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EN

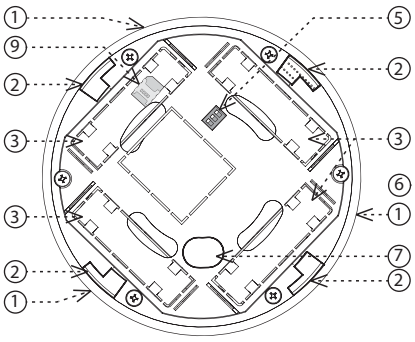
AirQS-101NB

Air quality sensor - carbon monoxide (CO)

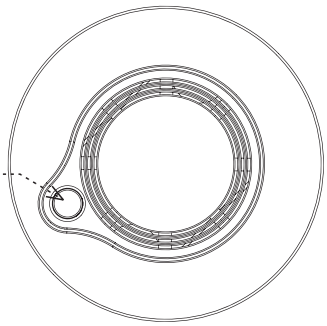
Characteristics

- AirQS-101 - is used as a safety device for monitoring the CO concentration resulting from incomplete combustion. It also informs you of the actual temperature, humidity and light intensity in the area.
- Provides a quick solution to learn about undesirable CO concentrations that can be immediately reacted too.
- The self-test function alerts you to a detector malfunction, eliminating its malfunction.
- Anti-sabotage: If access to the device is unauthorized, a message is immediately sent to the server.
- Thanks to the wireless solution and NB-IoT communication, it can communicate instantly to your chosen location and be operated immediately.
- Data is sent to the server from which it can be subsequently displayed as a smartphone, application, or Cloud notification.
- Battery power can be sent to the server when it is powered by a battery.
- Power supply: battery 4 x 1.5 V AA.

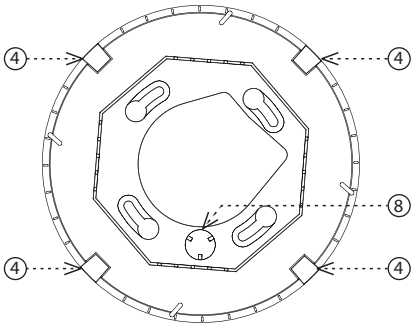
Description



The underside of the detector



The front of the detector



The inner side of the base

1. Two-color LED position
2. Holes for locking segments
3. Battery
4. Secure segments
5. DIP switch - Position 1 - Turn off scanning signaling
6. Button SET
7. Tamper position
8. Probe for magnet scanning tampermenty
9. NanoSIM slot

Cloud app assignment

It is done in your Smartphone application. Enter the relevant data located on the detector cover into the application.

General instrucions

Internet of Things (IoT)

- The IOT wireless communications category describes the Low Power Wide Area (LPWA). This technology is designed to provide full-range coverage both inside and outside buildings, energy-saving and low-cost operation of individual devices. The NarrowBand network is available to use this standard.

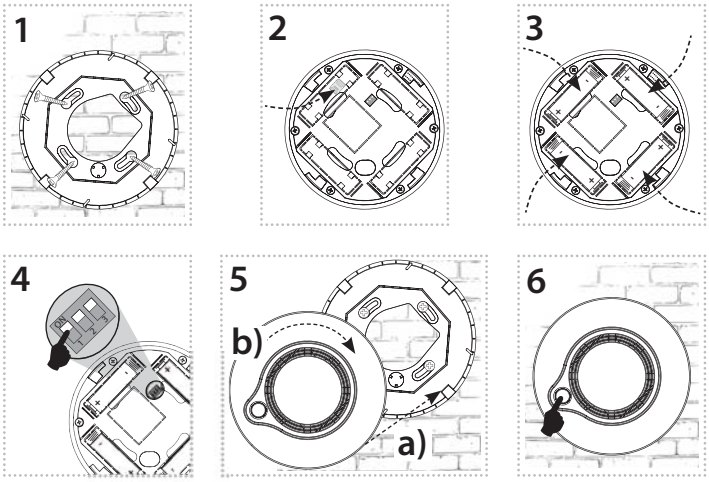
Information about the NarrowBand network

- The network provides two-way communication and the only one to use the licensed LTE band. Our devices allow band 1 (2100MHz), Band 3 (1800MHz), Band 8 (900MHz), Band 5 (850MHz), Band 20 (800MHz) and Band 28 (700MHz).
- It uses this SIM card technology for each device.
- The advantage of NarrowBand is the use of already built-up grids, which ensures sufficient reception outside and inside buildings.
- For more information on this technology, please visit www.vodafone.cz

Caution for proper operation:

- Products are installed according to the wiring diagram given for each product.
- For proper device functionality, it is necessary to have sufficient coverage of the selected network at the installation site.
- At the same time, the device must be registered in the network. Successful device registration on a given network requires a charge for traffic.
- Each network offers different tariff options - it always depends on the number of messages you want to send from your device. Information on these tariffs can be found in the current version of the ELKO EP pricelist.

