MODULE

ecoLAMBDA ver.2

TO OPERATE THE LAMBDA PROBE

INSTALLATION MANUAL

ISSUE: 1.0_EN

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ELECTRIC DEVICE UNDER VOLTAGE!

Before any action related to the power supply (cables connection, installation, etc.) check if the controller is not connected to the mains!

Installation should be done by a person with appropriate electrical qualifications. Improper cables connection could result in damage to the controller.

The controller cannot be used in steam condensation conditions and cannot be exposed to water.

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1. SAFETY

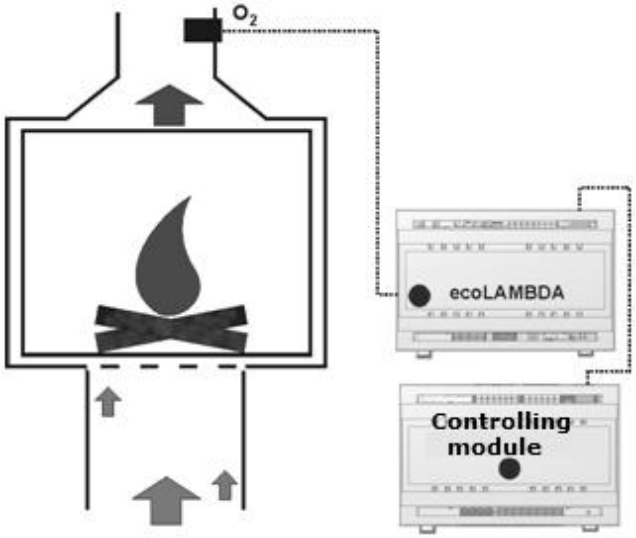
The module can only be used within the household and similar.

The module should be installed by a qualified and authorized installer, according to the requirements of EN 60335-1 standard.

2. GENERAL INFORMATION

ecoLAMBDA ver. 2 module is used for measuring the oxygen content in exhaust fumes. The measurement results are sent via RS485 transmission to the controllers cooperating with the module, whose task is to maintain the oxygen content and temperature of the exhaust fumes at a preset level.

The opeating instructions for the module are described in the manuals of the individual controllers, to which the module is attached.



Example of ecoLAMBDA module connection.

3. DIRECTIVE WEEE 2012/19/EU

Purchased product is designed and manufactured with the highest quality materials and components, which are recyclable and reusable.

The product meets the requiremenrs of the **Directive of the European Paliament and of the Council 2012/19/EU of 4 July 2012 on waste electrical and electronic equipment (WEEE)**, according to which it is marked by the symbol of crossed-out wheeled bin (like below), meaning that product is subjected to separate collection.

Responsibilities after finishing a period of using product:

• dispose of the packaging and product at the end of their period of use in an approopriate recycling facility,
• do not dispose of the product with other unsorted waste,
• do not burn the product.

By adhering obligations of waste electrical and electronic equipment controlled disposal mentioned above, you avoid harmful effects on the environment and human health.

4. TECHNCIAL DATA

Measurement parameters	- measurement range: 0..21% O_2, - accuracy ±1% O_2 and it refers to the module input itself, and does not consider the accuracy of the connected probe.
Lambda probe support	NGK, type ZFAS-U2
Data transmission	Standard RS485
Supply	~230 V, 18 W, 50 Hz
Terminal load capacity	Max. 2A
Operating conditions	- temp.: 0…60°C, - humidity 10…90%, without steam condensation.
Transport and storage conditions	-10…+60°C
Housing protection level	IP20 – after enclosure
Connectors	- screw terminals on mains voltage side: 2,5 mm^2, - screw terminals on signal side: 1,5 mm^2
Nominal surge voltage	2500 VAC
Standards	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A
Protection class	class II
Contamination level	2nd degree, according to PN-EN 60730-1
Module weight	0,6 kg
Dimensions	140 mm x 90 mm x 65 mm

5. SET CONTENTS

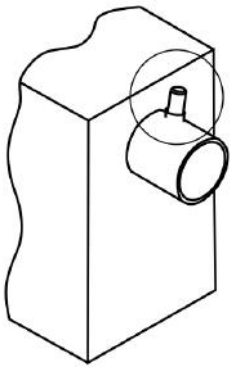
- ecoLAMBDA ver.2 module 1 pc
- NGK Lambda probe 1 pc
- Module installation manual 1 pc
- Transmission cable with connectors 1 pc

6. MOUNTING THE MODULE

For safety reasons against shock, the module has been designed to be used in the environement, where conductive contaminants may be present. In addition, the module cannot be used in steam condensation conditions or be exposed to water.

