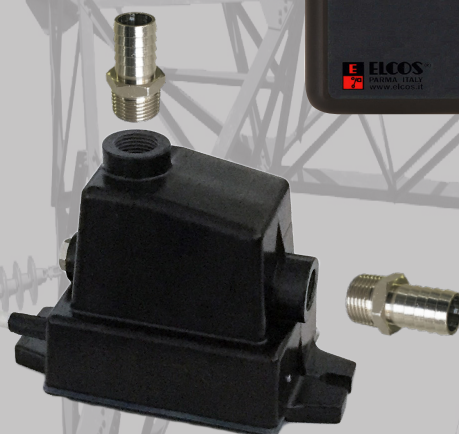
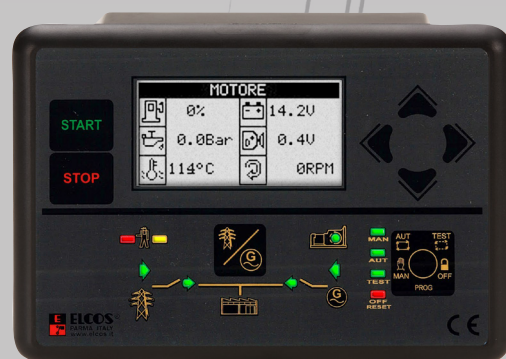


# EQUIPMENT FOR GENERATOR SETS

MADE IN ITALY





# CONTROL UNITS FOR AUTOMATIC GENERATOR SETS

Developed to equip automatic emergency panels.

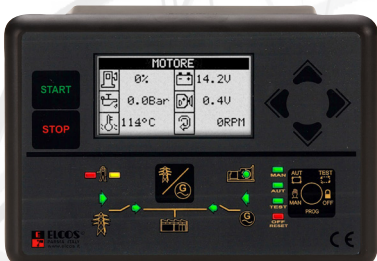
They are intended to check the status of the generator set and the mains, simultaneously showing the most important mains, engine and generator parameters on an easy-to-read display, indicating whenever setpoints are exceeded and other faults occur.



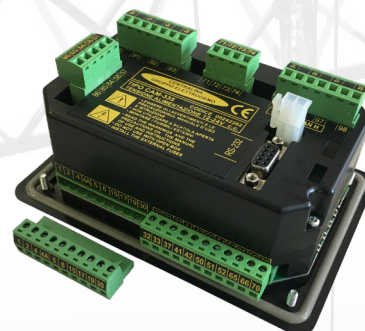
**CAM-684  
CAM-685**



**CAM-332**



**CAM-335**



**CAM-402**



**CAM-405**



# FUNCTIONS

	CAM-684	CAM-685	CAM-335 CAM-405	CAM-332 CAM-402
For petrol engines			●	●
For diesel engines	●	●	●	●
EJP function	●	●	●	●
Option of integrating 7 relays with various functions		●		
Three-phase mains voltmetric control	●	●	●	●
Three-phase generator voltmetric control	●	●	●	●
Glow plug management	●	●	●	●
On-board machine installation	●	●	●	●
Weekly self-test	●	●	●	●
Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese	●	●	●	●
Programmable language			●	
Routine maintenance indicators	●	●	●	●
Remote management with the option of using a GSM modem	●	●	●	
Management of refuelling of working tank from storage tank	●	●	●	
Clock for programming generator set starting or stopping	●	●	●	●
Engine running detection also with PICK-UP	●	●	(CAM-405 only)	
Start/Stop on power demand	●	●	●	
Possibility of starting the generator when the battery charge is low	●	●	●	●
Check of the pinion engaged on the crown gear	●	●		
Fault log (including data from the last 50 faults)	●	●	●	●
Display of faults including with numeric code	●	●	●	●
Management of rental hours			●	
Option of associating inputs and outputs with different functions			●	
Option of password protected programming	●	●	●	



# CENTRAL UNIT CONNECTIONS AND FUNCTIONS

**CAM-684 CAM-685**

REMOTE MANAGEMENT FROM A PERSONAL COMPUTER WITH REMOTE OPERATION SOFTWARE ZW-100

Dimensions (LxHxW) mm 290x200x62



## CONNECTIONS:

- > Direct connection
- > GSM Modem
- > Standard analogue modem
- > Multipoint connection
- > Ethernet connection
- > Internet connection

## GSM MODEM

Option of viewing the control unit instruments using a mobile phone, controlling starting and stopping and receiving an SMS notification message when the generator set alarm has been activated.



