

START-UP SHEET – 5000TOCe SENSOR

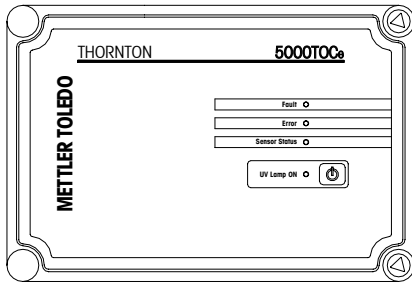


Figure 1

The 5000TOCe Sensor housing provides four LED status lights and a single push button key for local UV lamp control. See Figure 1.

UV Lamp ON LED: 1) When illuminated continuously, UV Lamp is on; or, 2) When flashing, indicates sensor is in rinse and auto-balance mode.

UV Lamp ON key: Allows the user to turn UV lamp on or off at the sensor.

Sensor Status LED: Illuminates continuously when sensor is powered and the patch cable is plugged in. Not lit if patch cable or power is disconnected.

Error LED: Illuminates continuously when an Error condition exists.

Fault LED: Flashing when a Fault condition exists.

The following steps are necessary to install, setup and operate a 5000TOCe Sensor in conjunction with the 770MAX Multiparameter Analyzer Transmitter. For complete details on the 5000TOCe Sensor, refer to Instruction Manual 58 130 082.

1. Sensor installation - The 5000TOCe Sensor is designed to be mounted in a variety of installation applications: Wall-mounted, pipe-mounted, and bench-top. The sensor is shipped with mounting tabs installed that can be removed for bench-top installation. A minimum clearance dimension of 18" (45.7 cm) is required on the left side of the sensor for UV lamp change-out. Two plumbing connections are provided on the right side of the enclosure. The lower connection is labeled 'Sample Inlet' and the upper connection 'Sample Outlet'. A third connection, a safety drain, is located on the bottom of the enclosure. For benchtop installations, this drain connector must be removed. Figure 2 shows a typical installed configuration. The installation kit (P/N 02205) includes installation tube assemblies and a high capacity inlet filter. Attach the high capacity inlet filter to the sample inlet connection as shown in Figure 4.

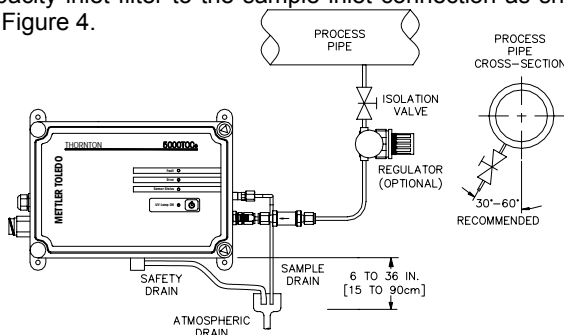


Figure 2

Connect the 0.125" (3 mm) PTFE tubing to a sample point isolation valve (not supplied). Warning: For inlet pressure above 85 psi (5.9 bar), a pressure regulator (Thornton p/n 58 091 552) is required. Flush sample tubing before installing at the sensor. Close the isolation valve. Attach the other end of the PTFE tubing to the high capacity inlet filter. In applications with high ambient humidity, irregular flow rates, high temperature water or water with significant changes in water temperature resulting in internal condensation, we recommend installation of the Sample Conditioning Coil (included). – See the 5000TOCe Instruction Manual for installation procedure. Connect the stainless steel drain tube (Thornton p/n 58 091 553) as shown in Figure 4. The 0.31" (8 mm) safety drain tubing connects to the tube fitting on the bottom of the enclosure and should also be directed to an atmospheric drain. See Figure 2 for dimensional restrictions regarding drain tubing.

2. Electrical connections are provided on the left side of the enclosure. There are two fittings: 1) AC Power bulkhead fitting for power cable, and 2) 770MAX patch cable connection. Feed the power cable through the bulkhead fitting on the side-wall. AC power connections are positioned on the right side of the printed circuit board, located on the backside of the sensor front cover. See Figure 3 for terminal wiring. Ensure line fuse is properly installed. See product label for specified fuse size.

