KWH-400 Series DIN Panel

This 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.

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.

Pulse 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 kWh 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. 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 is available.

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

Programming and Scaling

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 selfadhesive 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

Specifications

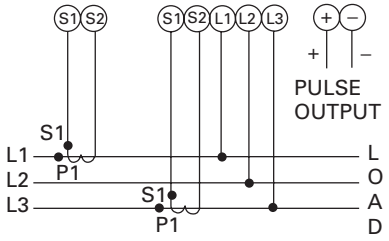
Active energy accuracy	Class 1.0 +/- 1.0% of range maximum
Auxiliary supply	Self powered
Input frequency	45-55HZ
Nominal input voltage	110-400V L-L (63.5-230V L-N)
Input voltage tolerance	85-500V L-L (49-288V L-N)
Nominal input voltage burden	<8VA
Nominal input current	5A
Start up current	0.2% of rated 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 digit
LED Indicator display	3 x Green: Voltage phase monitoring
3 x Red	Reverse connected CT warning
Pulse indicator	Red LED flashing at 1 kWh
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

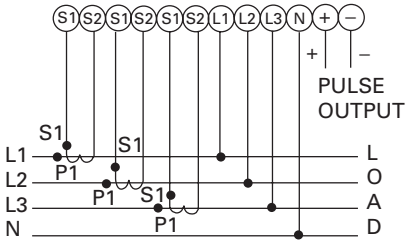
Description	Cat. no.
3-phase 3 and 4-wire, CT Connected 5A 110V L/L	KWH-110
3-phase 3 and 4-wire, CT Connected 5A 400V L/L	KWH-400

Connections

Three-phase Three-wire Unbalanced Load



Three-phase Four-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.