FIAMA since 1913

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QUALITY SYSTEM
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USER'S MANUAL AND MAINTENANCE

MICROPROCESSOR DIGITAL TACHOMETER "CG4_"

Manual purpose
This manual has been designed by the Manufacturer to provide the necessary information regarding the instrument to those who are authorized to carry out safely its installation, maintenance, dismantling and disposal. All the necessary information for the buyers and planners can be found in the Sales catalogue. Other than adopting good technical construction methods, the information should be read carefullyand strictly applied. Inobservance of this information could cause risks for the health and safety of people and economical damage. This information, provided by the Manufacturer in the original language(Italian) is also available in other languages to satisfy legislative and/or commercial needs. This manual must be kept in a good condition by a responsible person in an ideal place so that it is always available for consultation. In case this manual is lost or deteriorates, a replacement should be requested directly from the manufacturer quoting the manual's code. This manual reflects the state of skill of the instrument at the time of input on the market: however the manufacturer reserves the right to make changes, add or improve the manual without giving any reason to hold the present manual inadequate.

Identification of the equipment
The identification plate represented is applied to the instrument.
To find the identification code of the instrument, consult the sales catalogue.

Environmental conditions
Temperature setting: min. 0°C, max. + 50°C.
It is forbidden to use the instrument other than its specific use and in potentially explosive conditions or where anti-explo-sive elements are used.

Storage
Here below are some references to be followed for the storage of the instrument.
Avoid environments with excessive humidity and those exposed to bad weather (avoid open areas). Avoid putting the instrument directly on the ground. Store the instrument in its original packing.

Conformity declaration and CEE marking
The instrument answers to the following Communitarian Directives:
2014/30/EU Electromagnetic compatibility, 2014/35/EU Low voltage, 2011/65/EU RoHS.

Maintenance
Turn off the power before touching the internal parts.
Clean the external plastic parts using a soft, damp cloth with ethylic alcohol or water. Do not use hydrocarbon solvents (petrols, diluants, etc.): using these products could affect the proper mechanical functioning of the instrument.
Reparations should be done only and exclusively at the FIAMA technical assistance centre.

Calibrations and tests
It is advisable to calibrate the instrument periodically, once every working year.
To do the calibration, follow the calibration procedure indicated in the present manual .

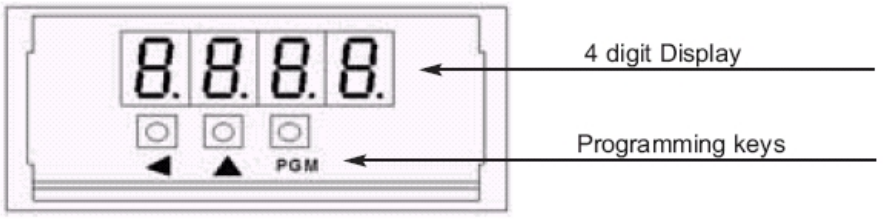
Assistance request procedure
For any kind of technical assistance request, contact the sales department of the Manufacturer directly indicating the information given on the identification plate, the number of hours used and the type of defect.

Manufacturer's responsibility
The manufacturer declines any responsibility in case of :
• Using the instrument contrary to the national safety and accident-prevention laws.
• Wrong installation, inobservance or wrong procedures of the instructions provided in the present manual.
• Defective electrical power supply.
• Modifications or tamperings.
• Operations carried out by untrained or unqualified staff.
The safety of the instrument also depends on the strict observance of the procedures indicated in the manual: always operate the instument in its functioning capacity and carry out a careful routine maintenance.
• All phases of inspection and maintenance should be done by qualified staff.
• The configurations provided in the manual are the only ones permitted.
• Do not try to use them anyway contrary to the indications provided.
• The instructions in this manual do not substitute but accomplish the obligations of the current legislation regarding the safety laws.

