

Getting started with the Statox 506

**This instruction is for quick orientation!
Prior to installation and operation please download and
read the detailed manual. Manuals in several languages
are accessible on our homepage www.compur.com.**

1 Safety Instructions

Statox 506 is a transmitter designed as an intrinsically safe device, group 2 category II. It measures the concentration of toxic gases and oxygen in ambient air. It is safe to be operated in classified areas zone 1 and zone 2.

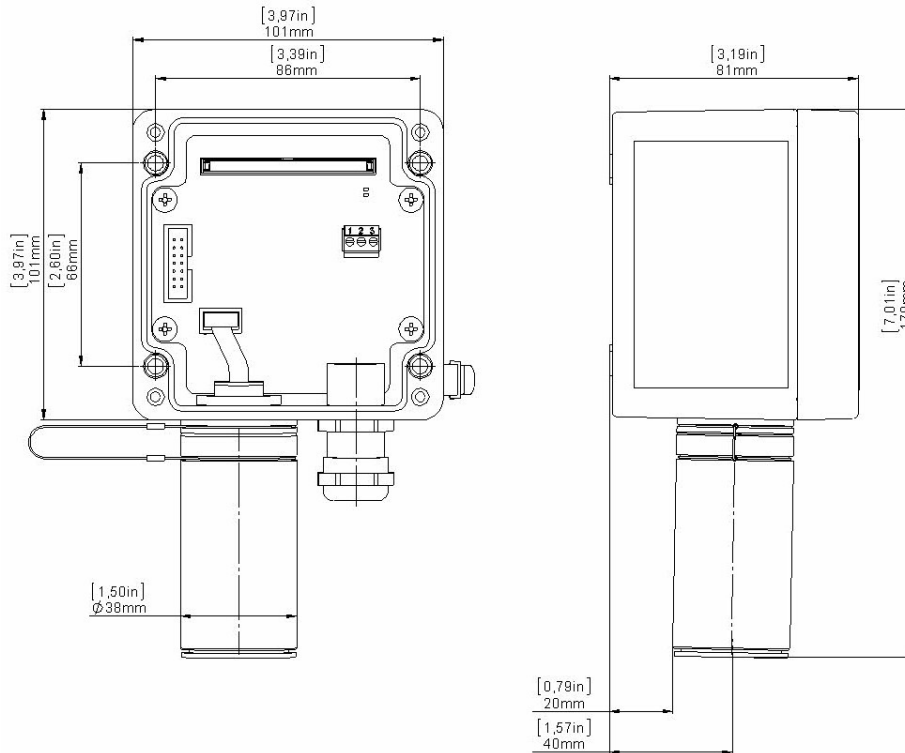
The gas specific parameters are stored in an F-Ram on board of the sensor. They will be downloaded into the sensor head electronics automatically as soon as the sensor is plugged in.

Safety advice:

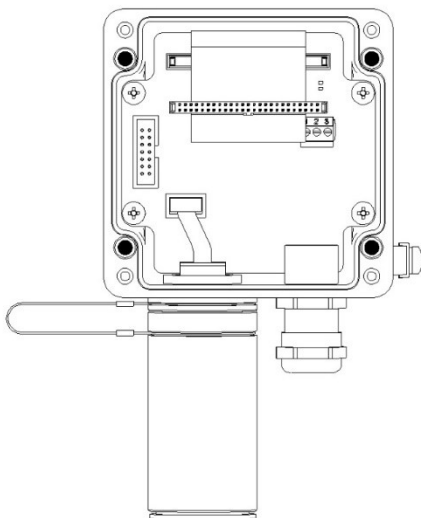
- Read and observe this manual carefully. Keep it in a safe place.
- This transmitter must be installed and connected observing the regulations for operation in hazardous areas. It must be performed by authorized and trained personnel only. Respect the regulations for the operation of safety instrumented systems including standard DIN EN 60079-14.
- If operated in a hazardous area, the sensor head power supply must run through an intrinsically safe repeater or the loop itself must be intrinsically safe, see chapters 3.1 and 3.2. Potential equalization must exist along the intrinsically safe circuit.
- Statox 506 must not be operated in an ambience outside the technical specifications, see chapter 8.
- Statox 506 must be operated and serviced by authorized and trained personnel only. Use only original Compur parts as spares and consumables.
- Do not operate uncomplete or damaged sensor heads.

