

BATCHFLUX and BATCHCONTROL

volumetric batching and dosing with
electromagnetic flowmeters



... A new era in volumetric batching!!!

- Optimum sanitary design
- Ceramic measuring tube
- Only 50 mm/2" overall width (DN < 25 / < 1")
- Extremely reliable and accurate

Variable-area flowmeters

Vortex flowmeters

Flow controller

Electromagnetic flowmeters

Ultrasonic flowmeters

Mass flowmeters

Level gauges

Communications engineering

Engineering systems & solutions



BATCHFLUX and BATCHCONTROL

**... a new era in volumetric
batching and dosing**

BATCHFLUX and BATCHCONTROL electromagnetic flowmeters from KROHNE are eminently suitable for the batching and dosing of electrically conductive liquids and pastes.

Fields of application

Optimum sanitary design for various sectors of the processing industry, e.g.

- chemical
- pharmaceutical
- cosmetics, and
- food.

BATCHFLUX

electromagnetic flowmeter for batching and dosing applications.

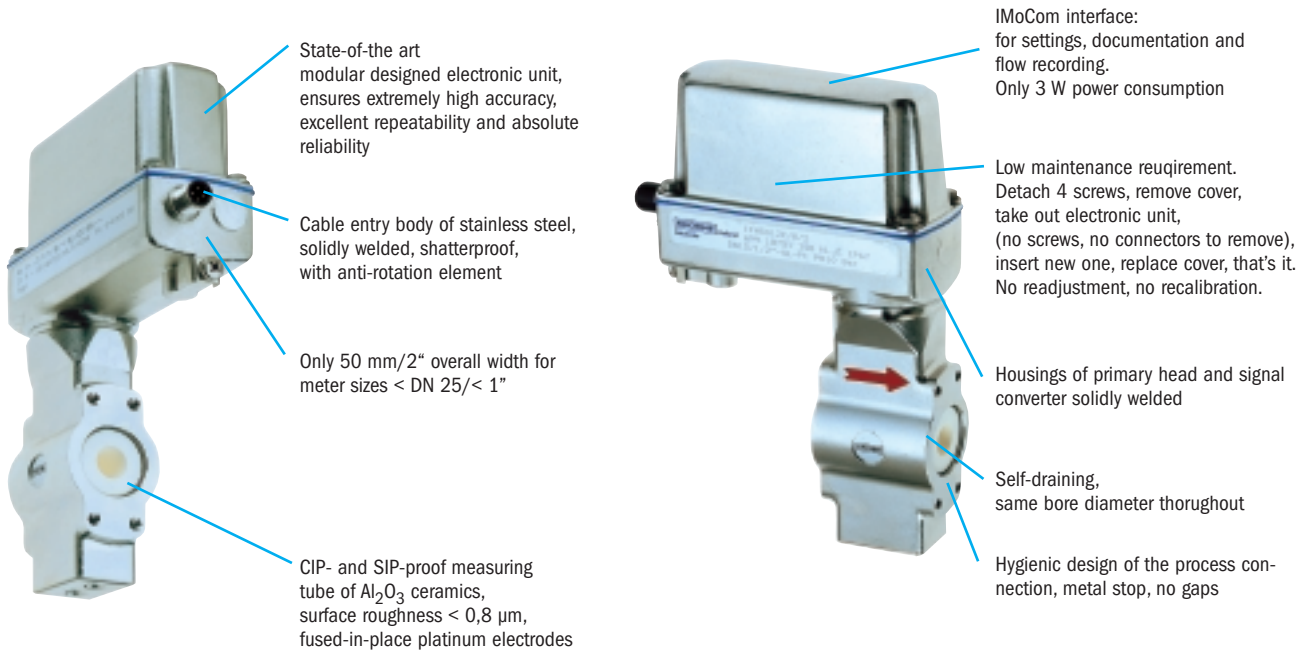
BATCHCONTROL

same as BATCHFLUX, but additionally with integrated batch controller, user programmable, backflow compensation and sensing of dribble quantities.

Calibrated on **EN 45 001** certified calibration rigs, calibration accuracy better than 99,97 % of the measured value.



