

ACES

Affordable Compact
Energy Solutions

USER MANUAL

ABC charger Series



ABC Sealed battery chargers IP-67
FOR LITHIUM AND LEAD-ACID BATTERIES



ACES ENERGY BV®

ABC Series Smart Battery Chargers

The ACES ABC series of high frequency PWM chargers have a compact and sealed structure design, they are suitable for lead acid batteries and Lithium ion NMC or LFP batteries.

They are used to cycle charge or floating charge batteries in electric cars, sightseeing vehicles, patrol vehicles, fork lifts, communication, electric power, boats, Lawn-Mowers, Agriculture Equipment, etc.

Active PFC and LLC new technology guarantee a good Power Factor and a very high efficiency.

The reliable hardware protections and impeccable charging strategies ensure a safe charging process.

REVISION RECORD

Version	Description	Effective Date	Edited by
0.0	First release	20180120	W. B
1.0	All ABC chargers in one user manual	20211030	W. B

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SAFETY INSTRUCTIONS AND WARNINGS

- Read always these instructions and warnings before use.
- On the AC mains side always make sure that there is an earth-leakage protection breaker.
- Make sure that on the AC and DC connections is always a circuit breaker or fuse for protection
- Always read the specifications of the battery and connect the charger only to a suitable battery
- Never use the charger in a place where is a risk for gas or fuel explosions
- Do not place the charger outside, but always in a space that has some protection from outside weather influences
- When the charger is installed, a minimum of 100 mm space around the charger is needed.
- Do not place the charger in a small not vented space; the charger will run too hot.
- Check if the fan is operating properly during charging
- Make sure the wires are placed in such a way that they cannot be damaged easily.
- If the charger is used for electric vehicles like cars or boats, the interlock connection shall be used to prevent the propulsion motor from starting during charging; If the charger has a CAN-bus this can be accomplished by CAN message.
- The Lithium Battery must have a BMS protection with balancing of the cells
- The Lithium version of the charger will not charge below 0 °C; only a special LFM model will charge below 0 °C
- Never charge dead or damaged batteries
- Do not attempt to disassemble the charger

INSTRUCTIONS FOR USE

- Check before use if there is no damage due to transport and if the charger is complete
- If possible stick the NTC temperature sensor close to or on the battery; for small chargers it is on the charger itself
- Connect the charger to a suitable battery with correct chemistry and voltage
- Connect the charger to the correct mains voltage
- After connection the charger will start charging automatically if the battery is not full
- The leds on the charger will show the status of the charging process
- The battery is now charged according the charging curve.
- For the LFP lithium batteries the end-voltage will be reached only when the battery cells are fully balanced; after charging to full the charger has a battery balancing phase that can last up to 3 hours.
- Except the ABC300 the Charger must be regularly maintained, the air-flow slot under the green plate must not be blocked, all dust and dirt substances must be cleaned.

MODEL RANGE OVERVIEW

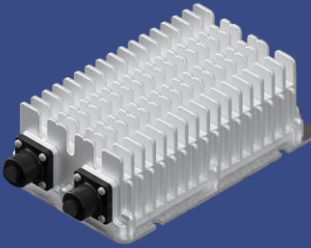
	Current (A)								
	5-10	10-15	15-20	20-25	25-30	30-35	35-50	50-60	80-100
12-16V									
24-34V									
36-51V									
48-68V									
60-85V									
72-102V									
80-113V									
144-168V									
Model >	300F	450F	700	720F	900F	1350	2000	3300	5000

This table shows the VI range of chargers; this user manual is limited to our standard models ; models with "F" are universal AC-mains

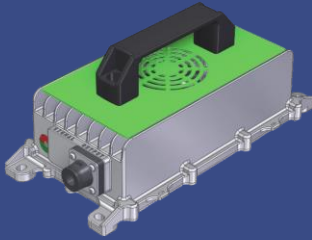
The ACES battery chargers can be used for following battery types:

- LA series: Lead acid batteries AGM and Flooded (models for GEL are optional)
- LI series: Lithium Ion NMC or NCA batteries (optional)
- LF series: Lithium Iron Phosphate (LFP) batteries; These chargers have a unique cell balancing mode

TECHNICAL SPECIFICATIONS (300F Series)

Product Picture						
Model	ABC300F-1212LA	ABC300F-1212LF	ABC300F-2412LA	ABC300F-2412LF	ABC300F-4805LA	ABC300F-4805LF
EAN number	4738474060927	4738474060928	4738471460929	4738478902750	4738474670561	4738477694861
Description	12V12A for LA	12V12A for LFP	24V12A for LA	24V12A for LFP	48V5A for LA	48V5A for LFP
Nominal Voltage(V)	12	12	24	24	48	48
Max Charge Voltage (V)	14.6	14.4	29.2	28.8	58.4	57.6
Max Charge Current (A)	12	12	12	12	5	5
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	72-150	12-120	72-150	12-120	30-60	5-50
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range (Vac)	85~265					
Nom. AC input voltage (Vac)	110/230					
AC input frequency (Hz)	45-65					
AC input rated current (A)	<3.3A @ 100VAC; <1.5A @ 220VAC					
AC Power Factor	> 0.99					
Efficiency (typ.)	87% @100VAC, 92% @ 220VAC					
Noise Level	< 30dB					
AC Input connection	EU plug (Default); EU plug, UK plug, US plug, AU plug, SA plug, FR plug, Israel plug are option					
AC Input cable	1.0m length black 3x1mm2 Power cable					
DC Output connection	SB50 default; M8 ring-terminal and Alligator clip are on request					
DC Output cable	1.2m length black 2x14AWG					
Temp. Sensor Cable	110 mm length temp. sensor covered heat shrink tube together with output cable					
Interlock protection	Default no interlock function, but can be customized					
CAN bus function	No					
LED Indicator	On the charger					
Cooling	Non-FAN type, Natural convection					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <85Vac the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will de-rate the charge current linearly to 50% when reaching 60°C. When the case reaching >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By NTC temperature sensor For the lead-acid charger the NTC is used for temperature compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
Dimensions (mm)	187 x 123 x 64.5					
N.W/G.W (kg)	1.2/1.8					

■ TECHNICAL SPECIFICATIONS (450F Series)


Product Picture						
Model	ABC450F-2415LA	ABC450F-2415LF	ABC450F-4808LA	ABC450F-4808LF	ABC450F-7205LA	ABC450F-7205LF
EAN number	4738474274301	4738471999818	4738474043754	4738470388040	4738478960958	4738476193303
Description	24V15A for LA	24V15A for LFP	48V8A for LA	48V8A for LFP	72V5A for LA	72V5A for LFP
Nominal Voltage(V)	24	24	48	48	72	72
Max Charge Voltage (V)	29.2	28.8	58.4	57.6	87.6	86.4
Max Charge Current (A)	15	15	8	8	5	5
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	90-180	15-150	50-100	8-80	30-60	5-50
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range (Vac)	90~264					
Nom. AC input voltage (Vac)	100/240					
AC input frequency (Hz)	45-65					
AC input rated current(A)	<4.5A@120VAC; <2.2A @ 220VAC					
AC Power Factor	> 0.99					
Efficiency (typ.)	87% @120VAC; 91% @230VAC					
Noise Level	< 55dB					
AC Input connection	Default EU plug; EU plug, UK plug, US plug, AU plug, SA plug, FR plug, Israel plug are option					
AC Input cable	1.0m length black 3 x 1mm2 Power cable					
DC Output connection	Default SB50; M8 terminal, Alligator clip are option					
DC Output cable	1.2m length black 2 x 14AWG DC cable					
Temp. Sensor Cable	110mm length temp. sensor covered heat shrink tube together with output cable					
Interlock protection	Default no interlock function, but can be customized					
CAN bus function	Default no CAN function, but can be customized					
LED Indicator	On the charger; extension cable with indicator on request					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024 FAN cover plate to protect					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <85Vac input the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will derate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Dimensions (mm)	264 x 132 x 71.8					
N.W / G.W (kg)	1 / 1.3					

TECHNICAL SPECIFICATIONS (700 Series)

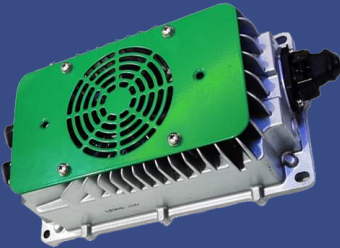


Model	ABC700-1220LA	ABC700-1220LF	ABC700-2420LA	ABC700-2420LF	ABC700-4810LA	ABC700-4810LF
EAN number	4738476656914	4738478282319	4738479215248	4738477912217	4738479513412	4738473531351
Description	12V20A for LA	12V20A for LFP	24V20A for LA	24V20A for LFP	48V10A for LA	48V10A for LFP
Nominal Voltage(V)	12	12	24	24	48	48
Max Charge Voltage (V)	14.6	14.4	29.2	28.8	58.4	57.6
Max Charge Current (A)	20	20	20	20	10	10
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	120-240	20-200	120-240	20-200	60-120	10-100
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range(Vac)	180-264					
Nom. AC input voltage (Vac)	220-240					
AC input frequency (Hz)	50-60					
AC input rated current (A)	< 5A @ 230VAC					
AC Power Factor	> 0.99					
Efficiency (typ.)	94%					
Noise Level	<55dB					
AC Input connection	Default EU plug; EU plug, UK plug, AU plug, SA plug, FR plug, Israel plug are option					
AC Input cable	1.2m length black 3x1mm ² Power cable					
DC Output connection	Default SB50; M8 terminal, Alligator clip are option					
DC Output cable	1.2m length black 2x12AWG DC cable					
Temp. Sensor Cable	110mm length temp. sensor covered heat shrink tube together with output cable					
Interlock protection	Yes, open contact if charger is connected to AC-mains; 1.2m length 2 x 20 AWG Blue, Yellow wires with 2 pin Interlock					
Bluetooth APP function	No					
LED Indicator	On the charger; extension cable with indicator on request					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <150Vac input the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will derate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By NTC temperature sensor For the lead-acid charger the NTC is used for temperature compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
Dimensions (mm)	187 x 122.5 x 72					
N.W / G.W (kg)	1.8 / 2.35					


