

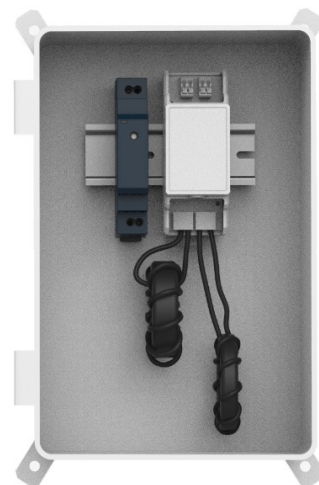
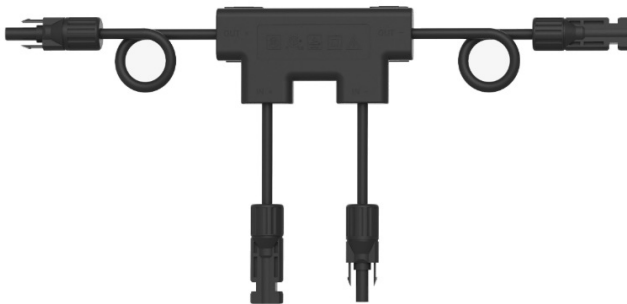


## hoymiles HRSD-1C Rapid Shutdown Solution User Manual

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Open Energy for All



**Rapid Shutdown  
USER MANUAL  
HRSD-1C HT10 HT10-Kit  
Rapid Shutdown User Manual**

### SAVE THESE INSTRUCTIONS

- This manual contains important instructions for the installation and maintenance of the Homilies product models HRSD-1C and the Transmitter.
- Risk of electric shock, do not remove the cover, disassemble, or repair, no user-serviceable parts inside. If it fails, contact Hoymiles Customer Support. Damaging or opening the product will void the warranty.
- Before installing or using the Hoymiles HRSD-1C System, please read all instructions and warning markings on

the Hoymiles products, relevant sections of your inverter manual, and photovoltaic (PV) module installation manual, and other available safety guides.

- Failure to adhere to these instructions may result in injury or death, damage to the system, or invalidation of the factory warranty.
- Perform all electrical installations in accordance with local codes.
- Do NOT disconnect the PV module from the HRSD-1C without first disconnecting the AC power.
- Installation must be performed by trained professionals only. Hoymiles do not assume liability for loss or damage resulting from improper handling, installation, or misuse of products
- Do not attempt to install in inclement weather.
- Be aware that the body of the running HRSD-1C is the heat sink and can reach high temperatures. To reduce the risk of burns, do not touch the body of the HRSD-1C.
- Do not operate the HRSD-1C if they have been physically damaged. Check existing cables and connectors and ensure they are in good condition and appropriate in rating. Do not operate HRSD1C with damaged or substandard wiring or connectors.
- Do not connect or disconnect under load. Turning off the Inverter and/or the HRSD-1C products may not reduce this risk. Internal capacitors within the inverter can remain charged for several minutes after disconnecting all power sources. Verify capacitors have discharged by measuring a voltage across inverter terminals before disconnecting wiring if service is required. Wait 30 seconds after rapid shutdown activation before disconnecting DC cables or turning off DC disconnect.
- The transmitter control power supply MUST be on the same AC branch circuit as the inverter to meet rapid shutdown requirements.

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## Product

### 1.1 HRSD-1C



|          |   |
|----------|---|
| Features | • Meets NEC2017&NEC2020 690.12 requirements                 |
|          | • Meets Sunspec RSD requirements                            |
|          | • PLC communication realize rapid shutdown with Transmitter |
|          | • Plug & play, no configuration required                    |
|          | • Lower power consumption and wider operating voltage range |
|          | • Much lower than arc noise. No risk of triggering AFCI     |

As part of Hoymile's rapid shutdown solution for PV systems, HRSD-1C can be connected with one module. It meets NEC2017, NEC 2020, UL 1741 and Sunspec Rapid Shutdown requirements, guaranteeing PV system safety.

When installed with and receiving a "permission to operate" signal from Hoymiles Transmitter, HRSD starts proper operation of PV system. In case of emergency, PV system would enter module-level rapid shutdown mode by simply disconnecting the AC power of the Transmitter or using an external initiator.

### 1.2 HT10

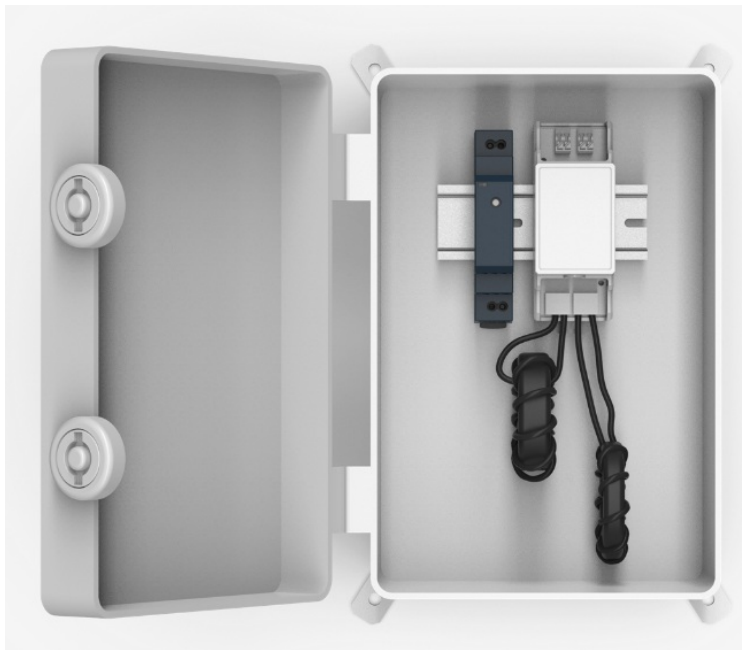


|          |  |
|----------|--|
| Features | • Meets NEC2017&NEC2020 690.12 requirements  |
|          | • Meets SunSpec RSD requirements   |
|          | • Equipped with single/dual core   |
|          | • Realize rapid shutdown by simply powering off the transmitter or using an external initiator |

The Transmitter HT10 is part of the Homilies Rapid Shutdown solution. When paired with Hoymiles rapid shutdown HRSD and powered on, HT10 sends a "permission to operate" signal to HRSD, to make PV modules connected in series and then connect to a string inverter, thus producing power.

In case of emergency, PV system would enter module-level rapid shutdown mode by simply disconnecting the AC power of the Transmitter or using an external initiator.

