# TOC DETECTOR

# miniTOC

*online/offline control*
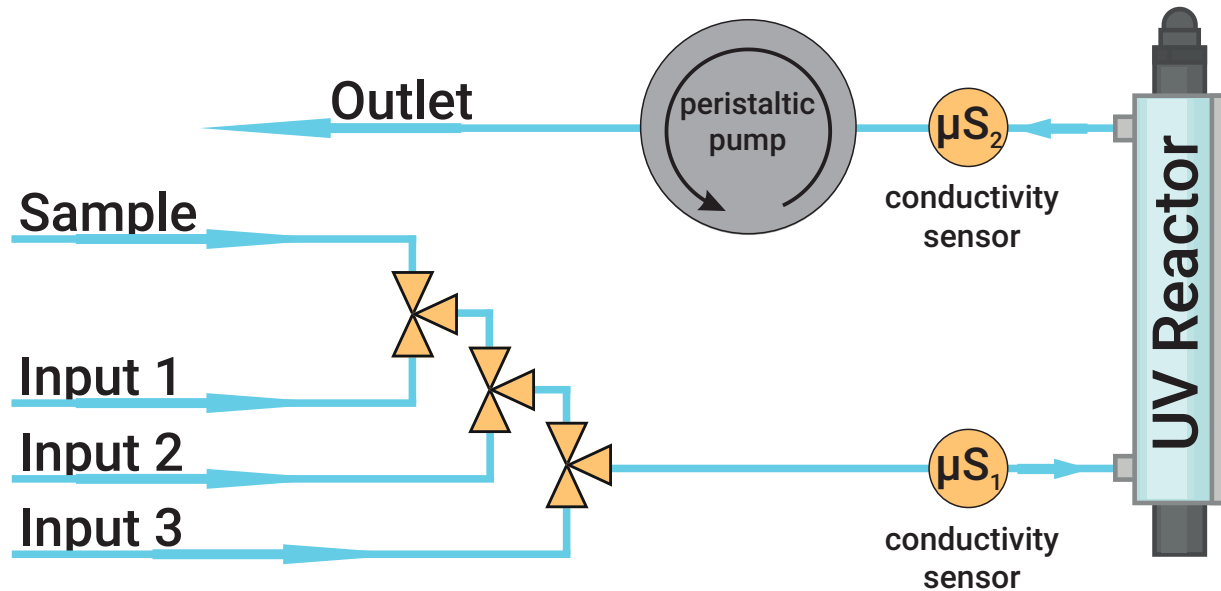*for pure and ultra pure water*

# TOC DETECTOR

The **miniTOC** system is designed for total organic carbon (TOC) online/offline monitoring of pure and ultra pure water.

The miniTOC monitoring device uses the high speed flow through concept and the efficient „direct surface" UV oxidation. In combination with conductivity detection the miniTOC guarantees a fast monitoring of values.

By measuring the conductivity before and after the UV oxidation the TOC value can be calculated.

