

## RI-D70 Series



### Three Phase Energy Meter (MID Certified)

- 100A direct connected
- High definition backlit LCD display
- Four module width DIN rail mounted
- Import active energy measurement
- Pulse output and Modbus or MBus communication
- Single pulse output
- MID B+D Certified (NMI Cert. No. : EU-TEC-T11065)
- LED pulse indication

#### Product Description

The RI-D70 Series forms part of the Rayleigh Instruments family of MID Certified energy meters, designed for the accurate measurement of energy consumption in residential, commercial, industrial and utility applications. The direct connection of the unit to a 100A ac circuit means the meter does not require additional current transformers.

This meter is housed in a four module width case suitable for DIN rail mounting, with a high definition backlit LCD display allowing easy reading of the recorded values.

Its MID status means the RI-D70 has been tested for build quality and accuracy and is certified for billing purposes.

The meter is currently available in two versions:-

- With Pulse output and Modbus RTU communication
- With Pulse output and MBus communication

#### Displayed Parameters

##### Import Active Energy (kWh)

Active energy

Reactive energy

Voltage

Current

Active power

Reactive power

Apparent power

Power factor

Frequency

Comm Baud Rate

Comm Address



## Display

Display Type	LCD, high definition	
Digit height	10mm (displayed value)	
Page scrolling	Auto scroll	
Displayed parameters and accuracies	Active energy	Class 1, Class B (IEC/EN62053-21, IEC/EN50470)
	Reactive energy	Class 2 (IEC/EN62053-23)
	Voltage	0.5% of full scale
	Current	0.5% of full scale
	Active power	0.5%
	Reactive power	0.5%
	Apparent power	0.5%
	Power factor	0.2% of unity
	Frequency	0.2% of full scale
	Comm Baud Rate	Dependant on model
	Comm Address	1...255
Energy maximum display	User programmable: 999999.99 or 9999999.9 (default)	
Resolution	0.01K or 0.1K depending energy Max. display setting	

## Programming

Programmable parameters	Communication address, Communication speed (Baud rate), Energy Max. display
Programming access	Password protected (user selectable)
Memory retention	Non-volatile memory

## Input

Connection	Three phase
Input voltage (Un)	230V (L - N), 400V (L - L)
Operating voltage range	161...279V (L - N), 300...520V (L - L)
Voltage circuit power consumption (Max.)	≤2W, 10VA per phase
Current rating (Imin-Iref)	0.5...10A
Max current (Imax)	100A
Current circuit power consumption (Max.)	N/A combined with voltage input
Starting current	40mA
Short time overcurrent	30 Imax / 10mS (IEC/EN62053-21 and -23)
Impulse voltage withstand	6kV 1.2μS
AC voltage withstand	4kV for 1 minute
CT ratio range	N/A direct connection
VT ratio range	N/A direct connection
Frequency	50Hz / 60Hz (Operating range 45...65Hz)
Current distortion factor	According to IEC/EN50470

## Auxiliary Supply

Voltage range	Self supplied from measuring input
Operating frequency	See input section
Power consumption	See input section

## Outputs

<b>Energy pulses</b>	
Number of pulse outputs	1
Pulse output function	1 x fixed 400imp/kWh.
Pulse output type	Passive transistor, require external DC supply
Pulse output Max. current	27mA
Pulse output voltage range	5...27VDC
Pulse duration	80mS
<b>Modbus Communication (RI-D70-C)</b>	
Communication type	RS485
Communication protocol	Modbus RTU
Address	1...255
Number of bits	8 bit
Parity	None (default) / Odd / Even
Baud rate	1200, 2400, 4800, 9600 (default)
Number of meters connected on the bus (Max.)	64
Max. distance from Master device	1000m
<b>Mbus Communication (RI-D70-MB)</b>	
Communication type	RS485
Communication protocol	Mbus EN13757-3
Address	1...255
Baud rate	2400, 4800, 9600 (default)
Number of meters connected on the bus	64 (dependant on the converter and baud rate - higher speed reduces number of meters)
Max. distance from Master device	1000m (64 meters)

## Insulation

Installation category	III
Pollution degree	2
Insulation voltage rating	300V (L - N)

## Environmental Conditions

Reference temperature	23°C ±1°C
Specified temperature operating range	-25°C...+55°C
Storage temperature	-30°C...+70°C
Relative humidity	0...95%, non condensing
Mechanical environment	M1
Electromagnetic environment	E2

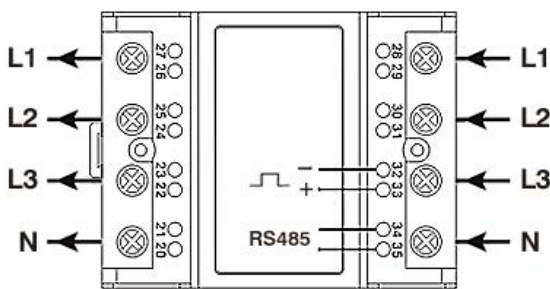
**Mechanical**

Housing	
Housing Type	4 module DIN 43880
Mounting	Snap-on 35mm rail
Tamper sealing	Terminal cover and meter housing (meter housing by means of a crimped seal)
Housing material	Self-extinguishing ABS
Protection degree (IEC/EN60529)	IP20 (terminals), IP51 (front of housing)
Weight	400g
Termination	
Current input terminal type	Screw type - rising clamp
Max. wire size	50mm <sup>2</sup>
Voltage input terminal type	Combined with current circuit
Max. wire size	N/A
Output terminal type	Screw type - rising clamp
Max. wire size	2.5mm <sup>2</sup>

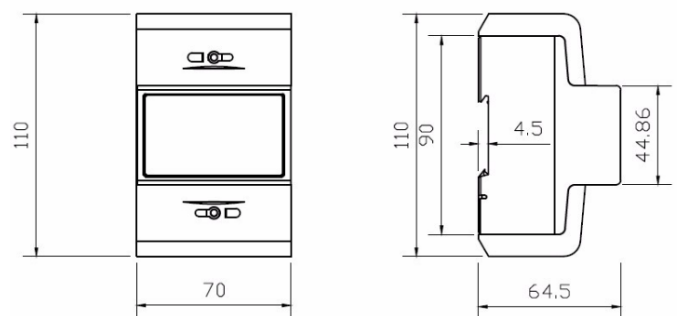
**Conformity**

Electromagnetic compatibility	Emission and immunity tests according to IEC/EN50470 Immunity test according to IEC/EN50470
Accuracy and functionality	IEC/EN50470-1:2006 - Electricity metering equipment (a.c.). Part 1: General requirements, tests and test conditions Metering equipment (class indexes A, B and C) IEC/EN50470-3:2006 - Electricity metering equipment (a.c.). Part 3: Particular requirements Static meters for active energy (class indexes A, B and C) EC Directive 2014/32/EU

**Wiring Diagrams**



**Dimensions (mm)**



RS485	34	35
Modbus	B	A
Mbus	Mbus2	Mbus1

**Model Selection Table**

Description and Communications	Model
Pulse and Modbus RTU	RI-D70-C
Pulse and Mbus	RI-D70-MB