

## General Specification

### Environmental

Operating Temperature:	0°C to 60°C (Calibration temperature 23°C)
Storage Temperature:	-10°C to 70°C
Temperature Coefficient:	< 100ppm/ °C
Relative Humidity:	0 - 85% non-condensing
Warm Up Time:	1 minute

### Display

Digit & Display:	3½ digit (1999) red LED (cosØ meter 3 digit)
Digit Height:	10.2mm high (FPM482), 14.2mm high (FPM964)
Decimal Point:	Internally selectable
Sampling Time:	Approx 0.4 sec (FPM482), 1 sec (FPM964)
Over Input Indication:	'1'
Polarity:	Automatic with (-) indicating negative inputs
Measuring Mode:	Dual slope
Input Mode:	Floating
Noise Elimination Ratio:	CMRR over 86dB 50/60Hz

### Enclosure

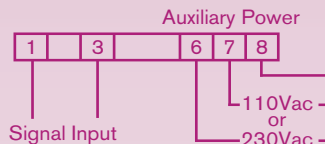
Enclosure:	Flame retardant black ABS plastic case
Enclosure Code:	Case IP54 (IP65 with gasket optional) to IEC529
Insulation Test:	2kV rms 50Hz 1min input/auxiliary (to IEC 414) 2kV rms 50Hz 1min terminals/case (FPM482) 4kV rms 50Hz 1min terminals/case (FPM964)
Markings:	CE marked

Specification subject to change without notice.

### Auxiliary Power Connections

#### FPM964 Standard Dual AC Auxiliary Supply

110/230Vac ±20% (Burden < 3VA)

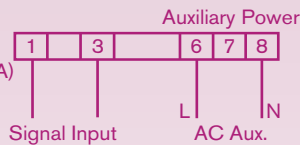


#### FPM964 Non Standard AC Auxiliary Supply

12Vac, 24Vac, 48Vac, 415Vac ±20% (Burden < 3VA)

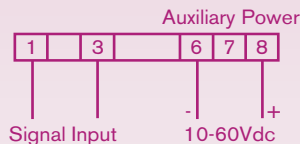
#### FPM482 Standard AC Auxiliary Supply

12Vac (±10%)  
24Vac, 48Vac, 110Vac, 230Vac ±20%  
(Burden < 3VA)



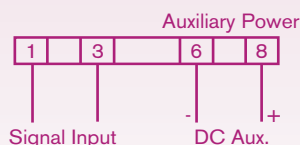
#### FPM964 DC Auxiliary Supply

10-60Vdc (Burden < 2W)



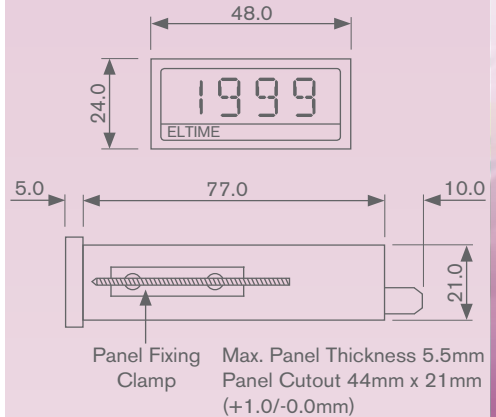
#### FPM482 DC Auxiliary Supply

12Vdc (±10%), 24Vdc, 48Vdc ±20%  
(Burden < 2W)

