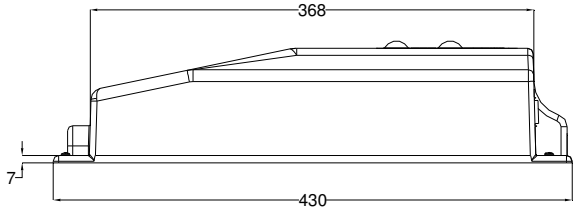
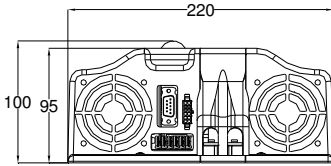


BATTERY CHARGER

NG3 CANBUS

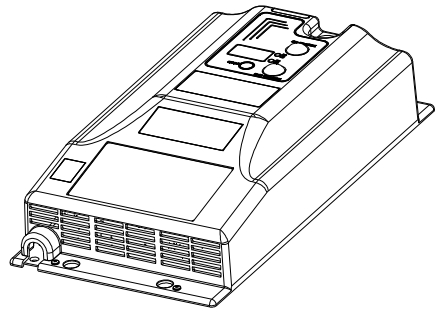
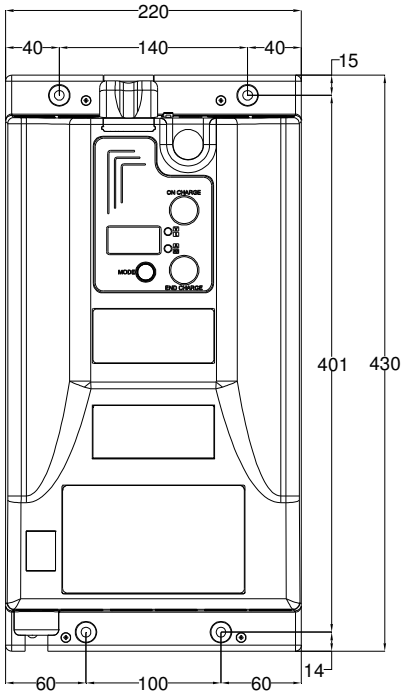


Mechanical dimension



N.B. All dimensions are expressed in mm.

Drilling details



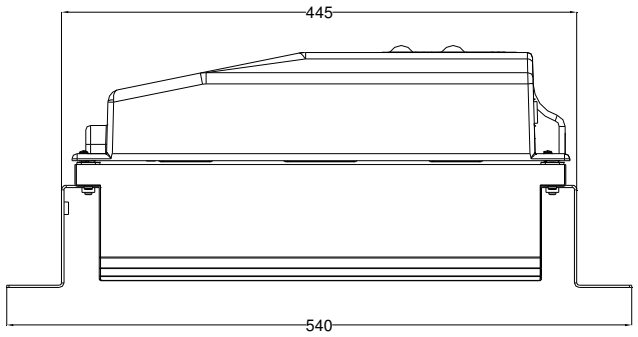
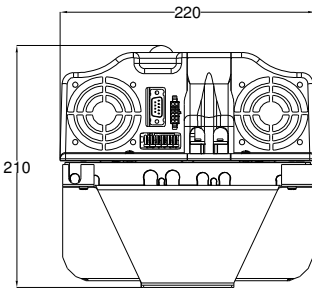
UP



Advised Installation

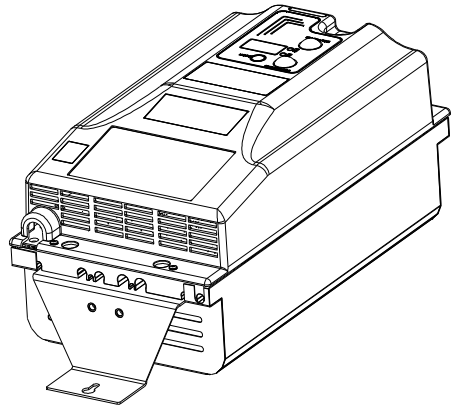
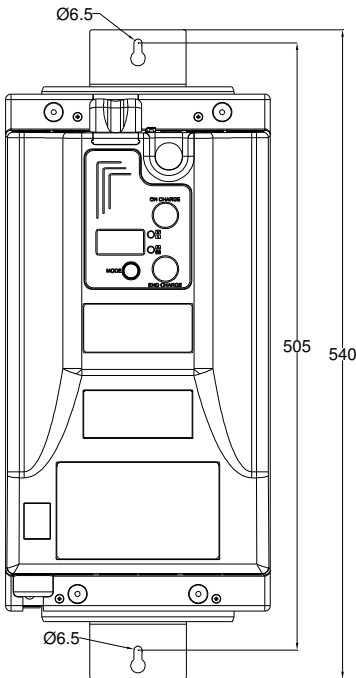
N.B. All dimensions are expressed in mm.