6.1.Installation and use of Lambda probe

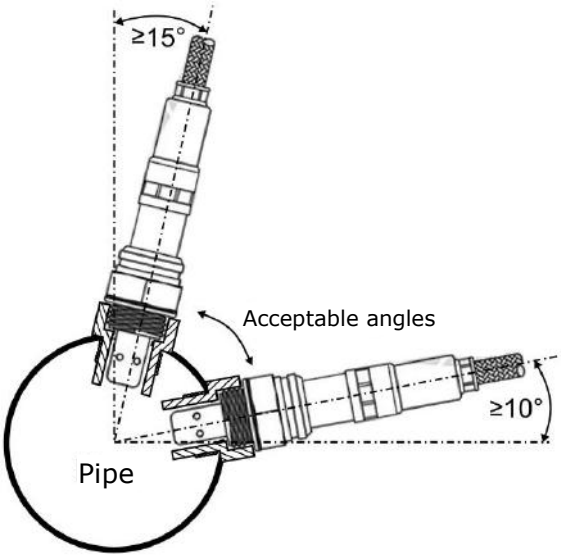
The NGK Lambda probe should be installed on the exhaust outlet (chimney or boiler flue).

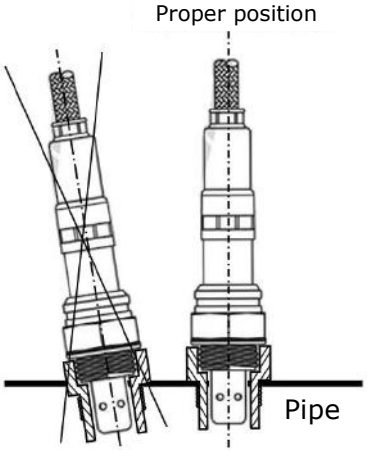


A place to install the Lambda probe.

The installation should be performed in a place where the fumes temperature is the highest, however does not exceed **700°C** – higher temperature will damage the probe.

The probe installation position on the exhaust outlet should be such that the probe axis was deviated from the horizontal level by an angle no less than 10°, but no more than 15° from the vertical.

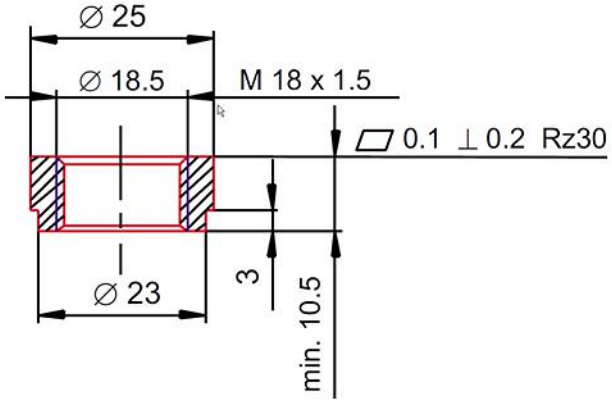




Lambda probe installation.

The NGK Lambda probe is equipped with a threaded M18x1,5 connection. It should be compatible with the nozzle welded or screwed into the installation of exhaust outlet. The shape of recommended connection nozzle is presented in the figure below. The recommended probe tightening torque is 40..60 Nm.

Caution for risk of burns. The probe's tip connected to the module may reach a temperature of several hundred ºC.

