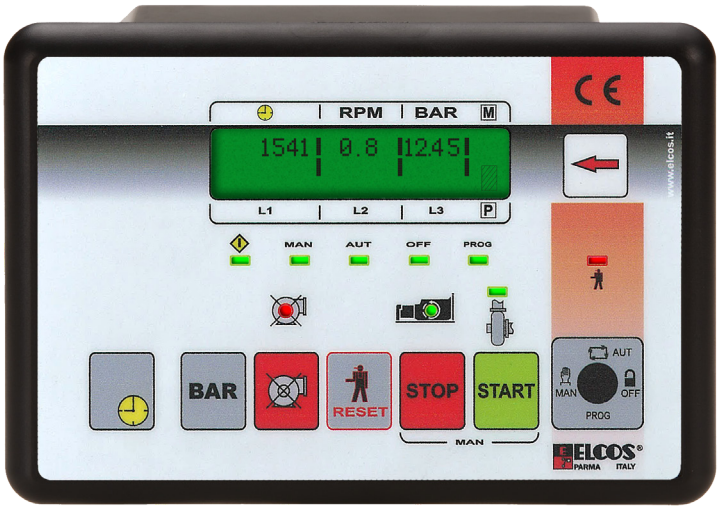
COMBINED CONTROL UNIT FOR CONTROLLING AN INDEPENDENT GENERATOR SET AND IRRIGATION MOTOR PUMP

TYPE CEM-120

www.elcos.it

RESERVED FOR THE MANUFACTURER



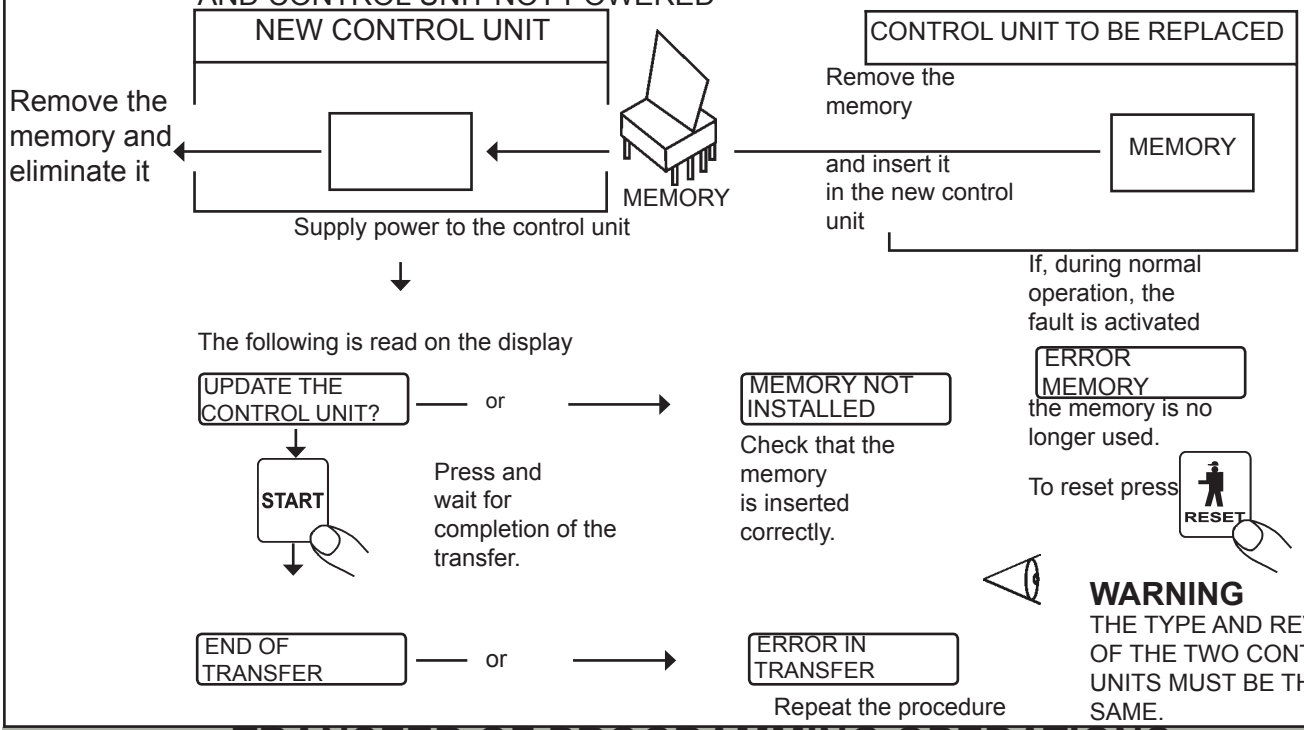
TECHNICAL PROGRAMMING OPERATIONS MANUAL

ELCOS®
PARMA ITALY
Tel. +39 0521/772021
Fax +39 0521/270218

REPLACING THE CONTROL UNIT

Before replacing the control unit, we advise transferring all the programming settings to the new control unit; if this operation is not carried out, the new control unit will operate with the factory programming settings. In this case, it is necessary to carry out programming of the current transformer.

PROCEDURE
TO BE CARRIED OUT WITH ENGINE STOPPED
AND CONTROL UNIT NOT POWERED

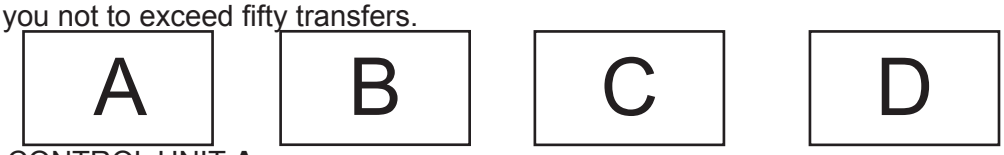


WARNING
THE TYPE AND REVISION OF THE TWO CONTROL UNITS MUST BE THE SAME.

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:



CONTROL UNIT **A** (STANDARD) ——— CONTROL UNITS **B - C - D** TO BE UPDATED ———

1. Switch off the power to the control units.
2. Remove the memory from control unit A.
3. Remove the memory from control unit B.
4. Insert memory B in control unit A.
5. Supply power to control unit A.
6. The following message is displayed. "UPDATE THE CONTROL UNIT?".
7. Press the **STOP** button.
8. The following message is displayed "SAVE DATA IN MEMORY?"
9. Press the **START** button.
10. The following message is displayed "END OF TRANSFER".
11. Switch off the power to control unit A.
12. Remove memory B from control unit A.
13. Insert memory B in control unit B.
14. Supply power to control unit B.
15. The following message is displayed "UPDATE THE CONTROL UNIT?".
16. Press the **START** button.
17. The following message is displayed "END OF TRANSFER".
18. Repeat from point 3 for memories C and D.

RESTORATION OF FACTORY PROGRAMMING OPERATIONS OF THE PROGRAMMING OPERATIONS: ENGINE, GENERATOR 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, simultaneously press (within 8 sec.) the three buttons, wait for the following to be written on the display:
STANDARD PROGRAMMING.

CONTROL UNIT STAND BY

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

TECHNICAL PROGRAMMING OPERATIONS

ACCESS TO PROGRAMMING MODE
Press to select: PROGRAMMING SETTINGS.

USER PROGRAMMING

TECHNICAL PROGRAMMING

STOP START

PRESS (10") SIMULTANEOUSLY TO DISPLAY TECHNICAL PROGRAMMING SETTINGS.

PRESS TO DISPLAY THE REQUIRED PROGRAMMING

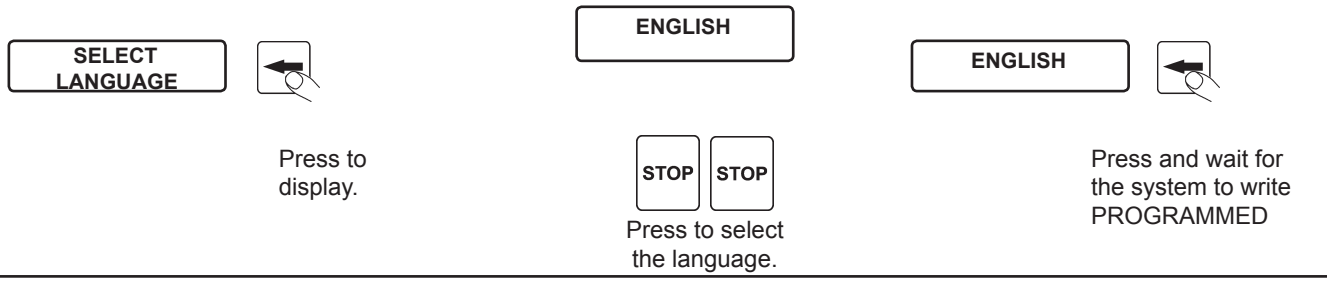
TO EXIT THE PROGRAMMING MODE.
To exit the programming mode select
- MAN
- AUT
- OFF