Mechanical dimension with Air Pump



N.B. All dimensions are expressed in mm.

Drilling details with Air Pump



UP



Advised Installation

N.B. All dimensions are expressed in mm.



ATTENTION: To reduce the risk of electric shock, do not remove cover. Refer servicing to qualified service personnel. Disconnect the mains supply before connecting or disconnecting the links to the battery.



Read the Instruction Manual carefully before use. Verify that the selected charge curve is suitable for the type of battery You have to re-charge.

Explanation of Graphical Symbols:



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the equipment's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.

This product is covered by warranty.

The relative warranty certificate is attached to the Instructions Manual.
If the Manual is not provided with this certificate, please ask your retailer for a copy.
For further references, please write the serial number in the proper space:

Serial No. _____

Information contained in this Manual relates to ZIVAN S.r.l. property which reserves the right to supply for the exclusive use of customers. No other use is allowed without a written authorization supplied by ZIVAN S.r.l.

ZIVAN S.r.l. will be not responsible for inaccuracies contained in this manual due to print or translation errors. ZIVAN S.r.l. has the right to make changes or improvements, also for the user interest, without prejudicing the essential characteristic of operation and safety.

Installation and safety instructions

Battery charger NG3 CANBUS has been designed to provide safety and reliable. It is necessary to observe the following precautions in order to avoid damage to persons and to the battery charger:

- Read the installation instructions contained in this Manual carefully. For further information put the Manual in a proper place.
- Fix the battery 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 antivibration supports.
- Preferably the charger should be installed in the vertical position with the fan facing up. The horizontal installation is allowed. Never install in the vertical position with the fan facing down.
- Ensure all ventilation ports are not obstructed, to avoid the overheating. Do not put the battery charger near heat sources. Make sure that free space around the battery charger is sufficient to provide adequate ventilation and an easy access to cables sockets.
- Protect the battery charger from ingress of water. Do not pour liquids and foreign objects inside the case.
- Verify that the available supply voltage corresponds to the voltage that is stated on the battery charger name plate.
- For safety and electromagnetic compatibility, the battery 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 earthing.
- 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, replace it immediately.
- 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.
- To recharge Lead Acid batteries: **WARNING: Explosive Gas – Avoid flames and sparks.** The battery must be positioned in a correctly cooled place.
- Do not use to charge batteries installed 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 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. ZIVAN S.r.l. 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.
- Do not try to service the battery charger yourself. Opening the cover may expose you to shocks or other hazards.
- If the battery charger does not work correctly or if it has been damaged, unplugged it immediately from the supply socket and from the battery socket and contact a retailer.

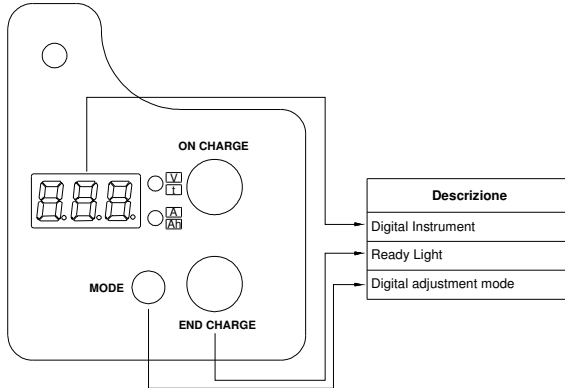
LED Indicator



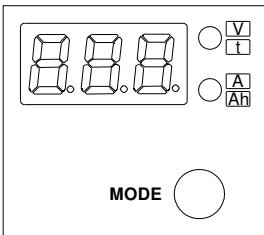
RED LED shows that battery is in the initial charging phase.
 YELLOW LED shows that battery charger has reached 80% of charge.
 GREEN LED shows that battery has reached 100% of charge.
 Further information can be found in the description of the Charging Curve.

