DEGA NS II Gas Detection Transmitter Instruction Manual

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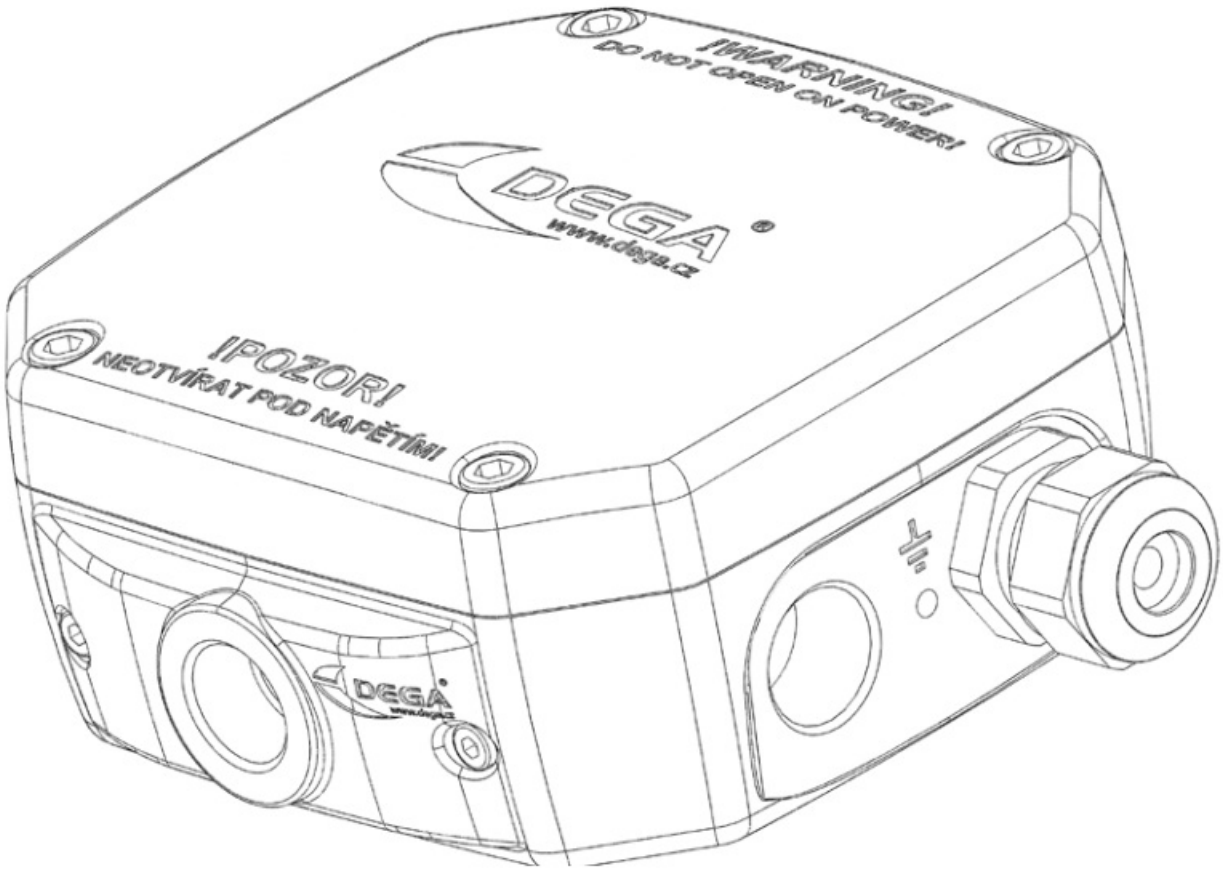
INSTALLATION MANUAL
Gas Detection Transmitter
DEGA NS II



DEGA CZ s.r.o. reserves the right to alter the specifications of the hardware and software described in this manual at any time and without prior notice.
DEGA CZ s.r.o. bears no liability for any damage resulting from use of this device.

Contents

For your safety

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 for installation only by a certified technician. The manufacturer is not liable for damages result 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 another attachments. Continued operation could result in injury or property damage.

Do not open the transmitter and do not replace the sensors in the transmitter in a potentially explosive atmosphere

Opening the cover, manipulating electronics, connecting the wiring in the sensor and replacing the sensor in a potentially explosive atmosphere can cause an explosion. If service is necessary, first unplug the device from the power supply, make certain there is no explosive atmosphere present and only then the transmitter may be disassembled and the sensors replaced.

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

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

Use appropriate cable types

To ensure compliance with the parameters of the product, use only the recommended cables described in this manual to connect the product to other devices or power.

Dispose of used products and transmitter sensors with respect to the environment

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

Use the transmitter 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 transmitter

Perform regular “CALIBRATION” (setting the detection limits, checking the responsiveness of the sensor, checking the functionality of the transmitter) 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 the manufacturer.

Certification according to standards

Certification according to the regulations CSN EN 60079-29-1 and ČSN EN 50271 applies only to NSM-CL II.

Special condition

The device must be installed in such a way that the sensor part is facing downwards.

Special condition

The product must be used in an environment with a degree of pollution of at most 2 as defined in IEC 60664-1.

Special condition

The overvoltage protection must be set to a level not exceeding 140 % of the peak supply voltage on the device’s power terminals.

Warning: The transmitter automatically checks it’s calibration period – the period of validity of it’s calibration. After 12 months since the last calibration (max. calibration period) the transmitter will transmit this fact to the host system. The transmitter must be calibrated immediately at a certified service center with a valid certificate of competence or the manufacturer. See section “Monitoring the calibration periods”.