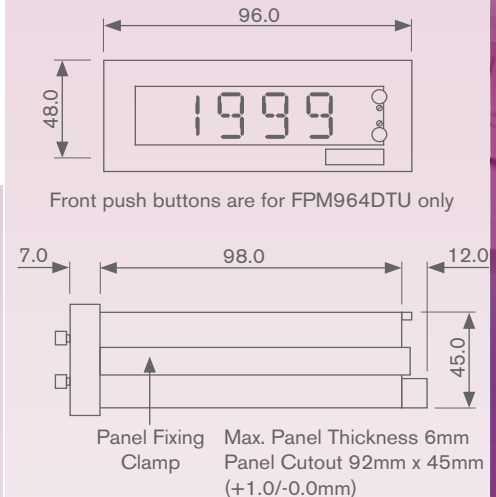


### Dimensions

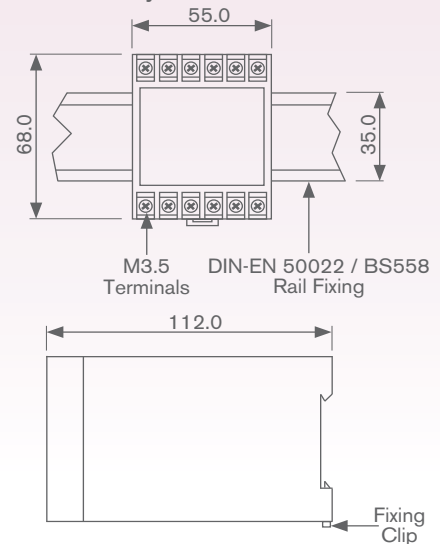
#### FPM482 Enclosure



#### FPM964 Enclosure



#### Watt/Var/CosØ Converter Unit and DTU Relay Unit Enclosure



All dimensions in mm

# Energy Monitoring



Global Suppliers of Measurement and Protection Equipment for Industry



## DIN Square kWh Meters

### Models Available

EL96GT DIN96 kWh Meter

EL96GTW DIN96 kWh Meter with Wattmeter

### Product Features

- Active energy (kWh) measurement
- Standard DIN square size
- Single phase, 3 phase and DC versions
- Accuracy class 1 (1%)
- Non-resettable
- Pulsed output option

Kilowatt hour meters are suitable for the monitoring of active energy (kWh) in all types of sub-metering applications. Models are available for single phase and three phase, balanced and unbalanced loads, as well as DC systems. The panel mounting kWh meters are accurate to class 1 to IEC1036 and AC models have a user selectable CT ratio through a rotary switch accessible from a removable cover on the meter.

The meters are housed in a compact DIN96 enclosure measuring only 61mm in depth and are available combined with an analogue instantaneous reading wattmeter (EL96GTW) if required. All meters have an electromechanical counter eliminating the need for any auxiliary power supply on the AC models. All meters are available with an optional voltage free pulsed output for input to data loggers, PLC's, building management systems or computers.

## kWh Meters – for measuring energy (kWh) consumption

### General Specification

Design complies with:

- IEC1036, IEC521

Accuracy:

- kWh counter class 1 to IEC1036
- Wattmeter class 1.5 to IEC51

Counter:

- 6 digit (4mm high) electromechanical

Scales (EL96GTW):

- 0-1 to 0-1000W, kW or MW

Front Panel LED's:

- Energy LED indicates correct connection of voltage and current
- Pulse LED indicates rate of energy measurement and pulse output

Enclosure Code:

- Case IP52 (IP65 option)

Weight:

- EL96GT 370g, EL96GTW 420g

Markings:

- CE marked

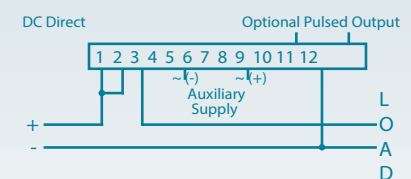
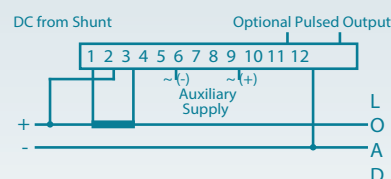
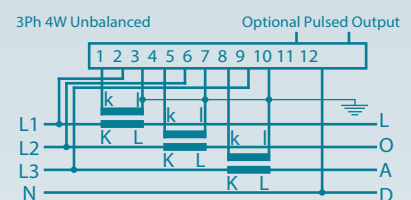
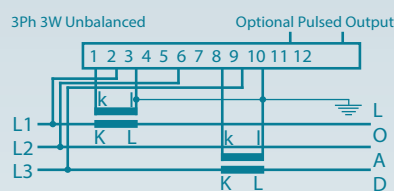
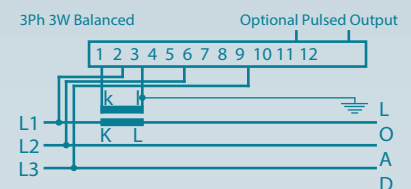
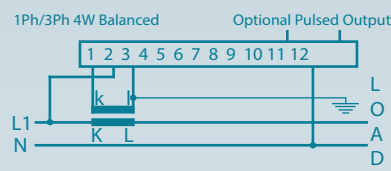
Pulsed Output:

