

Hours Run Meters (LCD)

LCD hours run meters are suitable for monitoring equipment and scheduling of events. These solid state electronic meters are black and feature an LCD display with large 7mm digits and optional electrical reset. The LCD hours run meters are available in two different DIN sizes and have exceptional reliability even in severe environments.

Memory is retained in excess of 25 years in the power off condition, by the use of non-volatile memory, so no internal battery is required. These instruments can record upto 99,999.9 hours before resetting with a 0.1 hour resolution, and have separate power and input terminals. Power consumption is minimal over the wide AC/DC supply voltage bands.



Models Available

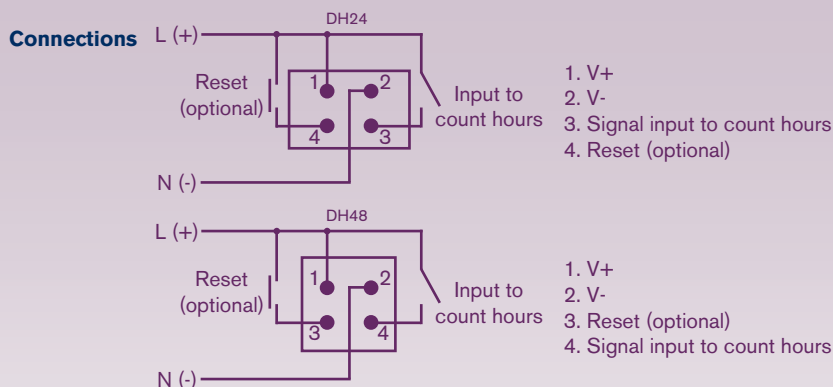
- DH24** DIN24x48 LCD Hours Run Meter
- DH48** DIN48 LCD Hours Run Meter

Product Features

- Hours run monitoring
- Standard DIN sizes
- Non-resettable or resettable
- Many options available (see page 22)

For dimensions see pages 23-24

Hours Run Meters - for monitoring hours of operation on machines



Ordering information

Code	DIN Size	Reset Type	Voltage
DH24	24 x 48mm LCD Hours Run Meter	-	-
DH48	48 x 48mm LCD Hours Run Meter	-	-
N	-	Non-Resettable	-
R	-	Electrical Reset	-
L	-	-	9-60Vdc & 15-75Vac
H	-	-	36-185Vdc and 75-270Vac
Example	DH24	R	L

Specification

Display:

- 6 digit LCD

Counting Range:

- 99,999.9 hours with operation indication

Numerals:

- DH24: 5mm high
- DH48: 7mm high

Accuracy:

- $\pm 0.04\%$ maximum error

Enclosure:

- Flame retardant ABS to DIN 43700

Enclosure Code:

- IP52 front

Mounting:

- Panel mounting

Operating Voltages:

- L: 9-60Vdc and 15-75Vac
- H: 36-185Vdc and 75-270Vac

AC Frequency Range:

- 48 to 440Hz

Power Consumption:

- < 2mA

Terminals:

- DH24: 4.8mm spade terminals
- DH48: 6.4mm spade terminals

Weight:

- DH24 40g, DH48 70g



Energy Meters (kWh Meters)

Models Available

EL96GT DIN96 kWh Meter

EL96GTW DIN96 kWh Meter with Wattmeter

Product Features

- Active energy (kWh) measurement
- Standard DIN square size
- Accuracy class 1 (1%)
- Non-resettable
- Pulsed output option
- Many options available (see page 22)

For dimensions see pages 23-24

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

Pulsed Output:

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

Pulsed Output Ratio:

- Once every counter increment

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

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

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	Code	Description
	EL96GT - 5L - /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

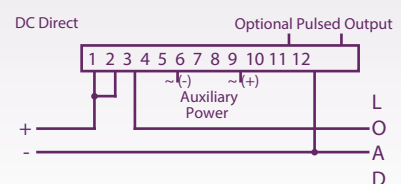
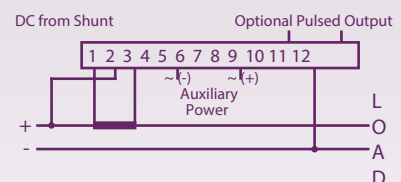
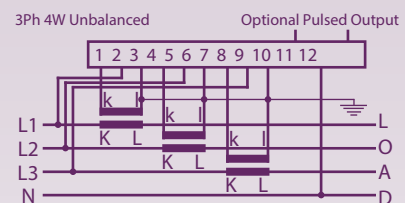
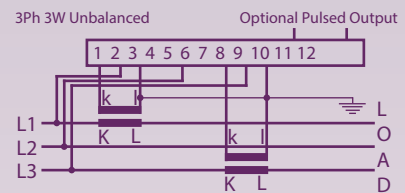
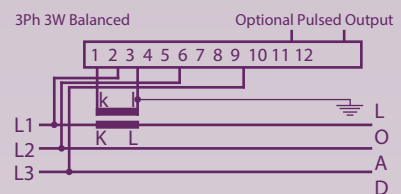
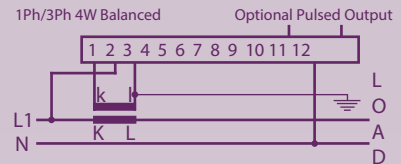
*** Standard Shunt Values