Technical data and information

Supply voltage:	24 V nominal, operational range 8-30 V
Cable connections via 4-20 mA:	shielded cable 3 x 1 mm (max. 1200 m) shielded cable 3 x 1,5 mm (max. 2400 m)
Cable connections via RS485:	shielded cable 4 x 0,8 mm (max. 1200 m) – see section “Installation of wiring for RS485“
Cable diameter range:	0,08 – 2,5mm 2 – , shielded wire 0,25 – 1,5 mm2 – shielded wire wit h cable cavity
Output:	4 – 20 mA, RS485 – protocol DEGA, or MODBUS
Functional safety EN61508:	SIL 2
ATEX certificate:	FTZÚ 15 ATEX 0041X
Labeling according to ATEX:	NSx-EL II II 3 G Ex nA IIC T5 Gc Tamb:-20°C- +60°C NSx-CL II II 3 G Ex d nA IIC T5 Gc Tamb:-20°C- +60°C NSx-CL II II 3 G Ex d nA IIC T4 Gc Tamb:-20°C- +40°C NSx-PL II PID II 3 G Ex ic ec nC IIC T4 Gc Tamb:0°C- +40°C

II – equipment group – non mining
3 G – zone 2 (atmosphere with the danger of explosion)
Ex db ec – protection type – flameproof enclosure “d”, secured “ec”, intrinsically safe “ic”
IIC – gas group
T4/T5 – temperature class
Gc – protection type EPL
Tamb – ambient temperature

Dimensions without bushings:	140x140x70 mm (WxHxD)
Dimensions of box:	175x140x70 mm (WxHxD)
Weight:	0,7 kg
Capacity of the internal memory of history:	44 days at 60s recording interval
Interval record storage memory:	60 s (adjustable range 1-255 s)
Dead band:	5% of range

Consumption/input at 24V (output RS485)		Warm-Up time
DEGA NSx-EL II DEGA NSx-CL II DEGA NSx-IL II DEGA NSx-PL II PID	25 mA/0,6 W 70 mA/1,7 W 50 mA/1,2 W 70 mA/1,7 W	DEGA NSx-EL II DEGA NSx-CL II DEGA NSx-IL II DEGA NSx-PL II PID

Consumption/input at 24V (output 4-20mA)		Time to stabilize (>5day without power)	
DEGA NSx-EL II DEGA NSx-CL II DEGA NSx-IL II DEGA NSx-PL II PID	45 mA/1,1 W 90 mA/2,2 W 70 mA/1,7 W 90 mA/2,2 W	DEGA NSx-EL II DEGA NSx-CL II DEGA NSx-IL II DEGA NSx-PL II PID	Up to several hours – b max. 1 h max. 30 min max. 30 min

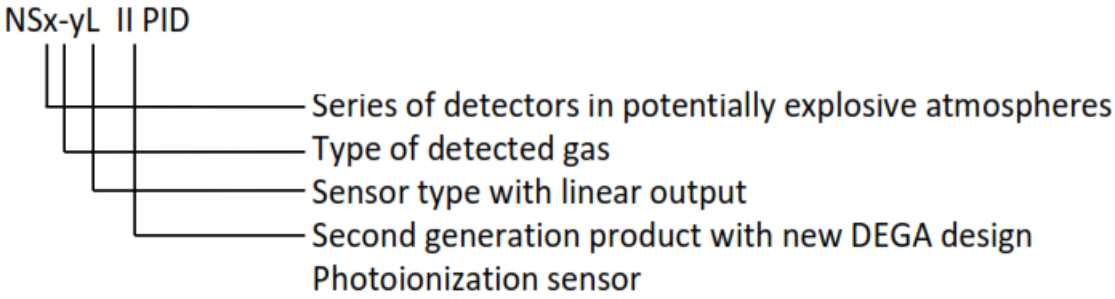
Response time (T90)		Sensor lifetime
DEGA NSx-EL II DEGA NSx-CL II DEGA NSx-IL II DEGA NSx-PL II PID	max. 180 s – based on sensor type T50=37s T90=98s max. 15 s max. 60 s	DEGA NSx-EL DEGA NSx-CL DEGA NSx-IL DEGA NSx-PL

Operational and storage conditions

Ambient temperature:	-20 °C to +60 °C (electrochemical and catalytic sensors), -20 °C to + 40 °C (infrared sensors) and 0 °C to + 40 °C (PID sensors)
Relative humidity:	0-95 % RH
Air pressure:	86 – 108 kPa
Oxygen content in the air:	17 – 24 % vol. (This applies for the catalytic and semiconductor sensors)
Flow of ambient air:	max. 2 m/s – flow directly to the sensor in not allowed
Protection level with a cover:	IP 54, with a DEGA WATER CAP IP66 cover
Location:	BE3N2 – explosive atmospheres – zone 2

Terminology

The marking system for sensors DEGA NSx-yL II:
Gas sensor DEGA



DEGA NSx-EL II with an electrochemical sensor
They operate on the principle of change of electrical parameters on the electrodes stored in electrolyte, due to oxidation/reduction reactions of the detected gas on it's surface. These sensors have good selectivity and the ability to detect very low concentrations of toxic gases.
DEGA NSx-CL II 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, a long lifetime and high stability. A minimum of 10 % of Oxygen in the air is required for their proper function.

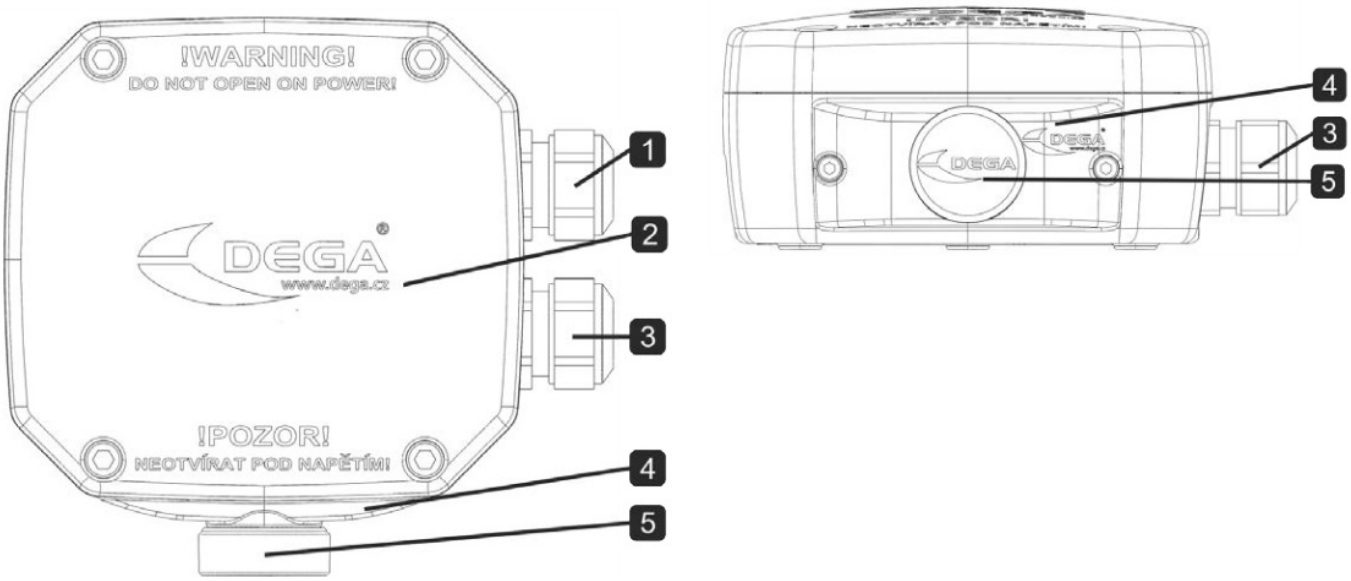
DEGA NSx-IL II with an infrared sensor (NDIR)

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 in catalytic sensors. The sensors are characterized by high stability and a long lifetime.

