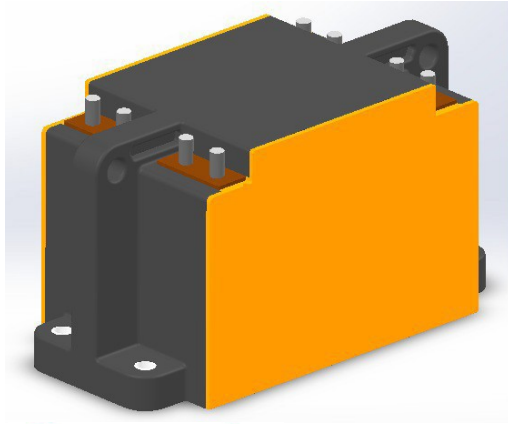




Intelligent Power Distribution Unit (iPDU) Model No.: iPDU12



Features:

- 1 Rated Voltage VDC(V) : 1500V
- 2 Rated Current IPN(A): 300
- 3 Communication Method: CAN FD

Application:

- 1 New energy storage system.
- 2 Power Distribution Management System for High Voltage Battery Packs of New Energy Vehicles.
- 3 High voltage DC distribution system.

Specification

Description	Symbol	Unit	Rated	Note
Contact Parameters				
Contact rated current	IPN	A	300	continued work
Overload current	IPM	A	400	@20min
Rated operating voltage	VO	VDC	1250	Contact rated switching voltage
Maximum operating voltage	VM	VDC	1500	Maximum switching contact voltage
Rated switching power	P	KW	375	Refer to capacitive loads and inductive loads
Maximum switching	PM	KW	600	Refer to capacitive loads and inductive loads
Mechanical durability	OPS	times	5x10 ⁵	No-load mechanical endurance
Electrical endurance	OPS	times	1x10 ³	@300A/1250V
Contact Action time	Ta	ms	≤60	Stable contact conduction
Contact Release time	Tr	ms	≤15	Non-over current and short-circuit conditions
Contact forms	H	A	2H	Normally open*2
Electrical contact resistance	RL	mΩ	≤0.1	Initial resistance value measured at 25°C



Contact protection(Unnecessary)	ON		Not	No arcing during normal switching.Charging BMS protocol, powering up after absorption
Impact resistant function	Off	g	10	Based on circuit breaker/contactor standards
	ON	g	20	Based on circuit breaker/contactor standards
Vibration resistant function	ON/Off	g	5	10~55Hz

Description	Symbol	Unit	Rated	Note
Electromagnetic circuit breaking capacity				
Fast charging over-current protection	ICL	A	300-2000A	User configurable
Discharge over-current protection	IoL	A	300-2000A	User configurable
Breaking current	IP	KA	6-15	Less than 15ms , 5OPS
Short-circuit current	IPS	KA	15-25	Less than 5ms , 1OP
Cut-off time	Tc	mS	5-15ms	The larger I2t, the faster the disconnection
Disconnection method 1			Coil rapid drain	Active breaking (IoL)
Disconnection method 2	Ampere's force	Homer's force	Coil venting	Active and passive breaking (IP)
Coil Parameters 25°C				
1	24 VDC	≥18VDC	≥18 VDC	Transient 24W,static PWM 15% 50W@60ms,holding power 5W
Shunt Resistance Sensor				
Rated current measurement range	IPN	A	600	Rated current measurement range
Over-current measurement capability	IoI	A	±1800	@15s
Over-range current measurement capability	IoM	A	±22000	@50ms
Rated current measurement range	Io	mA	1mA	-600A~600A
			10mA	<-600A or >600A
Full temperature rated current measurement accuracy	Xc	mA	±200mA	@-40A~40A
		%	±0.5%	@40A~600A or -40A~-600A
			±1%	@600A~1800A or -600A~-1800A
			±2%	@1800A~15000A or -1800A~-15000A
Current offset	Ios	mA	≤±100	Current offset
linearity	εL	%	0.2	linearity



