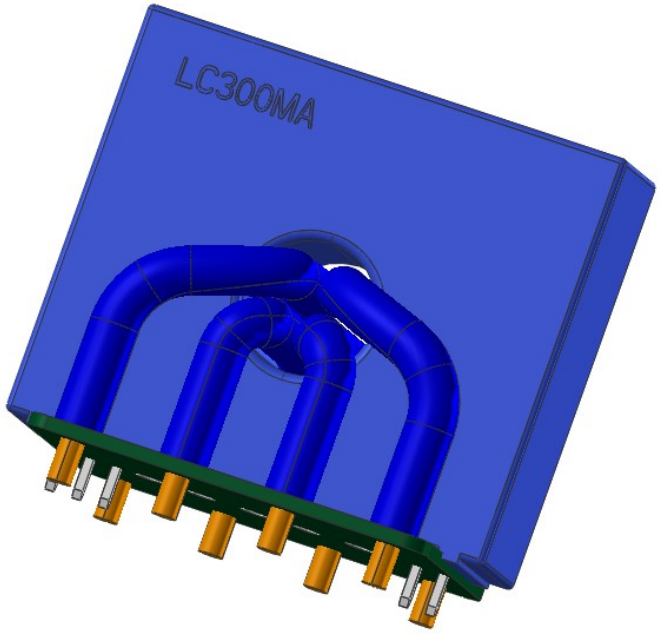
# RCMU102 series

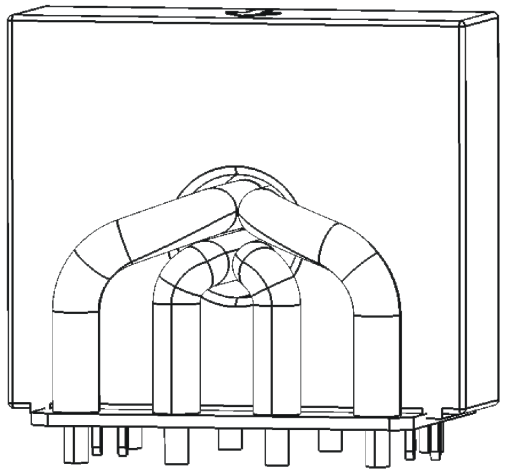
## Residual Current Monitoring Unit




Rev 1.2.2

# RCMU102 series

## Residual Current Monitoring Unit with ±12V~±15V or +5V Supply Voltage



**For electronic current detect: DC, AC, pulsed, mixed ...,with a galvanic isolation between primary circuit (high power) and secondary circuit (electronic circuit)**

### Features

- Capability up to ±600mA
- Self-check function
- Positive output for ADC
- Printed circuit board mounting
- Four through-hole conductors
- Casing and materials UL-listed

### Characteristics

- Stable accuracy
- Self stimulation
- Low hysteresis offset voltage
- Short response time
- Integration frequency filter
- Compact design

### Applications

- Appliance ground fault detection
- Solar inverter residual current
- Converter leakage current detection
- UPS and other power ground fault detection
- Electric vehicle charge station
- Single or 3 phases differential current detection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# RCMU102

at $T_A$= 25 °C, Vc = ±15V, unless otherwise noted

| Accuracy–dynamic Performance Data | | | |
|---|---|---|---|
| $V_{out}$ | Output voltage @ ±Ipn (Ipn=300mA) | \| 2.001*Ip/Ipn \| ① | V |
| $V_{OE}$ | Electrical offset voltage | < 25 | mV |
| $\varepsilon_L$ | Linearity error | 1 | % of Ipn |
| X | Accuracy | 2 | % of Ipn |
| $X_m$ | Accuracy at Tamb = 85 °C (max) | < 4 | % of Ipn |
| BW | Frequency bandwidth (-3dB) | DC...700 | Hz |
| $T_{Vout}$ | Temperature drift of Vout @ Ip=0 | < 300 | ppm/K |
| $I_C$ | Current consumption | < 26 | mA |
| $V_S$ | System working voltage (RMS) | < 750 | V |
| dCp | Creepage distance | 10.4 | mm |
| dCl | Clearance distance | 10.4 | mm |
| CTI | Comparative Tracking Index (group I) | 600 | V |

| Electrical Data | | | |
|---|---|---|---|
| $I_{PN}$ | Primary differential current | 300 | mA |
| $I_O$ | Measurement range | 0~±600 | mA |
| $I_M$ | Fault over current recovery limit | 100 | A |
| $V_C$ | Supply voltage | ±12 ~ ±15 | V |

| General Data | | | |
|---|---|---|---|
| $T_A$ | Ambient operating temperature | -40~+85 | °C |
| $T_S$ | Ambient storage temperature | -40~+105 | °C |
| m | Mass | 50 | g |
| | Standards | EN 50178 | IEC 60950-1 |
| | | UL 1741 | VDE 0126-1-1 |

Note :

①:The output voltage of the sensor is positive voltage by rectifier circuit.