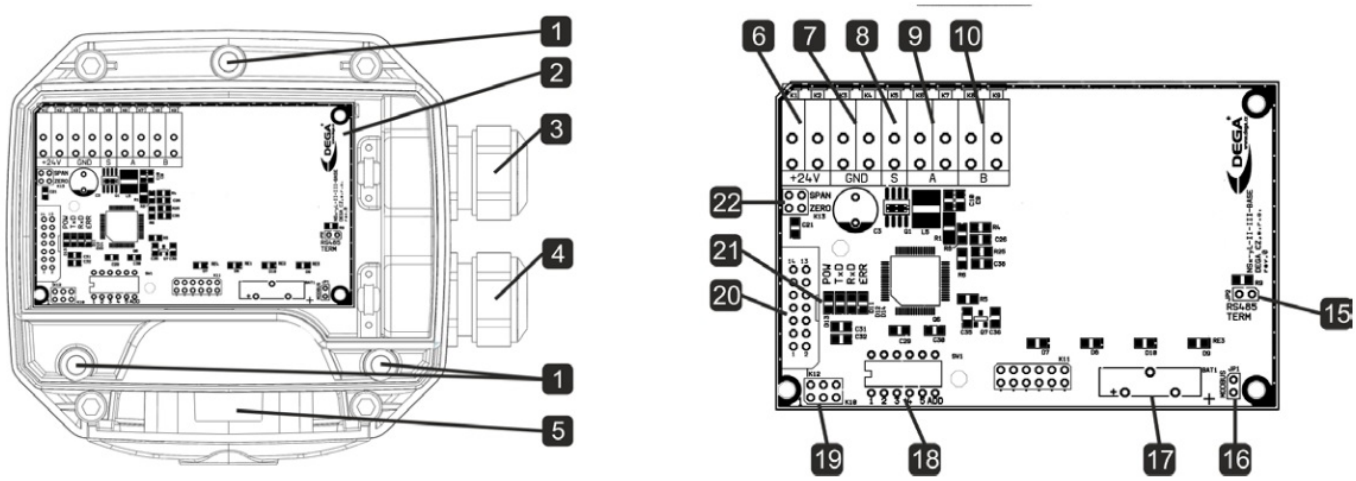
DEGA NSx-PL II PID with photoinitiator sensor

Sensitive scanning method to detect a wide range of VOC – volatile organic compounds. The sensor non-selectively detects all VOCs in the air already at concentrations in ppm.

Product description



1. Ex „e“ bushing
2. Body of the transmitter
3. Optional Ex „e“ bushing
4. Body of the removable sensor
5. Cover against splashing water (optional accessories)



1. Mounting holes
2. PCB electronics
3. Ex „e“ bushing

4. Optional Ex „e“ bushing
5. Body of the removable sensor
6. Power supply terminalblock+24V DC
7. Power supply terminal block GND
8. Signal terminal block 4-20mA
9. Terminal block RS485 A
10. Terminal block RS485 B
11. Jumper connector of the terminal resistor RS485
12. Jumper connector of the communication protocol (DEGA/MODBUS)
13. Battery CR2032
14. DIP switch for the RS485 address
15. Programming connector
16. LCD display connector
17. Status LED
18. Calibration jumpers

Assembly and disassembly of the transmitter

Before assembling, read the valid installation standards EN 60079-29-2 (Selection, installation, use and maintenance of detectors for combustible gases and oxygen) and EN 45544-4 (Guidelines for the selection, installation, use and maintenance of detectors of toxic substances).
In explosive environments the electrical installation must be performed according to DIN EN 60079.14 (Electrical installation in hazardous areas).
Secure that the sensor is reachable by air. The transmitter must be in a free area with no obstacles in its way (furniture etc.)
Ensure that the input of the sensor cannot be polluted by layers of dust or other contamination. To preserve the IP protection, the sensors must be mounted with the sensor down.

1. Assembly of the transmitter

   The transmitter consists of four parts – the body of the transmitter, the removable sensor and Ex „e“ bushings.

   Transmitter assembly procedure is as follows:

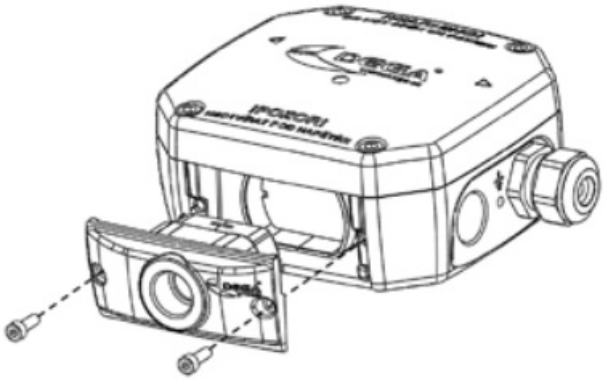
   a) Disassemble the transmitter with the four 4 mm hexagon socket screws

   b) Mount the transmitter on a flat surface with four 6 mm fasteners in height above the floor with the gas entrance facing downwards, as specified by the detected substance.

   c) Pull the cable through the bushing and, if necessary, secure it with a cable bridle.

   d) Connect the wiring to the terminal block of the sensor according to the chapters “Connecting the transmitter to the controllers”. When using the second ex . „e“ bushing, drill a hole with a diameter of max 16 mm. Only certified Ex “e” bushings with the M20x1,5 thread are allowed. While drilling make sure to not damage the transmitter electronics.

