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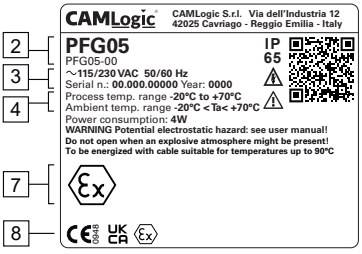
COSTRUZIONI MECCANICHE ELETTRICHE

Operating and maintenance instructions for rotary level indicators PFG05 & PFG57

PRODUCT IDENTIFICATION

The **PFG05** and **PFG57** series instruments are rotary level indicators for granular solids.
The device is identified by the label on the side of the case, the characteristics of which are given 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 and power consumption
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 certifications.

PRODUCT CHARACTERISTICS

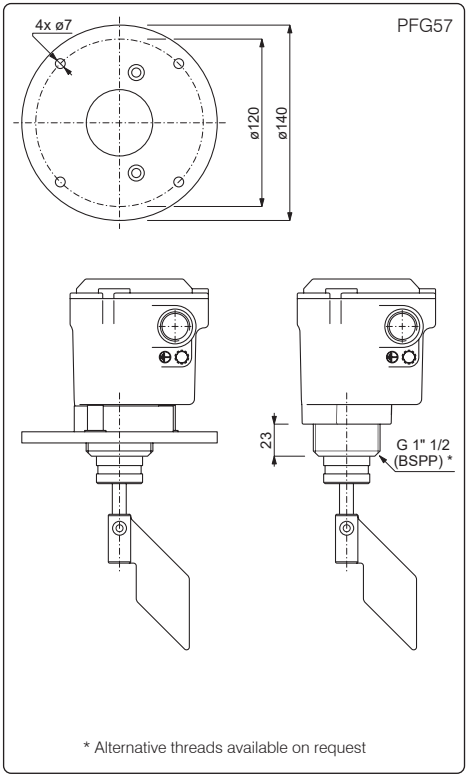
	PFG05	PFG57
Materials:	casing and cover in die-cast aluminium, shaft in AISI 303 / EN 1.4305 stainless-steel	
Connection to process:	G 2" 1/2 (BSPP)	G 1" 1/2 (BSPP)
Cable entry:	2x M20x1,5 (1/2 G or 1/2 NPT on request)	1x M20x1,5 (1/2 G or 1/2 NPT on request)
Power supply voltages:	115/230 and 24/48 VAC 50/60 Hz or 24 VDC	
Power consumption:	4W / 11W with the optional for low temperatures	
Cable size:	0,5 ÷ 2,5 mm² (14 AWG)	
Contacts capacity:	10A 250VAC / 0,5A 24VDC	0,1A 250VAC / 24VDC
Signal output:	SPDT	
Life cycle:	5 x10 ^ 5 minimum	
Process temperature:	-20 ÷ +70°C (-4 ÷ 158°F) - **standard** and **X** models -20 ÷ +200°C (-4 ÷ 392°F) - **AT** models -20 ÷ +200 / 400 / 600°C (-4 ÷ 392 / 752 / 1112°F) - **ATFV** models **(PFG05 only)**	
Ambient temperature:	-20 ÷ +70°C (-4 ÷ 158°F) for all models -40 ÷ +70°C (-40 ÷ 158°F) with the optional for low temperatures	
Max process pressure:	0,8 ÷ 5 bar (11,6 ÷72,5 psi) for non-certified products 0,8 ÷ 1,1 bar (11,6 ÷15,9 psi) for **ATEX** or **IECEx** certified products	
Protection rating:	IP 65 (dust-tight, protection against water jets)	
Rotation speed:	1 turn / minute	
Means of protection:	class I (PE connected) - overvoltage category II	
Environmental condition:	indoor and outdoor use, altitude up to 2000 m (6.562 ft), max. relative humidity 80% for temp. up to 31°C (88°F) decreasing linearly to 50% at 40°C (104°F), pollution degree 2	