### 1.3 HT10-Kit



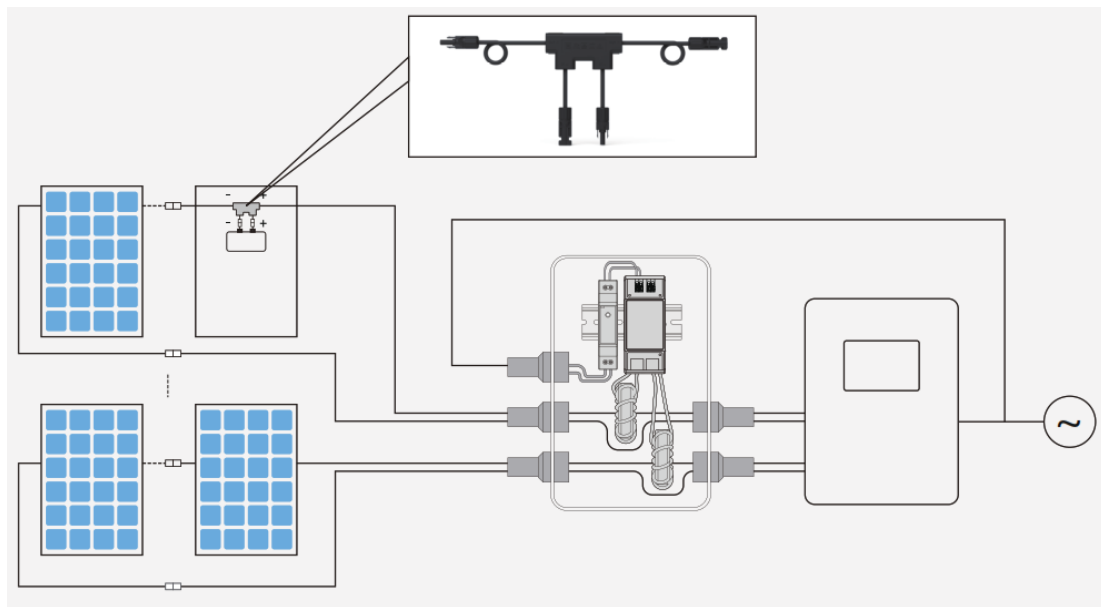
|                 |  |
|-----------------|--|
| <b>Features</b> | • Meets NEC2017&NEC2020 (690.12) and Sunspec RSD requirements                                  |
|                 | • Module-level rapid shutdown with Hoymiles HRSD   |
|                 | • Equipped with single/dual core   |
|                 | • Realize rapid shutdown by simply powering off the transmitter or using an external initiator |
|                 | • Weatherproof outdoor enclosure   |
|                 | • Includes power supply  |

Homilies Transmitter HT10-Kit is part of a rapid shutdown solution when paired with Hoymiles rapid shutdown HRSD. While powered on, HT10-Kit sends a “permission to operate” signal to HRSD to keep the PV modules connected in series to the string inverter and produce power.

PV system equipped with HRSD and HT10-Kit enters module-level rapid shutdown by simply disconnecting the AC power of the Transmitter during emergencies.

Homilies Transmitter Outdoor Kit includes one Transmitter, one or two cores, an 85~264V power supply, and an outdoor enclosure.

## System Overview



The HRSD-1C requires a Transmitter or inverter with a built-in transmitter for operation.

The Transmitter is installed in line with a solar PV inverter.

The HRSD-1C starts in the OFF position and measures 1V at the output. When power is supplied to the Transmitter, the HRSD-1C turns ON and allows full PV module voltage. The HRSD-1C constantly receives a “permission to operate” signal from the Transmitter. When power to the Transmitter is cut, this “permission to operate” signal ceases, sending every HRSD-1C into shutdown mode with output reduced to 1V.

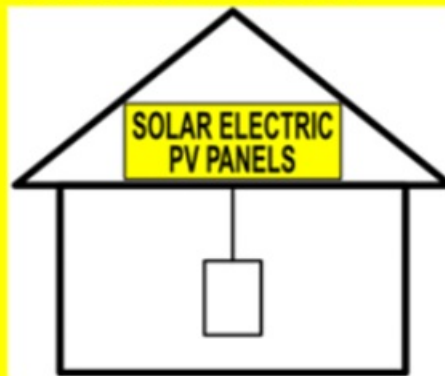
In this way, the PV array enters rapid shutdown in event of AC grid loss.

## Installation Notes

- Installation MUST comply with local regulations and technical rules.
- Perform all electrical installations in accordance with local codes.
- Be aware that only qualified professionals should install and/or replace the HRSD-1C.
- Before installing or using an HRSD-1C, please read all instructions and warnings in the technical documents and on the inverter system itself as well as on the PV array.
- Be sure to verify the voltage and current specifications of your PV module match those of the HRSD-1C.
- Never apply an external voltage source to a module or string equipped with HRSD-1C.
- HRSD-1C is shipped in the OFF position and will measure 1V at the output when the “permission to operate” signal is not present.
- Failing to follow the sequence of installation steps may result in HRSD-1C damage not covered under warranty.
- Connect HRSD-1C to its respective modules before connecting its outputs in series.
- Install HRSD-1C before powering on the Transmitter.
- If parallel string connections are needed, first connect the HRSD-1C to the PV modules, then connect all outputs of HRSD-1C in series, and finally pass one side (+ or -) of the string through the transmitter to turn the system ON.
- Do not touch any live parts in the system, including the PV array, when the system has been connected to the electrical grid.
- Place rapid shutdown system label no more than 1m (3ft) from the initiator (AC disconnect) or service panel containing means of disconnection if not at same location.

# SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY

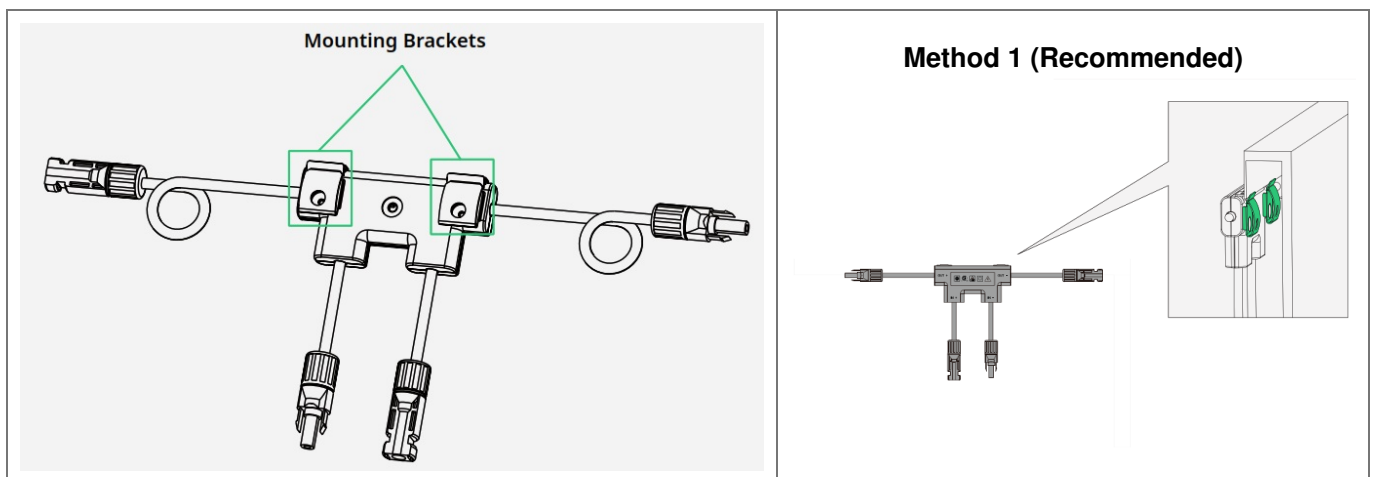


Place safety labels in proper location

## Installation

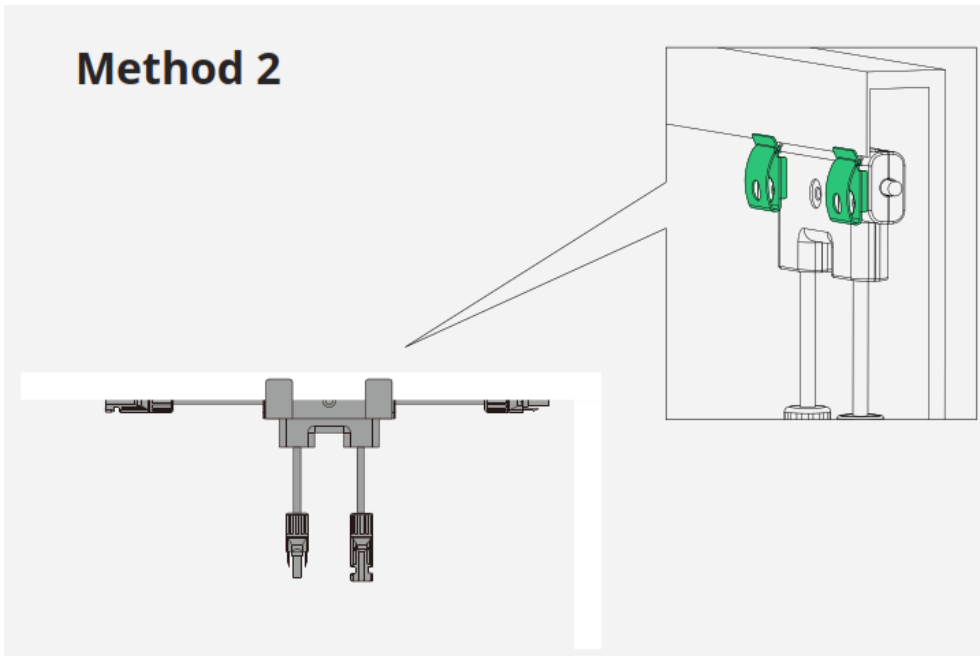
### 4.1 HRSD-1C Installation

A ). Buckle HRSD-1C on the PV module frame. HRSD-1C can be installed anywhere on the PV module frame.



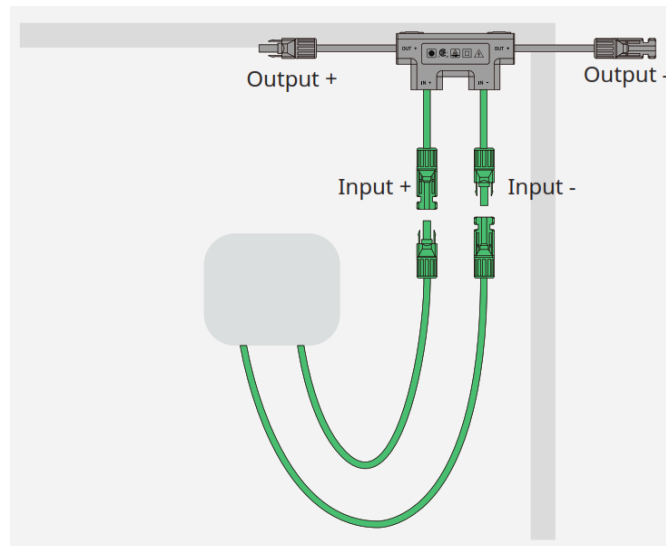
Allow a minimum of 1.5 cm of space between the roof and the HRSD-1C enclosure to ensure ventilation and heat dissipation

## Method 2

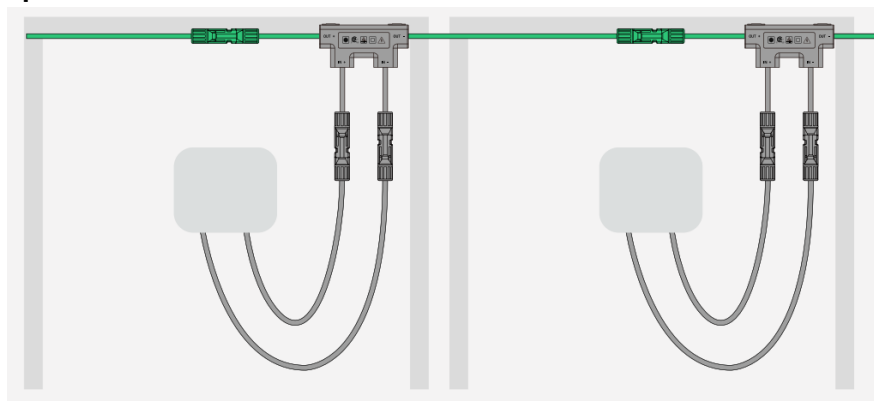


Allow a minimum of 1.5 cm of space between the roof and the HRSD-1C enclosure to ensure ventilation and heat dissipation

B ). Connect modules to inputs of HRSD-1C. Each HRSD-1C must have a PV module connected to its inputs.