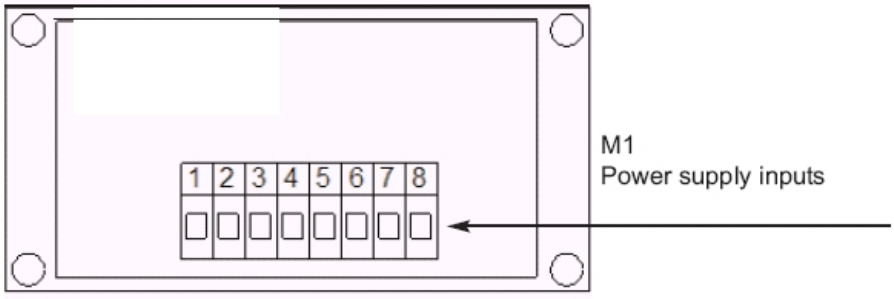
Description

The CG4_ instrument is a microprocessor programmable tachometer with a 4-digit display that processes signals supplied by sensors with a frequency output such as encoder, proximity, namur, pick-up, etc.
The Programming of the microprocessor, which is done by means of the keyboard behind the front panel, allows the setting of every parameter, which controls the operation of the tachometer.
The type of input sensor can be selected from the keyboard from: NPN, PNP, namur, pick-up and clean contact.
The broad range of input frequencies (0.01Hz, 10KHz) the operating mode as a frequency meter or period meter, make the CG4 a complete tachometer suitable for many applications.
Other features of the instrument comprise the possibility of setting the position of the decimal point and the availability of an anti-bouncing software filter for input from mechanical contacts.
Data maintenance with the machine switched off is ensured by non-volatile EEPROM.
The instrument's reading scale can be set in rpm, meters/minute, with the possibility of it operating as a frequencymeter.
The instrument is made in a panel container 48x96 to DIN 43700 standards

Frontal sight without panel



Sight from behind



Installation

Before installing the instrument, read the following warnings:
a) Connect the instrument strictly following the instructions of the manual.
b) Carry out the connections using the correct wires within the limits of the tension and power supply as indicated in the technical data.
c) The instrument does not have an ON/OFF switch, hence it comes on when connected to the power supply. For safety reasons, the equipment connected permanently to the power supply requires a bi-phasal selector switch which should be within easy reach of the operator.
d) If the instrument is connected to any apparatus not isolated electrically, carry out an earth connection to avoid it being connected directly through the structure of the machine.
d) It is the responsibility of the user to check, before using , the correct settings of the parameters of the instrument to avoid damage to persons or things.
e) The instrument cannot function in a dangerous environment (inflammable or explosive). It can be connected to elements that operate in the same atmosphere only through appropriate interfaces, according to the current safety regulations.
g) Avoid dust, humidity, corrosive gases, heat sources.

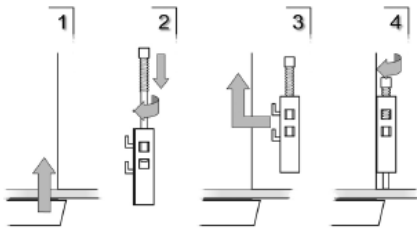
Power supply

a) Before connecting the instrument, check that the the power supply tension is within the permitted limits and that it corresponds to the one indicated on the tag.
b) Carry out the electrical connections with the instrument disconnected.
c) For the power line to instruments and sensors, a power supply line separate from that of the power is required : it is necessary to use an isolating transformer.
d) The power line should provide a device that separates the set fuses of the instruments and should not be used to regulate relays, contactors, etc.
e) If the network tension is very disordered (eg. from the change-over of the power units, motors, inverters, welders, etc.), use the appropriate filters of the network.
f) If an earth connection is needed, ensure that the plant has a good earth system: tension between neutral and earth <1V and the resistance <6 Ohm.

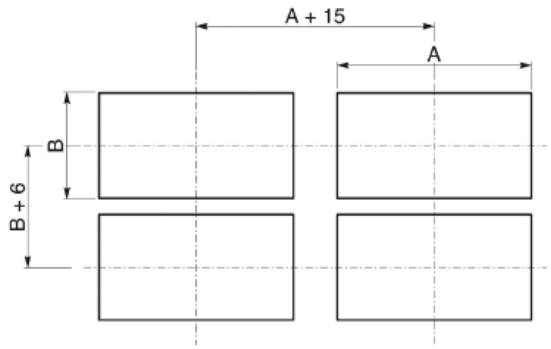
Connections entries and exits
a) Physically separate the entry wires from those of the power supply, the exits, and the power connections; use twined and shielded wires with the display connected to the earth only at one point.
b) Connect the exits of adjustments, alarms (meters, electrovalves, motors, ventilators, etc.) assembling units RC (resistance and condenser in series) parallel to the charged inductives that work alternatively.