All of the above warnings must be observed. Incorrect installation or connection will void the explosion proof rating and thus be dangerous to human life and assets.

2 Installation



Loosen the 4 captive screws. Put the cover on a clean place. In order to ease installation, the flat cable is not connected ex works.



Fasten the housing to the wall.

Screw specs: $\varnothing \leq 4.5$ mm, head $\varnothing \leq 6.9$ mm.

Install in an upright position with the sensor downwards!

Avoid ingress of dust or humidity.

Connect the cable as shown in chapter 3.

Connect the cover to the pcb with the flat cable. The plug is mechanically coded.

Fasten the cover.

Connect the ground contact to ground. It can take cables up to 4 mm². Reassure proper grounding.

Please find more installation instructions in the detailed manual on our homepage www.compur.com !

3 Electrical Connection

If installed in a classified area, the power supply must run through an intrinsically safe repeater. The combination Sensor head / repeater / cable must be within these parameters:

Specifications:

$U_o \leq U_i$ $I_o \leq I_i$ $C_o \geq C_i + l \cdot C_L$ $L_o \geq L_i + l \cdot L_L$	U_o, I_o, C_o, L_o : Approved repeater specifications. U_i, I_i, C_i, L_i : Approved sensor head specifications (→ Technical data) C_L = Cable capacity in nF/km L_L = Cable inductivity in nH/m l = Cable length in m
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The allowable cable length must be calculated from the cable capacity and the inductivity of the sensor head with this formula: $l_{max} = (C_o - C_i) / C_L$

<p>Example: Cable type LiYCY 0,75mm² : $C_L = 150$ nF/km Repeater: $C_o = 705$ nF Sensor head: $C_i = 24$ nF → $l_{max} = 4540$ m</p>
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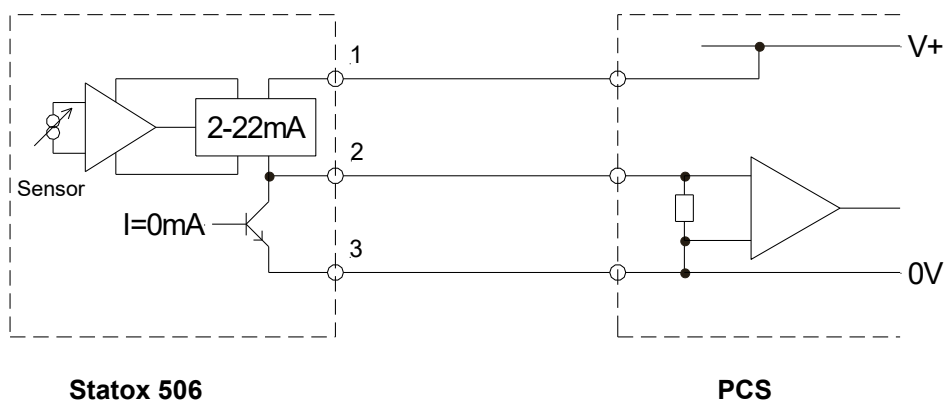
Recommended cable:

2 x or 3 x ≥ 0.5 mm², preferably shielded (e.g. LiYCY).
 Terminals: 0.25 – 2.5 mm² (AWG 24 - 12).
 The cable gland can accept cables from 4 to 12 mm outer diameter.

Advantage of 3 wire operation:

The signal in the error mode must always be 2 mA when operating in 2 wire installation in order to assure enough power for the operation.
 If you install the sensor head with a 3 wire cable, you can set the current in the error mode to 0 mA. Then you can set the current in the service mode to 2 mA and thus differentiate between system failure (critical error) and service mode (non - critical error).

If you operate the Statox 506 sensor head directly on a PCS, use the following diagram.
 In case of 2 wire operation use terminal 1 and 2.



