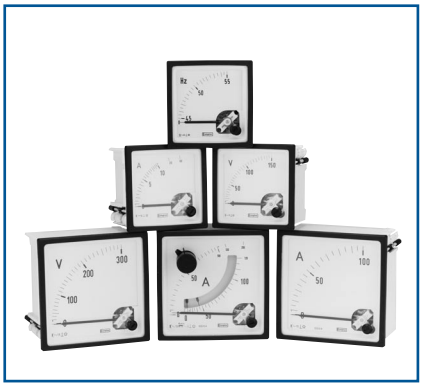
EURODIN Panel Meters



A range of 48, 72, 96 and 144mm DIN style panel meters offering measurement of all electrical parameters and featuring moving coil or moving iron movements. All meters incorporate slide in dials and terminal covers as standard. A range of customised options is available.

Features

A range of the most popular shortscale measuring instruments in 4 case sizes

Shock resistant sprung pivot and jewel movement

Terminal covers supplied as standard

EMC hard frequency meter –fully EMC and LVD compliant

¼" 'fast on' terminals available

Benefits

Low cost

Local indication

Ease of installation

Minimal training

Low maintenance

Customised options and features

Applications

Switchgear

Distribution systems

Generator sets

Control panels

Energy management

Building management

Utility power monitoring

Process control

Motor control

Approvals

Lloyds:

03/00055 - Moving coil meters

03/00056 - Moving iron meters

03/00057 - Frequency meters

Movements

Moving Coil Meter

This is a centre cored, self shielding moving coil movement, using pivots, hairsprings and sprung jewels. Variations in movement ranges are limited by design to 7: all intermediate ranges are achieved by shunting the next lowest range. All D.C. voltmeters are 1000 ohms per volt, rectified product run at 900 ohms per volt, millivolt meters use the 5 milliamp movement.

Moving Iron Meter

This is a clapper type repulsion design using pivots, hairsprings and jewels movement. The bottom jewel is oil filled to provide damping while the top is sprung for resilience. All voltmeters are manufactured with the voltage dropper resistors external to substantially reduce the self heating effects.

Frequency Meter

This uses a 100 microamp 4000 ohm movement driven by an EMC hard frequency conversion circuit.

Dials, Scales and Pointers

Standard dials are matt white with black printed scales and bar knife-edge pointers. Black dials with white or yellow scales and pointers are also available. Interchangeable slide in dials are used on models E242, E243, E244 and E246 90° moving iron, moving coil and frequency meters.

General options include red supplementary pointers, red indexes (quadrant scales), red, green or blue lines, bands or segments, finely spaced divisions, multi-scales, special scales and captions to customer' requirements.

Specification

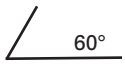
Type of Instrument	Moving Iron for Current and Voltage	Moving Coil for Current and Voltage	Moving Coil with rectifiers for Current and Voltage	Moving Coil with built in transducer for frequency measurement	Maximum Demand Indicators	Combined MDI with Moving Iron Movement
Format	48 x 48 mm 72 x 72 mm 96 x 96 mm 144 x 144 mm	48 x 48 mm 72 x 72 mm 96 x 96 mm 144 x 144 mm	48 x 48 mm 72 x 72 mm 96 x 96 mm 144 x 144 mm	72 x 72 mm 96 x 96 mm 144 x 144 mm	72 x 72 mm 96 x 96 mm	96 x 96 mm
Movement Type	Sprung pivot Jewel with silicon oil damping	Sprung pivot Jewel with eddy current damping	Sprung pivot Jewel with eddy current damping	Sprung pivot Jewel with eddy current damping	Sprung pivot Jewel with silicon oil damping	Sprung pivot Jewel with silicon oil damping
Burden	0.5VA to 15A then 0.8VA Voltmeters 4.5VA	See detailed specification	See detailed specification	See detailed specification	2.5VA	3VA
Accuracy	1.5% to DIN43780	1.5% to DIN43780	2.5% to DIN43780	0.5% to DIN43780	3% on MDI	3% on MDI 1.5% ammeter
Input Type	A.C. Current or Voltage	D.C. Current or Voltage	Rectified A.C. Current or Voltage	Frequency for all Voltage ranges	Mean RMS value and maximum demand Current	Mean RMS value and maximum demand current and instantaneous current
Measuring Range	6V - 600V 100 mA - 100A	15mV - 600V 25µA - 100A	6V - 600V 100µA - 100mA	57.7V @ 45 Hz-500V @ 44Hz	1A - 6A 8, 15 or 20 minute delays	1A - 6A 8, 15 or 20 minute delays 0 - 5A/6A instantaneous
Dielectric Voltage withstand Test	3 kV A.C.	3 kV A.C.	3 kV A.C.	3 kV A.C.	3 kV A.C.	3 kV A.C.

