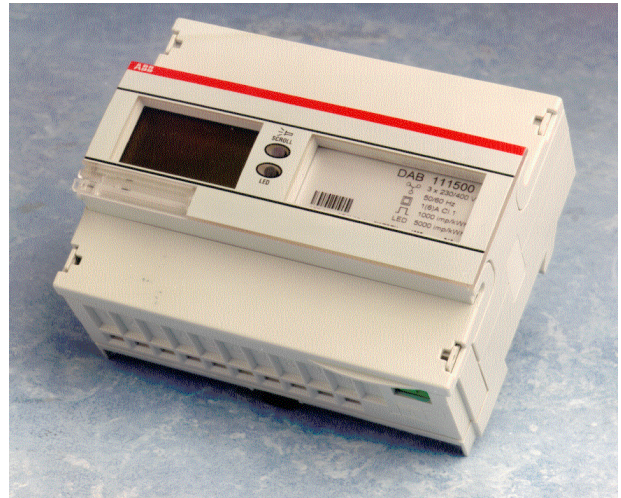


EM/3+ Three Phase Electricity Meters

THREE PHASE ELECTRICITY METERS



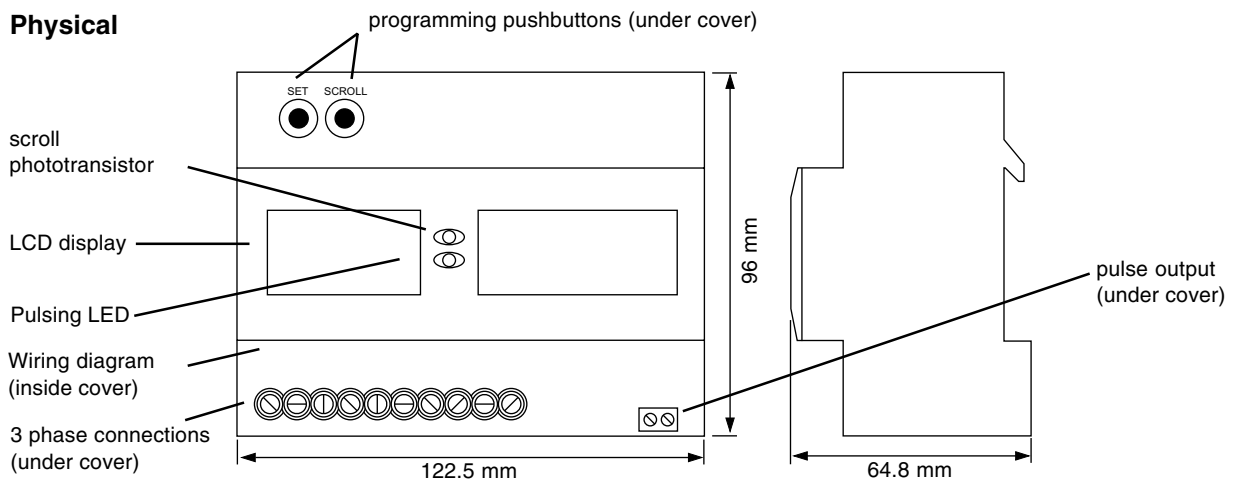
Description

The EM/3+ meters are electronic three phase energy meters suitable for sub-metering of all types of building. They each provide pulsed outputs via solid state relays suitable for connection to an IQ controller. They will monitor both balanced and unbalanced loads via a 4 wire connection (3 wattmeter method). There is both a direct-connected version and a version connected via current transformers. A range of split core current transformers up to 2000 A is also available.

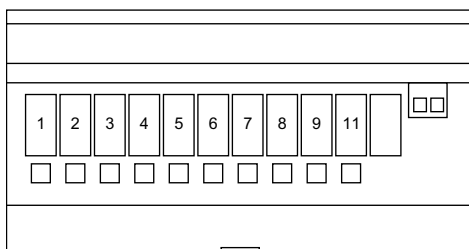
Features

- Compact solid state meter
- DIN rail mounting
- Visual display
- Panel mounting kit option
- Direct connected and indirect (via CTs) versions
- Programmable for VTs and CTs (EM3+/230/CT version)