Assembly



1. Place the base at the desired location (on a flat surface). You can use the base as a drilling template. Attach the base with suitable bonding material * according to the substrate.
2. Carefully insert nanoSIM (the device must not be energized when inserting or replacing nanoSIM!)
3. Insert the batteries into the detector and check that they are correctly positioned (a detector functionality message will be sent to the application when the batteries are inserted).
4. Set DIP 1 as required.
5. Attach the detector to the base so that the projection on the base faces the tamper position in the detector cover (a). Turn the detector clockwise (b).
6. Press the test button to test the correct alarm function (see Test Detector Test).

* Suitable fitting material can be, for example, a countersunk head screw, a screw Ø of 3 mm.

Function

The detector detects carbon monoxide (CO) content in confined spaces by means of a sensor. It is designed to alert you to the presence of CO before the condition becomes critical - that is, before most people experience the symptoms of CO poisoning, so you have time to solve the problem calmly.

Indications and states of the detector:

After inserting the batteries, the detector sends a preliminary message containing the measured values of temperature, humidity, light intensity, CO status and firmware version of the device.

- The detector scans every 10 seconds, the green LED blinks at the same time (the LED can be turned off by a DIP switch). Every 10 minutes the detector senses temperature, humidity and light intensity. It sends the measured and status data report at six hour intervals.
- Alarm indication for CO detection:
  30 ppm = no alarm signalled within 120 minutes.
  50 ppm = alarm signalling within 60-90 minutes.
  100 ppm = Alarm signalling within 10-40 minutes.
  Above 300 ppm, the detector must declare an alarm within 3 minutes.
- Alarm - sensor detects CO, red LED flashes at 1 second, detector sounds loud, intermittent "beep". Terminate alarm by ventilating the CO (fan ...).
- Dead battery:
  - sending a message to the server
  - Every 5 seconds 3x the red LED on the detector will flash.
- Detector failure:
  - sending a message to the server
  - Indication of the yellow LED on the detector and one short beep every 40 seconds.
- Removed from base:
  - sending a message to the server.
  - every 2 seconds the red LED on the detector blinks.

Information about carbon monoxide (CO)

Carbon monoxide is a colourless poisonous non-irritating gas without taste and odour; it prevents the transmission of oxygen in the blood. It is highly toxic to the human body. It is extremely flammable.
In homes, the most common sources of CO equipment are used for heating and cooking. Sources of dangerous CO concentrations can also be realised from vehicles in adjacent garages.
CO may arise from the combustion of fossil fuels, such as gasoline, propane, natural gas, naphtha and wood. It can escape from any defective, improperly installed or poorly ventilated facility.

CO concentrations in air are measured in ppm (parts per million).

At increased concentrations of CO in air (150-220 ppm) within 2-3 hours headache, dizziness, nausea, blunted thinking and congestion in the face occurs, longer exposure is life threatening. Concentrations of about 400 ppm show confusion, vomiting, drowsiness moving to unconsciousness and life-threatening condition can occur after 2-3 hours of remaining in this environment. Higher concentrations are manifested by convulsions, unconsciousness with breathlessness, shock, and the person is in direct danger to life.

Because carbon monoxide is a cumulative poison, its long-term exposure at low concentrations can cause symptoms of poisoning as well as short-term exposure at high concentrations. Remember the early symptoms of CO poisoning, and if there are any suspicions of poisoning, move out to fresh air and call for help.

We recommend that you take special precautions to protect people with the highest risk, as symptoms of poisoning may already occur with less CO than with a healthy adult. In the event of uncertainty, consult a physician.

Testing the detector

Long press the test button to start the detector test. During the test, the green LED flashes (two flashes every second). The siren's activity is first tested - a long tone sounds. After a successful test, the detector flashes and beeps three times. The application will automatically send a message about the successful completion of the test.