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

Notes:

1. Models with (L)ow CT ratios will have a pulse rate of 1pulse/kWh and models with (H)igh CT ratios will have a pulse rate of 1pulse/10kWh (unless a VT ratio is applicable). Other pulse rates are available to suit direct connected units or VT ratios etc.
2. The Wattmeter on all EL96GTW meters will be scaled.
3. Ensure that current transformers are mounted such that K faces the supply and L faces the load.
4. Secondary windings of the current transformers should be earthed.

Connections



Meter Options

Meter Terminal Covers

Available for FE72 and FE96* meters is a plastic terminal cover to finger-proof the terminals.
(Order Code: **FE72TC, FE96TC**) *All FE48 meters are supplied with terminal covers

Meter Terminal Covers

Available for all sizes of FE72, FE96 and EL meter are a pair of plastic terminal covers to finger-proof the terminals.
(Order Code: **MTC**)

DIN Square Blanking Plates

Available on all sizes of meter is a black plastic blanking plate to cover a DIN square hole.
(Order code: **FE48BP, FE72BP, FE96BP**)

Adjustable Red Pointer

Available on all sizes of shortscales meter is an adjustable red pointer which can be adjusted by a screwdriver from the front fascia. Not available on longscales meters.

(Order code: **ARP**)

Calibration Certificate

Calibration certificates traceable to national standards can be supplied on all meters.

(Order code: **CALCERT**)

6x Overload

Available on all ac ammeters is an overload reading of 6x the full scale current (2x is standard).

(Order Code: **6X O/L**)

Red Line On Scale

Available on any scale is a red line marked at any point on the scale, as specified by the customer.

(Order Code: **RL@ - specify**)

Coloured Sector On Scale

One or more specified coloured (red, green, yellow) sectors on the scale are available on all meters.

(Order Code: **Coloured Sector - specify**)

Heavily Damped Movements

1A or 5A DIN96 moving iron ammeters are available with a damped viscous movement and all moving coil meters are available with an electronically damped movement.

(Order Code: **HD movement**)

IP65 Sealing

All meters are available with a front sealed to IP65 and a neoprene gasket to retain sealing against the panel.

(Order Code: **IP65**)

Gaskets

Gaskets are available for all meters.

(Order Code: **G48F, G72F, G96F**)

Centre Zero Movement

Moving coil meters are available with a bi-directional reading, centre zero movement and scale. Moving coil meters are also available with an offset centre zero movement and scale.

(Order Code: **C/Z movement or O/Z movement**)

Suppressed Zero Movement

Moving Coil meters are available with a suppressed zero movement and scale (e.g. 15Vdc with suppressed scale from 0 to 10Vdc).

(Order Code: **S/Z movement**)

External Adjustable Trim Potentiometer

All moving coil meters are available with an external trim multi-turn potentiometer which is accessible from the back of the meter and adjusts the full scale reading by a minimum of $\pm 20\%$.

(Order Code: **EXT. TRIM. POT.**)

Polycarbonate Window

All sizes of FE meters have a glass window but a polycarbonate window is available. All sizes of EL meters have polycarbonate windows as standard.

(Order Code: **POLY window**)

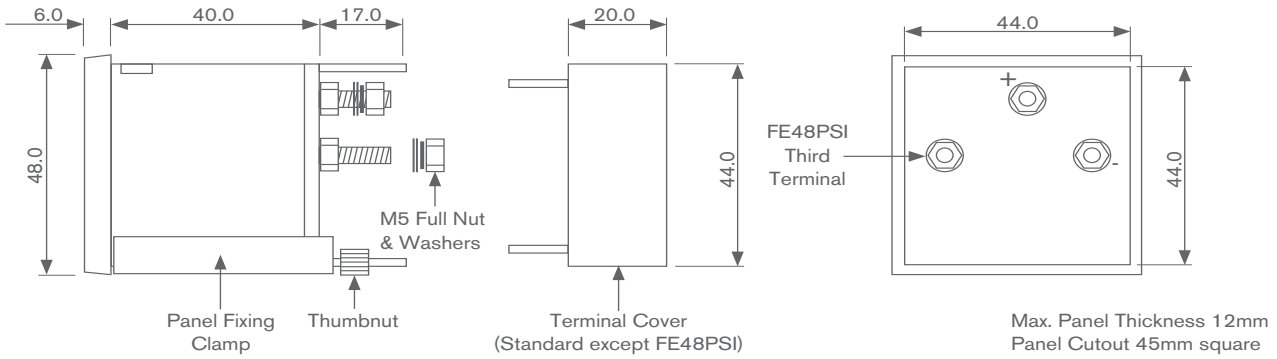
Anti-Glare Window

Anti-glare windows are available for all meters.

