

Operating Instructions

Multi-channel Gas Warning Unit



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1. Introduction

The ADOS gas warning unit is a microcontroller-aided multi-channel gas monitoring unit with warning and control functions.

Various types of sensor can be connected via a 4-20mA current interface, using 2 or 3 wire technique.

All information significant to operation, is displayed in clear on a 2-line and 16-digit display. The information includes the actual gas value, measuring point, alarm status or fault.

The alarms and centralised malfunctions are indicated on LED's. Three floating alarm outputs can be used optionally for ventilation and alarm control. One relay is responsible for fault indication.

Two keys are used for operating the equipment. These keys, together with menu-assistance, are used for setting minimal and maximum limit values, the measuring points, as well as other significant parameters, without any previous knowledge of programming skills. Alarms can be cancelled by keystroke. The alarm outputs can be tested without any application of gas.

The unit incorporates a RS232 interface for data communications and a voltage output of 0-5V.

The ADOS gas warning unit MWS 897, depending on the model, can be operated on 230 V~, 110 V~ or 24 V= voltage supplies.

The unit is enclosed in a plastic wall mounting housing, protection class IP 54.

2. Operating Summary

Display and operating controls are located on the frontside of the unit. Two buttons are used for the basic settings of the unit, stopping the measurement cycle, resetting the alarms and for performing test routines.

The basic settings of the unit are menu assisted, via the LC-Display and the following keys.

“SELECT” * switching between cyclic and stopping measure mode
 * selecting a menu item
 * change a value in a menu sub-item

“ENTER” * for selecting a menu item
 * to quit an alarm

By simultaneously pressing “ENTER” and “SELECT” keys, entry is made for the input of the code. After having entered the right code (number of the unit type “897”), entry is allowed into the basic adjustments. Here, all settings can be checked and modified if required.

A return back to the normal measurement cycle is made pushing the “SELECT” key or automatically after 90 seconds, if no new key is pressed.

By pushing the “ALARM RESET / ENTER” key during measurement, the internal buzzer can be prematurely cleared. The alarm (LED & relay outputs) can only be cancelled if the alarm condition is no longer present. Therefore it is not possible, if the actual gas value > limit.

After switch-on the unit is automatically ready for normal cyclic measurement operation.

To prevent alarm errors during the stabilising/warm up phase of the gas sensors, the alarm and fault monitoring is suppressed for approximately 5 minutes after switch on.

The measurement points will be checked periodically. In normal cycle mode each sensor is present in display for 4 seconds. The fault and alarm management is independent from the actual sensor on the display. All sensors will be checked permanently.

With the "SELECT" key it is possible to switch between cyclic measure mode and sensor hold on mode. The hold on mode focusses one sensor on the display. This is indicated by a "*" after the measuring point.

The first line of the display shows the actual or the average measure value, the gas and the unit. The second line shows the actual measuring point and the status of this sensor.

In case of a fault or because of special parameters being set, the following messages can occur instead of the gas concentration:

"?????" the sensor is operating below its normal reference point ($I < 3,5\text{mA}$)

"^^^^" the sensor has exceeded its measurement range ($> 110\%$)

"*****" the sensor has been muted and will not be evaluated

CO2: 0.211 VOL%
S2 alarm: 0

Normality, Measure point 2, no faults, no alarm

CH4: 85 % UEG
S4 alarm: 3

Third alarm of measure point 4

CO: 50 ppm
S1* alarm: 1

First alarm, sensor 1 in hold on mode

15min: 45 ppm
S1* alarm: 1

Display 15 minutes average value, alarm 1 from sensor 1

CO: ???? ppm
S1 fault

Input signal from measure point 1 $< 3,5\text{mA}$ = fault
Indication through fault LED and K4

3. Equipment settings / Menu

3.1 Navigation through menu

To modify the basic factory settings, both keys must be hold pressed. The input code is necessary to protect against unauthorised modification. To enter the code "897", the "SELECT" key must be pressed to increment the digit. Pressing the "ENTER" key confirms the input and switches to the next digit.