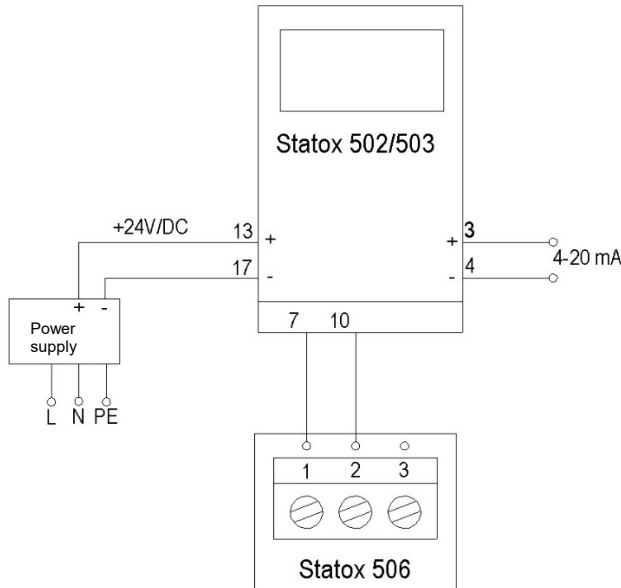
Caution:
 First complete the electrical connections, then plug the sensor in.

Please find more instructions in the detailed manual on our homepage www.compur.com !

3.1 Connection Diagram with Statox 502/503 Control Module in the 2-Wire Mode

Before connecting the Statox 506 to a Compur Statox 502 or Statox 503 Control Module, the appropriate program in the control module must be set. The programs are listed in the operation manual of the control module.

3.1.1 2-wire mode installation in non-hazardous areas



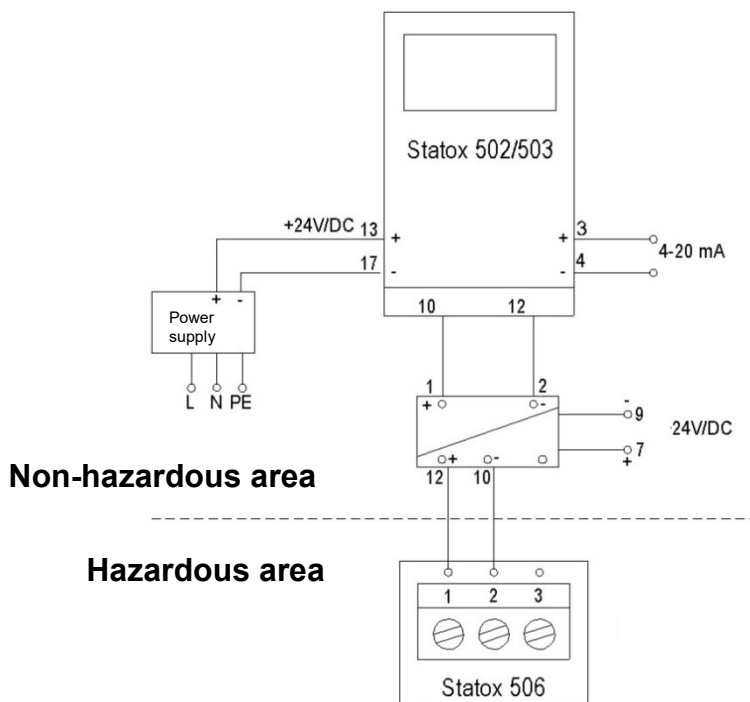
3.1.2 2-wire mode installation in hazardous areas

Caution:

The input / output terminals may be different for different intrinsically safe repeaters. Wrong connection might destroy the repeater and / or the control module. Avoid short-circuits and wrong polarity!

The terminal numbers at the repeater refer to model 9160/13-11-11 from R.Stahl, Waldenburg (Siemens 7NG4124-0AA00). It needs an own power supply and operates as current source at terminals 1 and 2.

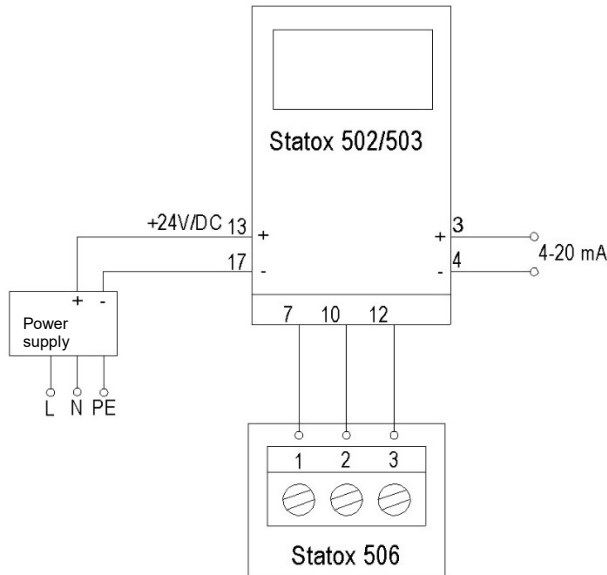
Do not operate control module and repeater on the same bus – the polarity is different!



