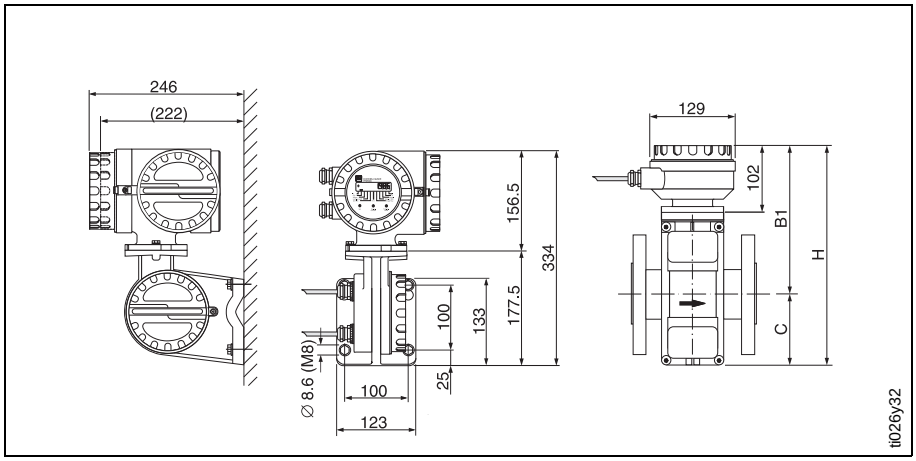
ti026y45

Dimensions

Promag 30 F
DN 15…300



Compact version



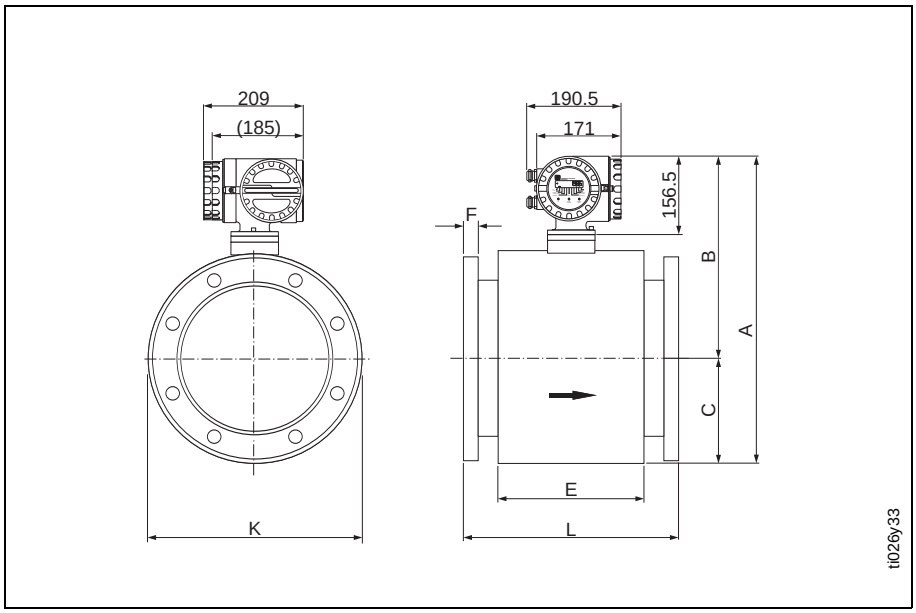
Remote version
(FS and FL version)