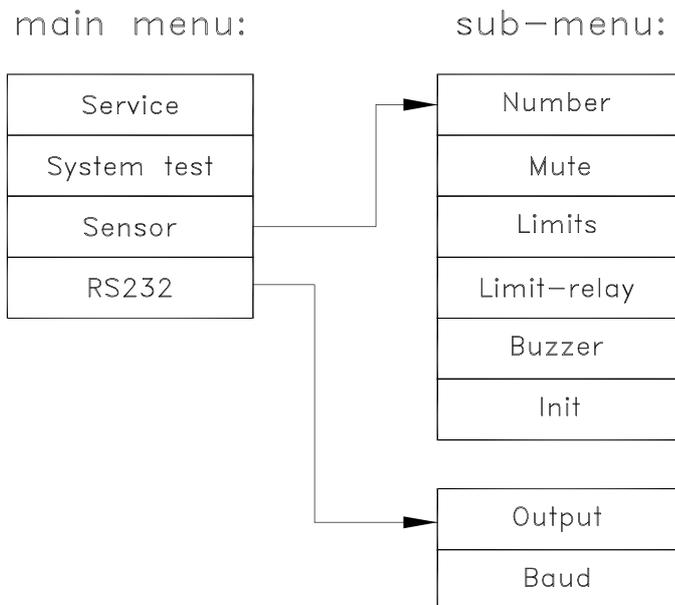
At the end of input the "ENTER" key must always be pressed for confirmation. With the "SELCT" key you can browse through the menu without making any modification or you can select a menu item.

After selecting a menu item, press the "ENTER" key and you can change the value with the "SELECT" key. After confirmation with "ENTER" the value will be saved in memory.

An incomplete modification instruction is not saved without pushing "ENTER". If no further key is pressed, after 90 seconds the system returns to normal measuring cycle. If a value was changed by mistake, enter the menu again and rectify it.

3.2 Block Diagramm Menu

The menu has the following tree structure:



3.5.4 Menu Function Sensor->Limit-relay

Assign the alarm relay to the limit value of a measuring point. The allocation is optional, each limit value can be assigned to a maximum of 3 alarm relays. One alarm relay can also be assigned more than once (e.g. collective/group alarm). It is not possible to use the fault relay K4 for other functions.

Select measuring point -> select limit -> amount of relay -> assignment

factory settings:

Sensor 1 Limit 1 -> K1

Sensor 1 Limit 2 -> K2

Sensor 1 Limit 3 -> K3

Sensor 2 Limit 1 -> K1

Sensor 2 Limit 2 -> K2

Sensor 2 Limit 3 -> K3

Sensor 3 Limit 1 -> K1

Sensor 3 Limit 2 -> K2

Sensor 3 Limit 3 -> K3

etc.

for example: to generate a group indication with relay K3 use following configuration

Sensor 1 Limit 1 -> K1

Sensor 1 Limit 2 -> K3

Sensor 1 Limit 3 -> 0

Sensor 2 Limit 1 -> K2

Sensor 2 Limit 2 -> K3

Sensor 2 Limit 3 -> 0

the settings can be tested with the menu item "System test"

3.5.5 Menu Function Sensor->Buzzer

Assigning the internal buzzer to a limit value at a measuring point. Select Level 0 = no function. The buzzer can always be reset by pressing the "ENTER" button.

3.5.6 Menu Function Sensor->Init

Base settings for a measurement point: gas, format, unit, range

Gas:	setting type of gas if the type of gas is not available, edit the letters of "User"
Format:	set the maximum number of digits in front of and after of the decimal place 2.1 -> 00.0 1.2 -> 0.00 3.0 -> 000
Unit:	physical size of the measuring range for example Vol.%, ppm, %LEL, etc.
Range:	upper and lower measure range z.B. ADOS TOX CO 300 ppm -> MIN = 0 und MAX = 300 GTR 196 with ph -> MIN = 2 und MAX = 13

3.6 Menu Function RS232

This menu is used to set the rate of transfer and the data to be output on the serial interface. Connections can be made to a qualified printer or pc programm "hyper terminal". Fixed settings: data bits 8, stop bits 1, parity none, protocol none

3.6.1 Menu Function RS232->Output

Setting type of output:

OFF: Serial interface is deactivated

single alarm: at every alarm or fault, output the relevant measuring

cyclic: The values measured at all measuring points are output at adjustable intervals. The intervals can be set from 1 to 30 minutes. Also alarms and faults are output as in single alarm mode

3.6.2 Menu Function RS232->Baud

Select the transfer rate on the RS232 interface. Baud rates of 110 and 57600 are permissible.

