

Autonics

PULSE METER

MP5M Series

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

■ Safety Considerations

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.  
※⚠ symbol represents caution due to special circumstances in which hazards may occur.
- ⚠ Warning** Failure to follow these instructions may result in serious injury or death.

**⚠ Caution** Failure to follow these instructions may result in personal injury or product damage.
- ⚠ Warning**
- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**  
Failure to follow this instruction may result in personal injury, economic loss or fire.
  - Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
  - Install on a device panel to use.**  
Failure to follow this instruction may result in fire or electric shock.
  - Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire or electric shock.
  - Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
  - Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire or electric shock.

- ⚠ Caution**
- When connecting the power/measurement input and relay output, use AWG 24(0.20mm<sup>2</sup>) to AWG 15(1.65mm<sup>2</sup>) cable and tighten the terminal screw with a tightening torque of 0.98 to 1.18N·m.**  
Use the wiring suitable for the load current capacity.  
Failure to follow this instruction may result in fire or malfunction due to contact failure.
  - Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
  - Use dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in fire or electric shock.
  - Keep the product away from metal chip, dust, and wire residue which from flowing into the unit.**  
Failure to follow this instruction may result in fire or product damage.

■ Ordering Information

|                     |                                                                  |
|---------------------|------------------------------------------------------------------|
| <b>MP 5 M - 4 N</b> | Main output (Comparative value output)                           |
| <b>N</b>            | Indicator                                                        |
| <b>1</b>            | Relay single (high-limit) output+<br>NPN open collector output   |
| <b>2</b>            | Relay dual (high/low-limit) output+<br>NPN open collector output |
| <b>2</b>            | 24VAC ~ 50/60Hz, 24-48VDC≡                                       |
| <b>4</b>            | 100-240VAC ~ 50/60Hz                                             |
| <b>M</b>            | DIN W72×H72mm                                                    |
| <b>5</b>            | 99999 (5-digit)                                                  |
| <b>MP</b>           | Pulse meter                                                      |

■ Unit Description

1: **Display**  
Displays current value in RUN mode.  
Alternately displays setting parameters and corresponding value in SETTING mode.

2: **MODE key**  
In RUN mode, press the key once to check max./min. value.  
In RUN mode, hold the key for over 2 sec to enter parameter groups.

3: **↔, ⏎ key**  
Select parameter groups, and select or setting values in the corresponding parameters.

4: **Output status indicator**

5: **Thumbwheel switch for HIGH/LOW setting value**

※The high-limit setting model(MP5M-□1) does not include the dotted line parts.

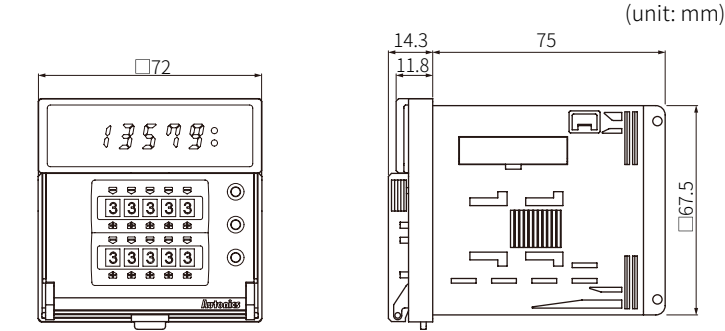
※The above specifications are subject to change and some models may be discontinued without notice.  
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, website).

