



INSERTION flow sensor for continuous flow measurement

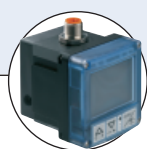
- Economic integration in pipe systems without any additional piping
- 3-wire frequency pulse version to directly interface with PLC's (both PNP and NPN)
- Connection to Bürkert devices in remote versions

Type 8020 can be combined with...



Type 8025

Flow transmitter
remote version



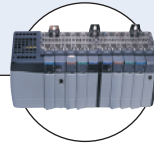
Type 8611

PI flow
controller



Type 2712 (8630)

Continuous
TopControl system



PLC

The paddle-wheel flow sensor for continuous flow measurement is especially designed for use in neutral, slightly aggressive, solid free liquids. The Bürkert designed fitting system ensures simple installation of the sensors into all pipes from DN 15 to 400. The sensor produces a frequency pulse signal, proportional to the flow rate, which can easily be transmitted and processed by a Bürkert remote transmitter / indicator (Type 8025/8032).

Technical data

General data

Compatibility	With fittings S020 (see corresponding data sheet)
Materials	
Housing / Union nut	PE / PC
Cable plug	PA
Materials wetted parts	
Fitting	Brass, stainless steel 1.4435/316L, PVC, PP, PVDF
Finger, paddle-wheel	PVDF
Axis, bearing / Seal	Ceramics / FKM (EPDM option)
Electrical connection	Cable plug EN 175301-803
Connection cable	1.5 mm ² cross section; max. 50 m length, shielded

Complete device data (fitting + electronic module)

Pipe diameter	DN 15 to 400
Measuring range	0.3 to 10 m/s
Fluid temperature with	
PVC fitting / PP fitting	0 up to 50°C (32 to 122°F) / 0 up to 80°C (32 to 176°F)
St. st., brass, PVDF fitting	-15 up to 100°C (5 to 212°F)
Fluid pressure max.	PN10 (145.1 PSI)
Viscosity / solid particles rate	300 cSt. max. / max. 1% (Size of particles 0.5 mm max.)
Accuracy	
Teach-In	≤ ± 1% of F.S.* (at 10 m/s) ¹⁾
Standard K-factor	≤ ± (1% of F.S.* + 3% o. Reading) ¹⁾
Linearity	≤ ± 0.5% of F.S.* (at 10 m/s) ¹⁾
Repeatability	≤ 0.4% of Reading ¹⁾

Environment

Ambient temperature	-15 up to + 60°C (5 to 140°F) (operating and storage)
Relative humidity	≤ 80%, without condensation

* F.S. = Full scale (10 m/s)

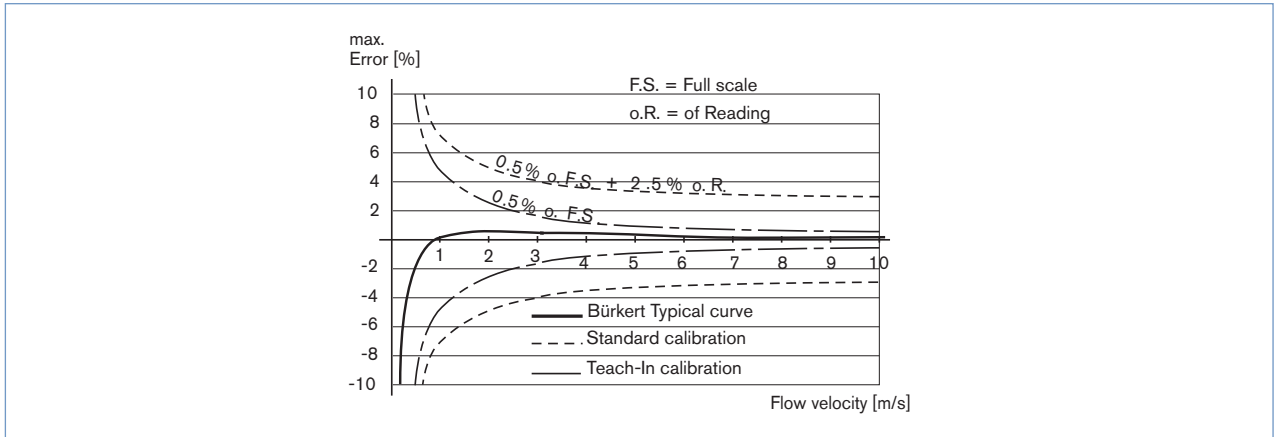
¹⁾ Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20°C (68°F), applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.