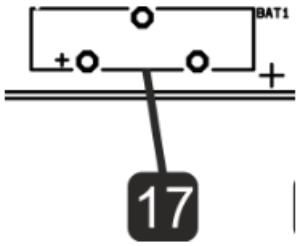
   e) Assemble the transmitter with the four 4 mm hexagon sockets screws.
2. Replacement of the sensor module



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

In case of need to replace the sensor module with a new piece, unscrew and remove the cover. On the sensor module, unscrew a pair of 3mm hexagon socket screws and remove the sensor module using a tool to prise it from the inside. Carefully insert a new module – the pins may not be bent. Secure with a pair of screws and slide the cover on the device, then secure it.

3. Replacement of the battery

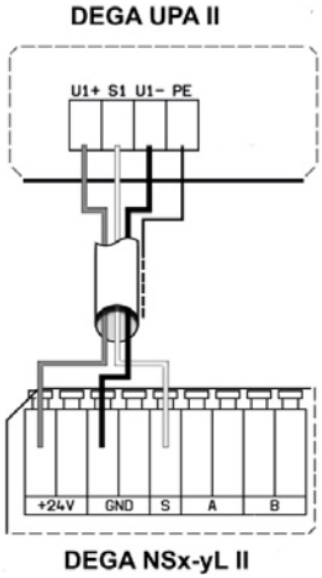


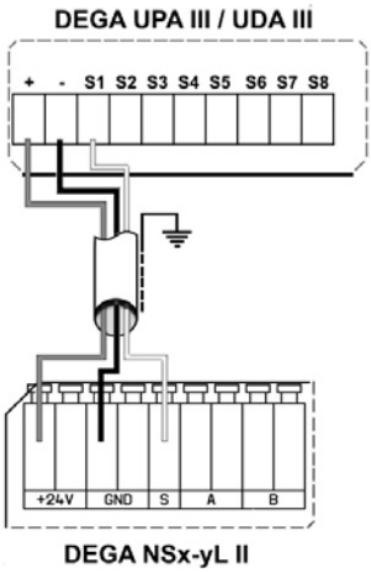
Panasonic	BR2032

The battery lifetime in the sensor is approximately 5 years. After this time some functions of the detector may not work properly. Remove the battery from the holder and replace it with one of the recommended types. Replacing the battery in a transmitter, which is not connected to the power, will erase the internal clock.

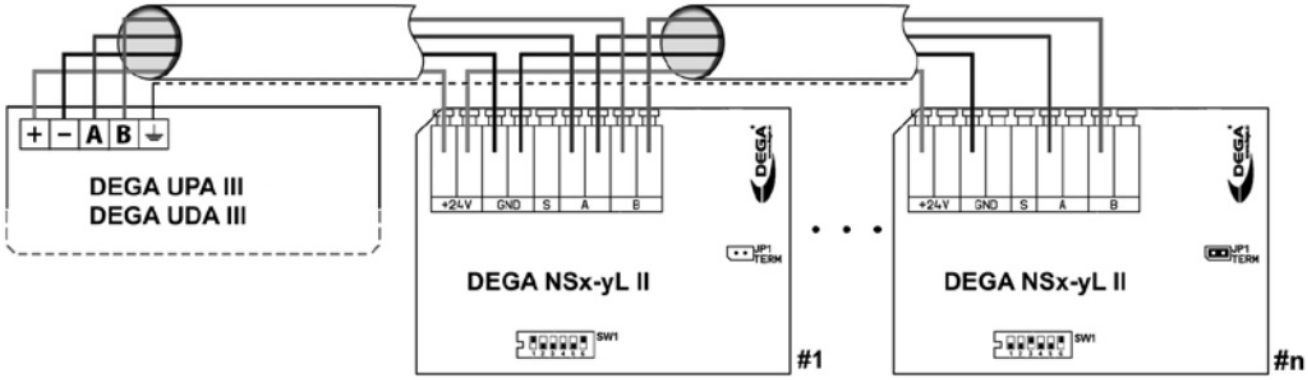
4. Connecting the transmitter via current loop to the controller DEGA UPA II DEGA UPA III a DEGA UDA III

Connect one transmitter to each channel of the controller as shown in the picture below.





5. Connecting the sensor via RS485 to the controller DEGA UPA III/UDA III



6. Installation of wiring for RS485 and power supply

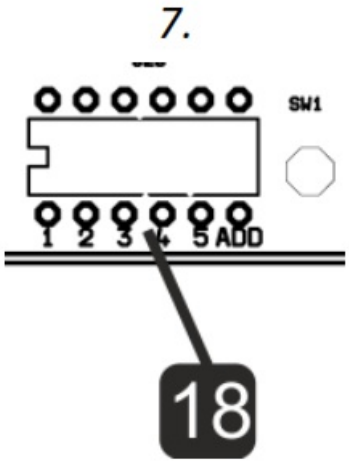
   Wiring must be installed using bus topology and in compliance with the RS485 policy.

   The maximum number of connected transmitters per controller channel is 32 (may be less depending on the configuration of the controller), while the total length of the controller (electrical distance between the controller and the last transmitter) should not exceed 1200 meters. Because of the voltage drops caused by individual sensors, the total sum of the distances between the individual transmitters, the total sum of the distances between the individual sensors and the controller L1 + L2 + L3 + … + L16… can be maximally:

Cable type	**NSx-CL II**	**NSx-IL II**	**NSx-EL II**	**NSx-PL II PID**
Shielded 4×0,8mm	2,1 km	2,9 km	4,2 km	2,1 km
Shielded 4x1mm	3,3 km	4,4 km	6,5 km	3,3 km
Shielded 4×1,5mm	6,2 km	7,3 km	11,6 km	6,2 km
Shielded 4×2,5mm	10,1 km	13,5 km	20,1 km	10,1 km

   Selecting the appropriate type of cable depends on the fire report and the protocol for determining external influences.

7. Setting the RS485 address of the transmitter



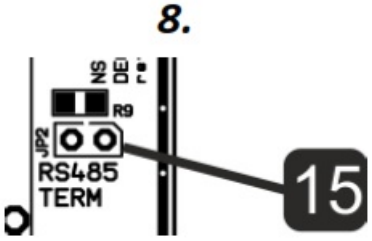
   Each transmitter must have a unique address within the entire bus, otherwise there will be communication collisions and malfunctions.

   The transmitter address can either be set internally using the Dega Config program or using the DIP switch on the PCB.

   If the position 6 (labeled ADD) is in the ON position, then the address is set according to the setting of pins 1-5. Otherwise the address set in Dega Config is accepted.