4. Maintenance work

The following maintenance work to be carried out, refers to a twice-yearly check that should be completed only by fully trained personnel.

The owner or operator of the system is offered the possibility of completing a maintenance contract with the manufacturer, the ADOS GmbH company, which will guarantee a smooth and efficient servicing by the company's own customer service.

The maintenance work can be divided into checking the sensor functions and checking the complete gas monitoring unit, MWS897.

Over a period of time, the properties of the sensors can change. Therefore, on all sensors fitted to the system, the relevant checks must be made as described in the operating instructions, to check the calibration with zero gas and calibration gas.

Because of the changes that are possible, after establishing that the sensitivity of the sensors is not sufficient, they must be re-calibrated or where necessary, replaced by new sensors.

The accuracy of the signals on the interface and the function of the output signals from the gas monitoring unit, must also be checked regularly.

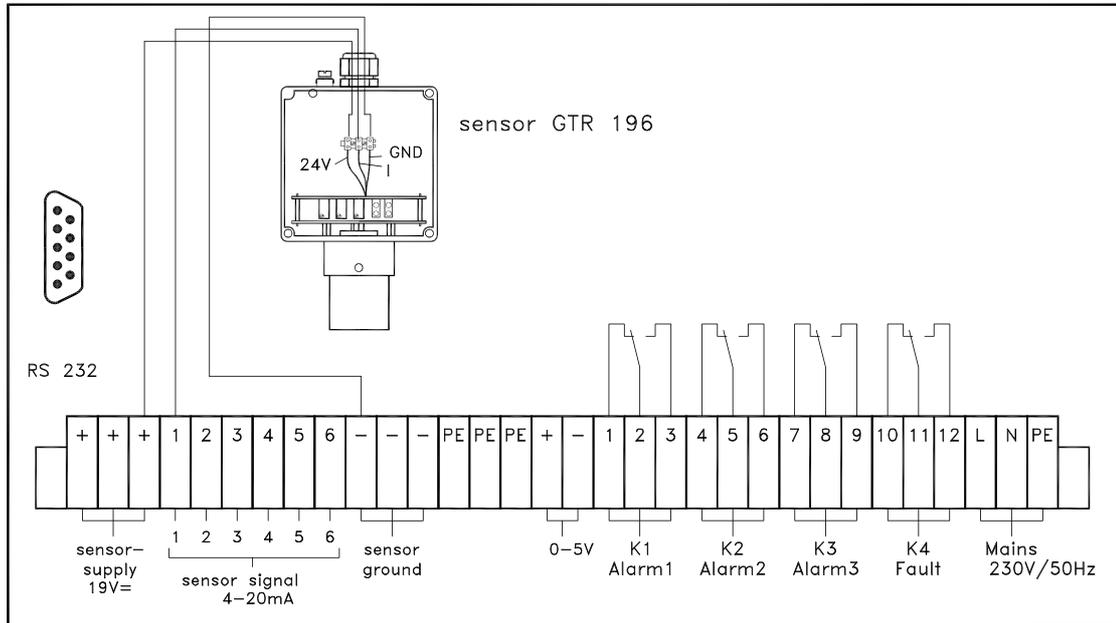
5. Technical Data

Sensor inputs	:	6 two-wire sensors (e.g. ADOS 592 TOX) or 3 three-wire sensors (e.g. GTR 196) or 2 three-wire sensors + 4 two-wire sensors
Sensor supply	:	19 V= / 300 mA
Measurement ranges	:	CO 0-300 ppm NO ₂ 0- 30 ppm CH ₄ 0-100 %UEG CO ₂ 0- 10 Vol% Other ranges on request
Effect of temperature	:	< 3% for ± 20° C temperature change
Ambient temperature	:	- 10 ...+ 40° C
Output signals	:	Serial interface RS 232 Baud : 9600 Data bits : 8 Parity : keine Stop bits : 1 Protocol : Hardware Analog output 0 - 5 V 3 alarm relay 230 V~ / 450 VA 1 fault relay 230 V~ / 450 VA
Voltage supply	:	230V, 50 Hz 115V, 60 Hz (optional) 24V= (optional)
Power consumption	:	14 VA
Dimensions (WxHxD)	:	225 x 180 x 105 mm
Weight	:	ca. 1,5 kg
Protection class	:	IP 54 (DIN EN 60529)

