



## Flowmeter for the continuous measurement of water

- Ultrasonic flowmeter using transit time method
- Dynamic range  $\geq 1:250$
- Low pressure drop
- No flow-settling section necessary in the inlet or outlet

Product variants described in the data sheet may differ from the product presentation and description.

### Can be combined with

	<b>Type 8032</b> Flowmeter/Threshold detector with paddle wheel	▶
	<b>Type 8611</b> eCONTROL - Universal controller	▶
	<b>Type 8802</b> ELEMENT continuous control valve systems - overview	▶
	<b>Type 8619</b> multiCELL - Multi-channel and multi-function transmitter/controller	▶

### Type description

The Type 8081 ultrasonic flowmeter is intended for the flow measurement of water which may be slightly charged with contaminants. It consists of an electronic module and a brass fitting with a built-in measuring tube. In combination with a controller and a control valve, it enables very simple flow control loops to be established. The electrical connection is made via a 5 pin M12 fixed connector.

The flowmeter features, depending on the version:

- a pulse output or
- a pulse output and a 4...20 mA current output.

Each version is available for 5 different flow ranges:

- model QN 0.6 DN15: 0.06 to 20 l/min (nominal flow rate 0.6 m<sup>3</sup>/h namely 10 l/min)
- model QN 1.5 DN15: 0.1 to 50 l/min (nominal flow rate 1.5 m<sup>3</sup>/h namely 25 l/min)
- model QN 2.5 DN20: 0.16 to 82 l/min (nominal flow rate 2.5 m<sup>3</sup>/h namely 41 l/min)
- model QN 3.5 DN25: 0.6 to 116 l/min (nominal flow rate 3.5 m<sup>3</sup>/h namely 58 l/min)
- model QN 6.0 DN25: 1 to 200 l/min (nominal flow rate 6.0 m<sup>3</sup>/h namely 100 l/min)

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## 1. General Technical Data

### Note:

If the device is mounted in a humid environment or outside, then the maximum voltage allowed is **35 V DC** instead of 36 V DC.

Product properties	
<b>Material</b>	
Please make sure the device materials are compatible with the fluid you are using. Detailed information can be found in chapter <a href="#">“3.1. Chemical Resistance Chart – Bürkert resistApp”</a> on page 5.	
<b>Non wetted parts</b>	
Housing	PPS
Cover	PA
Screws	Stainless steel
Fixed connector M12	Silicone
<b>Wetted parts</b>	
Fitting	Brass
Measuring tube	PES
Seal	EPDM
Dimensions	Detailed information can be found in chapter xxx.
Measuring element	2 ultrasound emitter-receiver cells
Measuring range	0.06...200 l/min
Pipe diameter	DN15...DN25
<b>Performance data</b>	
Measurement deviation	Flowrate: $\leq (0.01\% \text{ of full scale} + 2\% \text{ of measuring value})^{1)}$ Detailed information can be found in chapter <a href="#">“5.1. Measurement deviation diagram”</a> on page 6.
Repeatability	$\leq 1\%$
<b>Electrical data</b>	
Operating voltage (V+)	12...36 V DC
Current consumption	<ul style="list-style-type: none"> <li>• Own consumption: <math>&lt; 4 \text{ mA}</math></li> <li>• Consumption with load: <math>&lt; 1 \text{ A}</math></li> </ul>
Output signal	<p>The device is available with a pulse output or with a pulse output and a 4...20 mA analogue outputs</p> <ul style="list-style-type: none"> <li>• Device with a pulse (transistor) output: <ul style="list-style-type: none"> <li>– Pulse (transistor): NPN (as default setting) or PNP (on request), open collector NPN-output: 0.2...36 V DC, max. 700 mA, min. 5 mA Galvanic insulation and protected against overvoltage, polarity reversals and short circuit</li> </ul> </li> <li>• Device with a pulse (transistor) and a 4...20 mA analogue outputs: <ul style="list-style-type: none"> <li>– Pulse (transistor): PNP (as default setting) or NPN (on request), open collector PNP-output: operating voltage (V+), max. 700 mA Galvanic insulation and protected against overvoltage, polarity reversals and short circuit</li> <li>– Current: 4...20 mA (sourcing mode and PNP transistor as default setting, sinking mode and NPN transistor on request) Loop impedance max.: 1100 <math>\Omega</math> at 36 V DC; 610 <math>\Omega</math> at 24 V DC; 100 <math>\Omega</math> at 12 V DC</li> </ul> </li> </ul>
Scaling	<ul style="list-style-type: none"> <li>• Pulse (transistor): <ul style="list-style-type: none"> <li>– If model QN 0.6 or QN 1.5 : 1 pulse corresponds to a volume = 0.002 l (K factor = 500 pulse/litre)</li> <li>– If model QN 2.5 or QN 3.5 : 1 pulse corresponds to a volume = 0.005 l (K factor = 200 pulse/litre)</li> <li>– If model QN 6 : 1 pulse corresponds to a volume = 0.01 l (K factor = 100 pulse/litre)</li> </ul> </li> <li>• Current: 4 mA correspond to 0 l/min and 20 mA correspond to <math>Q_{\text{max}}</math> of flow range (by default)</li> </ul>
Voltage supply cable	1.5 mm <sup>2</sup> max. cross-section
<b>Media data</b>	
Temperature	+5...+90 °C (+41...+194 °F)

