## DIN W48×H24mm Small Digital Multi Panel Meter - Features



- Upgraded of M4N Series
- 1 power enables to supply the power to several M4NN units by insulating input and power part
- Display range : -1999 to 9999
- Power supply : 5-24VDC(insulation type)
- Preset output : OUT1, GO, OUT2(NPN/PNP open collector output )
- Power factor display and output: displays input of $1-5 \mathrm{~V}, 4$ to 20 mA , etc as -0.5 to 1 to 0.5
- Various input types

DC voltage model : $\pm 200 \mathrm{mV} / \pm 1 \mathrm{~V} / \pm 2 \mathrm{~V} / \pm 10 \mathrm{~V} / \pm 20 \mathrm{~V} / \pm 100 \mathrm{~V} / \pm 200 \mathrm{~V} / \pm 600 \mathrm{~V} /$ power factor
DC current model : $\pm 2 \mathrm{~mA} / \pm 10 \mathrm{~mA} / \pm 20 \mathrm{~mA} / 4$ to $20 \mathrm{~mA} / \pm 100 \mathrm{~mA} / \pm 200 \mathrm{~mA} / \pm 1 \mathrm{~A} / \pm 2 \mathrm{~A} / \pm 5 \mathrm{~A} /$ power factor
AC voltage model: $1 \mathrm{~V} / 2 \mathrm{~V} / 10 \mathrm{~V} / 20 \mathrm{~V} / 50 \mathrm{~V} / 110 \mathrm{~V} / 250 \mathrm{~V} / 600 \mathrm{~V} / \mathrm{AC}$ frequency
AC current model : $50 \mathrm{~mA} / 100 \mathrm{~mA} / 250 \mathrm{~mA} / 500 \mathrm{~mA} / 1 \mathrm{~A} / 2.5 \mathrm{~A} / 5 \mathrm{~A} / \mathrm{AC}$ frequency

## -Bracket




## M4NN Series

## Specifications

| Model |  | M4NN-DV-1 $\square$ | M4NN-DA-1 $\square$ | M4NN-AV-1 $\square$ | M4NN-AA-1 $\square$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Input |  | DC voltage | DC current | AC voltage, frequency | AC current, frequency |
| Max. allowable input |  | $-110 \%$ to $110 \%$ of the rated measurement input range (when not using MINUS input : -10\% to 110\%) |  | 110\% of the rated measurement input range |  |
| Power supply |  | $5-24$ VDC |  |  |  |
| Allowable voltage range |  | 5-26.4VDC |  |  |  |
| Power consumption |  | 3W |  |  |  |
| Display method |  | 7 segment LED Display(red), character height: 11mm |  |  |  |
| Display accuracy |  | $\cdot 23^{\circ} \mathrm{C} \pm 5^{\circ} \mathrm{C}$-DC type : $\pm 0.1 \%$ F.S. $\pm 2$ digit / AC Type $\pm 0.3 \%$ F.S. $\pm 3$ digit <br> ※For 5 A terminal of M4NN-DA, AA type, within $\pm 0.3 \%$ F.S. $\pm 3$ digit <br> $\cdot-10^{\circ} \mathrm{C}$ to $50^{\circ} \mathrm{C}-$ DC/AC type : $\pm 0.5 \%$ F.S. $\pm 3$ digit / Frequency : $\pm 0.5 \%$ F.S. $\pm 3$ digit <br> ※For 5A terminal of M4NN-DA, AA type, $\pm 1 \%$ F.S. $\pm 3$ digit |  |  |  |
| Display cycle |  | Setting displays cycle in RUN mode(selectable per 0.1 sec . within 0.1 to 5.0 sec .) |  |  |  |
| A/D conversion method |  | Practical oversampling using successive approximation ADC |  |  |  |
| Sampling cycle |  | 50 ms (resolution $1 / 12,000$ ) 16.6 ms (resolution $1 / 12,000$ ) |  |  |  |
| Max. display range |  | -1999 to 9999(4 digit) |  |  |  |
| Preset output* ${ }^{* 1}$ |  | NPN/PNP Open Collector output: 12-24VDC $\pm 2 \mathrm{~V} 50 \mathrm{~mA} \mathrm{Max.(resistance} \mathrm{load)}$ |  |  |  |
| AC measurement ${ }^{* 2}$ |  | - |  | Average value (AVG) measurement |  |
| Frequency measurement *2 |  | - |  | Measurement range : 0.100 to 9999 Hz (variable by decimal point position) |  |
| Insulation resistance |  | Min. 100MS (at 500VDC megger) |  |  |  |
| Dielectric strength |  | 2,000VAC for 1 min .(between external terminals and case) |  |  |  |
| Noise resistance |  | $\pm 2 \mathrm{kV}$ the square wave noise (pulse width: $1 \mu \mathrm{~s}$ ) by the noise simulator |  |  |  |
| Vibration | Mechanical | 0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min .) in each of $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ directions for 2 hours |  |  |  |
|  | Malfunction | 0.5 mm amplitude at frequency of 10 to 55 Hz (for 1 min .) in each of $X, Y, Z$ directions for 10 min . |  |  |  |
| Shock | Mechanical | $100 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 10G) in each of $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ directions for 3 times |  |  |  |
|  | Malfunction | $300 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 30G) in each of $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ directions for 3 times |  |  |  |
| Environment | Ambient temperature | -10 to $50^{\circ} \mathrm{C}$, storage: -20 to $60^{\circ} \mathrm{C}$ |  |  |  |
|  | Ambient humidity | 35 to 85\%RH, storage: 35 to 85\%RH |  |  |  |
| Connection |  | Plug/Socket terminal block(accessory) |  |  |  |
| Insulation type |  | Double insulation or reinforced insulation (mark: 回, dielectric strength between the measured input part and the power part: 1 kV ) |  |  |  |
| Unit weight |  | Approx. 28g |  |  |  |

