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User Manual

EXTOX-UNI K2

Gas Concentration Measuring Apparatus

Gas monitoring system manufacture and sales

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*Handling units and connection points of EXTUX-UNI K2 type gas concentration
measuring apparatus in basic construction*

EXTUX-UNI K2 type gas concentration measuring apparatus dimensions and cabling

EU Declaration of Conformity

SIL declaration

1. FUNCTION

EXTOX-UNI K2 is a general purpose gas and solvent detecting equipment which satisfies the need of industrial users mainly, in accordance with requirements of modern European Union directives and standards.

Its purpose is the measurement of concentration of explosion dangerous and toxic materials mixed in the air, in a lot of different installation sites such as boiler houses, or other installation sites. They warns in advance on emergency situations on the basis of measurement results and limit values of dangerous materials. Automatic intervention control to avoid explosion or toxic danger.

2. MAIN FEATURES

- * Installed system with remote transmitters*
- * Measurement of concentration of explosion dangerous, toxic and other materials in measuring ranges designated to lower flammable limit concentration or health hazard limits.*
- * A device designed to operate two transmitters with two independent measuring systems*
- * Possibility of using explosion proof or non explosion proof transmitters with different type and measurement method*
- * Processor controlled operation*
- * Two signalling levels per transmitter*
- * Storing of peak concentration value and date*
- * Built-in acoustic signal*
- * Possibility to operate an external horn from a live relay output*
- * Acoustic signal control can be assigned to any event*
- * Manual venting system control possibility*
- * Automatic venting system control possibility pre-programmable for time and duration of time*
- * Problem- free operation of 2 stage ventilators*
- * Programmable ventilator postrunning time*
- * Real time event log*
- * Built-in service switch*
- * Settings configurable with a computer diagnostics program*
- * Displaying of maintenance necessity*

3. **CONSTRUCTION**

The appliance is a plastic distribution cabinet with a transparent lid, equipped appropriate components according to the application. Its design allows for easy installation, commissioning and operation.

It can be mounted on vertical wall surface, it is suitable for connecting all the cables necessary for operation. It has all the status signals and handling units needed for proper operation.

Inside the cabinet are the components necessary for the operation of the appliance (mains transformer, control unit with signal processing electronics, supplementary intervention relays). The signal processing electronics can handle 2 pcs of semiconductor, or catalytic, or 4...20 mA type transmitters in two independent measurement systems. The status signals associated with the transmitters are identified on control unit by channel numbers.

The apparatus is designed in a way that it could be installed, put into operation and operated for long term easily (within specified conditions).

4. OPERATION

The apparatus can be operated as intended by means of gas concentration transmitters connected to it by cables. The apparatus operates according to the technical characteristics of the transmitters connected to it and according to the needs 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, provide status indications, operate intervention control contacts, and log events.

The device has two alarm levels, a self-fault and an audible alarm, and a voltage-free relay contact for each. The signal levels are switched on and off based on preset tipping levels and the instantaneous value of the measured concentration. The activation of the indicating levels can be set for increasing or decreasing concentration, the latching of the indications (only by manual reset or automatically) and the operation of the relay contacts (close or open when the indicating levels are activated) can also be preset.

An adequate measuring range can be assigned to each transmitter depending on applied transmitter and sensor type. 2 signal levels can be preset in the measuring ranges. The signal levels can be of automatically switching off or lockable (i.e. it can be switched off by acknowledgement button after disappearing of the state that generated the switch-on of the signal).

The signal levels (alarm 1. alarm 2.) are activated when the measured concentration exceeded the preset values in defined direction. The operation of signal levels are demonstrated by status LED-s. The operation of intervention control relays is made mainly on the basis of activity of signal levels. The cancel button located on central unit, is also used for switching off the danger warning acoustic signal besides switching off the lockable signals, otherwise the apparatus operates completely automatically.

The central unit is capable for operation according to several configurational settings. The configuration (including all the settings for users' requirements) and readout of event recorder is carried out by means of hardware keyed diagnostics program. If the customer needs the data of event recorder he/she can get it via cooperation of the manufacturer or its contracted partners.

The apparatus is capable to operate the intervention control relays not only on the base of signal levels activity but in preprogrammed way for time and time durations and by the effect of manual control. This service is important mainly in garages for ventilator control.