DN		PN			L[1]	A	B	C	K	E	F		H	B1	Weight[2]
[mm]	[inch]	DIN [bar]	ANSI [lbs]	JIS	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	DIN [mm]	ANSI [mm]	[mm]	[mm]	[kg]
15	1/2"	40	150	20K	200	340.5	256.5	84	120	94	14	11.2	286	202	6.5
25	1"	40	150	20K	200	340.5	256.5	84	120	94	16	14.2	286	202	7.3
32	–	40	–	20K	200	340.5	256.5	84	120	94	18	–	286	202	8.0
40	1 1/2"	40	150	20K	200	340.5	256.5	84	120	94	18	17.5	286	202	9.4
50	2"	40	150	10K	200	340.5	256.5	84	120	94	20	19.1	286	202	10.6
65	–	16	–	10K	200	390.5	281.5	109	180	94	18	–	336	227	12.0
80	3"	16	150	10K	200	390.5	281.5	109	180	94	20	23.9	336	227	14.0
100	4"	16	150	10K	250	390.5	281.5	109	180	94	22	23.9	336	227	16.0
125	–	16	–	10K	250	471.5	321.5	150	260	140	24	–	417	267	21.5
150	6"	16	150	10K	300	471.5	321.5	150	260	140	24	25.4	417	267	25.5
200	8"	10	150	10K	350	526.5	346.5	180	324	156	26	28.4	472	292	35.3
250	10"	10	150	10K	450	576.5	371.5	205	400	166	28	30.2	522	317	48.5
300	12"	10	150	10K	500	626.5	396.5	230	460	166	28	31.8	572	342	57.5

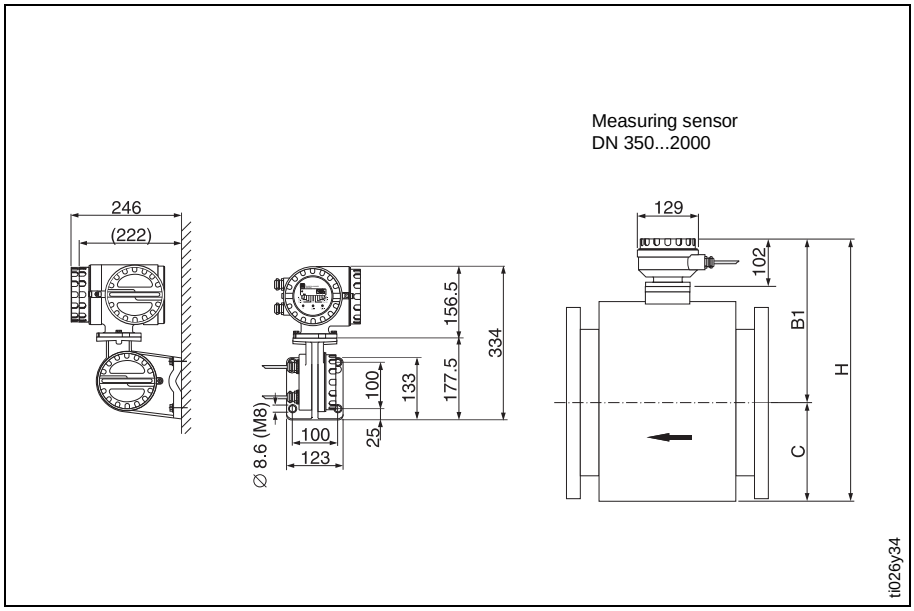
[1] The face-to face length is independent of the pressure rating.
[2] Weights of compact version

Dimensions

Promag 30 F
DN 350…2000



Compact version



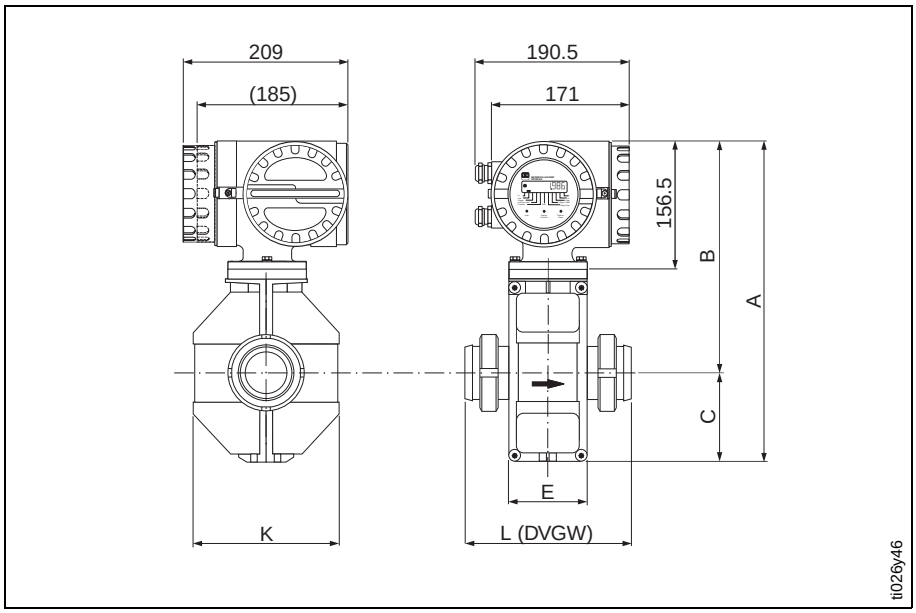
Remote version
(FS and FL version)

