

# FLOW SENSOR VORTEX

- Flow rate on hot industrial water, drinkable water, demineralised water
- Measuring independent from temperature
- Nominal diameters from ND 8 to ND 25 mm
- No moving parts
- Output signal: Analogue 4-20 mA or pulses
- Drinking water approval: KTW, W270, WRAS, ACS



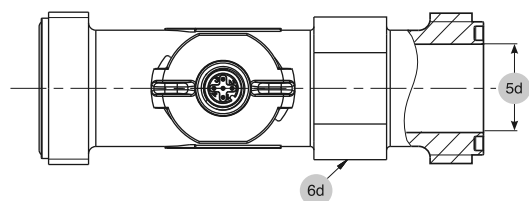
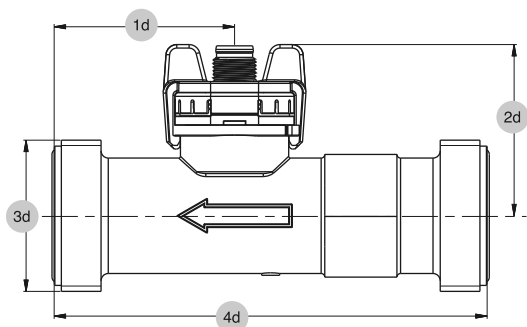
## DESCRIPTION

With no moving parts the flow sensor is not sensitive to particles, has marginal pressure loss and high accuracy; suitable for heating circuit water with the usual additives and for drinking water. The VORTEX flow sensor is also convenient for measuring flow rate of non electric conductive fluids (*osmosis, demineralised water*).

The flow sensor is based on the principle of Karman's vortex trail. The shedding of vortices on the damping body in the flow is directly proportional to the speed of the flow. A piezoelectric paddle detects the generated vortex and the electronic converts it to a frequency signal or to an analogue 4-20 mA signal.

## CODE NUMBERS

Code	Output	Aperture	Range	Connections
777 001	4-20 mA	ND 8	0.9 ... 15 L/min	1/2" Gas M
777 002	4-20 mA	ND 10	1.8 ... 32 L/min	3/4" Gas M
777 003	4-20 mA	ND 15	3.5 ... 50 L/min	1" Gas M
777 004	4-20 mA	ND 20	5.0 ... 85 L/min	1 1/4" Gas M
777 005	4-20 mA	ND 25	9.0 ... 150 L/min	1 1/2" Gas M
777 021	Pulses	ND 8	0.9 ... 15 L/min	1/2" Gas M
777 022	Pulses	ND 10	1.8 ... 32 L/min	3/4" Gas M
777 023	Pulses	ND 15	3.5 ... 50 L/min	1" Gas M
777 024	Pulses	ND 20	5.0 ... 85 L/min	1 1/4" Gas M
777 025	Pulses	ND 25	9.0 ... 150 L/min	1 1/2" Gas M



	1d	2D	3d	4d	5d	6d
ND 8	43.7	42.50	1/2" G	77	12	↻ 12
ND 10	39.5	40.85	3/4" G	90	12	↻ 12
ND 15	41.6	42.85	1" G	97	16	↻ 12
ND 20	42.6	44.85	1 1/4" G	117	20	↻ 12
ND 25	56	47.35	1 1/2" G	132	26	↻ 12

**BAMO MESURES**

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**FLOW SENSOR  
VORTEX**

18-11-2015

777 I1 01 B

**DEB**

**777-01/1**

777

## CARACTERISTIQUES TECHNIQUES

Measuring principle:	VORTEX Piezoelectric sensor element
Measuring ranges:	5 scales from 0.9 ... 15 L/min to 9.0 ... 150 L/min
Apertures:	Nominal diameters ND 8 / 10 / 15 / 20 / 25
Accuracy:	< 1% FS at < 50% FS (water) < 2% measuring value at > 50% FS (water)
Response time	Analogue output: < 500 ms – delay after switching power on < 2 s Pulse output: < 5 ms – delay after switching power on < 100 ms

