Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

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Технические характеристики на блоки управления автоматическим отключением для генераторных установок САМ компании ELCOS

CONTROL UNIT FOR GENERATING SET
TYPE CAM-685

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 USE MANUAL

It is equipped with display to show the INSTRUMENTS:

MAINS GENERATOR
- three mains voltmeters
- three generator voltmeters
- delta voltages phase/phase
- star voltages
- three mains/generator ammeters
- frequency meter
- wattmeter total and per phase
- varmeter "
- voltammeter "
- kilowatt-hour
- cosphimeter per phase
- partial hour-meter
- total hour-meter
- starting counter
- starting failure counter
- tachometer
- battery voltmeter
- battery charger current
  (with battery charger type CBS)
- fuel level gauge
- water oil thermometer
- oil pressure gauge

- Automatic supervision of faults with messages on the display
- Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese
- Information on 4 programmable preventive maintenance operations with display of the hours remaining before the maintenance work is due
- Remote controls (starting, stop and test)
- EJP function
- Possibility of linking 7 relays to various functions
- Preheating glow plugs management
- Management of refuelling of working tank from storage tank
- Clock to program starting or stopping the generating set
- Generator start/stop on request for power
- Possibility of starting the generating set in case of low battery-charge
- Programmable weekly selftest.
- Available inputs for fully programmable anomalies (times, polarities, stopping possibility and message about the anomaly)
- Three-phase voltmetric control, voltage failure, undervoltage, overvoltage, asymmetryc voltage and not correct phase sequence of the mains and of the generator.
- Anomaly historical log (including data from the last 50 occurred anomalies)
- Displaying of the most serious faults with both led and messages on the display
- Possibility of password protected programming.

MODES OF COMMUNICATION OF CAM-685

- CAN Bus Connection (SAE J1939)
- Serial ports RS232, RS485 and USB
- Connection with a remote panel (Type PRE-685) to display the instruments and errors managed by the CAM-685
- GSM Modem (to be mounted externally), possibility of displaying the control unit instruments with a mobile phone, operating the starting and stopping and notifying with an SMS message when the generating set is in alarm state.
- MODBus protocol through port RS232, RS485 and the serial port via USB
- Remote operation with personal computer (on request):
  - reading of the instruments shown on the display of the control unit
  - anomaly historical record
  - displaying of anomalies and operating status of the generating set.
  - start stop controls

TECHNICAL DATA

Supply by battery	12 Vdc 24 Vdc
Supply voltage	8 ÷ 32V
Selfconsumption with stopped engine and pressed emergency button	350 mA 12V 180 mA 24V
Suitable for three-phase generators having the following voltage range:	80 ÷ 430Vac ±10%; frequency 50 ÷ 60Hz
Dielectric withstand voltage between battery powered circuits and mains/group powered circuits	3750 Vac 50Hz 1 sec
Voltage sag in power line from battery	
Rated insulation voltage: • Terminal board at mains voltage	600V
• Terminal board at genset voltage	600V
• Terminal board at battery voltage	32V
Capacity of contacts for control of the mains/genset contactors and linkable relays	250V 3A (AC1)
Max load on the outputs	15 (starting) 0,25A,
	17 (stop) 1,5A, 19 (key) 0,25A, 6 (glow plugs) 0,25A
	70 (general alarm) 0,25A
Degree of rear protection	IP 20
Degree of front protection	IP 64
Temperature range	- 20 ÷ + 60°C
Weight	1170g
Dimensions with terminals disconnected (LxHxP)mm	290x200x62
Hole mm	274x185
Tachometer	5 digits
Instruments accuracy: oil pressure gauge, water thermometer, fuel level	±2%
Mains/generator voltmeter	Max 570V accuracy ±1% field of measurement 50 ÷ 570Vac
Rated current of the ammeters	5 A ac
Ammeter	Max 4800A, accuracy ±1% field of measurement 0,02 (20mA) ÷ 6A
Frequency meter:	0-85 Hz, accuracy ±0,1 Hz frequency field 45 ÷ 85Hz
Precision of the wattmeter, varmeter, voltammeter, kilowatt-hour and cosphimeter	±2%
Tachometer	Max 4000 RPM accuracy ± 10 RPM
Serial output parameters	9600 baud, 8 bit data, 1 bit stop; even parity
Rechargeable batteries (excluded from supply)	1,2V Type AAA