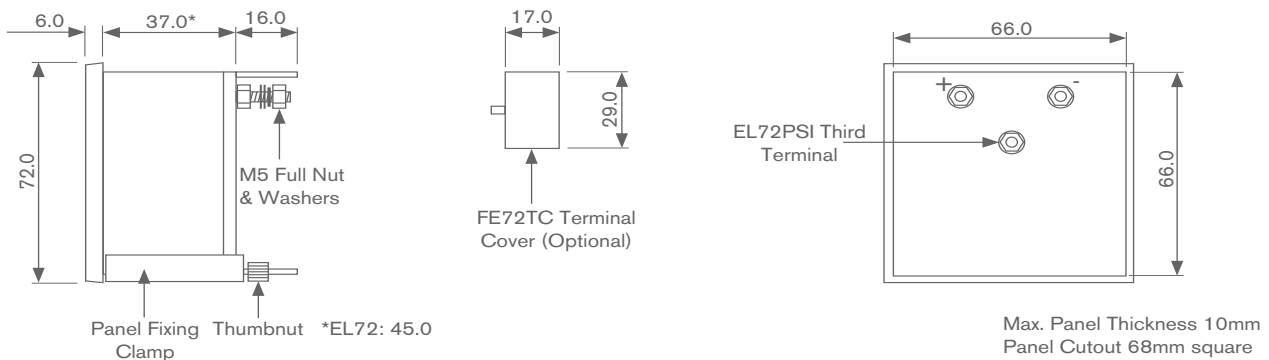
(Order Code: **AG window**)

Dimensions

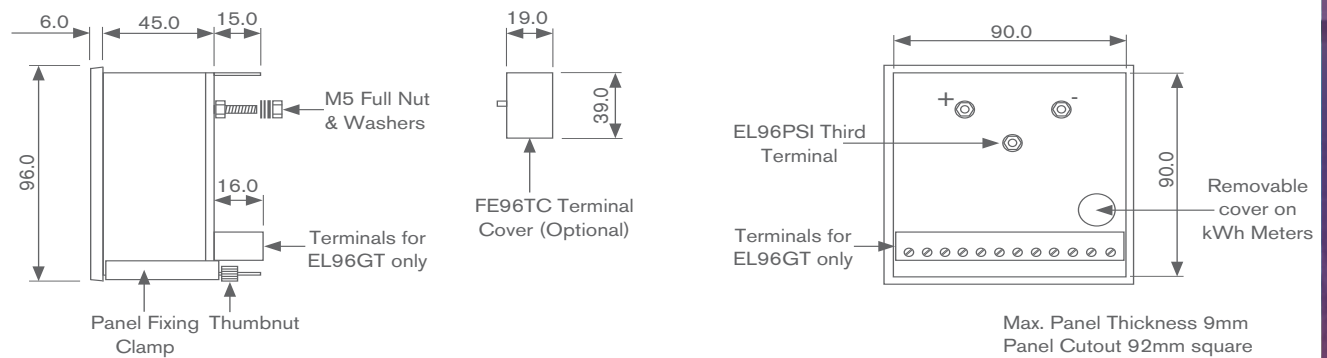
FE48 Enclosure



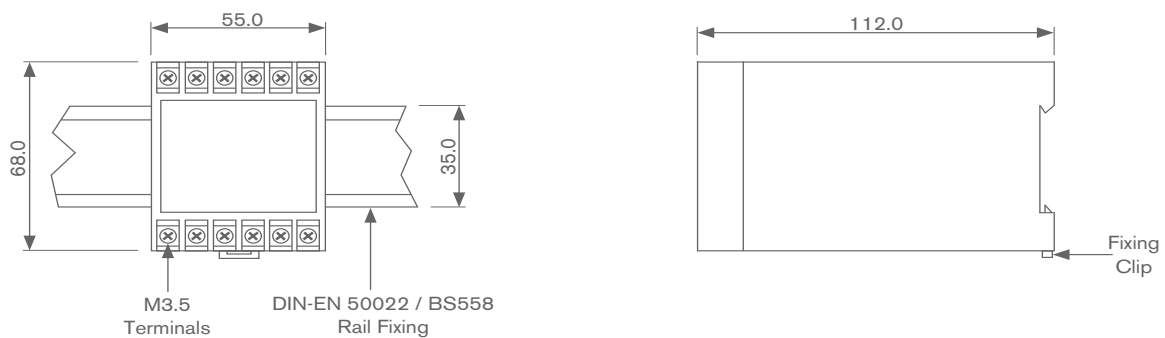
FE72/EL72 Enclosure



FE96/EL96 Enclosure



Watt/Var/cos ϕ Converter Unit Enclosure



All dimensions in mm