Description	Symbol	Unit	Rated	Note
Pre-charge Function				
Pre-charge current	IPN	A	8~80	Battery Voltage U/R
Pre-charge resistance	RL	Ω	7.5--50	Anti-Shock Wirewound Resistors
Pre-charge time	Tc	ms	≤ 400	Theoretical calculated value 120ms
Electrical Insulation Parameters				
Insulation resistance	RIS	M Ω	≥ 500 M Ω	
Dielectric withstand voltage	Vd	V	3700Vdc	Between housing + and terminal
	Vd	V	1500Vdc	Terminal to Terminal
Contact power consumption	PL	W	9	At IPN
BMU Parameters				
CAN data response time	Tr	ms	10	
CAN data frame upload cycle	Tp	ms	1~100	Configurable
Battery Voltage Accuracy	VOA	mV	± 100	iPDU voltage acquisition accuracy of 2%
Output Voltage	VOA	mV	± 100	iPDU voltage acquisition accuracy of 2%
Current acquisition accuracy	εL	%	± 0.3	The whole temperature range
SOC accuracy	Sc	%	< 5	Ampere-time Integral Measurement
Temperature acquisition accuracy	TA	$^{\circ}\text{C}$	± 1	
Temperature acquisition range	TR	$^{\circ}\text{C}$	85	
Environmental Parameters				
Power consumption	P	W	10	Total power consumption
Operating voltage	Vo	V	19--29	CAN bus compatible 24V
Operating temperature	To	$^{\circ}\text{C}$	45	The whole temperature range
Storage temperature	Ts	$^{\circ}\text{C}$	80	
Weight	W	Kg	3.5	Total weight
Volumetric	VLWH	mm	255*130*140	Length*Width*Height



Function Description:

This product is an intelligent electrified, standardized, professional intelligent battery pack disconnect system developed according to the needs of new energy battery packs. Completely cover all the functions of the traditional PDU, and greatly improve the functional performance while reducing the overall cost, volume and weight reduced by 2-3 times. Solving the outstanding problems of the traditional PDU: relay contact adhesion, contact arcing, electromagnetic interference; problems with one-time fuse blowing replacement, high dismantling the battery pack cost. Increased power pack high-voltage harness to fast charging input interface line leakage safety detection and connector interface loose arc detection, perfect and reliable arc-free control strategy and short-circuit breaking self-recovery maintenance-free replacement design, in line with automotive-grade safety features certification. Traditional PDU is composed of discrete parts (multiple relays, disposable fuses, shunts, open-loop current sensors, pre-charged resistors, large quantity of copper rows and disordered wiring harnesses, etc), which are not suitable for new energy storage conditions due to poor reliability. The iPDU12 high-reliability, intelligent electrification design concept is suitable for the future needs of intelligent, standardized, integrated, low-cost replacement-free and maintenance-free development of new energy battery packs. iPDU12 has independent intellectual property rights with more than 60 invention and utility model patents.

Features:

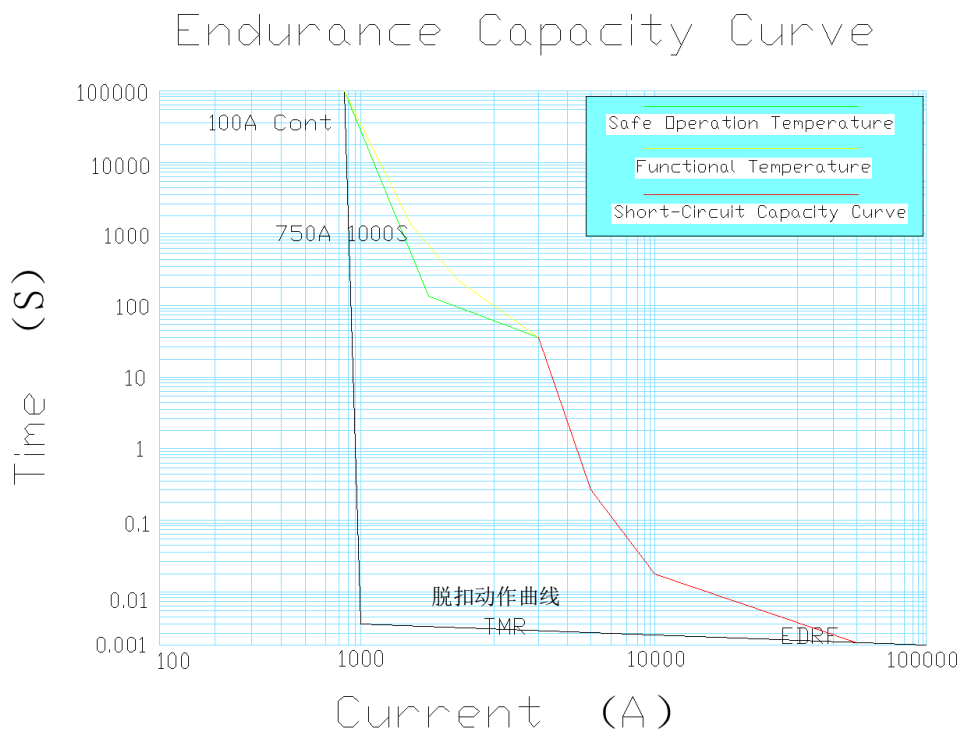
1. No arcing or sticking of the switch, and the electrical life of the contacts is close to the mechanical life.
2. The switch is free of electromagnetic interference, guaranteeing the safety of data transmission of the whole vehicle.
3. Equipped with output circuit arc and leakage detection function, dual contactor redundancy design
4. Load anomaly detection, connection shorted or error alarm function.
5. Accurate current and voltage measurement, SOC calculation (the anhaltime integral method) function.
6. With circuit breaker function, over-current and short-circuit protection.
7. Replaces the fuse and can be configured with over-current short-circuit current according to user requirements.
8. 6000-15000A breaking capacity, breaking time 5-12ms.
9. CAN FD communication, compatible with CAN 2.0.