■ Specifications

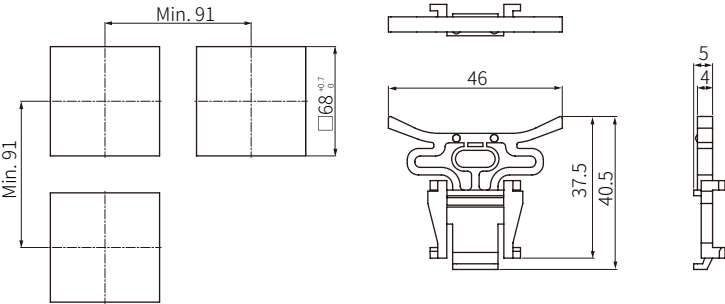
| Model                           |                    | MP5M-2N                                                                                                                                                                                                                                                                                     | MP5M-4N | MP5M-21                                              | MP5M-41 | MP5M-22                                    | MP5M-42 |
|---------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------------|---------|--------------------------------------------|---------|
|                                 |                    | Indicator                                                                                                                                                                                                                                                                                   |         | High-limit setting                                   |         | High/Low-limit setting                     |         |
| Display method                  |                    | 7-segment LED (zero blanking method)                                                                                                                                                                                                                                                        |         |                                                      |         |                                            |         |
| Character size                  |                    | W4×H8mm                                                                                                                                                                                                                                                                                     |         |                                                      |         |                                            |         |
| Display range                   |                    | -19999 to 99999                                                                                                                                                                                                                                                                             |         |                                                      |         |                                            |         |
| Power supply                    | AC voltage         | 100-240VAC ~ 50/60Hz                                                                                                                                                                                                                                                                        |         |                                                      |         |                                            |         |
|                                 | AC/DC voltage      | 24VAC ~ 50/60Hz, 24-48VDC≡                                                                                                                                                                                                                                                                  |         |                                                      |         |                                            |         |
| Power consumption               | AC voltage         | Max. 9VA (100-240VAC ~ 50/60Hz)                                                                                                                                                                                                                                                             |         |                                                      |         |                                            |         |
|                                 | AC/DC voltage      | Max. 6.5VA (24VAC ~ 50/60Hz), Max. 5W (24-48VDC≡)                                                                                                                                                                                                                                           |         |                                                      |         |                                            |         |
| Permissible voltage range       |                    | 90 to 110% of rated voltage                                                                                                                                                                                                                                                                 |         |                                                      |         |                                            |         |
| External power supply           |                    | Max. 12VDC≡ ±10% 80mA                                                                                                                                                                                                                                                                       |         |                                                      |         |                                            |         |
| Input frequency                 |                    | · Solid state input 1: Max. 50kHz (pulse width: min. 10μs)                                                                                                                                                                                                                                  |         |                                                      |         |                                            |         |
|                                 |                    | · Solid state input 2: Max. 5kHz (pulse width: min. 100μs)                                                                                                                                                                                                                                  |         |                                                      |         |                                            |         |
|                                 |                    | ※For F7, F8 operation mode, max. 1kHz (pulse width: min. 500μs)                                                                                                                                                                                                                             |         |                                                      |         |                                            |         |
| Input method                    |                    | · Contact input: Max. 45Hz (pulse width: min. 11ms)                                                                                                                                                                                                                                         |         |                                                      |         |                                            |         |
|                                 |                    | [Voltage Input] High: 4.5-24VDC≡, Low: 0-1VDC≡, input impedance: 3.9kΩ                                                                                                                                                                                                                      |         |                                                      |         |                                            |         |
|                                 |                    | [No-voltage Input] Short-circuit impedance: Max. 80Ω, Residual voltage: Max. 1VDC≡, Open-circuit impedance: Min. 100kΩ                                                                                                                                                                      |         |                                                      |         |                                            |         |
| Measurement range               |                    | · Operation mode F1, F2, F7, F8                                                                                                                                                                                                                                                             |         | : 0.0005Hz to 50kHz                                  |         |                                            |         |
|                                 |                    | · Operation mode F3, F4, F5, F6                                                                                                                                                                                                                                                             |         | : 0.01 to max. of each time range                    |         |                                            |         |
|                                 |                    | · Operation mode F9, F10, F11, F14                                                                                                                                                                                                                                                          |         | : 0 to 99999                                         |         |                                            |         |
|                                 |                    | · Operation mode F12, F13                                                                                                                                                                                                                                                                   |         | : -19999 to 99999                                    |         |                                            |         |
| Measurement accuracy (23°C±5°C) |                    | · Operation mode F1, F2, F7, F8                                                                                                                                                                                                                                                             |         | : F.S.±0.05%rdg±1-digit                              |         |                                            |         |
