BluTek Power

Model: BP-TH20F2010C8E-WT
3 Phase Input

The **BP-TH20F2010C8E-WT** from BluTek Power, Inc. is a 20 kW high-efficiency power module designed for electric vehicle (EV) charging systems and other advanced power conversion applications. It combines superior performance, compact power density, and intelligent communication features. The module supports a 260–533 VAC three-phase four-wire (three-phase + PE) input and delivers a constant output power range of 100–200 VDC. Its integrated CAN bus interface enables seamless communication with the system control unit for precise parameter configuration, real-time monitoring, and operational management. Reliable, efficient, and easy to integrate, this module is an ideal solution for DC fast chargers and high-power charging infrastructure.

Total Power	Input Voltage	Output Voltage	Minimum	Maximum
20K W	260 - 533VAC	10-200VDC	0A	200A

Maximum Input Current 38A
Maximum Output Current 200A

Special Features

High efficiency up to 95% Peak

- Active Power Factor Correction
- Dimensions: 460 x 218 x 80 mm (18.11 x 8.58 x 3.15 in.)
- Wide input voltage range: 260 – 533VAC
  - 3 P + PE
- Redundant operation
- Adjustable Output Voltages from 10-200VDC
- Adjustable Output Current 0.5A-200A
- Variable fan speed control
- Fully secure(OTP, OVP, OCP, SCP)
- LEDs Status :OK, Fault, Warning
- Front Panel Display and Functions Control
- CE Compliant
- Three Year Warranty
- CAN Communications
- Operative Temperature of -40 to 75C
- Low THD

Applications

- *Battery Charger*
- *LED Lighting*
- *Industrial Application*

Phone: 973-594-1800
Salesteam@BluTekPower.com

1. Input Specifications

Parameter	Description/Condition	Notes
Rated Input Voltage	323VAC ～ 456VAC	3P+PE
Input Voltage Range	260VAC ～ 533VAC	Fig. 1
Max. Input Current	38A	
THD	<5% @ 50-100% Input Current	Rated Input
Inrush Current	<150% Rated Input Peak Value	Rated Input
Voltage Unbalance	10% Max	Single or Two Phase Dip
Leakage Current	<1.5mA (<1KHz)	Rated Input
Input Frequency	50-60Hz	
Power Factor	>0.99	Rated Input
Peak Efficiency	≥95%	
Voltage Response Time After Receiving Stop Command	2ms MAX	From Current Value to 60V with 1s

.

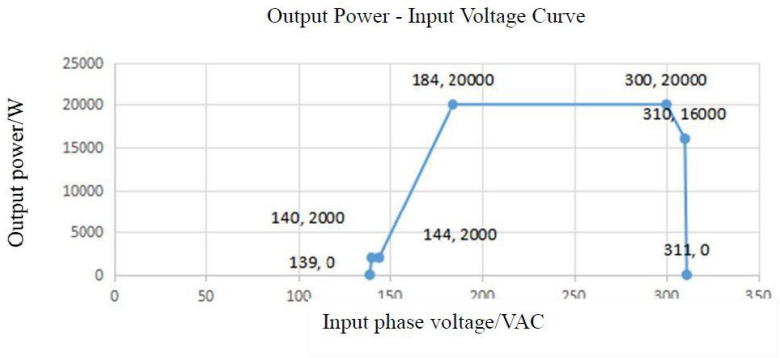
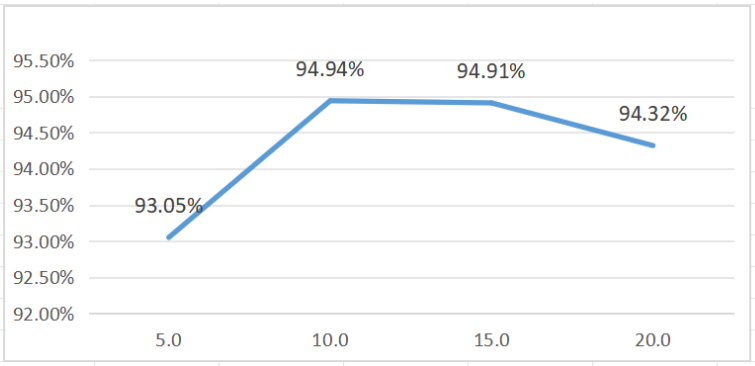