PROG (led off)

	see page		
LANGUAGE CHOICE	4	Italian, English, French, Spanish, German, Portuguese	
CHOICE OF FUNCTIONS	5	Stopping systems. G.S. frequency. Weekly automatic test. Battery voltage.	G.S. voltage. Choice of number of ammeters. G.S. protection devices in manual mode. Input 41.
	6		Fault information. Choice of unit of measurement.
RUNNING ENGINE SETTINGS	7	Adjustment of running engine threshold, tachometer and overspeed. Signal coming from the charging alternator.	Signal coming from the pick-up.. Signals coming from the generator.
PREVENTIVE MAINTENANCE	8	Access to preventive maintenance. Deletion of expired maintenance.	
RESET	8	Procedure for: Resetting of kilowatt-hour. Resetting of starting failures count.	Resetting of start-up count. Change of indicated hours.
PROGRAMMABLE TIMES	9	Preheating. Start-up. Pause.	Start delay after closing of the call. Stop delay after opening of the call. Time for connection of the general alarm.
	10	Stop. Cooling.	Weekly self-test duration. Insufficient intervention time or pump water overpressure.
ENGINE PROGRAMMING	12	Battery undervoltage. Battery overvoltage. Overtemperature warning.	Low oil pressure warning. Charging alternator fault. Number of starting attempts.
	13	Overtemperature. Fuel reserve.	G. S. start with battery with low charge. Choice of radiator fluid level probe.
	14	Fuel finished.	Engine warming.
GENERATOR PROGRAMMING	14	G.S. undervoltage. G.S. voltage present. G.S. overvoltage.	G.S. overload warning. G.S. overload. G.S. does not supply power.
	15	G.S. underfrequency. G.S. overfrequency.	G.S. asymmetry out of range.
PROGR. SETTING OF PUMP	15	Pump water overpressure (differential).	
CHOICE OF TRANSMITTERS	16	Choice of already programmed temperature and pressure transmitters.	
	18	Choice of already programmed fuel float.	
TEMP. PROBE PROGRAMMING	17	Programming of the ohmic values of the temperature transmitter.	
PRESS. PROBE PROGRAMMING	17	Programming of the ohmic values of the pressure transmitter.	
SWITCHING OFF INSTRUMENTS	18	Procedure for switching instruments on and off. Procedure for deleting the switching off.	
SWITCHING OFF FUNCTIONS	19	Procedure for switching functions on and off.	
	18	Procedure for deleting the switching off.	
FUEL FLOAT OHM VALUES	18	Programming of ohmic values of fuel float.	
CHOICE OF AMPEROM. TRANSF.	19	Procedure for choosing the A. T.	
AVAILABLE ANOMALY	20	Programming of times, polarity, possibility to stop. Fault message.	
ANOMALIY LOG	19	Faults that have occurred. Complete reset of the log.	
MOD BUS GSM PARAMETERS	20	GSM connection. Card address. Programming of telephone numbers. Baudrate. Code for resetting cyclic maintenance by mobile phone. Fault SMS..	

CHOICE OF LANGUAGE

CHOICE OF LANGUAGE. The preset language is Italian, the selectable languages are: ENGLISH-FRENCH-GERMAN-SPAIN-PORTUGUESE.



Press to display.

Press to select the language.

Press and wait for the system to write PROGRAMMED

CHOICE OF FUNCTIONS

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 the system to write PROGRAMMED.

GENERATOR FREQUENCY.

GENERATOR FREQUENCY

Press to display.

50 Hz
60 Hz
STOP START

Press to choose.

Factory setting
50 Hz

Press and wait for the system to write PROGRAMMED.

WEEKLY AUTOMATIC TEST. When the **WEEKLY AUTOMATIC TEST ON** programming is finished, the generator set immediately executes the test cycle.

WEEKLY AUTOMATIC TEST

Press to display.

ON
OFF
STOP START

Press to choose.

Factory setting
OFF

Press and wait for the system to write PROGRAMMED.

BATTERY VOLTAGE

Press to display.

24 V
12 V
STOP START

Press to choose.

Factory setting
12 V

Press and wait for the system to write PROGRAMMED.

G.S. VOLTAGE

Press to display.

SINGLE-PHASE
THREE-PHASE
STOP START

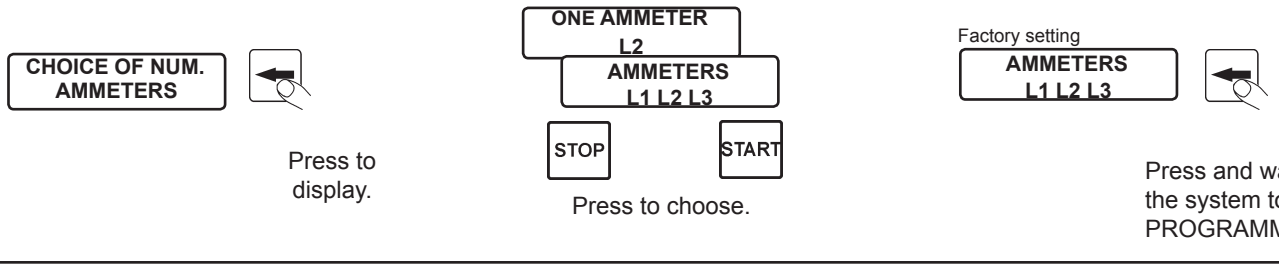
Press to choose.

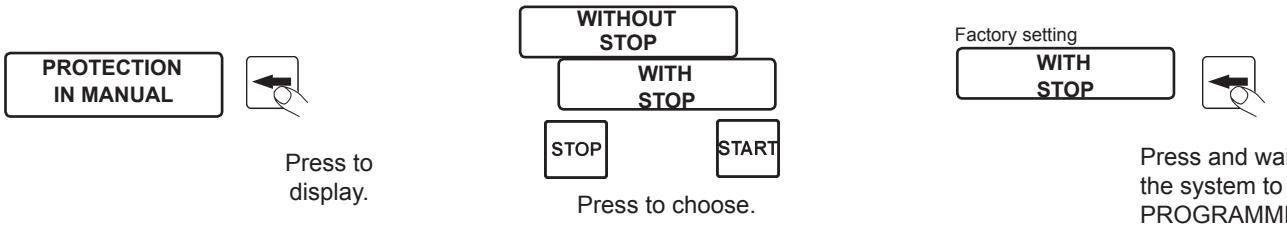
Factory setting
THREE-PHASE

Press and wait for the system to write PROGRAMMED.

CHOICE OF FUNCTIONS

CHOICE OF NUMBER OF AMMETERS. It is possible to choose: three ammeters or one ammeter, with the current transformer connected on phase L2.

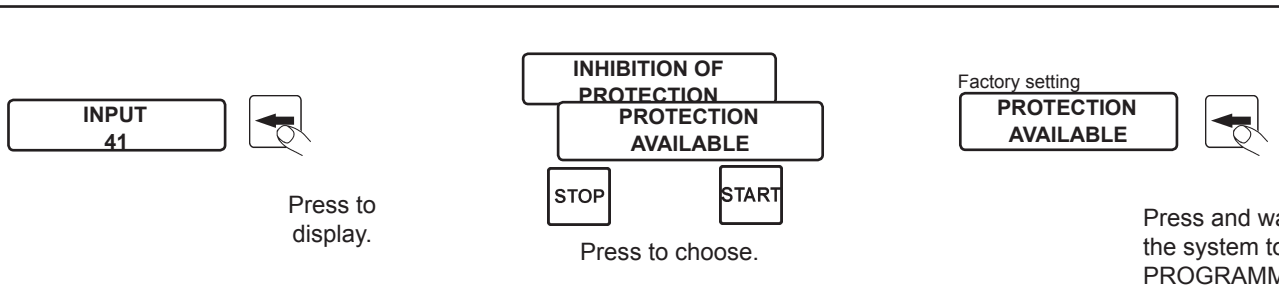


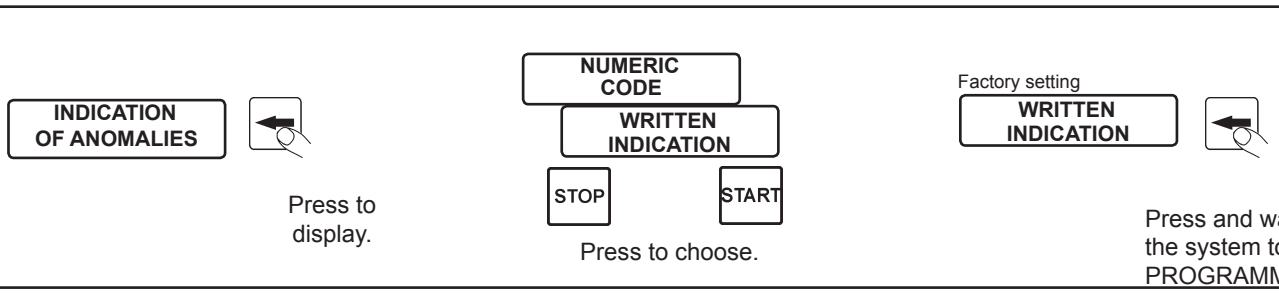


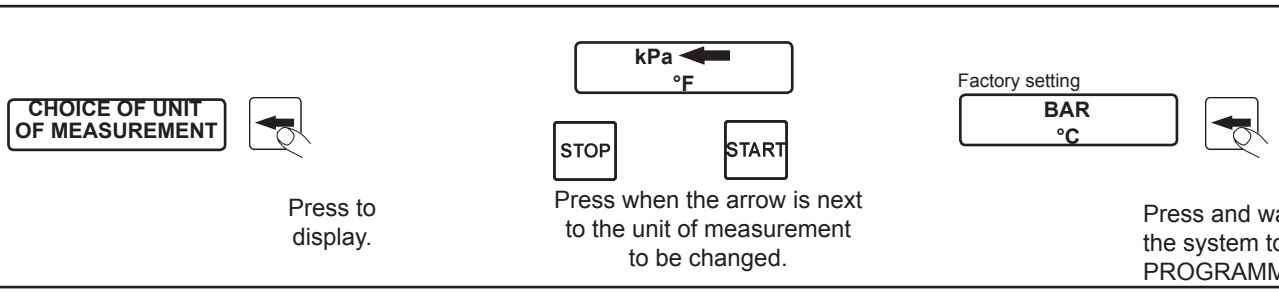
INPUT 41

Input 41 can be used in two ways:

1) Fully programmable **available protection** input (times, polarity, possibility to stop and message describing the fault)
   or
2) **Disabling of control unit protection devices**, when the input is connected to ground only the following protection devices remain active: OVERSPEED, OVERFREQUENCY and EMERGENCY. The remaining protection devices are switched off.







RUNNING ENGINE THRESHOLD, TACHOMETER, OVERSPEED AND UNDERSPEED ADJUSTMENTS

SIGNALS COMING FROM THE CHARGING ALTERNATOR

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

ADJUSTMENT OF RUNNING ENGINE THRESHOLD

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

RUNNING ENGINE THRESHOLD 66

Press to display.