TECHNICAL SPECIFICATIONS (720F Series)

Product Picture						
Model	ABC720F-1230LA	ABC720F-1230LF	ABC720F-2430LA	ABC720F-2430LF	ABC720F-4815LA	ABC720F-4815LF
EAN number	4738472557369	4738477206255	4738473993227	4738476632512	4738478759187	4738476460450
Description	12V30A for LA	12V30A for LFP	24V30A for LA	24V30A for LFP	48V15A for LA	48V15A for LFP
Nominal Voltage(V)	12	12	24	24	48	48
Max Charge Voltage (V)	14.6	14.4	29.2	28.8	58.4	57.6
Max Charge Current (A)	30	30	30	30	15	15
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	180-360	30-300	180-360	30-300	90-180	15-150
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range(Vac)	90-264					
Nominal AC input voltage(Vac)	100-240					
AC input frequency(Hz)	45-65					
AC input rated current(A)	<8.5A@100VAC; <3.6A @ 230VAC					
AC Power Factor	> 0.99					
Efficiency (typ.)	87% @100VAC, 91% @ 230VAC					
Noise Level	<55dB					
AC Input connection	10A pyramid type male jack					
AC Input cable	Default 2m length black 3x1.5mm ² extension power cable with EU plug, can be customized					
DC Output connection	Default SB50; M8 terminal, Alligator clip are option					
DC Output cable	3m length Red, Black 2x13 AWG DC cable					
Temp. Sensor Cable	1m length black temp. sensor cable 2 x 0.5mm ²					
Interlock protection	Yes, open contact if charger is connected to AC-mains; 1m length 2x0.5mm ² Grey, Green wires with 2 pin Interlock					
CAN bus function	Default no CAN function, but can be customized					
LED Indicator	On the charger; extension cable with indicator on request					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect					
Mounting or portable type	Both types					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <85Vac input the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will de-rate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By NTC temperature sensor For the lead-acid charger the NTC is used for temperature compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
Dimensions (mm)	268.5 x 156 x 78.5					
N.W/G.W (kg)	2.8/3.6					


TECHNICAL SPECIFICATIONS (900F Series)

Product Picture						
Model	ABC900F-2430LA	ABC900F-2430LF	ABC900F-3625LA	ABC900F-3625LF	ABC900F-4818LA	ABC900F-4818LF
EAN number	4738477095521	4738473213462	4738471923714	4738472845329	4738477581284	4738473995153
Description	24V30A for LA	24V30A for LFP	36V25A for LA	36V25A for LFP	48V18A for LA	48V18A for LFP
Nominal Voltage(V)	24	24	36	36	48	48
Max Charge Voltage (V)	29.2	28.8	43.8	43.2	58.4	57.6
Max Charge Current (A)	30	30	25	25	18	18
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	180-360	30-300	150-300	25-250	100-200	18-180
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range (Vac)	90-264					
Nom. AC input voltage(Vac)	100-240					
AC input frequency(Hz)	45-65					
AC input rated current(A)	9.8A@120VAC; 4.5A@230VAC					
AC Power Factor	> 0.99					
Efficiency (typ.)	90%@120Vac					
Noise Level	<55dB					
AC Input connection	10A pyramid type male jack					
AC Input cable	Default 2m length black 3x1.5mm ² extension power cable with EU plug, can be customized					
DC Output connection	Default SB50; M8 terminal, Alligator clip are option					
DC Output cable	2m length Red, Black 2x13 AWG DC cable					
Temp. Sensor Cable	1m length black temp. sensor cable 2x0.5mm ²					
Interlock protection	Yes, open contact if charger is connected to AC-mains; 1m length 2x0.5mm ² Grey, Green wires with 2 pin Interlock					
CAN bus function	No					
LED Indicator	On the charger; extension cable with indicator on request					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect					
Mounting or portable type	Both type					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <85Vac input the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will de-rate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By NTC temperature sensor For the lead-acid charger the NTC is used for temperature compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
Dimensions (mm)	231 x 136 x 116					
N.W/G.W (kg)	2.8/3.65					


TECHNICAL SPECIFICATIONS (1350 Series)

Product Picture						
Model	ABC1350-2425LA	ABC1350-2425LF	ABC1350-4825LA	ABC1350-4825LF	ABC1350-7218LA	ABC1350-7218LF
EAN number	4738475974781	4738477456179	4738477789536	4738471581419	4738476793893	4738474282863
Description	24V25A for LA	24V25A for LFP	48V25A for LA	48V25A for LFP	72V18A for LA	72V18A for LFP
Nominal Voltage (V)	24	24	48	48	72	72
Max Charge Voltage (V)	29.2	28.8	58.4	57.6	87.5	82.8
Max Charge Current (A)	25	25	25	25	18	18
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	150-300	25-250	150-300	25-250	100-200	18-180
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input voltage range (Vac)	180-264					
Nom. AC input voltage (Vac)	200-240					
AC input frequency (Hz)	50-60					
AC input rated current (A)	<7.5A @ 230VAC					
AC Power Factor	> 0.996					
Efficiency	92%@220VAC					
Noise Level	<52dB					
AC Input connection	Default EU plug; EU plug, UK plug, AU plug, SA plug, FR plug, Israel plug are option					
AC Input cable	2m length black 3x1.5mm ² Power cable					
DC Output connection	Default SB50; M8 terminal, Alligator clip are option					
DC Output cable	2m length black 2x10AWG (6mm ²) DC cable					
Temp. Sensor Cable	1m length temp. sensor 2 x 0.5mm ² wires					
Interlock protection	Yes, open contact if charger is connected to AC-mains; , 1m length 2x0.5mm ² Grey, Green wires with 2 pin Interlock Jack					
CAN bus function	Default no CAN function, but can be customized					
LED Indicator	On the charger; extension cable with indicator on request					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect					
IP Protection rating	IP67					
AC under voltage protection	When AC voltage <150Vac input the charger will switch off					
Over current protection	Yes; auto restart					
Short circuit protection	Yes; auto restart					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will de-rate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By NTC temperature sensor For the lead-acid charger the NTC is used for temperature compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
Dimensions (mm)	281 x 128 x 91					
N.W / G.W (kg)	2.5 / 4					

TECHNICAL SPECIFICATIONS (2000 Series)

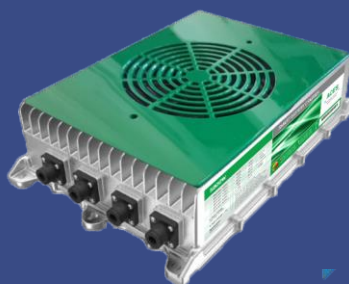
Product Picture								
Model	ABC2000-2450LA	ABC2000-2450LF	ABC2000-4835LA	ABC2000-4835LF	ABC2000-7225LA	ABC2000-7225LF	ABC2000-9615LA	ABC2000-9615LF
EAN number	4738475789880	4738476380437	4738470733598	4738477218081	4738476597248	4738471044181	4738476036099	4738479336387
Description	24V50A LA	24V50A LFP	48V35A LA	48V35A LFP	72V25A LA	72V25A LFP	96V15A LA	96V15A LFP
Nominal Voltage(V)	24	24	48	48	72	72	96	96
Max Charge Voltage (V)	29.2	28.8	58.4	57.6	87.6	86.4	116.8	115.2
Max Charge Current (A)	50	50	35	35	25	25	15	15
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery cap. range (Ah)	300-600	50-500	200-400	35-350	150-300	25-250	90-180	15-150
Charging protection <0 °C	-	Yes	-	Yes	-	Yes	-	Yes
Temp. compensation	Yes	-	Yes	-	Yes	-	Yes	-
AC input volt. range (Vac)	180-264							
AC input voltage (Vac)	200-240							
AC input frequency (Hz)	50-60							
AC input rated current(A)	<10A @ 230VAC							
AC Power Factor	> 0.99							
Efficiency (typ.)	94%							
Noise Level	<50dB							
AC Input connection	Default EU plug; EU plug, UK plug, AU plug, SA plug, FR plug, Israel plug are option							
AC Input cable	2m length black 3x2.5mm2 Power cable							
DC Output connection	Default SB50; M8 terminal, Alligator clip are option							
DC Output cable	3m length black 2x10mm2 dc cable (2 wires in 1 black wave tube; heat shrinkable tube at ends)							
Temp. Sensor Cable	1m length temp. sensor 2x0.5mm2 wires							
Interlock protection	Yes, open contact if charger is connected to AC-mains; 1m length 2x0.5mm2 Grey, Green wires with 2 pin Interlock Jack							
CAN bus function	Default no CAN function, but can be customized							
AUX PSU	Yes, option, 200mA/12V							
Bluetooth APP function	Yes, option							
LED Indicator	On the charger and 1m length 3x0.5mm2 wires with 3 pin extension Jack for optional external indicator							
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect							
IP Protection rating	IP67							
AC under-voltage prot.	When AC voltage <150Vac input the charger will switch off							
Over current protection	Yes; auto restart							
Short circuit protection	Yes; auto restart							
No-load protection	yes							
Battery reversed prot.	yes							
Temperature protection	The charger can operate up to 45°C and will derate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.							
Temperature compensation	By NTC temperature sensor; For the lead-acid charger the NTC is used for temp. compensation at -4mV/°C per 2V cell For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature							
Dimensions (mm)	282 x 167 x 95.5							
N.W/G.W (kg)	3.5/5.4							

TECHNICAL SPECIFICATIONS (3300 Series)

