CHARGING SOLUTIONS

ELECTROMOBILITY OFFER

TECHNICAL CATALOG

POCLAIN Hydraulics

e+h

CHARGING SOLUTIONS

The Poclain Hydraulics charging solutions are specifically designed for charge of Li-ion battery implemented in Poclain Hydraulics Electrohydraulic system.Charging Solutions integrates CAN communication with battery management system and Poclain Hydraulics controllers in order to ensure optimal battery charge and full monitoring.

Input voltage	Output voltage	Power	Communication	IP rating
230 - 400V AC	48V DC	3 - 5 kW	CAN	IP20 - 55

CONTENT






SAFETY INSTRUCTIONS

Display of safety instructions

Standardized safety instructions, symbols, terms and abbreviations are used so that you can use this documentation to work quickly and safely with your product. To give you a better understanding they are explained in the sections below.

⚠ SIGNAL WORD	Type and source of the hazard!
Consequences of not avoiding the hazard. ■ Indication of how to avoid the hazard.	

- **Safety sign:** Draws attention to the hazard.
- **Signal word:** Identifies the degree of the hazard.
- **Type and source of hazard:** Identifies the type and source of the hazard.
- **Precautions:** States how to avoid the hazard.

Danger classes in accordance with ANSI Z535.6

Safety sign, Signal word	Meaning
⚠ DANGER	**Identifies a dangerous situation that will result in death or serious injury if not avoided.**
⚠ WARNING	**Identifies a dangerous situation that may result in death or serious injury if not avoided.**
⚠ CAUTION	**Identifies a dangerous situation that will result in moderate or minor injuries if not avoided.**
NOTICE	**Damage to equipment: the product or the environment risks damage.**

Symbols

The following symbols mark notes that are not relevant to personal safety, but are intended to make this documentation easier to understand.

Symbol	Meaning
	**Poclain Hydraulics disclaims any liability for damage of any kind if use of the product is not compliant with a recommendation identified with this symbol.**
	**General information regarding the product or the repair procedure.**
	**Information on the model number.**
	**Weight of component without oil.**
	**Indication of necessary volume of oil.**
	**Units.**
	**Indication of necessary tightening torque.**
	**Screws.**
	**Information intended for Poclain-Hydraulics personnel.**

AND METHODOLOGY

The views in this document are created using metric standards.
The dimensional data is given in mm and in inches (inches are between brackets and italic)

General safety instruction

⚠ WARNING **Risk of electrical shocks!**

Modification of the charger can cause severe injuries to operator or damage to the machine due to electric shocks.

- Installation must be done done according to the state of the art with proper connectors.
- Do not use for any different purposes.
- Do not remove cover of the charger.
- Do not make any modification to the product.
- Refer servicing to qualified service personnel.
- Disconnect the main supply before connecting or disconnecting the links to the battery.
- Replace charger in case of any damage.

⚠ CAUTION **Risk of damage to the battery and machine.**

Improper selection of charge characteristics can cause damage to the battery and machine because of inappropriate current.

- Verify that the charge characteristics is adapted to your battery and CAN communication with battery management system is operating properly.
- Refer to battery user manual for appropriate communication.

Intended use

The Poclain Hydraulics chargers are specifically designed for charge of Li-ion battery implemented in Poclain Hydraulics Electrohydraulic system.
Poclain Hydraulics chargers integrates CAN communication with battery management system and Poclain Hydraulics controllers in order to ensure optimal battery charge and full monitoring.
Refer to Poclain Electromobility system technical catalog B79372X for more details about intended use.

Any use other than that described as Intended use is considered improped and is therefore impermissible. Poclain Hydraulics accepts no liability whatsoever for damage resulting from improper use. The user bears all risks arising from improper use.

ON-BOARD CHARGER

- **Sealed and robust**
- **Compact design**
- **Energy efficient**

General characteristics

Commercial name	OBC-220-48-3-CAN-1	OBC-220-48-3-CAN-3
Part number	B69097E	B83624U
Supply connection	Standard grid	Type 2 charging station CEI 62196
Features	-	Charge port lock and LED management

Description	Symbol	Test condition	Value and / or range	Unit
Operating range of temperature	Δ T	-	From -20 to +50	°C
Maximum relative humidity	RH	-	90%	-
Efficiency	η	At each operation condition	≤ 90%	-
Maximum size	a x b x c	Without connecting cable	316 x 220 x 94,2	mm
Weight	-	With connecting cable	8	kg
Enclosure class	-	-	IP55	-
AUX1 and AUX2 contact ratings	-	-	4	A

Mains side

Description	Symbol	Test condition	Value and / or range	Unit
Supply voltage	Vin	-	110 - 230 ± 10%	Veff
Frequency	f	-	50 ÷ 60	Hz
Absorbed maximum current per phase *	If_{max}	$P = P_{max}$	15	Aeff
Inrush current	-	Vin = 230Veff	< 3	A
Power factor	cos φ	$P = P_{max}$	0,98	-
Absorbed minimum power	Pin_{max}	End of charge - Standby	< 5	W
Absorbed maximum power	Pin_{max}	$P = P_{max}$	3,3	kW

* Maximum value per model. For the effective current absorption please refer to the On-Board Charger´s identification label.

