ACTEON 2050
SS-Temperature
User manual

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SIGNATURE:	SIGNATURE:	SIGNATURE:

IMPORTANT

Please read the manual carefully before switching on the device.

In order to maintain and ensure the good working order of the device, users must comply with the safety precautions and warnings featured in this manual.

Assembly and activation:

- Assembly, electrical connection, activation, operation and maintenance of the measuring system must only be carried out by trained personnel duly authorised by the end-user.

- Trained personnel must be familiar with and comply with the instructions in this activation manual.

- Make sure the power supply complies with the specifications on the nameplate before connecting the device.

- A clearly labelled power switch must be positioned near the device.

- Check all connections before turning the power on.

- Do not use damaged equipment: it may represent a hazard and should be labelled as faulty.

- Repairs must only be carried out by the manufacturer or by a Ponsel after-sales service.

- Before shutting the ACTEON cover, check that the cover sealing joint is correctly positioned in its groove.

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1 The measuring system

1.1 The basic system

A measuring system requires the following basic elements:

1.1.1 A Suspended Solids (SS) -Temperature transmitter:

PONACTEON2050-20	ACTEON 2050-20 SS meter and Thermometer transmitter (0.00-20.00g/l range MES5 sensor)
PONACTEON2050-50	ACTEON 2050-50 SS meter and Thermometer transmitter (0.00-50.00g/l range MES5 sensor)

1.1.2 A SS sensor

PONCIR-MES5-10	IR optical sensor for suspended solids measurements with 10-metre cable connection and 5mm optical length. Perch mounting or in-pipe installation. PVC body

1.1.3 Temperature sensor

PONCPC-T-10	Temperature sensor with 10m cable connection (perch-mounting or in-pipe installation)

1.2 Accessories:

1.2.1 Consumables

PONMANU-2050	Additional directions for use

1.2.2 Accessories for a tank-mounted installation without cleaning system

PON-ACT-24V	Optional 24VDC power supply
PONBJ-E	Watertight IP68 connection box for connecting the sensor at distances over 10 metres
PONCBMC-9	9-conductor coated cable for the Connection box/Acteon 2050 connection
PON-PDPCV-1	PVC stand and protective hood for one ACTEON transmitter
PON-PDPCV-2	PVC stand and protective hood for two ACTEON transmitters
PON-CASQ-1	PVC protective hood for one ACTEON transmitter
PON-CASQ-2	PVC protective hood for two ACTEON transmitters
PONPPCC-CIR	PVC elbowed sensor-holder perch for SS, sludge blanket, CTZ, NTU and TU20 sensors. Supplied with connector
PONPPCD-CIR	PVC straight sensor-holder perch for SS, sludge blanket, CTZ, NTU and TU20 sensors. Supplied with connector. SPECIFIC APPLICATION
PONCOUDE	90° elbow for sensor-holder perch closure
PONSPFR2C	Stainless steel ESHP or SSHP type mount for 2 perches -1 arm, 2 sliders
PONSPFR1C	Stainless steel ESHP or SSHP type mount for 1 perch -1 arm, 1 slider
PONSPFR-COUL	Additional slider for QRPM (Quick release perch mount) systems

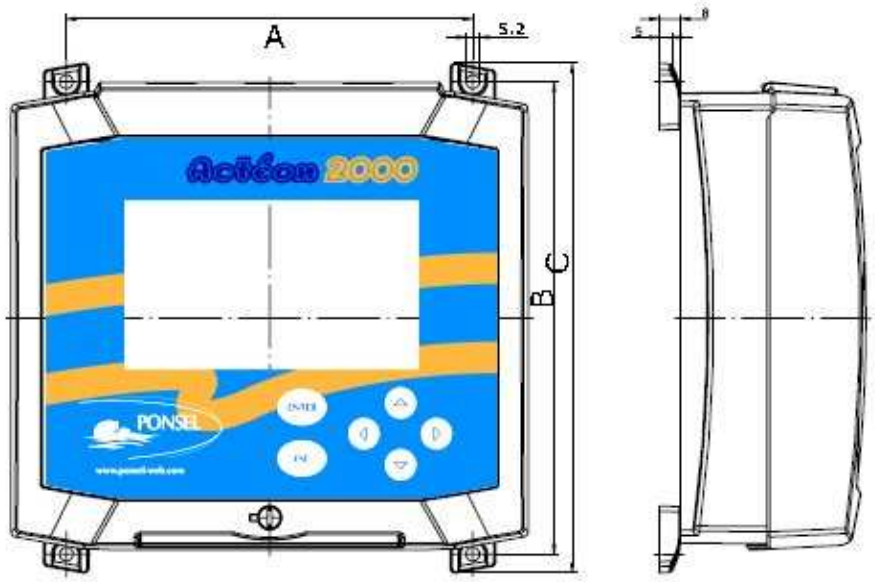
1.2.3 Accessories for MES5 (**PONCIR-MES5-10**) and Temperature sensor in-pipe installation

PONVCPO-63	Stainless steel 63mm clamp type assembly for in-pipe installation (316 L) (for SS OXY, Eh, pH, Temp., C2E and C4E sensors) To be fitted with the appropriate nipple. To be welded on stainless steel piping
PONNIP-MES	MES5 sensor nipple
PONNIP-T	Temperature sensor nipple

2 Installation

2.1 Mounting the ACTEON 2050 transmitter box

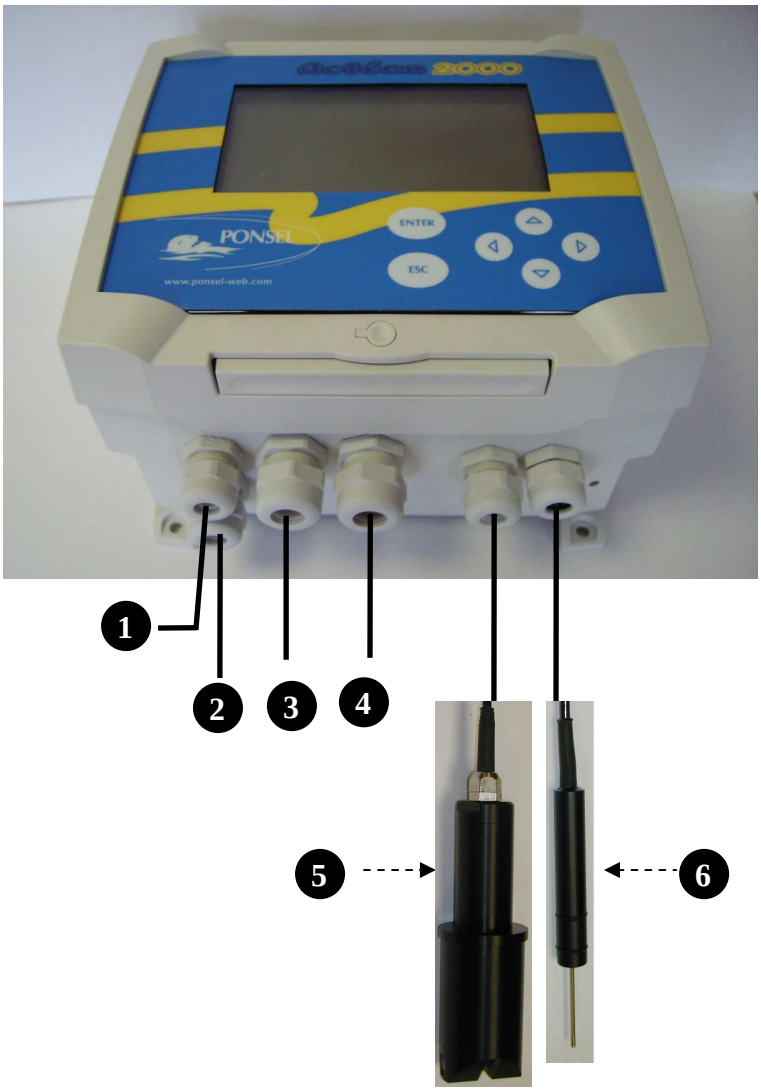
Acteon 2050 mounting diagram



	A	B	C
Dimensions (mm)	156.5	181	195.3

Figure 1 - Transmitter mounting diagram

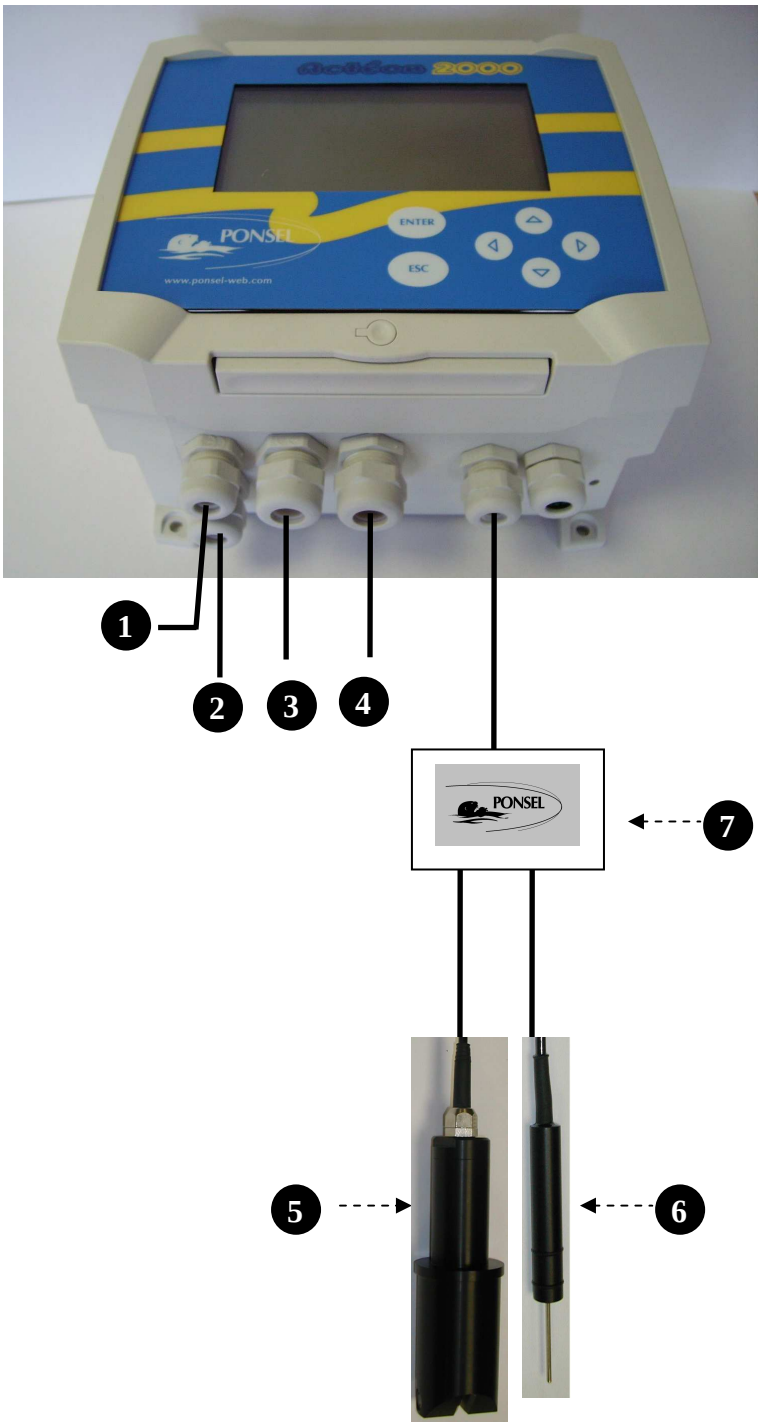
2.2 Connecting the ACTEON 2050 transmitter and MES and Temperature sensors



1. Power supply cable (230V~ or 24VDC)
2. Line out cable
3. Relay cable (2 channels)
4. 4-20mA cable (2 channels)
5. SS sensor (**PONCIR-MES5-10)**
6. Temperature sensor **(PONCPC-T-10)**

Figure 2 - Installing a measuring system

Comment:
If the connection cable between the sensor and transmitter is longer than 10 metres, a **watertight IP 68** connection box must be used (REF: **PON-BJ-E).**



1. Power supply cable (230V~ or 24VDC)
2. Line out cable
3. Relay cable (2 channels)
4. 4-20mA cable (2 channels)
5. SS sensor (**PONCIR-MES5-10)**
6. Temperature sensor **(PONCPC-T-10)**
7. Connection box **(PON-BJ-E)**

Figure 3 - Installation with a connection box

2.2.1 Acteon 2050 wiring:

See appendix (§15) at the end of the document.

2.3 Tank-mounting:

2.3.1 Using the stand and protective hood

A PVC protective hood (**PON-PDPVC-1**) is available for mounting the ACTEON 2050.
The hood is essential in the case of direct exposure to adverse weather or sunshine.

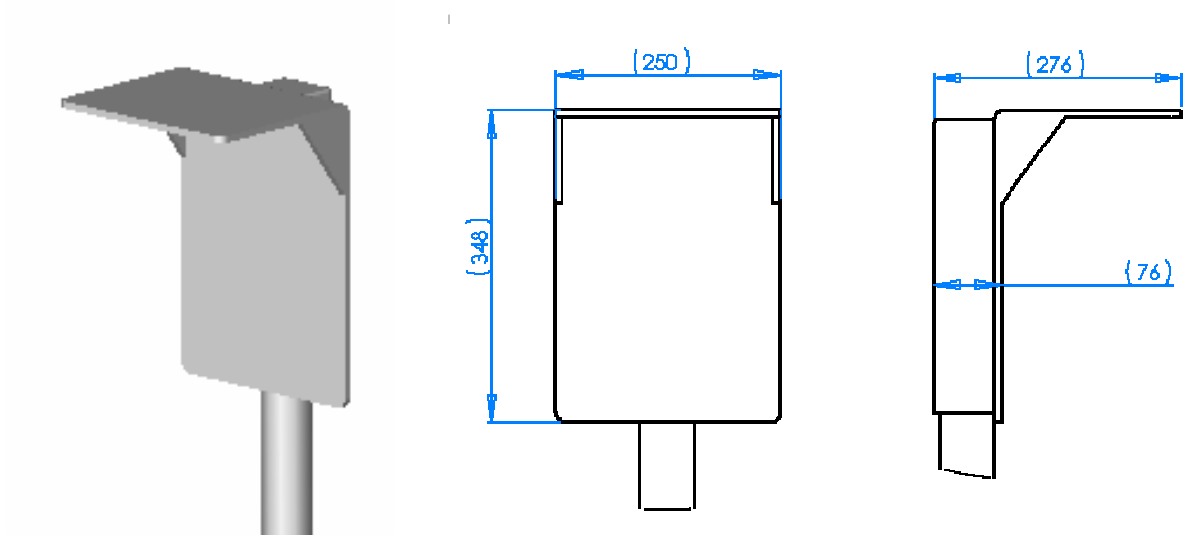


Figure 4 – Transmitter mount and hood

2.3.2 Installing the sensor in the sensor-holder perch (elbowed or straight) (**PONPPCC-CIR or PONPPCD-CIR)**

It is best to use the elbowed sensor-holder perch with its own installation system when submerging the sensor in a tank.

