

User Manual

Explosion-safe motion sensor Type series AR-021



II 3 G Ex nR IIC T6 Gc
II 3 D Ex tc IIIC T80°C Dc





1. Safety Instructions

The AR-021 motion sensor is an explosion-safe product suitable for use in hazardous areas with explosion hazard from flammable gases, vapors, mist and dust, classified as Zone 2 or Zone 22.

This manual must be read and understood for safe use of the motion sensor. All warnings and instructions must be followed.

- Installation must be carried out by personnel trained and qualified in explosion safety taking the instructions mentioned on the equipment and in this manual into consideration. Local regulations that apply to the installation must be followed.
- Connect this equipment to the supply voltage for which it is designed.
- Isolate electrical power to the motion sensor before electrical installation.
- The protection degree against ignition Restricted Breathing has been applied to the apparatus. The enclosure may not be opened if the motion sensor is energized.
- Installation of cables may not invalidate the protection degree Restricted Breathing, therefore only IP67 cable glands with the a clamping size meeting the cable diameter should be used.
- All unused openings should be plugged off in a properly closed and tight way.
- Either decommission the motion sensor or do not use it when it is damaged.
- During installation of the motion sensor national safety regulations must be observed.
- Only use the motion sensor under the environmental conditions for which it is specified. Deviating environmental conditions can contribute to damage to the equipment and may lead to possible danger to the life of the user.
- Do not use the motion sensor at temperatures deviating from the specified ambient temperature range.
- Follow all instructions written on the equipment and as mentioned in this manual.
- Repairs may only be carried out by the manufacturer or by a person appointed by the manufacturer.
- Modifications to the equipment or changes to the design are not permitted.
- The product may only be used for the function for which it is designed and shall be maintained in a good and clean condition.

If these instructions are not followed, the explosion safety of the equipment cannot be guaranteed. The equipment could then endanger the life of the user and could cause the ignition of an explosive atmosphere. Consequently, Artidor as the manufacturer will waive any responsibility.

2. Description

The explosion-safe motion sensor AR-021 is based on the latest high frequent radar technology and capable of detecting even the slightest movements. Thanks to the wide opening angle and its 8 m range, no movement can escape this modern sensor. Even through doors, panes of glass or thin walls, movements will be detected: the

response will only be limited by the settings used by the user. Since detection is only triggered by movement, the switch is immune against light sources and thermal radiation as well as against vapor and fog.

The sensor electronics offer an electrical output of up to 16 A, 230 V AC and an additional potential free contact. The intelligent, microprocessor-based sensor technology, for instance, switches the light ON and OFF again after the preset time. This is not only extremely convenient, but also increases safety and is energy and cost saving.

The motion sensor comprises of a coated aluminum or stainless steel housing with an impact resistant safety glass in a polyamide frame covering the sensor. The explosion safety to gas is arranged by the appliance of protection degree against ignition 'Restricted breathing'. The explosion safety to dust is arranged by the appliance of protection degree against ignition 'protected by enclosure'.

3. Characteristics

The characteristics of the motion sensor can be summarized as follows:

- Robust design
- Coated aluminum or stainless steel 316 housing and adjustable stainless steel 316 mounting bracket
- Provided with two Ex e cable glands
- Manufactured on the basis of the European Directive 2014/34/EU (ATEX 114)
- Suitable for use in gas and dust hazardous areas classified as zone 2 and 22
- Explosion safety category and protection degree against ignition applied:
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- Protection degree against the ingress of water and dust IP66
- Suitable for internal and external use.

4. CE - Marking

The motion sensor complies with the European Directives for EMC and ATEX and implicit to the Low Voltage Directive. With regard to explosion safety the motion sensor has been designed and manufactured on the basis of the essential health and safety requirements of European Directive 2014/34/EU (ATEX 114) relating to Group II Category 3GD. Harmonized European construction standards have been applied fulfilling the essential requirements of the directives.

