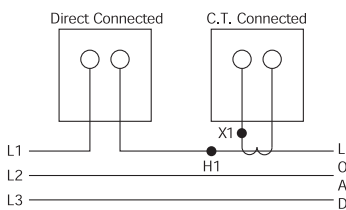
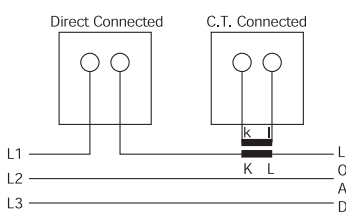


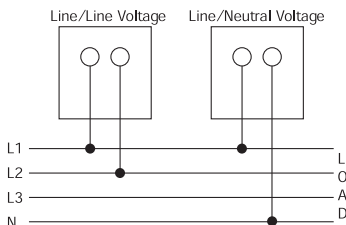


## Connections

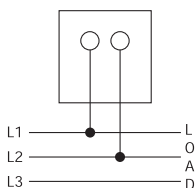
### AC Ammeter



### AC Voltmeter



## Connections



## Moving Iron AC Ammeters and Voltmeters

Designed to measure AC current or voltage, these meters indicate true RMS values and are substantially independent of system waveform. Scales are calibrated down to 20%, and ammeters can have overload scales of 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. Meters can be used to measure DC at reduced accuracy.

### Specifications

|                 |  |
|-----------------|--|
| Accuracy:       | Class 1.5  |
| Frequency:      | 50 or 60Hz, (400Hz on request)   |
| Burden at 50Hz: | Ammeters: 0.5VA<br>Voltmeters: Up to 4.5VA maximum   |
| Ratings:        | Ammeters: 0.5-100A AC direct connected<br>(40A for E242-75A and E246-02A)<br>Maximum system voltage 600V AC<br>Low load/high middle, maximum 10A |
| Voltmeters:     | 6-600V   |

### Product Codes

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

## Frequency Meters

Frequency meters use an integral electronic converter and a moving coil indicator. These easy to read meters have accuracy Class 0.5.

### Specifications

|            |   |
|------------|---|
| Ratings:   | 100-125V AC<br>200-250V AC<br>380-440V AC*<br>500V AC*<br>*Use E242-89A and 253-THZ in place of E242-41S for voltages over 380V Models available for use with VTs |
| Frequency: | 0.5%: 45/55Hz, 55/65Hz, 45/65Hz, 360/440Hz  |
| Burden:    | 4VA maximum   |

### Product Codes

|                 |          |          |          |
|-----------------|----------|----------|----------|
| Bezel size mm   | 48       | 72       | 96       |
| Scale length mm | 42       | 65       | 94       |
| Product codes   | E242-41S | E243-41S | E244-41S |

## DIN PANEL METERS - SHORT SCALE



### Features

- A range of the most popular short-scale measuring instruments in 4 case sizes
- Shock resistant sprung pivot and jewel movement
- Terminal covers supplied as standard
- EMC hard frequency meters are fully EMC and LVD compliant
- 1/4" '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

A range of 48, 72, 96 and 144mm DIN style panel meters measuring 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.

### Movements

#### Moving Coil Meter

Centre cored, self shielding moving coil movement, using pivots, hairsprings and sprung jewels. Seven variations have been designed in movement ranges: all intermediate ranges are achieved by shunting the next lowest range. All DC voltmeters are 1000 ohms per volt, rectified product run at 900 ohms per volt, millivolt meters use the 5 milliamp movement.

#### Moving Iron Meter

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

#### Frequency Meter

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

#### Dials, Scales and Pointers

Standard dials are white matt 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 the E242, E243, E244 and E246 90° moving iron, moving coil and frequency meter models.

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's requirements.

