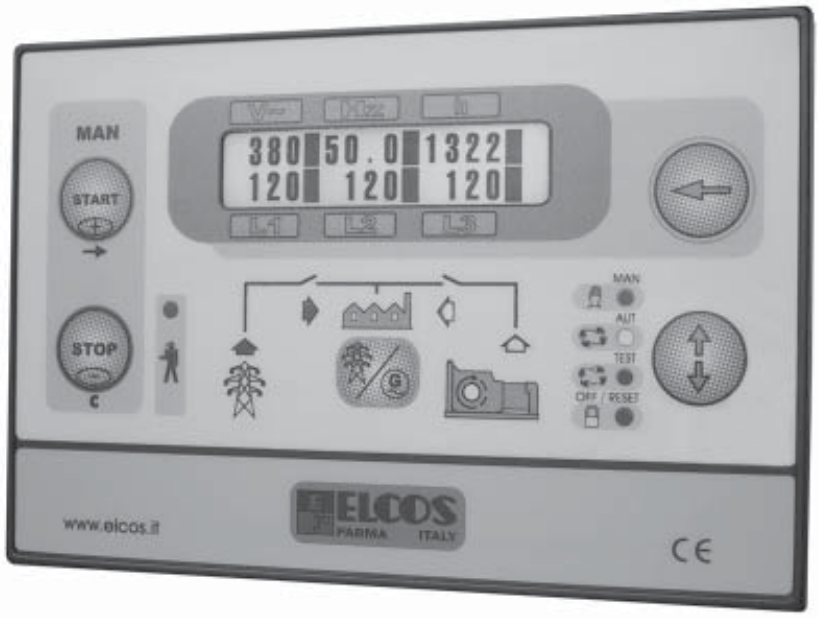
CONTROL UNIT FOR GENERATING SET

TYPE CAM-333

Made for the preparation of automatic emergency intervention switchboards.
This controls and commands the genset unit. It commands the mains and generator contactors to supply the user.

INSTRUCTION AND USER MANUAL



COMPLETE WITH DISPLAY FOR DISPLAYING:

- 13 INSTRUMENTS (Simultaneous reading of 6 instruments)
- ERROR MESSAGES
- USEFUL PROGRAMMING AND SIGNALS FOR GENERATOR SET MANAGEMENT

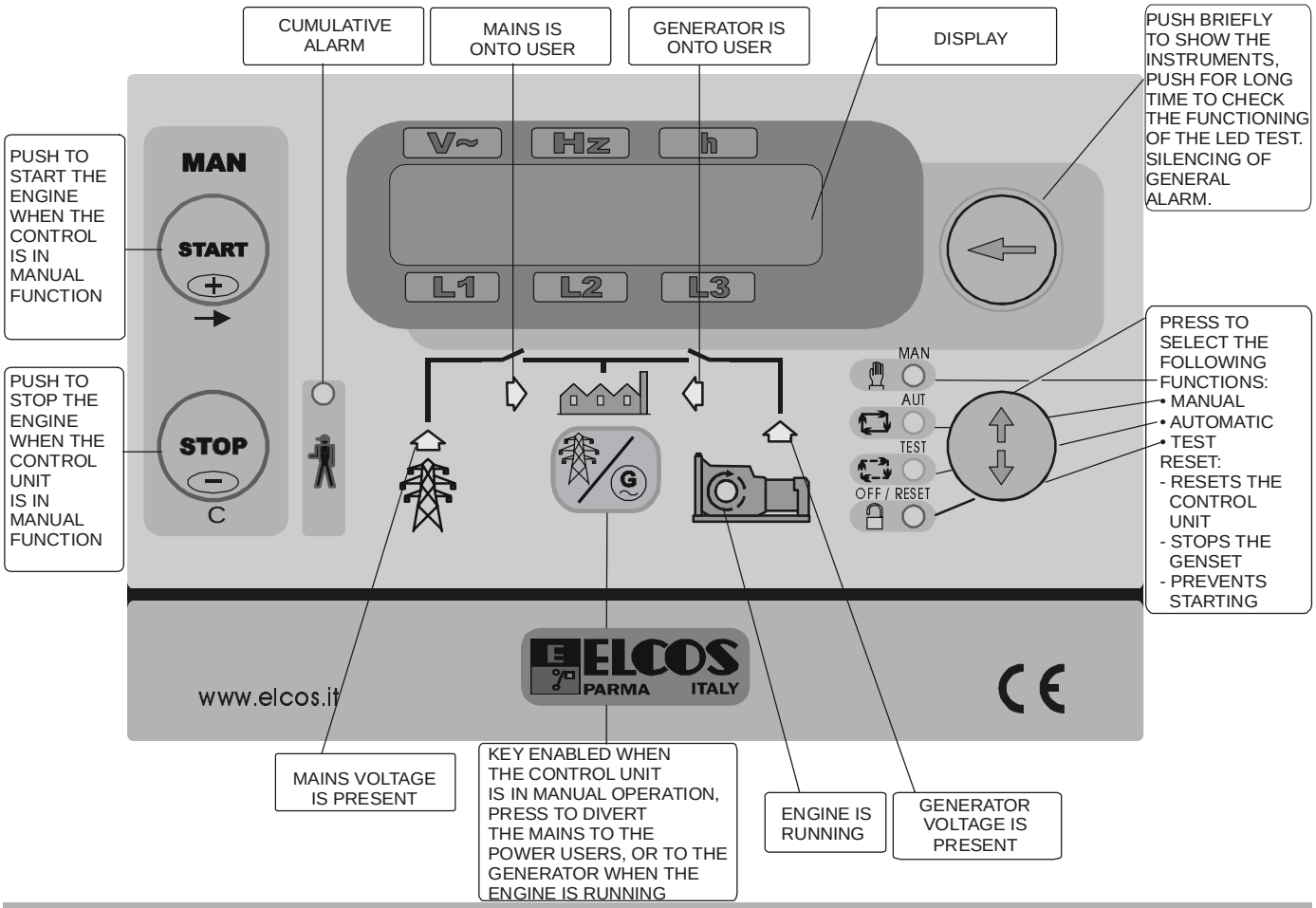
- **AUTOMATIC SUPERVISION OF FAULTS WITH MESSAGES ON THE DISPLAY**
- **TEXT IN 5 LANGUAGES: ITALIAN, ENGLISH, FRENCH, GERMAN AND SPANISH**
- **INFORMATION ON 4 PROGRAMMABLE PREVENTIVE MAINTENANCE OPERATIONS WITH DISPLAY OF THE HOURS REMAINING BEFORE THE MAINTENANCE WORK IS DUE**
- **CONTACT REMOTE CONTROLS (STARTUP AND STOP)**
- **CLOCK FOR PROGRAMMING THE STARTUP OR STOPPING OF THE GENSET**
- **REMOTE MANAGEMENT WITH THE POSSIBILITY OF USING A GSM MODEM**
- **PROGRAMMING OF PARAMETERS (THRESHOLD, TIMES, COUNTS ETC.) MADE EASY BY DIP SWITCH**
- **PROGRAMMABLE WEEKLY AUTOTEST**
- **COMPLETELY PROGRAMMABLE FAULTS AVAILABLE (TIMES, POLARITY, POSSIBILITY OF STOPPING AND MESSAGE ABOUT THE FAULT)**

Summary

TECHNICAL DATA

Battery power supply:	12 VDC and 24 VDC
Supply voltage:	8 ÷ 32V
For generators with nominal voltage:	220 ÷ 450Vac ±10%; frequency 50 ÷ 60Hz
Consumption with stopped engine:	70mA at 12V 40mA at 24V
Max consumption	190mA at 12V 130mA at 24V
Nominal insulation voltage:	
- Terminal board of mains:	380V
- Terminal board of generator:	450V
- Terminal board of battery:	32V
Amperes of contacts for gen./mains contactors:	250V 3A
Max amperes of the outputs	15 (starting) 3W 17 (stopping) 7W, 19 (key) 3W, 70 (general alarm) 3W
Degree of rear protection:	IP20
Degree of front protection:	IP 64
Temperature range:	–10 ÷ +50 º C
Weight:	410 g
Dimensions	144x96x49 mm
Hole	88X136 mm
Hour-meter:	4 digits
Battery voltmeter:	Max 38V, Precision 2%
Mains voltmeter	Max 500V, Precision ±2%
Generator voltmeter:	Max 500V, Precision ±2%
Generator ammeters:	Max 2400A, Precision ±2%
Frequency-meter:	0-85 Hz, Precision ±0,1 Hz
Voltammeter	Max 1500kVA, Precision ±4%
Tachometer	Max 4000 RPM Precision ±10 RPM
Serial output parameters	9600 baud, 8 bit data, 1 bit stop; no parity

BRIEF INSTRUCTIONS



INSTRUMENTS

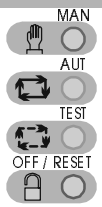
Normally the display shows three mains voltmeters. With the engine running the generator set instruments are shown. In the event of a fault, instead of the measurement, the display shows the message of the fault. The data can be transmitted (by cable or GSM modem) to a personal computer.