5. Application

The explosion-safe AR-021 motion sensor has been designed for and is suitable for use in hazardous classified areas due to flammable gases, vapors, mist, fibers and dust. Because it is explosion-safe and certified on the basis of Group II Category 3GD of the ATEX Directive it is suitable for use in the following types of zones in explosion hazardous areas:

- for combustible gases, vapors and mist: zone 2
- for combustible fibers and dust: zone 22.

6. Technical data

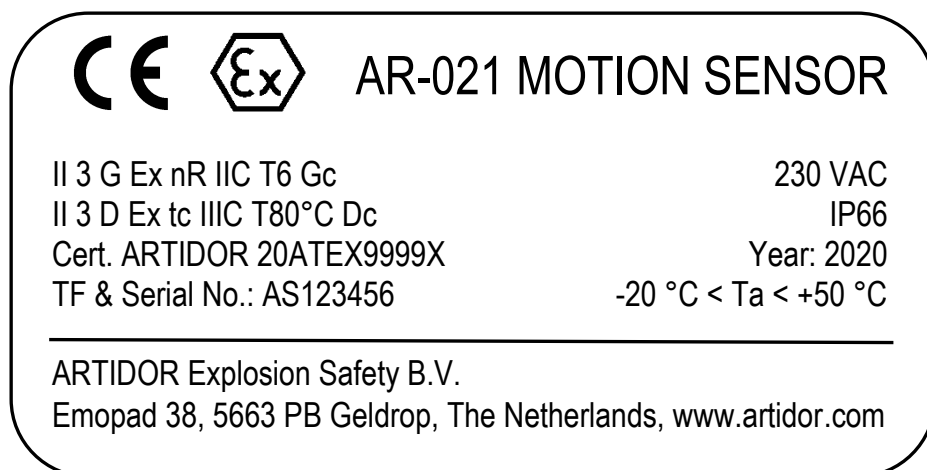
Explosion safety category:	II 3GD
Protection against ignition:	Ex nR IIC T6 Gc, Ex tc IIIC T80°C Dc
Conformity:	European Directive 2014/34/EU (ATEX) and 2014/30/EU (EMC)
Standards applied:	EN 60079-0:2018, EN 60079-15:2010 and EN 60079-31:2014
Sensor:	5.8 GHz radar currents, 1 mW transmission capacity
Range:	1 – 8 m, adjustable
Registration angle:	360° with 140° opening angle
Dimmer setting:	3 – 3,000 Lux
Preset time:	10 seconds - 12 minutes
Supply voltage:	230 VAC, 50 Hz
Output contacts:	1. Switched 230 V AC supply (L', N2) 2. Potential free contact (1, 2)

Contact data for L'-N2 and 1-2

Rated current 250 V AC:	16 A continuous
Rated current 24 V DC:	2 A (for potential free contacts 1, 2)
Breaking capacity max:	4,000 VA
Limited making current:	30 A, 250 V AC (max 4s, duty cycle 10%)
Electrical connection:	Connection terminals 8 x 2.5 mm ²
Material:	Housing: die cast aluminum, RAL 7015, slate gray, polyamide frame with impact resistant safety glass
Entries:	M16 cable gland (2x) suitable for cables from 5 – 9 mm in diameter
Ingress protection level:	IP66 according to EN 60529
Bracket:	Stainless steel 316L mounting bracket, mounting holes Ø6.5 (4x), mutual distance 60 x 60 mm
Ambient temperature:	-20 °C to +50 °C
Housing dimensions:	160 x 80 x 128 mm (incl. mounting bracket)
Weight:	1,340 grams (incl. mounting bracket)

7. Marking and warning on the equipment

The marking label as shown below will be attached to the motion sensor:



8. Installation instructions

- Installation of explosion-safe equipment such as this product must be carried out by personnel specially trained and qualified to do this, following the relevant requirements of the installation standard EN 60079-14.
- For the installation and use of this product the relevant safety regulations and also the generally recognized latest state of the technology apply.
- During assembly, care must be taken that the framework, screws and surface are strong enough to take the weight of the motion sensor.
- Isolate power from the electrical supply cable prior to installation.
- Install the connection cable and make sure that it is protected from mechanical and chemical influences.
- Connect the end of the cable in a proper way to an external connection box and ensure this is done professionally. The connection box is not supplied. Use a connection box that it is suitably protected for the (explosion hazard) classification of the surroundings in which it will be used.
- The motion sensor offers 8 connection terminals:



Power in:		Output:		Potential free contact:	
L	230 VAC phase	L'	230 VAC phase – switched	1	Connection 1
N1	Neutral	N2	Neutral (connected to N1)	2	Connection 2
PE	Earth	PE	Earth		

9. Operating instructions

All regulators and pushbuttons are only accessible when the housing is open. The opened device is not explosion-safe! If an explosion hazard cannot be excluded, undertake adjustments when the device is switched off only. Before switching on the device, close housing correctly!



Mechanical alignment: the detection area is approximately spherical. The range increases with the speed, size and conductivity of the object. The device should aim at approximately half the height of the object (1m for adults) in the required triggering distance.

Initial values for the regulators:

- Range at right stop = min. responsivity (range approx. 1m)
- Switch-off delay at right stop = shortest time (approx. 10s)
- Twilight setting (sun) at left stop = max. brightness (approx. 3.000 Lux), the device works despite daylight
- The green LED must be off during normal operation!

10. Troubleshooting

Switch doesn't switch on:

- Set range is too small, turn regulator to the left
- Twilight setting on Night Services, turn regulator to the left (sun)
- No power supply

Switch switches off directly after connecting power supply:

- This is normal. The motion sensor stabilizes in approx. 45 seconds. During this period of time, the relay will reload and switch off.

Switch doesn't switch off, or switches on again unintentionally:

- Set switch-off delay is too long, turn regulator to the right. Every movement during the switch-off delay starts the delay time again!
- Movements are detected within the range: adjust switch mechanically, reduce range (turn regulator to the right). The switch detects movements even through isolating walls (glass, plastic, wood) e.g. dripping raindrops on the window!

11. Maintenance

For the maintenance of the AR-021 motion sensor the requirements as stated in EN 60079-17 apply. If the motion sensor or the connection cable is no longer in good condition, very dirty or damaged, it must be repaired or cleaned immediately. The power supply to the motion sensor must be switched off and may only be restored after the maintenance has been carried out and approved.

The advised maintenance cycle for this motion sensor depends on its specific use and must therefore be agreed upon with the user for the expected use.

12. Repair

If repairs are carried out in an incompetent manner, the explosion-safety of the motion sensor can no longer be guaranteed. Therefore it is preferred that the motion sensor is returned to the manufacturer for repair.

13. Removal / re-use

The equipment can be completely processed as electronic waste. For processing regarding disposal or reuse of the product and its packaging, national disposal and environmental laws and legislation must be taken into consideration.

EU Declaration of Conformity

We

ARTIDOR Explosion Safety B.V.
Emopad 38, 5663 PB Geldrop, The Netherlands

herewith declare that the
Explosion-safe Motion Sensor type series

AR-021/*

labelled with the distinctive community mark including the code of the
protection degree against ignition and temperature class:

CE  II 3 G Ex nR IIC T6 Gc, II 3 D Ex tc IIIC T80°C Dc

produced under the ARTIDOR Quality Assurance system in accordance with
ISO 9001:2015 and annex VIII of Directive 2014/34/EU

is in conformity with the relevant Union harmonization legislation:

2014/30/EU
Concerning electromagnetic compatibility

2014/34/EU
Concerning equipment and protective systems intended
for use in potentially explosive atmospheres,

and that the following standards regarding explosion safety have been applied:

EN 60079-0:2018
EN 60079-15:2010
EN 60079-31:2014

This declaration of conformity is issued under the sole responsibility of the manufacturer

Geldrop, 1 January 2020

Signed



M. Moolenaar
Managing Director and EX Authorized Person