TARAtec CH10

indicator	Free chlorine, pH dependent
Application	especially for high chlorine concentrations, process water pH-value must be constant. The membrane system is mechanical resistant. The membrane system is highly resistant to surfactants (tensides).
Chlorination agents	inorganic chlorine compounds: NaOCl (=sodium hypochlorite), $Ca(OCl)_2$, chlorine gas, chlorine electrolysis with membrane cell
Measuring system	Membrane covered, amperometric 2-electrode system with integrated electronics
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 Response time t_{90} = approx. 8 min. Max. change in temperature: 5 °C per hour, 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: – 1 bar, – no pressure impulses and/or vibrations (see option 1)

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Flow rate (Incoming flow velocity)	approx. 15-30 l/h (33 – 66 cm/s) in TARAflow FLC, small flow rate dependence is given	
pH-range	pH 5 – pH 8, pay attention to the dissociation equilibrium HOCL (see diagram “Slope of TARAtec CH10 versus pH, p. 7)	
Run-in time	First start-up approx. 11 h	
Response time	T_{90}: approx. 8 min.	
Zero point adjustment	Not necessary	
calibration	At the device, by analytical chlorine determination - DPD-1 (up to 10 ppm) - iodometry (up to 200 ppm with photometer) - iodometry (up to 2000 ppm titration)	
interferences	ClO_2 O_3 Peracetic acid	
Absence of the disinfectant	Max. 24 h	
Connection	mV version: Modbus version: 4-20 mA version:	5-pole M12, plug-on flange 5-pole M12, plug-on flange 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: 2-pole terminal with mA-hood:	IP68 IP65
material	Elastomer membrane, PVC-U, PEEK	
Size	diameter: Length: mV version Modbus version 4-20 mA version	approx. 25 mm approx. 190 mm (analog signal processing) approx.. 205 mm (digital signal processing) approx. 205 mm approx. 220 mm (2-pole-terminal) approx. 190 mm (5-pole-M12)
Transport	+5 … +50 °C (Sensor, electrolyte, membrane cap)	

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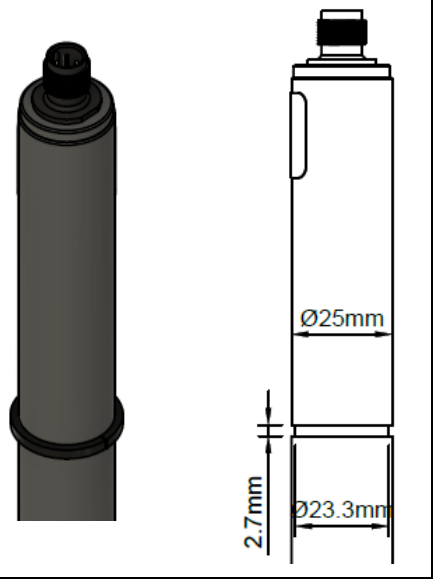
storage	Sensor: dry and without electrolyte no limit at +5 … +40 °C
	Electrolyte: in original bottle protected from sunlight at +5 … +35 °C min. 1 year or until specified EXP-Date
	Membrane cap: in original packing no limit at +5 … +40 °C (used membrane caps can not be stored)
maintenance	Regularly control of the measuring signal, min. once a week The following specifications highly depend on the water quality: Change of the membrane cap: once a year Change of the electrolyte: approx. every 3 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. CH10 (Analog output, analog internal signal processing)

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

	**Measuring range** (at pH 7.2)	**Resolution** (at pH 7.2)	**Output** **Output resistance**	**Nominal slope** (at pH 7.2)	**Voltage supply**	**Connection**
CH10-2000-M12	20…2000 ppm	1 ppm	0…-2000 mV 1 kΩ	-1 mV/ppm	±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.
CH10-20%-M12	0.05%...0.2% * (500…2000 ppm *)	100 ppm		-100 mV/% (-0.01mV/ppm)		

* concentration tested and approved up to 0.2% (2000 ppm)

(Subject to technical changes!)

2. CH10 (analog output, digital signal processing)

Analog-out / digital

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

	**Measuring range** (at pH 7.2)	**Resolution** (at pH 7.2)	**Output** **Output resistance**	**Nominal Slope** (at pH 7.2)	**Power supply**	**Connection**
CH10-2000-An-M12	20… 2000 ppm	1 ppm	analog 0…-2 V (max. -2.5 V) 1 kΩ	-1 mV/ppm	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.
CH10-20%-An-M12	0.05… 0.2 % * (500… 2000 ppm *)	100 ppm		-100 mV/% (-0.01 mV/ppm)		
CH10-2000-Ap-M12	20… 2000 ppm	1 ppm	analog 0…+2 V (max. +2.5 V) 1 kΩ	+1 mV/ppm		
CH10-20%-Ap-M12	0.05… 0.2 % * (500… 2000 ppm *)	100 ppm		+100 mV/% (+0.01 mV/ppm)		

* concentration tested and approved up to 0.2% (2000 ppm)

(Subject to technical changes!)

3. CH10 (digital output, digital signal processing)

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

	**Measuring range** (at pH 7.2)	**Resolution** (at pH 7.2)	**Output** **Output resistance**	**Power supply**	**Connection**
CH10-2000-M0c	20… 2000 ppm	1 ppm	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
CH10-20%-M0c	0.05… 0.2 % * (500… 2000 ppm *)	100 ppm			

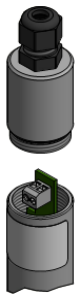
* concentration tested and approved up to 0.2% (2000 ppm)

(Subject to technical changes!)

