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PATR

Cable Energy Harvest Coil & Module

Operating Frequency	50Hz~60Hz
Max. Operating Current	1500A
Max. Withstanding surge	31.5kA in 4s

Applications

Power Grid Fault Indicator

Partial discharge Monitor

Transmission Line Monitor Device

Live Camera

Drone Charging in Field

Better Solution for Sustainable High End Manufacturing

Zero-Noise Energy Harvesting
OVP & OCP Ability. IP68 Protection

Introduction

PATR series cable energy harvest coil is based on electromagnetic field to obtain low-voltage power source from the power grid cable, store it in an external small power supply, and provide low voltage power for cable monitor systems and equipment. PATR energy harvest coil is a split-core type coil, applied polishing process to make the cutting surfaces of the magnetic core perfectly fit, greatly reducing noise. Meanwhile vacuum pressure impregnation is applied to bond the interlayer of the magnetic core, reducing the magnetostriction caused by magnetic field changes, lowering the noise of operation, and achieving zero noise operation.

The overvoltage/overcurrent protection (OVP/OCP) of PATR series cable energy harvest module limits the secondary side of PATR energy harvest coil to below 70VAC, reducing the risk of electric shock during installation and possessing intergraded function on OVP/OCP.

The waterproof and dustproof capability of PATR reaches IP68, enabling it to operate in extreme harsh environments. The cutting surfaces of PATR split-core type coil are conducted anti-corrosion treatment. PATR is equipped with high-strength clamps and shock-absorbing pads. For the lead wires, corrugated pipes are equipped for protection. Through multiple reinforcement protections, the energy harvest coil can operate stably in extreme environments, with zero noise harvesting, providing low-voltage power for power grid monitoring systems and equipment.

Electrical Parameters (Coil)

Operating Frequency	Max. Operating Current (Cable)*	Max withstanding surge current (Cable)*	Ingress Protection
50Hz~60Hz	1500A	31.5kA in 4s	IP68

Operating Temperature Range	Clamping voltage (Open circuit)	Temperature Rise	Lead Wire*
-25°C~+75°C	Less than 70V	Long-term operation below 55°C	Outdoor Copper Core Flexible Cable (2-Core, 1-Square)

Coiling Wire*	Operating Noise	Shipping Inspection Standards (25°C)
1.0mm Enameled Wire	＜5 db (Load 850A. Measure at a horizontal distance of 1 meter)	Output power of 15A is larger than 1W Test with 12V module

*refers to the parameters that are adjustable according to the requirements

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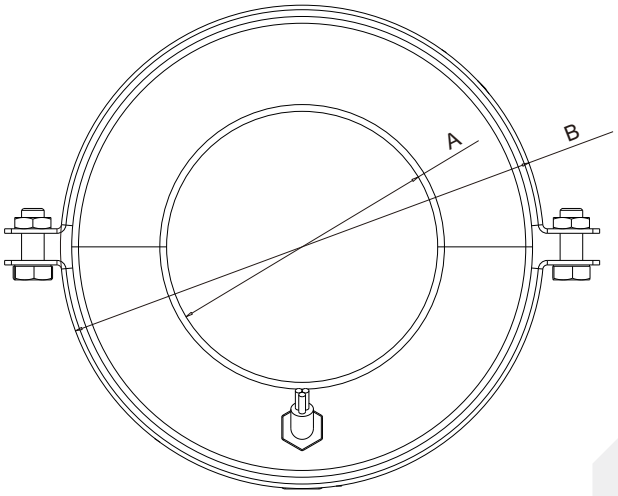
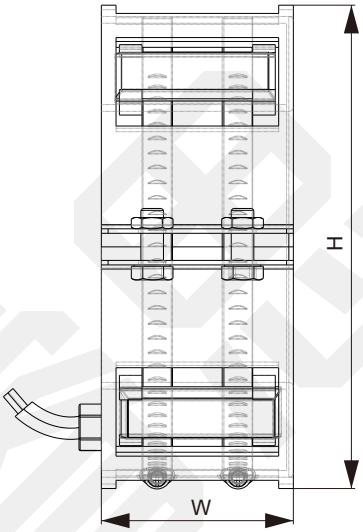
Dimensions (Coil)

Unit:mm





Internal Diameter	A	B	W	H	Weight
120	∅120±2.0	∅205±2.0	85±2.0	214±2.0	8.3kg
160	∅160±2.0	∅250±2.0	80±2.0	260±2.0	9.1kg
180	∅180±2.0	∅270±2.0	80±2.0	280±2.0	10.8kg