Pressure	PN16 (232.16 PSI)
<b>Process/Port connection &amp; communication</b>	
Process connection	G or NPT external thread; ¾", 1" or 1"¼
Electrical connection	5 pin M12 male fixed connector for female 5 pin M12 cable plug (not provided)
<b>Approvals and certificates</b>	
<b>Standards</b>	
Protection class according to IEC/EN 60529	IP65 with M12 cable plug plugged-in and tightened
<b>Directives</b>	
CE directives	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable)
Pressure equipment directives	Complying with Article 4, Paragraph 1 of 2014/68/EU directive Detailed information on the pressure equipment directive can be found in chapter <b>"2.1. Pressure Equipment Directive"</b> on page 4.
Certificate	On request: <ul style="list-style-type: none"> <li>• Test report 2.2</li> <li>• Calibration certificate</li> </ul>
<b>Environment and installation</b>	
Ambient temperature	Operating and storage: +5...+55 °C (+41...+131 °F)
Relative air humidity	≤ 80 %, without condensation
Height above sea level	Max. 2000 m

1.) Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20 °C (68 °F).

## 2. Approvals

### 2.1. Pressure Equipment Directive

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

#### Device used on a pipe

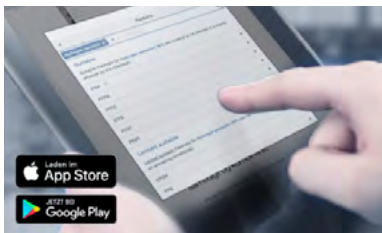
##### Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure, DN = nominal diameter of the pipe

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PS*DN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PS*DN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000

### 3. Materials

#### 3.1. Chemical Resistance Chart – Bürkert resistApp

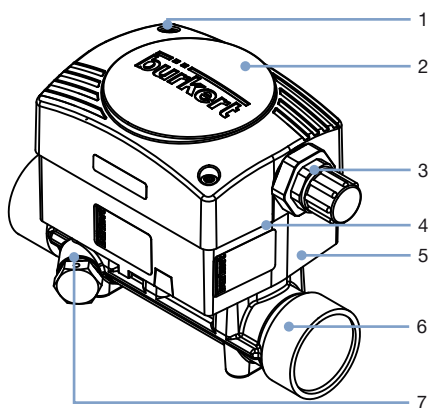


**Bürkert resistApp – Chemical Resistance Chart**

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start Chemical Resistance Check

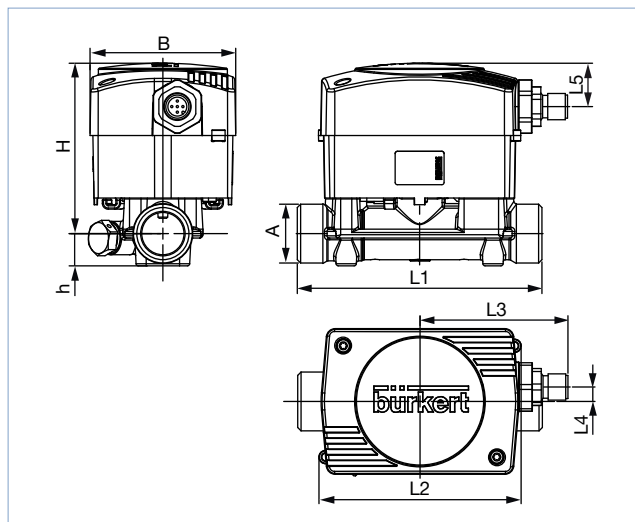
#### 3.2. Material specifications



No.	Element	Material
1	Screws	Stainless steel
2	Cover	PPS
3	M12 fixed connectors	PA
4	Seal	Silicone
5	Housing	PPS
6	Fitting and measuring tube (inside fitting)	Brass and PES
7	Seal	EPDM