Product Picture								
Model	ABC3300-4850LA	ABC3300-4850LF	ABC3300-7235LA	ABC3300-7235LF	ABC3300-9630LA	ABC3300-9630LF	ABC3300-14420LA	ABC3300-14420LF
EAN number	4738475751702	4738475904269	4738476346105	4738471841902	4738476371572	4738472424500	4738470616907	4738476203231
Description	48V50A LA	48V50A LFP	72V35A LA	72V35A LFP	96V30A LA	96V30A LFP	144V20A LA	144V20A LF
Nominal Voltage(V)	48	48	72	72	96	96	144	144
Max Charge Voltage (V)	58.4	57.6	87.6	86.4	116.8	115.2	168	165.6
Max Charge Current (A)	50	50	35	35	30	30	20	20
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery cap range (Ah)	300-600	50-500	200-4000	35-350	180-360	30-300	120-240	20-200
Charging protection <0 °C	-	Yes	-	Yes	-	Yes	-	Yes
Temp. compensation	Yes	-	Yes	-	Yes	-	Yes	-
AC voltage range (Vac)	180-264							
AC input voltage (Vac)	215-240							
AC input frequency (Hz)	50-60							
AC input rated current (A)	<15A @ 230VAC							
AC Power Factor	> 0.99							
Efficiency (typ.)	94% @220VAC							
Noise Level	<50dB							
AC Input connection	Default EU plug; EU plug, UK plug, AU plug, SA plug, FR plug, Israel plug are option							
AC Input cable	2m length black 3x2.5mm2 Power cable							
DC Output connection	Default SB50; M8 terminal, Alligator clip are option							
DC Output cable	3m length black 2x10mm2 dc cable (2 wires in 1 black wave tube; heat shrinkable tube at ends)							
Temp. Sensor Cable	1m length temp. sensor 2x0.5mm2 wires							
Interlock protection	Yes, open contact if charger is connected to AC-mains; 1m length 2x0.5mm2 Grey, Green wires with 2 pin Interlock Jack							
CAN bus function	Default no CAN function, but can be customized							
AUX PSU	Yes, option, 7.5A/12V or 7.5A/13.8V or 2A/24V							
Bluetooth APP function	no							
LED Indicator	On the charger and 1m length 3x0.5mm2 wires with 3 pin extension Jack for optional external indicator							
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect							
IP Protection rating	IP67							
AC-undervoltage prot.	When AC voltage <150Vac input the charger will switch off							
Over current protection	Yes; auto restart							
Short circuit protection	Yes; auto restart							
No-load protection	yes							
Battery reversed prot.	yes							
Temperature protection	The charger can operate up to 45°C and will derate the charge current linearly to 50% when reaching 60°C. When the case is >65°C the charging is will stop, after temperature decrease it will automatically resume.							
Temperature compensation	By NTC temperature sensor. For the lead-acid charger the NTC is used for temp. compensation at -4mV/°C per 2V cell. For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature							
Dimensions (mm)	315x198x123.5 (<72V); 326.5x188x114 (>72V)							
G.W (kg)	6.8 / 8							

TECHNICAL SPECIFICATIONS (5000 Series)

Product Picture





Model	ABC5000-4880LA	ABC5000-4880LF	ABC5000-7260LA	ABC5000-7260LF	ABC3300-9640LA	ABC5000-9640LF
EAN number	4738470664786	4738475209517	4738470392221	4738471232588	4738475707815	4738476917732
Description	48V80A for LA	48V80A for LFP	72V60A for LA	72V60A for LFP	96V40A for LA	96V40A for LFP
Nominal Voltage(V)	48	48	72	72	96	96
Max Charge Voltage (V)	58.4	57.6	87.6	82.8	116.8	115.2
Max Charge Current (A)	80	80	60	60	40	40
Battery type	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP	Lead-acid (wet/AGM)	LFP
Battery capacity range (Ah)	500-1000	80-800	360-720	60-600	240-480	40-400
Charging protection <0 °C	-	Yes	-	Yes	-	Yes
Temperature compensation	Yes	-	Yes	-	Yes	-
AC input range (Vac)	Three Phase 260~457Vac (Line voltage)					
AC input nominal (Vac)	400					
AC input frequency (Hz)	45-65					
AC input rated current(A)	<9A @ 400VAC					
AC Power Factor	> 0.95					
Efficiency	90%					
Noise Level	<50dB					
AC Input connection	Single terminal, can be customized					
AC Input cable	2m length black 4x14 AWG Power cables					
DC Output connection	Default SB175; can be customized					
DC Output cable	3m length black 2x16mm2 dc cable					
Temp. Sensor Cable	110mm length temp. sensor with heat shrink tube					
Interlock protection	Yes, open contact if charger is connected to AC-mains; 2m length 2x0.5mm2 Grey, Green wires with 2 pin Interlock Jack					
CAN bus function	Default no CAN function, but can be customized					
AUX PSU	Yes, option, 2A/12V					
Bluetooth APP function	Yes					
LED Indicator	On the charger and 1m length 3x0.5mm2 wires with 3 pin extension Jack for optional external indicator					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024FAN cover plate to protect					
IP Protection rating	IP67					
AC Input undervoltage prot.	When 3-phase AC voltage <250 VAC input the charger will switch off					
Over current protection	Yes					
No-load protection	yes					
Battery reversed protection	yes					
Temperature protection	The charger can operate up to 45°C and will de-rate the charge current linearly to 50% when reaching 60°C. When the case reaching >65°C the charging is will stop, after temperature decrease it will automatically resume.					
Temperature compensation	By cable with NTC temperature sensor. For the lead-acid charger the NTC is used for temp. compensation at -4mV/°C per 2V cell. For the Lithium charger the NTC is used to prevent charging < 0 °C ambient temperature					
AC Input connection	Black AC cable 2m 4 wires; (optional CEE 4P+E red plug IEC60309 or customized)					
DC Output connection	Output red / black DC 3m 16mm2 cable with Anderson SB175 grey connector					
Cooling	FAN cooling; The Fan rotates at charging and stops after fully charged; Green RAL6024 FAN cover plate to protect					
Dimensions (mm)	419 x 281.5 x 100.5					
N.W / G.W (kg)	18 / 20					

GENERAL SPECIFICATIONS FOR ALL CHARGER MODELS

SAFETY, EMC AND ENVIRONMENT

Safety test AC to DC	≤20mA@2000Vac/1min
Safety test AC to CASE	≤20mA@2000Vac/1min
Safety test DC to CASE	≤20mA@1000Vac/1min
Interlock contact	Open contact if charger is connected to AC-mains; Max 1A / 30V
Safety	IEC 60335-2-29:2016; IEC 61558-1-2019
Insulation Resistance test	AC to CASE > 100MΩ/DC 500V
EMC	EN 55014-1:2006; EN 55014-A2:2011; EN 61000-3-2:2014; EN 61000-3-3:2013 EN 61000-4-2/3/4/5/11
CE marking	Yes
Working ambient temp.	-20 ...+45°C ; 45...60°C linear de-rating to 50%
Storage temperature	-20 ...+60°C
Humidity	20...90 % RH

LED INDICATORS

LED Indication Label	For LI Battery	For LA Battery
		
Battery Capacity Status	In Charging: Red light flashes Fully Charged: Green light is lighting	Red LED flash per second, to show capacity < 80% Yellow LED flash per second, to show capacity > 80% Green LED lights constantly, to show capacity = 100%
Non Load Status	R,G,R,G,R,G	
Fault Status (“-“: means pause)	Over-volt/current protection: flash R, G, R, -, -, - Ambient temperature too high or low: flash R,G,R,G, -, - Over temperature: flash G,R,-,-,-,- Output under-voltage: flash R,G,-,-,-,- Input AC voltage abnormal: flash R,G,R,G,R,- Other faults: flash G,R,G,-,-,-	
Fully charged	Green LED lights constantly	

WARRANTY

Warranty will be granted according ACES Energy Warranty Conditions 24 months from the date of purchase.

No warranty will be provided when:

- Product failure due to improper use
- Product damage due to bad environmental use and natural disasters.
- The product is repaired by unauthorized persons
- Product appearance has obvious deformation, incomplete, other damage