CONTROL UNIT FOR GENERATING SET
TYPE CAM-684

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 USE MANUAL

It is equipped with display to show the INSTRUMENTS:

MAINS GENERATOR
- three mains voltmeters
- three generator voltmeters
- delta voltages phase/phase
- star voltages
- three mains/generator ammeters
- frequency meter
- wattmeter total and per phase
- varmeter "
- voltammeter "
- kilowatt-hour
- cosphimeter per phase

- partial hour-meter
- total hour-meter
- starting counter
- starting failure counter
- tachometer
- battery voltmeter
- battery charger current (with battery charger type CBS)
- fuel level gauge
- water oil thermometer
- oil pressure gauge

- Automatic supervision of faults with messages on the display
- Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese
- Information on 4 programmable preventive maintenance operations with display of the hours remaining before the maintenance work is due
- Remote controls (starting, stop and test)
- EJP function
- Preheating glow plugs management
- Management of refuelling of working tank from storage tank
- Clock to program starting or stopping the generating set
- Generator start/stop on request for power
- Possibility of starting the generating set in case of low battery-charge
- Programmable weekly selftest.
- Available inputs for fully programmable anomalies (times, polarities, stopping possibility and message about the anomaly)
- Three-phase voltmetric control, voltage failure, undervoltage, overvoltage, asymmetryc voltage and not correct phase sequence of the mains and of the generator.
- Anomaly historical log (including data from the last 50 occurred anomalies)
- Displaying of the most serious faults with both led and messages on the display
- Possibility of password protected programming.

MODES OF COMMUNICATION OF CAM-684

- CAN Bus Connection (SAE J1939)
- Serial ports RS232 and RS485
- Connection with a remote panel (Type PRE-685) to display the instruments and errors managed by the CAM-684
- GSM Modem (to be mounted externally), possibility of displaying the control unit instruments with a mobile phone, operating the starting and stopping and notifying with an SMS message when the generating set is in alarm state
- MODBus protocol through port RS232, RS485 and the serial port via USB
- Remote operation with personal computer (on request):
  - reading of the instruments shown on the display of the control unit
  - anomaly historical record
  - displaying of anomalies and operating status of the generating set.
  - start stop controls

