

tyco

Electronics



Kilowatt Hour Energy Meters

a vital part of your world

ENERGY DIVISION

Kilowatt Hour Energy Meters

An extensive range of DIN rail, panel mounting and ANSI style Kilowatt products which measure the real consumption of active energy. These instruments are ideal for secondary metering in switchgear, plant instrumentation and process control applications offering considerable advantages over traditional mechanical Ferraris disc type.

These models incorporate an electro-mechanical kWh counter or LCD display with associated electronics within the instrument case. Requiring no maintenance, the kWh energy meters support energy efficiency and awareness whilst ensuring systems remain balanced and safe.



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Features

- High accuracy
- Extensive range
- Pulsed output optional
- DIN rail, panel mounted or ANSI style
- Active energy consumption indication
- Direct connect

Benefits

- Energy efficiency and awareness
- Balanced and safe systems
- No maintenance

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Secondary metering

Approvals

- IEC and UL



Single-phase DIN Rail kWh Energy Meters

DRK-1PPO-240

Single-phase 230V – 15A Direct Connected, Pulse Output

This innovative two DIN module kWh energy meter measures the real consumption of active energy to Class 2 accuracy with a resolution of 0.1kWh displayed via a non-zeroing mechanical counter on the front panel. The module is operated via an internal shunt with pulsed output optically isolated from the power-supply and load. Ideally suited for environments with Category III over-voltage and level 2 pollution in accordance with IEC EN 61010-1.

Features

- Class 2 accuracy
- Pulsed output
- Direct connection up to 15A
- Non-zeroing 5-digit + 10th mechanical counter
- Static meter with direct start-up 22.5A max
- Active energy consumption indication
- 2 DIN module format

Benefits

- Replaces outdated rotating disk meters
- Increased energy efficiency and awareness
- High accuracy
- Balanced and safe systems
- Maintenance free

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor control
- Secondary metering

Approvals

- IEC EN 61010-1 CAT III
- IEC EN 61036
- EMC and LVD

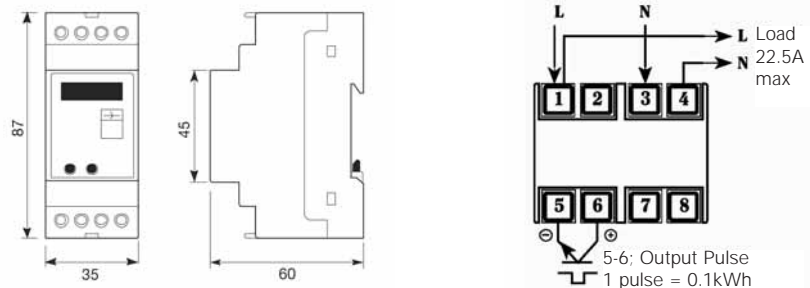
Specifications

Active energy accuracy	Class 2
Input frequency	45 - 65Hz
Nominal input voltage	230V
Input voltage tolerance	-15% to +10% of nominal
Nominal input voltage burden	4VA
Input current	Base 15A
Startup current	50mA
Max continuous input current	22.5A
Nominal input current burden	2VA
Current measurement	Internal shunt
System CT ratios	Direct connection up to 22.5A
Pulsed output	Opto-isolated
Pulse duration	75 milliseconds
Pulsed frequency	1 per 0.1kWh
Counter	5-digit + 1 decimal point mechanical counter
Reading resolution	0.1kWh
LED indicator display	Green – power supply Red – active power consumption @ 1 beat per 1Wh
Enclosure material	Class V-0 in accordance with UL94
Compliant with	IEC EN 61010-1CAT III, IEC EN 61036, EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	0 - 95%, non-condensing
Dimensions	2 x DIN modules wide x 87mm high
IP protection	IP51 at front, IP20 at rear

Ordering Codes

Description	Cat. no.
1-phase 230V – 15A direct connected, pulse output	DRK-1PPO-240

Dimensions and Connections



DRK-1PCT-240

Single-phase 230V – CT Connected 5A, Pulse Output

This innovative four DIN module kWh energy meter measures the real consumption of active energy to Class 2 accuracy with a resolution of 1 kWh displayed via a mechanical counter on the front panel. The module is operated via an internal current transformer with pulsed output optically isolated from the power supply and load.