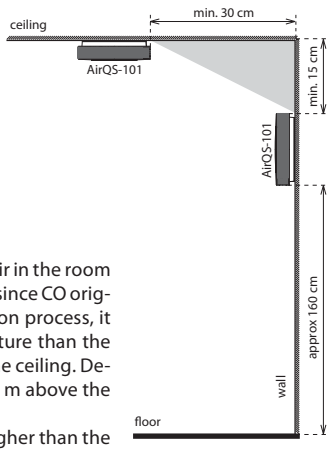
If the detector does not signal properly, check the correct detector assembly, the battery location, replace the batteries, and then repeat the test.

WARNING

Every detector must be tested regularly to ensure that it is properly installed and working properly.

- Test the detectors regularly at least once a week.
- When testing the device, keep the distance from the detector to the length of your arm or use hearing protection.
- Teach children to avoid touching the detector or interfering with the device. Warn the children against the risk of poisoning with carbon monoxide.
- Keep the detector clean.
- If it does not work properly, replace it immediately.

Placement recommendations



- The detector is intended for indoor use. Therefore, use it exclusively for scanning in closed, dry and dust-free areas.
- Ensure that the ventilation openings remain free and do not block it with other appliances, furniture or other objects.
- Place the detector in such a place that the ambient air can flow through the device.

Appropriate location

- Carbon monoxide has the same density as the air in the room and is therefore uniformly dispersed. However, since CO originates as a product of an incomplete combustion process, it is very likely that it will have a higher temperature than the ambient air and will therefore slowly climb to the ceiling. Detector location is useful at a height of about 1.6 m above the floor.
  - If you attach the device to a wall, it must be higher than the top edge of the window and door but at least 15 cm below the ceiling.
  - If you attach the device to the ceiling, it must be at least 30 cm from each wall
  - If the ceiling is inclined, place the device in the upper part of the room
- To increase security, detectors should be installed in any room with a fuel-burning appliance (gas, wood, coal, etc.) 2-3 meters away from the CO source (boiler, fireplace, water heater ...).
- Warning sound of the detector must be heard in the bedroom and rooms where you regularly spend time.
- In one-room sleeping and living rooms at the same time, such as studios, caravans or boats, the detector should be placed as near as possible to the sleeping area and as far as possible from the stove or combustion point.
- It is recommended that the CO detector be installed on each floor of a multi-storey house (e.g. CO in the cellar may not reach the alarm on the 1st floor).

Inappropriate location

- In areas with limited air circulation e.g.: vestibule, niches, etc.
- In places where there is a sudden change in temperature or humidity. Where condensation occurs.
- In close proximity to windows, doors, ventilation devices,
- In direct proximity to persons or animals.
- In direct sunlight or near a heat source.
- Do not place in a kitchen, garage or boiler room so that the sensor could come into contact with substances that could destroy or contaminate it.
- Do not place near ventilation ducts, smoke flues, chimneys, or any air vents.
- Do not place in areas with fixed air such as tops of arched ceilings or shielded roofs, where the CO may not have reached the sensor sufficiently quickly to alert you.
- Do not place this device near large batteries. Large batteries have emissions that can reduce the detector's operational capability.

Important Notice

- The detector can only warn you in time if it is properly installed and properly maintained and tested according to the instructions.
- The detector is not suitable as a measuring instrument or part of a device to alert in the presence of gas, smoke or exhaust gases, or as part of a fire alarm or similar security device.
- It does not detect smoke, fire or other poison gas except carbon monoxide, although carbon monoxide can arise in a fire. Therefore, it is advisable to install smoke detectors for early warning when a fire occurs.
- WARNING: This detector detects only the presence of carbon monoxide that reaches the sensor. However, carbon monoxide can occur in other areas.
- It is not intended for verification of normative values.
- The installation of this device does not replace the proper installation, use and maintenance of combustion equipment, including sufficient ventilation and exhaust system. It does not prevent the formation of carbon monoxide, nor can it solve existing problems with CO.
- For your own safety it is necessary to know the possible sources of CO in your home. Keep fuel systems and their chimneys and ventilation in good condition.
- Control and regular maintenance of your equipment is very important for your protection. Contact a licensed vendor or local utility company.
- The detector is not intended for installation in an industrial environment.
- Always be aware of potential dangers, develop safety awareness, and take precautions to avoid dangers whenever and wherever needed. The detector can reduce the likelihood of catastrophe but cannot guarantee 100% safety.
- Detailed information on the selection, installation, use and maintenance of carbon monoxide detectors in residential buildings can be found in EN 50292 ED.2.

