

Use and maintenance manual for membrane level indicator MN21

PRODUCT IDENTIFICATION

The MN21 is a membrane level indicator. The identification of the device takes place through the appropriate label placed on the side of the casing, the characteristics of which are shown below:

1. Manufacturer information
 2. Product model and reference code for the specific configuration
 3. Serial number and year of production
 4. Ambient and process temperature range
 5. QR code leading to the specific configuration and IP rating
 6. Usage warnings
 7. Markings and certificate numbers
 8. Conformities and certification symbols

Tampering with the label entails the loss of validity of the product certifications.

PRODUCT VARIANTS

MN21	..	..	..	..	Standard: ø180 mm flange with 4 holes ø160, EPDM and stainless steel AISI 316 / EN 1.4401 membrane
	T	..	..	..	Higher activation pressure range
	G	..	..	..	EPDM membrane only
	A	..	..	..	Screws that not protude from the membrane fixing counterflange
		F	..	..	Smaller flange (ø154 mm, 4 holes ø142)
			L	..	Optional led lamp

PRODUCT CHARACTERISTICS

- Casing and cover in die-cast aluminium with flanged connection to process
- Single cable entry: 1/2 Gas, 1/2 NPT, or M20x1,5
- Ambient temperature: -20 ÷ +70°C (-4 ÷ 158°F)
- Process temperature: -20 ÷ +70°C (-4 ÷ 158°F)
- IP protection rating: IP65 (dustproof, protection against water jets)
- Sensitivity: ~15 ÷ 25 mbar (standard), ~200 ÷ 1000 mbar (T models)
- Max contact capacity: 2A at 250V (AC) / 0,02A at 24V (DC)
- Signal output: microswitch SPDT
- Cable size: 0,5 ÷ 2,5 mm² (AWG 14)
- Life cycle: 5 x 10⁶ minimum
- Power consumption: none / 0,05W (models with lamp)
- Means of protection: Class I (PE connected)
- Overvoltage category: II
- Environmental conditions: indoor and outdoor use - altitude up to 6,562 ft (2000 m) - max. relative humidity 80% for temp. up to 31°C (88°F) decreasing linearly to 50% at 40°C (104°F)
- For use in wet location: no
- Pollution degree: 2

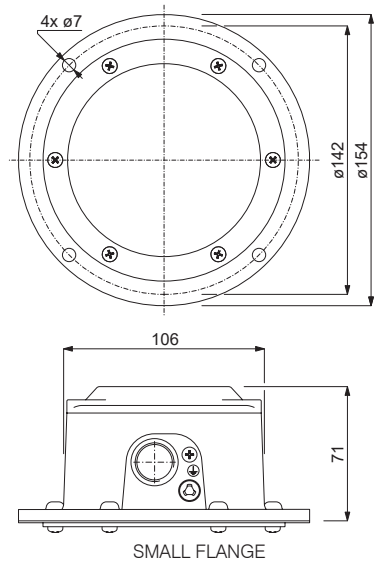
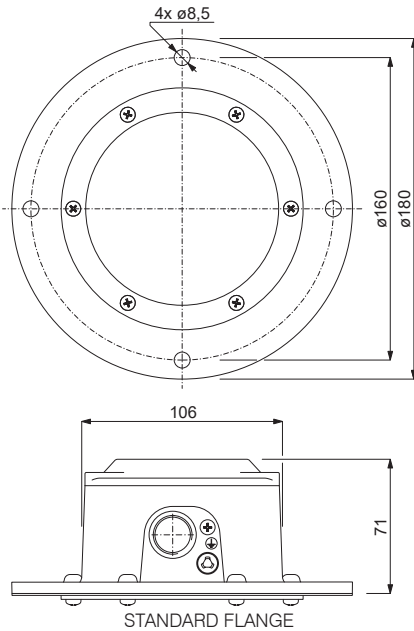
INSTALLATION

The indicator can be mounted in any position, on the wall of the silo or container, by means of a counterflange of dimensions corresponding to the dimensioning of the chosen model. The MN21 is available with two different flanged connections: standard with 4 ø8.5 holes on ø160, or smaller size with 4 ø7 holes on ø142. Seal the cable entry with a cable gland suitable for the working range indicated on the label. Place the cable in a way that it doesn't pull the level indicator.