Specifications

Active energy accuracy	Class 2
Input frequency	50 - 60Hz
Nominal input voltage	230V ac
Input voltage tolerance	-15% to +10% of nominal
Nominal input voltage burden	<2.5VA
Nominal input current	5A
Startup current	15mA
Max continuous input current	6A
Nominal input current burden	<2.5VA
Current measurement	Internal current transformer
System CT ratios	5, 10, 25, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 600, 800, 1000A
Pulsed output	Opto-isolated
Pulse duration	<100 milliseconds
Pulsed frequency	1 per kWh
Pulse capacity	3 - 30V dc, <20mA
Counter	7-digit mechanical counter
Reading resolution	1 kWh
LED indicator display	Green – power supply Red – active power consumption @ 1 beat per 1/16 kWh
Enclosure material	Class V-0 in accordance with UL94
Compliant with	IEC EN 61010-1, IEC EN 61036, EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	0 - 95%, non-condensing
Dimensions	4 x DIN modules wide x 87mm high
IP protection	IP20

Ordering Codes

Description	Cat. no.
1-phase 230V - CT connected 5A, pulsed output	DRK-1PCT-240

Dimensions and Connections



Features

- Direct connection up to 15A
- Class 2 accuracy
- Pulsed output
- Selectable CT ratios
- Dip switch settings
- 7-digit mechanical counter
- Insulated CT connections
- Active energy consumption indicator
- 4 DIN module format

Benefits

- Increased energy efficiency and awareness
- High accuracy
- Balanced and safe systems
- Maintenance free

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor control
- Secondary metering

Approvals

- IEC EN 61010-1
- IEC EN 61036
- EMC and LVD



Three-phase DIN Rail kWh Energy Meters

DRK-3PCT-415

Three-phase 400V CT Connected 5A, Pulse Output, Three- or Four-wire System

This innovative four DIN module kWh energy meter measures the real consumption of active energy to Class 2 accuracy with a resolution of 1kWh displayed via a mechanical counter on the front panel.

The module is operated via an internal current transformer with pulsed output optically isolated from the power supply and load.

Specifications

Active energy accuracy	Class 2
Input frequency	50 - 60Hz
Nominal input voltage	400V L-L (230V L-N))
Input voltage tolerance	-15% to +10% of nominal
Nominal input voltage burden	<2.5VA
Nominal input current	5A
Startup current	15mA
Max continuous input current	6A
Nominal input current burden	<2.5VA
Current measurement	Internal current transformer
System CT ratios	5, 10, 25, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 600, 800, 1000A
Pulsed output	Opto-isolated
Pulse duration	<100 milliseconds
Pulsed frequency	1 per kWh
Pulse capacity	3 - 30V dc, <20mA
Counter	7-digit mechanical counter
Reading resolution	1 kWh
LED indicator display	Green – power supply Red – active power consumption @ 1 beat per 1/4 kWh Yellow: warning of 1/4 kWh negative
Enclosure material	Class V-0 in accordance with UL94
Compliant with	IEC EN 61010-1, IEC EN 61036, EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	0 - 95%, non-condensing
Dimensions	4 x DIN modules wide x 87mm high
IP protection	IP20

Features

- Class 2 accuracy
- Pulsed output
- Selectable CT ratios
- Dip switch settings
- 7-digit mechanical counter
- Insulated CT connections
- Active energy consumption indicator
- 4 DIN module format
- 3 or 4-wire systems

Benefits

- Increased energy efficiency and awareness
- High accuracy
- Balanced and safe systems
- Maintenance free

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor control
- Secondary metering

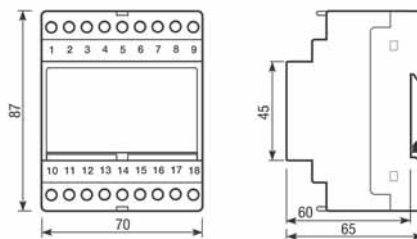
Approvals

- IEC EN 61010-1
- IEC EN 61036
- EMC and LVD

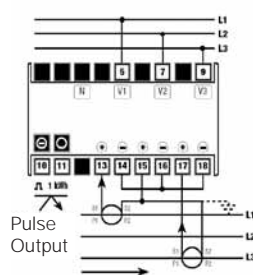
Ordering Codes

Description	Cat. no.
3-phase 230V -CT connected 5A, pulsed output, 3 or 4-wire	DRK-3PCT-415

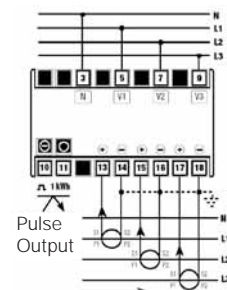
Dimensions and Connections



DRK-3PCT Three-phase CT connected 5A(*) three-wire system



DRK-3PCT Three-phase CT connected 5A(*) four-wire system



Concentrator Module for kWh Energy Meters

DRK-485

8 Input Remote kWh Energy Consumption Monitoring Device

The DRK-485 concentrator module remotely monitors energy consumption from up to 8 Crompton kWh meters within a 25 metre radius. The device communicates through a Modbus® connection to a computer COM port via a RS485 serial line. Up to 32 concentrator modules can be connected to the RS485 line without the need for signal amplifiers. Up to 247 modules in groups of 32 can be connected when separated by signal amplifiers.