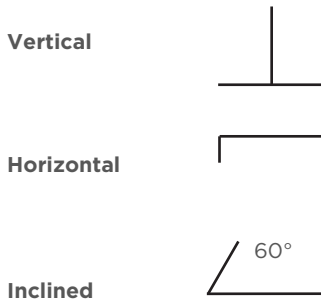
### Specifications

| 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 MD with moving iron movement                         |
|--|--|--|---|--|---|---|
| <b>Format</b>                            | 48 x 48mm<br>72 x 72mm<br>96 x 96mm<br>144 x 144mm | 48 x 48mm<br>72 x 72mm<br>96 x 96mm<br>144 x 144mm | 48 x 48mm<br>72 x 72mm<br>96 x 96mm<br>144 x 144mm  | 72 x 72mm<br>96 x 96mm<br>144 x 144mm                          | 72 x 72mm<br>96 x 96mm                                | 96 x 96mm   |
| <b>Movement type</b>                     | 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                   |
| <b>Burden</b>                            | 0.5VA-15A then 0.8VA voltmeters 4.5VA              | See detailed specifications                        | See detailed specifications                         | See detailed specifications                                    | 2.5VA   | 3VA   |
| <b>Accuracy</b>                          | 1.5% to DIN43780                                   | 1.5% to DIN43780                                   | 2.5% to DIN43780                                    | 0.5% to DIN43780   | 3%  | 3% on MDI<br>1.5% ammeter                                     |
| <b>Input type</b>                        | AC current or voltage                              | DC current or voltage                              | AC current or voltage                               | AC voltage   | AC current  | AC current  |
| <b>Measuring range</b>                   | 6-600V<br>100mA-100A<br>48mm only up to 40A        | 50mV-600V<br>100µA-40A,<br>48mm only 25A           | 15-600V<br>1mA-100mA and<br>1A & 5A                 | 57.7V @ 45Hz<br>500V @ 44Hz                                    | 0-1/1.2A or<br>0-5/6A<br>8, 15 or 20<br>minute delays | 1-6A 8, 15 or 20<br>minute delays<br>0-5A/6A<br>instantaneous |
| <b>Dielectric voltage withstand test</b> | 3kV AC   | 3kV AC   | 3kV AC  | 3kV AC   | 3kV AC  | 3kV AC  |

## Approvals

- Lloyds:  
03/00055 - Moving coil meters  
03/00056 - Moving iron meters  
03/00057 - Frequency meters
- UL file No E203000

## DIN16257 symbol meaning for calibration position



Inclination of dial surface.

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

## General Specifications

|                             |   |
|-----------------------------|---|
| Performance:                | BS EN60051  |
| Measuring ranges:           | DIN43701  |
| Accuracy overload:          | BS EN60051  |
| Dimensions:                 | DIN43700  |
| Scale marking generally to: | DIN43802  |
| Magnetic influence:         | BS EN60051  |
| Safety:                     | BS EN61010-1  |
| Terminals:                  | Clamp strap M4 for up to 25A. Clamp strap M8 for over 25A<br>1/4" spade terminals available for models E243 and E244  |
| Humidity range:             | Up to 95% RH (non condensing)   |
| Test voltage @50Hz:         | 3kV RMS for 1 minute  |
| Ammeter ranges:             | 1.0/1.2/1.5/2.5/5/6 and decade multiples thereof  |
| Overload AC current:        | x 1.2 continuous x 10 for 5 seconds   |
| AC voltage and 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<br>IP54 on request   |
| Case and base:              | Grade UL94V0  |
| Case:                       | Dimensions and panel cut out conform to IEC473, DIN43700.<br>Case made from glass filled polycarbonate self-extinguishing and non drip in accordance with UL94V-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 DIN16257. A deviation of 315° is permissible   |
| Insulation group:           | Insulation resistance more than 5Ω@ 500V  |
| Environmental:              | Measurement category III IEC 1010-1<br>Pollution degree 2 IEC 1010-1<br>Electrical rating 600V RMS (920V peak)  |
| Approvals:                  | EMC, LVD and Lloyds   |

## Dimensions

| Moving coil measuring range |        | Moving iron measuring range |        |
|-----------------------------|--------|-----------------------------|--------|
| 6-60A                       | C=67mm | 0-30A                       | 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 | 138 x 138 | 4 |

