Remote I/O R3 Series

MULTI POWER INPUT MODULE

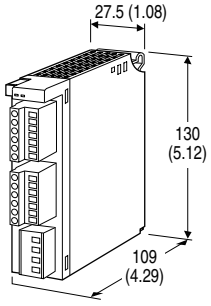
(clamp-on current sensor type CLSE use)

Functions & Features

• Measures simultaneously several variables of a heavy-current power system including computing bidirectional current, phase and harmonics
• 1 or 2 systems
• Uses clamp-on current sensors; No need of current transformers
• Current sensors are easy to install in existing systems

Typical Applications

• Energy demand management in manufacturing plants and buildings
• Multi-functional power monitor incorporated in electric devices or in switching boards: saves space, wiring works, and cost



mm (inch)

MODEL: R3–WTU1[1]ES[2]

ORDERING INFORMATION

• Code number: R3-WTU1[1]ES[2]
Specify a code from below for each [1] and [2].
(e.g. R3-WTU12ES/D/Q)
• Specify the specification for option code /Q
(e.g. /C01)

CONFIGURATION

1: Single-phase / 2-wire and 3-wire,
3-phase / 3-wire and 4-wire

[1] NO. OF SYSTEMS

1: 1 system
2: 2 systems

INPUT

E: 480 V AC / Sensor type CLSE

COMMUNICATION MODE

S: Single

[2] OPTIONS (multiple selections)

Data Capacity (address/slot occupied)

blank: 16 words (1)
/D: 32 words (2)
Be sure to use the R3-BSW base with free address setting capability. Refer to 'TRANSMISSION DATA DESCRIPTIONS.'

Other Options

blank: none
/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

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

/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

RELATED PRODUCTS

• PC configurator software (model: R3CON)
Downloadable at M-System's web site.
• Clamp-on current sensor (model: CLSE)
The clamp-on current sensors, not included in this product package, must be ordered separately. Required number depends upon the system configuration.
• Network module (model: R3-Nx)
In order to have the reset function from the host device, use V.2.00 or higher versions of the R3-NC1, -NC3, -NE1 and -NM1. With other versions and models, the resetting is possible using the R3CON PC Configurator.
For use with the R3-NLx, consult M-System.

GENERAL SPECIFICATIONS

Connection

Internal bus: Via the Installation Base (model: R3-BSx)
Voltage input: Separable terminal block
(applicable wire dia. ≤ 2.5, 0.5 – 3.5 mm^2)
Current input: Separable terminal block
(applicable wire dia. ≤ 2.4, 0.5 – 3.5 mm^2)
Internal Power: Via the Installation Base (model: R3-BSx)

Configuration: Single phase/2-wire and 3-wire, 3-phase/3-wire balanced/unbalanced load, 3-phase/4-wire balanced/unbalanced load

Isolation: Sensor core to sensor output or current input or voltage input to internal bus or internal power

Measured variables

Voltage: 1 – N, 2 – N, 3 – N, 1 – 2, 2 – 3, 3 – 1
Current: 1, 2, 3, N
Active / reactive / apparent power: 1, 2, 3, Σ
Power factor: 1, 2, 3, Σ
Frequency
Active energy: Incoming / outgoing
Reactive energy: Incoming / outgoing / lag (inductive) /lead (capacitive)
Apparent energy
Active / reactive / apparent power intervals (demand)
Average (demand) current: 1, 2, 3, N
Harmonic contents: Σ
Voltage: 1 – N, 2 – N, 3 – N, 1 – 2, 2 – 3, 3 – 1
Current: 1, 2, 3, N
Max. and min. values
Demand history: 1 to 4
(Programmable within 1 – 60 min.; factory set to 30 min.)
RUN indicator: Bi-color (red/green) LED;
Red when the internal bus operates normally.
ERR indicator: Bi-color (red/green) LED;
Red with the input abnormality (input ≥ 120 %, frequency out of 45 – 65 Hz range);
Green in normal operating conditions.
Low-end cutout: Converted as 0 % for the input below a preset value; programmable within 0 – 99.9 %; factory set to 1 %
Data resetting: All energy values, MAX / MIN current values, MAX / MIN values other than current, AVG (demand) values (The resetting from the host is possible by using V.2.00 or higher versions of the R3-NC1, -NC3, -NE1 and -NM1.)