There are 6 pcs of relays installed in the control box of appliance in basic construction as follows:

- 1 pce self error relay (OHR); its purpose is remote checking of operability
- 2 pcs alarm 1 (pre-alarm) relays (ER); 1 pce in each independent measuring system, their purpose intervention control in case of less dangerous concentration values
- 2 pcs alarm 2 (alarm) relays (RR), 1 pce in each independent measuring system their purpose is intervention control in case of more dangerous concentrations
- 1 pce voice relay (HR); its purpose is to operate the acoustic signal horn

Relay operation in function of signals and operating state in case of basic construction and basic configuration				
Signals and operating status	Status of relays			
	ER	RR	OHR	HR
Without power supply	basic position	basic position	basic position	basic position
After switching on during 1 minute heat-up time (independent from concentration)	basic position	basic position	pulls	basic position
No switched-on signal	basic position	pulls	pulls	basic position
Alarm 1. (pre-alarm) switched on	pulls	pulls	pulls	*
Alarm 1. (pre-alarm) and alarm 2. also switched on	pulls	basic position	pulls	**
Self error	x	x	basic position	***

* if acoustic signal is designated to alarm 1 (pre-alarm) it pulls

** if acoustic signal is designated to alarm 2 it pulls

*** ... if acoustic signal is designated to self-error also it pulls

x..... if self error signal is displayed only one channel and operating signal is illuminated the relays of other channel work according to the function according to the existing signal level





The closing and morse contacts of intervention control relays are utilized only which are in the control box (except self error relays). The **basic position is the break contact the closed contact means pulled state**. The alarm 1 (pre-signal) relay contacts are commoned paralelly, the alarm relay contacts are commoned serially to the outputs according to the most common type of use (the most common use is the closing type in case of presignal, break type in case of alarm).

The built-in service switch short-circuits the series-connected contact of the alarm 2. relays in the service position.

5. TRANSMITTERS CONNECTED TO THE APPLIANCE

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 ⁽¹⁾

Measuring principle	Ex protection	Types
Semiconductor		E-TD-S1/M, E-TD-S1/MB, E-TD-S2/M, E-TD-S2/MB
Catalytic		E-TD-P1/M, E-TD-P1/MB, E-TD-P3/M, E-TD-P3/MB
Elektrochemical		E-MC-E1
	-	E-MC-NE1, ECO-CO-2, ECO-NO2
Infrared		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		⁽²⁾

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

Notes:

⁽¹⁾ The list may be extended.

⁽²⁾ 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, from persistent 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 transmitters 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 transmitters shall not exceed the limit specified for the type of transmitter for the specific sensor.*
- * When using catalytic transmitters, splicing in the cables connecting the device and the transmitters shall be avoided.*
- * The cables connecting the instrument and transmitters, 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. Signal processing units 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
$\leq 3 \Omega$	0.75 mm^2	$\leq 62.5 \text{ m}$
	1 mm^2	$\leq 83 \text{ m}$
	1.5 mm^2	$\leq 125 \text{ m}$
	2.5 mm^2	$\leq 208 \text{ m}$
$\leq 8.9 \Omega$	0.75 mm^2	$\leq 185 \text{ m}$
	1 mm^2	$\leq 245 \text{ m}$
	1.5 mm^2	$\leq 370 \text{ m}$
	2.5 mm^2	$\leq 615 \text{ m}$

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

In the apparatus the following connecting points can be found in basic construction:

Numbering	Function
1	Network transformer secondary coil (connected by manufacturer)
2	Network transformer secondary coil (connected by manufacturer)
3	Acknowledgement button input GND p. (connected by manufacturer)
4	Acknowledgement button input positive p. (connected by manufacturer)
5	2nd channel additional alarm 2 relay (optionally connected by manuf.)
6	1nd channel additional alarm 2 relay (optionally connected by manuf.)
7	2nd channel additional alarm 1 relay (optionally connected by manuf.)
8	1nd channel additional alarm 1 relay (optionally connected by manuf.)
9	Common supply voltage of addit. relays (option. connected by manuf.)
10	1. transmitter connection point
11	1. transmitter connection point
12	1. transmitter connection point
13	1. transmitter connection point
14	2. transmitter connection point
15	2. transmitter connection point
16	2. transmitter connection point
17	2. transmitter connection point