DN		PN			L[1]	A	B	C	K	E	F			H	B1	Weight [2]	Weight
[mm]	[inch]	DIN [bar]	ANSI [lbs]	AWWA [Class]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	DIN [mm]	ANSI [mm]	AWWA [mm]	[mm]	[mm]	PN10/ANSI [kg]	PN6 [kg]
350	14"	10	150	–	550	738	456	282	564	276	26	34.9	–	683.5	401.5	110	–
400	16"	10	150	–	600	790	482	308	616	276	26	36.5	–	735.5	427.5	130	–
450	18"	–	150	–	650	840	507	333	666	292	–	39.7	–	785.5	452.5	240	–
500	20"	10	150	–	650	891	532.5	358.5	717	292	28	42.9	–	836.5	478.0	170	–
600	24"	10	150	–	780	995	584.5	410.5	821	402	28	47.6	–	940.5	530.0	230	–
700	28"	10	–	D	910	1198	686	512	1024	589	30	–	33.3	1143.5	631.5	350	–
750	30"	–	–	D	975	1198	686	512	1024	626	–	–	34.9	1143.5	631.5	450	–
800	32"	10	–	D	1040	1241	707.5	533.5	1067	647	32	–	38.1	1186.5	653.0	450	–
900	36"	10	–	D	1170	1394	784	610	1220	785	34	–	41.3	1339.5	729.5	600	–
1000	40"	10	–	D	1300	1546	860	686	1372	862	34	–	41.3	1491.5	805.5	720	–
1050	42"	–	–	D	1365	1598	886	712	1424	912	–	–	44.5	1543.5	831.5	1050	–
1200	48"	6	–	D	1560	1796	985	811	1622	992	28	–	44.5	1741.5	930.5	1200	900
1350	54"	–	–	D	1755	1998	1086	912	1824	1252	–	–	54.0	1943.5	1031.5	2150	–
1400	56"	6	–	–	1820	2148	1161	987	1974	1252	32	–	–	2093.5	1106.5	1800	1450
1500	60"	–	–	D	1950	2196	1185	1011	2022	1392	–	–	57.2	2141.5	1130.5	2600	–
1600	64"	6	–	–	2080	2286	1230	1056	2112	1482	34	–	–	2231.5	1175.5	2500	1800
1650	66"	–	–	D	2145	2360	1267	1093	2186	1482	–	–	63.5	2305.5	1212.5	3700	–
1800	72"	6	–	D	2340	2550	1362	1188	2376	1632	36	–	66.7	2495.5	1307.5	3300	2500
2000	78"	6	–	D	2600	2650	1412	1238	2476	1732	38	–	69.9	2595.5	1357.5	4100	3100

