

# INSTRUCTION MANUAL



Gas Detector

## DEGA NB III LCD



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## For your safety


### The detector must be mounted with the sensor module downwards

 To maintain IP protection, the detector must be mounted with the sensor module downwards


### Beware of static electricity

 Electronic components are sensitive to static electricity. Do not touch them directly - they may get damaged.

### The device is intended to be installed by a trained person

 The product is designed only for installation by a certified technician. The manufacturer is not liable for damages resulting from incorrect or improper handling.

### In case of malfunction, immediately unplug from the power supply

 If you notice an unusual smell or smoke emitting from the product, unplug it from the power supply, battery backup and all other attachments. Continued operation could result in injury or property damage.

### The detector is intended for use exclusively in a non-explosive environment

 Detectors DEGA NSx-yL II (ZONE 2) and NSx-yL III (ZONE 1) are designed for use in potentially explosive environment.

### Do not disassemble the product and ensure against the contact of its internal components with water



Contact of internal components of the product with water may cause an electric shock. In case of any malfunction entrust the servicing of the product exclusively to a certified service centre. Contact with water can create a short circuit in the product and consequent damage to property or personal injury.

### Use appropriate cable types



To ensure compliance with the parameters of the product, only use the recommended cable types described in this manual.

### Dispose of used products and detector sensors with respect to the environment



Detector sensors contain hazardous substances. Dispose of them in accordance with the current legislation on environmental protection.

### Use the detector only with the appropriate certified DEGA products



The device is certified as functionally and technically qualified only with original "DEGA" accessories. In case of using the device with any other products the manufacturer is not liable for any damages that may occur.

### Undertake regular functional checks and calibrations of the detector



Perform regular "CALIBRATION" (setting the detection limits, checking the responsiveness of the sensor, checking the functionality of the detector) and "OPERATIONAL AND FUNCTIONAL CHECKS" of the entire detection system (sensor excitation with subsequent control of optical and audible alarms, triggering fans, shutdown technology, etc.). Perform calibration and operational and functional checks only at certified service centers with a valid certificate of competence or at the manufacturer.

**Warning:** The detector automatically checks its calibration period - the period of validity of its calibration. After 12 months since the last calibration (max. calibration period) the detector will transmit this fact to the host system. The detector must be calibrated immediately at a certified service center with a valid certificate of competence or by the manufacturer. See section "Monitoring the calibration periods".

## Technical data and information

Supply voltage:	24 VDC
Wire diameter range:	0,08-2,5 mm <sup>2</sup> – wire, stranded wire 0,25-1,5 mm <sup>2</sup> – stranded wire with ferrule
Output:	2 x potential free relay
Dimensions without bushings	110 x 100 x 50 mm (WxHxD)
Weight:	0,3 kg

### Input

DEGA NBx-EL III LCD	1,1 W
DEGA NBx-CL III LCD	2,2 W
DEGA NBx-IL III LCD	1,7 W
DEGA NBx-SL III LCD	1,7 W
DEGA NBx-PL III PID LCD	2,2 W

### Warm-Up time

DEGA NBx-EL III LCD	some sensors max. 72 hours
DEGA NBx-CL III LCD	max. 30 s
DEGA NBx-IL III LCD	max. 15 s
DEGA NBx-SL III LCD	max. 180 s
DEGA NBx-PL III LCD PID	max. 15 s

### Consumption/input in the ALARM mode

DEGA NBx-EL III LCD	2,2 W
DEGA NBx-CL III LCD	3,3 W
DEGA NBx-IL III LCD	2,8 W
DEGA NBx-SL III LCD	2,8 W
DEGA NBx-PL III LCD PID	3,3 W

### Time to stabilize (>5 days without power)

DEGA NBx-EL III LCD	some sensors max. 72 hours
DEGA NBx-CL III LCD	max. 1 h
DEGA NBx-IL III LCD	max. 30 min
DEGA NBx-SL III LCD	max. 1 h
DEGA NBx-PL III LCD PID	max. 30 min

### Response time (T90)

DEGA NBx-EL III LCD	max. 180 s - based on sensor type
DEGA NBx-CL III LCD	max. 30 s
DEGA NBx-IL III LCD	max. 30 s
DEGA NBx-SL III LCD	max. 30 s
DEGA NBx-PL III LCD PID	max. 30 s

### Sensor lifetime in a clean environment

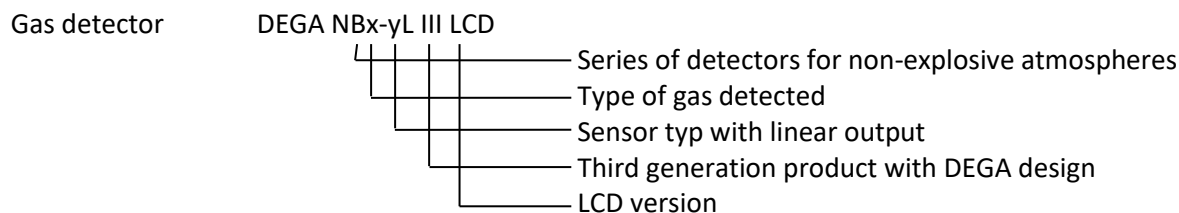
DEGA NBx-EL III LCD	2 years
DEGA NBx-CL III LCD	2 years
DEGA NBx-IL III LCD	5 years
DEGA NBx-SL III LCD	2 years
DEGA NBx-PL III LCD PID	5000 hours