Numbering	Marking	Function
18	MAINS	Network supply voltage phase wire (L) 230V
19		Network transformer primary coil guarded phase wire (connected by manufacturer)
20		Network transformer primary coil neutral wire (connected by manufacturer)
21		230V network supply voltage neutran wire (N)
22	HORN	Sound signal voltage-free relay contact, or network voltage neutral
23		Sound signal voltage-free relay contact, or fuse guarded and switchable 230V network phase
24	FAULT	Fault signal, voltage-free NO relay contact
25		Fault signal, voltage-free COMM relay contact
26		Fault signal, voltage-free NC relay contact
27	1. ALARM	Alarm 1. voltage-free relay contact
28		Not connected point
29		Alarm 1. voltage-free relay contact
30	2. ALARM	Alarm 2. voltage-free relay contact
31		Not connected point
32		Alarm 2. voltage-free relay contact

The connection points of the apparatus and the transmitters to which they are connected shall be connected as shown in the following table:

Transmitter types	Connection points of apparatus	Connection points of transmitters
<i>E-TD-S1/M, E-TD-S1/MB</i>	10 (1. transmitter GND, cable shielding)	Heating
	11 (1. transmitter Y)	Sense-
	12 (1. transmitter X)	Sense+
	13 (1. transmitter F+)	Heating
	14 (2. transmitter GND, cable shielding)	Heating
	15 (2. transmitter Y)	Sense-
	16 (2. transmitter X)	Sense+
	17 (2. transmitter F+)	Heating
<i>E-TD-S2/M, E-TD-S2/MB</i>	10 (1. transmitter GND, cable shielding)	Heating-
	11 (1. transmitter Y)	Sense-
	12 (1. transmitter X)	Sense+
	13 (1. transmitter F+)	Heating+
	14 (2. transmitter GND, cable shielding)	Heating-
	15 (2. transmitter Y)	Sense-
	16 (2. transmitter X)	Sense+
	17 (2. transmitter F+)	Heating+
<i>E-TD-P1/M, E-TD-P1/MB, E-TD-P3/M, E-TD-P3/MB</i>	10 (1. transmitter GND, cable shielding)	No connection point
	11 (1. transm. GND)	Heating-
	12 (1. transm. FK)	Out
	13 (1. transm. F+)	Heating+
	14 (2. transmitter GND, cable shielding)	No connection point
	15 (2. transm. GND)	Heating-
	16 (2. transm. FK)	Out
	17 (2. transm. F+)	Heating+
<i>E-MC-E1 E-MC-NE1</i>	10 (1. transmitter GND, cable shielding)	No connection point
	11 (1. transm. Ibe)	Power supply connection p.
	13 (1. transm. +Ut)	Power supply connection p.
	14 (2. transmitter GND, cable shielding)	No connection point
	15 (2. transm. Ibe)	Power supply connection p.
	17 (2. transm. +Ut)	Power supply connection p.

Transmitter types	Connection points of apparatus	Connection points of transmitters
<i>ECO-CO-2, ECO-NO2</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>No connection point</i>
	<i>11 (1. transm. Ibe)</i>	<i>-</i>
	<i>13 (1. transm. +Ut)</i>	<i>+</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>No connection point</i>
	<i>15 (2. transm. Ibe)</i>	<i>-</i>
	<i>17 (2. transm. +Ut)</i>	<i>+</i>
<i>E-TD-R1, E-TD-R1B, E-TD-R2, E-TD-R2B</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>8 (GND)</i>
	<i>11 (1. transm. Ibe)</i>	<i>11 (Iout)</i>
	<i>13 (1. transm. +Ut)</i>	<i>9 (+Us)</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>8 (GND)</i>
	<i>15 (2. transm. Ibe)</i>	<i>11 (Iout)</i>
	<i>17 (2. transm. +Ut)</i>	<i>9 (+Us)</i>
<i>IR-NE-1, IR-NE-2, IR-NE-3</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>GND</i>
	<i>11 (1. transm. Ibe)</i>	<i>Iki</i>
	<i>13 (1. transm. +Ut)</i>	<i>+Ut</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>GND</i>
	<i>15 (2. transm. Ibe)</i>	<i>Iki</i>
	<i>17 (2. transm. +Ut)</i>	<i>+Ut</i>
<i>Other two-wire transmitters of 4...20 mA</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>No connection point</i>
	<i>11 (1. transm. Ibe)</i>	<i>Power supply negative point</i>
	<i>13 (1. transm. +Ut)</i>	<i>Power supply positive point</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>No connection point</i>
	<i>15 (2. transm. Ibe)</i>	<i>Power supply negative point</i>
	<i>17 (2. transm. +Ut)</i>	<i>Power supply positive point</i>
<i>Other three-wire current source type transmitters of 4...20 mA</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>Power supply (-)</i>
	<i>11 (1. transm. Ibe)</i>	<i>Current output (Iout)</i>
	<i>13 (1. transm. +Ut)</i>	<i>Power supply (+)</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>Power supply (-)</i>
	<i>15 (2. transm. Ibe)</i>	<i>Current output (Iout)</i>
	<i>17 (2. transm +Ut)</i>	<i>Power supply (+)</i>

