TARAline BR1

indicator	bromine
Application	Drinking water, swimming pool water, service water, process water, sea water
bromine agents	Free bromine (HOBr) 1-Bromo-3-chloro-5.5-dimethyl-hydantoin (BCDMH)
Measuring system	membrane covered, amperometric potentiostatic 3-electrode system
electronic	Analog version: - voltage output - not galvanically isolated electronics - analog internal data processing - output signal: analog (analog-out/analog) Digital version: - electronic is completely galvanically isolated - digital internal data processing - output signal: analog (analog-out/digital) or digital (digital-out/digital) mA-version: - current output analog - not galvanically isolated electronics - output signal: analog (analog-out/analog)
Information about the measuring range	The actual slope of a sensor can vary production-related between 65% and 150% of the nominal slope Note: With a slope > 100% the measuring range is reduced accordingly. (Ex.: 150% slope → 67% of the specified measuring range)
Working temperature	Measuring water temperature: 0 … +45 °C (no ice crystals in the measuring water)
	Ambient temperature: 0 … +55 °C
Temperature compensation	Automatically, by an integrated temperature sensor Sudden temperature changes must be avoided
max. allowed working pressure	Operation without retaining ring: – 0.5 bar – no pressure impulses and/or vibrations
	Operation with retaining ring in TARAflow FLC: – 0.5 bar, – no pressure impulses and/or vibrations (see option 1)
Flow rate (Incoming flow velocity)	approx. 15-30 L/h (33 – 66 cm/s) in TARAflow FLC
pH-range	pH 6.5 – pH 9.5, highly reduced dependence on pH – value (see diagram last page “relative dependence on pH”)

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Run-in time	First start-up approx. 2 h	
Response time	T_{90}: approx. 2 min	
Zero point adjustment	Not necessary	
calibration	At the device, by analytical determination of the bromine concentration Recommendation depending on bromine agent: - Free bromine DPD1 - method - BCDMH DPD4 - method	
Cross sensitivities/ interferences	Cl_2: is also measured ClO_2: is also measured O_3: is also measured Corrosion inhibitors can lead to measuring errors. Stabilisers for water hardness can lead to measuring errors.	
Absence of the disinfectant	Max. 24 h	
Connection	mV version: 5-pole M12, plug-on flange Modbus version: 5-pole M12, plug-on flange 4-20 mA version: 2-pole terminal or 5-pole M12, plug-on flange	
max. length of sensor cable (depending on internal signal processing)	analog	< 30 m
	digital	> 30 m are permissible Maximum cable length depends on application
Protection type	5-pole M12 plug-on flange: IP68 2-pole terminal with mA-hood: IP65	
material	Microporous hydrophilic membrane, PVC, PEEK ,stainless steel 1.4571	
Size	diameter: approx. 25 mm Length: mV version approx. 190 mm (analog signal processing) approx.. 205 mm (digital signal processing) Modbus version approx. 205 mm 4-20 mA version approx. 220 mm (2-pole-terminal) approx. 190 mm (5-pole-M12)	
Transport	+5 … +50 °C (Sensor, electrolyte, membrane cap)	

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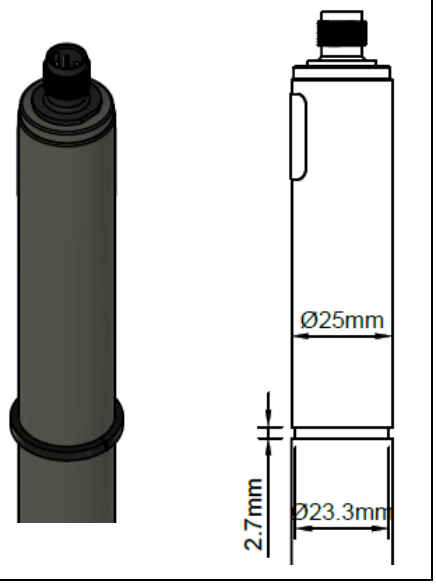
storage	Sensor:	dry and without electrolyte no limit at +5 … +40 °C
	Electrolyte:	in original bottle protected from sunlight at +5 … +35 °C min. 1 year or until the specified EXP-Date
	Membrane cap:	in original packing no limit at +5 … +40 °C (used membrane caps can not be stored)
maintenance	Regularly control of the measuring signal, min. once a week The following information highly depends on the water quality: Change of the membrane cap: once a year Change of the electrolyte: every 3 - 6 months	
CE	EMC tested RoHS compliant	

Option 1: **Retaining ring**	– When operating with pressures >0.5 bar in TARAflow FLC – Dimensions retaining ring 29 x 23.4 x 2.5 mm, slitted, PETP – Different positions for groove selectable (on request)	

Technical Data

1. BR1 (analog output, analog internal signal processing)

A potential-free electrical connection is necessary as the sensor electronic is not equipped with a galvanical isolation.

