

Autonics SMALL MULTI PANEL METER M4NN SERIES INSTRUCTION MANUAL



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

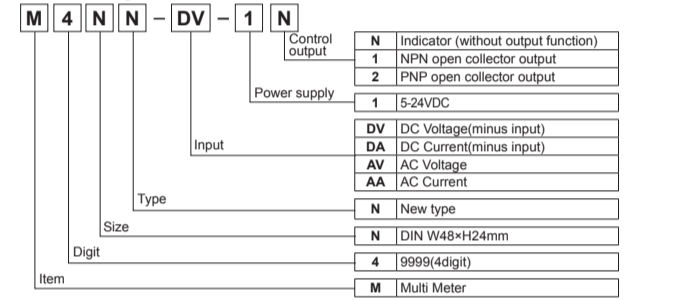
Safety Considerations

- Please observe all safety considerations for safe and proper product operation to avoid hazards.
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.
The symbols used on the product and instruction manual represent the following
Warning symbol represents caution due to special circumstances in which hazards may occur.
1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.
2. Install on a device panel to use.
3. Do not connect, repair, or inspect the unit while connected to a power source.
4. Check 'Connections' before wiring.
5. Do not disassemble or modify the unit.

Caution

- When connecting the power/measurement input, use AWG 24(0.20mm²) to AWG 20(0.50mm²) cable and tighten the terminal screw with a tightening torque of 0.74 to 0.90N-m.
Use the unit within the rated specifications.
Use dry cloth to clean the unit, and do not use water or organic solvent.
Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
Keep metal chip, dust, and wire residue from flowing into the unit.

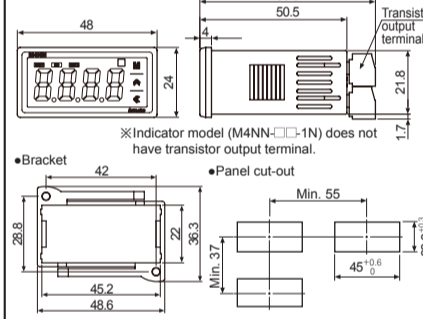
Ordering Information



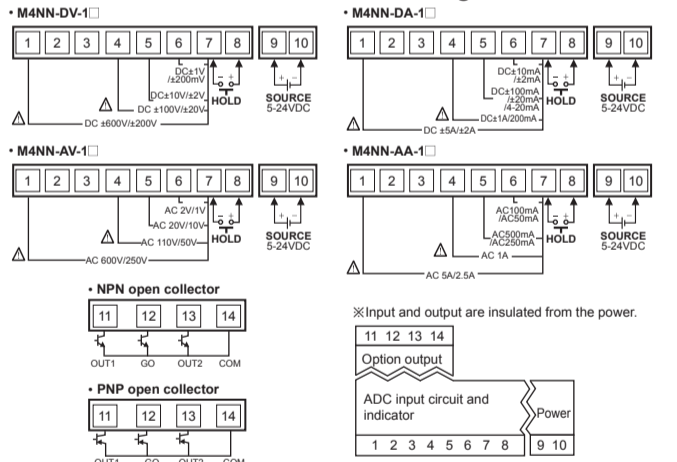
Unit Descriptions

- 1. Measured value display
2. MODE key
3. Up key
4. Shift key
5. OUT1(Red): OUT1 output indicator of preset
6. GO(Green): GO output indicator of preset
7. OUT2(Red): OUT2 output indicator of preset
8. UNIT sticker

Dimension



Connections and Insulated Block Diagram



Monitoring Max./Min. Value (PA 0 group: HPEL/LEPL, PA 2 group: PEEL)

It monitors Max./Min. value of display value based on current display value and then displays the data in HPEL mode and LEPL mode of parameter 0 group. Set delay time (0 to 30 sec) in PEEL mode of parameter 2 group in order to avoid caused by initial overcurrent or overvoltage, when monitoring the peak value. Delay time is 0 to 30 sec and it starts to monitor the peak value after set time.
When [PEEL] keys are pressed at HPEL and LEPL mode of parameter 0 group, it will be initialized.
When [PEEL] keys are pressed at HPEL mode when monitoring delay time [PEEL] of parameter 2 group is set as 0 sec [0.0].