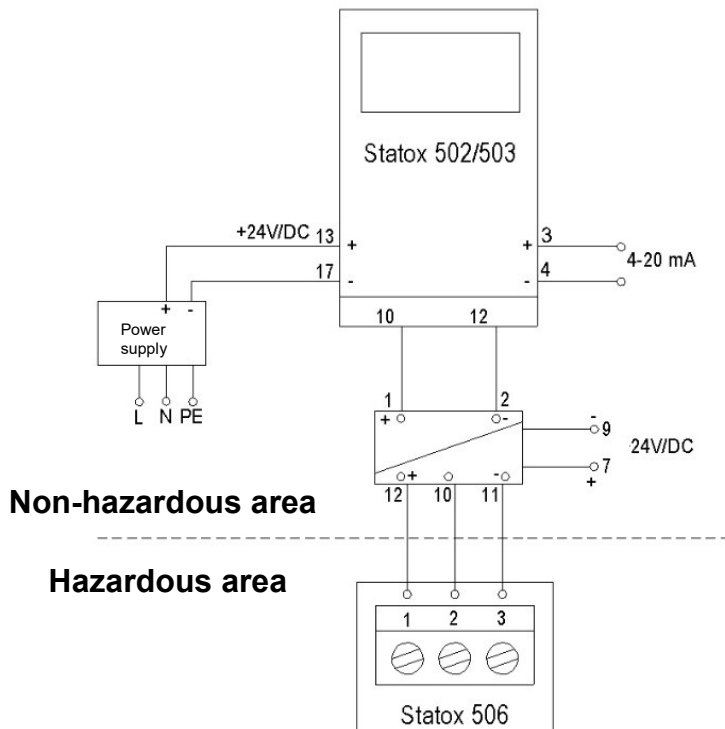
3.2 Connection Diagram with Statox 502/503 Control Module in the 3-Wire Mode

Before connecting the Statox 506 to a Compur Statox 502 or Statox 503 Control Module, the appropriate program in the control module must be set. The programs are listed in the operation manual of the control module.

3.2.1 3-wire mode installation in non-hazardous areas



3.2.2 3-wire mode installation in hazardous areas



Caution:

The input / output terminals may be different for different intrinsically safe repeaters. Wrong connection might destroy the repeater and / or the control module. Avoid short-circuits and wrong polarity!





The terminal numbers at the repeater refer to model 9160/13-11-11 from R.Stahl, Waldenburg (Siemens 7NG4124-0AA00). It needs an own power supply and operates as current source at terminals 1 and 2.

Do not operate control module and repeater at the same bus – the polarity is different!

4 Control Elements and Display

The display is an 8 digit 14-segment-LCD.