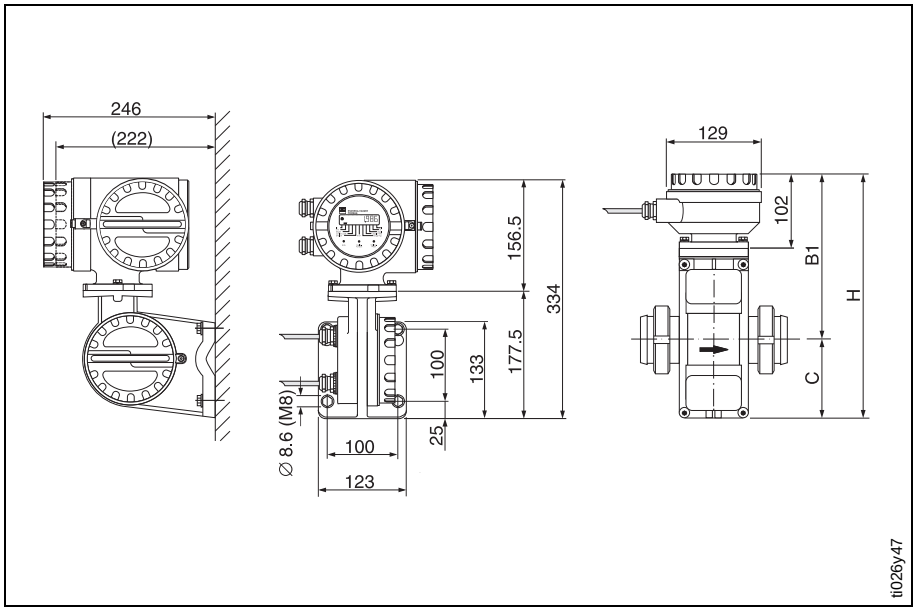
[1] Thickness of the flange face includes sealing strip. The face-to-face length is independent of the pressure rating.
[2] Weight of compact version DIN PN 10. If there is no DIN version, take ANSI or AWWA weight.

Dimensions

Promag 30 F
DIN 11851 couplings (DN 15...100)



Compact version



Remote version
(FS and FL version)

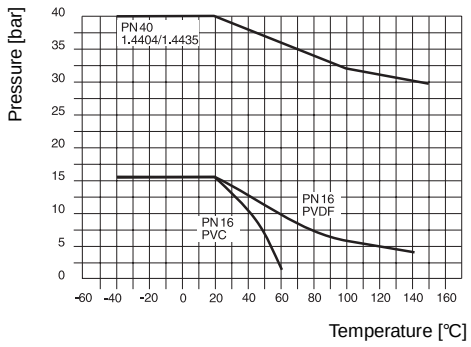
DN		PN	L	A	B	B1	C	K	E	H	Weight*
[mm]	[inch]	DIN [bar]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
15	1/2"	16	200	340.5	256.5	202	84	120	94	286	6.5
25	1"	16	200	340.5	256.5	202	84	120	94	286	7.5
32	–	16	200	340.5	256.5	202	84	120	94	286	7.5
40	1½"	16	200	340.5	256.5	202	84	120	94	286	9.5
50	2"	16	200	340.5	256.5	202	84	120	94	286	10.6
65	–	16	200	390.5	281.5	227	109	180	94	336	12.0
80	3"	16	200	390.5	281.5	227	109	180	94	336	14.0
100	4"	16	250	390.5	281.5	227	109	180	94	336	16.0

* Weights of compact version

Pressure/Temperature Load Diagrams

Promag A (DIN 2413 and 2505)

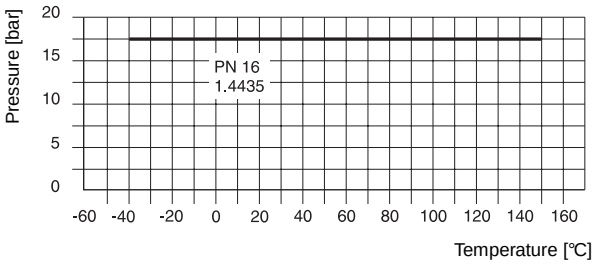
Flange material: Steel 1.4404/1.4435, PVDF, PVC



ti026y41

Promag H

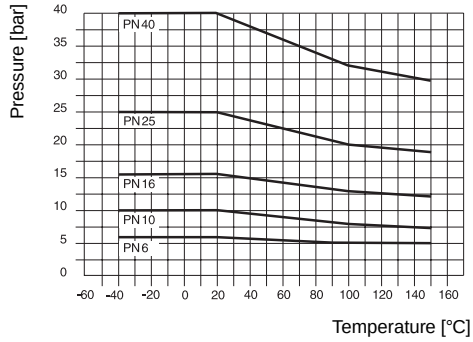
Flange material: Steel 1.4435



ti026y51

Promag F (DIN 2413 and 2505)