Batchflux/ Batchcontrol



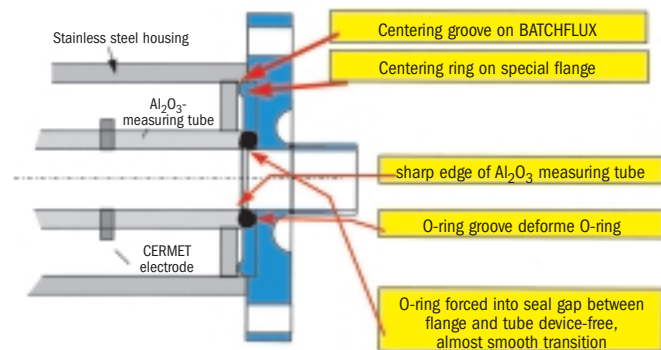
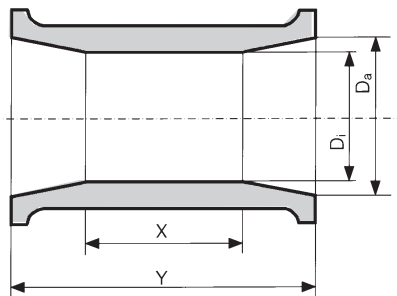
The ceramic measuring tube in detail

- Fine-grain-stabilized Aluminium Oxide Al₂O₃
- Minimal thermal expansion
- High long-term stability, absolutely vacuum resistant, no creep or flow under pressure and temperature
- Many standards calibration authorities use electromagnetic ceramic flowmeters as their custody transfer and reference standards
- Precise centering and crevice-free gasket system through exactly defined edges of the ceramic tube
- No loss of accuracy following device replacement.

Meter size		Pressure rating measuring tube		Dimensions in mm (inches)				Specific features
DN	mm	inches	PN	psig	D _a	D _i	X	Y
2.5	mm	1/10	40	580	6 (0.24)	2 (0.08)	20 (0.79)	50 (1.79)
4	mm	1/8	40	580	7 (0.28)	3 (0.12)	20 (0.79)	50 (1.79)
6	mm	1/4	40	580	9 (0.35)	5 (0.20)	20 (0.79)	50 (1.79)
10	mm	3/8	40	580	12 (0.47)	7 (0.28)	20 (0.79)	50 (1.79)
15	mm	1/2	40	580	14 (0.55)	12 (0.47)	20 (0.79)	50 (1.79)
25	mm	1	40	580	24 (0.94)	20 (0.79)	20 (0.79)	50 (1.79)
40	mm	1 1/2	40	580	37 (1.46)	30 (1.18)	20 (0.79)	50 (1.79)