Transmitter types	Connection points of apparatus	Connection points of transmitters
<i>Other three-wire current drain type transmitters of 4...20 mA</i>	<i>10 (1. transmitter GND, cable shielding)</i>	<i>Power supply (-)</i>
	<i>12 (1. transm. Iki)</i>	<i>Current input (Iin)</i>
	<i>13 (1. transm. +Ut)</i>	<i>Power supply (+)</i>
	<i>14 (2. transmitter GND, cable shielding)</i>	<i>Power supply (-)</i>
	<i>16 (2. transm. Iki)</i>	<i>Current input (Iin)</i>
	<i>17 (2. transm +Ut)</i>	<i>Power supply (+)</i>

Notes:

The role of the connection points of the apparatus is adapted to the type of transmitter to be used.

If the apparatus must be is operated by 24V direct voltage the network transformator is omitted and the power voltage must be connected to connection points 1 and 2. The polarity is indifferent.

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.

The cover of the appliance must not be removed when the appliance is energised, except in justified cases and for the time required to switch the service switch to the service position.

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.

It is forbidden to connect circuits of different voltage levels (e.g. 230 V and 24 V) to adjacent relay contacts of the device, which require reinforced insulation.

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.

If in the case of malfunction, the device should not be allowed to provide intervention control corresponding to a dangerous concentration (i.e. if the self-fault indication should not automatically result in an alarm signal), it is imperative that the device self-fault indication is used.

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, 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.

Correctly connected and switched on the device is ready for operation, but indicates the absence of a commissioning that can be performed by a computer diagnostic program. It gives a continuous self-fault indication, flashes the status LEDs and switches on the audible alarm for a few seconds every hour (every hour).

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, STATUS SIGNALS

The apparatus has the following controls:

- * Service switch (service – operate),*
- * Diagnostic connector (service),*
- * Acknowledgement button (audible alarm mute and alarm reset),*
- * Operation LED (O), (green),*
- * Acoustic signal LED (A), (red),*
- * 1 pc. alarm 1 (pre-signal) LED (red) per channel (1-A),*
- * 1 pc. alarm LED (red) per channel (A-2),*
- * 1 pc. self-error LED (yellow) per channel (F).*

All the operating buttons are located inside the box of appliance except for acknowledgement button

The network fuse B1 can only be accessed after opening the control house inside the capsulation.

12. HANDLINGS, INTERPRETATION OF STATUS SIGNAL

The operation of apparatus can be made on the basis of configurational settings.

The configurational settings are described in the protocol made with diagnostics program.

The apparatus can be operated in part automatically, in part manually according to the programmed operating methods as follows:

Event or what to do	Handling (Interpretation of status signal)
<i>One or several signals are activated because of change of gas concentration</i>	-
<i>One or several signals are deactivated because of change of gas concentration</i>	-
<i>The acoustic signal was activated because of activation of signal(-s) the operator acknowledge the reason and wants to switch off the acoustic signal ⁽¹⁾</i>	<i>The acknowledgement button must be pressed</i>
<i>The signal generating reason (dangerous concentration) stopped, the operator wants to switch off the locked signal(-s)</i>	<i>The acknowledgement button must be pressed</i>
<i>The operator wants to switch on the venting system ⁽²⁾ (no signalling, no acoustic signal)</i>	<i>The acknowledgement button must be pressed</i>
<i>The operator wants switch off the venting system (the venting system operates, no signalling, no acoustic signal)</i>	<i>The acknowledgement button must be pressed</i>
<i>The operator wants to switch on the automatic venting system pre-programmed according to the time and time durations ⁽³⁾ (no signalling, no acoustic signal)</i>	<i>The acknowledgement button must be pressed and must be kept permanently until the alarm 2. signal flashes twice</i>
<i>The operator wants to switch off the automatic venting system pre-programmed according to the time and time durations ⁽³⁾ (no signalling, no acoustic signal)</i>	<i>The acknowledgement button must be pressed must be kept permanently until the alarm 1. (pre-signal) flashes twice</i>