DIN 16257 symbol meaning for calibration position

Vertical

Horizontal

Inclined



Inclination of dial surface to the horizontal e.g 60°.

Required orientation must always be stated when ordering if other than vertical mounting is required.

General Specification

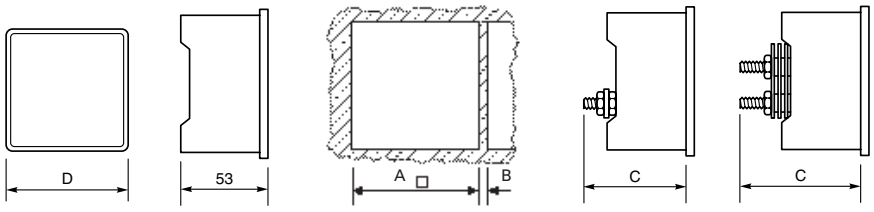
Performance	BSEN60051
Measuring Ranges	DIN 43701
Accuracy Overload	BSEN60051
Dimensions	DIN43700
Scale Marking Generally To	DIN43802
Magnetic Influence	BSEN60051
Safety	BSEN61010-1
Terminals	Clamp strap M4 up to 25A. Clamp strap M8 over 25A ¼" spade terminals available for models E243 & E244
Humidity Range	Up to 95% RH (non condensing)
Test Voltage @50Hz	3kV RMS for 1 minute
Ammeter Ranges	1.0/1.2/1.3/1.5/2.5/4/5/6/8 and decade multiples thereof.
Overload AC Current	x 1.2 continuous x 10 for 5 seconds
AC Voltage & Frequency	x 1.2 continuous x 2 for 5 seconds
Standard Calibration	23°C. Calibration at other temperatures available on request
Operating Temperature	-20°C to +60°C
Damping Time	Less than 3 seconds
Enclosure Code	IP52 as standard IP54 on request
Case and Base	Grade UL94V0 (Lexan 500R)
Case	Dimensions and panel cutout conform to IEC473, DIN 43700. Case made from glass filled polycarbonate self-extinguishing and non drip in accordance with UL94 V-O
Bezel	Slim-line DIN43802 black as standard
Bezel Window	Standard sheet glass, with zero adjusters where appropriate. Non reflecting glass or polycarbonate shatterproof windows are available.
Installation	Installations in switchboard panel or mosaic arrangement on equipment or machine with a panel thickness of up to 40mm in a horizontal or vertical plane
Fixing on Panel	Swivel captive fasteners, which can be fixed at either corner
Mounting Position	Normal vertical mounting or as indicated on the scale in accordance with DIN 16257. A deviation of ±15° is permissible
Insulation Group	Insulation resistance more than 5MΩ@ 500 V
Environmental	Measurement Category III IEC 1010-1 Pollution Degree 2 IEC 1010-1 Electrical Rating 600V RMS (920V Peak)
Approvals	EMC, LVD and Lloyds

Dimensions

For Moving Coil measuring range:		For Moving Iron measuring range:	
6A to 60A	C=67mm	0 to 30A	C=64mm
>60A	C=78mm	>30A	C=67mm

Max panel thickness = 40mm

D	A	B
48 x 48	45 x 45	4
72 x 72	68 x 68	4
96 x 96	92 x 92	4
144 x 144	135 x 135	4



Moving Iron A.C. Ammeters and Voltmeters

Designed to measure A.C. current or voltage, these meters indicate true r.m.s. values and are substantially independent of system waveform. Scales are calibrated down to 20%, and ammeters can have overload scales x2, x3, x5 or x6 for motor start duty. Ammeters can be supplied for use with -/1A or -/5A current transformers, whilst voltmeters can be scaled for use with voltage transformers. Heavy damping is available as an option. Meters can be used to measure D.C. at reduced accuracy.