• THREE MAINS VOLTMETERS	For three-phase voltages up to 500 V~ connected on CBV-015.
• THREE GENERATOR AMMETERS	Compatible with the amperometric transformers of type 30/5, 40/5, 50&5, 60/5, 80/5, 100/5, 200/5, 250/5, 300/5, 400/5, 500/5, 600/5, 800/5, 1000/5, 1200/5, 1500/5, 2000/5. Maximum reading of 2000A or 110% of the base scale current of the chosen transformer.
• GENERATOR VOLTMETER	For single-phase or two-phase of nominal value up to 500 V~.
• GENERATOR FREQUENCY METER	From 0 Hz to 85 Hz for alternating voltages with amplitude greater than 20 V~.
• VOLTAMMETER	Displays apparent power up to 1500KVA
• BATTERY VOLTMETER	For voltages between 9 and 38 volt.
• HOUR-METER	With four figures and a maximum reading of 9999. The hour-meter numbers flash when it is necessary to perform the periodic maintenance operations planned by the manufacturer of the genset unit.
• STARTUP COUNTER	Displays the number of startups that have occurred up to 9999.
• TACHOMETER	Displays the number of engine revs up to 8500 rpm.

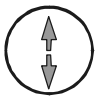
SIMULTANEOUS READING OF THE INSTRUMENTS

- WITH MAINS PRESENT: 3 MAINS VOLTMETERS
- WITH ENGINE RUNNING: GENSET VOLTMETER, GENSET FREQUENCY METER, 3 GENSET AMMETERS, HOUR-METER.

OPERATION



FUNCTION SELECTION



The function selected with the key is shown by the associated warning light.

MANUAL

The control unit commands are enabled.
Starting with key 

, stopping with key 

(keep pressed until the engine stops).

CONTROL FOR MAINS-GENERATOR CONTACTORS

It is left to the keys 

.
By pressing on the relevant key, the load is switched from the mains to the generator and vice versa.

PREPARATION FOR GENERATOR CONTACTOR CLOSING

When there is no generator voltage, the contactor can be closed by pressing the relevant key 

.
The LED that usually signals the closing of the contactor flashes to show it has been selected.
When the voltage is normal, the contactor closes and the LED stays on with a steady light.
Cancellation of the preparation occurs in two ways:
• by pressing briefly (less than 1 sec.) key 

.
• on de-energization of the prepared contactor.

PROTECTIONS

The generator set protection function in manual mode can be programmed in two ways:
· Display only of the fault that has intervened WITHOUT STOPPING the engine. The generator overfrequency fault is programmed with stopping of the engine. It cannot be programmed without stopping of the engine.
· Display of the fault that has intervened WITH ENGINE STOPPING. (The control unit is programmed in this way).

AUTOMATIC

When a fault occurs on the mains, detected by the internal voltmetric relay, or by an external call, once the MAINS FAULT STARTUP DELAY time has elapsed (programmed to 1 sec.), the control unit commands the opening of the mains contactor control, and starts the generator set. With engine running and generator voltage normal and once the GENERATOR CONNECTION TO POWER USERS DELAY has elapsed (programmed to 5 sec.) the generator contactor closes.
While it is running the generator set is protected from possible faults. When the mains voltage is restored and the MAINS ACCEPTANCE time has elapsed (programmed to 100 sec.), after the GENERATOR-MAINS INTERLOCK time (programmed to 1 sec.), the mains contactor closes. The COOLING TIME (programmed to 120 sec.) Then allows the engine to be cooled easily before it is stopped.

TEST

On pressing key 

, we obtain the engine startup cycle as in automatic, and the power users remain supplied by the mains. If a mains fault occurs during the test, the power unit remains in test mode, positions itself as in automatic operation and commands the closing of the generator contactor.

WEEKLY AUTOTEST

ENABLED WITH POWER UNIT IN AUTOMATIC OR TEST MODE

If the lever is positioned on TEST ENGAGED the general alarm is activated intermittently (for 8 sec.). When the general alarm is deactivated, and after a pause of 3 seconds, the engine starts and continues to run for the WEEKLY TEST TIME (programmed to 3 minutes).
This test will be repeated automatically every week on the exact day and at the hour to which the TEST ENGAGED lever has been positioned. During the automatic test cycle, WEEKLY TEST is shown on the display.

STOPPING OF ENGINE DURING THE TEST

Press key  .

UPDATING OF THE HOUR LEAVING THE SWITCH ON TEST ENGAGED

Keep pressed at the same time keys  and  until the TEST warning light 

starts to flash.
Press key 

within 3 sec.

The weekly test cycle is therefore obtained as if the switch had been repositioned.

OPERATION

OFF/RESET

When key  is pressed until Led 

comes on.
The engine cannot be started in any way and, if the running engine is stopped without carrying out engine cooling; it reactivates the protection devices and all the stopped functions. The mains contactor stays closed. The Leds and the instruments are active.

START UP

- In manual with key 

.
- In automatic, when a mains fault occurs, as detected by the internal voltmetric relay or with the remote controls, and after the MAINS FAULT STARTUP DELAY (programmed to 1 second) time has elapsed. To make starting easier, a special circuit establishes a series of programmable startups (programmed to 4 STARTUPS); the number of startups, the length of the pause time and the start up time can be programmed.

STARTING FAILURE

If the whole series of attempts is unable to start the engine, at the end of this cycle STARTING FAILURE is shown on the display and the stop signal is activated.

STOP

- In **manual** mode using key 

.

- In **Test** mode when the protection systems or the remote controls intervene.
- In **automatic** mode when the mains power returns, or when the protection systems or remote controls intervene.

Stopping can occur in two ways:
• With the solenoid deactivated while the engine is running and activated when stopped. This condition is maintained during the STOP TIME (programmed to 20 seconds) after the engine stopped detection.
• With solenoid or electro-valve activated while the engine is running and deactivated when stopped. This condition is maintained even when the engine is stationary.

DETECTION OF ENGINE RUNNING

This is obtained with detection (adjustable P1) of the battery charger alternator voltage (PERMANENT MAGNETS or PRE-EXCITATION) and from the frequency and residual voltage of the generator. When detection has been made it disconnects the starter motor and lights the LED  .

CLOCK

It allows generator set operation or stopping to be programmed. In AUT operation.

STARTING

Operation obtained as during mains failure.

STOP

It stops starting or running of generator set.

OPERATION

GENERATOR SET PROTECTION DEVICES

The intervention of the fault is displayed; it can cause the engine to be stopped and activates the general alarm. SEE TABLE on page 13.

FAULT DISPLAY

The display usually shows the mains voltmeters. When the engine is running the generator set instruments are shown.
When there is a fault, instead of the reading, the display shows the intervened fault message, and the associated LED flashes.

HOW TO SEE THE INSTRUMENT READINGS AGAIN

It is possible to access the reading of the measurements and at the same time silence the general alarm by pressing key  for 1 second.
The display will resume showing the previous fault 20 seconds after the last pressing of the key.

FAULT RESET

Reactivates protection devices and all stopped functions, by pressing key  , until the RESET LED comes on.

GENERAL ALARM

This is produced by mounting an acoustic signal, linked to the appropriate terminal.
It can be arranged so that it is activated continually or for a set time.

When key  is pressed the general alarm is silenced.
It is activated intermittently for 8 seconds, followed by a pause, before beginning the generator set start up for remote start up.

PREVENTIVE MAINTENANCE

When preventive maintenance operations need to be carried out, the figures of the hour-meter flash while the number of the intervened maintenance appears.

The timing for the maintenance operations and the procedure for zeroing the time up maintenance indication can be programmed by the manufacturer of the generator set unit.

COMMUNICATION PORT
REMOTE OPERATION (ON REQUEST)

When the special adaptor cable is connected to a personal computer remote operation is possible, in various ways, using a programme for the Windows operating system. The instructions for use and loading are on the program disk.

CALL START UP AND STOP COMMANDS

ENABLED WITH CONTROL UNIT IN AUTOMATIC

CALL

On closing the call contact (see page 10), operation is as with mains fault.

ENABLED WITH CONTROL UNIT IN AUTOMATIC

START UP

When the start up contact (see page 10) is closed REMOTE STARTUP is shown on the display. After the REMOTE STARTUP DELAY time (programmed to 1 sec.) has elapsed, the start up begins, the general alarm is activated intermittently (for 8 seconds), then the general alarm is deactivated and after a pause of 3 seconds the start up cycle begins and operation is as with mains fault.

When the start up contact is opened operation is as with mains return.

STOP

When the test contact is closed REMOTE TEST is shown on the display.
The control unit does not allow any start up operation, and if the generator set is running it is stopped.

The intervention of the remote control is shown on the display.

EMERGENCY STOP

The emergency stop can be activated in all working conditions, by mounting one or more click down push.
The stop is immediate (without engine cooling) and EMERGENCY STOP is shown on the display.

 Do not use the emergency push-button linked to a stop system that is not energized when the unit is running.

STOPPING FAILURE

This intervenes if the engine running signal is detected 60 seconds after the stop command.
STOPPING FAILURE will be read on the display.

VOLTMETRIC MAINS AND GENERATOR RELAYS

These check the mains and generator set voltage. They intervene when there is over-voltage (generator only), or voltage value failure or lowering even on just one phase of the voltage value.

THREE-PHASE MAINS RELAY

The relay is divided into two parts: the mains input part is managed by CBV-015-type equipment, the adjustments of the times and thresholds are managed by the control unit.

OPERATION

When voltage has been detected on the three phases, with a value within the preset limits, and after the **mains voltage present** delay (programmed to 100 sec.), the generator set stops. When the voltage goes down, so going outside the normal range, the generator set starts (for the starting and stopping procedures see automatic operation on page 4).