# Operational and storage conditions

Ambient temperature:	-20 °C to +60 °C (electrochemical, semiconductor and catalytic sensors) -20 °C up to +40 °C (infrared sensors) and 0 °C to +40 °C (PID sensors)
Relative humidity:	0-95 % RH
Air pressure:	80-120 kPa
Ambient air flow:	max. 2 m/s - flow directly to the sensor is not allowed
IP rating:	IP 54
Location:	BE1 - non-explosive atmospheres

# Terminology

## The marking system for sensors DEGA NBx-yL III LCD:



### DEGA NBx-EL III LCD with an electrochemical sensor

They operate on the principle of change of electrical parameters on the electrodes stored in electrolyte, due to oxidation or reduction reactions of the detected gas on its surface. These sensors have good selectivity and the ability to detect very low concentrations of toxic gases.

### DEGA NBx-CL III LCD with a catalytic sensor (Pelistor)

They operate on the principle of catalytic combustion - gas concentration is measured based on the amount of heat released in a controlled combustion reaction. The reaction is supported by a suitable temperature and the presence of a catalyst. These sensors can be used to detect a broad range of flammable gases. The sensors are characterized by fast response, long lifetime and high stability. A minimum of 10 % of oxygen in the air is required for their proper function.

### DEGA NBx-IL III LCD with an infrared sensor (NDIR)

Top quality scanning method. They operate on the principle of infrared spectroscopy. The sensors have excellent selectivity in organic matter, do not require any oxygen in the atmosphere and are resistant to catalyst poisons (sulfur and silicon compounds) which cause a change of sensitivity of catalytic sensors. The sensors are also characterized by high stability and a long lifetime.

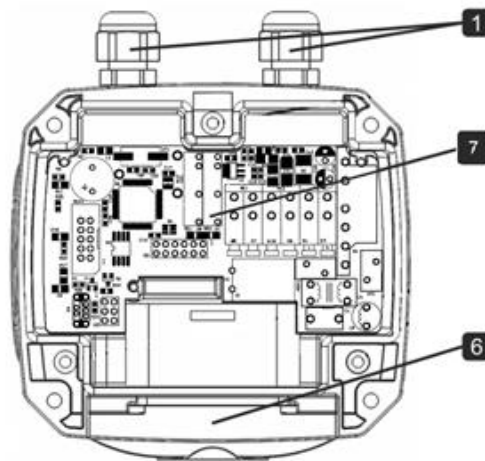
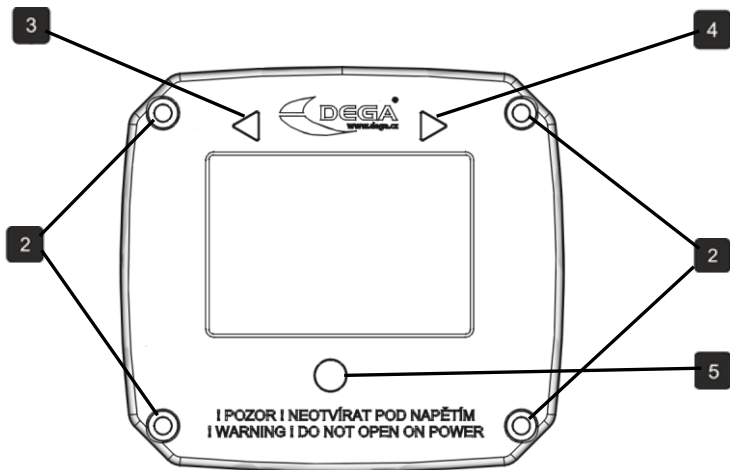
### DEGA NBx-SL III LCD with a semiconductor sensor

The sensors operate on the principle of changes in electrical conductivity of semiconductors by changing the concentration of the detected gas. Their advantage is a long lifetime in a clean environment and a wide range of different types of gases and vapors. Their disadvantage is their low selectivity - the sensor largely responds to other gases, for which it is not calibrated.

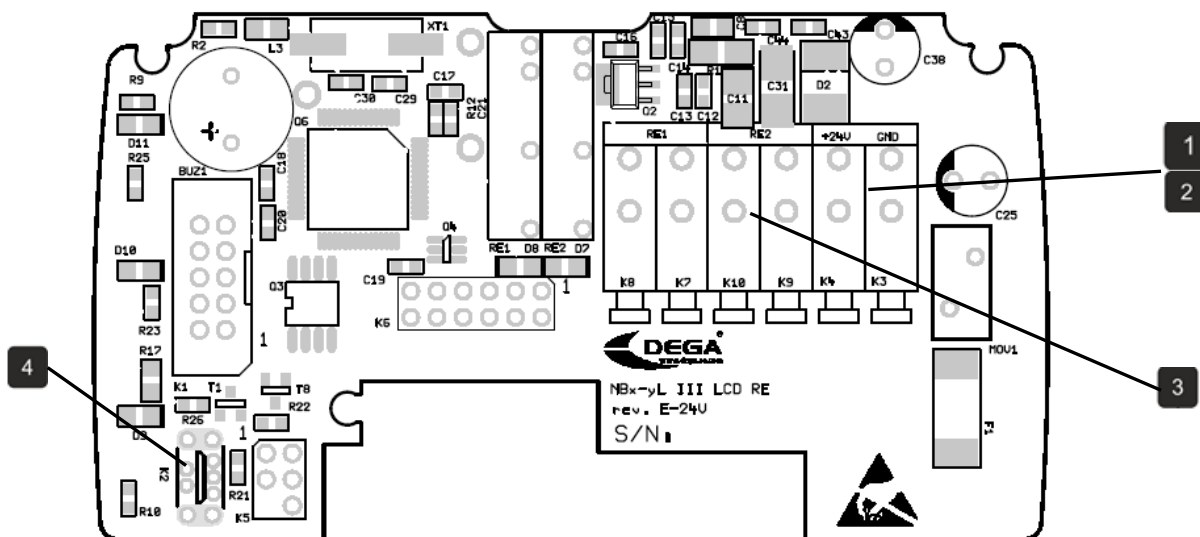
### DEGA NBx-PL III LCD PID with a photoionization sensor

