

# Modular Turbidity Sensor

## Manual **STS**



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Thank you for having chosen our product. These instructions should allow you an easy installation. Please study this documentation carefully and retain for further reference. Information about the materials used and general technical data can be obtained from the relevant technical data sheet.

## **1. General points**

This turbidity-sensor is a precision measuring device. The polished process fittings and optic is protected with a cap which should only be removed just prior to the installation. Take special care to avoid abrasive media, solid bodies and other mechanical damage (thumb-mark)

Please follow these instructions carefully so that the turbidity sensor works perfectly.

The pressure transmitter corresponds - under the condition that the installation has been properly effected - to the EMC standards EN 61000-6-3 and 4 as well as EN 61000-6-2 and EN 61326.

## 2. Installation / Removal

Install the turbidity sensor in the chosen process-adaptation and tighten with the following torque:

Torque: 10 - 20 Nm

### **Attention: Do not use any sealants!**

For the correspondent welding sleeves please take a look in our data sheet process measurement. **modular @ process**

Before removals, make sure that the tube carrying the medium is completely depressurized and emptied.

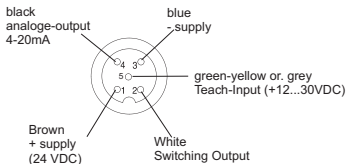
### **Attention: Serious injury can result if the line is still pressurized!**

After removal, the optic must be protected with the original cap immediately.

### 3. Electrical Connection

The electrical connection happens with a M12-plug connection. For pin assignment please refer the page “technical data”. For installation please use an additional connecting lead. We recommend WAKE 4.5-10/P00 (5-pole high-grade-steel-plug, 10 mtr. long). Another versions on request.

#### Plug



| Pin | Colour               | Designation           |
|-----|----------------------|-----------------------|
| 1   | brown                | +supply (24VDC)       |
| 2   | White                | Switching Output      |
| 3   | blue                 | -supply               |
| 4   | black                | Analoge Output 4-20mA |
| 5   | green-yellow or grey | Teach-Input (24V)     |

#### ATTENTION!

At lower deviation of dew points water condensation is possible, that can destroy the sensor. At stress with change of temperatures, e. G. a cold water jet on the hot sensor, it can come to absorption of fluids into the sensor. (Requirements cf. DIN EN 60068-2-14) At applications with dew point, temperature shock or thermal shock stresses we recommend to put the attached silikagel-bag into the connecting head.

The tightness classification after IP68 does not mean that these parts are suitable! for applications with lower deviation of dew point or temperature shock. (DIN 60068-2-14)

## 4. Cleaning and Maintenance

It is impossible to make sure, that absolutely no sediments or dirt affects the optic. To avoid any damage, please do not focus high pressure cleaning “jets of water” directly at the optic. In particular never clean the optic with tools or other mechanical objects. Do not insert hard objects into the optical path opening.

### Operation

The admissible range acc. to technical datasheet must be respected in any case.

In case of malfunction, please check the following points:

- Check the data on the label plate and compare with the installed configuration.
- Check wiring.
- Check the power supply and load.
- Check if the optic is ok or damage.
- Check the possibilities of EMC influences

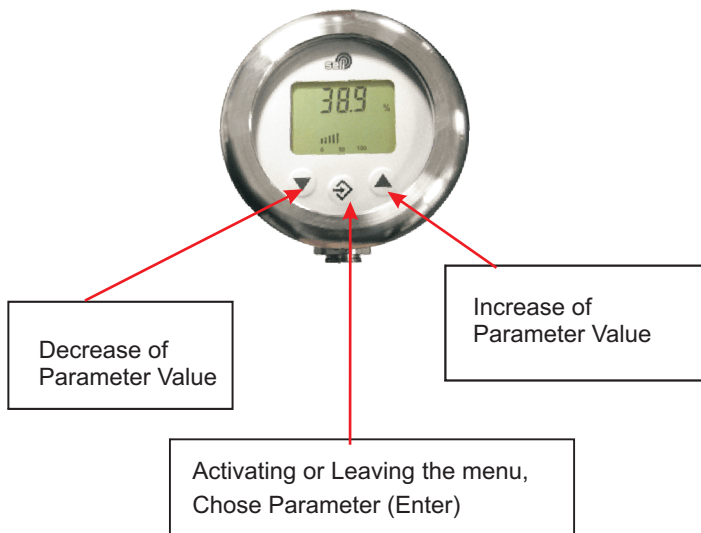
### Repair

Please send the sensor (if possible with the original packaging) directly back to us.