### 4. Dimensions

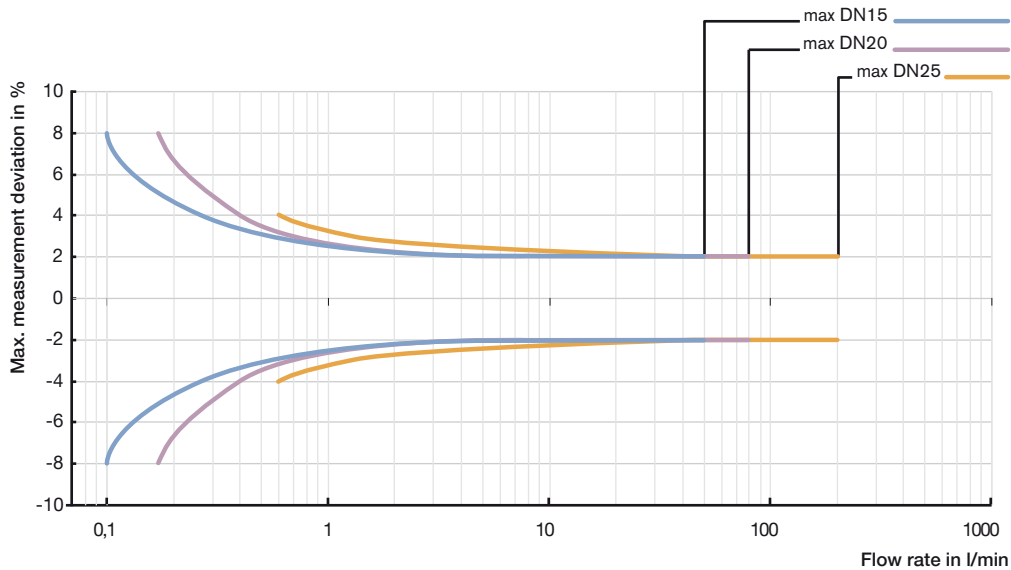
**Note:**  
Specifications in mm



DN	A	B	H	h	L1	L2	L3	L4	L5
15	G or NPT 3/4"	65.5	76.5	14.5	110	90	67	6.5	19.5
20	G or NPT 1"	65.5	79.0	18.0	130	90	67	6.5	19.5
25	G or NPT 1 1/4"	65.5	83.5	23.0	260	90	67	6.5	19.5

## 5. Performance specifications

### 5.1. Measurement deviation diagram



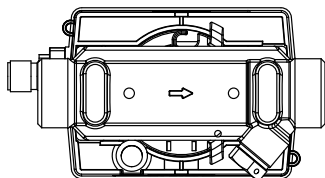
## 6. Product installation

### 6.1. Installation notes

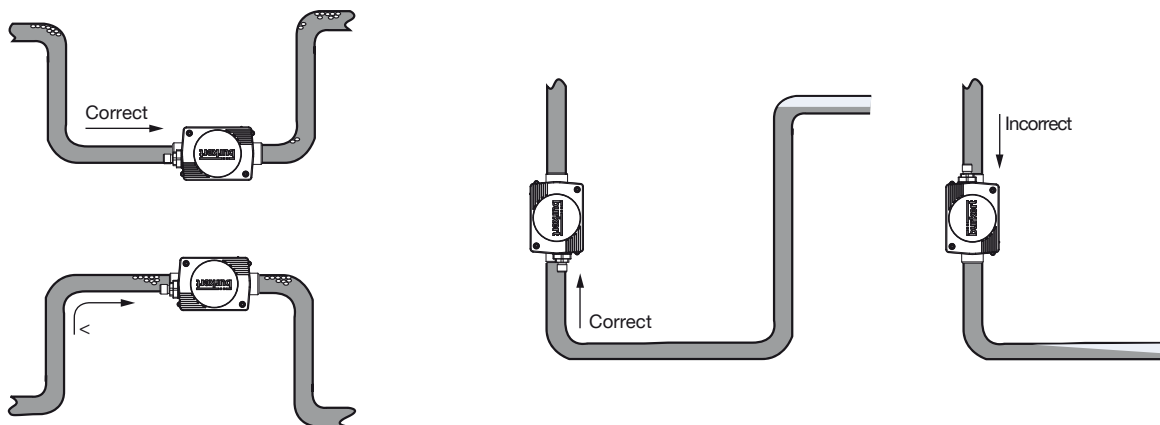
**Note:**

- The flowmeter is not designed for gas and steam flow measurement.
- Minimum straight upstream and downstream distances are not necessary.