# RCMU102B

at $T_A$= 25 °C, Vc = ±15V, unless otherwise noted

| Accuracy–dynamic Performance Data | | | |
|---|---|---|---|
| $V_{out}$ | Output voltage @ ±Ipn (Ipn=300mA) | 2.001*Ip/Ipn | V |
| $V_{OE}$ | Electrical offset voltage | < 25 | mV |
| $\varepsilon_L$ | Linearity error | 1 | % of Ipn |
| X | Accuracy | 2 | % of Ipn |
| $X_m$ | Accuracy at Tamb = 85 °C (max) | < 4 | % of Ipn |
| BW | Frequency bandwidth (-3dB) | DC...700 | Hz |
| $T_{Vout}$ | Temperature drift of Vout @ Ip=0 | < 300 | ppm/K |
| $I_C$ | Current consumption | < 26 | mA |
| $V_S$ | System working voltage (RMS) | < 750 | V |
| dCp | Creepage distance | 10.4 | mm |
| dCl | Clearance distance | 10.4 | mm |
| CTI | Comparative Tracking Index (group I) | 600 | V |

| Electrical Data | | | |
|---|---|---|---|
| $I_{PN}$ | Primary differential current | 300 | mA |
| $I_O$ | Measurement range | 0~±600 | mA |
| $I_M$ | Fault over current recovery limit | 100 | A |
| $V_C$ | Supply voltage | ±12 ~ ±15 | V |

| General Data | | | |
|---|---|---|---|
| $T_A$ | Ambient operating temperature | -40~+85 | °C |
| $T_S$ | Ambient storage temperature | -40~+105 | °C |
| m | Mass | 50 | g |
| | Standards | EN 50178 | IEC 60950-1 |
| | | UL 1741 | VDE 0126-1-1 |

# RCMU102S

at $T_A$= 25 °C, Vc = +5V, unless otherwise noted

| Accuracy–dynamic Performance Data | | | |
|---|---|---|---|
| $V_{out}$ | Output voltage @ ±Ipn (Ipn=300mA) | 2.5+1.2*Ip/Ipn | V |
| $V_{OE}$ | Electrical offset voltage | < 25 | mV |
| $\varepsilon_L$ | Linearity error | 1 | % of Ipn |
| X | Accuracy | 2 | % of Ipn |
| $X_m$ | Accuracy at Tamb = 85 °C (max) | < 4 | % of Ipn |
| BW | Frequency bandwidth (-3dB) | DC...700 | Hz |
| $T_{Vout}$ | Temperature drift of Vout @ Ip=0 | < 300 | ppm/K |
| $I_C$ | Current consumption | < 20 | mA |
| $V_S$ | System working voltage (RMS) | < 750 | V |
| dCp | Creepage distance | 10.4 | mm |
| dCl | Clearance distance | 10.4 | mm |
| CTI | Comparative Tracking Index (group I) | 600 | V |

| Electrical Data | | | |
|---|---|---|---|
| $I_{PN}$ | Primary differential current | 300 | mA |
| $I_O$ | Measurement range | 0~±500 | mA |
| $I_M$ | Fault over current recovery limit | 80 | A |
| $V_C$ | Supply voltage(±1%) | +5 | V |

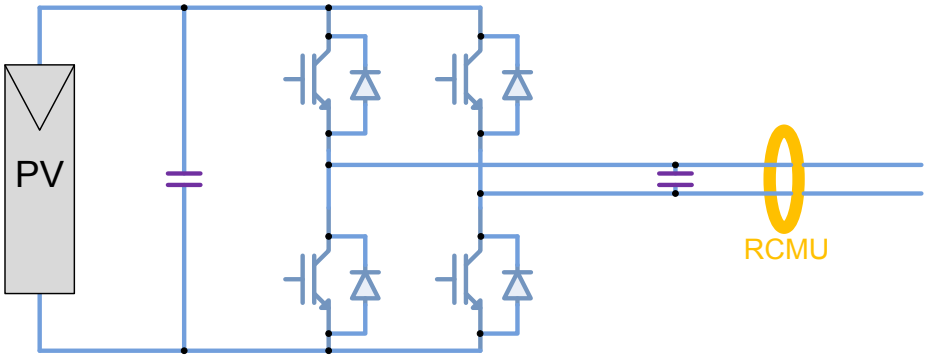
| General Data | | | |
|---|---|---|---|
| $T_A$ | Ambient operating temperature | -40~+85 | °C |
| $T_S$ | Ambient storage temperature | -40~+105 | °C |
| m | Mass | 50 | g |
| | Standards | EN 50178 | IEC 60950-1 |
| | | UL 1741 | VDE 0126-1-1 |

# Application information

## Self-check Function

Connect the CHK to voltage high (3.3V<= $V_{CHK}$ <=+Vc). Detector runs in self-test mode, check the OUT (PIN1), when the output voltage is 275mV to 375mV (RCMU 102S output voltage is 2.5V+175mV to 2.5V+225mV), the detector is ok. Then connect the CHK to voltage low ($V_{CHK}$ <=0.2V), the detector starts to monitor the residual current.