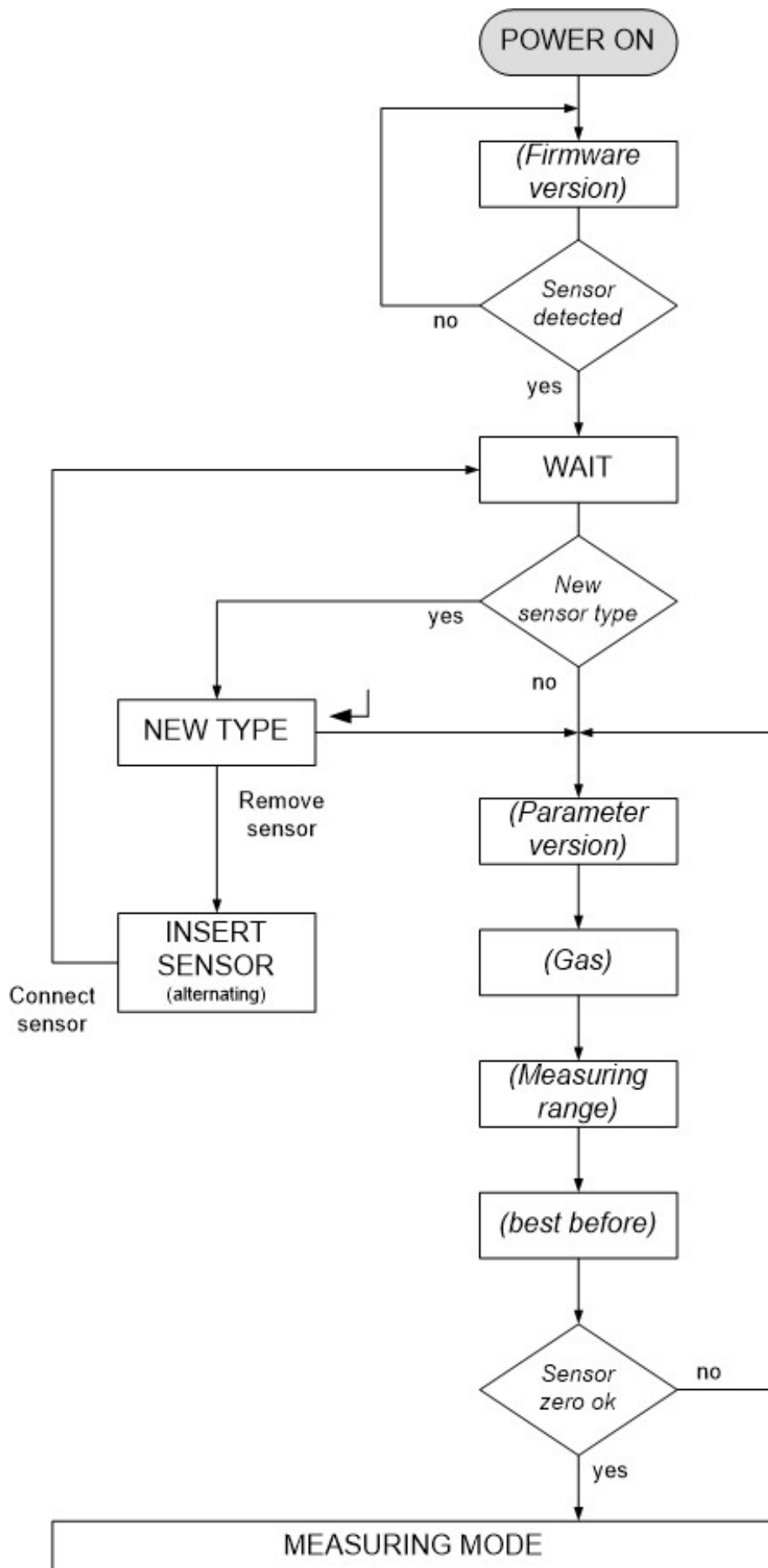
You can program the sensor head by holding the magnetic pin on the control buttons:

Symbol	Name	Function
	Right	Increase value. Navigate to the right. Push and hold the contact for speed mode.
	Left	Decrease value. Navigate to the left. Push and hold the contact for speed mode.
	Reset	Navigate backwards. Change entry.
	Enter	Main menu. Confirm.