- Voltage free isolated relay
- 5A contacts at 250Vac, 200msec

Pulsed Output Ratio:

- Once every counter increment

### Connections



### Notes:

1. Ensure that current transformers are mounted such that K faces the supply and L faces the load.
2. Secondary windings of the current transformers should be earthed.
3. The Wattmeter on all EL96GTW meters will be scaled as calculated by unless specified otherwise.

## Ordering information

Model	Code	Description
	EL96GT	96 x 96mm kWh Meter
	EL96GTW	96 x 96mm kWh Meter with Wattmeter

Current or CT Ratio	Code	Description
	1L	25/1 to 800/1A (selectable) - see table below *
	1H	200/1 to 6000/1A (selectable) - see table below **
	5L	25/5 to 800/5A (selectable) - see table below *
	5H	200/5 to 6000/5A (selectable) - see table below **
	Specify	Other CT ratio (specify)
	Specify	0.5 to 5 Amps direct (specify)
DC	Specify	0.1 to 10 Amps DC direct (specify) or 10 to 5000 Amps DC from 50, 60, 75mV shunt (specify)***

Wiring System	Code	Description
	/1	Single Phase
	/2	3 Phase 3 Wire Balanced
	/3	3 Phase 3 Wire Unbalanced
	/4	3 Phase 4 Wire Balanced
	/5	3 Phase 4 Wire Unbalanced
DC	/DC	DC System

Input Voltage	Code	Description
	Specify	110, 230 or 415Vac (specify L-N or L-L)
	Specify	50 to 440Vac upon request (specify)
DC	Specify	12, 24, 48Vdc or up to 600Vdc upon request

Auxiliary Power (DC)	Code	Description
DC	Specify	110, 230 or 415Vac (specify)
DC	Specify	12, 24 or 48Vdc (specify)

Options	Code	Description
	/P	Voltage Free Pulsed Output
	GTTC	Terminal Cover

### Example EL96GT - 5H - /5 - 415VL-L - /P

#### Current Transformer Primary Currents (Selectable)

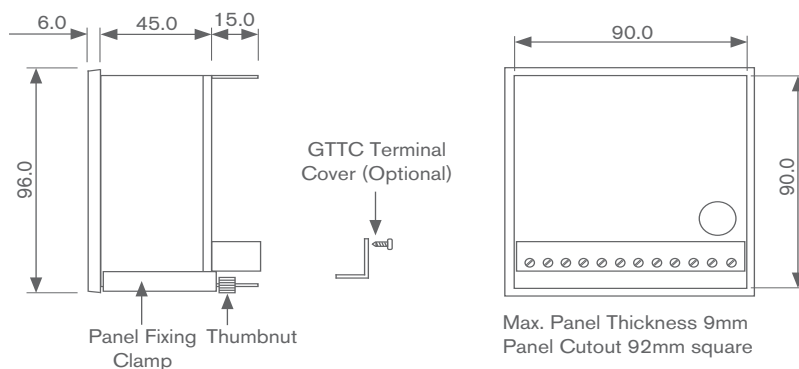
\* L 25, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800A

\*\* H 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 1600, 2000, 2500, 3000, 4000, 6000A

#### \*\*\* Standard Shunt Values

10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, 4000, 5000A

#### Dimensions



All dimensions in mm

#### Specification (AC Measurement)

##### Input Current, $I_n$ :

- 0-0.2A to 0-5A direct connected
- 1A or 5A CT operated

##### Input Voltage, $U_n$ :

- 110, 230, 415V or VT ratio
- (50 to 440V upon request)

##### Voltage Variation:

- $\pm 20\%$  of  $U_n$

##### Frequency:

- 50/60Hz

##### Overload:

- $1.2 \times I_n$  or  $U_n$  for 2 hours
- $6 \times I_n$  for 5 seconds

##### Test Voltage:

- 2kV rms for 1 minute

##### Burden:

- Voltage circuit  $< 3VA$  per phase
- Current circuit  $< 0.1VA$  per phase

##### Counter & Pulse Resolution:

- 1 kWh (L CT ratio model)
- 10 kWh (H CT ratio model)
- Other resolutions available on request to suit direct connected units or VT ratios

