

# Autonics

## SCALING METER M4NS/M4YS 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.
- ※Safety considerations are categorized as follows.
- 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
- ▲ symbol represents caution due to special circumstances in which hazards may occur.

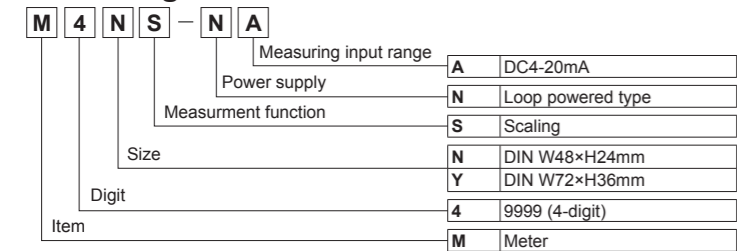
### ▲ Warning

- 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, fire, or economic loss.

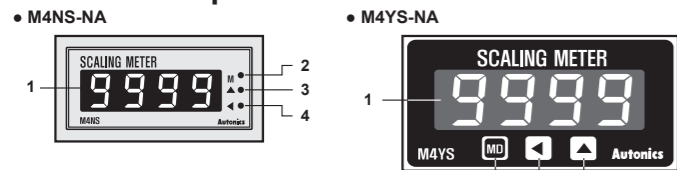
### ▲ Caution

- The unit must be installed on a device panel before use.** Failure to follow this instruction may result in electric shock.
- Do not connect, repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in electric shock.
- Do not disassemble or modify the unit. Please contact us if necessary.** Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit outdoors.** Failure to follow this instruction may result in electric shock or shortening the life cycle of the unit.
- Use the unit within the rated specifications.** Failure to follow this instruction may result in electric shock or shortening the life cycle of the unit.
- Be sure that there is not insulated between measuring input terminal and power terminal.** Failure to follow this instruction may result in product damage, or measured input malfunction.
- Check the polarity of the terminal before wiring the unit.** Failure to follow this instruction may result in product damage, fire or explosion
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.** Failure to follow these instructions may result in electric shock or fire.
- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, and impact may be present.** Failure to follow this instruction may result in fire or explosion.
- Keep dust and wire residue from flowing into the unit.** Failure may result in fire or product malfunction.
- Check the polarity of the measurement input contact before wiring the unit.** Failure to follow this instruction may result in fire or explosion

### ■ Ordering Information



### ■ Unit Description



- Display value, parameter, error display
- M, [MD] key: When enter into Parameter group, return to RUN mode, after completing Parameter setting
- ▲, [▲] key: When enter into the status of parameter setting
- ◀, [◀] key: When enter into the status of parameter setting and move digit

※The above specifications are subject to change and some models may be discontinued without notice.

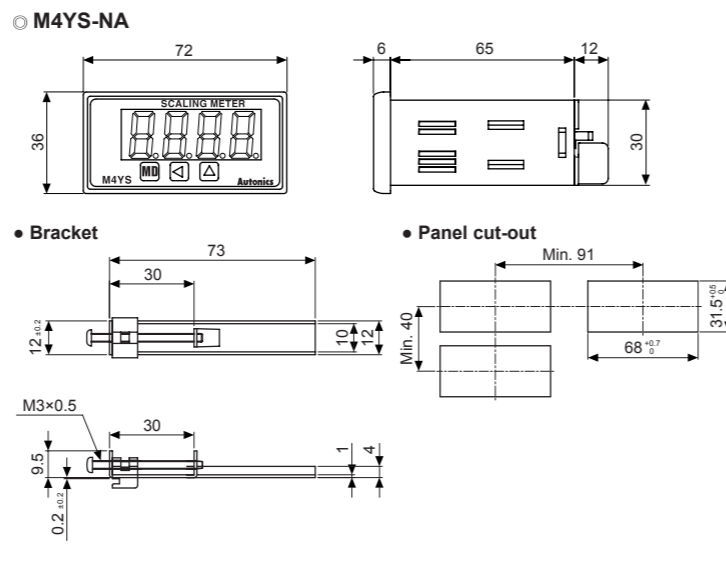
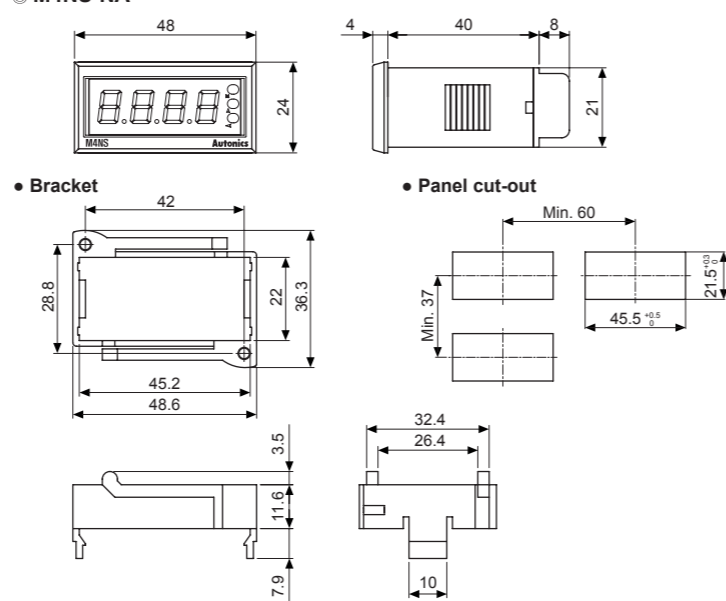
### ■ Specifications