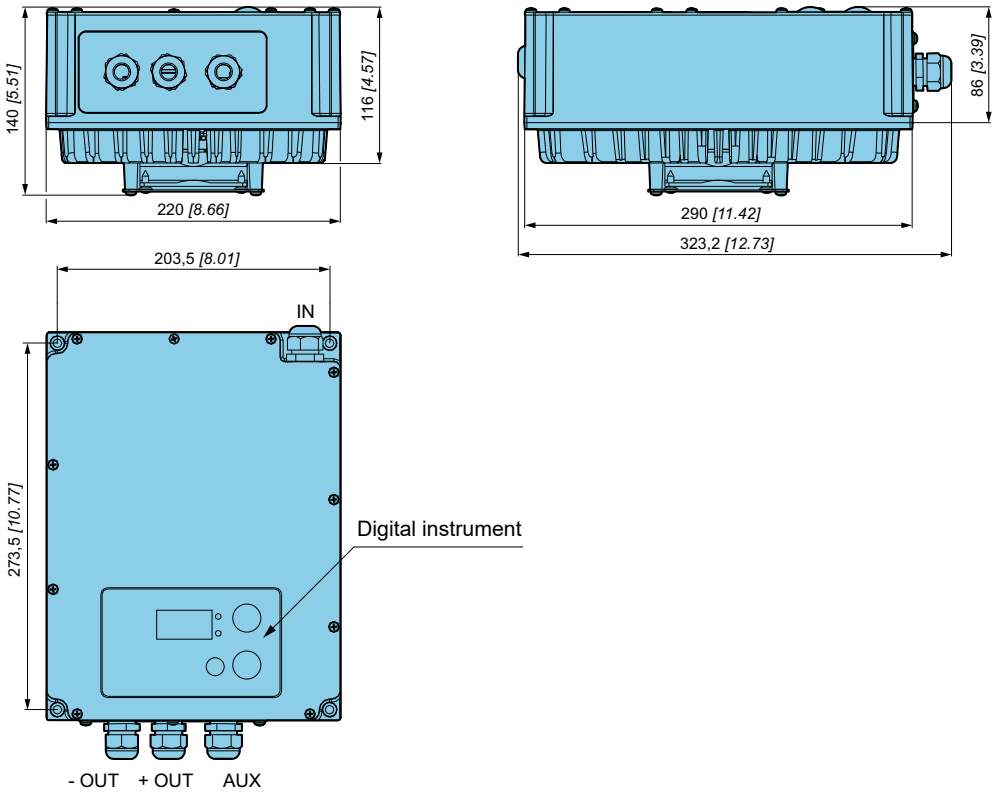
Battery side

Description	Symbol	Test condition	Value and / or range	Unit
Maximum output current	I1	Phase 1	60	A
Output current ripple	-	I = I1	< 5%	-
Absorbed current	I_a	Equipment turned off	< 0,5	mA
Output voltage ripple	-	U = U1		-
Maximum power supplied	P_{max}	U = U1, I = I1	3 000	W
Output capacity	C	-	1 410	mF

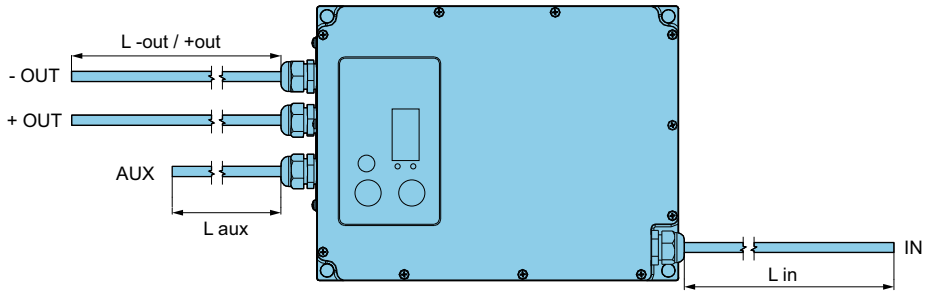
Protection and safety

Description	Symbol	Test condition	Value and / or range	Unit
Insulation	-	Mains to battery side Mains to ground Battery side to ground	1 250	V_{AC}
Leakage current (EMC filter)	I_L	Supplied equipment	< 7	mA
Input fuses	F1	Inside the equipment	20	A
Output fuses	F5	Inside the equipment	About 1,5 x I_1	A
Minimum output voltage of operation (Battery detector)	-	Equipment turn on	Curve according to battery specification. Contact your Poclain Hydraulics application engineer and battery supplier.	V / cell
Maximum output voltage	U_m	Phase 3 (IUIa - IUIU$_o$)	57,12	V
Reverse output polarity	-	At the connection to the battery	Protection provided by the output fuse	-
Thermal protection of semicoductors (Temperature of thermal alarm)	-	-	100	°C
Safety requirements (rules)	-	EN-60335-1, EN-60335-2-29, EN-60950-1		
EMC requirements (rules)	-	EN-61000-3-2, EN-61000-3-3, EN-61000-6-4, EN-61000-6-2		

Overall dimensions of the On-Board Charger



On-Board Charger connections



CAN1 version (P/N B69097E) connections

Power connections

Name	Description	Cable	Cable length
IN	Input cable	3x2,5 mm^2 section	L in = 3 000 mm ± 50 mm
+ OUT	Positive output	H70V2 cable, 1x10 mm^2 section, red color	L -out/+out = 3 000 mm ± 50 mm
- OUT	Negative output	H70V2 cable, 1x10 mm^2 section, black color	

