ALLtrac Plus

HIGH–FREQUENCY
BATTERY CHARGER

3842560958

Original user manual

11/2020 EN

Allgäu Batterie

ALLtrac Plus

Content

1 Introduction

READ CAREFULLY THIS USER MANUAL! KEEP THE USER MANUAL FOR THE FUTURE USE!

High frequency industrial battery chargers ALLtrac Plus produced by AXIMA company. It is determined for charging of tractions batteries. Voltage range of batteries is 12 – 110 V. Input current is according to type from 25 A. Mains voltage is 230 VAC or 3x400 VAC.

Chargers are modular and their base are power units managed by microchip control unit via CANBUS. Parallel connection allowed desired power. Control unit manages the charging process, state signalization on display and saves the data about charging to archive. Technical parameters are at the manufacturer label (serial label).

This user manual is intended for all types of ALLtrac plus chargers. Manufacturer label is on the left side of the charger.

Qualifician technician – the person who has the appropriate electrotechnical training and experience

Operator (end-user) – the person performing the connection and disconnection of the battery to or from the charger. Operator has to read this user-manual.

2 General information

Security notice

DANGER – high risk of critical injury or death

WARNING – potential risk of critical injury or death

CAUTION – potential risk of moderate injury or damage property

NOTICE – important information about possibility of damage of the device

3 Safety

The user manual has to be available near the charger. Pay attention to all security regulations, prevention of accidents and protection of the environment in each country where is charger used.

All notices about safety and danger on the charger have to be:
- well legible
- non-damaged
- uncovered

WARNING

- before the start, fix and repair all faults and barriers which threaten security
- charger modification is forbidden

3.1 Safety measures before start the operation

WARNING

- read carefully this user manual
- use charger only indoor
- connect the charger only to standard electricity supply

- use the charger only in well ventilated rooms
- do not manipulate with the charger during the operation
- only qualified technician can operate the charger
- charge only chargeble batteries
- do not touch the battery poles
- avoid sparking, smoking and manipulating with open fire near the battery, risk of explosion
- do not disconnect the battery from the charger during the charging
- push STOP button for end of charging and disconnect the battery
- avoid leaks of electrolyte
- ensure that the lithium battery charging is terminated when the maximum permissible voltage on each battery cell is reached, the maximum battery cell voltage is always specified by the battery manufacturer, it may cause an explosion or fire
- if charger does not work correctly, immediately inform your supplier and describe your problem
- never repair the charger, risk of electric shock
- Versuchen Sie niemals das Ladegerät selbst zu reparieren, es besteht die Gefahr eines Stromschlags

3.2 Safety measures during the operation

- do not use the charger in wet or moisture rooms
- use the charger only with in accordance with degree of protection on manufacturer label
- do not use the charger without cover, risk of electric shock
- never operate the charger if it is damaged
- make sure, qualified technician inspects the supply cable
- qualified technician has to repair all damaged safety devices before start the operation
- never deactivate safety devices

3.3 Danger gases and acids

- during the charging keep distance min 0,5m (20 inches) between the charger and battery
- potential sources of danger keep out of range from charging battery
- check the right ventilation in the charging room
- pay attention the battery contains electrolyte, it is dangerous for eyes and skin
- use protective glasses and suit
- in case of contact with acid, rinse thoroughly affected part of body, if necessary seek medical help
- dangerous and high explosive gases and steam are released during the charging
- do not inhale any released gases and steam from battery
- do not put place any tools or conductive objects on the battery
- do not disconnect battery from charger during charging

3.4 Risk of electric shock

- risk of electric shock from power supply and from charging current
- the risk of electromagnetic fields that can endanger the life of people using pacemakers
- electric shock can cause serious injury or death

Follow the instructions below:

- do not touch any conductive part inside the charger
- do not touch battery poles
- do not short-circuit the charging cables or terminals

NOTICE

All cables and connectors have to be secure, undamaged, insulated and sufficiently dimensioned. Loose connections, burned, damaged or insufficiently sized cables and connectors have to be repaired immediately by a qualified technician.

