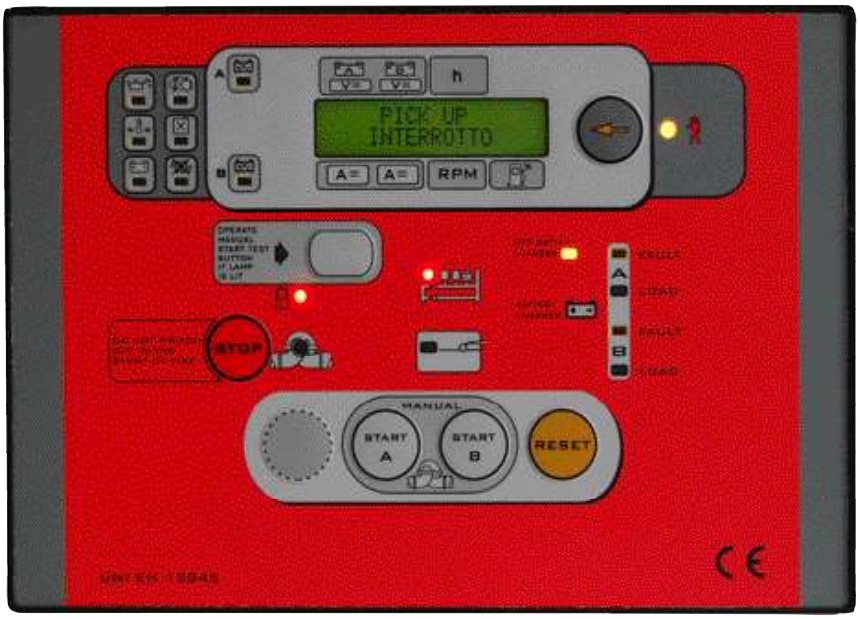
MONITORING AND CONTROL UNIT
FIRE-FIGHTING MOTOR PUMP
IN CONFORMITY TO UNI EN 12845 STANDARD
TYPE C-12845-485

INSTRUCTION AND USER MANUAL



COMPLETE OF:

- two battery ammeters
- two battery voltmeters
- total hour meter
- partial hour meter
- tachometer
- water thermometer
- oil thermometer
- oil pressure gauge
- fuel level indicator

- Automatic start with 6 impulses alternated on the two batteries.
- Manual start-up buttons.
- Test button.
- Button for in-site test for machine putting into service.
- Manual stop with button.
- Check of efficiency of the batteries.
- Engine automatic faults surveillance.
- History events.

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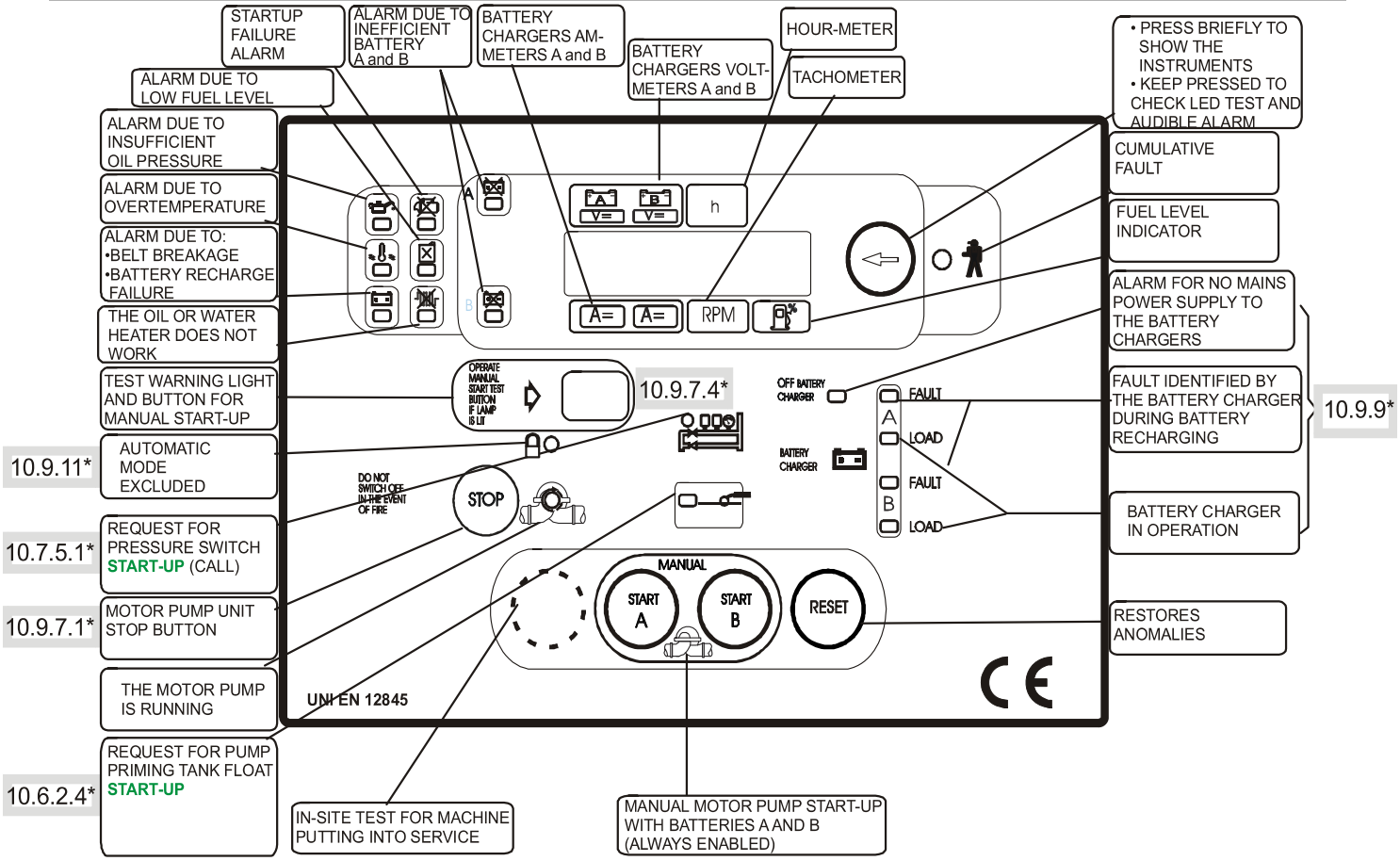
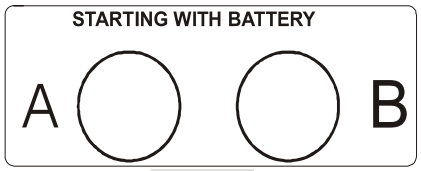
BRIEF INSTRUCTIONS