C ). Connect the outputs of HRSD-1C in series.



**Note:** When installing HRSD-1C, connect the input cables to the PV module before connecting the HRSD-1C output cables in series.

If disconnecting HRSD-1C, disconnect the HRSD-1C output cables from the string before disconnecting the input cables from the PV module.

Connectors from different manufacturers cannot be mated with each other.

The transmitter must be powered off during HRSD-1C installation.

HRSD-1C output Voltage is 0.9V to 1.1V when the Transmitter “permission to operate” signal is not present.

**Max. string length: 30 modules**

Max. cable length from the inverter (+) to the inverter (-): 1000ft (300m)

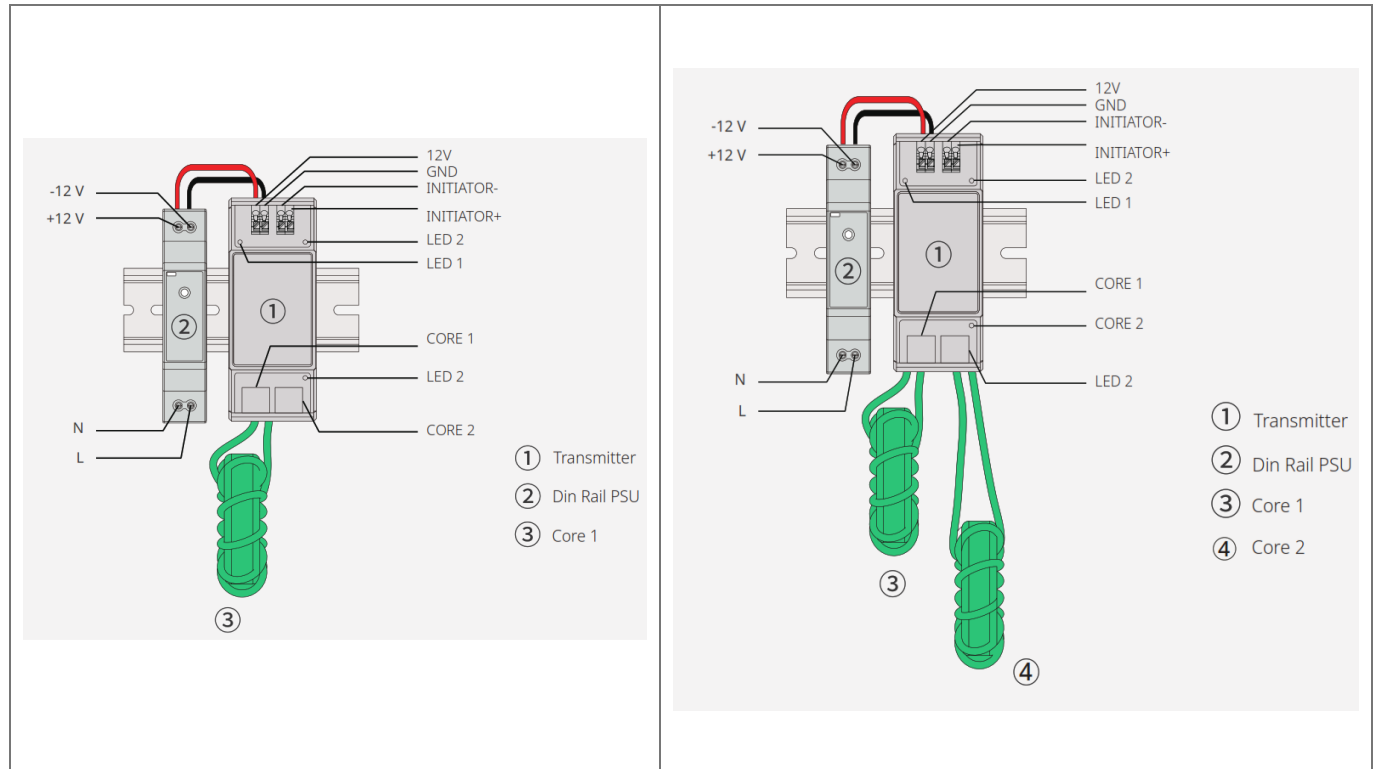
#### 4.2 HT10 Installation

A ). – Mount Transmitter HT10 and power supply on DIN rail.

– Connect DC leads from power supply to Transmitter.

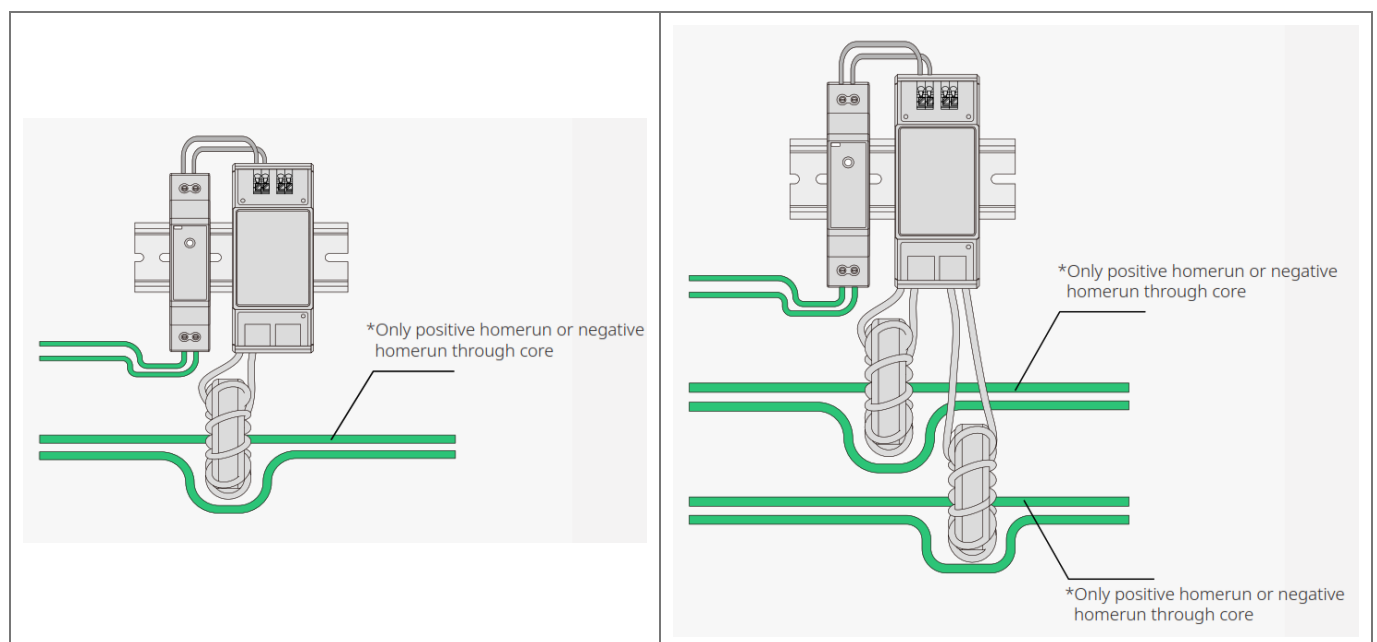
– Connect Core to Transmitter HT10.