Specifications

Input frequency	50 - 60Hz
Nominal input voltage	230V ac
Input voltage tolerance	-15% to +10% of nominal
Nominal input voltage burden	2VA
Digital communications	RS485 interface Modbus® protocol
Band handling	Dual charge
Baud rate	9600 bits per second
Transmission mode	ASCII
Error detection method	Longitudinal redundancy check
Max number of contactors	Up to 8 input signals (1 and 3-phase)
Pulse input duration	<100 milliseconds
LED indicator display	Green – power supply Red – data transit via RS485
Enclosure material	Class V-0 in accordance with UL94
Compliant with	IEC EN 61010-1, IEC EN 50081-1, IEC EN 50082-1, EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	0 – 95%, non-condensing
Dimensions	4 x DIN modules wide x 87mm high
IP protection	IP41 to front, IP20 to rear

Ordering Codes

Description	Cat. no.
Remote kWh energy consumption monitoring device	DRK-485

Dimensions and Connections



Features

- Collects up to 8 pulsed inputs
- Remote monitoring device
- Modbus® protocol
- 8 dip switch settings
- Dual charge rate handling
- Data transit and power indicators
- 4 DIN module format

Benefits

- Pulse collection
- Increased energy efficiency and awareness
- Balanced and safe systems
- Maintenance free

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor control
- Secondary metering

Approvals

- IEC EN 61010-1
- IEC EN 50081-1
- IEC EN 50082-1
- EMC
- LVD



Single-phase DIN Rail Kilowatt Hour Energy Meter (Direct Connection)

DRK-1P-230-D63

This three DIN module kWh energy meter measures the real consumption of active energy. The module meter has the highest accuracy class (1) with easy wiring, back illuminated LCD display, non-zeroing total counter and partial zeroing counter. This module passes the load cable through the case allowing up to 63A direct connection.

Features

- Class 1 accuracy
- Direct connected 63A
- Pulsed output (Opto)
- LCD display
- Non-zeroing total counter
- Active energy consumption indication
- 3 DIN module format

Benefits

- Energy efficiency and awareness
- High accuracy
- Balanced and safe systems
- No maintenance

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Secondary metering

Approvals

- IEC EN62052-11
- IEC EN62053-21
- EMC and LVD

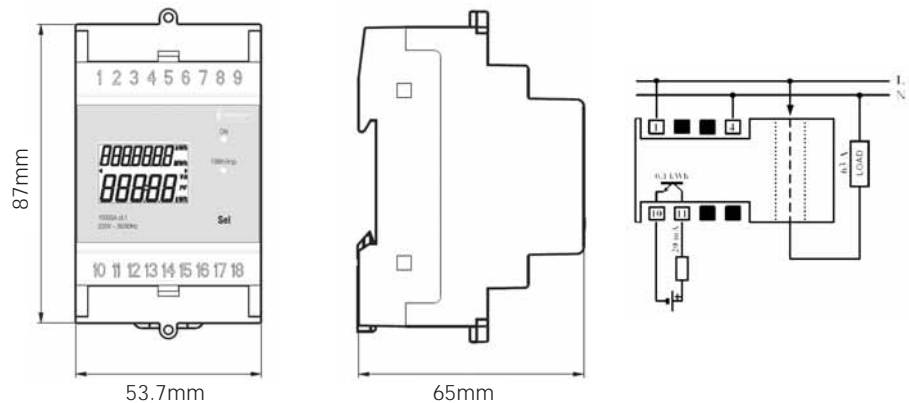
Specifications

Active energy accuracy	Class 1 in accordance with CEI-EN 62053-21
Input frequency	50-60Hz
Nominal input voltage	230V ac
Input voltage tolerance	-15% to +10% of nominal voltage
Nominal input voltage burden	<2.5VA
Max input current	63A
Current input Ib	10A
Nominal input power burden	<2.5VA
Pulsed output	Opto-isolated, open collector
Pulsed voltage	9-24 V dc ±10% (switchable O/P current 20mA max)
Pulsed duration	100 milliseconds ±15%
Pulsed frequency	1 per 0.1kWh
Display	LCD 7 + 5-digit
Reading resolution	0.1kWh and/or 0.1MWh (automatic)
LED indicator display	Green – Power supply Red – Flashing @ 10Wh
Enclosure material	Grey RAL 7035 class V-0 in accordance with UL94
Compliant with	IEC EN 62052-11, IEC EN 62053-21, EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	10% - 90%, non-condensing
Dimensions	3 x DIN modules wide 53.7mm x 87mm high
IP protection	IP51 at front, IP20 at rear

Product Codes

Description	Cat. no.
1-phase 230V – 63A direct connected, pulsed output (Opto)	DRK-1P-230-D63

Dimensions and Connections



Three-phase DIN Rail Kilowatt Hour Energy Meter (Direct Connection)

DRK-3P-400-D90

This seven DIN module kWh energy meter measures the real consumption of active energy. The module meter has the highest accuracy class (1) with easy wiring, back illuminated LCD display, non-zeroing total counter and partial zeroing counter. This module passes the load cable through the case allowing up 90A direct connection on a three-phase system.