**CENTRAL UNIT  
CAM-684  
CAM-685**



## BATTERY CHARGER CBS-031 or 061

By connecting the battery charger using the special serial cable (RS485), the central unit displays the following conditions:

- > Short circuiting, polarity inversion and battery cable disconnection.
- > Charging current and battery voltage.



**TRADITIONAL  
ENGINE**

or  
**ENGINE** equipped with control unit for the electronic control of the injection system. CAN Bus Connection (SAE J1939).



## EXPANSION MODULE MDE-088

The expansion module manages 8 digital inputs and 8 digital outputs with the central unit through the RS485 connection. Up to 4 modules can be connected at the same time.

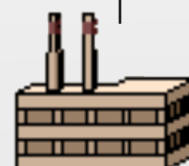
## CONTACTOR OR POWERED SWITCH CONTROL



**MAINS**



**GENSET**



## REMOTE PANEL PRE-685

Remotely repeats the instruments and faults managed by the central unit.

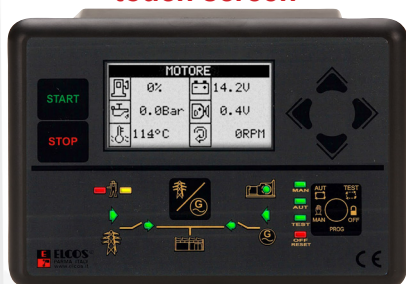


# CONNECTIONS AND FUNCTIONS OF CENTRAL UNIT CAM-335 CAM-405

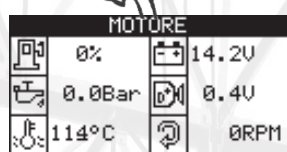


**Display with  
touch screen**

Dimensions  
(LxHxW) mm  
157x109x74



**CENTRAL UNIT  
CAM-335**



example



The controls and reading of the parameters are facilitated by the use of the display with touch screen



## EXPANSION MODULE MDE-088

The expansion module manages 8 digital inputs and 8 digital outputs with the central unit CAM-335 through the RS485 connection. Up to 4 modules can be connected at the same time.

Dimensions (LxHxW) mm 70x115x65

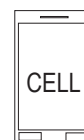
REMOTE MANAGEMENT FROM A PERSONAL COMPUTER WITH REMOTE OPERATION SOFTWARE ZW-100

### CONNECTIONS:

- > Direct connection
- > GSM Modem
- > Standard analogue modem
- > Multipoint connection
- > Ethernet connection

### GSM MODEM

Option of viewing the control unit instruments using a mobile phone, controlling starting and stopping and receiving an SMS notification message when the generator set alarm has been activated.



### TRADITIONAL ENGINE

or

**ENGINE** equipped with control unit for the electronic control of the injection system. CAN Bus Connection (SAE J1939).

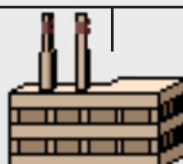
### CONTACTOR OR POWERED SWITCH CONTROL



MAINS



GENSET



# CONNECTIONS AND FUNCTIONS OF CENTRAL UNIT CAM-332 CAM-402

Dimensions (LxHxW) mm  
157x109x74



RS485 Parameter programming using PC

**CENTRAL UNIT  
CAM-332**



**TRADITIONAL ENGINE**  
diesel or petrol

FLOAT

## CONNECTION OF FLOOD PREVENTION FLOAT.

The generator starts when the float detects flooding during a mains power loss

## CONTACTOR OR POWERED SWITCH CONTROL



MAINS



GENSET





# SWITCHING CONTROL UNIT

Developed to equip switching panels (contactors or powered switches).  
Compatible with the CAM-109 and CAM-120/10 control units.

Dimensions (LxHxW) mm  
157x109x74



ATS-150

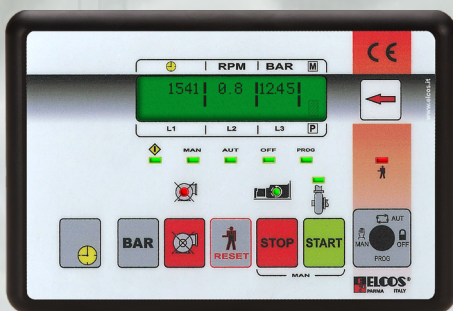
- > Three-phase mains voltmetric control and generator: minimum voltage, phase sequence, frequency, maximum voltage, absence of phase.
- > Buttons to start/stop engine and deviate the utility to the mains or generator.
- > Manual or automatic functions.