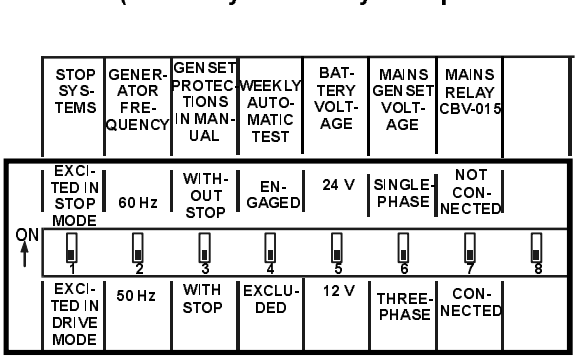
TWO-PHASE GENERATOR RELAY
INSIDE THE CONTROL UNIT
OPERATION

When voltage is detected on the two phases of the running generator set, with a value within the preset limits, and after the GENERATOR CONNECTION TO POWER USERS delay (programmed to 5 sec.) the generator contactor is closed. When the voltage goes up or down, so going outside the normal range, the generator contactor becomes de-energized.

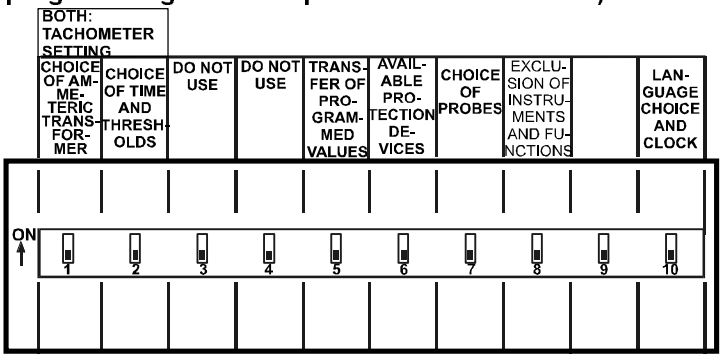
PROGRAMMING

TO BE CARRIED OUT WITH THE ENGINE OFF BEFORE
ENABLING POWER UNIT OPERATION

(Normally it is ready for operation wit just the programming of the amperometric transformer)



DIP A

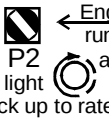


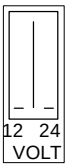
DIP B

SETTING OF RUNNING ENGINE THRESHOLD

FOR PRE-EXCITATION OR PERMANENT-MAGNET RECHARGE ALTERNATOR

It is not usually necessary to perform any calibration operations.
If, however, such operation should prove necessary, perform the following operations:
- Start the engine manually and turn it to the minimum running speed.
- Turn the potentiometer P2 until the indicator light is on.
- Bring the engine back up to rated speed.





WHERE THERE IS A PRE-EXCITATION ALTERNATOR HOOK THE DIVERTER IN THE POSITION CORRESPONDING TO THE RATED VOLTAGE OF THE BATTERY (12 - 24V).
DO NOT HOOK WITH OTHER TYPES OF ALTERNATORS

RESTORE FACTORY PROGRAMMING OF TIMES AND THRESHOLDS

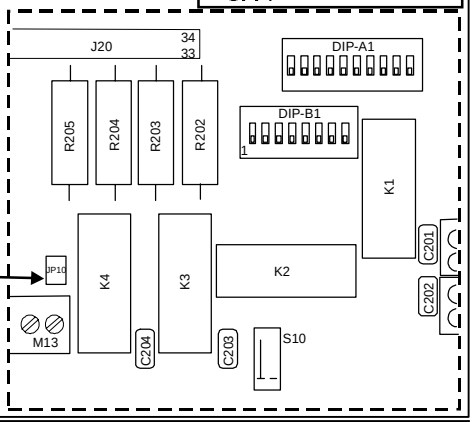
To restore all the factory-set programming:

Move DIP-B switches 1-3-5-7-9 to **ON.**

Press for at least 1 second, until the writing STANDARD PROGRAMMING appears

MOVE ALL THE DIP-B SWITCHES BACK TO **OFF**.

PROGRAMMING OF THE FOLLOWING IS NOT RESTORED:
• LANGUAGE • MAINTENANCE • OPERATING HOURS
• STARTUPS COUNTER • MESSAGES FOR THE FAULTS AVAILABLE TO THE USER • HISTORICAL REPORT .



EMERGENCY STOPPAGE

This can be obtained in all operating conditions, by mounting one or more push/buttons (release).

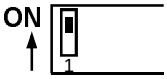
EMERGENCY PUSH-BUTTON

Remove the jumper if the emergency button is mounted.

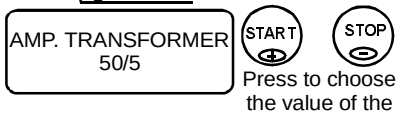
Mai installare un pulsante d'emergenza abbinato ad un sistema d'arresto che non sia eccitato in marcia.

CHOICE OF AMPEROMETRIC TRANSFORMER

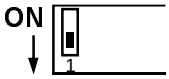
Amperometric transformers from 30/5 up to 2000/5 can be selected.



Move DIP-B switch 1 to **ON**

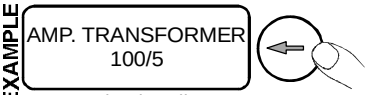


Press to choose the value of the amperometric transformer.

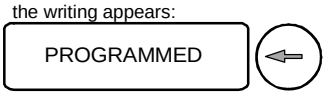


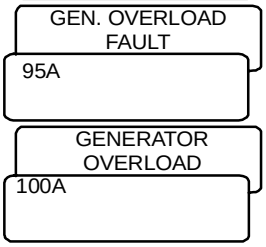
Move DIP-B switch 1 to **OFF**

EXAMPLE



Press and wait until the writing appears:





AUTOMATIC CALIBRATION (A.C.)
•GENERATOR OVERLOAD FAULT
•GENERATOR OVERLOAD
Once the A.C. has been programmed the thresholds set themselves automatically. The FAULT threshold is set to 95%, the overload threshold to 100% of the nominal value of the A.C.
To change the thresholds manually see page 16.

LED TEST

Press key for 20 sec.
All the LEDs light up for 3 sec.

AUTOMATIC EXIT FROM PROGRAMMING

When 3 minutes have passed during which no switch programmers has been moved and no keys have been pressed, the control unit will exit the programming.

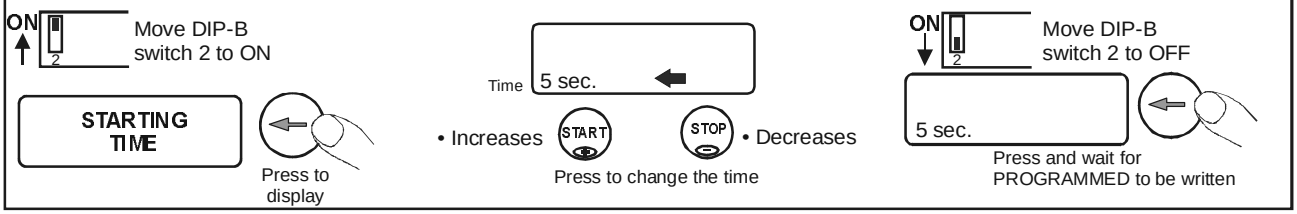
THE CONTROL UNIT ACCEPTS COMPLETE PROGRAMMING ONLY

To abandon an incomplete programming (without confirmation as shown by the written item "PROGRAMMED") move all the DIP-B switches to OFF.

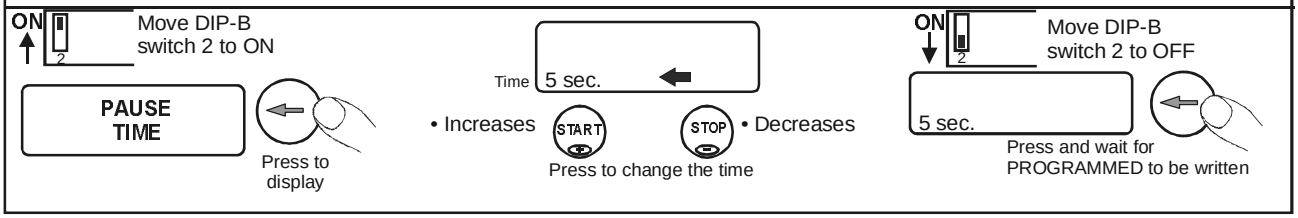
PROGRAMMABLE TIMES

DESCRIPTION	SECONDS	
	REGULATION RANGE	FACTORY SETTING
START UP TIME Start up attempt operation time	5÷25	5
PAUSE TIME Pause between start up attempts	1÷20	5
STOP TIME Stopping system operation time after the engine running signal has disappeared	10÷55	20
COOLING TIME Engine running time between the instant of release of the generator contactor and operation of the stopping system	10÷360	120
GENERATOR LINE INTERLOCK TIME Time elapsed between the opening of one contactor and the closing of the other	1÷20	1
REMOTE STARTUP DERLAY When the delay time is up the start up begins	0÷90	1
GENERAL ALARM INSERTION TIME Number 350 means continual operation without time limits	10÷350	350 (continual operation)
WEEKLY AUTOTEST TIME When the test time is up the engine stops	1÷60 minutes	3 minutes

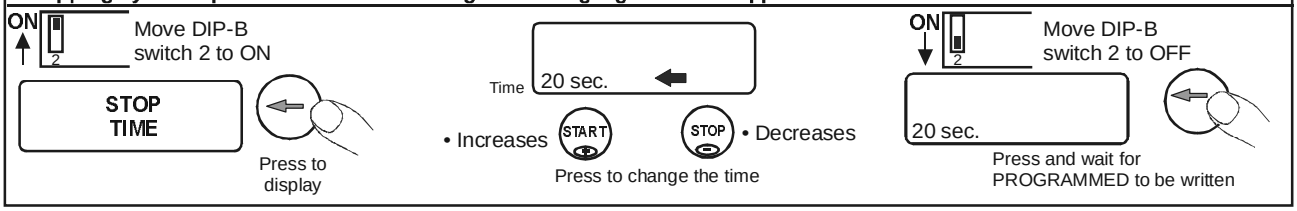
STARTING TIME. Start up attempt operation time.



