

CEA7

Automatic Mains Failure controller. AMF



ELECTRONICS



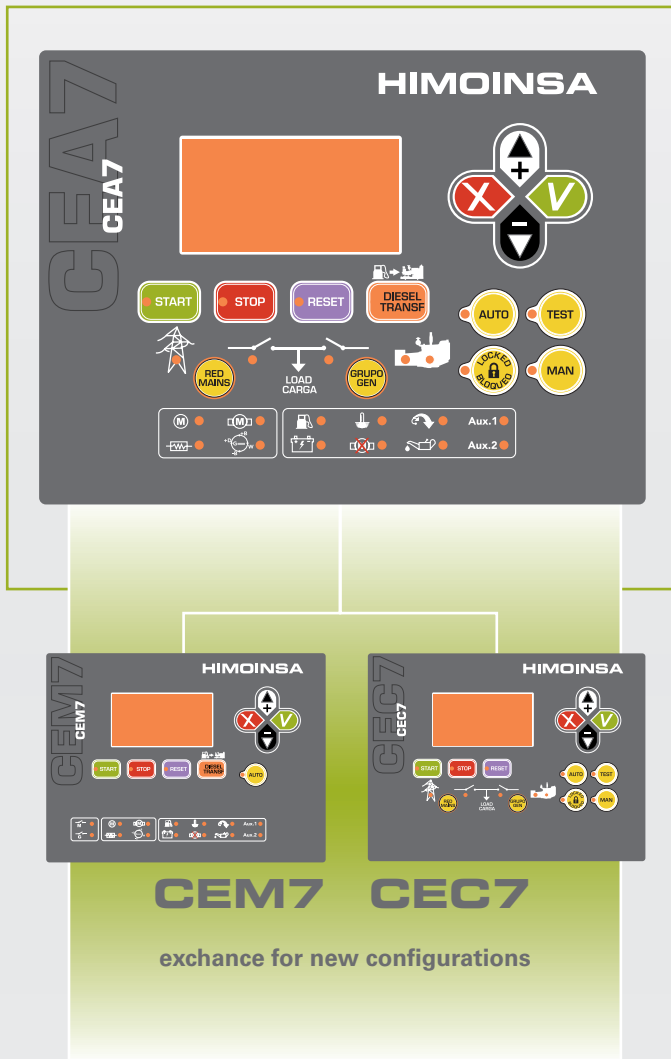
HIMOINSA®
THE ENERGY



CEA7

Automatic mains failure controller

ALARMS



When an alarm or warning is detected, the controller produces an acoustic alarm, at the same time the digital alarm output (AL) activates and the LED of RESET button flashes. This status will remain the same as long as the failure condition continues for a programmable period of time.

ENGINE alarms

- High water temperature.
- Low oil pressure.
- Battery charger alternator.
- Start Failure.
- Low coolant level.
- Fuel storage.
- Overspeed.
- Underspeed.
- Battery low voltage.
- High coolant temperature by sensor.
- Low oil pressure by sensor.
- Low fuel level by sensor.
- Unexpected shutdown.
- Stop Failure.
- Low Engine temperature.
- Genset voltage Droop.
- Emergency stop.
- Genset contactor switching failure.

GENERATOR alarms

- Overload.
- Genset voltage asymmetry.
- Maximum genset voltage.
- Minimum genset voltage.
- Maximum genset Frequency.
- Minimum genset Frequency.
- Erroneous phase sequence of the genset.
- Inverse power.
- Shortcircuit.

MAINS alarms

- Maximum Mains Voltage.
- Minimum Mains Voltage.
- Maximum Mains Frequency.
- Minimum Mains Frequency.
- Mains phase sequence failure.
- Mains power failure.
- Mains contactor switching failure.

(3 programmable alarms)





GENERAL DESCRIPTION

CEA7 controller is a supervision equipment for mains signal and also a supervision and electrical supply through the genset. This controller is composed by 2 different modules:

1. VISUALIZATION module
2. MEASUREMENTS module

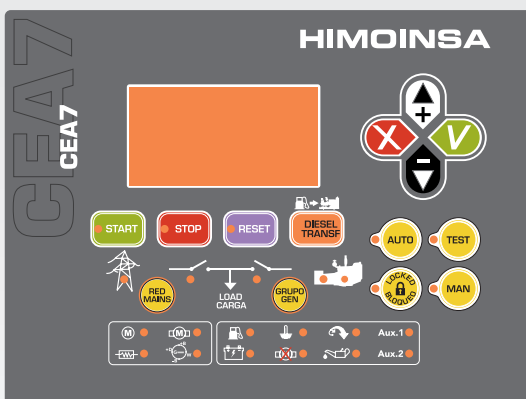
VISUALIZATION MODULE

The visualization module provides information about the status of the device and, at the same time, allows the user to interact with it. With this visualization module the user is able to control, program and configure the functions of the unit.