3.5 Protection of persons

WARNING

- unauthorized person must not enter to workplace during operation
- operation personnel has to have trained and warned to all dangers
- operation personnel has to have protective suit
- make sure people or property are not at risk before leaving the workplace

3.6 Safety inspection

NOTICE

Do safety inspection of charger minimal once per 6 months. Safety inspection may only perform by qualified technician.

Outside regular interval do safety inspection:

- after changes
- after installation other accessories or components
- after maintenance or repair

During the safety inspection, check the operation of the device that controls the lithium battery charging process.
Follow the relevant national and international standards and guidelines for safety inspections. Contact your supplier for more information on safety inspections.

4 Installation

4.1 Mechanical installation

Charger case place to:

- on a vertical surface (wall), fix with four screws, Ø 5 – 8 mm
- on a horizontal surface with AXI FF MONO holder and fix by screws

CAUTION

Conditions of right installation:

- operate the charger only in vertical position
- operate the charger only in suitable and well ventilated rooms with temperature up to +40°C
- ensure protection of charger against the charging fumes
- ensure sufficient distance between charger and battery
- ensure sufficient ventilation in charging room during the charging
- ensure sufficient cooling the charger
- keep minimal distance 100mm between other chargers
- do not cover charger ventilations holes
- do not use charger in dusty environment

4.2 Electrical installation

- before the connection battery to charger check the right plug connection, especially protective conductor and voltage
- make sure if plug for charger connection is protected by a suitable circuit breaker
- connect charger to power supply by movable wire
- output cables could be delivered with battery connector, plus pole is marked red
- charger is delivered with a standard length of output cables
- change the charging parameters if the length of output cables are changed

DANGER

Make sure power supply is properly grounded!

5 Operation

Charger is almost delivered with default settings according to specification in order. If the charger has not the default settings it has warning label „WARNING set the charger first before use“. In this case, the qualified technician makes the settings.

Check before start operation:
- charger case and the cables
- battery type and voltage, battery technical parameters must match the charger and its settings

5.1 Proper use

For proper use must be kept following steps:
- connect the charger to the power supply
- connect the battery to the charger
- standard charging starts and ends completely automatically, without pressing any button
- regeneration modes start by press button EQU/DES during verification time (10s) after connection the battery
- disconnect the battery after end of charging (green display)
- do not disconnect the charger from power supply during the charging or regeneration mode
- if you need to disconnect the battery from the charger while charging, first press the stop button

5.2 Improper use

NOTICE

Charger is designed only for charging traction batteries. Only that is its purpose. Any use beyond this purpose is not permitted. The manufacturer is not liable for any damages or unexpected or incorrect results resulting from such use.

DANGER

In case of improper use threatens:
- injury or death to operator or third person
- damage the device and other tangible assets
- inefficient operation of the charger

6 Maintenance and repairs

In standard operation conditions charger needs only minimal maintenance and care. Do regular visual check of the charger. If case of any fault, contact your service centre. It will ensure a long life for your charger.

Before the start operation of the charger ever check:
- power supply plug and cable
- charging conductors
- charging connectors to connecting the battery
- any signs of damage

If the surface of the charger dirty, clean up it only by soft cloth and cleaner solvent free.
Check of the charger must do qualified technician minimal every 6 months.

Repair instructions:
- maintenance and repairs can do only qualified technician
- use only original spare parts
- do not make any changes and modifications without the manufacturer's agreement
- ensure 1m safety zone around the charger during maintenance and repairs

The manufacturer does not guarantee the nonoriginal parts purchased elsewhere are designed and manufactured to meet the safety requirements.

7 Disposal

Do not dispose of the charger in the normal household waste!
In order to comply with the European Directive 2002/96 / EC on Waste Electrical and Electronic Equipment and its implementation in national law, end-of-life electrical equipment must be handed over to an approved recycling centre for disposal.