※1. Indicator (M4NN- $\square \square-1 N$ ) model does not have output function. ※2. AC, frequency measurement functions are only for AC measurement type.
※ Environment resistance is rated at no freezing or condensation.

## - Connections

- M4NN-DV-1 $\square$

- M4NN-DA-1 $\square$

- M4NN-AA-1

※Input and output are insulated from the power.



# Small Multi Panel Meter 

$\square$ Parameter settings


## Factory default

| Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA | Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| i n-r | 6004 | 58 | 600u | 58 | i nb.h | 1.000 | 1.000 | 1.000 | 1.000 |
|  | on | on | - | - | i nb.l | $\square$ | 0 | 0 | 0 |
| d 5p | 5tnd | 5tnd | 5tnd | 5tnd | H-riu | 600 | 5.00 | - | - |
| dot | $\square$ | 0 | 0 | 0 | L-rí | -600 | - 5.00 | - | - |
| H-5L | 600 | 500 | 600 | 5000 | i nb.E | - | - | 10-0 | 10-0 |
| L-5[ | -600 | -500 | 0 | 0 |  |  |  |  |  |

## M4NN Series

## - Parameter 2 group

| RUN mode |
| :--- | :--- | :--- |

## Factory default

| Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA | Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - 1.t ${ }^{* 1}$ | ${ }_{\square} \mathrm{FF}$ | ${ }_{\square} F F$ | ofF | -FF | PEL.L | 005 | 005 | 005 | 005 |
| - 屺. $\mathrm{E}^{* 1}$ | -FF | -FF | oFF | ofF | di 5.t | 0.25 | 0.25 | 0.25 | 0.25 |
| Hy5. ${ }^{* 1}$ | - | - | - | - | LoL | ${ }_{\square} F F$ | -FF | ofF | ofF |
| Hบ5.2 ${ }^{* 1}$ | - | - | - | - |  |  |  |  |  |

※It is not displayed for the indicator model.