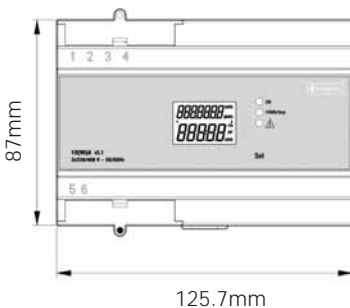
Specifications

Active energy accuracy	Class 1 in accordance with CEI-EN 62053-21 standard
Input frequency	50 - 60Hz
Nominal input voltage	3 x 230V ac L-N (400V L-L)
Input voltage tolerance	-15% to +10% of nominal voltage
Burden	< 2.5VA
Max input current	90A
Input current Ib	10A
Pulsed output	Opto-isolated, open collector type
Pulsed voltage	9-24V dc ±10% (switchable O/P current 20mA max)
Pulsed duration	100 milliseconds ±15%
Pulsed frequency	1 per 0.1 kWh
Display	LCD 7 + 5-digit
Reading resolution	0.1 kWh from 0000000.0kWh – 999999.9kWh 1 kWh from 1000000kWh to 9999999kWh (Automatic)
LED indicator display	Green - power supply Red - flashing @ 10kWh Yellow - indicates wrong connection
Enclosure material	Grey RAL 7035 class V-0 in accordance with UL94
Compliant with	IEC EN62052-11, IEC EN62053-21 (2003-03) EMC and LVD
Operating temperature	-10°C to +45°C
Storage temperature	-25°C to +70°C
Relative humidity	10% - 90%, non-condensing
Dimensions	7 x DIN modules wide 125.7mm x 87mm high
IP protection	IP51 at front, IP20 at rear

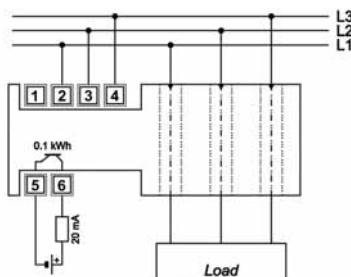
Product Codes

Description	Cat. no.
3-phase 230V L-N (400V L-L) – 90A direct connected, pulsed output (Opto)	DRK-3P-400-D90

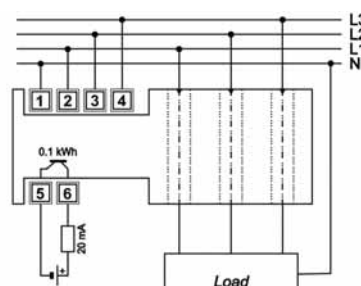
Dimensions and Connections



Three-wire System



Four-wire System



Features

- Class 1 accuracy
- Direct connected 90A
- Pulsed output (Opto)
- LCD display
- Non-zeroing total counter
- Active energy consumption indication
- 7 DIN module format

Benefits

- Energy efficiency and awareness
- High accuracy
- Balanced and safe systems
- No maintenance

Applications

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Secondary metering

Approvals

- IEC EN62052-11
- IEC EN62053-21
- EMC and LVD





Kilowatt Hour Energy Meter

240 'H' Series DIN Panel

This Class 1 instrument uses microprocessor controlled circuitry for optimum performance and accuracy. Incoming voltage and current signals are converted into numbers representing instantaneous values. These are then multiplied together to give the instantaneous power.

This sampling is repeated many times during each waveform cycle allowing the accurate measurements of distorted waveforms. Incoming power is indicated by the pulsing red LED indicator. Accumulated values are registered on the energy counter.

Features

- 1% of reading to IEC 1036/ BS EN 61036
- Compact 96mm DIN case
- Switchboard panel door mountable
- Combination of kWh or kVArh with instantaneous analogue Watts or VArS
- Pulsed and analogue output options
- 7-digit electro-mechanical counter
- 1% of reading measurement

Application

- Secondary metering
- Energy management
- Load control
- Import/export energy management
- Process control
- Distorted waveform power measurement
- Load profile data logging

Introduction

The 240 'H' series of kWh meters is a major upgrade in a product range offered by Tyco Electronics Crompton Instruments Business Unit. The self-contained meters are designed as either a stand-alone kWh counter or as a single integrated instrument combining a kWh counter with an analogue display of instantaneous power in Kilowatts. This provides both cost and space savings over conventional devices. 'H' series meters provide Class 1 accuracy and can also be used for secondary metering in switchgear, plant instrumentation and process control applications.