Auxilliary connections

Name	Description	Cable	Connector
AUX	Auxiliary output cable	16x0,5 mm^2 section, grey color, Cable length L aux = 150 mm ± 20 mm	MX150, 16-way

CAN3 version (P/N B83624U) connections

Power connections

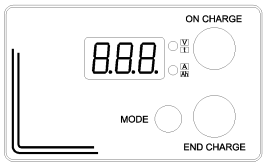
Name	Description	Cable	Cable length
IN	Input cable	3x2,5 mm^2 section	L in = 3 000 mm ± 100 mm
+ OUT	Positive output	H70V2 cable, 1x10 mm^2 section, red color	L -out/+out = 3 000 mm ± 100 mm
- OUT	Negative output	H70V2 cable, 1x10 mm^2 section, black color	

Auxilliary connections

Name	Description	Cable	Connectors
AUX	Auxiliary output cable	12x0,34 mm^2 section, grey color, Cable length L aux = 100 mm ± 20 mm	Deutsch, DTM04-12PA (grey color) Deutsch, DTM04-12PB (black color)

Visualisation

From the start the digital instrument will display the string of the following parameters:



BATTERY VOLTAGE (two-tone red upper LED)

CURRENT provided by the On-Board Charger (two-tone red lower LED)

TIME in hours remaining to the end of the charge (two-tone green upper LED)

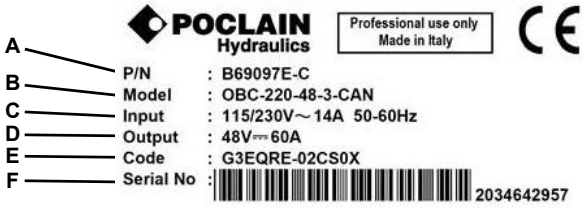
Ah supplied (two-tone green lower LED)

<MODE> button is inactive

LED Indicators

Color	Description
Red	Constant or max. current phase (IUIa)
Blinking red (4s ON - 1s OFF)	Voltage control phase (IUIa)
Red and blinking green (4s ON - 1s OFF)	Overcharging phase (IUIa)
Green	Wait phase (for equalization) (IUIa)
Blinking green (4s ON - 1s OFF)	End charge (only for CU1 BA2)
Green and red blinking together	Connection with CanConsolle or S/S HW - SW

Identification of the component



A : Part number and update:
B : Commercial name
C: Input voltage
D: Output voltage
E: Code
F: Serial number

Auxiliary output cable

CAN-1 version only (P/N B69097E)	
MX150, 16-way connector	
PIN	**Description**
1	CAN-H
2	CAN-L
3	CAN-ENG
4	CP signal
5	PP signal
6	Digital INPUT #1
7	J GND
8	Digital INPUT #2
9	AUX2 COM
10	+J 12
11	AUX NO
12	AUX2 NC
13	AUX1 COM
14	AUX1 NO
15	AUX1 NC
16	GND

CAN-3 version only (P/N B83624U)			
Deutsch DTM04-12PA connector		Deutsch DTM04-12PB connector	
PIN	**Description**	**PIN**	**Description**
1	-12V (Power supply)	1	PP signal
2	GND (Power supply)	2	CP signal
3	KSI input	3	LED1 (Red right)
4	GPI_1 input	4	LED2 (Green right)
5	GPI_2 input	5	LED3 (Blue right)
6	GPI GND	6	LED4 (Red left)
7	CAN-H	7	LED5 (Blue left)
8	CAN-L	8	LED6 (Blue left)
9	-	9	GND
10	AUX1-COM	10	ACTFW (actuator locking)
11	AUX1-N0	11	ACTRV (actuator unlocking)
12	AUX1-NC	12	ACTFB (actuator feedback)

Alarms and errors

When alarm situation stopping the charge occurs, the display shows one of the information below according failure detected:

<A> <alarm code identified with a 2 digits code>

Code	Alarm type	Description	Stop
A01	LOGIC FAILURE #1	Trouble on current detection	Yes
A02	CAN BUS KO	Trouble on CAN communication	No
A03	WATCHDOG	Logic board mis-working	Yes
A05	HIGH BATTERY TEMPERATURE	Battery temperature higher than 55°C	Temporary
A07	OVERCURRENT	Over current	Temporary
A08	HIGH TEMPERATURE	On-Board Charger high temperature	Temporary
A09	MISMATCH VOLTAGE	Battery voltage sensing error	Temporary
A10	TIMEOUT	Phase 1 finished for timeout	Yes
A13	BATTERY DISCONNECTED	Battery disconnected	Temporary
A14	PUMP PRESSURE ERROR	Wrong pump pressure. Air pump not working properly	No
A15	THERMAL SENSOR FAILURE	Thermal sensor not connected or failed	No
A16	LOGIC FAILURE #2	Logic supply failure	Temporary
A17	FLASH CHECKSUM	Microcontroller flash memory corrupted	Yes
A18	EEPROM CHECKSUM	EEPROM / Flash memory corrupted	Yes
A23	POWER FAILURE #1	Output current sensing circuit damaged	Yes
A24	WRONG INPUT MAINS	Input mains level out of the operating range	Yes
A25	SHORT OUTPUT	Short circuit at the output stage	Yes
A26	WRONG MARKER EEP	EEPROM / Flash memory corrupted	Yes
A27	NO MAINS	Input grid failure	Temporary
A28	LOW TEMPERATURE	On-Board Charger internal temperature below -30°C	Temporary
A29	CLOCK BATTERY OFF	Clock calendar battery discharged or not connected	No