## COMBINED PANEL AND CONTROL UNIT FOR OPERATING INDEPENDENT GENERATOR SET AND IRRIGATION PUMP

These perform the control and operation function of a generator set and an irrigation motor pump.

Dimensions (LxHxW) mm 157x109x74

### CEM-120 type control unit



CEM-120 instruments See page 9





- > Pump water pressure check.
- > Switching off of pump water protection.
- > Automatic monitoring of faults with display messages.
- > Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese.
- > Remote control (starting and stop).
- > Glow plug preheating management.
- > Clock for programming machine starting or stopping.
- > Routine maintenance indicator.
- > Programmable weekly self-test.
- > Available and fully programmable input for fault.
- > Possibility of starting the generator set in case of low battery charge.
- > Three-phase voltmetric control. Minimum and maximum voltage, asymmetry and incorrect phase sequence of the generator.
- > Fault log (including data from the last 100 faults).









TPA-200

supplied with  
**TPA-200 TYPE WATER PUMP ELECTRONIC PRESSURE SWITCH**  
(equipped with 3 m-long cable).  
Pump water pressure check.

# AUTOMATIC AND MANUAL CONTROL UNIT INSTRUMENTS

INSTRUMENTS	SPG-120/20	CAM-109	CAM-120/10	CAM-684 CAM-685
				
Dimensions (LxHxW)	144x96x49	157x109x52	157x109x74	290x200x62
Mains voltmeters				●
Generator voltmeters	● (Two-phase)	● (Single-phase)	●	●
Ammeters	● (generator)	● (1 generator ammeters)	● (generator)	● (mains/generator)
Frequency meter	●	●	●	● (mains/generator)
Wattmeter (total and per phase)		●	●	● (mains/generator)
Varmeter (total and per phase)		●	●	● (mains/generator)
Voltammeter (total and per phase)	● (total) ● (generator)	● (generator)	●	● (mains/generator)
Power factor indicator		●	●	● (mains/generator)
Kilowatt-hour meter (total)		●	●	● (mains/generator)
Partial hour-meter		●	●	●
Total hour-meter	●	●	●	●
Starting counter		●	●	●
Tachometer	●	●	●	●
Pick-up input				●
Battery voltmeter	●	●	●	●
Battery charger ammeter				● (with CBS battery charger)
Starting failure counter		●	●	●
Fuel level gauge	●	●	●	●
Water or oil thermometer	●		●	●
Oil pressure gauge	●		●	●
Pump water pressure gauge				
For diesel engines	●	●	●	●
For petrol engines		●		
CAN Bus (SAE J1939)			●	●
Serial port RS 232	●		●	●
Serial port RS 485			●	●
USB				●
GSM Modem (to be installed externally)			●	●
MODBus RTU Protocol			●	●



CAM-335 	CAM-332 	CAM-405 	CAM-402 	ATS-150 (switching control unit) 	CEM-120 (motor pump control unit) 
157x109x74	157x109x74	243x170x62	243x170x62	157x109x74	157x109x74
●	●	●	●	●	
●	●	●	●	●	●
● (mains/generator)	● (mains/generator)	● (mains/generator)	●		● (generator)
● (mains/generator)	● (mains/generator)	● (mains/generator)	●	● (mains/generator)	● (generator)
● (mains/generator)		● (mains/generator)			●
● (mains/generator)		● (mains/generator)			●
● (mains/generator)	● (mains/generator)	● (mains/generator)	●		●
● (mains/generator)		● (mains/generator)			●
● (mains/generator)		● (mains/generator)			●
●	●	●	●		●
●	●	●	●		●
●	●	●	●		●
●	●	●	●		●
		●			
●	●	●	●		●
●	●	●	●	●	●
●	●	●	●		●
●		●			●
●		●			●
●		●			●
●	●	●	●	●	●
●	●	●	●	●	
●		●			
●		●			●
●	●	●	●	●	
●		●	●	●	
●		●			
●		●			
●		●			
●	●	●	●	●	

# CONTROL UNITS FOR INDEPENDENT GENERATOR SETS

Control units for manual generator sets, developed for automatic operation.