COMPONENTS TO BE FITTED EXTERNALLY



10.9.7.3*

PUSH-BUTTONS LOCATED UNDER A BREAKABLE LID FOR EMERGENCY START

AUTOMATIC START-UP SWITCH **ENGAGED**

EXCLUDED

AUTOMATIC MODE DISABLED

LINE SWITCH (DOOR LOCK)

*PARAGRAPH NUMBER (OF REGULATION EN12845) TO CONSULT

HISTORY AND REVISIONS

Date	Level of the REVISION	Description	Page
December 2007		See manual without revision	
January 2008	2.12	Terminal 50 pump pressure switch connection	6
		Possibility of having the pump pressure switch off or on	enclosure A
		ENGINE AND PUMP IN OPERATION (Detection of pump running with pressure switch). Alarms: PUMP FAULT, PRESSURE WITH ENGINE STOPPED	enclosure E
		Weekly test: We have removed the connections with terminals 22 23 24	enclosure D
		Zeroing historical report (visible with remote management)	enclosure F
		Stopping at the reopening of the float of the priming tank	enclosure G
		Inclusion - exclusion of the stopping from priming float	enclosure A
		Stopping operation UNI10779 with switch AUTOMATIC START UP ENGAGED	3
July 2008	2.13	Delay in closing or opening the contact of the priming tank float	8
October 2008	2.14	Contact associable with the running engine or the general alarm	enclosure H
		If both the batteries are in the fault “INEFFICIENT BATTERY”, the startings continue all the same until the starting failure	4
		Correction: with WATER RESERVE or FUEL RESERVE or NO FUEL or STARTING FAILURE, the relay “PANEL FAULT” was not restored.	
December 2008	2.15	Fuel float interruption control	
May 2010	2.16	Portuguese added	10
April 2011	2.17	A programmable de-energization time of contacts 22 23 24 is entered when the stopped engine is detected.	8
September 2012	2.18	Weekly automatic test – stop during the test. Procedure run to show and reset the events history.	enclosure D - 9 enclosure B/C-F -10

(Reserved to the manufacturer)

Valid for firmware revisions higher than or equal to 2.18

INSTRUMENTS

- **A and B BATTERIES AMMETERS** — Full scale current 99A
- **A and B BATTERIES VOLTMETERS** — For voltages between 9 and 38 Volt.

} connected with the battery chargers Type CBS .....

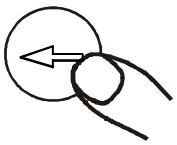
- **TOTAL HOUR METER** — With four figures and a maximum reading (hours and minutes) of 9999.
- **PARTIAL HOUR METER** — With four figures and a maximum reading (hours and minutes) of 9999.
- **TACHOMETER** — Full scale 9990 revolutions
- **FUEL LEVEL INDICATOR** — Displays the percentage of fuel present in the tank (full scale 100%)
- **WATER OR OIL THERMOMETER**
- **OIL THERMOMETER**

} Displays engine oil or water temperatures 30 ÷ 140°C.

- **OIL PRESSURE GAUGE** — Displays engine oil pressure up to 9 bars
- **A and B BATTERIES STARTUPS COUNTER** — Displays the number of startups that have occurred up to 9999

SIMULTANEOUS READING OF THE INSTRUMENTS

- BATTERY AMMETERS
- BATTERY VOLTMETERS
- FUEL LEVEL INDICATOR
- HOUR METER



Press to show the instruments

WITH ENGINE RUNNING

- TACHOMETER

FUNCTION **AUTOMATIC STOP** ALLOWED BY THE STANDARD **UNI 10779 July 2007** When necessary, for any activities that are not constantly manned, automatic stopping is permitted, providing the pumping system is used exclusively by the hydrant system.	**JUMPER** B	**JUMPER NOT CUT** (Factory setting) AUTOMATIC STOP NOT ACTIVATED	**JUMPER CUT** (During the led test **UNI 10779** appears on the display) AUTOMATIC STOP ACTIVATED
OPERATION (With automatic start up engaged) The motor pump stops 20 mins. after the contacts of the call pressure switches have been permanently closed. The display continuously shows how much time is left before the motor pump stops. The stop electromagnet remains energized for 15 seconds after detecting that the engine has stopped. The motor pump is not stopped when the switch is positioned on AUTOMATIC MODE EXCLUDED. When the switch is positioned back to AUTOMATIC START UP ENGAGED, the motor pump continues to run.			

OPERATION

PREPARATION FOR AUTOMATIC

Active with the switch AUTOMATIC STARTUP ENGAGED (from this position it is possible to remove the key), setting the switch to excluded, the automatic start is blocked. This exclusion is signalled by the flashing warning light  and by the following message displayed on the screen: AUTOM. STARTING EXCLUDED.

AUTOMATIC

When the equipment detects the opening of the starting call contact (pressure switches), the pump set begins to start up. The control unit checks (without commanding the stopping of the motor pump unit) for possible engine faults, during its operation

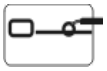
MANUAL STARTING

This can be done in three ways:

- through the emergency start push-buttons.
- through the push-buttons START A or START B
- through the test push-button with consent of the associated warning light  .

The test push-button receives the consent after the engine automatic startup (activated by the call pressure switches), followed by the turning off or after start failure. In both conditions the relative warning light  turns on. The circuit used to this end automatically becomes non-operative and the warning light turns off, when the test button is pressed and the motor is found running.

