

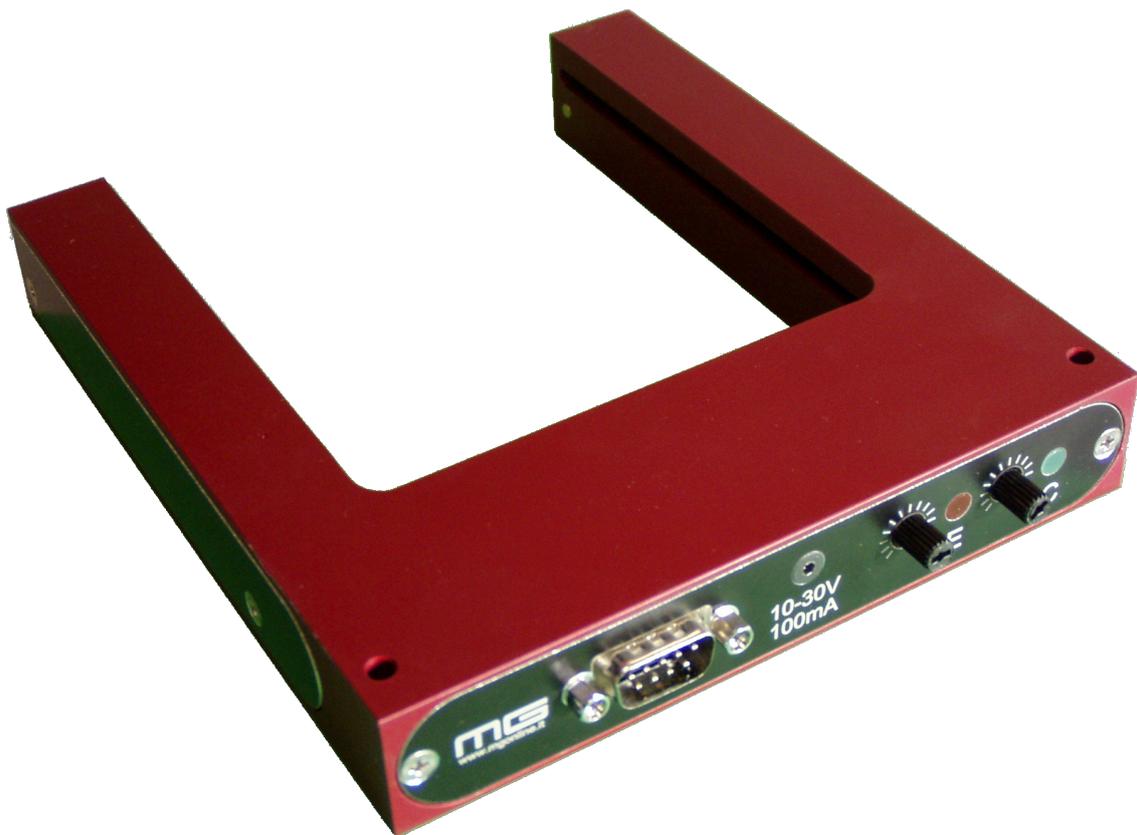
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Draft 1 05/07/2021



CPO_{RED 1}

INSTRUCTIONS FOR USE



1 - INTRODUCTION

The CPO optical counting sensor is a detection tool which, thanks to its sensitivity and adjustment characteristics, is the answer to all counting problems for objects in any material or shape, both free falling and forced.

It also offers the opportunity not to count objects in sizes under those desired, such as machining waste for example, which could accidentally cross the reading area.

2 – WARNINGS



- **ATTENTION:** for correct use of the equipment, it is essential to comply with the instructions in this manual. You are advised to read each part of it carefully before start-up, to prevent possible damage due to improper actions.
- The equipment **MUST NEVER** be used as a detection device to protect people.
- Do not use the equipment in environments with a dangerous atmosphere (flammable or explosive).
- Only use in enclosed environments not subject to water sprays.
- Avoid fumes or mist passing through the reading area, which could cause false readings or detection loss.
- The power supply must comply with the operating voltage planned and it is preferred not to share such supply with motors, relays or solenoids whose activation could reduce sensitivity or cause false detections.
- Connect the body of the sensor to the ground, using the best support to reject external electrical disturbance.
- Avoid sunlight or stroboscopic flashes directly striking the equipment.

