

## Plug-in Signal Conditioners M-UNIT

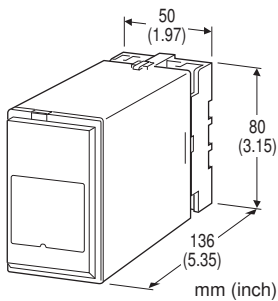
### VAR TRANSDUCER

#### Functions & Features

- Providing a DC output signal in proportion to AC reactive power
- 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



## MODEL: MERP-1[1][2][3]-[4][5]

### ORDERING INFORMATION

- Code number: MERP-1[1][2][3]-[4][5]
- Specify a code from below for each [1] through [5]. (e.g. MERP-11PA-C/Q)
- Calibration range (e.g. lag 1000 - lead 1000 var)
- VT ratio, CT ratio (e.g. VT 3300/110 V, CT 250/5 A)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q (e.g. /C01/S01)

### CONFIGURATION

1: 3-phase / 3-wire

#### [1] INPUT (unbalanced load)

(Voltage must be balanced.)

- 1: 110 V / 5 A AC
- 2: 110 V / 1 A AC
- 3: 220 V / 1 A AC
- 4: 220 V / 5 A AC

#### [2] OUTPUT SIGNAL POLARITY

P: Negative in lag, positive in lead

M: Negative in lead, positive in lag

#### [3] OUTPUT

##### Current

- A: 4 - 20 mA DC (Load resistance 600  $\Omega$  max.)
- B: 2 - 10 mA DC (Load resistance 1200  $\Omega$  max.)
- C: 1 - 5 mA DC (Load resistance 2400  $\Omega$  max.)
- D: 0 - 20 mA DC (Load resistance 600  $\Omega$  max.)
- E: 0 - 16 mA DC (Load resistance 750  $\Omega$  max.)
- F: 0 - 10 mA DC (Load resistance 1200  $\Omega$  max.)
- G: 0 - 1 mA DC (Load resistance 12 k $\Omega$  max.)
- GW: -1 - +1 mA DC (Load resistance 10 k $\Omega$  max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 k $\Omega$  min.)
- 2: 0 - 100 mV DC (Load resistance 100 k $\Omega$  min.)
- 3: 0 - 1 V DC (Load resistance 1000  $\Omega$  min.)
- 4: 0 - 10 V DC (Load resistance 10 k $\Omega$  min.)
- 5: 0 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 6: 1 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 1W: -10 - +10 mV DC (Load resistance 10 k $\Omega$  min.)
- 2W: -100 - +100 mV DC (Load resistance 100 k $\Omega$  min.)
- 3W: -1 - +1 V DC (Load resistance 1000  $\Omega$  min.)
- 4W: -10 - +10 V DC (Load resistance 10 k $\Omega$  min.)
- 5W: -5 - +5 V DC (Load resistance 5000  $\Omega$  min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [4] POWER INPUT

##### AC Power

- B: 100 V AC
- C: 110 V AC
- D: 115 V AC
- F: 120 V AC
- G: 200 V AC
- H: 220 V AC
- J: 240 V AC

##### DC Power

- S: 12 V DC
- R: 24 V DC
- V: 48 V DC
- P: 110 V DC

#### [5] OPTIONS

##### Other Options

blank: none

/Q: With options (specify the specification)



## SPECIFICATIONS OF OPTION: Q (multiple selections)

### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

### TERMINAL SCREW MATERIAL

/S01: Stainless steel

## 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 output to power

**Overrange output:** Approx. -10 to +120 % at 1 - 5 V

**Zero adjustment:** -5 to +5 % (front)

**Span adjustment:** 95 to 105 % (front)

## INPUT SPECIFICATIONS

**Frequency:** 50 or 60 Hz

### • Current Input

**Operational range:** 0 - 120 % of rating

**Overload capacity:** 1000 % of rating for 3 sec., 200 % for 10 sec., 120% continuous

### • Voltage Input

**Operational range:** 0 - 120 % of rating

**Overload capacity:** 150 % of rating for 10 sec., 120 % continuous

### ■How To Determine Var Range:

Calibration Range [var] = Measuring Range ÷ ((VT Ratio) × (CT Ratio))

Check that the required calibration range is within the available range in the table. Specify this range when ordering.

[example]

3-phase / 3-wire, measuring range 75 kvar, VT 220 / 110 V, CT 250 / 5 A

$75 \times 10^3 \text{ [var]} \div ((220 \div 110) \times (250 \div 5)) = 750 \text{ [var]}$

### • 3-phase / 3-wire

INPUT		AVAILABLE RANGE	BURDEN (VA)	
STD.RANGE			VOLT.	CURR.
110V/1A	200 var	100 - 240 var	0.2	0.1/phase
110V/5A	1000 var	500 - 1200 var	/phase	0.5/phase
220V/1A	400 var	200 - 480 var	0.4	0.1/phase
220V/5A	2000 var	1000 - 2400 var	/phase	0.5/phase

## OUTPUT SPECIFICATIONS

■ **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 maximum; 10 V for [±] output

■ **DC Voltage:** -10 - +12 V DC

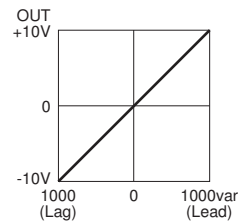
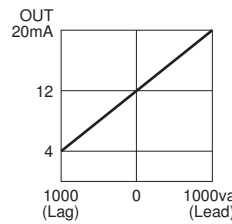
**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