AUTOMATIC STARTING

This takes place when the CALL pressure switch contacts are opened, which is shown by a fixed light coming on  . After the pressure switches have closed, the indicator starts to flash.
Automatic starting also happens when the pump priming float contact is closed, which is shown by a fixed light  coming on. When the contact opens, the indicator starts to flash. Flashing lights stay on for the whole time the motor is running.
In order to facilitate the startup, a specific circuit makes a sequence of 6 impulses automatically alternating on batteries A and B with 15 seconds cycles (5 secs. Startup, 10 secs. pause, both adjustable).
Engine starting is interrupted if the starter motor pinion does not succeed in engaging with the crown gear of the handwheel. After the first failure to engage, the starter motor makes a further five engagement attempts. At the sixth failure to engage the starter motor continues running for 5 seconds.
If a battery is found to fail during start-up, it is automatically suspended and the starting cycle proceeds on the other battery. If both the batteries are in the fault “INEFFICIENT BATTERY”, the starting continue all the same until the starting failure

DETECTION OF MOTOR PUMP RUNNING

The motor pump ON mode is monitored through a magnetic sender (pick-up) and it disconnects the starter motor.

STOP

THE ENGINE CAN ONLY BE TURNED OFF MANUALLY.
It is not possible to stop it when the call from the pressure switches is present and automatic start up engaged.
With call from the pressure switches present
Pressing the STOP pushbutton, the following message is displayed on the screen: DON’T SWITCH OFF IN EVENT OF FIRE ----STOP EXCLUDED.
• With call from the pressure switches absent.

Pressing the STOP pushbutton, the following message is displayed on the screen: DON’T SWITCH OFF IN EVENT OF FIRE.

PARTIAL HOUR METER

Press  to select (PARTIAL HOUR METER) the operating hours and minutes of the last run of the motor pump. The hours indicated are zero-set the next time the motor pump is started up.

OPERATION

BATTERY CHARGING

Automatic charging: fast charging is controlled in current, intermediate and maintenance charging in voltage.
The anomalies:

- battery A and/or FU1 blown
- battery B and/or FU2 blown

} detachment of battery cables and fuses blown

- short circuit of A and B battery cables
- mains failure battery chargers A and B,

are signalled by the warning lights: anomaly , FAULT and they are displayed.

BATTERIES CHECK

A special circuit checks the efficiency of the batteries, in particular DURING THE STARTING PHASE.

ALARMS

The alarms are indicated on the display by the relative led and by a flashing cumulative led.
They are divided into four groups

- STORED: inefficiency of batteries A and B
- NOT STORED AND ALWAYS ENABLED: minimum fuel level , mains power failure to the battery chargers A and B OFF BATTERY CHARGER , PICK-UP interrupted, oil or water heater failure and battery chargers A and B fault.
- CHECKED 10 SECONDS AFTER DETECTING ENGINE RUNNING AND STORED: insufficient oil pressure , charging alternator failure and PICK-UP fault.
- CHECKED WITH ENGINE RUNNING AND STORED IMMEDIATELY: engine overtemperature .

STARTUP FAILURE

It locks the starting cycle, if the engine has not started after the sixth attempt .
The starting cycles are released using the reset button, or the next time the motor is found to be running.

RESET

The memorized protections are reactivated, by pressing the RESET button.

REMOTE AUXILIARY FUNCTIONS

With switching without voltage contacts

- **Automatic start-up disabled** (automatic start-up switch disabled EXCLUDED AUTOMATIC MODE DISABLED)
- **Start up failure**
- **Pump operatine**
- **Switchboard fault**: occurred engine alarms (excluded minimum fuel level), not powered control unit, battery charger fault: mains failure, FLAT CABLE not connected and blown fuses (the battery charger fuses are signalled as: CHARGER BATTERY FAULT and INEFFICIENT BATTERY).
- **Minimum fuel level**.

TEST

IN-SITE COMMISSIONING TEST

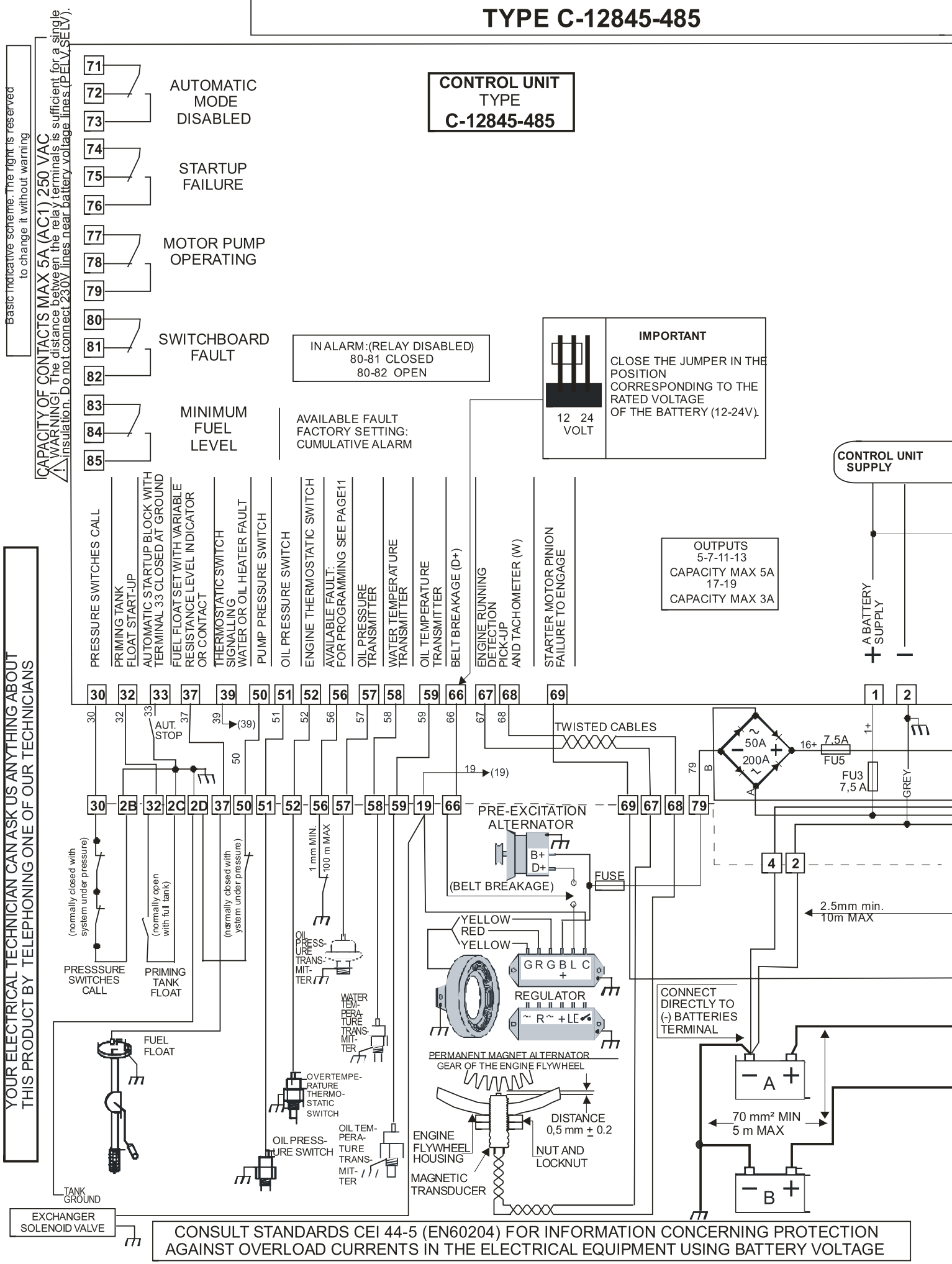
Programming move the DIP Switch 9 to ON.