Any electrical equipment that is already out of service must either be returned to the dealer or handed over to an approved collection and recycling site. Failure to comply with this European Directive may have adverse effects on the environment and your health!

If you dispose of the charger in a country outside the EU, comply with national law.
Just like a charger, dispose of its accessories and packaging in an environmentally friendly way.

8 Guarantee and liability

The manufacturer is only liable for defects caused by his fault. The manufacturer accepts no liability if the damage was caused by one or more of the following factors:

- the use of the charger is not intended for the intended purpose
- improper installation and operation
- charger operation with damaged protective parts and devices
- non-compliance with operating instructions
- unauthorized modification of the charger
- disasters caused by third party activities and force majeure

User is responsible for all changes which do in charger settings.
Improper operation or storage of the charger is not permitted. The manufacturer is not reliable for damages.
The manufacturer is not responsible for any damage resulting from improper use or storage.

9 Package content

Every package contents:

- charger
- user manual

Detailed specification is in the delivery note, for example delivered accessories.

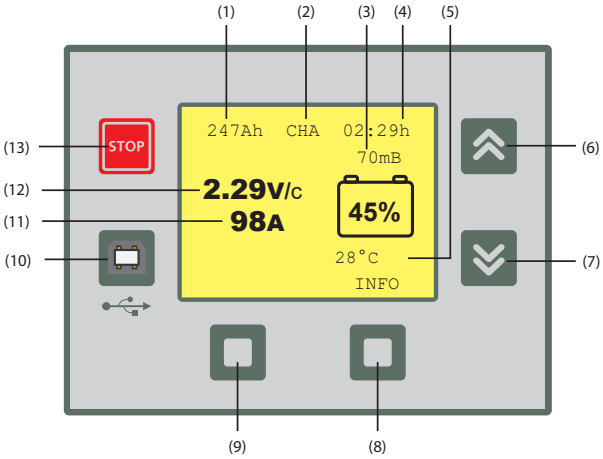
Keep this manual throughout the life of the charger. Store the manual so that it is always available to the operator.

Explanations and Abbreviations

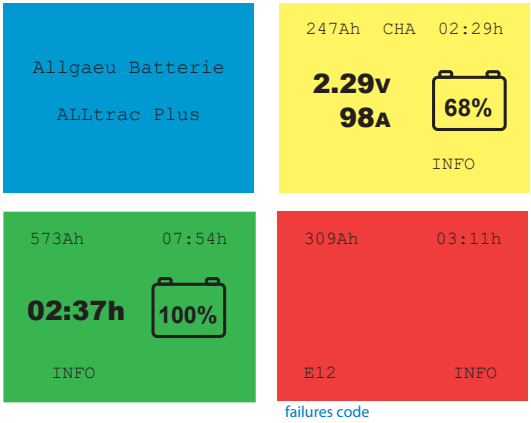
A	ampere (current)
Ah	ampere-hour
A/100Ah	current related to 100Ah capacity of battery
CE	mark designation of conformity to standards
Cnom	nominal battery capacity (in amp-hours)
°C	degree Celsius (temperature)
DES	desulphating
EQU	equalization
EUW	electrolyte mixing (aeration pump)
float	floating charging
h	hour
Hz	Hertz (frequency)
IM	identification module
Inom	nominal current
IP	degree of protection
I1, U1, I2	characteristic values of charging curve
kg	kilogram
kVA	power input
m	meter
maintenance	maintenance trickle charging after extra time
min	minute
s	second
SN	serial number
Unom	nominal voltage
V	volt (voltage)
V/cell	volt/cell of battery
VAC	alternating voltage
VDC	direct voltage
3 N PE	mains 3x400VAC/50-60Hz
1 N PE	mains 230VAC/50-60Hz

10 Display

ALLtrac Plus



(1) Ah supply (2) pressure (3) charging phases
(4) battery temperature (5) charging time
(6) button up (7) charging current
(8) button down (9) (10) function buttons
(11) USB connector (12) battery voltage (V/cell)
(13) "STOP" button



failures code

Display colours:
blue – standby mode (no battery connected)
yellow – charging or regeneration modes
green – battery charged
red – error (failures codes in chapter 12.)