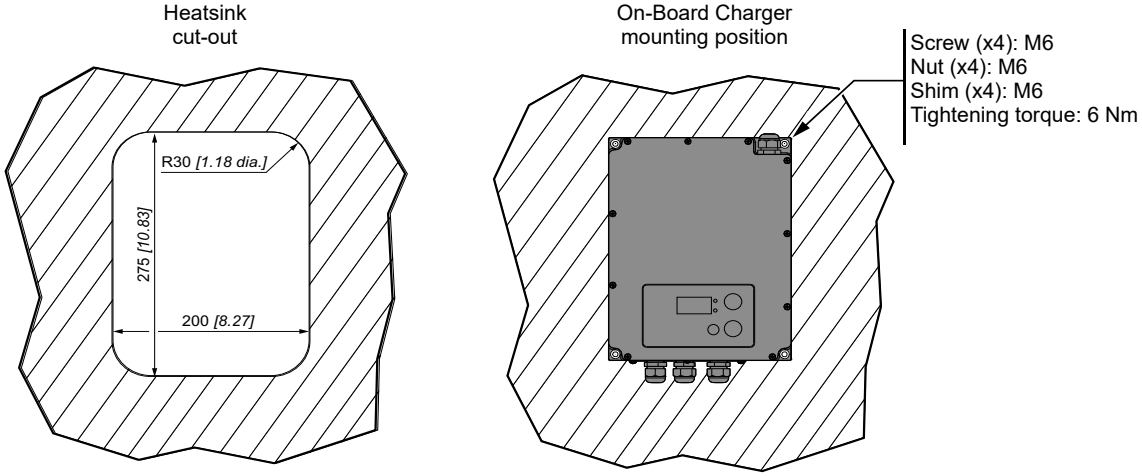
ON-BOARD CHARGER INSTALLATION

Fitting the On-Board Charger

The outline and mounting hole dimensions are shown below.

Mount the On-Board Charger on mounting surface with heatsink and its fan cut-out. Dimensions of cut-out 210x275mm *[8.27x10.83 in]*, with 30mm *[1.18 in]* radius at corners.
Secure the On-Board Charger using 4x M6 screws evenly torqued to the vehicle's mounting surface. Poclain Hydraulics On-Board Charger meets the IP55 requirements for environmental protection against dust and water.
The On-Board Charger can be installed in any direction. To ensure full power working install the On-Board Charger in adequately ventilated area and leave 50mm space between On-Board Charger fan and heat sink form other parts or walls is sufficient to keep the On-Board Charger cooled.

Nevertheless, in order to prevent external corrosion and leakage paths from developing, the mounting location should be carefully chosen to keep the On-Board Charger as clean and dry as possible.



Recommendations for use

Machine wiring recommendations

WARNING **Risk of electrical shocks!**

Modification of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- All the cables must be encased in flexible metal or plastic sleevings.
- All the cables or sleevings must be held well in place and locked in to prevent pull-out.
- Bring the sleeving supports close together.
- The sleevings must be able to slide into the anchoring.
- Separate power cables from control cables.

WARNING **Risk of electrical shocks!**

Mechanical damage of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- Avoid mechanical stresses in the cables.
- Do not place the cables or sleevings close to moving or vibrating parts.
- Do not lay the sleevings along sharp angles and protect them at each bend.
- Avoid laying the sleevings too close to high heat sources.
- Use wires with abrasion resistant sleevings.
- Avoid laying the sleevings too close to high heat sources.

⚠ WARNING **Risk of electrical shocks!**

Thermal damage of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- Use cables that resist temperatures between +85°C *[+185°F]* and +105°C *[+221°F]* close to heat sources.
- Use cables that resist temperature of -40°C *[-40°F]*.

⚠ CAUTION **Risk of damage to the wiring and machine.**

Electromagnetic radiation can cause damage to the wiring and machine.

- Pass the cables inside the machine, ensuring as much contact as possible with metal surfaces (steel).

NOTICE **Risk of damage to the product or environment.**

Extreme temperatures can damage the component or machine wiring.

- Do not put the converter in a storage environment below -40°C *[-40 °F]* and above +90°C *[+194 °F]*.
- Do not place the converter operating in an environment below -40°C *[-40 °F]* and above +90°C *[+194 °F]*.

NOTICE **Risk of damage to the product or environment.**

Mechanical damage can cause product malfunction.

- Avoid any mechanical shock.

Installation and safety instructions

Poclain Hydraulics On-Board Charger has been designed to provide safety and reliability.

It is necessary to observe the following precautions in order to avoid damage to persons and to the On-Board Charger.