Electrical data	
Power supply	12-36 V DC (via Bürkert transmitter for "Low Power" version)
Current consumption	with sensor
Pulse version	≤ 30 mA
Pulse "Low power" version	≤ 0.8 mA
Output: Frequency	
Pulse version	Transistor NPN/PNP, open collector, max. 100 mA, frequency: 0...300 Hz; duty cycle 1/2
Pulse "Low Power" version	Transistor NPN, open collector, max. 10 mA, frequency: 0...300 Hz; duty cycle 1/2
Reversed polarity of DC	Protected
Standards and approvals	
Protection class	IP65 with connector plugged-in and tightened
Standard and directives	
EMC	EN 61000-6-2, 61000-6-3
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration	EN 60068-2-6
Shock	EN 60068-2-27

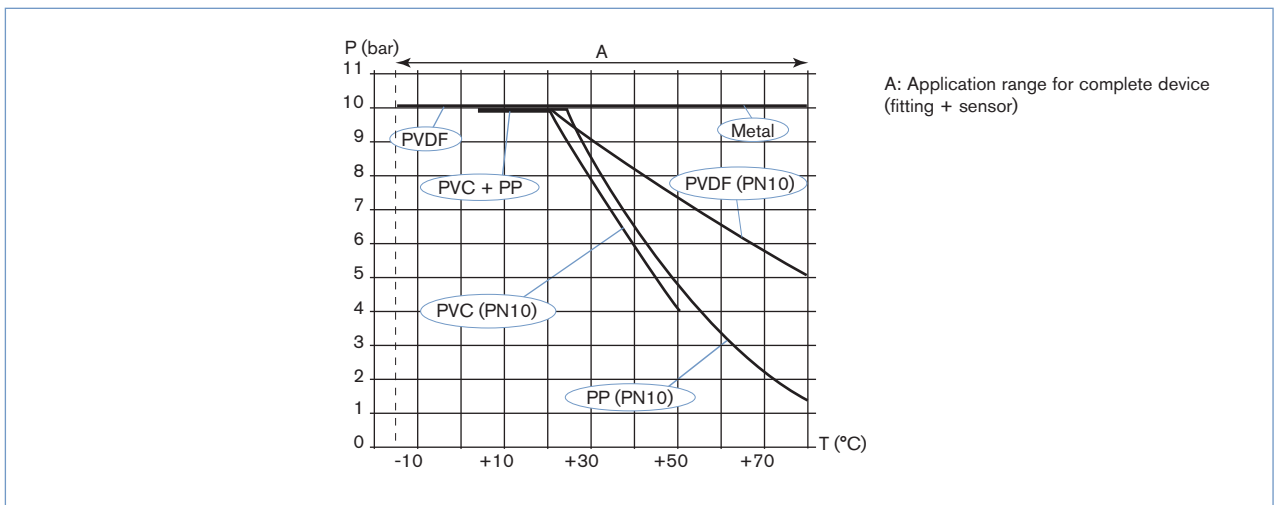
* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
Fluid group 1, §1.3.a	DN 25 only
Fluid group 2, §1.3.a	DN ≤ 32 or DN > 32 and PN*DN ≤ 1000
Fluid group 1, §1.3.b	DN ≤ 25 or DN > 25 and PN*DN ≤ 2000
Fluid group 2, §1.3.b	DN ≤ 400

Accuracy diagram



Pressure / temperature chart



Design and principle of operation



The flow sensor 8020 consists of a transducer and a paddle-wheel with ceramic bearings. The ceramic rotating axis is set on the end of a PVDF INSERTION armature. The transducer is mounted inside the armature.

When liquid flows through the pipe, the paddle-wheel is set in rotation, producing a measuring signal in the transducer. The frequency modulated induced voltage is proportional to the flow velocity of the fluid.

A conversion coefficient (K-factor, available in the instruction manual of the fitting), specific to each pipe (size and material) enables the conversion of this frequency into flow rate.

In a 3-wire system, the signal can be displayed or processed directly. The output signal is provided via cable plug according to EN 175301-803.

Two electronic module versions with frequency output are available:

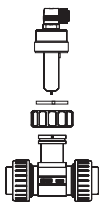
- with one pulse output (either NPN or PNP transistor output depending on wiring).

An external power supply of 12-36 V DC is required. It is designed for connection to any system with open collector NPN or PNP frequency input.