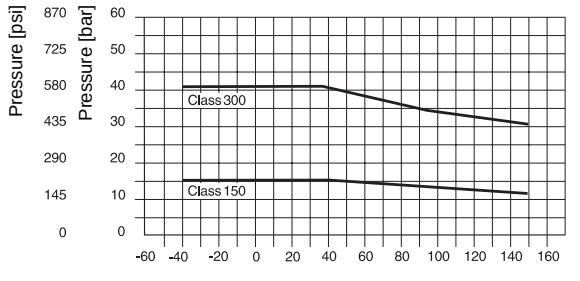
Flange material: Steel 37.2



ti026y36

Promag F (ANSI B16.5)

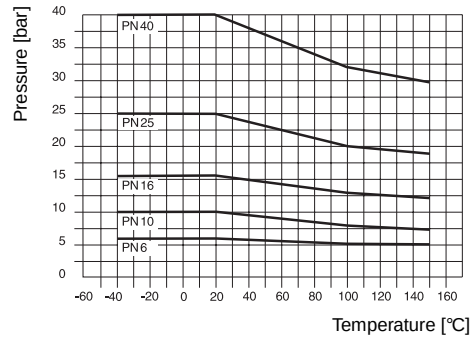
Flange material: Steel 316L



ti026y39

Promag F (DIN 2413 and 2505)

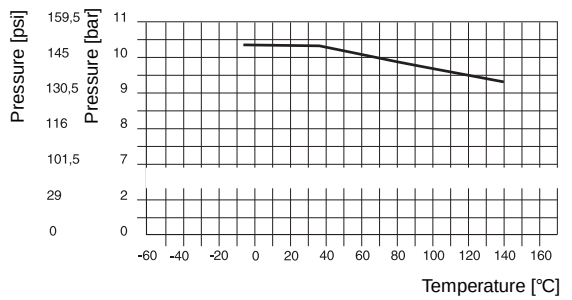
Flange material: Stainless steel 1.4571



ti026y37

Promag F (AWWA C 207, Class D)

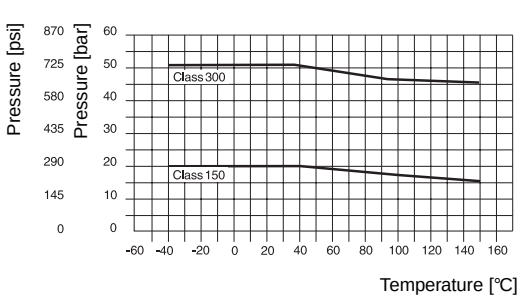
Flange material: Steel A 105



ti026y40

Promag F (ANSI B16.5)