Fig. 1 Input Power Curve

Input voltage (VAC)	Output voltage (VDC)	Output current (A)	Efficiency	Output power (kW)
400V	200	25	93.05%	5.0
	200	50	94.94%	10.0
	200	75	94.91%	15.0
	200	100	94.32%	20.0



2. Output Specifications

Parameter	Description/Condition	Notes
Output Voltage Range	10-200VDC	Fig. 2
Output Voltage Constant Power Range	100-200VDC	Fig. 2
Output Setpoint Accuracy	0.5%	
Rated Output Power	20KW	
Rated Output Current	200A	Fig. 2
Output Voltage Ripple	0.5%	Peak to Peak, 20MHZ Bandwidth
Output Current Ripple	≤1%	Peak to Peak, 100MHZ Bandwidth
Current Regulation Speed	30A/S	From Current Value to New Target Value

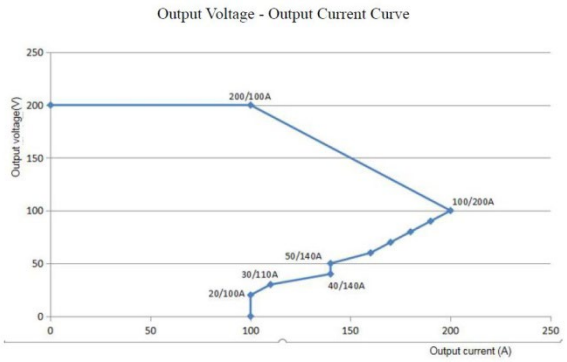


Fig. 2 Output Power Curve

3. Protection

Parameter	Description	Notes
Input		
Overvoltage Protection	528VAC 539VAC	The power supply module will shut down if the input voltage exceeds the over voltage threshold. The power supply module must be restarted by operation restart command.
Undervoltage Protection	237VAC 247VAC	The power supply module will shut down if the input voltage exceeds the umder voltage threshold. The power supply module must be restarted by operation restart command.
Phase Loss Proteciton	Yes	The power supply module will shut down if the phase loss protection is triggered. The power supply module must be restarted by operation restart command.
Ouput		
Overvoltage Protection	Yes	The power supply module will shut down if the output voltage exceeds the over voltage threshold. The power supply module must be restarted by operation restart command.
Short Circuit Protection	Yes	In case of a short circuit the power supply module will shut down and latch. After the short is removed the power supply module must be restarted by operation restart command.
Fan		
Fan Protection	Yes	The power supply module will shut down if the fan fault protection is triggered. After the fan is cleared or replaced the power supply module must be restarted by operation restart command.

4. Safety/Approval

Parameter	Description/Condition	Item	Note/Standard
Isolation Strength	Basic Isolation	AC-Enclosure	
	Reinforced	DC-Enclsoure	
	Reinforced	AC - DC	
	Reinforced	AC - CAN	
	Reinforced	DC - CAN	