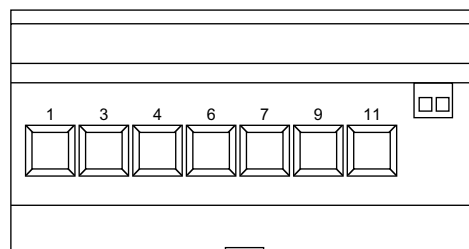
Physical



EM3+/230/CT



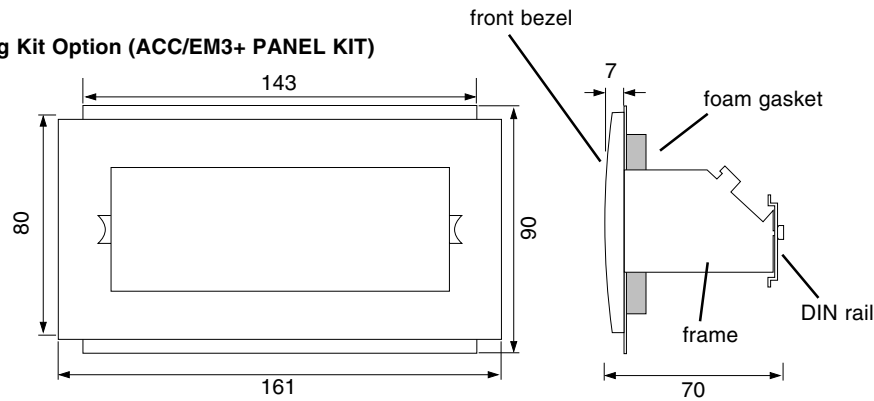
EM3+/230/D



Physical (continued)

dimensions in mm

Front Panel Mounting Kit Option (ACC/EM3+ PANEL KIT)



FUNCTIONALITY

The EM/3+ meters are solid state meters which will measure energy consumption on 3 phase loads using a 4 wire connection (3 wattmeter method). The indirect meter measures the energy via current transformers (voltage transformers may also be used). The meters mount on a standard DIN rail.

Panel Mounting Kit

The optional panel mounting kit enables the meter to be mounted in the front of a panel. It consists of a frame which supports a short length of DIN rail. A plastic bezel covers the two screw fixings. The DIN rail may be repositioned on the frame temporarily to support the meter while wiring and configuring its settings.

SET Button

The SET button is used to select menus and make configuration changes to the meters.

SCROLL Button

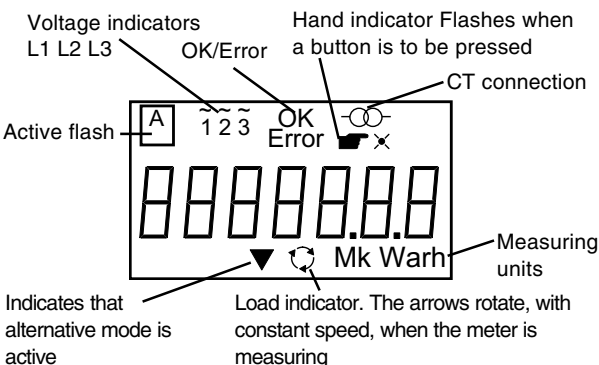
This button is used to select 'safe' functions (i.e. alternative display, or next quantity on display). If the scroll button is held down for more than 2 seconds it performs a 'Long SCROLL' function which can be used as an 'Escape' from lower level menus.

Scroll Phototransistor

This has the same function as the SCROLL button but is activated by an torch beam, so that the button may be 'pressed' even when mounted inside a panel.

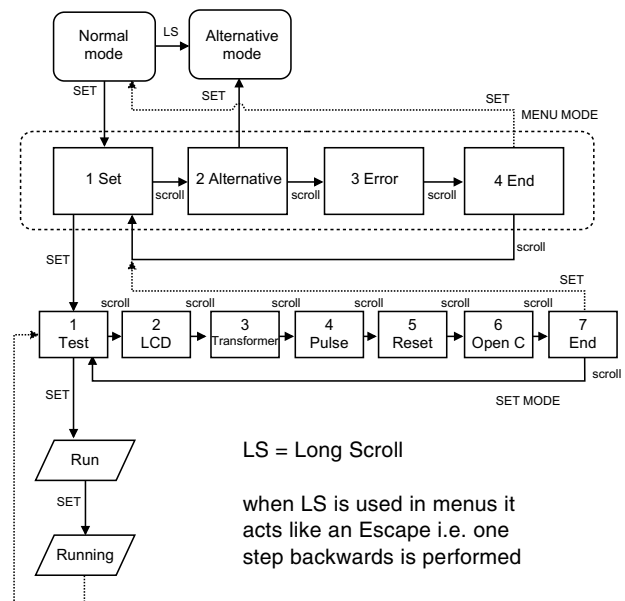
LCD Display

The LCD display gives a direct kWh reading and some installation information. In **normal mode** the active (A) will flash and the load indicator arrows will rotate during measurement. The connected phases are indicated by L1, L2, L3. The CT connection indicator will be missing for the /D version and the units are shown in bottom right hand corner (normally kWh, but may be MWh). The 'OK' indicator will show unless an error is present, indicated by 'Error'.