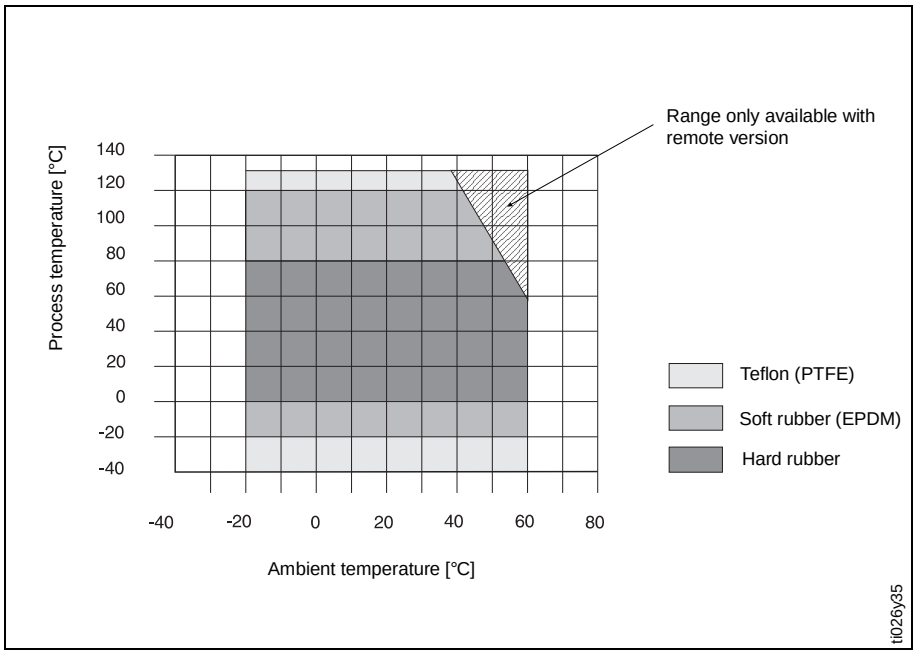
Flange material: Steel A 105



ti026y38

Temperature Ranges Promag 30 F

Temperature range
With high fluid and ambient temperatures, a seperately mounted Promag F sensor and Promag 30 transmitter is necessary (danger of electronics overheating)