Option of coupling with the ATS-150 control unit or with the ATS-LEM and ATS-NEC panels.

They start and monitor the generator set, stopping it in the event of a fault.

They show the main generator set parameters on the display.

CAN Bus Connection (SAE J1939) with engines equipped with control units for the electronic control of the injection system.

Dimensions (LxHxW) mm 157x109x79



**CAM-120/10**

- > **Manual start/stop buttons.**
- > Three-phase voltmetric control. Minimum and maximum voltage, asymmetry and phase sequence of the generator.
- > Remote start input (request).
- > Available and fully programmable input for fault (times, polarities, stopping option and fault message).
- > Glow plug preheating management.
- > Option of starting the generator when the battery charge is low.
- > Clock for programming engine starting or stopping.
- > Weekly self-test.
- > Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese.
- > Fault log (including data from the last 100 faults).
- > Routine maintenance indicator.

Dimensions (LxHxW) mm 157x109x52



**CAM-109**

- > **Manual start/stop buttons.**
- > Remote start input (request).
- > Option of starting the generator when the battery charge is low.
- > Available and fully programmable input for faults (times, polarities, stopping option and fault message).
- > Glow plug preheating management.
- > Clock for programming engine starting or stopping.
- > Weekly self-test.
- > Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese.
- > Fault log (including data from the last 100 faults).
- > Routine maintenance indicator.

## MULTI-INSTRUMENT WITH CONTROL AND PROTECTION DEVICE

Dimensions (LxHxW) mm 144x96x54



**SPG-120/20**

Texts in 5 languages: ITALIAN, ENGLISH, FRENCH, GERMAN, SPANISH.

### Start-up with externally installed key

DEVELOPED TO PROTECT generator sets with the option of notification or shut-down in the case of faults due to:

- > Too low oil pressure.
- > Overheating.
- > Battery charge failure (alternator belt breakage).
- > Minimum fuel level.
- > Low coolant level.
- > Generator overloading (does not replace the thermal-magnetic circuit breaker).
- > Generator overfrequency.
- > Generator underfrequency.
- > Generator undervoltage.
- > Battery overvoltage.
- > Battery undervoltage.



# AUTOMATIC BATTERY CHARGERS FOR LEAD BATTERIES (12 or 24V)



**CBS-010**  
**CBS-031**  
**CBS-061**  
**CBA-030**  
**CBA-060**

Dimensions (LxHxW) mm

70x115x65  
 97x119x63  
 123x119x83  
 136x93x125  
 168x135x138

**CBS - 031** (3.5 A)  
**CBS - 061** (6 A)

## THREE CHARGING LEVELS

- > **RAPID** WITH CURRENT CONTROL
- > **INTERMEDIATE** ——— WITH VOLTAGE CONTROL
- > **MAINTENANCE** ——— WITH VOLTAGE CONTROL

The battery charger signals the following conditions:

- > Short circuit
- > Polarity inversion
- > Battery cable disconnection

DIN rail hook mounting compliant with the DIN 41773 Standard

## SERIAL COMMUNICATION PORT RS485

Serial output for the transmission of data on battery status to the control units CAM-684 and CAM-685

## DATA SENT

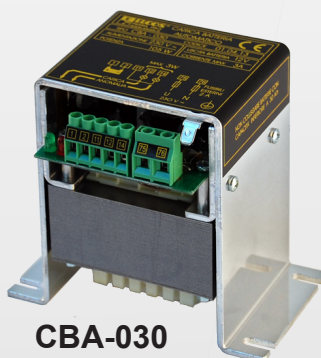
- > Battery voltmeter
- > Charging current ammeter
- > Battery charge status



**CBS-010** (1 A)

- > Also with DIN rail hook mounting option.
- > Battery charge status signals with LED (it is not possible to connect remote signals).

- > Rapid charging with current control
- > Intermediate and maintenance charging, with voltage control.
- > Remote signal option
- > Self-protection with cumulative signalling in the event of:
  - > Short circuit
  - > Polarity inversion
  - > Insufficient battery voltage



**CBA-030**  
(3 A)



**CBA-060**  
(6 A)

## ELECTRIC HEATERS FOR DIESEL ENGINES

We recommend that the engine temperature be kept at appropriate values using electric heaters even when the engine is not running.

