

ENGINE CONTROL AND PROTECTION DEVICE

TYPE DIP-061

INSTRUCTION AND USER MANUAL



MADE TO :

PROTECTING
with stoppage or alarm indication
only in case of anomaly for:

- insufficient oil pressure
- over-temperature
- belt breakage
- minimum fuel level
- air filter clogging
- cooling liquid low level
- over speed
- under speed

DISPLAYING
the following functions
on the dashboard:

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

Mounting also on the machine.

Suitable for stopping both with solenoid valve and with electromagnet, for engines equipped with charge alternators, both with pre-excitation and with permanent magnet.

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

PARMA

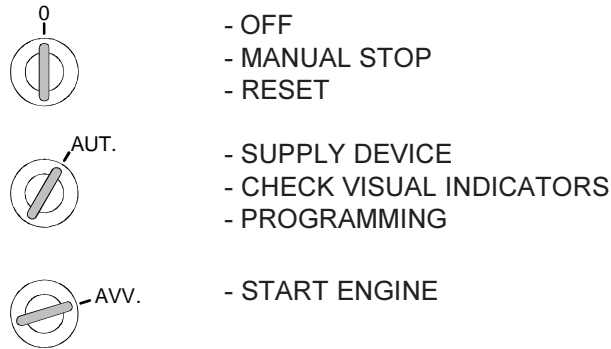


ELCOS[®]

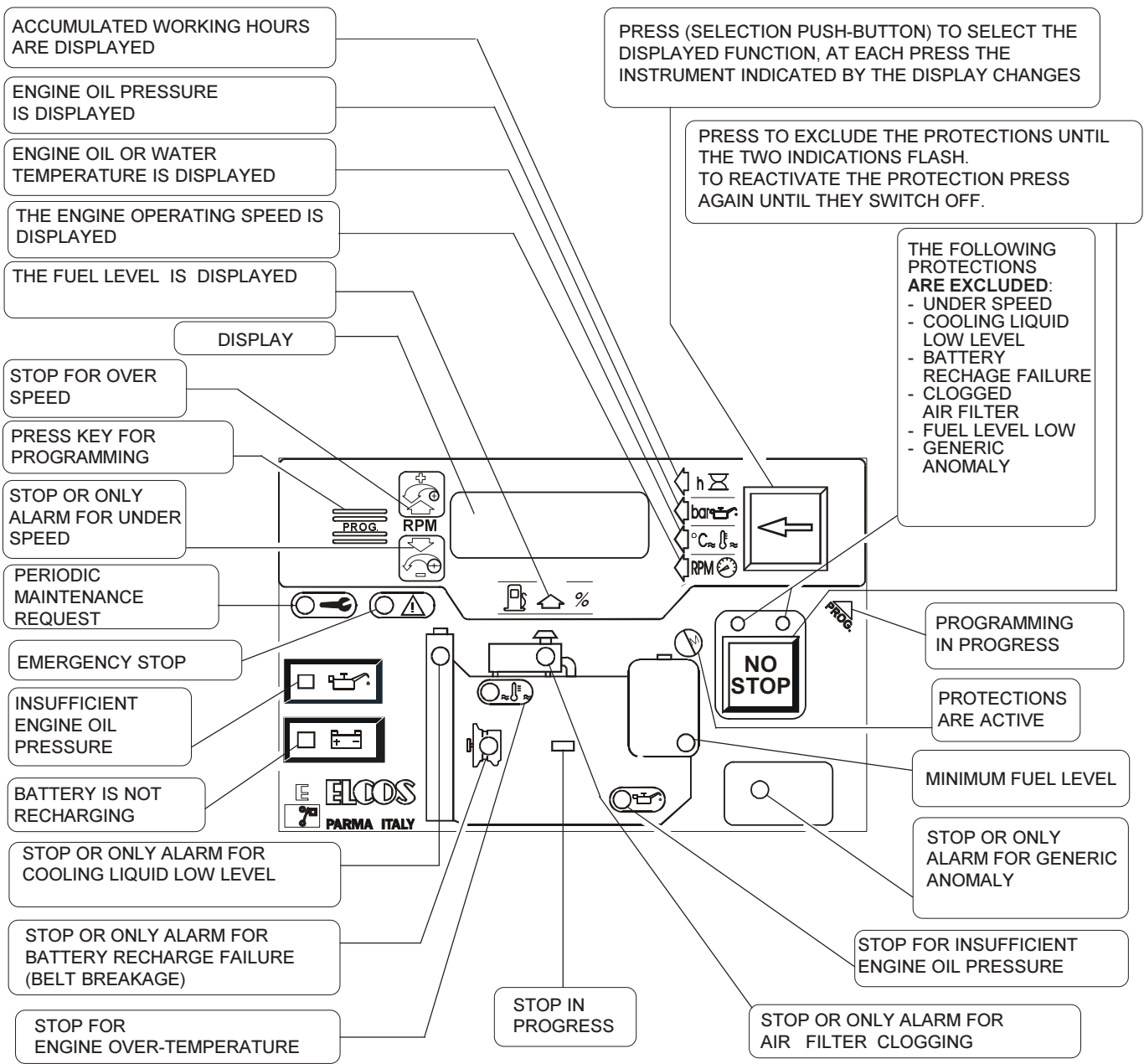
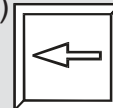
ITALY

