

PANEL FOR CONTROL AND PROTECTION OF IRRIGATION MOTOR PUMPSET

TYPE CEM-840

TYPE CEM-842

INTRODUCTION AND USER MANUAL



MADE TO :

PROTECT

motor pump sets by stopping them in the event of :

- insufficient oil pressure
- over-temperature
- belt breakage
- minimum fuel level
- air filter clogging
- low coolant level
- insufficient water pump pressure

DISPLAY

on the panel the functions of :

- hour-counter
- tachometer
- water pump pressure gauge
- timer
- fuel level gauge
- pump protection exclusion
- battery and oil lights
- protections intervention
- periodic maintenance request
- emergency stop

Assembly on the machine and in the open air.

Suitable for stopping both with solenoid valve and with electromagnet, for engines fitted with charge alternator, both with pre-excitation and with permanent magnets.

**BY SIMPLY STARTING, IT AUTOMATICALLY CONTROLS THE MOTOR PUMP.
ALL THE OTHER FUNCTIONS ARE EASY TO USE WITH JUST THREE PUSH-BUTTONS.**

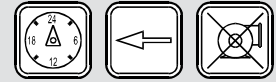
PARMA



ITALY

BRIEF INSTRUCTIONS

AFTER STARTING, (THE ENGINE PUMP PROTECTS ITSELF AUTOMATICALLY) IT IS POSSIBLE TO ACCESS THE OTHER FUNCTIONS BY SIMPLY USING JUST THREE PUSH-BUTTONS.



ACCUMULATED OPERATION HOURS ARE DISPLAYED

ENGINE PUMP OPERATING SPEED IS DISPLAYED

THE FUEL LEVEL IS DISPLAYED

DISPLAY

STOP FOR END OF WORK TIME

PRESS IF YOU WANT TO SET WORKING TIME (UP TO 24 HOURS)

TIMER IS DISPLAYED (IF SET)

PERIODIC MAINTENANCE REQUEST

EMERGENCY STOP

INSUFFICIENT ENGINE OIL PRESSURE

THE BATTERY IS NOT CHARGING

INDICATES PUMP WATER PRESSURE

STOPPAGE DUE TO LOW LEVEL OF COOLING LIQUID

STOPPAGE DUE TO LACK OF BATTERY CHARGING (BROKEN BELT)

STOPPAGE DUE TO HIGH ENGINE TEMPERATURE

STOPPAGE IN PROGRESS

CONTROLS MINIMUM PUMP WATER PRESSURE

PRESS TO SELECT THE DISPLAYED FUNCTION, EACH TIME IT IS PRESSED, THE INSTRUMENT INDICATED BY THE DISPLAY CHANGES.

PRESS UNTIL THE 2 SIGNS START FLASHING TO EXCLUDE PUMP PROTECTION. TO RE-ACTIVATE PROTECTION, PRESS AGAIN UNTIL THEY SWITCH OFF.

PUMP PROTECTION EXCLUDED

PUMP PROTECTION ACTIVE

THE WATER PUMP PRESSURE IS REGULAR

STOPPAGE DUE TO LOW PUMP WATER PRESSURE

ENGINE PROTECTIONS ARE ACTIVE

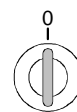
STOPPAGE DUE TO LOW FUEL LEVEL

STOP FOR INSUFFICIENT ENGINE OIL PRESSURE

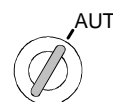
STOP OR ONLY ALARM FOR AIR FILTER CLOGGING

AUT.
-AVV.

ENGINE PUMP START



OFF
MANUAL STOP
RESET



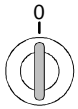
AUT.
UNIT POWER SUPPLY
LIGHTS CHECK



AVV.
ENGINE PUMP START

OPERATION

START KEY



- OFF
- MANUAL STOP
- RESTORE PROTECTIONS, CANCEL PUMP PROTECTION EXCLUSION AND TIMER, DEACTIVATE INSTRUMENTS.



AUT.

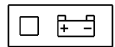
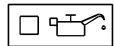
- UNIT POWER SUPPLY
- TURNS ALL THE LIGHTS ON FOR 2 SECONDS (EFFICIENCY CHECK)



AVV.


