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User Manual

EXTOX-UNI i-1

Gas Concentration Measuring Apparatus

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1. FUNCTION

The EXTUX-UNI i-1 is a general purpose gas and solvent vapour detector designed primarily to meet the needs of industrial users with advanced European Union directives and standards.

It is intended to measure the concentration of airborne fire, explosive or toxic substances. To predict emerging emergencies based on the measurement results and the limits of the hazardous substances. Automatic intervention control to avert fire, explosion or poisoning hazards.

2. MAIN FEATURES

* *Installed, remote transmitter system*
* *Measurement of concentrations of flammable, explosive, toxic and other substances in the ranges assigned to lower flammability limit concentrations and health limits using different types of transmitters*
* *Designed to operate with one piece transmitter*
* *Processor controlled operation*
* *Continuous concentration and status indication*
* *Four programmable alarm levels + muteable audible alarm + self fault signal*
* *Voltage-free relay contacts (6 pieces) assigned to signal levels, audible alarm, and self fault*
* *The audible alarm can be assigned to any alarm level and also to the self fault*
* *Differentiated audible alarm control according to signal levels*
* *The relay contact of the audible alarm can also be a direct mains voltage source*
* *Power supply for 24V sound and light signalling devices from the apparatus own power supply*
* *Built-in key-operated service switch*
* *Service status detection and indication*
* *Register output*
* *Mains power failure indication in uninterruptible mode*
* *Event logging*
* *Configurable settings with computer diagnostic software*

3. CONSTRUCTION

The device consists of a plastic enclosure with high IP protection, which can be mounted on a flat surface, and the electronics inside. The enclosure has a transparent lid and has controls and cable glands on the side of the enclosure. It can be installed without removing the cover by means of a special fixing frame. The displays on the inside front panel of the device are visible through the transparent lid.

The electronics inside the device is capable of 1 pc gas concentration measuring transmitter. The wiring of the cables into the device is made possible by the terminal blocks located on the electronics.

4. OPERATION

The apparatus can be operated as intended by means of gas concentration transmitters connected to it by cables. The apparatus shall operate in accordance with the technical characteristics of the transmitters connected to it and according to the requirements of the application.

During operation, the instrument ensures adequate power supply to the remote transmitters, processes the gas concentration dependent electrical signals from the transmitters, display the measured concentrations, provide status indications, operate intervention control contacts, transmit measured concentration values and log events.

The apparatus are equipped with four signal levels and self-error and audible alarms, and a corresponding voltage-free relay contact. The signal levels are switched on and off based on preset tilting levels and instantaneous values of the measured concentration. The activation of the signal levels can be set for increasing or decreasing concentrations, the latching of the signals (only by manual reset or automatically) and the operation of the relay contacts (close or open when the signal levels are activated) can also be preset.

The deactivation of each signalling level (if it has a latching setting) can be achieved by pressing the acknowledgement button, if the concentration otherwise allows.

Note: by default, the device's signal levels 1, 2, and 3 are automatically cleared and relay contacts are closed when the signals are activated. Their use is recommended for warning of emergency situations and for starting e.g. ventilation fans. Signal level 4 is not automatically de-energised (latching) and the relay contact opens when the signal is activated. Its use is recommended for emergency shut-down, current cut-off, gas magnetic valve closing, etc. The service switch short-circuits this contact directly when it is on.

The relay output of the self-error relay opens in case of failure. This signal is not a latching signal and the use of the cancel button is ineffectiv on it.

An audible alarm can be assigned to the activation of all signal levels, as well as to the self alarm.
The audible alarm relay contact gives a short circuit when the audible alarm is activated. The signal processing units are able to control the audible alarm in such a way that the audible alarm can be used to determine which alarm level is active.
The audible warning shall emit a number of successive audible pulses at regular intervals corresponding to the maximum number of activated signal levels (this operation may be omitted if required). The audible warning may also be deactivated by pressing the acknowledgement button.
Note: for audible alarms with different audible alarm controls for each level, continuous single tone types are recommended.

When switched on, the properties of the sensors in the transmitters cause the operation to start with a 1 minute time delay. During this time, the relays do not pull and the signalling levels are not activated. This corresponds to a self-error by default and to a dangerous concentration for level 4. At the end of the timing period, the relays and status LEDs are set to the operating state defined by the current concentration (instantaneous value) and the average values calculated for the specified time periods.

