

# M2M

## Technical features



### Auxiliary power supply

Voltage range	[V]	From 24 to 240 V AC/DC From 48 to 240 V AC/DC M2M I/O From 24 to 240 V DC and from 48 to 240 V AC M2M ETHERNET, M2M PROFIBUS
Frequency range	[Hz]	45 - 65
Protection fuse		T 0.5 A from 24 V to 100 V T 0.25 A from 100 V to 240 V

### Power consumption

[VA] 7 max

### Measurement type

Sampling TRMS

### Measurement accuracy

Voltage		±0.5% F.S. ±1 digit
Current		±0.5% F.S. ±1 digit
Frequency		40.0 - 99.9 Hz: ± 0,2% ± 0,1 100 - 500 Hz: ± 0.2% ± 1
Power factor		± 1% ± 1 digit (from $\cos\varphi=0.3$ Inductive to $\cos\varphi=0.3$ Capacitive)
Active power		± 1% ± 0.1% F.S (from $\cos\varphi=0.3$ Inductive to $\cos\varphi=0.3$ Capacitive)
Active energy		Class 1

### Measurement range

Voltage	[V]	From 10 to 500 approx. TRMS VL-N. No decimal places
Current		From 50 mA to 5 A TRMS 2 decimal places displayed
Frequency	[Hz]	From 40 to 500 1 decimal place displayed up to 99,9 and in integers above 100
Power factor		2 decimal places displayed

### Installation

Distribution networks		Low and medium voltage Low voltage M2M LV, M2M LV MODBUS Single-phase connection Three-phase with neutral - Three-phase without neutral
Current inputs	[A]	Always use external CT Primary from 1 to 10,000 A AC approx. Secondary 5 A and 1 A AC approx. N.B.: in case of CT secondary at 1 A the accuracy class is reduced to 2.5% F.S. ±1 digit, in the range 5-100% F.S.
Voltage inputs	[V]	Direct insertion up to 500 AC approx. Indirect insertion with VT: Primary from 60 to 60,000 V AC approx - secondary from 60 to 190 V AC N.B.: In case of VT secondary at less than 100 V the accuracy class is reduced to 2.5% F.S. ±1 digit, in the range 5-100% F.S.
Protection fuse for voltage inputs	[A]	0.1

### Data update frequency

2 times/second

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<b>Harmonic distortion count</b>	[Hz]	Band measurement up to 500
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### Energy measurement

Single-phase maximum value counted		10 GWh / GVarh / GVAh
Three-phase maximum value counted		30 GWh / GVarh / GVAh
Energy balance maximum value counted		10 GWh / GVarh / GVAh with sign
Input pulses maximum energy value counted		40 GWh / GVarh

### Terminal characteristics

Current inputs		Cross section 6 mm <sup>2</sup> - Step 6.35 mm
Voltage inputs		Cross section 2.5 mm <sup>2</sup> - Step 7.62 mm
Impulsive outputs		Cross section 2.5 mm <sup>2</sup> - Step 5.08 mm
RS485 Serial port		Cross section 2.5 mm <sup>2</sup> - Step 5.08 mm
Relay outputs		Cross section 2.5 mm <sup>2</sup> - Step 5.08 mm

<b>Overall dimensions</b>		96 mm x 96 mm x 77 mm (Depth inside switchboard: 57 mm)
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<b>Weight</b>	[Kg]	0.400 max
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### Standards

Overall dimensions		IEC 61554
Protection degree		IEC 60529
Accuracy class		IEC 60688, IEC 61326-1, IEC 62053-21 , IEC 62053-23, IEC 62053-31.
Electrical safety		IEC 61010-1

### User interface

Display		Scrolling text in user-selectable language
Display type		LCD with backlighting which can be set by user
Display dimensions	[mm]	72x57

### Communication interface

#### RS485 (M2M MODBUS, M2M LV MODBUS, M2M ALARM, M2M I/O)

- Protocol		Modbus RTU
- Electrical standard		RS485 with optical isolation
- Baud rate		4.8, 9.6, 19.2 kbps
- Parity number		Odd, Even, None
- Stop bit		1, 2
- Address		1-247
- Connectors		4-pole terminal (integrated 120 Ohm termination)