BRIEF INSTRUCTIONS

START KEY (FOR EXTERNAL MOUNTING)



AFTER STARTING (THE ENGINE PROTECTS ITSELF AUTOMATICALLY)
ACCESS TO THE OTHER DEVICE FUNCTIONS IS POSSIBLE
VIA A SIMPLE THREE PUSH-BUTTON OPERATION.



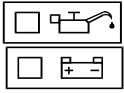
FOR SOME PROTECTIONS IT IS POSSIBLE TO SELECT TWO DIFFERENT TYPES OF INTERVENTION:

- ALARM, VISUAL INDICATION AND STOP
- VISUAL INDICATION AND ALARM ONLY

See pages 3 - 4 for programming.

OPERATION

OIL AND BATTERY LIGHTS



SWITCH ON WITH KEY TURNED TO "AUT"
THEY SWITCH OFF WHEN ENGINE IS
RUNNING WITH OIL PRESSURE AND BATTERY
RECHARGE SYSTEM REGULAR

ENGINE PROTECTIONS ENABLING

The engine protections are enabled in three ways:

- immediately for over speed.
- 10 seconds after threshold is passed (see page 4: INTERVENTION THRESHOLDS ADJUSTMENT) for under speed
- The under speed and over speed are detected by the "W" terminal extracted from the battery charge alternator (see pages 5).
- 20 seconds after the start pulse, indicated by the switching on of the PROTECTIONS ACTIVE light and, in any case, 1 minute from turning key to "AUT", for anomaly probes:

TEMPERATURE PROBES:

THERMOSTAT
TRANSMITTER (overtemperature)



- OIL PRESSURE SWITCH
(insufficient engine oil pressure)



- COOLING LIQUID LEVEL SWITCH
(cooling liquid low level)



- FUEL SWITCH

• fuel reserve flashing signal

(without engine stop)

• signal always on: stop can be

programmed for minimum fuel level

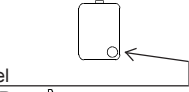
- BATTERY CHARGE ALTERNATOR

(battery recharge failure)

- AIR FILTER SWITCH

(clogged air filter)

- GENERIC ANOMALY



PROGRAMMING

All protections are programmed to stop the ENGINE.

By operating the following programmings it is possible to easily change the INTERVENTION THRESHOLDS for OVER-TEMPERATURE, OVER SPEED, UNDER SPEED and to select two different types of protection intervention (PROGRAMMABLE STOPS):

- Alarm, visual indication and stop

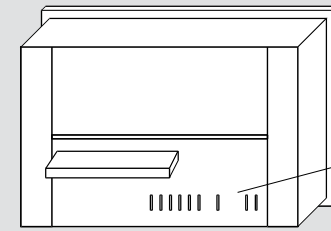
- Alarm and visual indication only,

for UNDER SPEED, COOLING LIQUID LOW LEVEL, FUEL LOW LEVEL, BATTERY RECHARGE FAILURE (belt breakage), CLOGGED AIR FILTER AND ENGINE GENERIC ANOMALY (free).

