PES7

indicator	Peracetic acid
Application	All kinds of water treatment, also sea water Conductivity acids are tolerated. (e. g. bottle washing machine, CIP-plants) The membrane system is mechanical resistant. Surfactants (tensides) are partially tolerated.
Measuring system	Membrane covered, amperometric 2-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 of sensors with 4-20 mA	Slope of a sensor can vary production-related or application-related between 65% and 150% of the nominal slope -> Recommendation to determine the suitable measuring range or the suitable sensor: Concentration to be measured x factor 1.5 = measuring range of the sensor Example: Concentration to be measured 1.6 ppm x 1.5 = 2.4 -> recommended sensor with a measuring range of 5 ppm
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 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: 1.0 bar, no pressure impulses and/or vibrations
Flow rate	approx. 15-30L/h in DF, small flow rate dependence is given
pH-range	pH 1 – pH 6
Run-in time	First start-up approx. 1 … 3 h

PES7

Response time	T_{90}: approx. 3 min.
Zero point adjustment	Not necessary
Slope calibration	At the device, by analytical determination
interferences	O_3: factor 2500 ClO_2: factor 1 H_2O_2: factor 0.005
influence of conductivity acids	1 % sulfuric acid, 1 % nitric acid or 1 % phosphoric acid in the water have no influence on the measuring behaviour.
Absence of the disinfectant	Max. 24 h
Connection	analog-out/analog version: 4-pole plug adapter analog-out/digital version: 4-pole plug adapter digital-out/digital version: 5-pole M12, plug-on flange 4-20 mA version: 2-pole terminal or 5-pole M12, plug-on flange
material	PVC-U, stainless steel 1.4571
Size	diameter: approx. 25 mm Length: analog-out/analog version approx. 175 mm version analog-out/digital approx. 195 mm version digital-out/digital 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)
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 depend on the water quality: Change of the membrane cap: once a year (depending on the water quality) Change of the electrolyte: every 3 - 6 months
CE	EMC-Testing DIN EN 61326-1, 61326-2-3 RoHS compliant

Technical Data

1. PES7 (analog output, analog internal signal processing)

analog-out / analog

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

	**Measuring range**	**resolution**	**Output** **Output resistance**	**Nominal slope**	**Voltage supply**	**Connection**
PES7H	0.5…200 ppm	0.1 ppm	0…-2000 mV 1 kΩ	-10 mV/ppm	±5 - ±15 VDC 10 mA	4-pole screw connector
PES7N	5…2000 ppm	1 ppm		-1 mV/ppm		
PES7L	0.005…2 % (20000 ppm)	0.001 % (10 ppm)		-1000 mV/% (-0.1 mV/ppm)		
PES7HUp	0.5…200 ppm	0.1 ppm	0…+2000 mV 1 kΩ	+10 mV/ppm	10 - 30 VDC 10 mA	
PES7Up	5…2000 ppm	1 ppm		+1 mV/ppm		
PES7Up5000	50…5000 ppm	1 ppm		+0.4 mV/ppm		

(Subject to technical changes!)

2. PES7 (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**	**Resolution**	**Output** **Output resistance**	**Nominal** **Slope**	**Power supply**	**Connection**
PES7H-An	0.5…200 ppm	0.1 ppm	analog 0…-2 V (max. -2.5 V) 1 kΩ	-10 mV/ppm	9-30 VDC approx. 56-20 mA	4-pole screw connector
PES7N-An	5…2000 ppm	1 ppm		-1 mV/ppm		
PES7L-An	0.005…2% (20000 ppm)	0.001% (10 ppm)		-1000 mV/% (-0.1 mV/ppm)		
PES7H-Ap	0.5…200 ppm	0.1 ppm	analog 0…+2 V (max. +2.5 V) 1 kΩ	+10 mV/ppm		
PES7N-Ap	5…2000 ppm	1 ppm		+1 mV/ppm		
PES7L-Ap	0.005…2% (20000 ppm)	0.001% (10 ppm)		+1000 mV/% (+0.1 mV/ppm)		

(Subject to technical changes!)

3. PES7 (digital output, digital internal signal processing)

digital-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**	**Resolution**	**Output** **Output resistance**	**Power supply**	**Connection**
PES7H-M0c	0.5…200 ppm	0.1 ppm	Modbus RTU There are no terminating resistors in the sensor.	9-30 VDC approx. 56-20 mA	5-pole M12 connector
PES7N-M0c	5…2000 ppm	1 ppm			
PES7L-M0c	0.005…2% (20000 ppm)	0.001% (10 ppm)			

(Subject to technical changes!)