Detailed information regarding the malfunction helps us in obtaining a faster analysis.

## 5. Control Elements

The Turbidity Sensor is controlled with three buttons, which are accessible after removing the cap.



### **Please Note: Keyboard Lock**

**The factory setting is with deactivated keyboard lock.**

**If the keyboard lock is activated (siehe Programmierung, einstellbar 0...100 min.) the lock works if no button ist pushed and the unit shows the acutal measured value.**

## 6. Programming

### 6.1 Menue

The values that are printed in bold or are underlined are standard-operator-parameter. The function "RST" resets all operator-parameter back to standard.

| Parameter   | Designation                            | Range                                  | Description   |
|-------------|--|--|---|
| <i>ESC</i>  | Top / End of menu                      | none                                   | Menue entrance / exit   |
| <i>-0-</i>  | reset                                  | none                                   | Resets the measured value to zero or the teached value. Same function als the teach-input   |
| <i>dSP</i>  | Display-Switchover                     | <i>turb</i> , <i>TEMP</i> , <i>RLT</i> | Definition of which value should be indicated:<br><i>turb</i> : Turbidity<br><i>TEMP</i> : Temperature<br><i>RLT</i> : Turbidity and Temperature in rotation<br><br>The analogue output always gives out a signal which is dependent on the turbidity, independent of the display-switchover. |
| <i>trb</i>  | (Measuring begin)                      | -100.0 ... <u>0</u> ... 100.0 %        | Specifies the 4mA-point.  |
| <i>trE</i>  | (Measuring end)                        | -100.0 ... 0 ... <b>100.0 %</b>        | Specifies the 20mA-point.   |
| <i>dRP</i>  | (Damping)                              | <u>0.0</u> ... 200.0 sec.              | Mutes the turbidity-value   |
| <i>r-0-</i> | (Range of Zero point)                  | <u>0</u> ... 100                       | Sets a range around the zeropoint indicated in digits. In this range the measured value is resetted to zero.  |
| <i>don</i>  | (Digital Output on)                    | -100.0 ... 0.0 ... <b>100.0%</b>       | Defines the switching-on point  |
| <i>doFF</i> | (Digital Output off)                   | -100.0 ... <b>0.0</b> ... 100.0%       | Defines the switching-off point   |
| <i>dLYP</i> | Schaltfunktion<br>(Digital Output typ) | <u>0</u> , 1                           | 0 = Closer<br>1 = Opener  |
| <i>ddlY</i> | (Digital Output delay)                 | <b>0.0</b> ... 200.0s                  | Delays the switching-point up to 200s.  |
| <i>RoLL</i> | (Analog Output low limit)              | <b>3.5</b> ... 22.5mA                  | Defines the minimal output current.   |
| <i>RoUL</i> | (Analog Output high limit)             | 3.5 ... <b>22.5</b> mA                 | Defines the maximal output current.   |

| Parameter    | Designation          | Range                  | Description   |
|--------------|----------------------|------------------------|---|
| $\rho_{out}$ | (Malfunction Output) | 3.5 ... <u>22.5</u> mA | If the sensor detects an internal error, an error-code is indicated and the defined current signal is given out.  |
| $R_{uLo}$    | Automatic key lock   | <u>0</u> ... 100min.   | In order to prevent unauthorized operation, the keypad will be locked after the adjusted time. The time setting „0“ deactivates the key lock function. A further operability is possible by delinking and subsequently of the power supply. |
| $r_{5t}$     | Reset                | 0, 1                   | Reset to standard parameter.  |
| $ESC$        | Top / End of menu1   | none                   | Menu entrance / exit  |

## 6.2 Switching Points

The Turbidity Sensor Seli STS has a PNP-Output, which will be configured by four parameters.

$don$  defines the digital output on point- and  $doff$  defines the digital output off point in %.

Together the two parameters defines the function of the switching output.

Is  $doff$  lower as  $don$ , so the output is activated, if the measured value oversteps  $don$ . It will be only switched off, if the measured value falls below  $doff$  again (Hysteresis-Function).

Is  $doff$ , is greater than  $don$ , so the output switches on, if the measured value is between the switching points (Window-Function)

If  $don$  and  $doff$  are equal, so the output switches on , if the measured value oversteps  $doff$  and it switches off , if the value falls below  $don$ .

Both parameters can be adjusted independent from each other within -100.0 – 100.0%.

*dLSP* reverses the function of the switching output. Is the value = 0, the switching output is NO, is the value = 1, the switching output is NC.

