tyco
Electronics

KWH-400 DIN Panel Mounted Kilowatt Hour Energy Meter

a vital part of your world

ENERGY PRODUCTS

KWH-400 – DIN Panel Mounted Kilowatt Hour Energy Meter

Features

Class 1.0 accuracy

Wide operating voltage 85V to 500V L-L 3 phase 3 and 4 wire

True RMS measurement

6 digit auto-resettable electro-mechanical counter

LED status and diagnostic indicators

Pulsed output

Fully programmable CT ratios

DIP switch settings

Fully isolated current input

Benefits

Replaces the need for rotating disc meters

Energy efficiency and awareness

Industry standard DIN96 case style

Tamper proof

Low VA burden

Applications

Switchgear

Distribution systems

Generator Sets

Control panels

Embedded generation

Energy management

Building management

Utility power monitoring

Process control

Motor monitoring

Compliant With

IEC 1036

This innovative self contained 96mm DIN panel mounted kilowatt hour meter measures the real consumption of active energy to Class 1.0 accuracy, displayed via a 6 digit auto-resetting electro-mechanical counter. The unit also provides status and diagnostic information via LED indicators on the front panel, and incorporates an integral pulsed output for communication of energy usage. The KWH-400 unit is designed for connection to either 3 phase 3 wire, or 3 phase 4 wire unbalanced loads and is ideal for secondary metering in switchgear, plant instrumentation and process control applications, offering considerable advantages over traditional rotating disc type kilowatt hour meters.

Operation

This class 1.0 instrument uses microprocessor controlled circuitry for optimum performance and accuracy. The unit takes the incoming voltage and current signals and converts them into numbers representing the instantaneous values. These are then multiplied together to give the instantaneous power. This sampling is repeated many times during each cycle of the waveform, which allows accurate true RMS measurement of distorted waveforms. These values are accumulated until enough energy has been measured to increment the counter by one digit. The electro-mechanical counter is auto-resetting, and will reset to 000000 from 999999.

3 Phase Voltage Status

The unit incorporates one green 'ON' LED for each voltage phase. Three illuminated LEDs indicate active monitoring of each of the three phases. In the event of a missing phase voltage, the appropriate LED will switch off, however, the meter will continue to accurately measure energy for the available voltage phases. A flashing green LED indicates incorrect phase sequence connection, and wiring should be checked. The meter will not give accurate readings if the phase sequence is incorrect.

Reverse Connected Current Transformers

For each of the three phases, a red 'REV' LED will illuminate to indicate a reverse connected CT. The wiring should be checked, but the meter will continue to accurately register the energy consumption even if the CTs are reverse connected.

Pulse Indicator

The unit features a dedicated red LED pulse indicator which flashes at a rate proportional to the measured power.

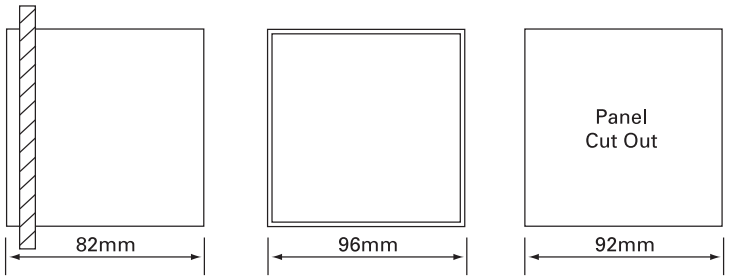
Pulsed Outputs

The KWH-400 unit features an integral pulsed output, pulsed at a rate proportional to the measured energy, and connected via screw clamp terminals. The pulse rate scales appropriately to the CT settings. The re-transmission of kW.h time based energy status to TTL circuits, CMOS circuits or management systems is achieved via the fully volt free opto-isolator open collector transistor output. A pull-up resistor will be required, and it is advisable to use a Schmitt Trigger input for TTL.

Current Transformers

To enable the safe and simple measurement of AC current, the KWH-400 unit requires a current transformer to be fitted to each of the three phases. Crompton Instruments offers an extensive range of suitable current transformers offering accurate measurement of AC current and ratio matching to a consistent 5 Amp secondary current, proportional to the primary current. See attached list for standard values.

Dimensions



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Programming and Scaling

The KWH-400 is direct connected up to 500V with 5 Amp CT inputs. The CT ratio is field programmable without any special tools via DIP switches mounted on the underside of the unit behind a tamper proof label.

Once the CT ratio has been programmed, the scale factor should be adjusted on the front display. A self-adhesive decimal point can be affixed in the appropriate position on the mechanical counter.