Characteristics:

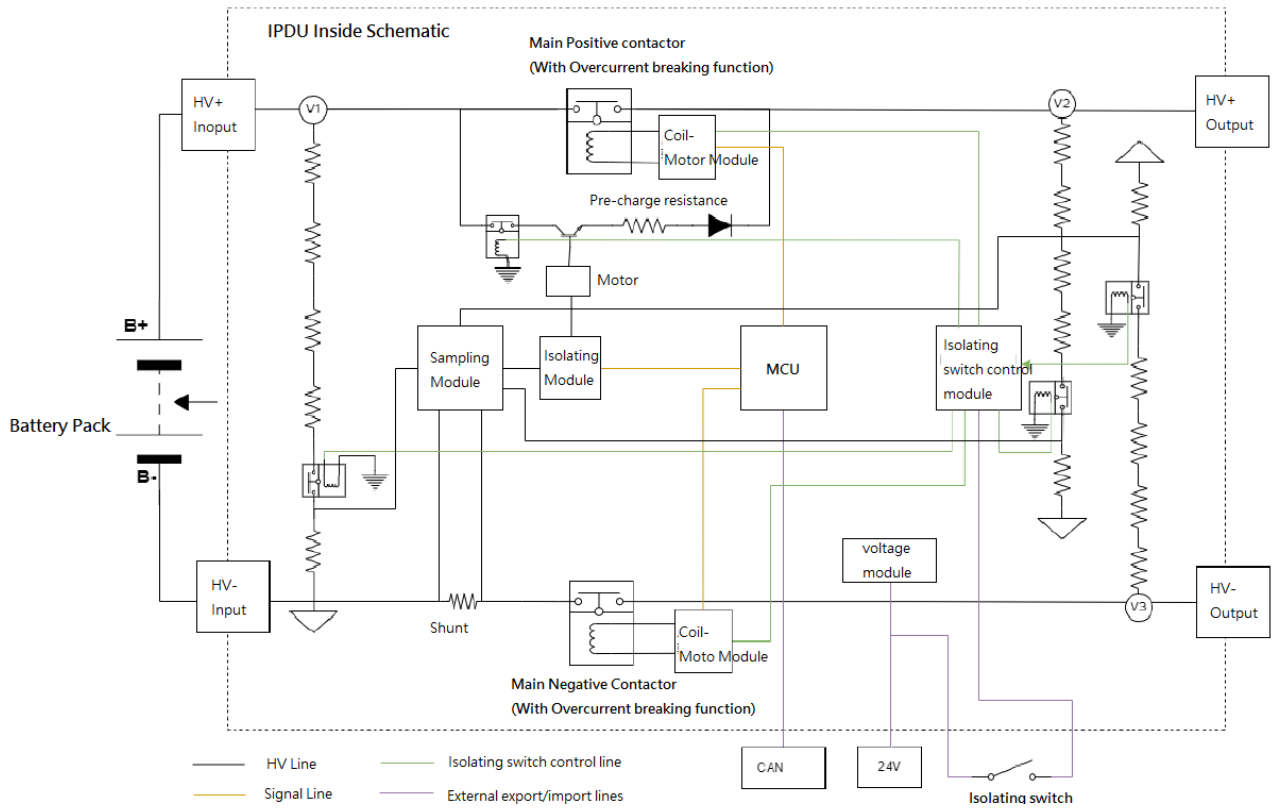
Feature	Description
Performance of switch contact protection	Magnetic blowing, interrupter, IGBT turn-on resistor precharge and arc diversion.
Contact sticking issues	No contact sticking issues.
Electrical switching life	100,000 times.
Switching transient EMC issues	No conducted, radiated, EFT interference(Protocol open).
Over-current protection function	The current is configured by the car manufacturer for over-current value, ≤15ms active breakage.
Short circuit physical disconnect	The higher the current, the faster the breaking. Passive breaking with circuit breaker function. 5-12ms, the breaking time is determined by I2t.
Intelligent insurance configuration	Solve the problem of fuse disposable, non-recoverable, uncontrollable, current and melting time matching blind spot、short fuse life due to di/dt current surge.
Load Circuit Arc Detection	Loose connection in load circuit harness arcing or disconnection.
Data Analytics and Intelligent Learning Models	Current, voltage, power and other parameters for data analysis and intelligent learning mode, to provide a reference for the configuration of load data under the operating conditions of the car factory.