Interpretation of signals:

Signals	Interpretation of signals
<i>The status signalling LEDs are flashing alternately from right side to left side</i>	<i>The apparatus is in heating-up period for 1 minute after switch on</i>
<i>Operating signal LED (green) is illuminated, no self-error signal</i>	<i>The apparatus operates.</i>
<i>Operating signal LED (green) not operated ⁽⁴⁾</i>	<i>The apparatus does not receive power supply or the apparatus became inoperable partially or completely</i>
<i>Self-error signal LEDs (yellow) are illuminated, the pre-signal and alarm LEDs are flashing simultenaously, the acoustic signal warmes time to time</i>	<i>The apparatus has been switched on without putting into operation or the maintenance is delayed by more than 1 month. The apparatus warns the user of skipped putting into operation or maintenance.</i>
<i>Self-error signal LED (yellow) illuminates on 1, or both channels ⁽⁴⁾</i>	<i>The channel is not capable for proper operation which has self-error signal because of transmitter error</i>
<i>Neither alarm 1. (pre-signal), nor alarm LEDs (red) illuminate</i>	<i>There is no dangerous concentration according to measurement results of the apparatus and preset signal levels</i>
<i>Alarm 1. (pre-signal) LEDs (red) illuminate one or both channels</i>	<i>The gas concentration exceeded the preset less dangerous level (gas danger)</i>
<i>The alarm 1. (pre-signal) and alarm LEDs (red) also illuminate on one or both channels</i>	<i>The gas concentration also exceeded the preset more dangerous level (there is increased gas danger)</i>

Notes:

(1) The acoustic signalis switched off automatically in case of switching off of acoustic signal-generating signal

(2) The venting system can be operated manually if it is allowed according to configurational settings. The venting system cannot be switched off by manual control if it was switched on because of signalling

(3) *The venting system can be operated automatically on each day of the week in each quarter of hour if it is preset suitably and permitted according to configurational settings and switched-on, for example in garages the equipment activates the venting system in early morning or in the evening in rush hours even the carbon monoxide concentration is not critical.*


(4) *In case of device failure (operation LED is not illuminated and/or self error(s) if the apparatus can prevent the proper operation of supervised establishment, the built-in service switch can be switched from operating function over to service function by responsible person, if it is realized without doubt that no dangerous concentration exists.*

If the service switch has to be switched on due to a fault, immediate action must be taken to repair it.

If there is selferror signal on one channel only, then the presignal or alarm generated on the other channel must be condidere as real gas danger, because at such failure the other channel can function properly.

13. ABBREVIATIONS AND SIGNAL MEANINGS

 *European suitability mark. The apparatus meets the requirements of the relevant European Union standards*

 *The prescription of user manual must be taken into account when using properly the apparatus*