- Read the installation instructions contained in this Manual carefully. For further information put the manual in a proper place.
- The appliance is not to be used by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.
- The appliance is not to be used by children.
- Do not put the battery On-Board Charger near heat sources.
- The On-Board Charger can be installed in any direction. To ensure full power working install the On-Board Charger in adequately ventilated area. 50mm space between On-Board Charger fan and heat sink form other parts or walls is sufficient to keep the On-Board Charger cooled.
- Verify that the available supply voltage corresponds to the voltage that is stated on the battery On-Board Charger name plate. In case of doubt, consult a retailer or local Electric Supply Authority.
- In order to protect against electric shock, please observe the in force local regulations. If an Residual Current Device (RCD) is used, it is warmly recommended the use of a class A, or better a class B switch.
- In case of permanently connected equipment a readily accessible disconnect device shall be incorporated external to the equipment
- For pluggable equipment the socket-outlet shall be installed near the equipment and shall be easily accessible.

- For safety and electromagnetic compatibility, the battery On-Board Charger has a 3-prong plug as a safety feature, and it will only fit into an earthed outlet. If you can not plug it in, chances are you have an older, non-earthed outlet; contact an electrician to have the outlet replaced. Do not use an adapter to defeat the grounding.
- To avoid damaging the power cord, do not put anything on it or place it where it will be walked on. If the cord becomes damaged or frayed, have it immediately replaced.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- If you are using an extension cord or power strip, make sure that the total of the amperes required by all the equipment on the extension is less than the extension's rating.
- Disconnect the mains supply before connecting or disconnecting the links to the battery.
- Do not use to charge starting batteries put on board of thermal engine cars.
- Avoid recharging of non-rechargeable batteries.
- Verify that the nominal voltage of the battery to be re-charged corresponds to the voltage stated on the battery On-Board Charger name plate.
- Verify that the selected charging curve is suitable for the type of battery to be re-charged. In case of doubt, consult your retailer. Poclain Hydraulics will not accept any responsibility in case of mistaken choice of the charging curve that may cause irreversible damage to the battery.
- In order to avoid voltage drop, thereby assuring 100% charge at the battery, the output cables must be as short as possible, and the diameter must be adequate for the output current.
- In case of thermal compensation of the battery voltage, put the thermal sensor in the warmest point inside the battery compartment.
- Do not try to service the battery On-Board Charger yourself. Opening the cover may expose you to shocks or other hazards.
- Do not open the On-Board Charger. Opening it may bring to a loss in the protection grade (IP), that may persist also after having restored the sealing.
- If the On-Board Charger does not work properly or if it has been damaged, unplug it immediately from the supply socket and from the battery socket and contact technical support.

This user manual informations must be communicated to any end user.

EXTERNAL CHARGER

- **Robust and Powerful**
- **Multivoltage capacity**
- **Intuitive, user friendly**

General characteristics

Commercial name	**EXC-380-48-5-CAN-1**
Part number	B83727G
Supply connection	Three phase grid connection

Description	Symbol	Test condition	Value and / or range	Unit
Operating range of temperature	Δ T	-	From -20 to +50	°C
Maximum relative humidity	RH	-	90%	-
Switching frequency	f_c	-	20 ± 5%	kHz
Efficiency	η	-	≤ 90%	-
Maximum size	a x b x c	Without connecting cable	550 x 270 x 120	mm
Weight	-	With connecting cable	9	kg
Enclosure class	-	-	IP20	-

Mains side

Description	Symbol	Test condition	Value and / or range	Unit
Supply voltage	Vin	-	400 ± 15%	Veff
Frequency	f	-	50 ÷ 60	Hz
Absorbed maximum current per phase *	If_{max}	P = P_{max}	See identification label	Aeff
Inrush current	-	Vin = 400Veff	< 2,5	A
Displacement power factor	DPF/cos φ	P = P_{max}	1	-
Power factor	PF	P = P_{max}	0,95	-
Absorbed minimum power	Pin_{max}	End of charge - Standby	< 10	W
Absorbed maximum power	Pin_{max}	P = P_{max}	5	kW

* Maximum value per model. For the effective current absorption please refer to the External Charger identification label.