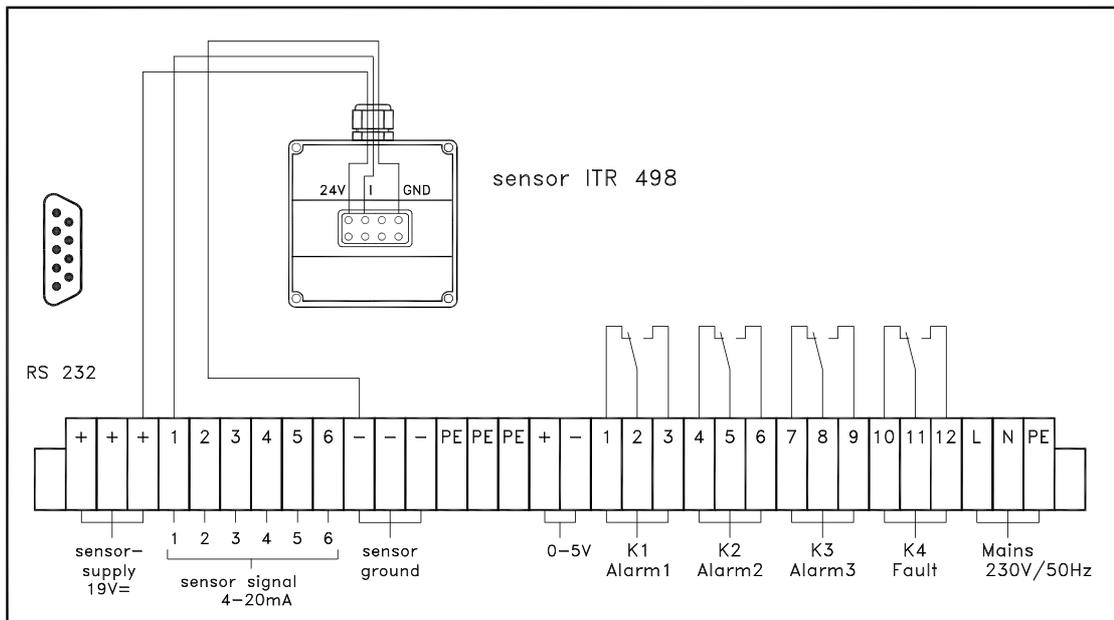
6. Cable list

Mains 230V/50Hz	:	NYM-J 3 x 1,5 mm ²
Mains 230V/50Hz for horns and warning banners	:	NYM-J 3 x 1,5 mm ²
Sensors	:	J-Y(ST)Y 2 x 2 x 0,8 mm ² , screened bzw. J-Y(ST)Y 4 x 2 x 0,8 mm ² , screened
Ex-Sensors	:	NYM (ST)-J 4 x 1,5 mm ² , screened
Warning banners and flash lights	:	NYM-J 3 x 1,5 mm ²
Horns	:	NYM-J 3 x 1,5 mm ²
Warning banners and flash lights	:	NYM-J 5 x 1,5 mm ²
Limit value K1, K2, K3	:	NYM-O 9 x 1,5 mm ²
Fault K4	:	NYM-O 3 x 1,5 mm ²