– If there is only one core that needs to be connected, please connect Core 1 first.



B ). – Pass either positive homerun or negative homerun through cores.

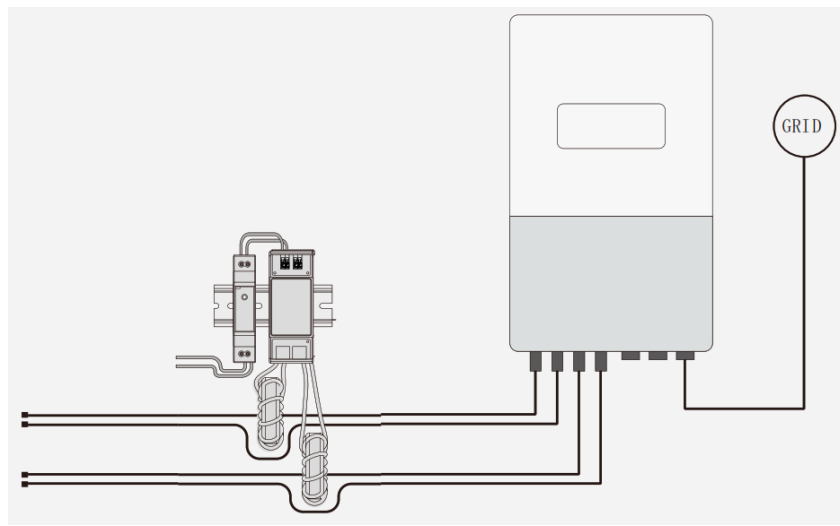
– Connect wires to the AC side of the power supply.



C ). – Connect the serially connected outputs of HRSD-1C to the inverter with a DC cable.

– Turn on AC power to Transmitter HT10 power supply to activate the “permission to operate” signal.





**Note:** Install HRSD-1C before powering on Transmitter HT10-Kit. The transmitter HT10-Kit power supply must be on the same AC branch circuit as the inverter to meet rapid shutdown requirements. When the PV system is operating, the Power LED1 should be lit and the Signal LED2 should be blinking. Place rapid shutdown system label no more than 1m (3ft) from Transmitter or AC disconnect if not at the same location.

**Note:** Max. number of strings per Core

\* : 5 (75A core) or 15 (150A core) Max. current per Core: 75A or 150A

Max. cable length from the inverter (+) to the inverter (-): 1000ft (300m)

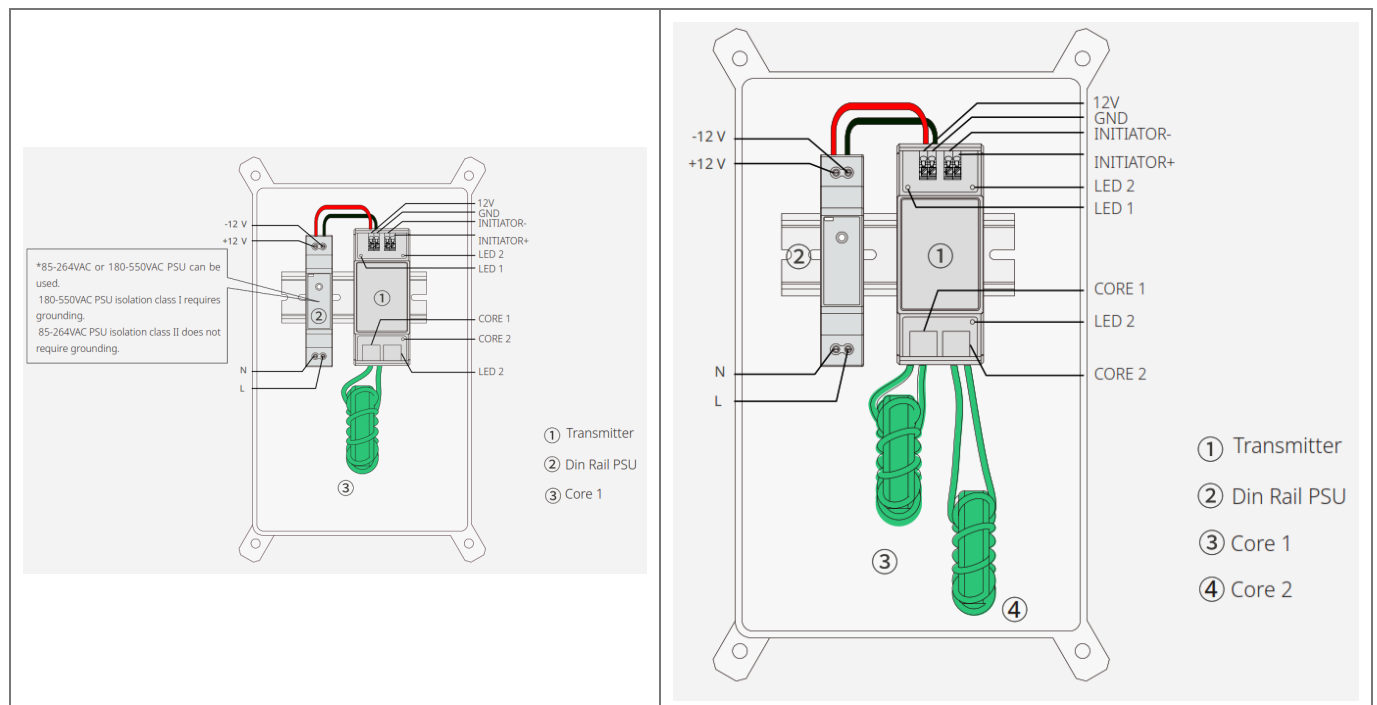
\* With  $\Phi$  6 mm DC cable diameter (without DC connector)

#### 4.3 HT10-Kit Installation

A ). – Mount Transmitter HT10-Kit and power supply on DIN rail.