	**Measuring range** **in ppm**	**Resolution** **in ppm**	**Output** **Output resistance**	**Nominal slope** (at pH 7.2) **in mV/ppm**	**Voltage supply**	**Connection**
BR1H-M12	0.005…2.000	0.001	analog 0…-2000 mV 1 kΩ	-1000	±5 - ±15 VDC 10 mA	5-pole M12 plug-on flange Function of wires: PIN1: measuring signal PIN2: +U PIN3: -U PIN4: signal GND PIN5: n. c.
BR1N-M12	0.05…20.00	0.01		-100		

(Subject to technical changes!)

2. BR1 (analog output, digital internal signal processing)

analog-out / digital

- The power supply is galvanically isolated inside of the sensor.
- The output signal is galvanically isolated too, that means potential-free.

	**Measuring range** **in ppm**	**Resolution** **in ppm**	**Output** **Output resistance**	**Nominal Slope** (at pH 7.2) **in mV/ppm**	**Power supply**	**Connection**
BR1H-An-M12	0.005…2.000	0.001	analog 0…-2 V (max. -2.5 V) 1 kΩ	-1000	9-30 VDC approx. 20-56 mA	5-pole M12 plug-on flange Function of wires: PIN1: measuring signal PIN2: +U PIN3: power GND PIN4: signal GND PIN5: n. c.
BR1N-An-M12	0.05…20.00	0.01		-100		
BR1H-Ap-M12	0.005…2.000	0.001	analog 0…+2 V (max. +2.5 V) 1 kΩ	+1000		
BR1N-Ap-M12	0.05…20.00	0.01		+100		

(Subject to technical changes!)

3. BR1 (digital output, digital internal signal processing)

- The power supply is galvanically isolated inside of the sensor.
- The output signal is galvanically isolated too, that means potential-free.

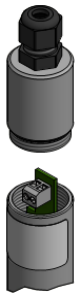
	**Measuring range** **in ppm**	**Resolution** **in ppm**	**Output** **Output resistance**	**Power supply**	**Connection**
BR1H-M0c	0.005…2.000	0.001	Modbus RTU There are no terminating resistors in the sensor.	9-30 VDC approx. 20-56 mA	5-pole M12 plug-on flange Function of wires: PIN1: reserved PIN2: +U PIN3: power GND PIN4: RS485B PIN5: RS485A
BR1N-M0c	0.05…20.00	0.01			

(Subject to technical changes!)

4. BR1 4-20 mA (analog output, analog internal signal processing)

A potential-free electrical connection is necessary as the sensor electronic is not equipped with a galvanical isolation.

4.1 Electrical connection: 2 pole terminal clamp

	**Measuring range** **in ppm**	**Resolution** **in ppm**	**Output** **Output resistance**	**Nominal slope** (at pH 7.2) **in mA/ppm**	**Voltage supply**	**Connection**
BR1MA-2	0.005 … 2.000	0.001	analog 4…20 mA uncalibrated	8.0	12…30 VDC R_L = 50Ω (12V)… 900Ω (30V)	2-pole terminal (2 x 1 mm²) Recommended: Round cable ∅ 4 mm 2 x 0.34 mm²
BR1MA-5	0.05 … 5.00	0.01		3.2		
BR1MA-10	0.05 … 10.00	0.01		1.6		
BR1MA-20	0.05 … 20.00	0.01		0.8		

(Subject to technical changes!)

4.2 Electrical connection: 5 pole M12 plug-on flange

	**Measuring range** **in ppm**	**Resolution** **in ppm**	**Output** **Output resistance**	**Nominal slope** (at pH 7.2) **in mA/ppm**	**Voltage supply**	**Connection**
BR1MA-2-M12	0.005 … 2.000	0.001	analog 4…20 mA uncalibrated	8.0	12…30 VDC R_L = 50Ω (12V)… 900Ω (30V)	5-pole M12 plug-on flange Function of wires: PIN1: n. c. PIN2: +U PIN3: -U PIN4: n c. PIN5: n. c.
BR1MA-5-M12	0.05 … 5.00	0.01		3.2		
BR1MA-10-M12	0.05 … 10.00	0.01		1.6		
BR1MA-20-M12	0.05 … 20.00	0.01		0.8		

(Subject to technical changes!)

Spare Parts

Type	**Membrane cap**	**Electrolyte**	**Emery**	**O-ring**
All BR1	M48.2 Art. No. 11047	ECP1.4/GEL, 100 ml Art. No. 11006.1	S1 Art. No. 11908	14 x 1.8 NBR Art. No. 11806

(Subject to technical changes!)

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relative dependence on pH