Plug-in Signal Conditioners K-UNIT

WATT TRANSDUCER

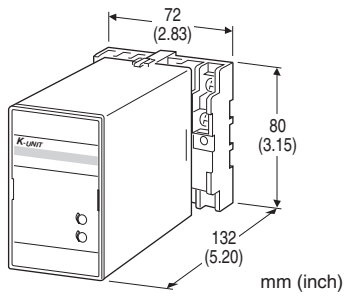
(for 3-phase / 4-wire, self-powered)

Functions & Features

• Providing a DC output signal in proportion to AC active power
• Pulse totalizer output
• Measuring bidirectional power flow
• DC output containing little ripple is ideal for computer input
• "Time division multiplication" method accepts distorted waveforms
• Isolation up to 2000 V AC
• High-density mounting

Typical Applications

• Centralized monitoring and control of power management system in a manufacturing facility or building
• SCR – Silicon Controlled Rectifier



MODEL: KUWEN–4[1][2][3][4]

ORDERING INFORMATION

• Code number: KUWEN-4[1][2][3][4]
Specify a code from below for each of [1] through [4] .
(e.g. KUWEN-41A0/Q)
• Calibration range (e.g. 0 – 980W)
• VT ratio, CT ratio (e.g. VT 3300 / 110 V, CT 250 / 5 A)
• Special DC output range (For codes Z & 0)
• Specify the specification for option code /Q
(e.g. /C01/S01)

CONFIGURATION

4: 3-phase / 4-wire

[1] INPUT (unbalanced load)

1: 63.5 V / 110 V / 5 A AC
2: 63.5 V / 110 V / 1 A AC
3: 127 V / 220 V / 1 A AC
4: 127 V / 220 V / 5 A AC
5: 220 V / 380 V / 1 A AC
6: 220 V / 380 V / 5 A AC
7: 110 V / 190 V / 1 A AC
8: 110 V / 190 V / 5 A AC

[2] DC OUTPUT

Current
A: 4 – 20 mA DC (Load resistance 600 Ω max.)
B: 2 – 10 mA DC (Load resistance 1200 Ω max.)
C: 1 – 5 mA DC (Load resistance 2400 Ω max.)
D: 0 – 20 mA DC (Load resistance 600 Ω max.)
E: 0 – 16 mA DC (Load resistance 750 Ω max.)
F: 0 – 10 mA DC (Load resistance 1200 Ω max.)
G: 0 – 1 mA DC (Load resistance 12 kΩ max.)
J: 0 – 5 mA DC (Load resistance 2400 Ω max.)
GW: -1 – +1 mA DC (Load resistance 10 kΩ max.)
Z: Specify current (See OUTPUT SPECIFICATIONS)
Voltage
1: 0 – 10 mV DC (Load resistance 10 kΩ min.)
2: 0 – 100 mV DC (Load resistance 100 kΩ min.)
3: 0 – 1 V DC (Load resistance 1000 Ω min.)
4: 0 – 10 V DC (Load resistance 10 kΩ min.)
5: 0 – 5 V DC (Load resistance 5000 Ω min.)
6: 1 – 5 V DC (Load resistance 5000 Ω min.)
1W: -10 – +10 mV DC (Load resistance 10 kΩ min.)
2W: -100 – +100 mV DC (Load resistance 100 kΩ min.)
3W: -1 – +1 V DC (Load resistance 1000 Ω min.)
4W: -10 – +10 V DC (Load resistance 10 kΩ min.)
5W: -5 – +5 V DC (Load resistance 5000 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)

[3] PULSE OUTPUT

0: None
1: Open collector

[4] OPTIONS

blank: none
/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating
TERMINAL SCREW MATERIAL
/S01: Stainless steel

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GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3.5 screw terminals
Screw terminal: Chromated steel (standard) or stainless steel
Housing material: Flame-resistant resin (black)
Isolation: Voltage input to current input to DC output to pulse output
Computation: Time division multiplication
Overrange output: Approx. -10 to +120 % at 1 – 5 V
Zero adjustment(DC output): -5 to + 5 % (front)
Span adjustment(DC output): 95 to + 105 % (front)

