CONTROL UNIT FOR DIESEL ENGINE
TYPE DCA-120/10

RESERVED TO THE MANUFACTURER

TECHNICAL PROGRAMMING MANUAL

BRIEF INSTRUCTIONS

READ:
- selection of functions on page 5
- when terminal 65 are connected is necessary programming ADJUSTMENT WITH CHARGING ALTERNATOR FREQUENCY (W) see page 6.
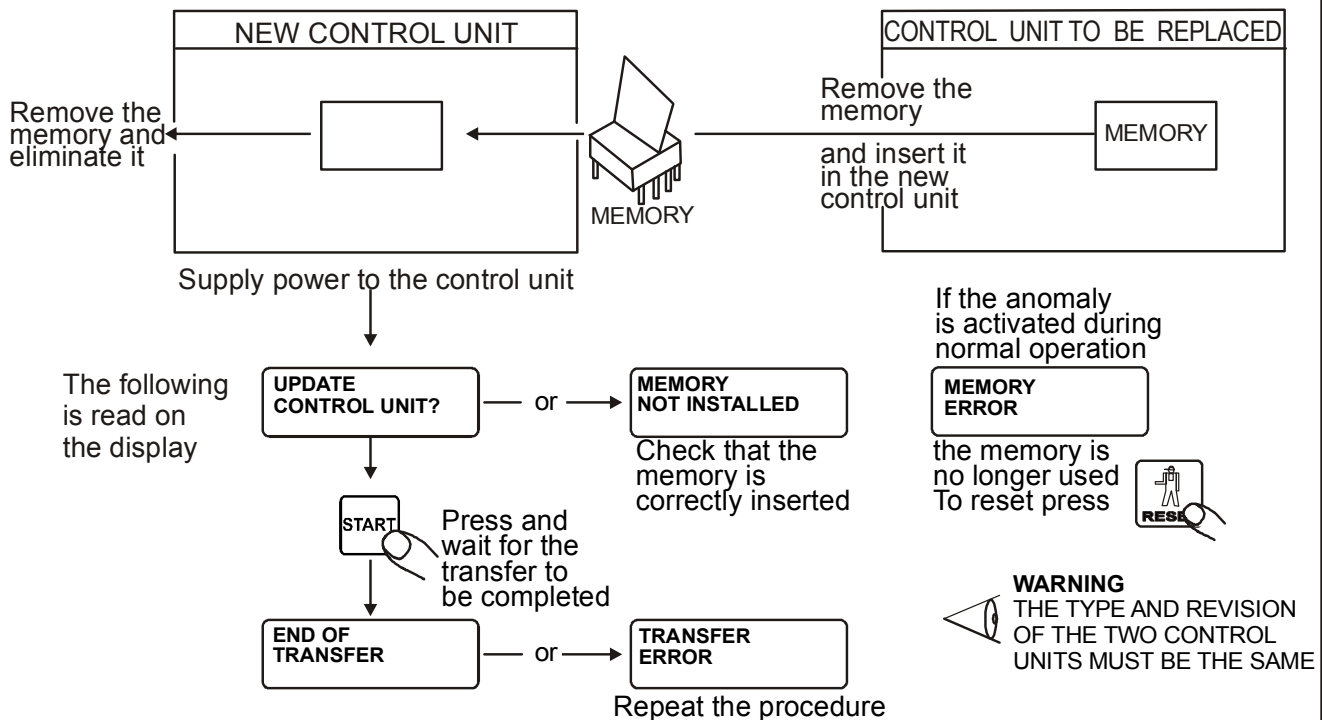
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PARMA   ITALY
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REPLACING OF CONTROL UNIT

Before replacing the control unit we recommend transferring all the programming to the new control unit, **if this is not carried out**, the new control unit will operate with the factory-set programming.

PROCEDURE TO BE CARRIED OUT WITH ENGINE STOPPED AND CONTROL UNIT **NOT** SUPPLIED WITH POWER

NEW CONTROL UNIT		CONTROL UNIT TO BE REPLACED

Remove the memory and eliminate it

MEMORY

Remove the memory and insert it in the new control unit

MEMORY

Supply power to the control unit

The following is read on the display

UPDATE CONTROL UNIT? — or → **MEMORY NOT INSTALLED**

Check that the memory is correctly inserted

If the anomaly is activated during normal operation

MEMORY ERROR

the memory is no longer used To reset press

RESET

START Press and wait for the transfer to be completed

END OF TRANSFER — or → **TRANSFER ERROR**

Repeat the procedure

WARNING
THE TYPE AND REVISION OF THE TWO CONTROL UNITS MUST BE THE SAME

TRANSFER OF PROGRAMMING OPERATIONS

It is possible to transfer the programming operations of a standard control unit onto several memories. We advise you not to exceed fifty transfers.

Example:

A	B	C	D

STANDARD CONTROL UNIT **A**

├── CONTROL UNITS **B** - **C** - **D** TO BE UPDATED ──┤
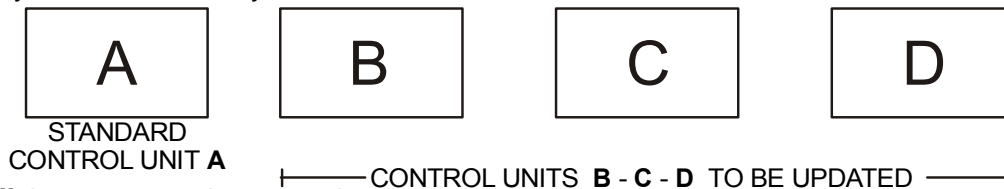
Switch off the power to the control units.

2. Remove the memory from the control unit A.
3. Remove the memory from the control unit B.
4. Insert the memory B in the control unit A.
5. Supply power to the the control unit A.
6. The following is read "UPDATE CONTROL UNIT?".
7. Press the STOP button.
8. The following is read: "SAVE DATA TO MEMORY?".
9. Press the START button.
10. The following is read: "END OF TRANSFER".

11. Switch off the power to the control unit A.
12. Remove the memory B from control unit A.
13. Insert the memory B in the control unit B.
14. Supply power to the the control unit B.
15. The following is read: "UPDATE CONTROL UNIT?".
16. Press the START button.
17. The following is read: "END OF TRANSFER".

18. Repeat from point 3 for memories C and D.

RESTORATION OF FACTORY PROGRAMMING OPERATION OF THE PROGRAMMING OPERATIONS: ENGINE AND PROGRAMMABLE TIMES

Disconnect the battery power supply to the control unit (we suggest opening the protection fuse).

Supply power to the control unit again, press at the same time (within 8 sec) the three keys, wait until STANDARD PROGRAMMING is written on the display.
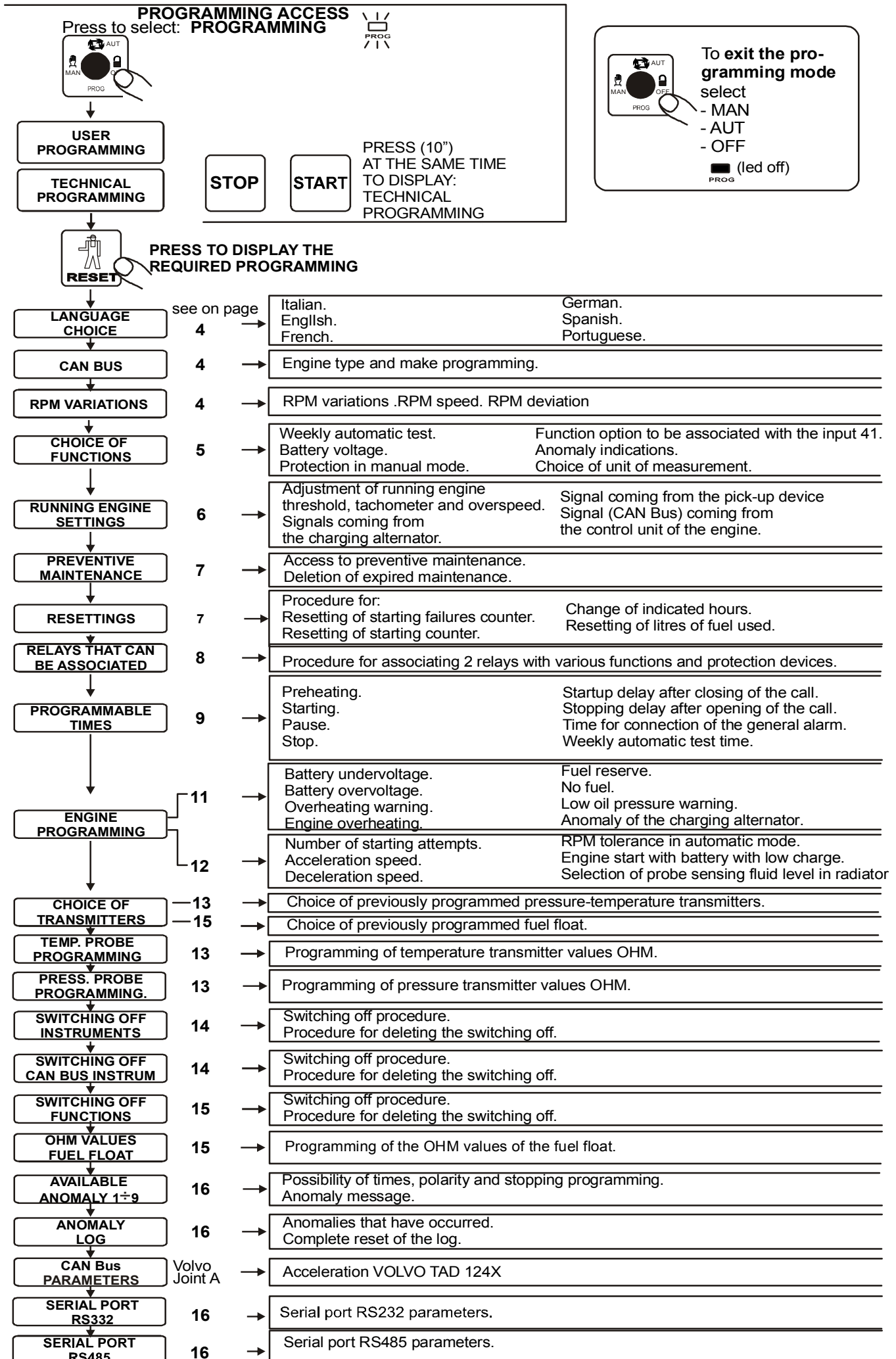
STOP | RESET | ←

CONTROL UNIT STAND BY

After 30 seconds of inactivity, the control unit enters STAND BY state, switching off completely all the signalling (led and display).
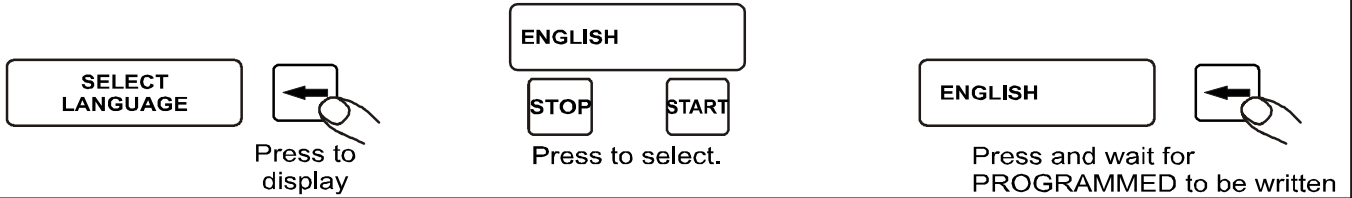To exit STAND BY state press one of the buttons.