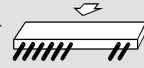
The protections for INSUFFICIENT OIL PRESSURE or for OVER-TEMPERATURE detected by thermostat (not by transmitter) produce immediate and memorized interventions with stop, it is not possible to programme them.

PROGRAMMING ACCESS

Turn key to "AUT"



Remove lower connector



Short circuit the blade contacts (for Faston) N°36 and N°39, until the switches on light then reopen the short circuit between the contacts.

FROM THIS MOMENT THE DEVICE WILL ACCEPT THE PROGRAMMING

PROGRAMMING SEQUENCE

Press the push-button to select the function to be programmed.

INTERVENTION THRESHOLDS ADJUSTMENT

ENGINE PROTECTIONS INTERVENTION

Immediate and memorized intervention with non-programmable stop (with switching on of light)

Intervention with 2 second delay memorized with non-programmable stop

PROGRAMMABLE STOPS

Intervention with 5 second delay memorized with programmable stop

Immediate and memorized intervention with programmable stop

Intervention with 5 second delay, memorized if programmed for stop, non-memorized if programmed without stop

Intervention with 5 second delay and memorized with programmable stop

RESTORING: is obtained by turning the start key to "ZERO"

OVER-TEMPERATURE

Adjustment field	Adjusted at:
90 ÷ 140 °C Press to increase by 1°C	97°C

OVER SPEED

1000 ÷ 4000 RPM Press to decrease by 5 rpm	4000 RPM
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UNDER SPEED

0 ÷ 3000 RPM Press to increase by 5 rpm	0 RPM
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To adjust the thresholds keep the push-button pressed until the desired threshold value is reached on the display

PROGRAMMABLE STOPS

For engine protections interventions. In this programming phase it is possible to select whether to stop engine or not:
- DO NOT STOP

Keep the push-button pressed until the lights switch on

- STOP

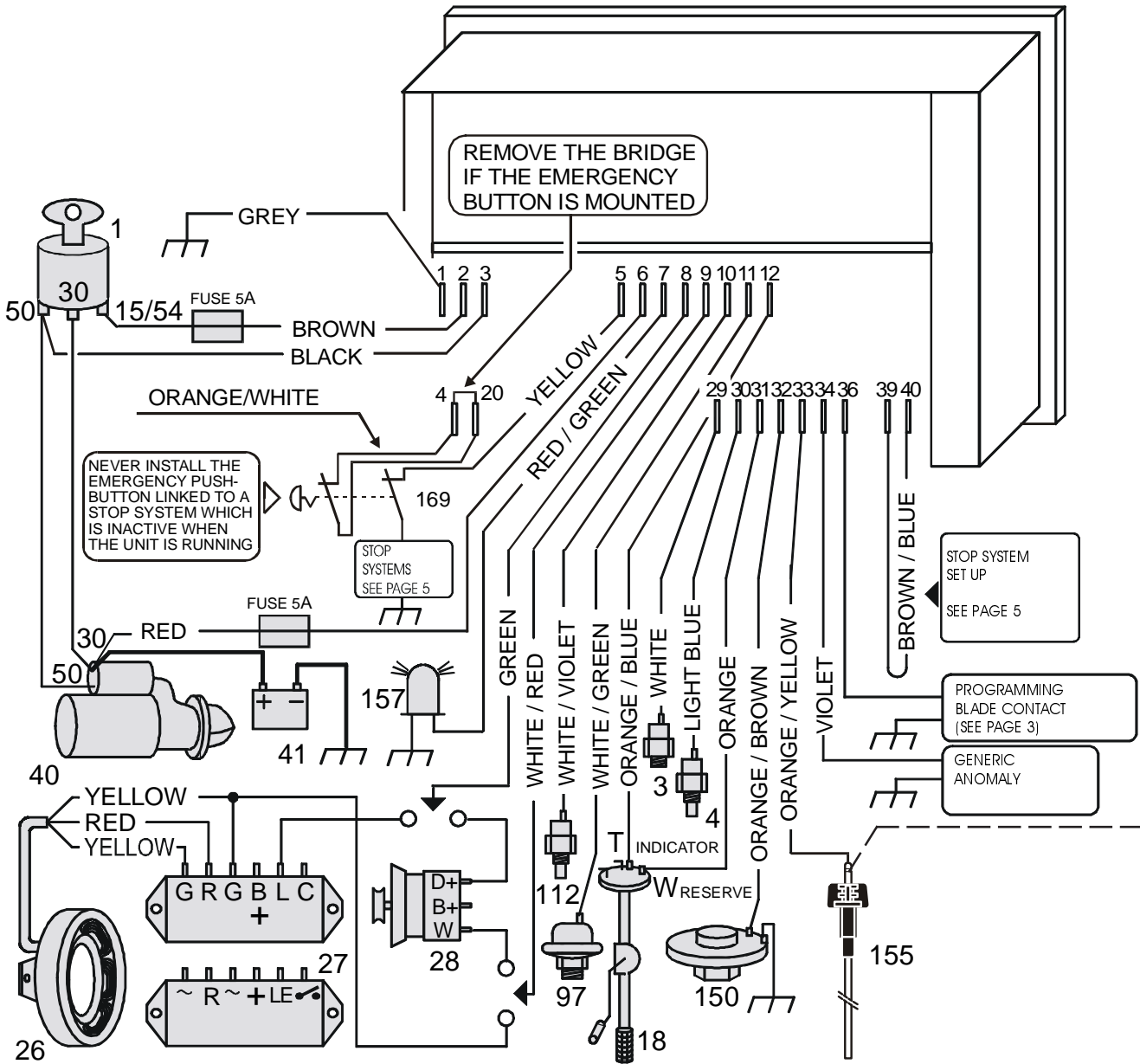
Keep the push-button pressed until the lights switch off