Display Modes

In addition to the **normal mode** display, **alternative**, **menu**, and **SET** modes may be selected.



LS = Long Scroll

when LS is used in menus it acts like an Escape i.e. one step backwards is performed

Alternative mode

This mode is selected by pressing the scroll button for more than 2 secs (long Scroll). The normal display is returned to in the same way.

This mode shows the energy register with one extra decimal point. It also shows the transformer ratio setting (VT x CT) - (only for /CT version).

Menu mode

This mode is selected by pressing the SET button. This gives SET, Alternative, and Error modes of display. The **Error** display shows an error as a number which can be decoded from a list of errors. The meter may be used to perform an installation check (see below) and any errors will be shown here.

FUNCTIONALITY (continued)

SET mode

This mode is selected from menu mode by pressing the SET button when SET is displayed. This gives Test, LCD, Transformer, Pulse, Reset, and Open C displays.

Test display: This enables the installation check to be performed by pressing the SET button when 'Run' is displayed and the hand symbol 'H' flashes. While the test runs, the word 'running' is displayed. When the test is complete the meter returns to SET mode, with the error segment set if appropriate. The error number may be seen from either Menu mode or alternative mode.

LCD display: Pressing SET when 'LCD' is displayed will illuminate all LCD segments until SET is pressed again whereupon the meter returns to SET mode.

Transformer display: (Pressing SET when 'Transformer' is displayed) enables the VT x CT ratio to be entered (max. ratio 999999). This is only used on the /CT version. The hand symbol 'H' and the primary recording $\text{---}\text{O}\text{---}$ symbol flash and all digits flash "-----".

The first digit is increased by 1 for every press of the scroll button until the setting is confirmed by pressing SET. The same procedure is then repeated for all the digits (10, 100 etc). When the last digit is ready, the hand symbol 'H' still flashes, and when the SET button is pressed as confirmation the new ratio will then be used by the meter.

Pulse display: Pressing SET when 'Pulse' is displayed enables the pulse ratio to be entered. This is only used on the /CT version (as in the /D version it is fixed at 100 pulses/kWh). This can be set to 10, 100, 640, 1000, 1280, or 2560 pulses/kWh, by stepping through the ratios with the scroll button, and pressing SET when the required ratio is displayed.

Reset: This has no effect on this meter version.

Open C: Not normally used

Pulsing LED: This LED pulses as the energy is supplied (5000 pulses per kWh on /CT version; 1000 pulses per kWh on /D version).

Pulse output

The pulse output is produced by a polarity independent solid state relay. The output can supply a maximum of 100 mA with a pulse width of 100 ms. The rate is set as described above to be 10, 100, 640, 1000, 1280 or 2560 pulses/kWh on the /CT version and fixed at 100 pulses/kWh on /D version.

INSTALLATION

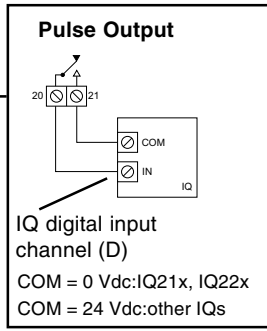
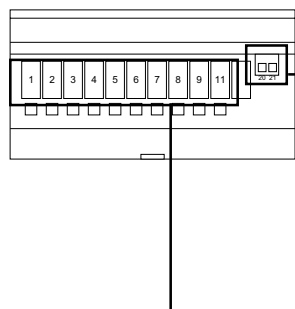
- If using mounting kit, mount on panel
- Mount unit on DIN rail
- Connect unit to mains supply
(using CTs, fuses, and VTs (optional) on /CT version)
- Connect pulse output to IQ

- Perform installation check (SET/Test/Run)
- Configure meter on /CT version (transformer ratio, pulse ratio)
- Configure IQ
- Test

