Controllers
for EPOS mini DC Power Systems

EPOS mini

ESC MS-48.60

ESC MA-48.60

POWER GENERATION & DISTRIBUTION

PROCESS INDUSTRY

DEFENCE & SECURITY

TELECOM

Product Description

Depending on configuration the ESC – Efore Shelf Controller – controller family provides standard to advanced control and supervision of the EPOS Mini systems. The ESC controller operates in both 48 VDC and 60 VDC system set-ups.

System build up

The ESC controller family contains two alternative master modules, the standard level ESC MS-48.60 and the advanced level ESC MA-48.60.

All interfaces to system internal functions, sensors etc such as contactors, temperature probes, rectifiers, distribution fuses are made through separate interface boards to/from which the information is transferred between the master and the peripheral function.

This arrangement allows the master to be disconnected and swapped without having to disconnect and reconnect all involved cabling.

Features

- Battery block measurement standard
- Battery tests w/ online analysis support
- Boost charge; manual, periodic, auto
- Adjustable temperature compensation
- Logs; event, alarm, temp, power, discharge
- Automatic system inventory lists
- Multilevel password protection
- Wide range of user configurable parameters
- TCP/IP and RS232
- SNMP v3 (GET, SET, TRAP)
- Local interface with display and buttons

Technical Specifications

General	ESC MS-48.60	ESC MA-48.60
Operating voltage (nominal)	48 VDC to 60 VDC	
Dimensions (HxWxD)	4U x 180 mm x 30 mm	
Weight	<1 kg	
Power system interfaces (via separate I/F boards)	2x Battery block measurement input, up to 5 blocks 1x battery contactor control "LVD", non-latching 1x load contactor control "PLD", non latching (optional) 1x temperature probe (optional) 1x battery current shunt 8x ERM 48/60-300 rectifier modules 1x alarm relay output 4x alarm relay outputs (optional) 2x battery MCB alarms 6x distribution MCB alarms 11x distribution MCB alarms (optional)	
Remote comm connections	-	RS 232: Lap top, Modem, Telnet RJ 45: TCP/IP and SNMP Trap
Local panel user I/F	Display 2x16 characters LCD 4 push buttons One 2-colour LED (red/green)	

Embedded functions

Function	ESC MS-48.60	ESC MA-48.60
Measurements	*Current*: Battery, Load, Rectifier total, Individual rectifier *Voltage*: Battery, System and Individual battery block *Temperature:* Battery and System Internal	
Voltage control	Float charge, Temperature compensation, Boost charge, Battery test	
Temperature compensation	Yes	
Boost charge	Automatic, Periodic, Manual	
Charge current limitation	Yes	
Battery tests	*Periodic, Manual:* Preferred time of day for test Blockage of specific days (time, weekday, specific dates) Test limits: Ampere-hour, Voltage level, Time	
Battery test result analysis	pass/no pass	Block voltage data Graphical results with current and voltage Tabled information ready for download
Cost save mode	Yes	
LVD	*Battery LVD*: Voltage mode *Load LVD ("PLD"):* Voltage or Time mode	
Event log/ alarm log	-	Yes, time stamped
Statistical data	-	System power Battery temperature Battery discharge level Battery tests
Inventory data	System type Rectifier type and serial number Controller type and serial number Software versions Extension boards (type and number of)	

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User intervention

Action	ESC MS-48.60	ESC MA-48.60
Display	*Display 2x16 characters LCD:* System state: FC, TC, BC, etc. System voltage Inventory list Load current Battery current Battery temperature Discharged ampere-hours Rectifier loading as XX%. Sum and indivual rectifier current Read active alarms Read non-acknowledged alarms Software version Nominal voltage version	
Settings (on unit front)	*Settings via 4 push button on unit front:* Change parameters Start or stop manual battery test Start or stop manual boost charge Acknowledge alarms Perform the system tests. Perform battery shunt calibration Change display language (Finnish, English) Select / deselect cost save mode Reset the ampere hour discharge log Change the periodic battery test timer value	
Settings (w/ remote access)	-	*RS232 and TCP/IP interface:* All system settings and parameters are possible read and adjust.
Remote comm	-	SNMP Trap: 4 different nodes Auto Email: 10 different adresses
Data upload	-	Communcation settings System parameters Software upgrade
Data dowload	-	Battery test data Communcation settings System parameters Logs
Protection	*Local panel:* Write access password on display	*Local panel:* Write access password on display *TCP/IP connection:* Multilevel password (user, power, admin) High security mode permits only SSH and HTTPS network connections
LED	GREEN - System OK, RED - User intervention required RED BLINKING - Active alarm	