As a general rule, oil or water heaters are required when the ambient temperature drops below 21°C.

The benefits are:

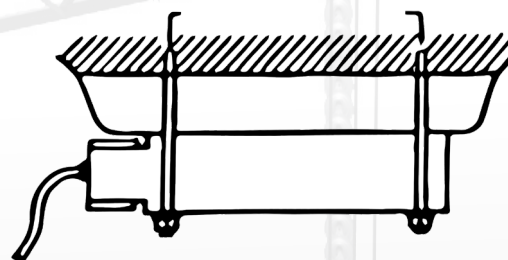
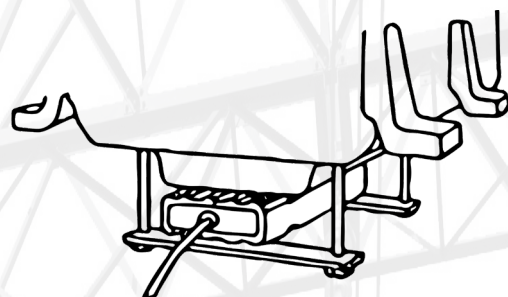
- > Ability to provide full power quickly
- > Minimised engine wear
- > Minimised energy absorption by batteries
- > Minimised carbon deposits to ensure easier and more reliable ignition.

## OIL HEATERS

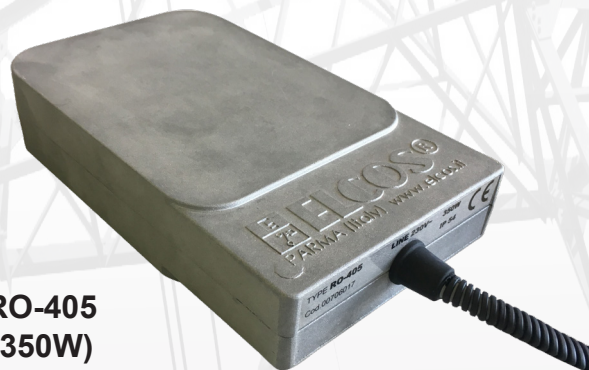
For applications in contact with the oil sump

Once the heater is assembled in contact with the engine oil sump, it prevents the oil temperature from falling below a certain value. This value is maintained thanks to an internal thermostat.

Electrical connections are made easier thanks to a **3 metre long cable**.



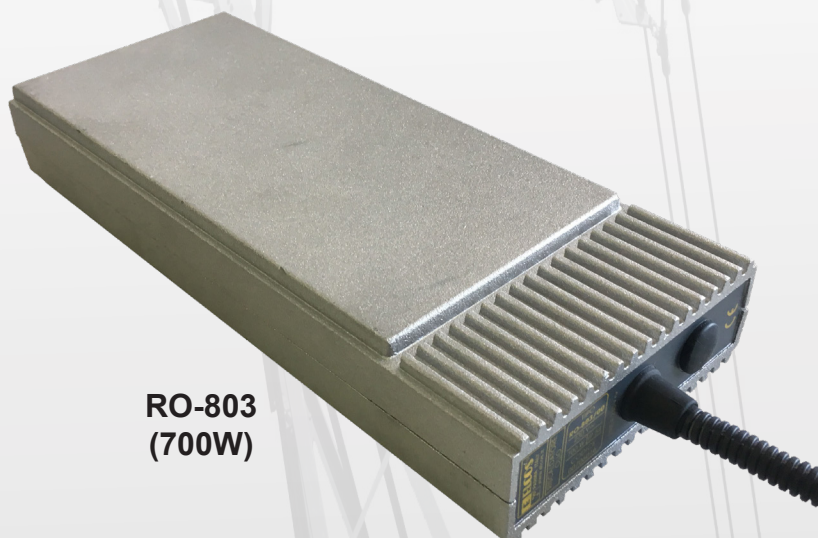
**RO-405  
(350W)**



Protection class  
**IP54**

Power supply voltage 230 VAC

**RO-803  
(700W)**





# WATER HEATERS

For water-cooled diesel engines

The heater prevents the cooling circuit temperature from falling below a certain value. This value is regulated by an internal thermostat. A second internal thermostat protects the appliance from any overheating. The water circulates using the thermosiphon principle.

