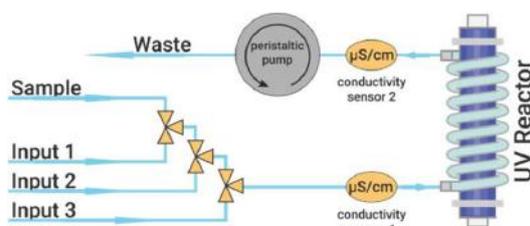


2.2 miniTOC²



Like its predecessor, the miniTOC² system has been developed to facilitate the online/offline monitoring of Total Organic Carbon (TOC) in pure and ultra pure water. The reliability of fast and accurate readings through conductivity detection has been further enhanced through the adaptation of the direct surface UV oxidation geometry and the optimization of fluidics and sensor coordination.



Technical Specifications	
Total Organic Carbon	
operating range	0.5 to 1500 ppb
display resolution	0.01 ppb (highest)
accuracy	< 50 ppb: ± 0.3 ppb > 50 ppb: ± 1 %
limit of detection	0.1 ppb
precision	0.3 ppb
Sample	
type of sample medium	pure or ultra pure water
sample volume flow	approx. 7 mL/min
max. input conductivity	< 2 μS/cm (upgradable to < 10 μS/cm) (87 μS/cm for conductivity calibration)
inlet pressure	< 0.5 bar (otherwise pressure reducer is needed), recommended 0.25 bar
sample temperature	10 °C to 50 °C / (50 °C to 95 °C heat exchanger is needed)
particle size	< 100 μm
input Connection / outlet Connection	All ports are UNF ¼ - 28 / 1 Port for waste UNF ¼ - 28
Measurement	
method & detection	UV oxidation based on conductivity
ports, basic	1 online + 1 for calibration/SST
ports, pro	1 online + 3 for calibration/SST, multiline up to 3 loops
period of measurement	2 sec (online mode) 4 min (sample mode)
Conductivity & Temperature	
display resolution	0.001 μS/cm
transmitter resolution / precision	0.025 nS/cm ± 0.3 %
accuracy / precision	< 0.200 μS/cm ± 0.001 μS/cm > 0.200 μS/cm ± 0.5 %
resolution	0.001 μS/cm
cell constant accuracy	1.5 %
conductivity reporting mode	temperature compensated to 25 °C or uncompensated
temperature resolution / precision	± 0.01 K / 0,1%
temperature sensor	PT 1000
temperature accuracy	± 0.1 K
Operation Conditions	
ambient parameters	relative humidity: 10 to 95 %, temperature: 10 to 45 °C
maximum Altitude	up to 3500 m
power requirements	110 - 240 ±10 % V AC, 50 - 60 Hz, max. 60 W
Physical Specifications	
UV lamp	1 UV lamp operation monitored
interface/display / operating system	8" TFT Touch Screen Color Display (resistive screen) / Windows 10 Pro 64bit
software	TOC Control
dimensions, weight	300 x 220 x 500 mm, 15 kg
Communication	
Analog output	Basic system: 2 x 0-20 mA Output according to Namur NE43 (TOC & Cond.) Pro system: up to 4 x 0-20 mA Output according to Namur NE43 (3 TOC & Cond.)
Digital output	1 x Relay Signal (Alarms & TOC Limit) + USB for Data export
Digital input	1 x Trigger (For remote control)
Interfaces	USB for Data export, Ethernet, Sampler
Compliance	
CE Compliance	2014/30/EU EMC Directive, 2014/35/EU Low Voltage Directive, 2011/65/EU RoHS Directive, EN IEC 63000 (2019), EN 61010-1 (2020), EN 61326-1 (2013), EN 61326-2-3 (2013) EN 61000-4-3:2020, EN 61000-6-1 (2019), EN 61000-6-3 (2011)
Related norms	DIN EN 1484, USP <643>, EP 2.2.44
Enclosure rating	IP 54
Software	21 CFR part 11 (optional)