Example: RED LED on with short flashing indicates a constant tension phase.

Display Indicator (if present)



To set the compensation value made by the charger in order to balance the voltage drop on the cables, please follow the procedure "Compensation setting of the voltage drop on output cables".



From the beginning the digital instrument shows the following sequence of parameters:

- **BATTERY VOLTAGE** (two-tone red upper led).
- **CURRENT** provided by the charger (two-tone red lower led).
- **TIME** in hours lacking to the end of charge (two-tone green upper led).
- **Ah** supplied (two-tone green lower led).
- **CONNECTED GADGETS** (no two-tone led on – only on a MASTER battery charge).

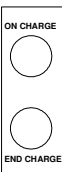
By pressing once the MODE button, the parameters' sequence stops: display keep on showing last visualization. By pressing again the MODE button, parameters' sequence restarts.

Compensation setting of the voltage drop on output cables.

While charging, with a long pressure of MODE Button, you can program voltage cables' drop. Please execute the following operations while charger is at maximum current.

1. Gauge the voltage drop at the ends of the output bars of the battery charger (close to the cover).
2. Gauge the voltage on the battery poles.
3. Make the difference between the two values to get the voltage drop compensation.
4. Press shortly the MODE button (ROLL) until reaching the voltage value closest to the required one: it is possible to ROLL parameters between 0,0V e 1,5V with steps of 0,1V.
5. Press long the MODE button (ENTER) to confirm.

Charging status and current phase of charge of the equipment are indicated through the light station:



PHASE	RED LED	GREEN LED
Phase 1	On	Off
Phase 2	On with short flashing	Off
Phase 3	On	On with short flashing
Phase 4	On with short flashing	On with short flashing
Phase5-Phase6	Off	On with short flashing
End of charge	Off	On

Charging curve selection (if display is present)

You can press the MODE button according to two modalities:

1. Long pressure (at least 1 second): during battery charger setting, it means ENTER
2. Short pressure (less than 1 second): during battery charger setting, it means ROLL.

Setting:

1. Turn on the equipment while pressing the MODE button.
2. **ROLL:** select the **branch** type:
 - 0 corresponds to a MASTER unit charger (connected with one or more SLAVES units).
 - from 1 to 8 it identifies the ID of the SLAVE (used together with a MASTER).
 - 9 identifies a STAND-ALONE charger (used as a single unit).
3. **ENTER: branch** type confirmation. Next selection includes **Battery type** choice (Lead acid type corresponds to BA1 otherwise Gel corresponds to BA2).
4. **ENTER: Battery type** confirmation: next level is Charging curve selection.
5. **ROLL:** select the desired **Charging curve**.
4 different charging curves are available:
 - a. CU1: IU1a curve plus equalization and maintenance;
 - b. CU2: IU1U2ob curve;
 - c. CU3: power supply;
 - d. CU4: programmable curve (ex. *Desulphation in standard version*).
6. **ENTER: Charging curve** confirmation: now select the **Capacity**.
7. **ROLL: Capacity** selection.
Starting point is a nominal value and by the ROLL you can select a value included between 50% and 140% of the nominal in steps of 10%. On the display it is shown the last capacity selected.
8. **ENTER: Capacity** confirmation: then you can select the **Recharging time** (in hours).
9. **ROLL: Recharging time** confirmed .
Starting from a suggested **Recharging time** (according to the capacity chosen at the previous step) this time can only be increased up to 20 hours max.
10. **ENTER: Recharging time** confirmation: battery charger goes into stand-by modality until output cables are connected to battery binding-clamps (if connections have already been done before starting the setting, once arrived at point 10, charger immediately starts).

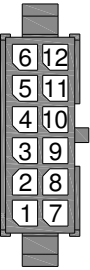
Warning: if some trouble or mistake occur during setting procedure, switch off the charger, then switch on again by keeping pressed the MODE button and restart setting operation from the beginning.