Battery side

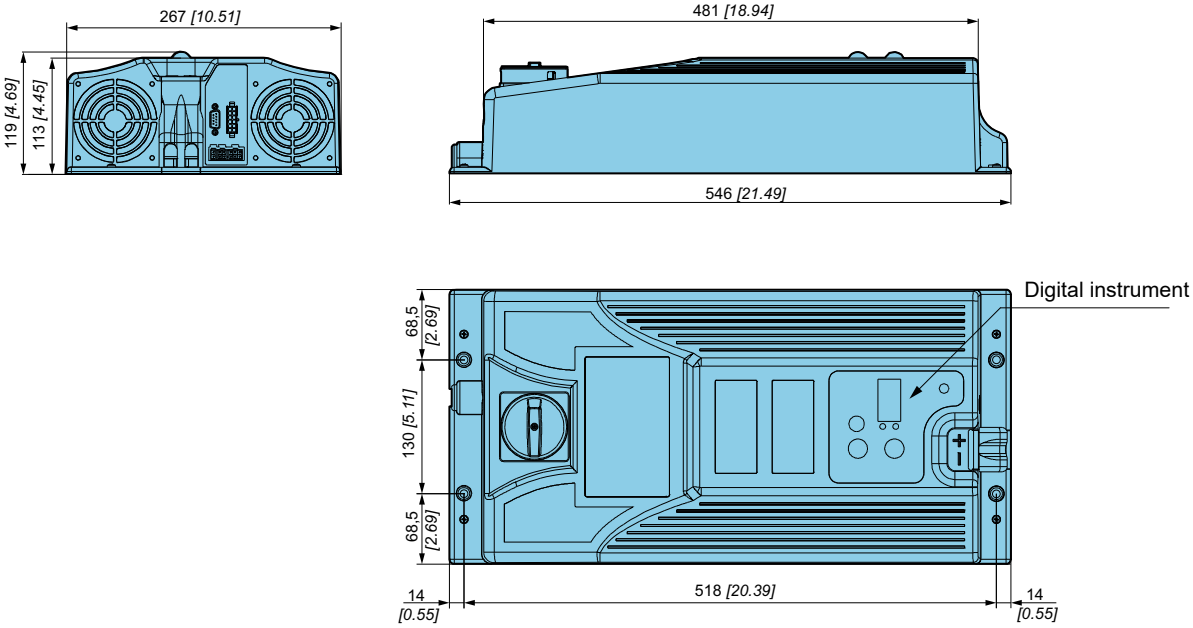
Description	Symbol	Test condition	Value and / or range	Unit
Maximum output current	I1	Phase 1	95	A
Output current ripple	-	I = I1	< 5%	-
Absorbed current	I_a	Equipment turned off	< 0,5	mA
Thermal compensation of output voltage	dU1 / dT	Phase 2	-5	mV / (°C x cell)
Operating range of temperature sensor	Δ T	-	From -20 to +50	°C
Output voltage ripple	-	U = U1	< 1%	-
Maximum power supplied	P_{max}	U = U1, I = I1	4 800	W
Output capacity	C	-	1 410	mF

Protection and safety

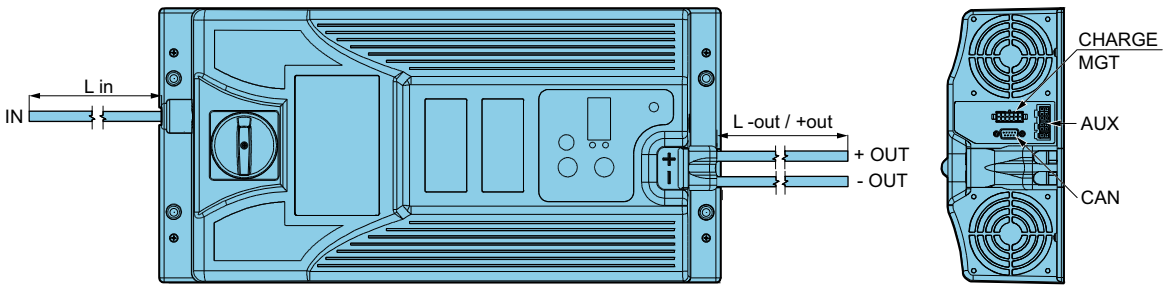
Description	Symbol	Test condition	Value and / or range	Unit
Insulation	-	Mains to battery side Mains to ground Battery side to ground	1 250	V_{AC}
Leakage current (EMC filter)	I_L	Supplied equipment	< 7	mA
Input fuses	F1-F2-F3	Inside the equipment	15	A
Output fuses	F5	Inside the equipment	About 1,2 x I_1	A
Minimum output voltage of operation (Battery detector)	-	Equipment turn on	1,5	V / cell
Maximum output voltage	U_m	Phase 3 (IUIa - IUIU$_o$)	57,6	V
Reverse output polarity	-	At the connection to the battery	Protection provided by the fuse F5	-
Thermal protection of semiconductors (Temperature of thermal alarm)	-	T_a= 55°C	100	°C
Safety requirements (rules)	-	EN-60335-1, EN-60335-2-29		
EMC requirements (rules)	-	EN-55011, EN-61000-4-2, EN-61000-4-4		

For different external charging power, please contact your Poclain Hydraulics application engineer.

Overall dimensions of the External Charger



External Charger connections



Power connections

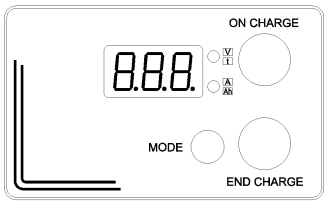
Name	Description	Cable	Cable length
IN	Input cable	3x2,5mm^2 section	2 000 mm
+ OUT	Positive output cable	1x25mm^2 section	4 000 mm
- OUT	Negative output cable	1x25mm^2 section	4 000 mm

Communication connections

Name	Description	Mating reference
CAN	SubD9 connector	mating type female
AUX	Molex Mini-fit connector	mating ref. 39-01-2060
CHARGE MGT	Molex Micro-fit connector	mating ref. 43025-1200

Visualisation

From the start the digital instrument will display the string of the following parameters:



BATTERY VOLTAGE (two-tone red upper LED)

CURRENT provided by the External Charger (two-tone red lower LED)

TIME in hours remaining to the end of the charge (two-tone green upper LED)

Ah supplied (two-tone green lower LED)

<MODE> button:
By pressing once, the parameters ' sequence is blocked and it will be kept the last value displayed. By pressing again on the MODE button the sequence of parameters restarts.