|                                 |                    | · Operation mode F3, F4, F5, F6                                                                                                                                                                                                                                                             |         | : F.S.±0.01%rdg±1-digit                              |         |                                            |         |
| Display cycle                   |                    | OFF (for F2, F14 operation mode), 0.05, 0.5, 1, 2, 4, 8 sec (same as update output cycle)                                                                                                                                                                                                   |         |                                                      |         |                                            |         |
| Operation mode                  |                    | Frequency/Revolutions/Speed (F1), Passing speed (F2), Cycle (F3),                                                                                                                                                                                                                           |         |                                                      |         |                                            |         |
|                                 |                    | Passing time (F4), Time interval (F5), Time differential (F6), Absolute ratio (F7), Density (F8), Length measurement 1 (F9), Interval (F10), Accumulation (F11), Addition/Subtraction-individual input (F12), Addition/Subtraction-phase difference input (F13), Length measurement 2 (F14) |         |                                                      |         |                                            |         |
| Prescale function               |                    | Direct input method (0.0001×10 <sup>-9</sup> to 9.9999×10 <sup>9</sup> )                                                                                                                                                                                                                    |         |                                                      |         |                                            |         |
| Hysteresis                      |                    | —                                                                                                                                                                                                                                                                                           |         | 0 to 9999 <sup>※1</sup>                              |         |                                            |         |
| Main output                     | Relay single       |                                                                                                                                                                                                                                                                                             |         | 250VAC~ 3A, 30VDC≡ 3A, 1c resistive load             |         | —                                          |         |
|                                 | Relay dual         | —                                                                                                                                                                                                                                                                                           |         | —                                                    |         | 250VAC~ 3A, 30VDC≡ 3A, 1a resistive load×2 |         |
|                                 | NPN open collector |                                                                                                                                                                                                                                                                                             |         | Max. 30VDC≡ 100mA                                    |         | Max. 30VDC≡ 100mA ×2                       |         |
| Memory retention                |                    | Non-volatile memory (number of inputs: 100,000 operations)                                                                                                                                                                                                                                  |         |                                                      |         |                                            |         |
| Insulation resistance           |                    | Over 100MΩ (at 500VDC≡ megger)                                                                                                                                                                                                                                                              |         |                                                      |         |                                            |         |
| Dielectric strength             |                    | 2,000VAC ~ 60Hz for 1 min                                                                                                                                                                                                                                                                   |         |                                                      |         |                                            |         |
| Noise immunity                  |                    | ±2kV the square wave noise (pulse width: 1μs) by noise simulator                                                                                                                                                                                                                            |         |                                                      |         |                                            |         |
| Vibration                       | Mechanical         | 0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour                                                                                                                                                                                                            |         |                                                      |         |                                            |         |
|                                 | Malfunction        | 0.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min                                                                                                                                                                                                             |         |                                                      |         |                                            |         |
| Shock                           | Mechanical         | 300m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times                                                                                                                                                                                                                     |         |                                                      |         |                                            |         |
|                                 | Malfunction        | 100m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times                                                                                                                                                                                                                     |         |                                                      |         |                                            |         |
| Relay life cycle                | Mechanical         | —                                                                                                                                                                                                                                                                                           |         | Min. 5,000,000 operations                            |         |                                            |         |
|                                 | Electrical         | —                                                                                                                                                                                                                                                                                           |         | Min. 100,000 operations (250VAC ~ 3A resistive load) |         |                                            |         |
| Environment                     | Ambient temp.      | -10 to 50°C, storage: -20 to 60°C                                                                                                                                                                                                                                                           |         |                                                      |         |                                            |         |
|                                 | Ambient humi.      | 35 to 85%RH, storage: 35 to 85%RH                                                                                                                                                                                                                                                           |         |                                                      |         |                                            |         |
| Approval                        |                    |                                                                                                                    |         |                                                      |         |                                            |         |
| Weight <sup>※2</sup>            |                    | Approx. 243g (approx. 168g)                                                                                                                                                                                                                                                                 |         | Approx. 256g (approx. 181g)                          |         | Approx. 265g (approx. 190g)                |         |