- ENGINE PUMP START

OIL AND BATTERY INDICATOR LIGHTS





Lit up with key on "AUT", they switch off with the engine running and regular oil pressure and battery charger system.

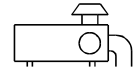
ENGINE PROTECTION

The engine protections are enabled when the ENGINE PROTECTION ACTIVE light  comes on (about 20 seconds after the end of starting impulse and however 1 minute after positioning the key on "AUT"). Intervention of the protection probes (fitted on the engine), indicated by the relevant lights, stops the engine, it is memorised and can be split into two groups:

immediate for :

- OIL PRESSURE SWITCH 
- HIGH TEMPERATURE SWITCH 

- AIR FILTER SWITCH

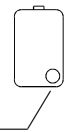


- BATTERY CHARGER ALTERNATOR (ALTERNATOR BELT BREAKAGE)



- FUEL LEVEL SWITCH

- Fuel reserve flashing signal 20% (T) (WITHOUT ENGINE STOP)
- Signal always on: stop for minimum fuel level (WITH ENGINE STOP) (W)





- PROBE FOR COOLANT LEVEL



RESET : is obtained by turning the starter key onto "ZERO"

PUMP PROTECTION

Pump protection is enabled when the PUMP PROTECTION ACTIVE  light comes on (after 1 consecutive minute of sufficient water pressure, indicated by the PUMP PRESSURE REGULAR LIGHT  and however 10 minutes after starting the engine pump).

The intervention of the protection (5 seconds after the decrease of the pressure detected by the PUMP WATER PRESSURE SWITCH on the panel) stops the engine, it is memorised and is indicated by the INSUFFICIENT PUMP WATER PRESSURE LIGHT (See PUMP WATER PRESSURE SWITCH ADJUSTMENT on page 5)



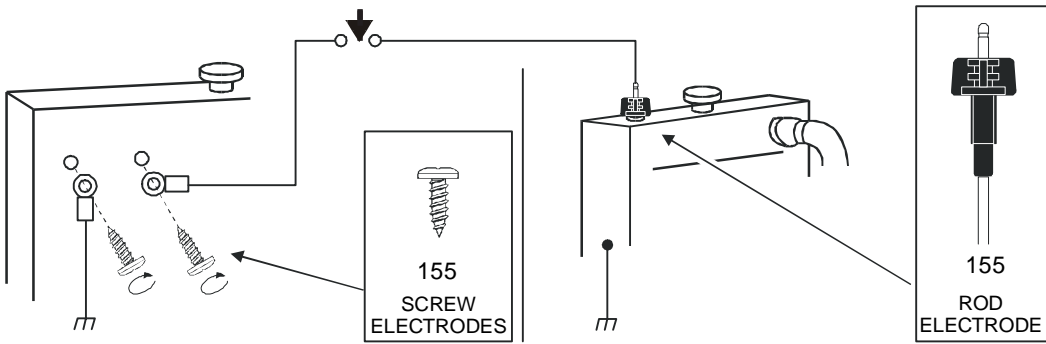
RESET : by turning the starter key onto "ZERO".

OPERATION

COOLANT LEVEL PROBE

FOR RADIATORS WITH PLASTIC EXPANSION TANKS

FOR RADIATORS WITH METAL EXPANSION TANKS



WARNING

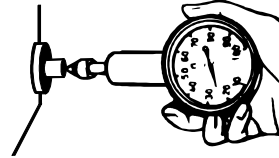
IF THE FUNCTION
• **LOW COOLING LIQUID LEVEL**
IS NOT USED:
CONNECT YELLOW/
ORANGE WIRE
TO EARTH



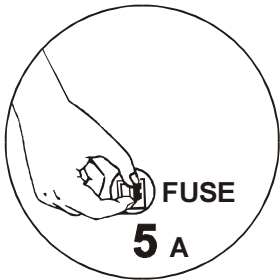
REPLACING FUSES

TACHOMETER ADJUSTMENT

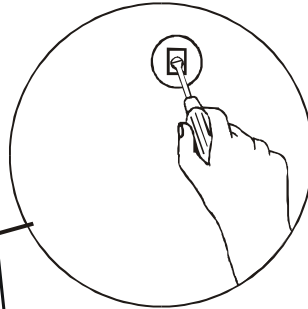
Run the engine at a constant and known rpm value (for example by means of a portable revolution counter).



