

## Flowmeter for continuous flow measurement



Type 8011 can be combined with...



**Type 8619**

Multifunction transmitter/controller



**Type 8802-GD**

TopControl System



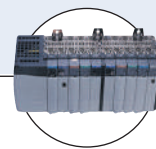
**Type 8611**

Universal Controller eControl



**Type 8032**

Flow controller



**PLC**

- Economic integration in pipe systems without any additional piping
- Magnetic measuring principle (paddle wheel with hall sensor)
- Output: transistor output (frequency pulse signal)

The paddle wheel flowmeter for continuous flow measurement is especially designed for use in neutral, slightly aggressive, solid free liquids. The 8011 consists of a fitting (S012) and an electronic module (SE11) connected together with screws. The Bürkert designed fitting system ensures simple installation into all pipes from DN06 to DN65. It can also be installed in fluid block systems.

The 8011 produces a frequency pulse signal, proportional to the flow rate, which can be processed by a Bürkert remote transmitter/controller.

The 8011 is available in two versions:

- with one pulse output: transistor NPN
- with two pulse outputs: transistor NPN and PNP.

### General data

<b>Compatibility</b>	with fittings S012
<b>Materials</b>	
Housing / Seal	PPS / EPDM
Fixed connector M12, cable gland	PA
1 meter cable	PVC
<b>Wetted parts materials</b>	
Fitting	Brass, stainless steel 1.4404/316L, PVC, PP
Paddle wheel / Holder	PVDF blue / PVDF
Axis and bearing / Seal	Ceramics (AL <sub>2</sub> O <sub>3</sub> ) / FKM (EPDM option)
<b>Electrical connection</b>	Fixed connector 5-pin M12 (or with 1 m cable, on request)
<b>Connection cable</b>	1.5 mm <sup>2</sup> max. cross-section

### Complete device data (fitting + electronic module)

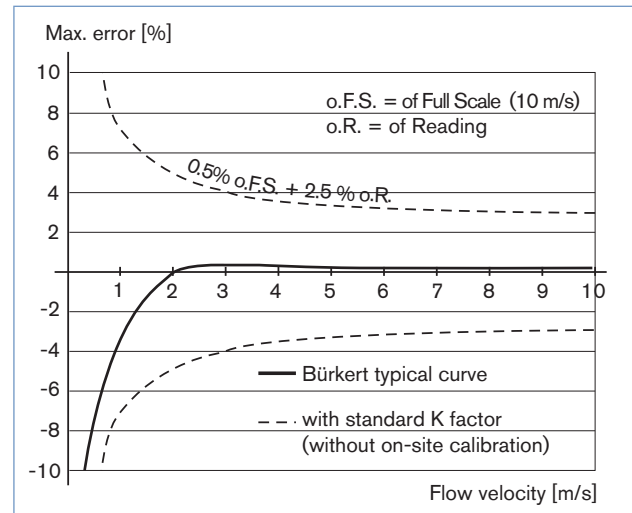
<b>Pipe diameter</b>	DN06 to DN50 (DN65 on request)
<b>Measuring range</b>	0.3 m/s to 10 m/s
<b>Measuring element</b>	magnetic hall sensor
<b>Medium temperature with</b>	
PVC fitting	0°C to 60°C
PP fitting	0°C to 80°C
Stainless steel, brass fitting	-15°C to 100°C (if T <sup>ambient</sup> ≤ 45°C) or -15°C to 90°C (if 45°C ≤ T <sup>ambient</sup> ≤ 60°C)
<b>Fluid pressure max.</b>	PN10 (with plastic fitting) PN16 (with metal fitting)
<b>Viscosity / Pollution</b>	max. 300 cSt. /max. 1% (size of particles 0.5 mm max.)
<b>Accuracy</b>	with standard K-factor ±(0.5% of FS.* + 2.5% of Reading) <sup>1)</sup>
<b>Linearity</b>	±0.5% of FS.* (at 10 m/s)
<b>Repeatability</b>	±0.4% of Reading <sup>1)</sup>