Replacing batteries

1. Rotate the detector counter clockwise and remove it from the base.
2. Remove the original battery and insert new batteries into the battery holder. Beware of polarity. The red LED on the detector will blink.
3. Attach the detector to the base so that the projection on the base faces the tamper position in the detector cover. Turn the detector clockwise.
4. Press the test button to test the correct alarm function (see Test Detector). WARNING - do not damage the test button during battery replacement, the device may not work properly.

Notice:

Only use batteries designed for this product correctly inserted in the device! Immediately replace weak batteries with new ones. Do not use new and used batteries together. If necessary, clean the battery and contacts prior to using. Avoid battery shorts! Do not dispose of batteries in water or fire. Do not dismantle batteries, do not try to charge them and protect them from extreme heating - danger of leakage! Upon contact with acid, immediately rinse the affected area with a stream of water and seek medical attention. Keep batteries out of the reach of children. If it is suspected that the battery has been swallowed or somehow placed inside the body, consult a doctor immediately. Give the doctor information about the type of battery (from battery case, device or its manual, etc.) to determine the chemical composition of the battery. Batteries must be recycled or returned to an appropriate location (e.g. collection container) in accordance with local legal provisions.

Maintenance and cleaning

To ensure proper operation, it is advisable to keep the detector clean.

- At least once every 6 months, clean the surface using a soft brush or cloth. Using a brushless vacuum cleaner, carefully clear the cover and the ventilation holes from dust and dirt.
- Never use water, detergents or solvents. The detector may be damaged.
- Do not use any chemicals near the device (such as cleaning products, hair spray ...) fumes can adversely affect the function of the device.
- Do not apply colour to the detector. When painting, remove the detector and return to the location after the work has finished.
- Do not disassemble the detector; do not attempt to clean the inside of the detector.
- After every cleaning, test the detector!
- If you do not use the detector for a long time, remove it, remove the batteries. Wrap the detector and store it in a cool, dry place.

What to do when CO is detected

If an alarm signal sounds and the detector is not being tested, CO is detected. Your immediate attention and actions are required.

1. Call the emergency line to give you location by phone and follow exactly the instructions you are given for your situation.
2. Open the door / window and move to an area of fresh air. Ensure that all persons have left the area. Check that none of the "affected" persons have signs of CO poisoning. In many cases, CO poisoning causes victims to realize that they do not feel well but become so disoriented that they are unable to save themselves either by escaping from the building or by calling for help. ATTENTION - children and pets may be at risk.

3rd Do not enter the area until help arrives, the space is sufficiently ventilated and the detector returns to normal.

- If the affected area is sufficiently ventilated by opening the windows and doors, the accumulated CO may dissipate before the help arrives. Although your problem may be temporarily resolved, it is imperative to identify the CO source and make the appropriate corrections!
- If the alarm is reactivated within 24 hours, repeat steps 1-3 and contact a qualified technician to check and / or turn off your equipment that could be the source of CO leakage (e.g. water heater, stove, oven, tumble dryer If the car is in the adjacent garage, turn the engine off.).

First aid

Move out in to the fresh air. If any symptoms of CO poisoning occur, contact a doctor!
Check that all people have left the room. If you find that a person remained in the area immediately call the medical rescue service on the phone they will tell you exactly what you do in a given situation.
If you need to return the affected area, it is always necessary to ensure maximum safety - carbon monoxide can poison the rescuer do not try to breathe in the room. Alternatively, you can vent the room by opening all windows. But you do not breathe at any price, even though the mask! You have to breathe fresh air! Take the affected person out of the contaminated area to fresh air. If the affected person breathes, keep them in a stabilized position. If they are not breathing, initiate artificial respiration. If they are in cardiac arrest, start resuscitation.