Nominal output voltage (V)	Output current (A)	Type	Case		Weight (kg)		Mains protection (A)	Nominal input current (A)
			without air pump	with air pump	without air pump	with air pump		
24	60	ALLtrac Plus 24E60	FF170	FF170	13	15	10	8,7
	100	ALLtrac Plus 24E100	FF170	FF170	13	15	16	14,1
	100	ALLtrac Plus 24D100	FF170	FF170	14	16	6	4,9
	200	ALLtrac Plus 24D200	FF250	FF250	25	26	10	9,8
48	50	ALLtrac Plus 48E50	FF170	FF170	13	15	16	14,1
	50	ALLtrac Plus 48D50	FF170	FF170	14	16	6	4,9
	100	ALLtrac Plus 48D100	FF170	FF170	18	20	10	8,0
	150	ALLtrac Plus 48D150	FF250	FF250	27	28	16	12,9
	200	ALLtrac Plus 48D200	FF250	FF250	30	31	20	16,0
80	25	ALLtrac Plus 80E25	FF170	FF250	13	16	16	14,1
	25	ALLtrac Plus 80D25	FF170	FF250	14	17	6	4,9
	50	ALLtrac Plus 80D50	FF170	FF250	17	20	10	8,0
	75	ALLtrac Plus 80D75	FF250	FF330	26	30	16	12,9
	100	ALLtrac Plus 80D100	FF250	FF330	28	32	20	16,0
	125	ALLtrac Plus 80D125	FF330	FF550	37	42	25	20,9
	150	ALLtrac Plus 80D150	FF330	FF550	40	45	32	24,0
	175	ALLtrac Plus 80D175	FF550	FF550	49	54	32	28,9
	200	ALLtrac Plus 80D200	FF550	FF550	52	56	40	32,0
	225	ALLtrac Plus 80D225	FF720	FF720	63	65	40	36,9

Nominal supply voltage	one-phase 1 N PE 230V ±15% 50/60Hz or three-phase 3 N PE 400V +15%/-10% 50/60Hz
Nominal power input	see the table of types on next page
Input protection	single-pole or three-pole circuit breaker in charging station wiring size according to charger, C or D type characteristics
Inrush switch-on current	$\leq I_{nom}$
Efficiency	up to 94%
Protection class	I
Pollution class	2
Degree of protection	IP20, IP54
Degree of protection after charger opening	IP00
Electric strenght input - output	4,2 kVDC
Output voltage tolerance in measuring	±1%
Output current tolerance in measuring	±2%
Safety (LVD)	EN 62368-1
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4
Case colour	typically black or any customized
Mounting	hanging in vertical position/ equipped with a stand standing on horizontal surface
Charger cooling	internal ventilators
Placing of the in- and outputs	bottom side of the charger
Operating environment	-10°C to +40°C, max. rel. humidity 80%, non-condensing
Storage	in dry conditions -25°C up to +80°C max. rel. humidity 80%, non-condensing
Temperature sensor – dimensions	Ø 6mm, length 50mm, cable length 1,5m
Range of temperature measurement	-10°C up to 80°C
Electrolyte level sensor – dimmensions / voltage	Ø 8mm, length 150mm / 5 up to 9VDC

Case	Dimensions (mm)			Mounting holes position (mm)	
	H	W	D	X	Y
FF170	477	302	169	230	515
FF250	477	302	254	230	515
FF330	477	302	339	230	515
FF550	477	547	339	499	515
FF720	477	717	339	669	515