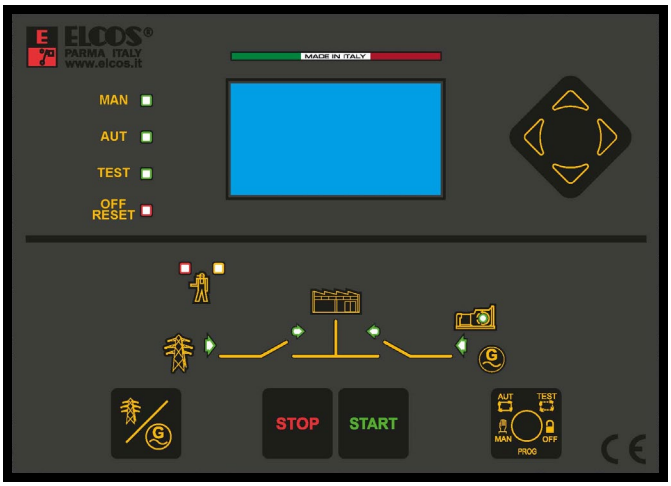
TECHNICAL DATA

Supply by battery	12 Vdc 24 Vdc
Supply voltage	8 ÷ 32V
Selfconsumption with stopped engine and pressed emergency button	350 mA 12V 180 mA 24V
Suitable for three-phase generators having the following voltage range:	80 ÷ 430Vac ±10%; frequency 50 ÷ 60Hz
Dielectric withstand voltage between battery powered circuits and mains/group powered circuits	3750 Vac 50Hz 1 sec
Voltage sag in power line from battery	
Rated insulation voltage: • Terminal board at mains voltage	600V
• Terminal board at genset voltage	600V
• Terminal board at battery voltage	32V
Capacity of contact for control of the genset contactor	250V 3A (AC1)
Max load on the outputs	15 (starting) 0,25A,
	17 (stop) 1,5A, 19 (key) 0,25A, 6 (glow plugs) 0,25A
	70 (general alarm) 0,25A
Degree of rear protection	IP 20
Degree of front protection	IP 64
Temperature range	- 20 ÷ + 60°C
Weight	1120g
Dimensions with terminals disconnected (LxHxP)mm	290x200x62
Hole mm	274x185
Tachometer	5 digits
Instruments accuracy: oil pressure gauge, water thermometer, fuel level	±2%
Mains/generator voltmeter	Max 570V accuracy ±1% field of measurement 50 ÷ 570Vac
Rated current of the ammeters	5 A ac
Ammeter	Max 4800A, accuracy ±1% field of measurement 0,02 (20mA) ÷ 6A
Frequency meter:	0-85 Hz, accuracy ±0,1 Hz frequency field 45 ÷ 85Hz
Precision of the wattmeter, varmeter, voltammeter, kilowatt-hour and cosphimeter	±2%
Tachometer	Max 4000 RPM accuracy ± 10 RPM
Serial output parameters	9600 baud, 8 bit data, 1 bit stop; even parity
Rechargeable batteries (excluded from supply)	1,2V Type AAA

GENSET CONTROL UNIT

CAM-405

Developed to equip automatic emergency panels.
It controls and operates genset, connecting the power user to the mains or generator.



Complete with backlit graphic display to view:

- Three voltmeters for the mains.
- Three voltmeters for the generator.
- Three mains/generator ammeters.
- Mains/generator frequency meter.
- Generator tachometer.
- Mains/generator kW (active), kVAR (reactive) and kVA (apparent) powers.
- Battery voltmeter.
- Fuel level gauge.
- Engine temperature.
- Oil pressure.
- Total hour-meter.
- Partial hour-meter.
- Start-ups counter.

Functions:

- Automatic monitoring of faults with display messages.
- Complete three-phase voltmetric control of mains and genset (undervoltage, overvoltage, phase asymmetry, incorrect phase sequence, underfrequency and overfrequency).
- Texts in 7 languages: Italian, English, French, German, Spanish, Portuguese and a programmable language.
- CAN Bus Connection SAEJ1939.
- RS232, RS485 serial ports and USB.
- MOD Bus RTU Protocol.
- 4-maintenance management.
- Management of rental hours.
- Remote controls (start, stop, EJP).
- Generator start and stop on power demand.
- Ability to start generator when the battery charge is low.
- Option of associating inputs and outputs with different functions.
- Pick-up input.
- Glow plug preheating management.
- Management of refuelling of working tank from storage tank.
- Clock for programming genset starting or stopping.
- Automatic test.
- Anomaly log.
- Option of password protected programming.
- Dimensions (LxHxW) 252x175x60mm

-	EEPROM ERROR	Failed access to the static memory.