7 V

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

Press to choose the voltage threshold.

Factory setting **7 V**

Press and wait for the system to write PROGRAMMED.

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

ADJUSTMENTS WITH CHARGING ALTERNATOR FREQUENCY (W)

TACHOMETER ADJUSTMENT

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

NECESSARY PROGRAMMING
(With terminal 65 of the control unit connected)

RPM/W CALIB. PRESS START

Start the engine whit the button **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 the system to write PROGRAMMED.

To stop press button **STOP**

SIGNALS COMING FROM THE PICK-UP MAGNETIC TRANSDUCER (control unit terminals 63 - 64)

With this signal do not connect terminal 65

TACHOMETER ADJUSTMENT

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

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

PICKUP CALIBRAT. PRESS START

Start the engine whit the button **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. 3.000 RPM**

Press and wait for the system to write PROGRAMMED.

To stop press button **STOP**

ADJUSTMENT OF RUNNING ENGINE AND OVERSPEED

with signals coming from the W of the charging alternator (control unit terminal 65)
PICK-UP (control unit terminals 63-64)

ADJUSTMENT OF RUNNING ENGINE THRESHOLD - first carry out tachometer adjustment

Normally no calibration 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 at how many revs you want to disable the starter motor.
Adjustment range 300 to 4000 RPM.

Factory setting **600 RPM**

Press and wait for the system to write PROGRAMMED.

OVERSPEED ADJUSTMENT

OVERSPEED

Press to display.

1860 RPM

STOP **START**

Press to choose the overspeed threshold.
Adjustment range 1530 to 5100 RPM.

Factory setting **1860 RPM**

Press and wait for the system to write PROGRAMMED.

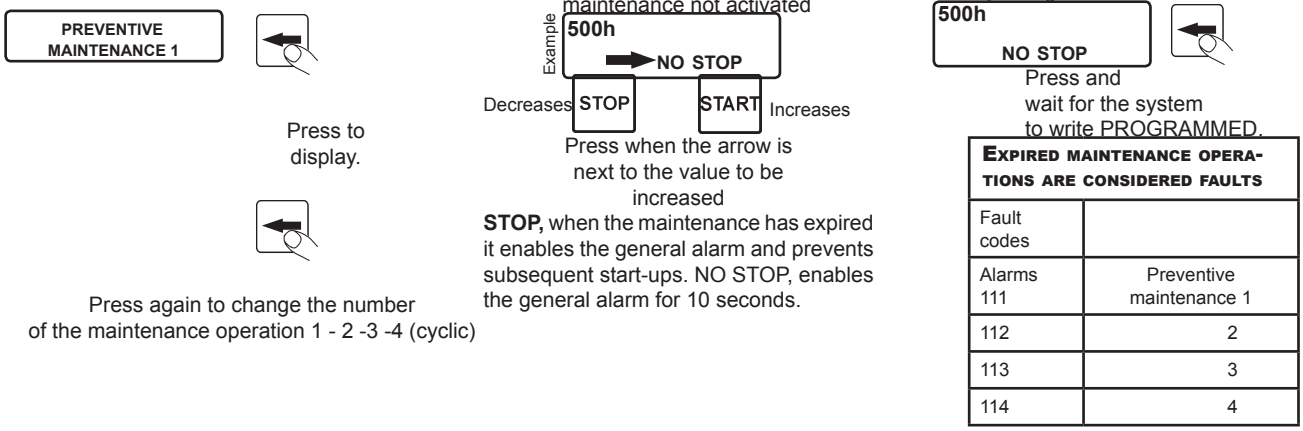
SIGNALS COMING FROM THE GENERATOR

- **ADJUSTMENT OF RUNNING ENGINE THRESHOLD no adjustment**
- **TACHOMETER ADJUSTMENT see page 5 ADJUSTMENT OF TACHOMETER WITH GENERATOR FREQUENCY**
- **OVERFREQUENCY ADJUSTMENT - see page 12 GENERATOR OVERFREQUENCY**

PREVENTIVE MAINTENANCE

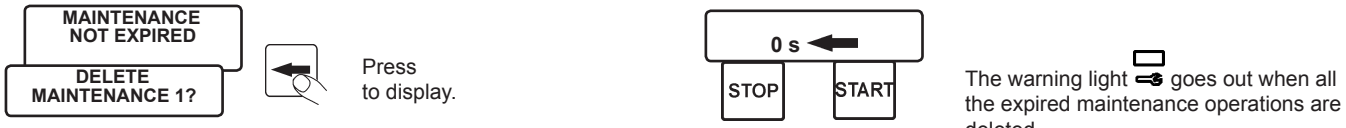
The control unit manages three fixed time notifications and a cyclic notification. Notifications 1, 2 and 3 are for a fixed time and trigger only once, when the hour meter reaches the programmed value. Notification number 4 is cyclic and triggers after the programmed hours and whole multiples of them. The request for maintenance is indicated: by the flashing of the hour meter, the intermittent switching on of the yellow warning light and the message on the display.
Example 1: Notification 4 is programmed to 100. The notification triggers after 100, 200, 300, 400 ... hours.
Example 2: Notification 1 is programmed to 100. The notification triggers at 100 hours, and never triggers again.
The factory value for all the notifications is zero. The maintenance operations are programmed by the G.S. manufacturer during testing. The maximum value is 59999 hours.

ACCESS TO PERIODIC PROGRAMMING



EXPIRED MAINTENANCE OPERATIONS ARE CONSIDERED FAULTS	
Fault codes	
Alarms 111	Preventive maintenance 1
112	2
113	3
114	4

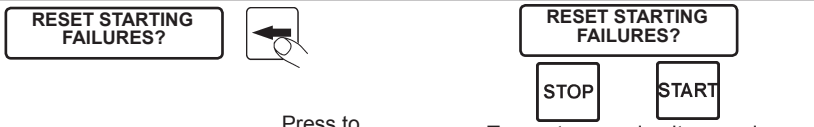
DELETION OF EXPIRED MAINTENANCE OPERATIONS



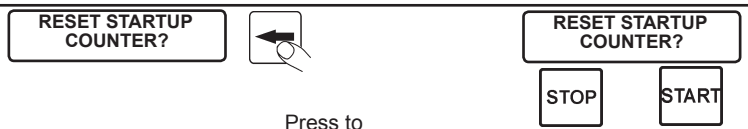
CHANGE RESETTING OPERATIONS

RESETTING OF KILOWATT-HOUR.

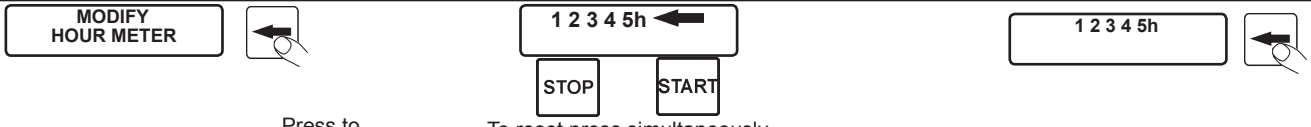
RESETTING OF COUNT OF FAILURES TO START.



RESETTING OF START-UP COUNT.



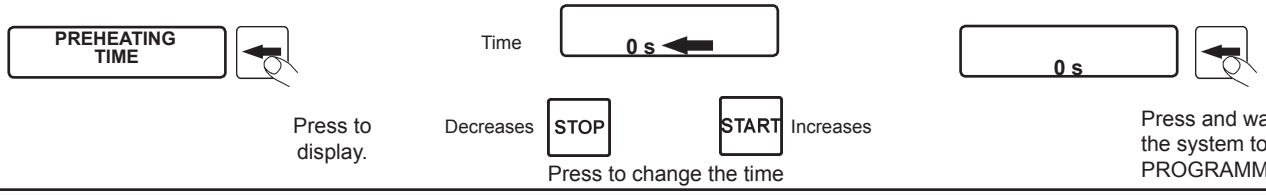
CHANGE OF INDICATED HOURS. When you change the value of the hour meter the preventive maintenance programming must be done again.



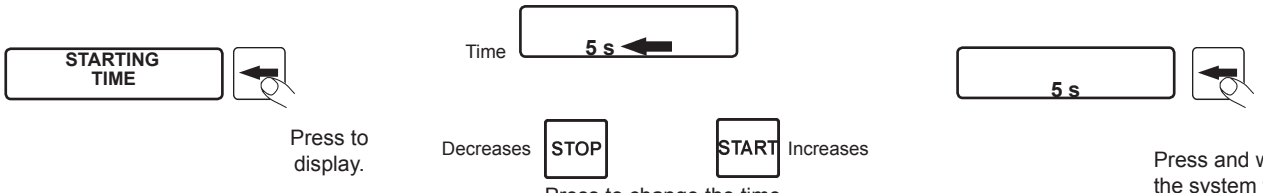
PROGRAMMABLE TIMES

DESCRIPTION	SECONDS	
	ADJUSTMENT RANGE	FACTORY SETTING
PREHEATING TIME preheating operation time.	**0 to 60**	**0 (off)**
STARTING TIME operation time of attempt to start.	**5 to 25**	**5**
PAUSE TIME pause between attempts to start.	**1 to 20**	**5**
STOPPING TIME Stopping system operation time after the engine running signal has disappeared.	**1 to 55**	**20**
COOLING TIME Engine operating time between the moment of releasing the generator contactor and operation of the stopping system.	**0 to 360**	**120**
START-UP DELAY AFTER THE CALL With the call contact closed and the delay expired, start-up begins.	**1 to 600**	**1**
STOP DELAY AFTER OPENING OF THE CALL On opening of the call contact and after the delay has expired, the generator contactor is de-energized.	**1 to 600**	**1**
TIME FOR CONNECTION OF THE GENERAL ALARM Number 350 indicates continuous operation with no time limits.	**10 to 350**	**350 (continuous operation)**
WEEKLY SELF-TEST DURATION When the test time expires, the engine stops.	**1 to 60 minutes**	**3 minutes**
INSUFFICIENT INTERVENTION TIME OR PUMP WATER OVERPRESSURE after the increase or lowering of pump water pressure and when this time has expired, the stopping process begins.	**0 to 300**	**5**

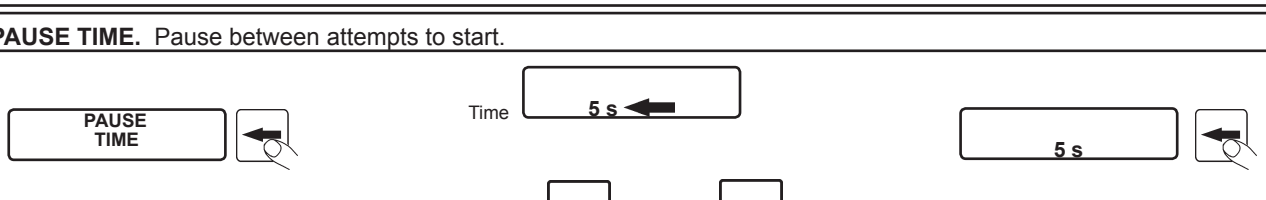
PREHEATING TIME. Preheating operation time. 0 seconds, preheating off.