When programming has been completed, check that the set values are correct by going over the previous steps using the push-button . **END OF PROGRAMMING**

Turn the key to "ZERO" and then reinsert the connector (see page 3).

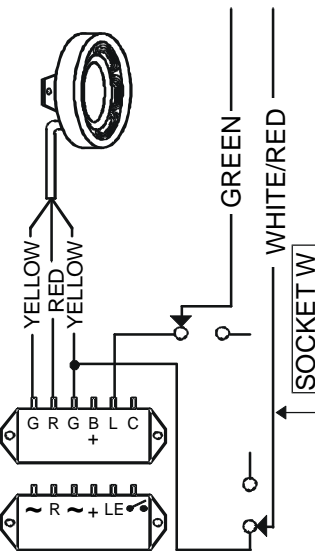
WIRING DIAGRAM

RECOMMENDED COLOURS

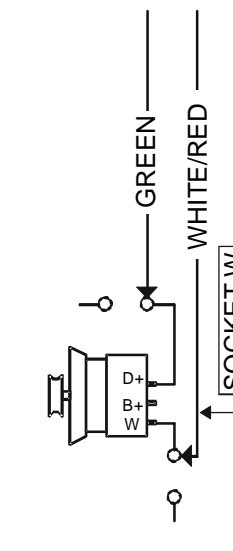


CHARGE ALTERNATOR TYPES:

PERMANENT MAGNETS



PRE-EXCITATION



FOR DIFFERENT REGULATORS, ASK FOR THE RELEVANT SCHEME

ACCESSORIES AVAILABLE ON REQUEST

- (1) START KEY
- (2/7) ELECTROMAGNET OR SOLENOID VALVE
- (3) OIL PRESSURE SWITCH
- (4) TEMPERATURE SWITCH
- (18) FUEL FLOAT FOR INDICATOR AND RESERVE
- (97) OIL PRESSURE TRANSMITTER
- (112) TEMPERATURE TRANSMITTER
- (155) COOLANT LEVEL PROBE