PROGRAMMING ACCESS
Press to select: **PROGRAMMING**

To **exit the programming mode** select
- MAN
- AUT
- OFF

■ (led off)
PROG

USER PROGRAMMING

TECHNICAL PROGRAMMING

STOP **START** PRESS (10")
AT THE SAME TIME
TO DISPLAY:
TECHNICAL
PROGRAMMING

PRESS TO DISPLAY THE REQUIRED PROGRAMMING
RESET

Menu	see on page	Description
LANGUAGE CHOICE	4	Italian. / English. / French. / German. / Spanish. / Portuguese.
CAN BUS	4	Engine type and make programming.
RPM VARIATIONS	4	RPM variations .RPM speed. RPM deviation
CHOICE OF FUNCTIONS	5	Weekly automatic test. / Battery voltage. / Protection in manual mode. / Function option to be associated with the input 41. / Anomaly indications. / Choice of unit of measurement.
RUNNING ENGINE SETTINGS	6	Adjustment of running engine threshold, tachometer and overspeed. / Signals coming from the charging alternator. / Signal coming from the pick-up device / Signal (CAN Bus) coming from the control unit of the engine.
PREVENTIVE MAINTENANCE	7	Access to preventive maintenance. / Deletion of expired maintenance.
RESETTINGS	7	Procedure for: / Resetting of starting failures counter. / Resetting of starting counter. / Change of indicated hours. / Resetting of litres of fuel used.
RELAYS THAT CAN BE ASSOCIATED	8	Procedure for associating 2 relays with various functions and protection devices.
PROGRAMMABLE TIMES	9	Preheating. / Starting. / Pause. / Stop. / Startup delay after closing of the call. / Stopping delay after opening of the call. / Time for connection of the general alarm. / Weekly automatic test time.
ENGINE PROGRAMMING	11	Battery undervoltage. / Battery overvoltage. / Overheating warning. / Engine overheating. / Fuel reserve. / No fuel. / Low oil pressure warning. / Anomaly of the charging alternator.
	12	Number of starting attempts. / Acceleration speed. / Deceleration speed. / RPM tolerance in automatic mode. / Engine start with battery with low charge. / Selection of probe sensing fluid level in radiator
CHOICE OF TRANSMITTERS	13	Choice of previously programmed pressure-temperature transmitters.
	15	Choice of previously programmed fuel float.
TEMP. PROBE PROGRAMMING	13	Programming of temperature transmitter values OHM.
PRESS. PROBE PROGRAMMING.	13	Programming of pressure transmitter values OHM.
SWITCHING OFF INSTRUMENTS	14	Switching off procedure. / Procedure for deleting the switching off.
SWITCHING OFF CAN BUS INSTRUM	14	Switching off procedure. / Procedure for deleting the switching off.
SWITCHING OFF FUNCTIONS	15	Switching off procedure. / Procedure for deleting the switching off.
OHM VALUES FUEL FLOAT	15	Programming of the OHM values of the fuel float.
AVAILABLE ANOMALY 1÷9	16	Possibility of times, polarity and stopping programming. / Anomaly message.
ANOMALY LOG	16	Anomalies that have occurred. / Complete reset of the log.
CAN Bus PARAMETERS	Volvo Joint A	Acceleration VOLVO TAD 124X
SERIAL PORT RS332	16	Serial port RS232 parameters.
SERIAL PORT RS485	16	Serial port RS485 parameters.

LANGUAGE CHOICE

LANGUAGE SELECTION. The language set up in the factory is ITALIAN; the languages that can be selected are: ENGLISH - FRENCH - GERMAN - SPANISH and PORTUGUESE.
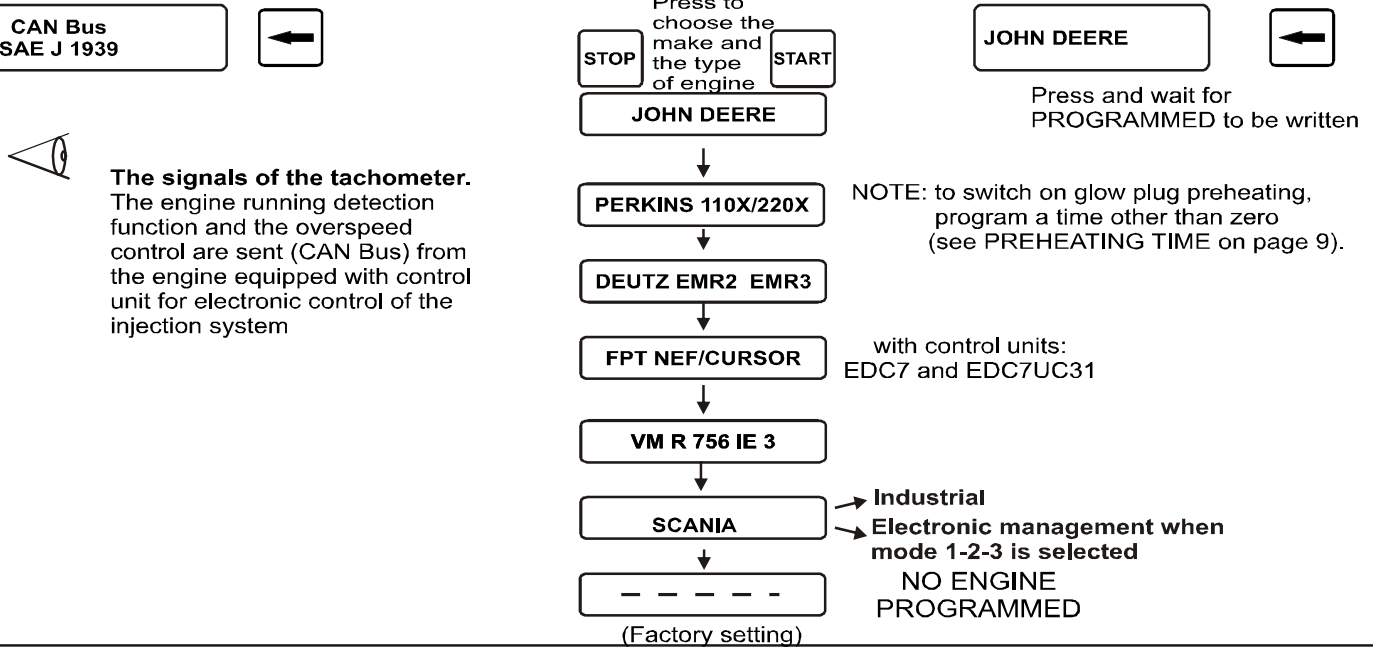
| SELECT LANGUAGE | ← Press to display | ENGLISH / STOP START — Press to select. | ENGLISH | ← Press and wait for PROGRAMMED to be written |

CAN Bus

ENGINE TYPE AND MAKE PROGRAMMING OPERATIONS
Protocol CAN Bus SAE J1939

CHOICE OF MAKE AND TYPE OF ENGINE equipped with control unit for electronic control of the injection system.

CAN Bus SAE J 1939   ←

The signals of the tachometer.
The engine running detection function and the overspeed control are sent (CAN Bus) from the engine equipped with control unit for electronic control of the injection system

Press to choose the make and the type of engine
STOP   START

JOHN DEERE
↓
PERKINS 110X/220X
↓
DEUTZ EMR2 EMR3
↓
FPT NEF/CURSOR
↓
VM R 756 IE 3
↓
SCANIA
↓
– – – – –
(Factory setting)

→ Industrial
→ Electronic management when mode 1-2-3 is selected
NO ENGINE PROGRAMMED

JOHN DEERE   ←
Press and wait for PROGRAMMED to be written

NOTE: to switch on glow plug preheating, program a time other than zero (see PREHEATING TIME on page 9).

with control units:
EDC7 and EDC7UC31

RPM VARIATIONS:
RELAYS acceleration and deceleration of the engine are managed by the relays present in DCA-120/10
SPEED 123 function active only in SCANIA electronic engines, allows the speed of the engine to be changed by pressing the hare and tortoise buttons.
SETPOINT function active only in SCANIA engines, on pressing the hare button the RPM reach the SETPOINT value. See description on page 3 of the user manual.

| RPM VARIATIONS | ← Press to display | RELAYS / SPEED 123 / SETPOINT — STOP START — Press to choose | RELAY | ← Press and wait for PROGRAMMED to be written |
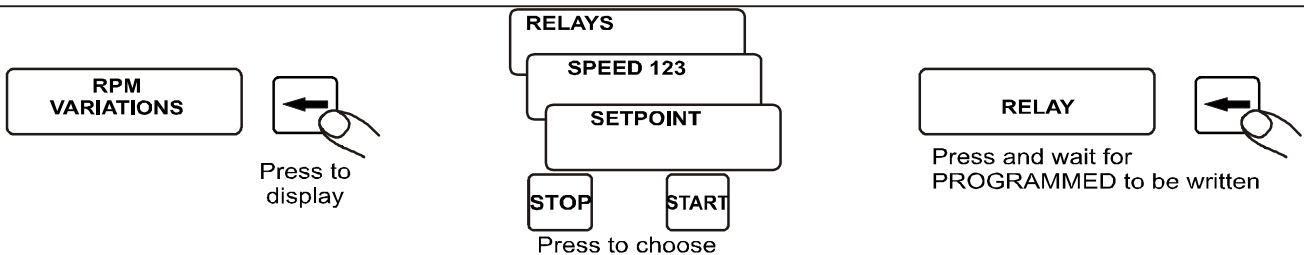
RPM SPEED: active only in SCANIA engines, it is the range of revs the engine goes to in SETPOINT mode.

| REGIME RPM | ← Press to display | 1500 RPM / 1800 RPM — STOP START — Press to choose | Factory setting / 1500 RPM | ← Press and wait for PROGRAMMED to be written |
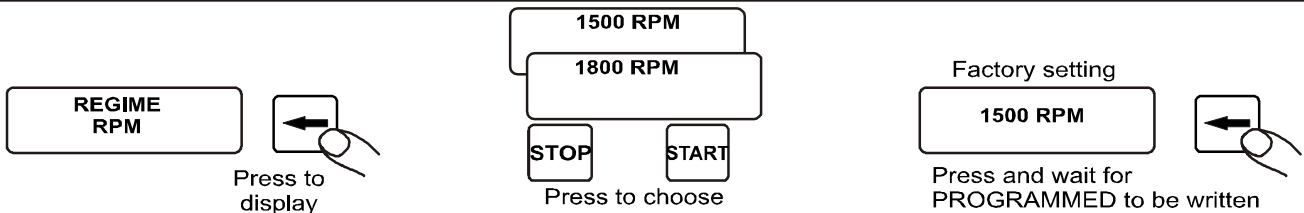
RPM DEVIATION: active only in SCANIA engines, it can range from -120 to + 120 RPM, by default the setting is 0 RPM. This is the value that is added to or subtracted from the RPM speed, for example if 68 RPM is set and the RPM speed is 1800 RPM, the engine will go to 1868 RPM.