INPUT SPECIFICATIONS

Frequency: 50 / 60 Hz (45 – 65 Hz)
• **Voltage Input**
Rated voltage
Line-to-line (delta voltage): 480 V
Line-neutral (phase voltage): 277 V
Consumption VA: ≤ U_{LN}^2 / 300 kΩ / phase
Overload capacity: 200 % of rating for 10 sec., 120 % continuous
Selectable primary voltage range: 50 – 400 000 V
• **Current Input**
CLSE-R5: 0 – 5 A AC
CLSE-05: 0 – 50 A AC
CLSE-10: 0 – 100 A AC
CLSE-20: 0 – 200 A AC
CLSE-40: 0 – 400 A AC
CLSE-60: 0 – 600 A AC
Operational range
Current: 0 – 115 % of the rating
Voltage, apparent power: ≤ 120 % of the rating
Active/reactive power: ±120 % of the rating
Frequency: 45 – 65 Hz
Power factor: ±1

INSTALLATION

Operating temperature: -10 to +55°C (14 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Installation Base (model: R3-BSx)
Use the R3-BSW with Option /D.
Weight: 170 g (0.37 lb)

PERFORMANCE in percentage of span

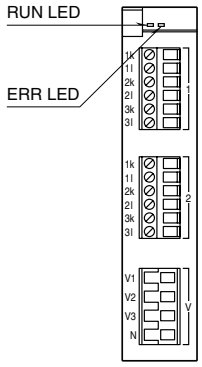
Accuracy (at 23°C ±10°C or 73.4°F ±18°F, 45 – 65 Hz)
Add the accuracy of the current sensor for overall values.
Voltage: ±1.0 % of the rating
Current: ±1.0 % of the rating
Power: ±1.0 % of the rating
Power factor: ±3.0 %
Frequency: ±1.0 % of the rating
Energy: ±2 %
Harmonic contents: ±2.5 % of the rating
Conversion data: 16 bits / 32 bits
Data allocation mode: 16 or 32
(Refer to 'TRANSMISSION DATA DESCRIPTIONS.')
Current consumption: 60 mA
Input response time: ≤ 2 sec. (0 – 100 % ±1 %)
≤3 sec. for frequency and harmonic contents
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @ 1 minute (voltage input or current input to internalbus or internal power)
2000 V AC @ 1 minute (sensor core to sensor output)
2000 V AC @ 1 minute (power input to FG; isolated on the power supply module)

TRANSMISSION DATA DESCRIPTIONS

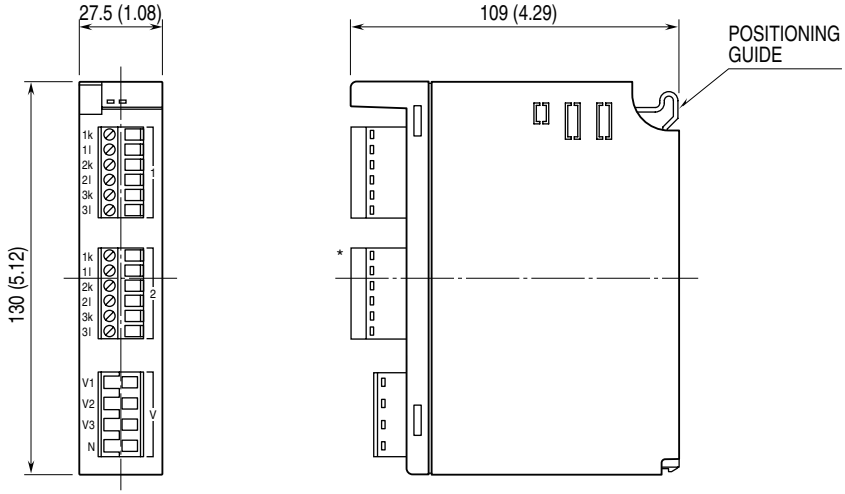
■ **MEASURANDS**
• **16-word Mode (standard)**
Measurands and assigned word numbers are specified using the R3CON PC Configurator.
Max. 16 words per module (slot). 1 word = 16 bits, 2 words = 32 bits
• **32-word Mode (option /D)**
Measurands and assigned word numbers are specified using the R3CON PC Configurator.
Max. 32 words by virtually assigning addresses (n) and (n+1) per module. 1 word = 16 bits, 2 words = 32 bits
Be sure to use the R3-BSW base with free address setting capability. DO NOT assign the address (n+1) to any module. A duplicate address will cause malfunctions.
■ **RESET**
Measurands to be reset can be specified among: all energy