\* FS. = Full scale (10 m/s)

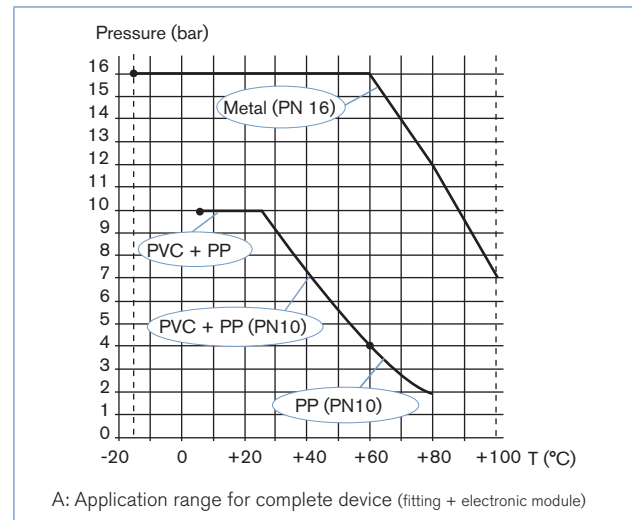
<sup>1)</sup> Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20°C, applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.

Electrical data	
<b>Operating voltage (V+)</b>	One pulse output version 4.5 - 24 V DC, filtered and regulated Two pulse outputs version 6 - 36 V DC, filtered and regulated
<b>Current consumption</b>	< 5 mA (without load)
<b>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
<b>Short circuit</b>	Protected for transistor output
<b>Output</b>	One pulse output version Transistor NPN open collector, max. 20 mA, NPN output: 0.2 - 24 V DC, frequency up to 300 Hz (Frequency [Hz] = K factor [pulse/litre] x flow rate [l/s]) Two pulse outputs version Transistor NPN and PNP open collector, max. 700 mA, NPN output: 0.2 - 36 V DC, PNP output: operating voltage, frequency up to 300 Hz (Frequency [Hz] = K factor [pulse/litre] x flow rate [l/s])
Environment	
<b>Ambient temperature</b>	-15°C to +60°C (operating and storage)
<b>Relative humidity</b>	≤ 80%, without condensation
Standards, directives and approvals	
<b>Protection class</b>	IP67 with multipin M12 (IP65 with cable)
<b>Standard and directives</b>	EN 61000-6-3, EN 61000-6-2
EMC	Complying with article 3 of §3 from 97/23/CE directive.*
Pressure	
Vibration	EN 60068-2-6
Shock	EN 60068-2-27
<b>Approval/Certificate on request</b>	3.1 certificate; 2.2 certificate; Surface finish certificate; Calibration certificate; FDA (only for device with EPDM seal and stainless steel fitting) KTW (only for device with EPDM seal and stainless steel or brass fitting)
* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).	
<b>Type of fluid</b>	<b>Conditions</b>
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	PN*DN ≤ 2000
Fluid group 2, §1.3.b	DN ≤ 200

## Accuracy diagram



## Pressure/temperature diagram

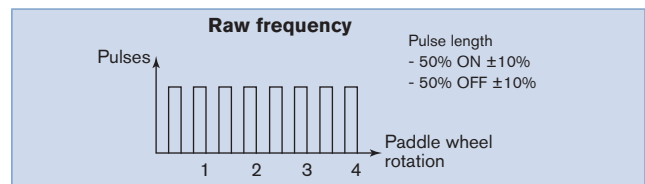


## Main features

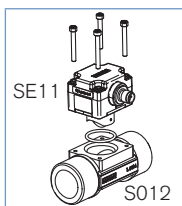
### 8011 with magnetic principle

#### Version with Transistor output

- ▶ Transistor output: NPN or NPN/PNP operation.
- ▶ With one transistor output
  - Raw frequency (2 pulses per paddle wheel rotation)



## Design and principle of operation



The flowmeter 8011 is built up with an electronic module and a measurement paddle wheel associated to a fitting. This connection is made by means of screws.