| RPM DEVIATION | ← Press to display | 0 RPM — STOP START — Press to choose | Factory setting / 0 RPM | ← Press and wait for PROGRAMMED to be written |
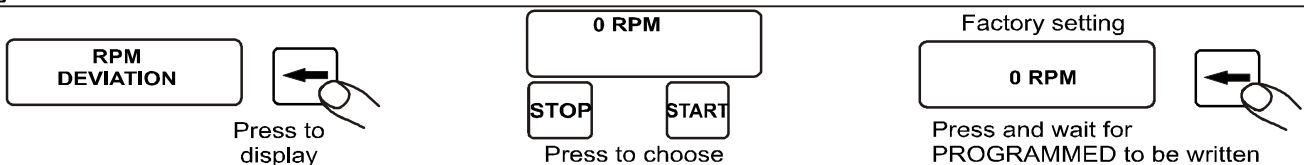
◁⚞ READ BEFORE USING THE CONTROL UNIT

CHOICE OF FUNCTIONS

WITH STOPPING SYSTEM "ENERGIZED IN STOP MODE" consult our technical office.

| STOPPING SYSTEMS | ← Press to display | ENERGIZED IN STOP MODE / ENERGIZED IN RUN MODE
STOP START
Press to choose | Factory setting
ENERGIZED IN RUN MODE | ←
Press and wait for PROGRAMMED to be written |

WEEKLY AUTOMATIC TEST. When **WEEKLY AUTOMATIC TEST ON** programming has been completed, with control unit in automatic mode, the engine carries out immediately the test cycle.

| WEEKLY AUTOMATIC TEST | ← Press to display | ENGAGED / OFF
STOP START
Press to choose | Factory setting
OFF | ←
Press and wait for PROGRAMMED to be written |

| BATTERY VOLTAGE | ← Press to display | 24 V / 12 V
STOP START
Press to choose | Factory setting
12 V | ←
Press and wait for PROGRAMMED to be writtenMATO |

| PROTECTIONS IN MANUAL | ← Press to display | WITHOUT STOP / WITH STOP
STOP START
Press to choose | Factory setting
WITH STOP | ←
Press and wait for PROGRAMMED to be written |

FUNCTION OPTION TO BE ASSOCIATED WITH THE INPUT 41
Input 41 can be used in two ways:
1) Fully programmable **protection input available** (times, polarities, possibility of stopping and message regarding the anomaly)
   or
2) **Inhibition of control unit protection** devices when the input is connected to ground, all the protection devices of the control unit are switched off. No switching off is possible for: OVERSPEED and EMERGENCY.

| INPUT 41 | ← Press to display | INHIBITION OF PROTECTIONS / PROTECTION AVAILABLE
STOP START
Press to choose | Factory setting
PROTECTION AVAILABLE | ←
Press and wait for PROGRAMMED to be written |

| INDICATION OF ANOMALIES | ← Press to display | NUMERIC CODE / WRITTEN INDICATION
STOP START
Press to choose | Factory setting
WRITTEN INDICATION | ←
Press and wait for PROGRAMMED to be written |

CHOICE OF UNIT OF MEASUREMENT. It is possible to select the units of measurement Kpa - °F - BAR -°C.

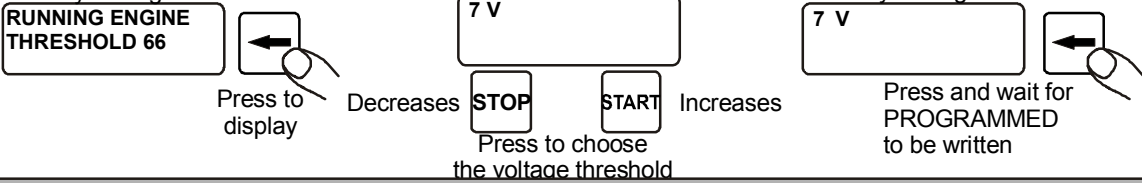| CHOICE OF UNIT OF MEASUREMENT | ← Press to display | Kpa ← / °F
STOP START
Press when the arrow is next to the unit of measurement to be modified. | Factory setting
BAR °C | ←
Press and wait for PROGRAMMED to be written |

RUNNING ENGINE THRESHOLD, TACHOMETER AND OVERSPEED ADJUSTMENTS

SIGNALS COMING FROM THE CHARGING ALTERNATOR

Adjustment with control unit connected to D+ (control unit terminal 66) of the pre-excitation alternator.

RUNNING ENGINE THRESHOLD ADJUSTMENT
Normally no adjustment needs to be carried out, but if it is necessary to carry it out: **stop the engine.**
Choose the threshold voltage coming from the charging alternator (terminal D+)
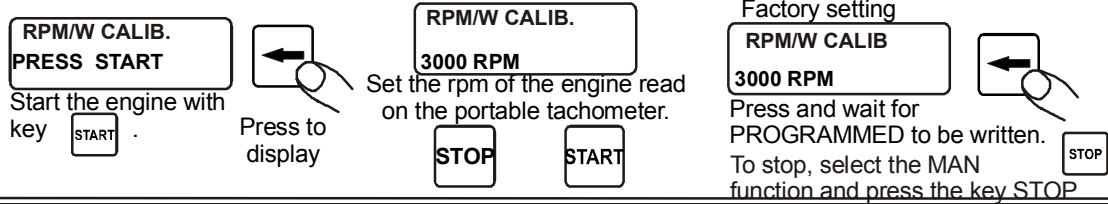Adjustment field 3÷12 (12V) 6÷24 (24V)
Factory setting 7V 14V

| RUNNING ENGINE THRESHOLD 66 |

Press to display

Decreases **STOP** | 7 V | **START** Increases

Press to choose the voltage threshold

Factory setting
| 7 V |

Press and wait for PROGRAMMED to be written

ADJUSTMENTS WITH CHARGING ALTERNATOR FREQUENCY (W)

Adjustment with control unit connected to W (control unit terminal 65) of the pre-excitation alternator or to the yellow wire of the permanent magnet alternator.

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

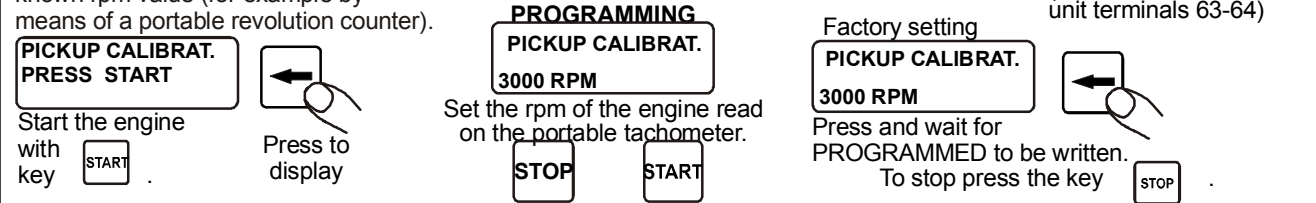NECESSARY PROGRAMMING (With connected control unit terminal 65)

| RPM/W CALIB. PRESS START |

Start the engine with key [START] .

Press to display

| RPM/W CALIB. 3000 RPM |

Set the rpm of the engine read on the portable tachometer.

STOP **START**

Factory setting
| RPM/W CALIB 3000 RPM |

Press and wait for PROGRAMMED to be written.
To stop, select the MAN function and press the key STOP

[STOP]

SIGNALS COMING FROM THE PICK-UP MAGNETIC TRANSDUCER (control unit terminals 63 and 64)
do not connect terminal 65 with this signal.

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

NECESSARY PROGRAMMING (With connected control unit terminals 63-64)

| PICKUP CALIBRAT. PRESS START |

Start the engine with key [START] .

Press to display

PROGRAMMING
| PICKUP CALIBRAT. 3000 RPM |

Set the rpm of the engine read on the portable tachometer.

STOP **START**

Factory setting
| PICKUP CALIBRAT. 3000 RPM |

Press and wait for PROGRAMMED to be written.
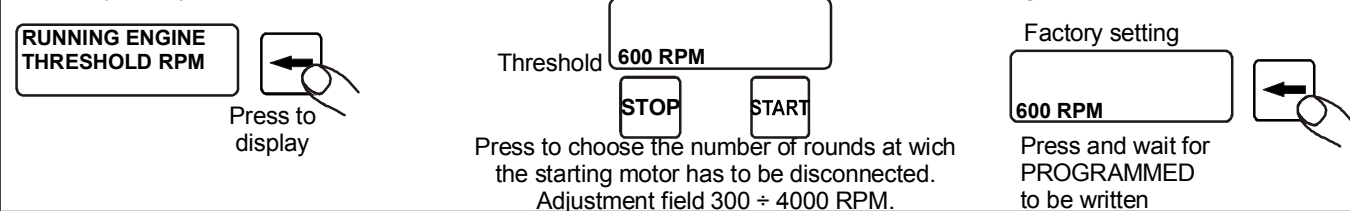To stop press the key [STOP] .

ENGINE RUNNING, OVERSPEED AND UNDERSPEED
With signals coming from W of the charging alternator (control unit terminal 65)
PICK-UP (control unit terminals 63 - 64)
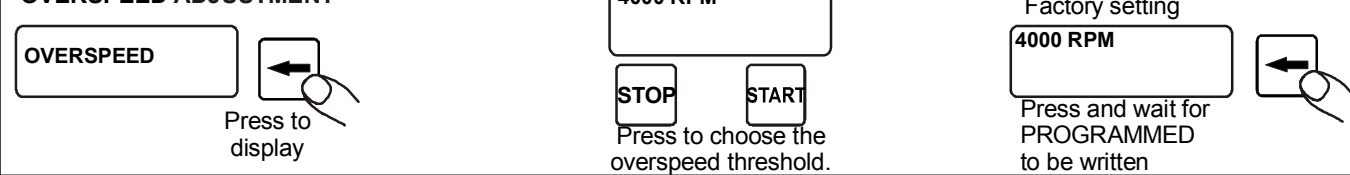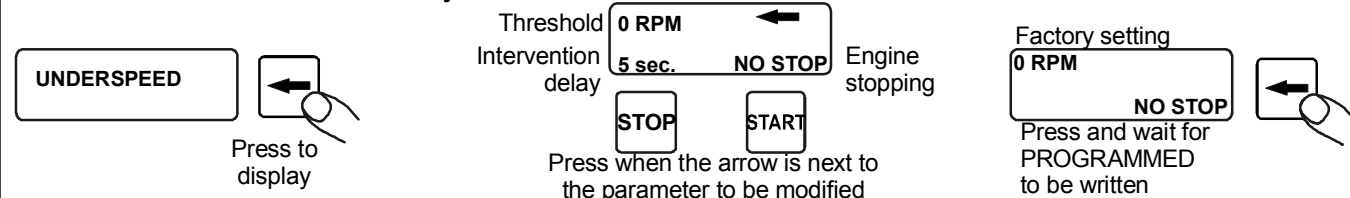
RUNNING ENGINE THRESHOLD ADJUSTMENT before carry out the tachometer adjustment
Normally no adjustment needs to be carried out, but if it is necessary to carry it out: **stop the engine.**

| RUNNING ENGINE THRESHOLD RPM |

Press to display

Threshold | 600 RPM |

STOP **START**

Press to choose the number of rounds at wich the starting motor has to be disconnected.
Adjustment field 300 ÷ 4000 RPM.