Sensitive scanning method for detection of a wide range of VOC - volatile organic compounds. The sensor does not selectively detect all VOCs in the air at concentrations in ppm.

# Product description



- |  |                            |                                  |                                   |
|--|----------------------------|----------------------------------|-----------------------------------|
| <b>1</b> Cable glands                  | <b>2</b> Allen screws 3 mm | <b>3</b> Magnetic control „BACK“ | <b>4</b> Magnetic control „FRONT“ |
| <b>5</b> Magnetic control „ENTER/EXIT“ | <b>6</b> Sensor module     | <b>7</b> PCB with electronics    |                                   |



- |   |   |                                       |   |
|---|---|---------------------------------------|---|
| <b>1</b> Power supply terminal block 24 VDC - L | <b>2</b> Power supply terminal block 24 VDC - N | <b>3</b> Relay outputs terminal block | <b>4</b> Connector for service operations |
|---|---|---------------------------------------|---|

# Installation, assembly and disassembly of the detector

Before assembling, read the valid installation standards ČSN EN 60079-29-2 (Selection, installation, use and maintenance of detectors for combustible gases and oxygen) and ČSN EN 45544-4 (Guidelines for the selection, installation, use and maintenance of detectors of toxic substances).

Make certain that the sensor input is accessible by air. The detector must be in an open area with no obstacles in its way (furniture etc.) Ensure that the input of the sensor is not be polluted by layers of dust or otherwise contaminated.

**To maintain IP protection, the detector must be mounted with the sensor down.**

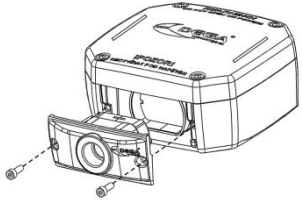
### 1. **Assembly of the detector**

The detector consists of four parts - the body of the detector, the removable sensor and bushings.

Detector assembly procedure is to be performed in the following steps:

- a) Disassemble the detector using four hexagon socket 3 mm screws
- b) Use a screwdriver to break out holes for the bushings
- c) Mount the detector on a flat surface using three 6 mm fasteners in a height above the floor with the gas entrance facing downwards, according to the specifications of the detected substance
- d) Direct the cables through the bushings
- e) Connect the wiring to the terminal block of the detector
- f) Assemble the detector using four hexagon socket 3 mm screws

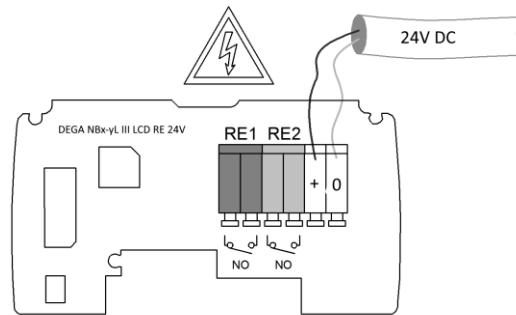
### 2. **Replacement of the sensor module**



This activity must not be performed when the detector is energized.

In case of need to replace the sensor module with a new piece, unscrew and remove the cover. Unscrew a pair of 3 mm hexagon screws on the sensor module and carefully remove the sensor module so as not to damage the pins of the sensor unit. Carefully insert the new sensor module – be careful not to bend the pins! Screw the two 3 mm hexagons screws and put back the cover. Screw the cover.

### 3. **Connecting the detector – 24 VDC.**



## Detector functions


### 1. **Turning on the detector**

When the detector power is switched on, automatic test procedures begin, which can take up to 180 seconds, depending on the sensor used. During this sequence, the internal electronics are tested and the sensor is stabilized to prevent false alarms after switching on. At this time, only the time (glow) until the start of the measurement is shown on the display. After forming, the detector starts measuring values and works according to its settings.


### 2. **Gas detection**

The detector continuously measures the concentration of the detected gas in the atmosphere.

### 3. **Malfunction**

In case of malfunction the LCD screen displays the measured concentration, an error code and a key symbol . On the PCB, this condition is indicated by the orange „ERR“ LED. The meaning of each error code is explained in Attachment 2.