B1 Mains supply fuse

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

<i>Power supply:</i>	230 V~ $\pm 10\%$ 50 Hz, $P < 15\text{ VA}$ ⁽¹⁾ , or 24 V $\overline{\text{DC}}$, +4V/-2V $I < 0.3\text{ A}$ ⁽²⁾
<i>Protection class:</i>	II.
<i>Pollution degree:</i>	1.
<i>Mains supply fuse (B1):</i>	T630 mA 250 V
<i>Intervention control relay contacts in basic construction</i> ⁽³⁾	
<i>Alarm 2. :</i>	1 pc. contact, loadability 250 V~ 2A, or 30 V $\overline{\text{DC}}$ 2A
<i>Alarm 1. (pre-signal):</i>	1 pc. contact, loadability 250 V~ 2A, or 30 V $\overline{\text{DC}}$ 2A
<i>Self-error:</i>	1 pc. contact, with NO, COMM and NC lead outs. Loadability 250 V~ 2A, or 30 V $\overline{\text{DC}}$ 2A
<i>Acknowledgeable voice:</i>	1 pc. closing contact, loadability 250 V~ 2A, or 30 V $\overline{\text{DC}}$ 2A in voltage free version, or in under voltage version 100 mA (during signal the network voltage appears on the output)
<i>Insulation strength between mains power supply points and 1...17 connection points:</i>	4000 V~ 50 Hz 1 min (Test voltage)
<i>Insulation strength between 1...17 connection points and relay contacts:</i>	4000 V~ 50 Hz 1 min (Test voltage)
<i>Insulation strength between mains power supply points and relay contacts</i> ⁽⁴⁾ :	4000 V~ 50 Hz 1 min (Test voltage)
<i>Number of connectable transmitters:</i>	2 pcs.
<i>Measuring range:</i>	according to the measuring range of the transmitters connected to the apparatus
<i>Indication levels:</i>	Adjusted as required within the meas. range
<i>Dimensions:</i>	312 x 248 x 130 mm {width, height, depth}
<i>Protection (MSZ EN 60529):</i>	IP65
<i>Cable entry options:</i>	Transmitters PG16 cable glands ($\varnothing 7...14\text{ mm}$) Mains supply, intervention control, visible alarm device PG11 cable glands ($\varnothing 4.5...10\text{ mm}$) Audible alarm device PG9 cable gland ($\varnothing 3.5...8\text{ mm}$)
<i>Available cross-sections</i>	0.25...2.5 mm ²
<i>Operating temperature range:</i>	-20°C ... 50°C
<i>Weight:</i>	approx. 2.9 kg

*Semiconductor transmitters I.**(E-TD-S1/M, E-TD-S1/MB)**parameters of connection points:*

$$U_{heat} \leq 5.5 \text{ V}_{AC}, \text{ short-circuit protected}$$

$$I_{load} \leq 167 \text{ mA},$$

$$U_{meas} = 0 \dots 1.83 \text{ V}_{AC}$$

$$I_{in} \leq 1.42 \text{ mA}$$

$$R_{loop} \leq 3 / 3.8 / 6.2 / 6.6 / 7.9 \ \Omega \quad (5)$$

*(cable loop resistance)**Semiconductor transmitters II.**(E-TD-S2/M, E-TD-S2/MB)**parameters of connection points:*

$$U_{heat} \leq 5.5 \text{ V}_{AC}, \text{ short-circuit protected}$$

$$I_{load} \leq 167 \text{ mA},$$

$$U_{meas} = 0 \dots 1.83 \text{ V}_{AC}$$

$$I_{in} \leq 1.42 \text{ mA}$$

$$R_{loop} \leq 8.9 / 11.9 \ \Omega \quad (5)$$

*(cable loop resistance)**Catalytic transmitter**(E-TD-P1/M, E-TD-P1/MB)**E-TD-P3/M, E-TD-P3/MB)**parameters of connection points:*

$$U_{out} = 3.4 \text{ V}_{AC}, \text{ short-circuit protected}$$

$$I_{nominal} = 70 \text{ mA},$$

$$R_{load} = 10 \text{ k}\Omega$$

$$U_{meas} \leq 210 \text{ mV (in bridge diagonal)}$$

$$R_{loop} \leq 3 \ \Omega \text{ (cable loop resistance)}$$

*Electrochemical, infrared and**other 4...20 mA transmitters**parameters of connection points:*

$$U_{out} = 21 \dots 28 \text{ V}_{AC}, \text{ unstabilized, short-circuit protected}$$

$$I_{load} \leq 180 \text{ mA, or } 25 \text{ mA}$$

$$R_{load} = 100 \ \Omega \text{ (for ingoing current)}$$

$$R_{load} = 200 \ \Omega \text{ (for outgoing current)}$$

Notes:

- (1) The power consumption of mains voltage devices operated directly from the appliance is added to this power.*
- (2) The 24 V_{AC} power supply must be isolated from the 230 V mains supply by reinforced insulation.*
- (3) Information on loadability of contacts of apparatus equipped with additional relays can be found in Connection Booklet!*
- (4) Not applicable with under voltage version*
- (5) The maximum permissible value depends on the type of sensor installed in the transmitter*

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.*

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.