The current concentration is continuously readable on a 3-digit 7-segment LED display. The display shows, according to the measuring ranges

LFL%,
VOL %, or
ppm units.

The concentration is transmitted by the signal processing units as an analogue recording output in the range 4...20 mA or 0.4...2 V. In the event of an error, the recording output is switched off (output current significantly below 4 mA or output voltage significantly below 0.4 V).

The instrument can be operated from 230 V 50 Hz mains voltage or from 24 V DC. The use of a 24 V uninterruptible power supply is recommended.
The 24 V DC connection points may also be used as a voltage source under limited load conditions.

5. *TRANSMITTERS CONNECTED TO THE APPLIANCE* [1]

The device can operate with different types of transmitters, with different measuring principles and protection. The type of transmitter is determined by the concentration of the chemical to be detected, the measuring range and the classification of the area. The internal design and technical parameters of the signal processing units in the instrument depend in part on the type of transmitter connected to them.

List of transmitters that can be connected to the instrument [2]

Measuring principle	***Ex protection***	***Types***
Semiconductor	Ex	*E-TD-S1/M, E-TD-S1/MB, E-TD-S2/M, E-TD-S2/MB*
Catalytic	Ex	*E-TD-P1/M, E-TD-P1/MB, E-TD-P3/M, E-TD-P3/MB E-TD-P4/M, E-TD-P4/MB, E-TD-P5/M, E-TD-P5/MB*
Elektrochemical	Ex	*E-MC-E1*
	-	*E-MC-NE1, ECO-CO-2, ECO-NO2*
Infravred	Ex	*E-TD-R1, E-TD-R1B, E-TD-R2, E-TD-R2B*
	-	*IR-NE-1, IR-NE-2, IR-NE-3*
Other of 4…20 mA		[3]

For more information on the features and applications of the listed transmitters, please refer to their respective user manuals.

Notes:
(1) The device can also be equipped with a built-in sensor for certain tasks. In this case the device does not need to be connected to a transmitter.
(2) The list may be extended.
(3) 2, 3, or 4 wire types are possible.

6. INSTALLATION

The appliance should only be installed in locations where the technical parameters of the appliance fully meet the requirements. In addition, the installation site must be chosen in such a way as to ensure that the installation and regular maintenance of the apparatus can be carried out and that it can be operated and handled safely and in accordance with its intended purpose. Since the apparatus and the transmitters connected to it are electronic devices with substantially different characteristics, different rules must be taken into account for their installation.

The apparatus is not of explosion-proof design and must not be installed in rooms or zones where there is a risk of explosion.

The transmitters connected to the apparatus must be installed in accordance with the instructions in their respective user manuals.

The installation of the device is usually described in the design documentation. The instructions contained therein must be followed, but the contents of the design documentation must not contradict the installation instructions for the apparatus listed here. If the installation of the appliance is not based on the design documentation, installation may be decided upon with due care and, if necessary, after consultation with the manufacturer. The apparatus shall be mounted on a vertical flat surface and protected from inadmissible ambient temperatures, radiant heat, strong UV radiation, shock, damage, strong electromagnetic disturbances and immersion in water. Cables routed into the appliance must also be secured separately in the vicinity of the appliance to relieve the load. In addition, the installation location must be chosen in such a way that reasonable cabling is possible while fulfilling the above conditions.

7. CABLING

The following instructions must be observed when wiring the appliance:

* *The selection of cables for connecting the device must take into account the technical specifications in the user manuals of the device, the transmitter and other devices connected to the device (e.g. the audible and visual alarms).*
* *The loop resistance of the cables connecting the device and the transmitter shall not exceed the limit specified for the type of transmitter for the specific sensor.*
* *When using catalytic transmitter, splicing in the cables connecting the device and the transmitter shall be avoided.*
* *The cables connecting the instrument and transmitter, the cable for the recording outputs, the cable for the remote push-button (if remote push-button is required) shall be of the shielded type only.*
* *Cables must be identified.appliance shall always be connected to the transmitter assigned to them by type and serial number.*
* *Separate cables must be used for connecting different voltage levels.*
* *When sizing cables, allow sufficient length for connection.*
* *Cables shall be installed on a route that avoids the proximity of planned, reasonable, high-current cables.*
* *Mechanical protection of cables shall be provided. in explosive zones, a minimum length of track shall be chosen.*
* *The installation of the cables is the responsibility of the installer.*