values, MAX / MIN current values, MAX / MIN values other than current and AVG (demand) values.
Refer to 'I/O DATA DESCRIPTIONS' in the R3-WTU instruction manual for resetting from the host device.
For detailed information for the selection of measurands and other settings, refer to the R3CON Users Manual.

EXTERNAL VIEW



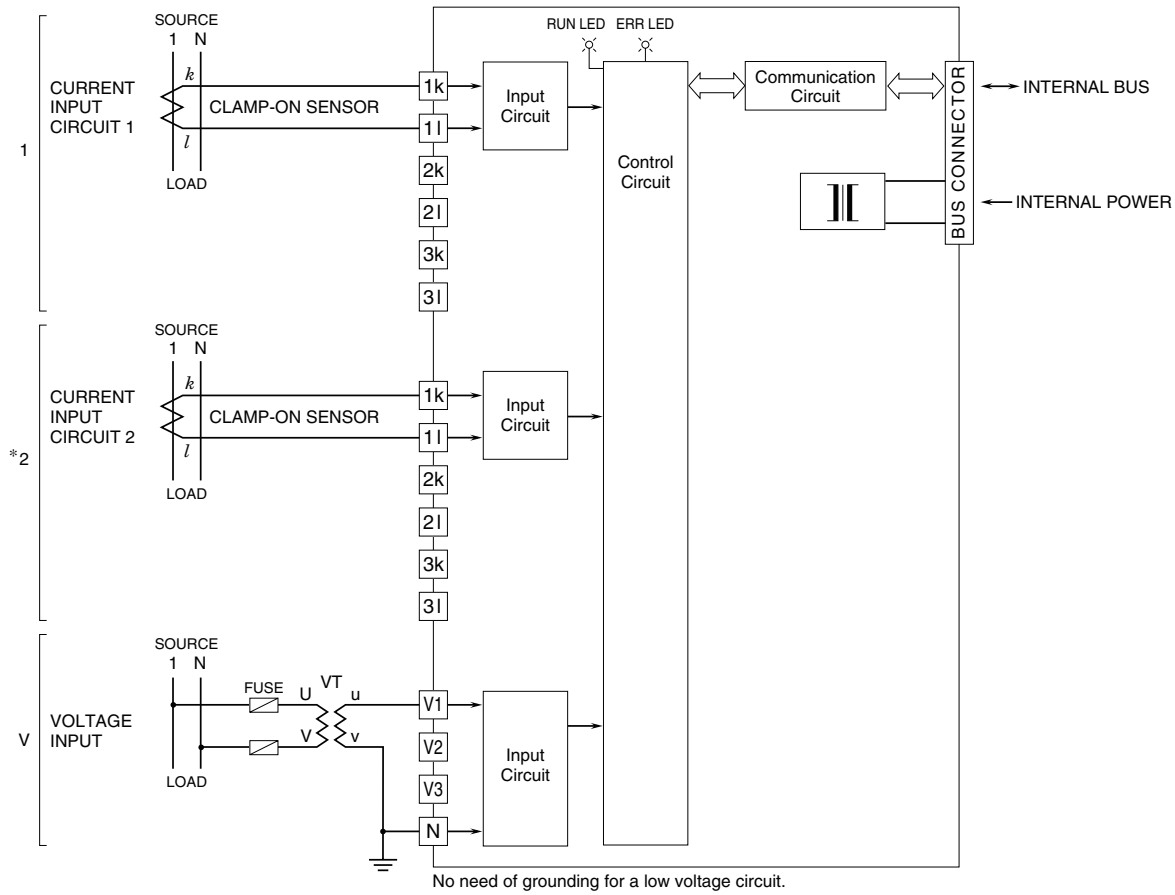
DIMENSIONS unit: mm (inch)



*Provided only with two circuits option.