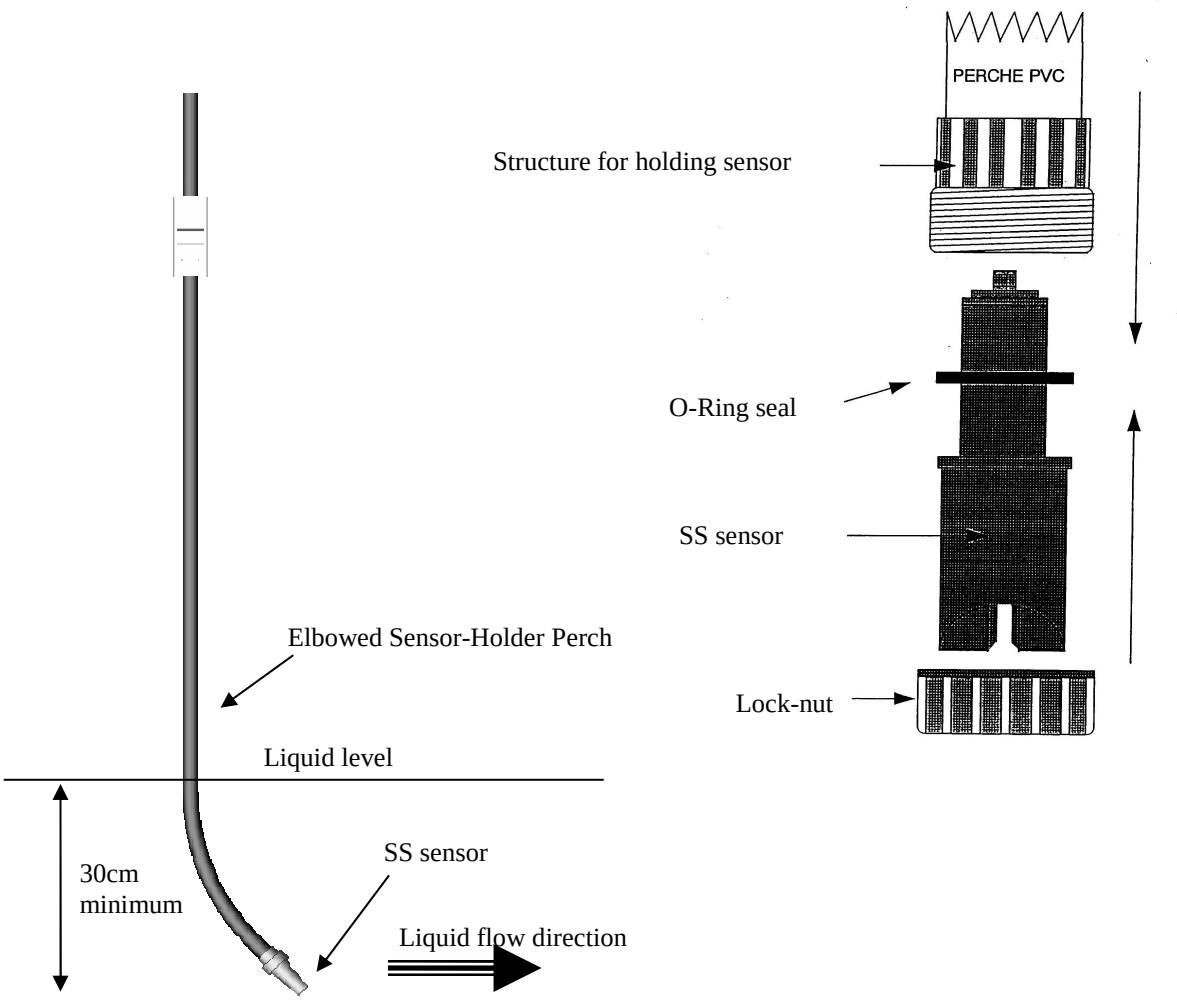


Figure 5 – Elbowed Sensor-Holder Perch

Comment:

Use elbowed sensor-holder perches in heavily soiled tanks to prevent fibre build-up on the perch. If there is a directional flow, the sensor's optical slit should be pointing in the direction of the flow.

Installing the SS sensor in the nozzle:

The standard sensor comes sealed to a 10-metre cable connection, making it submersible up to a several bars of pressure.

1) Completely unscrew the tightening seal located on the sleeve of the SS sensor beforehand.
2) Pass the sensor cable through the bottom of the perch (widest end) until it comes out of the other end.
3) Slide the cable through the perch until the SS sensor sleeve fits into the bottom of the perch.
4) Slot the SS sensor sleeve insert in the lateral hole located in the lower end of the perch. Tighten the lock-nut until the sensor is secured in the perch (do not over tighten).
5) Set the perch on the edge of the tank or on the bridge.

2.3.3 Installing an Elbowed Sensor-Holder Perch (ref: **PONPPCC-CIR**) or Straight Sensor-Holder Perch (ref: **PONPPCD-CIR)** on QRPM (ref: **PONSPFR** and **PONSPFR2**)

1) Fix the stainless steel QRPM to the infrastructure.
2) Next, fix a sensor-holder perch to the stainless steel QRPM as shown in the diagram below.

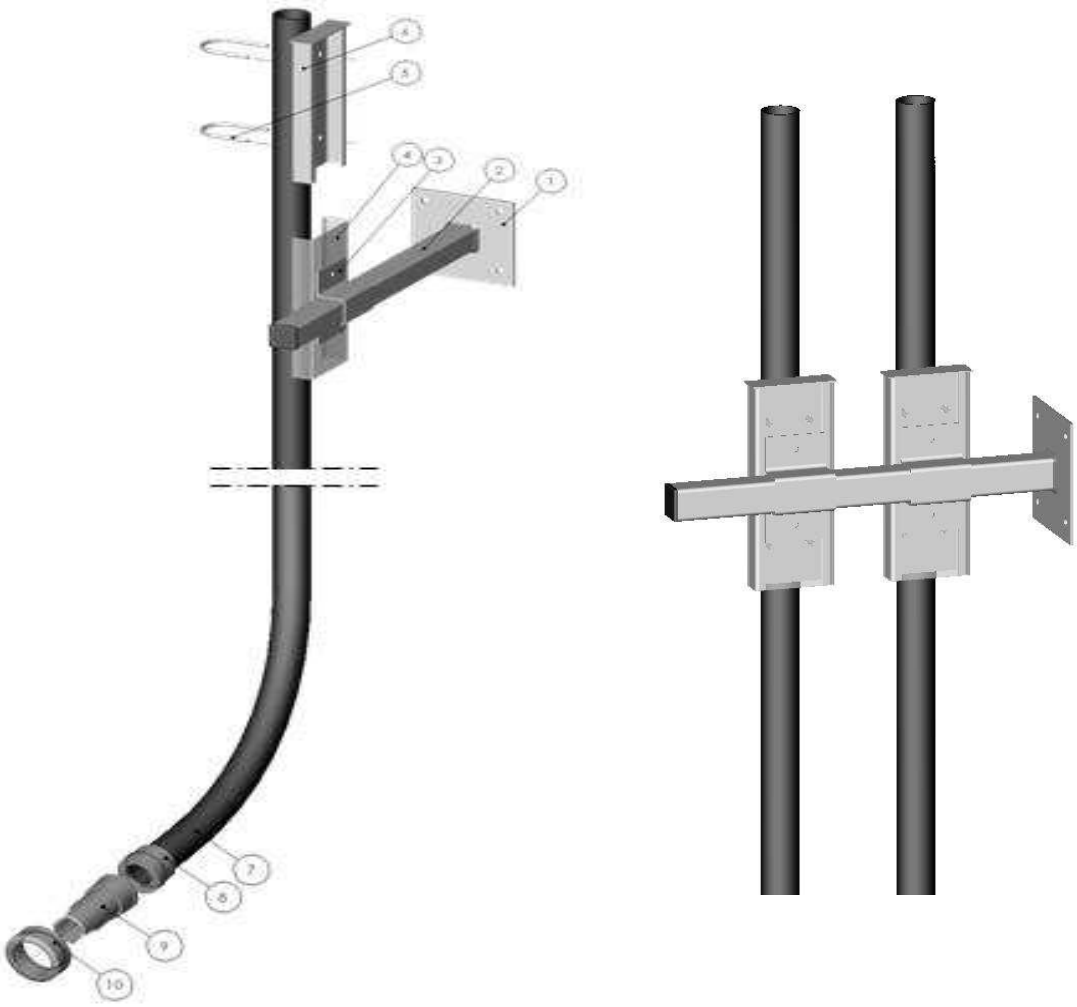


Figure 6 - Installing a perch on a QRPM with one or two sliders

A second slider may be added to install a second sensor-holder perch for the temperature sensor (see diagram above).

2.4 In-pipe installation:

The sensors can be supplied for installation in a pressure pipe (<20 bars) with quick release conical coupling clamps. (see Figure 7 - SS sensor in-pipe installation
)

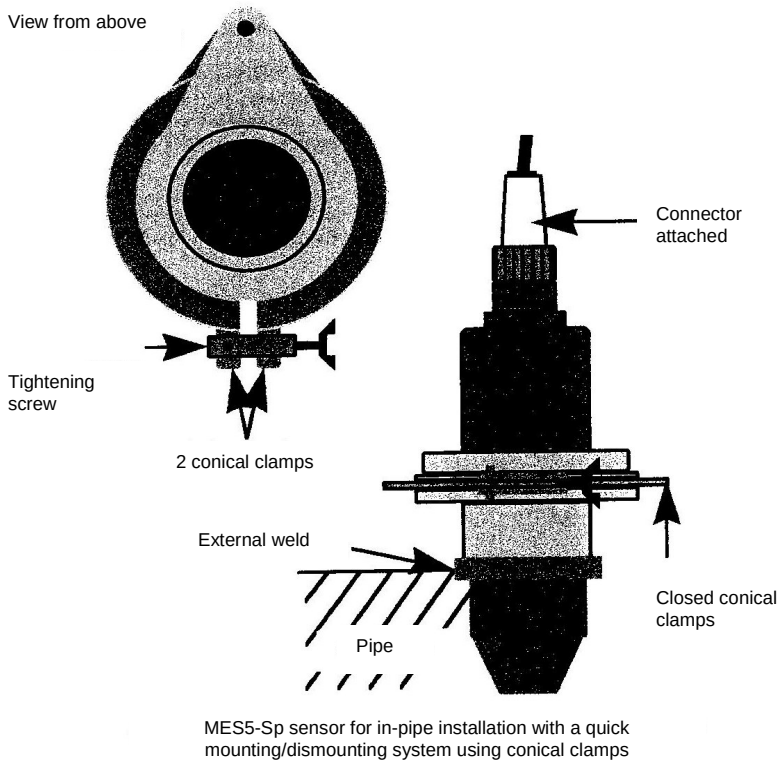


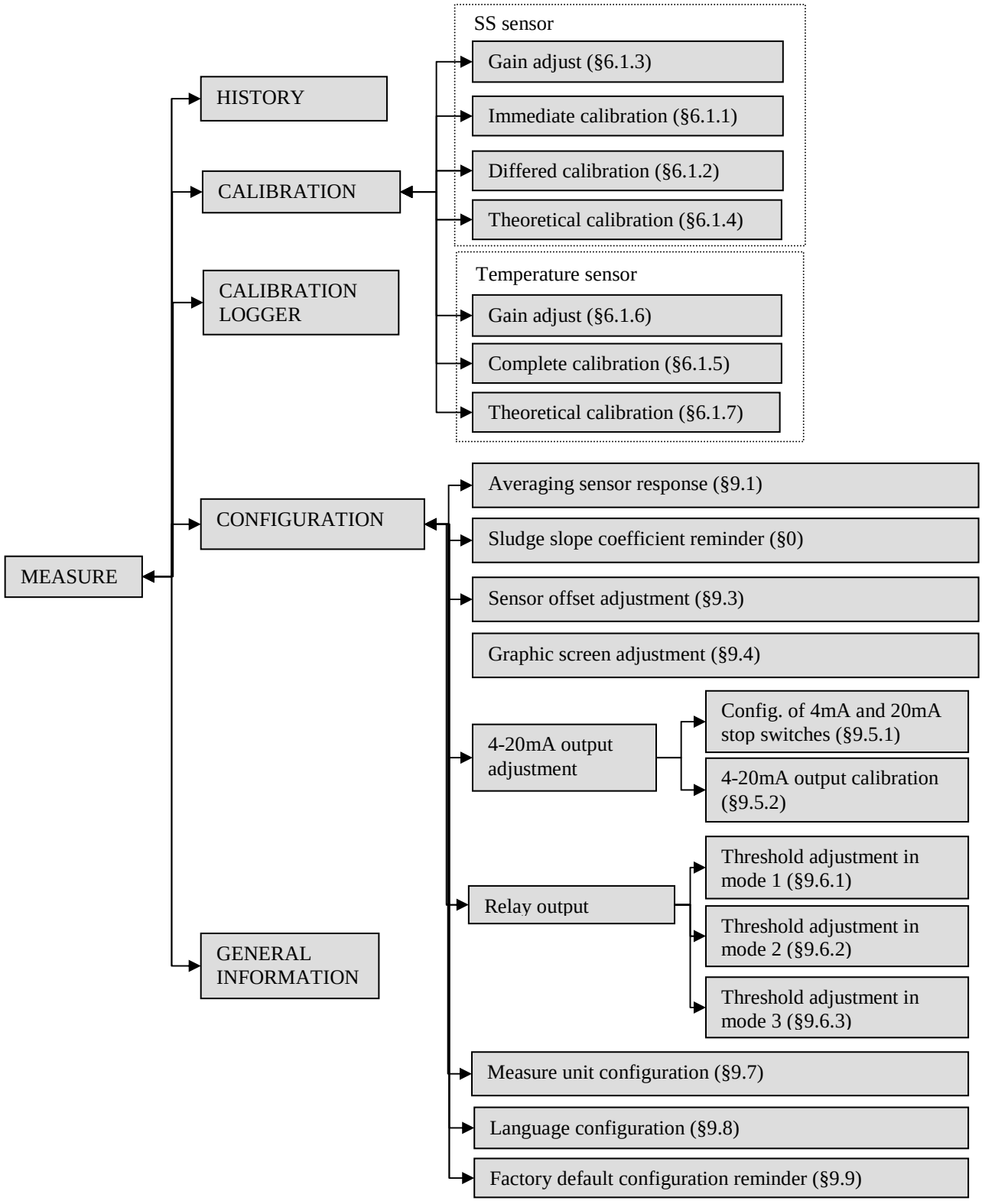
Figure 7 - SS sensor in-pipe installation

3 ACTEON 2050 transmitter

3.1 Control console:

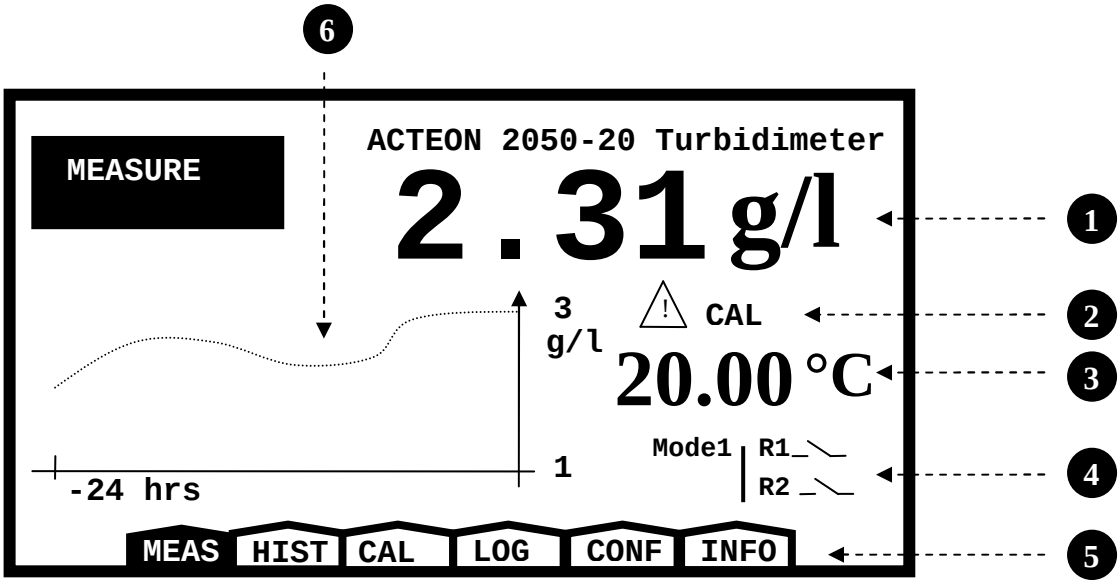
1. ENTER key for accessing menus or confirming actions
2. ESC key for exiting menus or cancelling actions
3. ◁ key for moving left in menus
4. ▷ key for moving right in menus
5. △ key for increasing a value or selecting the menu above
6. The ▽ key for decreasing a value or selecting the menu below
7. Control screen
8. Quarter-turn screw to seal the cover

4 Block diagram of ACTEON 2050 menus:



5 The measurement window

In measure mode the measurement screen displays various information:**Erreur !**



1 SS measurement

2 Measurement state indicator:

(!) **THEOR CAL** : Indicates use of the theoretical coefficients as calibration coefficients.

(!) **CAL** : Indicates incorrect calibration point on the probe.

(!) **DRY WEIGHT** : Indicates differed calibration has been carried out but the dry weight has not yet been entered.

: No icon displayed means that the last calibration is correct.

3 Temperature transmitted by the temperature sensor

In the event of faulty wiring or uninstalled sensor, the temperature will not be displayed.

Comment: The following icon is displayed if the temperature is higher than the operating temperature (55°C)

(!) HOT

4 R1 and R2 relays: state and operating mode

Contact is inactive.