The address can be set from in the range of 1-31 using binary values. A table with DIP switch settings for the individual addresses is provided in Attachment 1.

8. Termination resistor



According to the RS485 specifications, the last device on the bus must end with the termination resistor 120R. Plug a jumper on the JP2 connector of the last device on the bus to include the 120R terminating resistor. In the default configuration the jumper connector is not plugged.

9. Communication protocol switch DEGA/MODBUS

Plugging a jumper in the JP1 connector will switch from the DEGA communication protocol to the MODBUS communication protocol.

Transmitter functions

The detector's motherboard is equipped by status LEDs, which help in detecting problems during the installation.
LED „POW“ shines at correct power
LED „TxD“ flashes when transmitting a packet via RS485
LED „RxD“ flashes when a packet is correctly received via RS485
LED „ERR“ shines/flashes in case of malfunction or substandard situations

1. **Turning on the transmitter**

   After turning on the power the LED “POW” starts shining and the LED “ERR” starts flashing, indicating a forming sequence of the sensor and automatic testing procedures, which can take up to 180s depending on the sensor used.

   The output of the current loop is 1mA. During this sequence, testing of internal electronics and stabilization of the sensor in order to eliminate false alarms after turning on take place. After the completion of the formation, a 4mA current begins to flow on the output of the current loop and the transmitter starts working according to its settings.

2. **Gas detection**

   The transmitter continuously measures the detected gas concentration in the atmosphere and converts its current value into a 4-20 mA signal or transmits its value to the evaluation unit via DEGA/MOBUS protocol.

3. **Malfunction**

   If a malfunction of electronics or the sensor is detected during operation, the transmitters starts transmitting via a

0,5mA current loop. On the PCB this state is indicated by the yellow LED “ERR”.

4. **Monitoring the calibration periods**

   The transmitter continuously checks the calibration validity of the connected sensor.

   After 12 months since the last calibration (max. calibration interval) the LED “ERR” starts flashing. The connected sensor must be calibrated immediately. The transmitter will transmit the information about the ending calibration via current loop. The transmission will be as follows: 10s of transmitting a 4-20mA signal informing about the actual gas concentration followed by a 1 second interval of 2mA current.

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

   The transmitter periodically stores the current detected concentration into its internal memory after 60s. The internal memory retains data from the last 64260 measurements (cca. 44 days). In order to read this information, the program Dega Config is required. See the Dega Config program instruction manual.

Operation, maintenance, inspection and service of the transmitter

1. **Usage limits**

   To maintain proper operation of the transmitter, 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 crosssensitivity to other gases than those they are set for. Therefore we recommend that you 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. Long term crossing of the measuring range causes a decrease in sensitivity. In case of an atmosphere with oxygen content of less than 17 %, the measured value will be undervalued. In case of an atmosphere with oxygen content of more than 25 %, the measured value will be overvalued.

   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: Acids and alkali vapors may etch the optical system and distort the measurements. A check or a calibration may be necessary.

   d) photoionization sensors: it is necessary to clean the UV lamp regularly, its clogging may cause loss of signal.

   2. Operation

   To maintain proper operation of the transmitter 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 set off, even if the concentration of the gas does not exceed the set level. Given the range of disturbing gases or vapors (diluents, 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 included at the respective sensors. Therefore we recommend to that you 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 sensors have a different lifetime depending on the sensing technology used and environmental conditions. Characteristics of the sensors vary over time. Therefore it is required to perform regular checks and calibrations, which can be done in two ways:

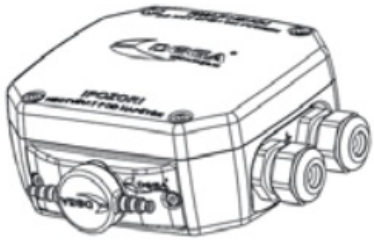
a) 1x every six months carry out a „calibration“ and functional control – adjust the sensitivity of the sensor using calibration gas and check the functionality of the system. The exact interval depends on the purity of the environment, required accuracy and the occurrence of disturbing gases in the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

b) 1x every twelve 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. Also carry out a „functional control” 1 x every three months – checking the function of the entire detection system using a test gas, which does not exceed the range of the sensor. We recommend using gas intended for laboratory use.

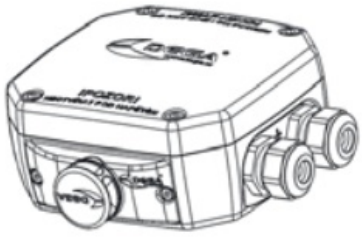
Means for testing fire alarm detectors may not be used for the „functional control“!
Perform calibration only at certified service centers with a valid certificate of competence or at the manufacturer.
For the Czech Republic only DEGA CZ s.r.o.

Accessories and basic types of transmitters

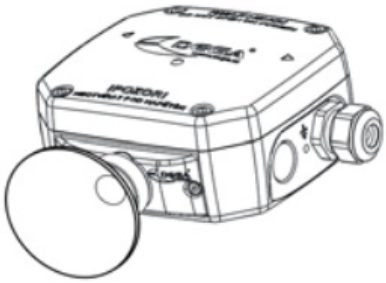
1. Calibration adapter/connection to the gas pump DEGA GAS INLET



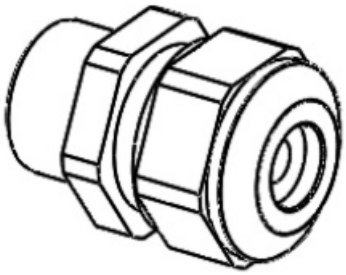
2. Cover against splashing water DEGA WATER CAP



3. Funnel for gas collection DEGA COLLECT CAP



4. Additional Ex „e“ bushing DEGA BUSHING for NSxII



M20x1,5

Basic types of transmitters

1. Transmitters with a catalytic sensor NSx-CL II

Product code	Transmitter type	Detected gas	Measurement range	Measurement of current loop (4-20mA)	Resolution	Calibration gas
30100069	DEGA NSM-CL 100 II	Methane (CH4) Natural gas CNG	0–100 % LEL	0-20 % LEL	0,1 % LEL	Methane 0,88 %
30100070	DEGA NSP-CL 100 II	Butane (C4H10) Propane-Butane LPG	0–100 % LEL	0-20 % LEL	0,1 % LEL	Butane 0,32 %
30100071	DEGA NSH-CL 100 II	Hydrogen (H2)	0–100 % LEL	0-20 % LEL	0,1 % LEL	Hydrogen 0,8 %
30100068	DEGA NSHC-CL 100 II	Other flammable and combustible gases and vapors according to the selectivity of the sensor	0–100 % LEL	0-20 % LEL	0,1 % LEL	According to the selectivity of the sensor