Example table for possible cable lengths:

Loop resistance of cable connecting appliance with transmitter	***Wire cross section***	***Permissible cable length in case of copper wire***
≤3 Ω	*0.75 mm^2*	*≤62.5 m*
	1 mm^2	*≤83 m*
	1.5 mm^2	*≤125 m*
	2.5 mm^2	*≤208 m*
≤8.9 Ω	*0.75 mm2*	*≤185 m*
	1 mm2	*≤245 m*
	1.5 mm2	*≤370 m*
	2.5 mm2	*≤615 m*

Note: if a surge arrester is to be included in the cable connecting the apparatus to the transmitter, its series resistance per line must also be taken into account.
The permissible cable length may be drastically reduced when using such devices.

8. CONNECTION POINTS

The signal processing units of the device have the following connection points:

Connector	Marking	Function
CS2	230V~ L	Mains power supply phase conductor input
	230V~ N	Mains power supply neutral conductor input
CS7	HANG N	Sound signal voltage-free relay contact, or neutral conductor output
	HANG L	Sound signal voltage free relay contact, or fuse guarded and switchable phase conductor output
CS8	JSZ4	Signal level 4 voltage-free relay contact
	SZK	Service switch connection point for signal level (connected by manufacturer)
	SZK	Service switch connection point for signal level (connected by manufacturer)
	JSZ4	Signal level 4 voltage-free relay contact
CS9	JSZ3	Signal level 3 voltage-free relay contact
	JSZ3	Signal level 3 voltage-free relay contact
CS10	JSZ2	Signal level 2 voltage-free relay contact
	JSZ2	Signal level 2 voltage-free relay contact
CS11	JSZ1	Signal level 1 voltage-free relay contact
	JSZ1	Signal level 1 voltage-free relay contact
CS12	ÖH	Fault signal voltage-free relay contact
	ÖH	Fault signal voltage-free relay contact
CS5	SZERVIZ	Service switch status input positive point (connected by manufacturer)
	GND	Service switch status input GND point (connected by manufacturer)
CS3	Törlés	Acknowledgement button input positive point (connected by manufacturer)
	GND	Acknowledgement button input GND point (connected by manufacturer)
CS4	RK+	Recorder output positive point
	GND	Recorder output GND point
CS1	SZM+	24V supply voltage positive point (input and output)
	SZML	Uninterrupted power supply detection point
	SZM-	24V supply voltage GND point (input and output)

Additional connection points are built into the appliance depending on the type of transmitter required. The connection points of the appliance and the transmitters to which they are connected shall be connected as shown in the following table:

Transmitter types	***Connection points of appliance***	***Connection points of transmitters***
E-TD-S1/M, E-TD-S1/MB	*F+*	*Heating*
	X	*Sensor-*
	Y	*Sensor+*
	GND	*Heating*
E-TD-S2/M, E-TD-S2/MB	*F+*	*Heating+*
	X	*Sensor-*
	Y	*Sensor+*
	GND	*Heatings-*
E-TD-P1/M, E-TD-P1/MB, E-TD-P3/M, E-TD-P3/MB,	*F+*	*Heating+*
	FK	*Output*
	GND	*Heating-*
E-TD-P4/M, E-TD-P4/MB, E-TD-P5/M, E-TD-P5/MB	*F+*	*Heating+*
	FK	*Output*
	F-	*Heating-*
E-MC-E1 E-MC-NE1	+	*Power supply connection point*
	Ibe	*Power supply connection point*
ECO-CO-2, ECO-NO2	+	+
	Ibe	-
E-TD-R1, E-TD-R1B, E-TD-R2, E-TD-R2B	+	*9 (+Us)*
	Ibe	*11 (Iout)*
	GND	*8 (GND)*
IR-NE-1, IR-NE-2, IR-NE-3	+	*+Ut*
	Ibe	*Iout*
	GND	*GND*
Other two-wire transmitters of 4…20 mA	+	*Power supply (+)*
	Ibe	*Power supply (-)*
Other three-wire current source type transmitters of 4…20 mA	+	*Power supply (+)*
	Ibe	*Current output (Iout)*
	GND	*Power supply (-)*
Other three-wire current drain type transmitters of 4…20 mA	+	*Power supply (+)*
	Iki	*Current input (Iin)*
	GND	*Power supply (-)*

9. CONDITIONS OF SAFE OPERATION

It is forbidden to connect electrical equipment to the appliance which is not necessary for its intended use or which may cause the limits specified in the technical data of the appliance to be exceeded.