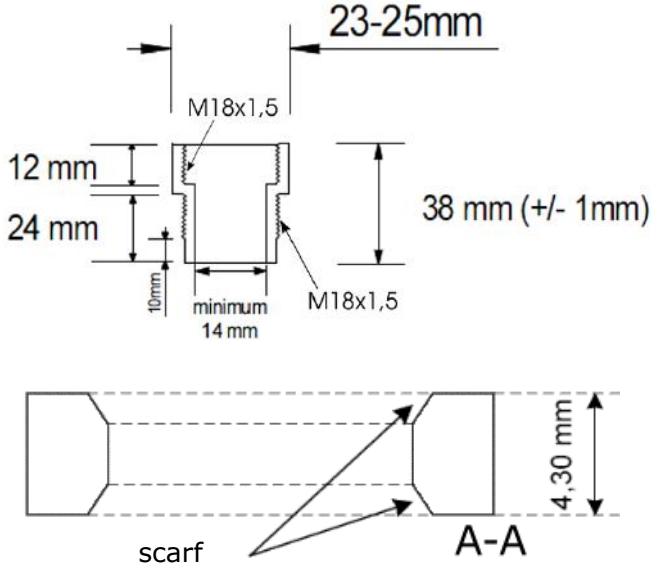


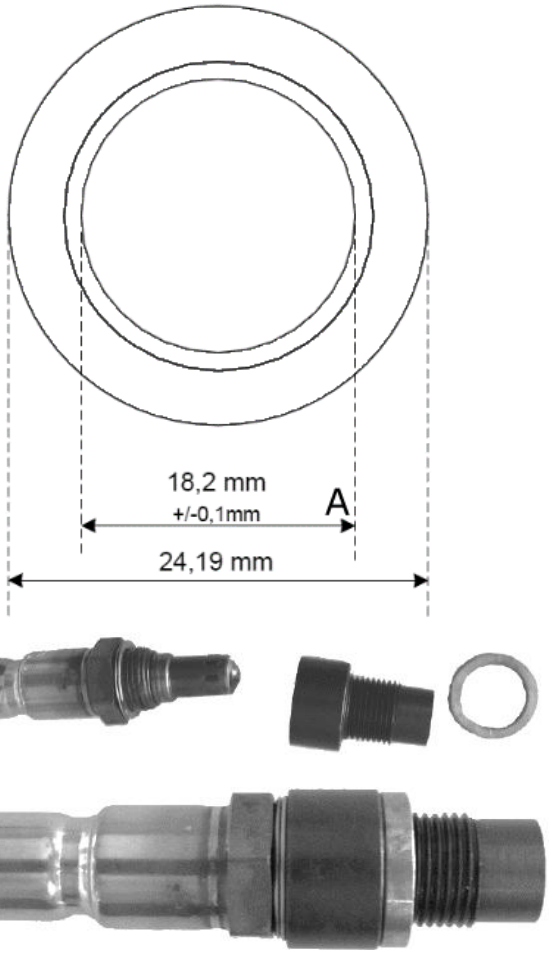
Recommended shape of probe's connection nozzle.

Maximum acceptable operating temperatures of NGK Lambda probe:

- 600°C – for the probe and its metal parts,
- 200°C – for the cable on section from probe to the plug,
- 120°C – for the probe's plug,
- 60°C – for the cable between probe's plug and the module.

Lambda probe tip should be additionally protected against accumulation of soot by a threaded sleeve with a ring made according to the figure below.

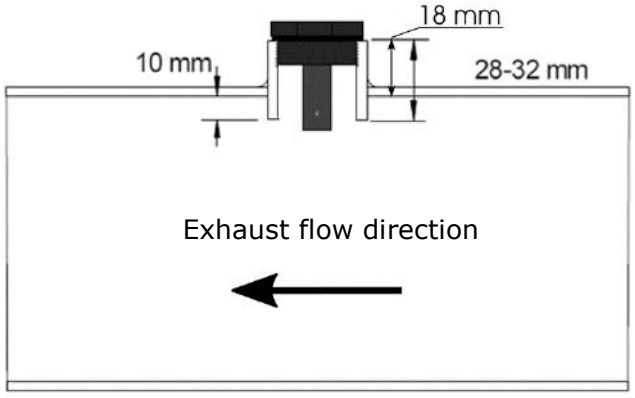




Lambda probe thermowell.

A properly secured probe can be embedded in the duct or flue, according to the figures below.

The minimum installation distance of Lambda probe from the exhaust fan is 150 mm.



Method of Lambda probe thermowell installation.

Usage conditions of NGK Lambda probe:

- the probe must not be left in the presence of the flue gas flowing around it without being powered by the module.
- protect the probe from steam condensation.