The key features of our water heaters:

- > Direct assembly, without the use of brackets
- > Presence of a coolant drainage plug
- > Factory fitted 3-metre power feed cable

**Special electro-coating applied to body that protects from glycol corrosion**

Versions with GAS ½" thread

**Type**

**RA-0511** (500 W)

**RA-1011** (1000 W)

**RA-0511/110** (500 W)

**RA-1011/110** (1000W)

Protection class

**IP54**

Power supply voltage

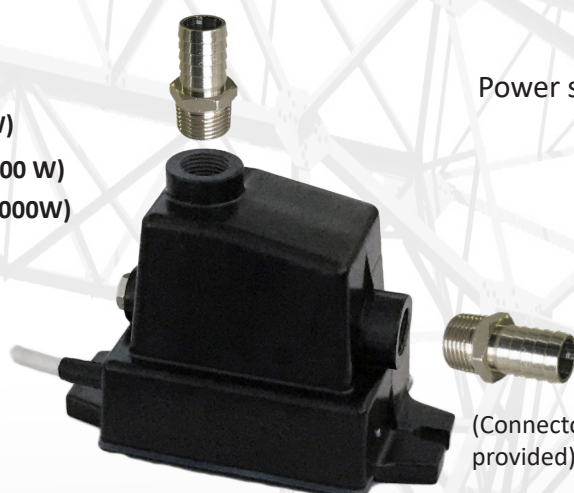
230 VAC (standard)

110 VAC version

**type**

**RA- 0511/110**

**RA- 1011/110**



(Connectors not provided)

**ELECTRO-COATING**

Version with hose connectors for Ø 16 internal hose

**Type**

**RA-0500** (500 W)

**RA-1000** (1000W)

**RA-1500** (1500W)

Versions with GAS ½" thread

**Type**

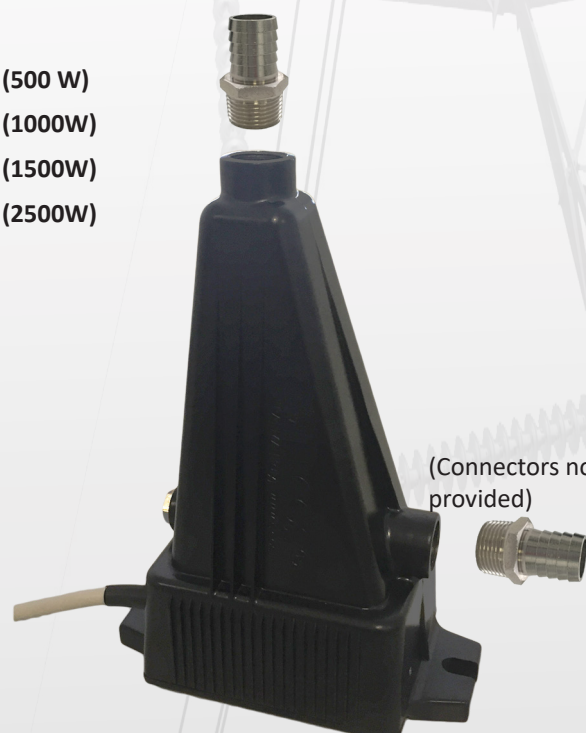
**RA-0501** (500 W)

**RA-1001** (1000W)

**RA-1501** (1500W)

**RA-2501** (2500W)

Coolant drainage plug



(Connectors not provided)

# ENGINE PROTECTION DEVICES

Start-up with externally installed key

The devices are manufactured in containers with reduced dimensions **completely embedded in polyurethane resin**

Front protection class

**IP66**

Rear (connections)

**IP00**



**DIP-806**



**DIP-521**

DEVELOPED TO PROTECT engines by stopping them in the event of fault due to:

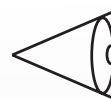
	DIP-806	DIP-804	DIP-521
Too-low oil pressure	●	●	●
Overheating	●	●	●
Inefficient battery charge alternator (belt breakage)	●	●	●
Fuel reserve (engine is not stopped)	●	●	
Low coolant level	●		
Overfrequency	●		

## KEY FOR EMERGENCY MANUAL STARTING



Thanks to the key the following functions can be accomplished autonomously

- > Starting
- > Stopping
- > Switching of mains and generator contactors



**MAINS/GENSET SWITCHING:**

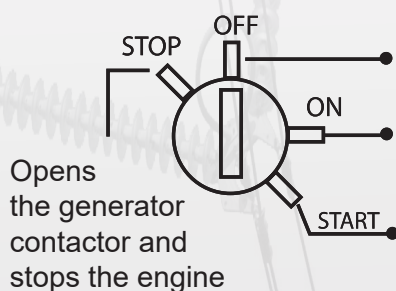
- > Use contactors only.
- > Not recommended for currents higher than 300 A.