When liquid flows through the pipe, the paddle wheel is set in rotation. The non-wetted permanent magnets inserted in the paddle wheel generate a measuring signal which frequency is proportional to the flow velocity.

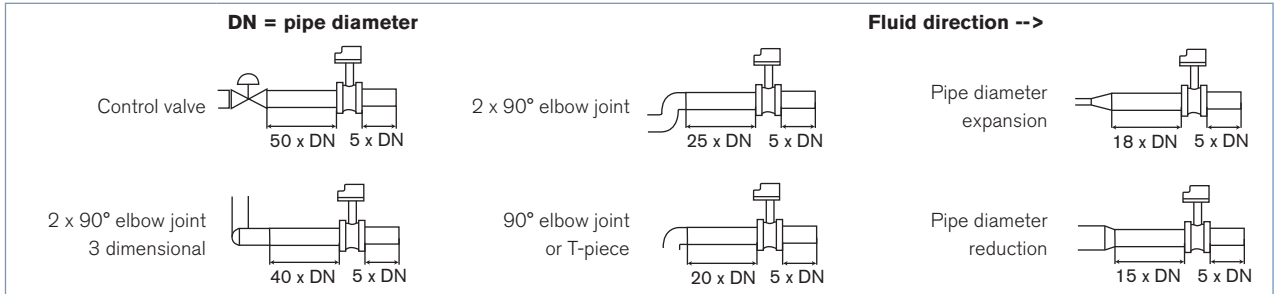
It is designed for connection to any system with open collector NPN or PNP frequency input.

The output signal is provided via a fixed connector 5-pin M12 (or a 1 m-length cable on request).

### Installation

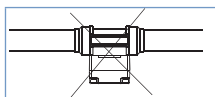
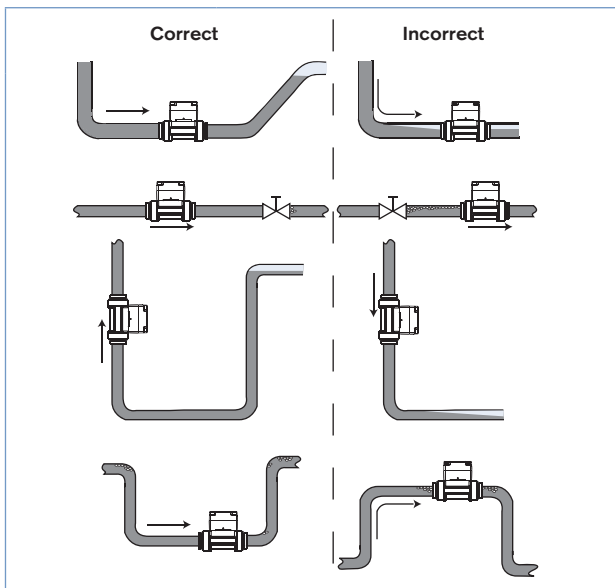
Minimum straight upstream and downstream distances must be observed. According to the pipe design, necessary distances can be bigger or use a flow conditioner to obtain the best accuracy. For more information, please refer to EN ISO 5167-1.

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 flowmeter can be installed in either horizontal or vertical pipes, but following additional conditions should be respected

- always install the 8011 so that the paddle wheel axis is horizontal
- ensure the pipe is maintained full at all times, near the device
- ensure the pipe design does not allow the build-up of air bubbles or cavities within the medium, near the device



When installing the 8011 on an horizontal pipe, make sure the paddle wheel is oriented down.