Model	M4NS-NA	M4YS-NA
Power supply	Loop powered type	
Display method	7-segment LED display (red)	
Character height	10mm	14mm
Display accuracy <sup>*1</sup>	F.S. 0.3% rdg ±1-digit	
Display cycle	0.5 sec/1 sec/2 sec/3 sec/4 sec/5 sec	
Resolution	12,000 resolution	
Max. display	-1999 to 9999	
Setting type	Setting type with the front keys	
Measuring input range <sup>*2</sup>	DC4-20mA	
Self-diagnosis function	Error display function	
Insulation resistance	Over 100MΩ (at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1 min	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min) 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. 10G) in each X, Y, Z direction for 3 times
Environment	Ambient temp.	-10 to 50°C, storage: -25 to 60°C
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH
Unit weight	Approx. 44g	Approx. 110g

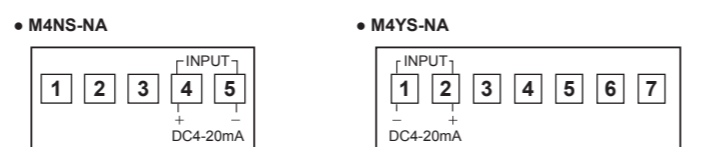
※1: Ambient temperature (25°C ±5°C): F.S. 0.3% rdg of ±1-digit (-10 to 50°C: F.S. 0.4% rdg ±1-digit)  
 ※2: Impedance between input lines: Max. 600Ω (based on 24VDC)  
 Please be aware that activating input power is based on 24VDC, and the recommended impedance also will be lowered if the activating power is lower.  
 ※Environment resistance is rated at no freezing or condensation.

### ■ Dimensions

(unit: mm)



### ■ Connections



### ■ Parameter

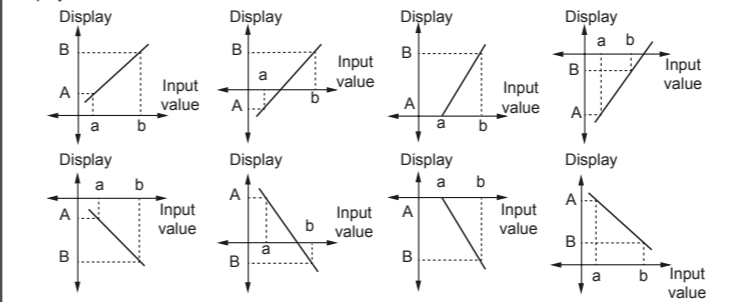
Display	Function	Setting range
L-5C	Low scale	-1.999 to 9.999, -19.99 to 99.99, -199.9 to 999.9, -1999 to 9999
H-5C	High scale	-1.999 to 9.999, -19.99 to 99.99, -199.9 to 999.9, -1999 to 9999
dot	Decimal point	0000, 000.0, 00.00, 0.000
l n b L	Input bias low	-100 to 100
l n b H	Input bias high	0.900 to 1.100
PEL	Max./Min. time	0 to 30
d t 5t	Display time	0.5 / 1.0 / 2.0 / 3.0 / 4.0 / 5.0
EPC	Error %	0, 1, 2, 3, 4
LoC	Lock	ON, OFF