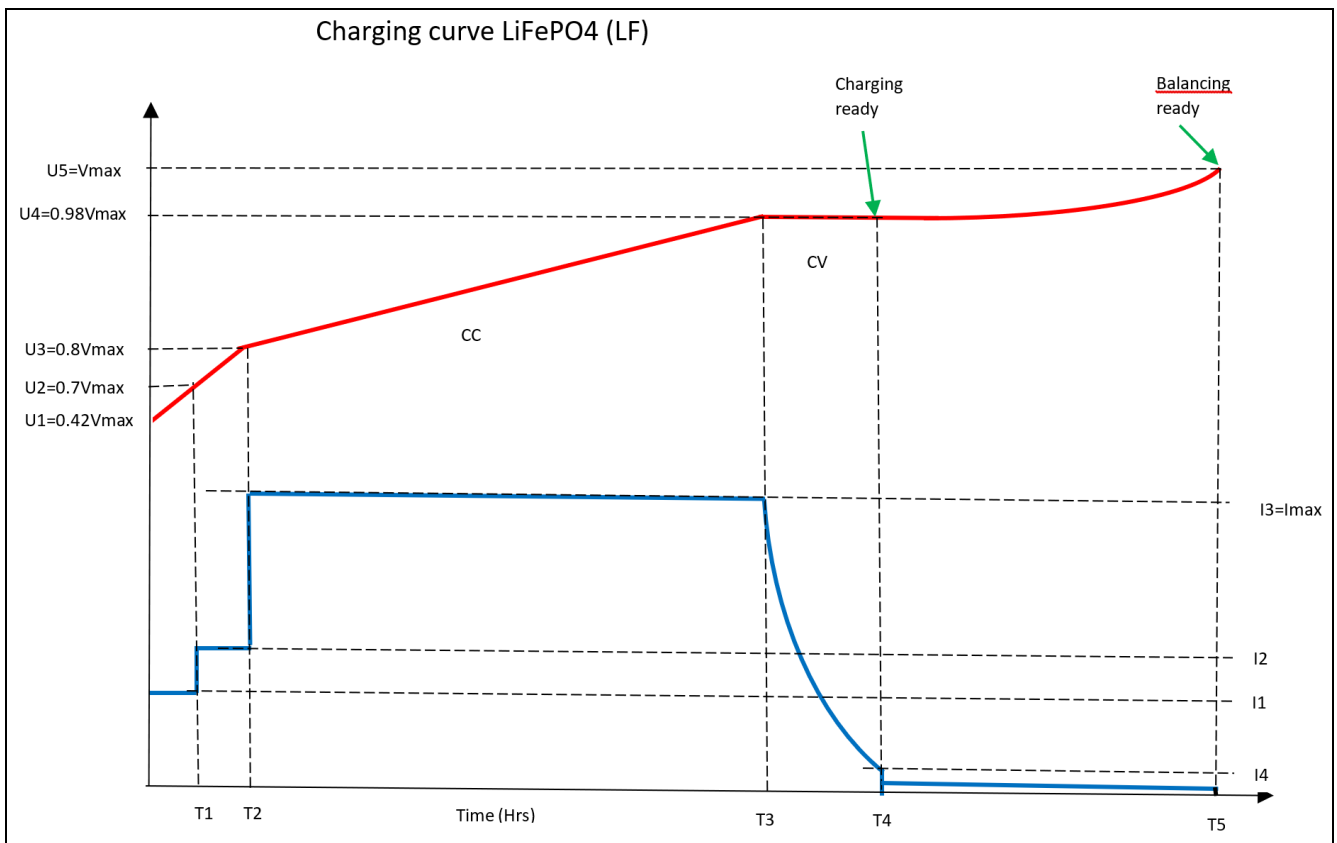
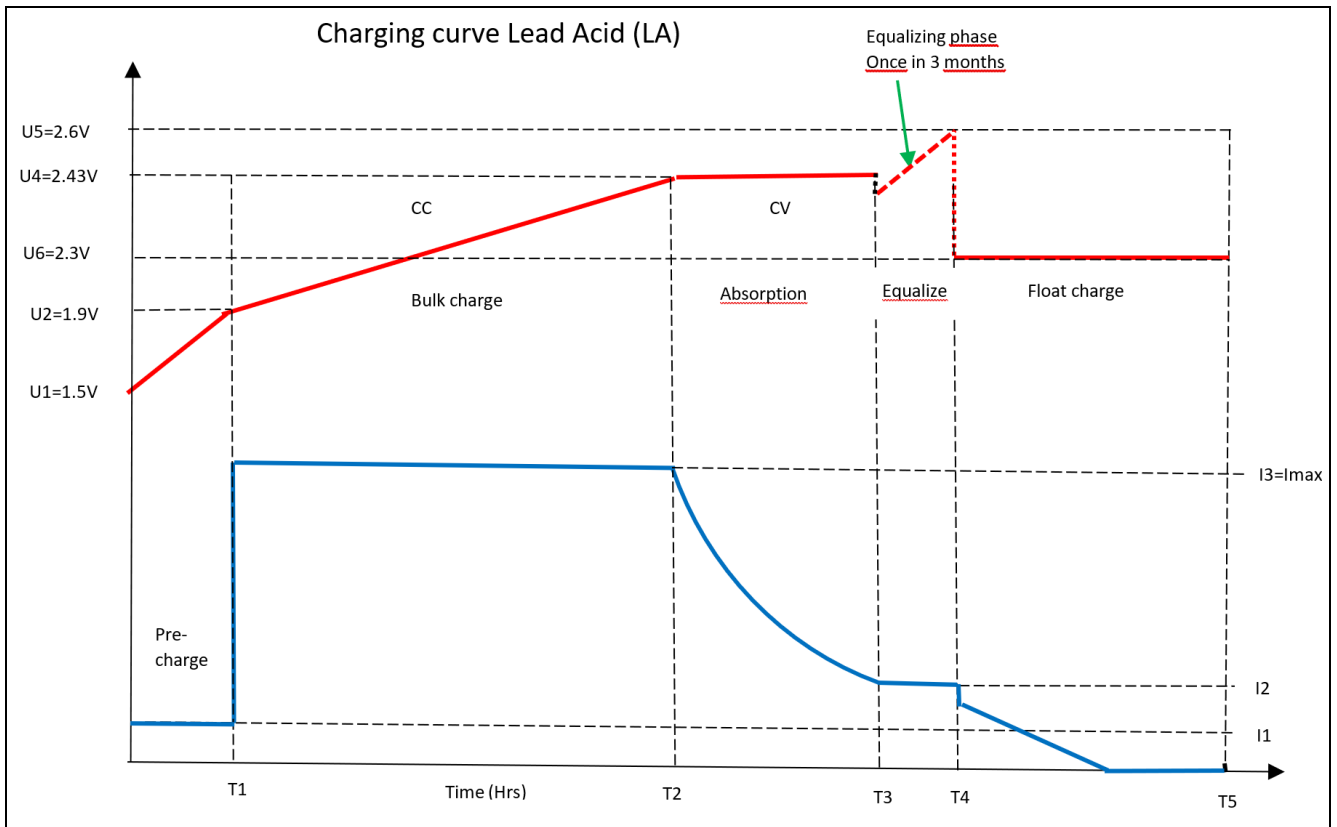
GENERAL

- Installation Type:** Portable or On-board usage, except the ABC300 it has a green FAN cover plate on the top side to protect the FAN and a blank aluminum bottom bracket with installation holes that shall be used for onboard EV.
- Accessories:** Handgrip + 2 screws in separate bag; for some models also Interlock connector and/or LED extension cable.
- Packing:** One 3-layer carton box with EPE foam protection, on carton outside has a carton label, the content of Carton label include Model, Max. Charging voltage, Charging current and Series number with 1D Bar-code (The Series number with 1D Bar-code must match the inside product).

See label example:



■ CHARGING CURVE FOR Lead-acid (LA) and LiFePO4 (LF) batteries



COMMON FAULTS AND SOLUTIONS

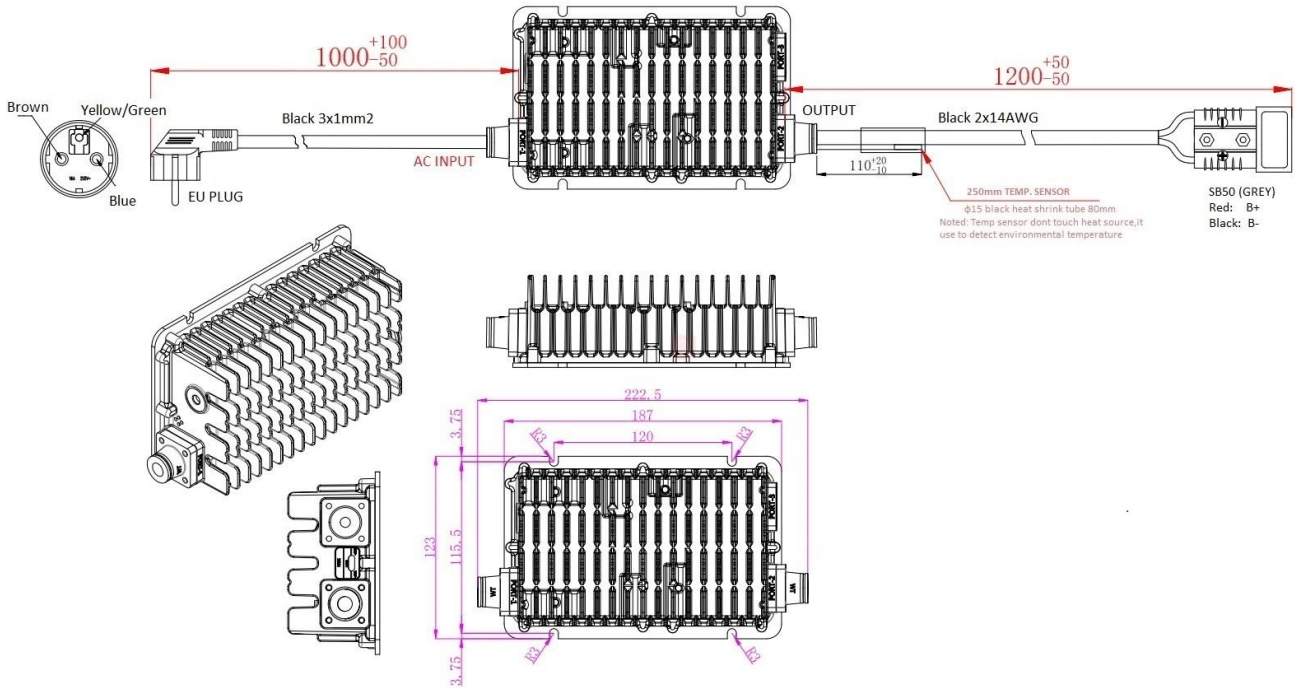
LED Indication Status	Fault Indication	Solution
R, G, R, G, R, G	No Load connection	Check the connection between charger and battery, whether B+,B- polarity reversed, whether battery voltage lower than start voltage
R, G, R, -, -, -	Over Voltage/Current	If restart the charger still can't fix, the charger failed, return to repair
R, G, R, G, -, -	Environmental Temp over-heat or too low	Check whether temperature around the charger too high, whether the FAN rotate normally, whether the heat emission slots under the FAN cover blocked, whether environment ventilation isn't good, check the temperature sensor probe...etc
G, R, -, -, -, -	Charger over-heat	Check the temperature as upon
R, G, -, -, -, -	Output under-voltage	If restart the charger still can't fix, the charger failed, return to repair
R, G, R, G, R, -	Input AC voltage abnormal	Check Input AC voltage need charger spec, also check AC plug connection
G, R, G, -, -, -	When one of upon 5 faults repeat 5 times, the LED shows status	Unplug the AC power and re-power on the charger, to see which fault item match, fix it accordingly.