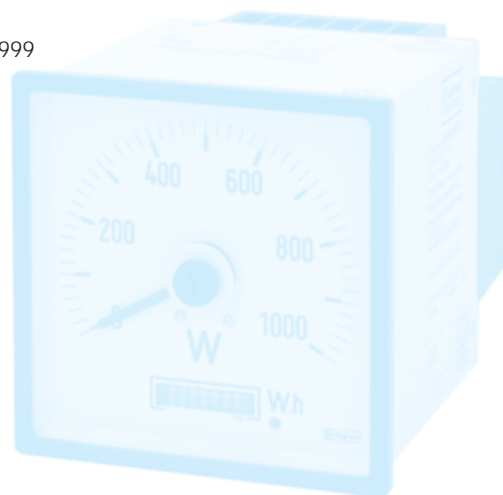
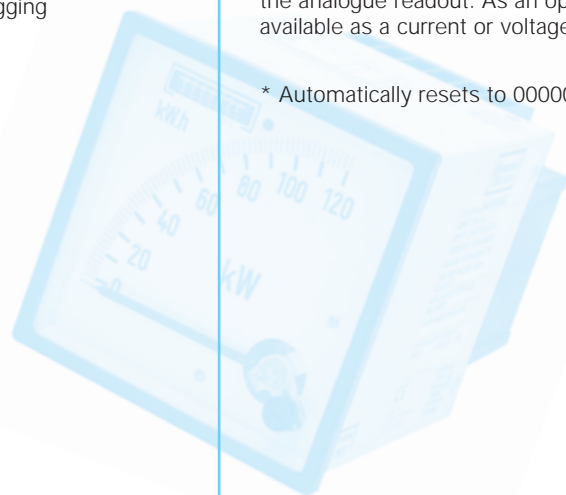
These meters offer increased functionality over traditional disc-type kWh meters, offering instantaneous Watt readings and providing pulsed output of kWh for data loggers and computers. They can be scaled in Watts, Kilowatts and Megawatts. A range of kVArh meters is also available. All models are switchboard panel mountable.

Operational Principles

The electro-mechanical counters are auto-resetting. * Resetting is an option on LCD counter versions. Counter pulses may be outputted via volt-free relay contacts or from an opto-isolator as an option for high pulse rates

Instrument models displaying instantaneous power have a moving coil meter to provide the analogue readout. As an option, the instantaneous power reading can be made available as a current or voltage signal, similar to a power transducer.

* Automatically resets to 0000000 from 9999999



Options

The following 5 models all measure Watts or VArS but come with varying display options. All models can have optional analogue kW signal terminals and kWh pulse terminals at the rear. Analogue output is not available on the LCD counter version.

Single Electro-mechanical Counter Model

This model incorporates a 7-digit auto-resetting* electro-mechanical kWh or kVArh counter. Relay or opto-isolator pulsed output and analogue output options are also available. The optional analogue output shows the instantaneous Watts or VArS on a separate analogue indicator.

* Automatically resets to 0000000 at 9999999



Electro-mechanical Counter & Shortscale Indicator

This model incorporates a 7-digit auto-resetting* electro-mechanical kWh or kVArh counter and a short-scale instantaneous Watts or VArS indicator. Options include a relay or opto-isolator pulsed output and analogue output.

* Automatically resets to 0000000 at 9999999



Two Electro-mechanical Counters

This model incorporates two 7-digit auto-resetting* electro-mechanical kWh or kVArh counters. Relay or opto-isolator pulsed output and analogue output options are available. Two counters permit registering of both import and export of kWh or kVArh.

* Automatically resets to 0000000 at 9999999



Single LCD Counter

This model incorporates an 8-digit LCD kWh or kVArh counter and an optional external reset. Relay or opto-isolator pulsed output options are also available. An internal battery ensures constant display even without ac power and a 10 year memory back-up.

* Automatically resets to 00000000 at 99999999 but will display an * in the top left hand corner of the display



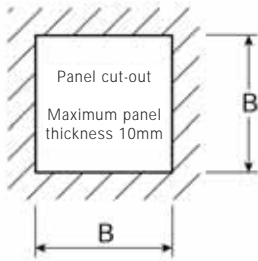
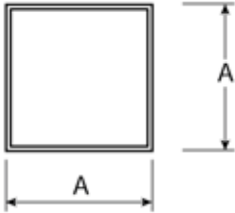
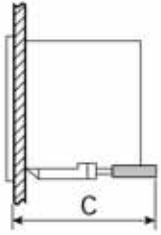
Electro-mechanical Counter & Longscale Indicator

This model incorporates a 7-digit auto-resetting* electro-mechanical kWh or kVArh counter and a long-scale instantaneous Watt and VArS indicator. Relay or opto-isolator pulsed output and analogue output options are also available. This model gives precise indication of Watts or VArS.