Minus Input Display Setting (PA1 group: ni nu)

- When minus input is unnecessary, or when display 0 not to display minus input due to display minus input due to unstable input value around 0, set OFF this minus input display function.
When setting OFF, low-limit value of input range is set 0 and it displays minus input as 0.
The low-limit value of L-SC, oU, L-RG parameters is changed based on "0". Min. display value is "0" and H-SC/H-RG parameters display max. value of the input range.
The i nbH, i nbL, oU, L-RG parameters are initialized to factory default.
In case of DC Current measurement input model, when measured input range [i nr] is set as 4-20, this parameter is not displayed.

AC Frequency Measurement (PA1 group: di SP)

It measures input signal frequency when it is an AC input. It uses fixed decimal point by dot parameter setting of parameter 1 group, measured range can be changed by setting and measured range of decimal point position is as below chart. It is available to adjust upper gradient at i nbH and i nbL of parameter 1 group. In order to measure frequency normally, input signal, over 10% F.S. of the measured range, should be supplied. Please select the proper point of measurement terminal.
Measured range
Accuracy of frequency measurement: Below 1kHz, F.S. ±0.1rdg ±2digit. From 1 to 10kHz, F.S. ±0.3rdg ±2digit.
i nbH: 0.100 to 9.999 (gradient adjustment of high-limit value)
i nbL: 10², 10¹, 10⁰, 10⁻¹ (index adjustment of i nbH)

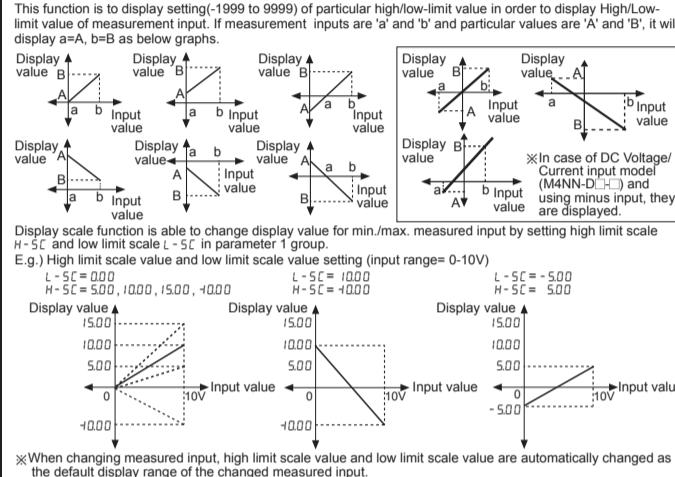
Error Display

Table with 2 columns: Display and Description. Rows include HHHH (exceeded max. allowable input), LLLL (exceeded min. allowable input), d-HH (exceeded max. display range), d-LL (exceeded min. display range), F-HH (exceeded max. measured range), PF-H (display range over LAG 0.50), PF-L (display range under LEAD -0.50).

Specifications

Specifications table with columns: Model (M4NN-DV-1, M4NN-DA-1, M4NN-AV-1, M4NN-AA-1), Measurement input, Max. allowable input, Power supply, Allowable voltage range, Power consumption, Display method, Display accuracy, Display cycle, AD conversion method, Sampling cycle, Max. display range, Preset output, AC measurement, Frequency measurement, Insulation resistance, Dielectric strength, Noise immunity, Vibration, Shock, Environment, Connection type, Insulation type, Approval, Weight.

Prescale (PA1 group: H-SC/L-SC)

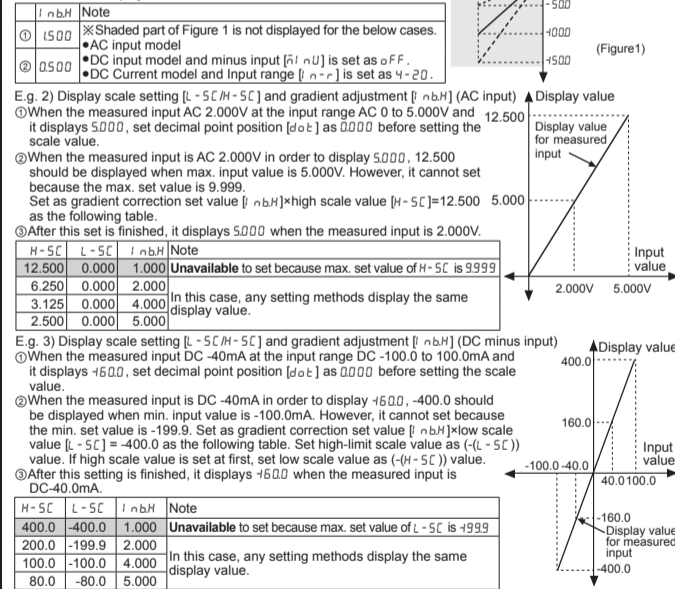


Error Correction (PA1 group: i nbH/i nbL)