Part Number Information

Example: PATRC16015070VM059 (PATR Coil Φ160mm 150turns 70V 5m Standard)

P	A	T	R	C	1	6	0	1	5	0	7	0	V	M	0	5	9

Series	Product	Internal Diameter *	Winding Turns *	Clamping voltage (Open circuit)	Length of Lead Wire *	Code
PATR	C=Coil	120=120mm 160=160mm 180=180mm	150=150 turns 120=120 turns	70V=70VAC 90V=90VAC	M05=5m M10=10m	9=Standard

*. If the standard parameters cannot meet the requirements, please contact us for customization.

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Electrical Parameters (Module)

Input Protection	Output Power*	Output Ripple	Output Voltage*	Conversion Efficiency
Surge Protection Circuit	30W	⩽Vo1%	12.8V	⩾ 90% (Full Load)

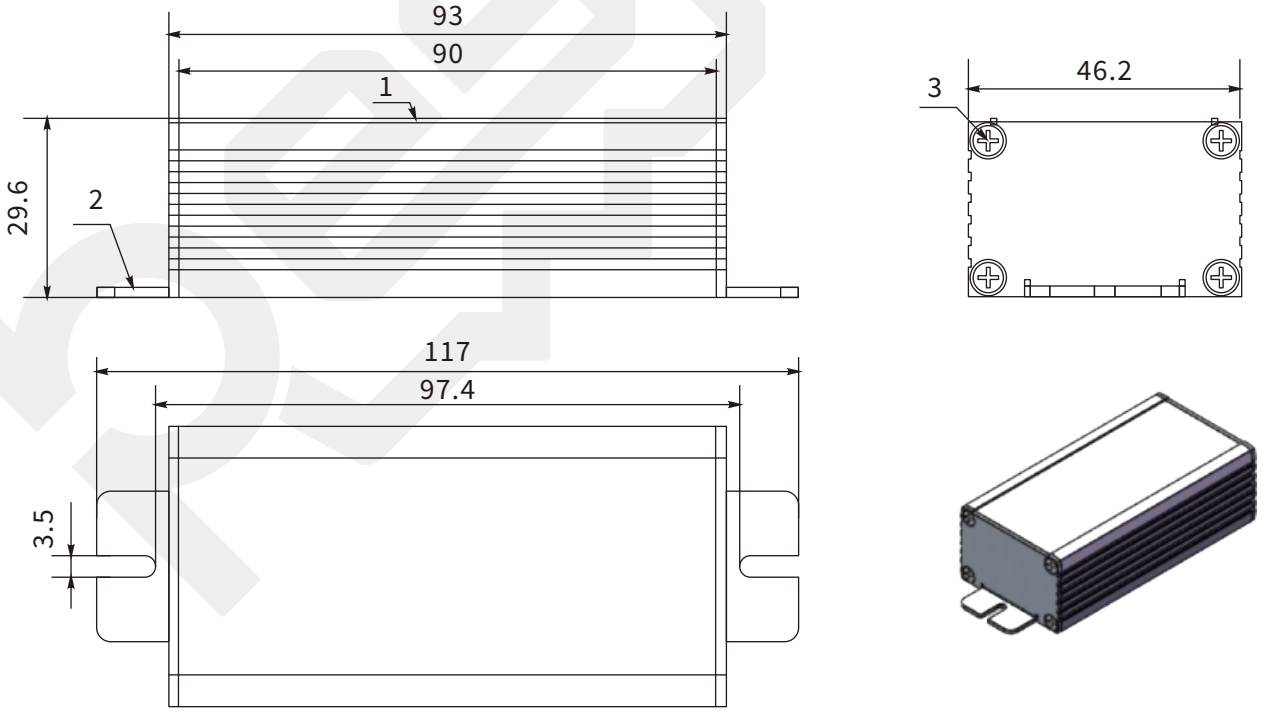
Output Protection	Ambient Temperature	Storage Temperature	Max. Operating Current (Cable)	Max withstanding surge current (Cable)*
Overvoltage/Overcurrent Protection	-40℃~+75℃	-40℃~+70℃	1500A	31.5kA 4s

Charging Current Limit*	Float Voltage Limit*	Heat Dissipation	Ingress Protection
0.5A	12.8V	Natural Cooling / Wind Cooling	IP68

*refers to the parameters that are adjustable according to the requirement

Dimensions (Module)