LED Indicators

Phase	Red light	Green light
Phase 1	On	Off
Phase 2	On with short flashing	Off
Phase 3	On (firmware CB: off)	On with short flashing
Phase 4	On with short flashing (firmware CB:off)	On with short flashing (firmware CB:on)
Phase 5 - Phase 6	Off	On with short flashing (firmware CB:on)
End of charge	Off	On

Communication connectors pin-out

Molex Micro-fit connector (mating ref. 43025-1200)

PIN	Description
1	Reserved
2	Pump pressure sensor
3	Reserved
4	Hardware S/S
5	GND
6	Not used
7	PPT100
8	NPT100
9	Green LED
10	GND
11	Red LED
12	Not used

Molex Mini-fit connector (mating ref. 39-01-2060)

PIN	Description
1	AUX2-NC
2	AUX2-COM
3	AUX2-NO
4	AUX1-NC
5	AUX1-COM
6	AUX1-NO

SubD9 connector (mating type: female)

PIN	Description
1	CAN low
2	CAN low
3	CAN negative
4	-12V (internal)
5	CAN high with termination (120 Ω)
6	GND (internal)
7	CAN high
8	CAN high
9	CAN positive

Alarms and errors

When alarm situation stopping the charge occurs, the display shows one of the information below according failure detected:

<A> <alarm code identified with a 2 digits code>

Display code	Alarm type	Description	Charge stop
A01	LOGIC FAILURE #1	Trouble on current circuit (turn off/on the External Charger. If the problem persists please contact customer service.	Yes
A02	CAN BUS KO	Trouble on CAN communication (verify CANBUS communication).	No
A03	WATCHDOG	Logic board trouble (turn off/on the External Charger. If the problem persists please contact customer service).	Yes
A05	HIGH BATTERY TEMPERATURE	Battery temperature higher than 55°C (the External Charger restarts when battery temperature goes under 50°C).	Temporary
A06	MISSING PHASE	One of the three input phase cannot be detected by the External Charger (check for all three phases to be connected to the External Charger, or contact customer service) .	Temporary
A07	OVERCURRENT	Anomalous input current absorption (External Charger restarts after 3 seconds. If the problem persists please contact customer service).	Temporary
A08	HIGH TEMPERATURE	Internal high temperature (turn off/on the External Charger. If the problem persists please contact customer service).	Yes
A09	MISMATCH VOLTAGE	Trouble on voltage circuit (turn off/on the External Charger. If the problem persists please contact customer service).	Yes
A10	TIMEOUT	End of Phase 1 due to timeout (check if External Charger is suitable for the specified battery type – disconnect the battery).	Temporary
A11	OVER DISCHARGE	Over discharged battery	No
A12	DEEP DISCHARGE	Deeply discharged battery	No
A13	CONNECTION FAULT	Connection fault in the output cables. Disconnect the battery and wait for the display to show three dots before connecting a new battery.	Temporary
A15	TH. SENSOR KO	Thermal sensor failure.	No
A16	LOGIC FAILURE #2	Voltage sag (External Charger restarts after 3 seconds. If the problem persists please contact customer service).	Temporary
A17	FLASH CHECKSUM	Error in flash memory (turn off/on the External Charger. If the problem persists please contact customer service)	Yes
A18	EEPROM KO	Problem in EEPROM communication (turn off/on the External Charger. If the problem persists please contact customer service).	Yes
A21	LOGIC FAILURE #3	The output voltage has exceed a safety threshold (turn off/on the External Charger. If the problem persists please contact customer service).	Yes
A29	CLOCK BATTERY OFF	The Clock battery is discharged or removed (if the battery needs to be replaced contact customer service)	No
A30	NODE RESET	The CAN Node has been set to 126, which is a forbidden value (the External Charger forces you to enter the “Changing curve selection” described in the previous page)	Yes

EXTERNAL CHARGER INSTALLATION

Recommendations for use

External Charger is an electronic appliance, only for professional use, developed to recharge different battery types depending on the firmware installed. According to the application and the software programmed it is also allowed as power supply use.

Machine wiring recommendations

⚠WARNING **Risk of electrical shocks!**

Modification of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- All the cables must be encased in flexible metal or plastic sleevings.
- All the cables or sleevings must be held well in place and locked in to prevent pull-out.
- Bring the sleeving supports close together.
- The sleevings must be able to slide into the anchoring.
- Separate power cables from control cables.

⚠WARNING **Risk of electrical shocks!**

Mechanical damage of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- Avoid mechanical stresses in the cables.
- Do not place the cables or sleevings close to moving or vibrating parts.
- Do not lay the sleevings along sharp angles and protect them at each bend.
- Avoid laying the sleevings too close to high heat sources.
- Use wires with abrasion resistant sleevings.
- Avoid laying the sleevings too close to high heat sources.

⚠WARNING **Risk of electrical shocks!**

Thermal damage of the cables can cause severe injuries to operator or damage to the machine due to electric shocks.

- Use cables that resist temperatures between +85°C *[+185°F]* and +105°C *[+221°F]* close to heat sources.
- Use cables that resist temperature of -40°C *[-40°F]*.

⚠CAUTION **Risk of damage to the wiring and machine.**

Electromagnetic radiation can cause damage to the wiring and machine.

- Pass the cables inside the machine, ensuring as much contact as possible with metal surfaces (steel).