It is not recommended to switch off the appliance without justification when it is in continuous operation in accordance with its intended purpose.

The apparatus is an electrical appliance operating on 230 V mains voltage and may still carry an 'foreign' voltage of 230 V at its relay contacts after the mains supply has been switched off. Opening of the enclosure to unauthorised persons is prohibited.

Unauthorised opening of the enclosure of the apparatus under inappropriate conditions may reduce the insulation strength between the individual circuits.

The wiring and connection of the apparatus shall be carried out in such a way that the reinforced insulation between the different voltage levels of the circuits is not damaged.

The instrument shall not be exposed to electromagnetic disturbances of higher than permissible strengths, as such disturbances may degrade the accuracy of measurement, cause false indications or loss of functionality.

Overvoltage arresters shall be incorporated in the instrument's connecting cables if overvoltage is likely to occur or if overvoltage protection is not otherwise ensured.

No modifications may be made to the apparatus without the manufacturer's authorization and the wiring of the apparatus must always be carried out in accordance with the connection point assignment or wiring instructions.

10. COMMISSIONING

Commissioning is conditional on the device being correctly installed, including transmitters, accessories (according to the scope of delivery), wiring, in accordance with the instructions in the user manuals and taking into account the technical data, and the network (or 24 V) supply voltage.

The commissioning of the apparatus shall consist of checking that the installation is correct, checking the condition of the apparatus (and of the transmitters and other accessories supplied with it), connecting the cables, switching on the apparatus and checking its operation in situ with a measuring gas in accordance with its intended purpose.

Commissioning is carried out by the manufacturer's own specialist service or by partner companies contracted by the manufacturer, against payment, after prior order and appointment.

The installation of the appliance is carried out by authorised technicians who have the professional knowledge and technical equipment necessary for the installation of the appliance.

One of the important tools required for the installation of the equipment is a computerised, hardware-keyed diagnostic programme developed for this purpose.

When the apparatus is put into service, a report of the work carried out on the apparatus is drawn up using the diagnostic software. In addition to the general administrative data, the report shall contain the operational and configuration data resulting from the commissioning and other details of the commissioning work carried out. During commissioning, it is also possible to change certain settings of the equipment as required.

The commissioning of the apparatus shall not include checking the correct operation of the intervention devices to be controlled by the intervention control contacts of the apparatus. If these devices (e.g. ventilation fans, solenoid switches for current cut-off, gas solenoid valves, signalling devices) are not yet installed or cannot be controlled at the time of commissioning, the appliance may still be commissioned. However, in order to avoid possible malfunctions at a later stage, it is recommended to request commissioning at a time when the complete system can be tested.

Attention! Switching on the equipment without the required commissioning procedure and any operation performed on the equipment without using the computer hardware keyed diagnostic program shall not be considered as commissioning.

For commissioning, please contact the manufacturer's service department at the following address:

Műszer Automatika Kft.
H-2040 Budaörs, Komáromi u. 22.
Postal address: H-2040 Budaörs, Pf. 296.
Phone: +36-23-365–280, +36-23-414–922, +36-23-414–923
gazszerviz@muszerautomatika.hu

or at the contracted partners of the manufacturer.

If the conditions for commissioning are not met by the customer at the agreed time, or if the technical conditions are not suitable, or if immediate modification is not possible, commissioning will be cancelled.
Any additional costs incurred due to the failure of the commissioning due to the fault of the customer shall be borne by the customer.