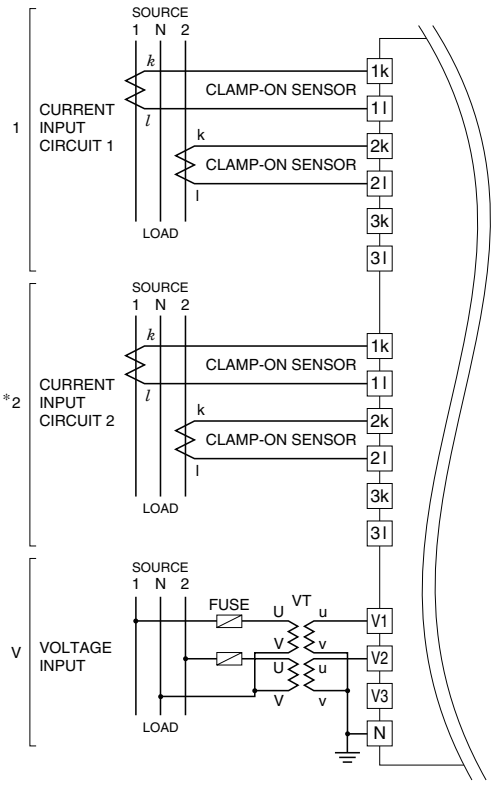
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ **SINGLE-PHASE/2-WIRE**

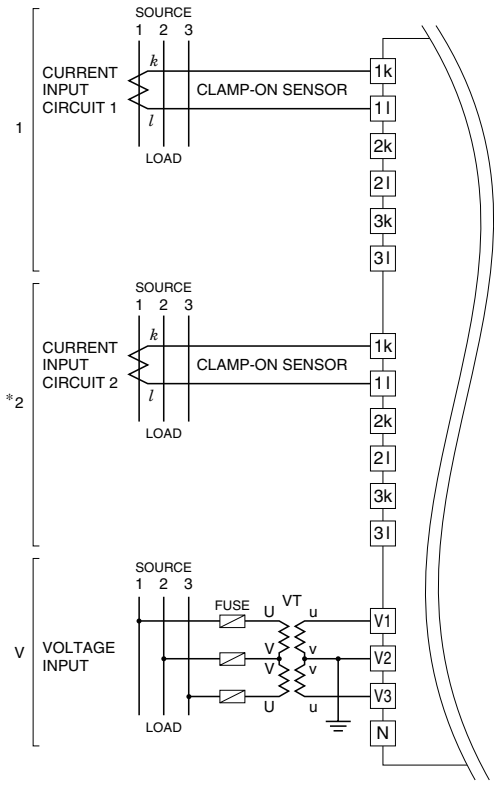


No need of grounding for a low voltage circuit.
*. Provided only with two circuits option.