Press the button (the screen displays COMMISSIONING TEST) isolating the fuel supply (move the relative lever towards motor stop by hand, or hold down the stop button),

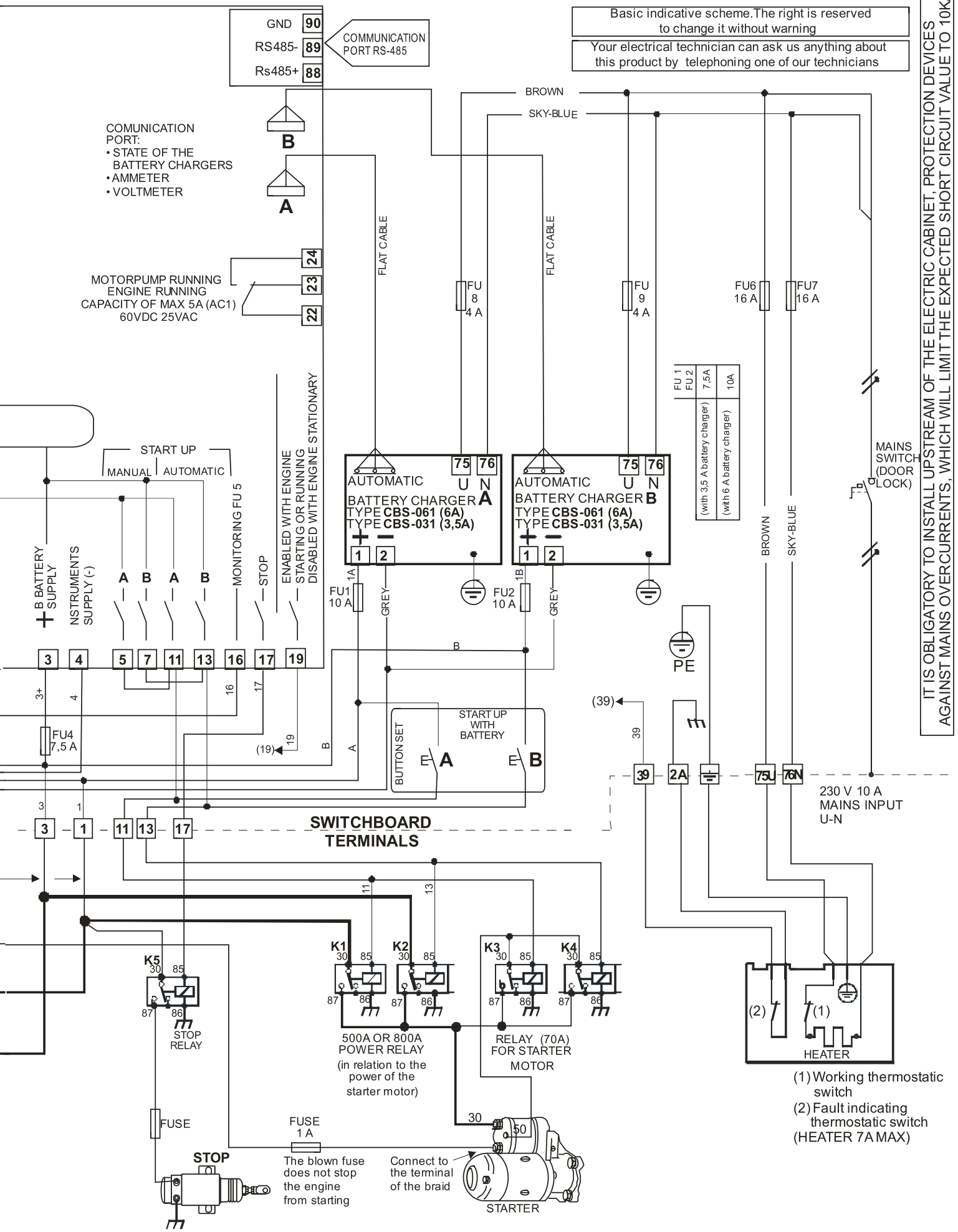
keep pressed (about 3 secs) the button until the starter motor starts, a circuit produces 6 alternate impulses on the batteries A and B with 30-second cycles (15 secs. startup and 15 secs. pause).
WARNING DO NOT use the stop button with electro-stop running intermittently, usually these electromagnets cannot be excited for more than 40-50 seconds at a time.
After completion of 6 cycles, startup failure is activated and the relative warning light turns on.
Restore the fuel supply (release the lever or the motor stop button) and press the manual startup test pushbutton . Move the DIP switch 9 back to OFF.

