Paddlewheel flow sensor

Type 406020/ …

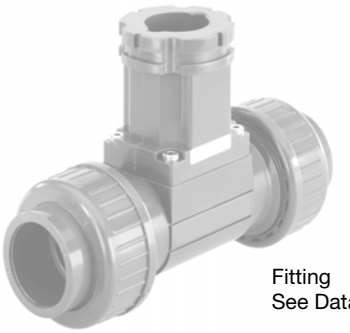
Brief description

The paddlewheel rate sensor is designed for continuous measurement of the flow of neutral and weakly aggressive liquids containing low levels of solids.

Flow speeds of 0.3 to 10 m/s can be measured.
The sensor provides a frequency pulse signal proportional to the flow speed.
Standardized fittings ensure easy installation of the measuring transducer in tubes ranging from DN15 to DN400 (see Data Sheet 406090).

Example of mounting

Flow sensor

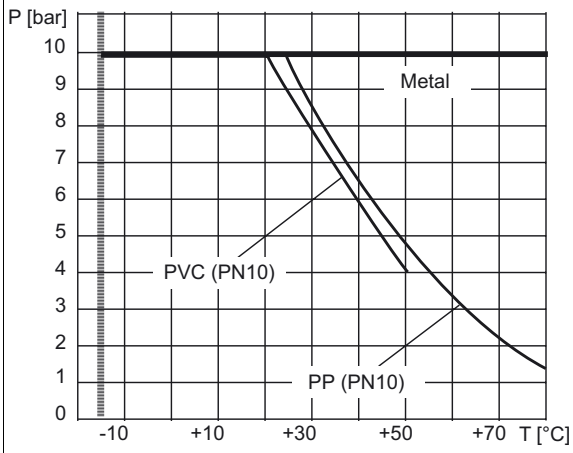


Fitting
See Data Sheet 406090

Key features

- Simple mounting.
- For pressures up to PN10 and temperatures up to +70°C.
- Three-wire frequency pulse signal is suitable for direct connection to PLC.

Technical data

Operating conditions	
Measurement medium	Water or other neutral or weakly aggressive liquids
Viscosity of the measurement medium	≤ 300 cStokes
Medium temperature	In combination with PVC fitting: 0 to +50°C In combination with PP fitting: 0 to +80°C In combination with PE fitting: 0 to +70°C In combination with stainless stell fitting: -15 to +80°C
Ambient temperature	-10 to +60°C operating temperature -20 to +60°C storage temperature
Tube diameter	For diameters DN15 to DN 400. Only in combination with fittings as per Data Sheet 406090.
System pressure	In combination with a PVC or PE fitting: 
Minimum inlet and outlet distances	See illustrations on page 5/5
Relative humidity	≤ 80%, non-condensing
Enclosure protection	IP65 (with mating connector connected)
EMC	EN 61000-6-2, EN 61000-6-3
Vibration	EN 60068-2-6
Impact	EN 60068-2-27
Measuring range	
Flow speed	0.3 to 10 m/s
Accuracy	With standard K factor: ≤ ± 3% of measured value after teach-in: ≤ ± 0.5% of measured value
Linearity	≤ ± 0/5% of measurement range end (at 10 m/s)
Repeatability	≤ ± 0.4% of measured value
Materials	
Enclosure, union nut	PE, PC
Cable plug	PA
Parts in contact with medium	Sensor: PVDF, ceramic, FKM Fitting: see data sheet 406090

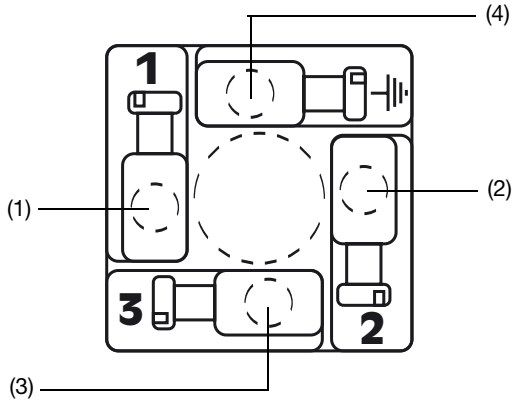
Electrical data	
Power supply voltage	DC 12 to 36 V
Power consumption	≤ 50 mA
Output	Pulse: 0 - 300 Hz, clock ratio: 50%, ≤ 100 mA, protected against reverse polarity
Connection	Device socket EN 175301-803
Recommended connecting cable	max. 1.5 mm^2, max. 50 m long, shielded