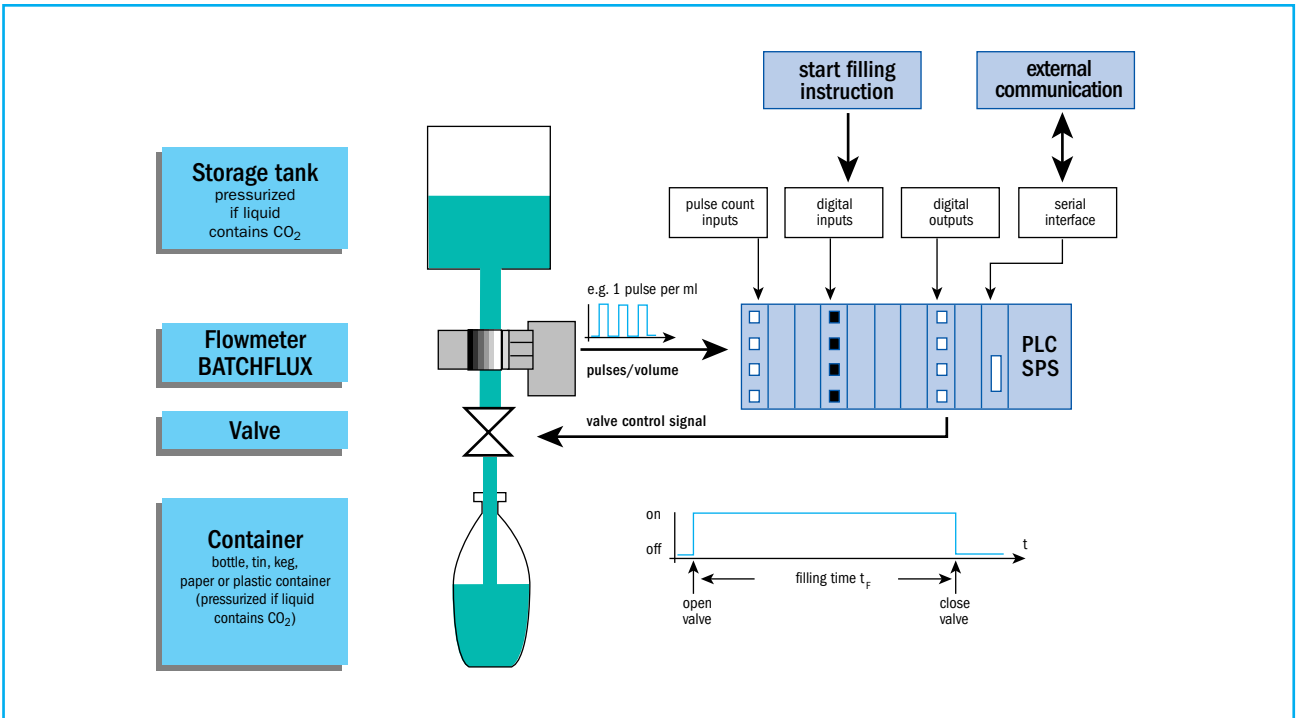
venturi measuring tube

15	mm	1/2	10	145	14 (0.55)	14 (0.55)	-	50 (1.79)	straight tube (option)
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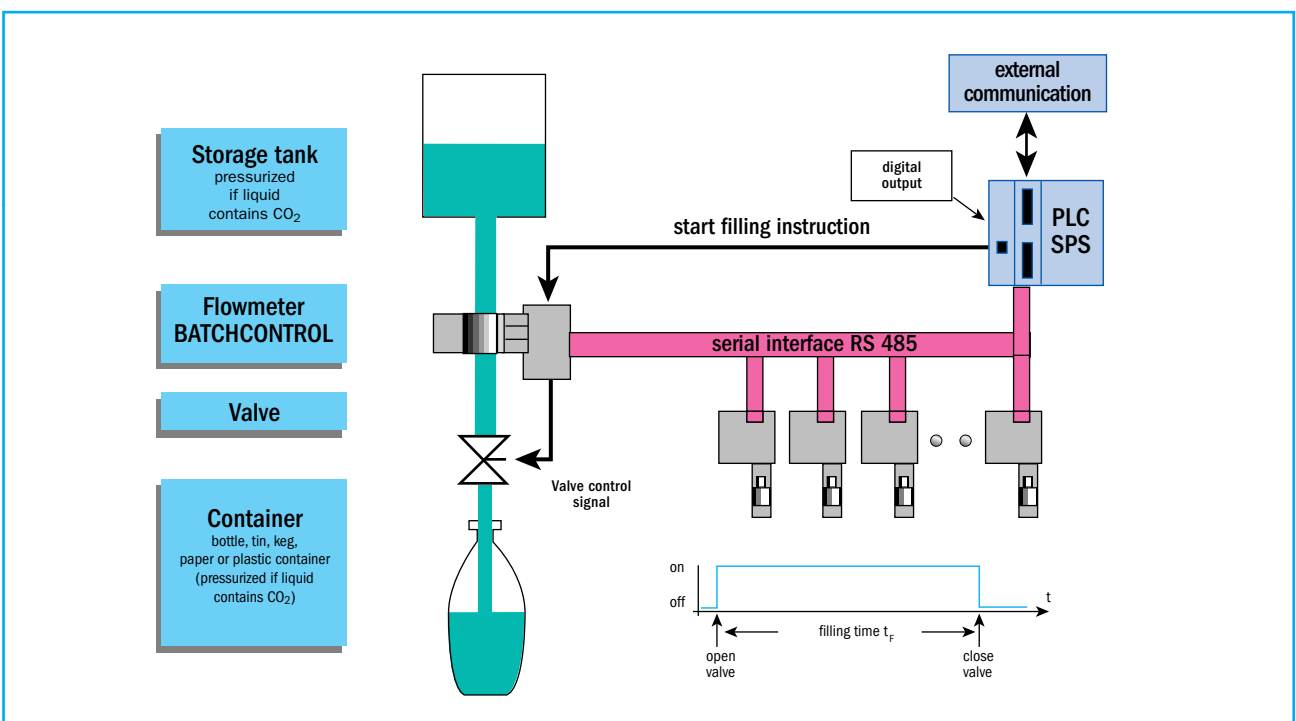


Background
Water
Wastewater
Abrasive, corrosive and hot products
Non-contact measurement K_v ≥ 0.05 µs/cm
Food, Beverage, Pharmaceutical
High Pressure and special connections
Integral and Remote
Signal converter
Remote
Calibration / Measuring Principle
Sizing / Installation guides
Ordering guide