Factory setting
| 600 RPM |

Press and wait for PROGRAMMED to be written

OVERSPEED ADJUSTMENT

| OVERSPEED |

Press to display

| 4000 RPM |

STOP **START**

Press to choose the overspeed threshold.

Factory setting
| 4000 RPM |

Press and wait for PROGRAMMED to be written

UNDERSPEED ADJUSTMENT is factory excluded

| UNDERSPEED |

Press to display

Threshold | 0 RPM |
Intervention delay | 5 sec.   NO STOP | Engine stopping

STOP **START**

Press when the arrow is next to the parameter to be modified

Factory setting
| 0 RPM   NO STOP |

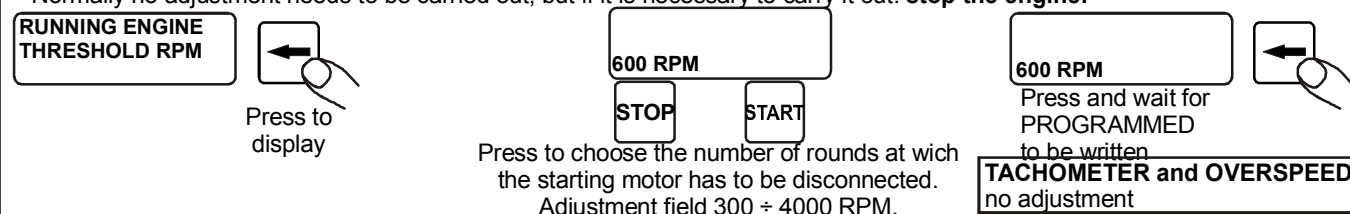Press and wait for PROGRAMMED to be written

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SIGNALS COMING (CAN Bus protocol SAE J1939) FROM THE ENGINE EQUIPPED WITH CONTROL UNIT
FOR THE ELECTRONIC CONTROL OF THE INJECTION SYSTEM.

With this signal do not connect the terminals 63 - 64 - 65.
Running engine threshold adjustment
Normally no adjustment needs to be carried out, but if it is necessary to carry it out: **stop the engine.**

| RUNNING ENGINE THRESHOLD RPM |

Press to display

| 600 RPM |

STOP **START**

Press to choose the number of rounds at wich the starting motor has to be disconnected.
Adjustment field 300 ÷ 4000 RPM.

| 600 RPM |

Press and wait for PROGRAMMED to be written

TACHOMETER and OVERSPEED
no adjustment

PREVENTIVE MAINTENANCE

The control panel manages three fixed-time indications and one cyclical. The indication numbers 1, 2 and 3 are of prefixed time and trigger only once, when the hour-meter reaches the programmed value. The indication number 4 is cyclical and triggers after the programmed hours and their integer multiples. Request for maintenance is indicated by: he flashing of the hour-meter, the intermittent lighting of the yellow warning light 🔧 and the message on the display.

Example 1: Indication 4 is programmed at 100. The indication triggers after 100, 200, 300, 400 ... hours
Example 2: Indication 1 is programmed at 100. The indication triggers at 100 hours, and does not trigger again. The factory value for all indications is zero. The maintenance operations are programmed by the engine manufacturer during testing. The maximum value is 59999 hours.

ACCESS TO THE PREVENTIVE MAINTENANCE PROGRAMMING

example

zero hours preventive maintenance not activated

PREVENTIVE MAINTENANCE N. 1	← Press to display
500h ➡ NO STOP	Decreases **STOP** **START** Increases
← Press again to change the maintenance number 1 - 2 -3 -4 (cyclical)	Press when the arrow is next to the value to be increased

| 500h NO STOP | ← Press and wait for PROGRAMMED to be written |

STOP, when maintenance has expired it stops the engine, enables the general alarm and prevents further startups. **NO STOP**, enables the general alarm for 10 seconds.

The expired maintenances are considered anomalies

anomalies codes		
ALARM	preventive maintenance	
111		N. 1
112		N. 2
113		N. 3
114		N. 4

EXPIRED MAINTENANCES DELETING

| MAINTENANCES NOT EXPIRED DELETE MAINTENANCE 1? | ← Press to display |
| | ← Press again to change the number of the expired maintenance operation |

| DELETE MAINTENANCE 1? | |
| **STOP** **START** | To delete press simultaneously and wait for PROGRAMMED to be written |

The warning light 🔧 switches off when all the expired maintenances have been deleted.

RESETTINGS AND CHANGE

RESETING OF STARTING FAILURES COUNTER

| RESET STARTING FAILURES? | ← Press to display |

| RESET STARTING FAILURES? | |
| **STOP** **START** | To reset press simultaneously and wait for PROGRAMMED to be written |

RESETTING OF STARTING COUNTER

| RESET STARTUP COUNTER? | ← Press to display |

| RESET STARTUP COUNTER? | |
| **STOP** **START** | To reset press simultaneously and wait for PROGRAMMED to be written |

CHANGE OF INDICATED HOURS. When you change the value of the hour meter the preventive maintenance programming must be done again.

VARIAZIONE CONTAORE	← Press to display the hours to be changed
1 2 3 4 5h ← **STOP** **START**	Press to change the hours
1 2 3 4 5h	← Press and wait for PROGRAMMED to be written

RESETTING OF LITRES OF FUEL USED

| RESET FUEL LITRES? | ← Press to display |

| RESET FUEL LITRES? | |
| **STOP** **START** | To reset press simultaneously and wait for PROGRAMMED to be written |

RESETTING ANOMALY CAN BUS. Valid only with CAN-BUS connection. The faults stored in the engine control unit are restored through this command. Not all engine control units support this command, and therefore the actual operation of this function is not guaranteed.

| RESET ANOMALY CAN BUS? | ← Press to display |

| RESET ANOMALY CAN BUS? | |
| **STOP** **START** | To reset press simultaneously and wait for PROGRAMMED to be written |

RELAYS THAT CAN BE ASSOCIATED

It is possible to associate a relay with each of the protection devices listed in the basic table or with the functions included in this list:

DESCRIPTION OF DISPLAY	MEANING
• WEEKLY AUTOMATIC TEST	Weekly test in progress
• DAILY START TIMER	Starting by timer
• CALL	Starting on closing of the call contact
• STARTING WITH GSM	Starting with GSM telephone
• MANUAL STARTING	Manual starting
• MODE AUT • MODE MAN • MODE OFF	Function selected
• STOP	Stopping in progress
• RUNNING ENGINE	The engine has started

PREVENTIVE
 	
MAINTENANCE N. 1
          "   2
          "   3
          "   4
	Expired maintenances

OUTPUTS THAT CAN BE ASSOCIATED

Capacity of contacts
1A 50VDC 25VAC
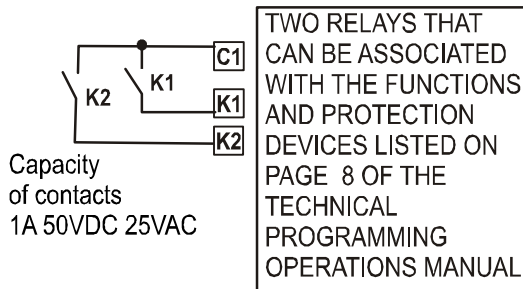
TWO RELAYS THAT CAN BE ASSOCIATED WITH THE FUNCTIONS AND PROTECTION DEVICES LISTED ON PAGE 8 OF THE TECHNICAL PROGRAMMING OPERATIONS MANUAL

PROGRAMMING

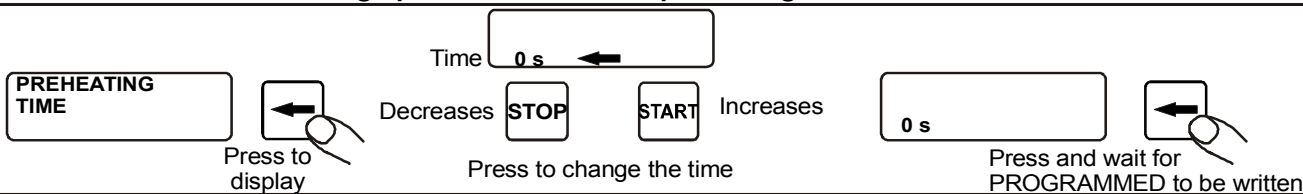**PROGRAMMING OF 2 RELAYS.** The 2 relays are energized when the corresponding fault or the selected function is detected
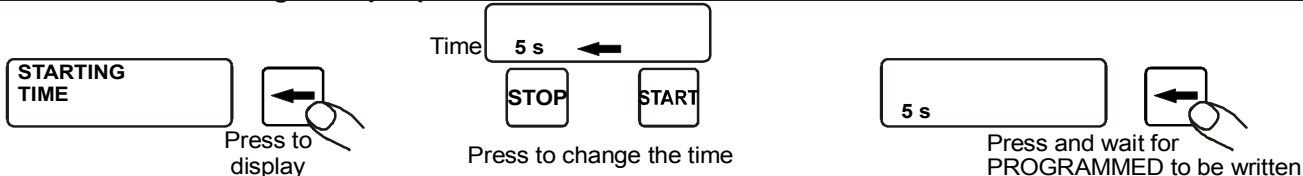
Example

OVERHEATING WARNING

Press to display

RELAY K-

Decreases **STOP**   **START** Increases

Press to choose the relay to be associated

RELAY K 1

Press and wait for PROGRAMMED to be written
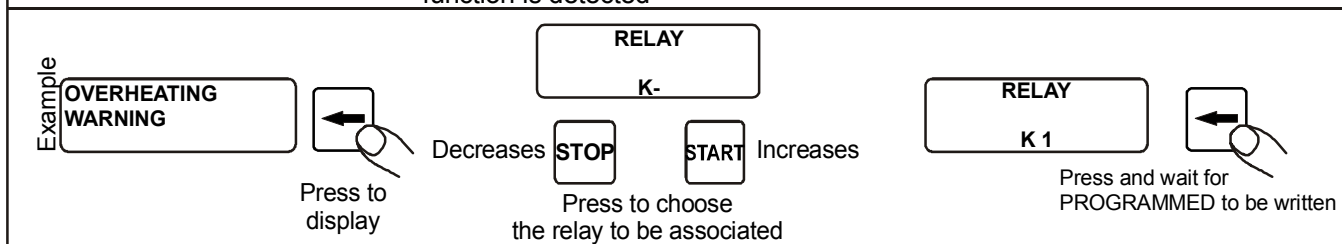
PROGRAMMABLE TIMES