Contact is active.

5 ACTEON menu

6 Trend line can be configured from 1 min to 24 hours (with automatic scaling)

6 Calibrating the ACTEON 2050

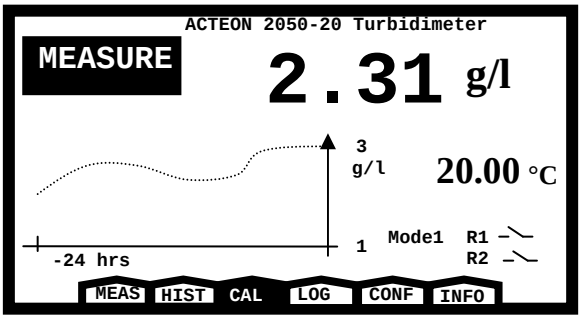
Important information.

Calibration frequency:
The SS sensor must be calibrated (zero + slope) at least once every two weeks, during the regular optics cleaning process.
However, recalibration is advisable as soon as a shift of more that +/-0.2g/l occurs (during automatic control with a recently calibrated reference SS meter, or during "dry weight" analysis, while taking account of the fact that the analysis can sometimes be delayed by up to 24 hours in relation to the current state of the active sludge measured with the controlled PONSEL SS-meter. Hence the possible use of a "differed calibration" to compensate for this problem).
If frequent recalibrations are carried out (once a day for example), there is no need to take the sensor + perch out of the water, clean the optics or zero adjust in clean water. Simply adjust the slope in situ by leaving the sensor in place in the sludge being measured.

Sensor calibration and positioning procedures: Even though, in our detailed explanations, we have always mentioned sludge specimens taken from tanks and placed in buckets for sensor calibration, there is no objection to calibrating the sensor in situ attached to a perch and placed in the measurement medium at the point where it will subsequently be installed for regular measurements. The sludge content in g/l may already have been measured for this point ("immediate calibration" or "gain adjust" menus), for instance by using a recently calibrated reference SS meter, or sludge may be taken from near the optical measurement unit and analysed while immediately following up with a "differed calibration" without waiting on the results of this analysis.
In this case calibrate in situ during a stable stage in the activation process. Avoid calibrating during bubble aeration or during stagnation periods. Calibration should preferably take place after aeration. An SS sensor should be placed in the most stable hydraulic conditions possible, without excessive turbulence or stagnation, and with regular mixing, so that the SS are perfectly suspended in the medium and that the location is representative of the SS content in the tank as a whole and in the active sludge area.
In situ calibration remains relevant in the sense that it integrates the hydraulic mixing regime and suspends the SS, while sludge in a pail only approximates this hydraulic mixing regime, and can thus result in more or less large measurement differentials in the tank after calibration. Moreover, in situ calibration is carried out at the tank's temperature thus preventing heat shocks and shifts.

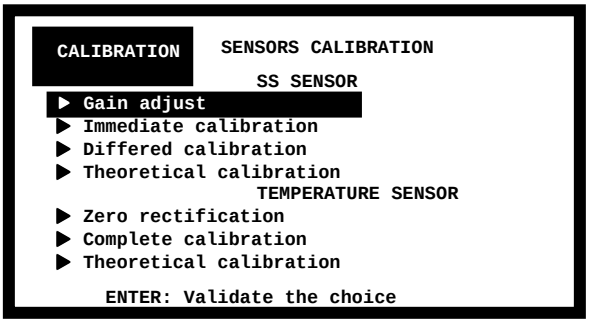
6.1 Calibrating the sensors:

Select the calibration menu in the measurement window:



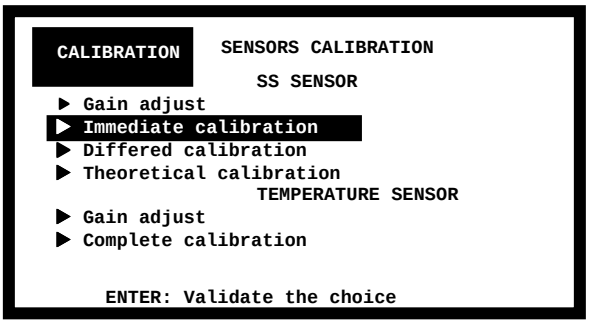
Use the ▷ and ◁ keys to navigate the ACTEON menu

Select the CAL menu then press ENTER.



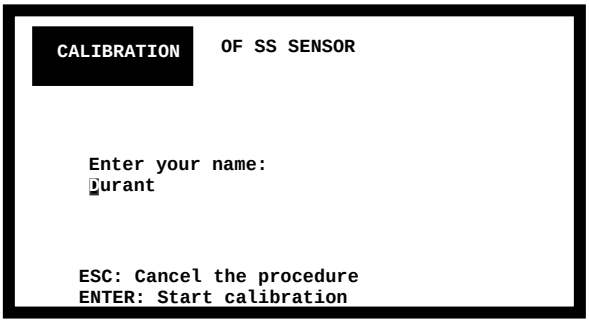
6.1.1 Two point SS sensor calibration (immediate calibration):

Use the following procedure to calibrate your SS sensor in one go; zero and slope adjustments (gain adjust) are carried out immediately afterwards. This procedure requires previous knowledge of the SS content of the activated sludge sample used as the calibration solution. This information can be had either via a recently calibrated reference SS meter or through analysis of a fraction of the sample sludge immediately after sample taking then refrigerating the remaining amount at 4°C in an airtight bottle in the dark to prevent fermentation. Once the analysis results have been obtained, the sludge can be used as calibration solution during this "immediate calibration" procedure, provided that it is brought up to tank temperature.
Clean the SS sensor beforehand. The sensor optics must be free of dirt and stains (clean optical slit with damp cloth). See MAINTENANCE chapter (§13.1.3) for cleaning instructions.



Use the △and▽keys to select the type of calibration and the probe to be calibrated.

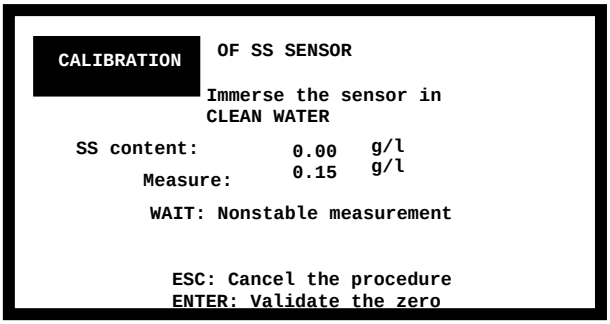
Select the ▶ Immediate calibration menu and press ENTER.



Use the ▷and◁ keys to move the cursor in the name section.
Use the keys △and▽ to change the letters. (The scrolling order of the letters is A…Z,0..9,?,>,space)

Enter your name or reference then press ENTER

Dip the sensor in clean water with no bubbles (tap water for example). Preferably, this water must be at the same temperature as the tank sludge in which the probe will be placed.
Stir the water with the probe to disperse any bubbles on the optic windows.



AWAIT MEASUREMENT STABILISATION

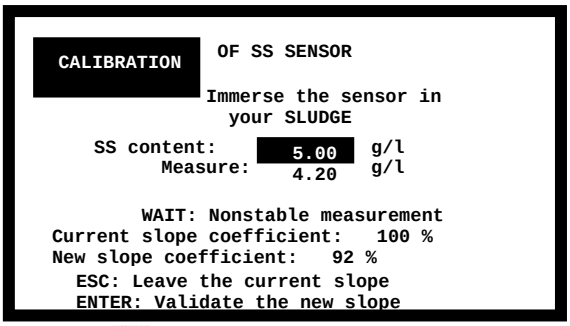
Press the ENTER key to confirm the first calibration point

Calibration Correct ?

No → If the first calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.2.1)

Yes

Take a representative sample of the measurement medium, enough to immerse the sensor (in a 5 litre pail or larger). Dip the sensor in the half-filled pail of sludge and keep stirring gently to prevent decanting and to keep the SS in suspension as much as possible.
Advice: The sample sludge must remain at the temperature of the tank and must not be active → calibrate immediately after sample taking.

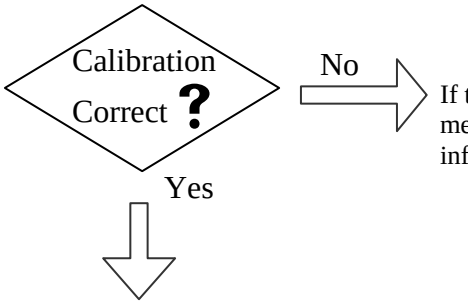


Use the △and▽ keys to adjust sludge concentration

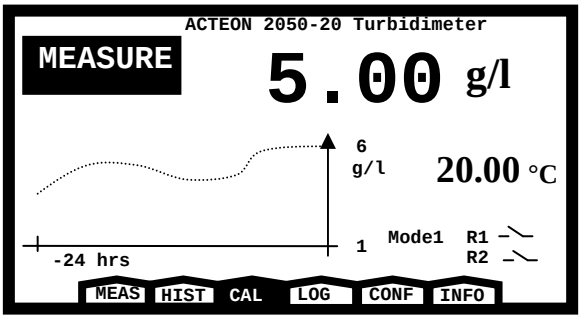
AWAIT MEASUREMENT STABILISATION

Press the ENTER key to confirm the second calibration point

.



If the second calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.2.2)

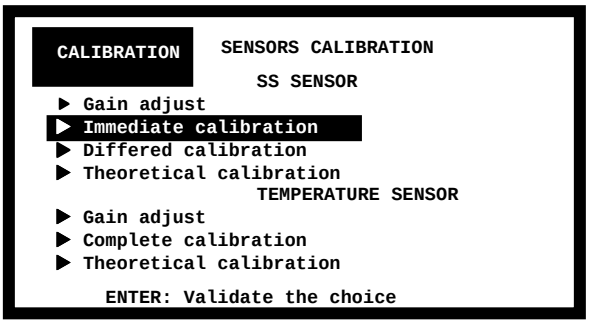


<u>Comment</u>: The measurement window is displayed again once the calibration has been correctly carried out.

6.1.2 Two point SS sensor calibration (differed calibration):

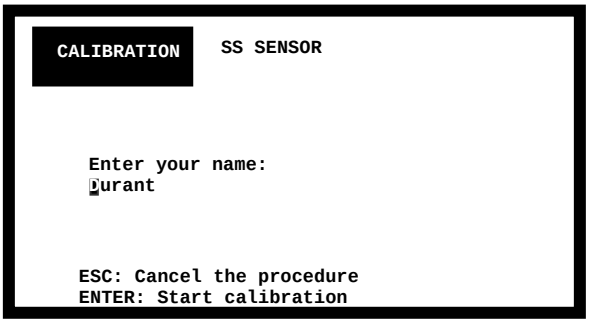
The following procedure enables complete calibration of your SS sensor in two successive steps. The delay for active sludge dry weight analysis can be between several hours to 24 hours or more (centrifugal, filtering, thermobalance, etc).

1) The first step consists in zeroing the sensor in CLEAN water, then measuring and recording the infrared emission in your unidentified sludge sample.
Send a fraction of this sample for analysis while carrying out the first step.



Use the △and▽keys to select the type of calibration and the probe to be calibrated.

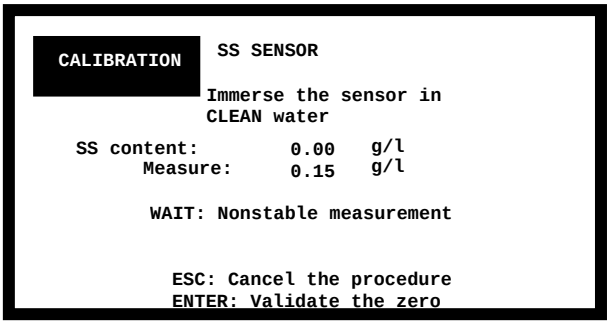
Select the ▶ Immediate calibration menu then press ENTER.



Use the ▷and◁ keys to move the cursor in the name section.
Use the keys △and▽ to change the letters. (The scrolling order of the letters is A…Z,0..9,?,>,space)

Enter your name and reference and press ENTER

Dip the sensor in clean water with no bubbles (tap water for example). Preferably, this water must be at the same temperature as the tank sludge in which the probe will be placed.
Stir the water with the probe to disperse any bubbles on the optic windows.



AWAIT MEASUREMENT STABILISATION

Press the ENTER key to confirm the first calibration point

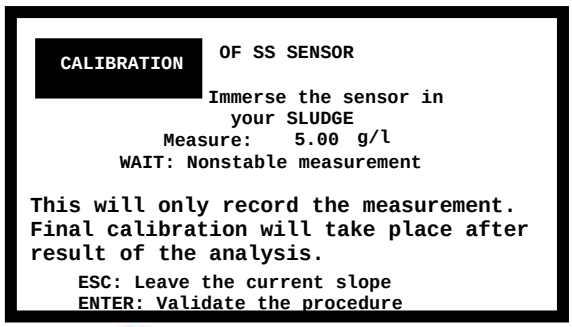
Calibration Correct ?

No

If the first calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.2.1)

Yes

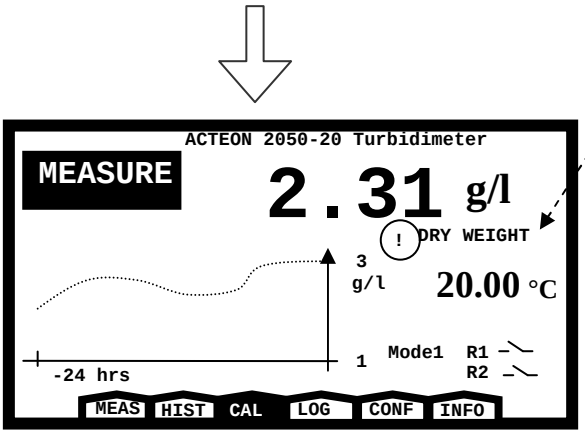
Take a representative sample of the measurement medium, enough to immerse the sensor (in a 5 litre pail or larger). Dip the sensor in the half-filled pail of sludge and keep stirring gently to prevent decanting and to keep the SS in suspension as much as possible.
Advice: The sample sludge must remain at the temperature of the tank and must not be active → calibrate immediately after sample taking.



AWAIT MEASUREMENT STABILISATION

Press the ENTER key to confirm the second calibration point

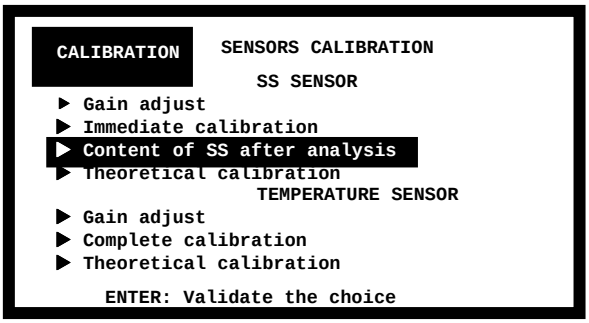
.



Indicates the device awaits dry weight input following sludge sample analysis

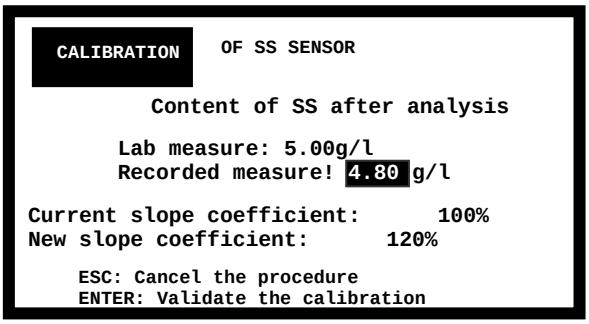
<u>Comment:</u> The measurement window is displayed again once the calibration has been correctly carried out
The displayed MEASURE g/l value remains unchanged. The previous slope was not overwritten and remains displayed (until end of 2nd step), and the SS-meter will give another useable measurement: this is still attributed to the previous calibration slope coefficient and not the current one.

2) The second step consists in entering the sludge sample dry weight obtained after a variable delay in order to complete the SS sensor calibration, which means calculating and recording the new slope.
This step is not affected by the state of the optical sensor, which can be disconnected from the device, connected and in the air or preferably connected and already in the tank. In the latter case, at the end of this step and immediately following calibration confirmation and automatic return to MEASURE mode, the g/l value displayed will be that of the SS content of the sludge measured at the sensor's location in the tank.



☞ Use the △and▽keys to select the type of calibration and the probe to be calibrated.