- with one pulse "Low Power" output (NPN transistor output).

An external power supply of 12-36 V DC is required. Can only be connected to separate versions of flow transmitters Type 8025/8032.

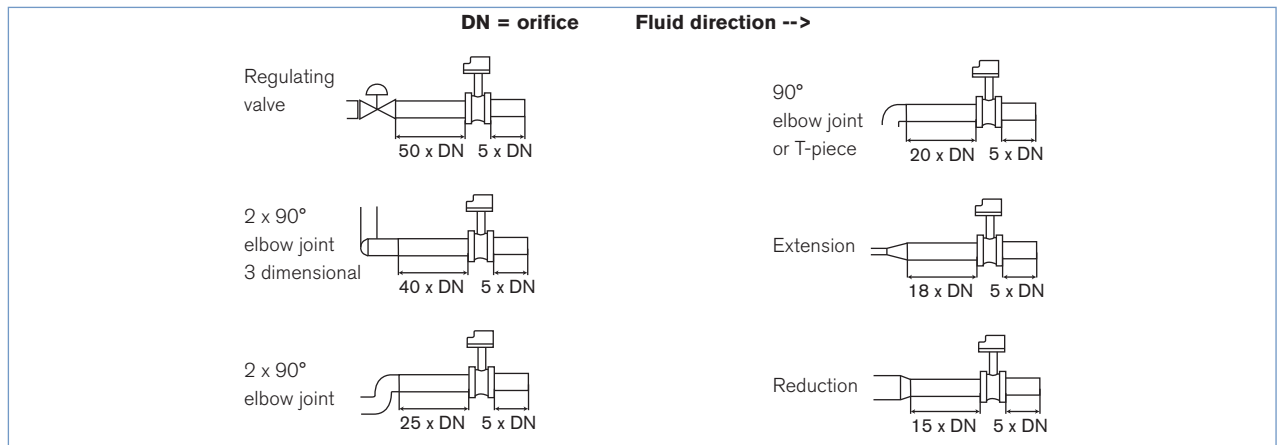
Installation



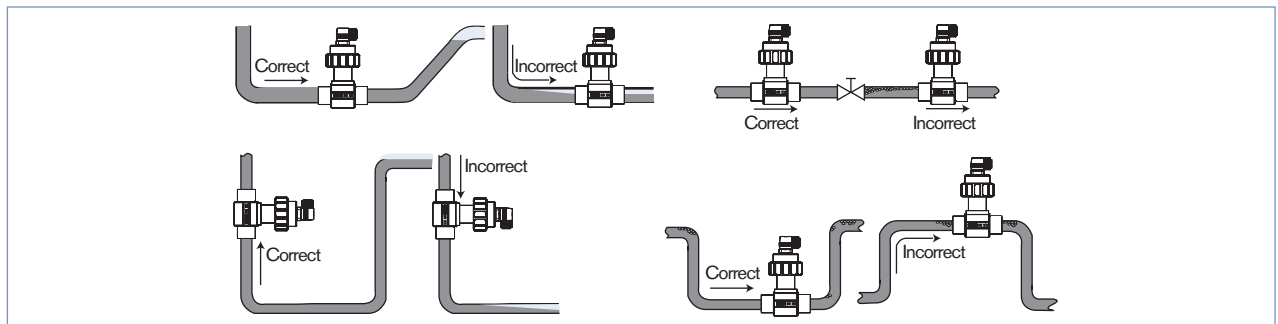
The 8020 flow sensor can easily be installed into any Bürkert INSERTION fitting system Type S020, by just fixing the main nut.

Minimum straight upstream and downstream distances must be observed. According to the pipe's design, necessary distances can be bigger or use a flow conditioner to obtain the best accuracy. For more information, please refer to EN ISO 5167-1.

EN ISO 5167-1 prescribes the straight inlet and outlet distances that must be complied with when installing fittings in pipe lines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated prescribed minimum inlet and outlet distances. These ensure calm, problem-free measurement conditions at the measurement point.



The flow rate sensor can be installed into either horizontal or vertical pipes.



Pressure and temperature ratings must be respected according to the selected fitting material.

The suitable pipe size is selected using the diagram Flow / Velocity / DN.