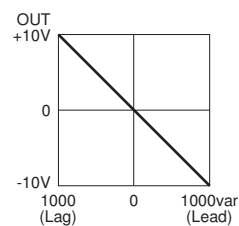
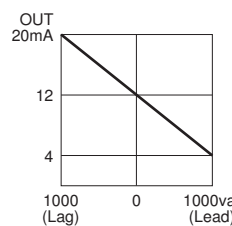
**Load resistance:** Output drive 1 mA max. at ≥ 0.5 V

### ■ OPERATION DIAGRAM (example)

#### • Negative in lag, positive in lead



#### • Negative in lead, positive in lag



## INSTALLATION

### Power input

• **AC:** Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 2 VA

• **DC:** Operational voltage range: rating ±10 %, or 85 - 150 V for 110 V rating, ripple 10 %p-p max., approx. 2 W (18 mA at 110 V)

**Operating temperature:** -5 to +60°C (23 to 140°F)

**Operating humidity:** 30 to 85 %RH (non-condensing)

**Mounting:** Surface or DIN rail

**Weight:** 400 g (0.88 lb)

## PERFORMANCE in percentage of span

**Accuracy:** ±0.5 %

**Temp. coefficient:** ±0.05 %/°C (±0.03 %/°F)

**Response time:** ≤ 1 sec. (0 - 90 %)

**Ripple:** 0.5 %p-p max. (50/60 Hz)

The output ripple may increase when there is great difference between the frequencies of input signal and power supply.

**Line voltage effect:** ±0.1 % over voltage range

**Insulation resistance:** ≥ 100 MΩ with 500 V DC

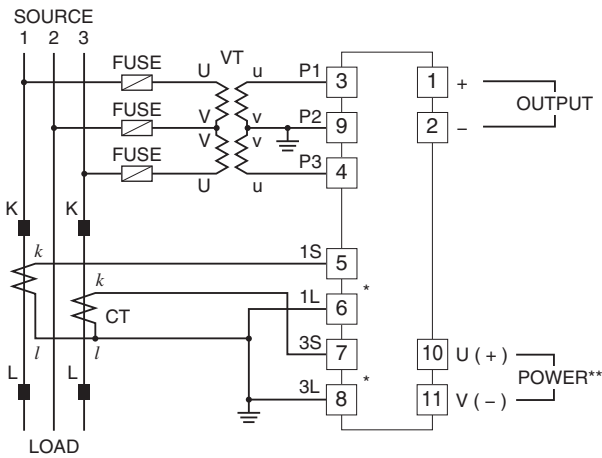
**Dielectric strength:** 2000 V AC @ 1 minute



(voltage input to current input to output to power to ground)

## CONNECTION DIAGRAM

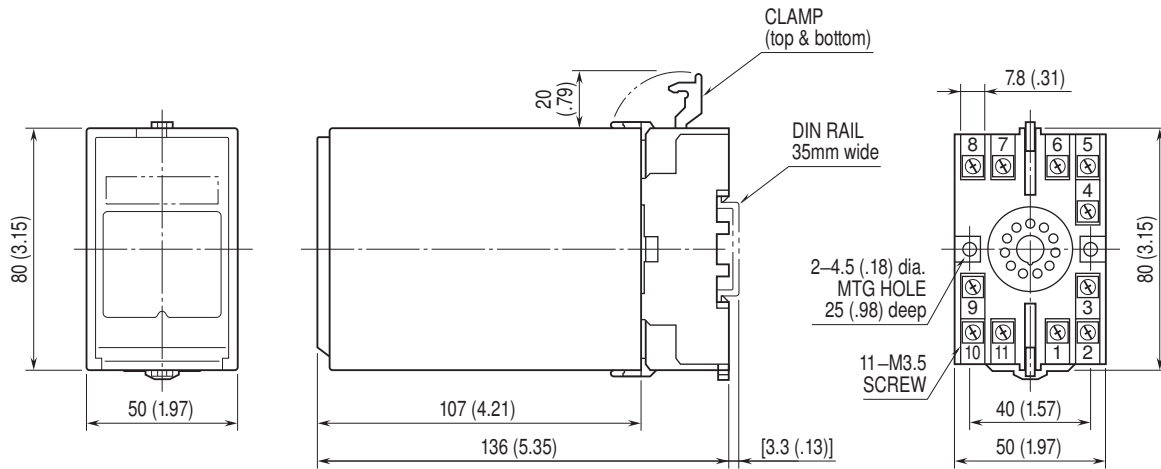
3-PHASE / 3-WIRE



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

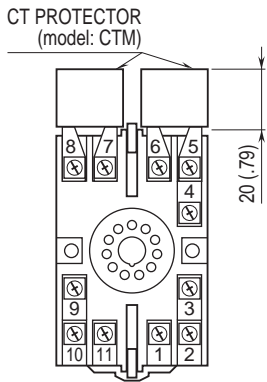
\*\*The transducer can be powered from the input voltage when the voltage is sufficiently stable and meets other supply voltage requirements.

## DIMENSIONS unit: mm (inch)



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

**TERMINAL ASSIGNMENTS unit: mm (inch)**



Specifications are subject to change without notice.