BATCHFLUX

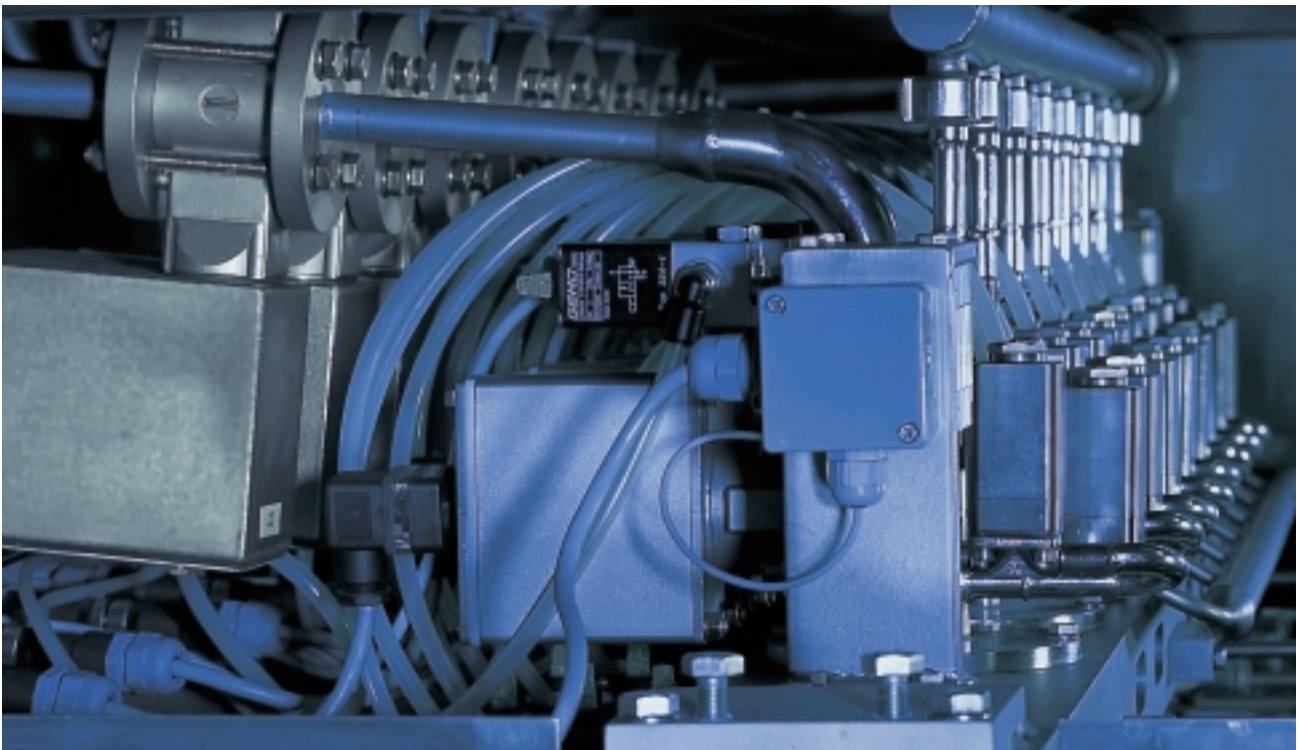
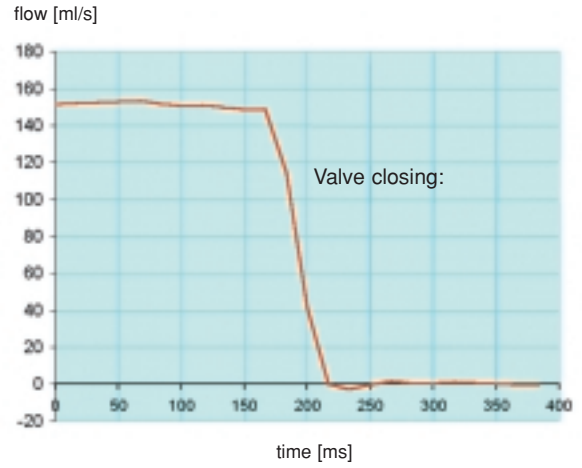
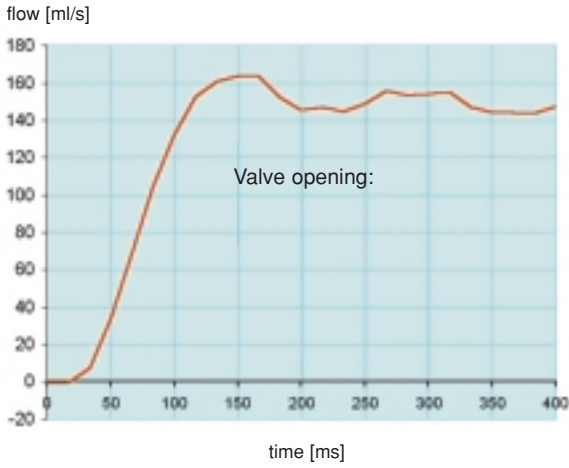


BATCHCONTROL
with integrated batch controller



Optimization of system parameters

The IMoCom interface allows visualization of system and valve properties, permitting longterm studies for optimization of the overall system.