* Automatically resets to 0000000 at 9999999



Dimensions



	A	B	C
244	96	92	142

Dimensions in mm

Ordering Codes for Wattmeters

Voltage system	Mechanical counter only	Mechanical counter + meter 90° scale	Import export counter only	LCD counter only	Mechanical counter + meter 240° scale
1-phase	244-HWM	244-HWG	244-HEM	244-HWS	244-HWB
3-phase 3-wire balanced load	244-HWN	244-HWH	244-HEN	244-HWT	244-HWC
3-phase 3-wire balanced load with reversed CTs	244-HW2	244-HW3	-	244-HW4	-
3-phase 4-wire balanced load	244-HWY	244-HWV	244-HE7	244-HWZ	244-HWU
3-phase 3-wire unbalanced load	244-HWP	244-HWJ	244-HEP	244-HWW	244-HWD
3-phase 4-wire unbalanced load	244-HWQ	244-HWK	244-HEQ	244-HWX	244-HWE
Transducer inputs	244-KWL	244-KWF	-	244-KWR	244-KWA

Example: 3ph 4W unbalanced mechanical counter with 240° meter.
Specify: 244-HWE followed by voltage ratio, current ratio, frequency, Fsd Watts, energy/pulse and options if required.

Ordering Codes for Varmeters

Voltage system	Mechanical counter only	Mechanical counter + meter 90° scale	Import export counter only	LCD counter only	Mechanical counter + meter 240° scale
1-phase	244-HXM	244-HXG	244-HIM	244-HWS	244-HXB
3-phase 3-wire balanced load	244-HXN	244-HXH	244-HIN	244-HXT	244-HXC
3-phase 3-wire unbalanced load	244-HXP	244-HXJ	244-HIP	244-HXW	244-HXD
3-phase 4-wire unbalanced load	244-HXQ	244-HXK	244-HIQ	244-HXX	244-HXE
Transducer inputs	244-KXL	244-KXF	-	244-KXR	244-KXA

Example: 3ph 4W unbalanced mechanical counter with 240° meter.
Specify: 244-HXE followed by voltage ratio, current ratio, frequency, Fsd Watts, energy/pulse and options if required.

Specifications

Complies with	IEC 1036/BS EN 61036
Case	Grade UL94V2
Enclosure code	IP54 to IEC529 IP55 optional
Safety requirements	IEC 1010-1 (300V ac rms Category III installation, Degree 2 pollution)
Vibration	Lloyd's shipping specifications
Dielectric strength	2kV rms for 1 minute
Temperature range	Operational 0°C to +60°C Storage -25°C to +70°C Calibrated at 23°C
Temperature coefficient	0.05%/per °C
Humidity range	Up to 95%, non-condensing
Accuracy	kWh or kVArh ± 1 % of reading Watts or VArS ± 1.5 % of FS for long scale indicator Watts or VArS ± 2 % of FS for short scale indicator Class1 to IEC1036 and BS EN61036 (kWh functionality only)
Input	
Voltage	Nominal voltages 63.5, 110, 120, 220, 230, 240, 400, 415, 440, 480V ac or via VT
Voltage range	57.7V to 480V ac or via VT
Voltage variation	± 20 % of nominal system voltage
Current	1 or 5 amps ac. CT operated
Frequency	45 to 65Hz inclusive
Burden	
Voltage	Maximum 4VA per circuit
Current	Maximum 0.2VA per circuit
Overload	
Voltage	1.2 times continuously 2 x rating for 5 seconds Current: 2 times continuously 10 x rating for 5 seconds
Counter	
Electro-mechanical	7-digit counts 9999999 and automatically resets at 9999999. Digit height 4mm.
Liquid crystal display (LCD)	8-digit counts 99999999. After the maximum reading is reached, an * will display in the top left hand corner. Digits will return to zero and the * will remain. Counter resettable via terminals in the rear of the unit. 10 year back-up power with included lithium battery. Digit height 8 millimetre.
EMC	Please consult Technical Sheet T89/336 for full information.

Output kWh Measurement Options

Note: The pulse rate must be the same as the counter rate

1-pole relay

Ratings ac	120V 5A non-inductive
Ratings dc	30V resistive 5A resistive
Energy/pulse	Standard 1kWh/pulse
Maximum pulse rate	10000/hr
Pulse duration	50ms

Opto-isolator

Output	Open collector
Switching	Up to 40mA 25V dc Observe the polarity
Energy/pulse	Standard 1kWh/pulse
Maximum pulse rate	10000/hr
Pulse duration	50ms

Analogue output

Any standard transducer output (For instantaneous kW and kVAr measurement)
To BSEN 60688 Class 0.5 (IEC688:1992)

Accuracy range	0/120%
Response time	<250ms
Compliance voltage	10V
Open circuit	<20V

Available outputs

0/1mA, 0/5mA, 0/1mA, 0/20mA and bipolar

0-1V, 0-5V, 0-10V and bipolar 4/20mA, 1-5V

Compliance voltage

10V

Open circuit O/P voltage

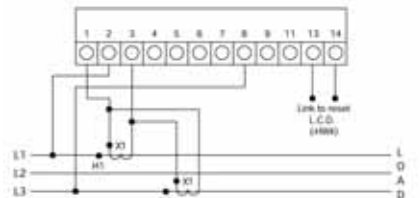
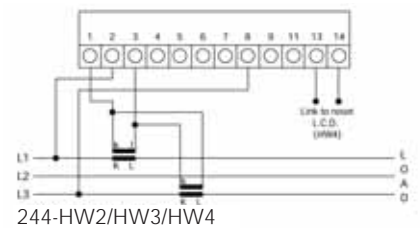
<20V