Circuit Breaker Function Release Curve and Temperature Safety Range(Current vs. time):

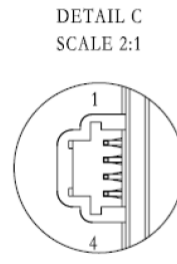
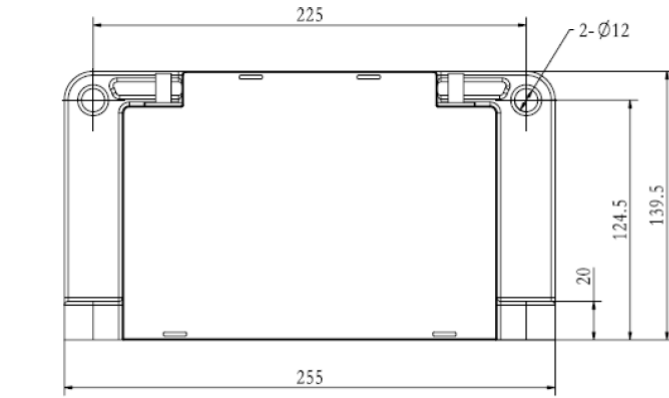




Schematic:

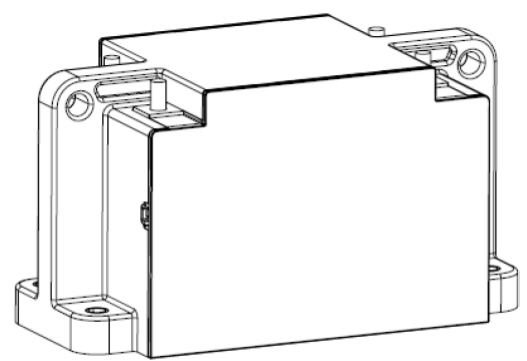
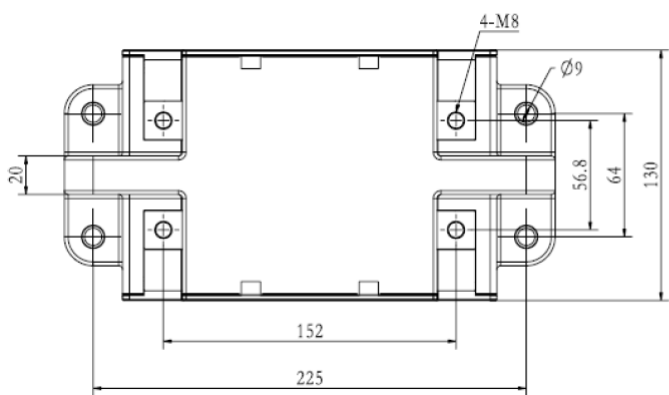


Mechanical Dimensions:



Connector : TE 1473672-1

PIN OUT	
1	CAN-L
2	CAN-H
3	GND
4	Vcc

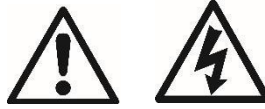




Caveats:

The use of iPDU must comply with the IEC61010-1 standard. The sensor must be placed in an electronic or electrical device that meets the standards and safety requirements of the application in accordance with the instructions for use.

Attention! Watch out for the electric shock!