Specification

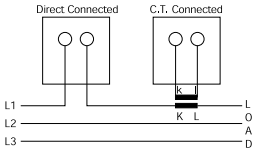
Accuracy:	Class 1.5
Frequency:	50 or 60Hz, (400Hz on request)
Burden at 50Hz:	Ammeters: 0.5VA Voltmeters: Up to 4.5VA maximum
Ratings:	Ammeters: 0.5A to 100A A.C. direct connected (40A for E242-75A and E246-07A). Maximum system voltage 600V A.C. Low load / high middle maximum 10A
Voltmeters:	6V to 600V

Product Codes

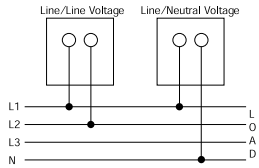
Bezel Size mm	48	72	96	144
Scale length mm	42	65	94	145
Product Codes				
A.C. ammeter	E242-75A	E243-02A	E244-02A	E246-02A
x2 overload ammeter	E242-752A	E243-022A	E244-022A	E246-022A
x3 overload ammeter	E242-753A	E243-023A	E244-023A	E246-023A
x5 overload ammeter	E242-755A	E243-025A	E244-025A	E246-025A
x6 overload ammeter	E242-756A	E243-026A	E244-026A	E246-026A
A.C. voltmeter	E242-75V	E243-02V	E244-02V	E246-02V

Connections

A.C. Ammeter



A.C. Voltmeter



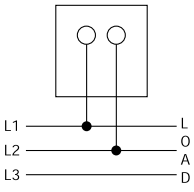
Frequency Meters

These Frequency meters use an integral electronic converter and a moving coil indicator. This meter is easy to read with an accuracy class 0.5.

Specification

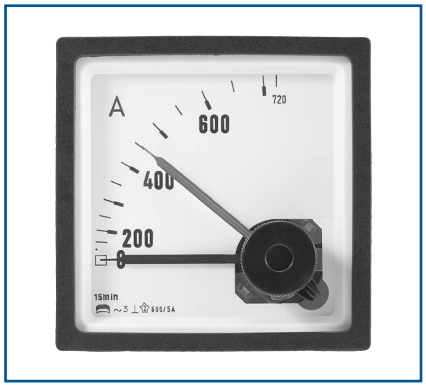
Ratings:	100V-125V A.C 200V-250V A.C. 380V-440V A.C.* 500V A.C.* *Use E242-013 and 253-THZ in place of E242-41S on voltages over 380V Models available for use with V.T.s
Frequency:	0.5%: 45/55Hz, 55/65Hz, 45/65Hz, 360/440Hz
Burden:	4VA Maximum

Connections



Product Code

Bezel Size mm	48	72	96	144
Scale length mm	42	65	94	145
Product Code	E242-41S	E243-41S	E244-41S	E246-41S



Maximum Demand Indicators

The thermal/time characteristic of an MDI monitors the most economic use of cable, fusegear and transformers. The directly heated bimetal element indicates mean r.m.s. current over 8, 15, or 20 mins, and a red slave pointer shows the highest value reached. The reset knob is wire sealable. Scales are calibrated to match the C.T. primary plus 20% overload. End values are selected from : 1.2, 1.8, 2.4, 3, 3.6, 4.8, 6, 7.2, 9 Amps and their multiples of 10 and 100.

Specification

Accuracy:	Class 3
Options:	5A for use with separate C.T. 5/5A saturating C.T. 1/5A saturating C.T.
Burden at 50 Hz:	MDI - 2.5VA, C.T. - 2VA
Overload withstand:	Standard: 5 x FL for 5 seconds, 10 x FL for 1 second With Saturating C.T.: 10 x FL for 3 seconds 20 x FL for 1 second
Frequency:	50/60Hz

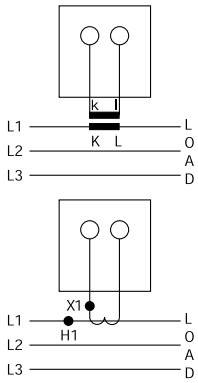
Product Codes

Bezel Size mm	72	96
Scale length mm*	65	94
Product Codes		
8 Minute Time Lag Without limiting C.T. for use with 5A C.T.	E243-16B	E244-16B
15 Minute Time Lag Without limiting C.T. for use with 5A C.T.	E243-16A	E244-16A
20 Minute Time Lag Without limiting C.T. for use with 5A C.T.	E243-16J	E244-16J

* Scaled 0/100/120% of C.T. primary value.

Connections

Maximum Demand Indicators



Combined A.C. Ammeter and Maximum Demand Indicator

Where the instantaneous and maximum demand currents are required, these instruments combine both movements in one case. It can also replace an existing A.C. Ammeter. Specification as above.