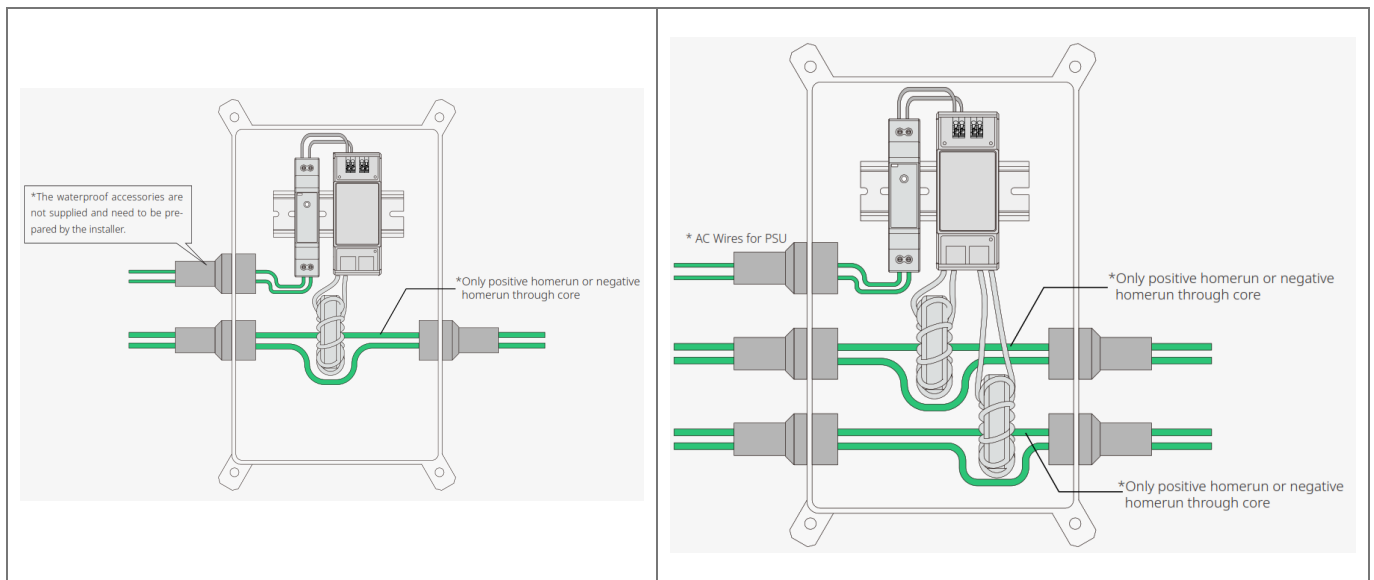
– Connect DC leads from power supply to Transmitter HT10-Kit.

– Connect Core to Transmitter HT10-Kit. If there is only one core that needs to be connected, please connect Core 1 first.



B ). – Pass either positive homerun or negative homerun through cores.

– Connect wires to the AC side of the power supply.



C ). – Connect ground wires.

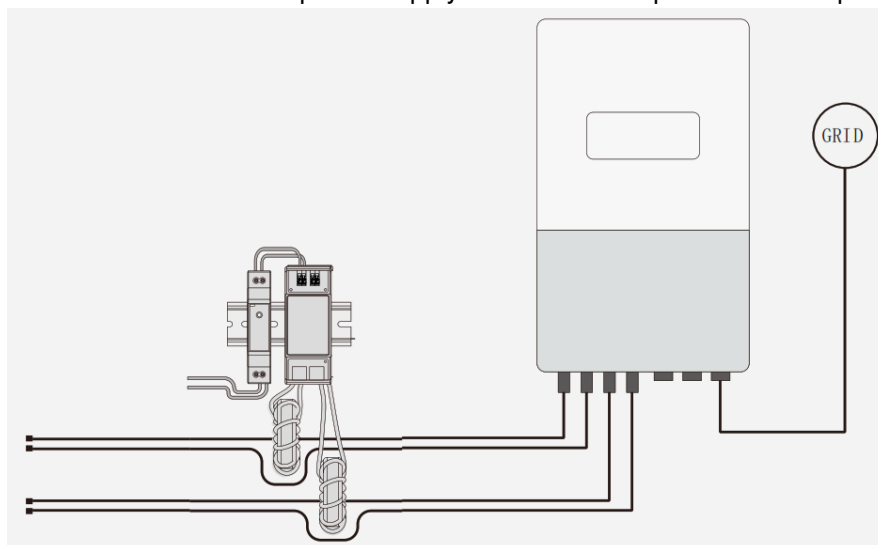
– Ground all conduit connections.

– The nonmetallic enclosure does not provide bonding between conduit connections.

– Use grounding-type bushings and jumper wires.

D ). – Connect the serially connected outputs of HRSD-1C to the inverter with a DC cable.

– Turn on AC power to Transmitter HT10-Kit power supply to activate the “permission to operate” signal.



**Note:** Install HRSD-1C before powering on Transmitter HT10-Kit.

The transmitter HT10-Kit power supply must be on the same AC branch circuit as the inverter to meet rapid shutdown requirements.

When the PV system is operating, the Power LED1 should be lit and the Signal LED2 should be blinking.

Place rapid shutdown system label no more than 1m (3ft) from Transmitter or AC disconnect if not at the same location.