## Parameter 0 group



## Factory default

| Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA | Parameter | M4NN-DV | M4NN-DA | M4NN-AV | M4NN-AA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| -U 1.4*1 | 600 | 5.00 | 600.0 | 5.000 | -Uट.L* ${ }^{\text {* }}$ | -600 | -5.00 | 000.0 | 0.000 |
| - U I.L ${ }^{* 1}$ | -600 | -5.00 | 000.0 | 0.000 | H.PE $\mu^{* 1}$ | 0 | 0.00 | 0.0 | 0.000 |
| - U2. $H^{* 1}$ | 600 | 5.00 | 600.0 | 5.000 | L. $P E \mu^{* 1}$ | 0 | 0.00 | 0.0 | 0.000 |

[^0]
## Small Multi Panel Meter

## Specification of measurement input and range

| Type | Measured input range |  | Input impedance | Display range［ 5 tad ］ | Note |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DC voltage | －600 to 600V | ［600u］ | $4.694 \mathrm{M} \Omega$ | －600 to 600 | ※For DC input，not to display minus input，set minus input display［ $\bar{n} \mathrm{i}$ n H ］of PA1 group as ofF． <br> Ex）When the display range is -600 to 600 V ，set［ni nU］of PA1 group as of $F$ and this display range is 0 to 600 V ． |  |
|  | －200 to 200V | ［200u］ | $4.694 \mathrm{M} \Omega$ | －199．9 to 200.0 |  |  |
|  | －100 to 100V | ［100u］ | $794 \mathrm{k} \Omega$ | －100．0 to 100.0 |  |  |
|  | －20 to 20 V | ［20ヶ］ | $79 \mathrm{k} \Omega$ | -19.99 to 20.00 |  |  |
|  | －10 to 10 V | ［104］ | 79 k ת | -10.00 to 10.00 |  |  |
|  | －2 to 2 V | ［2u］ | $79 \mathrm{k} \Omega$ | －1．999 to 2.000 |  |  |
|  | －1 to 1V | ［1ヶ］ | $7.5 \mathrm{k} \Omega$ | -1.000 to 1.000 |  |  |
|  | －200 to 200 mV | ［0．2．］ | $7.5 \mathrm{k} \Omega$ | －199．9 to 200.0 | dot | Display range |
| DC current | －5 to 5A | ［5R］ | $0.01 \mathrm{k} \Omega$ | -5.00 to 5.00 | 0 | －1999 to 9999 |
|  | －2 to 2A | ［こR］ | $0.01 \Omega$ | －1．999 to 2.000 | 0.0 | －199．9 to 999.9 |
|  | －1 to 1A | ［1R］ | $0.1 \Omega$ | －1．000 to 1.000 | 0.00 | －19．99 to 99.99 |
|  |  |  |  |  | 0.000 | －1．999 to 9.999 |
|  | －200 to 200 mA | ［0．2月］ | $0.1 \Omega$ | －199．9 to 200.0 | （display range depends on the decimal point position） |  |
|  | －100 to 100 mA | ［0．18］ | $1.1 \Omega$ | －100．0 to 100.0 |  |  |
|  | －20 to 20 mA | ［20ラR］ | $1.1 \Omega$ | －19．99 to 20.00 |  |  |
|  | 4 to 20 mA | ［4－20］ | $1.1 \Omega$ | 4.00 to 20.00 |  |  |
|  | －10 to 10 mA | ［10ヶR日］ | $11.1 \Omega$ | －10．00 to 10.00 |  |  |
|  | －2 to 2 mA | ［こก月］ | $11.1 \Omega$ | -1.999 to 2.000 | ※Please wire proper terminal to its max．input voltage within 30 to |  |
| AC voltage | 0 to 600V | ［600～］ | $4.987 \mathrm{M} \Omega$ | 0.0 to 600.0 |  |  |
|  | 0 to 250 V | ［250～］ | $4.987 \mathrm{M} \Omega$ | 0.0 to 250.0 | $100 \%$ of input terminal． When it is higher than input volt－ age，it may cause breakdown of terminal and ouEr display range and the accuracy is decreased when it is connected to the termi－ nal under $30 \%$ ． |  |
|  | 0 to 110V | ［110P］ | $1.087 \mathrm{M} \Omega$ | 0.0 to 440.0 |  |  |
|  | 0 to 50 V | ［50u］ | $1.087 \mathrm{M} \Omega$ | 0.00 to 50.00 |  |  |
|  | 0 to 20V | ［20」］ | $200 \mathrm{k} \Omega$ | 0.00 to 20.00 |  |  |
|  | 0 to 10V | ［104］ | $200 \mathrm{k} \Omega$ | 0.00 to 10.00 |  |  |
|  | 0 to 2V | ［2．］ | $20 \mathrm{k} \Omega$ | 0.000 to 2.000 | ※For the range setting of $A C$ voltage，when setting as 0 to 110V（ 1 IOP ）and using P．T for $440 \mathrm{~V} / 110 \mathrm{VAC}, 110 \mathrm{~V}$ is input and 440 V is displayed automatically by the set scale value for P．T us－ ers＇convenience． |  |
|  | 0 to 1V | ［14］ | $20 \mathrm{k} \Omega$ | 0.000 to 1.000 |  |  |
| AC current | 0 to 5A | ［5R］ | $0.01 \Omega$ | 0.000 to 5.000 |  |  |
|  | 0 to 2.5 A | ［2．5R］ | $0.01 \Omega$ | 0.000 to 2.500 |  |  |
|  | 0 to 1A | ［1R］ | $0.05 \Omega$ | 0.000 to 1.000 |  |  |
|  | 0 to 500 mA | ［0．5A］ | $0.1 \Omega$ | 0.0 to 500.0 |  |  |
|  | 0 to 250 mA | ［0．25月］ | $0.1 \Omega$ | 0.0 to 250.0 | ※Frequency measurement range （AC voltage／current）$: 0.100 \text { to } 9999 \mathrm{~Hz}$ |  |
|  | 0 to 100 mA | ［0．18］ | $0.5 \Omega$ | 0.0 to 100.0 |  |  |
|  | 0 to 50mA | ［50ヶ月） | $0.5 \Omega$ | 0.00 to 50.00 |  |  |