**Principle of miniTOC**

Outlet

Sample

Input 1

Input 2

Input 3

peristaltic pump

$\mu S_2$
conductivity sensor

$\mu S_1$
conductivity sensor

UV Reactor

**mP TOC DETECTOR**

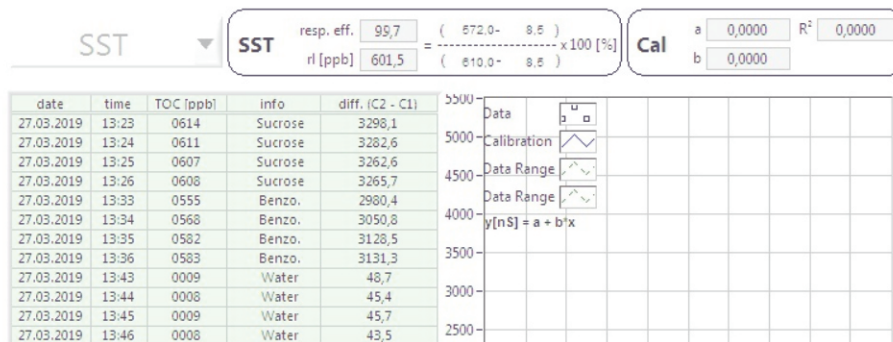| | |
|---|---|
| method & detection | UV oxidation (partial) & conductivity |
| sample volume flow | approx.14 mL/min |
| period of measurement | 2 sec (online mode) \| 1 min + 5 min purging (offline mode) |
| measurement range | 0.5 to 1000 ppb |
| detection accuracy | ± 0.5 ppb  or 1 % (whatever is greater) |
| ports | 1 for sample, 1 for SST (basic)   \|   1 for sample, 3 for SST (pro) |
| related norms | USP <643>,  EP 2.2.44, DIN EN 1484 |
| ambient parameters | relative humidity: 10 to 95 %, temperature: 10 to 45 °C |
| interface ports | analog (0 - 20 mA), according to Namur NE43 |
| dimensions, weight, power | 300 x 200 x 500 mm, 14 kg, 110 - 230 V, 50 Hz, 60 Watt |

| type of sample | pure to ultra pure water |
|---|---|
| sample input conductivity | < 2 µS/cm (upgradable to < 10 µS/cm) |
| inlet pressure | < 0.5 bar |
| sample temperature | < 50 °C |

miniTOC    99,7 % test passed ok    cont.

SST

SST   resp. eff. 99,7    rl [ppb] 601,5

$$= \frac{(\ 572.0 - \quad 8.5\ )}{(\ 610.0 - \quad 8.5\ )} \times 100\ [\%]$$

Cal   a 0,0000   R² 0,0000    b 0,0000

| date | time | TOC [ppb] | info | diff. (C2 - C1) |
|---|---|---|---|---|
| 27.03.2019 | 13:23 | 0614 | Sucrose | 3298,1 |
| 27.03.2019 | 13:24 | 0611 | Sucrose | 3282,6 |
| 27.03.2019 | 13:25 | 0607 | Sucrose | 3262,6 |
| 27.03.2019 | 13:26 | 0608 | Sucrose | 3265,7 |
| 27.03.2019 | 13:33 | 0555 | Benzo. | 2980,4 |
| 27.03.2019 | 13:34 | 0568 | Benzo. | 3050,8 |
| 27.03.2019 | 13:35 | 0582 | Benzo. | 3128,5 |
| 27.03.2019 | 13:36 | 0583 | Benzo. | 3131,3 |
| 27.03.2019 | 13:43 | 0009 | Water | 48,7 |
| 27.03.2019 | 13:44 | 0008 | Water | 45,4 |
| 27.03.2019 | 13:45 | 0009 | Water | 45,7 |
| 27.03.2019 | 13:46 | 0008 | Water | 43,5 |

Data
Calibration
Data Range
Data Range
y[nS] = a + b·x

### configuration miniTOC pro

The miniTOC can be ordered as configuration with 4 inputs. This and an additional software upgrade option allows the user to measure up to 3 loops sequentially and configure the duration of the intervall.

### check of sample flow

Initiates alarm in case of inlet flow is zero in combination with pressure sensor.

### heat exchanger

If the medium temperature is higher than 50 °C a heat exchanger is required.

### 21 CFR part 11 software

Software with 21 CFR part11 conformity for pharma applications.

### pressure regulator

If the medium pressure is higher than 1 bar a pressure transducer is required.

### IP54

The housing protects the miniTOC from dust deposits and water jets.

### offline version & autosampler

An offline configuration is available for the miniTOC. By using the offline mode of the miniTOC pro the system is also upgradable with an autosampler with 15 positions for 100 mL vials.

| Description | Cat. No. |
|---|---|
| UV reactor | 921-0040 |
| tube for peristaltic pump | 825-0196 |
| calibration solution for miniTOC, USP traceable | 275-0041 |
| SST Kit miniTOC, USP traceable | 275-0042 |
| documents for IQ/OQ validation | 915-0066 |
| documents for IQ/OQ validation (CFR conform) | 915-0067 |
| 100 mL vials for autosampler | 275-0046 |
| septa for vials for autosampler | 275-0060 |

**mP TOC DETECTOR**

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