TECHNICAL SPECIFICATIONS

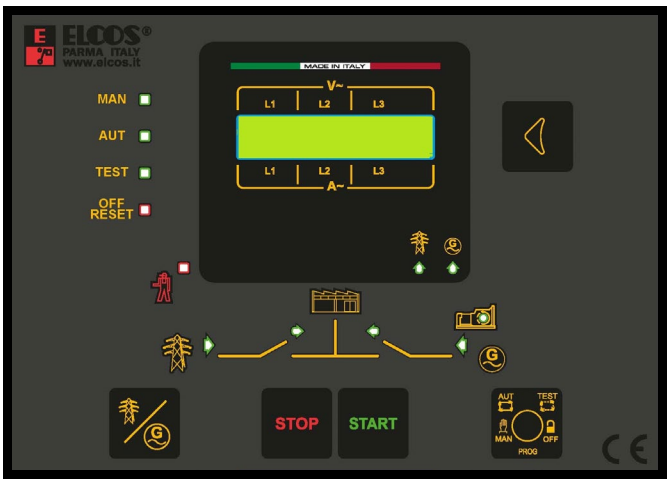
Power supply			
Suitable for batteries		12Vdc	24Vdc
Operating range		8 ÷ 48Vdc	
Absorption with engine not running		130mA@12Vdc	90mA@24Vdc
Voltage dip on battery power supply		From 10Vdc to 0Vdc for 20ms	
Digital inputs			
Type of input		Negative	
Maximum current supplied		0.30mA	
Voltage threshold for low signal		≤ 0.2Vdc	
Voltage threshold for high signal		≥ 2Vdc	
Terminal input 65			
AC voltage		5.5 ÷ 65Vac	
Measurement range		50 - 1500Hz	
Pick-up input terminals 63-64			
AC voltage		0.5 ÷ 5.5Vac	
Measurement range		100 - 15000Hz	
Minimum pick-up impedance		>400ohm	
Mains and generator voltmetric inputs			
Dielectric strength voltage between battery voltage circuits and mains/generator voltage circuits		3750Vac 50Hz 1sec	
Rated insulation voltage	Mains voltage terminal	600Vac	
	Genset voltage terminal	600Vac	
	Battery voltage terminal	48Vac	
Insulation class		1	
Measurement range		80 ÷ 570Vac (three-phase)	45 ÷ 340Vac (single-phase)
Accuracy		±1%	
Frequency meter			
Measurement range		45 - 85Hz	
Accuracy		±0.1Hz	
Amperometric inputs			
Measurement range		20mA ÷ 6Aac	
Amperometric transformer ratio		/5	
Maximum displayable current		4800Aac	
Accuracy		±1%	
Digital outputs			
Type of output		Positive (battery voltage)	
Maximum load	Terminal 6, 15, 19, 70.	0.25 A	
	Terminal 17	1.5 A	
Outputs 71 - 72, 73 - 74, 79 - 80			
Type of output		Dry contact	
Maximum applicable voltage		275Vac	
Maximum load		3 A	
Displayed powers (kW, kVAR, kVA, kWh)			
Accuracy		±2%	
Engine instruments			
Oil pressure	0 ÷ 360ohm	0.0 ÷ 9.0BAR	0 ÷ 900kPa
Temperature	0 ÷ 3000ohm	0 ÷ 140°C	0 ÷ 284°F
Fuel level	0 ÷ 360ohm	0 ÷ 100%	
Accuracy (pressure gauge, thermometer, fuel level)		±2%	
Lines of communication			
RS232 (No optoisolator)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
RS485 (No optoisolator)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
USB 2.0 (Micro USB-B)	Interface	Not isolated. Maximum cable length 3 m.	
CAN Bus (No optoisolator)	Baud-rate	250kbps	
	Protocol	SAE J1939	
Environmental conditions			
Operating temperature		-20 ÷ 60°C	
Storage temperature		-20 ÷ 60°C	

Relative humidity	≤ 80%
Protection class	
Back	IP 20
Front	IP 54
Container	
Weight	540g
Dimensions (LxHxW)	243x170x62mm
Perforations	227x155mm
Material	PC/ABS
Terminals	
Screw	M3
Nominal wire size	2.5mm^2
Installation	
Wall-mounted	
4 nuts	M4
Nut locking force	1,0 ÷ 1,5 Nm

GENSET CONTROL UNIT

CAM-402

Developed to equip automatic emergency panels.
It controls and operates genset, connecting the power user to the mains or generator.



Complete with backlit display to view:

- Three voltmeters for the mains.
- Three voltmeters for the generator.
- Three mains/generator ammeters.
- Mains/generator frequency meter.
- Generator tachometer.
- Apparent mains/generator power, kVA.
- Battery voltmeter.
- Fuel level gauge.
- Total hour-meter.
- Partial hour-meter.
- Start-ups counter.

Functions:

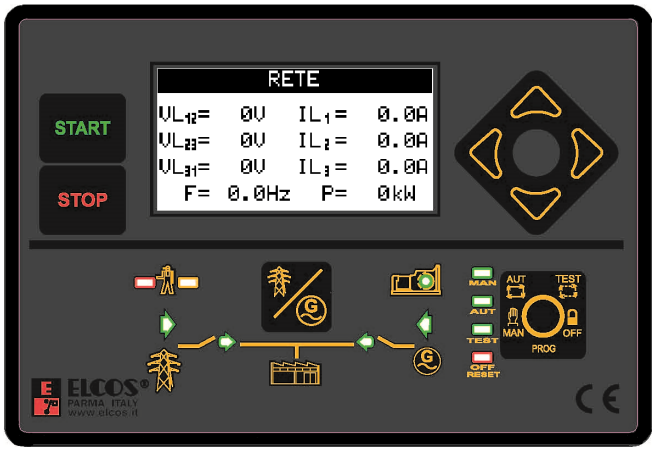
- Automatic monitoring of faults with display messages.
- Complete three-phase voltmetric control of mains and genset (undervoltage, overvoltage, phase asymmetry, incorrect phase sequence, underfrequency and overfrequency).
- Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese.
- RS485 serial port.
- MOD Bus RTU Protocol.
- 4-maintenance management.
- Remote controls (start, stop, EJP).
- Ability to start generator when the battery charge is low.
- Glow plug preheating management.
- Clock for programming genset starting or stopping.
- Programmable weekly self-test.
- Anomaly log (including data from the last 50 anomalies that caused cut-outs).
- Dimensions (LxHxW) 252x175x60mm