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

TACHOMETER ADJUSTMENT

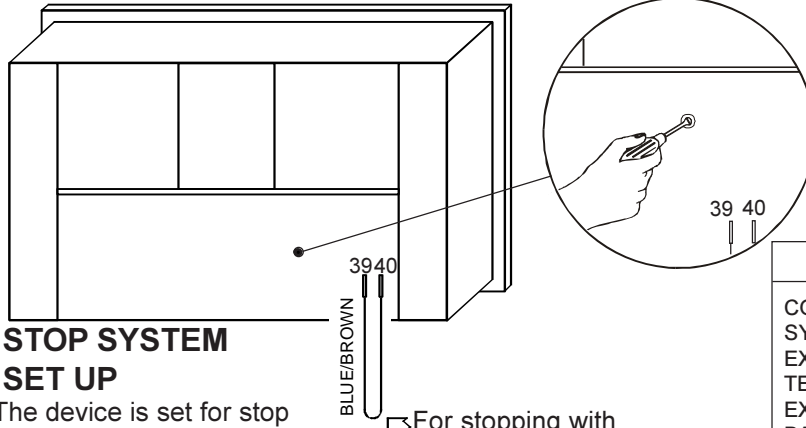
Bring the engine up to a constant working speed and at a noted value (e.g. using a portable tachometer).

To aid the regulation it is possible to see the decimal (for 1 minute) every time the "tachometer" is selected.



Use the relevant push-button to select the TACHOMETER instrument. A number other than zero must be visible on the display. (If this is not the case, do not perform any adjustments but check the plant thoroughly).

Then rotate the potentiometer (max. 20 turns), which is accessible from the rear of the device, clockwise until the correct indication appears on the display. (If the indication does not vary during adjustment, check system carefully.)



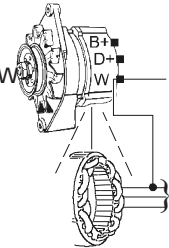
STOP SYSTEM SET UP

The device is set for stop command with **ELECTROMAGNET**

For stopping with **SOLENOID VALVE** remove this jumper

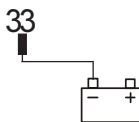
SOCKET W

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

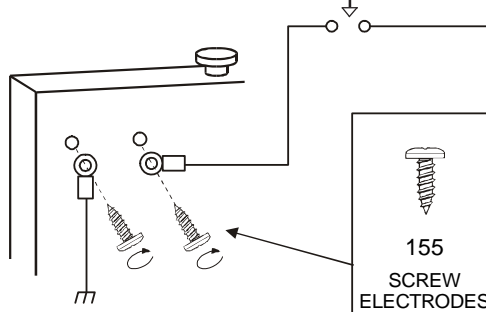


TO TACHOMETER (WHITE / RED WIRE)
To diodes bridge (inside alternator)

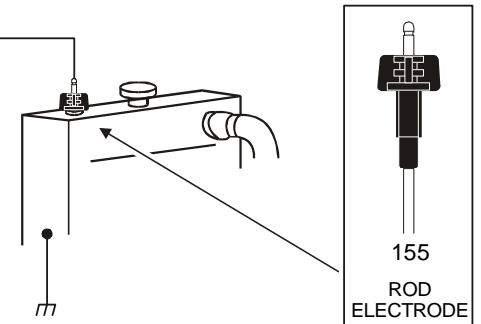
WARNING
IF THE COOLING LIQUID LOW LEVEL FUNCTION IS NOT USED, CONNECT TERMINAL 33 TO EARTH