5. Electromagnetic Compatibility

5.1 Immunity

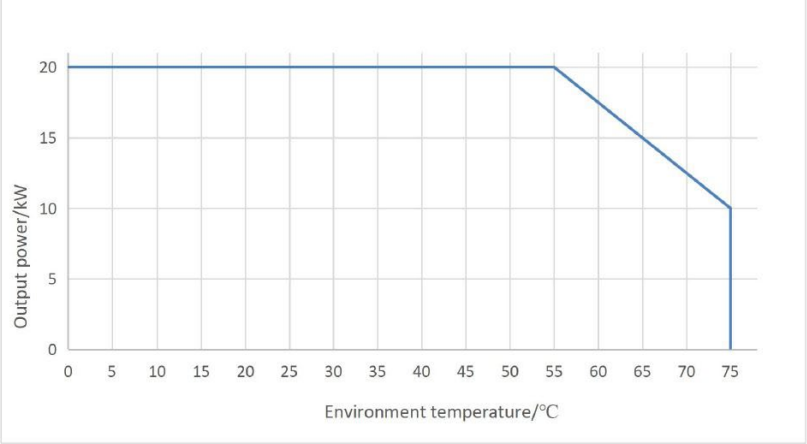
Specification	Clause	Test Description	Result
EN IEC 61851-21-2:2021	6	Emission - Low voltage AC mains port	Pass
EN IEC 61851-21-2:2021	6	Emission - wired network port	N/A
EN IEC 61851-21-2:2021	Annex B	Radiated disturbance test for keyless entry	Pass
EN IEC 61851-21-2:2021	6	Emission - Enclosure port	Pass
EN IEC 61851-21-2:2021	Annex D	Voltage transient disturbances	Pass
EN IEC 61000-3-2:2019/A1:2021 EN IEC 61851-21-2:2021	6	Harmonic current emission	Pass
EN IEC 61000-3-3:2013/A1:2019 EN IEC 61851-21-2:2021	6	Voltage fluctuations and flicker	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-2:2008	5	Electrostatic discharge immunity test	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-3:2006+A1:2007+A2:2010	5	Radiated, radio-frequency, electromagnetic field immunity test	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-4:2012	5	Electrical fast transient /burst immunity test	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-5:2014	5	Surge immunity test	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-6:2013	5	Immunity to conducted disturbances, induced by radio-frequency fields	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-8:2009	5	Immunity - Enclosure port - Power-frequency magnetic field	Pass
EN IEC 61851-21-2:2021 IEC 61000-4-11:2004 IEC 61000-4-34:2005+A1:2009	5	Voltage dips, short interruptions and voltage variations immunity tests	Pass

5.2 Emission

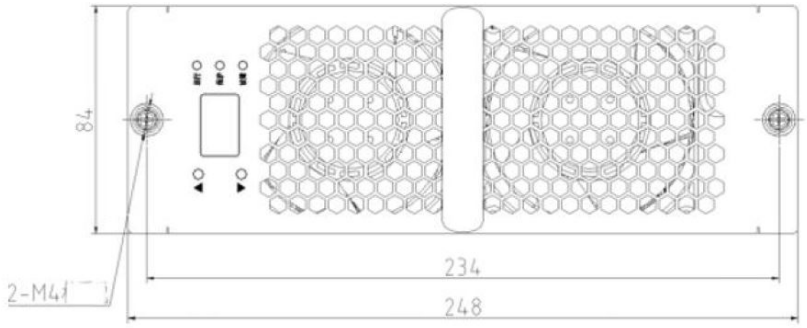
Parameter	*Description/Condition*	*Criterion*
Conducted Emissions	FCC Part 15 Subpart B:2021	Class A
Radiated Emission	FCC Part 15 Subpart B:2021	Class A
Harmonics Emission	IEC61000-3-2	Class A
Acoustical Noise	46dB at 1 meter, 25 C , 50% Load	-
AC Flicker	IEC61000-3-3	Pass

6. *Environmental Specifications*

Parameter	*Description/Condition*	*Min*	*Nom*	*Max*	*Units*
Ambient Temperature	Derating Above 55°C (Fig.4)	-40		75	°C
Storage Temperature	Non- operational	-40		85	°C
Altitude	Derating Above 2000m		2000		Meter
Humidity	Non-condensing	5		95	%
Audible Noise			60		dBa
IP Grade	IP20				
Expected Fan Life	At 45°C Ambient Temperature		70,000		Hours
Coating	Double-sided plotting				
MTBF	At 45°C Ambient Temperature		700,000		Hours
Vibration	To IEC 60068-2-6				
Shock	To IEC 60068-2-27				
Salt Mist	To IEC 60068-2-52				



7. Signals and Controls



7.1 Front Panel LED Functions

LED	*Status*	*Definition*
Green Indicator	Steady On	Normal Operaiton
	Flashing	Standby Mode
	Off	*No AC Input*
Yellow Indicator	Steady On	*Input over-voltage, input under-voltage, input phase missing, over-temperature, address duplication.*
	Flashing	Communication Outage
	Off	Working in Debug-mode
Red	Steady On	Fan Fault Output Over Voltage Output Short Circuit Over Temperature Internal Communication Interruption Unrecoverable Output Fault
	Off	Working normal without failure

Notes:

- No AC input or input voltage is not within the working range, resulting in no output of the charging module, all three indicator lights out.
- There is no mutually exclusive relationship between the indicators, as long as the conditions are met, all three indicators can be lit at the same time.
- When loading the module software, the three indicator lights remain fully on; At the end of loading, all lights return to normal display.