Note: ("-": means pause)

■ Connections and drawings of all charger models

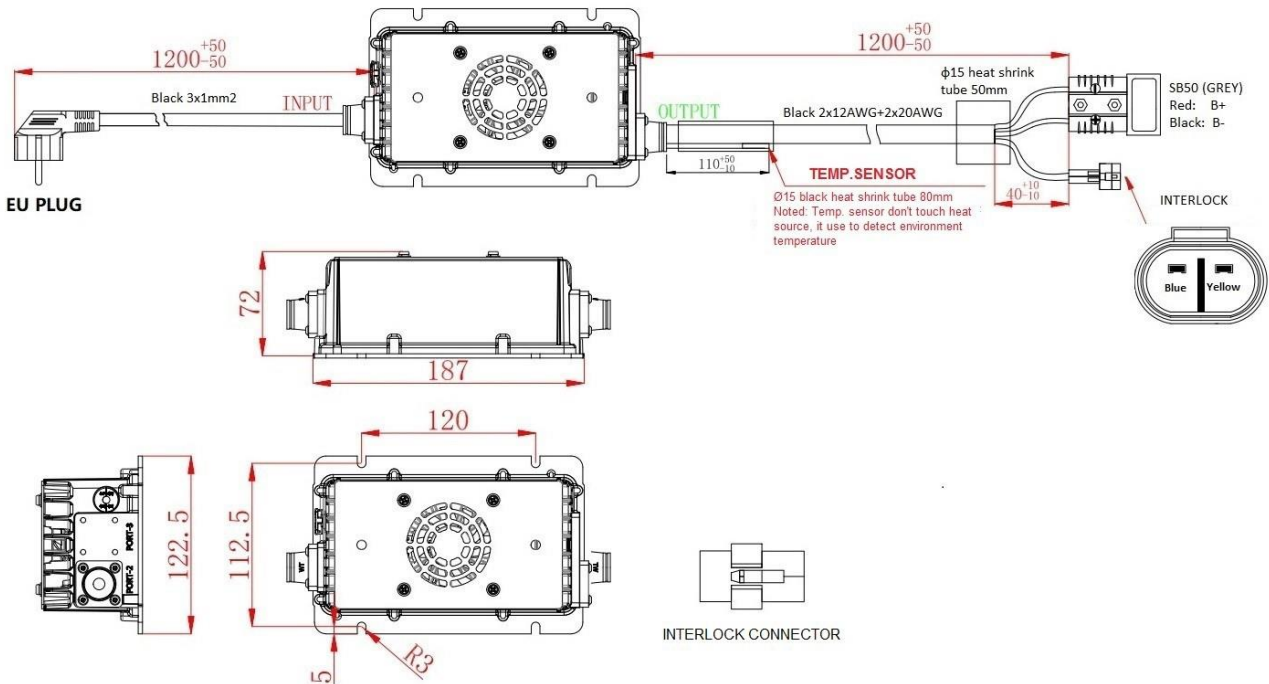
ABC300F drawings:

ABC300F SERIES SMART BATTERY CHARGER



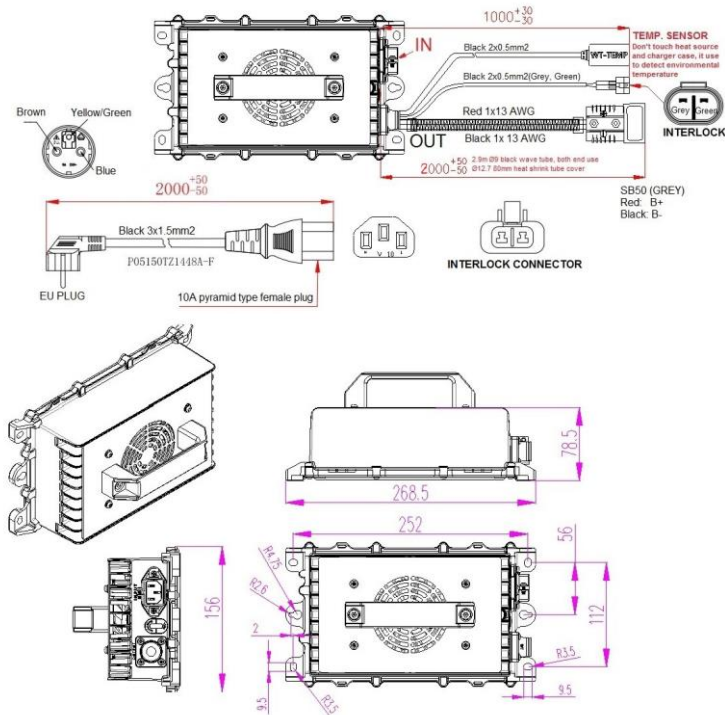
ABC700 drawings:

ABC700 SERIES SMART BATTERY CHARGER



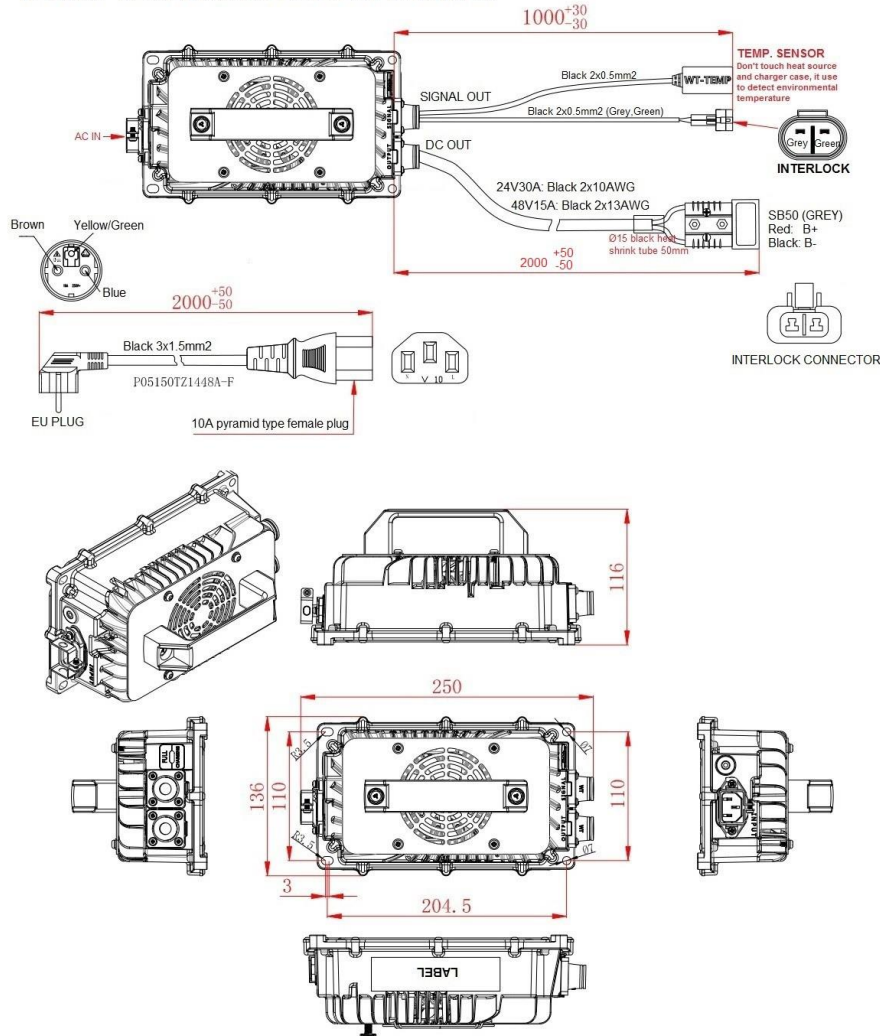
ABC720F drawings:

ABC720F SERIES SMART BATTERY CHARGER

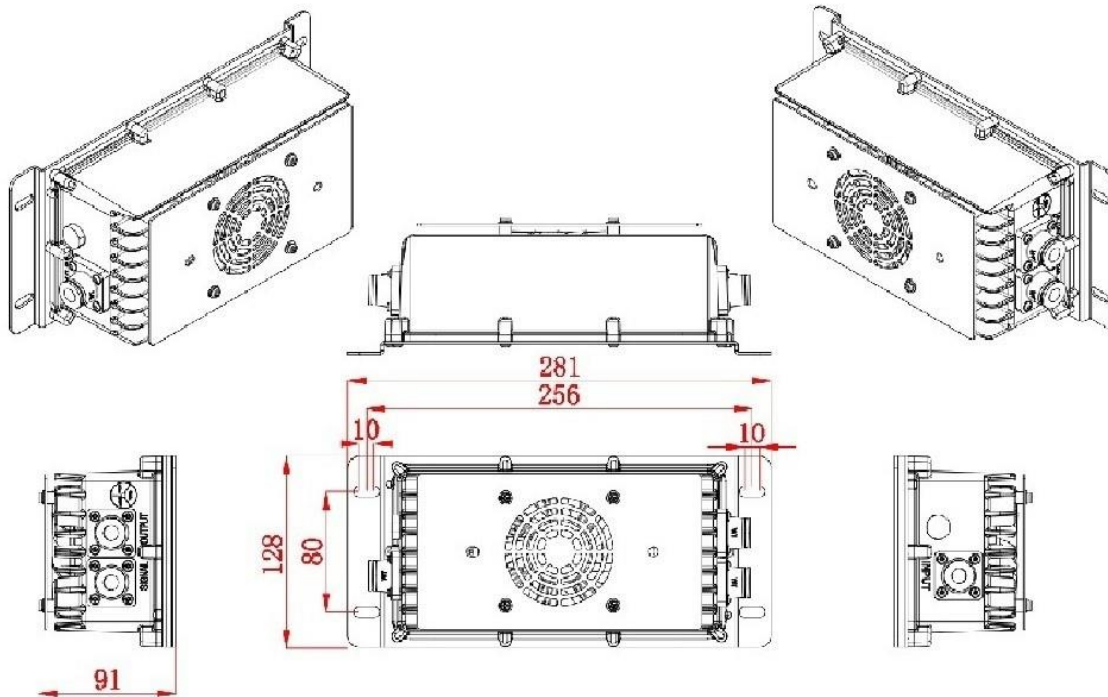
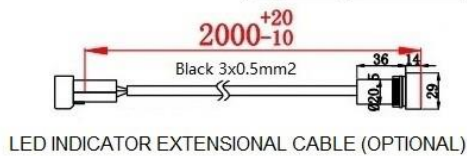
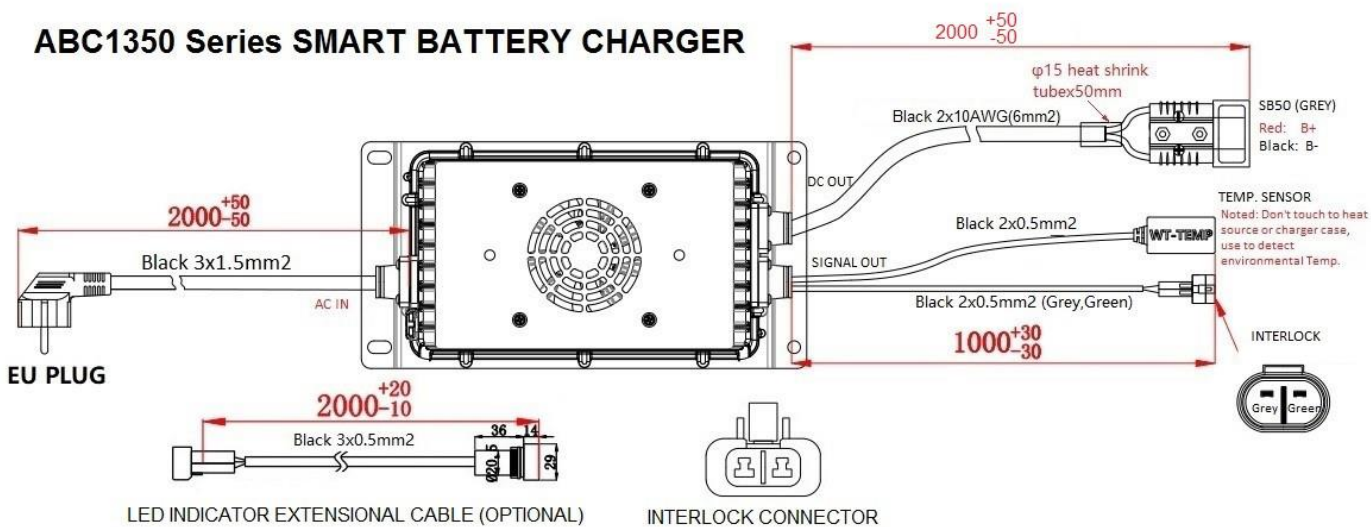


ABC900F drawings:

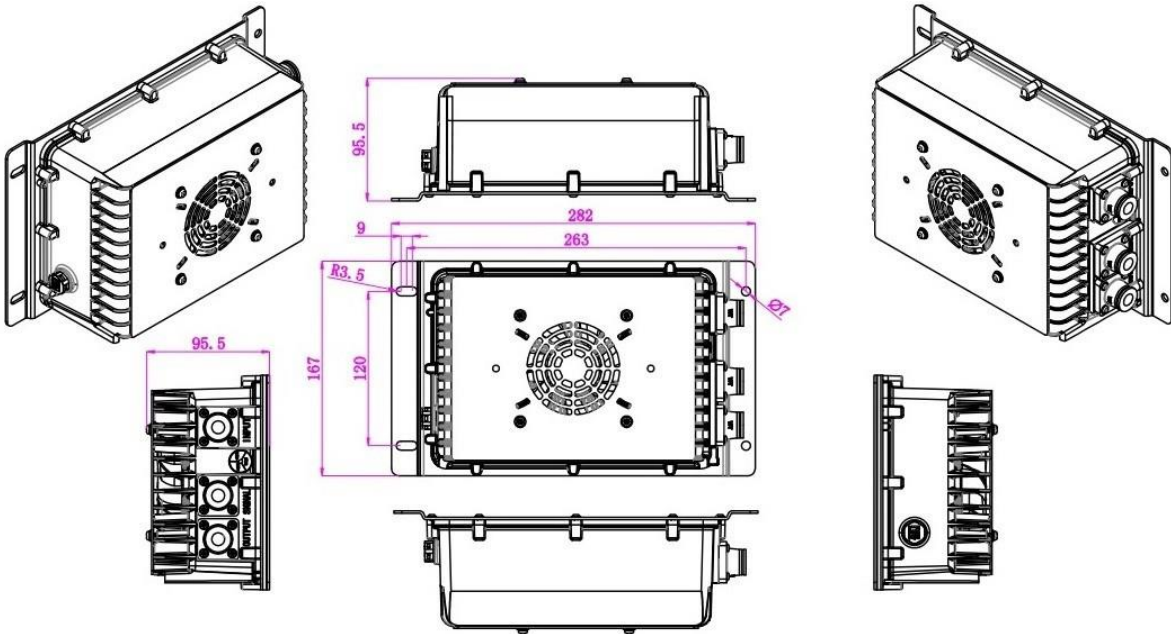
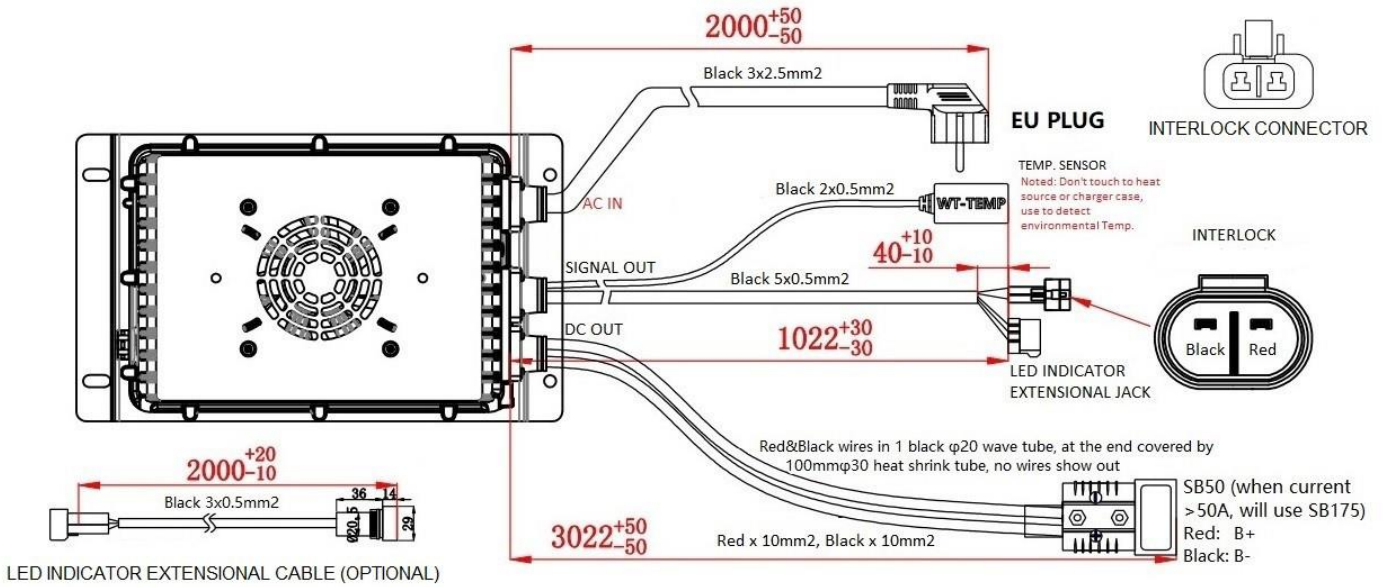
ABC900F SERIES SMART BATTERY CHARGER