MEASUREMENTS MODULE

The measurements module controls and monitors the control board. It is located in the rear part of the panel, in order to reduce the wiring and to avoid electromagnetic disturbances. Every signal, sensor and actuator is connected to this module.

Connection between the measure module and visualization mode is made by means of a **CAN BUS** (Communication Bus). This produces an interconnection between additional modules which guarantees the proper working of the controller.



CEA7 visualization module

1. VISUALIZATION MODULE

- Backlit graphic display of 128 x 64.
- 14 BUTTONS.

Only Push Buttons:

4 push buttons for MENU and programming: UP, DOWN, CANCEL/BACK and ENTER.

2 contactor control push buttons: GENSET and MAINS. Push Button with LED:

4 control push buttons : GENSET: START, STOP, RESET y Fuel Transference.

4 mode push buttons: AUTO, MAN, TEST y LOCKED.

LEDs for alarms and genset status.

Engine status LEDs:

- Engine Started.
- Pre-heating.
- Engine Start.
- Battery charger alternator.

Alarm LEDs:

- Fuel storage.
- Battery levels.
- High temperature.
- Start Failure.
- Overspeed.
- Low Oil Pressure.
- AUX 1 (Free to programme).
- AUX 2 (Free to programme).

Electric power status LEDs:

- Mains power status.
- Engine Status.
- Genset power supply status.

Contactors status LEDs:

- Mains contactor active.
- Genset contactor active.

Multi-languages.



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2. MEASUREMENTS MODULE

The measurements module provides the following readings of the electric mains supply:

- Phase to neutral voltage.
- Phase to phase voltage.
- Phase Amperage.
- Frequency.
- Real, apparent and reactive powers.
- Power factor and cos phi.
- Instant power (KwH) and historical power (day, month, year).

Engine features:

Engine alarm inputs:

- Fuel reserve.
- Oil pressure.
- Coolant temperature.
- Coolant level.
- Emergency stop. (stop button).

Analogic engine inputs:

- Fuel level.
- Oil Pressure.
- Coolant Temperature.
- Configurable input (i.e. Oil temperature).
- Battery charge alternator voltage.

Configurable inputs; the measurements device has 5 inputs that can be programmed to carry on the following functions:

- Mains contactor confirmation.
- Genset contactor confirmation.
- Rate change notice.
- Rate change.
- Start disabling.
- External start.
- Test.
- Manual override.
- 3 programmable alarms.

Engine statistics:

- Number of working hours.
- Number of starts.

Controls Engine's Functions:

- Pre-heating or Glow Plug.
- Stop.
- Start.
- Coolant heater.
- Fuel Transfer pump.
- Alternator excitation.

The measurements module has outputs which allow monitoring of the operative conditions of the controller:

- Engine running (on).
- Control board alarm.
- 3 programmable outputs which monitor the control board alarm conditions or the inputs about the engine data.

CEA7 Controller has also 3 relay outputs incorporated:

- Mains contactor Output.
- Genset Contactor Output.
- Fuel Pump / Water heating Output.



PHG measurements module





VARIOUS FUNCTIONS

- Interface CAN/USB. Allows communication with the control panel in local mode making easier parameter programming, alarm configuration, programmable inputs/outputs.
- Interface CAN/RS232 Allows remote communication with the control panel through an analogic modem or a GSM modem.
- Positioning system GPS. Allows through the interface CAN/RS232 to find the exact position of the genset.
- Interface CAN/ Allows communication with the control panel with systems working with protocol MODBUS.
- Interface CAN/LAN offers the option to connect the CEA7 control panel to an Ethernet net.
- Interface CAN/J1939 allows monitoring of engines which are compatible to this protocol.
- EJP Functions (Standard for French market)
- EJP/T Functions (for French market)
- SRC Functions (Genset start and changeover even with Mains presence through an external signal)
- Preheating functions of the spark plugs.
- Keyboard block Functions.
- Decanting Fuel Pump Functions command.
- Remote monitoring functions for control panel status (i.e. Reset status or Automatic Status, etc..)
- Possibility to block all the functions after a predefined number of working hours , maintenance or rent.
- Automatic test weekly or daily.
- External start and Stop
- Three programmable alarms for different used defined by the user.