3 – ELECTRICAL CHARACTERISTICS

Voltage supply	10-30Vdc, o 12Vac
Current supply	100mA typical 30mA
Outputs	PNP o NPN max 24Vdc 100mA
Outputs protection	Overvoltage and overcurrent
Signal delay	< 1mS
Signal duration	> 15mS < 1Sec. (other than sensor block signal)
Max. count	100pz/Sec.
Errors	Signalled on output and with optical indication

4 – MECHANICAL CHARACTERISTICS

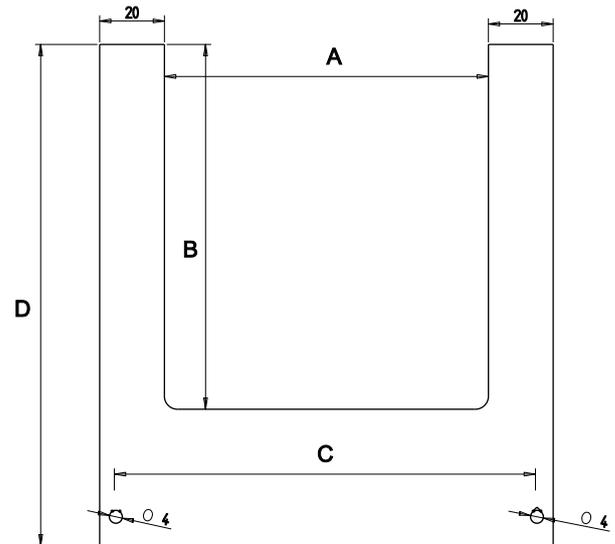
- Dimensions in mm. of versions available:

AREA	A	B	C	D
100x100	100	100	130	156
150x100	150	100	180	156
150x150	150	150	180	206
200x100	200	100	230	156
200x200	200	200	230	256

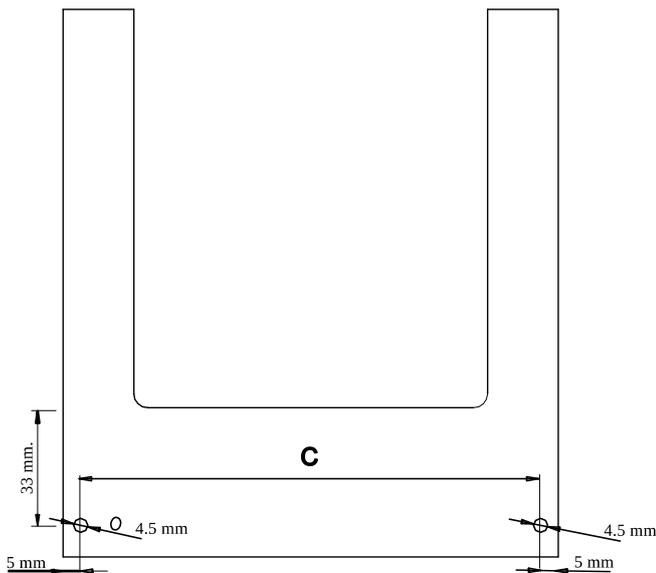
-Thickness:24mm.

-Material: Anodised aluminium

-Level of protection IP53



5 – INSTALLATION



Fasten to a stable support using the two, 4.5 mm holes prepared so the pieces to signal, on falling, pass through the active reading area.

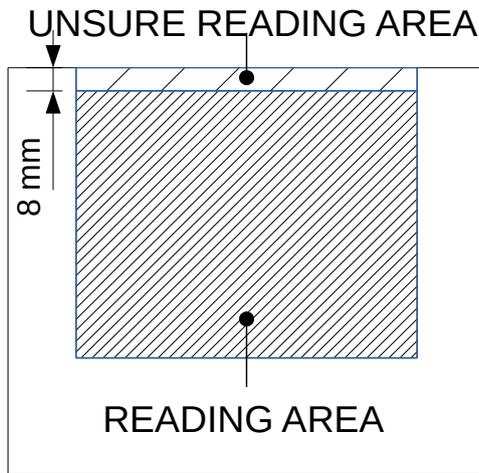
The CPO can also work in the presence of small vibrations produced by surrounding equipment; you should remember that these vibrations should have an intensity normally supportable by an electronic control. If vibrations are more intense, you are advised to use specific dampening supports.

The counting scale can work in any position; assembly that is not horizontal promotes fine dust gathering on the reading glass, thereby damaging count efficiency.

Avoid positioning the equipment in the direction of very intense light sources (direct sunlight or very powerful lamps), even if it can automatically adapt to environmental light variations.