☞ Select the ▶ Content of SS after analysis menu and press ENTER.



Use the △and▽ keys to adjust sludge concentration.

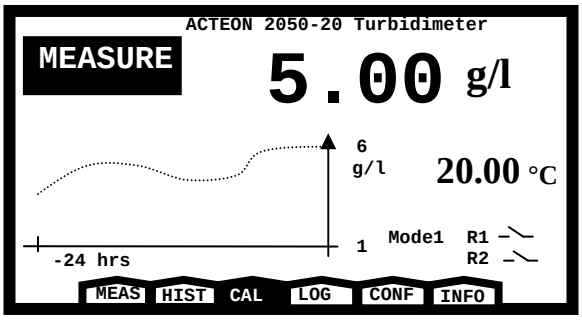
Press the ENTER key to confirm the second calibration point

Calibration Correct ?

No

If the second calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.2.2)

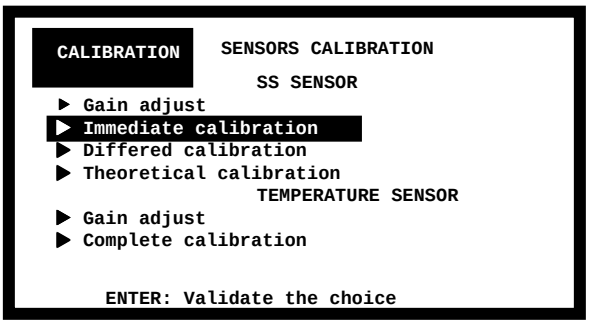
Yes



<u>Comment</u>: The measurement window is displayed again once the calibration has been correctly carried out.

6.1.3 SS sensor slope adjustment:

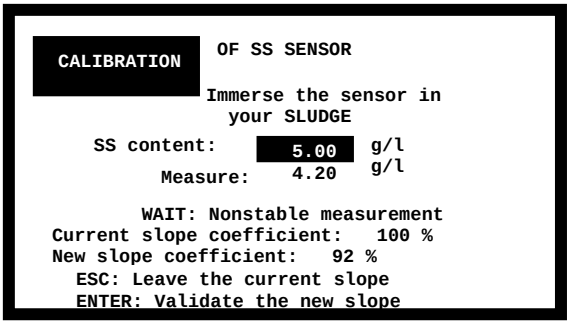
If clean water zeroing is not required (when the sensor is not excessively dirty), you can recalibrate the sensor in situ in the active tank sludge, without removing the sensor-holder perch, which can be tedious for example in the case of daily readjustments. This can also be done in a pail.



Use the △and▽keys to select the type of calibration and the probe to be calibrated.

Select the ▶ Gain adjust menu and press ENTER.

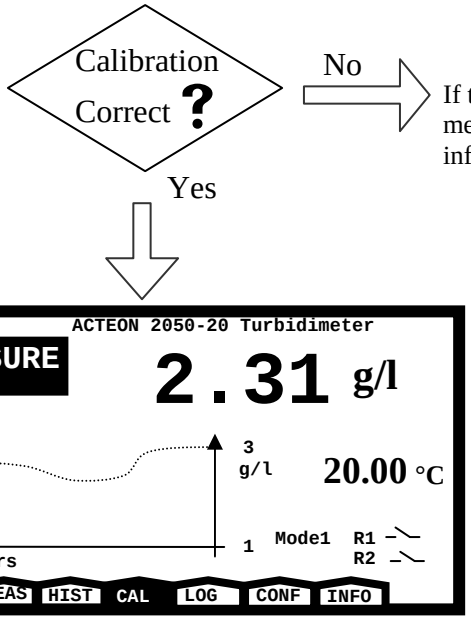
Take a representative sample of the measurement medium, enough to immerse the sensor (in a 5 litre pail or larger). Dip the sensor in the half-filled pail of sludge and keep stirring gently to prevent decanting and to keep the SS in suspension as much as possible.
Advice: The sample sludge must remain at the temperature of the tank and must not be active → calibrate immediately after sample taking.



Use the △and▽ keys to adjust sludge concentration.

AWAIT MEASUREMENT STABILISATION

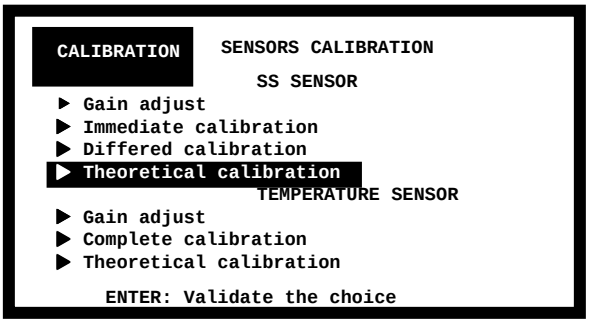
Press the ENTER key to confirm gain adjust.



<u>Comment</u>: The measurement window is displayed again once the calibration has been correctly carried out.

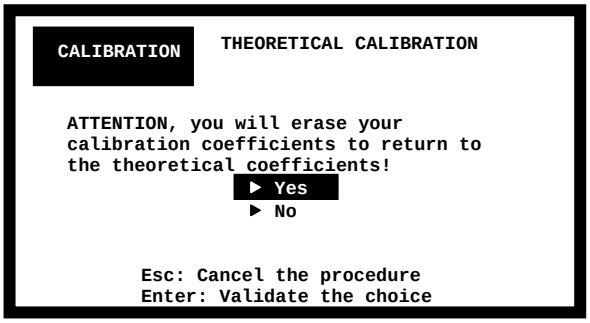
6.1.4 Returning to SS measurement theoretical calibration:

Theoretical calibration is carried out using SS sensor theoretical coefficients.



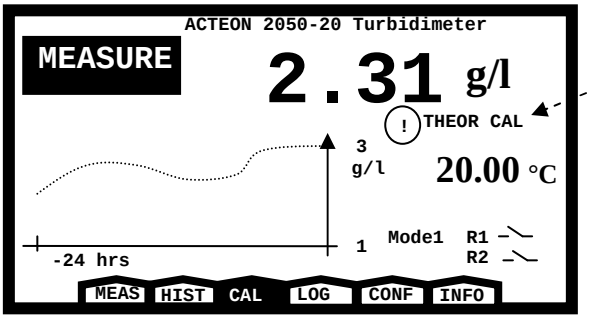
Use the △and▽keys to select the type of calibration and the probe to be calibrated.

Select the ▶ Theoretical calibration menu and press ENTER.



Use the △and▽keys to select the procedure confirmation.

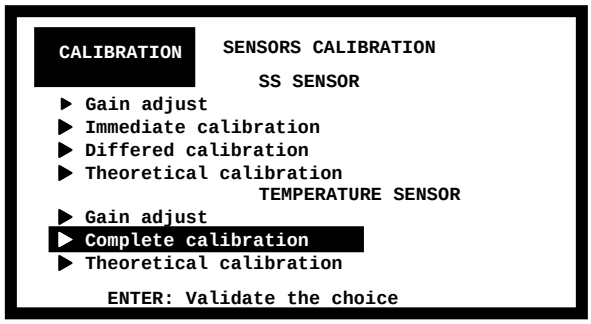
Select ▶ Yes and press ENTER to return to the theoretical coefficients.



Indicates that the device has been calibrated with the theoretical coefficients.

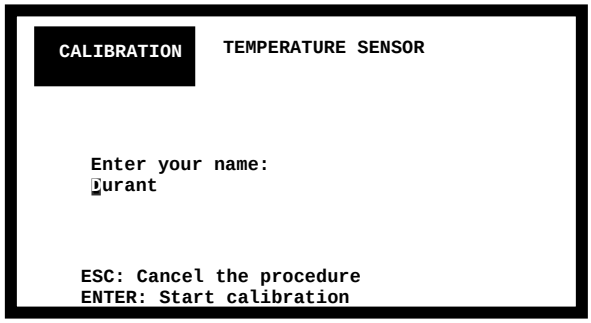
6.1.5 Two point temperature sensor calibration (complete calibration):

Use the following procedure to completely calibrate your temperature sensor.
You will need a precision thermometer and water at 0°C for this procedure.



Use the △and▽keys to select the type of calibration and the probe to be calibrated.

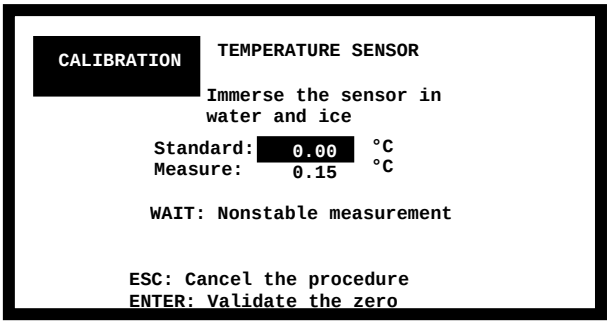
Select the ▶ Complete calibration menu of the temperature sensor and press ENTER.



Use the ▷and◁ keys to move the cursor in the name section.
Use the △and▽ keys to change the letters. (The scrolling order of the letters is A…Z,0..9,?,>,space)

Enter your name and reference and press ENTER.

Immerse the sensor in a water and crushed ice mixture at 0.00°C.



Use the △and▽ keys to adjust the water temperature value.

AWAIT MEASUREMENT STABILISATION

Press the ENTER key to confirm the first calibration point.

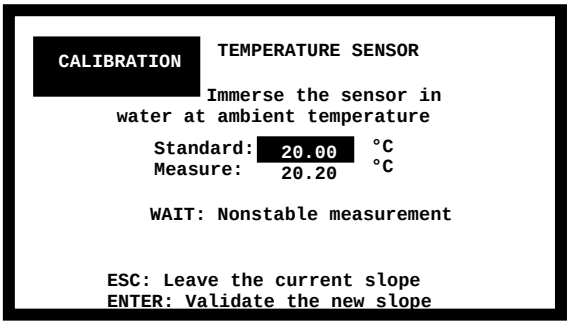
Calibration Correct ?

No

If the first calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.3.1)

Yes

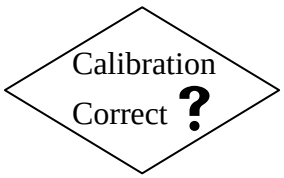
Immerse the sensor in water at ambient temperature.



Use the △and▽ keys to adjust the water temperature value.

AWAIT MEASUREMENT STABILISATION

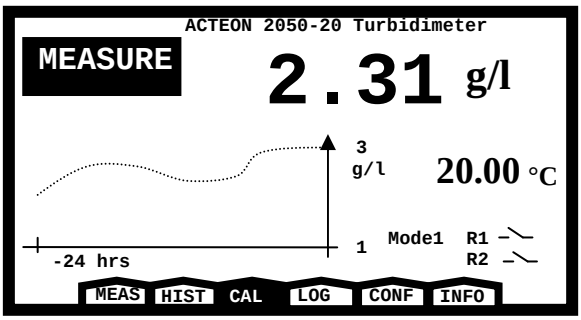
Press the ENTER key to confirm the second calibration point.



No

If the second calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.2.2)

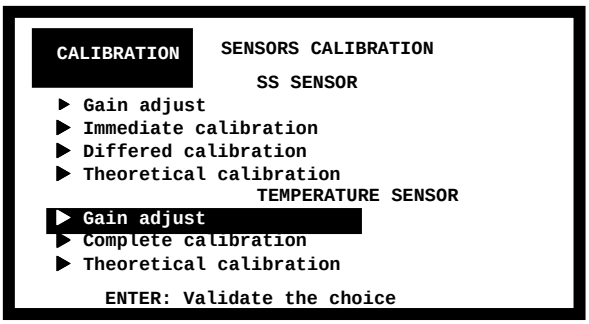
Yes



<u>Comment</u>: The measurement window is displayed again once the calibration has been correctly carried out.

6.1.6 Adjusting the temperature sensor slope:

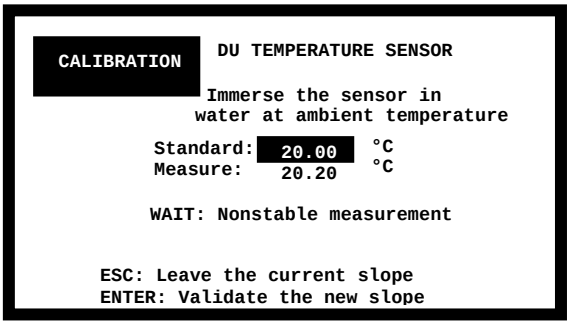
If you observe a small measurement error, you may only adjust the slope of your sensor by carrying out the following procedure:



Use the △and▽keys to select the type of calibration and the probe to be calibrated.

Select the ▶ Gain adjust menu of the temperature sensor and press ENTER.

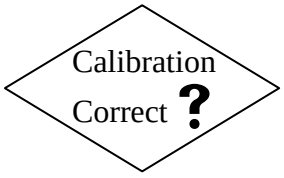
Immerse the sensor in water at ambient temperature.



Use the △and▽ keys to adjust the ambient water temperature value.

AWAIT MEASUREMENT STABILISATION

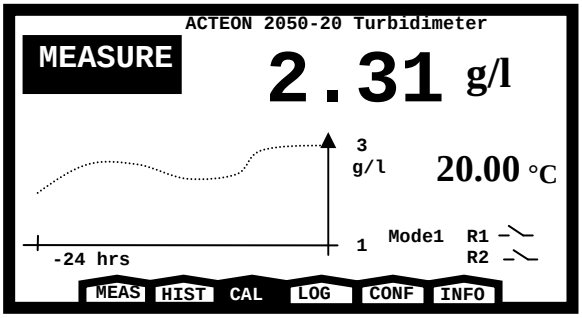
Press the ENTER key to confirm slope adjustment.



No

If the second calibration point is incorrect, an error message window appears (see "Error message information" chapter §6.3.2)

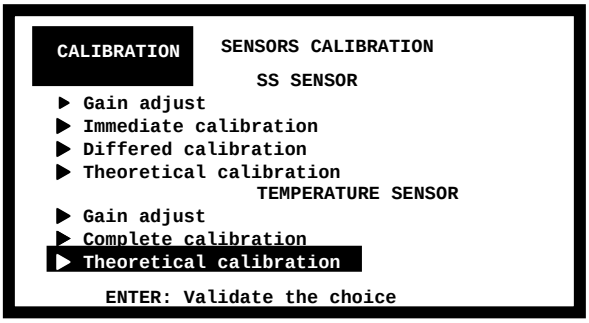
Yes



<u>Comment</u>: The measurement window is displayed again once gain adjust has been correctly carried out.

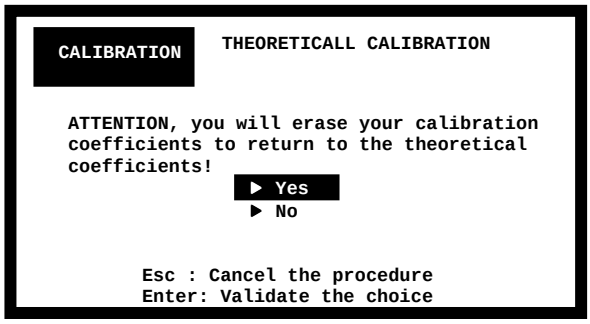
6.1.7 Returning to temperature measurement theoretical calibration:

Theoretical calibration is carried out using the theoretical coefficients (PT100 theoretical slope and offset zeroing).
Follow the instructions below to carry out theoretical calibration:



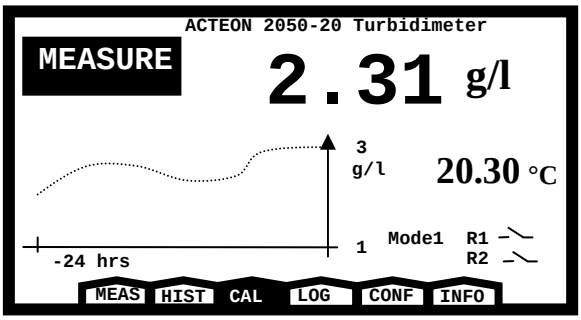
Use the △and▽keys to select the type of calibration and the probe to be calibrated.

Select the ▶ Theoretical calibration menu and press ENTER.



Use the △and▽keys to select the procedure confirmation.