11. HANDLING UNIT, DISPLAYS, STATUS SIGNALS

The device has the following handling unit, displays and status signals:

* *Key-operated service switch*
* *Acknowledgement button,*
* *Computer communication connection point (accessible after removing the cover, for service purposes only).*
* *3-digit seven-segment LED display,*
* *LED indicating that the audible alarm is activated (red),*
* *LED indicating activation of signal level 4 (red),*
* *LED indicating activation of signal level 3 (red),*
* *LED indicating activation of signal level 2 (red),*
* *LED indicating activation of signal level 1 (red),*
* *Mains / Uninterruptible Power LED (green),*
* *Operation / Fault LED (green),*

12. HANDLINGS, INTERPRETATION OF STATUS SIGNALS

The appliance can be handled in the same way, according to the following table

Event	***Handlings (interpretation of status signal)***
None of the LEDs are lit. On the display, the decimal points alternately light up as a running light. The displayed concentration value changes as the sensor in the transmitter stabilises.	*- (You have to wait until the power on after the 1 minute timer has elapsed.)*
The Operation / Sefl-error LED is lit, the display shows a concentration value that is not set to trigger a signal level(s)	*- (The apparatus operating, and the concentration is in the safe range.)*
The Mains / Uninterruptible Power LED is lit continuously	*- (The apparatus operates from mains voltage.)*
Mains / Uninterruptible LED flashes	*- (The apparatus powered by the batteries of the uninterruptible power supply.)*
The display changes the concentration to a level(s) that is (are) set to are activated, but no audible alarm	*- (The concentration changes in a dangerous direction, but in the form of an audible alarm no indication of this.)*
Activated signal level(s) also trigger the audible alarm in continuous mode or in differentiated mode per signal level	*Press the acknowledge button to mute the beep. (The signal processing unit has already sounded an audible warning to warn of the growing danger. If the hazardous concentration which activated the alarm level(s) is still present, pressing the acknowledge button will not deactivate the alarm level(s) together with the audible alarm.)*
The display changes the concentration to a value such that, according to the settings, the indication level(s) may be automatically switched off	*- (The concentration is again in the non-hazardous range according to the settings.)*

Event	***Handling (Interpretation of Status Signal)***
Concentration that caused the triggering of the alert level(s) has been removed, but alert level(s) remain triggered	*By pressing the acknowledge button to turn off the settings according to the settings. (Activation of the signal level(s) will activate a dangerous range a concentration reaching a danger level. Human intervention is required.)*
When using catalytic transmitters, concentrations significantly above the measurement limit (overload), the display will read "OUL" regardless of the further concentration appears on the display. When the concentration is increasing, the indicating levels are switched on and only the acoustic signal is silenced by pressing the acknowledgement button.	*Do not turn on the service switch! The cause of the override condition must first be ascertained and eliminated. When the concentration is definitely no longer higher than the measurement limit, the acknowledgement button must be kept pressed continuously for 15 s. (Due to the ambiguous operation of the catalytic sensors, the signal processing unit does not allow to clear the signal by pressing the acknowledgement button momentarilythe override condition.)*
The digits flash on the display with a period of 200 ms.	*(The display is overflowing. The 1000 local value cannot be displayed.)*
The Operation / Self-error LED is lit. The signal processing unit is working as intended, but you need the version number of the signal processing unit software and the serial number.	*Turning on the service switch (After displaying the data once, the "Ser" text and the current concentration are displayed alternately. The use of the service switch is logged.)*
The Operation / Self Error LED is not lit, the display alternates between the measured concentration and "Ser". Every 5 seconds on the hour the audible alarm sounds	*Press the acknowledge button to mute the beep as required (The signal processing unit indicates that no maintenance has been performed.)*
The Operation / Self errort LED is not lit. The signal processing unit is not working properly, may show a negative concentration, or may not work at all. Self-error condition. Not the same as a condition indicating lack of maintenance.	*Ensure that there are no dangerous concentrations in the area monitored by the signal processing unit. Temporarily turn on the service switch to keep the installation operational. (If the technical condition of the signal processing unit still allows this, the code numbers indicating the cause of the fault will be repeated immediately after the "Err" message, in addition to the typical indications when the service switch is switched on. Arrangements should be made for repair as soon as possible as detailed in Chapter 17.)*

13. ABBREVIATIONS AND SIGNAL MEANINGS

LFL%	*Lower flammability limit concentration in %*
VOL%	*Percentage by volume*
ppm	*pars per million (parts per million of a given volume)*
F2	*Mains fuse (for own consumption of the apparatus)*
F4	*Audible alarm contact mains fuse (if contact is switched mains voltage source)*
	*Device protected by double or reinforced insulation*
	*Caution! (Reference to documentation!)*
CE	*The apparatus meets the requirements of the relevant European Union standards*

14. CLEANING

The appliance is covered in plastic. Cleaning, or regular and frequent cleaning, is normally only required if the specifications of the installation in which the appliance is installed require it or if the contamination becomes an obstacle to its proper use.