Keep pressed the button to check led test.

DIAGRAM OF CONNECTION TO THE CONTROL
TYPE C-12845-485



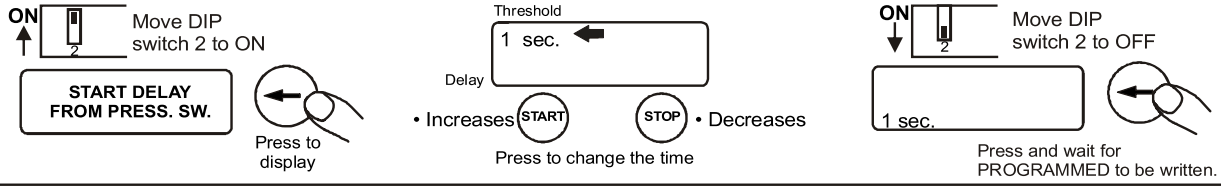
AND MONITORING CONTROL UNIT OF THE MOTOR PUMP UNIT IN CONFORMITY TO EN 12845 STANDARD



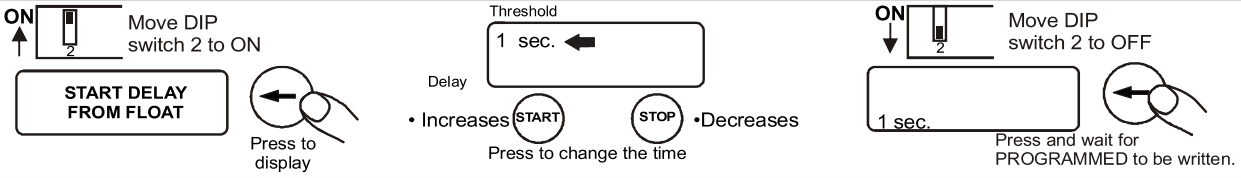
PROGRAMMABLE TIMES

DESCRIPTION	SECONDS	
	SETTING FIELD	FACTORY SETTING
DELAYED START AFTER OPENING OF THE CONTACTS OF THE CALL PRESSURE SWITCHES	1÷120	1
DELAY IN CLOSING OR OPENING THE CONTACT OF THE PRIMING TANK FLOAT	1÷10	1
STARTING TIME Start up attempt operation time	5÷10 sec.	5 sec.
PAUSE TIME Pause between start up attempts	5÷10 sec.	10 sec.
STOP STAND-BY TIME (UNI 10779)	1÷30 min.	20 min.
CONTACT. 22-23-24 TIME De-energization delay (stopped engine)	0÷600 sec.	0 sec.

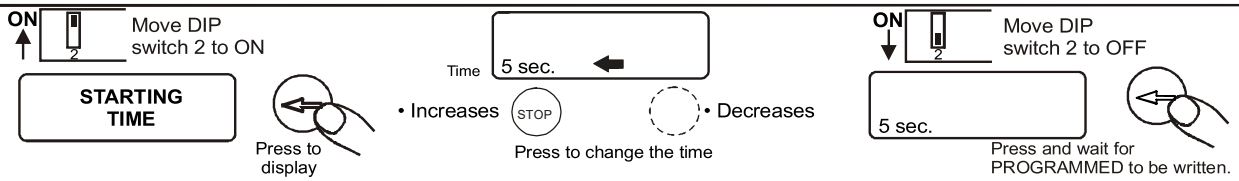
DELAYED START AFTER OPENING OF THE CONTACTS OF THE CALL PRESSURE SWITCHES.



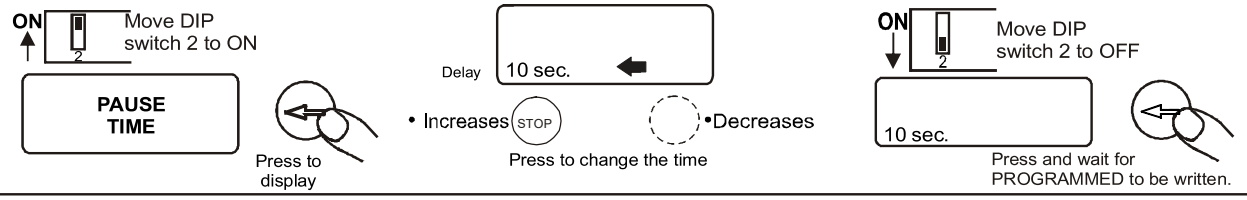
DELAY IN OPENING OR CLOSING OF THE PRIMING TANK FLOAT CONTACT.



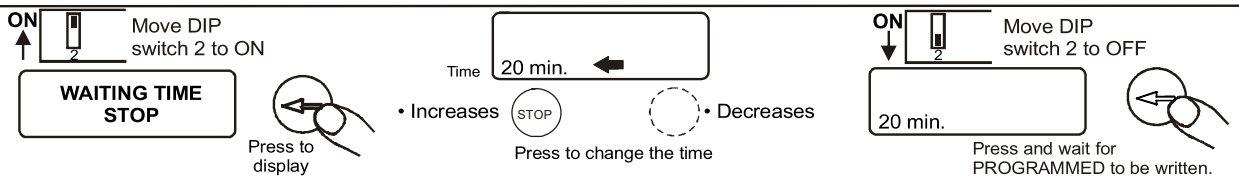
STARTING TIME. START UP ATTEMPT OPERATION TIME.