INPUT SPECIFICATIONS

Frequency: 50 or 60 Hz
• **Voltage Input**
Operational range: 85 – 110 % of rating
Overload capacity: 150 % of rating for 10 sec., 110 % continuous
• **Current Input**
Operational range: 0 – 120 % of rating
Overload capacity: 1000 % of rating for 3 sec., 200 % for 10 sec., 120 % continuous

■ **How To Determine Wattage Range**

Calibration Range [W] = (Measuring Wattage) ÷ ((VT Ratio) × (CT Ratio))
Check that the required calibration range is within the available range in the table.
[example]
3-phase / 4-wire, measuring wattage 75 kW,
VT 127 / 127 V, CT 250 / 5 A
$(75 \times 10^3\ [W]) \div ((127 \div 127) \times (250 \div 5)) = 1500\ [W]$

■ **INPUT RANGE**

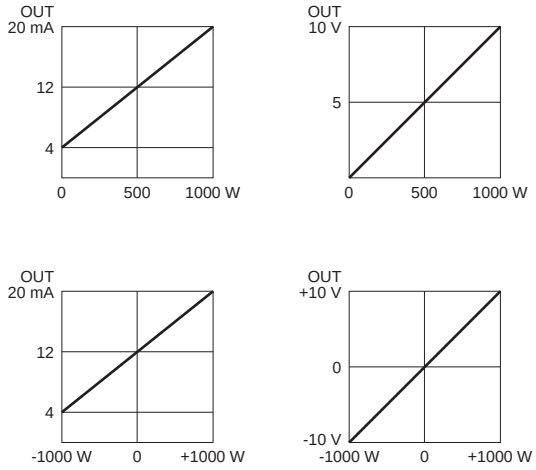
• **3-phase / 4-wire**

INPUT		AVAILABLE RANGE	BURDEN (VA)	
	STD.RANGE		VOLT.	CURR.
$\frac{110V}{\sqrt{3}}$/1A	±200 W	±100 – ±240 W	$P_1 - P_2$: 2.5 P_3 : 0.1	0.1 /phase
$\frac{110V}{\sqrt{3}}$/5A	±1000 W	±500 – ±1200 W		0.5 /phase
$\frac{190V}{\sqrt{3}}$/1A	±350 W	±175 – ±420 W	P_1 : 2.5 P_2, P_3 : 0.2	0.1 /phase
$\frac{190V}{\sqrt{3}}$/5A	±1750 W	±875 – ±2100 W		0.5 /phase
$\frac{220V}{\sqrt{3}}$/1A	±400 W	±200 – ±480 W	$P_1 - P_2$: 2.5 P_3 : 0.3	0.1 /phase
$\frac{220V}{\sqrt{3}}$/5A	±2000 W	±1000 – ±2400 W		0.5 /phase
$\frac{380V}{\sqrt{3}}$/1A	±700 W	±350 – ±840 W	P_1 : 2.5 P_2, P_3 : 0.4	0.1 /phase
$\frac{380V}{\sqrt{3}}$/5A	±3500 W	±1750 – ±4200 W		0.5 /phase

OUTPUT SPECIFICATIONS

■ **DC OUTPUT**
• **DC Current**: 0 – 20 mA DC and ± 1 mA
Minimum span: 1 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 12 V max.
• **DC Voltage**: -10 – +12 V DC
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max. at ≥ 0.5 V
■ **Pulse Output**: Open collector; 0 Hz at 0 W (Cutout at approx. 0.5 – 1.0 %)
Rating: 35 V DC @ 100 mA
ON voltage: ≤ 1 V at 100 mA
ON duration: max. 0.5 sec., min. 50 msec.
Frequency range: 2.777 Hz (at 100 %)
[Example] 1000 W calibration range
2.777 [Hz] × 3600 [sec.] ÷ 1 [kW] = 10000 [pulse/kWh]

■ **OPERATION DIAGRAM (example)**



INSTALLATION

Operating temperature: -10 to +55°C (14 to 131°F)
Operating humidity: 30 to 85 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 500 g (1.1 lb)

PERFORMANCE in percentage of span

Accuracy: ±0.5 % (at 23°C ±10°C or 73.4°F ±18°F, 45 – 65 Hz)
Response time: ≤ 2 sec. (0 – 100 % ±1 %)
Ripple: 0.5 %p-p max.
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @ 1 minute (voltage input to current input to DC output to pulse output to ground)
Impulse withstand voltage: 1.2 / 50 µsec., ±5 kV (input to output or ground)