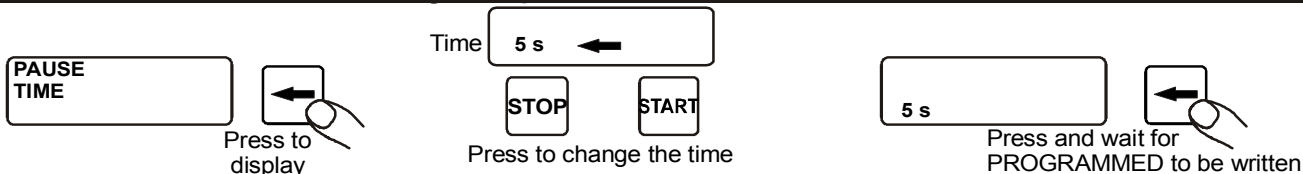| DESCRIPTION	SECONDS	
	ADJUSTMENT FIELD	FACTORY SETTING
PREHEATING TIME - Preheating operation time	0÷60	0 (preheating off)
STARTING TIME Starting attempt operation time	5÷25	5
PAUSE TIME Pause between starting attempts	1÷20	5
STOPPING TIME - Stopping system operation time after the running engine signal has disappeared	1÷55	20
STARTUP DELAY AFTER CLOSING OF CALL - On closing the call contact and when the delay time is up, the start up begins	1÷600	1
STOPPING DELAY AFTER OPENING OF CALL - On opening the call contact and when the delay time is up, the engine stops	1÷600	1
GENERAL ALARM INSERTION TIME - Number 350 means continual operation without time limits	10÷350	350 (continual operation)
ENGINE HEATING TIME - Engine acceleration time	0÷300 (zero operation excluded)	180
RNGINE COOLING TIME - Engine deceleration time.	0÷300 (zero operation excluded)	180
WEEKLY AUTOTEST TIME - When the test time is up, the engine stops	1÷60 minutes	3 minutes

PROGRAMMABLE TIMES

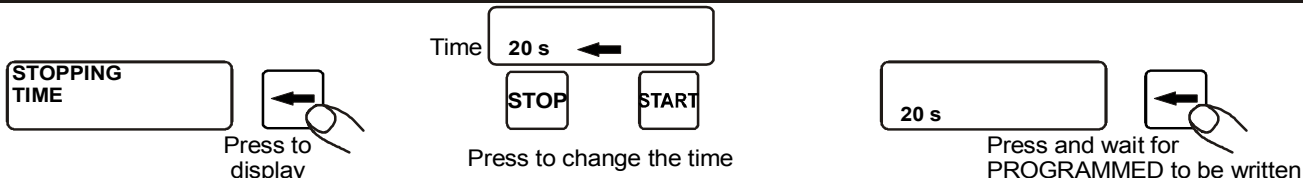## PREHEATING TIME. Preheating operation time. 0 sec. preheating off.

| PREHEATING TIME | ← Press to display | Time [0 s ←] Decreases STOP START Increases Press to change the time | [0 s] | ← Press and wait for PROGRAMMED to be written |

STARTING TIME. Starting attempt operation time.

| STARTING TIME | ← Press to display | Time [5 s ←] STOP START Press to change the time | [5 s] | ← Press and wait for PROGRAMMED to be written |

PAUSE TIME. Pause between starting attempts

| PAUSE TIME | ← Press to display | Time [5 s ←] STOP START Press to change the time | [5 s] | ← Press and wait for PROGRAMMED to be written |

STOPPING TIME. Stopping system operation time after the running engine signal has disappeared.

| STOPPING TIME | ← Press to display | Time [20 s ←] STOP START Press to change the time | [20 s] | ← Press and wait for PROGRAMMED to be written |

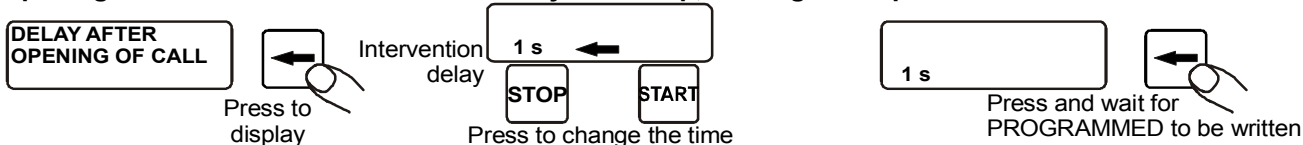## STARTUP DELAY AFTER CLOSING OF CALL.
On closing the call contact and when the delay time is up, the start up begins.

| STARTUP DELAY AFTER CALL | ← Press to display | Intervention delay [1 s ←] STOP START Press to change the time | [1 s] | ← Press and wait for PROGRAMMED to be written |

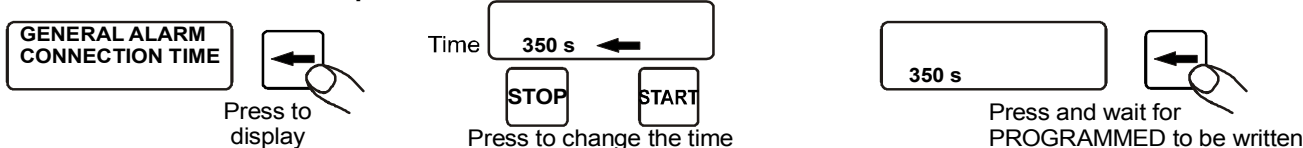## STOPPING DELAY AFTER OPENING OF CALL.
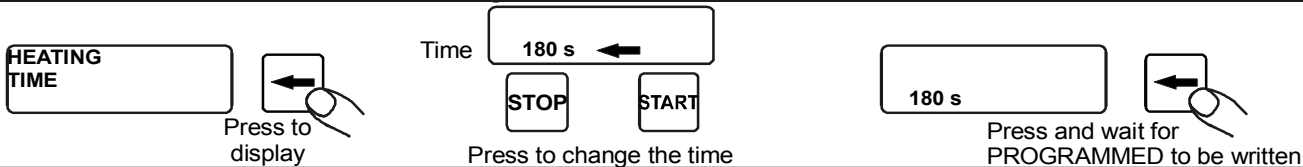## On opening the call contact and when the delay time is up, the engine stops.

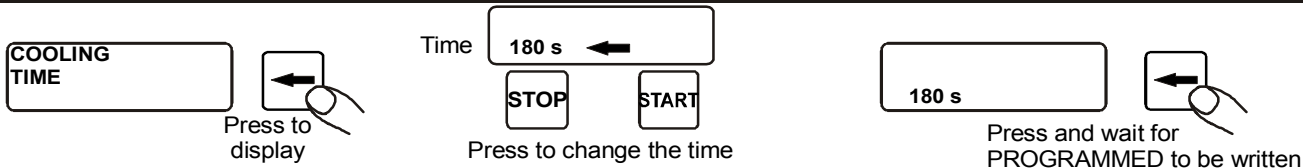| DELAY AFTER OPENING OF CALL | ← Press to display | Intervention delay [1 s ←] STOP START Press to change the time | [1 s] | ← Press and wait for PROGRAMMED to be written |

GENERAL ALARM CONNECTION TIME.
Number 350 means continual operation without time limits.

| GENERAL ALARM CONNECTION TIME | ← Press to display | Time [350 s ←] STOP START Press to change the time | [350 s] | ← Press and wait for PROGRAMMED to be written |

ENGINE HEATING TIME. After start the engine remains decelerated for this time.

| HEATING TIME | ← Press to display | Time [180 s ←] STOP START Press to change the time | [180 s] | ← Press and wait for PROGRAMMED to be written |

ENGINE COOLING TIME. The engine is decelerated for this time before stopping.

| COOLING TIME | ← Press to display | Time [180 s ←] STOP START Press to change the time | [180 s] | ← Press and wait for PROGRAMMED to be written |

WEEKLY AUTOTEST TIME. When the test time is up, the engine stops.

| WEEKLY AUTOTEST TIME | ← Press to display | Time [3 min ←] STOP START Press to change the time | [3 min] | ← Press and wait for PROGRAMMED to be written |
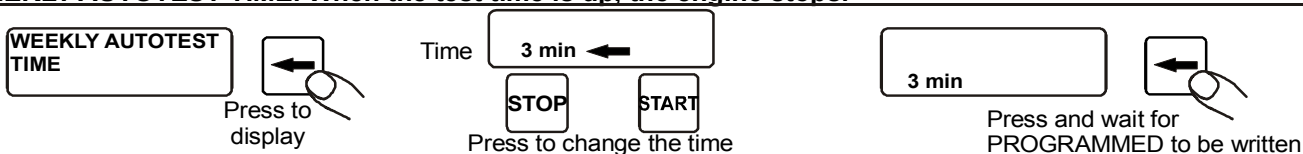
BASIC TABLE
PROGRAMMING