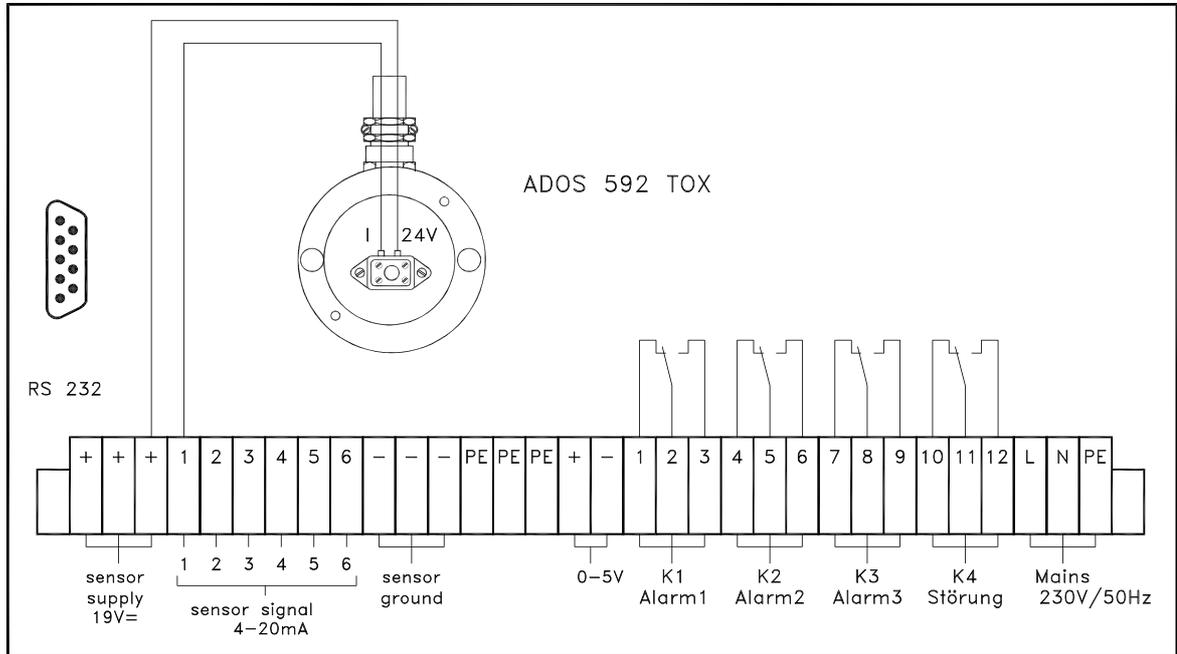
7. Terminal schematic



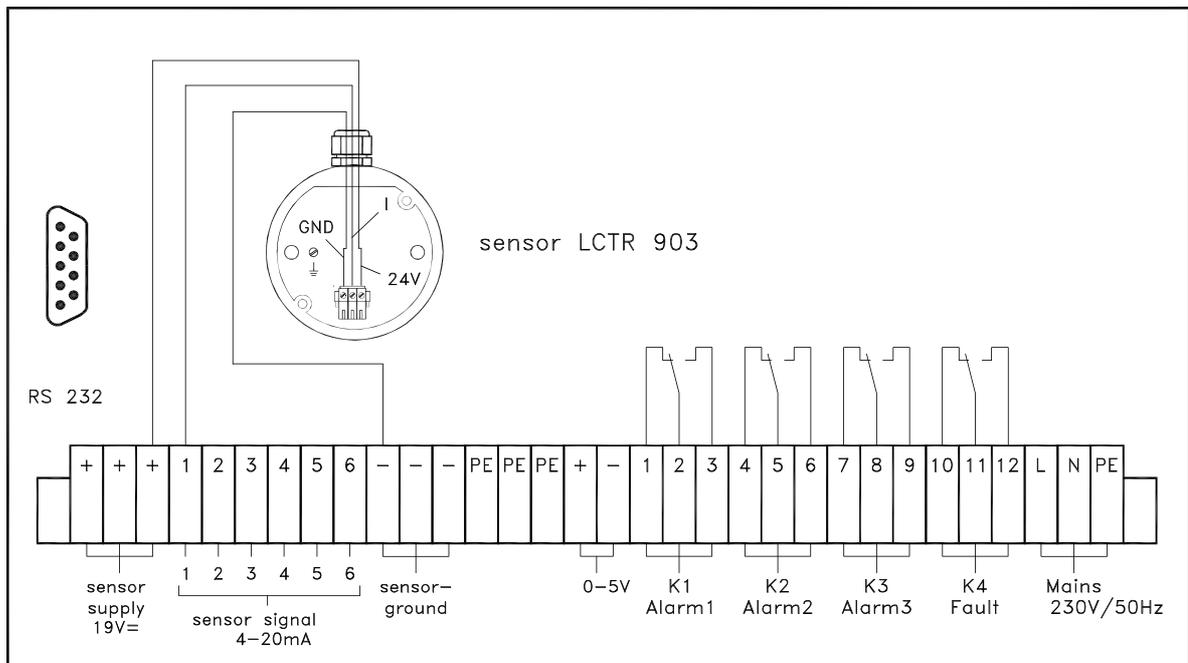
Drawing no. 890-5622/e : MWS 897 with sensor GTR 196