The apparatus should never be cleaned with chemicals or tools that will dissolve the cover material, damage it, reduce the transparency of its waterproof cover, or make the contents of the data plate illegible.

Cleaning of the apparatus must be carried out only when the cover is closed and the openings of the service switches must be protected against the ingress of cleaning agents.

Cleaning must not impair the safe operation of the appliance or result in water entering the appliance.

If, during cleaning or for any other reason, water enters the interior of the appliance, despite its higher IP protection, this may lead to a malfunction. In such a case, it is therefore recommended to contact the service immediately.

15. TECHNICAL DATA

Power supply:	*230 V~ ± 10 % 50 Hz, P < 14 VA [1], or 24 V⎓, +4V/-2V I < 0.3 A [2]*
Protection class:	*II.*
Pollution degree:	*1*
Mains supply fuse:	*T100 mA 250 V*
Audible alarm contact mains fuse:	*T1 A 250 V*
Relay contact rating:	*250 V~ 4A, or 30 V⎓ 4 A*
Insulation strength between of the mains power supply points and transmitter, also controller points:	*4000 V~ 50 Hz 1 min (Test voltage)*
Insulation strength between transmitter, also controller points and relay contacts:	*4000 V~ 50 Hz 1 minute (Test voltage)*
Insulation strength between of the mains power supply points and relay contacts [3]:	*4000 V~ 50 Hz 1 minute (Test voltage)*
Insulation strength between relay contact:	*4000 V~ 50 Hz 1 minute (Test voltage)*
24 V supply voltage points load capacity [4]:	*3W (24V 125 mA)*
Measuring range:	*According to the measuring range of the transmitters connected to the instrument*
Indication levels:	*Adjusted as required within the measuring range*
Register output [5]:	*4...20 mA, $R_{load} \leq 220\ \Omega$, or 0.4...2 V, $R_{load} \geq 100\ K\Omega$*
Dimensions:	*310 x 165 x 94 mm (w x h x d)*
Protection (MSZ EN 60529):	*IP65*
Cable entry options:	*2 pcs PG16 cable gland (∅7...14 mm) 1 pc PG13.5 cable gland (∅5...12 mm) 2 pcs PG11 cable gland (∅4.5…10 mm)*
Available cross-sections:	*0.25...2.5 mm^2*
Operating temperature:	*-20 °C...+50 °C*
Weight:	*Approx. 1.5 kg*
Semiconductor transmitters I. (E-TD-S1/M, E-TD-S1/MB) parameters of connection points:	*$U_{heat} \leq 5.4$ V ⎓, short-circuit protected $I_{load} \leq 167$ mA, $U_{meas} = 0...2.5$ V ⎓ $I_{in} \leq 0.95$ mA $R_{loop} \leq 3 / 3.8 / 6.2 / 6.6 / 7.9\ \Omega$ [6] (cable loop resistance)*

Semiconductor transmitters II. *(E-TD-S2/M, E-TD-S2/MB)* *parameters of connection points:*	$U_{heat} \leq 5.4$ V ⎓, *short-circuit protected* $I_{load} \leq 167$ mA, $U_{meas} = 0...2.5$ V ⎓ $I_{in} \leq 0.95$ mA $R_{loop} \leq 8.9 / 11.9\ \Omega$ (6) *(cable loop resistance)*
Catalytic transmitters I. *(E-TD-P1/M, E-TD-P1/MB,* *E-TD-P3/M, E-TD-P3/MB)* *parameters of connection points:*	$U_{out} = 3{,}4$ V ⎓, *short-circuit protected* $I_{nominal} = 70$ mA $R_{load} = 10\ k\Omega$ $U_{in} \leq 200$ mV *(in bridge diagonal)* $R_{loop} \leq 3\ \Omega$ *(cable loop resistance)*
Catalytic transmitters II. *(E-TD-P4/M, E-TD-P4/MB,* *E-TD-P5/M, E-TD-P5/MB)* *parameters of connection points:*	$I_{nominal} = 200$ mA ⎓, $U_{out} \leq 5.4$ V, $R_{load} = 10\ k\Omega$ $U_{in} \leq 150$ mV *(in bridge)* $R_{loop} \leq 3.75 / 10 / 12 / 12.5 / 15\ \Omega$ (6) *(cable loop resistance)*
Electrochemical, infrared and *other 4...20 mA transmitters* *connection points parameters* (7,8):	$U_{out} = 21...28$ V ⎓, *unstabilised,* *short-circuit protected* $I_{load} \leq 180$ mA, *or* 25 mA $R_{load} = 100\ \Omega$ *(for ingoing current)* $R_{load} = 213\ \Omega$ *(for outgoing current)*