2. Transmitters with an electrochemical sensor NSx-EL II

Product code	Transmitter type	Detected gas	Measurement range	Measurement of current loop (4-20mA)	Resolution	Calibration gas
30100022	DEGA NSCO-EL 1000 II	Carbon Monoxide (CO)	0–1000 ppm	0-130 ppm	1 ppm	Carbon Monoxide 130 ppm
30100019	DEGA NSCO-EL 200 II	Carbon Monoxide (CO)	0–200 ppm	0-200 ppm	0,1 ppm	Carbon Monoxide 130 ppm
30100020	DEGA NSCO-EL 500 II	Carbon Monoxide (CO)	0–500 ppm	0-500 ppm	0,1 ppm	Carbon Monoxide 130 ppm
30100021	DEGA NSCO-EL A500 II	Carbon Monoxide (CO)	0- A500 ppm	0-500 ppm	1 ppm	Carbon Monoxide 130 ppm
30100022	DEGA NSCO-EL 2000 II	Carbon Monoxide (CO)	0–2000 ppm	0-2000 ppm	1 ppm	Carbon Monoxide 130 ppm
30100039	DEGA NSA-EL 100 II	Ammonia (NH3)	0-100 ppm	0-50 ppm	0,1 ppm	Ammonia 100 ppm
30100041	DEGA NSA-EL 1000 II	Ammonia (NH3)	0-1000 ppm	0-300 ppm	1 ppm	Ammonia 100 ppm
30100044	DEGA NSA-EL 10000 II	Ammonia (NH3)	0-10000 ppm	0-10000 ppm	1 ppm	Ammonia 100 ppm
30100040	DEGA NSA-EL 500 II	Ammonia (NH3)	0-500 ppm	0-500 ppm	1 ppm	Ammonia 100 ppm
30100043	DEGA NSA-EL 5000 II	Ammonia (NH3)	0-5000 ppm	0-5000 ppm	1 ppm	Ammonia 100 ppm
30100042	DEGA NSA-EL 2000 II	Ammonia (NH3)	0-2000 ppm	0-2000 ppm	1 ppm	Ammonia 100 ppm
30100016	DEGA NSCL2-EL 20 II	Chlorine (Cl2)	0-20 ppm	0-5 ppm	0,01 ppm	Chlorine 5 ppm
30100017	DEGA NSCL-EL 200 II	Chlorine (Cl2))	0-200 ppm	0-200 ppm	0,1 ppm	Chlorine 50 ppm

30100051	DEGA NSO2-EL 1 II	Oxygen (O2)	0-1 %	0-1 %	0,01 %	Air
30100052	DEGA NSO2-EL 100 II	Oxygen (O2)	0-100 %	0-30 %	0,1 %	Air
30100053	DEGA NSO2-EL T100 II	Oxygen (O2)	0-100 %	0-30 %	0,1 %	Air
30100054	DEGA NSO3-EL 5 II	Ozone (O3)	0-5 ppm	0-0,2ppm	0,01ppm	Chlorine 5 ppm
30100055	DEGA NSO3-EL 100 II	Ozone (O3)	0-100 ppm	0-100 ppm	0,1ppm	Chlorine 5 ppm
30100035	DEGA NSHCL-EL 20 II	Hydrogen chloride (HCl)	0-20 ppm	0-10 ppm	0,01 ppm	Hydrogen chloride 10 ppm
30100036	DEGA NSHCL-EL 200 II	Hydrogen chloride (HCl)	0-200 ppm	0-200 ppm	0,1 ppm	Hydrogen chloride 25 ppm
30100032	DEGA NSH2S-EL 50 II	Hydrogen sulfide (H2S)	0-50 ppm	0-15 ppm	0,1 ppm	Hydrogen sulfide 25 ppm
30100030	DEGA NSH2S-EL 500 II	Hydrogen sulfide (H2S)	0-500 ppm	0-500 ppm	1 ppm	Hydrogen sulfide 500 ppm
30100029	DEGA NSH2S-EL 100 II	Hydrogen sulfide (H2S)	0-100 ppm	0-100 ppm	0,1 ppm	Hydrogen sulfide 25 ppm
30100031	DEGA NSH2S-EL 2000 II	Hydrogen sulfide (H2S)	0-2000 ppm	0-2000 ppm	1 ppm	Hydrogen sulfide 2000 ppm
30100048	DEGA NSNO2-EL 20 II	Nitrogen dioxide (NO2)	0-20 ppm	0-15 ppm	0,01 ppm	Nitrogen dioxide 20 ppm
30100049	DEGA NSNO2-EL 100 II	Nitrogen dioxide (NO2)	0-100 ppm	0-100 ppm	0,1 ppm	Nitrogen dioxide 20 ppm

30100050	DEGA NSNO2-EL 500 II	Nitrogen dioxide (NO2)	0-500 ppm	0-500 ppm	1 ppm	Nitrogen dioxide 100 ppm
30100046	DEGA NSNO-EL 250 II	Nitric oxide (NO)	0-250 ppm	0-15 ppm	0,1 ppm	Nitric oxide 150 ppm
30100045	DEGA NSNO-EL 25 II	Nitric oxide (NO)	0-25 ppm	0-25 ppm	0,1 ppm	Nitric oxide 15 ppm
30100047	DEGA NSNO-EL 1000 II	Nitric oxide (NO)	0-1000 ppm	0-100 ppm	1 ppm	Nitric oxide 150 ppm
30100064	DEGA NSSO2-EL 20 II	Sulfur dioxide (SO2)	0-20 ppm	0-3,5 ppm	0,01 ppm	Sulfur dioxide 4 ppm
30100065	DEGA NSSO2-EL 200 II	Sulfur dioxide (SO2)	0-200 ppm	0-200 ppm	0,1 ppm	Sulfur dioxide 50 ppm
30100066	DEGA NSSO2-EL 2000 II	Sulfur dioxide (SO2)	0-2000 ppm	0-2000 ppm	1 ppm	Sulfur dioxide 1000 ppm
30100061	DEGA NSSO2-EL 100 II	Sulfur dioxide (SO2)	0-100 ppm	0-100 ppm	0,1 ppm	Sulfur dioxide 50 ppm
30100062	DEGA NSSO2-EL 1000 II	Sulfur dioxide (SO2)	0-1000 ppm	0-1000 ppm	1 ppm	Sulfur dioxide 1000 ppm
30100063	DEGA NSSO2-EL 10000 II	Sulfur dioxide (SO2)	0-10000 ppm	0-10000 ppm	1 ppm	Sulfur dioxide 1000 ppm
30100005	DEGA NSCH2O-EL 10 II	Formaldehyde (CH2O)	0–10 ppm	0-0,7 ppm	0,01 ppm	Carbon Monoxide 130 ppm
30100007	DEGA NSCH2O-EL 1000 II	Formaldehyde (CH2O)	0–1000 ppm	0-1000 ppm	1 ppm	Carbon Monoxide 450 ppm
30100006	DEGA NSCH2O-EL 50 II	Formaldehyde (CH2O)	0–50 ppm	0-50 ppm	0,1 ppm	Carbon Monoxide 130 ppm