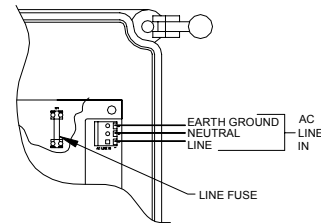


Figure 3

At this point, sample water can be introduced into the sensor. First, close the inlet needle valve by turning fully clockwise the adjustment knob. Slowly open the sample point isolation valve. Next, open the needle valve slowly, which will start flow to the sensor. Use the inlet needle valve to vary flowrate and make adjustments as needed to establish flow. Turning the adjustment knob counter-clockwise three turns should provide sufficient flow through the sensor. Once there is flow, check to be sure there are no leaks inside the enclosure. **Allow the sensor to initially flush with sample water (4-24 hrs is recommended).** Close front cover and connect the 770MAX patch cable to the connector on the bottom left side of enclosure.

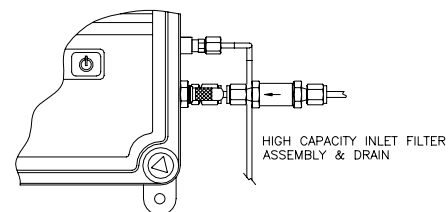


Figure 4

3. Setting the Flowrate – Prior to making a TOC measurement, proper operational flow must be established (20 mL/min \pm 5%). In the 770MAX TOC measurement menus, select the measurement attached to TOC sensor channel, go to Set Flow Rate option (refer to menu tree on reverse side of this sheet) and select 'Yes'. Once this is done, the four sensor LED lights become indicators showing when proper flowrate is established. All four LEDs will be lit when the flow rate is set properly. If only the bottom one or two LEDs are lit, flow is too low. If only the top one or two LEDs are lit, the flow is too high. Turn the adjustment knob clockwise to decrease flow. Turn adjustment knob counter-clockwise slowly to increase flow.

Once the flow rate is set, return the Set Flow Rate function in the 770MAX menu back to "No" and exit menus. LEDs will revert to their normal function.

4. TOC Measurement Setup is accessed through the 'Measurements' menu of the 770MAX instrument. Upon reaching the 'Measurements' menu, push enter and select the measurement (A,B,C...P) connected with the channel of the TOC sensor. Use the page-down key to access the additional menu screens. At the third menu screen, you will be prompted to push '5' to enter the TOC menus available. The menu tree shown below illustrates the setup options that are available when a 5000TOCe Sensor is attached to a 770MAX (*menus shown below reflect factory default settings for a 5000TOCe Sensor*). **NOTE:** A maximum of two Smart 5000TOCe Sensors can be attached to one 770MAX with the two remaining Smart inputs available for any other 770MAX Smart sensors.

5. TOC Sensor Startup requires the following steps for the sensor to begin making TOC measurements. Once all Measurement Setup options are configured, the user can push the UV lamp button at the sensor or move back to the screen showing the 'UV Lamp On' option. By selecting 'Yes' to this function, the sensor UV Lamp will turn on and TOC measurement will begin. However, during initial startup, the 770MAX will display the message, 'press the UV Lamp ON switch on Sensor #x, to turn on UV lamp', (x = channel). Push 'enter' to continue. This message will remain until the 'sensor' key is pushed. Once the 'sensor' key is pushed, the measurement will begin. If the Auto-Start feature is set to 'Yes' this message will not be displayed. If the Auto-Start feature was left in the 'No' position, then this message will again appear after a sensor power loss.

Note: It is recommended to use the 5000TOCe Sensor with the 770MAX transmitter with software Version 5.2 or above. Contact Thornton Customer Service for upgrade information.