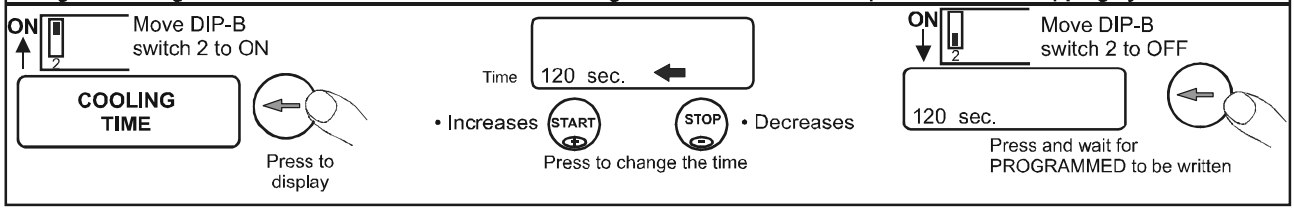
PAUSE TIME. Pause between startup attempts.



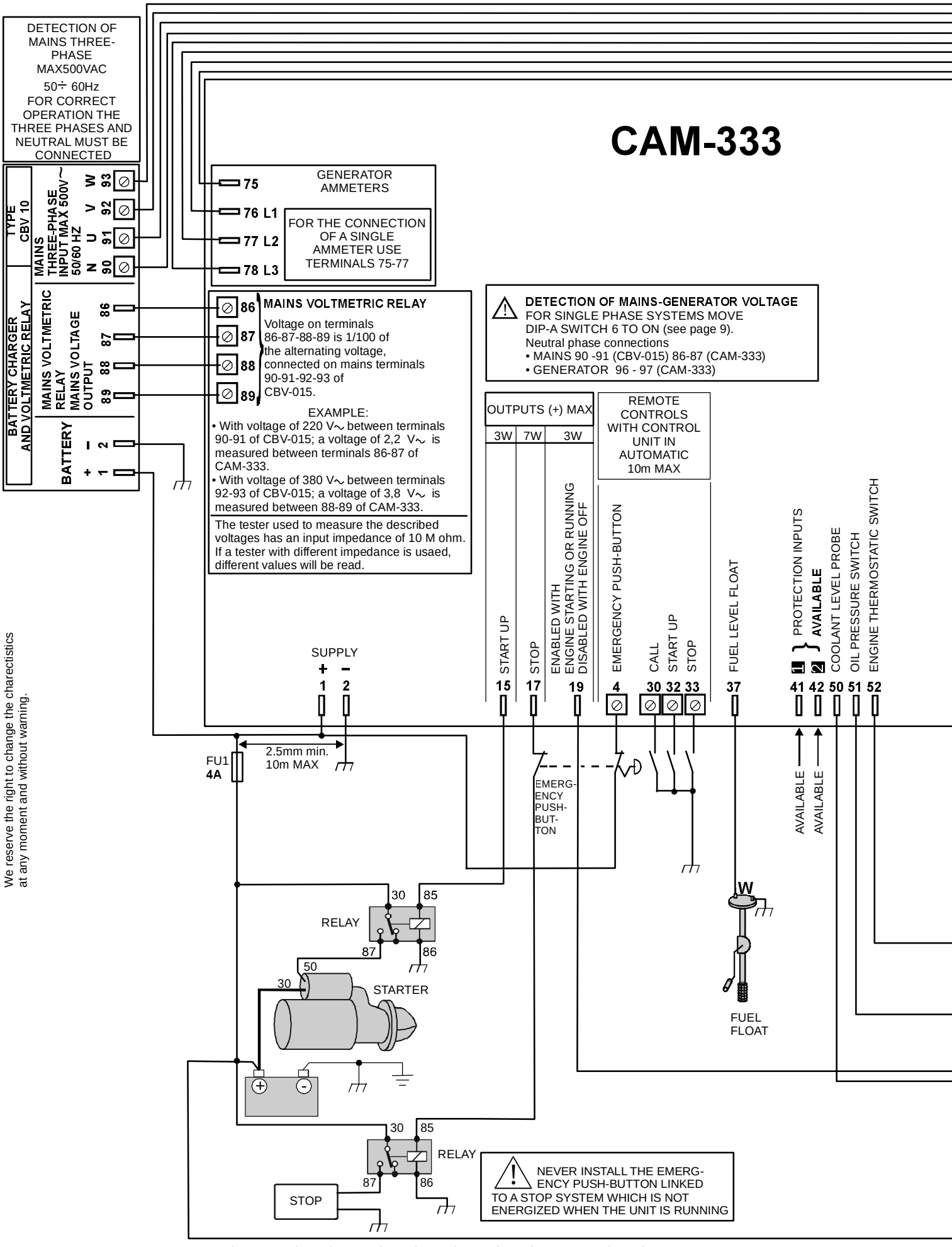
STOP TIME.
Stopping system operation time after the engine running signal has disappeared.



COOLING TIME.
Engine running time between the instant of release of the generator contactor and operation of the stopping system.

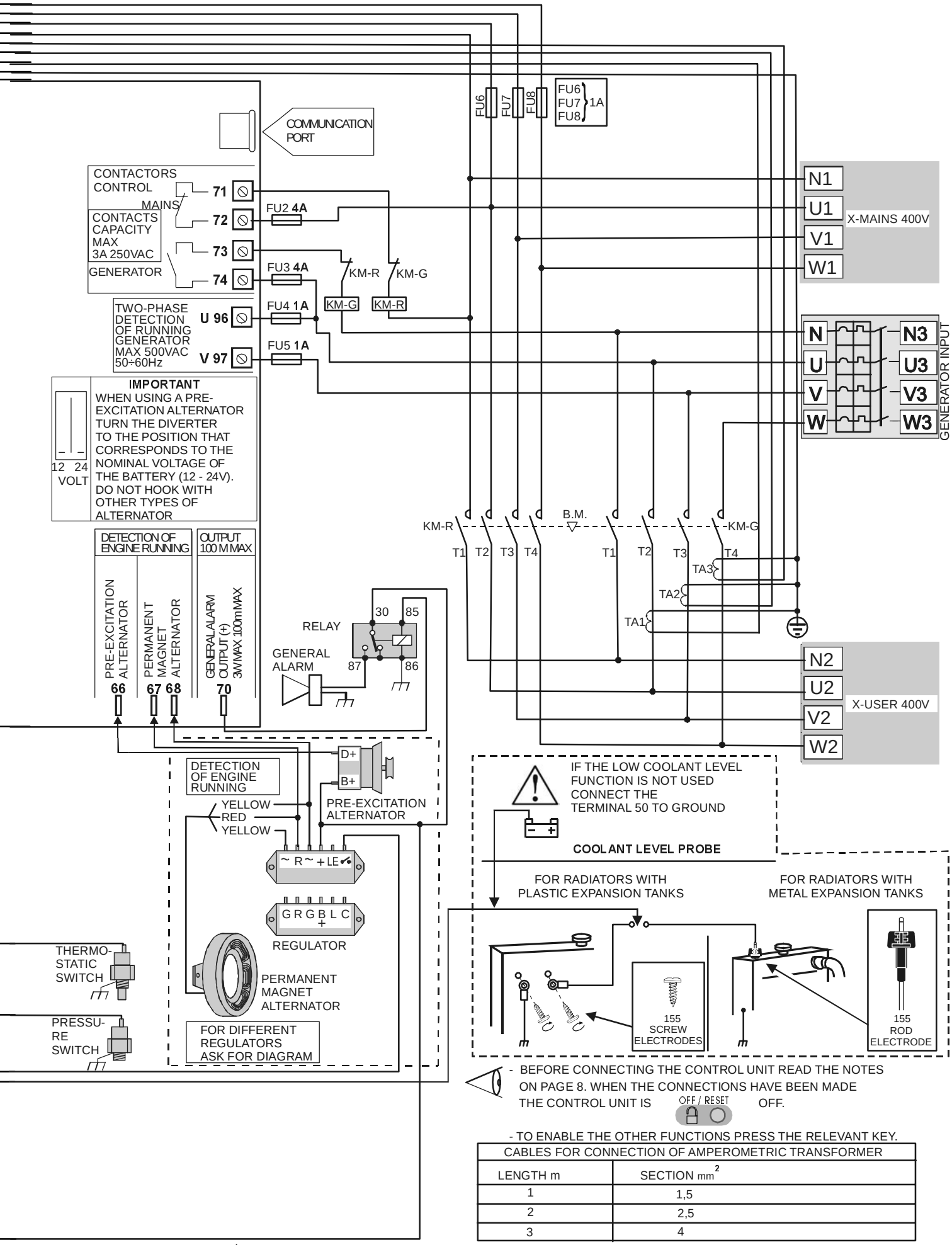


WIRING DIAGRAM



We reserve the right to change the charectistics at any moment and without warning.