SAFETY WARNINGS

The installation, maintenance and diagnostics of the device must be carried out only by authorized personnel informed about the regulations in force. Before starting work, specialized personnel must have read and understood the instruction. When using electrically operated equipment, it is necessary to take the appropriate safety precautions, required by the current regulations, to reduce the risk of fire, electric shock, and injury to people.

OVERALL DIMENSIONS



Before installing the device, check its perfect integrity making sure that it has not been damaged during transport.

The removal/replacement/modification of any part of the device entails the loss of validity of the certifications of the product itself. The earthing connection is mandatory and the sole responsibility of the installer. The level indicator must be used within the range of temperatures indicated on the plate.

Learn more about the product and find drawings of each model on our website.



SPECIFIC CONDITION FOR USE OF ATEX / IECEx MODELS

⚠ It is necessary for the operator to refer to this documentation to preserve the protection afforded by the equipment!

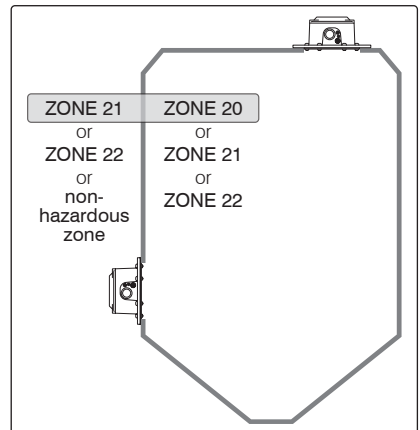
In accordance with Directive 1992/92/EC / DSEAR 2002, it is responsibility of the user to ensure that the equipment, used in areas where explosive atmospheres might be present, is maintained in such a way as to reduce the risk of explosion. The installation must be carried out in compliance with IEC 60079-14 / BS EN 60079-14.

Install the device in compliance with the Ex-zones indicated in the image alongside (wall thickness of containment ≥ 1 mm). Only the connection to process can be installed in zone 20.

Seal the cable entry with a cable gland certified for the tb protection method, in compliance with the Directive 2014/34/EU / S.I. 2016 No. 1107, able to guarantee a minimum ingress protection (IP) of 65.

The device is not explosion-proof when the casing is open. Close the cover minding the correct orientation. After installing, check that you have completely tightened the cover screws and that you have properly tightened the cable gland, before starting the device. Avoid the onset of electrostatic charges on plastic parts (do not dry rub).

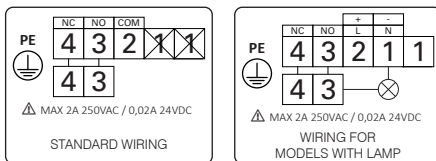
The maximum surface temperature is calculated taking into account a safety margin, but without considering a possible dust deposit on the equipment. During installation, use and maintenance, any electrostatic charging should be avoided, for example by: protection from direct air flow, cleaning with wet clothes, earthing connection of the housing perfectly grounded.



ELECTRICAL CONNECTION

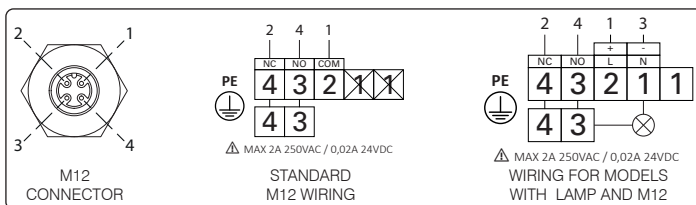
On the device there are two terminals for the protective earth connection, marked by the relative symbols (IEC 60417 / BS EN 60417-1): one inside the casing and one outside, in proximity of the cable entry. The entire connection of the device must take place while the device is de-energized. The earthing connection, by means of an M5x8 screw and a notched stainless-steel washer, must take place before any other connection is established. The cross-sectional area of the protective earth (PE) conductor must be the same as that of the phase conductor (S), with a maximum of 16mm².

Connect both earthing terminals to the ground. Protect the cables with an overload protection element (rated current $\leq 2A$). A disconnect switch must be present near the device, to cut off power supply in the event of fault.



⚠ Utilize cables suitable for use up to 90°C.