Remember the sensitivity of the peripheral zone of the reading area cannot be considered

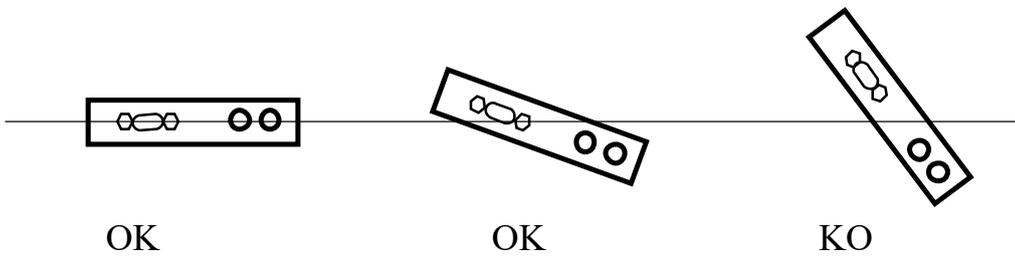
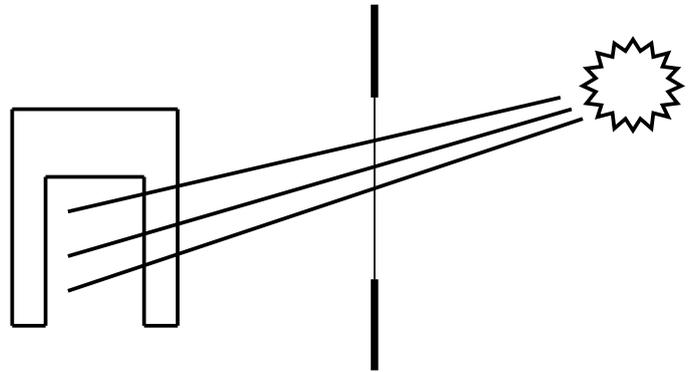
uniform; you are therefore advised, particularly in the presence of small parts to count, to always use the central part of the area.



- At the end of installation, check the pieces to count always fall by crossing the reading area.

- To avoid malfunctions, avoid installation under direct sunlight or stroboscopic lights.

- Do not install too tilted to avoid dust build-up on the reading glass.



7 - Electrical connections

Connect the connector and fasten it with the relevant screws.

If possible, connect the support to an electrical ground.

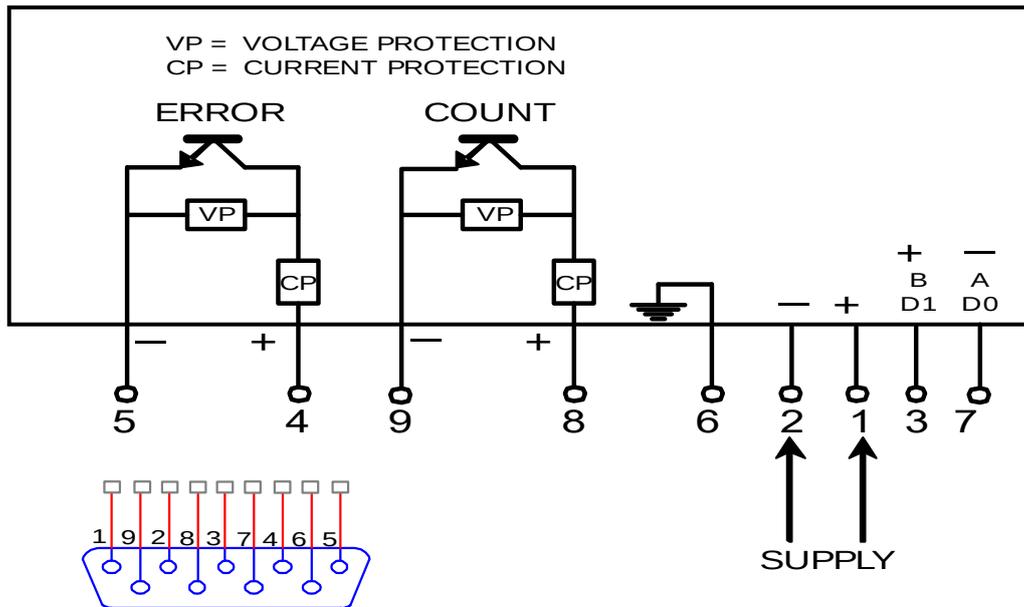
The power supply should be connected on pins 1 and 2 which should be between 10 and 30V direct or between 12 and 18 V alternating. You are advised to use a "clean" power supply, i.e. a line where there are no relays or motors or solenoid valves assembled nearby without anti-disturbance filters.

Pins 8 and 9 host the passage signalling output (Clock), which is opto-insulated. It can be used as a PNP or NPN signal. This output can pilot a maximum load of 100mA at a maximum voltage of 24Vdc.

Pins 4 and 5 host the equipment functions block output (Error), each with the same electrical characteristics.