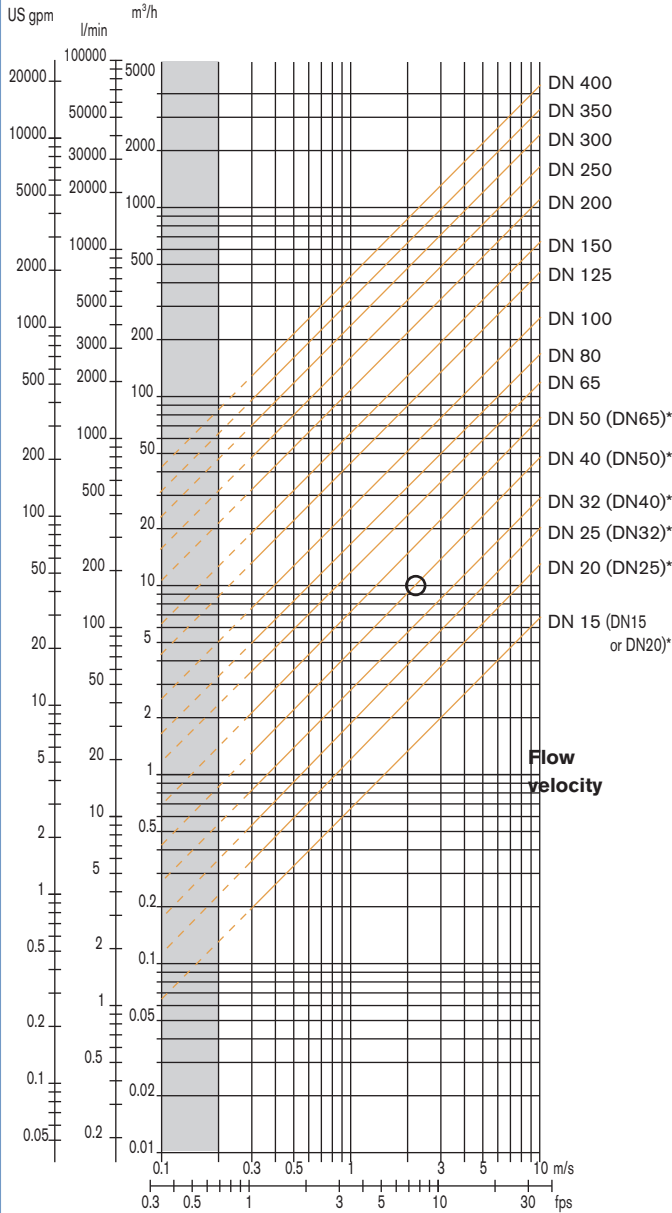
The sensor is not designed for gas flow measurement.

Selection of fitting / pipe size

Example:

- Specification of nominal flow: 10 m³/h
- Ideal flow velocity: 2...3 m/s
- For these specifications, the diagram indicates a pipe size of DN40 [or DN50 for (*) mentioned fittings]

Flow rate



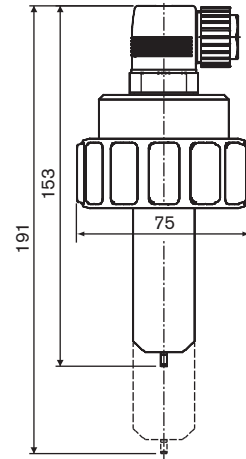
* for following fittings:

- with external threads acc. to SMS 1145
- with weld-ends acc. to SMS 3008, BS 4825 / ASME BPE or DIN 11850 Series 2
- Clamp acc. to SMS 3017 / ISO 2852, BS 4825 / ASME BPE or DIN 32676

Dimensions

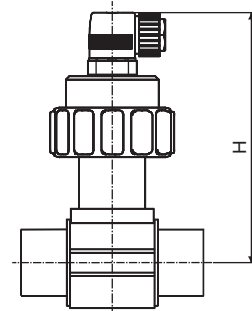
Type 8020 standard

(pulse or pulse "Low Power" version)



Note:

The length of the sensor finger depends on the fitting used. See datasheet Type S020.