### ■ Factory Default

Parameter	Factory default	Parameter	Factory default
L-5C	0400	PEL	015
H-5C	2000	d t 5t	0.5
dot	0000	EPC	3
l n b L	0000	LoC	oFF
l n b H	1.000		

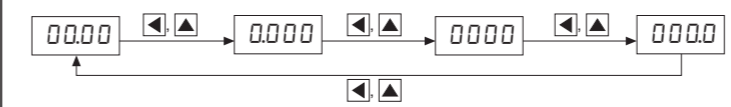
### ■ Display Scale Function

This function is to display the value with setting certain HI/Low limit value against 4-20mADC input. For example If set a=4mADC, b=20mADC and A,B as display value, it will be displayed a=A, b=B.



### ■ Decimal Point Setting Function

This function is to set the decimal point position of display value (set in parameter setting group).



### ■ Correction Function

This function is to adjust the error of display value after calculating scale value for measuring input and also correct the input error of sensor etc.  
 l n b L: -100 to 100 [Adjust deviation of low value]  
 l n b H: 0.900 to 1.100 [Correct gradient (%) of high value]  
 E.g.) When display value is 0.0 to 500.0 against 4-20mA input, if the display value is "1.2" for 4mA input, set -12 (ignore the decimal point) as l n b L value to display "0.0". It is enable to remove offset of Low display value.  
 ※When completed above Low value setting then apply 20mA, if the display value is "500.5", the correction value will be 5005/5000=0.999, set 0.999 as l n b H value then enable to correct High value is 50005×0.999 = 5000). It is also ignore the decimal point.

### ■ Display Cycle Delay Function

It is difficult to display when the measuring input value is fluctuating. In this case it is able to make display value stable by delaying display cycle. Display cycle can be changed in [d t 5t] mode of Parameter 2 (0.5s/1.0s/2.0s/3.0s/4.0s/5.0s). If select [5.0 S], it will be the measuring input value on an average for 5sec, then display it every 5 sec

### ■ Max./Min. Value Monitoring Function

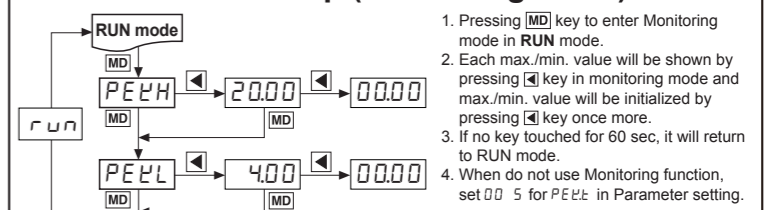
This function is to monitor Max. value and Min.value by current display value then display its Data in PEL mode and PEL mode. Enable to set delay time in PEL mode to protect the wrong Data by initial over current and settable from 0 to 30 sec and start to monitor after delay time.

### ■ Error Display Function

- Error display**
  - When [L L L L] display  
 1) Input current is lower than 3% in 4-20mADC (16mA scale)  
 [L L L L] will display when it is under 3.52mA [16mA×3%=0.48mA] → 4mA-0.48mA=3.52mA  
 2) When it is beyond Min. display value (-1999)[by display value]
  - When [H H H H] display  
 1) Input current is higher than 3% in 4-20mADC (16mA scale)  
 [H H H H] display [16mA×3%=0.48mA] → 20mA+0.48mA=20.48mA.  
 When it is higher than 20.48mA.  
 2) When it is beyond Max. display value (9999)[by display value]
- Turn Error display off**  
 [L L L L] and [H H H H] are displayed when input is out of measuring range, therefore it will be disappeared automatically when input returns to measuring range.
- Error setting and sort**  
 It will display the error message according to the setting value which set % value against analog input range and set it in [EPC] mode by [▲] key.