### 4. **Monitoring the calibration periods**

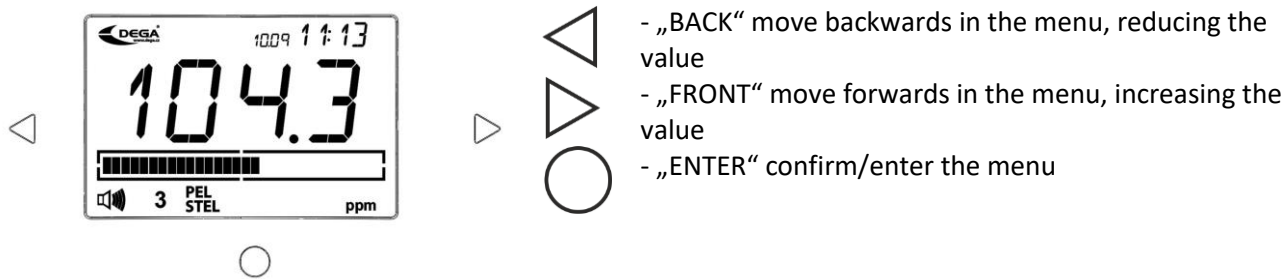
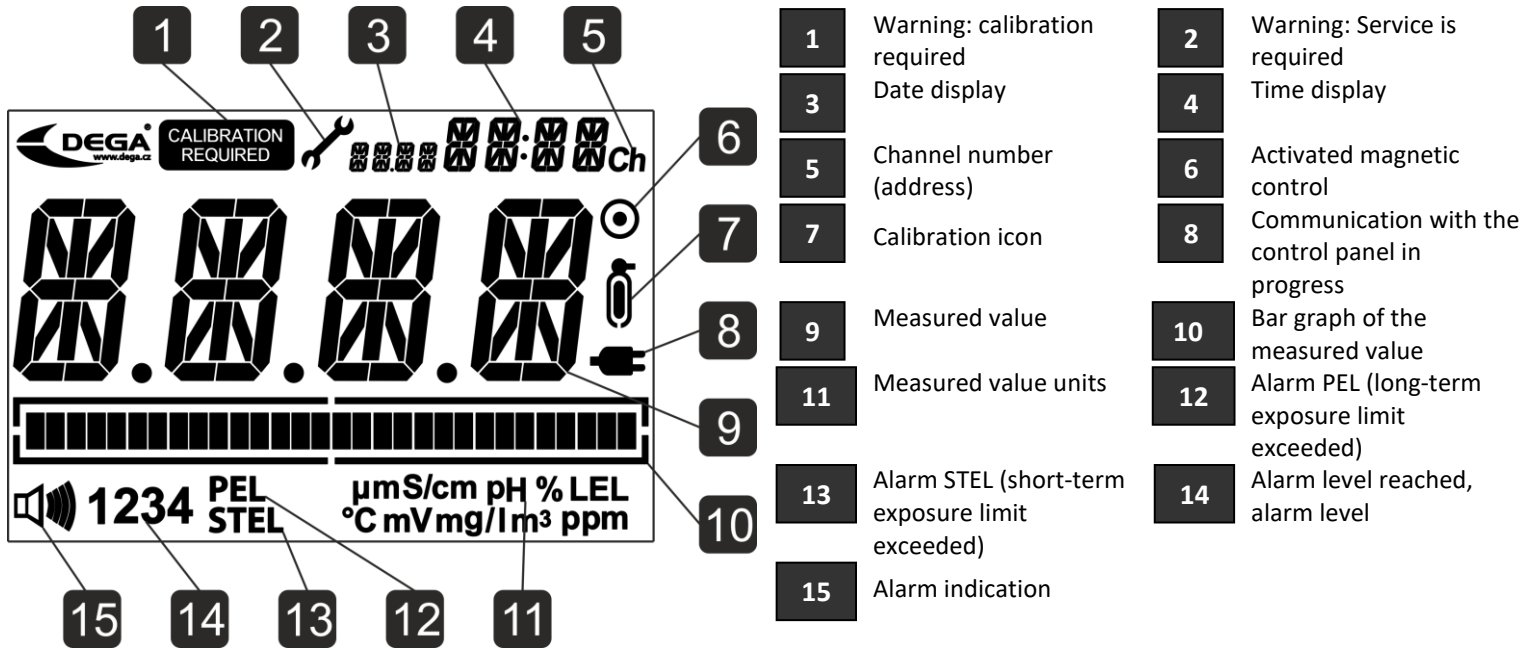
The detector continuously checks the calibration validity of the connected sensor. After 12 months from the last calibration (max. calibration interval),  flashes on the LCD display. The connected sensor must be calibrated immediately.

## 5. Reading the record of measured concentrations and alarms

The detector periodically, after 60 s, stores the current detected concentration into its internal memory. The internal memory retains data from the last 64260 measurements (cca 34 days). In order to read this information, the program DegaConfig is required. See the DegaConfig program user manual.

## Detector control

The detector equipped with an LCD display can be controlled by the magnetic contact located on the sides of the display.

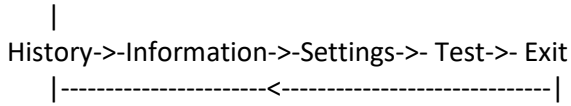







Placing a magnet into the indent „○“ for 5 s activates the magnetic control, which is displayed by the icon „⊙“ on the LCD.