Press the push-button to select the TACHOMETER instrument. The display must show a number other than zero (otherwise do not make any adjustment but check the system carefully).



Then turn the potentiometer (20 rpm maximum) inside the panel, clockwise until the display gives the right indication. (If the indication does not vary during adjustment, check system carefully.)

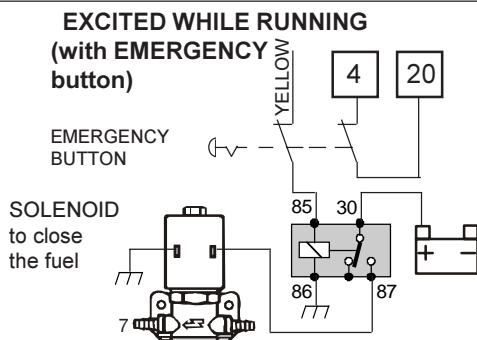
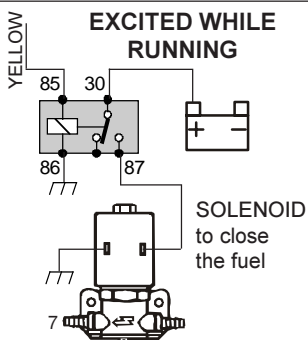


TO REPLACE THE FUSES AND ADJUST THE TACHOMETER, REMOVE THE COVER FROM THE CENTRALIZED CONTROL PANEL AND LOOSEN THE SCREWS AT THE SIDES

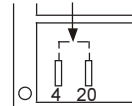
The unit has been designed to control stopping with an **ELECTROMAGNET**

STOP SYSTEM SET UP
To stop with the **SOLENOID VALVE** cut and insulate the **BLUE/BROWN** lead

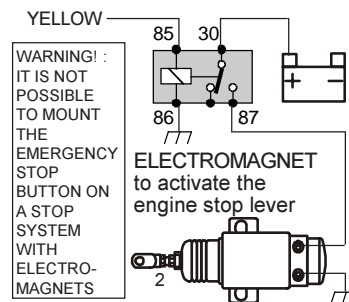
STOP SYSTEMS



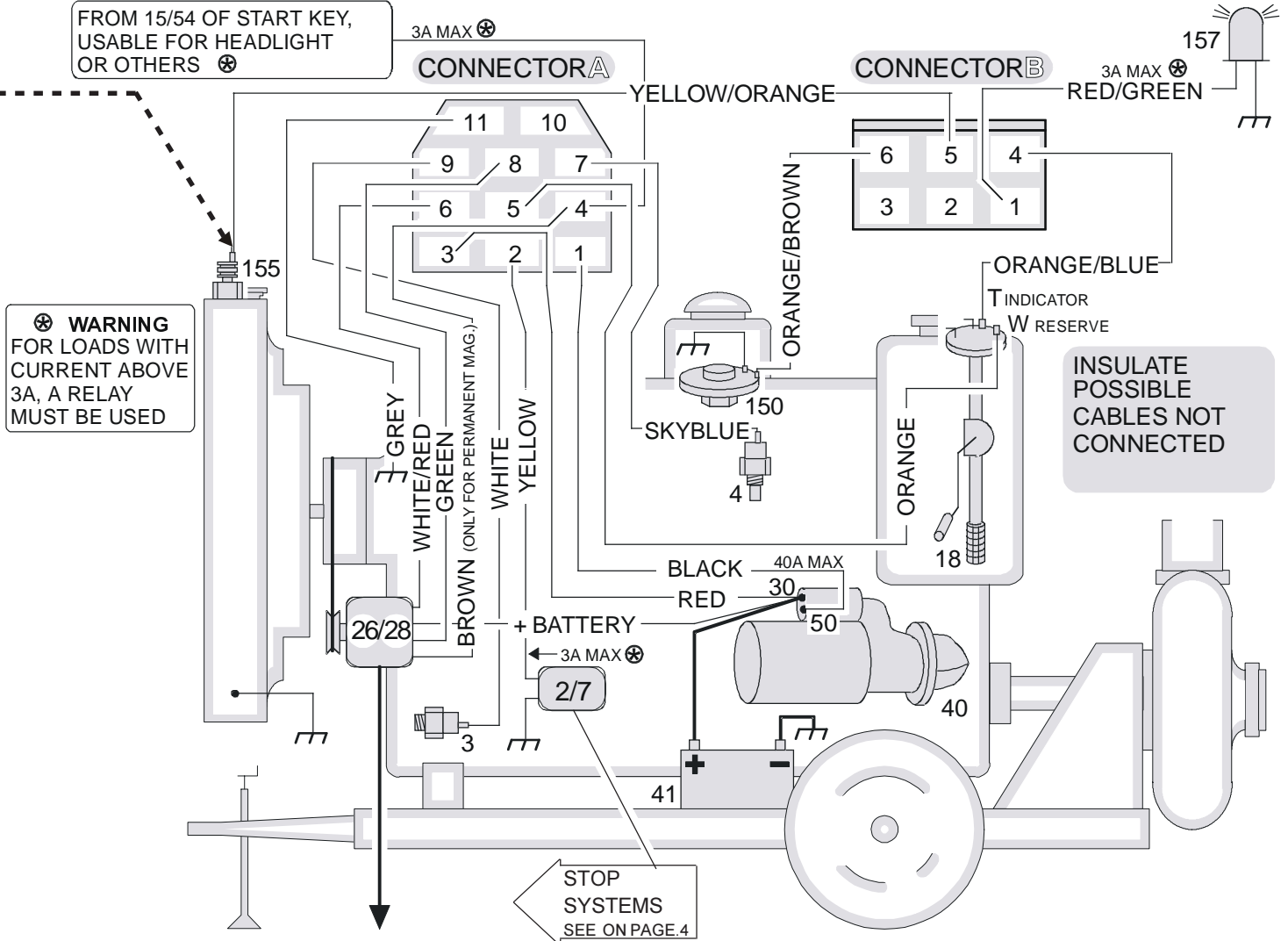
WHEN THE EMERGENCY BUTTON IS MOUNTED REMOVE THE 4-20 BRIDGE (LOCATED INSIDE THE PANEL)