TECHNICAL SPECIFICATIONS			
Power supply			
Suitable for batteries		12Vdc	24Vdc
Operating range		8 ÷ 48Vdc	
Absorption with engine not running		110mA@12Vdc	60mA@24Vdc
Voltage dip on battery power supply		From 10Vdc to 0Vdc for 250ms	
Digital inputs			
Type of input		Negative	
Maximum current supplied		0.55mA	
Voltage threshold for low signal		≤ 0.2Vdc	
Voltage threshold for high signal		≥ 2Vdc	
Terminal input 65			
AC voltage		0.5 ÷ 65Vac	
Measurement range		40 ÷ 2000Hz	
Mains and generator voltmetric inputs			
Dielectric strength voltage between battery voltage circuits and mains/generator voltage circuits		3750Vac 50Hz 1sec	
Rated insulation voltage	Mains voltage terminal	600Vac	
	Genset voltage terminal	600Vac	
	Battery voltage terminal	48Vac	
Measurement range		80 ÷ 570Vac (three-phase)	45 ÷ 340Vac (single-phase)
Accuracy		±1%	
Frequency meter			
Measurement range		45 ÷ 85Hz	
Accuracy		±0.1Hz	
Amperometric input			
Measurement range		20mA ÷ 6Aac	
Amperometric transformer ratio		/5	
Maximum displayable current		4800Aac	
Accuracy		±1%	
Digital outputs			
Type of output		Positive (battery voltage)	
Maximum load	Terminal 6, 15, 19, 70.	0.25 A	
	Terminal 17	1.5 A	
Contactors command outputs			
Type of output		Dry contact	
Maximum applicable voltage		275Vac	
Maximum load		3 A (AC1)	
Power displayed (kVA)			
Accuracy		±2%	
Engine instruments			
Fuel level	0 ÷ 360 Ohm	0 ÷ 100%	
Accuracy		±2%	
Lines of communication			
RS485 (Not opto isolated)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
Environmental conditions			
Operating temperature		-20 ÷ 60°C	
Storage temperature		-20 ÷ 60°C	
Relative humidity		≤ 80%	
Protection class			
Back		IP 00	
Front		IP 54	
Container			
Weight		450g	
Dimensions (LxHxW)		243x170x62mm	
Perforations		227x155mm	
Material		PC/ABS	
Terminals			
Screw		M3	
Nominal wire size		2.5mm^2	
Installation			
Wall-mount, 4 nuts		M4	

GENSET CONTROL UNIT

CAM-335

Developed to equip automatic emergency panels.
It controls and operates genset, connecting the power user to the mains or generator.



Complete with backlit graphic display with touch screen to view:

- Three voltmeters for the mains.
- Three voltmeters for the generator.
- Three mains/generator ammeters.
- Mains/generator frequency meter.
- Generator tachometer.
- Mains/generator kW (active), kVAR (reactive) and kVA (apparent) powers.
- Battery voltmeter.
- Fuel level gauge.
- Water/oil thermometer.
- Oil pressure gauge.
- Total hour-meter.
- Partial hour-meter.
- Start-ups counter.