7.2 Front Panel Display

The digital meter can display the output voltage, output current, module address, group number, software version number, fault code and other information of the module, see Figure 2-6 for details. When the module is powered on and in standby, the digital tube displays oFF by default; The output voltage is displayed by default after startup. The display range of output voltage is from 000 to 999, and the display accuracy is 1V. The corresponding table of module fault codes is shown in the following table:

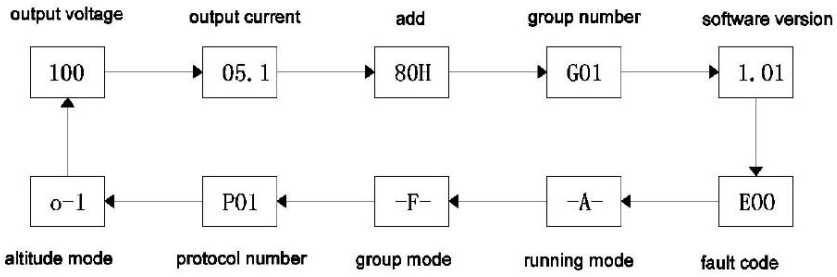
Fault code	Fault content
E00	There is no fault and it can operate normally
E01	AC input over-voltage, under-voltage or phase loss protection
E02	The DC output over-voltage is faulty
E03	Unrecoverable No output failure
E04	The internal temperature of the module is too high
E05	The DC output short-circuit fault occurs
E06	Fan failed
E07	Discharge fault
E08	Module over-temperature protection
E09	Front-end and back-end communication within the module is interrupted
E10	Module address duplication

Note: The table shows only part of the critical faults.

7.3 Front Panel Push Button Discription

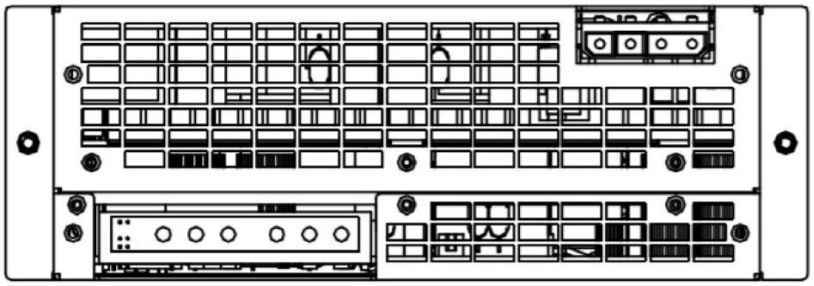
There are two buttons on the front panel of the module, a left button（◄）and a right button (►). When the module is working normally or in standby mode, short press the key to switch the display interface of the digital meter to view the module information, or long press the key (for at least 2.5s) to enter/exit the setting interface. In the setting interface, short press the key to change the module parameters.

1）Take the module output voltage 100V, output current 5.1A, address 80H, group number 1, software version 1.01, fault-free, automatic mode, fixed grouping mode, and protocol number 01 as an example. Press the ◄ or ► to switch sequentially, as shown in Figure 2-4. See Table 2-3 for instructions on key operation.