NOTICE **Risk of damage to the product or environment.**

Extreme temperatures can damage the component or machine wiring.

- Do not put the converter in a storage environment below -40°C *[-40 °F]* and above +90°C *[+194 °F]*.
- Do not place the converter operating in an environment below -40°C *[-40 °F]* and above +90°C *[+194 °F]*.

NOTICE **Risk of damage to the product or environment.**

Mechanical damage can cause product malfunction.

■ Avoid any mechanical shock.

NOTICE **Risk of damage to the product or environment.**

Humidity exposure can cause product damage.

■ Avoid any risk of humidity exposure.

Installation and safety instructions

Poclain Hydraulics External Charger has been designed to provide safety and reliability.

It is necessary to observe the following precautions in order to avoid damage to persons and to the External Charger.

Installation instructions

- Do not operate on the External Charger while it is connected to the grid. Always disconnect it before.
- Do not modify or repair the External Charger. Only authorized personnel could do it.
- Only installation instruction listed in this manual could be done by qualified personnel. Further action are avoided.
- Fix the battery External Charger to a stable surface through the appropriate holes inserted on the fixing flanges. In case of installation on a vehicle it is advisable to use anti-vibration supports.
- Ensure that no flammable materials are stored in the area surrounding the External Charger.
- Ensure all ventilation ports are not obstructed, to avoid the overheating. Do not put the battery External Charger near heat sources. Make sure that free space around the battery External Charger is sufficient to provide adequate ventilation and an easy access to cables sockets.
- To recharge Lead Acid batteries: WARNING: Explosive Gas – Avoid flames and sparks. The battery must be positioned in a correctly cooled place.
- Verify that the available supply voltage corresponds to the voltage that is stated on the battery External Charger name plate. In case of doubt, consult a retailer or local Electric Supply Authority.
- In order to protect against electric shock, please observe the in force local regulations. If an RCD is used, it is warmly recommended the use of a class B switch. Warning: in case of damage, the External Charger may generate pulsating fault currents with DC components.
- For safety and electromagnetic compatibility, the battery External Charger has a 3-prong plug as a safety feature, and it will only fit into an earthed outlet. If you can not plug it in, chances are you have an older, non-earthed outlet; contact an electrician to have the outlet replaced. Do not use an adapter to defeat the grounding.
- In order to avoid voltage drop, thereby assuring 100% charge at the battery, the output cables must be as short as possible, and the diameter must be adequate for the output current.
- After the installation make sure that all opening and doors of the External Charger are closed and secured.

Safety instructions

- Read the installation instructions contained in this Manual carefully. For further information put the manual in a proper place.

- External Charger is not to be used by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.
- External Charger must be installed by qualified personnel.
- Risk of electric shock. If the External Charger is provided with a plug, connect it only to an outlet that has been properly installed and grounded in accordance with all local codes and ordinances.
- A grounded outlet is required to reduce risk of electric shock. Do not use ground adapters or modify plug.
- Do not touch uninsulated portion of output connector or uninsulated battery terminal.
- To avoid damaging the power cord, do not put anything on it or place it where it will be walked on. If the cord becomes damaged or frayed, refer to qualified personnel for replacing it immediately.
- Do not operate External Charger if the AC supply cord is damaged or if the External Charger has received a blow, been dropped, or otherwise damaged in any way. Refer all repair work to qualified personnel.
- For safety and electromagnetic compatibility, the battery External Charger has a 3-prong plug as a safety feature, and it will only fit into an earthed outlet. If you can not plug it in, chances are you have an older, non-earthed outlet; contact an electrician to have the outlet replaced. Do not use an adapter to defeat the grounding.
- If you are using an extension cord or power strip, make sure that the total of the amperes required by all the equipment on the extension is less than the extension's rating.
- Avoid recharging of non-rechargeable batteries.
- Do not use to charge batteries installed on board of thermal engine cars.
- Verify that the nominal voltage of the battery to be re-charged corresponds to the voltage stated on the battery External Charger name plate.
- Verify that the selected charging curve is suitable for the type of battery to be re-charged. In case of doubt, consult Your retailer. The producer will not accept any responsibility in case of mistaken choice of the charging curve that may cause irreversible damage to the battery.
- To recharge Lead Acid batteries: WARNING: Explosive Gas – Avoid flames and sparks. The battery must be positioned in a correctly cooled place.
- Ensure that no flammable materials are stored in the area surrounding the External Charger.
- If the battery External Charger does not work correctly or if it has been damaged, unplugged it immediately from the supply (turn off the switch) and from the battery socket and contact a retailer.
- Do not try to service the battery External Charger yourself. Opening the cover may expose you to shocks or other hazards.
- In order to avoid voltage drop, thereby assuring 100% charge at the battery, the output cables must be as short as possible, and the diameter must be adequate for the output current.
- In case of thermal compensation of the battery voltage, put the thermal sensor in the warmest point inside the battery compartment.
- Do not try to service the battery External Charger yourself. Opening the cover may expose you to shocks or other hazards.
- Disconnect the mains supply or turn the charge off (turn off the switch) before connecting or disconnecting the links to the battery.

This user manual informations must be communicated to any end user.

Maintenance instructions

- Make sure charge connections to battery terminals are tight and clean.

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