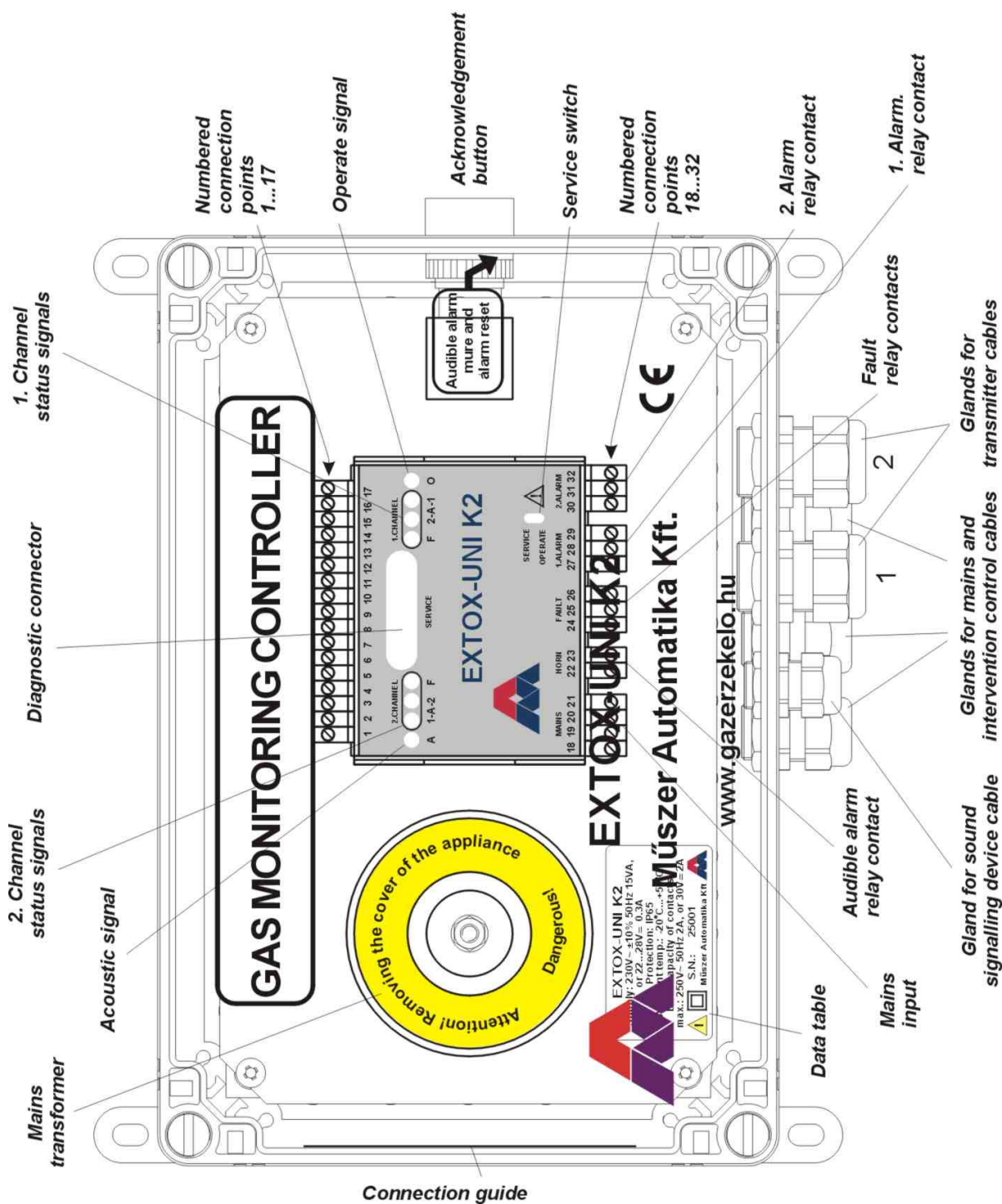
If the maintenance of the appliance is more than one month overdue, the appliance will warn the operator of the missed maintenance. It shall continue to operate as intended (if its technical condition allows), but shall give a self-report of any malfunction for 5 seconds on the hour, also flashes the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

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),*
- 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

*Handling units and connection points
of EXTOK-UNI K2 type gas concentration
measuring apparatus in basic construction*



EXTOX-UNI K2 type gas concentration measuring apparatus dimensions and cabling