#### Profibus (M2M PROFIBUS)

- Protocol		Profibus with slave DP-V0 function in compliance with IEC 61158 regulations
- Electrical standard		RS485 with optical isolation
- Baud rate		Automatic detection [9.6 - 12 Mbps]
- LED indicators		Green for communication status and Red for communication error
- Address		0-126
- Connectors		DB 9 female connector (do not use connectors with 90° cable outlet)

#### Ethernet (M2M ETHERNET)

- Protocol		Modbus TCP/IP
- Connectors		RJ45

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### Digital output programmed as pulse

Contact supply external voltage	[V]	48 max (peak AC/DC)
Maximum current	[mA]	100 (peak AC/DC)
Pulse duration	[ms]	50 OFF (min) / 50 ON closed contact
Pulse frequency		10 pulses/s (max)

### Digital output programmed as alarm

Contact supply external voltage	[V]	48 max (peak AC/DC)
Maximum current	[mA]	100 (peak AC/DC)
Alarm activation delay	[s]	1 - 900 s (programmable)
Alarm return hysteresis		0 - 40% (programmable)

### Relay output (M2M ALARM)

Normal current	[A]	16 AC1 - 3 AC15
Max. instantaneous current	[A]	30
Nominal voltage	[V]	250 V AC
Max. instantaneous voltage	[V]	400 V AC
Nominal load	[VA]	4000 AC1 - 750 AC15

### Analogue output (M2M I/O)

Programmable electrical parameters		Span [0 - 20 mA or 4 - 20 mA]
Load		Typical 250 Ohm, max 600 Ohm

### Digital inputs (M2M I/O)

Nominal voltage	[V]	24 V DC (absorption = 13 mA)
Maximum voltage	[V]	32 V DC (absorption = 22 mA)
Max. voltage for OFF status	[V]	8 V DC
Min. voltage for ON status	[V]	18 V DC

### Hour counters

Countdown timer		Countdown of system operating time with the activation of a programmable threshold on total current. Upon expiry of the maintenance period set an icon will appear on the display.
Count-up timer		Operational time of device

### Climatic conditions

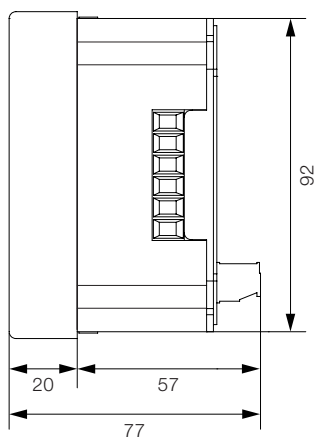
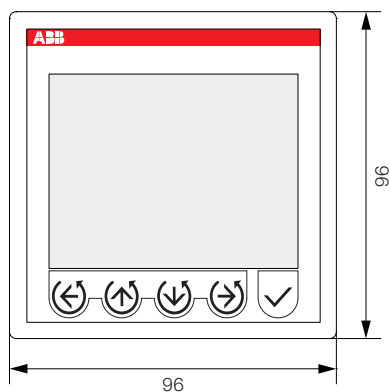
Storage	[°C]	from -10 to +60
Operation	[°C]	from -5 to +55
Relative humidity		Max 93% (non-condensing) at 40°C

### Protection degree

Frontal		IP54
At terminals		IP20

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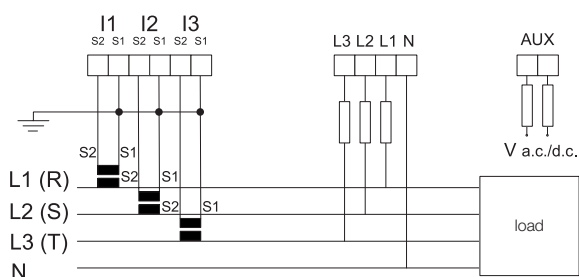


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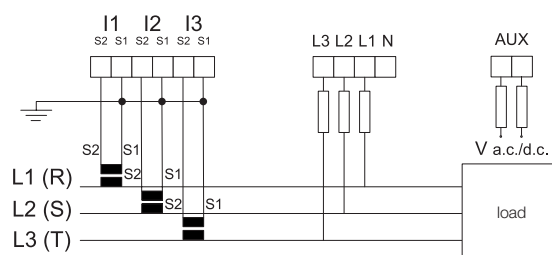
## Wiring diagrams

### Measurement input and auxiliary power supply connections

Three-phase + neutral with 3 CT



Three-phase with 3 CT



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