ANOMALY CODE (ALARM)	ENGINE FUNCTIONS AND PROTECTIONS (DISPLAY INFORMATION)	INSTANT OF ACTIVATION (SECONDS)	THRESHOLDS ADJUSTMENT FIELD	THRESHOLDS FACTORY SETTING	INTERVENTION DELAY ADJUSTMENT RANGE	INTERVENTION DELAY FACTORY SETTING (SECONDS)	STORES THE FUNCTION	STOP PROGRAMMABLE	STOP FACTORY SETTING	INTERVENTION OCCURS WHEN:
120	BATTERY UNDER-VOLTAGE	ALWAYS ACTIVE	8÷12(12V) 16÷24(24V)	11 (12V) 22 (24V)	1÷5	2	YES	DOES NOT STOP		Battery voltage remains lower than the programmed threshold for the whole of the intervention delay time.
121	BATTERY OVER-VOLTAGE	"	12÷18(12V) 24÷36(24V)	16 (12V) 32 (24V)	=	5	YES	YES	WITHOUT STOP	Battery voltage exceeds the programmed threshold for the whole of the intervention time.
123	OVER-HEATING WARNING	"	90÷140°C	95°C	=	=	YES	WITHOUT STOP		The temperature detected by the transmitter exceeds the set threshold.
124	ENGINE OVER-HEATING	"	90÷140°C	100°C	=	=	YES	STOPS		
125	OVER-HEATING DETECTED BY THERMO-STATIC SWITCH	WITH RUNNING ENGINE			=	=	YES	STOP		The temperature exceeds the threshold set by the thermostatic switch. No programming is possible.
129	FUEL RESERVE	ALWAYS ACTIVE	0÷99%	10%	1÷5	1	NOT	ALWAYS ACTIVE		The fuel level remains lower than the threshold for the whole of the intervention delay time.
130	NO FUEL	"	0÷99%	1%	1÷20	3	YES	YES	WITH STOP	
131	LOW OIL PRESSURE WARNING	10 AFTER DETECTION OF RUNNING ENGINE	0÷6bar	0,5 bar	1÷5	1	YES	NOT	DOES NOT STOP	The pressure detected by the transmitter remains lower than the programmed threshold for the whole of the intervention delay time.
132	LOW OIL PRESSURE	10 AFTER DETECTION OF RUNNING ENGINE	=	=	=	IMMEDIATE	YES	NOT	STOP	The pressure is lower than the threshold set by the pressure switch. (No programming is possible).
133	STOPPING FAILURE	AFTER THE STOP COMMAND	=	=	=	60	YES			See description on page 4 of the instructions and user manual. (No programming is possible).
135	LOW COOLANT LEVEL	ALWAYS ACTIVE	=	=	=	5	YES	STOPS		The cooling liquid falls below the electrode and the intervention delay time has elapsed. (No programming is possible).
136	CHARGING ALTERNATOR FAULT (belt breakage)	10 AFTER DETECTION OF RUNNING ENGINE	=	=	=	3	YES	YES	WITHOUT STOP	Alternator does not recharge the battery and the intervention delay time has elapsed.
137	NUMBER OF STARTING ATTEMPTS (STARTING FAILURE)	ALWAYS ACTIVE	1÷10 STARTINGS	4 STARTINGS	=	=	YES	STOP		See description on page 3 of the instruction and user manual.
138	ENGINE START IN CASE OF LOW BATTERY-CHARGE	ALWAYS ACTIVE	Minimum threshold 12,2÷12,7 24,4÷25,4 / 13,5÷14,5 27÷29 Maximum threshold	12,4(12V) 24,8 (24V) / 13,6(12V) 27,2(24V)	900÷7200	1200 (20 minutes)	NOT			The voltage detected at the battery is lower than the minimum threshold (the engine starts). The voltage exceeds the maximum threshold after the intervention delay time (the engine stops).
139	OVER-SPEED	"	1000 ÷ 4000 RPM	4000 RPM	=	2	YES	STOP		The speed exceeds the programmed threshold at least two seconds, stops the engine.
140	INTERRUPTED FUEL FLOAT	"	=	=	=	=	NOT	DOES NOT STOP		The circuit of the fuel float is interrupted (no programming is possible).
144	INTERRUPTED PICK-UP	ALWAYS ACTIVE	=	=	=	=	=	DOES NOT STOP		The circuit of PICK-UP is interrupted. No programming is possible.
145	UNDER-SPEED	10 AFTER THE THRESHOLD IS EXCEEDED	0÷3000 RPM	0 RPM	1÷10	5	YES	YES	DOES NOT STOP	The speed remains lower than the programmed threshold for the whole of the intervention delay time.
146	ANOMALY PICK-UP	"	=	=	=	1	=	DOES NOT STOP		PICK-UP is an anomaly. No programming is possible.
419	EMERGENCY STOP	"	=	=	=	=	=	STOP		The emergency button is pressed. (No programming is possible).
421	AVAILABLE									Available fully programmable anomaly see on page 13.
430	CAN Bus ANOMALY	ALWAYS ACTIVE	=	=	=	=	=	DOES NOT STOP		The DCA-120 does not communicate with the control unit of the engine.
440	MEMORY ERROR	"	=	=	=	=	=	DOES NOT STOP		During the normal operation the memory is no longer used.

BASIC TABLE PROGRAMMING

ANOMALY CODE ALARM	ANOMALY (DISPLAY INFORMATION) ALARM	ENGINE FUNCTIONS AND PROTECTIONS	INSTANT OF ACTIVATION (SECONDS)	THRESHOLDS ADJUSTMENT FIELD	THRESHOLDS FACTORY SETTING	INTERVENTION DELAY ADJUSTMENT RANGE	INTERVENTION DELAY FACTORY SETTING SECONDS	STORES THE FUNCTION	STOP PROGRAMMABLE	STOP FACTORY SETTING	INTERVENTION OCCURS WHEN:
441	MEMORY NOT INSTALLED		ALWAYS ACTIVE	=	=	=	=	=	DOES NOT STOP		The memory is no longer recognized by the control unit.
443	INCORRECT FUEL FLOAT TABLE		"	=	=	=	=	=			Just one value or non-increasing or decreasing values are programmed.
446	OIL PRESS. TABLE NOT CORRECT		"	=	=	=	=	=	DOES NOT STOP		
447	OIL TEMP. TABLE NOT CORRECT		"	=	=	=	=	=			

N. B.: all the programming is to be carried out with the engine off. ANOMALY CODES: ALARM **111-112-113-114** (see on page 8).

With CAN Bus active, anomaly codes **123-124-131** are managed only by the engine control unit (CAN Bus).

ENGINE PROGRAMMING

BATTERY UNDERVOLTAGE. The engine does not stop.

BATTERY OVERVOLTAGE. The protection device is factory-programmed to not stop.
Non-adjustable intervention delay of 5 sec.

PROTECTION ENGAGEMENT DUE TO ENGINE OVERTEMPERATURE
The temperature is sensed by the (TEMPERATURE) TRANSMITTER and is programmable. The protection is adjusted according to two levels: it is engaged when they are exceeded. The alert level is programmed as a warning; the other level is programmed to stop the engine (the overtemperature is sensed by the thermostat which always causes the engine to stop).

ENGINE OVERHEATING WARNING.

OVERHEATING.

FUEL RESERVE. The engine does not stop.
NO FUEL. It is possible to programme the stop; it is factory-programmed to stop.

LOW OIL PRESSURE WARNING. (this is the pressure sensed by the pressure transmitter)
It is programmed as a warning and does not cause the engine to stop. (This is the low pressure sensed by the pressure switch which causes the motor to stop).

ANOMALY OF THE CHARGING ALTERNATOR. It is possible to programme the stop; it is factory-programmed to stop.

ENGINE PROGRAMMING

NUMBER OF STARTUP ATTEMPTS. 10 programmable startup attempts. (Starting failure).

| NUMBER OF STARTUP ATTEMPTS | Press to display | Number of attempts | 4 STOP START | 4 | Press and wait for PROGRAMMED to be written |

Press to choose the number of startup attempts.

Setting of speed of
ACCELERATION AND DECELERATION
The speed variator completes its maximum travel in 60 mm.
It adjusts the engine speed in pulses followed by pauses. Acceleration and deceleration can both be adjusted, the value to set ranges from 1 to 10: 1 - SLOW MODE, 10 - FAST MODE.

WE ADVISE AGAINST
the use of speed variators where PRECISE setting OF THE NUMBER OF REVOLUTIONS is necessary

ACCELERATION SPEED
Starts at the end of **ENGINE HEATING**. Ends when working speed is reached.

| ACCELERATION SPEED | Press to display | MODE 2 STOP START Press to choose | Factory setting 2 | Press and wait for PROGRAMMED to be written |

DECELERATION SPEED
Starts after opening of the CALL. After deceleration has ended E**NGINE COOLING** starts.

| DECELERATION SPEED | Press to display | MODE 5 STOP START Press to choose | Factory setting 5 | Press and wait for PROGRAMMED to be written |

RPM TOLERANCE IN AUTOMATIC MODE. Takes the accelerator back to the chosen working speed with a tolerance of ±50 RPM. Setting field 20÷150 RPM.

| RPM TOLERANCE IN AUTOMATIC | Press to display | Tolerance 50 RPM STOP START Press to choose the number of revolutions | 50 RPM | Press and wait for PROGRAMMED to be written |

CHANGES IN RPM :
it is used to program changes in the rpm by pressing button 🐢 or 🐇
when the MOTOR SPEED 1-2-3 function is enabled. The factory value is 10 rpm.
The range is between 5 and 50 rpm.

| CHANGES IN RPM | Press to display | 10 RPM STOP START Press to choose the number of revolutions | 10 RPM | Press and wait for PROGRAMMED to be written |

ENGINE START WITH BATTERY WITH LOW CHARGE. (With control unit in automatic mode).
Starts or stops the generating set in relation to the voltage detected at the battery terminals.

| START WITH FLAT BATTERY | Press to display | Minimum threshold 12,4 Volt ← 13,6 Maximum threshold Intervention delay 1200 s STOP START Press when the arrow is next to the parameter to be modified | 12,4 Volt 13,6 1200 s | Press and wait for PROGRAMMED to be written |

RADIATOR LIQUID LEVEL PROBE SELECTION

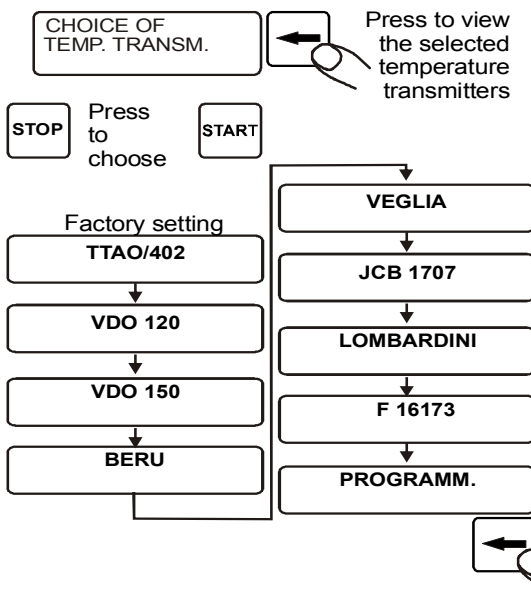| RADIATOR LEVEL PROBE | Press to display | REVERSED OPERATION / NORMAL OPERATION STOP START Press to choose | Factory setting NORMAL OPERATION | Press and wait for PROGRAMMED to be written |

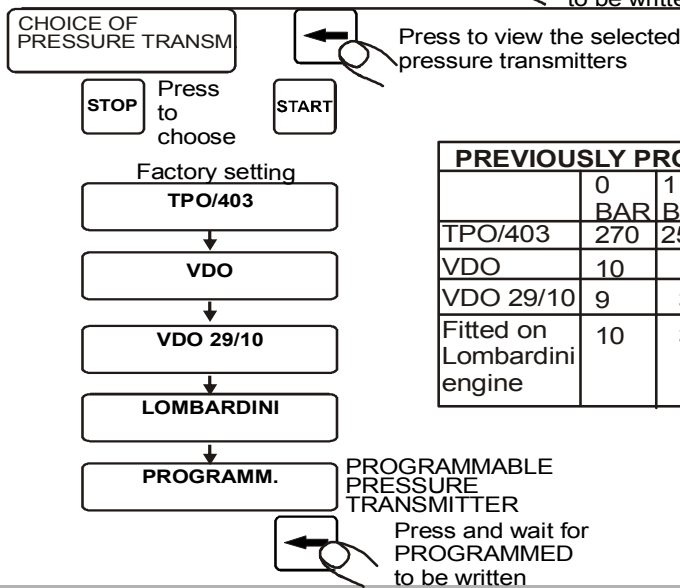## DESCRIPTION

SELECT PROBES	MESSAGE SHOWN ON THE DISPLAY	SELECT PROBES	MESSAGE SHOWN ON THE DISPLAY
RADIATOR CORE IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS **ACTIVE**	REVERSED OPERATION	RADIATOR CORE IN THE ABSENCE OF LIQUID THE CORE SIGNAL IS **REMOVED** THE CONTROL UNIT IS PROGRAMMED FOR NORMAL OPERATION	NORMAL OPERATION

CHOICE OF TEMP. TRANSM.