UPLINK

Function	Byte	0-14	15					16	17	18	19	20	21	22	23	24
	Bit		7-4	3	2	1	0									
START		IMEI	0xC	Tamper: 1 - opened 0 - close	Battery: 1 - low 0 - OK	reserved	Alarm: 1 - alarm 0 - OK	FW version	Run time[0]	Run time[1]	Temperature [0]	Temperature [1]	Humidity [0]	Humidity [1]	Illuminance [0]	Illuminance [1]
HEARTBEAT			0x0					0x00								
ALARM			0x6					alarm message number (01 - XY)								
ALARM__CANCELED			0x4					alarm clear flag 0x00 - CO cleared, 0x01 - button pressed, 0x02 detector inserted in to the base								
TEST			0x2					test result								

Notes

Unit	Example
Temperature [°C] * 10	00F5 = 245 = 24,5 °C
Humidity [%] *10	01A1 = 417 = 41,7 %

Example

Message example	Byte	
04 00 00 48 00 54 01 25	04	Message type and flags - first digit define message type according to the table (0 is heartbeat) and second digit define flags of battery, tamper and smoke alarm - 4 Hex is 0100 binary so according to the table the battery is low
	00	Value according to the message type - in this case message type is Heartbeat so byte don´t have useful value
	00	Run time in hours - 0 * 256 hours
	48	Run time in hours - 48 Hex is 72 decimaly so the run time is 72 hours
	00	Temperature - 0054 Hex is 84 decimaly so the temperature is 8.4 °C
	54	
	01	Humidity - 0125 Hex is 293 decimaly so the humidity is 29.3 %
	25	

Technical parameters

	AirQS-101NB
Power supply	
Battery power:	battery 4x 1.5 V AA*
Battery life by frequency *:	
1x 10 minutes	2.5 years
1x 60 minutes	3.5 years
1x 12 hours	3.5 years
1x 24 hours	3.5 years
Input	
Measurement of CO concentration:	YES
Sensitivity:	0 - 10 000 ppm
Accuracy:	5% (0 - 500 ppm)
Temperature measuring:	built-in sensor
Sensitivity:	-25 .. 110 °C
Accuracy:	± 3 °C
Humidity measuring:	built-in sensor
Sensitivity:	0 .. 90 % RH
Accuracy:	± 4 %
Light intensity measurement:	built-in sensor
Range:	0.045 - 188 000 Lx
Setting	
Alarm Detection:	message to the server, indication LED, audible alarm
Battery status view:	message to the server, indication LED
Button SET:	Test / setting / signalling
DIP switch:	Position 1 - Turn off scanning signaling
Control	
Detection area:	max. 40 m^3
Recommended installation height:	max. 4 m
Acoustic signal:	greater than 85 dB at 3 meters
Test button SET:	yes
Communication	
Protocol:	NB-IoT
Transmitter frequency:	LTE Cat NB1**
Range in open space:	Approx. 30 km***
Transmission power (max.):	200 mW / 23 dBm
Other parameters	
Humidity:	up to 92% relative humidity (RH) / 10% to 85% RH, no condensation or frost
Working temperature:	0…+40°C (Pay attention to the operating temperature of batteries)
Storage temperature:	-30…+70°C
Operation position:	Horizontal (ceiling) / Vertical (Wall)
Mounting:	screws
Protection degree:	IP20
Color:	white
Dimension:	Ø 120 x 36 mm
Weight:	184 g (without battery)

* Values are calculated under ideal conditions and may vary according to alarm frequency
** Multiple frequency bands of B1 / B3 / B5 / B8 / B20 / B28
*** Depending on network coverage

Warning

Read the operating instructions before installing the device and putting it into operation. Instruction manual is designated for mounting and also for user of the device. It is always a part of its packing. Installation and connection can be carried out only by a person with adequate professional qualification upon understanding this instruction manual and functions of the device, and while observing all valid regulations. Trouble-free function of the device also depends on transportation, storing and handling. In case you notice any sign of damage, deformation, malfunction or missing part, do not install this device and return it to its seller. It is necessary to treat this product and its parts as electronic waste after its lifetime is terminated. Before starting installation, make sure that all wires, connected parts or terminals are de-energized. While mounting and servicing observe safety regulations, norms, directives and professional, and export regulations for working with electrical devices. Do not touch parts of the device that are energized – life threat. To ensure the transmission of the radio signal, make sure that the devices in the building where the installation is installed are correctly located. Unless otherwise stated, the devices are not intended for installation in outdoor and damp areas, they must not be installed in metal switchboards or in plastic cabinets with metal doors - this prevents transmission of the radio frequency signal. iNELS Air is not recommended for controlling life-saving instruments or for controlling hazardous devices such as pumps, heaters without thermostat, lifts, hoists, etc. - radio frequency transmission may be overshadowed by obstruction, interference, transmitter battery may be discharged etc., thereby disabling the remote control.