Function	***Operation Method***	***Effect***
Displayed Page	short time press◄or►	Switch the displayed pages in the order described in Figure 2-6
	Long press ◄ or ►for about 2.5s, the display starts to blink	Enter the settings screen from the display screen
	Short press◄or►	Increases or decreases the setting parameter
Set Data	Short press◄or►	Increases or decreases the setting parameter
	Long press ◄ about 2.5s, the display blinking position changes	Change the parameter setting bit (one / ten / hundred)
	Long press ► about 2.5s	Save the current parameters and return to the display page
address setting	Using 80H to replace 91H as an example: 1) First press ◄ or ► until the display appears for 80H, press ◄or ► for 2.5 seconds to release, and the display flashes (" 0 "flashes); 2) Short press ◄, 80H to change to 81H, then long press ◄2.5 seconds to release, the display "8" flashes; Then press ◄, 81H to 91H; Long press ►2.5 seconds, the display no longer flickers, data saved	
Operation mode setting	1) Enter the setting on the display, and the data saving operation is the same as above; 2) Automatic mode: -A - Debug mode: -c-	Automatic mode: upper computer controls module start and stop; Debugging mode: The module starts up automatically, which is convenient to confirm the status of the module on site.
Group mode setting	1) Enter the setting on thedisplay, and the data saving operation is the same as above; 2) Fixed packet mode: -F - Dynamic packet mode: -d-	Only the State Grid protocol is supported.Modify the module grouping mode and save the parameters after power off
Protocols setting	1) Enter the setting on the display, and the data saving operation is the same as above; 2) State Grid Agreement: P01 Factory Agreement: P02	Switchable communication protocol
Reserved	Display o-1	Reserved
Parameter Settings in debug mode	For example, replace 200V with 150V: 1) First press ◄ or ► until the display 200 appears, press ◄ or ► for 2.5 seconds and release, the display flashes in one bit; 2) Long press ◄ 2.5 seconds the display starts flashing; Then press ◄ , change 200 to 150; Then long press ◄ 2.5 seconds and release, the display stops flashing. 3) Long press ►2.5 seconds, the disply no longer flashes, data saved	Voltage and current parameters can be set

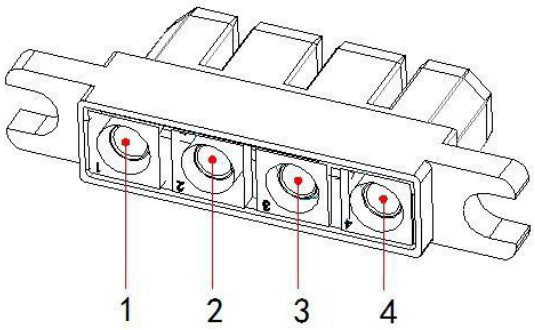
8. Input/Output Connectors Information



8.1 Connector Information

Connectors	*Part No.*	*Vendor*
AC Input Connector	DJ-4-85AT	Anfeite
DC Output Connector	DJ-14T	Anfeite

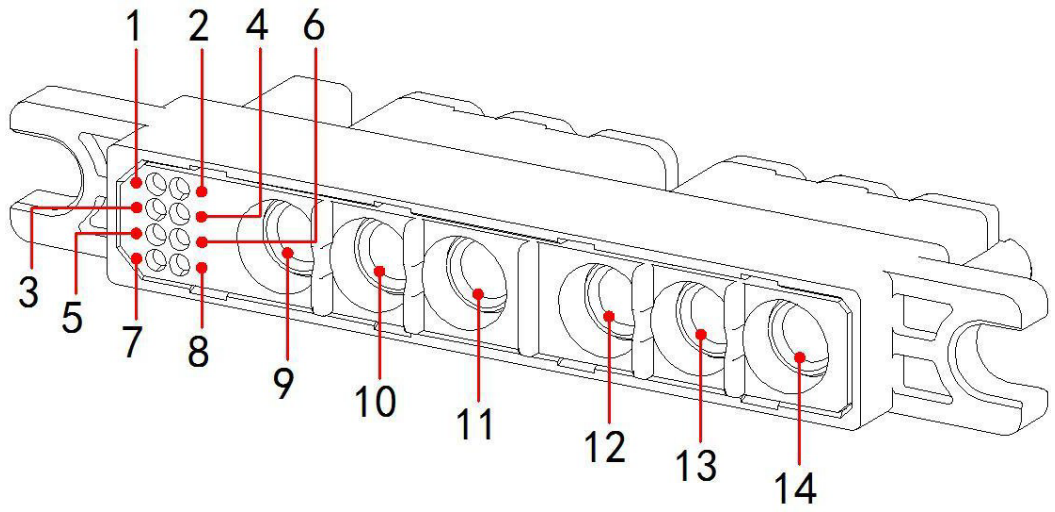
8.2 Input Connector Pinout Definition



Pin Number	Definition
1	Input Phase C
2	Input Phase B
3	Input Phase A
4	PE (Connects to the ground terminal in the system)