YOUR ELECTRICAL TECHNICIAN CAN ASK US ANYTHING ABOUT THIS PRODUCT BY TELEPHONING ONE OF OUR TECHNICIANS



- BEFORE CONNECTING THE CONTROL UNIT READ THE NOTES ON PAGE 8. WHEN THE CONNECTIONS HAVE BEEN MADE THE CONTROL UNIT IS OFF / RESET OFF.

- TO ENABLE THE OTHER FUNCTIONS PRESS THE RELEVANT KEY.

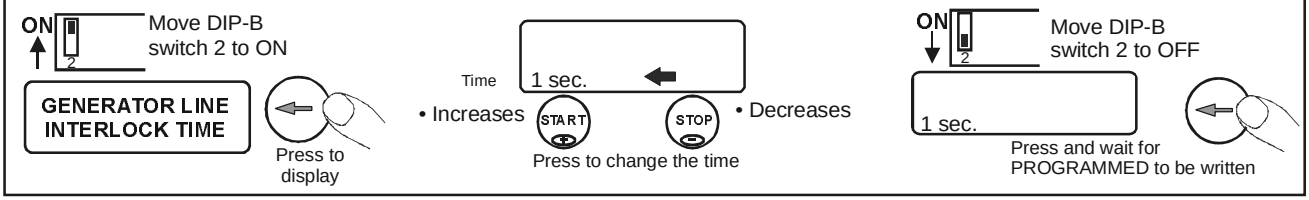
CABLES FOR CONNECTION OF AMPEROMETRIC TRANSFORMER	
LENGTH m	SECTION mm^2
1	1,5
2	2,5
3	4

CONSULT STANDARDS CEI 44-5 (EN 60204) FOR INFORMATION CONCERNING PROTECTION AGAINST OVERLOAD CURRENTS IN THE ELECTRICAL EQUIPMENT USING BATTERY VOLTAGE.

PROGRAMMABLE TIMES

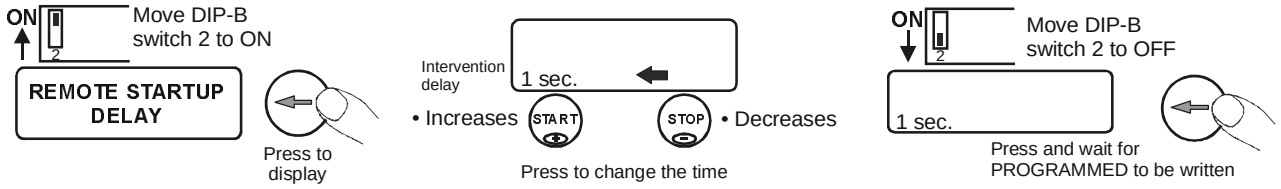
GENERATOR LINE INTERLOCK TIME.

Time elapsed between the opening of one contactor and the closing of the other.



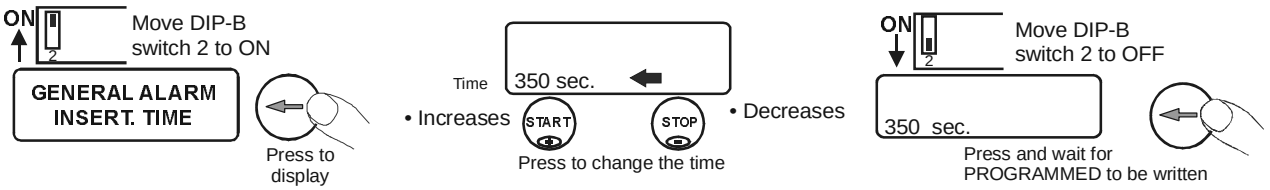
REMOTE STARTUP DELAY.

When the delay time is up, the startup begins.



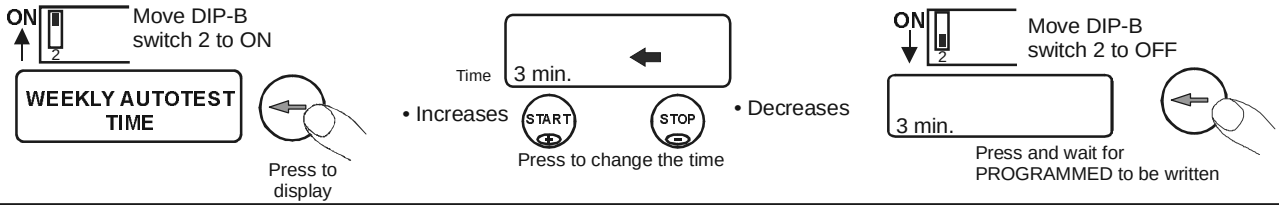
GENERAL ALARM INSERTION TIME

Number 350 means continual operation without time limits.



WEEKLY AUTOTEST TIME.

When the test time is up, the engine stops.



BASIC TABLE

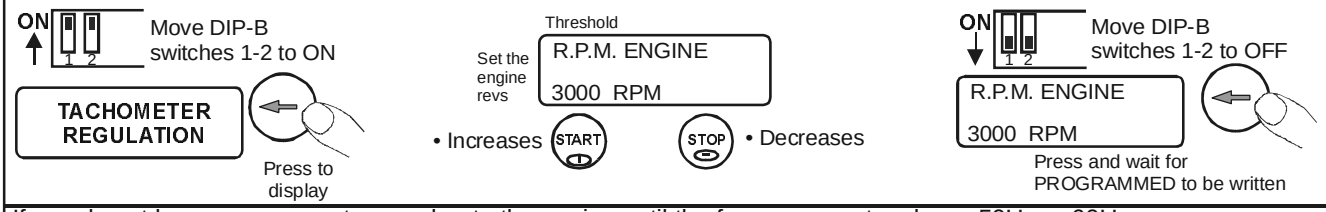
PROGRAMMING

GENERATOR SET PROTECTION (DISPLAY INFORMATION)	INSTANT OF ACTIVATION (SECONDS)	THRESHOLDS		INTERVENTION DELAY		STORES THE FUNCTION	ENGINE COOLING	STOP		INTERVENTION OCCURS WHEN:
		REGULATION FIELD	FACTORY SETTING	ADJUSTMENT RANGE	FACTORY SETTING			PROGRAMMABLE	FACTORY REGULATION	
				SECONDS						
BATTERY UNDER-VOLTAGE	ALWAYS ACTIVE	8÷12(12V) 16÷24(24V)	11 (12V) 22 (24 V)	1÷5	2	YES	NOT	DOES NOT STOP		Battery voltage remains lower than the programmed threshold for the whole of the intervention delay time.
BATTERY OVER-VOLTAGE	"	12÷18(12V) 24÷36(24V)	16 (12V) 32 (24V)	=	5	YES	YES	YES	WITHOUT STOP	Battery voltage exceeds the programmed threshold for the whole of the intervention time.
OVERTEMPERATURE DETECTED BY THERMOSTATIC SWITCH	"	=	=	=	IMMEDIATE	YES	NOT	STOPS		The temperature exceeds the threshold set by the thermostatic switch. No programming is possible.
NO FUEL	"	=	=	1÷5	3	YES	YES	YES	WITH STOP	The fuel level remains lower than the programmed threshold for the whole of the intervention delay time.
LOW OIL PRESSURE	10 AFTER DETECTION OF ENGINE RUNNING	=	=	=	IMMEDIATE	YES	NOT	STOP		The pressure is lower than the threshold set by the pressure switch.
GENERATOR UNDER-VOLTAGE	10 after the threshold is exceeded	80÷ 400V~	335V two-phase 193V single-phase	1÷10	3	YES	YES	YES	WITH STOP	The generator voltage remains lower than the programmed threshold for the whole of the intervention delay time (opens the generator contactor).
GENERATOR VOLTAGE PRESENT	Always active	100÷ 400V~	355V two-phase 205V single-phase	1÷15	GENERATOR CONNECTION TO POWER USERS DELAY 7	NOT	NOT	DOES NOT STOP		The voltage (controlled on two phases) stays permanently above the programmed threshold for the whole of the delay time for generator connection to power users (closes the genset contactor)
GENERATOR OVER-VOLTAGE	After detection of engine running	100÷ 500V~	440V TWO-PHASE 254V SINGLE-PHASE	0÷10	3	YES	NOT	YES	WITH STOP	Generator voltage remains above the programmed threshold for the whole of the intervention delay time (opens the generator contactor).
GENERATOR UNDER-FREQUENCY	10 after the threshold is exceeded	0÷60Hz	0 Hz	0÷10	5	YES	NOT	YES	WITH STOP	Generator frequency remains lower than the programmed threshold for the whole of the intervention delay time (opens the generator contactor).
GENERATOR OVER-FREQUENCY	ALWAYS ACTIVE	51÷85Hz	60 (50Hz) 72 (60Hz)	0÷5	2	YES	NOT	STOPS		Generator frequency remains above the programmed threshold for the whole of the intervention delay time (opens the generator contactor).
GENERATOR OVERLOAD WARNING	"	0÷120% (MAX 2400A)	47,5A (TA 50/5)	0÷30	20	YES	NOT	DOES NOT STOP		Generator current remains above the programmed threshold for the whole of the intervention delay time.
GENERATOR OVERLOAD	"	0÷120% (MAX 2400A)	50A (TA 50/5)	0÷30	10	YES	YES	YES	WITH STOP	De-energizes the generator contactor.
GENERATOR DOES NOT SUPPLY	"	=	=	0÷180	60	YES	NOT	YES	WITHOUT STOP	The generator does not supply voltage for the whole of the intervention delay time.
LINE MAIN UNDERVOLTAGE (LINE FAULT)	"	100÷ 400V~	338V three-ph. 195V single-ph.	1÷600	(STARTUP DELAY AFTER MAINS FAULT)1	=	=	=		At least one phase at a value lower than the programmed threshold and the intervention delay time has elapsed (opens the mains contactor).
LINE VOLTAGE MAIN PRESENT	"	100÷ 500V~	352V three-ph. 203V single-ph.	1÷3600	(Mains acceptance time)100	YES	YES	STOPS WHEN MAINS VOLTAGE RETURNS		With engine running the three phases stay permanently above the programmed threshold for the whole of the intervention delay time (closes the contactor and lights up the LED indicating mains voltage present).
STOPPING FAILURE	AFTER THE STOP COMMAND	=	=	=	60	YES	NOT	=		See description on page 7. (No programming is possible)
RADIATOR LOW COOLANT LEVEL	ALWAYS ACTIVE	=	=	=	5	YES	NOT	STOPS		The cooling liquid falls below the electrode and the intervention delay time has elapsed. (No programming is possible)
RECHARGE ALTERNATOR FAULT	10 AFTER DETECTION OF ENGINE RUNNING	=	=	=	3	YES	NOT	YES	WITH STOP	Alternator does not recharge the battery and the intervention delay time has elapsed.
NO. STARTUP ATTEMPTS (STARTING FAILURE)	ALWAYS ACTIVE	1÷10 STARTUPS	4 STARTUPS	=	IMMEDIATE	YES	NOT	WITH STOP		See description on page 5
1 2 AVAILABLE										Available completely programmable faults. See page 17.