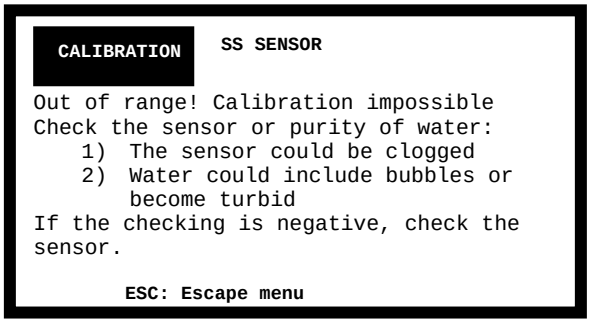
Select ▶ Yes and press ENTER to return to the theoretical coefficients.



6.2 SS sensor calibration error message

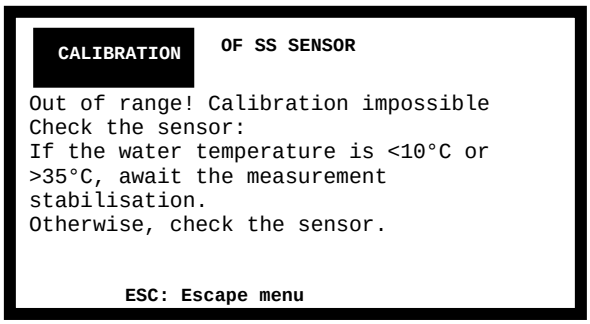
6.2.1 CLEAN WATER calibration error

One of two messages may be displayed depending on the calibration error.
1) First type of information:



Your SS sensor response is too low:
1) Clean the sensor head with a water jet, focussing on the insides of the optical measuring channel.
2) Replace the water with clean water.

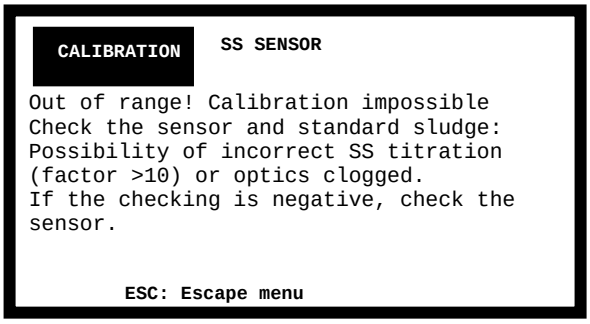
2) Second type of information:



Your SS sensor response is too high:
1) Check the water temperature.

If you are unable to calibrate the SS sensor after these checks, seek advice from an after-sales service (see last page).

6.2.2 SLUDGE calibration error



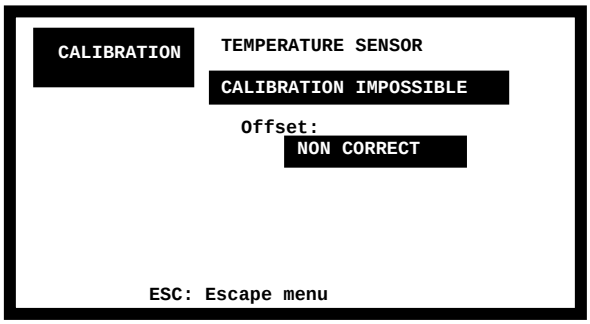
Your SS sensor response is too low:

1) Check the sludge titration (dry weight).
2) Clean the sensor head with a water jet, focussing on the insides of the optical measuring channel.

If you are unable to calibrate the SS sensor after these checks, seek advice from an after-sales service (see last page).

6.3 Temperature sensor calibration error message information

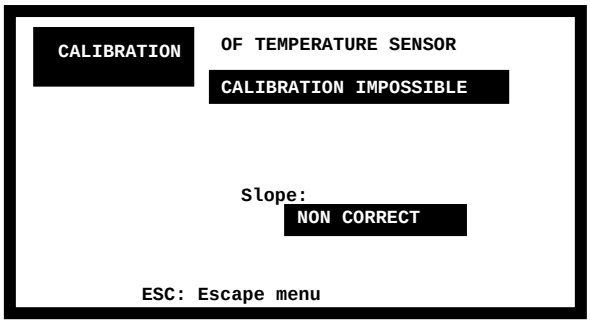
6.3.1 0℃ calibration error



If an error occurs during calibration in water at 0°C:
1) Check the water temperature with a precision thermometer.
2) Check the connection between the temperature sensor and ACTEON 2050.

If you are unable to calibrate the SS sensor after these checks, seek advice from an after-sales service (see last page).

6.3.2 Ambient water calibration error



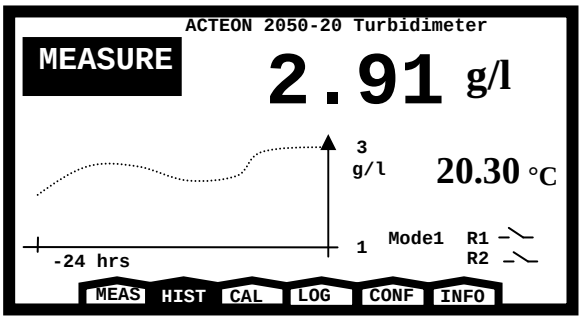
If an error occurs during calibration in water at ambient temperature:
1) Check the water temperature with a precision thermometer.
2) Check the connection between the temperature sensor and ACTEON 2050.

If you are unable to calibrate the SS sensor after these checks, seek advice from an after-sales service (see last page).

7 VIEWING MEASUREMENT HISTORY

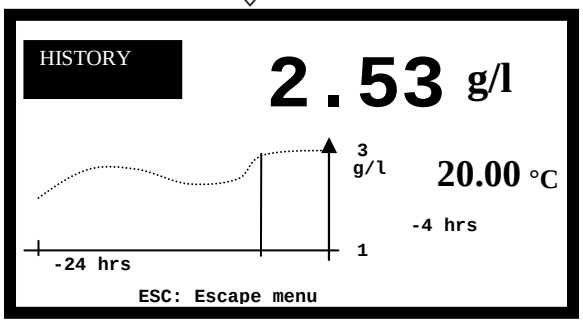
The history menu can be used to consult the last 100 data items recorded and displayed on the trend line.

To view this data, follow the instructions below:



Use the ▷and◁ keys to navigate the ACTEON menu.

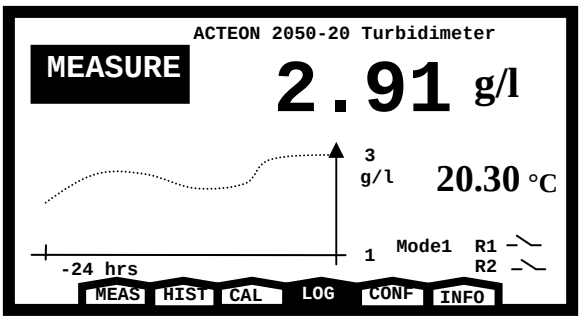
Select the HIST menu and press ENTER.



Use the ▷and◁ keys to move the cursor along the trend line.

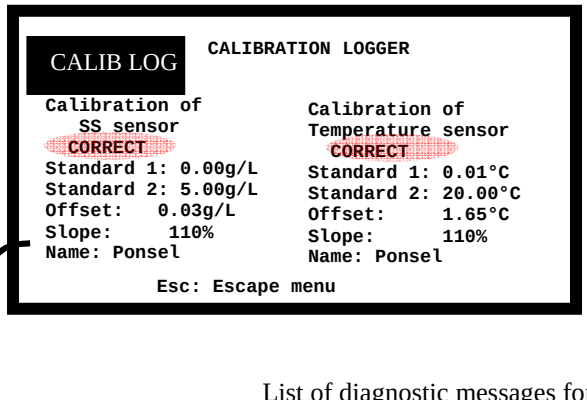
8 VIEWING THE SENSOR CALIBRATION REPORT

The calibration logger is used to check the reports of the most recent calibrations.
Follow the instructions below to access this information:



Use the ▷and◁ keys to navigate the ACTEON menu

Select the LOG menu and press ENTER.

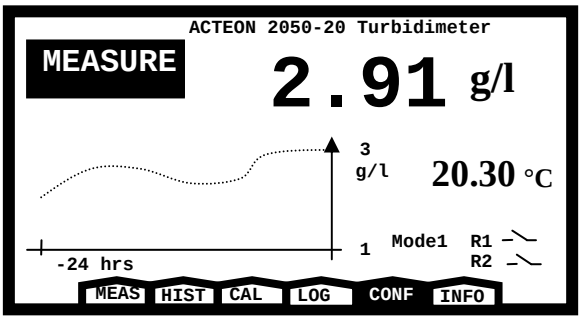


List of diagnostic messages for the last calibration:

Message	Explanation
CORRECT	ACTEON 2050 has been calibrated correctly.
THEORETICAL coef.	ACTEON 2050 is using the theoretical coefficients (slope and zero turbidity). This message is displayed after a theoretical calibration.
THEORETICAL slope	ACTEON 2050 is using the theoretical slope.
THEORETICAL zero	ACTEON 2050 is using the theoretical zero turbidity (transmission in clean water).
THEORETICAL offset	ACTEON 2050 is using the theoretical offset (SS sensor offset can be adjusted in the configuration menu (§9.3).
INCORRECT slope	ACTEON 2050 is incorrectly calibrated because the slope calculated during calibration is incorrect (in this case ACTEON 2050 is using the last correctly calculated slope).
INCORRECT zero	ACTEON 2050 is incorrectly calibrated because the zero turbidity (transmission in clean water) calculated during calibration is incorrect (in this case ACTEON 2050 is using the last correctly calculated slope).
INCORRECT offset	ACTEON 2050 is incorrectly calibrated because the offset measured during offset adjustment is incorrect (in this case ACTEON 2050 is using the last correctly measured offset).
AWAITING DRY WEIGHT	ACTEON 2050 is awaiting the information obtained from the sludge analysis in order to complete the differed calibration.

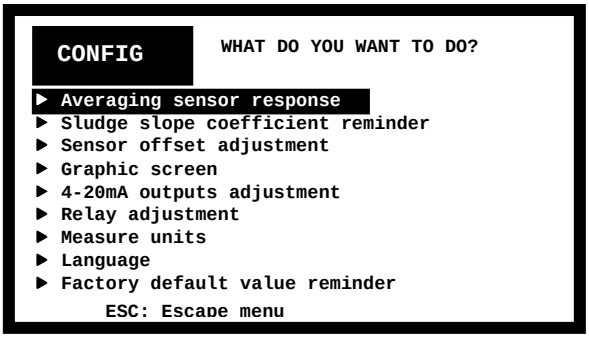
9 CONFIGURING ACTEON 2050

Select the configuration menu in the measurement window:



Use the ▷and◁ keys to navigate the ACTEON menu.

Select the **CONF** menu and press ENTER.



9.1 Configuring sensor response averaging

This configuration makes the sensor response more stable and responsive.
By default, the averaging procedure involves 10 measurements. This means that the displayed value is the average measurement over the last 10 seconds:

```
CONFIG        WHAT DO YOU WANT TO DO?

▶ Averaging sensor response
▶ Sludge slope coefficient reminder
▶ Sensor offset adjustment
▶ Graphic screen
▶ 4-20mA outputs adjustment
▶ Relay adjustment
▶ Measure units
▶ Language
▶ Factory default value reminder
      ESC: Escape menu
```

Use the △and▽keys to select the configuration required.

Select the ▶ Averaging sensor response menu and press ENTER.

```
CONFIG        AVERAGING SENSOR RESPONSE

Average on: 10 measures.

1   = Instantaneous answer
100 = Answer very strongly averaged


        Esc : Cancel the procedure
        Enter: Validate the averaging
```

Use the △and▽ keys to increase and decrease the averaging.

Select the averaging desired and press ENTER.

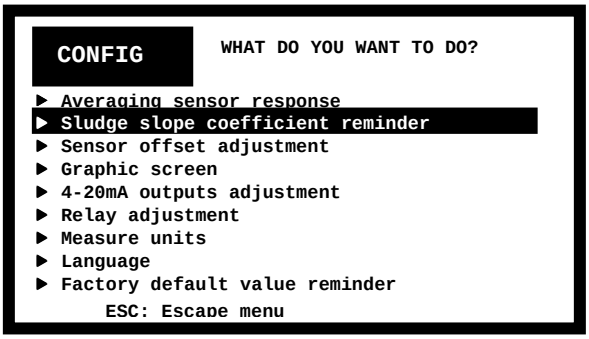
```
CONFIG        WHAT DO YOU WANT TO DO?

▶ Averaging sensor response
▶ Sludge slope coefficient reminder
▶ Sensor offset adjustment
▶ Graphic screen
▶ 4-20mA outputs adjustment
▶ Relay adjustment
▶ Measure units
▶ Language
▶ Factory default value reminder
      ESC: Escape menu
```

Comment:
Increase the averaging if your measurement is unstable.
Decrease the averaging if the measurement process is too slow.

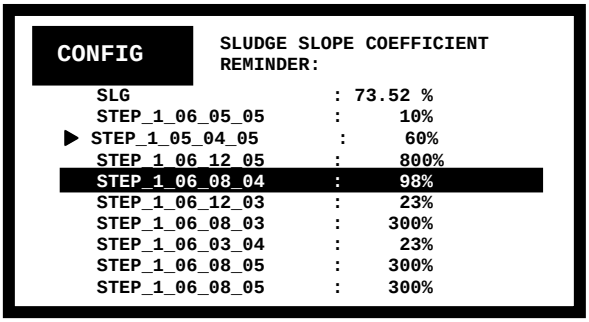
9.2 Sludge slope coefficient reminder

ACTEON 2050 can be used to retrieve the last 10 slope coefficients:



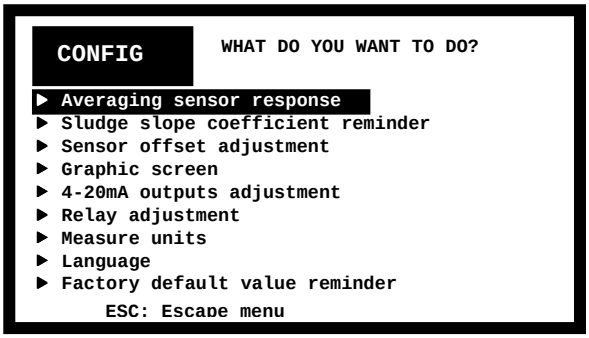
Use the △and▽keys to select the configuration required.

Select the ▶ Sludge slope coefficient reminder menu and press ENTER.



Use the △and▽ keys to select the 10 last slopes (taken during calibrations).

Select the desired slope and press ENTER.

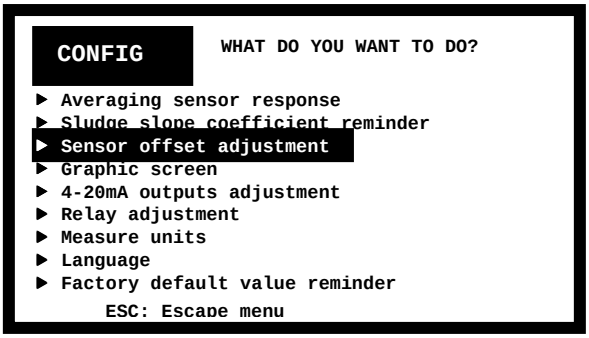


Comment:

▷indicates the slope currently used.

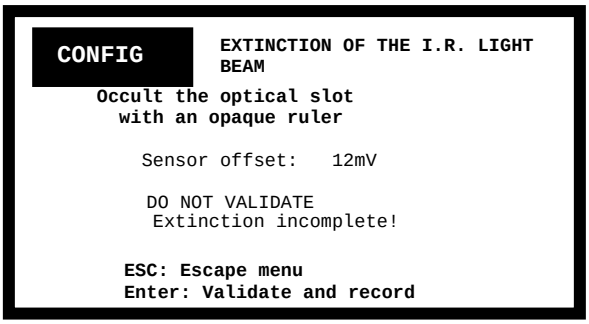
9.3 Adjusting SS sensor offset

You must adjust the SS sensor offset when activating or changing the SS sensor. This operation should be carried out only once.



Use the △and▽keys to select the configuration required.

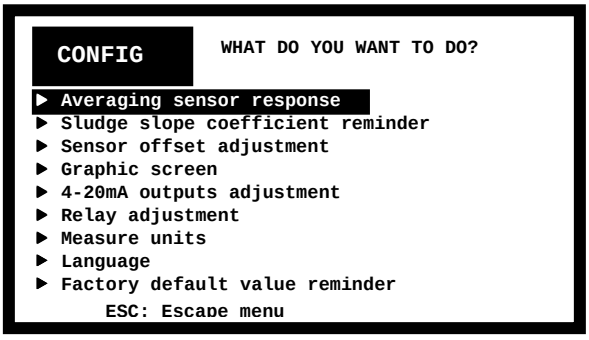
Select the ▶ Sensor offset adjustment menu and press ENTER.