5 Start up

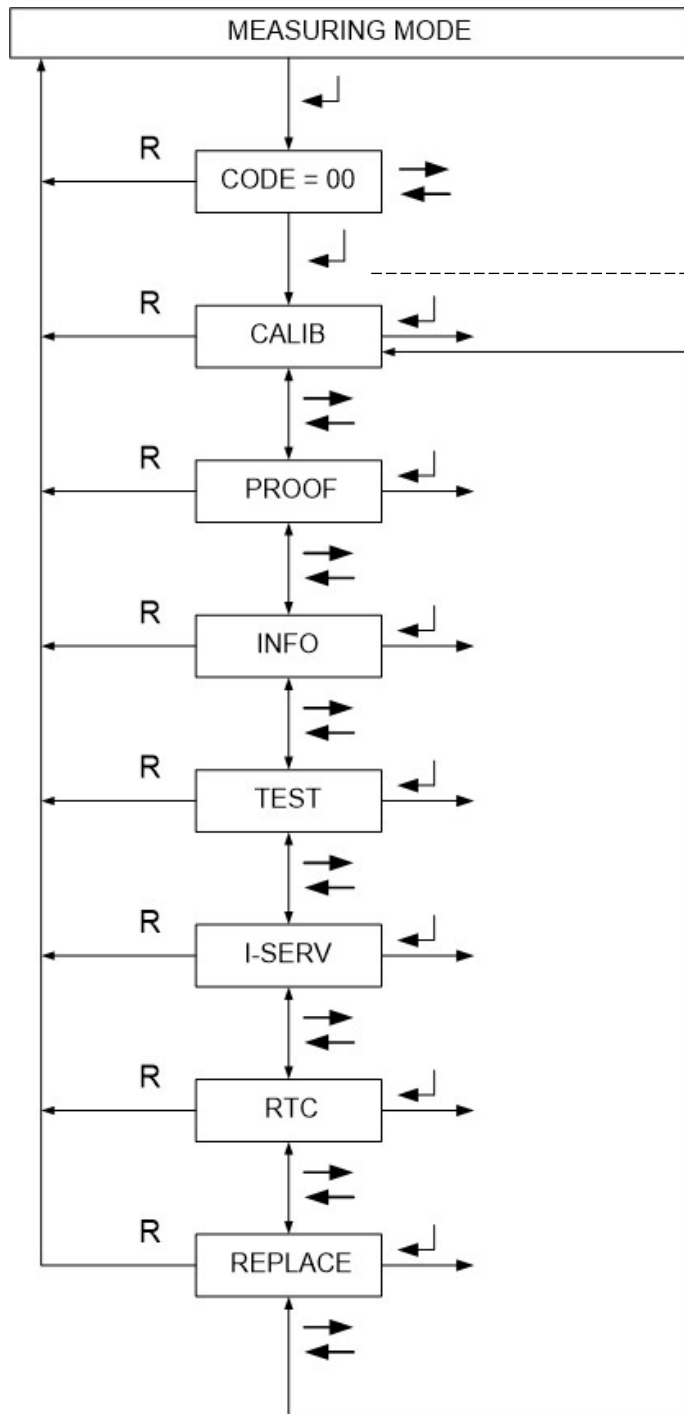
- After connecting the sensor head to power, it performs a self-test and after a few seconds displays the software index.
- Remove the yellow protection cap from the sensor cover.
- Install the sensor and the dust filter which is included in the sensor package.
- After the sensor has been plugged in, the sensor head reads the sensor parameters and displays the parameter set index, the target gas, the measuring range and the best-before date of the sensor in the format week / year. After zero has stabilized, the sensor head goes into the measuring mode.
- If you plug in another sensor type as before, the display shows NEW TYPE. Confirm this with ENTER. Otherwise remove the sensor and plug in the right type.
- **As long as the sensor head has not gone into the measuring mode, it is in the ERROR mode. (0 mA signal in 3-wire operation, 2 mA in 2-wire operation)**
- Once the sensor head has started the measuring mode you can program the real time clock and the service mode setting.
- Some sensors do require a certain warm-up time until zero has stabilized. If sensor and sensor head have different temperatures, allow enough time to equalize. 1 hour after installation a zero adjust should be done.

Please find more instructions in the detailed manual on our homepage www.compur.com !



6 Main Menu

- Push the ENTER – button in order to enter the main menu. Use the left / right – buttons to enter the password “94”. This password cannot be changed.
- After you have entered the password, the sensor head is now in the service mode. The output is set to 2 or 4 mA. The measured value will not be transmitted.
- You can navigate in the main menu in either direction. Enter a sub menu by pushing the ENTER – button. RESET brings you step by step back into the measuring mode.
- If you do not operate a button for more than 5 minutes, the sensor head will return automatically into the measuring mode. Exceptions to this are listed in the relevant sub menus.
- Please find a full description of all sub menus in the detailed manual on our homepage www.compur.com !



Dial Code 94.
If you enter a wrong
code, the sensor head
will return to the
measuring mode.

Now you are in the
service mode.

7 Error Messages

Any critical error reduces the output current to 2 mA (2-wire operation) or 0 mA (3-wire operation). Non critical errors may occur during maintenance procedures (e.g. calibration). They will not change the status.