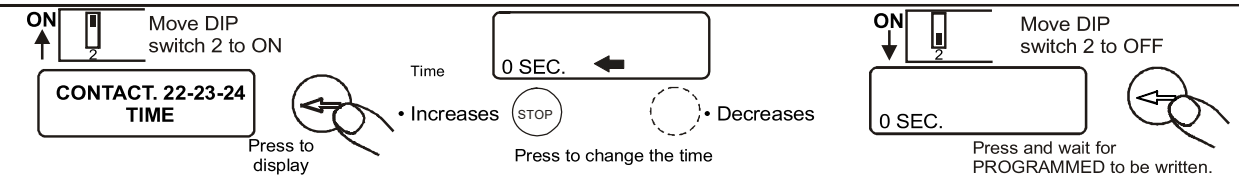
PAUSE TIME. PAUSE BETWEEN START UP ATTEMPTS.



STOP STAND-BY TIME (UNI 10779).



CONTACT 22-23-24 TIME. OPENING TIME OF CONTACT 22-24 AFTER DETECTION OF THE STOPPED ENGINE.



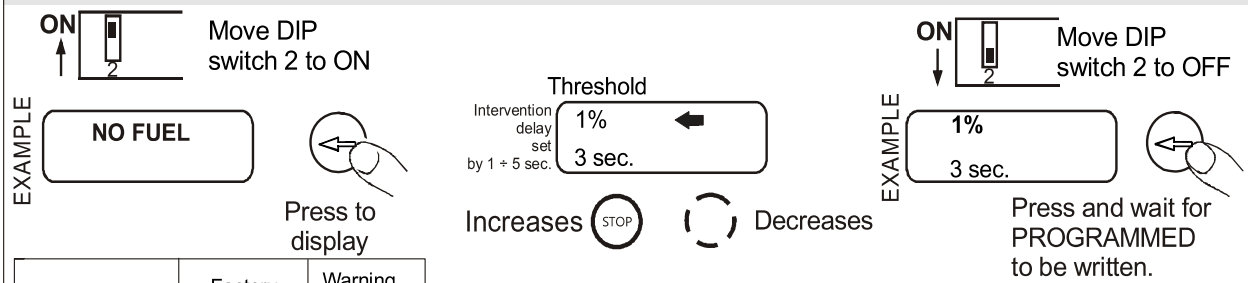
IN-SITE ACTIVATION TEST

Start up and pause 15 NOT ADJUSTABLE seconds.

PROGRAMMING

CONTROL UNIT TYPE **C-12845-485**

FUEL LEVEL. Variable-resistance float programming (T).



FUNCTION	Factory setting	Warning light ☒
• Max. fuel level	95%	OFF
• Min. fuel level	25%	FLASH-ING ON
• Fuel reserve	10%	STEADY ON
• No fuel	1%	STEADY ON

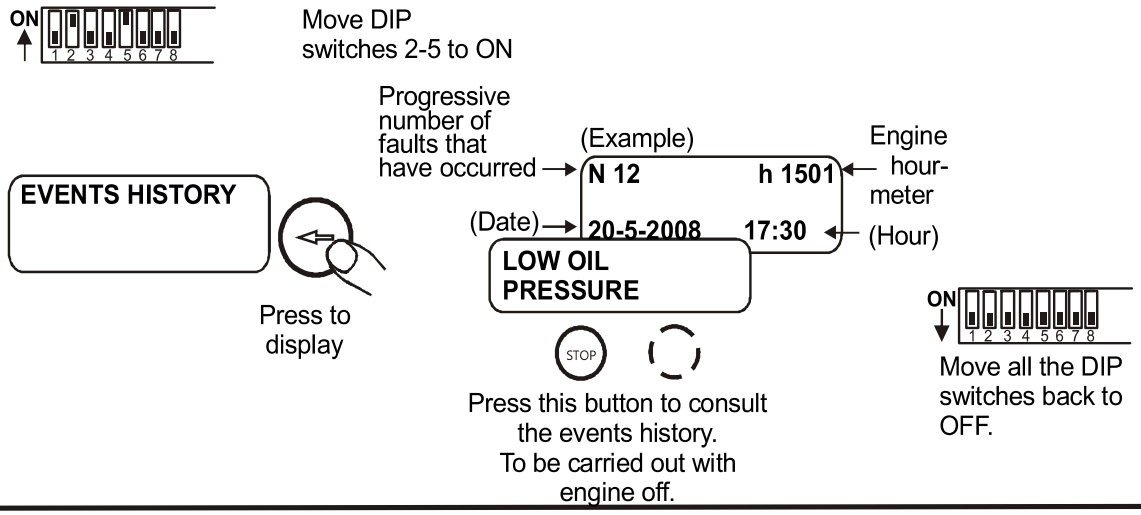
When the fuel level is lower 25% than the nominal filling level, the MIN. FUEL LEVEL alarm is enabled

PROGRAMME ONE LEVEL AT A TIME

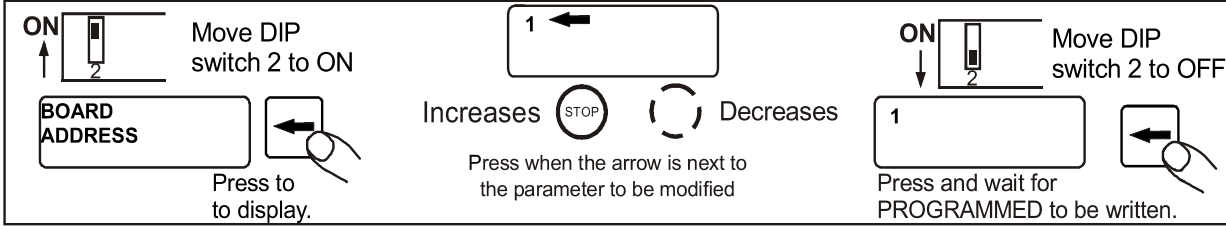
WITH TERMINAL W	WARNING LIGHT	DISPLAY
WHEN THE CONTACT CLOSES TO GROUND	☒ FLASHING ON	MINIMUM FUEL LEVEL

EVENT HISTORY

Data relating to the latest 100 events is collected.