30100008	DEGA NSC2H4-EL 10 II	Ethylene (C2H4)	0–10 ppm	0-10 ppm	0,01 ppm	Ethylene 2 ppm
30100009	DEGA NSC2H4-EL 1500 II	Ethylene (C2H4)	0–1500 ppm	0-1500 ppm	1 ppm	Ethylene 200 ppm
30100010	DEGA NSC2H4-EL 200 II	Ethylene (C2H4)	0–200 ppm	0-200 ppm	0,1 ppm	Ethylene 200 ppm
30100011	DEGA NSC2H4O-EL 10 II	Ethylene oxide (C2H4O)	0–10 ppm	0-1,5 ppm	0,01 ppm	Ethylene oxide 2 ppm
30100012	DEGA NSC2H4O-EL 100 II	Ethylene oxide (C2H4O)	0–100 ppm	0-100 ppm	0,1 ppm	Ethylene oxide 100 ppm
30100013	DEGA NSC2H4O-EL 1000 II	Ethylene oxide (C2H4O)	0–1000 ppm	0-1000 ppm	1 ppm	Ethylene oxide 100 ppm
30100014	DEGA NSC2H4O-EL 500 II	Ethylene oxide (C2H4O)	0–500 ppm	0-500 ppm	1 ppm	Ethylene oxide 100 ppm
30100024	DEGA NSH-EL 1000 II	Hydrogen (H2)	0–1000 ppm	0-400 ppm	1ppm	Hydrogen 1000 ppm
30100025	DEGA NSH-EL 4000 II	Hydrogen (H2)	0–4000 ppm	0-4000 ppm	1ppm	Hydrogen 1000 ppm
30100026	DEGA NSH-EL 400000 II	Hydrogen (H2)	0–400000 ppm	0–100 % LEL	0,1 %	0,8 % obj
30100037	DEGA NSHCN-EL 50 II	Hydrogen cyanide (HCN)	0–50 ppm	0-50 ppm	1 ppm	Hydrogen sulfide 1 ppm
30100059	DEGA NSPH3-EL 5 II	Phosphine (PH3)	0–5 ppm	0-0,2 ppm	0,01 ppm	Hydrogen sulfide 25 ppm
30100056	DEGA NSPH3-EL 20 II	Phosphine (PH3)	0–20 ppm	0-20 ppm	0,01 ppm	Hydrogen sulfide 25 ppm
30100057	DEGA NSPH3-EL 200 II	Phosphine (PH3)	0–200 ppm	0-200 ppm	0,1 ppm	Hydrogen sulfide 25 ppm

30100058	DEGA NSPH3-EL 2000 II	Phosphine (PH3)	0–2000 ppm	0-2000 ppm	1 ppm	Hydrogen sulfide 250 ppm
30100060	DEGA NSSIH4-EL 50 II	Silane (SiH4)	0–50 ppm	0-5 ppm	0,1 ppm	Hydrogen sulfide 25 ppm

30100018	DEGA NSCLO2-EL 5 II	Chlorine dioxide (ClO2)	0-1 ppm	0-0,4 ppm	0,01 ppm	Chlorine 5 ppm
30100027	DEGA NSH2O2-EL 100 II	Hydrogen peroxide (H2 O2)	0-100 ppm	0-100 ppm	0,1 ppm	Sulfur dioxide 25 ppm
30100028	DEGA NSH2O2-EL 500 II	Hydrogen peroxide (H2 O2)	0-500 ppm	0-500 ppm	1 ppm	Sulfur dioxide 250 ppm
30100033	DEGA NSHBr-EL 20 II	Hydrogen bromide (HBr)	0-20 ppm	0-20 ppm	0,01 ppm	Hydrogen sulfide 25 ppm
30100034	DEGA NSHBr-EL 200 II	Hydrogen bromide (HBr)	0-200 ppm	0-200 ppm	0,1 ppm	Hydrogen sulfide 250 ppm
30100038	DEGA NSHF-EL 10 II	Hydrogen fluoride (HF)	0-10 ppm	0-10 ppm	0,01 ppm	Nitrogen dioxide 20ppm
30100067	DEGA NSVOC-EL 20 II	VOC	0-20 ppm	0-20 ppm	0,01 ppm	VOC 20ppm
30100003	DEGA NSBR2-EL 20 II	Bromine (Br)	0-20 ppm	0-20 ppm	0,01 ppm	Chlorine 5 ppm
30100004	DEGA NSBR2-EL 200 II	Bromine (Br)	0-200 ppm	0-200 ppm	0,1 ppm	Chlorine 50 ppm
30100002	DEGA NSALC-EL 200 II	Alkohol	0-200 ppm	0-200 ppm	0,1 ppm	Ethanol 200 ppm
30100015	DEGA NSRCOOH-EL 100 II	Organic acids	0-100 ppm	0-100 ppm	0,1 ppm	Ammonia 300 ppm