※1: Setting range will vary depending on the decimal point.  
※2: The weight includes packaging. The weight in parenthesis is for unit only.  
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

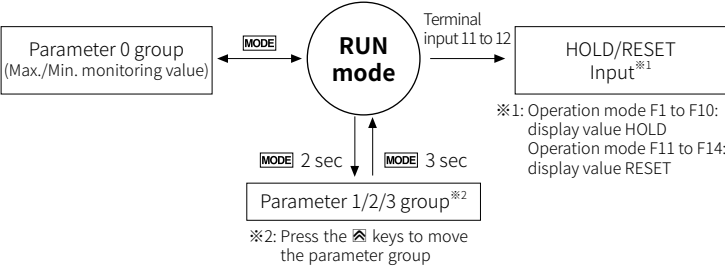


• Panel cut-out



• Bracket

■ Parameter Groups



- Press the   keys to select or set the desired value.
  - Press the **MODE** key once after changing the setting value, to save the setting value and move to the next parameter.
  - Hold the **MODE** key for 1.5 sec at any parameters to return to the select parameter group mode.
  - Hold the **MODE** key for 3 sec to save the setting value and return to RUN mode after changing the setting value.
  - If there is no key input for 60 sec while setting the parameters, the new settings are ignored, and the unit will return to RUN mode with previous settings.
- ※Each parameter and corresponding setting value will flash alternately every 0.5 sec.  
※Input operation mode setting range for each parameter is different.  
Please refer to '■ Operation Mode by Parameter Groups'.

• Parameter 0 Group

| Parameter      | Description           | Setting range | Factory default | Note                                                                                                    |
|----------------|-----------------------|---------------|-----------------|---------------------------------------------------------------------------------------------------------|
| <i>H P E P</i> | Max. monitoring value | —             | 99999           | Reset(current value):                                                                                   |
| <i>L P E P</i> | Min. monitoring value | —             | -99999          | Hold  key over 2 sec |

• Parameter 1 Group [*P R r I*]

| Parameter                            | Description                | Setting range                                                                                                                                                                                        | Factory default    | Note                                                         |
|--------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------|
| <i>o d E</i>                         | Operation mode             | <i>F 1</i> to <i>F 14</i>                                                                                                                                                                            | <i>F 1</i>         |                                                              |
| <i>I n - R</i>                       | Input sensor type          | <i>n P n . H F</i> : NPN solid state input 1<br><i>n P n . n F</i> : NPN solid state input 2<br><i>n P n . L F</i> : NPN contact input                                                               | <i>n P n . H F</i> |                                                              |
| <i>I n - b</i>                       |                            | <i>P n P . H F</i> : PNP solid state input 1<br><i>P n P . n F</i> : PNP solid state input 2<br><i>P n P . L F</i> : PNP contact input                                                               |                    |                                                              |
| <i>o U t - t</i>                     | Output mode                | <i>5 t R r d</i> : S (Standard)<br><i>o U t - H</i> : H (High)<br><i>o U t - L</i> : L (Low)<br><i>o U t - b</i> : B (Block)<br><i>o U t - I</i> : I (One-shot)<br><i>o U t - F</i> : F (Deflection) | <i>5 t R r d</i>   | Only appears in High/Low-limit setting models                |
| <i>H Y S</i>                         | Output hysteresis※1        | 0000 to 9999                                                                                                                                                                                         | 0000               | Only appears in High-limit and High/Low-limit setting models |
| <i>G U R r d</i>                     | Delay monitoring※2         | <i>F . d E F Y</i> : L Comparative output limit function<br><i>5 t R r t</i> : Start compensation timer function<br>Compensation time (0.0 to 99.9 sec)                                              | —                  | Only appears in High/Low-limit setting models                |
| <i>R U t o R</i><br><i>R U t o b</i> | Auto-zero time (unit: sec) | 0.1 to 9999.9                                                                                                                                                                                        | 9999.9             | Input A<br>Input B                                           |
| <i>n E n o</i>                       | Memory retention           | <i>o F F</i> , <i>o n</i>                                                                                                                                                                            | <i>o F F</i>       |                                                              |