N. B. : ALL PROGRAMMING IS TO BE CARRIED OUT WITH THE ENGINE OFF.

ENGINE PROGRAMMING

SETTING THE TACHOMETER. Bring the engine to constant known revs (for example using a tachometer). In this case the setting is carried out with the engine running.



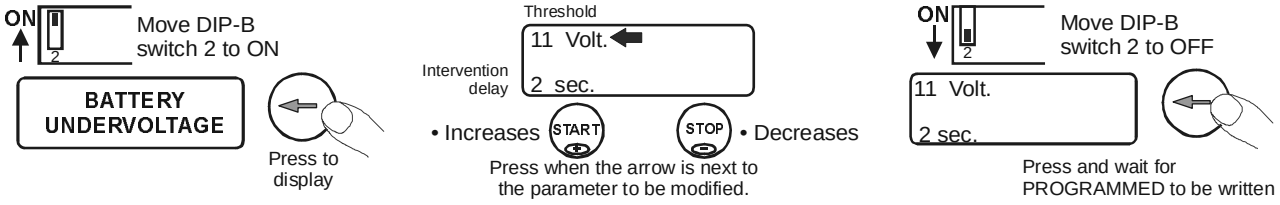
If you do not have a revs counter accelerate the engine until the frequency meter shows 50Hz or 60Hz .

For engines at 1500 revs/min

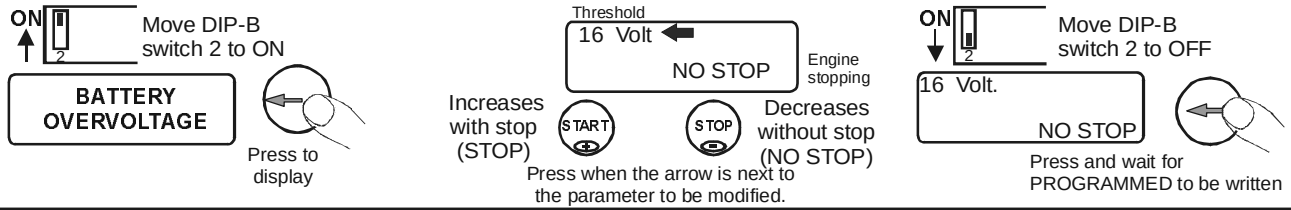
Calibrate: 1500 RPM for gensets at 50 Hz
1800 RPM for gensets at 60 Hz

IT IS FACTORY-PROGRAMMED FOR ENGINES AT 3000 revs/min:
3000 RPM for gensets at 50 Hz
3600 RPM for gensets at 60 Hz

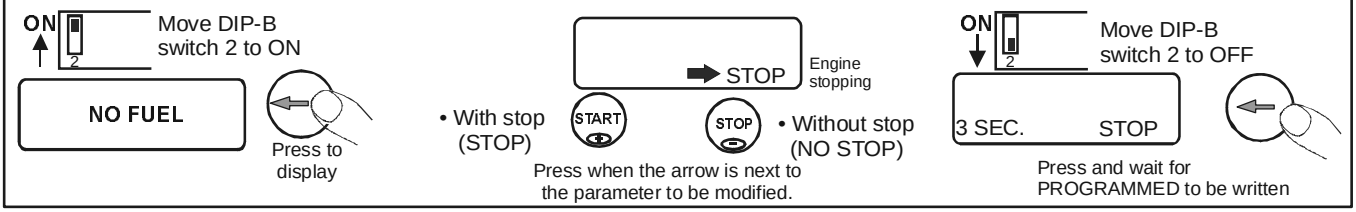
BATTERY UNDERVOLTAGE. The engine does not stop.



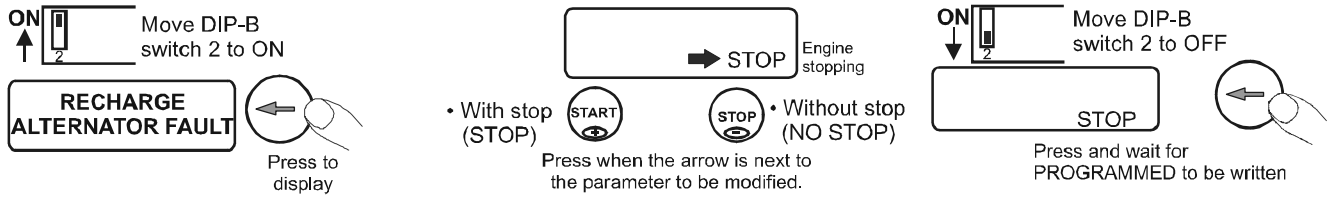
BATTERY OVERVOLTAGE.
The protection device is factory-programmed to not stop. Non-adjustable intervention delay of 5 sec..



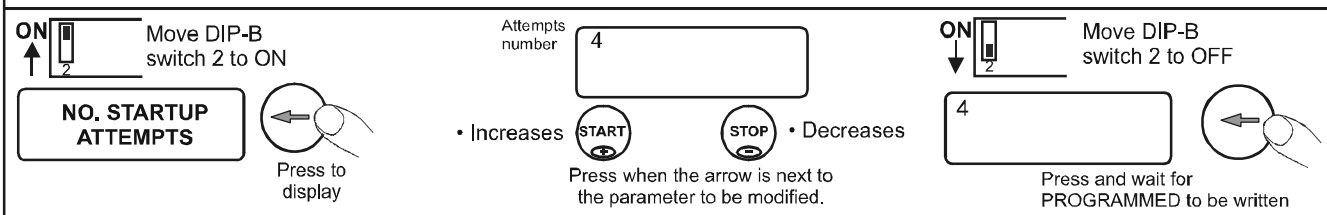
NO FUEL. It is possible to programme the stop; it is factory-programmed to stop.



ALTERNATOR DOES NOT RECHARGE. It is possible to programme the stop; it is factory-programmed to stop.

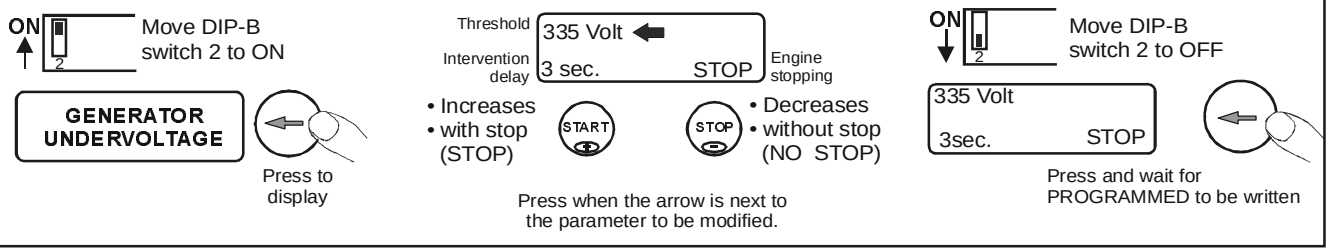


NUMBER OF STARTUP ATTEMPTS. 10 programmable startup attempts. (Starting failure).