Cover the optical slot with a dark coloured ruler and press ENTER.

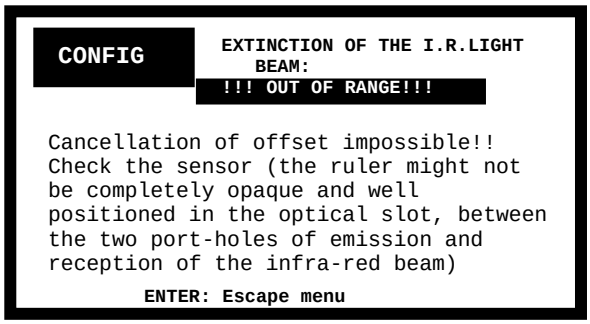
Offset Correct ? — No → If the offset is too high check that the dark coloured ruler is positioned properly over the optical slot (see following page)

Yes

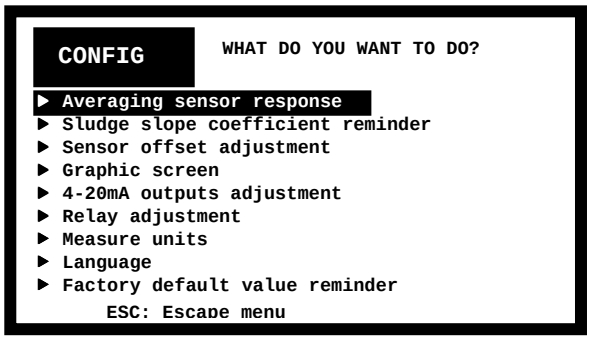


<u>Comment:</u> SS sensor offset has been correctly adjusted.

The following message will be displayed if the offset is incorrect:



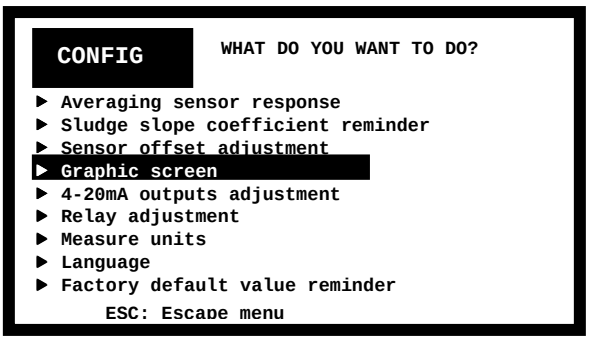
Press the ENTER key then restart SS sensor offset adjustment.



<u>Comment:</u> The SS sensor offset has not been updated. Your device is using the last correct offset.

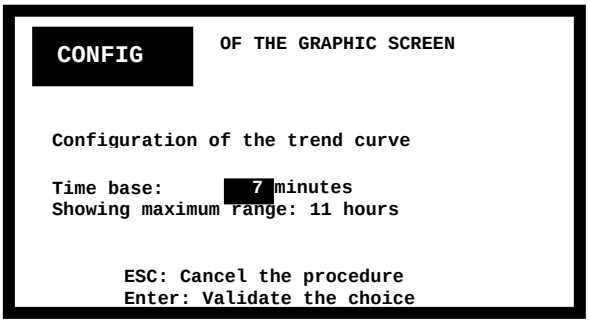
9.4 Configuring the trend line

The trend line can be used to check regulation cycles and detect anomalies.
Follow the instructions below to adapt the time base to the trend line:



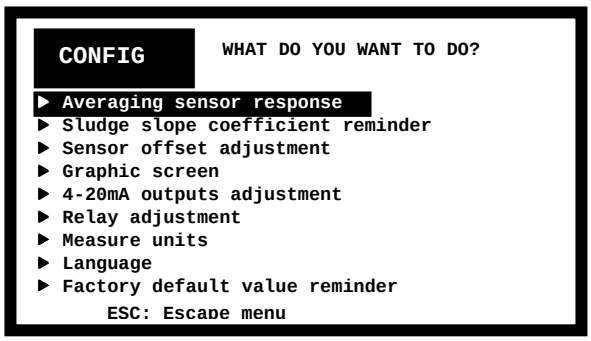
Use the △and▽keys to select the configuration required.

Select the ▶ Graphic screen menu and press ENTER.



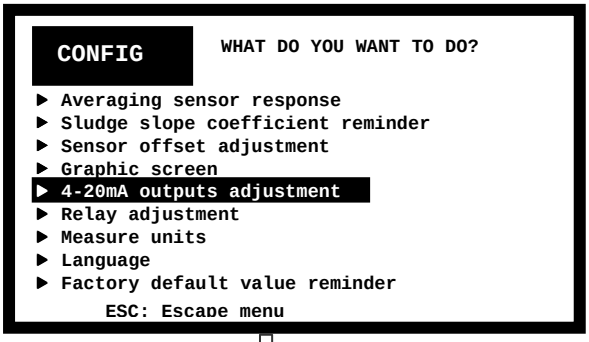
Use the △and▽ keys to increase the time base in order to adjust the duration of the trend curve. (1 sec to 15 min)

Select the time base chosen and press ENTER.



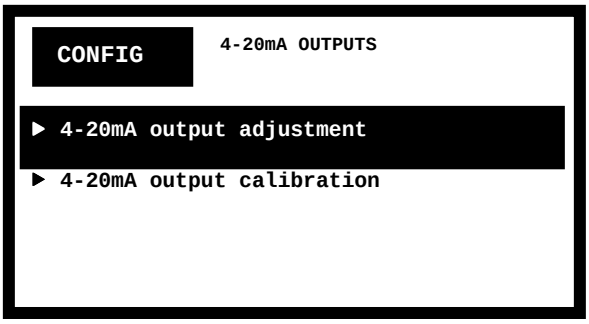
9.5 Configuring the two 4-20mA outputs

Comment:
For greater 4-20mA output precision, it is advised to calibrate the outputs during activation.

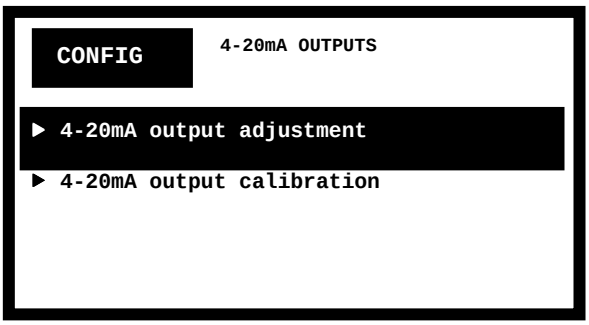


Use the △and▽keys to select the configuration required.

Select the ▶ 4-20mA output adjustment menu and press ENTER.

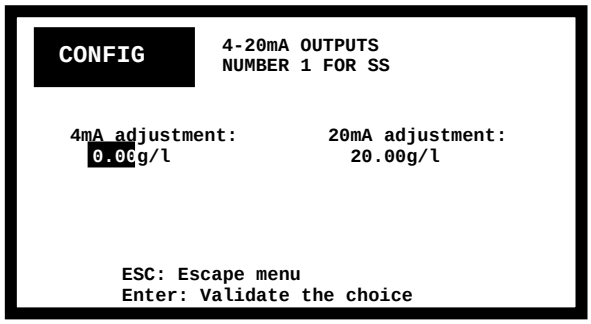


9.5.1 Adjusting 4-20mA output stop thresholds



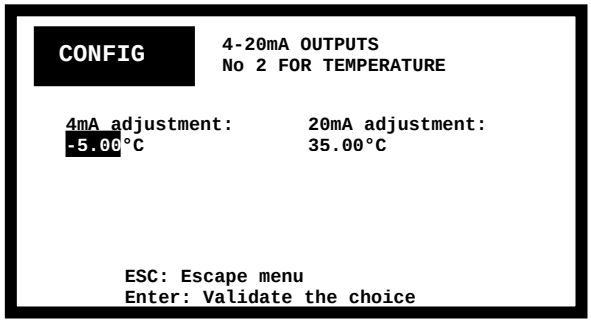
Use the △and▽keys to select the configuration required.

Select the **4-20mA output adjustment** menu and press ENTER.

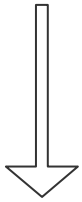


Use the △and▽ keys to increase and decrease the 4 and 20mA stop values.
Use the ◁ and ▷ keys to select 4mA or 20mA.

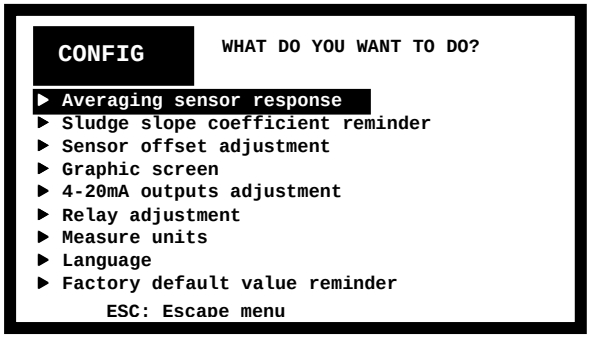
Configure the SS 4-20mA output and press ENTER.



Use the △and▽ keys to increase and decrease the 4 and 20mA stop values.
Use the ◁ and ▷ keys to select 4mA or 20mA.



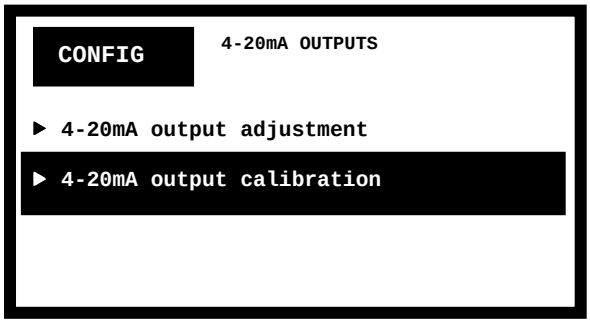
Configure the 4-20mA output for temperature and press ENTER.



<u>Comment:</u> Both 4-20mA outputs have been configured correctly.

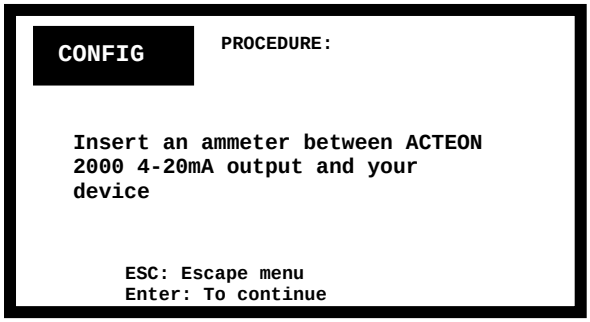
9.5.2 Calibrating 4-20mA outputs

Calibrating the 4-20mA outputs improves their level of accuracy by taking into account the device load.

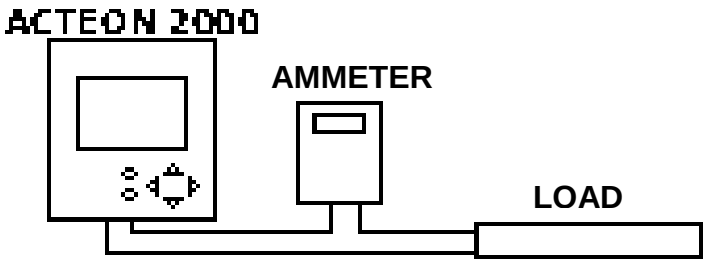


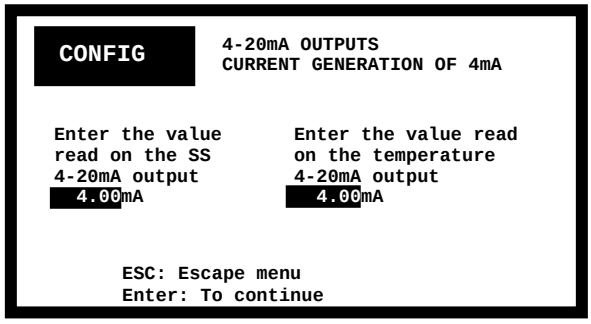
Use the △and▽keys to select the configuration required.

Select the **▶ 4-20mA output calibration** menu and press ENTER.



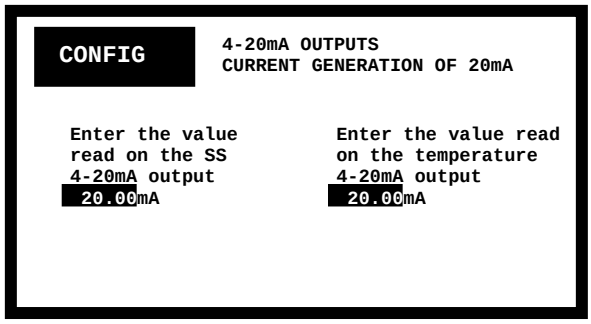
Insert an ammeter between your device (surveillance, datalogger, etc.) and the ACTEON 4-20mA outputs and press ENTER.





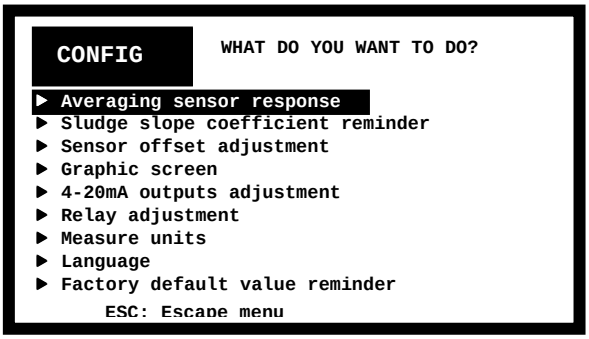
Use the △and▽ keys to increase and decrease the 4mA value.
Use the ◁ and▷ keys to select the pH 4-20mA output or the temperature 4-20mA output.

Adjust the 4mA outputs and press ENTER.



Use the △and▽ keys to increase and decrease the 20mA value.
Use the ◁ and ▷ keys to select the pH 4-20mA output or the temperature 4-20mA output.

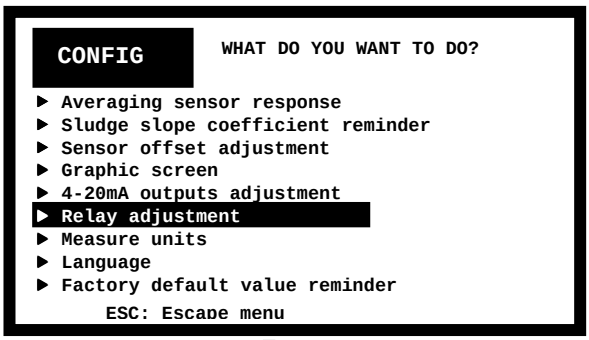
Adjust the 20mA outputs and press ENTER.



9.6 Adjusting relay outputs

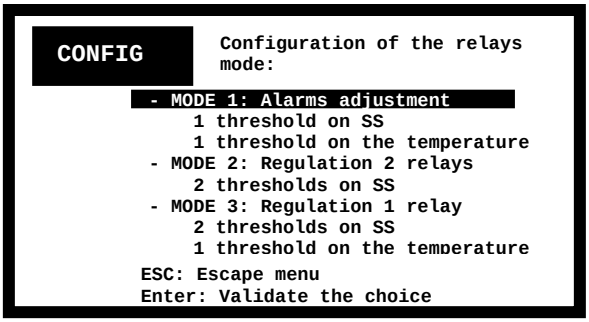
The 2 relays can be configured in 3 different modes:
- Mode 1 is used to configure relay R1 on an SS measurement value and relay R2 on a temperature measurement value.
- Mode 2 is used to configure relays R1 and R2 on two SS measurement values.
- Mode 3 is used to configure:
  - relay R1 on two SS measurement thresholds in regulation mode (forced start-up and shutdown delays can be configured).
  - relay R2 on a temperature measurement threshold in alarm mode.

The 2 relays can be configured with the following attributes:
- Alarm threshold: Threshold trigger value
- Hysteresis: Hysteresis value for relay switching (prevents relay hunting)
- Triggering direction:
  - Above: Means the relay contact is closed above the alarm threshold.
  - Below: Means the relay contact is open below the alarm threshold.
- Forced start-up and shutdown delay (only in mode 3)



Use the △and▽keys to select the configuration required.

Select the ▶ Relay adjustment menu and press ENTER.



Use the △and▽keys to select the configuration required.