MAIN CONSTRUCTIVE DATA

- Working temperature: min -20°C max 80 °C.
- Voltage supply: min. 8V max. 30V.
- Maximum amperage consume when rest: 100mA.
- Starting output amperage: 70A in transitory regime, 40A during one second. 20 A in regime of stationary work.
- Output amperage when engine stop: (exc./des). 70A in transitory regime, 40A during one second. 20 A in regime of stationary work.
- Pre-heating output amperage: 70A in transitory regime, 40A during one second. 20 A in regime of stationary work.
- Alarm contact amperage, Engine working 1A.
- Genset/Mains contactors max. amperage 8A.
- Genset frequency status: 30-80 hz.
- Pick-up frequency status: 100 Hz at 8 KHz.
- Fuel level resistance: 330 Ohms.
- Measure Accuracy: 1%.
- Protection rank: IP65 (on control panel).

Possibility of installing the Second Zero Suppression expansion is an electronic module whose function is to avoid the second zero that is produced in the switching when the power returns and the generator group disconnects.



CEA7

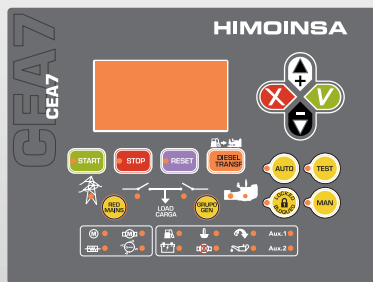
Automatic mains failure controller

DIMENSIONS AND MECHANIZING

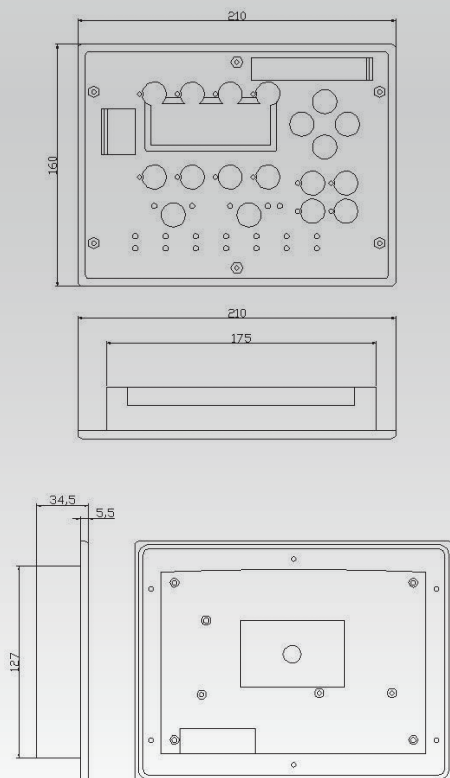
Maximum dimensions:

210x160x35,5 mm

Weight: 437 g



Visualization module CEA7



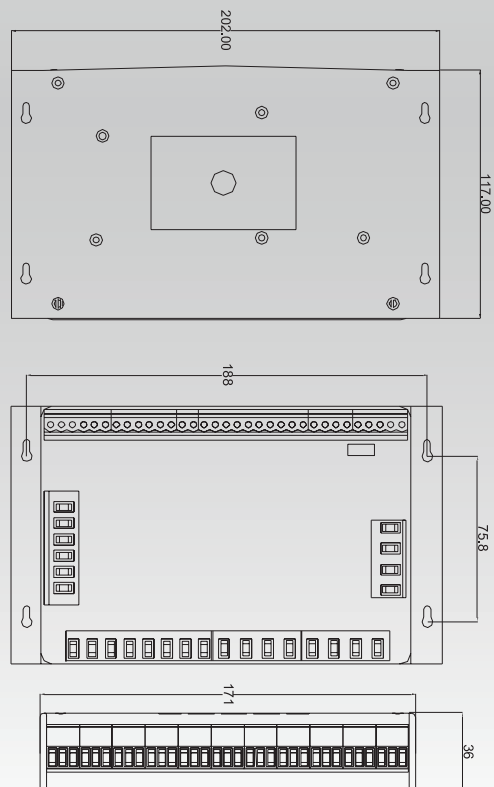
Maximum dimensions:

202x117x36 mm







Weight: 324 g



Measurements module PHG



Quick controllers list

	M6	CEM7	CEC7	CEA7
 GENERATOR READINGS				
Voltage among phases	x	●	●	●
Voltage among phases and neutral	x	●	●	●
Amperage	x	●	●	●
Frequency	x	●	●	●
Apparent power (kVA)	x	●	●	●
Active power (kW)	x	●	●	●
Reactive power (kVAr)	x	●	●	●
Power factor	x	●	●	●
 MAINS READINGS				
Voltage among phases	x	x	●	●
Voltage among phase and neutral	x	x	●	●
Amperage	x	x	●	●
Frequency	x	x	●	●
Apparent power	x	x	x	●
Active power	x	x	x	●
Reactive power	x	x	x	●
Power factor	x	x	x	●
 ENGINE READINGS				
Coolant temperature	x	● ⁽¹⁾	x	● ⁽¹⁾
Oil pressure	x	● ⁽¹⁾	x	● ⁽¹⁾
Fuel level (%)	x	●	x	●
Battery voltage	x	●	x	●
R. P. M.	x	●	x	●
Battery charge alternator voltage	x	●	x	●
 ENGINE PROTECTIONS				
High water temperature	P	P ⁽²⁾	x	P ⁽²⁾
High coolant temperature by sensor	x	A ⁽³⁾	x	A ⁽³⁾
Low engine temperature by sensor	x	A ⁽⁵⁾	x	A ⁽⁵⁾
Low oil pressure	P	P ⁽²⁾	x	P ⁽²⁾
Low oil pressure by sensor	x	A ⁽³⁾	x	A ⁽³⁾
Low coolant level	x	P	x	P
Unexpected shutdown	●	●	x	●
Fuel storage	A	A	x	A
Fuel storage by sensor	x	A ⁽³⁾	x	A ⁽³⁾
Stop failure	x	●	x	●
Battery voltage failure	x	A	x	A
Battery charge alternator failure	A	A	x	A
Overspeed	P	P	x	P
Underspeed	X	P	x	P
Start failure	●	●	x	●
Emergency Stop	●	●	●	●
 ALTERNATOR PROTECTIONS				
High frequency	P	P	P ⁽⁶⁾	P
Low frequency	x	P	P ⁽⁶⁾	P
High voltage	x	P	P ⁽⁶⁾	P
Low voltage	x	P	P ⁽⁶⁾	P
Over amperage	x	P	x	P
Short-circuit	x	P	x	P
Asymmetry among phases	x	P	P ⁽⁶⁾	P
Incorrect phase sequence	x	P	P ⁽⁶⁾	P
Inverse power	x	P	x	P
Overload	x	P	x	P
Genset signal droop	x	x	P	x
 COUNTERS				
Total hour counter	x	●	●	●
Partial hour counter	x	●	●	●
Kilowattimeter	x	●	●	●
Starts valid counters	x	●	●	●
Starts failure counters	x	●	●	●
Maintenance	x	●	●	●

- Standard
- x Not included
- ⁽¹⁾ Optional

NOTE: All the protection are programmable to carry out "warning" or "engine stop with or without cooling".



COMMUNICATIONS

	M6	CEM7	CEC7	CEA7
RS232	x	●	●	●
RS485	x	●	●	●
J1939	x	●	x	●
Modbus	x	●	●	●
Modbus IP	x	●	●	●
CCLAN	x	●	x	●
Software for PC	x	●(4)	●(4)	●(4)
Analogic modem	x	●	●	●
GSM/GPRS modem	x	●	●	●
Remote screen	x	●	x	●
Telesignal		●(8+4)		●(8+4)



FEATURES

Alarms history		(10) / (●+100)	(10)	(10) / (●+100)
External start	●	●	●	●
Start inhibition	x	●	●	●
Mains failure start	x	●(CEC7)	●	●
Start under normative EJP	x	●	x	●
Key start	x	x	x	x
Pre-heating engine control	●	●	x	●
Genset contactor activation	●	●	x	x
Main & Genset contactor activation	x	x	●	●
Fuel transfer control	x	●	x	●
Engine temperature control	x	●	x	●
Manual override		●	x	●
Programmable alarms		●	x	●
Genset start function in test mode		●	x	●
Programmable outputs		●	x	●
Magnetic Pick-up control	x	●	x	●
Multilingual		●	●	●

SPECIAL FUNCTIONS

Positioning GPS	x	●	●	●
Synchronization with mains	x	●(MPS5.0)	●	●(MPS5.0)
Mains Synchronism	x	●(MPS5.0)	●	●(MPS5.0)
Second Zero Suppressor	x	●(+ CEC7)	●	●
RAM7	x	●	●	●
Remote screen	x	●	●	●
Timer	x	●	●	●

A: Warning. Warning alarm without engine stop

P: Alarm with Engine Stop

(1) Bulbs installation necessary.