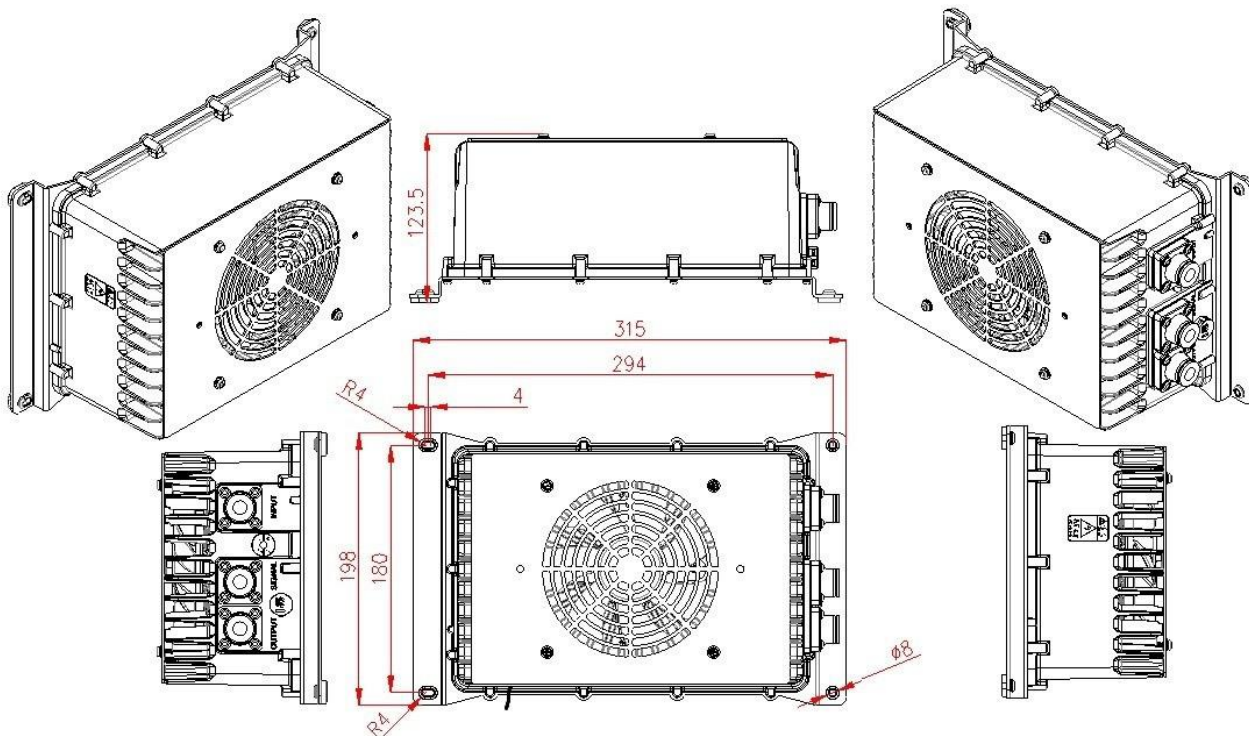
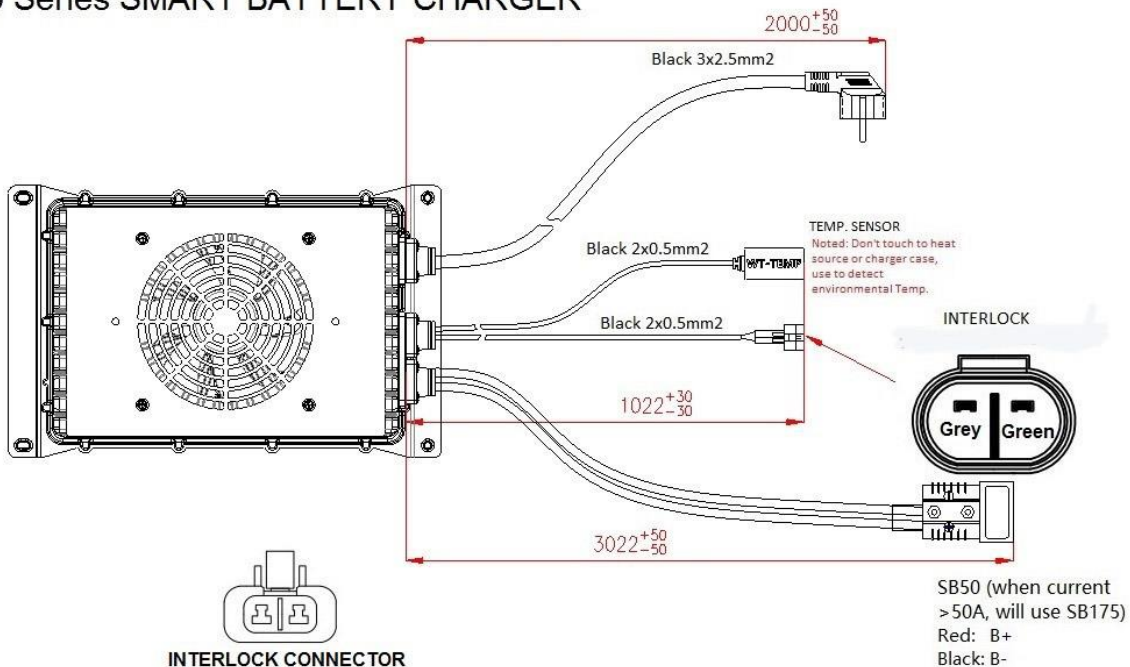
ABC1350 Series SMART BATTERY CHARGER



ABC2000 SMART BATTERY CHARGER

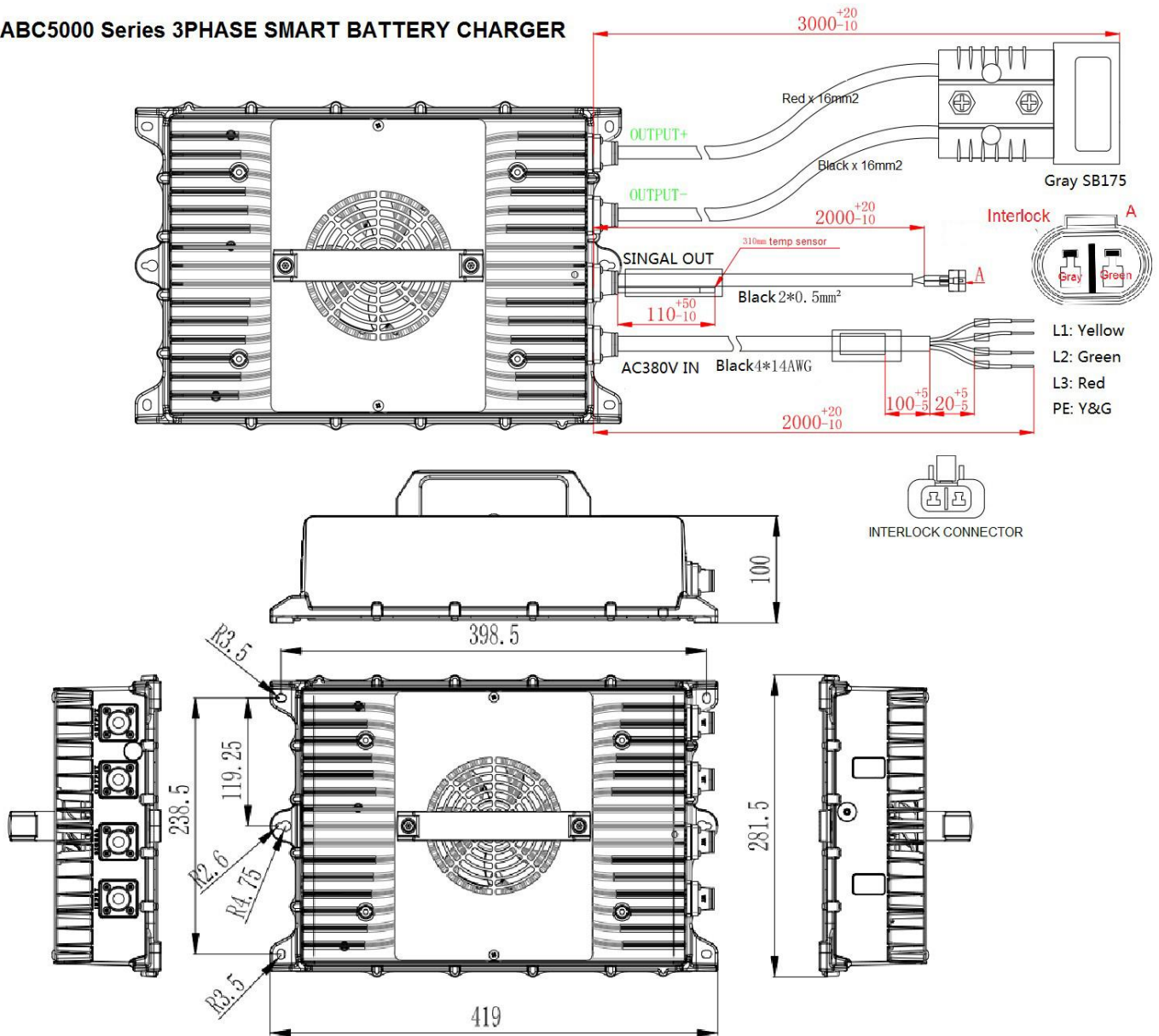


ABC3300 Series SMART BATTERY CHARGER



ABC5000 drawings:

ABC5000 Series 3PHASE SMART BATTERY CHARGER



■ LIST OF ALL AVAILABLE MODELS

Model Name	Rated Output Volt / Current	Charge End-voltage	Battery type Chemistry	Number Cells series	Maximum Cell charge Voltage
ABC300F-1212LI	12V/12A	12,6	Lithium NMC	3	4,2
ABC300F-1212LF	12V/12A	14,4	LiFePO4	4	3,6
ABC300F-1212LA	12V/12A	14,6	AGM, WET	6	2,433
ABC300F-2412LI	24V/12A	29,4	Lithium NMC	7	4,2
ABC300F-2412LF	24V/12A	28,8	LiFePO4	8	3,6
ABC300F-2412LA	24V/12A	29,2	AGM, WET	12	2,433
ABC300F-3607LI	36V/07A	42,0	Lithium NMC	10	4,2
ABC300F-3607LF	36V/07A	43,2	LiFePO4	12	3,6
ABC300F-3607LA	36V/07A	43,8	AGM, WET	18	2,433
ABC300F-4805LI	48V/05A	58,8	Lithium NMC	14	4,2
ABC300F-4805LF	48V/05A	57,6	LiFePO4	16	3,6
ABC300F-4805LA	48V/05A	58,4	AGM, WET	24	2,433
ABC450-2415LI	24V15A	29,4	Lithium NMC	7	4,2
ABC450-2415LF	24V15A	28,8	LiFePO4	8	3,6
ABC450-2415LA	24V15A	29,2	AGM, WET	12	2,433
ABC450-3610LI	36V10A	42,0	Lithium NMC	10	4,2
ABC450-3610LF	36V10A	43,2	LiFePO4	12	3,6
ABC450-3610LA	36V10A	43,8	AGM, WET	18	2,433
ABC450-4808LI	48V8A	58,8	Lithium NMC	14	4,2
ABC450-4808LF	48V8A	57,6	LiFePO4	16	3,6
ABC450-4808LA	48V8A	58,4	AGM, WET	24	2,433
ABC450-6006LI	60V/6A	75,6	Lithium NMC	18	4,2
ABC450-6006LF	60V/6A	72,0	LiFePO4	20	3,6
ABC450-6006LA	60V/6A	73,0	AGM, WET	30	2,433
ABC450-7205LI	72V/5A	84,0	Lithium NMC	20	4,2
ABC450-7205LF	72V/5A	82,8	LiFePO4	23	3,6
ABC450-7205LA	72V/5A	87,6	AGM, WET	36	2,433
ABC700-1220LI	12V/20A	12,6	Lithium NMC	3	4,2
ABC700-1220LF	12V/20A	14,4	LiFePO4	4	3,6
ABC700-1220LA	12V/20A	14,6	AGM, WET	6	2,433
ABC700-2420LI	24V/20A	29,4	Lithium NMC	7	4,2
ABC700-2420LF	24V/20A	28,8	LiFePO4	8	3,6
ABC700-2420LA	24V/20A	29,2	AGM, WET	12	2,433
ABC700-3615LI	36V/15A	42,0	Lithium NMC	10	4,2
ABC700-3615LF	36V/15A	43,2	LiFePO4	12	3,6
ABC700-3615LA	36V/15A	43,8	AGM, WET	18	2,433
ABC700-4810LI	48V/10A	58,8	Lithium NMC	14	4,2
ABC700-4810LF	48V/10A	57,6	LiFePO4	16	3,6
ABC700-4810LA	48V/10A	58,4	AGM, WET	24	2,433
ABC700-6010LI	60V/10A	75,6	Lithium NMC	18	4,2
ABC700-6010LF	60V/10A	72,0	LiFePO4	20	3,6
ABC700-6010LA	60V/10A	73,0	AGM, WET	30	2,433
ABC720-1230LI	12V/30A	12,6	Lithium NMC	3	4,2
ABC720-1230LF	12V/30A	14,4	LiFePO4	4	3,6
ABC720-1230LA	12V/30A	14,6	AGM, WET	6	2,433
ABC720-2430LI	24V/30A	29,4	Lithium NMC	7	4,2
ABC720-2430LF	24V/30A	28,8	LiFePO4	8	3,6
ABC720-2430LA	24V/30A	29,2	AGM, WET	12	2,433