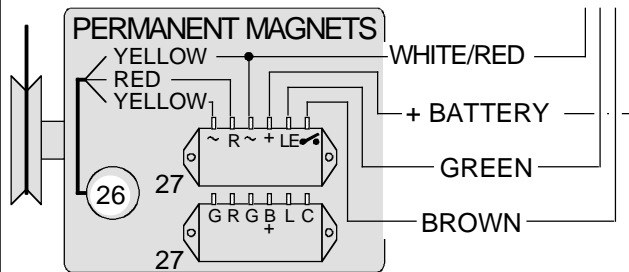
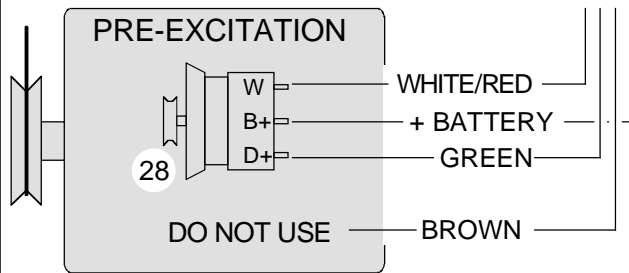
EXCITED IN STOP MODE



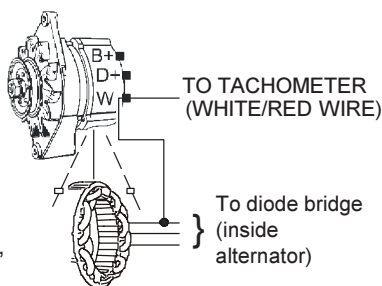
WIRING DIAGRAM



CHARGE BATTERY ALTERNATOR:



CONNECTION SYSTEM FOR EXTRACTING THE W TERMINAL IN PRE-EXCITATION BATTERY CHARGE ALTERNATORS. (BOSCH, MARELLI, LUCAS, ECC...)