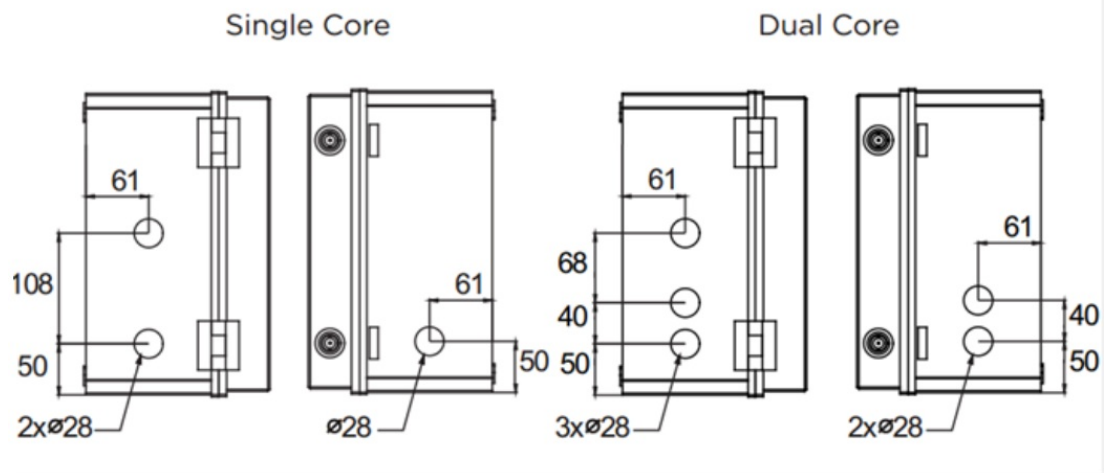
**Note:** Max. number of strings per Core

\* : 5 (75A core) or 15 (150A core) Max. current per Core: 75A or 150 Max. cable length from the inverter (+) to the inverter (-): 1000ft (300m)

\* With  $\Phi$  6 mm DC cable diameter (without DC connector)

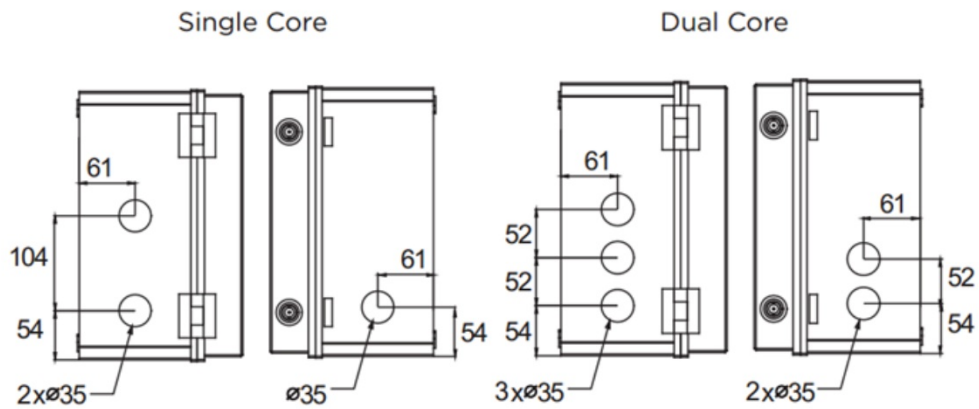
#### 4.4 Conduit Drilling Guide

Enclosure Drilling Guide for .75" Conduit



Enclosure Drilling Guide for 1" Conduit

Drilling Guide for 1" Conduit

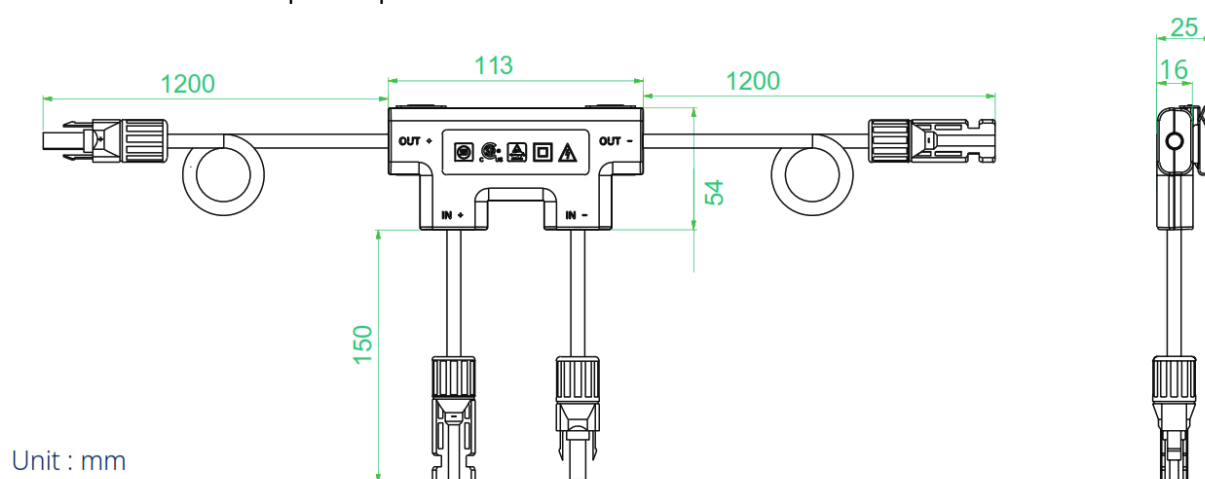


## Technical Specifications

### 5.1 HRSD-1C

|                             |   |
|-----------------------------|---|
| Electrical                  |   |
| Input Voltage Range         | 8-80V   |
| Maximum Current             | 15A (20A or 25A optional)                               |
| Maximum System Voltage      | 1000V (1500V optional)                                  |
| Communication Type          | Sunspel PLC   |
| Shutdown Output Voltage     | 1V  |
| Power Consumption           | 200mW   |
| Mechanical                  |   |
| Input Connectors            | MC4 (standard)  |
| Input Cable Length          | 0.15m   |
| Output Connectors           | MC4 (standard)  |
| Output Cable Length         | 1.2m 1  |
| Dimensions                  | 113 x 54 x 16mm   |
| Environmental               |   |
| Operating Temperature Range | -40°C to +85°C (-40°F to +185°F)                        |
| Outdoor Rating              | IP68/NEMA6P   |
| Compliance                  |   |
| Safety                      | UL1741, CSA C22.2 No. 330-17, IEC/EN 62109-1            |
| EMC                         | FCC Part15 Class B, ICES-003, IEC/EN 61000-6-1/-2/-3/-4 |

\*1: Fits PV module in landscape and portrait installation.