12 Failures

Code	Failure description	Reason	Steps to remedy
E1x	Incorrect initial conditions, battery failures, high battery, temperatures		
E11	Voltage of battery lower than..98% of Unom/V/ cell., deep discharged battery.	• Battery is deeply discharged during operation • Wrong setting • Wrong callibration of charger	• Check electrolyte level • Discharge max. to 80% of capacity • Check setting of charger • Recalibrate the charger
E12	Battery has been disconnected during charging without regular stop of charging by STOP button.	• Inadmissible interrupt of charging by disconnecting of connector during operation (charging)	• To terminate the charging cycle use allways STOP button!
E13	Battery temperature >TbatMAX: - if battery is connected to charger and its temperature is higher than set value, charging don't start - If temperature of battery overrun set value during charging, charging current falls to set value of and charging continues. If than temperature increase to (TbatMAX-2)°C, charging current decrease to Imax.	• To high temperature of battery ambient • Cycles of charging and discharging proceed with no break – increase of temperature • Too high charging current	• Lower enviroment temperature • Make longer pauses between charging and discharging cycles • Check setting of charger
E14	Temperature of control unit >65°C: - if battery is connected to charger and inner temperature is higher than set value, charging don't start - If inner temperature of charger overrun set value during charging, charging current falls to value set in folder „Charging – Temperature measurement" and charging continues. If than temperature decrease to (T-5)°C, charging current increase to Imax.	• To high temperature of charger ambient • Charger exceedingly coated by dust	• Lower enviroment temperature. • Clean up the charger • If the charger is in IP54 case – clean up or change the filter inserts
E15	Voltage of battery > Umax (set in charging curve).	• Failure of power unit • Failure of control unit	• Repair/exchange of power unit • Repair/exchange of control unit
E2x	Incorrect charging duration		
E21	The constant current charging phase I1 is taking too long; charging terminates and fails.	• A faulty battery or incorrect charger settings • Excessive battery capacity or insufficient charger current	• Check the battery – electrolyte density, temperature, voltage of single cells • Check setting of charger
E22	Constant voltage phase U1 too long, charging goes further to next phase.	• Defective battery • Wrong setting of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check setting of charger
E23	The constant current charging phase I2 is taking too long; charging terminates and fails.	• Defective battery • Wrong setting of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check setting of charger
E24	During charging phase I1+ U1 more than 90% of nominal capacity is supplied.	• A completely flat battery • Incorrect charger settings	• Check the battery – electrolyte density, temperature, voltage of single cells • Checking de-charging circumstances • Checking charger setting
E3x	Deviations charging current		
E31	Charging current I1 <80% of set value.	• One phase of three phase mains is missing • Defective power unit • Wrong calibration of charger	• Check the mains • Check power units of charger • Recalibrate the charger
E32	Charging current I1 >110% of set value.	• Defective power unit • Wrong calibration of charger	• Check power units of charger • Recalibrate the charger
E5x	Failures of aeration system		
E51	Low pressure in the aeration system failure of airpump or aeration piping. If the pressure is not restored and the correct pressure value is not reached within 1 minute, the charging current value decreases to the 80% Ichar value in the "charging" and the pump is not switched any more.	• Failure of airpump • Pressure loss in piping system	• Check the airpump • Check piping system of aeration
E52	High pressure in the aeration system, fault in the pump or in hose system. If the pressure is not restored and the correct pressure value is not reached within 1 minute, the charging current value decreases to the 80% Ichar value in the "charging" and the pump is not switched any more.	• Clogged piping of aeration system.	• Check piping system of aeration
E53	More than 5 faults of aeration system (pressure too low or too high) during the common charging cycle; the charging current value decreases to the 80% Ichar value in the "charging" and the pump is not switched any more.	• Failure of airpump • Pressure loss in piping system • Clogged piping of aeration system.	• Check the airpump • Check piping system of aeration
E54	Leakage in the air system, the pressure goes down too fast.	• Pressure loss in piping system	• Check piping system of aeration