Press to view the selected temperature transmitters

STOP — Press to choose — START

Factory setting
TTAO/402
VDO 120
VDO 150
BERU

VEGLIA
JCB 1707
LOMBARDINI
F 16173
PROGRAMM.

PROGRAMMABLE TEMPERATURE TRANSMITTER

Press and wait for PROGRAMMED to be written

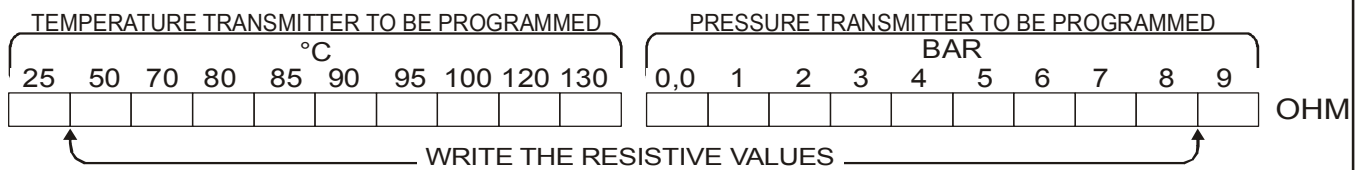| PREVIOUSLY PROGRAMMED TEMPERATURE TRANSMITTERS TABLE										
	25°C	50°C	70°C	80°C	85°C	90°C	95°C	100°C	120°C	130°C
TPO/402	896	365	196	145	127	110	97	85	53	
VDO 120	548	287	95	69	59	51	44	38	22	17
VDO 150	498	323	183	113	96	83	73	62	37	29
BERU		1100	567	395	319	278	227	165		
VEGLIA		708	399	245	210	175	153	130	75	59
JCB 1707	503	200	105	78	67	59	51	45		
Fitted on Lombardini engine	927	322	155	112	96	83	71	62	36	29
F 16173 Fitted on AIFO engines		834	436	322	280	243	213	187	113	89

OHM

CHOICE OF PRESSURE TRANSM

Press to view the selected pressure transmitters

STOP — Press to choose — START

Factory setting
TPO/403
VDO
VDO 29/10
LOMBARDINI
PROGRAMM.

PROGRAMMABLE PRESSURE TRANSMITTER

Press and wait for PROGRAMMED to be written

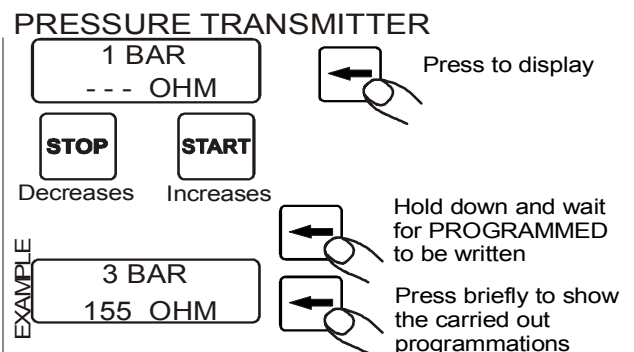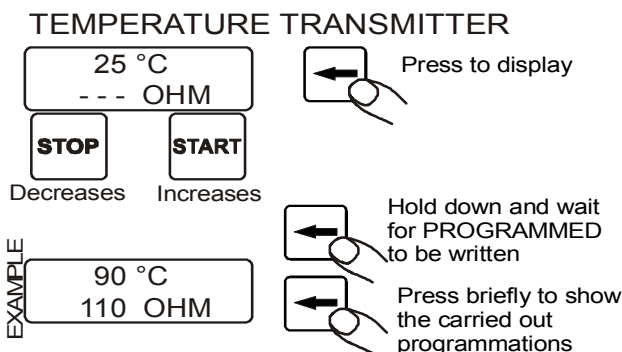| PREVIOUSLY PROGRAMMED PRESSURE TRANSMITTERS TABLE										
	0 BAR	1 BAR	2 BAR	3 BAR	4 BAR	5 BAR	6 BAR	7 BAR	8 BAR	9 BAR
TPO/403	270	251	203	157	114	79	52			
VDO	10		50		85		119		152	
VDO 29/10	9	38	57	77	99	114	134	149	164	180
Fitted on Lombardini engine	10	31	52	71	90	107	124	140	156	170

OHM

TEMPERATURE AND PRESSURE TRANSMITTERS (PROBES) VALUES OHM PROGRAMMING

The control unit is set in the factory for pressure and temperature transmitters type TPO/403 (Pressure) and TTAO/403 (Temperature).
A max. of 10 resistive values can be set corresponding to the characteristic curves of other pressure and temperature transmitters.

PROGRAMMING OF CORRESPONDENCE

TEMPERATURE TRANSMITTER TO BE PROGRAMMED

°C
25 50 70 80 85 90 95 100 120 130

PRESSURE TRANSMITTER TO BE PROGRAMMED

BAR
0,0 1 2 3 4 5 6 7 8 9

OHM

WRITE THE RESISTIVE VALUES

PROGRAMMING

TEMPERATURE TRANSMITTER

25 °C
- - - OHM

STOP — START
Decreases — Increases

Press to display

Hold down and wait for PROGRAMMED to be written

Press briefly to show the carried out programmations

EXAMPLE
90 °C
110 OHM

PRESSURE TRANSMITTER

1 BAR
- - - OHM

STOP — START
Decreases — Increases

Press to display

Hold down and wait for PROGRAMMED to be written

Press briefly to show the carried out programmations

EXAMPLE
3 BAR
155 OHM

CAUTION: it is necessary to programme at least two values (For precision in temperature and pressure control we recommend programming at least 4 values).
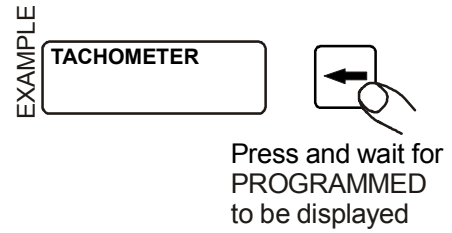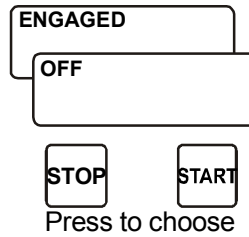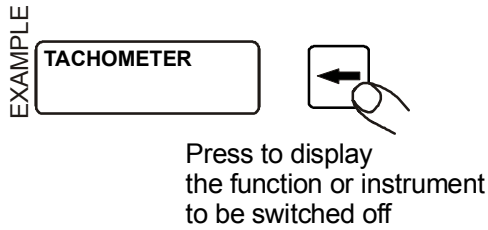When programming just one value or non monotonic values, the fault is detected.

OIL TEMP. TABLE NOT CORRECT   or   OIL PRESS. TABLE NOT CORRECT"

SWITCHING OFF AND ON PROCEDURE OF INSTRUMENTS AND FUNCTIONS

Instruments and functions can be switched off and engaged by following the procedures given below.

EXAMPLE

| TACHOMETER |

Press to display the function or instrument to be switched off

ENGAGED
OFF

STOP   START

Press to choose

EXAMPLE

| TACHOMETER |

Press and wait for PROGRAMMED to be displayed

INSTRUMENTS SWITCHING OFF			CAN Bus INSTRUMENTS SWITCHING OFF		
		(See procedure over)			
Measurements produced by the DCA-120 control unit	FACTORY PROGRAMMING				Measurements produced by the control unit of the engine (CAN Bus)
	ENGAGED	OFF	ENGAGED	OFF	
TACHOMETER	●		●		FUEL USED
THERMOMETER INCLUDES/EXCLUDES also the measurement produced by the engine control unit (CAN Bus)	●		●		INSTANT. CONSUMPTION
			●		FUEL TEMPERATURE
OIL PRESSURE GAUGE INCLUDES/EXCLUDES also the measurement produced by the engine control unit (CAN Bus)	●		●		TURBOCHARGER TEMPERATURE
			●		OIL TEMPERATURE
			●		INTERCOOLER TEMPERATURE
			●		INTAKE TEMPERATURE
			●		COOLING LIQUID LEVEL
			●		FUEL PRESSURE
			●		COOLING LIQUID PRESSURE
				●	ENGINE TORQUE
			●		ENGINE LOAD
				●	ENGINE POWER
			●		ENGINE IGNITION VIA CANBUS Only for engines featuring this control
				●	SPEED SETUP Only for engines featuring this control

FUNCTIONS SWITCHING OFF (see procedure in the preceding page)

		ENGAGED	OFF
MAN MODE 🖑 (MANUAL)		●	
AUT MODE ♻ (AUTOMATIC)		●	
OFF MODE 🔒 (STOP)		●	
BATTERY UNDERVOLTAGE		●	
BATTERY OVERVOLTAGE		●	
SWITCHING OFF NOT VALID **ON CAN Bus ACTIVE**	OVERHEATING WARNING	●	
	ENGINE OVERHEATING (Sensed by the temperature transmitter)	● ●	
	LOW OIL PRESSURE WARNING	●	
STOPPING FAILURE		●	
RPM CONTROL IN AUTOMATIC MODE. (automatic control of working speed) with this function excluded, engine heating and cooling are not carried out.	When the function is included, carry out the connections (of the VAR-201) indicated in the user instruction manual on page 5.		●
ENGINE SPEED 1-2 See description in the instructions and user manual.			●
EMERGENCY STOP STANDBY When enabled, it switches to standby even if the emergency stop button has been pressed.			●
REMOTE HARE AND REMOTE TORTOISE			●
STARTING WITH FLAT BATTERY			●
STAND BY		●	
PICK-UP INTERRUPTED			●
SMS SENDING EVERY START AND STOP – An SMS message is sent whenever the SMS system is started up or stops automatically			●
SMS PASSAGE MODE AUT			●
SMS PASSAGE MODE OFF			●
SMS RESTORATION OF CYCLICAL MAINTENANCE see description in modem joint (B)			●
SMS RESET FAULTS			●
CHARGING ALTERNATOR To exclude this function, also release the selector and carry on the procedure described on page 6. See TACHOMETER ADJUSTMENT with SIGNALS COMING FROM THE PICK-UP MAGNETIC TRANSDUCER.	12 24 VOLT	●	
GENERAL ALARM **switching off is possible** when this intervenes to warn of the imminent automatic starting except for call starting. **It cannot be switched off** when the intervention is caused by a fault.		●	

CHOICE OF THE PREVIOUSLY PROGRAMMED FUEL FLOAT

FUEL FLOAT CHOICE. The control unit is programmed for a float/rheostat assembly, suitable for the FUEL LEVEL indication.

CHOICE OF FUEL FLOAT ← Press to display

STOP Press to choose START

VEGLIA
↓
VDO
↓
DATCON
↓
W
↓
PROGRAMM.