COOLING LIQUID LEVEL PROBE SELECTION
FOR RADIATORS WITH PLASTIC EXPANSION TANKS

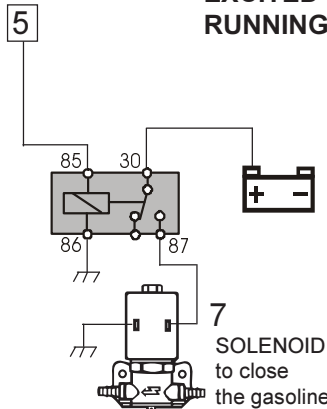


FOR RADIATORS WITH METAL EXPANSION TANKS



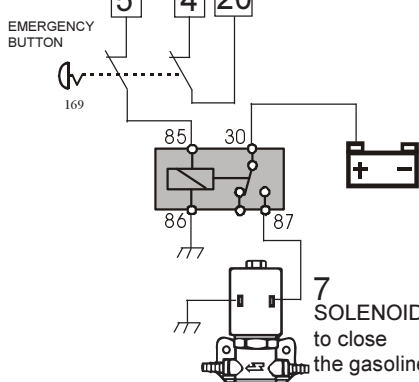
STOP SYSTEMS

EXCITED WHILE RUNNING

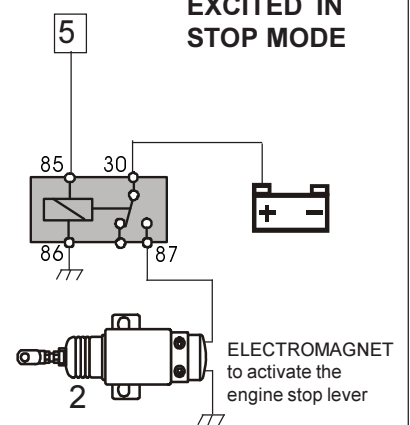


WHEN THE EMERGENCY BUTTON IS MOUNTED REMOVE THE 4-20 BRIDGE

EXCITED WHILE RUNNING (WITH EMERGENCY BUTTON)





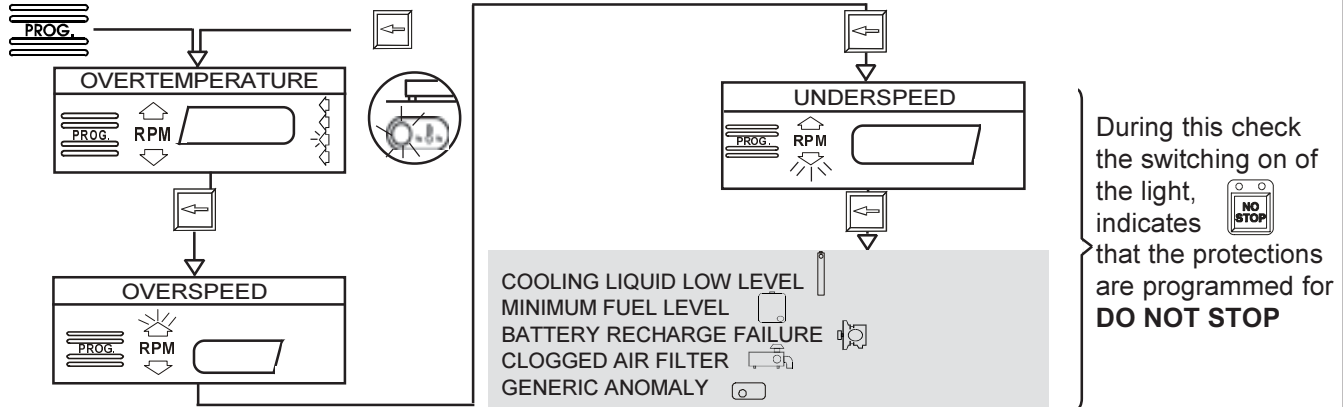
EXCITED IN STOP MODE



WARNING! : IT IS NOT POSSIBLE TO MOUNT THE EMERGENCY STOP BUTTON ON A STOP SYSTEM WITH ELECTROMAGNETS








PROGRAMMED FUNCTIONS CHECK

To check the OVER-TEMPERATURE, OVER SPEED and UNDER SPEED intervention thresholds and to check which anomalies do not stop the engine, keep the push-button  pressed and press the push-button  at the same time, each time this last push-button is pressed, the type of function checked, in the order shown below, changes (shown by the corresponding light).




OPERATION

ENGINE PROTECTIONS EXCLUSION

- The push-button  excludes the engine stop for the protections  -  -  -  -  :
- exclusion is obtained by keeping it pressed for at least 3 seconds; the function is indicated by the two intermittent indications .
 - the exclusion is cancelled by again pressing the push-button, or by turning the start key to "ZERO".

ENGINE STOP






- The device orders stoppage in three ways:
- by turning the start key to "ZERO"
 - on protection intervention
 - for external emergency intervention
- The device is suitable for two different stop systems (during which the light  is on):
- activating the ELECTROMAGNET for 20 seconds, which pulls the STOP lever
 - cutting off the supply to the SOLENOID VALVE, which closes the Diesel passage


MAIN ALARM


This can be obtained by mounting a visual and/or acoustic indicator externally, connected to the relevant output. It is activated on any protection intervention.
RESET: by turning the start key to "ZERO".