## －Functions

© Minus input display［PA 1 group：$\overline{\text { nil nid }}$
（1）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 as aFF．
（2）When setting as oFF，low－limit value of input range is set 0 and it displays minus input as 0 ．
 are changed based on＂ 0 ＂．
Min．display value is＂ 0 ＂and $H-5 L, H-r i$ parameters display max．value of the input range．
i nb．H／i nb．L／ou $\square . t$／Hப5．$\square$／ou $\square . H$ parameters are initialized to factory default．
※In case of DC Ampere measurement input model， when $: n-r$（measurement input range）is set as $4-20$ ， this function is not displayed．

## © AC frequency measurement ［PA 1 group：di 5P ］

It measures input signal frequency when it is an AC input． It uses fixed decimal point［PA 1：dot］，measured range can be changed by setting and measured range of decimal point position is as below chart．It is available to adjust up－ per gradient at［PA 1：：nb．H］and［PA 1：：nb．E］．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．
（1）Measurement range

| Dot position | 0.000 | 0.00 | 0.0 | 0 |
| :--- | :--- | :--- | :--- | :--- |
| Measurement | 0.100 to | 0.10 to | 0.1 to | 1 to 9999 Hz |
| range | 9.999 Hz | 99.99 Hz | 999.9 Hz |  |

※Accuracy of frequency measurement：Below 1 kHz ，F．S $\pm 0.1 \mathrm{rdg} \pm 2$ digit，from 1 kHz to 10 kHz, F．S． $\pm 0.3 \mathrm{rdg} \pm 2$ digit （2）i nb．H： 0.100 to 9.999 ［gradient adjustment of high value］
（3）i nb．E：10 $0^{-2}, 10^{-1}, 10^{0}, 10^{1}$［index adjustment of i nb．H］

## © Zero adjustment［low－limit display value deviation correction］

This function is to forces the display value of measured in－ put to 0 （Zero）．
－Zero adjustment range：－99 to＋99
－Zero adjustment method：Press the 图＋$<$ keys for 3 sec．
Press the 龱 $+\mathbb{<}$ keys 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 nb．L automati－ cally．
※If zero adjustment range is exceeded，the error（ouEr） flashes twice and then move to RUN mode，maintaining previous setting value．