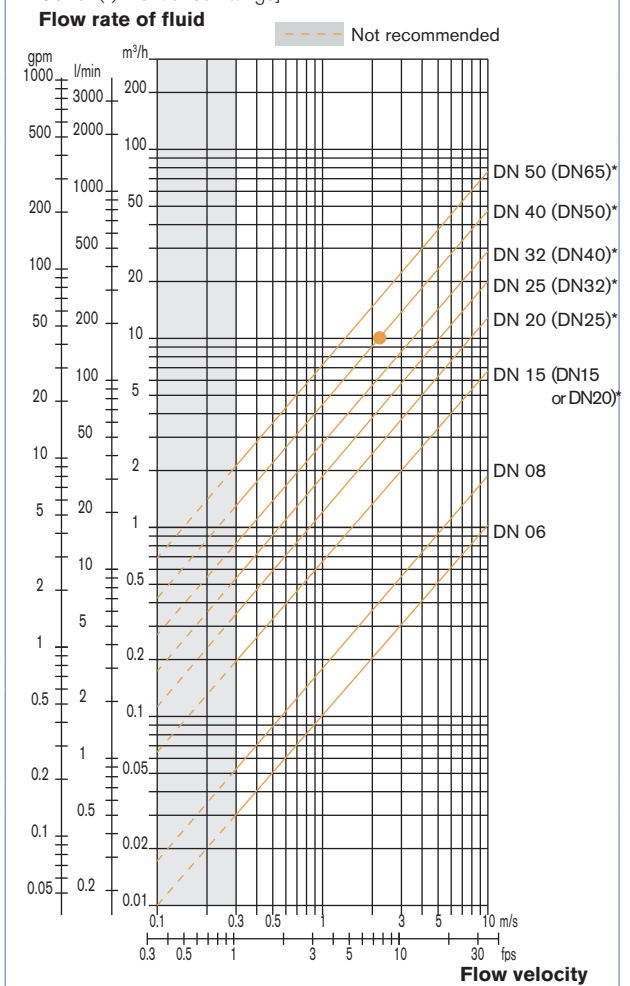
Pressure and temperature ratings must be respected according to the selected fitting material.  
The suitable pipe size is selected using the diagram Flow/Velocity/DN.  
The measuring device is not designed for gas flow measurement.

### Diagram Flow/Velocity/DN

**Example:**

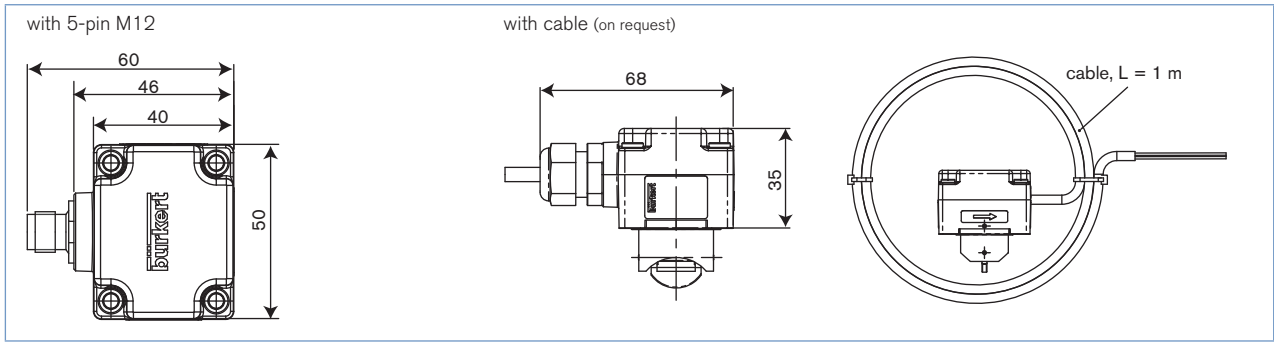
- Flow: 10 m<sup>3</sup>/h
- Ideal flow velocity: 2...3 m/s

For these specifications, the diagram indicates a pipe size of DN40 [or DN50 for (\*) mentioned fittings]



- \* for following fittings with:
- external threads acc. to SMS 1145
  - 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

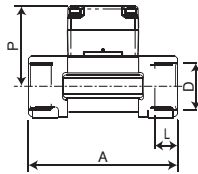
Dimensions [mm] electronic module



Dimensions 8011

8011 with internal thread connection

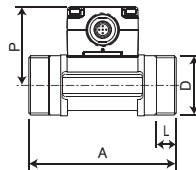
G, NPT or Rc  
in stainless steel (316L - 1.4404) or  
brass (CuZn39Pb2)