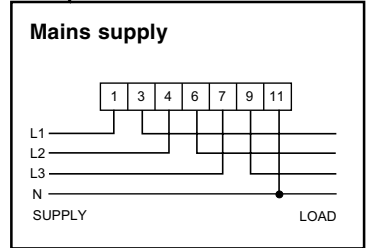
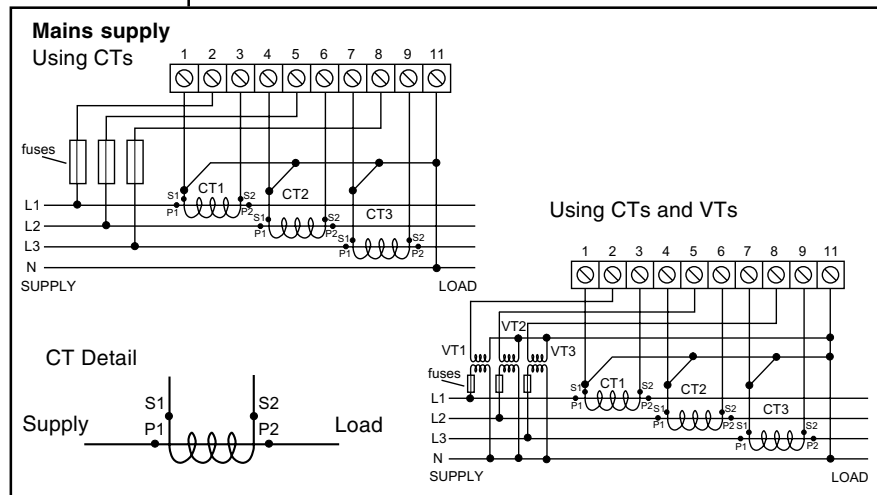
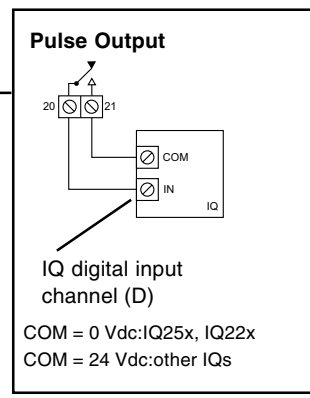
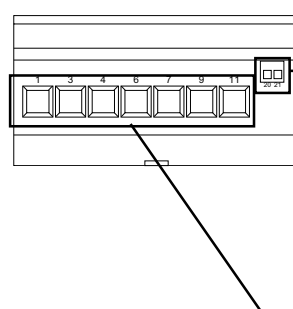
The installation procedure is covered in the EM/3+/230/CT Installation Instructions TG100779 or the EM/3+/230/D Installation Instructions TG200321; other settings are described in the Delta meter installation instructions. Both installation instructions are supplied with the product. The optional Panel Mounting Kit Installation Instructions TG200202 are supplied with the kit (ACC/EM3+ PANEL KIT).

CONNECTIONS

EM/3+/230/CT



EM/3+/230/D



ORDER CODES

EM/3+/230/CT	Three phase kWh meter via 4 wire connection using CTs.
EM/3+/230/D	Three phase kWh meter via 4 wire direct connection.
ACC/EM3+ PANEL KIT	Optional Panel Mounting Kit includes front bezel, short length of DIN rail, and foam gasket.

For details of available current transformers see CT Data Sheet, TA102139.

SPECIFICATIONS**Electrical**

Accuracy	
/CT	:Class 1 IEC 1036
/D	:Class 2 IEC 1036
Voltage	:3 x 230 Vac, -20 %, +15 %
Frequency	:50/60 Hz \pm 2.5 %
Voltage inputs power	:Dissipates less than 4 VA, 2W per phase, typically 2.5 VA, 1.5 W
Current range	
/CT	:6 A maximum, (1 A nominal as IEC1036)
/D	:65 A maximum (5 A nominal as IEC 1036)
*Starting current	:<25 mA
Current Inputs power:	<0.2 VA per phase
Mains terminals	
/CT	:10 mm ² cross section area wire
/D	:25 mm ² cross section area wire
Pulse output terminals	:2.5 mm ² cross section area wire
Pulse output voltage:	247 Vac/Vdc maximum
Pulse output current:	100 mA maximum
Pulse length	:100 ms \pm 1 ms
Pulse output ratio	
/CT	:Programable to 10, 100, 640, 1000, 1280, 2560 pulses/kWh
/D	:Fixed at 100 pulses/kWh

* current at which meter starts to register energy

Mechanical

Dimensions	
Meter	:122.5 x 96 x 64.8 mm
Mounting Kit	:102 x 190 x 77 mm
Weight	
Meter	:500 g
Mounting Kit	:186 g
Material	
Meter	:Polycarbonate in transparent front cover, bottom case, upper case, and terminal cover. Glass reinforced polycarbonate in terminal block.
Protection Meter	:IP20
Protection class	:Class 2 (double insulated)
Resistance to heat and fire	:Equivalent to IEC 695-2-1

Environmental

Temperature	:-40 °C to +55 °C
Humidity	:75 %RH (yearly average), 95 %RH (30 days/year)

Indicators

Display	:LCD with 7 digits, 7 mm height
Pulse LED	
/CT	:5000 pulses/kWh of energy consumed
/D	:1000 pulses/kWh of energy consumed

Standards

Meter	:IEC 1036
Pulse Output	:SO DIN 43864, IEC 62053-31

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