Electrical connection

Connection	Terminal assignment
Supply voltage DC 12 to 36 V	1 L+ 3 L-
Output pulse (PNP)	Pls+
	3 L-
Output pulse (NPN)	1 L+
	2 Pls-

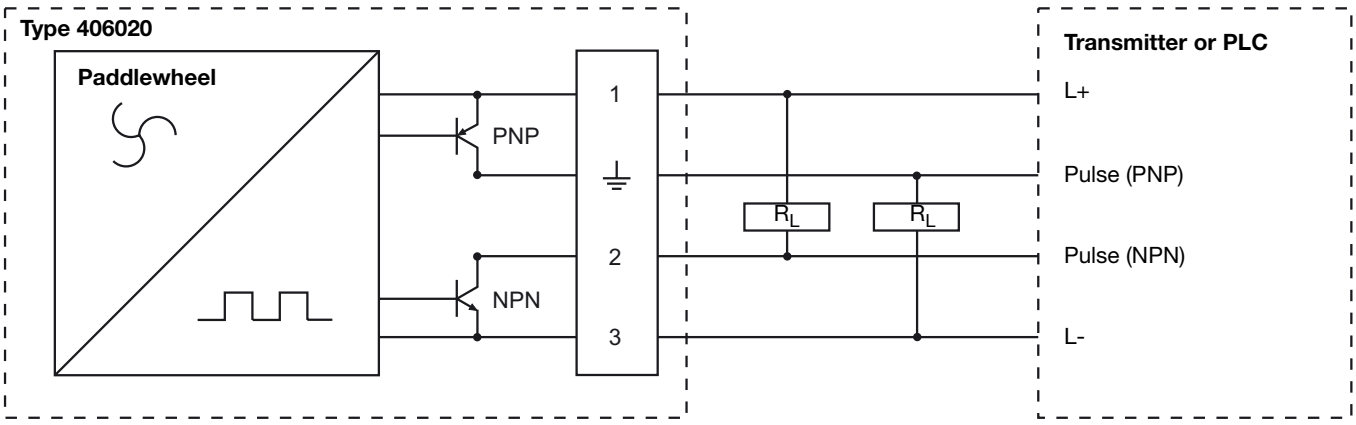
Terminal assignment

(1) Supply voltage
(2) Output pulse NPN transistor
(3) 0 V
(4) Output pulse PNP transistor

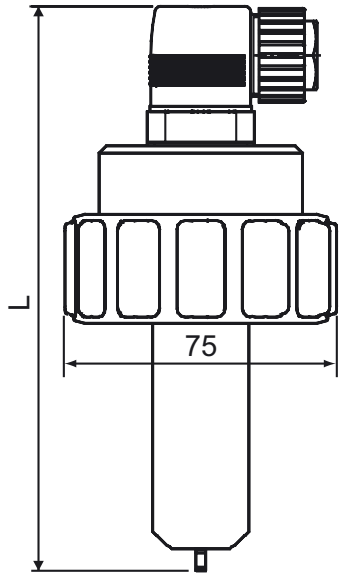


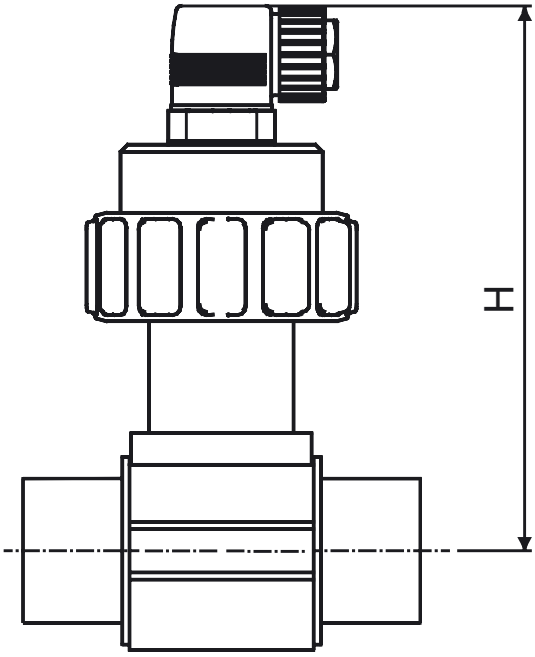
Connection example

L+ and L- must always be connected!
Pulse (PNP) or pulse (NPN) are optionally connected.