• Parameter 2 Group [*P R r R 2*]

| Parameter          | Description                                       | Setting range                                                                                                                                                          | Factory default | Note                               |
|--------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------|
| <i>d o t</i>       | Decimal point location of display value           | 00000, 0000.0, 000.00, 00.000, 0.0000                                                                                                                                  | 00000           |                                    |
| <i>t . U n t</i>   | Tim unit, time range                              | <i>t . 5 E C</i> (sec)<br>9999.9 : 999.99s<br>9999.9 : 9999.9s<br>9999.9 : 99999s<br><i>t . n I n</i> (min)<br>9999.9 : 999.99m<br>9999.9 : 9999.9m<br>9999.9 : 99999m | 999.99          |                                    |
| <i>P 5 C . R H</i> | Input A prescale mantissa (x)                     | 0.000 1 to 9.9999                                                                                                                                                      | 6.0000          |                                    |
| <i>P 5 C . R Y</i> | Input A prescale exponent (y)                     | 10 ~ 9 (10 <sup>9</sup> ) to 10 09 (10 <sup>9</sup> )                                                                                                                  | 10 0 1          |                                    |
| <i>P 5 C . b H</i> | Input B prescale mantissa (x)                     | 0.000 1 to 9.9999                                                                                                                                                      | 6.0000          |                                    |
| <i>P 5 C . b Y</i> | Input B prescale exponent (y)                     | 10 ~ 9 (10 <sup>9</sup> ) to 10 09 (10 <sup>9</sup> )                                                                                                                  | 10 0 1          |                                    |
| <i>d I S P t</i>   | Measured value display cycle (unit: sec)※3        | 0.05, 0.5, 1, 2, 4, 8                                                                                                                                                  | 0.05            |                                    |
| <i>C o U n b</i>   | Input B setting value of operation mode F16 (INB) | 1 to 99999                                                                                                                                                             | 99999           | Only appears in operation mode F16 |

• Parameter 3 Group [*P R r R 3*]

| Parameter      | Description     | Setting range                                                                                                                                                                   | Factory default | Note |
|----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|
| <i>L o C</i>   | Lock            | <i>o F F</i> : Unlock<br><i>L o C . 0</i> : Lock all<br><i>L o C . 1</i> : Parameter 1/2/3 lock<br><i>L o C . 2</i> : Parameter 2/3 lock<br><i>L o C . 3</i> : Parameter 3 lock | <i>o F F</i>    |      |
| <i>n r 5 t</i> | Parameter reset | <i>E n R</i> (Enable), <i>d I S R</i> (Disable)                                                                                                                                 | <i>E n R</i>    |      |

※1: The setting range varies depending on the decimal point setting.  
※2: Press  key to move parameters.  
※3: Setting range *o F F* is available in operation mode F2, F16.

■ Operation Mode by Parameter Groups

(●: parameter display, X: no parameter display)