Technical Data
Measuring Sensor

	Promag A	Promag D	Promag H	Promag F
Nominal diameter	DN 2, 4, 8, 15, 25	DN 25...100	DN 25...100	DN 15...2000
Nominal pressure	PN 40	PN 40	PN 16	DIN: PN 6 (DN 1200…2000) PN 10 (DN 200...1000) PN 16 (DN 65...150) PN 40 (DN 15...50) PN 16/25 (DN 200...300), option PN 40 (DN 65...100), option ANSI: Class 150 ($^1/_2$...24") Class 300 ($^1/_2$...6"), option AWWA: Class D (28... 48") JIS: 10K (DN 50...300) 20K (DN 15...40) 20K (DIN 50...300), option
Process connection	Internal and external thread, PVC adhesive coupling, hose connection, welded nipple, aseptic welded nipples for pipelines according to DIN 11850, Tri-Clamp®, Flange connection (DIN, ANSI, JIS)	Wafer Tri-Clamp® (option) Sanitary coupling as per DIN 11851 (option)	Weld nipples for OD tube, SMS, JIS, ISO and DIN 11850 tubes DIN 11851 thread SMS thread ISO 2853 thread Tri-Clamp® ISO 2852	Flange connection (DIN, ANSI, JIS) Sanitary coupling as per DIN 11 851 (DN 15...100)
Flange material	DIN: Stainless steel 1.4404; PVDF ANSI: 316L; PVDF JIS: 316L; PVDF Threaded stubs: 1.4435; PVC	—	1.4435/316 L	DIN: St. 37.2, Stainless steel St. 1.4571 ANSI: A105, 316L AWWA: A 105, A 36 JIS: S20C, SUS 316L
Fluid temperature range and liner material	–20...+ 130 °C PFA	–40...+ 150 °C PTFE –20...+ 120 °C Soft rubber 0...+ 80 °C Hard rubber	–20...+ 150 °C PFA –20...+ 130 °C (with EPDM gaskets)	DN 15...600: –40...+ 130 °C PTFE DN 25...2000: –20...+ 120 °C Soft rubber DN 65...2000: 0...+ 80 °C Hard rubber
Ambient temperature range	–20...+ 60 °C	–20...+ 60 °C	–20...+ 60 °C	–20...+ 60 °C
Electrode material	1.4435, Platinum/Rhodium 80/20, Titanium, Hastelloy C-22, Tantalum	1.4435, Platinum/Rhodium 80/20, Titanium, Hastelloy C-22, Tantalum	1.4435	1.4435, Platinum/Rhodium 80/20, Hastelloy C-22, Tantalum
Electrodes fitted	Measuring and reference electrodes Option: Measuring, reference and empty pipe detection electrodes	Measuring and reference electrodes Option: Measuring, reference and empty pipe detection electrodes	Measuring and empty pipe detection electrodes	DN 15...2000: Measuring, reference and EPD electrodes (standard for 1.4435 and Hastelloy C-22)
Minimum conductivity	5 µS/cm	5 µS/cm	5 µS/cm	5 µS/cm
Gasket material	Viton, Kalrez (option) Silicone (aseptic version)	—	EPDM, Silicone	—
Housing material	1.4435 incl. threaded stub (see also page 17)	Varnished steel (Option: stainless steel)	1.4301	DN 15...300: powder-coated die-cast aluminium DN 350...2000: varnished steel
Type of protection	IP 67 (IP 68 option) NEMA 4X (NEMA 6P opt.)	IP 67 (IP 68 option) NEMA 4X (NEMA 6P opt.)	IP 67 NEMA 4X	IP 67 (IP 68 option) NEMA 4X (NEMA 6P as option)
CIP cleanable	Yes (note max. temperature)	Yes (note max. temperature)	Yes (note max. temperature)	Yes (note max. temperature)
SIP cleanable	—	—	Yes (note max. temperature)	—
Power supply	The sensor is supplied by the measuring transmitter			
Ex version	CENELEC: EEx d/de; Ex Zone 2 VDE 0165 SEV: EEX d/de; Ex n FM/CSA: Class I, Div. 1 FM/CSA: Class I, Div. 2	Ex Zone 2 VDE 0165 FM/CSA: Class I, Div. 2	Ex Zone 2 VDE 0165 FM/CSA: Class 1, Div. 2	CENELEC: EEx d/de; Ex Zone 2 VDE 0165 SEV: EEx d/de; Ex n FM/CSA: Class I, Div. 1 FM/CSA: Class I, Div. 2
Approvals	—	—	3A approval EHEDG-tested	—
Cable entries (remote version)	PG 11 cable glands (5...12 mm) or NPT $^1/_2$", M20 x 1.5 (8...15 mm), G $^1/_2$" threads for cable glands	PG 13.5 cable glands (5...15 mm) or NPT $^1/_2$", M20 x 1.5 (8...15 mm), G $^1/_2$" threads for cable glands	PG 13.5 cable glands (5...15 mm) or NPT $^1/_2$", M20 x 1.5 (8...15 mm), G $^1/_2$" threads for cable glands	PG 13.5 cable glands (5...15 mm) or NPT $^1/_2$", M20 x 1.5 (8...15 mm), G $^1/_2$" threads for cable glands