DN	P	A	D	L
[mm]	[mm]	[mm]	[inch]	[mm]
15	57.5	84.0	G 1/2 NPT 1/2 Rc 1/2	16.0 17.0 15.0
20	55.0	94.0	G 3/4 NPT 3/4 Rc 3/4	17.0 18.3 16.3
25	55.2	104.0	G 1 NPT 1 Rc 1	23.5 18.0 18.0
32	58.8	119.0	G 1 1/4 NPT 1 1/4 Rc 1 1/4	23.5 21.0 21.0
40	62.6	129.0	G 1 1/2 NPT 1 1/2 Rc 1 1/2	23.5 20.0 19.0
50	68.7	148.5	G 2 NPT 2 Rc 2	27.5 24.0 24.0

8011 with external thread connection

G, NPT or Rc  
in stainless steel (316L - 1.4404),  
brass (CuZn39Pb2)  
or PVC

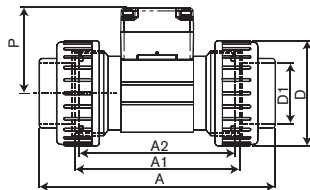


DN	P	A	D	L
[mm]	[mm]	[mm]	[inch]	[mm]
06	52.5	90.0	G 1/2	-
08	52.5	90.0	** 1/2	M 16 x 1.5

\*\* G, NPT, RC according to fitting version

8011 with True union connection

DIN 8063, ASTM D 1785/76 or JIS K in PVC



DN	P	D	A			D1			A2	A1
			DIN	ASTM	JIS	DIN	ASTM	JIS		
15	57.5	43	128	130.0	129	20	21.3	18.40	90	96
20	55.0	53	144	145.6	145	25	26.7	26.45	100	106
25	55.2	60	160	161.4	161	32	33.4	32.55	110	116
32	58.8	74	168	170.0	169	40	42.2	38.60	110	116
40	62.6	83	188	190.2	190	50	48.3	48.70	120	127
50	68.7	103	212	213.6	213	63	60.3	60.80	130	136

## Ordering chart for 8011, 4.5-24 V DC, 5-pin M12, NPN output

! Two versions of the fitting in DN15 and DN20 exist, having different K factors.

Only version 2, identified by the "v2" marking, is available from March 2012. The "v2" marking can be found:

- on the bottom of the DN15 or DN20 fitting in plastic:





- on the side of the DN15 or DN20 fitting in metal:




Process connection	Standard	Output*	Item no. DN06 - 1/4"	Item no. DN06 - 1/2"	Item no. DN08 - 1/2"	Item no. DN15	Item no. DN20	Item no. DN25	Item no. DN32	Item no. DN40	Item no. DN50
<b>Brass - Medium temperature max. 100°C, PN16</b>											
Internal thread	G	Pulse NPN	-	-	-	559 918	559 919	559 920	559 921	559 922	559 923
	NPT	Pulse NPN	-	-	-	559 924	559 925	559 926	559 927	559 928	559 929
	Rc (ISO7)	Pulse NPN	-	-	-	559 930	559 931	559 932	559 933	559 934	559 935
External thread	G	Pulse NPN	559 915	559 916	559 917	-	-	-	-	-	-
<b>Stainless steel - Medium temperature max. 100°C, PN16</b>											
Internal thread	G	Pulse NPN	-	-	-	559 939	559 940	559 941	559 942	559 943	559 944
	NPT	Pulse NPN	-	-	-	559 946	559 947	559 948	559 949	559 950	559 951
	Rc (ISO7)	Pulse NPN	-	-	-	559 952	559 953	559 954	559 955	559 956	559 957
External thread	G	Pulse NPN	559 936	559 937	559 938	-	-	-	-	-	-
	NPT	Pulse NPN	-	-	559 945	-	-	-	-	-	-
<b>PVC - Medium temperature max. 60°C, PN10</b>											
True union	DIN	Pulse NPN	-	-	-	559 960	559 961	559 962	559 963	559 964	559 965
	ASTM	Pulse NPN	-	-	-	559 966	559 967	559 968	559 969	559 970	559 971
	JIS	Pulse NPN	-	-	-	559 972	559 973	559 974	559 975	559 976	559 977
External thread	G	Pulse NPN	-	559 958	559 959	-	-	-	-	-	-