Comments:

(1) The power consumption of mains voltage devices operated directly from the appliance is added to this power.

(2) The 24 V DC power supply must be isolated from the 230 V mains supply by reinforced insulation.

(3) Not applicable when the audible relay contact is used as a direct mains voltage source

(4) In mains powered mode

(5) Not galvanically isolated. The circuit connected to the recording output must be isolated from the 230V mains supply by reinforced insulation.

(6) The maximum permissible value depends on the type of sensor installed in the transmitter

(7) In the case of an integrated oxigen sensor, transmitter cannot be connected to the apparatus

(8) If another sensor is built in, other gas can be detected

16. GUARANTEE

The appliance is warranted to be free from defects in material and workmanship ***1 year*** *after the appliance has been put into service by the manufacturer's service technician or by one of the manufacturer's authorised partners, provided that all instructions for installation, putting into service, safe use, handling, operation and maintenance have been fully complied with. The guarantee may be extended for a further* ***2 years*** *if the operator or his authorised representative concludes a regular maintenance contract with the manufacturer's service provider for a period of 3 years from the date of installation.*

Note: if the apparatus contains a built-in sensor, the sensor is not covered by the external warranty period.

Attention! Operation without the required commissioning procedure may invalidate the warranty.

The warranty only covers defects of manufacturing origin. It does not apply to damage caused during transport, storage, installation and use, or to failures resulting from non-compliance with the instructions in the user manual.

17. SERVICE, MAINTENANCE

The device is also a safety device for the protection of life and property. It must be regularly maintained to ensure reliable, long-term operation. Depending on the sensors of the transmitters connected to the device and the stresses to which it is subjected, maintenance should be carried out at least ***every 3...12 months****, also in the case of faultless operation from time of commissioning.*

Maintenance is defined as the work on the equipment which requires the necessary readiness to maintain it in the technical condition necessary for it to function as intended. The maintenance of the equipment must also comply with the instructions in the transmitter's instructions for self-users.

The maintenance is carried out by the manufacturer's own service technicians or by partner companies contracted by the manufacturer against payment.

The maintenance of the equipment shall be carried out by authorised technicians who have the necessary professional knowledge and technical equipment for the maintenance of the equipment. One of the main tools used for maintenance is the computerised hardware key diagnostic programme developed for this purpose.

During maintenance, it is possible to read the logbook of the instrument and to change certain settings.

During maintenance, the diagnostic program will produce a record of the work carried out on the device. In addition to the general data required for administration, the log contains the operational and configuration data resulting from the maintenance and details of the maintenance work carried out.

Attention! The device cannot be serviced without the use of the computerised hardware key diagnostic program. Any activity performed without this is not considered maintenance.