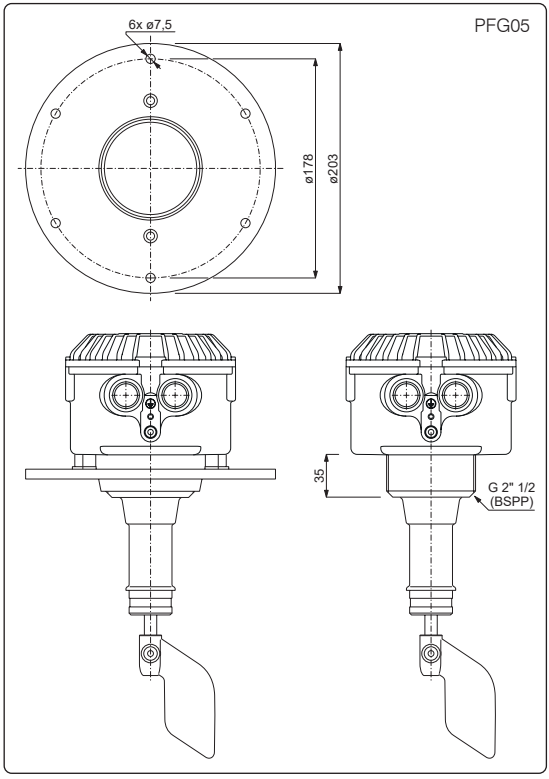
INSTALLATION

The device can be installed in any position. In case of an horizontal or tilted installation, mount the device with the cable entrance on the right side for PFG05 models, or lower side for PFG57 models. The coupling of the instrument with the wall of the container can be either threaded or flanged; images on page 2 show the standard couplings. Always refer to the technical drawings supplied by the Manufacturer together with this manual.
Protect the device from falling material or excessive weight, using protective deflectors. For cable entries, 1 (one) or 2 (two) M20x1,5 are available. Seal the cable entries with cable glands or sealing caps suitable for the operating range shown on label. The protective caps supplied with the device are only for protection during transport and storage, they are not suitable for the use of the instrument and it is responsibility of the installer to replace them.
The diameter of the power supply cable must correspond to the tightening range indicated by the cable gland used.

ELECTRICAL CONNECTION

The entire connection of the device must take place while the device is de-energized. The earthing connection, with the supplied M5x8 screw and notched stainless-steel washer, must take place before any other connection is established.
One terminal for the protective earth connection is outside the casing, near the cable entry, and another is inside. Both are marked by the PE symbol (IEC 60417 / EN 60417-1). 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.



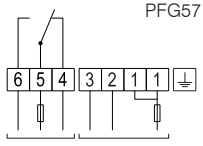


Before putting the device into service, make sure that the power supply voltage corresponds to the voltage indicated on the plate. Protect the power and signal carrying cables with an overload protection element (rated current ≤ 10A). In models with screw terminals, remove a maximum of 5 mm of insulation from the electrical cable.
A disconnect switch must be present near the device, to cut off power supply in the event of a fault, in an easy to reach position and marked as the disconnecting device of the equipment. Use cables that are suitable for use up to 90°C and that are rated at least 300V.The wiring diagram is located inside the lid.

	115/230 AC	24/48 AC	24 DC
1	Neutral	Neutral	±24V
2	115V	24V	±24V
3	230V	48V	unused

4	Normally closed
5	Common
6	Normally open

PFG57

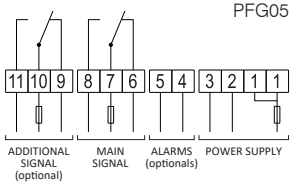


Overload protection elements:
POWER: Fuse gG 1A 250V
SIGNAL: Fuse gG 2A 250V

	115/230 AC	24/48 AC	24 DC
1	Neutral	Neutral	±24V
2	115V	24V	±24V
3	230V	48V	unused

4	Rotation control (V = contact 1)
5	Voltage control (V = contact 7)
6	Normally closed
7	Common
8	Normally open
9	Normally closed
10	Common
11	Normally open

PFG05



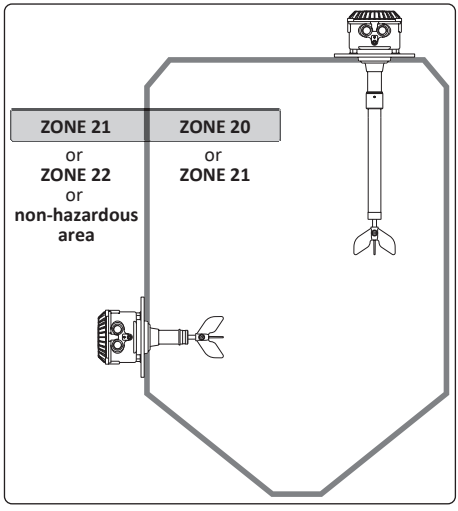
Overload protection elements:
POWER: Fuse gG 1A 250V
SIGNAL: Fuse gG 2A 250V

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 instructions. When using electrically operated equipment, it is necessary to take the appropriate safety precautions, required by current regulations, to reduce the risk of fire, electric shock, and injury to people.
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.
Level indicators must be used within the range of ambient temperatures indicated on the plate. The models with the optional for low temperatures are suitable for use in temperatures up to -40°C, thanks to the internal self-regulating heater, which guarantees a service temperature inside the casing, necessary to its proper operation. When an internal temperature of 20°C is reached, the heater switches off autonomously.