CT Ratio	DIP Switch Setting				Multiplier
	4	3	2	1	
5/5A	1	1	1	1	0.01
10/5A	1	1	1	0	0.1
20/5A	1	1	0	1	0.1
30/5A	1	1	0	0	0.1
40/5A	1	0	1	1	0.1
50/5A	1	1	1	1	0.1
60/5A	1	0	1	0	0.1
75/5A	1	0	0	1	0.1
80/5A	0	1	1	0	0.1
100/5A	1	1	1	0	1
125/5A	0	1	0	0	1
150/5A	1	0	0	0	1
200/5A	1	1	0	1	1
250/5A	0	1	1	1	1
300/5A	1	1	0	0	1
400/5A	1	0	1	1	1
500/5A	1	1	1	1	1
600/5A	1	0	1	0	1
750/5A	1	0	0	1	1
800/5A	0	1	1	0	1
1000/5A	1	1	1	0	10
1200/5A	0	1	0	1	10
1250/5A	0	1	0	0	10
1500/5A	1	0	0	0	10
1600/5A	0	0	1	1	10
2000/5A	1	1	0	1	10
2500/5A	0	1	1	1	10
3000/5A	1	1	0	0	10
3200/5A	1	1	0	1	10
4000/5A	1	0	1	1	10
5000/5A	1	1	1	1	10

Specification

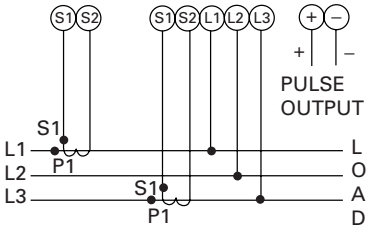
Active Energy Accuracy:	Class 1.0 +/- 1.0% of range maximum
Auxiliary Supply:	Self powered
Input Frequency:	45 - 55HZ
Nominal Input Voltage:	110V – 400V L-L (63.5 – 230V L-N)
Input Voltage Tolerance:	85 - 500V L-L (49 – 288V L-N)
Nominal Input Voltage Burden:	<8VA
Nominal Input Current:	5A
Start Up Current:	0.2% of rated current
Max Continuous Input Current:	6A
Nominal Input Current Burden:	<2 VA
Power Factor:	0.5 lag – unity – 0.8 lead
Current Measurement:	3 x current transformers (not included)
System CT Primary Ratios:	5, 10, 20, 30, 40, 50, 60, 75, 100, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1250, 1500, 1600, 2000, 3200, 5000A
Pulsed Output:	Volt free optical Isolator with open collector transistor output
Pulse Capacity:	50V DC, <40mA
Pulse Duration:	>200 milli seconds
Counter:	6 digit auto-resetting electro-mechanical
Reading Resolution:	1 per kW.h
LED Indicator Display:	3 x Green: Voltage phase monitoring 3 x Red: Reverse connected CT warning
Pulse Indicator:	Red LED flashing at rate proportional to the measured power
Enclosure Style:	Panel mount to DIN 42700
Enclosure Material:	Glass filled polycarbonate
Terminals:	M4 captive screw clamp
Fixing:	2 side clamps
Compliant With:	IEC 1036. EMC and LVD
Operating Temperature:	0 to +55°C
Storage Temperature:	-10 to +70°C
Relative Humidity:	0 .. 95% non condensing
Dimensions:	96mm high x 96mm wide x 82mm deep
Panel Cut Out:	92mm x 92mm
IP Protection:	IP54
Weight:	500g approx

Product Codes

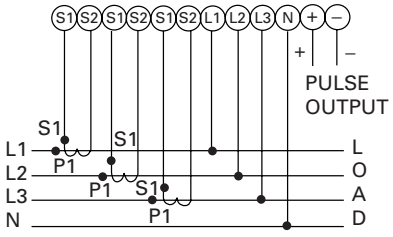
Order Code	Description
KWH-400-110	3 phase 3 and 4 wire, CT Connected 5A 110V L/L
KWH-400-400	3 phase 3 and 4 wire, CT Connected 5A 400V L/L

Connections

3 Phase 3 Wire Unbalanced Load

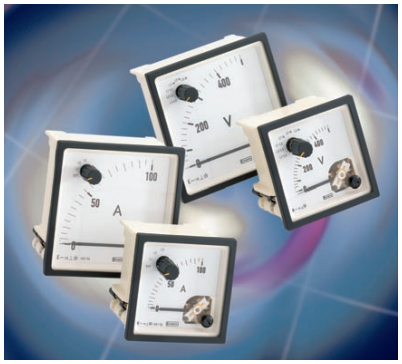


3 Phase 4 Wire Unbalanced Load



It is recommended that all voltage lines are fitted with 1 Amp HRC fuses. For safety reasons, CT secondary connections should be grounded according to local codes of practice.

Other New Products



DIN Panel Meter with Build in Selector Switch

- Moving iron mechanisms
- True RMS measurements
- 72mm or 96mm case styles
- Slide in dials
- Terminal covers as standard

Integra 1560 - Multifunction Transducer

- Upto 4 Analogue outputs
- Options - Profibus, Lonworks, 2 x Modbus, 2 x Pulsed outputs
- Programmable via software or remote displays
- Upto 32 electrical & power quality measurements

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