Unit:mm



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Part Number Information

Example: PATRM12V30WLP9 (PATR Module 12V 30W Lithium Iron Phosphate Battery Standard)

P	A	T	R	M	1	2	V	3	0	W	L	P	9

Series	Module	Output Voltage *	Output Power *	Output Terminal *	Code
PATR	M=Module	05V=5V 09V=9V 12V=12V 15V=15V 24V=24V	30W=30W 15W=15W	LP=Lithium Iron Phosphate Battery LI=lithium Ion Battery SC=Supercapacitor LA=Lead Acid Battery NC=No Charge & Discharge Management	9=Standard N=Noise Canceling

1. If the standard parameters cannot meet the requirements, please contact us for customization.
2.Output voltage depends on the type of your battery. For examples, Lead Acid battery are typically 7.2V, 14.4V;
Lithium Ion battery are typically 4.2V, 12.6V. We support custom design to matching your battery.

Power Output Curve

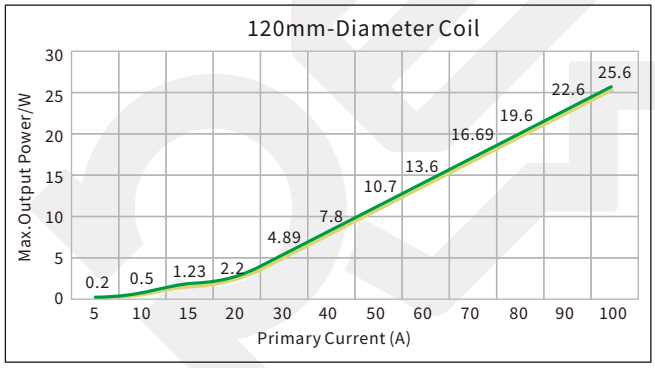
Test with 12V output energy harvest module for the power output test. (Due to individual differences in the performance of the harvest coil, the diagrams are for reference.)

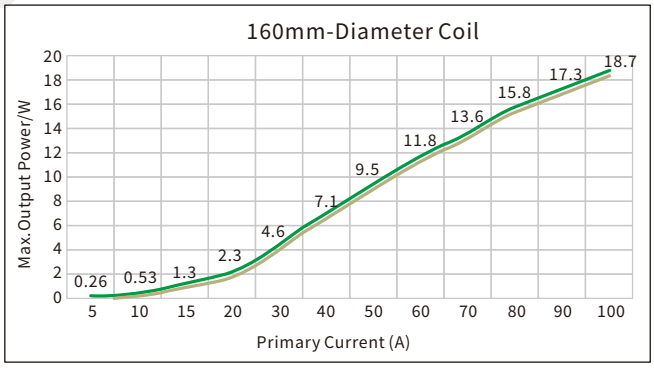
Test Conditions: Apply AC 50Hz @ Room temperature 25°C.

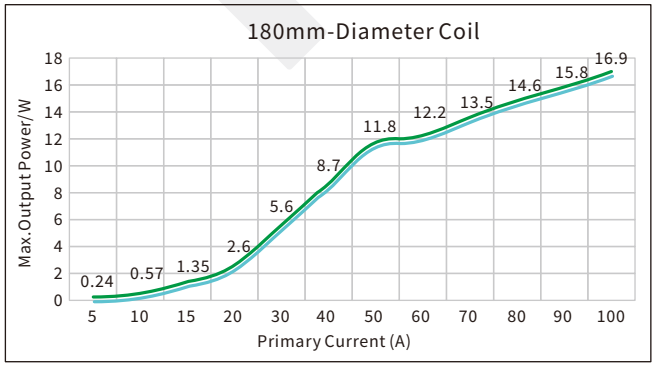
Note:

1.Test result could be slightly different under 60Hz.

2.If the product is stored in a low-temperature environment for a long time, please place it at room temperature for at least 36 hours before testing its power output capability.