Functions:

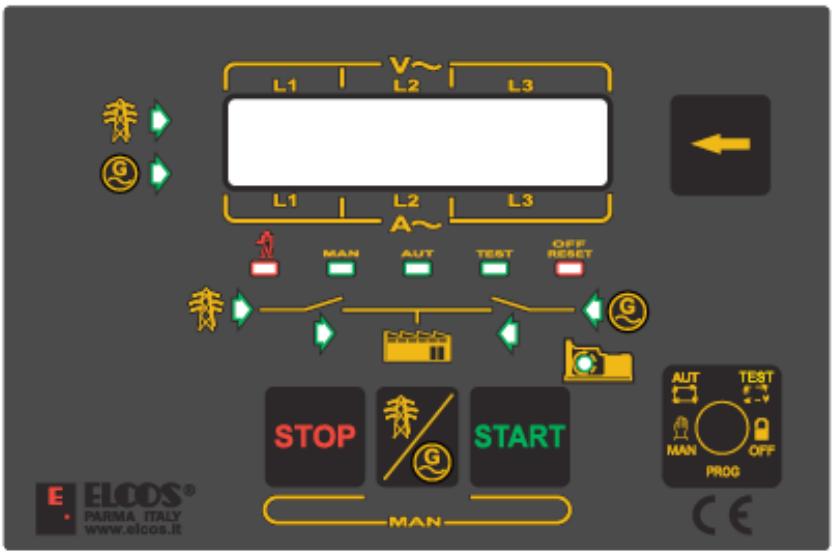
- Automatic monitoring of faults with display messages.
- Complete three-phase voltmetric control of mains and genset (undervoltage, overvoltage, phase asymmetry, incorrect phase sequence, underfrequency and overfrequency).
- Texts in 7 languages: Italian, English, French, German, Spanish, Portuguese and a programmable language.
- CAN Bus Connection SAEJ1939.
- RS232, RS485 serial ports and USB.
- MOD Bus RTU Protocol.
- 4-maintenance management.
- Management of rental hours.
- Remote controls (start, stop, EJP).
- Generator start and stop on power demand.
- Ability to start generator when the battery charge is low.
- Option of associating inputs and outputs with different functions.
- Glow plug preheating management.
- Management of refuelling of working tank from storage tank.
- Clock for programming genset starting or stopping.
- Automatic test.
- Anomaly log.
- Option of password protected programming.
- Dimensions (LxHxW) 157x109x74mm

TECHNICAL SPECIFICATIONS

Power supply			
Suitable for batteries		12Vdc	24Vdc
Operating range		8 ÷ 48Vdc	
Absorption with engine not running		130mA to 12Vdc	90mA to 24Vdc
Voltage dip on battery power supply		From 10Vdc to 0Vdc for 20ms	
Digital inputs			
Type of input		Negative	
Maximum current supplied		0.30mA	
Voltage threshold for low signal		≤ 0.2Vdc	
Voltage threshold for high signal		≥ 2Vdc	
Terminal input 65			
AC voltage		5.5 ÷ 65Vac	
Measurement range		50 - 1500Hz	
Mains and generator voltmetric inputs			
Dielectric strength voltage between battery voltage circuits and mains/generator voltage circuits		3750Vac 50Hz 1sec	
Rated insulation voltage	Mains voltage terminal	600Vac	
	Genset voltage terminal	600Vac	
	Battery voltage terminal	48Vac	
Insulation class		1	
Measurement range		80 ÷ 570Vac (three-phase)	45 ÷ 340Vac (single-phase)
Accuracy		±1%	
Frequency meter			
Measurement range		45 - 85Hz	
Accuracy		±0.1Hz	
Amperometric inputs			
Measurement range		20mA ÷ 6Aac	
Amperometric transformer ratio		/5	
Maximum displayable current		4800Aac	
Accuracy		±1%	
Digital outputs			
Type of output		Positive (battery voltage)	
Maximum load	Terminal 6, 15, 19, 70.	0.25 A	
	Terminal 17	1.5 A	
Contactors command outputs			
Type of output		Dry contact	
Maximum applicable voltage		275Vac	
Maximum load		3 A	
Displayed powers (kW, kVAR, kVA, kWh)			
Accuracy		±2%	
Engine instruments			
Oil pressure	0 ÷ 360Ohm	0.0 ÷ 9.0BAR	0 ÷ 900kPa
Temperature	0 ÷ 3000Ohm	0 ÷ 140°C	0 ÷ 284°F
Fuel level	0 ÷ 360Ohm	0 ÷ 100%	
Accuracy (pressure gauge, thermometer, fuel level)		±2%	
Lines of communication			
RS232 (No optoisolator)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
RS485 (No optoisolator)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
USB 2.0 (Micro USB-B)	Interface	Not isolated. Maximum cable length 3 m.	
CAN Bus (No optoisolator)	Baud-rate	250kbps	
	Protocol	SAE J1939	
Environmental conditions			
Operating temperature		-20 ÷ 60°C	
Storage temperature		-20 ÷ 60°C	
Relative humidity		≤ 80%	
Vibration resistance		1g on the 3 axes (CEI EN 60068-2-6)	
Impact resistance		15 on the 3 axes (CEI EN 60068-2-27)	
Protection class			
Back		IP 20	
Front		IP 64	
Container			
Weight		480g	
Dimensions (LxHxW)		157x109x74mm	
Perforations		137x88 mm	
Material		PC/ABS V0	