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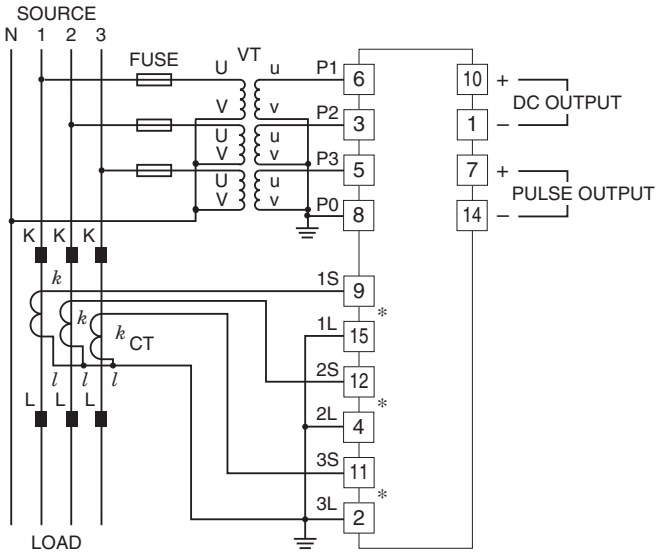
CONNECTION DIAGRAM

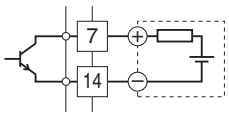
■ **3-PHASE/4-WIRE**



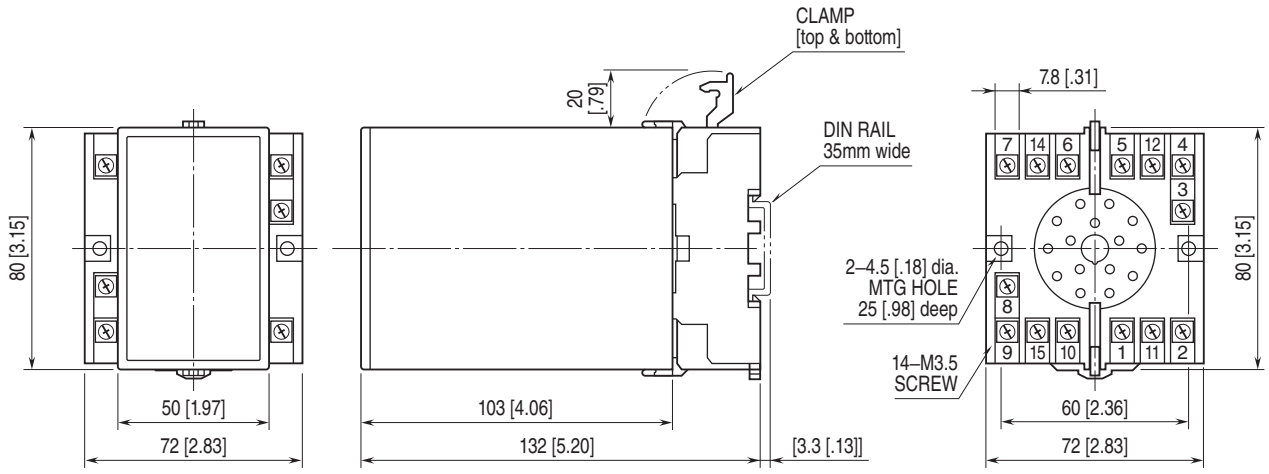
*CT Protector (model: CTM) attached to these terminals.

Pulse Output Connection Example

■ **Open Collector**



EXTERNAL DIMENSIONS unit: mm [inch]



• When mounting, no extra space is needed between units.

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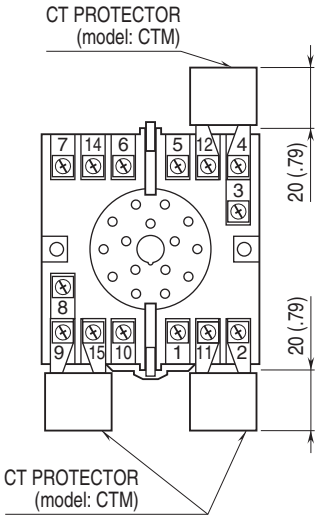
TERMINAL ASSIGNMENTS unit: mm [inch]



⚠ Specifications are subject to change without notice.

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