4. PES7 4-20 mA (analog output, analog internal signal processing)

analog-out / analog

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**	**resolution**	**Output Output resistance**	**Nominal slope**	**Voltage supply**	**Connection**
PES7MA-CC	0.5…200 ppm	0.1 ppm	4…20 mA uncalibrated	0.08 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
PES7MA-D	5…500 ppm	1 ppm		0.032 mA/ppm		
PES7MA-M	5…1000 ppm	1 ppm		0.016 mA/ppm		
PES7MA-MM	5…2000 ppm	1 ppm		0.008 mA/ppm		
PES7MA-5M	50…5000 ppm	1 ppm		0.0032 mA/ppm		
PES7MA-XM	0.005…1 % (10000 ppm)	0.01 % (10 ppm)		16 mA/% (0.0016 mA/ppm)		

(Subject to technical changes!)

4.2 Electrical connection: 5 pole M12 plug-on flange

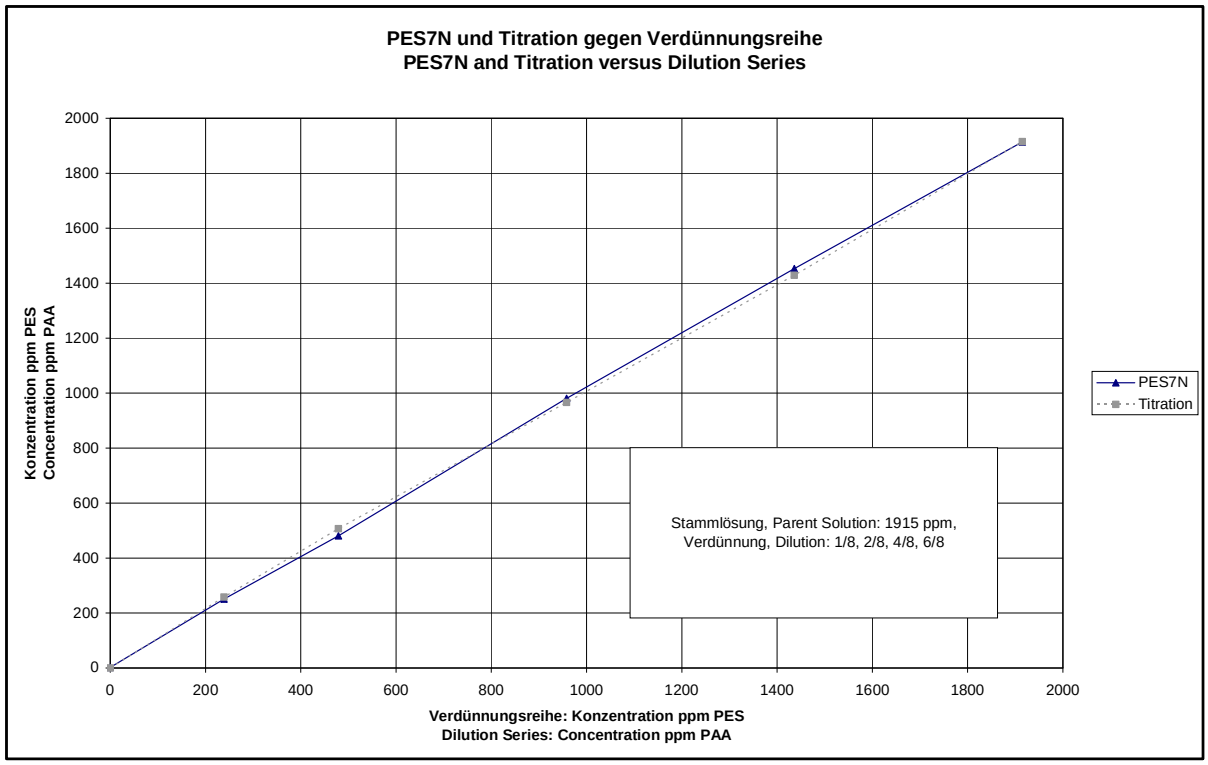
	**Measuring range**	**resolution**	**Output Output resistance**	**Nominal slope**	**Voltage supply**	**Connection**
PES7MA-CC-M12	0.5…200 ppm	0.1 ppm	4…20 mA uncalibrated	0.08 mA/ppm	12…30 VDC R_L 50Ω…R_L 900Ω	5-pole M12 plug-on flange Function of wires: PIN2: +U PIN3: -U
PES7MA-D-M12	5…500 ppm	1 ppm		0.032 mA/ppm		
PES7MA-M-M12	5…1000 ppm	1 ppm		0.016 mA/ppm		
PES7MA-MM-M12	5…2000 ppm	1 ppm		0.008 mA/ppm		
PES7MA-5M-M12	50…5000 ppm	1 ppm		0.0032 mA/ppm		
PES7MA-XM-M12	0.005…1 % (10000 ppm)	0.01 % (10 ppm)		16 mA/% (0.0016 mA/ppm)		