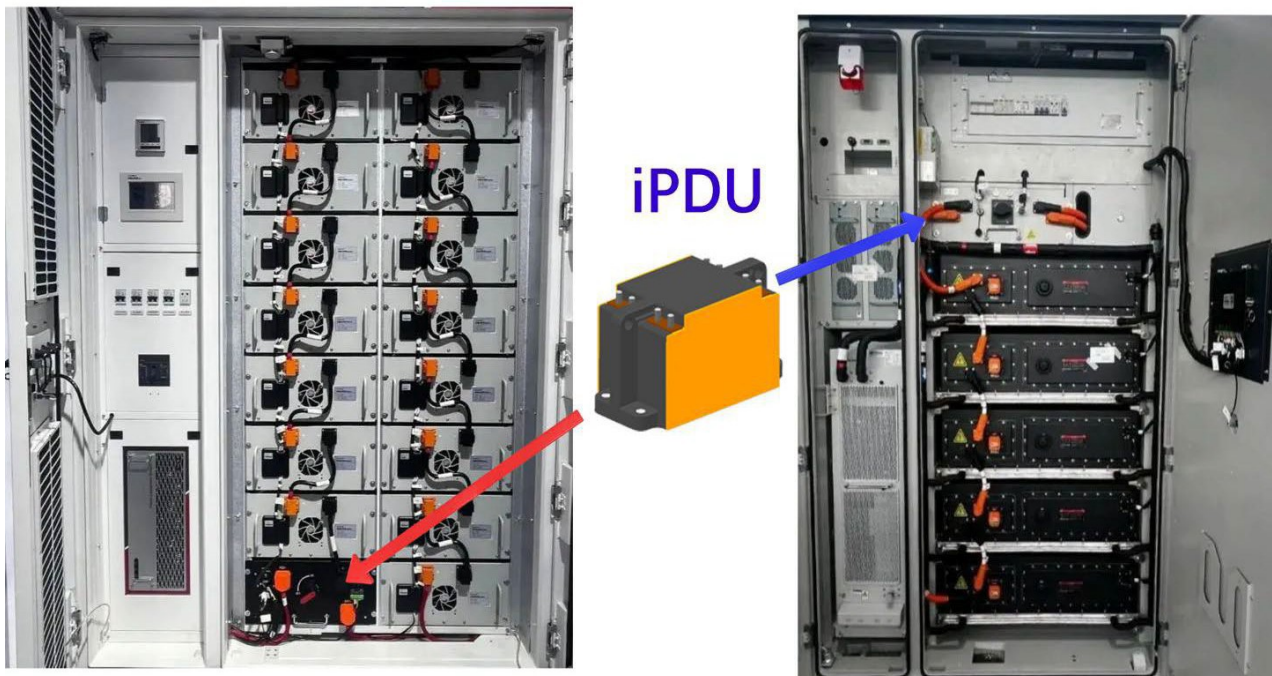


Certain parts of the iPDU ,such as raw edge bus-bar and power supply, may be subjected to hazardous voltages when it is in operation, ignoring these will lead to damage and serious danger. After installation, the conductive parts must be kept out of the reach of the outside world. Protective cases or shields can be added if necessary. The mains power supply must be disconnectable.

Typical Applications:

According to the current new energy vehicle high voltage, high current and fuse in operating condition, design a new ideal circuit breaker to solve the related problems.

1. Contactors are protected by semiconductors when switching, no arcing of contacts and no damage to contacts, electrical life is close to mechanical life, no electromagnetic interference. The contacts of the contactor will not be damaged and will not become abnormally hot or sticky. Replace the disposable fuse function. It can be configured according to user needs load over-current, circuit breaker protection parameters, intelligent disconnection and intelligent judgment recovery, to ensure that the contactor switch is safe and reliable. Dual contactor redundancy design.
2. Reliable over-current and short-circuit breaking capacity ensures that the load is in a safe state under abnormal conditions. (6000-15000A)
3. Ability to judge load circuits for misconnections, short circuits, poor contact, arcing, etc.
4. Accurate measurement of current, voltage, temperature and humidity parameters. Detecting contact damage and providing information on the safety and security of BMS work.



The iPDU can be mounted inside or outside the battery pack.



Product Conformity:

1. ISO9001 IA TF/TS16949 ISO14001 certified company
2. Conforms to IEC60947-2 and GB/T10330 standards
3. Plastic housing, epoxy and circuit board assembly meets UL 94-V0

Representations:

1. This information is for customer's reference only, products and specifications, parameters may be changed due to product improvement, etc. The specific parameters and performance of each product involved should be based on the specifications and samples provided by LANSON without prior notice.
2. With regard to the application area, need to evaluate the contactor in each specific application area of all the performance parameters required, the customer should be based on the use of specific load conditions to select the product to match, which does not specify the requirements of the conditions, please contact LANSON in order to obtain more technical support. LANSON expressly declares that the information in this material is for selection reference only, and that the responsibility for product selection rests solely with the customer.