Specification

Accuracy:	Moving Iron Ammeter: Class 1.5 MDI: Class 3
Burden at 50Hz:	MI - 0.5VA, MDI - 2.5VA Saturating C.T. - 2VA

Product Codes

Bezel Size mm	96
Scale length mm*	94
Product Codes	
8 Minute Time Lag Without limiting C.T. for use with 5A C.T. 3VA	E244-16Q
15 Minute Time Lag Without limiting C.T. for use with 5A C.T. 3VA	E244-16C
20 Minute Time Lag Without limiting C.T. for use with 5A C.T. 3VA	E244-16H

* Scaled 0/100/120% of C.T. primary value.

Moving Coil D.C. Ammeters and Voltmeters

Moving Coil Meters are suitable for all D.C. systems. The linear scale is calibrated down to zero and the accuracy maintained down to 10%. High currents are measured with separate shunts and suitably scaled indicators. Suppressed, centre and offset zero models are available.

Specification

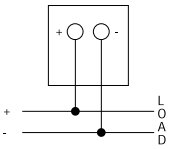
Accuracy:	Class 1.5
Ratings:	Ammeters: 100µA to 25A, (200µA for 05 model) 4/20mA suppressed zero 40A for model E242, E243 & E244 up to 100A Voltmeters: 50mV to 600V 1/5V suppressed zero 50, 60, 75, 100, 150mV for use with shunts
Impedance:	Ammeters: 75mV internal shunt above 60mA Voltmeters: 1000Ω/V above 1V

Product Codes

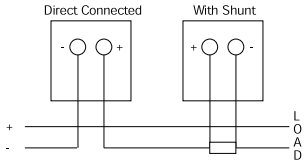
Bezel Size mm	48	72	96	144
Scale length mm	42	65	94	145
Product Codes				
Ammeters	E242-89A	E243-01A	E244-01A	E246-10A
Ammeters suppressed zero	E242-89R	E243-01R	E244-01R	E246-10R
Voltmeters	E242-89V	E243-01V	E244-01V	E246-10V
Voltmeters suppressed zero	E242-89S	E243-01S	E244-01S	E246-10S

Connections

D.C. Voltmeter



D.C. Ammeter



Moving Coil Rectified A.C. Ammeters and Voltmeters

For high frequency or linear full scale A.C. measurements, these instruments measure average values of sinusoidal waveforms and are scaled in r.m.s. values. The high quality silicon bridge rectifier gives a linear scale down to near zero, where some compression occurs.

Specification

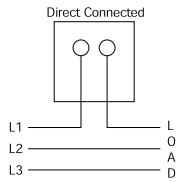
Accuracy:	1.5% ES
Ratings:	Ammeters: 250µA to 1A A.C. Over 1A via C.T.s Voltmeters: 15V to 600V a.c. direct connected Models available for use with V.T.s
Frequency:	50/60Hz, (Single Frequencies 25Hz to 3kHz on request)

Product Codes

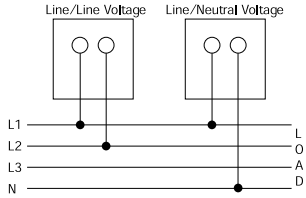
Bezel Size mm	48	72	96	144
Scale length mm	42	65	94	145
Product Codes				
Ammeters	E242-89B	E243-01B	E244-01B	E246-10B
Voltmeters	E242-89W	E243-01W	E244-01W	E246-10W

Connections

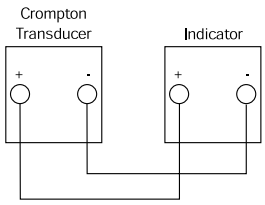
A.C. Ammeter



A.C. Voltmeter



Connections



Process Indicators

Used to check process functions locally or remotely at centralised controls. These moving coil instruments offer a wide variety of electrical and mechanical readouts operated by transducer, tachogenerator, thermocouple, resistance bulb or other D.C. analogue signals. Suppressed, centre and offset zero models are available on request.

Specification

Accuracy:	Class 1.5
Ratings:	1, 2, 5, 10 & 20mA 4/20mA suppressed zero

Product Codes

Bezel Size mm	48	72	96	144
Scale length mm	42	65	94	145
Product Codes				
A.C. Current	E242-89A	E243-01A	E244-01A	E246-10A
A.C. Voltage	E242-89V	E243-01V	E244-01V	E246-10V
Speed	E242-892	E243-012	E244-012	E246-102
Frequency	E242-893	E243-013	E244-013	E246-103
Phase Angle	E242-894	E243-014	E244-014	E246-104
Watts	E242-895	E243-015	E244-015	E246-105
VArs	E242-896	E243-016	E244-016	E246-106
VA	E242-897	E243-017	E244-017	E246-107