(2) Shot protection.

(3) Programmable analog. protection. (Depends on bulb installations)

(4) Standard when optional of communication is included.

(5) Change over activation not allowed before reaching at the temperature level programmed.

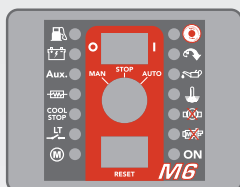
(6) Only protection with connection to CEM7.

CEC7: available when the controller CEC7 is incorporated to the installation.

MPS 5.0: available application when the module MPS 5.0 has been incorporated to the panel.

Note: AS5 + CC2 configuration, will have all CEM7 functionality plus CEC7 mains readings.

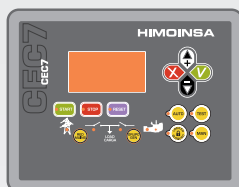
Quick control panel list



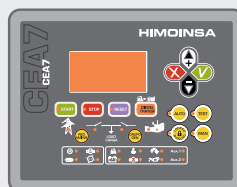
M6



CEM7



CEC7



CEA7

FUNCTIONALITY

- Auto-start (Key Start)
- Auto-start
- Automatic Control Panel Without mains control
- Automatic Control Panel With Mains Control (customer change over contactors)
- Automatic Control Panel With Mains Control (Himoinsa change over contactor with display)
- Automático Mains Failure (wall mounted panel)

PANEL MODEL

- M6
- M5
- AS5
- AS5
- AS5+CC2
- AC5

CONTROLLER MODEL

- M6
- CEM7
- CEM7**
- CEA7
- CEM7+CEC7
- CEA7

**Pre-heating resistance in the Genset and Battery charger in the control panel included.

Available Software:



Configuration



Monitoring



Fleet management



ADVANTAGES

HIGH PROTECTION

Protection for the Genset, as well as the different instruments and devices connected to the genset. Protection for: Overvoltage, Undervoltage, Asymmetry, Overamperage, Overfrequency, underfrequency, Overload, Incorrect genset phase sequence, inverse power, Shortcircuit, High coolant temperature, Low Oil Pressure, Overspeed, Underspeed, Battery charger Failure, Fuel reserve, Low coolant level, genset droop, maximum and minimum mains voltage failure, max. and min. mains frequencies failure, mains sequence failure, droop mains signal failure, mains & genset changeover failure, etc.

COMPLETE HANDFUL OF MEASURES

Allows the reading of a handful of measures with no need of additional instruments or external gauges. Apart from protection, offers continuously the parameters of genset works and the digital readings for: Voltage, amperage, frequency, Fuel Level, tachometer (hour counter) power consumption, battery alternator voltage, battery voltage, engine temperature*, oil pressure*, Current power measures, cosine of phi per phase, reading and situation of the programmable inputs, Total energy consumption measures (day, month and year**), Alarm control.

GREAT VERSATILITY

These module systems allow the adaptation and growing with the market demand and the law requirements. The modularity allows to have a sharp growth and all-purpose components (even with different types of engines). Depends of the plate location is possible to obtain different configurations. We start from a standard design and according to the needs it is possible to

develop new extensions.

Install only the necessary elements. Basis stock reduction. The same control panel for different voltage. Electrical Supply voltage: 12/24V.

SIMPLE

Installation is really simple. Wiring system is shortened. Easy to turn a manual device system into automatic and vice versa. With one simple programming of the control panel you can adjust measures and levels (i.e. automatic filling of the fuel tank). Power outputs remain protected. More than 64 nodes and more than 1.000 meters without signal repeater.

FAST PROGRAMMING

Possibility to personalize the features of the control panel to your own application. Apart from programming measure parameters, thresholds, times, alarms, regulations, etc, you can also program the control panel to stop the genset (with or without cooling time) or simply give you a warning with no stop of the engine.

DIFFERENT STARTING MODE

Manual Start, Automatic Start, Mains failure, or free voltage contact.

NEW BUSINESS LINES

This control panel allows the creation of new business lines and different managing possibilities since it contains:

- Preventive maintenance.
- Fungible.
- Routes generation.
- Genset Global positioning.
- Remote control.
- Antitheft follow up.
- Protection/security.

* Only with the corresponding sensors installed

** Only with programming timer.



ELECTRONICS

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