## 5.2 HT10

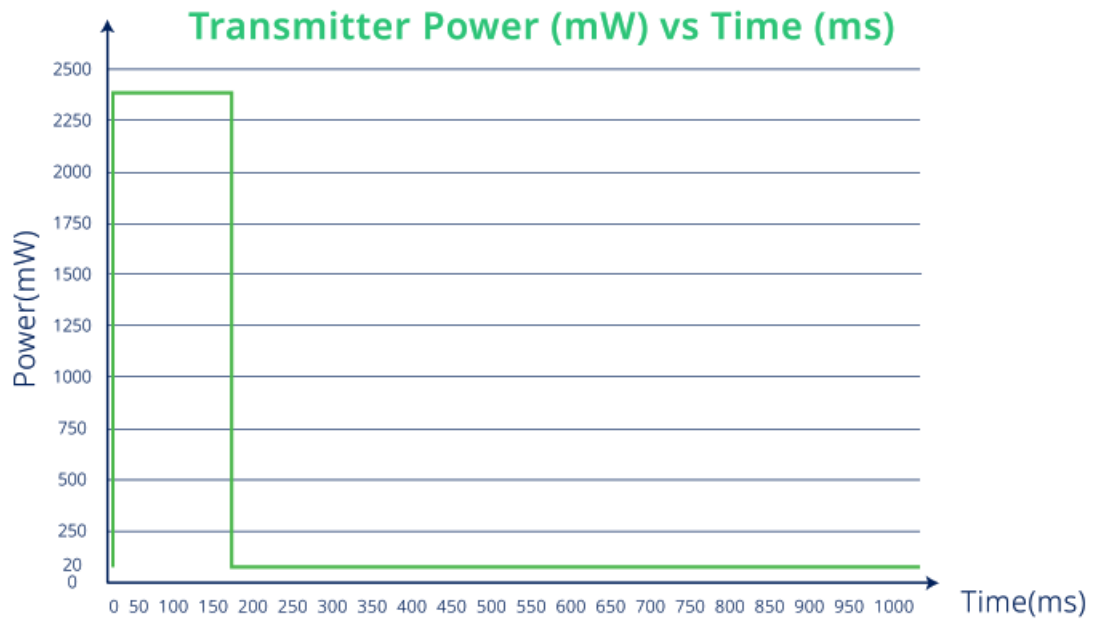
| Electrical                |               |  |
|---------------------------|---------------|--|
| Transmitter Input Voltage | 12VDC (+/-2%) |  |
| Transmitter Input Current | 1A            |  |
| Communication Type        | Sunspel PLC   |  |

| Core                              |         |      |
|-----------------------------------|---------|------|
| Max. Number of Cores Connected    | 2       |      |
| Max. Current per Core             | 75A     | 150A |
| Max. String Voltage               | 1500VDC |      |
| Max. Number of Strings per Core 1 | 5       | 15   |

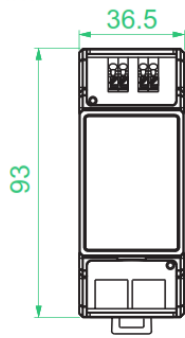
| Mechanical                  |                                  |
|-----------------------------|----------------------------------|
| Dimensions                  | 93 x 36.5 x 53 mm                |
| Mounting Type               | DIN35 Rail                       |
| Environmental               |                                  |
| Operating Temperature Range | -40°C to +85°C (-40°F to +185°F) |
| Outdoor Rating              | IP30/NEMA1                       |
| Compliance                  |                                  |
| Safety                      | UL1741, CSA C22.2 No. 330-17     |
| EMC                         | FCC Part15 Class B, ICES-003     |

When installed inside an inverter, HT1 needs to be powered with the following power curve at least.

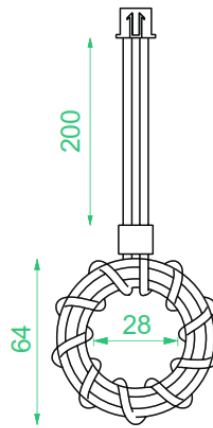
- Voltage: 12VDC (+/-2%)
- Power Standby: 0.2W
- Duty Cycle: 16%
- Max Power: 3W



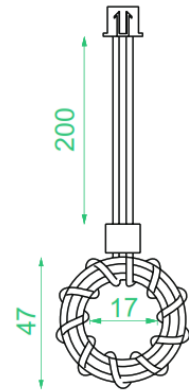
Unit : mm



Transmitter



Core-150A



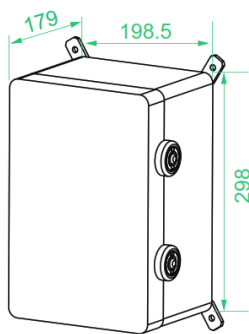
Core-75A

### 5.3 HT10-Kit

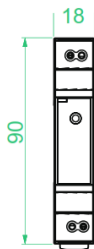
|                            |               |
|----------------------------|---------------|
| Electrical                 |               |
| Power Supply Input Voltage | 85-264VAC     |
| Transmitter Input Voltage  | 12VDC (+/-2%) |
| Transmitter Input Current  | 1A            |
| Communication Type         | SunSpec PLC   |

| Core                              |         |      |
|-----------------------------------|---------|------|
| Max. Number of Cores Connected    | 2       |      |
| Max. Current per Core             | 75A     | 150A |
| Max. String Voltage               | 1500VDC |      |
| Max. Number of Strings per Core 1 | 5       | 15   |

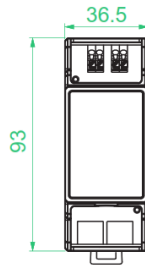
| Mechanical                  |                                  |
|-----------------------------|----------------------------------|
| Dimensions                  | 198.5 x 298 x 179 mm             |
| Mounting Type               | Wall mounted                     |
| Environmental               |                                  |
| Operating Temperature Range | -40°C to +85°C (-40°F to +185°F) |
| Outdoor Rating              | IP65/NEMA4                       |
| Compliance                  |                                  |
| Safety                      | UL1741, CSA C22.2 No. 330-17     |
| EMC                         | FCC Part15 Class B, ICES-003     |



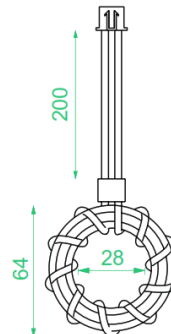
Unit : mm



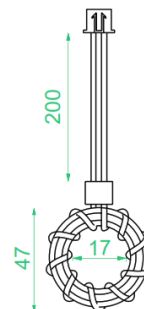
Power Supply  
(optional)



Transmitter



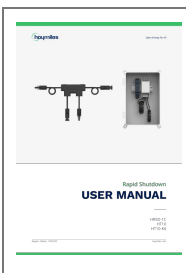
Core-150A



Core-75A

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## Documents / Resources



[hoymiles HRSD-1C Rapid Shutdown Solution](#) [pdf] User Manual  
 HRSD-1C, HT10, HT10-Kit, Rapid Shutdown Solution, HRSD-1C Rapid Shutdown Solution