Background

Water Wastewater

Abrasive, corrosive and hot products

Non-contact measurement $K < 0.05 \mu\text{s/cm}$

Food, Beverage, Pharmaceutical

High Pressure and special connections

Integral and Remote

Remote

Calibration / Measuring Principle

Sizing / installation guides

Ordering guide

Technical data

Meter sizes		
with venturi measuring tube	DN 2.5, 4, 6, 10, 15, 25, 40 (1/10", 1/8", 1/4", 3/8", 1/2", 1", 1 1/2")	
with straight measuring tube (option)	DN 15 (1/2")	
Connection		
	sandwich (flangeless) design with precisely defined sealing faces	
Electrical conductivity		
	≥ 5 µS/cm (≥ 20 µS/cm for demineralized cold water)	
Ambient temperature		
-25 ... +40 °C / -13 ... +104 °F	Product temperature	
-25 ... +60 °C / -13 ... +140 °F	-60 ... +140 °C / -76 ... +356 °F	
	-60 ... + 60 °C / -76 ... +140 °F (information on higher temperatures available on request)	
	steam cleaning up to +150 °C / +302 °F	
Temperature shock resistance		
in 10 minutes	<i>Temperature rising</i>	<i>Temperature falling</i>
sudden change	ΔT = 150 °C = 302 °F	ΔT = 120 °C = 248 °F
	ΔT = 120 °C = 248 °F	ΔT = 80 °C = 176 °F
Operating pressure		
	40 bar / 580 psig, dependent on gaskets used	
	(10 bar / 150 psig for DN 15 and 1/2" with straight measuring tube)	
Electrode design		
	fused-in-place electrodes	
Protection category (EN 60 529/IEC 529)		
	IP 67 equivalent to NEMA 6 (complete device, incl. signal converter)	
Materials of construction		
Housing	≤ DN 15 / 1/2": stainless steel 1.4462 / Duplex	
	≥ DN 25 / ≥1": stainless steel 1.4301 or SS 304 AISI	
Measuring tube	fine-grain-stabilized, high-density HiTec ceramics,	
	purity 99.7 % Al ₂ O ₃ (+ZrO ₂), CIP- and SIP-proof	
Electrodes	platinum	
Cover seal	silicone	
Low-flow cutoff		
	cutoff 'on' value	1 - 19 % } adjustable
	cutoff 'off' value	2 - 20 % }
Power supply		
Voltage	24 V DC, ± 25% (18-30 V DC)	
Power consumption	BATCHFLUX: ≤ 3 W	BATCHCONTROL: ≤ 5 W
Electrical connection		
	M12×1 - connector	
Operator control		
	All operating data factory-set to your specifications.	
	Available as option for change of operating data:	
	- HHT 010, hand-held terminal <i>or</i>	
	- KROHNE software for operator control and data output	
	via PC, connected to the IMoCom interface	

To help you select the right device...

Meter size		Optimum flow rate for filling		Filling times > 1.5 s, fill quantity	
DN mm	inches	ml / s	US Gal / min	ml	US Gal
2.5	1/10	3 - 10	0.048 - 0.159	≥ 10	≥ 0.003
4	1/8	10 - 30	0.159 - 0.476	≥ 20	≥ 0.005
6	1/4	20 - 60	0.317 - 0.951	≥ 40	≥ 0.011
10	3/8	60 - 200	0.951 - 3.170	≥ 100	≥ 0.026
15	1/2	150 - 500	2.378 - 7.925	≥ 200	≥ 0.053
25	1	400 - 1200	6.340 - 19.020	≥ 600	≥ 0.159
40	1 1/2	1000 - 3000	15.850 - 47.551	≥ 1500	≥ 0.396

Outputs BATCHFLUX

Pulse output (standard)	passive circuit
Function	All operating data factory-set to your specifications, connection of electronic totalizers, digital pulse division, interpulse period non-uniform, therefore if frequency meters counters connected, allow for minimum counting
	interval: gate time, counter $\geq \frac{1000}{P_{100\%} \text{ [Hz]}}$
Pulse rate for Q = 100%	max. 10 kHz, fixed or optionally in pulses per m ³ , litres, US gallons or in user-defined unit
Pulse width	$\leq 10 \text{ Hz: } 50, 100, 200 \text{ or } 500 \text{ ms}$ $> 10 \text{ Hz: } \bullet \text{ automatic, pulse width} = \frac{1}{2 \times f_{100\%}}$ $\bullet \text{ symmetrical, } 1 : 1$
Passive mode	connection of electronic or electromechanical totalizers
	external voltage: $U_{\text{ext}} \leq 30 \text{ V DC} / \leq 24 \text{ V AC}$
	load rating: $I_{\text{max}} \leq 20 \text{ mA}$
Pulse and status outputs (option 1 + 2)	active circuit
Pulse output	
Function, pulse rate and pulse width	see pulse output (standard) above
Active mode	internal voltage: $U_{\text{ext}} \leq 30 \text{ V AC}$
	load rating: $I_{\text{max}} \leq 20 \text{ mA}$
Status output	
Function	all operating data factory-set to your specifications, can be set to signal direction, errors or trip points
Active mode	voltage internal: $U_{\text{int}} \leq 30 \text{ V DC}$
	load rating: $I_{\text{max}} \leq 150 \text{ mA}$