9.6.1 Configuring relays in mode 1:

```
CONFIG      MODE 1: ADJUSTMENT OF THE
            THRESHOLDS AND HYSTERESIS

Rel 1 connected to SS measurement:
Alarm threshold: 2.01g/l Hyst: 0.10g/l
Above the threshold, R1 is on

Rel 2 connected to temperature measurement:
Alarm threshold:20.01°C Hyst: 0.06°C
Above the threshold, R2 is on

        ESC: Cancel the procedure
        Enter: Validate the choice
```

Use the △and▽keys to increase the values.
Use the ◁ and ▷ keys to navigate the selections.

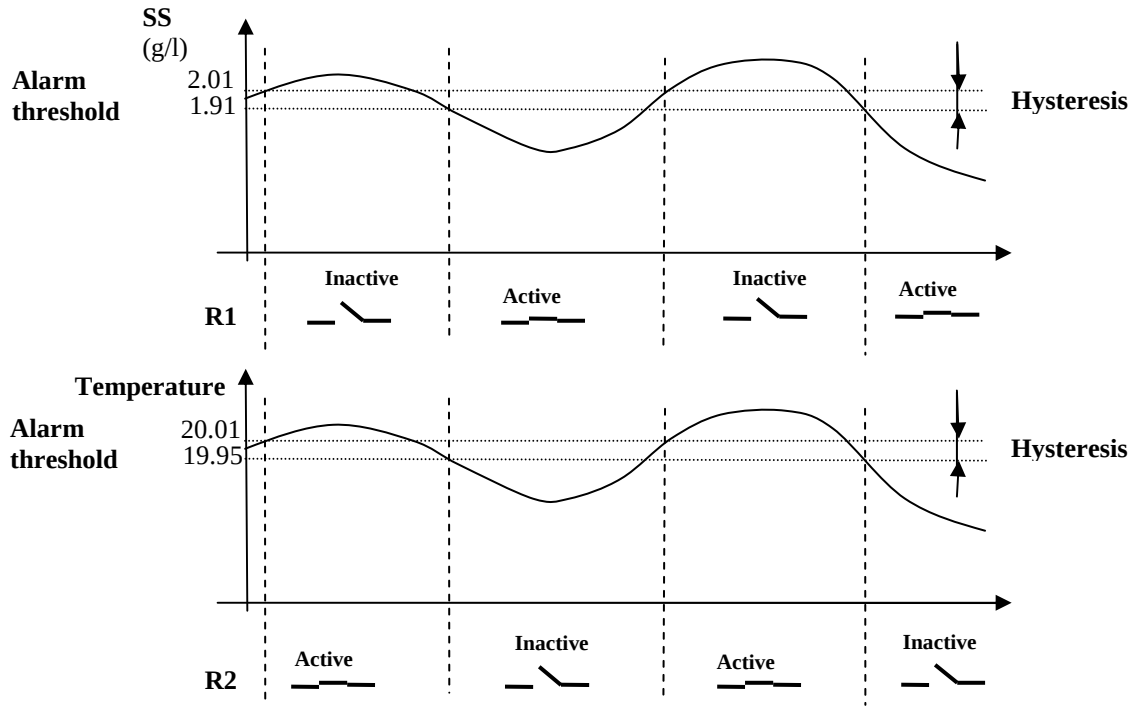
Configure the two relays and press ENTER.

```
CONFIG      WHAT DO YOU WANT TO DO?

▶ Averaging sensor response
▶ Sludge slope coefficient reminder
▶ Sensor offset adjustment
▶ Graphic screen
▶ 4-20mA outputs adjustment
▶ Relay adjustment
▶ Measure units
▶ Language
▶ Factory default value reminder
      ESC: Escape menu
```

<u>Comment:</u> Both relays are configured correctly in mode 1.

In the above example, the relays are configured as indicated below:



9.6.2 Configuring relays in mode 2:

```
CONFIG      MODE 2: ADJUSTMENT OF THE
            THRESHOLDS AND HYSTERESIS

Rel 1 connected to SS measurement:
Alarm threshold: 2.01g/l Hyst: 0.10g/l
Below the threshold, R1 is on

Rel 2 connected to SS measurement:
Alarm threshold: 4.51g/l Hyst: 0.10g/l
Above the threshold, R2 is on

        ESC: Cancel the procedure
        Enter: Validate the choice
```

Use the △and ▽keys to increase the values.
Use the ◁ and ▷ keys to navigate the selections.

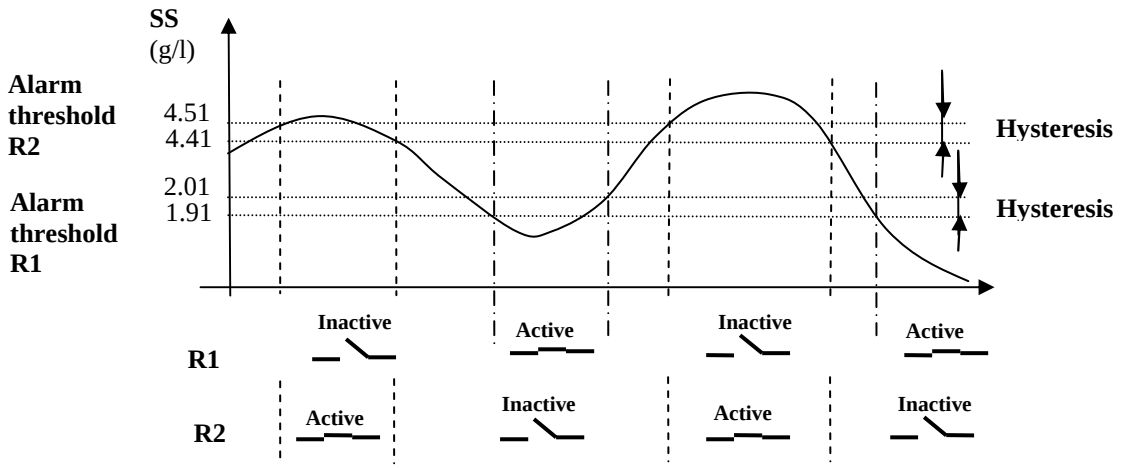
Configure the two relays and press ENTER.

```
CONFIG      WHAT DO YOU WANT TO DO?

▶ Averaging sensor response
▶ Sludge slope coefficient reminder
▶ Sensor offset adjustment
▶ Graphic screen
▶ 4-20mA outputs adjustment
▶ Relay adjustment
▶ Measure units
▶ Language
▶ Factory default value reminder
      ESC: Escape menu
```

<u>Comment:</u> Both relays are configured correctly in mode 2.

In the above example, the relays are configured as indicated below:



9.6.3 Configuring relays in mode 3:

```
CONFIG    MODE 3: HYSTERESIS THRESHOLD
          AND DELAY ADJUSTMENT

Rel 1 connected to SS measurement:

High turbidity threshold      :  5.50g/l
Forced start-up delay         :    10 min
Low turbidity threshold       :  3.50g/l
Forced shutdown delay         :     3 min

        ESC: Cancel the procedure
        Enter : Validate the choice
```

Use the △and▽keys to increase and decrease the values.
Use the ◁ and ▷ keys to navigate the selections.

Configure relay 1 in regulation mode and press ENTER.

```
CONFIG    MODE 3: ADJUSTMENT OF THE
          THRESHOLD, HYSTERESIS AND
          TEMPERATURE
Rel 2 connected tO temperature measurement:
Alarm threshold: 20.01°C Hyst: 0.06°C
Above the threshold, R2 is on

        ESC: Cancel the procedure
        Enter: Validate the choice
```

Use the △and▽keys to increase and decrease the values.
Use the ◁ and ▷ keys to navigate the selections

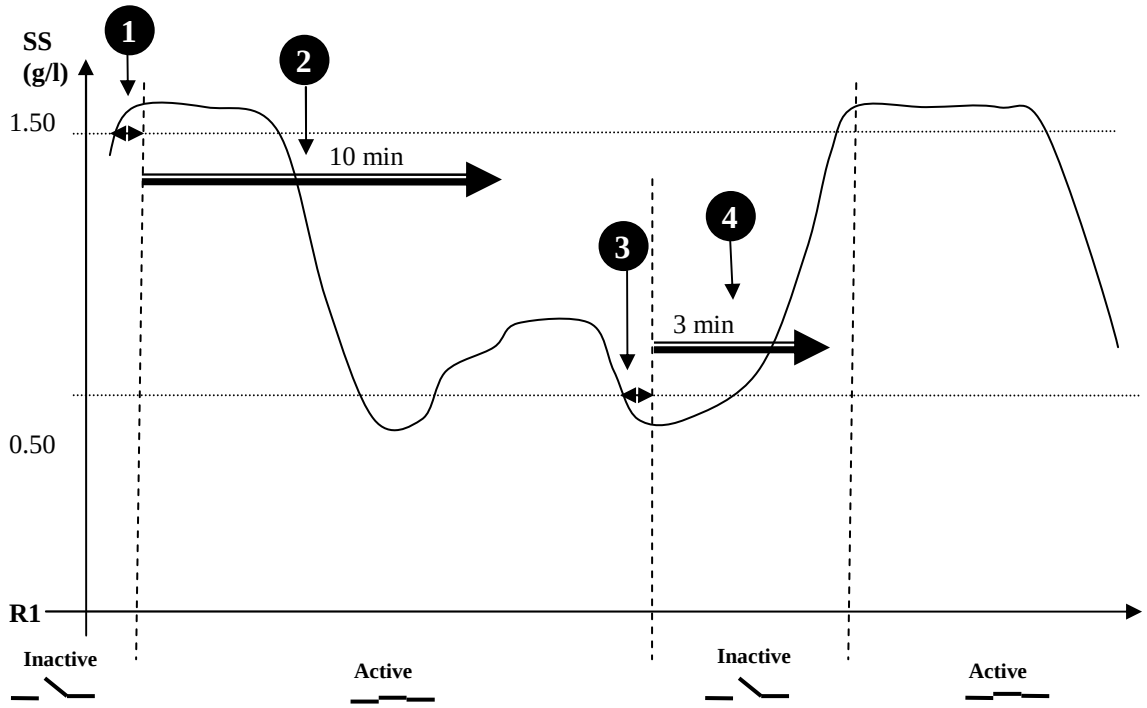
Configure relay 2 and press ENTER.

```
CONFIG    WHAT DO YOU WANT TO DO?

▶ Averaging sensor response
▶ Sludge slope coefficient reminder
▶ Sensor offset adjustment
▶ Graphic screen
▶ 4-20mA outputs adjustment
▶ Relay adjustment
▶ Measure units
▶ Language
▶ Factory default value reminder
      ESC: Escape menu
```

<u>Comment:</u> Both relays are correctly configured in mode 3.

In the above example, the relays are configured as indicated below:

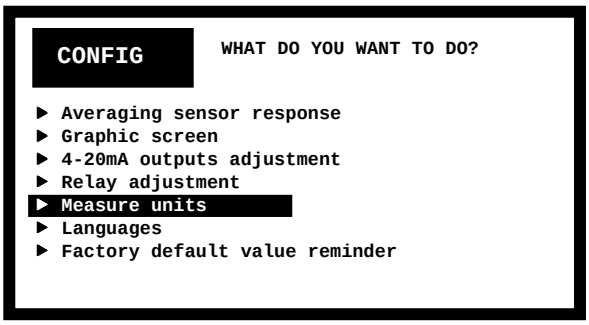


1. The SS value must go beyond the high threshold for at least 45 sec.
2. Forced start-up delay
3. The SS value must go beyond the low threshold for at least 45 sec.
4. Forced shutdown delay

Comment:
In mode 3, the high threshold must always be 1g/l higher than the low threshold.
During forced shutdown delay, the relay remains open regardless of the measured SS value.
During forced start-up delay, the relay remains open regardless of the measured SS value.

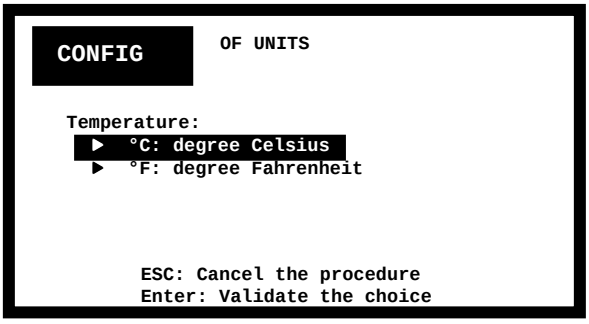
9.7 Adjusting measurement units:

ACTEON 2050 can be configured in °C and °F for temperature measurement.



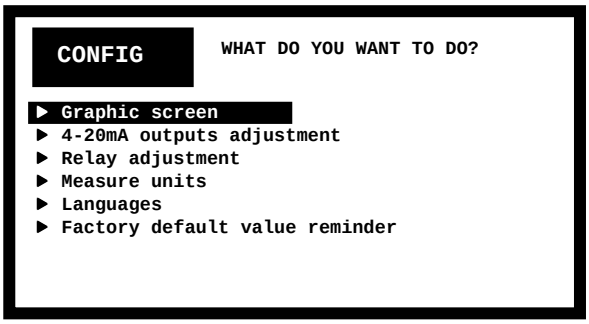
Use the △and▽keys to select the configuration required.

Select the ▶ Measure units menu and press ENTER.



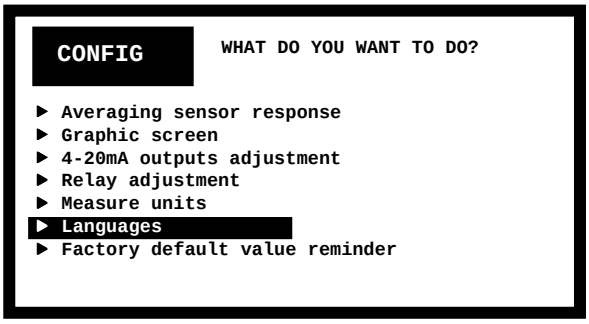
Use the △and▽keys to select the unit desired.

Select the required measurement unit and press ENTER.



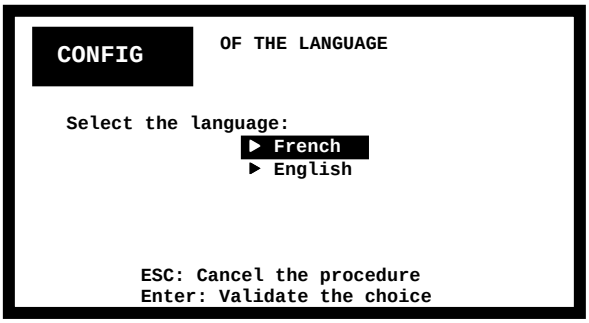
9.8 Setting the language:

ACTEON 2050 can be configured in French or English.



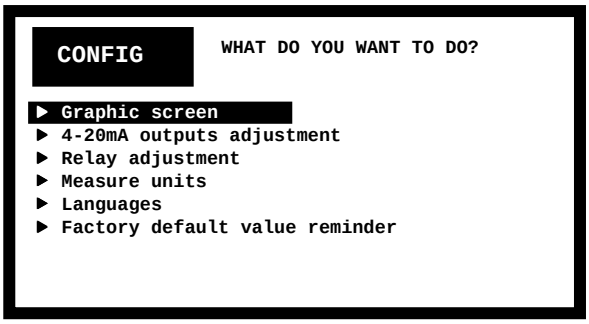
Use the △and▽keys to select the configuration required.

Select the ▶ Language menu and press ENTER.



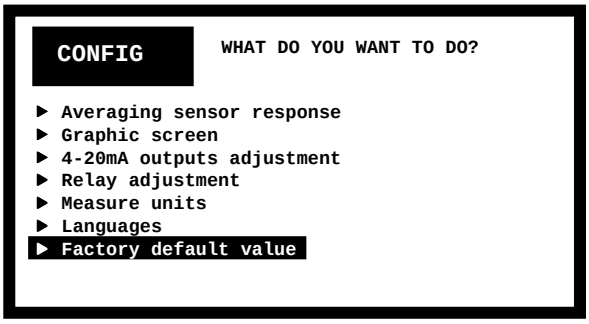
Use the △and ▽keys to select the language required.

Configure the language and press ENTER.