BOARD ADDRESS. **Factory preogramming** 1.



DIP - SWITCH

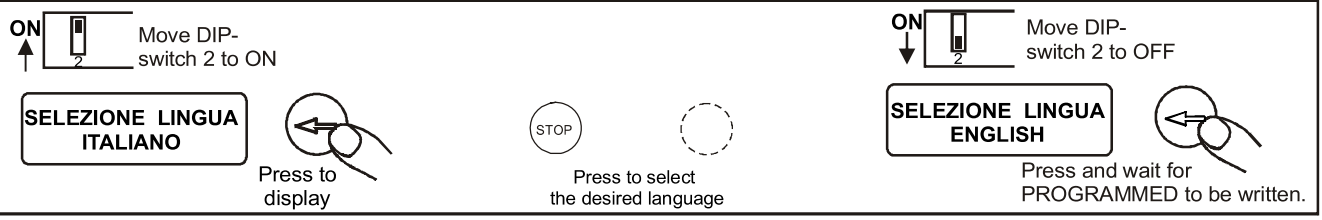
WAIT AT LEAST TWO SECONDS AFTER EACH MOVEMENT.

	TACHO-METER CALIBRA-TION	CHOICE •LAN-GUAGE •TIMES •THRESH-OLD	TRANSMIT-TERS TABLE	FUEL FLOAT T or W / Float values table	INSTRU-MENTS EXCLU-SION	AVAILABLE PROTEC-TION	BATTERY VOLTAGE	STOP SYSTEMS ⚠ EXCITED IN DRIVE. WARNING STOP NOT CON-FORM TO THE EN 12845 STANDARD	IN-SITE ACTI-VATION TEST	NOT USED IN REGULATION EN12845
ON							24 V		EN-GAGED	
	1	2	3	4	5	6	7	8	9	10
OFF							12 V	EXCITED IN STOP MODE	EX-CLUDED	

DIP 2 - 5 VIEW THE EVENTS HISTORY

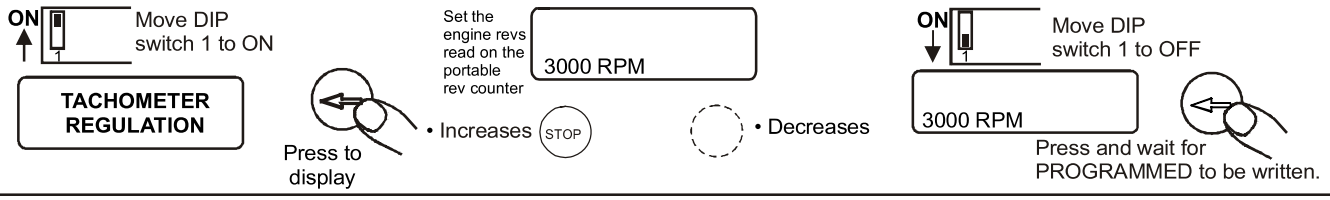
PROGRAMMING

LANGUAGE SELECTION. The factory set language is ITALIAN; the languages that can be selected are: ENGLISH - SPANISH - GERMAN - FRENCH - PORTUGUESE.

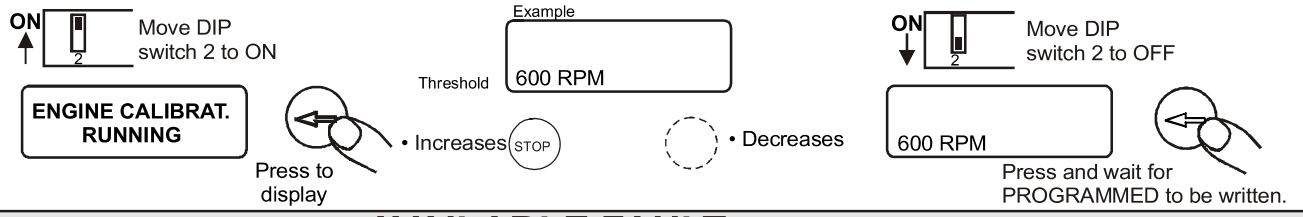


CALIBRATION:
TACHOMETER AND MOTORPUMP RUNNING THRESHOLD
Exclude the automatic startup using the relative switch. EXCLUDED AUTOMATIC MODE EXCLUDED
Manually start the motorpump, then calibrate first the tachometers while the motorpump is in operation.
Stop the engine and calibrate the threshold of the motor pump in operation.

TACHOMETER REGULATION. Bring the engine to constant known revs (for example using a portable revs counter).

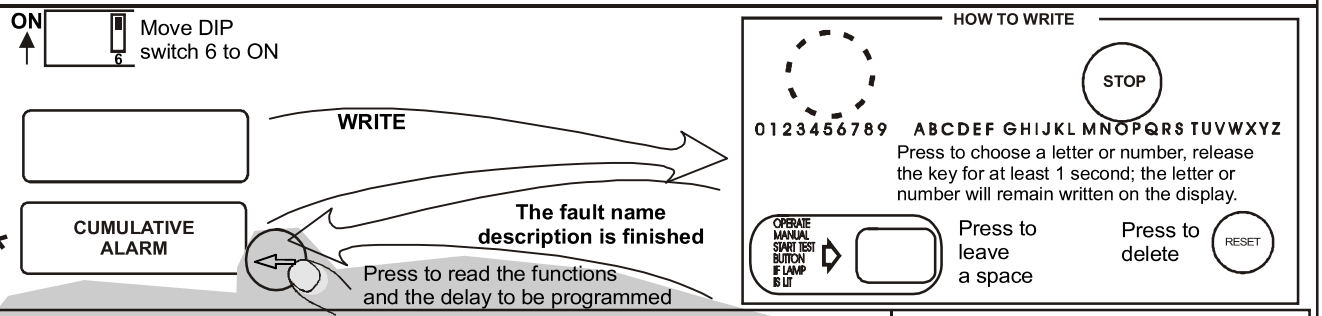


MOTORPUMP RUNNING THRESHOLD CALIBRATION. Disconnects the starter motor.