It corrects display error of measurement input. i nbL: -99 to 99 (adjust deviation of low-limit value) i nbH: 0.100 to 9.999 (correct gradient of high-limit value) Display value=(Measured value x i nbH) + i nbL
E.g.) When the measured range is 0 to 500V, and the display range is 0 to 500.0. If the low display value is 12 to 0V input, set -12 as i nbL value to display 0.0 by adjusting offset of the low-limit value.
The display value to 500V measured input varies by adjusting the offset of low-limit value. If this display value is 50.0, calculate 500.0/501.0 (desired display value/the display value), and set the 0.998 correction value as the i nbH to display 500.0 by adjusting gradient of high-limit value.
The offset correction range of i nbL is within -99 to 99 for "D", "E" digit regardless of decimal point position [dot].
High limit error correction function is available as "Gradient correction" and low limit error correction function is available as "Zero adjustment".

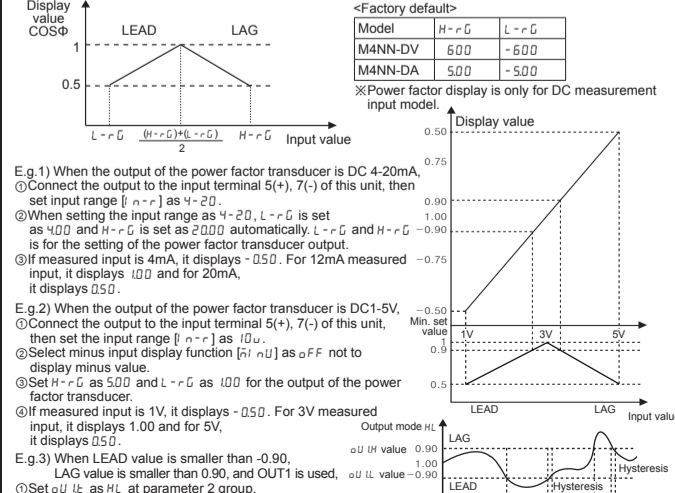
Gradient Correction (PA1 group: i nbH)

This function is to adjust gradient of standard display value or scale value for the input value within the measured input range. By adjusting gradient, it is available as "High limit error correction function".
As the below figure (Figure 1), in case of display gradient 1 for the measured input 100V, this function is to adjust display value by adjusting the gradient as 1.5 times or 0.5 times.
Set range: 0.100 to 9.999, factory default: 1.000 (unit: multiply)
E.g.) Gradient adjustment
When the measured input is 100.0V in order to display 150.0, set gradient correction set value [i nbH] as 1.500. This value is also applied for minus input. When the measured input is -100.0V, it displays +50.0.
When the measured input is -100.0V in order to display -50.0, set gradient correction set value [i nbH] as 0.500. This value is also applied for plus input. When the measured input is 100.0V, it displays 50.0.



Power Factor [PF] Display (PA1 group: H-RG/L-RG)

This function displays LEAD and LAG by analog output signal from the power factor transducer.
It is available to accept several outputs of the power factor transducer by high-limit [H-RG]/low-limit [L-RG] analog output value setting in the power factor transducer.
Power factor value is displayed as cosφ value -0.50(LEAD) to 1.00 to 0.50 (LAG).
LEAD is when current phase leads voltage phase, LAG is when current phase lags behind voltage phase. LEAD and LAG are invalid power.
Set range: From min. to max. selected value from measurement input [i nr].
When setting 20.0V in i nr, H-RG and L-RG are available to set from +99.9 to 20.00.
When setting 10.0V, H-RG and L-RG are available to set from +10.0 to 10.00. (X(H-RG > L-RG))



Measurement Input (PA 1 group: i nr)

Measurement Input table with columns: Type, Measured input range, Display, Input impedance, Display range, Note.

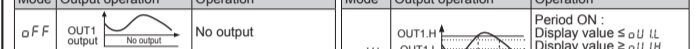
Display Cycle Delay (PA 2 group: di S)

In some applications the measured input may fluctuate which in turn causes the display to fluctuate. By adjusting the display cycle delay function time at di S of parameter 2 group, the operator can adjust the display time within a range of 0.1 sec to 5 sec. For example, if the operator sets the display cycle time to 4.0 sec, the display value is displayed the averaged input value over 4 sec in every 4 sec.