## Initialization



## © Error display

| Display | Description |
| :--- | :--- |
| $H H H H$ | Flashes when measured input is exceeded the max． <br> allowable input（＋110\％） |
| LLLL | Flashes when measured input is exceeded the min． <br> allowable input（MINUS input on ：－110\％ofF ：－10\％） |
| $d-H H$ | Flashes when display input is exceeded max．display <br> range（9999） |
| $d-L L$ | Flashes when display input is exceeded min．display <br> range（－1999） |
| $F-H H$ | Flashes when input frequency is exceeded the max． <br> measured range（10kHz）and display range（9999） |
| $P F-H$ | Flashes when power factor display value to measured <br> input is over than LAG 0．50 |
| $P F-L$ | Flashes when power factor display value to measured <br> input is less than LEAD－0．50 |

※Error is cleared when the input value is within measurement range or display range．

## Display cycle delay［PA 2 group：$\downarrow$ i5．t］

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 $d$ I5．t of PA 2 ，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 ．

## © Monitoring max．／min．display value ［PA 0 group：H．PEย／L．PEц，PA 2 group：$P E \varepsilon . t$ ］

It monitors Max．／Min．value of display value based on current display value and then display the data in $\mathrm{H} . \mathrm{PEL}$ ， $L . P E L$ of PAO．Set delay time（ 0 to 30 sec ．）in PE $\mu$ ． mode of parameter 2 in order to avoid caused by initial overcurrent or over voltage，when monitoring the peak value．Delay time is 0 to 30 sec ．and it starts to monitor the peak value after set time．
When the 囚，因 keys are pressed at $H . P E L, L . P E t$ mode of PAO，it will be initialized．
※Monitoring function is not indicated when setting the of PE H．E PA 2 as＂ 005 ＂．

## Small Multi Panel Meter

O Error correction[PA 1 group: | пb.H / i nb.L] It corrects display value error of measurement input. i $\cap b . L: \pm 99$ [adjust deviation of low value],
i nb.H: 0.100 to 9.999 [correct gradient of high value] Display value $=($ measured value $\times i n b . H)+i n b . L$ Ex) When the measured range is 0 to 500 V , and the display range is 0 to 500.0 . If the low display value is "1.2" to 0 V input, set -12 as i nb.L value to display " 0.0 "by adjusting offset of the low value. The display value to 500 V measured input varies by adjusting the offset of low value. If this display value is " 501.0 ", calculate $500.0 / 501.0$
(desired display value/the display value), and set the 0.998 correction value as the $i n b . H$ to display 500.0 by adjusting gradient of high value.
※The offset correction range of $i n b . L$ is within -99 to 99 for $\mathrm{D}^{-0}, \mathrm{D}^{-1}$ digit regardless of dot.
※High limit error correction function is available as
"Gradient correction function"and low limit error correction function is available as "Zero adjustment function".

## Gradient correction[PA 1 group: : пb.H]

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 1), in case of display gradient 1 for the measured input 100 V , 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: times)
Ex1) Gradient adjustment
(1)When the measured input is 100.0 V in order to display 150.0, set gradient correction set value(i nb.H) as 1,500 . This value is also applied for minus input. When the measured input is -100.0 V , it displays -150.0 .
(2) When the measured input is -100.0 V in order to display -050.0, set gradient correction set value( $($ nb.H ) as 0.500 . This value is also applied for plus input. When the measured input is 100.0 V , it displays 50.0 .

|  | i $\cap \mathrm{b} . \mathrm{H}$ | Note |
| :---: | :---: | :---: |
| (1) | 1.500 | ※Shaded part of Figure 1 is not displayed for the below cases <br> - AC input model |
| (2) | 0.500 | - DC input model and Minus input[ $\bar{n}$ inu $u$ ]is set as oFF <br> - DC current input model and Input range [ $1 n-r$ ] is set as 4-20 |



Ex2) Scale setting [L-5ᄃ/H-5ᄃ] ]and gradient adjustment [ $: ~ \cap b . H](A C$ input)
(1) When the measured input AC 2.000 V at the input range AC 0 to 5.000 V and it displays 5.000 , set decimal point position
[dot ]as 0.000 before setting the scale value.
(2) When the measured input is AC 2.000 V in order to display $5.000,12.500$ should be displayed when max. input value is 5.000 V . However, it cannot set because the max. set value is 9.999 .
Set as Gradient correction set value [ $[\cap b . H$ ] $\times$ High scale value $[H-5[]=12,500$ as the following table.
(3)After this setting is finished, it displays 5.000 when the measured input is 2.000 V .