Dielectric withstand test voltage

2.2kV rms for 1 minute

Dimensions

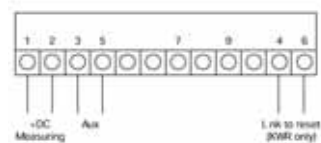
Three-phase three-wire Balanced Load with Reversed Connected CTs



Transducer Input Models

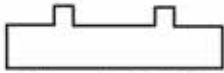
Pulsed output connections (optional) via relay 7 (NO), 9 (COM) and 11 (NC) via transistor 7 (+VE) and 9 (-VE)

244-KWA/KWF/KWL/KWR



244 - HW and HX

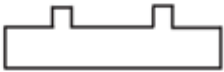
Opto-isolator output connection
N/O +VE COM -VE



15	16		25	28	26
+	-		COM	N/O	N/C

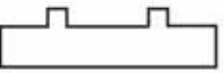
15 (+) Analogue O/P
16 (-) Analogue O/P

244 - HE and HI



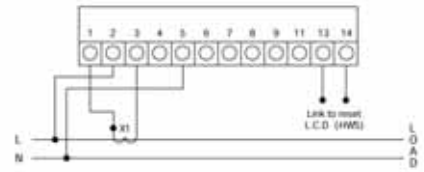
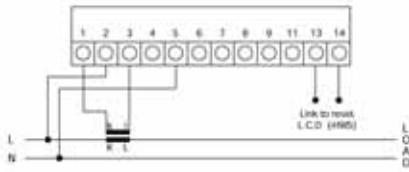
21	24	15	25	28	16
COM	N/O	N/C	COM	N/O	N/C
EXPORT			IMPORT%		

With analogue output



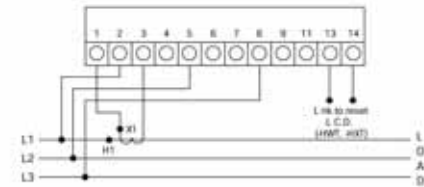
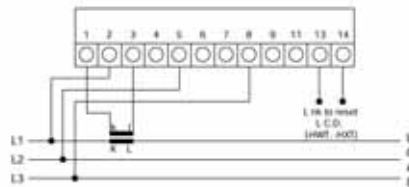
15	16	21	24	25	28
+	-	COM	N/O	COM	N/O
		EXPORT	IMPORT		

Single-phase



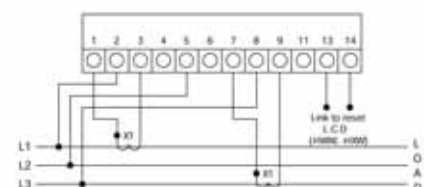
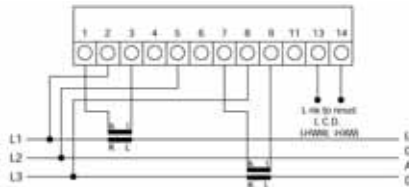
244-HWM/HWG/HWS/HWB
244-HEM
244-HXM/HXG/HXS/HXB/HIM

Three-phase three-wire Balanced Load



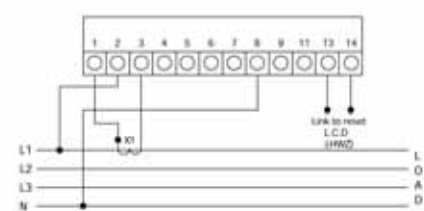
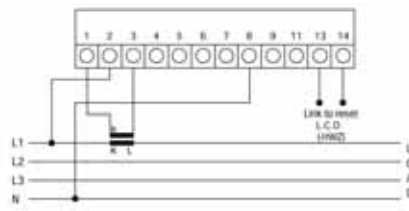
244-HWN/HWH/HWT/HWC
244-HEN
244-HXN/HXH/HXT/HXC
244-HIN

Three-phase three-wire Unbalanced Load



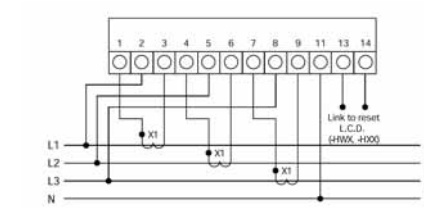
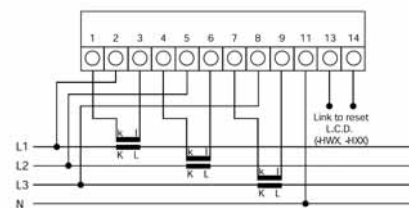
244-HWP/HWJ/HWW/HWD
244-HEP
244-HXP/HXJ/HXW/HXD
244-HIP

Three-phase four-wire Balanced Load



244-HWY/HWV/HWZ/HWU/HE7

Three-phase four-wire Unbalanced Load



244-HWQ/KWQ/HWK/HWX/HWE
244-HEQ
244-HXQ/HXK/HXX/HXE
244-HIQ



AC Watt/Watt Hour Meters

A high quality range of switchboard instruments which complies with the American specification ANSI-C39.1(1981) accuracy Class 1. Moving coil indication gives instantaneous Watt reading. Self-contained circuitry drives an impulse counter to indicate KWh.