3. Transmitters with an infrared sensor NSx-IL II

Product code	Transmitter type	Detected gas	Measurement range	Measurement of current loop (4-20mA)	Resolution	Calibration gas
30100075	DEGA NSCO2-IL 5 II	Carbon dioxide (CO2)	0-5 % vol.	0-2,5 % vol.	0,1 %	Carbon dioxide 2,5 % vol.
30100076	DEGA NSCO2-IL HC II	Carbon dioxide (CO2)	0-100 % vol.	0-2,5 % vol.	0,1 %	Carbon dioxide 2,5 % vol.
30100077	DEGA NSCO2-IL 500 II	Carbon dioxide (CO2)	0-500 ppm	0-2,5 % vol.	0,1 %	Carbon dioxide 2,5 % vol.
30100079	DEGA NSM-IL 100 II	Methane (CH4) / Natural gas /Coal gas / CNG	0–100 % LEL	0-20 % LEL	0,1 %	Methane 0,88 % LEL
30100080	DEGA NSP-IL 100 II	Butane / LPG / Propane-Butane	0–100 % LEL	0-20 % LEL	0,1 %	Butane 0,32 % LEL
30100084	DEGA NSC2H6-IL 100 II	Ethane (C2 H6)	0–100 % LEL	0-20 % LEL	0,1 %	Ethane 20 % LEL
30100082	DEGA NSC2H5OH-IL 100 II	Ethanol (C2 H5OH)	0–100 % LEL	0-20 % LEL	0,1 %	Ethanol 20 % LEL
30100083	DEGA NSC2H4-IL 100 II	Ethylen (C2H4)	0–100 % LEL	0-20 % LEL	0,1 %	Ethene 20 % LEL
30100081	DEGA NSC2H4O-IL 100 II	Etyhelen oxide (C2 H4O)	0–100 % LEL	0-20 % LEL	0,1 %	Etyhelen oxide 20 % LEL
30100087	DEGA NSC6H14-IL 100 II	Hexane (Petrol)	0–100 % LEL	0-20 % LEL	0,1 %	Hexane 20 % LEL

30100088	DEGA NSN2O-IL 1 II	Nitrous oxide (N2O)	0-1 % LEL	0-0,5 % LEL	0,01 %	Nitrous oxide 0,5 % LEL
30100086	DEGA NSC5H12-IL 100 II	Pentane (C5H12)	0–100 % LEL	0-20 % LEL	0,1 %	Pentane 20 % LEL
30100085	DEGA NSC3H6-IL 100 II	Propylene (C3H6)	0–100 % LEL	0-20 % LEL	0,1 %	Propylene 20 % LEL
30100078	DEGA NSHC-IL 100 II	Other flammable and combustible gases and vapors according to the selectivity of the sensor	0–100 % LEL	0-20 % LEL	0,1 %	Hexane 0,18 % LEL

4. Transmitters with a semiconductor sensor NSx-SL II

Product code	Transmitter type	Detected gas	Measurement range	Measurement of current loop (4-20mA)	Resolution	Calibration gas
30100074	DEGA NSY-SL 100 II	Acetylene (C2H2)	0–100 % LEL	0-20 % LEL	0,1 %	20 % LEL
30100073	DEGA NSR-SL 2000 II	Refrigerant: R401A, R404A, R407C, R32, R410A, R12, R22	0–2000 ppm	0-20 % LEL	1 ppm	According to the type of refrigerant
30100072	DEGA NSHFO-SL 2000 II	Refrigerant: R1234yf	0–2000 ppm	0-2000 ppm	1 ppm	According to the type of refrigerant

5. Transmitters with a PID sensor NSx-PID II

Product code	Transmitter type	Detected gas	Measurement range	Measurement of current loop (4-20mA)	Resolution	Calibration gas
30100089	DEGA NSVOC-PID II	VOC	0–4000 ppm	0-500 ppm	0,1ppm	Izobutylene 300ppm

LEL – Lowest explosion level
ALARM “PEL”: Permitted exposure limit – maximal permitted value of the average concentration over time.
Alarm settings can be chosen freely within measurement range according to customer requirements

Attachments

1. Chart for setting the transmitter address

address	1	2	3	4	5
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON

address	1	2	3	4	5
17	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON
19	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON
21	ON	OFF	ON	OFF	ON
22	OFF	ON	ON	OFF	ON
23	ON	ON	ON	OFF	ON
24	OFF	OFF	OFF	ON	ON
25	ON	OFF	OFF	ON	ON
26	OFF	ON	OFF	ON	ON
27	ON	ON	OFF	ON	ON
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON
32	OFF	OFF	OFF	OFF	ON

2. Signalization transmitted by the 4-20mA current loop

   Measurement: The measure concentration is directly proportional to 4-20mA current output

   Exceeding the range of measured concentrations: Current output ranges from 20 to 22mA

   End of valid calibration: Current output transmits the actual measured concentration for 9s in a 4-20mA range and for 1s 2mA current

   Malfunction: Current output will be set to 0,5mA

   Maintenance (sensor preheating sequence): Current output will be set to 1mA

3. Conversion between volumetric concentration and lower explosion limit of methane

$$\%DVM = \frac{\%obj}{4,4} * 100$$

   – level of lower explosion limit concentration in %

   – volume sample of gas

   – lower explosive limit of methane (4.4 % by volume)

4. Package content

1x sensor

1x bushing

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 the 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 and business name of the seller, his identification number, in case of a legal person their name, identification number and registered office, in case of a physical person their name, surname, place of residence and warranty certificate, provided 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 card.
2. Claims concerning the product (for a warranty repair only complete devices are accepted) 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 center or to the manufacturer.
3. A condition for the recognition of the rights under the warranty is the installation of the product having been undertaken by an authorized person in possession of a valid certificate from the manufacturer.
4. 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 concerned product part, because in such a case replacing the entire product would contradict the standard norms (§ 616, paragraph 4 of the Commercial Code).
5. The buyer who exercises the right of warranty repair is not entitled to the return of the parts that have been replaced.
6. 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 transmitter 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 product and its 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 sensors, i.e. setting detection limits
- wear or damage of the transmitter sensors, including the necessity of their replacement
- wear parts and consumables (such as the key for removing the sensor, seals, etc.), which 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

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User Manual ver.: 05.08.2020 14:52:00

Documents / Resources

	[DEGA NS II Gas Detection Transmitter](#) [pdf] Instruction Manual NS II, NS II Gas Detection Transmitter, Gas Detection Transmitter, Detection Transmitter, Transmitter

References

- [Webhosting je aktivní](#)

- DEGA CZ – Výrobce detektorů plynů
- DEGA CZ – Výrobce detektorů plynů