Reaching level 4 alarm in case of catalytic and semiconductor sensors causes a ratchet phenomenon, where even after recovery from gas leak, the detector is still in level 4 alarm and needs to be manually reset by pressing „○“.

**Main menu structure:**






Enter the 5 s menu by holding down the magnet




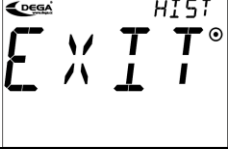
Menu	Display	Description
History	 HIST <sup>⊙</sup>	Browsing the alarm history
Information	 INF <sup>⊙</sup>	Information about detector settings
Settings	 SET <sup>⊙</sup>	Detector configuration
Test	 TEST <sup>⊙</sup>	Testing the detector functions
Exit	 EXIT <sup>⊙</sup>	Return to normal operation

**1. Menu History „HIST“**

Browsing the history




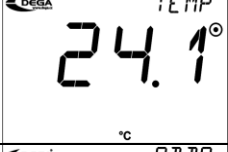
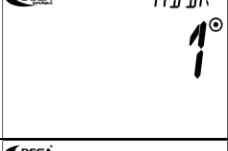

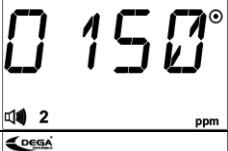
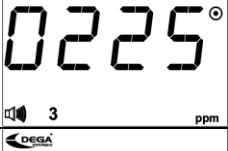

Menu	Display	Description
History of all alarms	 HIST ALRM <sup>⊙</sup>	Use „◀▶“ to go trough individual alarms. Displays the date and time of the alarm. Return to the history menu „○“
Highest concentration in the past hour	 HIST HI 1 <sup>⊙</sup>	Displays the highest measured concentration and alarm for the past hour. Return to History menu „○“
Highest concentration in the past 8 hours	 HIST HI 8 <sup>⊙</sup>	Displays the highest measured concentration and alarm for the past 8 hours. Return to History menu „○“
Highest concentration in the past 12 hours	 HIST HI 12 <sup>⊙</sup>	Displays the highest measured concentration and alarm for the past 12 hours. Return to History menu „○“
Highest concentration in the past 24 hours	 HIST HI 24 <sup>⊙</sup>	Displays the highest measured concentration and alarm for the past 24 hours. Return to History menu „○“



Highest concentration stored in the memory		Displays the highest measured concentration and alarm, that is stored in the memory. Return to History menu „○“
Exit		Return to the main menu








## 2. Information menu „INF“

Information about settings. Sequentially displays the following information. Access previous information by pressing „○“









Menu	Display	Description
Date of next calibration		Displays the date of the next calibration
Date of last calibration		Displays the date of the last calibration
Power voltage		Displays the power voltage
Temperature		Displays the chip temperature (about 15°C higher than the ambient temperature)
RS485 device address		Displays the device address
Alarm level 1		Displays alarm level 1
Alarm level 2		Displays alarm level 2
Alarm level 3		Displays alarm level 3
Alarm level 4		Displays alarm level 4

### 3. Settings menu „SET“











**Protected by password 0004.** After entering a wrong password, the detector returns to measurement mode. The password can be changed in the menu SET -> PSWD.

Menu	Display	Description
Calibration	 SET CAL <sup>⊙</sup>	Sensor calibration
Setting the alarms	 SET SETA <sup>⊙</sup>	Setting the alarms
Changing the password	 SET PSWD <sup>⊙</sup>	Changing the password
Setting the year	 SET YEAR <sup>⊙</sup>	Setting the year
Setting the date	 SET DATE <sup>⊙</sup>	Setting the date
Setting the time	 SET TIME <sup>⊙</sup>	Setting the time
Exit	 SET EXIT <sup>⊙</sup>	Return to the main menu

#### Calibration

- Connect fresh air to the sensor input. The icon „“ flashes. After the value stabilizes, move onto the next step using „“
- Using „“ select the concentration of the calibration gas, confirm „“
- Connect the calibration gas to the sensor input. The icon „“ flashes. **Wait until the value stabilizes and confirm** „“
- Using „“ switch between „YES“ - save calibration, or „NO“ - return to the Settings menu. Confirm the selected option „“
- In case of saving a new calibration, the detector will restart after 5 s.

#### Setting the alarms

- Using „“ select the concentration for alarm 1. Confirm „“
- Using „“ select the concentration for alarm 2. Confirm „“
- Using „“ select the concentration for alarm 3. Confirm „“
- Using „“ select the concentration for alarm 4. Confirm „“
- Using „“ switch between „YES“ - save settings, or „NO“ - return to the Settings menu. Confirm the selected option „“

### Changing the password

- Using „◀▶“ select a number in thousands. Save the selected number „○“
- Using „◀▶“ select a number in hundreds. Save the selected number „○“
- Using „◀▶“ select a number in tens. Save the selected number „○“
- Using „◀▶“ select a number in units. Save the selected number „○“
- Using „◀▶“ switch between „YES“ - save settings, or „NO“ - return to the Settings menu. Confirm the selected option „○“

### Setting the year

- Using „◀▶“ select a number in thousands. Save the selected number „○“
- Using „◀▶“ select a number in hundreds. Save the selected number „○“
- Using „◀▶“ select a number in tens. Save the selected number „○“
- Using „◀▶“ select a number in units. Save the selected number „○“
- Using „◀▶“ switch between „YES“ - save settings, or „NO“ - return to the Settings menu. Confirm the selected option „○“