E55	Charger blocked due to aeration system failures.	• Blockage of charger due to overrun of setted nr. of failures E51, E52, E54. • Failure of airpump • Pressure loss in piping system • Clogged piping of aeration system.	• Check the airpump • Check piping system of aeration • Charger must be unblocked by service engineer
E9x	Failures of comunication		
E91	Failure of comunication with IM at battery connecting.	• IM Is not used • IM is defective • IM is not programmed • Defective wiring or connector	• Connect, change or programme IM • Check connection between IM and charger
E94	Failure at temperature check – temperature sensor or IM.	• Defective temp. Sensor • Defective IM • Defective wiring or connector	• Change temperature sensor • Change IM • Check connection between temp. Sensor or IM and charger
F1x	Failures of the starting condition and failures of battery		
F10	Power units with different voltage levels has been connected together.	• Power units with different voltage levels • Wrong callibration	• Use right units • Right setting of the power units
F11	Battery with high impedance. Voltage during initial test increase more than 19% of Unom/V/cell.	• Deeply sulphated battery	• Check battery and its use • Check electrolyte density and voltage of single cells
F12	The initial battery voltage is higher than 135% of Unom/V/cell, i.e. not suitable battery.	• Battery with higher nominal voltage than is set in charger	• Check battery voltage
F13	Battery voltage>115% Unom, battery charging is initiated only after a rate fall below 115% Unom.	• The battery is fully charged	• Disconnect battery • If mains connection is maintained, eventual voltage reduction will trigger automatic recharging
F14	The battery voltage during the charging overruned seted value (Umax) – charging is stopped.	• Defective battery • Defective wiring charging cable • Defective connector • Failure of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check charging cable • Check functions of charger
F15	Voltage monitors of single modules connected in parallel vary more than 3% of Unom.	• Voltage monitor failed	• Exchange of power unit
F16	Battery temperature during charging >(Tbat MAX+5)°C, charging is stopped.	• To high temperature of battery ambient • Cycles of charging and discharging proceed with no break – increase of temperature • Too high charging current	• Lower enviroment temperature • Make longer pauses between charging and discharging cycles • Check setting of charger
F17	Output voltage during charging is lower than Umin (set in charging curve) – longer than 1min. or battery with lower voltage than is set was connected to charger	• Voltage monitor failed • Battery was connected	• Exchange of power unit • Connect right battery type or change the chargers setting
F18	Low level of electrolyte	• Insufficient maitanance • Error automatical refilling • Wrong setting of switching valves	• Refill water to battery • Check function of aut. refilling • Check charger setting
F2x	Incorrect charging duration		
F21	Constant current phase I1 runs too long, charging is stopped.	• Defective battery • Wrong setting of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check charger setting
F22	Constant current phase U1 runs too long, charging is stopped.	• Defective battery • Wrong setting of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check charger setting
F23	Maximal duration of phase I2 overrunned.	• Battery is deeply discharged during operation • Wrong setting • Wrong callibration of charger	• Check electrolyte level • Discharge max. to 80% of capacity • Check setting of charger • Recalibrate the charger
F3x	Deviations of charging current		
F31	The charging current <50% of the desired value, charging is stopped.	• One phase of three phase mains is missing • Defective power unit • Wrong calibration of charger	• Check the mains • Check power units of charger • Recalibrate the charger
F32	The charging current >120% of the desired value, charging is stopped.	• Defective power unit • Wrong calibration of charger	• Check power units of charger • Recalibrate the charger
F33	The charging current >120% of the Inom – value, charging is stopped.	• Defective power unit • Wrong calibration of charger	• Check power units of charger • Recalibrate the charger
F35	During charging has been charged more than 125% of nominal capacity.	• Defective battery • Wrong setting of charger	• Check the battery – electrolyte density, temperature, voltage of single cells • Check setting of charger
F4x	Communication of control unit		
F40	Communication with power unit failed.	• Wrong contact on wiring • Defective control unit • Defective power unit	• Check wiring • Repair/exchange control unit • Repair/exchange power unit

Module fault reporting

(they are shown in EVENTS folder in program AXIFF)

F1	main error	F5	output relay error
F2	diods overheating	F6	CAN bus communication error
F3	transistors overheating	F7	internal supply error
F4	overvoltage on output of power supply unit	F8	insufficient power

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This instruction manual is valid also for OEM versions.

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