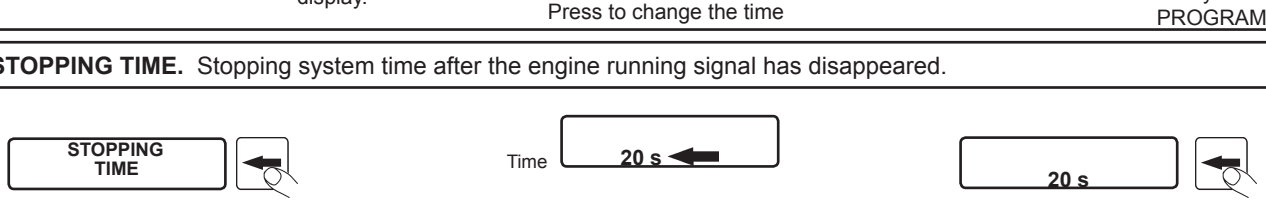
STARTING TIME. Operation time in the attempt to start.



PAUSE TIME. Pause between attempts to start.

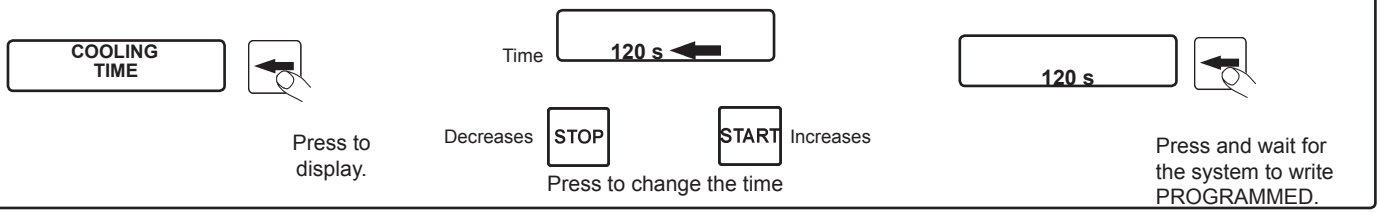


STOPPING TIME. Stopping system time after the engine running signal has disappeared.

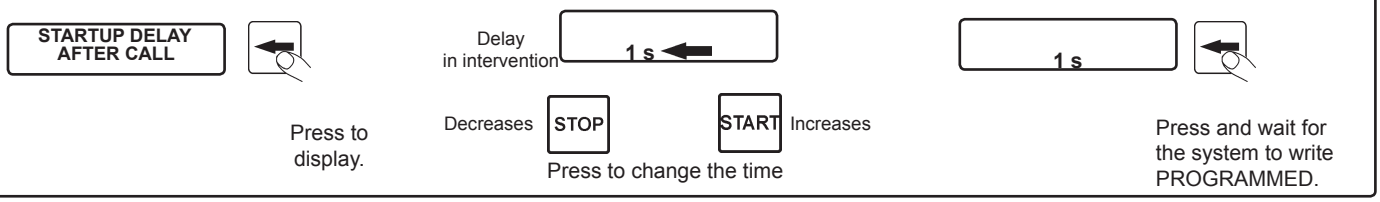


PROGRAMMABLE TIMES

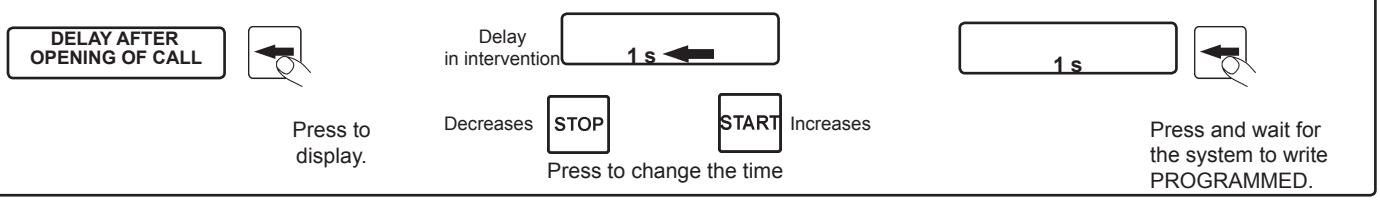
COOLING TIME. Engine operating time between the moment of releasing the generator contactor and operation of the stopping system.



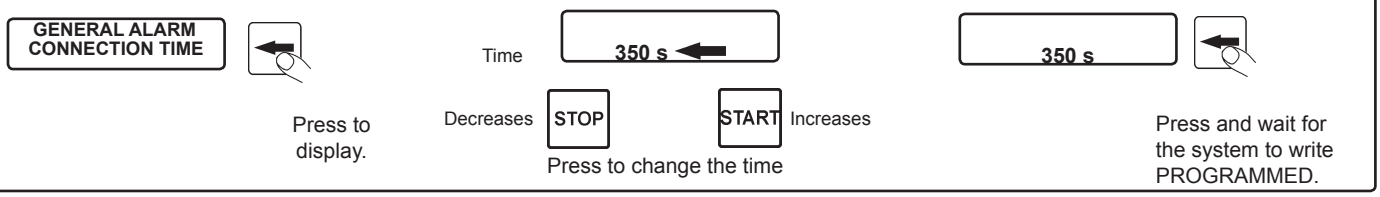
START-UP DELAY AFTER CLOSING OF THE CALL.
With the call contact closed and the delay time expired, start-up begins.



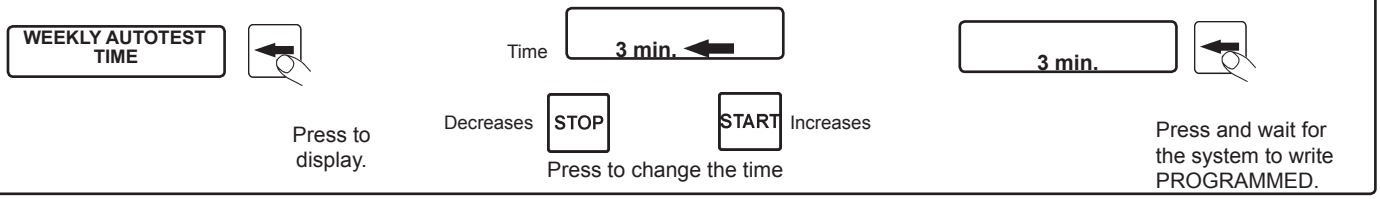
STOP DELAY AFTER OPENING OF THE CALL.
On opening of the call contact and after the delay has expired, the generator contactor is de-energized.



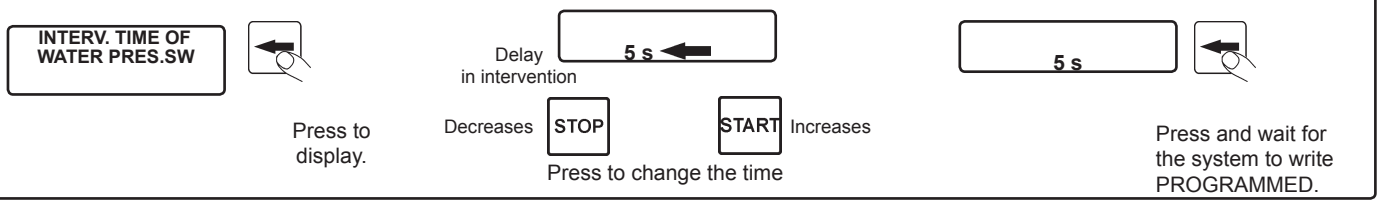
TIME FOR CONNECTION OF THE GENERAL ALARM.
Number 350 means continuous operation with no time limits.



WEEKLY SELF-TEST DURATION.
When the test time expires, the engine stops.



INSUFFICIENT INTERVENTION TIME OF PUMP WATER OR PUMP WATER OVERPRESSURE.
After the increase or lowering of pump water pressure and when this time has expired, the stopping process begins.