Error	Character	Reason	Measure to be taken
No display	critical	Ribbon cable loose or damaged. If no current $\geq 2\text{mA}$ in 2-wire mode: Wrong polarity or blown fuse.	Check ribbon cable. Check polarity. The fuse must exclusively be replaced by authorized Compur representatives!
ERR 1	critical	The sensor diagnostic system (heart beat) has detected a sensor defect.	Confirm with ENTER. If this does not help, replace sensor.
ERR 2	critical	4-20 mA output problem. Actual and nominal value do not match.	Confirm with ENTER. If problem persists contact your local Compur representative.
ERR 3	non critical	Timeout during calibration. (Wrong or unstable gas, sensor has lost sensitivity or is too slow, adsorption effects)	Confirm with ENTER. Gas detection continues with the last valid calibration data. Display shows alternately measured value and CALIB. If calibration continues to fail, replace sensor.
ERR 4	critical	Too much zero drift. Zero drifted negative during the measuring mode. As soon as the measured value goes up, the message will disappear.	Confirm with ENTER. Enter the password and adjust zero. If problem persists, replace sensor.
ERR 5	non critical	Signal too high during zero adjustment. Maybe zero air was not clean.	Confirm with ENTER. System returns to CALIB. Start a new zero adjustment. Until a zero adjustment has been successful, the measured value and ZEROADJ are displayed alternately. If the problem persists, replace sensor.
ERR 6	non critical	Timeout, no stable zero found.	Confirm with ENTER. The last valid zero value is used. Measured value is displayed alternatingly with ZEROADJ. Try synthetic air. If problem persists, replace sensor.
ERR 7	non critical	During calibration: Sensor not sensitive enough or span gas is bad or wrong.	Confirm with ENTER. Gas detection continues with the last valid parameters. Display shows alternately the measured value and CALIB. If calibration continues to fail replace sensor.
ERR 8	critical	Transmitter is operated out of the specified temperature range.	Confirm with ENTER to restart. Check temperature, see chapter 6.7
ERR 10	critical	Sensor FRAM problem.	Confirm with ENTER. If problem persists, replace sensor.
ERR 11	critical	Hardware problem amplifier.	Confirm with ENTER, If problem persists contact your local Compur representative.
ERR 12	critical	Hardware problem potentiostat	Confirm with ENTER, If problem persists contact your local Compur representative.
ERR 13	critical	Hardware problem power supply	Confirm with ENTER, If problem persists contact your local Compur representative.
ERR 15	critical	Flash problem	Confirm with ENTER, If problem persists contact your local Compur representative.
ERR 16	non critical	Watchdog problem after user-initiated WD-test	Confirm with ENTER. Try again. If problem persists contact your local Compur representative.

8 Technical Data

Instrument name, type:	Statox 506 Transmitter Type 5376
Manufacturer:	COMPUR Monitors GmbH & Co. KG, D-81539 München
Measuring principle:	electrochemical
Operation temperature:	-30°C to +60°C ambient air temperature
Storage temperature:	-30°C to +60°C
Humidity:	0 to 99% r.F. (non condensing)
Pressure:	900 to 1100 hPa
Accuracy at calibration concentration:	± 10%
Power supply:	24 VDC (12 -28 VDC)
Connections:	2- or 3-wire operation
Terminal width:	0.25 – 2.5 mm ² (AWG 24 – 12)
Output:	0 - 22 mA, max. load 545 Ohm
• Service mode:	2 or 4 mA adjustable
• System failure:	0 mA 3-wire operation, 2 mA 2-wire operation
• Overrange:	22 mA
Display:	8-digits, 14 segments
Dimensions (HxWxD):	180 x 111 x 81 mm
Weight:	ca. 1200 g
Housing material:	Cast aluminium, enameled / stainless steel
Ingress protection EN 60529:	IP 66
Installation:	Sensor downwards
EMV:	EN 50270
ATEX marking:	Ex ib IIB T4 Gb
Application:	II 2G
Approval:	BVS 18 ATEX E 066 X / N2
	(X- Marking: requires potential equalization along the intrinsically safe loop)
Power supply U_i :	max. 28 VDC
Current I_i :	max. 93 mA
Power P_i :	max. 650 mW
Internal capacity C_i :	24 nF
Internal Inductivity L_i :	neglectable
Functional safety:	SIL 2 compliant with IEC 61508

Please find the sensor specifications in the detailed manual on our homepage www.compur.com !

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