4. CH10 4-20 mA (analog output, analog internal signal processing)

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

4.1 Electrical connection: 2 pole terminal clamp

	**Measuring range** (at pH 7.2)	**Resolution** (at pH 7.2)	**Output** **Output resistance**	**Nominal slope** (at pH 7.2)	**Voltage supply**	**Connection**
CH10MA-2000	20… 2000 ppm	1 ppm	4…20 mA uncalibrated	0.008 mA/ppm	12…30 VDC R_L 50Ω…R_L 900Ω	2-pole terminal (2 x 1 mm²) Recommended: Round cable ∅ 4 mm 2 x 0.34 mm²
CH10MA-20%	0.05… 0.2% * (500… 2000 ppm *)	100 ppm		0.8 mA/% (0.00008 mA/ppm)		

* concentration tested and approved up to 0.2% (2000 ppm)

(Subject to technical changes!)

4.2 Electrical connection: 5 pole M12 plug-on flange

	**Measuring range** (at pH 7.2)	**Resolution** (at pH 7.2)	**Output Output resistance**	**Nominal slope** (at pH 7.2)	**Voltage supply**	**Connection**
CH10MA-2000-M12	20… 2000 ppm	1 ppm	4…20 mA uncalibrated	0.008 mA/ppm	12…30 VDC R_L 50Ω…R_L 900Ω	5-pole M12 plug-on flange Function of wires: PIN1: n. c. PIN2: +U PIN3: -U PIN4: n c. PIN5: n. c.
CH10MA-20%-M12	0.05… 0.2% * (500… 2000 ppm *)	100 ppm		0.8 mA/% (0.00008 mA/ppm)		

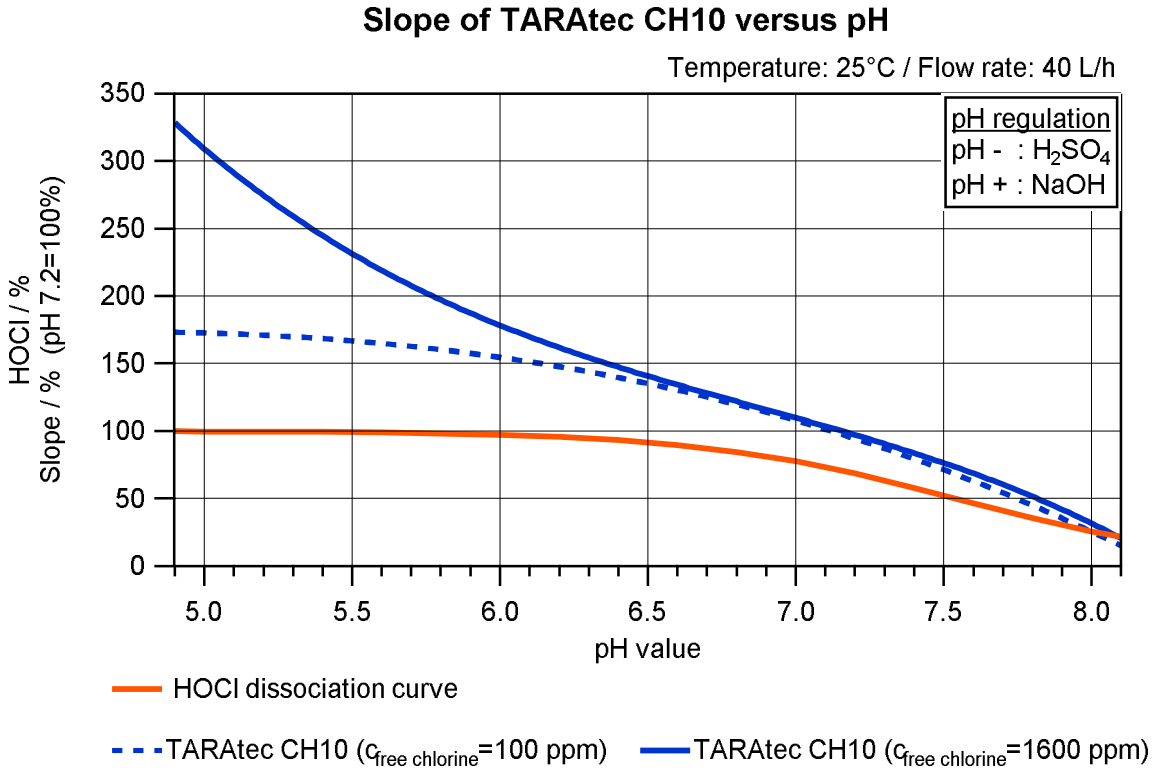
* concentration tested and approved up to 0.2% (2000 ppm)

(Subject to technical changes!)

Spare Parts

Type	**Membrane cap**	**Electrolyte**	**Emery**	**O-ring**
All CH10	M10.1D-S with G-holder Art. no. 11054	ECH10/W, 100 ml Art. no. 11055	S2 Art. no. 11906	20 x 1.5 silicone Art. no. 11803

(Subject to technical changes!)


Slope of TARAtec CH10 versus pH
Temperature: 25°C / Flow rate: 40 L/h
pH regulation
pH - : H2SO4
pH + : NaOH
HOCl / %
Slope / % (pH 7.2=100%)
350
300
250
200
150
100
50
0
5.0
5.5
6.0
6.5
7.0
7.5
8.0
pH value
HOCl dissociation curve
TARAtec CH10 (c free chlorine=100 ppm)
TARAtec CH10 (c free chlorine=1600 ppm)