### Setting the date



- Using „◀▶“ select a number in thousands. Save the selected number „○“
- Using „◀▶“ select a number in hundreds. Save the selected number „○“
- Using „◀▶“ select a number in tens. Save the selected number „○“
- Using „◀▶“ select a number in units. Save the selected number „○“
- Using „◀▶“ switch between „YES“ - save settings, or „NO“ - return to the Settings menu. Confirm the selected option „○“

### Setting the time

- Using „◀▶“ select a number in thousands. Save the selected number „○“
- Using „◀▶“ select a number in hundreds. Save the selected number „○“
- Using „◀▶“ select a number in tens. Save the selected number „○“
- Using „◀▶“ select a number in units. Save the selected number „○“
- Using „◀▶“ switch between „YES“ - save settings, or „NO“ - return to the Settings menu. Confirm the selected option „○“

#### 4. Menu Test „TEST“

**Protected by password 0004.** By entering a wrong password, the detector returns to measurement mode. The password can be changed in the menu SET -> PSWD.

Menu		
Detector restart		Using „◀▶“ switch between „YES“ - for restart, or „NO“ for returning to Test menu. Confirm „○“.
Return to main menu		Return to main menu

# Operation and maintenance of the detector

## 1. Usage limits

To maintain proper operation of the detector it is necessary to respect the fact that step changes of humidity, condensation or rapid changes of pressure can cause incorrect indication of the measured value. Each sensing technology is suited for different methods of application, as described below. All sensors are characterized by a smaller or larger cross-sensitivity to other gases than those which they are set for. Therefore we recommend to have the air in the deployment area of the detection system analyzed before processing project documentation.

**a) catalytic sensors:** Trace amount of vapors of silicon compounds and sulfur compounds cause a permanent loss of sensitivity, which requires recalibration or replacement of the sensor. Longterm crossing of the measuring range causes a decrease in sensitivity. In case of an atmosphere with oxygen content of less than 17 %, there measured value will be overvalued. In case of an atmosphere with oxygen content of more than 25 %, the measured value will be undervalued.

**b) electrochemical sensors:** Constant exposure to toxic gases or short-term exposure to gases, which greatly exceed the maximum range of the sensor, can damage the electrochemical sensor, which requires recalibration or replacement. High temperature along with low relative humidity have a negative effect on the sensor's lifetime. In case of an atmosphere with oxygen content of less than 1 % for longer than 1 hour, the measured value will be undervalued.

**c) infrared sensors:** Vapor acids and alkalis can etch the optical system and distort the measurements. A check or a calibration may be necessary.

**d) semiconductor sensors:** Short-term exposure to gases or vapors of organic solvents, which greatly exceed the maximum range of the sensor, may damage the sensor and a recalibration or replacement may be required. In case of an atmosphere with an oxygen content of less than 18 %, the measured value will be undervalued.

**e) photoionization sensors:** the UV lamp or sensor must be replaced regularly, as its clogging of can cause loss of signal.

## 2. Operation

To maintain proper operation of the detector it is necessary to respect the fact that the presence of certain concentrations of gases or vapors, other than those for which the sensor is set, can cause an alarm, even if the concentration of the gas does not exceed the set level. Given the range of disturbing gases or vapors (diluent, exhaust gases, vapors of organic substances, disinfectants, etc.) a generally allowable concentration of interfering gases can not be determined. Data on cross-sensitivity to certain gases are listed at the appropriate sensors. Therefore we recommend to have the air in the deployment area of the detection system analyzed before processing project documentation.

## 3. Operation/Maintenance

In case of contamination the surface can be cleaned with a slightly moistened cloth. The connected transmitters require performing of regular calibrations.

### Recommended Default settings:

**1 x every 6 months** carry out a „**calibration**“ - adjust the sensitivity of the sensor using calibration gas and check the functionality of the system. The exact interval depends on the purity of the environment, required accuracy and the occurrence of disturbing gases in the atmosphere.

a) **The calibration interval can be changed by the DEGA Config software.**

Perform calibration only at certified service centers with a valid certificate of competence or at the manufacturer.

**For the Czech Republic only DEGA CZ s.r.o.**

# Accessories

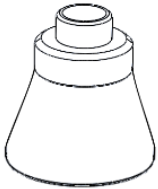
1. **Calibration adapter/connection to the gas pump DEGA GAS INLET**



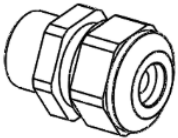
2. **Cover against splashing water DEGA WATER CAP**