CAM-332

Developed to equip automatic emergency panels.
It controls and operates genset, connecting the power user to the mains or generator.



Complete with backlit display to view:

- Three voltmeters for the mains.
- Three voltmeters for the generator.
- Three mains/generator ammeters.
- Mains/generator frequency meter.
- Generator tachometer.
- Apparent mains/generator power, kVA.
- Battery voltmeter.
- Fuel level indicator.
- Total hour-meter.
- Partial hour-meter.
- Start-ups counter.

Functions:

- Automatic monitoring of anomalies with display messages.
- Complete three-phase voltmetric control of mains and genset (undervoltage, overvoltage, phase asymmetry, incorrect phase sequence, underfrequency and overfrequency).
- Texts in 6 languages: Italian, English, French, German, Spanish and Portuguese.
- RS485 serial port.
- MOD Bus RTU Protocol.
- 4-maintenance management.
- Remote controls (start, stop, EJP).
- Ability to start generator when the battery charge is low.
- Glow plug preheating management.
- Clock for programming genset starting or stopping.
- Programmable weekly self-test.
- Anomaly log (including data from the last 50 anomalies that caused cut-outs).

SPECIFICATIONS

Power supply			
Suitable for batteries		12 Vdc	24 Vdc
Operating range		8 ÷ 48Vdc	
Absorption with engine not running		110mA to 12Vdc	60mA to 24Vdc
Voltage dip on battery power supply		From 10Vdc to 0Vdc for 250ms	
Digital inputs			
Type of input		Negative	
Maximum current supplied		0.55mA	
Voltage threshold for low signal		≤ 0.2Vdc	
Voltage threshold for high signal		≥ 2Vdc	
Terminal input 65			
AC voltage		0.5 ÷ 65Vac	
Measurement range		40 ÷ 2000Hz	
Mains/generator voltmetric inputs			
Dielectric strength voltage between battery voltage circuits and mains/generator voltage circuits		3750Vac 50Hz 1sec	
Rated insulation voltage	Mains voltage terminal	600Vac	
	Genset voltage terminal	600Vac	
	Battery voltage terminal	48Vac	
Measurement range		80 ÷ 570Vac (three-phase)	45 ÷ 340Vac (single-phase)
Accuracy		±1%	
Frequency meter			
Measurement range		45 ÷ 85Hz	
Accuracy		±0.1Hz	
Amperometric input			
Measurement range		20mA ÷ 6Aac	
Amperometric transformer ratio		/5	
Maximum displayable current		4800Aac	
Accuracy		±1%	
Digital outputs			
Type of output		Positive (battery voltage)	
Maximum load	Terminal 6, 15, 19, 70.	0.25 A	
	Terminal 17	1.5 A	
Contactors command outputs			
Type of output		Clean contact	
Maximum applicable voltage		275Vac	
Maximum load		3 A (AC1)	
Power displayed (kVA)			
Accuracy		±2%	
Engine instruments			
Fuel level	0 ÷ 360 Ohm	0 ÷ 100%	
Accuracy		±2%	
Lines of communication			
RS485 (Not opto isolated)	Baud-rate	1200 ÷ 115200 bps	
	Parity	None/even	
Environmental conditions			
Operating temperature		-20 ÷ 60°C	
Storage temperature		-20 ÷ 60°C	
Relative humidity		≤ 80%	
Protection class			
Back		IP 00	
Front		IP 64	
Container			
Weight		450g	
Dimensions (LxHxW)		157x109x74mm	
Perforations		137x88mm	

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