Pins 3 and 7 can be connected to a EIA/TIA 485 communication interface that allows the device to be controlled remotely. Refer to the appropriate manual for instructions on how to use this interface.

Pin 6 can be connected to a ground wire to increase resistance to electrical disturbances of the equipment. The sleeve of a shielded cable must not be used for this connection.



8 – CPO use

Once powered and having waited a few seconds to enable the CPO to optimise reading, the equipment starts to work and signals on output C and with the green light switching on each passage of an object in the reading field.

The CPO can, within certain limits distinguish objects that pass through the reading field and therefore avoid the count of undesired objects such as work waste.

Knob E considerably adjusts detection of small objects. Maximum sensitivity is obtained by adjusting the knob completely in an anti-clockwise direction. Turning the knob clockwise reduces sensitivity to detection of small objects.

Knob C adjusts the speed with which objects are detected. Maximum speed is obtained with the knob completely turned anti-clockwise. Turn the knob clockwise to reduce the detection speed, i.e. this requires the object occupying the reading field for a greater time to be detected.

Example: The vertically falling pens must be counted, but the caps that came off should not be counted.

In this case, the crossing surface, being the vertical pens, is narrow and is equal if not lower than that of the caps and therefore the sensitivity necessary to detect the pens is

similar to that for cap detection. However, the pens are much longer than the caps and therefore take more time to cross the reading field. Thanks to detection speed adjustment, you can avoid the caps being counted.

If an object is blocked inside the reading zone, or the dirt blocks the lens, or the faults prevent the CPO from working properly, the error output and the red led activate by signalling the problem to the counting and control equipment and the system administrator. This information and settings can also be read and modified remotely via the EIA/TIA485 interface, allowing recipes to be stored for counting objects with different sizes. The remote configuration is stored in the CPO. If needed, it is possible to delete the configuration data remotely or by turning both the sensitivity and speed potentiometers fully clockwise.

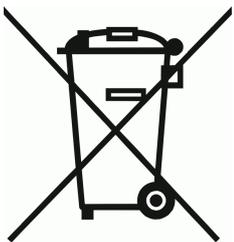
9 – Configuration

The communication and operation parameters are recorded inside the CPO, their modification (if necessary) can be done directly through the external programming keyboard (optional) or from a control device through the EIA/TIA 485 interface. Refer to the appropriate manual for the use of the CPO with remote control for instructions on available programming.

10 – Maintenance

The only maintenance required is periodic cleaning of the reading glass with a soft brush to prevent dust build-up. If the glass gets dirty with greasy or oily residue, it can be cleaned with a damp cloth with some dry degreaser, among those that don't leave residue. Never use contact cleaning spray or oily products for cleaning.

10 – Disposal



Never dispose of as domestic waste, but process it as industrial waste.

10 – Warranty

M.G. srl guarantees its product, identified via a manufacturing code or by a brand name, is free of material and manufacturing defects which would mean it does not conform to the technical specifications indicated, and is committed for 12 months, starting from delivery date, to repairing or replacing the faulty part, component, equipment or part of it free of charge, returned to the manufacturer, unless the fault or malfunction is due to:

- a) poor installation, even if conducted by qualified staff;
- b) improper use of the product, due to lack of expertise, negligence or non-compliance with the operating instructions;
- c) lack of or poor maintenance, even if carried out by qualified staff;
- d) repairs or changes made by the purchaser on his own initiative;
- e) irregular voltage conveyance of the power lines, insufficient capacity and/or abnormal electrical installations;
- f) abrasive or corrosive action of the physical or chemical agents;
- g) poor or non-operation of the software or hardware or loss of data, registered by the purchaser, following storms, lightening, high temperatures or variation of electrical voltage, earthquakes, fires, etc.

The warranty also excludes all parts subject to normal wear, for which replacement is planned as ordinary maintenance.

In all cases in which the warranty remains excluded, as above given for example purposes, no compensation is due from M.G. srl for any damage caused to the purchaser and/or third parties due to use or poor operation of the product or for the period during which the system should remain inactive, as a result of faults and/or repairs, even if within the terms of warranty.

No indemnity will however be recognized for the purchaser or third parties for consequences deriving from no or improper functioning of the software and/or hardware, herein including direct and indirect damage.

For repairs or replacement, this part, component, equipment or part of it, must be sent/delivered to the manufacturer's plant on receipt of written authorization from M.G. srl and will not involve renewal of the period of warrant for the entire device, but only the relevant part.

The manufacturer reserves the right to make changes, at any time, to the equipment built and/or sold without being in any way obliged to make the same changes to the equipment previously built and/or sold.

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This manual contains confidential information. All rights reserved.

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