Built to be connected in the panels and to control units for automatic generator sets

**ADE-200/OS** for electromagnets energised when running and de-energised when stopped

**ADE-200/ON** for electromagnets energised when stopped and de-energised when running

### OPERATION



Normal control unit operation

Controls opening of the mains contactor. Sets closure of the generator contactor, which will close after start-up and with the presence of generator voltage

Generator start-up

**DURING OPERATION THE GENERATOR SET PROTECTION DEVICES ARE NOT ACTIVE**



# PULL ELECTROMAGNETS FOR DIESEL ENGINE STOP

## CONTINUOUS SERVICE



ESC-046/00



ESC-060/00

TYPE	STROKE mm	FORCE Kg	
		at stroke start	at stroke end
ESC-046/00	35	3	12
ESC-060/00	50	7.5	30
ESI-046/00	35	1	25
ESI-060/00	50	5	50

## INTERMITTENT SERVICE



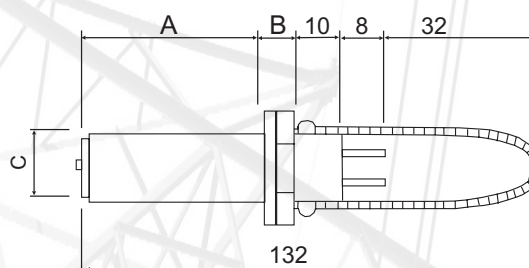
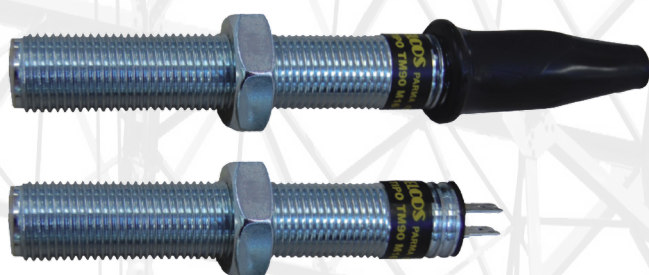
ESI-046/00



ESI-060/00

## MAGNETIC TRANSDUCERS

### SPEED SENSORS



#### PICK-UP

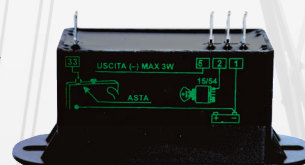
M16X1.5  
M18X1.5  
5/8"-W18-UNF  
3/4"-W16-UNF

TYPE	A	B	C
TM90-M16	68	8	M16X1.5
TM90-M18	66	9	M18X1.5
TM90-5/8	67	8	5/8"W18-UNF
TM90-3/4	66	9	3/4"W16-UNF

## RADIATOR COOLANT LEVEL PROBE



Indicates insufficient  
coolant level in the radiator



For expansion tank made of:  
PLASTIC: **SOL - 010/00**  
METAL: **SOL - 015/00**

## RUNNING SPEED DETECTION DEVICES

### VIA MAGNETIC TRANSDUCER

**MOS - 100/00** > Detects the running engine, simulates terminals W and D+ of a battery charge alternator  
**DRV - 100** > Detects overspeed of a diesel engine

### VIA BATTERY CHARGE ALTERNATOR

**DRS - 100** > Detects overspeed of a diesel engine



ELCOS puts forward 8 different control units for genset control panels



We can supply standard control panels with various shapes and sizes for wall, floor and on-board machine mounting.

MADE IN ITALY

Our catalogue contains a complete range of accessories for gensets:

- > Electric heaters for diesel engines
- > Electromagnets
- > Speed sensors
- > Automatic battery chargers

Key for emergency manual starting

Thanks to the key the following functions can be accomplished autonomously

- > Starting
- > Stopping
- > Switching of mains and generator contactors