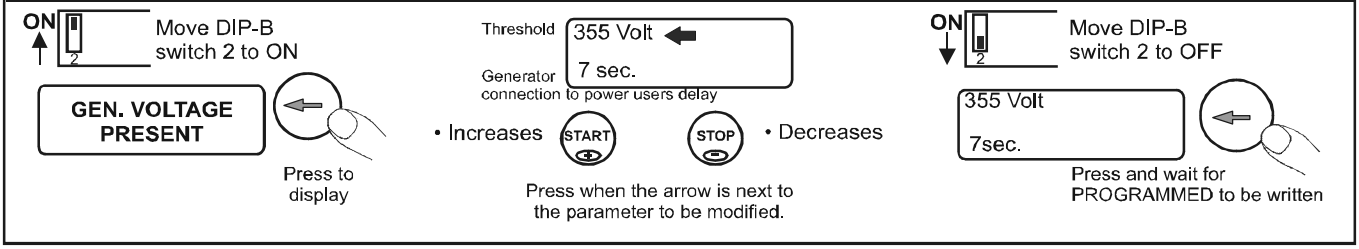


GENERATOR PROGRAMMING

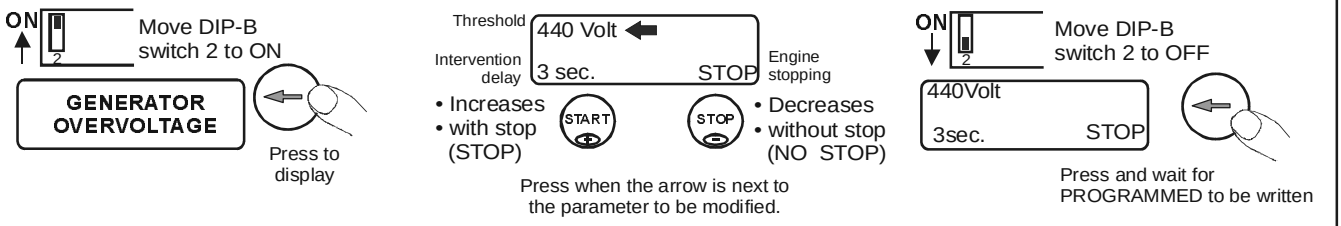
GENERATOR UNDERVOLTAGE. The protection activates when the generator voltage continues to remain above the programmed value for 10 seconds. The threshold set in factory is 335 V with an intervention delay of 3 seconds.



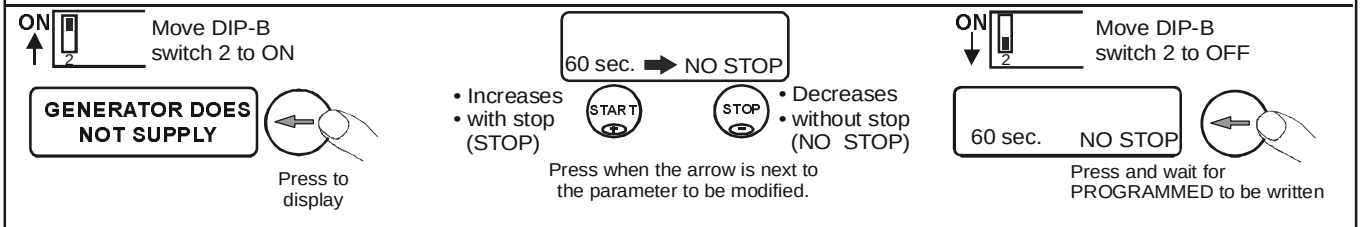
GENERATOR VOLTAGE PRESENT. The generator contactor closes when the voltage stays permanently above the programmed threshold for the whole of the delay time for generator connection to power users.



GENERATOR OVERVOLTAGE . It is factory-programmed to stop.

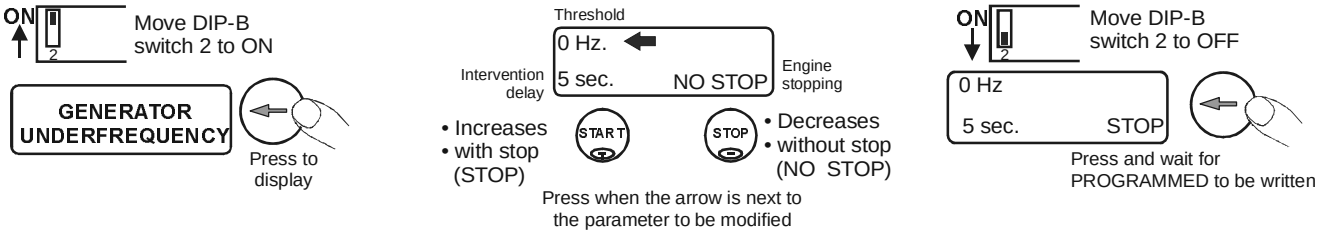


GENERATOR DOES NOT SUPPLY. The generator does not supply voltage for the whole of the intervention delay time.

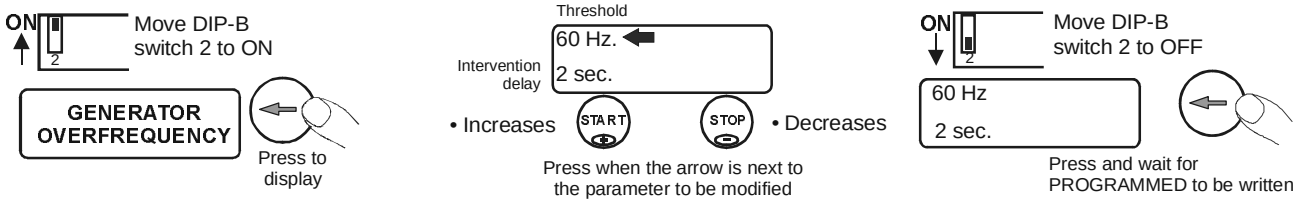


GENERATOR PROGRAMMING

GENERATOR UNDERFREQUENCY. In the factory the protection is excluded. To activate it, it is necessary to programme an intervention frequency other than 0 Hz. The protection activates when the generator frequency remains continuosly above the programmed value for 10 seconds.

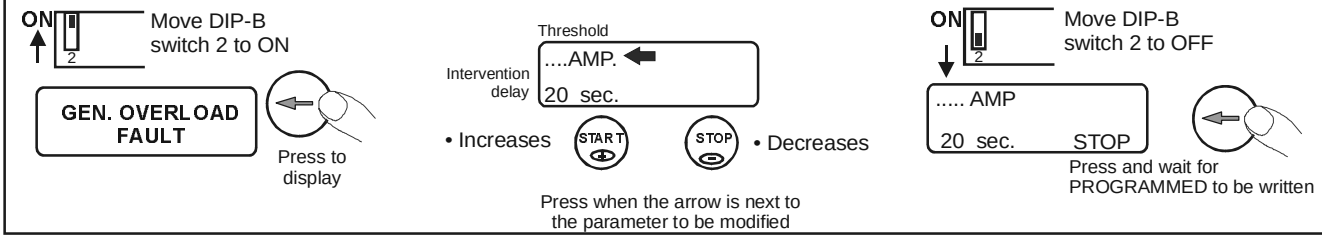


GENERATOR OVERFREQUENCY. The threshold set in the factory is 60 Hz, suitable for plants at 50Hz. In situations of OVERFREQUENCY the engine is stopped. Non-programmable stoppage.

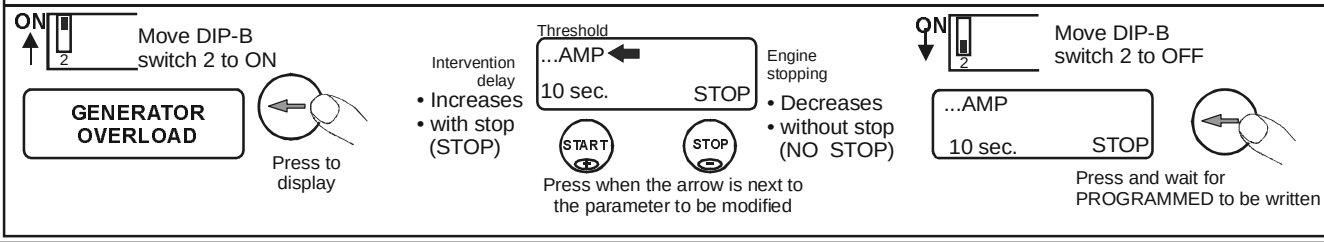


GENERATOR OVERCURRENT. The protection can be regulated at two levels and intervenes when they are excedeed. **Does not replace the overload switch.** The warning level acts only as a signal, while the other level can be programmed to stop the engine. For example, if we choose transformer 100/5 the factory setting of the overcurrent will trigger the intervention at 100A, but only when the amperometric transformer withstands that current.

GENERATOR OVERLOAD WARNING.

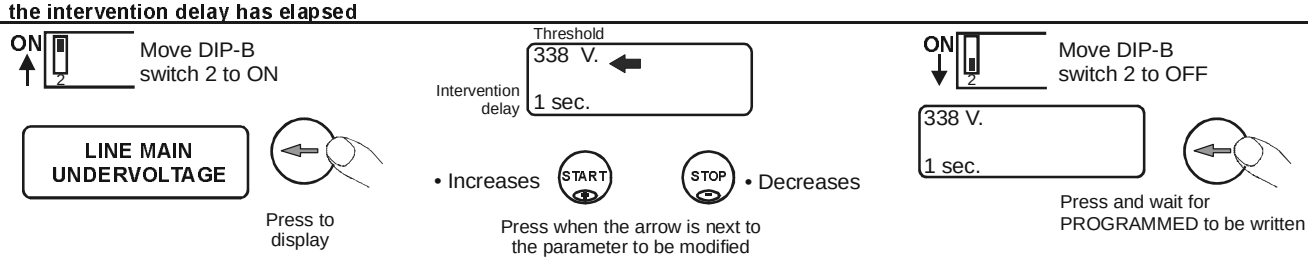


GENERATOR OVERLOAD.