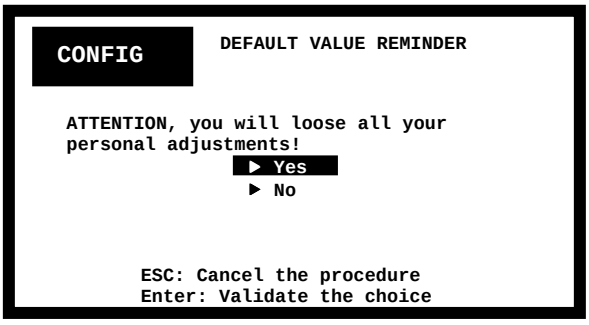
9.9 Resetting factory default values:

ACTEON 2050 can be reinitialised with the default parameters:



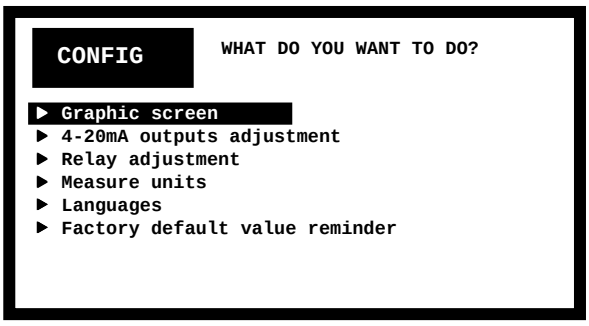
Use the △and▽keys to select the configuration required.

Select the ▶ Factory default value menu and press ENTER.



Use the △and▽keys to select the procedure confirmation.

Select ▶ Yes and press ENTER.

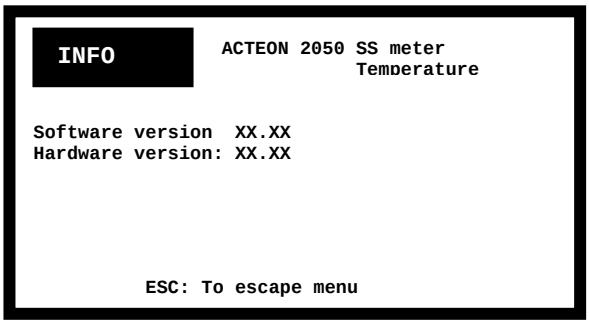


After having reset the factory default parameters, ACTEON 2050 will be configured with the following parameters:

Sensor response averaging	30 measurements
SS sensor offset	0mV
Time base for trend line display	1 minute
4-20mA output adjustment	SS output: The 4mA stop is set to 0g/l and the 20mA stop is set to 20g/l (ACTEON 2050-20) or 50g/l (ACTEON 2050-50) Temp. °C output: The 4mA stop is set to -5°C and the 20mA stop is set to 35°C.
Relay output adjustment	The relays are configured in mode 1: - R1: threshold: 0.00g/l hyst: 0.20 below the threshold, relay R1 is active. - R2: threshold: 50.00°C; hysteresis: 0.10 above the threshold, relay R2 is active
Temperature measurement unit	°C
Language	English

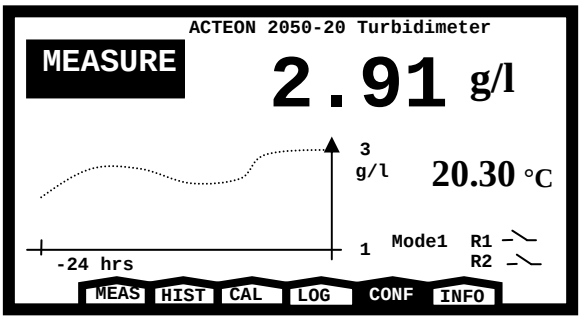
10 Information menu

The INFO window provides information on the device type and version. The software and hardware versions will be requested when you call PONSEL Technical support or After-sales service.



11 ADJUSTING THE ACTEON 2050 DISPLAY CONTRAST

The LCD screen contrast can be adjusted to modify the display. This adjustment is only possible from the measurement window.



Press the ESC and ▽ keys simultaneously to reduce the contrast.
Press the ESC and △ keys simultaneously to increase the contrast.

12 Technical specifications:

Technical specifications	
Suspended solids measurement range (temperature compensated)	***0-20g/l for Acteon 2050-20*** ***0-50g/l for Acteon 2050-50***
Suspended solids measurement accuracy	***+/0.5% of the full scale***
Temperature measurement range	***-10.00 to +50.00°C***
Temperature measurement accuracy (°C)	***±0.1°C***
Casing	***ABS (IP 65)***
Display	***Liquid crystal display (LCD) screen***
Operating temperature	***-25°C to +55°C***
Power supply	**230/115VAC 60Hz, optional:** ***12-24VDC*** ***Protected by a 250mA fuse***
Max power consumption	***10VA***
4-20mA outputs	***2 galvanic isolation outputs (max resistive load 700ohms):*** ***- Adjustable from 0.00 to 20.00g/l or 0.00 to 50.00g/l depending on the model*** ***- Adjustable from 10.00°C to +50.00°C***
Relay outputs	***2 relays that can be configured in 3 different modes:*** ***- Adjustment in alarm mode (1 SS and 1 temperature (°C) threshold)*** ***- Adjustment in adjustment mode (2 SS thresholds)*** ***- Adjustment in adjustment mode (2 SS and 1 temperature (°C) threshold)*** ***Interrupting capacity: 3A under 230VAC or 50VDC***
Standard	***CE***

13 Sensors

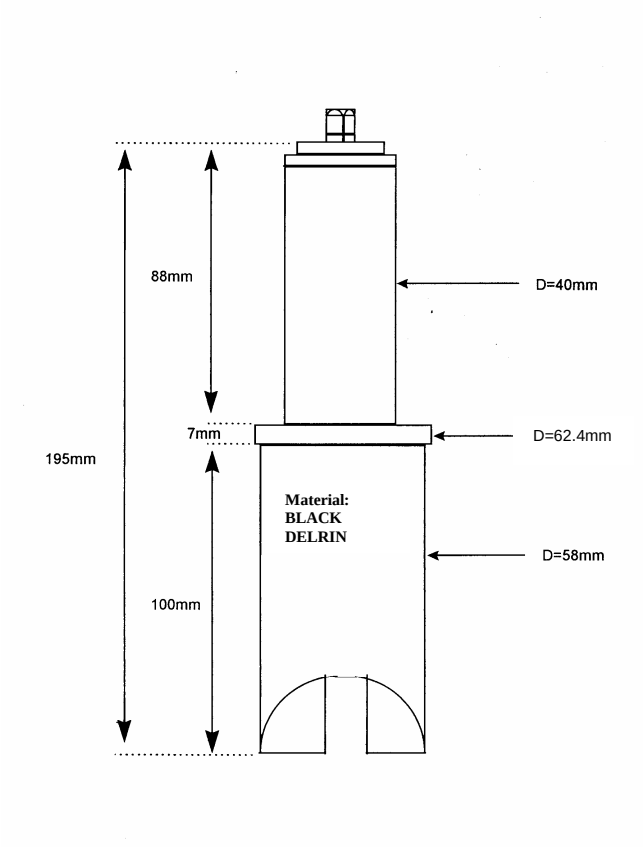
13.1 SS sensor

13.1.1 Specifications:

Operating temperature: -10°C to 50°C
Max operating pressure: 5 bars (completely submersible with cable: IP 68 protection)
Material: PVC bodied sensor
Weight: Approx. 1kg

Working range: 0-20g/l (for Acteon 2050-20)
0-50g/l (for Acteon 2050-50)
(Average for urban sludge in real extended aeration)
Emission/reception wavelength: λ_0 = 950nm (5mm optical length)
Type of emission: Pulsed
Recurrence frequency: 10Hz
Transmitted signal: intensity of light transmitted at 0° (demodulated continuous low impedance 0-1V signal).
Unaffected by daylight. NTC thermistor temperature compensation (from 5°C to 35°C)

13.1.2 Mechanical diagram:



13.1.3 Maintenance:

Depending on the type of environment, periodically rinse the probe thoroughly with a water jet, particularly focussing on the insides of the optical measuring channel.

Never use hard, pointed, rough or blunt objects such as wire brushes, cutters, screwdrivers, knives, and scrapers to clean the SS sensor. This may damage the probe and scratch the optics or remove their polish.
Preferably use a soft cloth or paper towel soaked in alcohol to clean the SS sensor optics. Never scrape or scratch the glass optic windows: Soak them for 1 hour in clean water, surface active agent + diluted scale inhibitor (for dry dirt layer and limestone deposits) solution.
Advice: For better cleaning results, finish cleaning by rubbing both windows with alcohol-soaked cotton buds.

Recommended cleaning frequency:

For urban wastewater treatment active sludge, it is recommended to clean the optics every two weeks.

Comment:
The best possible cleaning frequency for optics in this kind of probe can only be determined through experimentation as the dirt level depends on several factors which vary according to sites, processes, sludge quality, hydraulics, etc.
This frequency may be increased from one week to one month as the case may be.

If you notice a lot of damping in the measurements:
- Clean the SS sensor (especially the optics)
- Zero calibrate in clean water

13.2 Temperature sensor

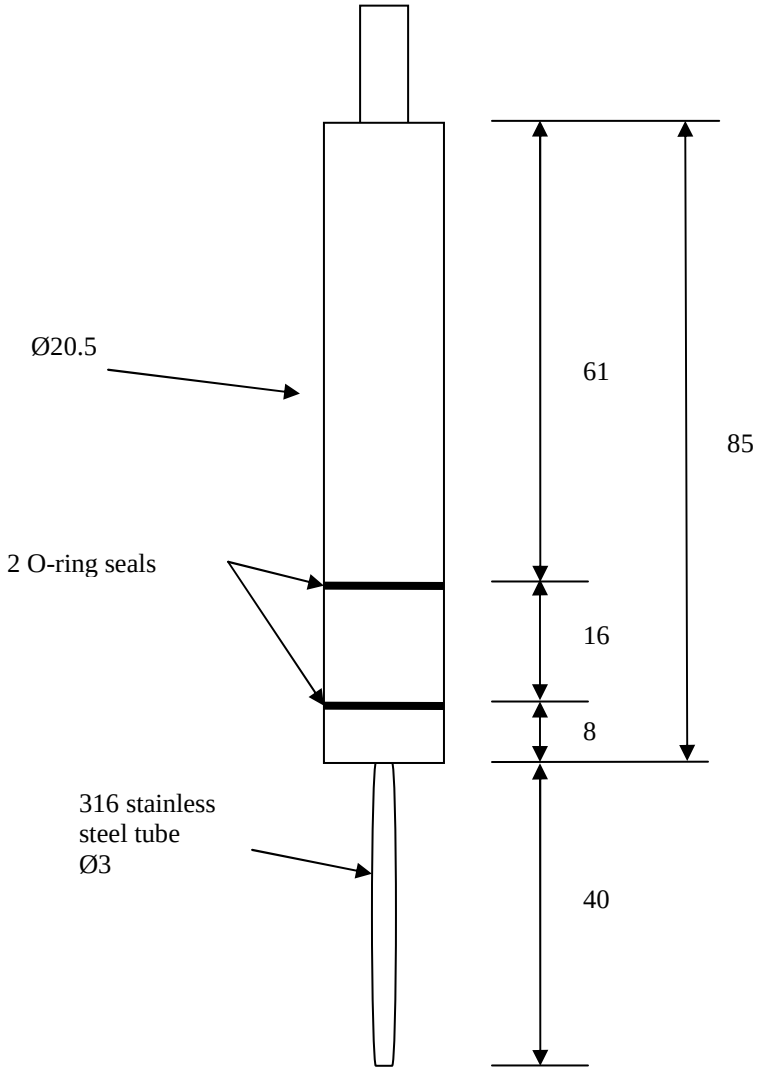
Stainless steel sensor with DELRIN shaft

Working temperature: -20 to 55°C
Pressure: 5 bars max
Cable: stranded
Measurement principle: PT100 (3-wire assembly)

13.2.1 Maintenance:

Rinse the temperature sensor with a water jet every 3 months.

13.2.2 Mechanical diagram:



14 Questions & Answers

14.1 Display screen troubleshooting:

The LCD screen is too dark:

Press ESC then press the ▽ key several times to reduce the contrast.

Strange characters are displayed on the LCD screen:

RESET the microcontroller and follow the instructions below to reinitialise the LCD screen:

1) Open the ACTEON 2050 transmitter box.

2) Insert a LEAD or PLASTIC PENCIL in the hole located on the upper part of the box. DO NOT USE SCREWDRIVERS OR METAL INSTRUMENTS.

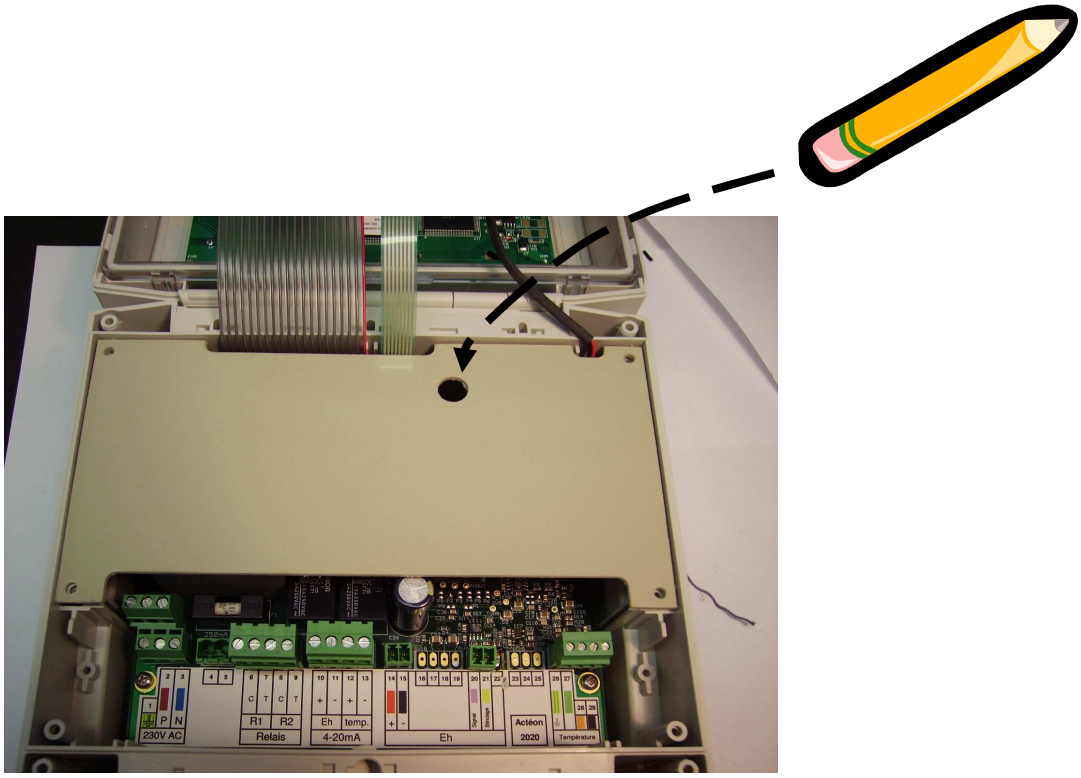


Figure 8 – Resetting ACTEON 2050

3) Check that the display screen restarts.

Comment:

Your settings and calibrations are not lost but saved on the EEPROM.

14.2 SS measurement troubleshooting:

If you notice a lot of damping in the measurements:
- Clean the SS sensor (especially the optics)
- Zero calibrate in clean water

15 Appendix:

Wiring diagram for the ACTEON 2050 terminal:

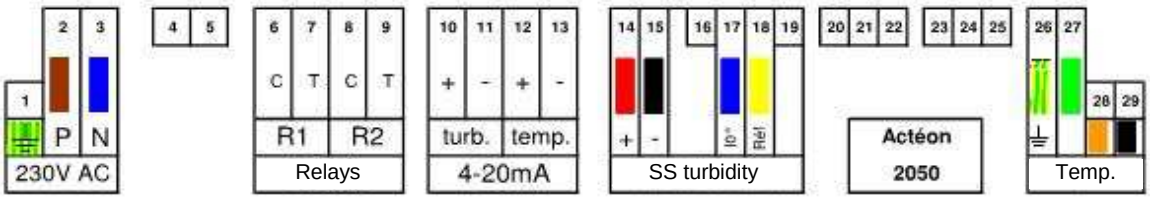


Figure 9 - Transmitter wiring terminal layout

If the temperature sensor is not connected, terminal points 28 and 29 must be connected to the shunt (supplied with the terminal).
If the temperature sensor is connected, the shunt between terminal points 28 and 29 must be removed.

Before shutting the ACTEON cover, check that the cover sealing joint is correctly positioned in its groove.

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