Model Name	Rated Output Volt / Current	Charge End-voltage	Battery type Chemistry	Number Cells series	Maximum Cell charge Voltage
ABC720-3620LI	36V/20A	42,0	Lithium NMC	10	4,2
ABC720-3620LF	36V/20A	43,2	LiFePO4	12	3,6
ABC720-3620LA	36V/20A	43,8	AGM, WET	18	2,433
ABC720-4815LI	48V/15A	58,8	Lithium NMC	14	4,2
ABC720-4815LF	48V/15A	57,6	LiFePO4	16	3,6
ABC720-4815LA	48V/15A	58,4	AGM, WET	24	2,433
ABC720-6012LI	60V/12A	75,6	Lithium NMC	18	4,2
ABC720-6012LF	60V/12A	72,0	LiFePO4	20	3,6
ABC720-6012LA	60V/12A	73,0	AGM, WET	30	2,433
ABC720-7210LI	72V/10A	84,0	Lithium NMC	20	4,2
ABC720-7210LF	72V/10A	82,8	LiFePO4	23	3,6
ABC720-7210LA	72V/10A	87,6	AGM, WET	36	2,433
ABC900F-2430LI	24V/30A	29,4	Lithium NMC	7	4,2
ABC900F-2430LF	24V/30A	28,8	LiFePO4	8	3,6
ABC900F-2430LA	24V/30A	29,2	AGM, WET	12	2,433
ABC900F-3625LI	36V/25A	42,0	Lithium NMC	10	4,2
ABC900F-3625LF	36V/25A	43,2	LiFePO4	12	3,6
ABC900F-3625LA	36V/25A	43,8	AGM, WET	18	2,433
ABC900F-4818LI	48V/18A	58,8	Lithium NMC	14	4,2
ABC900F-4818LF	48V/18A	57,6	LiFePO4	16	3,6
ABC900F-4818LA	48V/18A	58,4	AGM, WET	24	2,433
ABC1350-1225LI	12V/25A	12,6	Lithium NMC	3	4,2
ABC1350-1225LF	12V/25A	14,4	LiFePO4	4	3,6
ABC1350-1225LA	12V/25A	14,6	AGM, WET	6	2,433
ABC1350-2425LI	24V/25A	29,4	Lithium NMC	7	4,2
ABC1350-2425LF	24V/25A	28,8	LiFePO4	8	3,6
ABC1350-2425LA	24V/25A	29,2	AGM, WET	12	2,433
ABC1350-3625LI	36V/25A	42,0	Lithium NMC	10	4,2
ABC1350-3625LF	36V/25A	43,2	LiFePO4	12	3,6
ABC1350-3625LA	36V/25A	43,8	AGM, WET	18	2,433
ABC1350-4825LI	48V/25A	58,8	Lithium NMC	14	4,2
ABC1350-4825LF	48V/25A	57,6	LiFePO4	16	3,6
ABC1350-4825LA	48V/25A	58,4	AGM, WET	24	2,433
ABC1350-6020LI	60V/20A	75,6	Lithium NMC	18	4,2
ABC1350-6020LF	60V/20A	72,0	LiFePO4	20	3,6
ABC1350-6020LA	60V/20A	73,0	AGM, WET	30	2,433
ABC1350-7218LI	72V/18A	84,0	Lithium NMC	20	4,2
ABC1350-7218LF	72V/18A	82,8	LiFePO4	23	3,6
ABC1350-7218LA	72V/18A	87,6	AGM, WET	36	2,433
ABC2000-2450LI	24V/50A	29,4	Lithium NMC	7	4,2
ABC2000-2450LF	24V/50A	28,8	LiFePO4	8	3,6
ABC2000-2450LA	24V/50A	29,2	AGM, WET	12	2,433
ABC2000-3635LI	36V/35A	42,0	Lithium NMC	10	4,2
ABC2000-3635LF	36V/35A	43,2	LiFePO4	12	3,6
ABC2000-3635LA	36V/35A	43,8	AGM, WET	18	2,433
ABC2000-4835LI	48V/35A	58,8	Lithium NMC	14	4,2
ABC2000-4835LF	48V/35A	57,6	LiFePO4	16	3,6
ABC2000-4835LA	48V/35A	58,4	AGM, WET	24	2,433

Model Name	Rated Output Volt / Current	Charge End-voltage	Battery type Chemistry	Number Cells series	Maximum Cell charge Voltage
ABC2000-6030LI	60V/30A	75,6	Lithium NMC	18	4,2
ABC2000-6030LF	60V/30A	72,0	LiFePO4	20	3,6
ABC2000-6030LA	60V/30A	73,0	AGM, WET	30	2,433
ABC2000-7225LI	72V/25A	84,0	Lithium NMC	20	4,2
ABC2000-7225LF	72V/25A	82,8	LiFePO4	23	3,6
ABC2000-7225LA	72V/25A	87,6	AGM, WET	36	2,433
ABC2000-8020LI	80V/20A	96,6	Lithium NMC	23	4,2
ABC2000-8020LF	80V/20A	97,2	LiFePO4	27	3,6
ABC2000-8020LA	80V/20A	97,3	AGM, WET	40	2,433
ABC2000-9615LI	96V/15A	117,6	Lithium NMC	28	4,2
ABC2000-9615LF	96V/15A	115,2	LiFePO4	32	3,6
ABC2000-9615LA	96V/15A	116,8	AGM, WET	48	2,433
ABC3000-24100LI	24V/100A	29,4	Lithium NMC	7	4,2
ABC3000-24100LF	24V/100A	28,8	LiFePO4	8	3,6
ABC3000-24100LA	24V/100A	29,2	AGM, WET	12	2,433
ABC3000-4850LI	48V/50A	58,8	Lithium NMC	14	4,2
ABC3000-4850LF	48V/50A	57,6	LiFePO4	16	3,6
ABC3000-4850LA	48V/50A	58,4	AGM, WET	24	2,433
ABC3300-3650LI	36V/50A	42,0	Lithium NMC	10	4,2
ABC3300-3650LF	36V/50A	43,2	LiFePO4	12	3,6
ABC3300-3650LA	36V/50A	43,8	AGM, WET	18	2,433
ABC3300-4850LI	48V/50A	58,8	Lithium NMC	14	4,2
ABC3300-4850LF	48V/50A	57,6	LiFePO4	16	3,6
ABC3300-4850LA	48V/50A	58,4	AGM, WET	24	2,433
ABC3300-6035LI	60V/33A	75,6	Lithium NMC	18	4,2
ABC3300-6035LF	60V/33A	72,0	LiFePO4	20	3,6
ABC3300-6035LA	60V/33A	73,0	AGM, WET	30	2,433
ABC3300-7235LI	72V/35A	84,0	Lithium NMC	20	4,2
ABC3300-7235LF	72V/35A	82,8	LiFePO4	23	3,6
ABC3300-7235LA	72V/35A	87,6	AGM, WET	36	2,433
ABC3300-9630LI	96V/30A	117,6	Lithium NMC	28	4,2
ABC3300-9630LF	96V/30A	115,2	LiFePO4	32	3,6
ABC3300-9630LA	96V/30A	116,8	AGM, WET	48	2,433
ABC3300-14420LI	144V/20A	168,0	Lithium NMC	40	4,2
ABC3300-14420LF	144V/20A	165,6	LiFePO4	46	3,6
ABC3300-12020LA	120V/20A	146,0	AGM, WET	60	2,433
ABC5000-24100LI	24V/100A	29,4	Lithium NMC	7	4,2
ABC5000-24100LF	24V/100A	28,8	LiFePO4	8	3,6
ABC5000-24100LA	24V/100A	29,2	AGM, WET	12	2,433
ABC5000-4880LI	48V/80A	58,8	Lithium NMC	14	4,2
ABC5000-4880LF	48V/80A	57,6	LiFePO4	16	3,6
ABC5000-4880LA	48V/80A	58,4	AGM, WET	24	2,433
ABC5000-7260LI	72V/60A	84,0	Lithium NMC	20	4,2
ABC5000-7260LF	72V/60A	82,8	LiFePO4	23	3,6
ABC5000-7260LA	72V/60A	87,6	AGM, WET	36	2,433
ABC5000-9640LI	96V/40A	117,6	Lithium NMC	28	4,2
ABC5000-9640LF	96V/40A	115,2	LiFePO4	32	3,6
ABC5000-9640LA	96V/40A	116,8	AGM, WET	48	2,433