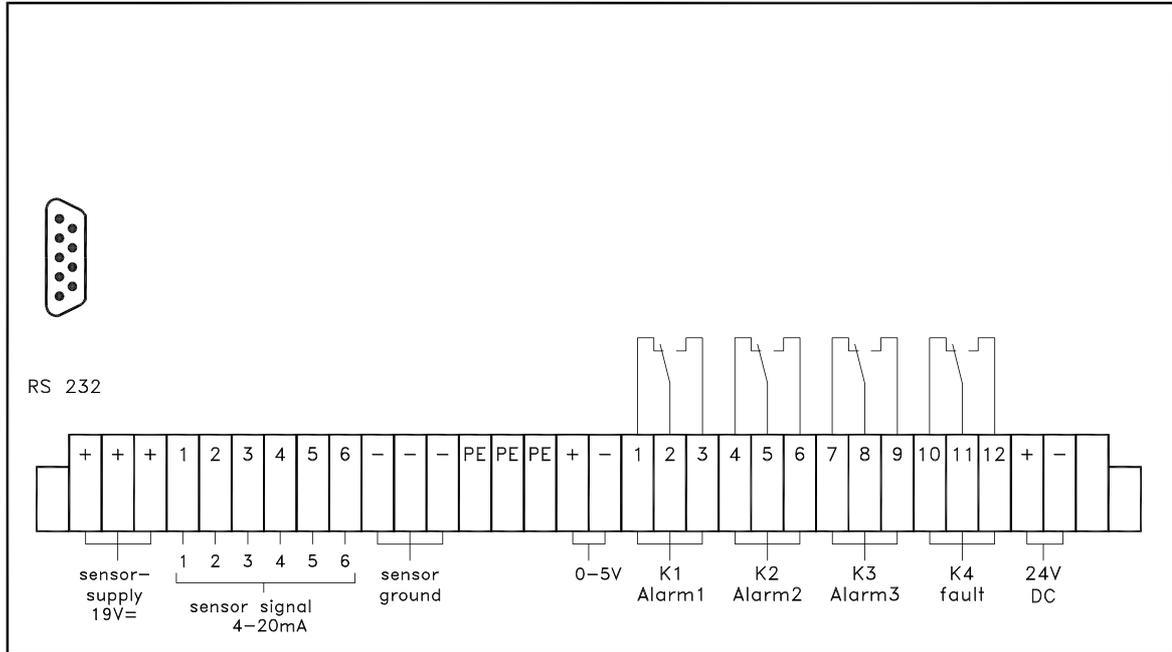
Drawing no. 890-5622/f : MWS 897 with sensor ITR 498



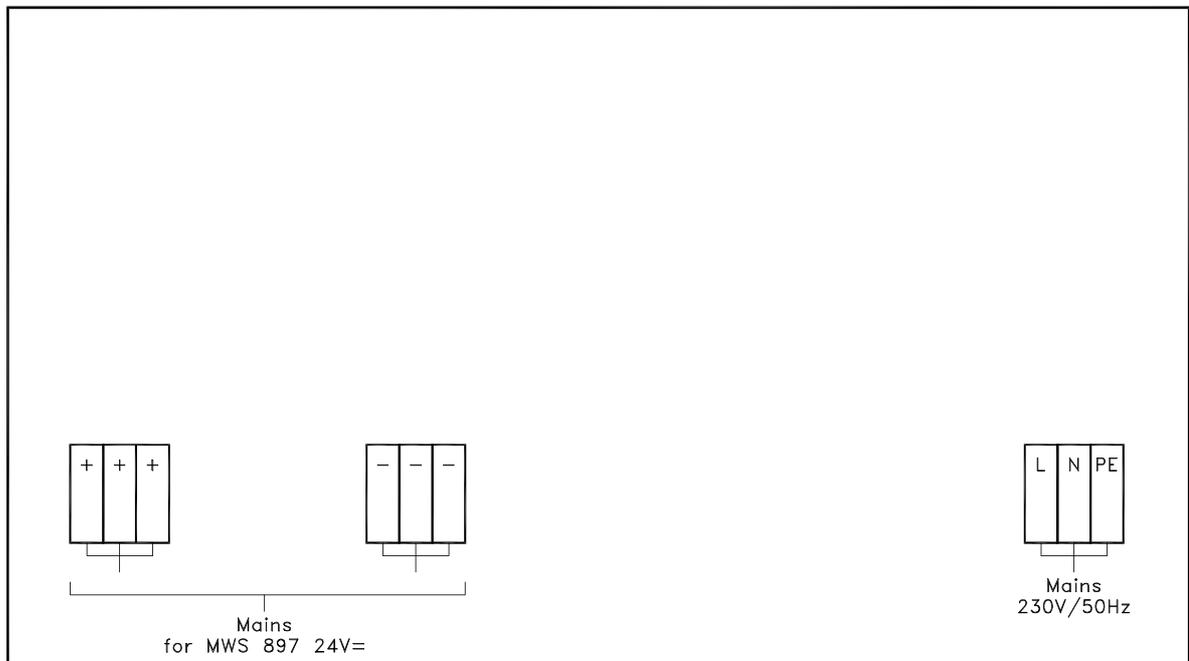
Drawing no. 890-5622/g : MWS 897 with sensor ADOS 592 TOX