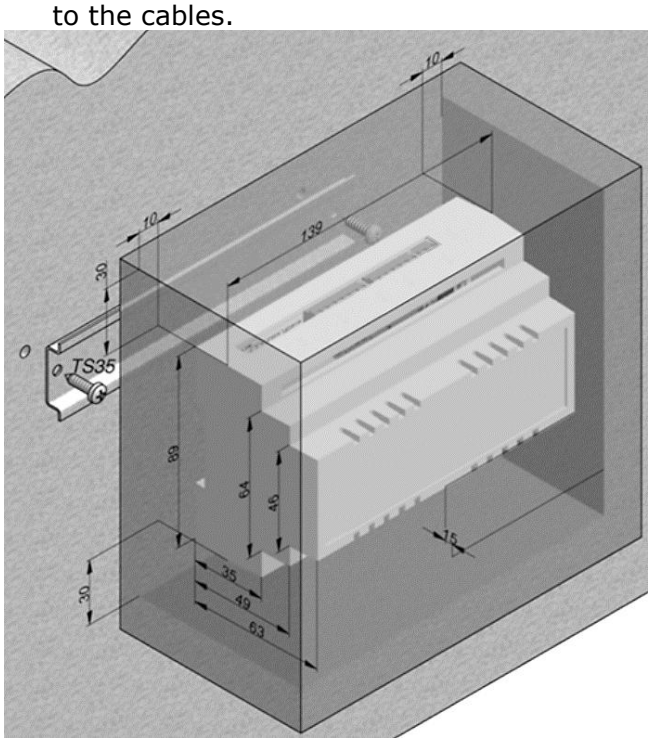
Noncompliance to the above requirements will shorten the life or even damage the Lambda probe.

After powering the module and up to a few minutes after it is turned off, the Lambda probe is still heated up to a high temperature. Do not touch the heated sensor or allow it to come in contact with flammable elements. Do not use the sensor near flammable luquids or gases. Noncompliance to these recommendations can result in severe scalding and fire.

6.2. Module installation

The ecoLAMBDA ver.2 module is designed for enclosure. A standard installation housing can be used for enclosure of eight modules.
The module should be installed so that:

- a degree of protection corresponding to the environmental conditions was provided,
- it provided protection against dust and water,
- the accepted operating temperature was not exceeded,
- the air exchange in the housing was ensured,
- the access to hazardous parts was prevented,
- the electrical installation, to which the module is connected, has a device enabling disconnection of both poles of mains supply, according to the regulations concerning the construction of such installation.
- the connecting cables should be enclosed or attached to the fixed elements in a way that no mechanical stresses can occur in relation to the cables.



Module installation.

Before placing the module on the TS35 mounting rail, lift the latches using scredriver. After it is placed on the rail, press the latches back to their original position. Ensure, that the device is securely attached and it cannot be removed from the rail without the use of a tool.

6.2.1. Connectors support

The ecoLAMBDA ver.2 module is equipped with screw terminals adapted to accept the cable with a ferrule ending. The range of permissible cross-sectional areas to connect terminals is presented in the table below:

Circuit type	Cable cross-section
Mains circuits	0,5÷2,5 mm^2
Low voltage circuits	0,25÷0,75 mm^2

The length of stripped wire should be 6÷7 mm.

6.2.2. Supply connection

The device should be installed with mains supply disconnected!

The module is designed for 230 VCA, 50 Hz supply. The power supply is connected to L, N terminals, in accordance with the electrical scheme. The supply cables should be routed in a way preventing them to come in contact with the cables connected to low voltage components, additionally all cables cannot come in contact with surfaces that exceed theit nominal temperature.

For safety reasons the module has to be implicitly connected to the 230 VAC power network, keeping the proper connection sequence of L phase and N neutral wires. Make sure that the wires L and N have not been switched within the electrical installation of the building, e.g. in the electrical socket or distribution box.

6.2.3. Transmission connection

Communication of the ecoLAMBDA ver.2 module with other devices is established via RS485 transmission connector. When connecting the transmission, pay attention to keep proper polarity of D+, D- signals between the module and other devices and the cross-section of connection cable wires should be min. 0,5mm^2.

6.2.4. Connecting Lambda probe to the module

The ecoLAMBDA ver.2 module cooperates with the **NGK** Lambda probe type **ZFAS-U2**. Using Lambda probe of other type does not guarantee the reliability of measurements.

Connection of module to Lambda probe should be made in accordance to the below table and electrical diagram.