Technical Data Transmitter

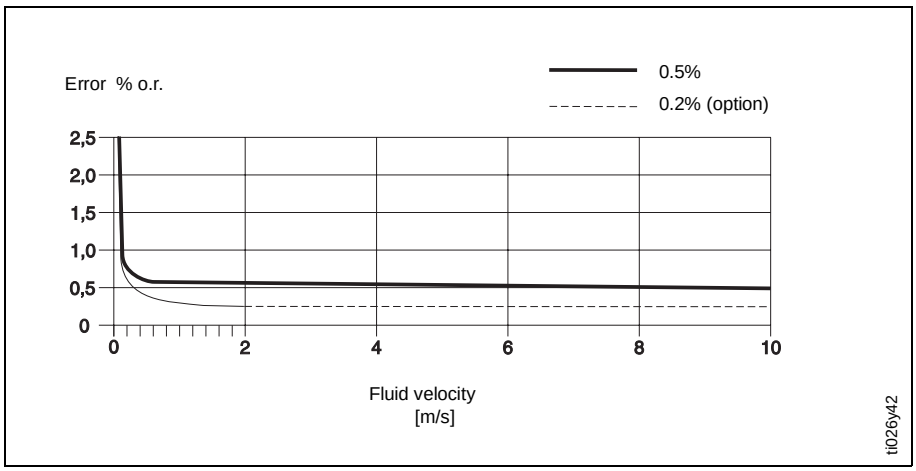
Promag 30 measuring system

Housing material	Powder-coated die-cast aluminium
Coating	Powder-coated 2-component epoxy resin
Protection	IP 67, NEMA 4X
Ambient temperature	-20...+ 60 °C
Resistance to shock and vibration	Acceleration up to 2 g/2 h per day; 10...100 Hz (complete measuring system)
Cable entries	Power supply cable and signal cable (inputs/outputs): PG 13.5 cable glands (5...15 mm) or NPT $^1/_2$", M20 x 1.5 (8...15 mm), G$^1/_2$" threads for cable glands Remote-mounted version (coil and signal cable): PG 13.5 cable glands (5...15 mm) or NPT $^1/_2$", M20 x 1,5 (8...15 mm), G$^1/_2$" threads for cable glands
Power supply	85...260 V AC, 45...65 Hz 20... 55 V AC, 16...62 V DC Supply failure: Bridging over min. 1 mains cycle (22 ms)
Power consumption	AC: < 15 VA (incl. sensor) DC: < 15 W (incl. sensor)
Galvanic insulation	Input and output galvanically isolated from supply, from sensor and from each other
Full-scale value scaling	0.4...10 m/s
Current output	0/4...20 mA adjustable, galvanically isolated, $R_L < 700\ \Omega$, Time constant: automatically assigned Full-scale value: can be set Temperature coefficient: 0.01% o.r./°C
Pulse output (Open Collector)	f_{max} = 400 Hz, U_{max} = 30 V, I_{max} = 250 mA, galvanically isolated, pulse value adjustable, pulse/pause 1:1, pulse width max. 2 s
Status output (Open Collector)	U_{max} = 30 V, I_{max} = 250 mA Adjustable for: System and process error messages, Flow direction recognition
Auxiliary input	U = 3...30 V DC, R_i = 1.8 kΩ, galvanically isolated Adjustable for measured value suppression or external totalizer reset (if instrument fitted with display)
Compatibility with interference (EMC)	As per EN 50082 Part 1 and 2 / EN 50082 Part 1 and 2, and NAMUR recommendations (complete measuring system)
Ex version	Compact und remote version for: CENELEC: EEx d/de; Ex-Zone 2 VDE 0165 FM/CSA: Class I, Div. 1 FM/CSA: Class I, Div. 2 SEV: EEx d/de SEV: Ex n others in preparation

Error Limits

Measuring uncertainty under reference conditions

Pulse output	±0.5% o.r. ±0.01% o.f.s. (f.s. = 10 m/s) (with Promag 30 D: plus ±0.2% o.r.)
Current output	plus typ. ±10 µA.
Repeatability	±0.1% o.r. ±0.005% o.f.s.
Options	Promag 30 A and F: ±0.2% o.r. ±0.05% of Q_k Promag 30 D: ±0.45% o.r. ±0.05% of Q_k Q_k = desired reference flowrate for the calibration (v = 2...10 m/s). Give Q_k when ordering.
Power supply	within the specified range, voltage supply fluctuations have no influence



Reference conditions (DIN 19200 and VDI/VDE 2641)

Fluid temperature	+ 28 °C ±2 K
Ambient temperature	+ 22 °C ±2 K
Warmup time	30 minutes
Installation at reference conditions	inlet lengths > 10 x DN outlet lengths > 5 x DN The sensor and transmitter are grounded. The sensor is centred in the piping.

Supplementary Documentation

☐ Technical Information Promag 33, 35, 39	individual order codes
☐ Operating Manual Promag 30, 33, 35, 39	individual order codes
☐ Promag System Information	SI 010D/06/e
☐ Ex Documentation Promag 30/33 CENELEC	EX 001D/06/A2
☐ Ex Documentation Promag 30/33 SEV	EX 004D/06/C2
☐ Ex Documentation Promag 30/33 FM	EX 006D/06/A2

Subject to modification

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CV4.2