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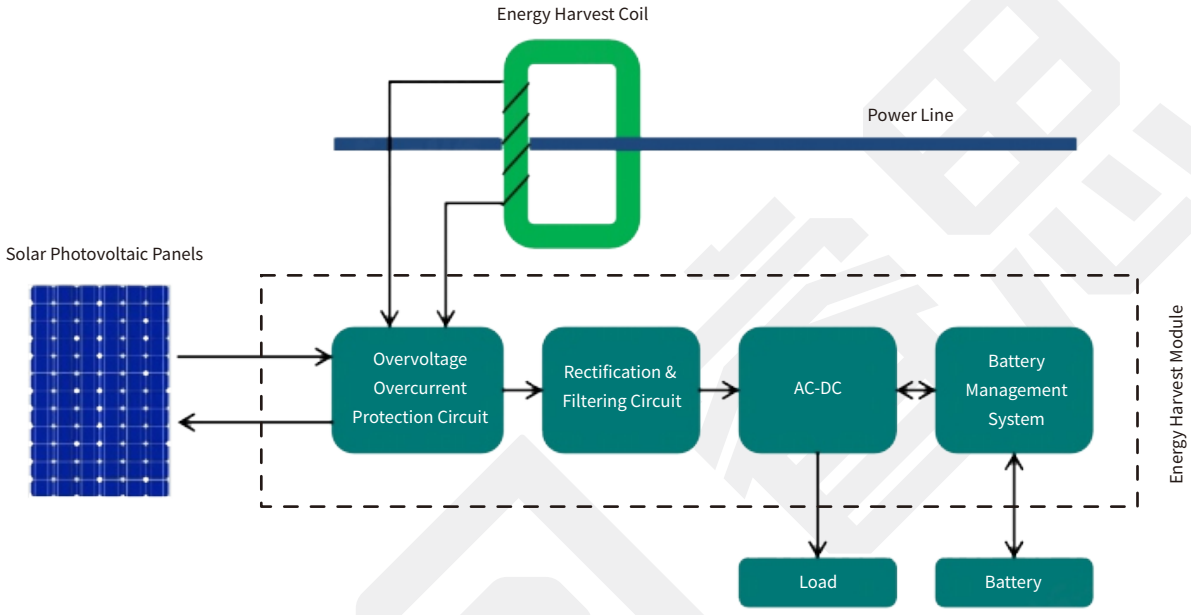
Typical Application Demonstration

The cable energy harvest equipment consists of two parts: the cable energy harvest coil and the cable energy harvest module.
The typical application is shown in the following diagram:



Instructions

1. The output voltage is adjusted according to different battery types. When the battery is not connected, the output voltage of the module is the maximum voltage of battery charging.
2. When charging and discharging with a battery, the output voltage equals to the battery voltage.
3.Operating Strategy of Energy Harvesting Module
   1) Prioritize supplying to the load. When the output power of the harvest coil is insufficient, the harvest coil and the battery jointly supply to the load. When the output power of the harvest coil exceeds requirement of the loading devices, the battery is charged at the same time. The power supply from harvest coil or battery can be switched smoothly.
   2) When the cable current is too high, leading to high harvest coil output voltage, the overvoltage protection (OVP) of the module is triggered, controlling the thyristor to continuously switch and pull down the input voltage.
   3) Under the condition of dual input from coil and photovoltaic panel, the coil prioritizes power supply. When the supply of coil is insufficient, the coil and photovoltaic panel operate in parallel.

4. Terminal Definition

Input Terminal		Note	Output Terminal		Note
INPUT A	Coil 1 Input or Photovoltaic Input	Coil or photovoltaic input are no polarity.	VB+	Battery Positive Terminal	Connect the wires correctly. No reverse connection.
	Coil 1 Input or Photovoltaic Input		VB-	Battery Negative Terminal	
INPUT B	Coil 2 Input or Photovoltaic Input		Vo	Positive Output	
	Coil 2 Input or Photovoltaic Input		GND	Ground Output	

5. Indicator Light Demonstration

Indicator Light	Status	Demonstration
Green	Off	Module output voltage (to battery/load) less than rating voltage
	On	Module output voltage (to battery/load) is now in rating voltage (Normal Condition)
Red	Off	1.Module input voltage (from coil) is low 2.Battery is now in charging
	On	Module input voltage (from coil) is normal (Normal Condition)

Marking

Product	Illustration	Demonstration
Coil		LOGO: RESI Part Number: PATRC16015070VM059 Winding Turns:150 turns Internal Diameter:160mm Ingress Protection: IP68 Production Number: 2024011801
Module		LOGO: RESI Part Number:PATRM12V30WLP9 Input Terminal: INPUT A INPUT B Output Terminal: Load Battery Load Positive Output: Vo Load Ground Output: GND Battery Positive Terminal: VB+ Battery Negative Terminal: VB-

Note: Input terminals are no polarity, and can be coil or photovoltaic input, please connect the wires correctly. No reverse connection.

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Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2024.10.12	LFY
V1	Drawing update	2024.12.18	LFY

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