BASIC TABLE OF TECHNICAL PROGRAMMING

CODE ANOMALIE (ANOMALIES) ALARM	FUNCTIONS AND PROTECTION DEVICES OF GENERATOR SET AND IRRIGATION MOTOR PUMP (INDICATION ON THE DISPLAY)	INSTANT OF ACTIVATION (seconds)	THRESHOLDS FOR		DELAY IN INTERVENTION		STORES THE FUNCTION	COOLING HEATER	Stop		THE INTERVENTION OCCURS WHEN:
			ADJUSTMENT RANGE	FACTORY ADJUSTMENT	ADJUSTMENT RANGE	FACTORY ADJUSTMENT			PROGRAMMABLE	FACTORY SETTING	
					SECONDS						
120	BATTERY UNDERVOLTAGE	ALWAYS ACTIVE	8 to 12(12V) 16 to 24(24V)	11 (12V) 22 (24V)	1 to 5	2	YES	NO	DOES NOT STOP		The battery voltage remains lower than the programmed threshold for the entire intervention delay time.
121	BATTERY OVERVOLTAGE	"	12 to 18(12V) 24 to 36(24V)	16 (12V) 32 (24V)	=	5	YES	YES	YES	WITHOUT STOP	The battery voltage exceeds the programmed threshold for the entire intervention time
123	WARNING OF OVERTEMPERATURE	"	90 to 140°C	95°C	=	=	YES	YES	YES	WITHOUT STOP	The temperature measured by the transmitter exceeds the set threshold.
124	ENGINE OVERTEMPERATURE	"	90 to 140°C	100°C	=	=	YES	NO	STOPS		
125	OVERTEMPERATURE DETECTED BY THERMOSTAT	WITH ENGINE RUNNING	=	=	=	=	YES	NO	STOP		The temperature exceeds the threshold of the thermostat. No programming is possible.
129	FUEL RESERVE.	ALWAYS ACTIVE	0 to 99%	10%	1 to 5	1	NO	NO	DOES NOT STOP		The fuel level remains below the threshold for the entire intervention delay time.
130	FUEL FINISHED	"	0 to 99%	1%	1 to 20	3	YES	YES	YES	WITH STOP	
131	LOW OIL PRESSURE WARNING	10 AFTER DETECTION OF ENGINE RUNNING	0 to 6 bar	0 to 5 bar	1 to 5	1	YES	NO	DOES NOT STOP		The pressure measured by the transmitter remains lower than the programmed threshold for the entire intervention delay time.
132	LOW OIL PRESSURE	10 AFTER DETECTION OF ENGINE RUNNING	=	=	=	IMMEDIATE	YES	NO	STOPS		The pressure is lower than the set threshold of the pressure switch (no programming is possible).
133	FAILURE TO STOP	AFTER STOP CONTROL	=	=	=	60	YES				See description on page 5 of the user instruction manual (no programming is possible).
135	LOW LEVEL IN RADIATOR	ALWAYS ACTIVE	=	=	=	5	YES	YES	STOPS		The coolant 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 ENGINE RUNNING	=	=	=	3	YES	NO	YES	WITHOUT STOP	The alternator does not charge the battery and the intervention delay time has elapsed.
137	NUMBER OF ATTEMPTS TO START (FAILURE TO START)	ALWAYS ACTIVE	1 to 10 START-UPS	4 START-UPS	=	=	YES	NO	STOP		See description on page 4 of the user instruction manual.
138	G.S. START WITH FLAT BATTERY	ALWAYS ACTIVE	Minimum threshold 12.2 to 12.7 24.4 to 25.4 13.5 to 14.5 27 to 29 Maximum threshold	12.4 (12V) 24.8 (24V) 13.6 (12V) 27.2 (24V)	900 to 7200	1200 (20 minutes)	NO				The voltage measured on the battery remains lower than the minimum threshold for 60 seconds (time not adjustable) the engine starts. If during running, a call occurs, the control unit closes the generator contactor. The engine stops after the battery voltage remains above the maximum threshold for the entire intervention delay time.
139	OVERSPEED	"	RPM of engine 1530 to 5100	THRESHOLD for overspeed 1500 1800 3000 3600	=	2	YES	NO	STOP		The speed remains higher than the programmed threshold for at least two seconds; causes the engine to stop.
				1860 (62Hz) 2220 (74Hz) 3720 (62Hz) 4400 (74Hz)							
140	FUEL FLOAT DISCONNECTED	"	=	=	=	=	NO	DOES NOT STOP			The fuel float circuit is disconnected (no programming is possible).
144	PICK-UP DISCONNECTED	ALWAYS ACTIVE	=	=	=	=	=	DOES NOT STOP			The PICK-UP circuit is disconnected. No programming is possible.
146	PICK-UP FAULT	"	=	=	=	1	=	DOES NOT STOP			The PICK-UP is faulty. No programming is possible.
220	G.S. UNDERVOLTAGE	10 AFTER THE THRESHOLD IS EXCEEDED	50 to 500V ~	335V three-phase. 193V single-phase	1 to 10	3	YES	YES	YES	WITH STOP	The generator voltage remains lower than the programmed threshold for the entire intervention delay time.

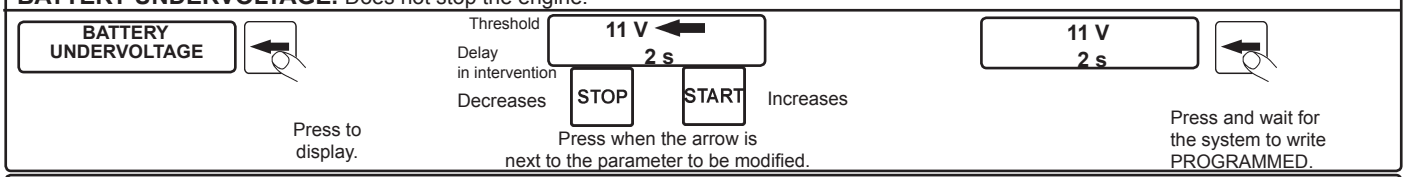
BASIC TABLE OF TECHNICAL PROGRAMMING

CODE ANOMALIE (ANOMALIES) ALARM	FUNCTIONS AND PROTECTION DEVICES OF GENERATOR SET AND IRRIGATION MOTOR PUMP (INDICATION ON THE DISPLAY)	INSTANT OF ACTIVATION (seconds)	THRESHOLDS FOR		DELAY IN INTERVENTION		STORES THE FUNCTION	COOLING HEATER	Stop		THE INTERVENTION OCCURS WHEN:
			ADJUSTMENT RANGE	FACTORY ADJUSTMENT	ADJUSTMENT RANGE	FACTORY ADJUSTMENT			PROGRAMMABLE	FACTORY SETTING	
					SECONDS						
	G.S. VOLTAGE PRESENT	ALWAYS ACTIVE	50 to 400V~	355V three-phase 205V single-phase	1 to 600	Generator connection to power user delay 7	NO	DOES NOT STOP			The voltage steadily remains above the programmed threshold for the entire generator connection to power user delay time (the generator contactor closes).
222	G.S. OVERVOLTAGE	After detection of engine running	50 to 500V~	440V THREE-PHASE 253V SINGLE PHASE	0 to 10	3	YES	NO	YES	WITH STOP	The generator voltage remains higher than the programmed threshold for the entire intervention delay time.
223	G.S. UNDERFREQUENCY	10 after the threshold is exceeded	45 to 60Hz	45 Hz	0 to 10	5	YES	YES	YES	WITH STOP	The frequency of the generator remains lower than the programmed threshold for the entire intervention delay time.
224	G.S. OVERFREQUENCY	ALWAYS ACTIVE	45 to 74Hz	60 (50Hz) 72 (60Hz)	0 to 5	2	YES		NO	STOPS	The frequency of the generator remains higher than the programmed threshold for the entire intervention delay time.
225	G.S. OVERLOAD WARNING	"	0 to 120% (MAX 2400A)	47.5A (CURR. TRANSF. 50/5)	0 to 30	20	NO	NO	DOES NOT STOP		The current of the generator remains higher than the programmed threshold for the entire intervention delay time.
226	G.S. OVERLOAD	"	0 to 120% (MAX 2400A)	50A (CURR. TRANSF. 50/5)	0 to 30	10	YES	YES	YES	WITH STOP	
227	G.S. DOES NOT SUPPLY POWER	"	=	=	0 to 180	60	YES	NO	YES	WITHOUT STOP	The generator does not supply power for the entire intervention delay time.
230	INCORRECT G.S. PHASE SEQUENCE	"	=	=	=	=	NO		DOES NOT STOP		The connections of the mains phases are incorrect. The generator contactor is not closed (no programming is possible).
231	G.S. ASYMMETRY OUT OF RANGE	"	5 to 20%	15%	1 to 600%	15	YES	YES	STOPS		The percentage difference of the genset voltages remains above the programmed threshold for the entire intervention delay time (the generator contactor opens).
419	EMERGENCY STOP	"	=	=	=	=	=	NO	STOP		The emergency button is pressed. (No programming is possible).
421	AVAILABLE 1										Fully programmable available fault, see page 20.
440	MEMORY ERROR	ALWAYS ACTIVE	=	=	=	=	=	DOES NOT STOP			During normal operation the memory is no longer used.
441	MEMORY NOT INSTALLED	"	=	=	=	=	=				The memory is no longer recognized by the control unit.
443	TABLE OF FUEL FLOAT INCORRECT	"	=	=	=	=	=				Just one value is programmed or non-increasing or decreasing values are programmed
446	TABLE OF PRESS. OIL INCORRECT	ALWAYS ACTIVE	=	=	=	=	=				
447	TEMPERATURE TABLE INCORRECT	"	=	=	=	=	=				
444	INSUFFICIENT WATER PRESSURE	After switching on	=	=	=	5	YES	YES		WITH STOP	The pump water pressure remains lower for the entire intervention delay time.
445	PUMP WATER OVERPRESSURE	P									The pump water pressure remains higher for the entire intervention delay time.
449	WATER TRANSMITTER DISCONNECTED	ALWAYS ACTIVE	=	=	=	60	YES	NO		WITH STOP	The pressure transmitter circuit is disconnected.

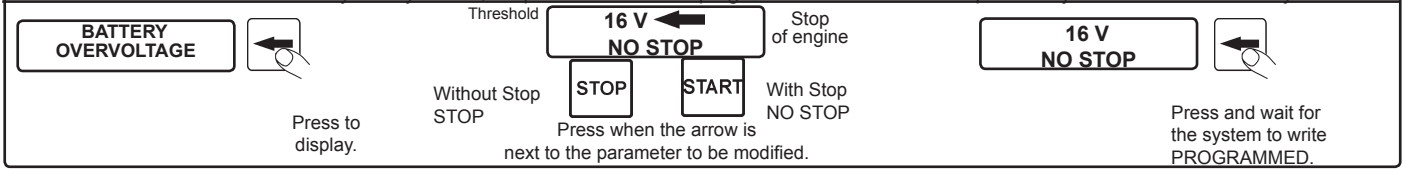
N. B.: all the programming settings are to be carried out with the engine stopped. FAULT CODES: ALARM **111-112-113-114** (see page 8). THE ALARM FAULT CODES **500–501 – 502 – 503 – 504** are describe in the modem attachment (B).