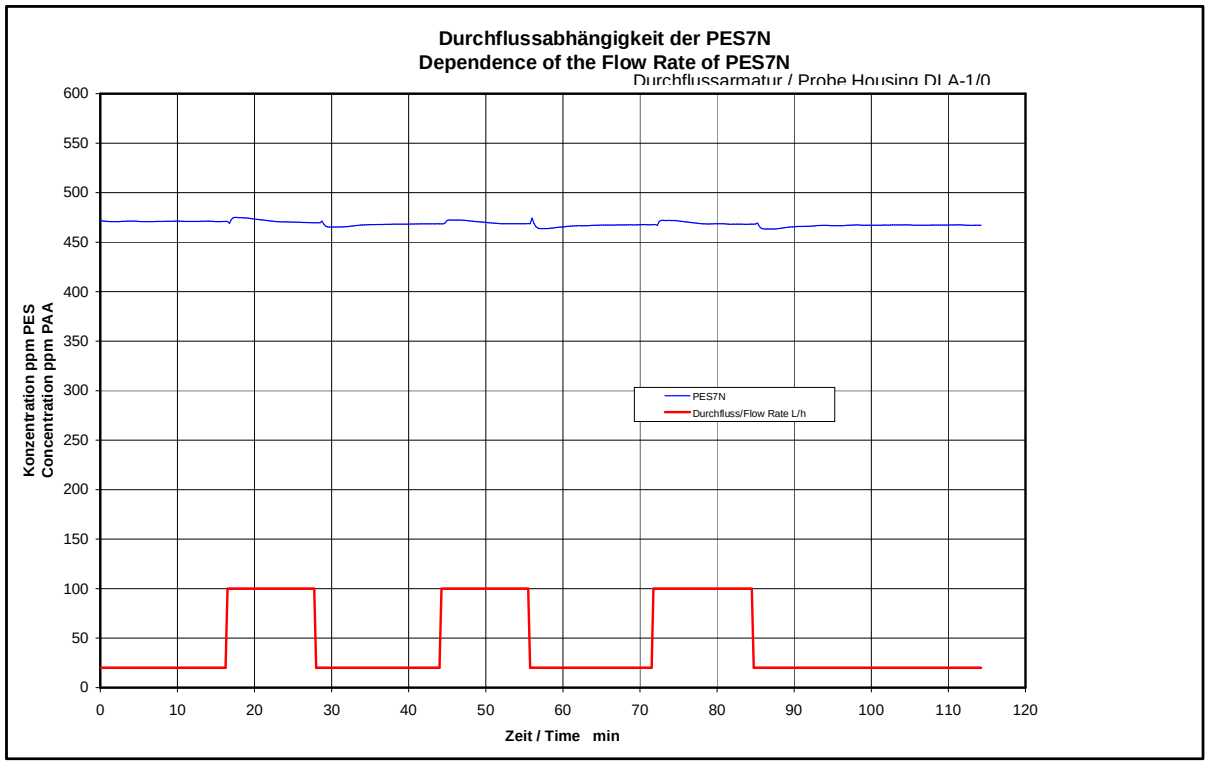
(Subject to technical changes!)

Spare Parts

Type	Membrane cap	Electrolyte	Emery	O-ring
PES7H	M7.1N	EPS7/W, 100 ml	S2	14 x 1.8 silicone
PES7HUp				
PES7N				
PES7Up				
PES7L	M7.1L	EPS7L/W, 100 ml		
PES7Up5000				
PES7MA-CC	M7.1N	EPS7/W, 100 ml		
PES7MA-D				
PES7MA-M				
PES7MA-MM				
PES7MA-5M	M7.1L	EPS7L/W, 100ml		
PES7MA-XM				

(Subject to technical changes!)


PES7N und Titration gegen Verdünnungsreihe
PES7N and Titration versus Dilution Series
Konzentration ppm PES
Concentration ppm PAA
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
PES7N
Titration
Stammlösung, Parent Solution: 1915 ppm,
Verdünnung, Dilution: 1/8, 2/8, 4/8, 6/8
Verdünnungsreihe: Konzentration ppm PES
Dilution Series: Concentration ppm PAA


Durchflussabhängigkeit der PES7N
Dependence of the Flow Rate of PES7N
Durchflussarmatur / Probe Housing DLA-1/0
Konzentration ppm PES
Concentration ppm PAA
600
550
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
110
120
PES7N
Durchfluss/Flow Rate L/h
Zeit / Time min