Alarms (Two-tone audible message)


A two-tone audible message and the YELLOW LED flashing show that an Alarm situation has occurred:

Display code (if display is present)	Alarm Type	Charge stop	Description (Action)
1	LOGIC FAILURE #1	Yes	Trouble on current circuit (turn off/on the charger. If the problem persists please contact customer service).
2	CAN BUS KO	No	Trouble on CAN communication (verify CANBUS communication).
3	WATCHDOG	Yes	Logic board trouble (turn off/on the charger. If the problem persists please contact customer service).
5	HIGH TEMPERATURE BATTERY	Temporary	Battery temperature over than 55 °C (the charger restarts when battery temperature goes under 50 °C).
7	OVERCURRENT	Temporary	Anomalous input current absorption (charger restarts after 3 seconds. If the problem persists please contact customer service).
8	HIGH TEMPERATURE	Yes	Internal high temperature (turn off/on the charger. If the problem persists please contact customer service).
9	MISMATCH VOLTAGE	Yes	Trouble on voltage circuit (turn off/on the charger. If the problem persists please contact customer service).
10	TIMEOUT	Yes	End of Phase 1 due to timeout (check if charger is suitable for the specified battery type).
11	OVER DISCHARGE	No	Over discharged battery
12	DEEP DISCHARGE	No	Deeply discharged battery.
13	BATTERY DISCONNECTED	Temporary	Battery disconnection while charging (charger restarts from init when a new battery is connected).
14	PUMP MISTAKE	No	Air pump mis-working
15	TH. SENSOR KO	No	Thermal sensor failure.
16	LOGIC FAILURE #2	Temporary	Voltage sag (charger restarts after 3 seconds. If the problem persists please contact customer service).
17	FLASH CHECKSUM	Yes	Error in flash memory (turn off/on the charger. If the problem persists please contact customer service)
18	EEPROM KO	Yes	Problem in EEPROM communication (turn off/on the charger. If the problem persists please contact customer service).

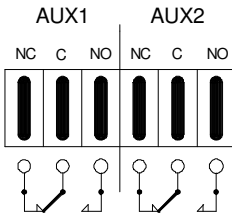
Micro-fit contacts	
Pin N°	Description
1	Pump pressure sensor
2	Generic digital input
3	GND
4	Hardware S/S
5	GND
6	Not used
7	PPT100
8	NPT100
9	Green LED
10	GND
11	Red LED
12	Not used



CANBUS connector pinout	
Pin N°	Description
1	CAN low
2	CAN low
3	CAN negative
4	+12V (internal)
5	CAN high with termination (120Ω)
6	GND (internal)
7	CAN high
8	CAN high
9	CAN positive



Auxiliary Contacts



Nominal current/Max instant current A	2/3
Nominal voltage/ Max voltage commutable Vac	125/250
Nominal load in AC1 VA	125
Nominal load in AC15 (230Vac) VA	25
Single phase engine capacity (230 Vac) Kw	-
Break power in DC1: 30/110/220 VA	2/0.3/-
Minimum mW commutable charge (V/mA)	10 (0.1/1)
Mechanical length AC/DC cycles	—/10×10 ⁶
Electrical duration with nominal charge in A1 cycles	100×10 ³
Isolation according EN 61810-1 2nd edition	1.2 kV/2
Isolation between coil and contacts (1.2/50 μs) kV	1.5
Dielectric rigidity between open contacts Vac	750

Unless otherwise stated, the auxiliary contacts provide the following functions:

Section	Function	Description
AUX1	Mains Presence	When the equipment is switched on, the contact Normally Open (NO) CLOSES and instead the contact Normally Closed (NC) OPENS.
AUX2	End of charge	When the Stop Phase is reached, the contact Normally Open (NO) CLOSES and instead the contact Normally Closed (NC) OPENS.