ENGINE PROGRAMMING SETTINGS

BATTERY UNDERVOLTAGE. Does not stop the engine.



BATTERY OVERVOLTAGE. By factory default, the protection device is programmed not to cause a stop. Non-adjustable intervention delay of 5 sec.



INTERVENTION DUE TO ENGINE OVERTEMPERATURE. The temperature is measured by the (TEMPERATURE) TRANSMITTER and is programmable. The protection device can be set on two levels and intervenes when these are exceeded. The warning level is programmed only as notification, the other level is programmed to stop the engine (the overtemperature is also detected by the thermostat that always causes the engine to stop).

ENGINE OVERTEMPERATURE WARNING

OVERHEATING WARNING — Press to display.

Threshold: 95°C/203°F NO STOP — Decreases / Increases — Stop of engine

STOP START — Press when the arrow is next to the parameter to be modified

95°C NO STOP — Press and wait for the system to write PROGRAMMED.

OVERTEMPERATURE.

OVERHEATING ENGINE — Press to display.

Threshold: 100°C/212°F

STOP START — Press when the arrow is next to the parameter to be modified

100°C — Press and wait for the system to write PROGRAMMED.

FUEL RESERVE. Does not stop the engine.
FUEL FINISHED. It is possible to program the stop; by factory default it is programmed to stop.

NO FUEL
- FUEL RESERVE (10%)
- FUEL FINISHED (1%)

Press to display.

Threshold: 1% 3 s STOP — Delay in intervention — Stop of engine

STOP START — Press when the arrow is next to the parameter to be modified

1% 3 s STOP — Press and wait for the system to write PROGRAMMED.

PROGRAM ONE LEVEL AT A TIME

LOW OIL PRESSURE WARNING. (The pressure measured by the pressure transmitter). This is programmed as notification and does not stop the engine. (The low pressure detected by the pressure switch causes the engine to stop).

OIL PRESSURE LOW WARNING — Press to display.

Threshold: 0.5Bar/500Kpa 1 s — Delay in intervention

STOP START — Press when the arrow is next to the parameter to be modified

0.5Bar 1 s — Press and wait for the system to write PROGRAMMED.

CHARGING ALTERNATOR FAULT. It is possible to program the stop; by factory default it is programmed to stop.

CHARGING ALTERN. ANOMALY — Press to display.

STOP — Stop of engine

STOP START — Press when the arrow is next to the parameter to be modified

NO STOP — Press and wait for the system to write PROGRAMMED.

NUMBER OF ATTEMPTS TO START. 10 attempts to start can be programmed. (Failure to start).

NUMBER OF STARTUP ATTEMPTS — Press to display.

Number of attempts: 4

STOP START — Press when the arrow is next to the parameter to be modified.

4 — Press and wait for the system to write PROGRAMMED.

STARTING OF GENERATOR SET WITH BATTERY WITH LOW CHARGE. (With control unit in automatic mode). Starts or stops the generator set depending on the voltage measured at the battery terminals.

START WITH FLAT BATTERY — Press to display.

Minimum threshold: 12.4Volt — Maximum threshold: 13.6 — Delay in intervention: 1200 s

STOP START — Press when the arrow is next to the parameter to be modified

12.4Volt 13.6 1200 s — Press and wait for the system to write PROGRAMMED.

CHOICE OF RADIATOR FLUID LEVEL PROBE.

RADIATOR LEVEL PROBE — Press to display.

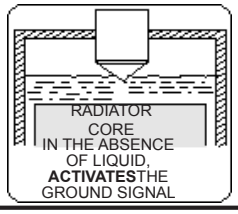
NORMAL OPERATION / **REVERSED OPERATION** — Factory setting

STOP START — Press to choose.

NORMAL OPERATION — Press and wait for the system to write PROGRAMMED.

DESCRIPTION

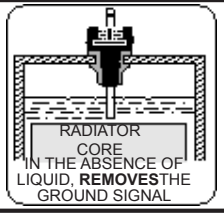
CHOICE OF PROBES



THIS IS DISPLAYED ON THE DISPLAY

REVERSED OPERATION

CHOICE OF PROBES



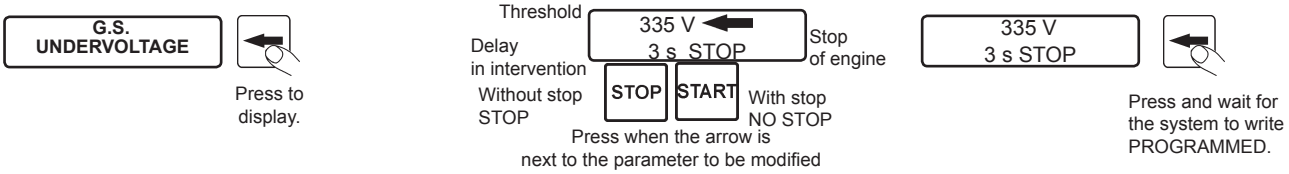
THE CONTROL UNIT IS PROGRAMMED FOR NORMAL OPERATION

THIS IS DISPLAYED ON THE DISPLAY

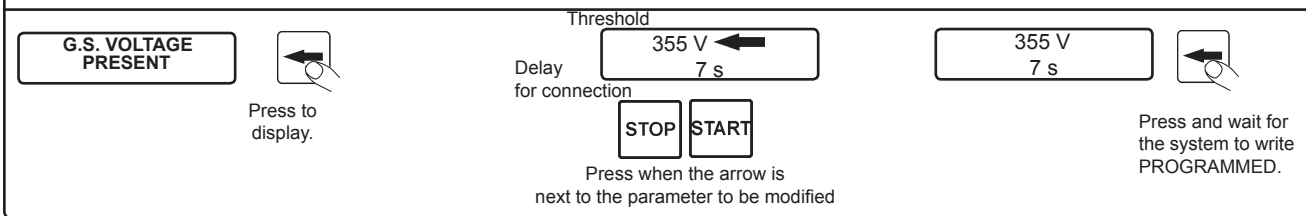
NORMAL OPERATION

GENERATOR PROGRAMMING

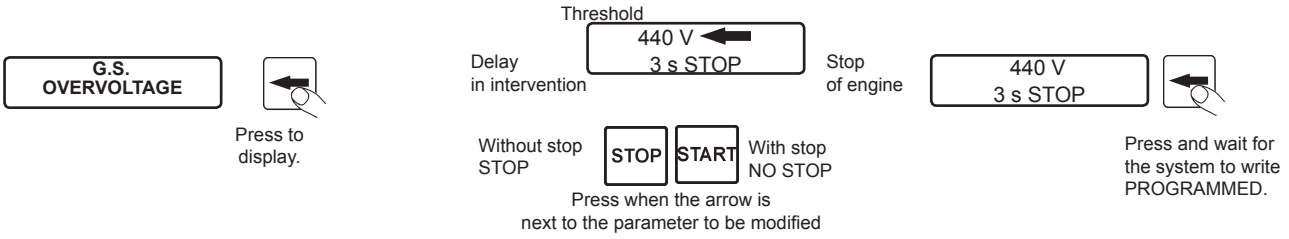
GENERATOR UNDERVOLTAGE. The protection device is activated when the generator voltage steadily stays higher than the programmed value for 10 seconds. The preset threshold is 335V with intervention delay of 3 seconds.



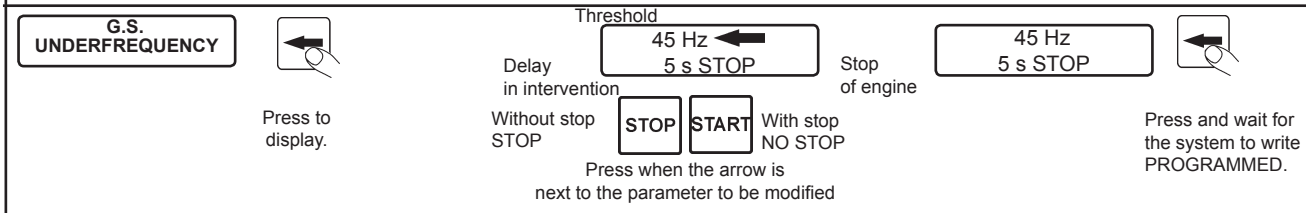
GENERATOR VOLTAGE PRESENT. The generator contactor closes when the voltage steadily remains above the programmed threshold for the entire generator connection to power user delay time.



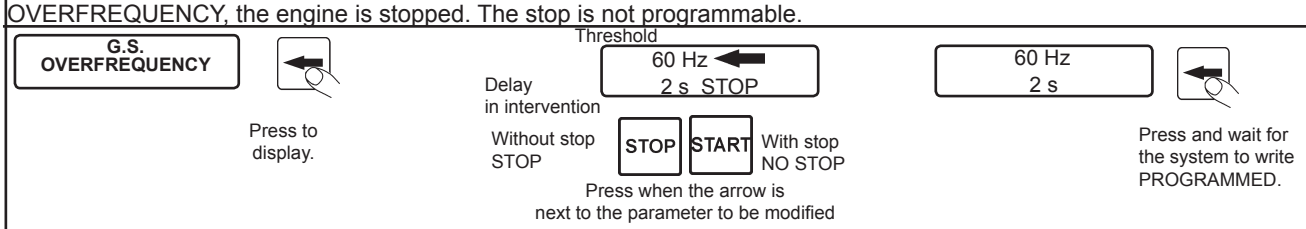
GENERATOR OVERVOLTAGE. It is factory programmed to stop.