*ddlS* allows to delay the reaction of the switching output by up to 200s. This value counts as well for the enabling as for the disabling (0,1 sec.-steps).

### 6.3 Teach-Function (Calibration)

To adjust the measurement to different medias, a teach-function is implemented in the sensor.

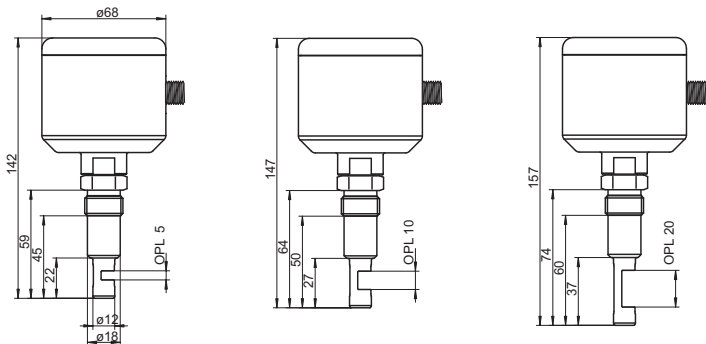
Use the function "-0-" in the menu to teach the measuring value. Alternatively you can give a +24V-signal on to the input "Teach". Then the sensor learns the turbidity value which just happens.

## 7. Technical Data

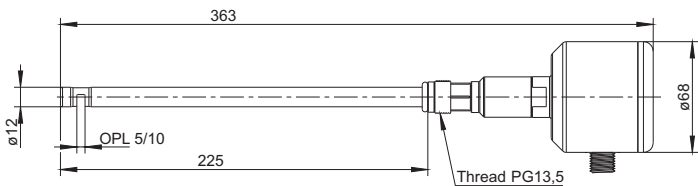
|                 |   |
|-----------------|---|
| Supply Voltage: | 12...30 VDC   |
| Current demand: | ca. 80 mA (30VDC, and<br>analoge-output = 22,5 mA)                                  |
| Power input:    | 2,4 W max.  |
| Analoge Output: | 4-20 mA   |
| Current limit:  | 3,5 mA min.,<br>22,5 mA max. adjustable   |
| Torque:         | 10 - 20 Nm  |
| Load:           | $\leq (U_b - 4V) / 20mA$ (max. 400 Ohm at 12V,<br>1000 Ohm at 24V, 1300 Ohm at 30V) |
| Teach-Input:    | Digital-Input, +12...30VDC,<br>circa 1,6mA input current                            |
| Switch-Output:  | Semiconductor switching, PNP-switching  |
| Switched Power: | 200mA max. , thermally protected<br>against overload                                |

## 7.1 Technical Data / Drawings

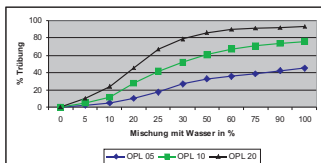
### STS01



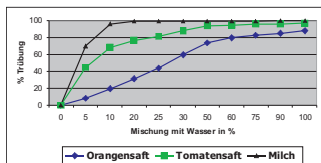
### STS02



## 8. Typical Turbidities



Wheat beer with different OPLs



Different products with OPL 010

## 9. Order Code

### Order Code

STS 01-  -  -  -

#### Optical Pathlength

Optical Pathlength 5 mm

Optical Pathlength 10 mm

Optical Pathlength 20 mm

005

010

020

#### Configuration Measuring-Range

Measuring range 0...100,0%

Special Constructions on request

1

K

#### Interface / Parameterization

4...20 mA

Special Constructions on request

A

K

#### Display / Control Unit

with integrated display

without Display

Special Constructions on request

1

0

X

## 9. Order Code

### Order Code

STS 02 

|  |
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 - 

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#### Optical Pathlength

Optical Pathlength 5 mm

|     |
|-----|
| 005 |
|-----|

Optical Pathlength 10 mm

|     |
|-----|
| 010 |
|-----|

#### Configuration Measuring-Range

Measuring range 0...100,0%

|   |
|---|
| 1 |
|---|

Special Constructions on request

|   |
|---|
| K |
|---|

#### Interface / Parameterization

4...20 mA

|   |
|---|
| A |
|---|

Special Constructions on request

|   |
|---|
| K |
|---|

#### Display / Control Unit

with integrated display

|   |
|---|
| 1 |
|---|

without Display

|   |
|---|
| 0 |
|---|

Special Constructions on request

|   |
|---|
| X |
|---|

### Accessories



ph Redox-Holder SAW-830

seli GmbH Automatisierungstechnik

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