3. **Funnel for gas collection DEGA COLLECT CAP**



4. **Additional DEGA CABLE GLAND for NB III**



PG9

# Gas specification

Gas	Formula	CAS	Measuring range
Acetylene	C <sub>2</sub> H <sub>2</sub>	74-86-2	0-100 % LEL
Ammonia	NH <sub>3</sub>	7664-41-7	0-100 ppm
Ammonia	NH <sub>3</sub>	7664-41-7	0-1000 ppm
Ammonia	NH <sub>3</sub>	7664-41-7	0-10000 ppm
Ammonia	NH <sub>3</sub>	7664-41-7	0-500 ppm
Ammonia	NH <sub>3</sub>	7664-41-7	0-5000 ppm
Ammonia	NH <sub>3</sub>	7664-41-7	0-2000 ppm
Bromine	Br	7726-95-6	0-20 ppm
Bromine	Br	7726-95-6	0-200 ppm
Butane / Propan-Butane / LGP	C <sub>4</sub> H <sub>10</sub>	106-97-8	0-100 % LEL
Carbon dioxide	CO <sub>2</sub>	124-38-9	0-5 % vol.
Carbon dioxide	CO <sub>2</sub>	124-38-9	0-100 % vol.
Carbon monoxide	CO	630-08-0	0-1000 ppm
Carbon monoxide	CO	630-08-0	0-200 ppm
Carbon monoxide	CO	630-08-0	0-500 ppm
Carbon monoxide	CO	630-08-0	0-2000 ppm
Ethane	C <sub>2</sub> H <sub>6</sub>	74-84-0	0-100 % LEL
Ethanol	C <sub>2</sub> H <sub>5</sub> OH	64-17-5	0-100 % LEL
Ethylene	C <sub>2</sub> H <sub>4</sub>	74-85-1	0-10 ppm
Ethylene	C <sub>2</sub> H <sub>4</sub>	74-85-1	0-200 ppm
Ethylene	C <sub>2</sub> H <sub>4</sub>	74-85-1	0-1500 ppm
Ethylene	C <sub>2</sub> H <sub>4</sub>	74-85-1	0-100 % LEL
Ethylene oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	0-10 ppm
Ethylene oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	0-100 ppm
Ethylene oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	0-1000 ppm
Ethylene oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	0-500 ppm
Ethylene oxide	C <sub>2</sub> H <sub>4</sub> O	75-21-8	0-100 % LEL
Formaldehyde	CH <sub>2</sub> O	50-00-0	0-10 ppm
Formaldehyde	CH <sub>2</sub> O	50-00-0	0-50 ppm
Formaldehyde	CH <sub>2</sub> O	50-00-0	0-1000 ppm
Hexane (Petrol)	C <sub>6</sub> H <sub>14</sub>	110-54-3	0-100 % LEL
Hydrogen	H <sub>2</sub>	1333-74-0	0-100 % LEL
Hydrogen	H <sub>2</sub>	1333-74-0	0-1000 ppm
Hydrogen	H <sub>2</sub>	1333-74-0	0-4000 ppm
Hydrogen	H <sub>2</sub>	1333-74-0	0-40000 ppm
Hydrogen bromide	HBr	10035-10-6	0-20 ppm
Hydrogen bromide	HBr	10035-10-6	0-200 ppm
Hydrogen cyanide	HCN	74-90-8	0-50 ppm
Hydrogen fluoride	HF	7664-39-3	0-10 ppm
Hydrogen chloride	HCl	7647-01-0	0-20 ppm
Hydrogen chloride	HCl	7647-01-0	0-200 ppm

Gas	Formula	CAS	Measuring range
Hydrogen peroxide	H <sub>2</sub> O <sub>2</sub>	7722-84-1	0-100 ppm
Hydrogen peroxide	H <sub>2</sub> O <sub>2</sub>	7722-84-1	0-500 ppm
Hydrogen sulfide	H <sub>2</sub> S	7783-06-4	0-50 ppm
Hydrogen sulfide	H <sub>2</sub> S	7783-06-4	0-500 ppm
Hydrogen sulfide	H <sub>2</sub> S	7783-06-4	0-100 ppm
Hydrogen sulfide	H <sub>2</sub> S	7783-06-4	0-2000 ppm
Chlorine	Cl <sub>2</sub>	7782-50-5	0-20 ppm
Chlorine	Cl <sub>2</sub>	7782-50-5	0-200 ppm
Chlorine dioxide	ClO <sub>2</sub>	10049-04-4	0-50 ppm
Methane	CH <sub>4</sub>	74-82-8	0-100 % LEL
Nitric oxide	NO	10102-43-9	0-25 ppm
Nitric oxide	NO	10102-43-9	0-250 ppm
Nitric oxide	NO	10102-43-9	0-1000 ppm
Nitrogen dioxide	NO <sub>2</sub>	10102-44-0	0-20 ppm
Nitrogen dioxide	NO <sub>2</sub>	10102-44-0	0-100 ppm
Nitrogen dioxide	NO <sub>2</sub>	10102-44-0	0-500 ppm
Nitrous oxide	N <sub>2</sub> O	10024-97-2	0-1 % vol.
Organic acids	RCOOH		0-100 ppm
Other flammable and combustible gases and vapors	HC		0-100 % LEL
Oxygen	O <sub>2</sub>	17778-80-2	0-1 %
Oxygen	O <sub>2</sub>	17778-80-2	0-30 %
Ozone	O <sub>3</sub>	10028-15-6	0-5 ppm
Ozone	O <sub>3</sub>	10028-15-6	0-100 ppm
Pentane	C <sub>5</sub> H <sub>12</sub>	109-66-0	0-100 % LEL
Phosphine	PH <sub>3</sub>	7803-51-2	0-5 ppm
Phosphine	PH <sub>3</sub>	7803-51-2	0-20 ppm
Phosphine	PH <sub>3</sub>	7803-51-2	0-200 ppm
Phosphine	PH <sub>3</sub>	7803-51-2	0-2000 ppm
Propylene	C <sub>3</sub> H <sub>6</sub>	115-07-1	0-100 % LEL
Refrigerant	R		0-2000 ppm
Refrigerant	HFO	754-12-1	0-2000 ppm
Silane	SiH <sub>4</sub>	7803-62-5	0-1 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-20 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-200 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-2000 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-100 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-1000 ppm
Sulfur dioxide	SO <sub>2</sub>	7446-09-5	0-10000 ppm
Volatile organic compounds	VOC		0-20 ppm (el. sensor)
Volatile organic compounds	VOC		0-3000 ppm - according to gas (PID sensor)