Assembly of the instrument
To carry out the correct installation of the instrument, it is necessary to follow the shown procedure:

1. Insert the instrument in the opening provided.
2. Screw the screw on the fixing block.
3. Hook the block to the instrument through the joints.
4. Block the instrument by screwing the screws of the two blocks.
5. Then carry out the electrical connections.



To assemble several instruments placed side by side, it is necessary to follow the interaxes as shown in the design.The articles A and B can be read under space dimensions found in the present manual.



Programming

In order to start your programming by means of the keyboard, remove the frontal panel using a screwdriver with a flat blade (insert the screwdriver between the panel and the instrument).

Here you are the keys, that have to be employed in order to programme the parameters .

PGM	it allows the programming of the instrument and confirms the data, which have already been inserted
▲	it is employed to go from a constant to the other, or to increase the digit which is being modified
◄	it is employed to leave the programming and to go from a digit to the following one

The input to the programming phase takes place by pushing the key **PGM**: the instrument shows the necessity of a password, and "000" - whose first digit blinks - is visualised on the display.

Programme the number **273**. Through the key ▲ the blinking digit is increased; through the digit ◄ the blinking digit is shifted to the left side.

At the end of the input, confirm the operation by **PGM**. On the display you can see InP that represents the first parameter of the configuration menu: if the inserted password is wrong, the input to the programming phase is refused, and the instrument goes back to the working phase.

If you push the digit ▲ you can see the following programming constants:

InP	type of sensor input (PNP, NPN, NAMUR, mechanical contact, PICK-UP)
n.dEC.	decimal point position
nodE	read out mode (revolution-counter, meter-counter, frequencymeter)
SEt1	not employed in the CG4
HIS1	not employed in the CG4
SEt2	not employed in the CG4
HIS2	not employed in the CG4
t.out	time out value
dEL	not employed in the CG4
End	end of program marker

If you push the digit **PGM** you will activate the modification of the visualized constant

If you push this digit ◄ you will leave the programming phase.

By means of ▲ key choose the constant you want to programme, and push "**PGM"** in order to modify it.

- **Type of sensor input** InP

By means of ▲ key choose the kind of sensor connected with the instrument among the following ones:

nPn	NPN open collector
PnP	PNP open collector
nAMu	NAMUR sensor (2 wires)
CONt	mechanical contact
PIC	Pick-up sensor

- **Decimal point position** n.dEC.

Move the decimal point towards the position you need by ▲ key.

- **Programming of the read-out mode** nodE

By means of the ▲ key choose the kind of read-out you need among the following ones:

rPM

Revolutions / Minute: push **PGM** , n.tAC appears and it represents the number of the reference for a revolution, push **PGM,** and set the number of the references fitted to the rotating shaft by means of the keys ▲ and ◀ ; confirm it by **PGM.**

mtMI

Meters / Minute: push **PGM** and roLL. appears as circumference of the roller, push **PGM**, set the development in millimeters of the roller, wheel or shaft (whose peripheral speed is measured in mt/min) by ▲ and ◀ and confirm by **PGM**.
Push ▲ and n.tAC is visualised (which is the reference number for a revolution), push **PGM** and set the reference number fitted to the shaft by these following keys ▲ and ◀ , confirm it by **PGM**.

FrEq.

Frequencymeter: employ this kind of read out in order to get the read out ratio you need, this is to say that a certain value of the display has to correspond to a frequency of the input.

Push **PGM** , and VAL. appears as the value to be read on the display, push **PGM**, and programme the read-out which has to be visualized on the display by the keys ▲ and ◀, confirm it by **PGM**.
Push ▲ and COSt. appears, push **PGM** and programme the value of the frequency, which is expressed in Hertz, which has to correspond to the read -out previously introduced.

Example:
1) Supposing you want to visualize the value 720 on the display with an input-frequency of 12 Hertz then programme VAL=720 and COST=12.

2)Supposing you want to read 15 with a frequency of 1,23 Hertz then programme VAL=1500 and COST=123 in order to consider the decimal part of the frequency in input.