#### Specification (DC Measurement)

##### Input Current, $I_n$ :

- 0-0.1A to 0-10A direct connected
- 0-10A to 0-5000A from  
50, 60 or 75mV shunt

##### Input Voltage, $U_n$ :

- 12, 24 or 48Vdc
- (upto 600V upon request)

##### Voltage Variation:

- 0-120% of  $U_n$

##### Overload:

- $1.2 \times U_n$  continuous,  $2 \times U_n$  for 3 sec
- $1.2 \times I_n$  continuous,  $10 \times I_n$  for 3 sec

##### Test Voltage:

- 1kV rms for 1 minute

##### Counter & Pulse Resolution:

- 1 Wh, 10Wh, 0.1kWh or 1kWh
- Other resolutions available on request

##### Auxiliary Power Supply:

- 12, 24, 48Vdc, 110, 230 or 415Vac

##### Auxiliary Power Supply Variation:

- -10% to +20% of nominal

Specification subject to change without notice.



## DIN Rail Mounting kWh Meters

### Models Available

#### EL100GT DIN Rail Mounting kWh Meter

### Product Features

- Active energy (kWh) measurement
- DIN rail mounting enclosure
- Single phase, 3 phase and DC versions
- Accuracy class 1 (1%)
- Non-resettable
- Pulsed output option
- Fingerproof terminal cover included

Kilowatt hour meters are suitable for the monitoring of active energy (kWh) in all types of sub-metering applications. Models are available for single phase and three phase, balanced and unbalanced loads, as well as DC systems. The kWh meters are accurate to class 1 to IEC1036 and AC models have a user selectable CT ratio through a rotary switch accessible from a removable cover on the meter.

The meters are housed in a compact DIN rail mounting enclosure measuring only 100mm in width. All meters have an electromechanical counter eliminating the need for any auxiliary power supply on the AC models. All meters are available with an optional voltage free pulsed output for input to data loggers, PLC's, building management systems or computers.

## kWh Meters – for measuring energy (kWh) consumption

### General Specification

#### Design complies with:

- IEC1036, IEC521

#### Accuracy:

- Class 1 to IEC1036

#### Counter:

- 7 digit (4mm high) electromechanical

#### Front Panel LED's:

- Energy LED indicates correct connection of voltage and current
- Pulse LED indicates rate of energy measurement and pulse output

#### Enclosure Code:

- Case IP50, terminals IP10

#### Weight:

- 350g

#### Markings:

- CE marked

#### Pulsed Output:

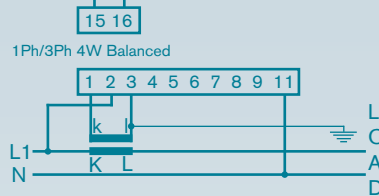
- Voltage free isolated relay
- 5A contacts at 250Vac, 200msec