DN [mm]	H [mm]			
	T-Fitting	Saddle	Plastic spigot	St. St. spigot
15	156.0			
20	153.5			
25	153.5			
32	157.0			
40	161.0			
50	167.0	191.5		162.5
65	167.0	190.5	172.5	167.0
80		194.5	177.5	173.0
100		199.5	184.0	183.5
110		195.5		
125		202.5		194.5
150		212.5	230.0	205.5
180		236.5		
200		248.5	251.0	226.0
250			269.0	286.0
300			280.5	305.5
350			294.0	317.5
400			308.5	

Ordering chart for sensor Type 8020

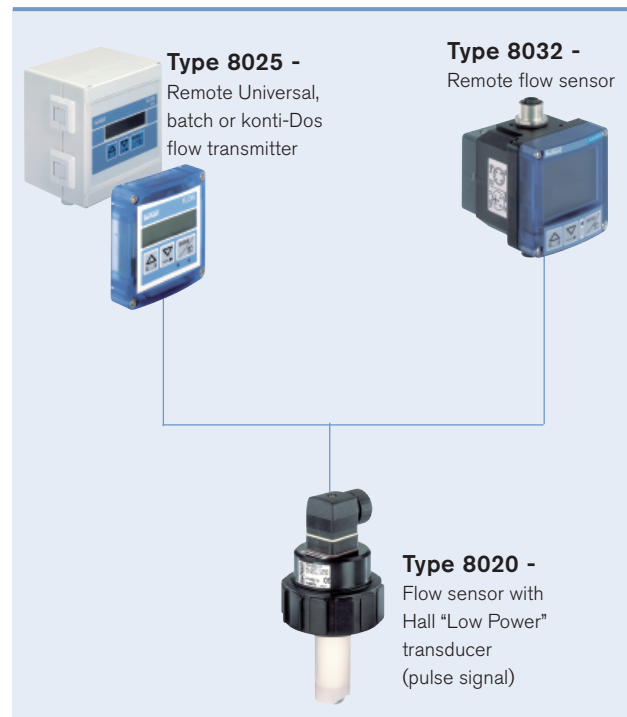
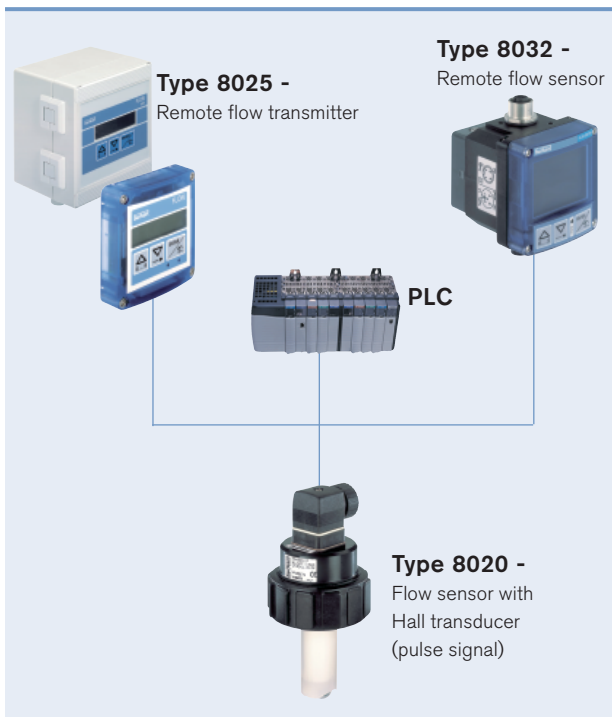
A flow sensor Type 8020 consists of: - a sensor Type 8020
 - an INSERTION fitting Type S020 (DN 15 - DN 400) (Refer to corresponding data sheet - has to be ordered separately)

Description	Voltage supply	Output	Sensor version	Electrical connection	Item no.
Pulse version sensor (pluggable to Types 8025 Universal transmitter, batch controller or konti-Dos; 8032; PLC)	12-36 V DC	Frequency with pulse, PNP or NPN	short	Cable plug EN 175301-803	419 587
			long	Cable plug EN 175301-803	419 589
Pulse "Low Power" version sensor (pluggable to Types 8025, 8032 remote version)	from associated transmitter	Frequency with pulse, NPN	short	Cable plug EN 175301-803	419 591
			long	Cable plug EN 175301-803	419 593

Ordering chart for accessories (to be ordered separately)

Specifications	Item no.
Set with 1 green FKM and 1 black EPDM gasket	552 111
Ring	619 205
Union nut	619 204
Cable plug EN 175301-803 with cable gland (Type 2508)	438 811
Cable plug EN 175301-803 with NPT1/2 " reduction without cable gland (Type 2509)	162 673

Interconnection possibilities with the sensor Type 8020



To find your nearest Bürkert facility, click on the orange box →

www.burkert.com

In case of special application conditions, please consult for advice.

Subject to alteration.
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