

## OVERVIEW


**RI-D175-C**  **Modbus**
**RI-D175-MB**  **M-Bus**

**RoHS**


## SPECIFICATIONS

|                                   |                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wiring input                      | 1Ø, 2 wire Direct Connected                                                                                                                                                                                                                                                                                             |
| Input voltage (Un)                | 230V                                                                                                                                                                                                                                                                                                                    |
| Operating voltage range           | 196...253V                                                                                                                                                                                                                                                                                                              |
| Current rating (Imin-Iref)        | 0.02...5A / Max current (Imax) 45A                                                                                                                                                                                                                                                                                      |
| Frequency range                   | 50Hz (operating range 45...55Hz)                                                                                                                                                                                                                                                                                        |
| Short time overcurrent            | 30 x Imax. for 10ms (IEC/EN62053-21 and -23)                                                                                                                                                                                                                                                                            |
| Impulse voltage withstand         | 6kV 1.2µs                                                                                                                                                                                                                                                                                                               |
| AC voltage withstand              | 4kV for 1 minute                                                                                                                                                                                                                                                                                                        |
| Auxiliary                         | Self supplied from measuring input                                                                                                                                                                                                                                                                                      |
| Power consumption                 | ≤2W / 10VA                                                                                                                                                                                                                                                                                                              |
| Energy maximum display            | 999999.9 (default) or 99999.99 programmable                                                                                                                                                                                                                                                                             |
| Displayed parameters and accuracy | Active energy: Class 1, Class B (IEC/EN62053-21, IEC/EN50470)<br>Reactive energy: Class 2 (IEC/EN62053-23)<br>Voltage: 0.5% of full scale<br>Current: 0.5% of full scale<br>Active power: 0.5%<br>Reactive power: 0.5%<br>Apparent power: 0.5%<br>Power factor: 1% of unity<br>Frequency: 0.1% of full scale (L-N >20V) |
| Communication                     | RS485: Modbus RTU or MBus EN13757-3<br><b>Address Register at <a href="http://www.rayleigh.com">www.rayleigh.com</a></b>                                                                                                                                                                                                |
| Modbus RTU (RI-D175-C only)       | Address: 1... 255<br>Data bits / Parity: 8 bit / None, Odd, Even<br>Baudrate: 1200, 2400, 4800, 9600<br>Bus loading: 64 meters max<br>Max distance: 1000m                                                                                                                                                               |
| MBus EN13757-3 (RI-D175-MB only)  | Address: 1... 255<br>Baudrate: 2400, 4800, 9600<br>Bus loading: 64 meters max (dependant on converter and baudrate)<br>Max distance: 1000m (64 meters)                                                                                                                                                                  |
| Pulse output                      | 1 x fixed 1000 imp/kWh / 5 - 27V DC (external supply) / 10mA max / pulse duration 80ms                                                                                                                                                                                                                                  |
| Operating temperature             | -25°C ... +55°C                                                                                                                                                                                                                                                                                                         |
| Storage temperature               | -30°C ... +70°C                                                                                                                                                                                                                                                                                                         |
| Relative humidity                 | 0... 95%, non-condensing                                                                                                                                                                                                                                                                                                |
| Net weight                        | 120g                                                                                                                                                                                                                                                                                                                    |
| Housing material                  | Self-extinguishing ABS                                                                                                                                                                                                                                                                                                  |
| Insulation voltage rating         | 300V (L - N)                                                                                                                                                                                                                                                                                                            |
| Installation category             | III                                                                                                                                                                                                                                                                                                                     |
| Protection degree                 | IP20 (terminals), IP51 (front of housing)                                                                                                                                                                                                                                                                               |

## ! SAFETY PRECAUTIONS

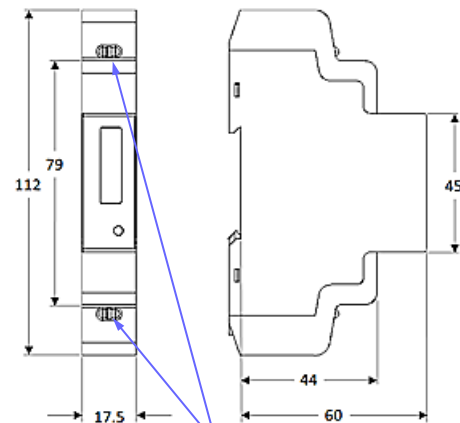
Safety related notification, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of personnel as well as the instrument.