#### Pulsed Output Ratio:

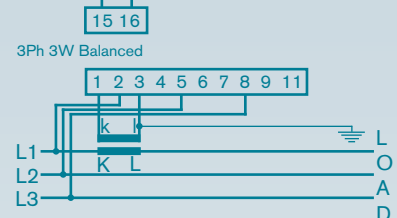
- Once every counter increment

### Connections

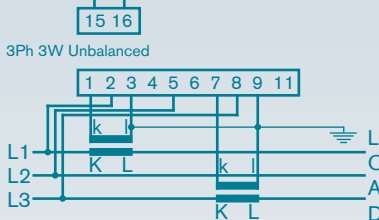
#### Optional Pulsed Output



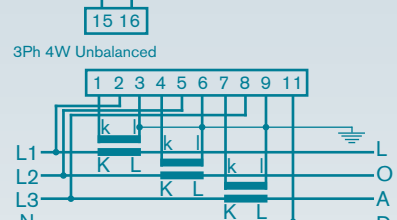
#### Optional Pulsed Output



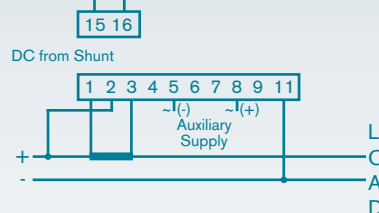
#### Optional Pulsed Output



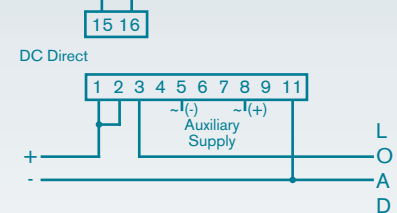
#### Optional Pulsed Output



#### Optional Pulsed Output



#### Optional Pulsed Output



### Notes:

1. Ensure that current transformers are mounted such that K faces the supply and L faces the load.
2. Secondary windings of the current transformers should be earthed.

## Ordering information

Model	Code	Description
	EL100GT	DIN Rail Mounting kWh Meter

Current or CT Ratio	Code	Description
	1L	25/1 to 800/1A (selectable) - see table below *
	1H	200/1 to 6000/1A (selectable) - see table below **
	5L	25/5 to 800/5A (selectable) - see table below *
	5H	200/5 to 6000/5A (selectable) - see table below **
	Specify	Other CT ratio (specify)
	Specify	0.5 to 5 Amps direct (specify)
DC	Specify	0.1 to 10 Amps DC direct (specify) or 10 to 5000 Amps DC from 50, 60, 75mV shunt (specify)***

Wiring System	Code	Description
	/1	Single Phase
	/2	3 Phase 3 Wire Balanced
	/3	3 Phase 3 Wire Unbalanced
	/4	3 Phase 4 Wire Balanced
	/5	3 Phase 4 Wire Unbalanced
DC	/DC	DC System

Input Voltage	Code	Description
	Specify	110, 230 or 415Vac (specify L-N or L-L)
	Specify	50 to 440Vac upon request (specify)
DC	Specify	12, 24, 48Vdc or up to 600Vdc upon request

Auxiliary Power (DC)	Code	Description
DC	Specify	110, 230 or 415Vac (specify)
DC	Specify	12, 24 or 48Vdc (specify)

Options	Code	Description
	/P	Voltage Free Pulsed Output

**Example** EL100GT - 5L - /1 - 230VL-N - /P

### Current Transformer Primary Currents (Selectable)

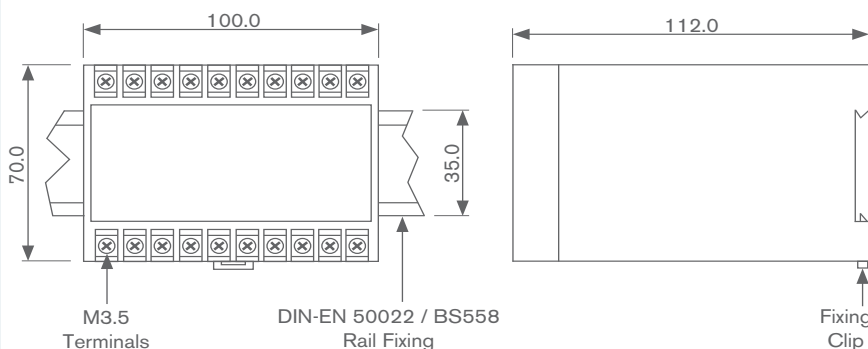
\* L 25, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800A

\*\* H 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 1600, 2000, 2500, 3000, 4000, 6000A

### \*\*\* Standard Shunt Values

10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, 4000, 5000A

### Dimensions



All dimensions in mm

### Specification (AC Measurement)

#### Input Current, $I_n$ :

- 0-0.2A to 0-5A direct connected
- 1A or 5A CT operated

#### Input Voltage, $U_n$ :

- 110, 230, 415V or VT ratio
- (50 to 440V upon request)

#### Voltage Variation:

- $\pm 20\%$  of  $U_n$

#### Frequency:

- 50/60Hz

#### Overload:

- $1.2 \times I_n$  or  $U_n$  for 2 hours
- $6 \times I_n$  for 5 seconds

#### Test Voltage:

- 2kV rms for 1 minute

#### Burden:

- Voltage circuit  $< 3VA$  per phase
- Current circuit  $< 0.1VA$  per phase

#### Counter & Pulse Resolution:

- 1 kWh (L CT ratio model)
- 10 kWh (H CT ratio model)
- Other resolutions available on request to suit direct connected units or VT ratios