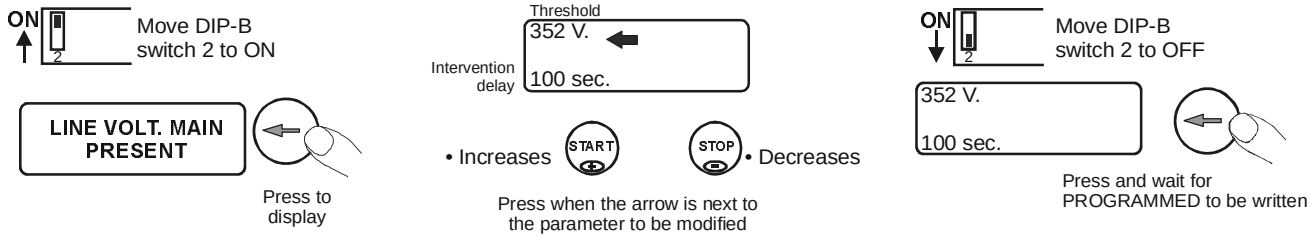


MAINS PROGRAMMING

SOTTOTENSIONE RETE. The generator set starts if at least one phase has a value lower than the programmed threshold and the intervention delay has elapsed



LINE VOLTAGE MAIN PRESENT. The generator set stops (the stop is not programmable) after the intervention delay (mains acceptance) programmed at 100 sec..



PROGRAMMING OF AVAILABLE FAULTS AND LANGUAGE CHOICE

AVAILABLE FAULTS PROGRAMMING: 1 2.
THE NEW DESCRIPTION OF THE FAULT NAME IS NOT TRANSLATED.

ON 6 — Move DIP-B switch 6 to ON

EXAMPLE

1 — WRITE

1 FAILURE PARALLEL — The fault name description is finished

Press to read the functions and the delay to be programmed

HOW TO WRITE

0123456789 ABCDEFGHIJKLMNOPQRSTUVWXYZ

Press to choose a letter or number, release the key for at least 1 second; the letter or number will remain written on the display.

START Press to leave a space →

Press to delete C STOP

FUNCTIONS TO BE PROGRAMMED DESCRIBED ON THE DISPLAY		DESCRIPTION
NO STOP	STOP	Choice of whether to stop the engine
NOT STORED	STORED	Choice of whether to store the cause of the alarm
POLARITY ACTIVE AT GROUND	**POLARITY** ACTIVE OPEN	The probe intervenes when it closes or opens to ground
ACTIVATION ALWAYS ACTIVE	**ACTIVATION** ACTIVE RUNNING	Instant of probe activation
COOLING NOT ACTIVE	COOLING ACTIVE	Choice of whether to cool the engine before stopping it
INTERVENTION DELAY (ADJUSTABLE) 0 ÷ 60 SEC.		The intervention occurs when the intervention delay has elapsed

START Press to modify the functions and the intervention delay STOP

ON 6 — To confirm the programming move DIP-B switch 6 to OFF

Press and wait for PROGRAMMED to be written on the display

NOTE the interventions always activate the general alarm

SELECT LANGUAGE. The language set up in the factory is ITALIAN; the languages that can be selected are: ENGLISH, SPANISH, GERMAN and FRENCH

ON 10 — Move DIP-B switch 10 to ON

SELEZIONE LINGUA ITALIANO

START STOP — Press to select

ON 10 — Move DIP-B switch 10 to OFF

SELEZIONE LINGUA ENGLISH

Press and wait for PROGRAMMED to be written

CLOCK PROGRAMMING

CLOCK. Allows generator set operation or stopping to be programmed

TIME SETTING. Switching off the power supply (1+ 2-) to the control unit will zero the clock

SELECT THE OFF FUNCTION (see page 4)

CLOCK 00:00 — Press to display

Example: CLOCK 23:15

• Increases START STOP • Decreases

Press to set the clock

STARTING CONSENT. Operation obtained as during mains failure.

ON 10 — Move DIP-B switch 10 to ON

TIMER START GENERATOR — Press to display

Example: Intervention delay — FROM 12:15 / TO 15:20

• Increases START STOP • Decreases

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

ON 10 — Move DIP-B switch 10 to OFF

FROM 12:15 / TO 15:20

Press and wait for PROGRAMMED to be written

STOP. Stops starting or running of generator set

ON 10 — Move DIP-B switch 10 to ON

TIMER STOP GENERATOR — Press to display

Example: Intervention delay — FROM 23:00 / TO 07:30

• Increases START STOP • Decreases

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

ON 10 — Move DIP-B switch 10 to OFF

FROM 23:00 / TO 07:30

Press and wait for PROGRAMMED to be written

NOTICES

Used only to check and command a genset unit. It commands the mains and generator contactors to supply the user. It has been designed to be installed only inside on an electrical panel as a single unit and so that it can be connected to other components (contactors, fuses, thermo-magnetic switches, etc.) which the installer will have available to complete the plant.

Warning: Components carrying dangerous voltage levels

Only assigned and suitably trained personnel are allowed access to the control unit. No maintenance operations are permitted unless the plant is disconnected from the mains and the battery. As an additional safety measure, the plant phases should be short-circuited and earthed.
Not withstanding the above, only assigned and trained personnel can perform the following operations with the plant on:
- make a visual inspection of the control unit, the connections and their markings;
- measure the voltage and/or current values;
- programming of the functions.

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

Warning:
Adhere closely to the following advice

- When making connections always follow the instructions and the Wiring Diagram on page 10-11.
- Any interventions on the unit must be performed with the motor stationary and terminal 50 of the starting motor disconnected.
- Check that the consumption of the connected equipment are compatible with the described technical characteristics.
- Install in such a way that there is always adequate heat disposal.
- Always install under other equipment which produces or spreads heat.
- Handle and connect without mechanically stressing the electronic card.
- Make sure that no copper conductor cuttings or other waste material fall inside the control unit.
- Never disconnect the terminals of the battery with engine running.
- Never use a battery charger for the emergency start-up; the control panel could be damaged.
- In order to safeguard people and equipment, before connecting an external battery charger, disconnect the electrical system terminals from the battery poles.

THIS CONTROL UNIT IS NOT SUITABLE FOR OPERATING IN THE FOLLOWING CONDITIONS:
- Where the environmental temperature is outside the limits indicated in the manual.
- Where the air pressure and temperature variations are so rapid as to produce exceptional condensation.
- Where there are high levels of pollution caused by dust, smoke, vapour, salts and corrosive or radioactive particles.
- Where there are high levels or heat from radiation caused by the sun, ovens or the like.
- Where attacks from mould or small animals are possible.
- Where there is the risk of fire or explosions.
- Where the control panel can receive strong vibrations or knocks.
- Where the control panel is protected by barriers or casing with protection level less than IP20.

ELECTROMAGNETIC COMPATIBILITY

This control unit functions correctly only if inserted in plants which conform with the CE marking standards; it meets the exemption requirements of the standard EN50082-2 but it cannot be excluded that malfunctions could occur in extreme cases due to particular situations.
The installer has the task of checking that the disturbance levels are within the requirements of the standards.

CONDUCTION AND MAINTENANCE

The following maintenance operations should be performed every week:
- check that the indicators function;
- check the batteries;
- check that the conductors are tight, check the condition of the terminals.

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

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

ORDERING DATA

GENERATING SET CONTROL UNIT

Type CAM - 333 code 24.22.19

ACCESSORIES SUPPLIED

KIT PMO CAM-333 code 80.43.46

ACCESSORIES ON REQUEST

BATTERY CHARGER WITH VOLTMETRIC RELAY
TYPE CBV-015 12 V. code 01.04.03
TYPE CBV-015 24 V. code 01.04.04

CONFORMITY DECLARATION

CE

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

type **CAM-333** manufactured in the year **2004**

used in the ways and for the purposes described in this instruction and user manual is in conformity with the following directives:
73/23/CEE concerning electrical materials used within certain voltage limits
89/336/CEE concerning electromagnetic compatibility
both modified by the directive 93/68/CEE
because it is built and functions in accordance with the harmonized Standards:
EN61010-1, EN61326-1, EN61326/A1, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN60529, EN60439-1.

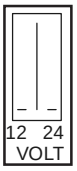
ELCOS® S.r.l.
Via Naviglio Alto 24/A - 43100 PARMA

Parma, 12/09/2000
President
Ruggero Lombardo

Ruggero Lombardo

ELCOS
Parma (Italy)
www.elcos.it

READ BEFORE USING CONTROL UNIT CAM-333

- Before inserting the white connectors on the terminal boards, check that on the “fastons” there are no voltages differing from the battery ones.
- Check the position of the DIP-A switches.
  Programme the values of the amperometric transformers. See on page 8.
- 

  Where there is a pre-excitation alternator hook the diverter in the position corresponding to the rated voltage of the battery (12÷24V).
  Do not hook with other types of alternator
- When the connections have been made the power unit is 

OFF,
  to enable the other functions press the relevant key  .
- If CBV-015 does not connect: move DIP 7A to ON and connect a voltmetric relay using input 30 (CALL)

BEFORE STARTING THE GENERATOR SET
if the display shows:

- EMERGENCY STOP
  There are no jumpers JP1 (see page 8)
  or else the emergency push-button is pressed
- LOW RADIATOR COOLANT LEVEL
  no connection to terminal 50.