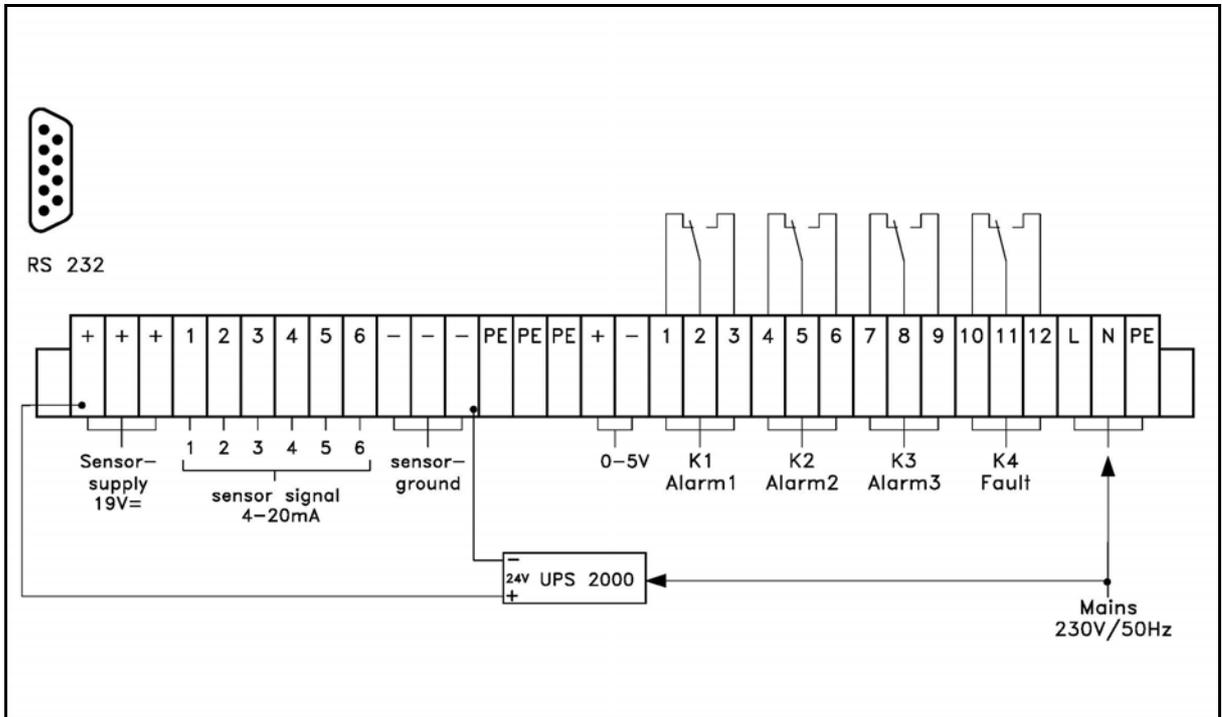
Drawing no. 890-5622/h : MWS 897 with sensor LCTR 903



Drawing no. 890-5622/c : MWS 897 24V DC



Drawing no. 890-5622/d : MWS 897 USV



Drawing no. 890-5622/i : MWS 897 230V with UPS 2000