Parameters

Name	Range 48V	Range 60V	Resolution	Default 48V	Default 60V
Float Charge	42-57.6 VDC	52.5-72 VDC	0.1 VDC	54.5 VDC	68.1 VDC
Temperature compensation					
Enable / disable	on/off	on/off		disabled	disabled
V / degC	0-144 mV	0-180 mV	1 mV	72 mV	90 mV
Max voltage	42-59 VDC	52.5-73.75 VDC	0.1 VDC	57.6 VDC	72 VDC
Min voltage	42-59 VDC	52.5-73.75 VDC	0.1 VDC	42 VDC	52.5 VDC
Nominal temperature	-20 °C to +50 °C	-20 °C to +50 °C	1 °C	20 °C	20 °C
Boost charge					
Voltage addition ("BC Add")	0 – 6 VDC	0 – 7.5 VDC	0.1 VDC	3.12 VDC	3.9 VDC
Allowed temperature min	-20 °C to +50 °C	-20 °C to +50 °C	1 °C	0 °C	0 °C
Allowed temperature max	-20 °C to +50 °C	-20 °C to +50 °C	1 °C	30 °C	30 °C
Manual					
Maximum time	1 min – 24 h	1 min – 24 h	1 min	1 h	1 h
Periodic					
Enable / disable	on/off	on/off		disabled	disabled
Maximum time	1 min – 24 h	1 min – 24 h	1 min	1 h	1 h
Period (count / year)	1-12	1-12	1	2	2
Automatic					
Enable / disable	on/off	on/off		disabled	disabled
Maximum time	1 min – 24 h	1 min – 24 h	1 min	1 h	1 h
Start current	1 – 60 A	1 – 60 A	1 A	5 A	5 A
Stop current	1 – 60 A	1 – 60 A	1 A	3 A	3 A
Battery test					
Battery nominal capacity					
Manual					
Ignore time	0 min - 24 h	0 min - 24 h	1 min	15 min	15 min
Stop voltage	42.2 - 57.7 VDC	48-72 VDC	0.1 VDC	43.2	54 VDC
Shutdown voltage	42.2 - 57.7 VDC	48-72 VDC	0.1 VDC	42.2 VDC	52.5 VDC
Time limit	1 min-24 h	1 min-24 h	1 min	1 h	1 h
Ah-limit	1-400 Ah	1-400 Ah	1 Ah	100 Ah	100 Ah
Periodic					
Enable/disable	on/off	on/off		disabled	disabled
Ignore time	0 min - 24 h	0 min - 24 h	1 min	15 min	15 min
Stop voltage	42.2 - 57.7 VDC	48-72 VDC	0.1 VDC	43.2	54 VDC
Shutdown voltage	42.2 - 57.7 VDC	48-72 VDC	0.1 VDC	42.2 VDC	52.5 VDC
Time limit	1 min-24 h	1 min-24 h	1 min	1 h	1 h
Ah-limit	1-400 Ah	1-400 Ah	1 Ah	100 Ah	100 Ah
Period (count / year)	1-12	1-12	1	2	2
Charge time limit	0-100 h	0-100 h	1 h	3	3
Allowed weekdays and time windows	Any	Any		Allways	Allways
Forbidden days	Any	Any		None	None
Charge current limitation					
Limit	5 – 61 A	5 – 61 A	1 A	61 A	61 A
Battery LVD					
Disconnect	38.4 - 57.7 VDC	48 – 72 VDC	0.1 VDC	43.2 VDC	54 VDC
Pickup	38.4 - 57.7 VDC	48 – 72 VDC	0.1 VDC	48 VDC	60 VDC
Load LVD					
Mode	Voltage/Time	Voltage/Time		Voltage	Voltage
Disconnect	38,4 - 57,7 VDC	48 - 72 VDC	0.1 VDC	43.2 VDC	54 VDC
Pickup	38,4 - 57,7 VDC	48 - 72 VDC	0.1 VDC	48 VDC	60 VDC
Time limit					
Cost Save Mode Enabled	on/off			disabled	disabled
Battery shunt offset	-5 to +5 A	-5 to +5 A	0.2 A	0	0
Display language				English	English