- If the equipment is not used in a manner specified by the manufacturer it may impair the protection provided by the equipment
- Do not use the equipment if there is any mechanical damage
- Do not exceed the stated maximum ratings of the device
- No repairs, maintenance or adjustments are possible
- Read complete instruction prior to installation or operation of the unit
- The equipment in its installed state must not come into close proximity to any heating sources, oils, steam, caustic vapours or other unwanted process by-products
- Do not use in hazardous or classified location where explosion or other dangers can be triggered by the device

## INSTALLATION

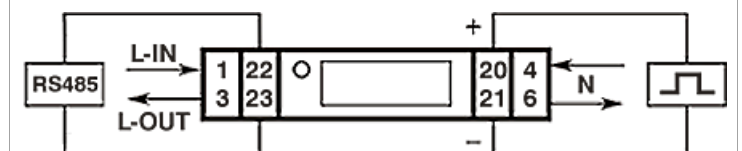
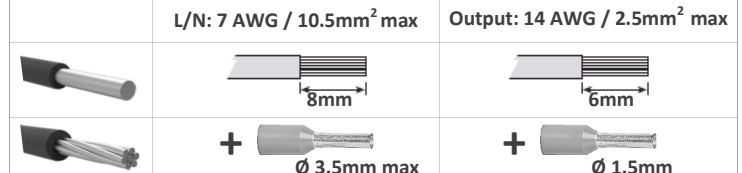
 Risk of electric shock! To avoid personal and material damage, the installation process must be performed by qualified and trained personnel only.

- To prevent the risk of electrocution, always isolate and lock-off the power supply to the equipment prior to undertaking any work
- Always confirm absence of electricity prior to starting work using appropriate voltage detection equipment
- Wiring shall be done strictly according to the terminal layout
- Confirm that all connections are correct before energizing the equipment
- Routing of connecting cables should be away from any internal EMI sources
- Copper cable should be used



All dimensions in mm

**Security Hasp: Must be sealed to comply with MID**

|                                                                                      |       |       |
|--------------------------------------------------------------------------------------|-------|-------|
|  |       |       |
| RS485                                                                                | 22    | 23    |
| Modbus                                                                               | A     | B     |
| MBus                                                                                 | MBus1 | MBus2 |
|  |       |       |
|  |       |       |

## POWER UP CYCLE

|                            |          |
|----------------------------|----------|
| Software version           | 34AE     |
| Comm Baud Rate             | bd 9600  |
| Pulse Weight (imp/kWh)     | C 1000   |
| Comm ID                    | Id 01    |
| Serial Number 2nd 4 digits | 5nL00 10 |
| Serial Number 1st 4 digits | 5nH 1802 |



### EU DECLARATION OF CONFORMITY

RAYLEIGH INSTRUMENTS LIMITED  
Raytel House, Cutlers Road, South Woodham Ferrers, Chelmsford, Essex CM3 5WA, UK

Hereby declares under its sole responsibility the products described below:

|                |                                                                                     |
|----------------|-------------------------------------------------------------------------------------|
| Product Family | RI-D175 SINGLE PHASE ENERGY METER (DIN RAIL MOUNT)                                  |
| Models         | RI-D175-P, RI-D175-C, RI-D175-MB, RI-D175CT-P, RI-D175CT-C, RI-D175CT-MB, RI-D20M-P |

comply with the provisions of the following European Directives:

2014/32/EU – Measuring Instruments Directive (MID)  
2011/65/EU – RoHS Directive

based on compliance with the following harmonised standards:

EN 50470-1:2006 - Electricity metering equipment (AC), General requirements, tests and test conditions.  
EN 50470-3:2006 - Electricity metering equipment (AC), Particular requirements  
EN 63000:2018 – Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

|                     |                      |
|---------------------|----------------------|
| EC Type Examination | MID Annex B          |
| Certificate Number  | T13061               |
| Issued By           | NMi Certin B.V. 0122 |

#### Particulars:

- The product is traceable by its serial number applied on the product's casing exterior.
- CE marking is applied to the product's casing and packaging.
- Conformance of installation is realized only when conducted by a competent installer.

Issued: 10<sup>th</sup> July 2025  
Chelmsford UK

James Mackie - Technical Manager  
On behalf of Rayleigh Instruments Limited

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RI-D175-EU-DC-V01

## OPERATION



Auto-scroll

|                              |          |
|------------------------------|----------|
| Total kWh                    | 123456.0 |
| Import kWh                   | 123456.0 |
| Export kWh                   | 123456.0 |
| Voltage                      | V 230.0  |
| Current                      | A 12.00  |
| Active Power                 | P 1234.0 |
| Power Factor                 | PF 1.00  |
| Frequency                    | F 50.0   |
| Pulse Weight (imp/kWh)       | C 1000   |
| Baud Rate (Change via RS485) | bd 9600  |
| Comm ID (Change via RS485)   | Id 01    |
| Serial Number 1st 4 digits   | 5nH 1802 |
| Serial Number 2nd 4 digits   | 5nL00 10 |