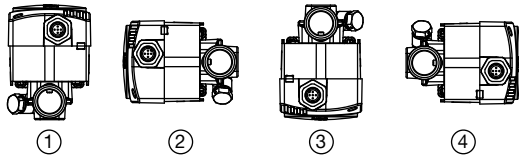
The correct direction of fluid flow in the pipe is indicated with an arrow, engraved on the underside of the fitting.



The flowmeter can be installed into either horizontal or vertical pipes. When horizontally mounted, the max. fluid temperature is 90 °C. The max. fluid temperature must be reduced to 80 °C when the electronic (black enclosure) is turned upwards. When vertically mounted the max. fluid temperature is also 80 °C.



The 8081 works correctly when the pipe is full and free of any air bubbles near the flowmeter. In presence of bubbles in the pipe, the left installation no.1 should be avoided.



If the absence of any air bubbles cannot be guaranteed, the device should be fitted on a horizontal pipe, with the electronic enclosure facing down. This way, the bubbles will not interfere with the propagation of ultrasound waves.



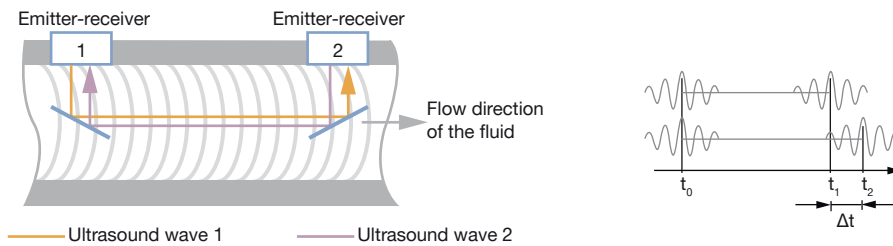
It is equally advisable to place stop valves before and after the flowmeter, in order to facilitate the assembly and disassembly of the latter.



## 7. Product operation

### 7.1. Measuring principle

The 8081 ultrasonic flowmeter is based on the transit time method. The sound transit time from emitter 1 to receiver 2 will be measured and compared with the transit time from emitter 2 to receiver 1. The difference in transit time is directly proportional to the flow speed of the fluid.



The electronic module delivers a pulse signal proportional to the volume or an industry standard 4...20 mA signal, proportional to the flow rate.

## 8. Ordering information

### 8.1. Bürkert eShop – Easy ordering and quick delivery



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## 8.2. Bürkert product filter























### Bürkert product filter – Get quickly to the right product


You want to select products comfortably based on your technical requirements? Use the Bürkert product filter and find suitable articles for your application quickly and easily.

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## 8.3. Ordering chart

Model	DN	Flow range	Process connection	Outputs	Article no.
QN 0.6	15	0.06...20 l/min	External thread G 3/4"	Pulse, NPN	560131 
				Pulse, PNP + 4...20 mA as source	560113 
			External thread NPT 3/4"	Pulse, NPN	560612 
				Pulse, PNP + 4...20 mA as source	560617 
QN 1.5	15	0.1...50 l/min	External thread G 3/4"	Pulse, NPN	559865 
				Pulse, PNP + 4...20 mA as source	559868 
			External thread NPTx3/4"	Pulse, NPN	560613 
				Pulse, PNP + 4...20 mA as source	560618 
QN 2.5	20	0.16...82 l/min	External thread G 1"	Pulse, NPN	559866 
				Pulse, PNP + 4...20 mA as source	559869 
			External thread NPT 1"	Pulse, NPN	560614 
				Pulse, PNP + 4...20 mA as source	560619 
QN 3.5	25	0.6...116 l/min	External thread G 1 1/4"	Pulse, NPN	559867 
				Pulse, PNP + 4...20 mA as source	559870 
			External thread NPT 1 1/4"	Pulse, NPN	560615 
				Pulse, PNP + 4...20 mA as source	560620 
QN 6.0	25	1...200 l/min	External thread G 1 1/4"	Pulse, NPN	560132 
				Pulse, PNP + 4...20 mA as source	560114 
			External thread NPT 1 1/4"	Pulse, NPN	560616 
				Pulse, PNP + 4...20 mA as source	560621 

## 8.4. Ordering chart accessories

Description	Article no.
5 pin M12 female cable plug moulded on cable (2 m, shielded)	438680 
5 pin M12 female cable plug with plastic threaded locking ring	917116 



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