ACCESSORIES AVAILABLE ON REQUEST

- (2/7) ELECTROMAGNET OR SOLENOID VALVE ⊕
- (3) OIL PRESSURE SWITCH
- (4) THERMOSTAT
- (18) FUEL FLOAT FOR INDICATOR AND RESERVE
- (155) COOLANT LEVEL PROBE

- (26) PERMANENT MAGNETS CHARGE ALTERNATOR
- (27) ALTERNATOR CHARGE BATTERY REGULATOR
- (28) PRE-EXCITATION CHARGE ALTERNATOR
- (40) STARTING MOTOR
- (41) BATTERY
- (157) GENERAL ALARM LIGHT ⊕
- (150) AIR FILTER CLOGGING SWITCH

WATER PUMP PRESSURE SWITCH REGULATION

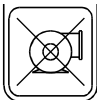
Turn the knob to a value two bar less than the pressure indicated by the pressure gauge. It is not necessary to adjust the pressure switch again if the working pressure remains constant.

OPERATION

PUMP PROTECTION EXCLUSION

The push-button

- exclusion is indicated by



excludes pump protection:

obtained by keeping it pressed for at least 3 consecutive seconds; the function is the two intermittent lights



- this exclusion is cancelled by pressing the push-button again or by turning the starter key onto "ZERO".

STOPPING THE ENGINE PUMP


The unit shut down the engine in four conditions:

- turning the starter key onto "ZERO"
- protection intervention
- timer intervention at the end of the work period
- for external emergency intervention.


The unit adapts to two different stop system (during which the STOP light  is activated):

- by working the ELECTROMAGNET for 20 seconds which pulls the STOP lever
- by cutting off power to the SOLENOID VALVE shutting off the flow of fuel.

EMERGENCY STOP

It can be obtained in all functioning conditions, mounting one or more release-type buttons. It is indicated by the visual signal .

INSTRUMENT SELECTION


The centralized control panel comprises three instruments (indicated by the relevant arrow-shaped visual signals), WHICH CAN BE SELECTED IN SEQUENCE BY PRESSING the button .

Each time it is pressed IT SHOWS the next instrument.

WHEN THE TIMER IS set the duration of the display of the instruments is limited to 30 seconds from the activating of the button; the TIMER then reappears.

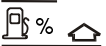
INSTRUMENTS



HOURCOUNTER - Total hours of operation. With the engine running the signal  pulsates to indicate the correct functioning of the HOUR-COUNTER).




TACHOMETER - Speed of engine pump



INDICATOR - Fuel level percentage

TIMER


Enabled with the key on "AUT" it makes it possible, if necessary, to have the engine pump work for an adjustable length of time (24 hours maximum) , at the end of which it stops and the WORK TIME OVER sign  lights up.

The work time is set by pressing the TIMING push button  (lights up ) until the desired value appears on the DISPLAY .

On releasing the push-button, the timer automatically starts working, continuously displaying the remaining work time.

CORRECTING OF THE SET TIME

To ZERO the set time there are two methods:

- keep the TIMING push-button pressed until it reaches zero;
- keep the TIMING push-button pressed and at the same time press the INSTRUMENT SELECTION push-button .

To INCREASE the set time:

- press the TIMING push-button.

To DECREASE the set time:

- zero the time (see above)
- set the desired value once more, pressing the TIMING button again.

CANCELLING THE TIMER

This is done in two ways :

- by zeroing (see above) the set time (the engine pump does not have to be stopped).
- by turning the starter key onto "ZERO" (the engine pump will stop).

PERIODIC MAINTENANCE

When it is necessary to perform the periodic maintenance operations, the visual signal  lights up.

The times for maintenance operations and the reset procedure (time for maintenance) can be accessed by the engine pump manufacturer.

Surveys a close-couple diesel pump while operating, commanding stopping if there are anomalies in the parts controlled by the probes.

Designed to be installed also on board the machine.

NOTICES



Warning: adhere closely to the following advice

- Always install under other equipment which produces or spreads heat.
- Always follow the Wiring Diagram on page 4-5 when making connections.
- Check that the line loading and the consumption of the connected equipment are compatible with the technical characteristics on page 8.
- All technical interventions must be performed with the engine stationary and terminal 50 of the starter motor disconnected.
- Never use a battery charger for the emergency start-up, this could damage the equipment.
- To protect the safety of persons and the equipment, before connecting an external battery charger, disconnect the electrical plant terminals from the battery poles.
- Do not detach the battery terminals with the close coupled pump running.

THIS CONTROL PANEL IS NOT SUITABLE FOR OPERATING IN THE FOLLOWING CONDITIONS:

- Where the environmental temperature is outside the limits indicated in the Technical Data on page 8.
- Where there are high levels or heat from radiation caused by the sun, ovens or the like.
- Where there is the risk of fire or explosions.
- Where the device can receive strong vibrations or knocks.