GENERATOR UNDERFREQUENCY.
By factory default, the protection device is switched off. To activate it, you must program an intervention frequency different from 0 Hz. The protection device is activated when the generator frequency steadily stays higher than the programmed value for 10 seconds.

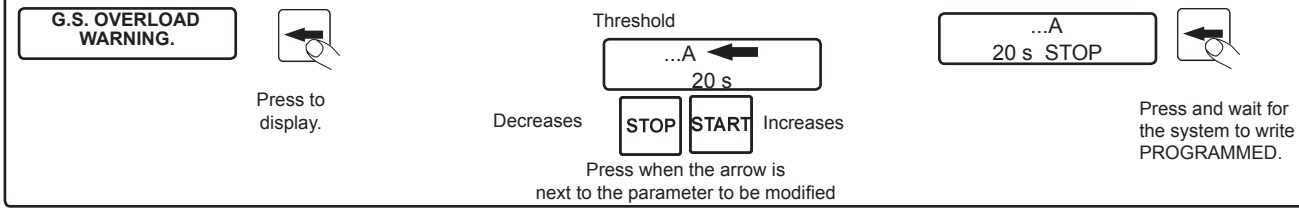


GENERATOR OVERFREQUENCY.
The factory set threshold is 60 Hz, suitable for 50 Hz systems. In the event of OVERFREQUENCY, the engine is stopped. The stop is not programmable.

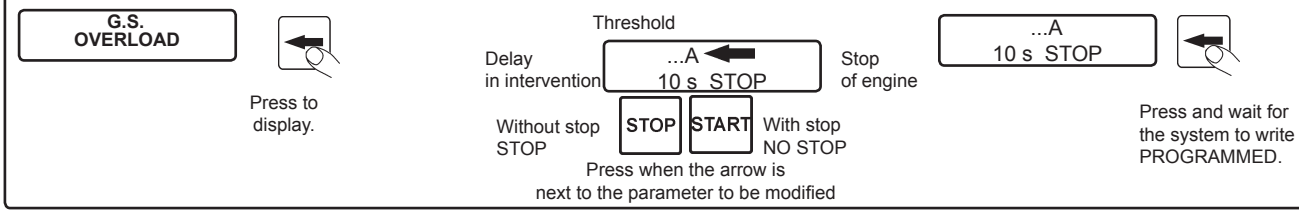


GENERATOR OVERCURRENT. The protection device can be set on two levels and intervenes when these are exceeded. **It does not replace the overload switch.** The warning level acts only as notification, whereas the other level can be programmed to stop the engine.
For example, if transformer 100/5 is chosen, the factory setting of the overcurrent triggers the intervention at 100A, but only when the current transformer withstands this current.

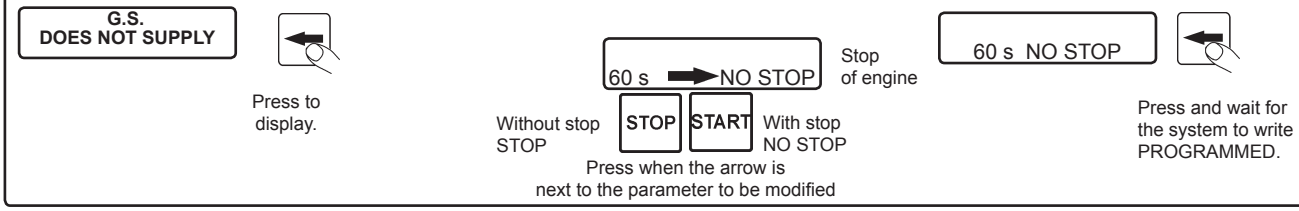
GENERATOR OVERLOAD WARNING.



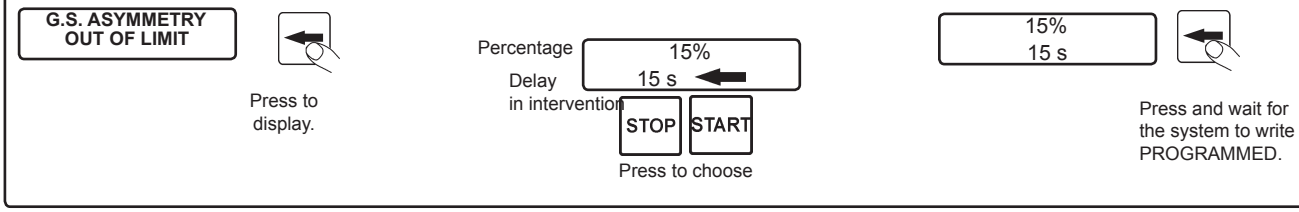
GENERATOR OVERLOAD.



GENERATOR DOES NOT SUPPLY POWER.
The generator does not supply power for the entire intervention delay time.

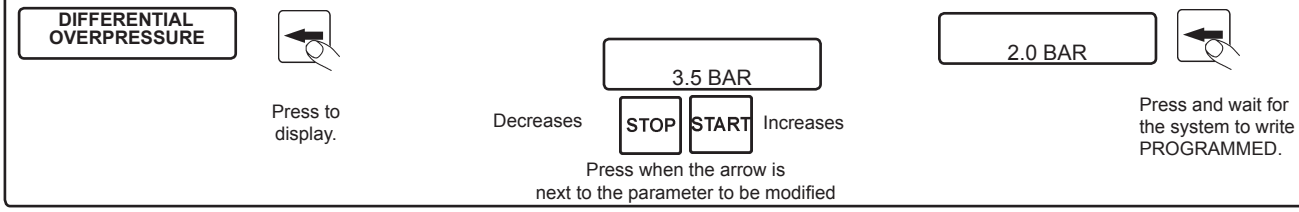


GENERATOR ASYMMETRY OUT OF RANGE. Asymmetry percentage higher than the set threshold.
This unbalance is the increase and decrease of the voltage of two phases compared to the voltage of another phase.



PUMP PROGRAMMING

PUMP WATER OVERPRESSURE. Factory setting: differential 2 bar.
It is possible to program: the differential is adjustable 1-1.5-2-2.5-3-3.5. For a working pressure between 1 and 4 bar, the overpressure differential is fixed at 1 bar.



CHOICE OF ALREADY PROGRAMMED TEMPERATURE AND PRESSURE TRANSMITTERS

CHOICE OF TEMP. TRANSM.

Press to display choice of 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 the system to write PROGRAMMED

TABLE OF ALREADY PROGRAMMED TEMPERATURE TRANSMITTERS

	25°C	50°C	70°C	80°C	85°C	90°C	95°C	100°C	120°C	130°C	OHM
TTAO/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 engine: Lombardini	927	322	155	112	96	83	71	62	36	29	
F 16173 Fitted on engines: AIFO		834	436	322	280	243	213	187	113	89	

CHOICE OF PRESSURE TRANSM..

Press to display choice of pressure transmitters.

STOP Press to choose START

Factory setting

TTAO/403 → VDO → VDO/29/10 → LOMBARDINI → PROGRAMM.

PROGRAMMABLE PRESSURE TRANSMITTER

Press and wait for the system to write PROGRAMMED

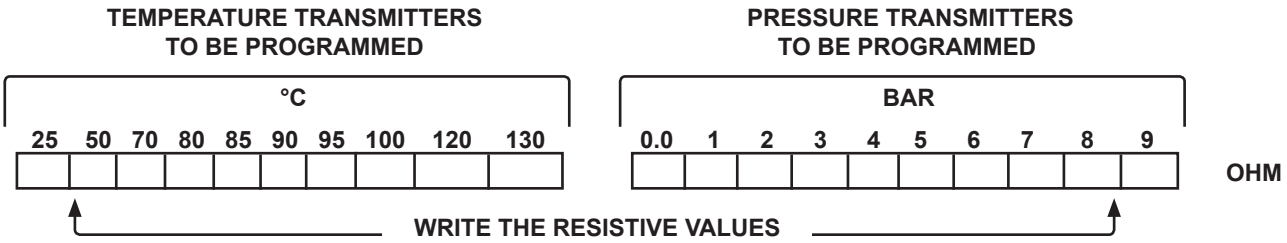
TABLE OF ALREADY PROGRAMMED PRESSURE TRANSMITTERS

	0 BAR	1 BAR	2 BAR	3 BAR	4 BAR	5 BAR	6 BAR	7 BAR	8 BAR	9 BAR	OHM
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 engine: Lombardini	10	31	52	71	90	107	124	140	156	170	