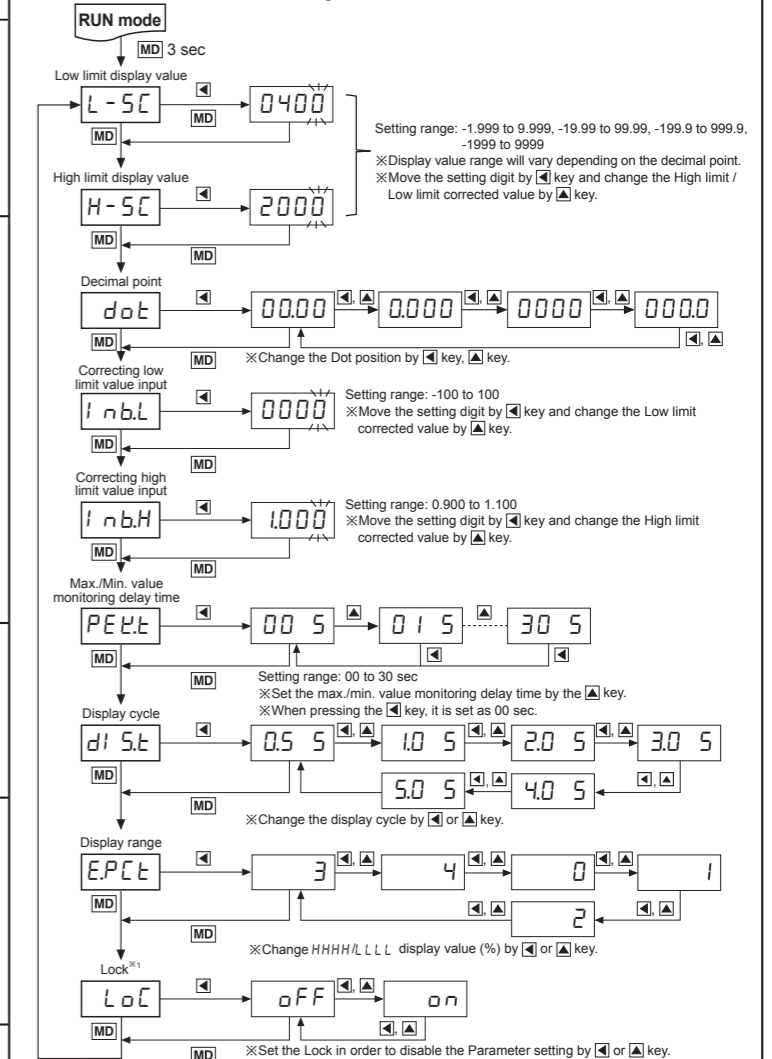
Display	Description
EPC 0	L L L L / H H H H are displayed when it is over 0% out DC4-20mA range
EPC 1	L L L L / H H H H are displayed when it is over 1% out DC4-20mA range
EPC 2	L L L L / H H H H are displayed when it is over 2% out DC4-20mA range
EPC 3	L L L L / H H H H are displayed when it is over 3% out DC4-20mA range
EPC 4	L-5C / H-5C are displayed always when it is out DC4-20mA range

### ■ Parameter 0 Group (Monitoring Mode)



- Pressing [MD] key to enter Monitoring mode in RUN mode.
- Each max./min. value will be shown by pressing [▲] key in monitoring mode and max./min. value will be initialized by pressing [▲] key once more.
- If no key touched for 60 sec, it will return to RUN mode.
- When do not use Monitoring function, set 00 5 for PEL in Parameter setting.

### ■ Parameter 1 Group



- ※Press the [MD] key after changing the setting value of the parameter, the setting value is saved and it moves to next parameter.
- ※After entering setting parameter, hold the [MD] key for 3 sec, it displays [RUN] and returns to RUN mode
- ※If any key is untouched for 60 sec, it will return to RUN mode.
- ※1: Lock oFF: Enable to change or set Parameter.  
 o n: Disable to change or set Parameter but enable to check the setting value in parameter group. Disable to enter into the status of change setting value by pressing [▲] key.

### ■ Cautions During Use

- Please use separated line from high voltage line or power line in order to avoid inductive noise.
  - Please use power switch or circuit breaker in order to turn OFF the power.
  - The switch or circuit breaker should be installed near by users for safety.
  - Be sure to avoid using this unit near by machinery makes strong high frequency noise. (welding machine, high capacity SCR unit etc.)
  - Input line: Shield wire must be used when the measuring input line is getting longer or there are lots of noises.
- ※Failure to follow these instructions may result in product damage.

### ■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Sleeper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, CO<sub>2</sub>, Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate)Meters
- Display Units
- Sensor Controllers

**Autonics Corporation**  
<http://www.autonics.com>

■ HEADQUARTERS:  
 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002

■ OVERSEAS SALES:  
 #402-303, Bucheon Techno Park, 655, Pyeongcheon-ro, Wornji-gu, Bucheon, Gyeonggi-do, South Korea, 14502  
 TEL: 82-32-610-2730 / FAX: 82-32-329-0728

■ E-mail: sales@autonics.com