| Operation mode | F1                             | F2                                         | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 |
|----------------|--------------------------------|--------------------------------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| Parameter      | <i>H P E P</i>                 | ●                                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   | X   | ●   | ●   | X   |
| 0 group        | <i>L P E P</i>                 | ●                                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   | X   | ●   | ●   | X   |
| 1 group        | <i>o d E</i>                   | Appears in all operation modes(F1 to F14). |    |    |    |    |    |    |    |     |     |     |     |     |
|                | <i>I n - b</i> ※1              | X                                          | ●  | X  | X  | X  | ●  | ●  | ●  | ●   | ●   | ●   | X   | ●   |
|                | <i>o U t - t</i> ※2            | ●                                          | ●  | ●  | ●  | X  | ●  | ●  | ●  | ●   | X   | ●   | ●   | ●   |
|                | <i>H Y S</i> ※1                | ●                                          | X  | X  | X  | X  | X  | ●  | X  | X   | X   | X   | X   | X   |
|                | <i>G U R r d</i>               | ●                                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | X   | X   | X   | X   | X   |
| 2 group        | <i>R U t o R</i>               | ●                                          | X  | X  | ●  | X  | X  | ●  | ●  | X   | X   | X   | X   | X   |
|                | <i>R U t o b</i>               | X                                          | X  | X  | X  | X  | X  | ●  | ●  | X   | X   | X   | X   | X   |
|                | <i>n E n o</i>                 | X                                          | X  | X  | X  | X  | X  | X  | X  | X   | ●   | ●   | ●   | ●   |
|                | <i>d o t</i>                   | ●                                          | ●  | X  | X  | X  | X  | ●  | ●  | ●   | ●   | ●   | ●   | ●   |
|                | <i>t . U n t</i>               | X                                          | X  | ●  | ●  | ●  | X  | X  | X  | X   | X   | X   | X   | X   |
| 3 group        | <i>P 5 C . R H</i>             | ●                                          | ●  | X  | ●  | X  | X  | ●  | ●  | ●   | ●   | ●   | ●   | ●   |
|                | <i>P 5 C . R Y</i>             | ●                                          | ●  | X  | ●  | X  | X  | ●  | ●  | ●   | ●   | ●   | ●   | ●   |
|                | <i>P 5 C . b H</i>             | X                                          | X  | X  | X  | X  | X  | ●  | ●  | X   | X   | X   | X   | X   |
|                | <i>P 5 C . b Y</i>             | X                                          | X  | X  | X  | X  | X  | ●  | ●  | X   | X   | X   | X   | X   |
|                | <i>d I S P t</i>               | ●                                          | ●  | ●  | X  | X  | X  | ●  | ●  | X   | X   | X   | X   | ■   |
| 3 group        | <i>C o U n b</i>               | X                                          | X  | X  | X  | X  | X  | X  | X  | X   | X   | X   | X   | ●   |
|                | <i>L o C</i><br><i>n r 5 t</i> | Appears in all operation modes(F1 to F14). |    |    |    |    |    |    |    |     |     |     |     |     |

※1: Only appears in high/low-limit setting models.  
※2: Only appears in high-limit setting models, high/low-limit setting models.  
※3: The settings for *I n - b* and *I n - R* are applied.  
※4: (●) F output mode(*o U t - F*) cannot be set.  
※5: (■) setting range: *o F F*, 0.05, 0.5, 1, 2, 4, 8

• Monitoring delay function by output mode

| Output mode              | S mode           | H mode           | L mode           | B mode           | I mode           | F mode           |
|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Parameter                | <i>5 t R r d</i> | <i>o u t - h</i> | <i>o u t - L</i> | <i>o u t - b</i> | <i>o u t - I</i> | <i>o u t - F</i> |
| Comparative output limit | ●                | X                | X                | ●                | X                | ●                |
| Start compensation timer | ●                | ●                | X                | ●                | ●                | ●                |

■ Connections

• Indicator (MP5M-□N)

※Use terminals of size specified below.

※1: Operation mode F1 to F10 : Display value HOLD  
Operation mode F11 to F14 : Display value RESET

※2:

| Model   | Source          |
|---------|-----------------|
| MP5M-21 |                 |
| MP5M-22 | 24-48VDC≡       |
| MP5M-2N | 24VAC ~ 50/60Hz |
| MP5M-41 | 100-240VAC ~    |
| MP5M-42 | 50/60Hz         |
| MP5M-4N |                 |

• High-limit setting (MP5M-□1)

CONTACT OUT: 250VAC ~ 3A, 30VDC≡ 3A RESISTIVE LOAD

CONTACT OUT: 250VAC ~ 3A, 30VDC≡ 3A RESISTIVE LOAD

• High/Low-limit setting (MP5M-□2)

CONTACT OUT: 250VAC ~ 3A, 30VDC≡ 3A RESISTIVE LOAD

CONTACT OUT: 25