- **Threshold for relay 1** SEt1

Not employed in the CG4

- **Hysteresis for threshold 1** HIS1

Not employed in the CG4

- **Threshold for relay 2** SEt2

Not employed in the CG4

- **Hysteresis for threshold 2** HIS2

Not employed in the CG4

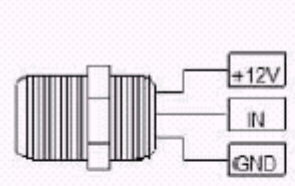
- **Time-Out programming** t.Out

The Time-OUT represents the time in seconds, after which the instrument is resetted, if no other impulses arrive at the input.
N.B.: Its programming value must be always higher than the smallest time interval between two following impulses. If this process does not follow the previous description, the instrument will always visualize “zero “ The time-out value “ 0 “ is not allowed; if your maximum frequencies are higher than 200Hz don’t forget to programme a value, which has to be higher than 1.

- **Power on delay for activation relay** dEL

Not employed in the CG4

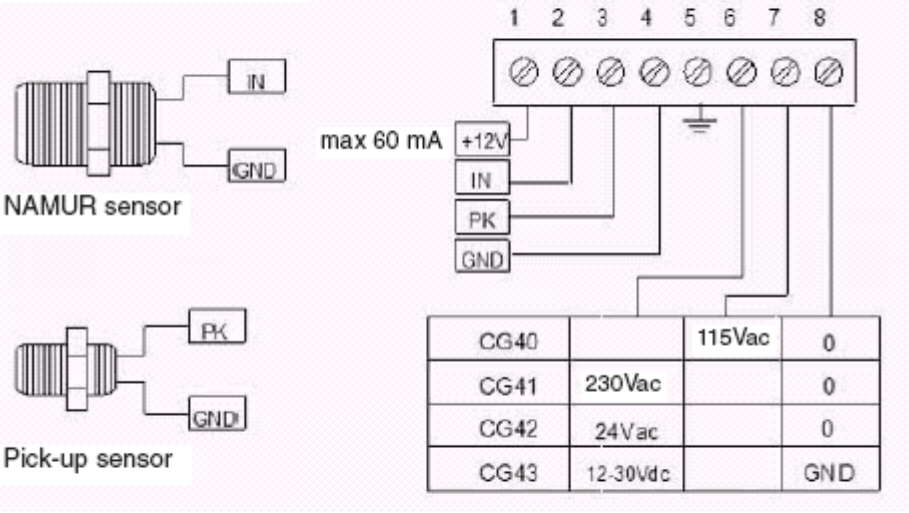
Wiring Diagram



Amplified sensor NPN, PNP, PUSH-PULL

NAMUR sensor

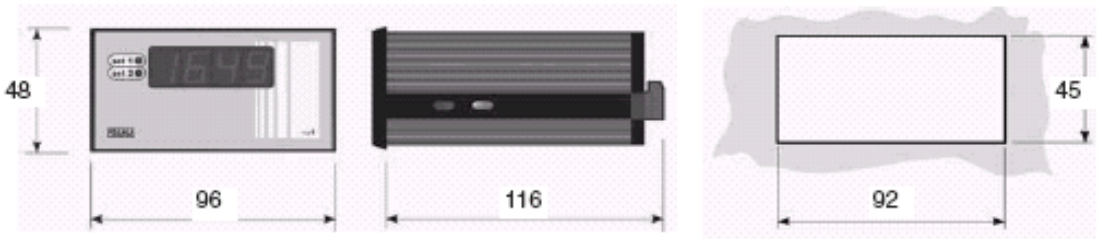
Pick-up sensor



CG40		115Vac	0
CG41	230Vac		0
CG42	24Vac		0
CG43	12-30Vdc		GND

Mechanical contact

Overall dimensions



Technical features

Power supply	115Vac, 230Vac, 24Vac, 12÷25Vdc ±10%
Mains frequency	50/60 Hz
Absorbed power	3VA
Display	4 digits
Input type	Opto-insulated
Sensor power supply	12Vdc (max 60mA)
Sensor input	Open collector NPN, PNP Push-Pull Namur Pick-up mechanical contact
Input frequency	0.01Hz - 10 KHz
Memorization of work parameter	EEPROM
Use temperature	0-50 °C
Relative humidity	35-85%
Self-extinguishible shock-resistant box	DIN 43700
Size (with terminal box)	48x96x120 mm
Drilling template	45x92 mm
Degree of front protection of the box	IP54
Electromagnetic compatibility	2014/30/EU
Low voltage	2014/35/EU
RoHS	2011/65/EU

Manufacturer
All communications to the manufacturer should be addressed to:
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FIAMA srl is not responsible for any damage to persons or things caused by tamperings and wrong use and in any case that are not consistent with the features of the instrument.