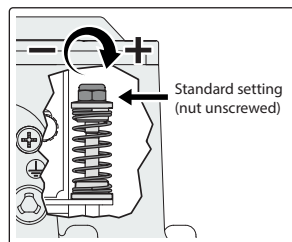
The indicator can be supplied with an M12 circular connector for a quick and safe electrical connection. The connector will be mounted on the cable entry with a M20x1,5 or G 1/2 thread and wired to the circuit in accordance to the diagrams shown below. **ATTENTION!** Do not separate the connector when powered.



SENSITIVITY ADJUSTMENT

The sensitivity of the instrument can be adjusted by means of the self-locking nut shown in the image alongside. Screwing the nut increases the compression of the spring and consequently the resistance of the membrane to the material to be detected, increasing the pressure necessary to trigger the microswitch. Conversely, unscrewing reduces the compression of the spring and decreases the pressure needed to trigger the microswitch.

- The standard setting, with the nut fully unscrewed, corresponds to an activation pressure of 15 mbar (T models = 200 mbar).
- Every two turns (clockwise) of the nut correspond to an increase of 1,25 mbar (T models = 100 mbar).
- Fully tightened the activation pressure is 25 mbar (T models = 1000 mbar).
- The return hysteresis value is 4 mbar (T models = 50 mbar).



MAINTENANCE

Maintenance must be carried out in compliance with IEC 60079-17 / BS EN 60079-17 standards. CAMLogic level indicators need no routine maintenance, however it is advisable to carry out the following check: at each opening of the cover or removal of the instrument, visually check the sealing gaskets present. Replace the EPDM membrane on the connection process every 72 months. In case there is evidence of damage or excessive tearing of the gaskets on the cover or other parts of the device, contact the manufacturer CAMLogic for the replacement with suitable materials. The diameter of the cable must correspond to the tightening range indicated by the cable gland used.

REPAIRS

The MN21 level sensor can only be repaired by the manufacturer CAMLogic or following instructions from the manufacturer. In case of doubts concerning malfunctions or repairs, contact the manufacturer: CAMLogic S.r.l. - Via dell'Industria 12-12/A - 42025 Cavriago - Italy. Repairs must be carried out in compliance with IEC 60079-19 / BS EN IEC 60079-19 standards.

WARRANTY



CAMLogic, in addition to the terms of the supply contract, guarantees its products for a period of twenty-four (24) months from the date of shipment. This warranty is expressed only in the repair or replacement free of charge of parts that, after careful examination by the manufacturer, turn out to be defective. Warranty, excluding all liability for direct or indirect damage, is considered to be restricted to only defects in materials and has no effect if the parts returned turn out to have been anyhow dismantled, tampered with or repaired by anyone other than the manufacturer.

Warranty likewise excludes damage deriving from negligence, carelessness, bad or improper use of the level gauge, or from bad handling by the operator and faulty installation. Warranty is moreover forfeit if non-genuine spare parts have been used. A returned level indicator, even if under warranty, must be shipped carriage free.

Ex MARKING DETAILS

Standard MN21 models and T models have ATEX and IECEx certification for Zone 20/21.

Models with the optional lamp, as well as A & G models, will have ATEX certification for Zone 22 instead.

	II	1/2	D	Ex	ta/tb	IIIC	T85°C	IP65	Da/Db	ATEX MARKING for dusts, Zone 20/21 (standard & T models)
	II	3	D	Ex	tc	IIIB	T85°C	IP65	Dc	ATEX MARKING for dusts, Zone 22 (A & G models)
				Ex	ta/tb	IIIC	T85°C		Da/Db	IECEx MARKING for dusts, Zone 20/21 (standard & T models)
										European Community marking for equipment intended for use in areas at risk of explosion.
										Group II equipment intended for use in surface industry.
										Category: 1 suitable for use in areas classified as Zone 20 2 suitable for use in areas classified as Zone 21 3 suitable for use in areas classified as Zone 22 A double category refers to the inside/outside parts of the process.
										Combustible dusts ; combustible substance present in the installation area and in the internal volume.
										Ex symbol.
										Protection method Ex t - protection against ignition of combustible dusts. ta = very high level of protection tb = high level of protection tc = augmented level of protection
										Dust types: IIIC (conductive dusts) or IIIB (non-conductive dusts)
										Temperature class (max. surface temperature reached by the device)
										IP65 (Ingress Protection) - 6 = dust-tight, no dust ingress; 5 = protected against water jets, limited ingress protection.
										EPL (Equipment Protection Level): level of protection of the equipment. Da = very high level of protection Db = high level of protection Dc = augmented level of protection