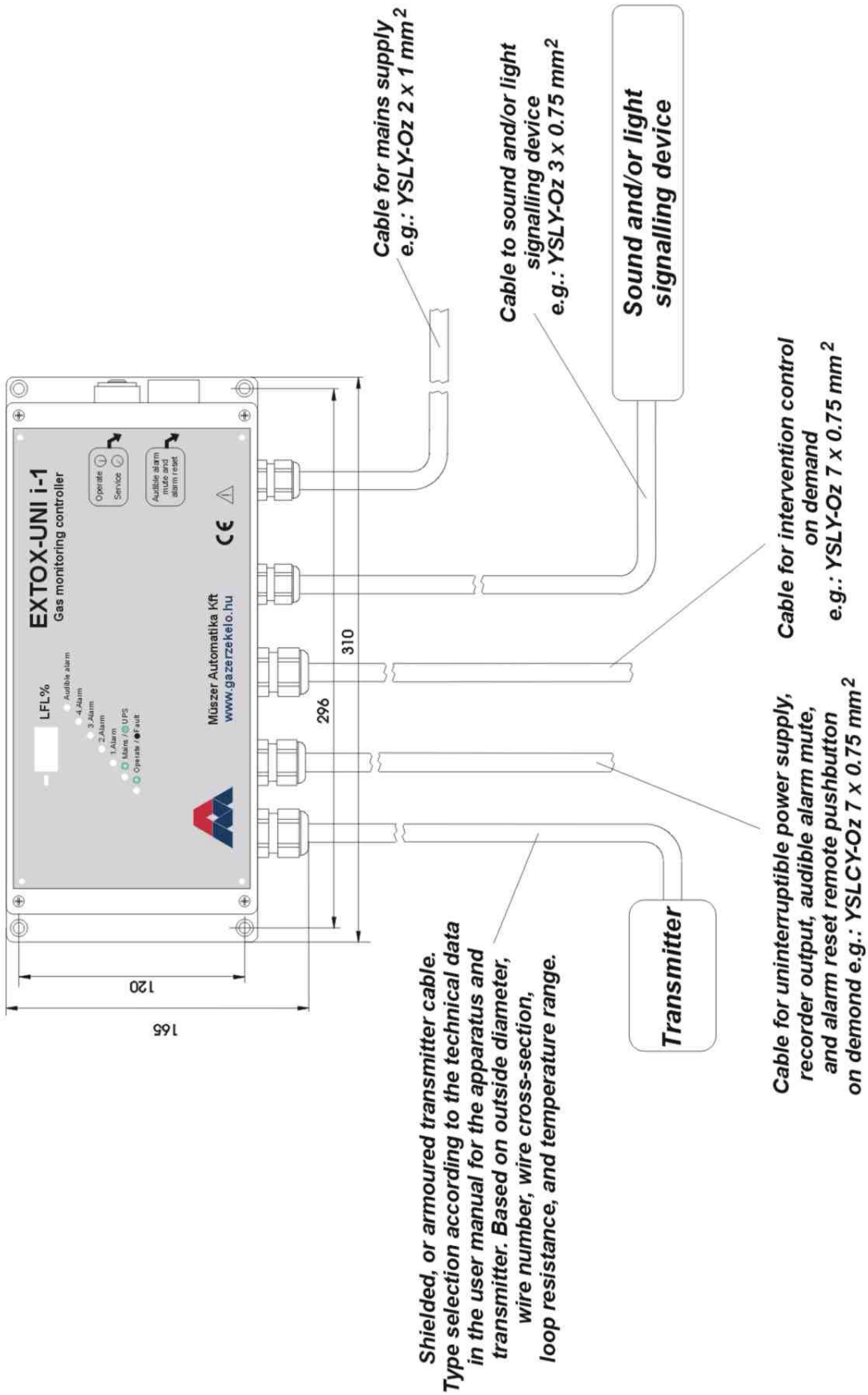
If the maintenance of the appliance is more than one month overdue, the appliance will warn the operator of the missed maintenance. It shall continue to operate as intended (if its technical condition allows), but shall give a self-report of any malfunction for 5 seconds on the hour and alternately display the concentration and ***'SEr'*** *on the display.*

In order to ensure the long-term reliable operation of the instrument, a maintenance contract may be concluded with the manufacturer or its authorised partners for an operating period beyond the warranty period. If, during operation, the appliance fails due to lack of maintenance or in spite of it (e.g. due to damage or the effect of unacceptable circumstances), repair is possible outside the regular maintenance. The repair can also be initiated with the manufacturer or its contracted partner (usually the one who carried out the installation or concluded the maintenance contract).

When initiating a repair, the following information must be provided:

- the type of equipment
- the name of the installation where the equipment is located,
- the place of installation,
- serial numbers,
- circumstances of the malfunction (if known)
- the nature of the failure (if possible, a precise description),
- the fault code displayed when the service switch is in the on position (if displayed)
- name and contact details of the contact person on the operator's side with whom to arrange a repair date and time, and conditions of works on site

EXTOX-UNI i-1 type
gas concentration measuring apparatus
dimensions and cabling



EXTOX-UNI i-1 type gas concentration measuring apparatus dimensions and cabling in version with integrated oxigen sensor