To program or change previously programmed values see FUEL FLOAT PROGRAMMING

FLOAT	TANK LEVEL	OHM
VEGLIA (factory setting)	FULL	0
	EMPTY	300
VDO	FULL	150
	EMPTY	0
DATCON	FULL	37
	EMPTY	240

W
FUEL CONTROL W
← Press and wait for PROGRAMMED to be written

It is possible to programme the use of a float with contact that closes to ground in lack of fuel. FUEL CONTROL W

FUEL FLOAT PROGRAMMABLE

PROGRAMMING OF THE OHM VALUES OF THE FUEL FLOAT

It is possible to program 10 resistive values corresponding to the characteristic curves of other floats

PROGRAMMING OF CORRESPONDENCE
FLOAT TO BE PROGRAMMED
OHM
0% 10 20 30 40 50 60 70 80 90 100% OHM
WRITE THE RESISTIVE VALUES
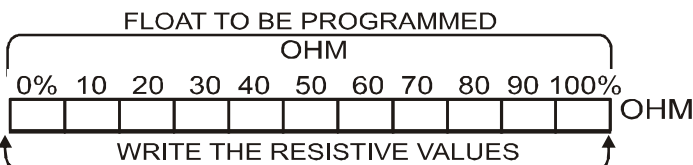
CAUTION: it is necessary to programme at least two values (to obtain a good precision in fuel control we recommend programming at least 4 values).
When programming just one value or non-monotonic values, the fault is detected. INCORRECT FUEL FLOAT TABLE

50% OHM
- - - OHM
← Press to display
STOP Decreases   START Increases

50%
100 OHM
Hold down and wait for PROGRAMMED to be written
← ← Press briefly to show the carried out programmations

AVAILABLE ANOMALY PROGRAMMING 1÷9
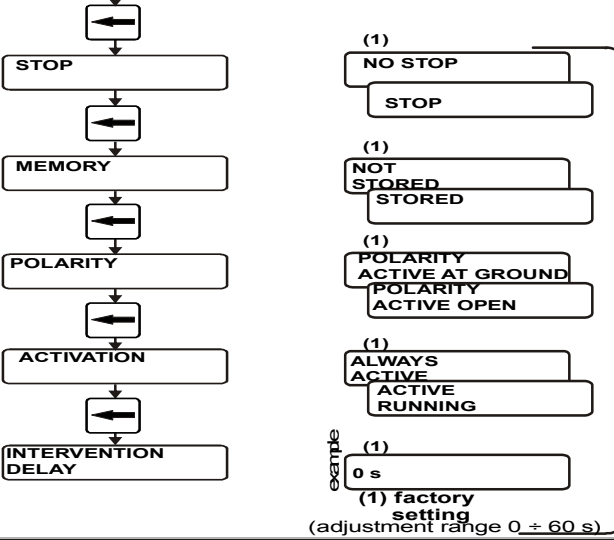
◁ THE NEW DESCRIPTION OF THE ANOMALY IS NOT TRANSLATED

ANOMALY TEXT	←

HOW TO WRITE

| STOP	Press to shift the cursor
START	- Press to write - Hold pressed until the clearing of one segment keep pressed for the complete clearing

example

1	PARALLEL FAILED

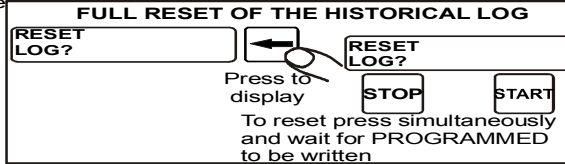TO INCREASE THE NUMBER OF INPUTS IT IS NECESSARY TO COMBINE EXPANSION MODULE MDE-088 WITH DCA-120/10.

↓

STOP		(1) NO STOP
		STOP

↓

MEMORY		(1) NOT STORED
		STORED

↓

POLARITY		(1) POLARITY ACTIVE AT GROUND
		POLARITY ACTIVE OPEN

↓

ACTIVATION		(1) ALWAYS ACTIVE
		ACTIVE RUNNING

↓

INTERVENTION DELAY		example (1) 0 s

(1) factory setting
(adjustment range 0 ÷ 60 s)

STOP	START

Press to modify the functions and the intervention delay

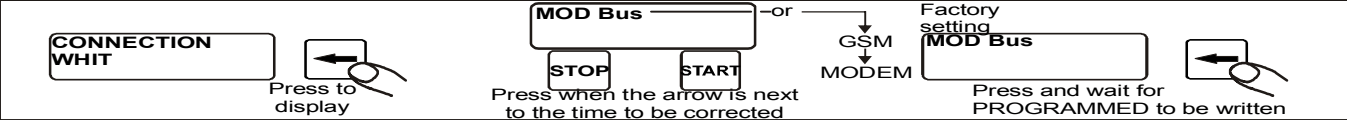**NOTE** the interventions always activate the general alarm

Press and wait for PROGRAMMED to be written
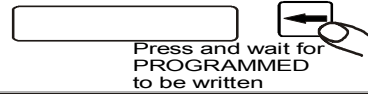
ANOMALIES HISTORICAL LOG

The data of the last 50 anomalies that have stopped the engine are collected.

ANOMALIES OCCURRED	←

Press to display

Progressive number of faults that have occurred
Date →

N 12	h 1501
20-05-2008	17:30

Engine hour-meter
← Hour

LOW OIL PRESSURE

Decreases **STOP**   **START** Increases

FULL RESET OF THE HISTORICAL LOG

RESET LOG?	←	RESET LOG?

Press to display

STOP	START

To reset press simultaneously and wait for PROGRAMMED to be written
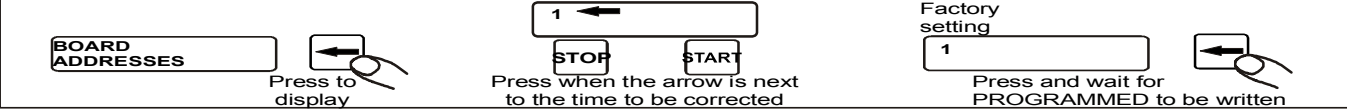

SERIAL PORT RS232

◁ SERIAL PORT RS232. MOD BUS - GSM - MODEM - Select GSM 9600 bps to enable connection with the mobile phone and program the three telephone numbers to inform when the engine is in alarm condition.
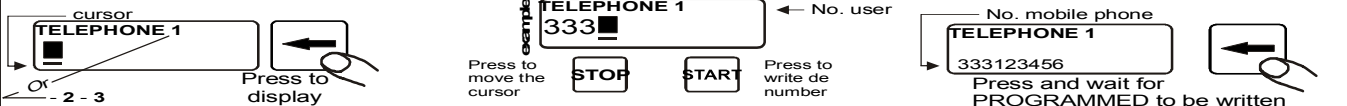
CONNECTION WHIT	←

Press to display

MOD Bus	—or

STOP	START

Press when the arrow is next to the time to be corrected

GSM
MODEM

Factory setting

MOD Bus

Press and wait for PROGRAMMED to be written

BOARD ADDRESSES. Addresses can be set for up to 9 boards (control units).

BOARD ADDRESSES	←

Press to display

1 ←

STOP	START

Press when the arrow is next to the time to be corrected

Factory setting

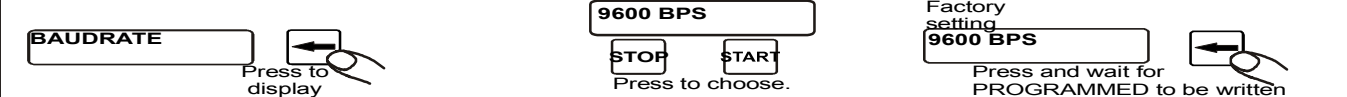| 1 |
|---|

Press and wait for PROGRAMMED to be written

Programming of telephone numbers of the users to inform when the engine is in alarm.
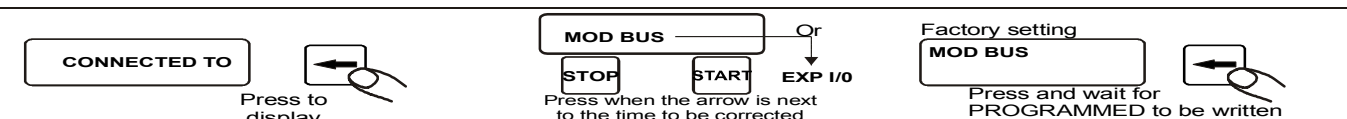Refer to "Sending SMS messages" in the Modem Manual

cursor

TELEPHONE 1

Oʳ - 2 - 3

←

Press to display

example

TELEPHONE 1
333■

← No. user

Press to move the cursor **STOP**   **START** Press to write de number

No. mobile phone

TELEPHONE 1
333123456

Press and wait for PROGRAMMED to be written

CODE FOR RESETTING CYCLIC MAINTENANCE: write **006** or **SERVICE** using a mobile phone

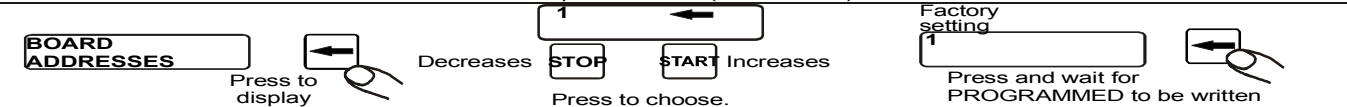---

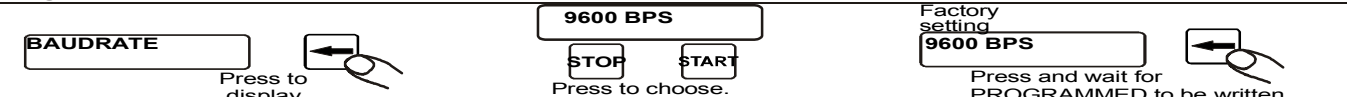**BAUDRATE.** Select 4800/9600/14400/19200/28800/34400

BAUDRATE	←

Press to display

9600 BPS

STOP	START

Press to choose.

Factory setting

9600 BPS

Press and wait for PROGRAMMED to be written

SERIAL PORT RS485

CONNECTION: port RS485 can be used to communicate with protocol MOD BUS or the I/O extension.

CONNECTED TO	←

Press to display

MOD BUS	Or

STOP	START	**EXP I/0**

Press when the arrow is next to the time to be corrected

Factory setting

MOD BUS

Press and wait for PROGRAMMED to be written

BOARD ADDRESSES. Addresses can be set for up to 9 boards (control units).

BOARD ADDRESSES	←

Press to display

1 ←

Decreases **STOP**   **START** Increases

Press to choose.

Factory setting

1

Press and wait for PROGRAMMED to be written

BAUDRATE. Select 4800/9600/14400/19200/28800/34400.

BAUDRATE	←

Press to display

9600 BPS

STOP	START

Press to choose.

Factory setting

9600 BPS

Press and wait for PROGRAMMED to be written

SETUP: N,8,1 or E, 8, 1

SETUP	←

Press to display

E,8,1	Or

STOP	START	**N,8,1**

Press to choose.

Factory setting

E,8,1

Press and wait for PROGRAMMED to be written