AVAILABLE FAULT

THE NEW DESCRIPTION OF THE NAME OF THE FAULT IS NOT TRANSLATED.



FUNCTIONS TO BE PROGRAMMED DESCRIBED ON THE DISPLAY		DESCRIPTION
NOT STORED *	STORED	Choice of whether to store the cause of the alarm
POLARITY ACTIVE TO GROUND *	**POLARITY** ACTIVE OPEN	The probe intervenes when it closes or opens his own contact
ACTIVATION ALWAYS ACTIVE *	**ACTIVATION** ACTIVE RUNNING	Instant of probe activation
RELAY SWITCHING NOT ACTIVE (CONTACT 83-84-85)	RELAY SWITCHING' ACTIVE (CONTACT 83-84-85) *	Intervention lights up the cumulative flashing led and switches over the contacts on the terminals 83 84 85
INTERVENTION RELAY (ADJUSTABLE) 0 ÷ 60 SEC. * FACTORY SETTING 10 seconds for the water reserve		The intervention occurs when the intervention delay has elapsed

Press to modify the functions and the intervention delay — STOP

ON 6 To confirm the programming move DIP switch 6 to OFF

Press and wait for PROGRAMMED to be written on the display

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CONTROL AND MONITORING UNIT
MOTORPUMP UNIT
IN CONFORMITY TO EN12845 STANDARD
TYPE C-12845-485

Carries out the automatic control and monitoring functions of a fire-fighting motorpump unit. It has been designed to be installed only inside on an electrical panel and to be connected to other components (contactors, battery chargers, etc.) which the installer will have available to complete the plant.

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NOTICES

Warning:
Components carrying dangerous voltage levels

Only assigned and suitably trained personnel are allowed access to the control unit. No maintenance operations are permitted unless the plant is disconnected from the mains and the battery. As an additional safety measure, the plant phases should be short-circuited and earthed. Not withstanding the above, only assigned and trained personnel can perform the following operations with the plant on:

- make a visual inspection of the control unit, the connections and their markings.
- measure the voltage and/or current values.

These interventions, however, must be performed using equipment which ensures appropriate levels of electrical protection.

Warning:
adhere closely to the following advice

- At the point of mains installation, the presumed short circuit current must not exceed 10kA.
- All technical interventions on the motorpump must be performed with the engine stationary and terminal 50 of the start motor disconnected.
- Check that the user equipment power consumption is compatible with the technical features described.
- Install in such a way that there is always adequate heat disposal.
- Always install under other equipment which produces or spreads heat.
- Make sure that no copper conductor cuttings or other waste material fall inside the equipment.
- If necessary, the fuses must only be replaced with the same type as the original.
- Never disconnect the terminals of the battery with engine running.

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

- Where the environmental temperature is outside the limits specified lin the present technical manual.
- Where the air pressure and temperature variations are so rapid as to produce exceptional condensations.
- Where there are high levels of pollution caused by dust, smoke, vapour, salts and corrosive or radioactive particles.
- Where there are high levels or heat from radiation caused by the sun, ovens or the like.
- Where attacks from mould or small animals are possible.
- Where there is the risk of fire or explosions.
- Where the switch-board can receive strong vibrations or knocks.

CONDUCTION AND MAINTENANCE

The following maintenance operations should be performed every week:

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

ELECTROMAGNETIC COMPATIBILITY

This control unit 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.

NOTE CONCERNING CONNECTION OF COMMAND AND SAFETY DEVICES TO THE PANEL

With the direct connection of engine protection probes and remote control and command contacts to the control switch-board, particular anomalous situations (earth anomalies or interruption of electrical connections) could block the start-up or provoke its early activation.

To reduce these risks, if he believes it to be necessary, the installer can take on the responsibility of applying that which is described in paragraphs 9.4.2.1 and 9.4.2.2 of standard CEI EN60204-1 (CEI 44-5) to the said connections.

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

Any use which differs from that which is indicated in this instruction and user manual must be authorized by us to the manufacturer.

YOUR ELECTRICAL TECHNICIAN CAN ASK ANY QUESTIONS ABOUT THIS CONTROL UNIT BY TELEPHONING OUR TECHNICIAN

TECHNICAL DATA

- TWO BATTERIES SUPPLY VOLTAGE AT	12 VDC and 24 VDC
- SUPPLY VOLTAGE	8 ÷ 32 VDC
- CIRCUIT LOADING WITH ENGINE STATIONARY	70 mA at 12V 40 mA at 24V
- MAXIMUM LOADING	130 mA at 12V 70 mA at 24V
- CAPACITY OF CONTACTS 5-7-11-13	MAX 5A 25 VAC 60 VDC
- CAPACITY OF CONTACTS 17-19	MAX 3A 25 VAC 60 VDC
- CAPACITY OF CONTACTS from 71 to 85	MAX 5A (AC1) 250 VAC
- DEGREE OF REAR PROTECTION	IP 20
- DEGREE OF FRONT PROTECTION	IP 64
- TEMPERATURE RANGE	-10 ÷ +60 °C
- HOUR METER	4 DIGITS
- TACHOMETER	4000 rpm ± 15 rpm
- BATTERY CHARGERS VOLTMETERS	MAX 38 V Precision 5%
- BATTERY CHARGERS AMMETERS	MAX 99 A Precision 5%
- OIL PRESSURE GAUGE, WATER AND OIL THERMOMETERS, AND FUEL LEVEL INSTRUMENTS PRECISION	2%
- SERIAL COMMUNICATION PARAMETERS	9600 baud, 8 bit data, 1 bit stop; EVEN parity
- INSTALLATION CONDITIONS	INSIDE FOR INTERNAL USE
- WEIGHT	850 gr
- DIMENSIONS	L243 x H170 x P62
- HOLE	227X155

ORDERING DATA

TYPE C-12845-485	Code 00242291

ACCESSORIES KIT

KIT MU-C-12845-485	Code 40804523