Required items for first installation & instrument commissioning		
miniTOC² instrument Basic	278-0001	miniTOC² instrument Pro The miniTOC ² can be ordered as configuration with 3 inputs. This and an additional software called multiline mode upgrade option allows the user to measure up to 3 loops sequentially and configure the duration of the interval.
Installation kit	Installation kit of miniTOC-Analyzer - 2x Lagoprene tube 3.2 mm ID, 6.4 mm OD (825-0203) - 5 m PTFE tube 1.6 mm ID, 3.2 mm OD (825-0105) - 4 x fitting UNF 1/4" 28, PEEK, short incl. ferrule (825-0328)	278-0025
Installation & Training	Installation and customer/distributor training at customer site or on site of membraPure of a miniTOC. Travel and accommodation to be paid separately by customer.	915-0022
Options		
Multiline Mode	Allows in combination with the configuration miniTOC pro the user to measure up to 3 loops sequentially and configure the duration of the interval.	278-0015
Sample Mode	An offline configuration is available to analyse single samples	278-0016
Analog output	4 - 20 mA signal of TOC and conductivity, according to Namur NE43 it is adjustable 0 - 4 mA to differentiate between idle status and signal error	278-0022
Additional analog output, Multiline Mode	just needed if interval mode is requested	278-0023
Conductivity	extended conductivity of sample up to 10 µS/cm	278-0017
Check of inlet pressure	control of inlet pressure, miniTOC, initiates system error in case of inlet flow is zero and system generates a negative pressure	278-0018
Trigger Input	starts system if potentialfree contact is present, Trigger with 24 V DC	278-0020
Collective error option	potential-free contact in the event of a fault message: Sample input error, Disturbance UVm Humidity detector, Exceed limit	278-0019
Dual pump configuration	The miniTOC ² series systems can be equipped with a second pump head, which alternates to handle sample transport, thereby extending runtime and halving the associated pump tube replacement (maintenance interval to 12 months (2 x 6 months))	278-0026
Pressure regulator	If the medium pressure is higher than 0.5 bar or a stable pressure level cannot be confirmed a pressure transducer is required.	921-0607
Heat exchanger	If the medium temperature is higher than 50 °C a heat exchanger is required.	275-0063
Bottle kit	set of empty glass bottles with colour coated caps for easy connection to miniTOC/uniTOC. Facilitates the process for system suitability test (and calibration).	275-0017
21 CFR part 11 software	Software with 21 CFR part 11 conformity for pharma applications	278-0024
21 CFR part 11 software upgrade	As part of a service, the membraPure team can connect to the device via online access to make the necessary changes, such as activating user management, in order to achieve CFR compatibility. Please note that in this case it is not possible to use the previous data recordings without CFR21.	278-0034
CSV documents	Documents for CSV (computer system validation) miniTOC ²	278-0035
Autosampler miniTOC²		
Autosampler	By using the sample mode of the miniTOC ² the system is also upgradable with an autosampler Dimensions: L (mm) 570 x W 540 x H 460 (with needle) Weight 20 kg Interface connection: USB Power requirements: 110 - 240 V AC, 50 - 60 Hz, max. 50 W	278-0033
Autosampler rack	The autosampler will be equipped with one rack, holding 40 positions for 40 mL vials. Overall, the autosampler is designed to be equipped with two trays.	278-0037*
Spare parts	Fitting UNF 1/4" 28, PEEK, incl. Ferrule for connecting the tubing to the probe holder	825-0333*
	Tubing for autosampler	825-0105*
	Replacement sample needle	921-0672*
	40 mL glas vial with Cap EPA quality for autosampler, Pkg of 100 pcs	278-0040*

*We recommended to have one item in stock.

Available system configurations and options

	miniTOC ² basic	miniTOC ² pro
Sample Port	✓	✓
Input 1	✓	✓
Input 2	-	✓
Input 3	-	✓
IP 54	✓	✓
Pressure reducer	*	*
Heat exchanger	*	*
2 µS Input conductivity	✓	✓
10 µS input conductivity	*	*
Monitor mode	✓	✓
Sample mode	*	*
Multiline mode	-	*
CFR Software	*	*
Internal pressure monitoring	*	*
Autosampler	* sample mode required	
Leakage Sensor	✓	✓
UV Sensor	✓	✓
Analog outputs, 2 channel	*	*
Analog outputs, 4 channel	-	*
Trigger (24V)	* only in combination with analogue output	
Error outputs	*	*

✓ included * purchasable – not available

Consumables & Spare Parts / miniTOC²

UV lamp 185 nm & 254 nm	827-0169*
Glass coil	827-0132
Tube for peristaltic pump	827-0203*
Calibration solution for miniTOC, USP traceable	275-0041
SST Kit miniTOC, USP traceable	275-0042
Kit TOC stock solutions 100 ppm of sucrose and 100 ppm of benzoquinone in 2 bottles (10 mL)	275-0047
Glass bottles (empty) with colour coded caps	275-0017
Bottle connection set SST / calibration for USP traceable standards	275-0133

*We recommended to have one item in stock

Documents / IQ/OQ/PQ

Documents for IQ validation (non conform with 21CFR part 11 software)	278-0003
Documents for OQ validation (non conform with 21CFR part 11 software)	278-0004
Documents for PQ validation (non conform with 21CFR part 11 software)	278-0005
Documents for IQ validation (conform with 21CFR part 11 software)	278-0009
Documents for OQ validation (conform with 21CFR part 11 software)	278-0010
Documents for PQ validation (conform with 21CFR part 11 software)	278-0011
Validation support IQ/OQ TOC Analyzer miniTOC ² , cooperation in qualifying the setup during the installation	915-0052

Spare parts electronics

EVG for UV lamp	825-1010
PC with touchdisplay	827-0162
Mainboard	827-0253
UV lamp plug	827-0248

Spare parts fluidics

T connector	825-0269
Cross piece	827-0223
Dummy plug	825-0260
Tube clip	825-0170
Connector port green	825-0116
Connector port red	825-0291
Connector port natural	825-0292
Connector port black	825-0293
Connector port blue	825-0294
Fitting UNF ¼ " 28, PEEK, short	825-0247
Fitting UNF ¼ " 28, stainless steel, short	827-0245
Hose clamp stainless steel 4,7mm	827-0284
Hose clamp stainless steel 6,3mm	827-0285
Hose clamp stainless steel 9,5mm	827-0286
Hose clamp stainless steel 15,9mm	827-0287
PTFE, tube for port, ID 1.6 mm, OD 3.2 mm	825-0105
3/2 valve	827-0133
O-Ring	827-0276
Adapter glas spiral	827-0138
Adapter tube	827-0139

Spare parts peristaltic pump

Pump	827-0131
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Spare parts sensors

Conductivity sensor PT 1000	827-0009
Pressure sensor	860-1704
Leakage sensor	827-0171