■ **SINGLE-PHASE/3-WIRE**



■ **THREE-PHASE/3-WIRE, BALANCED LOAD**



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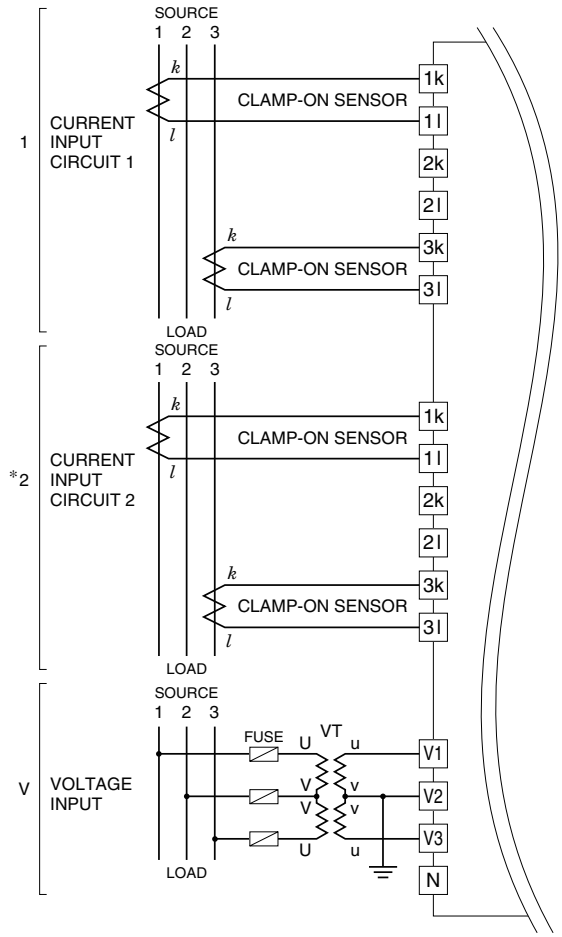
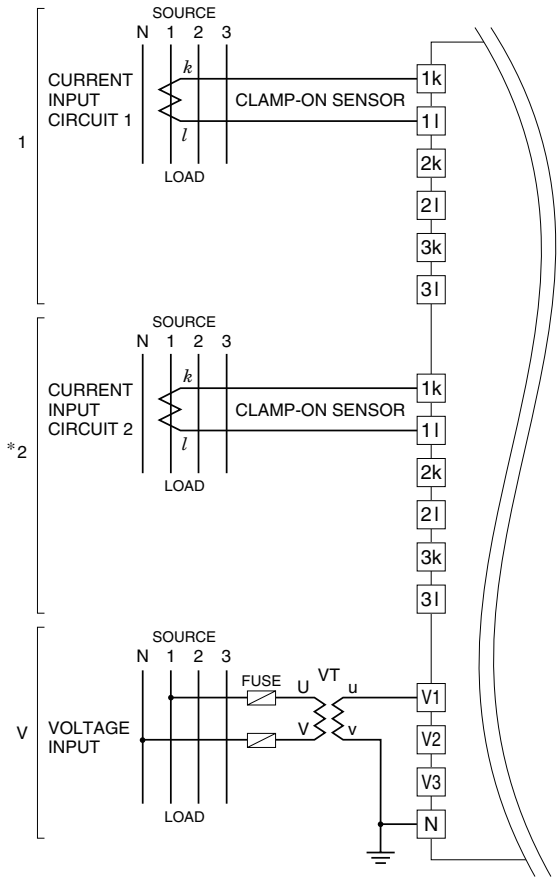
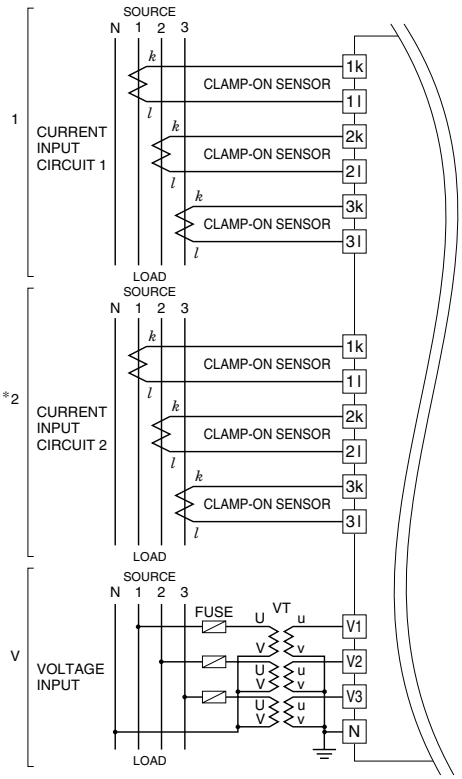
■ THREE-PHASE/3-WIRE, UNBALANCED LOAD



■ THREE-PHASE/4-WIRE, BALANCED LOAD



■ THREE-PHASE/4-WIRE, UNBALANCED LOAD



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⚠ Specifications are subject to change without notice.

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