### OPERATING CONDITIONS

Medium:	Hot industrial water, heating circuit water with the usual additives Drinkable water – Demineralised water
Temperature media:	+125°C (as a maximum)
Ambient temperature:	-15 ... +85°C
Pressure limits:	12 bar at +40°C - 6 bar at 100°C - max. test pressure is 18 bar at 40°C
Cavitations	Respect the following equation to prevent cavitations, $P_{\text{abs outlet}} / P_{\text{differential}} > 5.5$

### ELECTRICAL OVERVIEW

Power supply:	8 ... 33 V DC	4,75 ... 33 V DC												
Output signal:	Analogue 4-20 mA	Frequency, square pulse < 0,5 ... > $U_{\text{IN}} - 0.5$ V												
		<table> <tr> <th>Frequency range</th> <th>Volume per pulse</th> </tr> <tr> <td>~ 34 ... 437 Hz</td> <td>~ 0.56 ml</td> </tr> <tr> <td>~ 24 ... 382 Hz</td> <td>~ 1.40 ml</td> </tr> <tr> <td>~ 19 ... 269 Hz</td> <td>~ 3.09 ml</td> </tr> <tr> <td>~ 14 ... 229 Hz</td> <td>~ 6.22 ml</td> </tr> <tr> <td>~ 12 ... 202 Hz</td> <td>~ 12.40 ml</td> </tr> </table>	Frequency range	Volume per pulse	~ 34 ... 437 Hz	~ 0.56 ml	~ 24 ... 382 Hz	~ 1.40 ml	~ 19 ... 269 Hz	~ 3.09 ml	~ 14 ... 229 Hz	~ 6.22 ml	~ 12 ... 202 Hz	~ 12.40 ml
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Electrical connection:	3 pins, M12x1 (IP 65)	3 pins, M12x1 (IP 65)												
Last/Load against GND or IN:	< $(U_{\text{IN}} - 8 \text{ V}) / 20 \text{ mA}$	< 1 mA / < 100 nF												
Current consumption last free ( $I_{\text{IN}}$ ):	–	< 2 mA												

### SPECIFIC PARAMETERS vs. APERTURES

2) including length of 3xDN  
(upper & lower stream)  
3) Pv: [Pa] and Q: [L/min]

	Measuring range	Flow rate	Pressure drop <sup>2), 3)</sup>	Mass
ND 8	0.9 ... 15 L/min	0.30 ... 5.0 m/s	Pv = 85.00 x Q <sup>2</sup>	~ 47 g
ND 10	1.8 ... 32 L/min	0.32 ... 5.6 m/s	Pv = 22.50 x Q <sup>2</sup>	~ 57 g
ND 15	3.5 ... 50 L/min	0.33 ... 4.7 m/s	Pv = 6.70 x Q <sup>2</sup>	~ 68 g
ND 20	5.0 ... 85 L/min	0.29 ... 5.0 m/s	Pv = 2.50 x Q <sup>2</sup>	~ 92 g
ND 25	9.0 ... 150 L/min	0.33 ... 5.5 m/s	Pv = 0.92 x Q <sup>2</sup>	~ 100 g

### WETTED PARTS (All materials in contact with the fluid are FDA compatible)

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

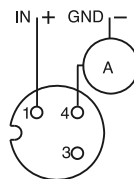
### TESTS AND APPROVALS

Drinkable water approval:	KTW / W270 / WRAS / ACS
CE mark:	Electromagnetic compatibility acc. to EN 61326-2-3

### STORAGE TEMPERATURE

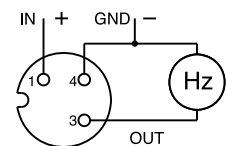
-30 ... +85 °C

## ELECTRICAL CONNECTIONS



Current output

Connector:  
3 pins M12x1



Frequency output

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