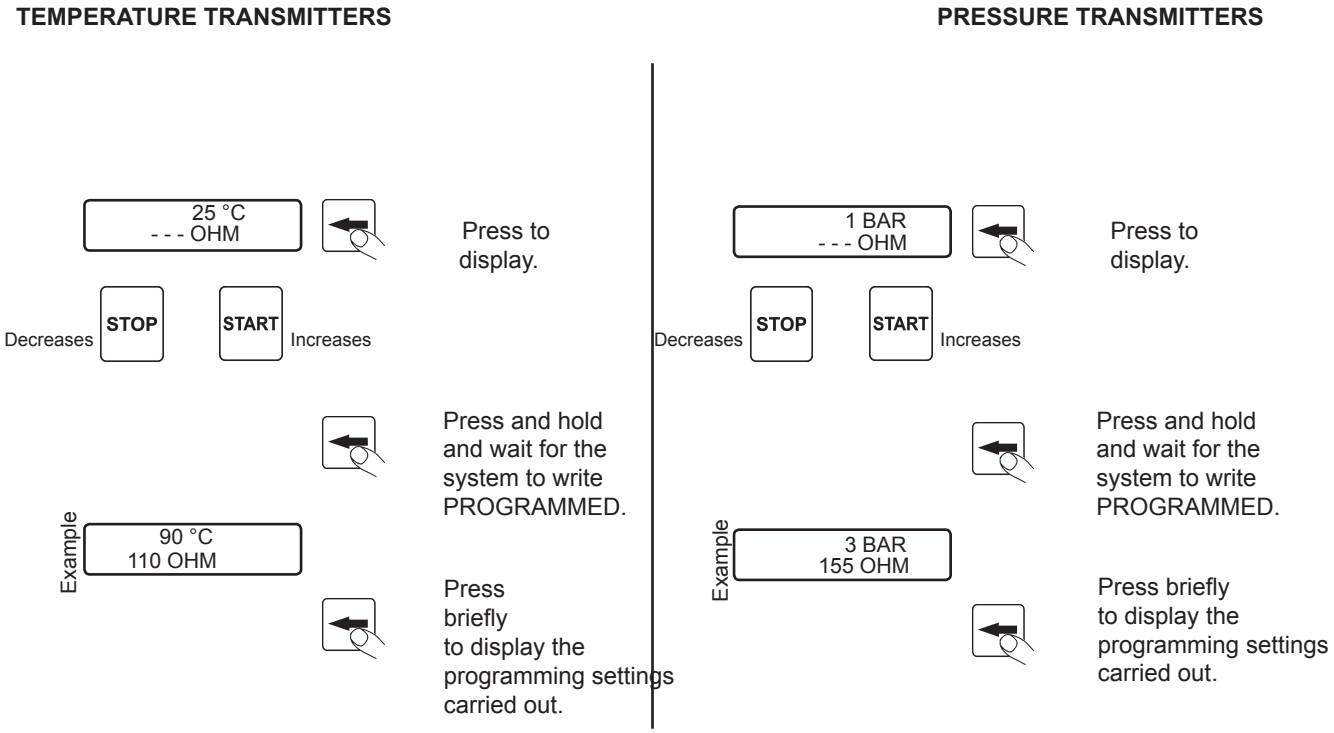
PROGRAMMING OF THE OHMIC VALUES OF THE TEMPERATURE AND PRESSURE TRANSMITTERS (PROBES)

By factory default, the control unit is set for pressure and temperature transmitters TYPE TPO/403 (Pressure), TTAO/403 (Temperature). It is possible to program 10 resistive values, corresponding to the characteristic curves of other temperature and pressure transmitters.

PROGRAMMING OF CORRESPONDENCE



TECHNICAL PROGRAMMING



WARNING: It is necessary to program at least 2 values (to obtain good precision in the control of temperature and pressure, we recommend programming at least 4 values).
If just one value is programmed or non-monotone values are programmed, the fault is detected.

OIL TEMP. TABLE NOT CORRECT OR OIL TEMP. TABLE NOT CORRECT.

PROCEDURE FOR SWITCHING INSTRUMENTS AND FUNCTIONS ON AND OFF

Instruments and functions can be switched on or off using the following procedures.

EXAMPLE

KVOLTAMMETER

Press to display the function and the instrument to be switched off.

ENGAGED

OFF

STOP START

Press to choose.

Factory setting

EXAMPLE

KVOLTAMMETER

Press and wait for PROGRAMMED to be displayed.

SWITCHING OFF OF INSTRUMENTS

(See above procedure)

Measurements produced by the control unit CEM-120	FACTORY PROGRAMMING SETTINGS	
	ON	OFF
WATTMETER		•
VARMETER		•
VOLTAMMETER		•
POWER FACTOR METER		•
KILOWATT-HOUR		•
TACHOMETER	•	
THERMOMETER	•	
OIL PRESSURE GAUGE	•	

CHOICE OF ALREADY PROGRAMMED FUEL FLOAT

CHOICE OF FUEL FLOAT. The control unit is programmed for a float with rheostat, suitable for FUEL LEVEL indication.

CHOICE OF FUEL FLOAT

Press to display.

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

STOP START

Press to choose

VEGLIA → VDO → DATCON → W → PROGRAMM.

To program or change the already programmed values, see FUEL FLOAT PROGRAMMING

W

MANAGEMENT OF FUEL W

Press and wait for PROGRAMMED to be displayed.

MANAGEMENT OF FUEL W
It is possible to program the use of a float with contact that closes to ground when there is no fuel.

PROGRAMMABLE FLOAT FUEL

PROGRAMMING OF OHMIC VALUES OF 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

50%
- - - OHM

Decreases STOP START Increases

Press to display.

WARNING: It is necessary to program at least 2 values (to obtain good precision in the control of the fuel, we recommend programming at least 4 values). If just one value is programmed or non-monotone values are programmed, the fault is detected

INCORRECT FUEL FLOT TABLE

50%
- - - OHM

Press and hold and wait for the system to write PROGRAMMED.

Press briefly to display the programming carried out.

SWITCHING OFF OF FUNCTIONS (See procedure on previous page)

	ON	OFF
MAN MODE (MANUAL)	•	
AUT MODE (AUTOMATIC)	•	
OFF MODE (LOCKED)	•	
BATTERY UNDERVOLTAGE	•	
BATTERY OVERVOLTAGE	•	
OVERTEMPERATURE WARNING	•	
ENGINE OVERTEMPERATURE (Measured by the temperature transmitter)	•	
LOW OIL PRESSURE WARNING	•	
FAILURE TO STOP	•	
START WITH FLAT BATTERY		•
G.S. UNDERVOLTAGE	•	
G.S. OVERVOLTAGE	•	
G.S. UNDERFREQUENCY		•
G.S. OVERLOAD WARNING	•	
G.S. OVERLOAD	•	
G.S. DOES NOT SUPPLY POWER	•	
INCORRECT G.S. PHASE SEQUENCE	•	
G.S. ASYMMETRY OUT OF RANGE	•	
STAND BY	•	
PICK UP DISCONNECTED		•
SENDING OF SMS AT EACH START AND STOP - an SMS message is sent for each automatic start-up or stop		•
SMS ON CHANGING TO AUT MODE		•
SMS ON CHANGING TO OFF MODE		•
SMS ON RESETTING CYCLIC MAINTENANCE - see description in modem attachment (B)		•
SMS ON FAULT RESET		•
CHARGING ALTERNATOR - for this switching off, also release the deflector and carry out the procedure described on page 5; see ADJUSTMENT OF TACHOMETER WITH GENERATOR FREQUENCY (switching off to be avoided, incomplete engine running detection) 12 24 VOLT	•	
GENERAL ALARM - **switching off is possible** when this intervenes to warn of an imminent automatic start-up except for a call start-up. **It cannot be switched off** when the intervention is caused by a fault.	•	

CHOICE OF CURRENT TRANSFORMER

It is possible to select current transformers from 30/5 up to 2000/5.

STOP START Press to choose the value of the current transformer.

AMP. TRANSFORMER 50/5

EXAMPLE

AMP. TRANSFORMER 100/5

Press and wait for the system to write

PROGRAMMED

G.S. OVERLOAD WARNING

95A

G.S. OVERLOAD

100A

AUTOMATIC CALIBRATION (A. C.)
- GENERATOR OVERLOAD WARNING
- GENERATOR OVERLOAD

After the A. C. is programmed, the thresholds are automatically adjusted.
The WARNING threshold is set at 95%,
the overload threshold is set at 100% of the nominal value of the A. C.
To change the thresholds manually, refer to page 15

FAULT LOG

The data of the last 100 faults that have stopped the engine are collected.

ANOMALIES OCCURRED

Press to display.

Number (progressive) of faults that have occurred
Date
(Example)
N 12 h1501 20-05-2014 17:30
Hour meter of engine
Time
LOW OIL PRESSURE

Decreases STOP START Increases

COMPLETE RESET OF THE LOG

RESET LOG?

Press to display.

RESET LOG?

STOP START

To reset press simultaneously and wait for the system to write PROGRAMMED.

PROGRAMMING OF AVAILABLE FAULT

THE NEW DESCRIPTION OF THE FAULT IS NOT TRANSLATED.

ANOMALY TEXT

HOW TO WRITE

STOP Press to move the cursor

START - Press to write
- Press and hold until a segment is deleted
press and hold to delete completely

STOP

MEMORY

POLARITY

ACTIVATION

INTERVENTION DELAY

(1) NO STOP / STOP

(1) NOT STORED / STORED

(1) POLARITY ACTIVE AT GROUND / POLARITY ACTIVE OPEN

(1) ALWAYS ACTIVE / ACTIVE RUNNING

EXAMPLE (1) 0 s (can be set from 0 to 60 s)

(1) FACTORY SETTINGS

STOP START Press to change the functions and the intervention delay.

NOTE the interventions always activate the general alarm.

Press and wait for PROGRAMMED to be displayed.

MOD BUS GSM PARAMETERS

SERIAL PORT RS232. MOD BUS - GSM - MODEM -
Select GSM 9600 bps to activate the connection with the telephone number to be notified when the G.S. is in alarm condition.

CONNECTION WITH — Press to display.

MOD Bus — Or GSM MODEM

STOP START Press when the arrow is next to the parameter to be modified.

Factory programming setting: **MOD Bus**

Press and wait for the system to write PROGRAMMED.

CARD ADDRESS. Up to 9 cards (control units) can be addressed.

BOARD ADDRESSES — Press to display.

1

STOP START Press when the arrow is next to the parameter to be modified.

Factory programming setting: **1**

Press and wait for the system to write PROGRAMMED.

Programming of telephone numbers of users to be notified when the machine is in alarm condition. See "Sending SMS messages" in the MODEM manual

Cursor — **TELEPHONE 1** — Press to display.

Or 2 - 3

Example: **TELEPHONE 1** 333 — No. of user

Press to move the cursor. STOP START Press to write the number.

Mobile phone number: **TELEPHONE 1** 333123456

Press and wait for the system to write PROGRAMMED.

CODE FOR **RESETTING** OF **CYCLIC MAINTENANCE**: with your mobile phone, write **006** or **SERVICE**.

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

BAUDRATE — Press to display.

9600 BPS

STOP START Press to choose.

Factory programming setting: **9600 BPS**

Press and wait for the system to write PROGRAMMED.

FAULT SMS. Number of times a fault SMS will be sent in the event that no “OK” reply is received : 0 to 10.

FAULT SMS — Press to display.

3

STOP START Press to choose.

Factory programming setting: **3**

Press and wait for the system to write PROGRAMMED.