| $H-5 L$ | $L-5 L$ | nb.H | Note |
| :--- | :--- | :--- | :--- |
| 12.500 | 0.000 | 1.000 | Unavailable to set because max. <br> set value of $H-5 L$ |
| 6.250 | 0.000 | 2.000 | In this case, any setting methods |
| 3.125 | 0.000 | 4.000 | display the same display value. |
| 2.500 | 0.000 | 5.000 |  |



Ex3) Scale setting $[t-5[/ H-5 L]$ and gradient adjustment [! nb.H] (DC minus input)
(1) When the measured input DC -40 mA at the input range

DC -100.0 to 100.0 mA and it displays -160.0 , set decimal point position[dot] as 0.000 before setting the scale value.
(2) When the measured input is DC -40 mA in order to display $-160.0,-400.0$ should be displayed when min. input value is -100.0 mA . However, it cannot set because the min. set value is -199.9.
Set as Gradient correction set value[ $\mathrm{i} \cap \mathrm{b} \cdot \mathrm{H}] \times$ Low scale value $[L-5[]=-400.0$ as the following table.
Set high scale value as (-[L-5ᄃ]) value. If high scale value is set at first, set low scale value as (-[H-5[]) value.
(3)After this setting is finished, it displays -160.0 when the measured input is DC-40.0mA.

(A)
Phot

Photo
electric
electric
sensor
(B)
Fiber

Fiber
optic
optic
sensor
(C)
(C)
Door/Area
sensor
(D)
Proxi

Proximity
sensor
(E)
Press

Pressure
sensor
sensor
(F)
Rota

Rotary
encoder
(G)

Connector/
Socket
(H)

Temp.
control
controller
(I)
SSR/
P

Power
controller
(J)
Count

Counter
$\stackrel{(K)}{\text { Timer }}$
Timer
(L)
Panel

Panel
meter
(M)

Tachol
Speed/ Pulse
meter
(N)
Display
unit

Display
unit
unit
(O)

Sensor
controller
(P)
Switchin
mode power
supply
(Q)

Stepper
motor\&
motor\&
Driver\&Controller
(R)
(R)
Graphic/

Logic
panel
(S)
Field
network
device
(T)
Software
(U)
Other

## Power factor (PF) display

[PA 1 group: $\mathrm{H}-\mathrm{r} \mathrm{E} / \mathrm{L}-\mathrm{r} \mathrm{f}$ ]
(1)This function displays LEAD and LAG by analog output signal from the power factor transducer.
(2)It is available to accept several outputs of the power factor transducer by max. (H-r■)/min.(L-rஏ) analog output value setting in the power factor transducer.
(3) Power factor value is displayed as cosø value -0.50 (LEAD) to 1.00 to 0.50 (LAG).
(4)LEAD is when current phase leads voltage phase, LAG is when current phase lags behind voltage phase. LEAD and LAG are invalid power.
(5)Set range: From min. to max. selected value from measurement input( $\left(\begin{array}{rl}n-r\end{array}\right)$
Ex) When setting 200V in in-r, $H-r \longleftarrow$ and $L-r i$ are available to set from - 199.9~200.0. When setting $10 \mathrm{~V}, \mathrm{H}-\mathrm{r}$ ᄃ and $\mathrm{L}-\mathrm{r} \check{\mathrm{L}}$ are available to set from - 10.00~10.00 (※Н-гெ > L-гち)


Ex1) When the output of the power factor transducer is DC $4-20 \mathrm{~mA}$,
(1)Connect the output to the input terminal $5(+), 7(-)$ of this unit, then set input range( $\left(\begin{array}{rl}n-r)\end{array}\right)$ as
(2) When setting the input range as $4-20, L-r i$ is set as 4.00 and $H-r_{E}$ is set as 20.00 automatically.
(3) If measured input is 4 mA , it displays -0.50 . For 12 mA measured input, it displays 1.00 and for 20 mA , it displays 0.50 .