INSTRUMENTS


The device incorporates five instruments (indicated by the relative lights in the form of an arrow), which can be individually selected on the DISPLAY for the following sizes:

- total working hours (HOUR COUNTER) 
 - engine oil pressure (PRESSURE GAUGE) 
 - engine oil and water temperature (THERMOMETER) 
 - engine speed (TACHOMETER) 
 - fuel level percentage (INDICATOR) 
- TRANSMITTERS FITTED ON ENGINE**


The TACHOMETER is displayed when the key ("AUT") is inserted, or if called up by the SELECT INSTRUMENTS button .

With the HOUR COUNTER selected and with the engine running, the light  pulses, to indicate the correct functioning of the instrument. The hour counter memorizes the working hours even when the battery is disconnected. To display PRESSURE GAUGE, THERMOMETER, TACHOMETER, FUEL LEVEL INDICATOR the INSTRUMENT SELECTION push-button has to be pressed. At each press the next instrument is displayed.

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 manufacturer.

EMERGENCY STOP

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

Used only to survey a diesel engine while operating, commanding stopping if there are anomalies in the parts controlled by the probes.

Designed to be installed inside dashboards, electric panels, etc....

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 disconnect the terminals of the battery with engine running.
- 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.

NOTE: THE HOLE IN THE CASING USED TO INSTALL THE EQUIPMENT COULD INFLUENCE THE LEVEL OF PROTECTION. STEPS MUST BE TAKEN TO MAINTAIN THE ORIGINAL LEVEL OF PROTECTION.

THIS DEVICE 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 of 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 protection device functions correctly only if inserted in plants which conform with the CE marking standards; it meets the exemption requirements of the standard EN50082-2 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 of the standards.

CONDUCTION AND MAINTENANCE

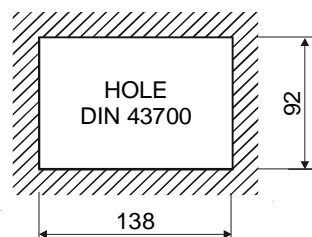
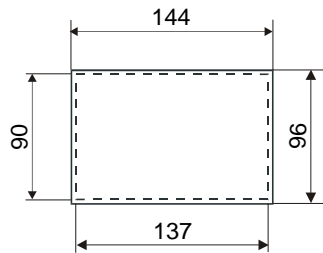
The following maintenance operations should be performed every week:

- check that the indicators function;
- check the batteries;
- check that the conductors are tight, check the condition of the terminals.

UNLESS WE MAKE A WRITTEN DECLARATION STATING THE CONTRARY, THIS PROTECTION DEVICE 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 PROTECTION DEVICE BY TELEPHONING ONE OF OUR TECHNICIANS

DIMENSIONS



TECHNICAL DATA

- BATTERY SUPPLY VOLTAGE	12 or 24 V
- CIRCUIT LOADING WITH KEY AT ZERO	10mA
- YELLOW (STOP) OUTPUT [5] MAX. CURRENT	3A
- RED/GREEN (MAIN ALARM) OUTPUT [7] MAX. CURRENT	3A
- TEMPERATURE RANGE	-10 ÷ +60 °C
- HOUR-COUNTER	4 DIGITS
- ENGINE OIL PRESSURE GAUGE	0 ÷ 7 bar
- ENGINE OIL / WATER THERMOMETER	+ 20 ÷ +145 °C
- TACHOMETER	4000 rpm
- PROTECTION LEVEL DASHBOARD / REAR	IP65 / IP20
- WEIGHT	600 g

ORDERING DATA

Type DIP-061 12 V code 02.66.13

Type DIP-061 24 V code 02.66.14

ACCESSORIES SUPPLIED

- CABINET SOCKET PMO-170 code 80.42.70

- CABINET SOCKET PMO-172 code 80.42.72

CONFORMITY DECLARATION



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

type **DIP-061**

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

- 2004/108/CE related to the electromagnetic compatibility and that repeals the directive 89/336/CEE,

because it is built and functions in accordance with the harmonized Standards: EN61326-1, EN61326/A1, EN61000-4-2, EN61000-4-4, EN61000-4-6, EN60529.

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Parma, 23/01/2009
President

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