## Photovoltaic Inverter Residual Current

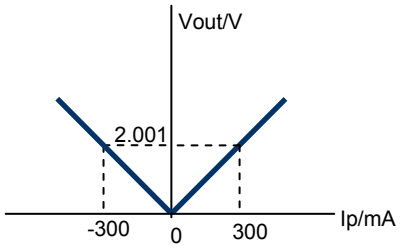



For no separation of power grid and the photovoltaic power generation between the inverter, according to VDE0126-1-1, there must be RCMU (residual current monitoring unit).

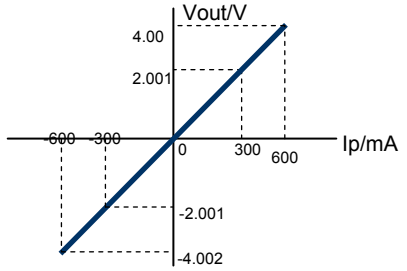
From VDE0126-1-1, inverters without a basic insulation (e.g. basic insulated transformer) between the grid and the photovoltaic-Generator must have a fault current monitoring unit (RCMU) installed. The d.c. and a.c. component of the fault current depend on the construction of the inverter and on the d.c. voltage of the PV-generator.

## Output Voltage

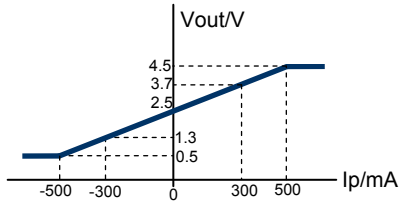
### RCMU102

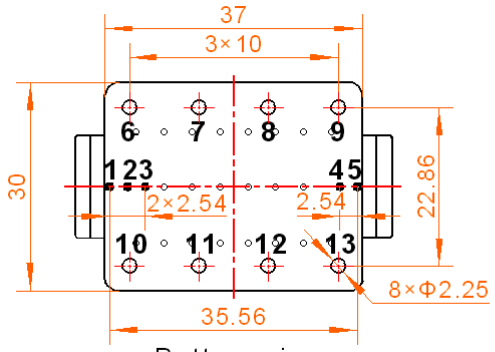



### RCMU102B

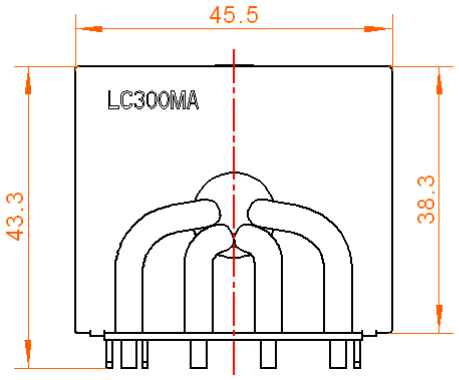



### RCMU102S

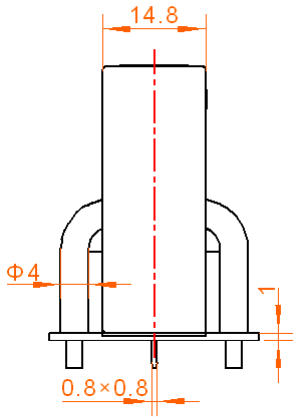




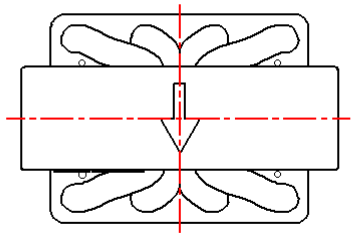
Bottom view



Front view



Right view


Top view

## Dimensions in RCMU 102 series

(In mm. general linear tolerance ±0.25mm)

### Mechanical Characteristics

- Pin-out case length 4mm
- Primary 5 pins 0.8 x 0.8 mm (-0.1mm)
  Recommended PCB hole 1.2 mm
- Through-hole diameter : 12 mm

### Pin Definition

| | | |
|---|---|---|
| 1 | OUT | Output Voltage |
| 2 | CHK | Product Self-check |
| 3 | GND | Power Ground |
| 4 | V+ | Supply Voltage +12V ~ +15V |
| 5 | V- | Supply Voltage -12V ~ -15V |
| 4① | V+ | Supply Voltage +5V |
| 5② | Vref | Reference Voltage |

①②:**RCMU 102S Pin Definition**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