Ex2) When the output of the power factor transducer is DC15 V ,
(1)Connect the output to the input terminal $5(+), 7(-)$ of this unit, then set the input range ( $\boldsymbol{n}^{-r}$ )as $10 \nu$.
(2)Select Minus input display function( $\bar{n} i$ nid) as ofF not to display minus value.
(3)Set $H-r i$ as 5.00 and $L-r i 4$ as 1.00 for the output of the power factor transducer.
(4) If measured input is 1 V , it displays -0.50 . For 3 V measured input, it displays 1.00 and for 5 V , it displays 0.50 .


Ex3) When LEAD value is smaller than - 0.90 , LAG value is smaller than 0.90, and OUT1 is used,

- Setoul it as HL at PA2.
- Setoul $1 . H$ as 0.90 and ou $1 . \mathrm{L}$ as -0.90 at PAO.
※oul.t is also same setting as out itc.


Display scale function[PA 1 group: $H-5[/ L-5[]$ This function is to display setting(-1999 to 9999) of particular High/Low-limit value in order to display High/Low-limit value of measurement input. If measurement inputs are 'a' and 'b' and particular values are ' $A$ ' and ' $B$ ', it will display $a=A, b=B$ as below graphs.



Display


※In case of DC Volt/Ampere input model(M4NN-D $\square-\square$ ) and using Minus input, they are displayed.

Display scale function is able to change display value for min ./max. measured input by setting high limit scale[H-5[], and low limit scale [ $\mathrm{L}-5[$ ] in parameter 1 group.
Ex) High limit scale value and low limit scale value setting (In case of input range $=0 \mathrm{~V}$ to 10 V )

※When changing measured input, high limit scale value and low limit scale value are automatically changed as the default display range of the changed measured input.

Preset output mode [PA 2 group: od l.t loul $\mathrm{l} . \mathrm{t}$ ]

| Mode | Output mode | Operation |
| :---: | :---: | :---: |
| ofF |  | No output |
| Hi |  | Period ON <br> : Display value $\geq$ oU $1 . \mathrm{H}$ <br> Period OFF <br> : Display value $\leq$ oU 1. H-HY5. $\mid$ |
| Lo |  | Period ON <br> : Display value sou i. L <br> Period OFF <br> : Display value $\geq$ ou $1 . L+$ HY5. I |
| HL |  | Period ON <br> : Display value $\leq$ ou $1 . \mathrm{L}$ or Display value $\geq$ oU $1 . \mathrm{H}$ Period OFF <br> : Display value $\geq$ ou $1 . \mathrm{L}+$ HY5. 1 or Display value $\leq$ oul 1 H-HY5. I |
| $\mathrm{HL}-\mathrm{E}$ |  | ```Period ON : OUT.L \(\leq\) Display value \(\leq\) - U IH+HY5.I Period OFF : Display value \(\leq\) oU \(1 . H-H 45.1\) or Display value \(\geq\) oU \(1 . \mathrm{H}^{+}\) Hy5. 1``` |

※Set output mode separately for each OUT1/OUT2.
※OUT1/OUT2 are operated individually depending on output operation mode.
※Setting value mode of parameter group 0 is displayed depending on output operation mode.
※GO outputs when the period both OUT1/OUT2 are off. (NPN/PNP Open collector output type)

|  | (A) Photo electric sensor |
| :---: | :---: |
|  | (B) <br> Fiber optic sensor |
|  | (C) Door/Area sensor |
|  | (D) <br> Proximity sensor |
|  | (E) Pressure sensor |
|  | (F) Rotary encoder |
|  | (G) Connector/ Socket |
|  | (H) Temp. controller |
|  | (I) <br> SSR/ <br> Power controller |
|  | (J) Counter |
|  | (K) Timer |
|  | (L) Panel meter |
|  | (M) Tacho/ Speed/ Pulse meter |
|  | (N) Display unit |
|  | (O) Sensor controller |
|  | (P) Switching mode power supply |
|  | (Q) <br> Stepper motor\& Driver\&Controller |
|  | (R) Graphic/ Logic panel |
|  | (S) Field network device |
|  | (T) <br> Software |
|  | (U) Other |


[^0]:    ※It is not displayed for the indicator model.