ELECTROMAGNETIC COMPATIBILITY

This control panel functions correctly only if inserted in plants which conform with the CE marking standards; it meets the exemption requirements of the standard EN50082-1, but it cannot be excluded that malfunctions could occur in extreme cases due to particular situations.

The installer has the task of checking that the disturbance levels are within the requirements off the standards.

CONDUCTION AND MAINTENANCE

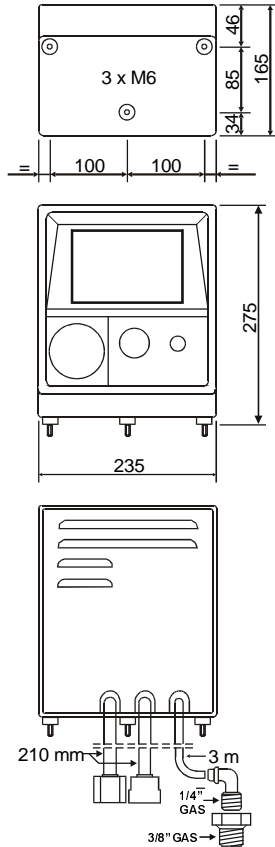
The following maintenance operations should be performed every week:

- check the functions of the signals;
- check the condition of the batteries;
- check the condition of the connectors and that they are tight.

UNLESS WE MAKE A WRITTEN DECLARATION STATING THE CONTRARY, THIS CONTROL PANEL IS NOT SUITABLE FOR USE AS A CRITICAL COMPONENT IN EQUIPMENT OR PLANTS RESPONSIBLE FOR KEEPING PERSONS OR OTHER LIVING BEINGS ALIVE.

**YOUR ELECTRICAL TECHNICIAN CAN ASK US ANYTHING ABOUT
THIS CONTROL PANEL BY TELEPHONING ONE OF OUR TECHNICIANS**

DIMENSIONS



TECHNICAL DATA

- BATTERY VOLTAGE SUPPLY	12 or 24 V
- MAX CURRENT YELLOW OUTPUT (STOPPING)	3 A
- MAX CURRENT RED/GREEN OUTPUT (GENERAL ALARM)	3 A
- MAX CURRENT BLACK OUTPUT (STARTING)	40 A
- MAX CURRENT BROWN OUTPUT (AUXILIARY)	3 A
- TEMPERATURE RANGE	-10 ÷ +60 °C
- HOUR-COUNTER	4 DIGITS
- TACHOMETER	4000 rpm
- TIMER	1' ÷ 24 h
- WATER PUMP PRESSURE GAUGE	20 bar CEM-840 10 bar CEM-842
- WATER PUMP PRESSURE SWITCH	4 ÷ 14 bar CEM-840 2 ÷ 5 bar CEM-842
- WATER PUMP PRESSURE SWITCH DIFFERENTIAL	1 bar
- MAX. WATER PUMP PRESSURE	21 bar CEM-840 7 bar CEM-842
- DEGREE OF PROTECTION BOX/CONNECTOR	IP23/IP21
- PANEL WEIGHT	3100 g
- TOTAL WEIGHT (PANEL + ACCESSORIES + PACKAGE)	4400 g

ORDERING DATA

TYPE	CODE
CEM-840 12V	21.08.31
CEM-842 12V	21.08.35
CEM-840 24V	21.08.32
CEM-842 24V	21.08.36

ACCESSORIES KIT

- PRE - WIRED FEMALE CONNECTOR CEM-540-840	CODE 80.43.84
- ELBOW GTN 6x8x1/4" GAS	CODE 19.01.11
- NIPPLE F1/4"GAS-M3/8"GAS	CODE 19.02.41

CONFORMITY DECLARATION



The company Elcos s.r.l. assumes full responsibility for declaring that the equipment:

type **CEM-840**
CEM-842

used in the ways and for the purposes described in the instruction and user manual is in conformity with the directive:

- 89/336/CEE concerning electromagnetic compatibility
modified by the directive 93/68/CEE

because it is built and functions in accordance with the harmonized Standards EN 50081-1, EN 50082-1, EN 60529.

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