Table 1-1 Definitions of pinouts for input connectors

8.3 Output Connector Pinout Definition



Pin number	Definition	Pin number	Definition
1	CAN H	2	CAN L
7	PS Off (12+)	8	PS Off RTN (12-)
9, 10、11	OUT-	12, 13、14	OUT+
3、4、5、6	Empty needle		

Table 1-2 Definition of pinout for output connectors

Note: The power supply will turn off when an external 12V is applied to pin 7 of the output connnector. To restart the startup command is required.

9. Mechanical Features

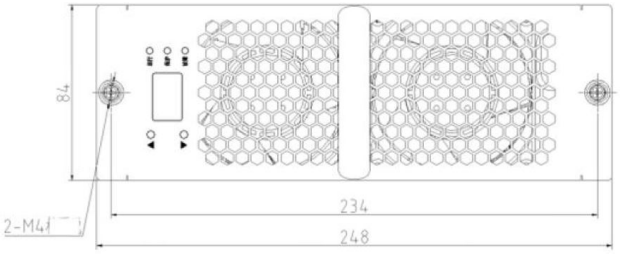
9.1 Weight

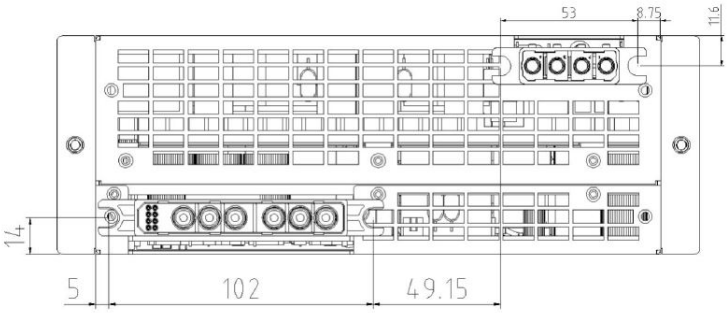
Parameter	*Max*	*Units*
Weight	15	kg

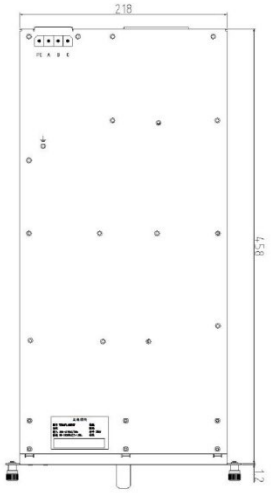
9.2 Mechanical Outline

The anti-disassembly label is an important basis for product quality assurance. Do not remove it.

Dimension : L* W * H =460.5mm*218mm*84mm(including connectors, without handles and raised front plate).