Main Menu
Select a menu using
↑↓ then press Enter
Goto: **Measurements**

MEASUREMENT: A ↑
Sensor Input: **Chan 1**
Units: **gC/L Auto**
Name: **none** ↓

Sensor Input: Shows channel connected to measurement
Units: Options are TOC (ppt, ppb, ppm, Auto), gC/L (n, μ, m, Auto)
Name: 6-digit user entered name

MEASUREMENT: A ↑
Multiplier1^Δ: **1.23456**
Adder1^Δ: **0.56789**
Averaging: **Special** ↓

***Multiplier:** TOC calibration constant
***Adder:** TOC calibration constant
Averaging: Options are None, Low, Medium, High, and Special
***Note:** There are two Multipliers and Adders for multi-linear calibration (available on 770MAX software rev 5.2)

MEASUREMENT: A ↑
Set Flow Rate: **No**
UV Lamp: **Off**
Push 5 for TOC menu ↓

Set Flow Rate: Yes/No. Allows the user to adjust the flow rate through the sensor when Yes is selected. Must be turned back to No once complete.
UV Lamp: On/Off. Turns the UV lamp on or off. (For initial start-up, the sensor key must be pushed)

MEASUREMENT: A ↑
Resolution: **Auto** ↓

Resolution: Measurement display resolution (Auto, 1., 0.1, 0.01, 0.001)

MEASUREMENT: A ↑
Reading= 1.2345 gC/L
5803600X SN=00342391
Cal Date: 01/01/07

Reading: Shows Current TOC measurement
TOC Sensor Part # and Serial #
Cal Date: Date of last calibration

TOC Setup Ch 1 ↑
Lamp Remain: **4500 hr**
Lamp Reset: **01/01/07**
Lamp Limit: **4500 hr** ↓

Lamp Remain: Time remaining on UV Lamp limit.
Lamp Reset: User entered date of last UV Lamp change.
Lamp Limit: User selectable from 400 to 9999 hours. 4500 hours recommended.

TOC Setup Ch 1 ↑
Auto Start: **No**
Rinse Time: **015 min**
Flow: 20.00 ml/min ↓

Auto Start: No/Yes. Allows sensor to automatically start a measurement when power is restored to a 5000TOCe Sensor.
Rinse Time: Selectable from 1 to 999 minutes.
Flow: Flow rate can be viewed as a displayed number (available on 770MAX software rev 5.2).

TOC Setup Ch 1 ↑
AutoBal: **No**
AutoBal Time: **4500 hr**
AutoBal Limit: **15%** ↓

AutoBal: Yes/No. Option for balancing both conductivity sensors before starting a TOC measurement. Factory default is No.
AutoBal time: Selectable from 24 to 4500 hours.
AutoBal limit: Selectable from 0 to 20%.

TOC Setup Ch 1 ↑
AutoBal in **N/A hr**
AutoBal Hold: **Yes**
AutoBal Now: **N/A** ↓

AutoBal in: If required, set time before next Autobalance.
AutoBal Hold: Yes/No. Option to hold the last measurement during an Auto-balance.
AutoBal Now: Yes/No. Allows an auto-balance immediately upon selecting "yes" and exiting menu.

TOC Setup Ch 1 ↑
Sensor Key Lock: **No**
Cond Limit: **2.0000 μS**
Over-ride limit: **No**

Sensor Key Lock: Yes/No. Allows the user to disable the key on the 5000TOCe Sensor.
Cond. Limit: Selectable. Set above 0.0.
Over-ride limit: Yes/No. If No is selected, error message will occur when conductivity limit is exceeded. Conductivity limit will be ignored when Yes is selected.

- Bold text in menus indicates user selectable field.

Mettler-Toledo Thornton, Inc.
36 Middlesex Turnpike
Bedford, MA 01730 USA
Tel. +1-781-301-8600
Fax +1-781-301-8701
Toll Free +1-800-510-PURE (US and Canada only)
thornton.info@mt.com

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