Outputs BATCHCONTROL

Valve output 1	passive, max. 300 mA, max. 30 V, switches to ground
Valve output 2 and 3	passive, max. 150 mA, max. 30 V, switches to ground
Control input	passive, 20 mA, max. 30 V

Error limits under reference conditions

F = error in % M.V.
M.V. = measured value

Pulse output	DN 2.5 - 6 / 1/10" 1/4"	DN 10 - 40 / 3/8" 1 1/2"
Flow velocity	$v \geq 1 \text{ m/s } \geq 3.3 \text{ ft/s}$ $v \geq 1 \text{ m/s } < 3.3 \text{ ft/s}$	$F < \pm 0.5 \% \text{ v.M.}$ $F < \pm 0.4 \% \text{ v.M.} + 1 \text{ mm/s}$ $< \pm 0.4 \% \text{ v.M.} + 0.04 \text{ inches/s}$
		$F < \pm 0.3 \% \text{ v.M.}$ $F < \pm 0.2 \% \text{ v.M.} + 1 \text{ mm/s}$ $< \pm 0.2 \% \text{ v.M.} + 0.04 \text{ inches/s}$
Reproducibility	Fill time T_F $1.5 \text{ s} < T_F \leq 3 \text{ s}$ $3.0 \text{ s} < T_F \leq 5 \text{ s}$ $5.0 \text{ s} < T_F$	Standard deviation $\leq 0.4 \%$ $\leq 0.2 \%$ $\leq 0.1 \%$

Reference conditions: similar to EN 29 104

Product	water at 20°C / 68°F
Inlet / outlet runs	10 x DN / 5 x DN (DN = meter size)
Primary head	properly grounded and centered
Valve closing time variation	< 1 ms
Flow velocity	1 m/s / 3.3 ft/s

Wet calibrated on EN 45 001 certified calibration rigs by direct comparison of volumes.

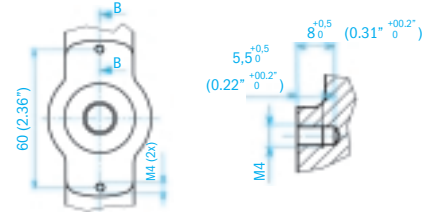
Background
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Abrasive, corrosive and hot products
Non-contact measurement $K \leq 0.05 \mu\text{s/cm}$
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Dimensions and weights

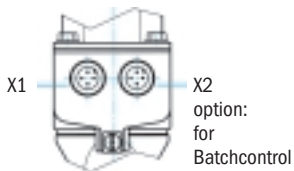
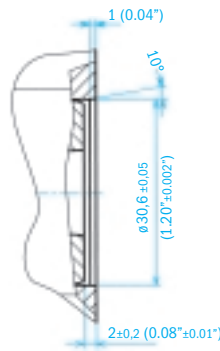
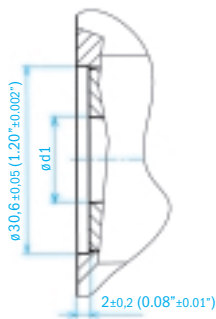
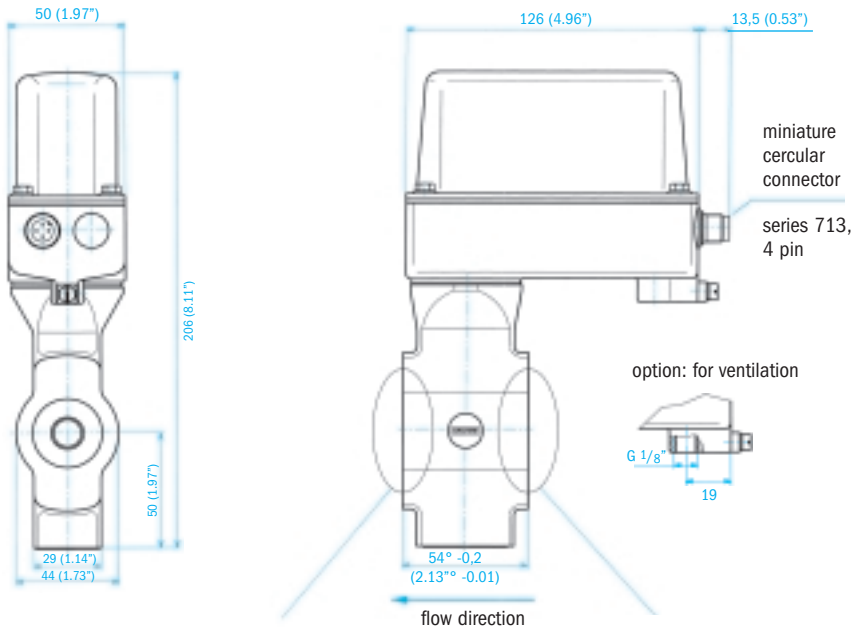
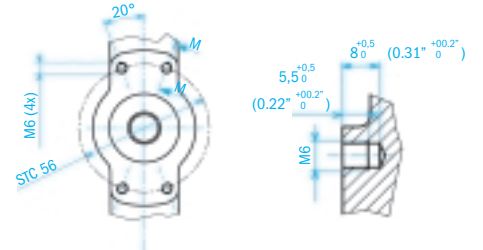
DN 2.5 - 15 / 1/10" - 1/2"