TECHNICAL FEATURES

Ta=25°C unless otherwise specified

Mains side

Description	Symbol	Test Condition	Value and/or Range	Unit
Supply Voltage	V _{in}	-	230 ± 10%	V _{eff}
Frequency	f	-	50 ± 60	Hz
Absorbed Maximum Current	I _{in,max}	P = P _{max}	22	A _{eff}
Inrush Current	-	V _{in} = 230V _{eff}	< 1,35	A
Power Factor	cosφ	P = P _{max}	0,68	-
Absorbed Minimum Power	P _{in,min}	End of charge	< 5	W
Absorbed Maximum Power	P _{in,max}	P = P _{max}	3	kW

Battery side

Description	Symbol	Test Condition	Value and/or Range	Unit
Output current	I	-	See curve	-
Maximum output current	I _I	Phase 1	See curve	A
Output current ripple	-	I = I _I	< 5%	-
Absorbed current	I _a	Equipment turned off	< 0,5	mA
Output voltage	U	-	See curve	-
Constant output voltage	U _I	Phase 2	See curve	V
Thermal compensation of output voltage	dU _I /dT	Phase 2	-5 (programmable)	mV / (°C _{cell})
Operating range of Temperature Sensor	ΔT	-	from -20 to +50	°C
Output voltage ripple	-	U = U _I	< 1%	-
Maximum power supplied	P _{max}	U = U _I , I = I _I	2880	W
Output capacity	C	-	Depend on the model (>0,2)	mF

General

Description	Symbol	Test Condition	Value and/or Range	Unit
Operating range of temperature	ΔT	-	from -20 to +50	°C
Maximum relative humidity	RH	-	90%	-
Switching frequency	f _c	-	30 ± 5%	kHz
Efficiency	η	At each operation condition	> 85%	-
Maximum size	a×b×c	Without connecting cable	430×220×100	mm
Weight	-	Without connecting cable	5,5	kg
Enclosure class	-	-	IP20	-

Protection and Safety

Description	Symbol	Test Condition	Value and/or Range	Unit
Insulation	-	Mains to Battery side	1250	V _{AC}
Insulation	-	Mains side to Earth	1250	V _{AC}
Insulation	-	Battery side to Earth	1250	V _{AC}
Leakage current	I _L	Supplied equipment	< 3	mA
Input fuse	F1	Inside the equipment	20/25/32	A
Output fuse	F2	Inside the equipment	about 1,2×I _I	A
Minimum output voltage of operation (Battery Detector)	-	Equipment turn on	1,5	V/cell
Maximum output voltage	U _m	Phase 3 (IU _{Ia} - IU _{IUo})	See curve	V
Reverse output polarity	-	At the connection to the Battery	Protection provided by fuse F2	-
Thermal protection of semiconductors (Temperature of Thermal Alarm)	-	Ta=55°C	100	°C
Safety Requirements (Rules)	-	EN60335-1, EN60335-2-29	-	-
EMC Requirements (Rules)	-	EN55014-1, EN61000-3-3 EN55014-2, EN61000-4-2 EN61000-4-4, EN61000-4-5 EN61000-4-6, EN61000-4-11	-	-

ADDITIONAL FEATURES WITH AIR PUMP**Standard Version**

The Air Pump technology generates a re-mix of the acid inside the battery by a delivery of air pumping.

The battery charger controls the air pump by an auxiliary contact (generally AUX1).

An air injection cycle along all the charging period is held as per requirements of the battery specifications.

Pressure sensor version

Further to the characteristics of the standard version it is also available an electronic circuit equipped with an air pressure sensor.

At the beginning of the charging process, the sensor verifies that the pressure in the circuit is included in a definite window between a minimum and a maximum value (look at the following table). When an anomaly occurs the battery charger will modify the charging factor by effecting a charge without detecting and controlling the Air Pump

Technical Features

Description	Symbol	Test Condition	Value and/or Range	Unit
Power absorbed by the Air Pump	P_{ap}	Air Pump controlled	90	W
Input fuse	-	Equipment interns	1,6	A
Maximal dimensions	$a \times b \times c$	Without connecting cables	540×220×210	mm
Weight	-	Without connecting cables	10,5	kg
Air Delivery*	Q	Air Pump controlled	4÷13	l/min
Available pressure range	Δp	Starting charging point	50÷250	mbar

* To know the effective air delivery please refer to the plate values.



This device is in conformity with the Low Voltage directive 2006/95/CE and EMC directive 2004/108/CE and their further modifications.

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