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Alarms

Name	Range 48V	Range 60V	Resolution	Default 48V	Default 60V
Mains fault					
Enable/disable	on/off			enabled	enabled
Delay	0-24 h	0-24 h	1 min	0 min	0 min
Relay assignment	0-5	0-5	1	1	1
Rectifier fault					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Phase fault					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Mains low voltage					
Enable/disable	on/off			enabled	
Alarm limit	80-335 VAC	80-335 VAC	1 VAC	180 VAC	180 VAC
Delay	0-24 h	0-24 h	1 min	1 h	1 h
Relay assignment	0-5	0-5	1	1	1
Battery test fail					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Battery fuse open					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Distribution fuse open					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
DC over voltage					
Enable/disable	on/off			enabled	enabled
Alarm limit	42-59 VDC	52.5-73.75 VDC	0.1 VDC	58 VDC	73 VDC
Relay assignment	0-5	0-5	1	1	1
DC low voltage					
Enable/disable	on/off				
Alarm limit	42-59 VDC	52.5-73.75 VDC	0.1 VDC	45.6 VDC	57 VDC
Delay	0-24 h	0-24 h	1 min	0 min	0 min
Relay assignment	0-5	0-5	1	1	1
Over load					
Enable/disable	on/off			disabled	disabled
Alarm limit	1-100 %	1-100 %	1 %	90 %	90 %
Delay	0-24 h	0-24 h	1 min	1 h	1 h
Relay assignment	0-5	0-5	1	1	1
External 1 alarm					
Enable/disable	on/off			enabled	enabled
Delay	0-24 h	0-24 h	1 min	1min	1min
Relay assignment	0-5	0-5	1	1	1
External 2 alarm					
Enable/disable	on/off			enabled	enabled
Delay	0-24 h	0-24 h	1 min	1min	1min
Relay assignment	0-5	0-5	1	1	1
Over temperature					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Battery over temperature					
Enable/disable	on/off			enabled	enabled
Alarm limit	-40 to + 80 degC	-40 to + 80 degC	1 degC	30 degC	30 degC
Relay assignment	0-5	0-5	1	1	1
Automatic boost charge fault					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1
Temperature sensor missing					
Enable/disable	on/off			enabled	enabled
Relay assignment	0-5	0-5	1	1	1

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Order Information

The ESC controller of your choice is built into the EPOS Mini system at the factory. Hence the selection of appropriate controller module is made when you configure your EPOS Mini system. Please refer to datasheet on EPOS Mini –RU for further information on how configuration could be made. For spare parts delivery and suitable accessories please refer to tables below.

Controller

These units are intended as spare parts. Controller for a new system shall be ordered together with the system. Please revert to product selection information above.

Description	Part no.	Fits in
ESC MS-48.60	94M126-*	EPOS Mini 48/60-300.4 and .8
ESC MA-48.60	94M261-*	EPOS Mini 48/60-300.4 and .8

Accessories

Accessories may be added to the controller / system after installation.

Description	Part no.	Fits in
Battery block volt meas. set; 4 blocks, 5m	77CBS00340-*	EPOS Mini 48/60-300.4 and .8
Temperature probe kit , 5 m	94M268-*	EPOS Mini 48/60-300.4 and .8 w/ optional Relay extension module

Options

Options need to be ordered together with the system for installation into the system at the factory, before delivery to the customer.

Description	Part no.	Fits in
Relay extension option with temp probe i/f	94M129-*	EPOS Mini 48/60-300.4 and .8
Battery LVD	94M130-*	EPOS Mini 48/60-300.4 and .8
Load LVD ("PLD")	94M130-*	EPOS Mini 48/60-300.8 only.

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