Terminal	Designation	Wire color
Probe type: **NGK ZFAS-U2**		
7	**UN**	Grey
8	**VM**	Black
9	**IA**	Red
10	**IP**	White
11	**-**	Brown
12	**+**	Blue

7. FUSE REPLACEMENT

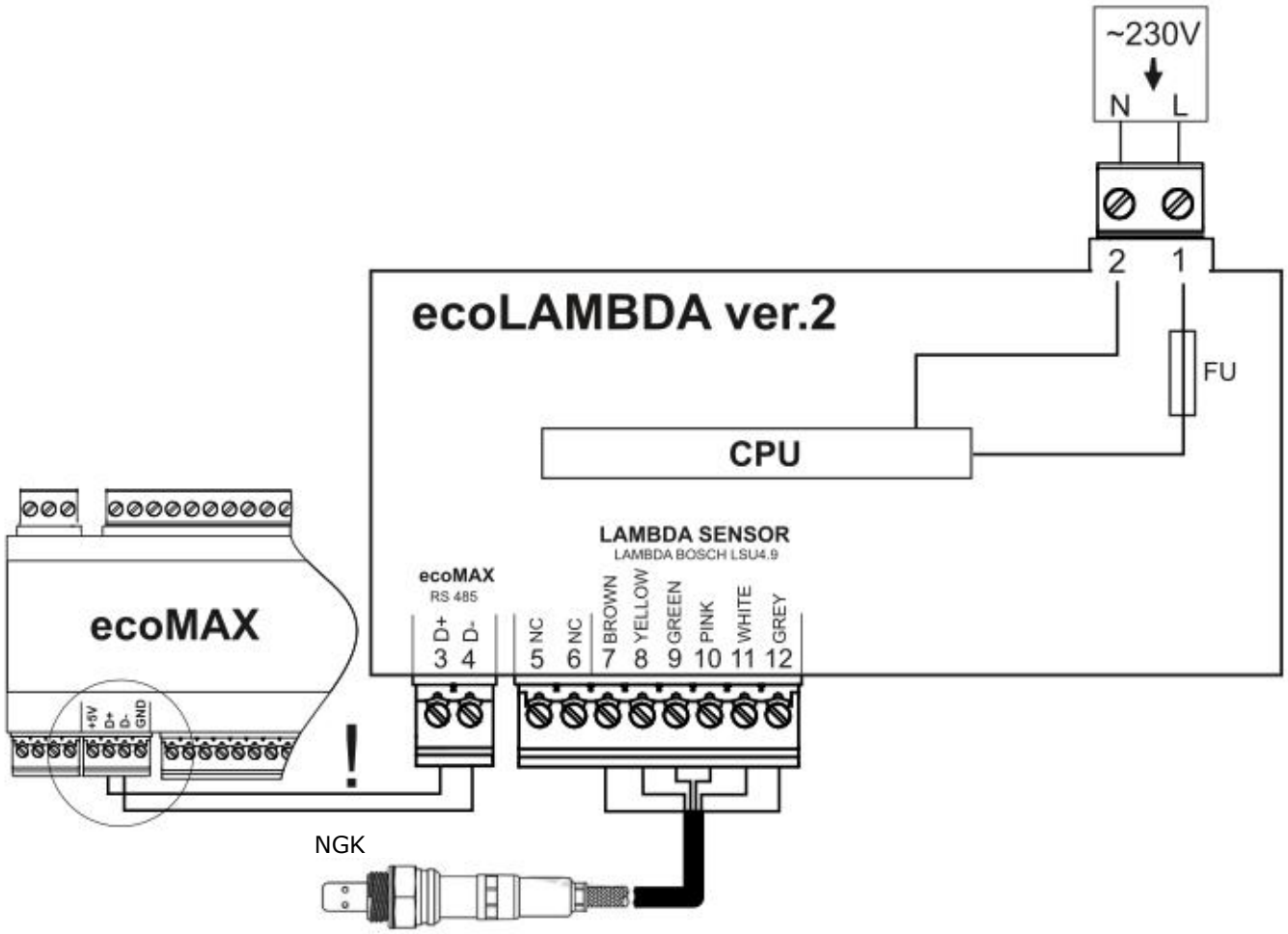
Before replacing the fuse disconnect the mains supply from the module.

The mains fuse is located inside the module housing on electrical board. The fuse used here is a 1,25 A / 250 VAC, fine fuse, 5 mm x 20 mm, type 215P.

In order to remove the fuse, unscrew the screws of the module's housing and take off its top cover and then lift the fuse holder with a flat screwdriver and pull out the fuse.

The fuse can only be replaced by a qualified person, after the mains supply is disconnected.

8. ELECTRICAL SCHEME



Electrical wiring diagram of the module: FU – fuse (1,25 A / 250 VAC), ecoMAX – the main controller, NGK – Lambda probe type ZFAS-U2, RS485 – transmission (D+, D-), **!** – connect only with two wires (do not connect with four wires, because of risk to damage the controller).

Changes register:

The manufacturer reserves the right to make design and software changes without prior notice.

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