Dimensions in mm (inches)

option: 2x M4 threaded wholes on both sides (section B-B)



option: 4x M6 threaded wholes on both sides (section M-M)



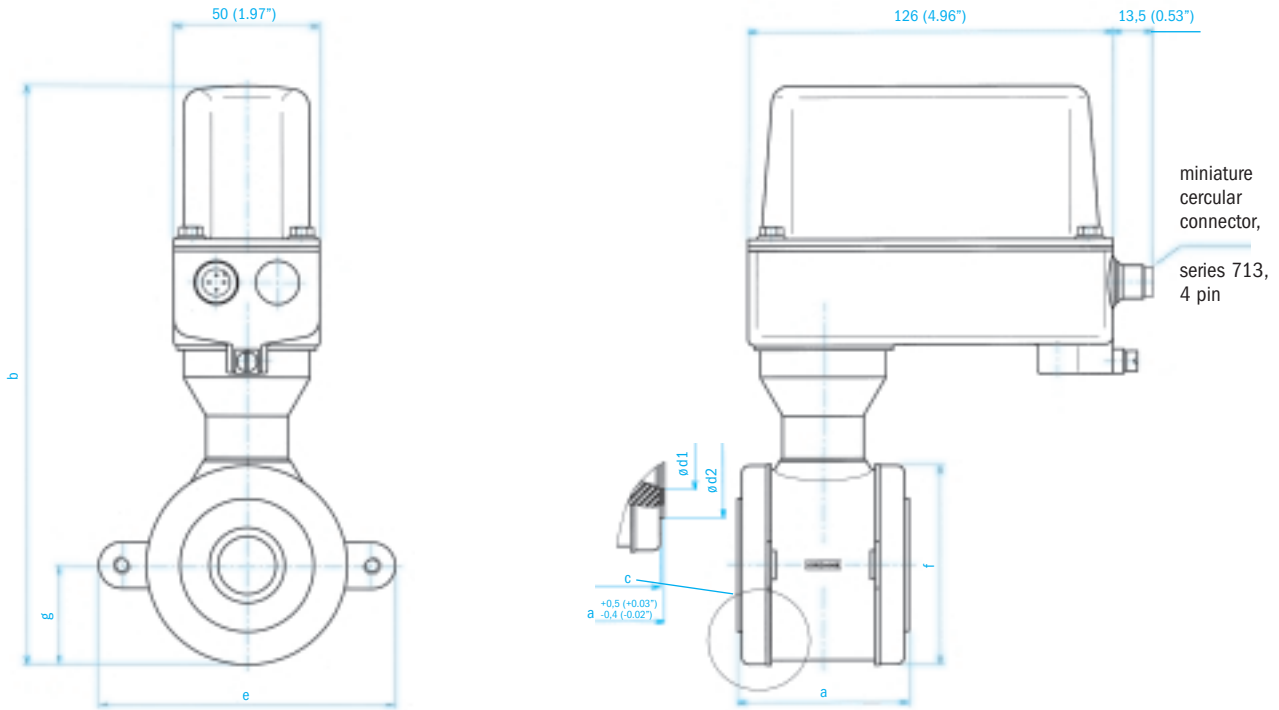
Meter size	Dimension $\varnothing d_1$	Weight
DN	inches	mm (inches)
2.5	1/10	6 (0.24)
4	1/8	7 (0.28)
6	1/4	9 (0.35)
10	3/8	12 (0.47)
15	1/2	14.3 (0.56)

Weight	kg	(lb)
1.6	1.6	(3.6)
1.6	1.6	(3.6)
1.6	1.6	(3.6)
1.6	1.6	(3.6)
1.6	1.6	(3.6)

Dimensions and weights

DN 25 - 40 / 1" - 1½"

Dimension in mm (inches)



Meter size		Dimension in mm (inches)						Weight	
DN	inches	a	b	c	e	f	g	kg	lb
25	1"	58 (2.28)	200 (7.87)	55 (2.17)	102 (4.02)	68 (2.68)	34 (1.34)	1.6	(3.6)
40	1½"	83 (3.27)	215 (8.46)	80 (3.15)	117 (4.61)	83 (3.27)	42 (1.65)	2.3	(5.1)

Background	Water	Abrasive, corrosive and hot products	Non-contact measurement $K < 0,05 \mu\text{s}/\text{cm}$	Food, Beverage, Pharmaceutical	High Pressure and special connections	Integral and Remote	Signal converter	Remote	Calibration / Measuring Principle	Sizing / installation guides	Ordering guide
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Electrical connection

To ensure correct functioning of your flowmeter, please take note of the following.