Specifications

Dielectric withstand	2.3KV for 1 minute
Pulsed duration	250 milliseconds \pm 15%
Pulse/hour	1 per kWh Min 100/hour Max 10,000/hour
Counter	Counts 999999 then resets to 0. Height 4mm
Analogue response time	2.5 seconds to full scale. Overshoot 33% max.
Operating temperature	0°C to +40°C (077) -40°C to +70°C (078)
Storage temperature	-10°C to +50°C
IP protection	077 to IP54 (NEMA 3S) 078 to IP67 (NEMA 6)
Input frequency	50-60Hz

Self-contained (KHB/E/G) as above specification with below

Input voltage	63V to 480V
Input voltage tolerance	-20% to +10% of nominal voltage
Input voltage max burden	1VA
Input current	1A or 5A. CT operated
Input current max burden	2VA
Dielectric withstand	2.3KV for 1 minute

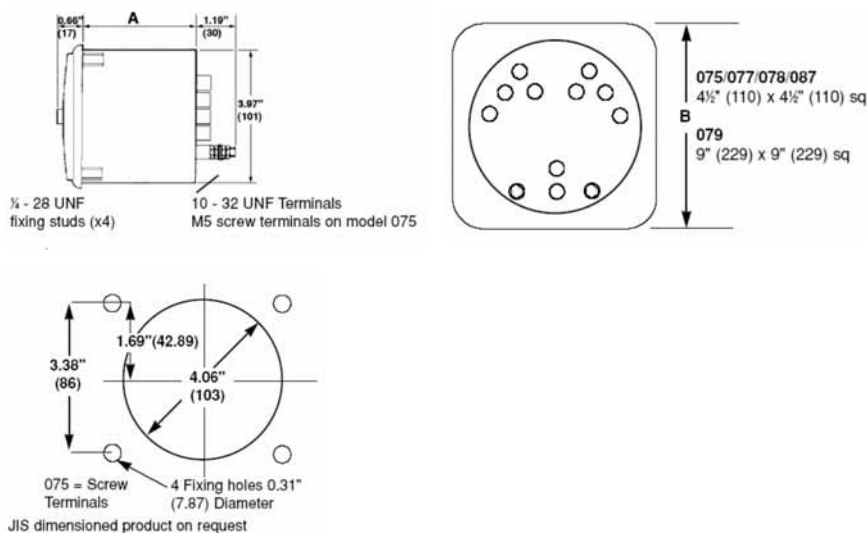
Transducer driven (KHA) as above specification with below

Input voltage (aux)	120V, 240V
DC input (from transducer)	1mA, 4-20mA, 0-5V & 0-10V

Product Codes

Description	Catalogue. No.
Transducer indicator - standard	077-KHAU
Transducer indicator - sealed	078-KHAU
1-phase - standard	077-KHBU
1-phase - sealed	078-KHBU
3-phase 3-wire - standard	077-KHEU
3-phase 3-wire - sealed	078-KHEU
3-phase 4-wire - standard	077-KHGU
3-phase 4-wire - sealed	078-KHGU

Dimensions



Features

- Class 1 accuracy
- Rugged hi-Q taut band suspension
- Bump shock and vibration proof
- 078 versions hermetically sealed

Applications

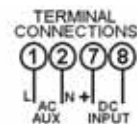
- Load control
- Distribution systems
- Import/export energy management
- Distorted waveform power Measurement
- Process control
- Secondary metering

Approvals

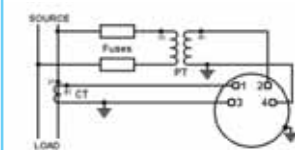
- ANSI-C39.1(1981)
- American Bureau of Shipping
- UL recognised file E87815
- CSA approved file LR52592

Connections

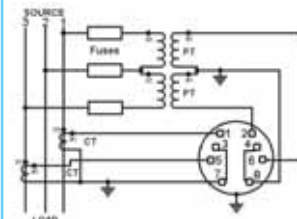
Transducer Indicator (KHA)



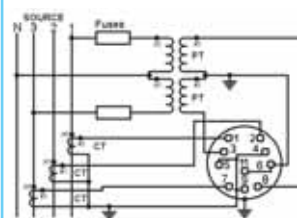
Single-phase (KHB)



Three-phase three-wire (KHE)



Three-phase four-wire (KHG)





tyco

Electronics

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a vital part of your world

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