Zero Adjustment

Forces the display value of measured input to 0(Zero).
Zero adjustment range: -99 to 99
Zero adjustment method: Press [dot] and [M] key in RUN mode for 3 sec.
When zero point adjustment with front key and hold terminal is finished normally, zero point of measurement terminal is displayed and the adjusted value is saved in i nbL.
If zero adjustment range is exceeded, the error [ouE-] flashes twice and then move to RUN mode, maintaining previous setting value.

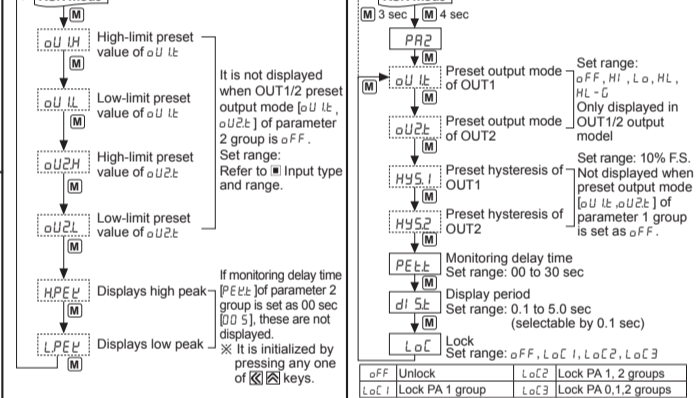
Initialization



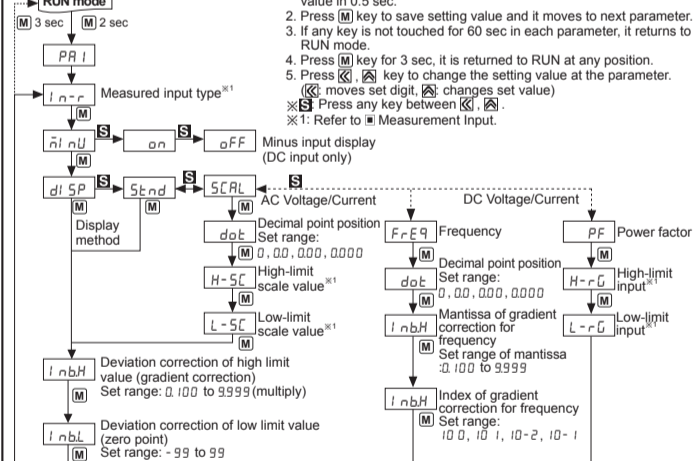
Preset Output Mode (PA 2 group: ou U/ou Z)

Preset Output Mode table with columns: Mode, Output operation, Operation.

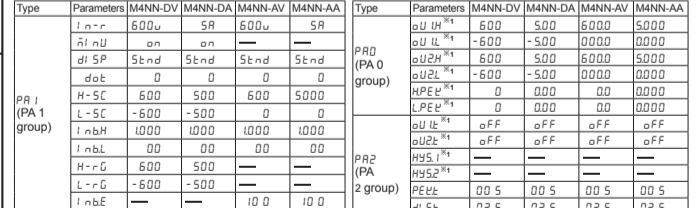
Parameter 0 Group



Parameter 1 Group



Parameter 2 Group



Factory Default

Factory Default table showing default values for various parameters across different models.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
5-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
Keep away from high voltage lines or power lines to prevent inductive noise.
In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
Do not use near the equipment which generates strong magnetic force or high frequency noise.
This unit may be used in the following environments:
Indoors
In the environment condition rated in 'Specifications'
Altitude max. 2,000m
Pollution degree 2
Installation category II

Major Products

- Photocentric Sensors, Temperature Controllers, Fiber Optic Sensors, Temperature/Humidity Transducers, Door Sensors, SSRs/Power Controllers, Door Side Sensors, Counters, Area Sensors, Timers, Proximity Sensors, Panel Meters, Pressure Sensors, Tachometer/Pulse (Rate) Meters, Rotary Encoders, Display Units, Connector/Sockets, Sensor Controllers, Switching Mode Power Supplies, Control Switches/Lamps/Buzzers, I/O Terminal Blocks & Cables, Stepper Motors/Drivers/Motion Controllers, Graphic/Logic Panels, Field Network Devices, Laser Marking System (Fiber, Co., Nd: YAG), Laser Welding/Cutting System

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