SPECIFIC CONDITION FOR INSTALLATION IN EXPLOSIVE ATMOSPHERES

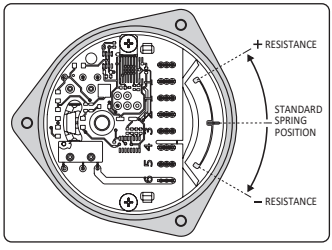
⚠ It is necessary for the operator to refer to this document to preserve the protection afforded by the equipment!



In accordance with Directive 1992/92/EC / DSEAR 2002, it is responsibility of the user to ensure that the equipment, used in areas where an explosive atmosphere might be present, is maintained in such a way as to reduce the risk of explosion. Installation must be carried out in compliance with IEC 60079-14 / EN 60079-14 standard.
Install the device in compliance with the Ex-zones (all parts can be installed in zone 21; only the mechanical part - paddle, shaft, support - below the connection to process can be installed in zone 20).
Seal the cable entries with cable glands or sealing caps certified in compliance with the Directive 2014/34/EU / S.I. 2016 No. 1107 for the tb protection method, provided with a gasket for the interface with the device casing, able to guarantee a minimum ingress protection (IP) of 65. The plastic protective caps supplied with the level indicator are not suitable for use in explosive atmospheres and it is responsibility of the installer to replace them.
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 tightened the cable glands and any sealing caps correctly, before starting the device. Avoid the onset of electrostatic charges on plastic parts (do not rub dry). With models for high temperature applications **PFG*AT**, use cables suitable for temperatures ≥ 100°C. For all **PFG57** versions, the equipment should be installed in such a way that the risk of mechanical danger is low (the aluminium case must be protected against impact.
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.

SENSITIVITY ADJUSTMENT FOR PFG57 MODELS

The sensitivity of the instrument is adjustable thanks to the spring, which can be moved to increase or decrease the resistance to the material. The standard setting is with the spring in the middle position. Increased resistance increases the force required to stop the paddle rotating, improving its functionality with sticky or heavy materials. Conversely, positioning the spring to decrease resistance increases sensitivity and makes the instrument more suitable for light materials.



MAINTENANCE

Maintenance must be carried out in compliance with IEC 60079-17 / EN 60079-17 standards. CAMLogic level indicators need no routine maintenance, however it is advisable to carry out the following checks: at each opening of the cover or removal of the instrument, visually check the sealing gaskets present.
Always turn off the power before opening the instrument cover. 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 screws on the cover must be fully tightened and the cable glands and/or sealing caps must be properly tightened; make sure that the power and grounding terminals are correctly connected and in good condition.

REPAIRS

The level sensors series PFG05 and PFG57 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 (RE) - Italy (camlogic@camlogic.it - www.camlogic.it).
In any case, the repairs must be carried out in compliance with IEC 60079-19 / 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

All PFG05 and PFG57 models have **ATEX** and **IECEx** certifications for Zone 20/21.
However, when the optional led lamp is selected, models can only come with **ATEX** certification for Zone 22 instead.

Ex	II	1/2	D	Ex	ta/tb	IIIC	T*°C	IP65	Da/Db	**ATEX** MARKING for dusts, Zone 20/21
Ex	II	3	D	Ex	tc	IIIB	T*°C	IP65	Dc	**ATEX** MARKING for dusts, Zone 22 (certification for **L** models)
				Ex	ta/tb	IIIC	T*°C		Da/Db	**IECEx** MARKING for dusts, Zone 20/21
										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) **T85°C** for **standard** and **X** models - **T200°C** for **AT** and **ATFV** models
										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

PFG05 PFG57

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

Symbol	Reference	Description
⎓	IEC 60417-5031 (2002-10)	Direct current
~	IEC 60417-5032 (2002-10)	Alternating current
⏚	IEC 60417-5019 (2006-08)	Protective earth / protective ground
⚡	IEC 60417-6042 (2010-11)	Caution: risk of electric shock
⚠	ISO 7000-0434B (2004-01)	Caution: if the instrument is used in a manner not specified by the manufacturer, the protection offered by the equipment may be impaired.

Please note: *the printed version of this manual may not reflect the most recent changes.*
Please always refer to the updated digital version available on the official CAMLogic website: www.camlogic.it