# Add-on modules

Product code	Name	Product description
20200004	DEGA NB III Relay Modul	Internal 2-relay, 250 V/10 A

# Attachments

## 1. Table of error codes

code	cause	solution
1	Sensor is not present (EEPROM is not communicating)	Disconnect and reconnect the sensor, then restart the sensor by disconnecting and reconnecting the power
2	Unknown sensor type	Contact the manufacturer
3	Type 2 sensor ID not found in the settings table LMP91000	Contact the manufacturer - FW update required
4	the EEPROM sensor CRC does not match	Sensor error - contact the manufacturer
5	LMP91000 not responding	Sensor error - contact the manufacturer
6	The set sensor ID does not match the connected sensor	Checking the configuration of the sensor required
7	Reserved	Reserved
8	EL sensor test error	Sensor error
9	Detector is in preheating mode	Wait a few minutes, the detector will automatically enter measurement mode
10	Reserved	
11	reserved	
12	Error reading the internal FLASH	Restart the detector. If the error persists, contact the manufacturer
13	Error reading the internal FLASH	Restart the detector. If the error persists, contact the manufacturer
14	Error reading the internal FLASH	Restart the detector. If the error persists, contact the manufacturer
15	Sensor error	Replace the sensor
16	The device exceeded the maximum calibration interval by 50 %	Calibration is necessary
129	The measured value exceeds the range of -10 %	If the error persists, contact the manufacturer
130	The result of the AD conversion is out of range	Contact the manufacturer

## 2. Package content

1 x NB III LCD body

1 x NB III LCD sensor unit

# General warranty terms and conditions

**When following the instructions for installation, operation and maintenance, the manufacturer guarantees 24 months from the date of receipt for the product.** Should the product purchased be put into operation by an entity other than the seller, the warranty period commences from the date that the product is put into operation, provided that the buyer ordered its commissioning within three weeks of its receipt. The customer expressly acknowledges that during a warranty period that extends beyond the length of the warranty period that is specified in the Commercial Code (the statutory warranty) s/he can neither require replacement of the product nor may s/he withdraw from the contract.

1. When claiming a product defect, it is necessary to submit a proof of purchase of the item containing the following information: name and surname, name of the seller, his identification number, in case of a legal person the name, identification number and registered office, in case of a physical person - surname, address and warranty certificate, if the buyer received one from the seller. The validity of the warranty shall not be affected by non-compliance with the obligations related to the issuance of the warranty certificate.
2. Claims concerning the product (only complete devices are accepted for a warranty repair) may be filed during the warranty period only with the seller from which it was purchased; subsequently, the seller is required to forward the product to an authorized service centre or to the manufacturer.
3. A condition for the recognition of the rights under the warranty is the installation of the product performed by an authorized person in possession of a valid certificate from the manufacturer.
5. Claims regarding a product defect that can be dealt with reasonably quickly and without additional consequences will be resolved by remedying the defect (repair) or by replacement of the product part, because in such a case it is a contradiction of the standard norms that the entire product should be replaced (§ 616, paragraph 4 of the Commercial Code).
6. The buyer who exercises the right of warranty repair is not entitled to the return of the parts that have been replaced.
7. The warranty period can be extended for up to 48 months and its validity can be extended beyond the standard length on the basis of the conclusion of an individual warranty contract. Further information may be obtained through a specific business meeting.

## This warranty is not applicable to:

- a detector that has not **been put into operation by the manufacturer or by a certified employee** in possession of a valid certificate issued by the manufacturer
- A product that **did not have regularly performed calibrations and functional checks** by the manufacturer or by a certified employee in possession of a valid certificate issued by the manufacturer
- damage caused by fire, water, static electricity, power surges in the electric supply or in the public network, accident, improper use of the product, wear and tear
- contamination of the sensors of the device and their subsequent cleaning
- damage caused by **improper installation, any adjustment, modification** or improper manner of use inconsistent with the instruction manual, the technical standards or the applicable safety regulations in the Czech Republic
- damage to the product during transportation caused by improper handling or handling of the product in a manner contrary to the advice provided in the instruction manual
- DEGA products that have **been used in association with other than original DEGA products, including consumables and accessories**
- **calibration of detectors**, i.e. setting detection limits
- **wear or destruction of the sensors of the detector, including the necessity to replace them**
- bearing additional parts or consumables (e.g. a foil label, seal, etc.), that are detrimental to normal wear and tear during operation, together with wear and tear of the product and its parts caused by their normal use

For the complete version of the general business conditions and of the claims procedure go to [www.dega.cz](http://www.dega.cz)

Manufacturer: DEGA CZ s.r.o., Malešická 2850/22c, 130 00 Praha 3, Czech republic

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