- **Overvoltage class:** in conformity with VDE 0120 and IEC 664, the integral flowmeters are designed for overvoltage category III in the supply circuits and overvoltage category II in the output circuits.
- **Safety isolation:** the integral flowmeters need to be fitted with an isolating facility.
- Electrical connection and repairs may only be carried out by specialists.
- Protect flowmeters against direct radiant heat (e.g. hot product tanks), insulate if necessary.
- Do not expose flowmeters to intense vibration; if necessary, support the pipeline on both sides of the flowmeter. Level of vibration according to IEC 068-2-34; below 2.2 g in the 20 - 150 Hz frequency range.
- Power supply (voltage) 24 V DC ± 25 %.
- For measurement reasons, connect the FE functional ground of the power supply to the remote U-clamp terminal on the signal converter housing.
- For functional extra-low voltage of 24 V DC, protective separation (PELV) must be ensured (VDE 0100 / VDE 0106 and IEC 364 / IEC 536 or equivalent national regulations).

BATCHFLUX

Standard version	4-pin connector M12×1 for power supply 24 V DC and passive pulse output
Option 1	4-pin connector M12×1 for power supply 24 V DC and active pulse and status outputs, switch to ground of the supply power
Option 2	same as Option 1, both outputs switch to +24 V DC of the power supply

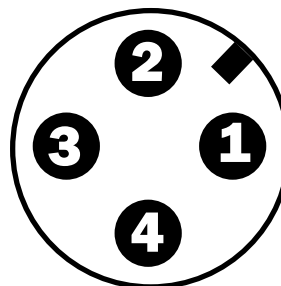
Pin	Standard	Option 1	Option 2
1	+ 24 V	+ 24 V	+ 24 V
2	pulse output	status output (to ground)	status output (to +24 V)
3	pulse output \perp	pulses output (to ground)	pulse output (to +24 V)
4	ground	ground	ground

BATCHCONTROL

Pin	Connector X1	Connector X2
1	1st switching output	Profibus - B -
2	2nd switching output	Profibus - A -
3	+24 V	control input
4	ground	3rd switching output

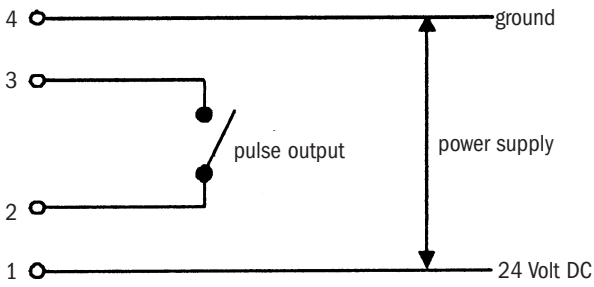
Pin assignment

(customer-specific arrangement possible)

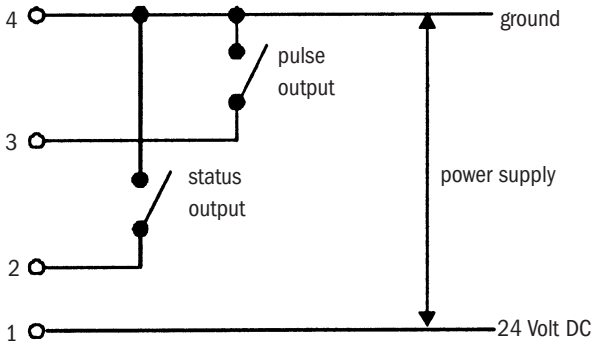


Connection diagrams BATCHFLUX

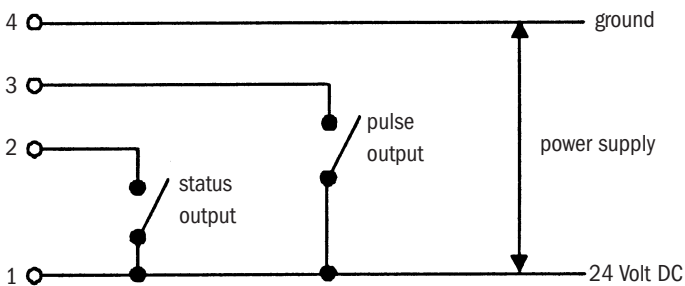
Standard



Option 1



Option 2



Background	Water Wastewater	Abrasive, corrosive and hot products	Non-contact measurement $K \leq 0.05 \mu\text{s/cm}$	Food, Beverage, Pharmaceutical	High Pressure and special connections	Integral and Remote	Remote	Calibration / Measuring Principle	Sizing / installation guides	Ordering guide
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