### i Further versions on request

 **Process connection**  
Weld ends, Clamp, Flange, True union, spigot

 **Materials**  
Fitting: PVC, PP,  
Seal: EPDM  
Special surface finish

 **Electrical connection**  
with 1 m cable

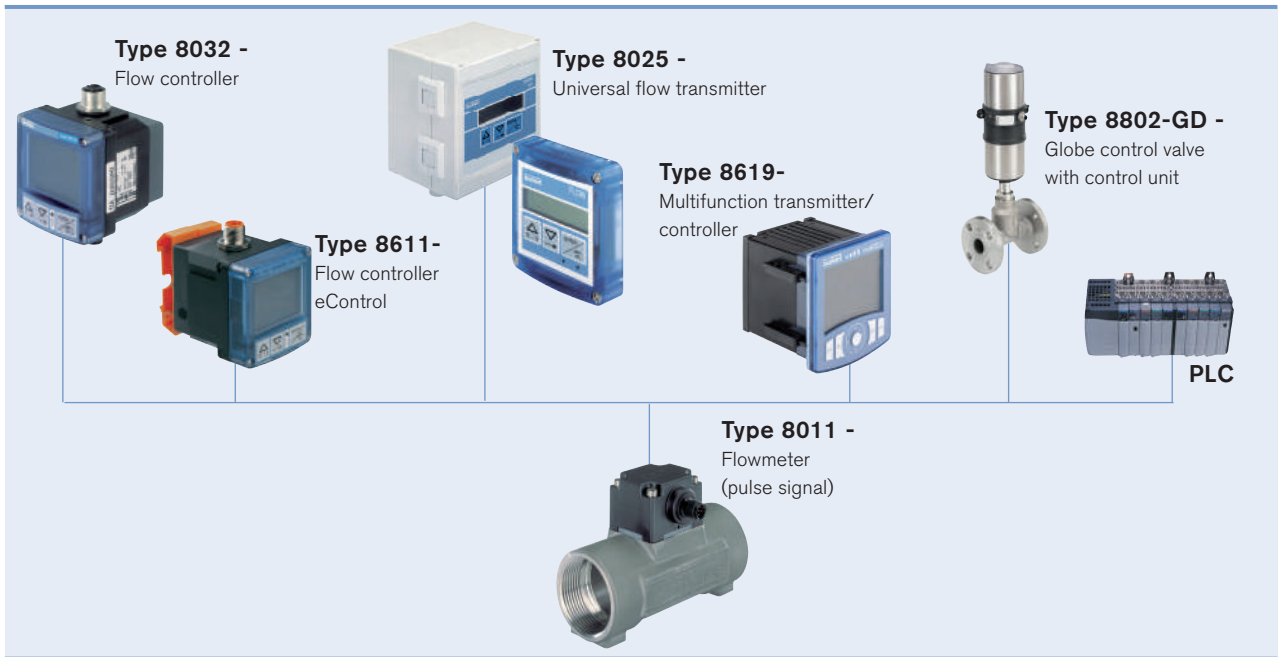
 **Additional**  
Two pulse NPN/PNP outputs

Please also use the "request for quotation" form on page 8 for ordering further versions of the 8011

[go to page](#)



Interconnection possibilities with the 8011



Fluid block system using Type 8011

The modular concept of the electronic module Type SE11 allows fully customized, pre-mounted and tested solutions to completely meet application needs. It is designed for being mounted in a system block, associated with other Bürkert products. This allows cost reduction and compact design for customized solutions.

Please contact your Bürkert local office to have individual counselling and engineering support in order to find the best solution corresponding to your application.