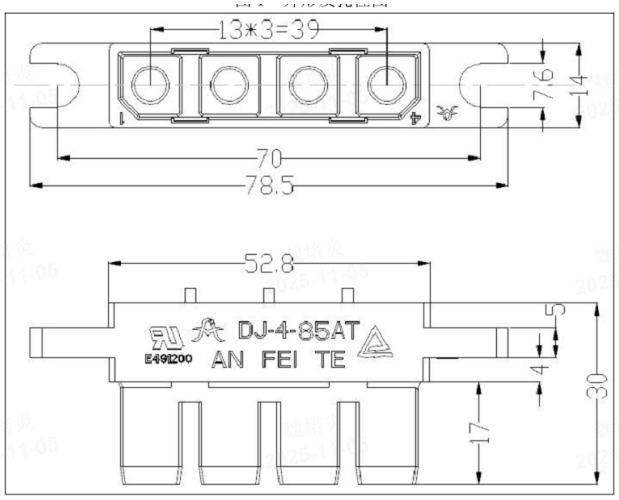


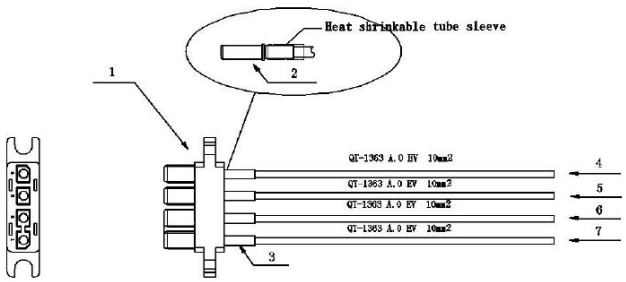
10. Ordering Information

Model No.	Description
BP-TH20F2010C8E-WT	20 kW high-efficiency power module
BP-ACMC2.5-01	AC Mating Connector Cable 2.5 meters length
BP-DCMC2.5-01	DC Mating Connector Cable 2.5 meters length
BP-CAN-01	The CANopen toolkit includes developer tools, a small adapter to connect to your laptop, and a link to download the GUI and user manual.

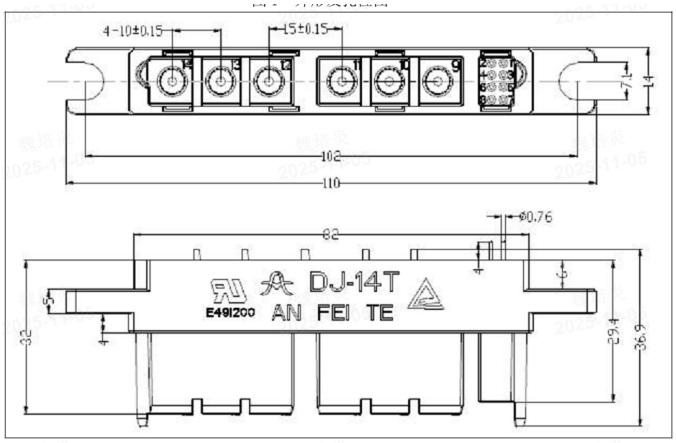
10.1 Accessories

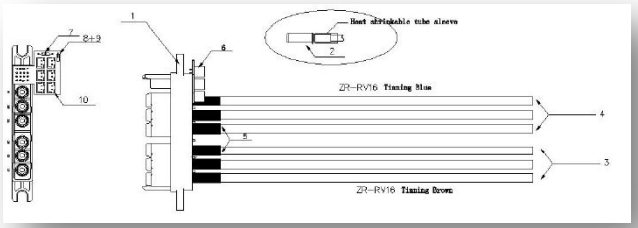
10.1.1 AC Mating Connecor Cable Drawing





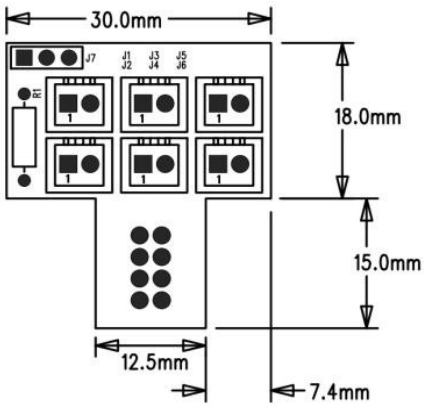
AC Cable

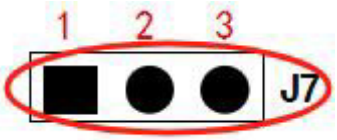




DC Cable

10.1.2 DC Mating Connecor Cable Drawing





Pin number	Definition	Pin number	Definition
J1-1	CAN L	J1-2	CAN H
J2-1	CAN L	J2-2	CAN H
J3-1	PS Off (12+)	J3-2	PS Off RTN (12-)
J4-1	PS Off (12+)	J4-2	PS Off RTN (12-)
J5、J6	Empty needle		
J7	Jumper terminals(When pins 1 and 2 are shot-circuiting, the matching resistor is connected;When pincs 2 and 3 are shot-circuiting, the matching resistor is not connected		

Table 1-3 Pinout definition of adapter plate

Note: The power supply will turn off when an external 12V is applied to pin J3-1 or J4-1 of the output connnector cable. To restart the startup command is required.

10.1.3 CAN Tool Kit

CANopen toolkit contains developer tools including a CAN communication adapter for connection to a laptop and a URL for downloading the GUI and a user manual.