### Specification (DC Measurement)

#### Input Current, $I_n$ :

- 0-0.1A to 0-10A direct connected
- 0-10A to 0-5000A from 50, 60 or 75mV shunt

#### Input Voltage, $U_n$ :

- 12, 24 or 48Vdc
- (upto 600V upon request)

#### Voltage Variation:

- 0-120% of  $U_n$

#### Overload:

- $1.2 \times U_n$  continuous,  $2 \times U_n$  for 3 sec
- $1.2 \times I_n$  continuous,  $10 \times I_n$  for 3 sec

#### Test Voltage:

- 1kV rms for 1 minute

#### Counter & Pulse Resolution:

- 1 Wh, 10Wh, 0.1kWh or 1kWh
- Other resolutions available on request

#### Auxiliary Power Supply:

- 12, 24, 48Vdc, 110, 230 or 415Vac

#### Auxiliary Power Supply Variation:

- -10% to +20% of nominal

Specification subject to change without notice.



## 100A Direct Connected kWh Meters

### Models Available

- A100C** Single Phase 100A Direct kWh Meter
- A1100** Three Phase 100A Direct kWh Meter

### Product Features

- Active energy (kWh) measurement
- 100A direct connection
- Single phase and 3 phase versions
- Surface mounting enclosure
- OFGEM approved
- Non-resettable
- Pulsed output option

Direct connected kilowatt hour meters are suitable for the monitoring of active energy (kWh) in all types of metering applications of supplies up to 100A. Models are available for single phase and three phase, balanced or unbalanced loads and all the meters are OFGEM approved.

The meters are housed in a surface mounting enclosure and have a liquid crystal display. The meters have a non-volatile memory providing count retention in the power off condition and eliminating the need for any auxiliary power supply.

All meters are available with an optional voltage free pulsed output for input to data loggers, PLC's, building management systems or computers.

## kWh Meters – for measuring energy (kWh) consumption up to 100A directly

### Specification

#### Approval:

- OFGEM

#### Accuracy:

- A100C class 2 to IEC 62053-21
- A1100 class 1 to IEC 61036

#### Counter:

- 7 digit high contrast wide angle LCD
- 9.8mm x 3.5mm digits

#### Counter & Pulse Resolution:

- 0.01 kWh

#### Input Current, $I_n$ :

- 20-100A direct connected

#### Input Voltage, $U_n$ :

- A100C: 230V
- A1100: 3x230/400V

#### Voltage Variation:

- A100C: 210-250V
- A1100: 220-240VL-N

#### Frequency:

- 50Hz (60Hz available upon request)

#### Test Voltage:

- 4kV rms 50Hz for 1 min (to IEC 414)

#### Impulse Withstand:

- A100C: 12kV 1.2/50 $\mu$ s 40ohm source
- A1100: 12kV 1.2/50 $\mu$ s 500ohm source

#### Burden:

- A100C: 0.66W (8.5VA) capacitive
- A1100: 0.9W (9VA) capacitive

#### Current Circuit Burden:

- A1100: 2VA at 100A/phase (maximum)

### Specification Continued

#### Pulsed Output:

- 20mA at 27Vdc maximum
- 100ms pulse length

#### Pulsed Output Ratio:

- 100 pulses/kWh (=10Wh/pulse)

#### Optical Test Output:

- A100C: LED flashes 1000 imp/kWh
- A1100: LED flashes 500 imp/kWh

#### Enclosure Code:

- Case IP53 to IEC 60529

#### Operating Temperature:

- -20°C to 55°C

#### Storage Temperature:

- -25°C to 85°C

#### Humidity:

- Annual mean 75%
- 95% for 30 days spread over one year

#### Certified Product Life:

- A100C: 20 years
- A1100: 10 years

#### Connections:

- Screw type terminals

#### Weight:

- A100C 350g, A1100 900g

#### Markings:

- CE marked

Specification subject to change without notice.