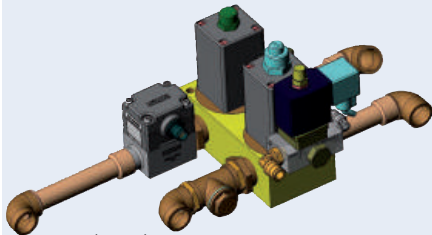
Example of flow control systems with SE11 electronic module

**Cooling of molding tools  
in plastic injection machines**

Flow (8011) + temperature +  
manual On/Off valve



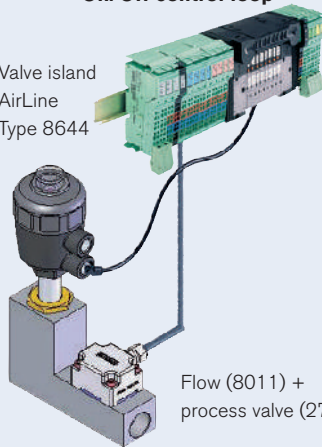
**Cooling of welding robot  
in automotive industry**



Flow (8011) +  
pilot valve (6014) +  
On/Off diaphragm valve (0263)

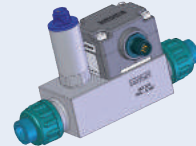
**On/Off control loop**

Valve island  
AirLine  
Type 8644



Flow (8011) +  
process valve (2712)

**Filter monitoring in  
waste water treatment**



Flow (8011) +  
pressure (8314)

**Flow regulation  
in Ro water treatment skid**



Process valve  
(2712 + 8630)  
+ Flow (8011)

## Flowmeter 8011 - request for quotation

Please fill in and send to your local Bürkert Sales Centre with your inquiry or order.

## Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

<b>Flowmeter 8011</b>	<b>Quantity:</b> <input type="text"/>	<b>Desired delivery date:</b> <input type="text"/>
<b>Fitting S012</b>		
<b>■ Pipe diameter DN</b> <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> 15 <input type="checkbox"/> 20 <input type="checkbox"/> 25 <input type="checkbox"/> 32 <input type="checkbox"/> 40 <input type="checkbox"/> 50 <input type="checkbox"/> 65		
<b>■ Materials:</b> <b>Body</b> <input type="checkbox"/> Brass <input type="checkbox"/> Stainless steel <input type="checkbox"/> PVC <input type="checkbox"/> PP <b>Seal</b> <input type="checkbox"/> FKM <input type="checkbox"/> EPDM		
<b>■ Process connection:</b> <b>Internal thread</b> <input type="checkbox"/> G <input type="checkbox"/> NPT <input type="checkbox"/> Rc <b>External thread</b> <input type="checkbox"/> G <input type="checkbox"/> NPT <input type="checkbox"/> Rc <b>Weld ends</b> <input type="checkbox"/> EN ISO1127/ISO4200 <input type="checkbox"/> SMS 3008 <input type="checkbox"/> BS4825/ASME BPE <input type="checkbox"/> DIN 11850 S2 <b>Clamp</b> <input type="checkbox"/> ISO (for pipe EN ISO1127/ISO4200) <input type="checkbox"/> SMS 3017/ISO2852 <input type="checkbox"/> BS4825/ASME BPE <input type="checkbox"/> DIN 32767 <b>Flange</b> <input type="checkbox"/> EN1092-1 <input type="checkbox"/> ANSI, B16-5-1988 <input type="checkbox"/> JIS, 10K <b>True union</b> <input type="checkbox"/> DIN 8063 <input type="checkbox"/> ASTM <input type="checkbox"/> JIS <b>Spigot</b> <input type="checkbox"/> DIN 8063		
<b>■ Special surface finish</b> <input type="checkbox"/> without <input type="checkbox"/> with         Ra int. = <input type="text"/> Ra ext. = <input type="text"/>		
<b>Electronic module SE11</b>		
<b>■ Electrical connection</b> <input type="checkbox"/> Multipin M12 <input type="checkbox"/> with 1 m cable		
<b>1. Transistor output feature</b>		
<b>■ Transistor operation*</b> <input type="checkbox"/> NPN <input type="checkbox"/> NPN/PNP		

\* Refer to electrical features for operating voltage and current limits