Dimensions





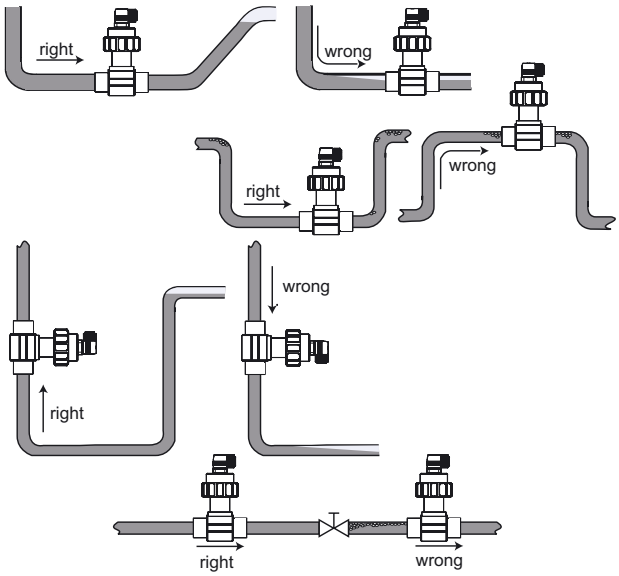
Tube diameter DN	L	H Built into T fitting	Tube diameter DN	L	H Built into welded adapter
15	153	156	65	191	173
20		154	80		178
25		154	100		184
32		157	150		230
40		161	200		251
50		167	250		269
			300		281
			350		294
			400		309

Note: suitable fittings can be found in Data Sheet 406090.

Mounting

Installation

To ensure accurate flow measurements, the flow sensor of type 406020 must be installed in vertical or horizontal tubing.

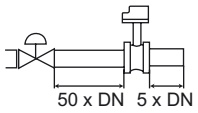


Minimum inlet and outlet distances

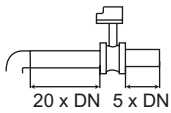
To eliminate turbulence in the tubing, the minimum inlet and outlet distances must be observed.
To ensure greater accuracy, the length of these zones for eliminating turbulence can be increased.
For additional information see EN ISO 5167-1.

The direction of flow is from left to right.

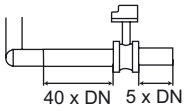
DN = Nominal tube width.



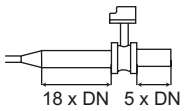
Control valve



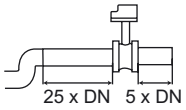
1 x 90° elbow
or T piece



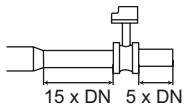
2 x 90° elbow
Three-dimensional



Extension



2 x 90° elbow



Reduction

Mounting recommendation

Fittings for flow rate sensors - see Data Sheet 406090

PVC and stainless steel T fitting 	**Nominal flow rate width** DN15 to DN50	**Sensor version (basic type extension)** Short sensor
PE welded adapter 	**Nominal flow rate width** DN65 to DN100 DN125 to DN400	**Sensor version (basic type extension)** Short sensor Long sensor
Stainless steel welded adapter with radius 	**Nominal flow rate width** DN50 to DN200 DN250 to DN350	**Sensor version (basic type extension)** Short sensor Long sensor
PP connecting clamps 	**Nominal flow rate width** DN50 to DN200	**Sensor version (basic type extension)** Long sensor

Information for ordering: Paddlewheel flow sensor

(1) Basic type
406020 Paddlewheel flow sensor

(2) Basic type extension
001 Short sensor[1]
002 Long sensor[1]

(3) Output
440 Frequency pulse

(4) Electrical connection
61 Cable socket

(5) Extra codes
000 None

	(1)		(2)		(3)		(4)		(5)
Order code		/		-		-		/	
Sample order	406020	/	001	-	xxx	-	61	/	000

[1] See "Mounting recommendation" table above.