

Autonics PANEL METER MT4Y SERIES

INSTRUCTION MANUAL



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

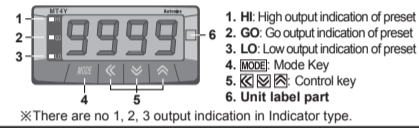
Safety Considerations

- ⚠ 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 fire, personal injury, or economic loss.
 - Install on a device panel to use. Failure to follow this instruction may result in electric shock or fire.
 - Do not connect, repair, or inspect the unit while connected to a power source. Failure to follow this instruction may result in electric shock or fire.
 - 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 electric shock or fire.

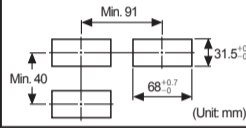
Caution

- When connecting the power/measurement input and relay output, use AWG 24(0.20mm²) to AWG 15(1.65mm²) cable and tighten the terminal screw with a tightening torque of 0.98 to 1.18N·m. Use proper cables for the rated load current. 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 product damage.
- 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. Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit. Failure to follow this instruction may result in fire or product damage.

Front Panel Identification

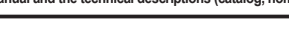
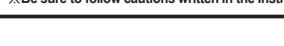
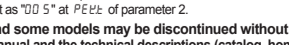
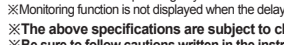
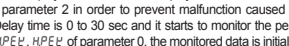
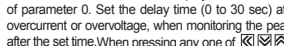
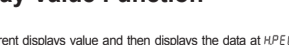
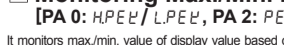
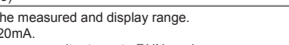
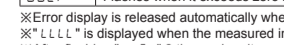
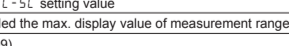
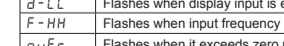
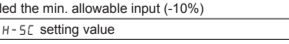
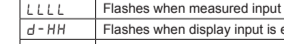
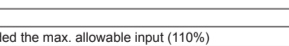
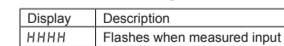
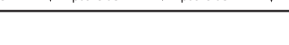
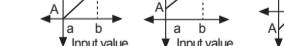
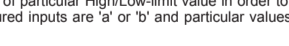
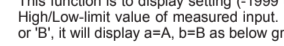
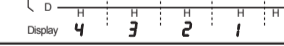
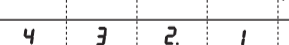
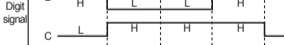
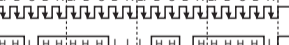
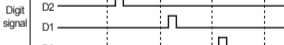
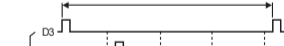
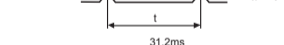
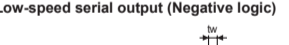
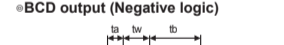
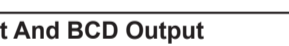
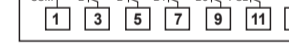
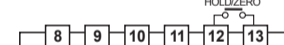
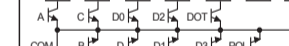
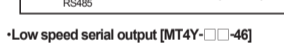
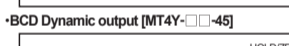
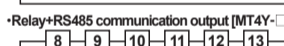
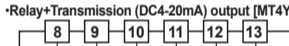
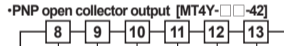
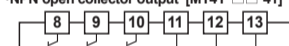
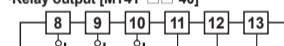
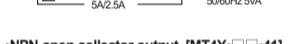
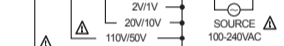
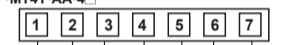
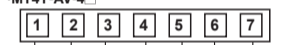
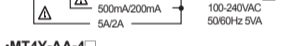
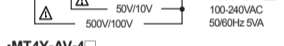
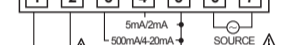
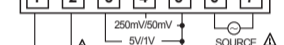
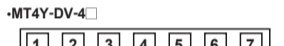
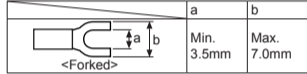


Panel Cut-Out



Connections

Use terminals of size specified below.



Specifications

Series	MT4Y
Power supply	100-240VAC~50/60Hz
Allowable voltage range	90 to 110%
Power consumption	5VA
Display method	7 Segment LED display (red) (Character height: 14.2mm)
Display accuracy	• 23°C±5°C - DC Type: F.S. ±0.1%, rdg±2digit / AC Type: F.S. ±0.3%, rdg±3digit DC/AC Type F.S. ±0.3% rdg ±3digit max. only for 5A terminal. • 10°C to 50°C - DC/AC Type: F.S. ±0.5% rdg±3digit
Input specification	DC Voltage/Current, AC Voltage/Current, AC Frequency
Max. allowable input	110% F.S. for each measured input range
AD conversion method	Practical oversampling using successive approximation ADC
Sampling cycle	DC type: 50ms, AC type: 16.6ms
Max. indication range	-1999 to 9999 (4digit)
Preset output	• Relay output - Contact capacity: 250VAC~3A, 30VDC=3A/Contact composition: N.O (1A) • NPN/PNP Open collector output - 12-24VDC=±2V 50mA Max. (Load resistance) • RS485 communication output - Baud rate: 1200/2400/4800/9600, Communication method: 2-wire half duplex, Synchronous method: Asynchronous method, Protocol: Modbus type • Serial/BCD output - NPN Open collector output, 12-24VDC Max. 50mA (Resistive load) • DC-20mA output - Resolution: 12,000division (Load resistance max. 600Ω), Response time: Max. 450ms
Sub output (Transmission output)	• RS485 communication output - Baud rate: 1200/2400/4800/9600, Communication method: 2-wire half duplex, Synchronous method: Asynchronous method, Protocol: Modbus type • Serial/BCD output - NPN Open collector output, 12-24VDC Max. 50mA (Resistive load) • DC-20mA output - Resolution: 12,000division (Load resistance max. 600Ω), Response time: Max. 450ms
Insulation resistance	Over 100MΩ (at 500VDC megger) between external terminal and case
Dielectric strength	2,000VAC for 1 minute between external terminal and case
Noise immunity	±2kV the square wave noise (pulse width: 1μs) by the noise simulator
Vibration	Mechanical 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours Maifunction 0.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min
Shock	Mechanical 100ms/2 (approx. 10G) in each X, Y, Z direction for 3 times Maifunction 300ms/2 (approx. 30G) in each X, Y, Z direction for 3 times
Relay life cycle	Mechanical Min. 20,000,000 operations Maifunction Min. 100,000 operations (250VAC 3A Load current)
Environment	Ambient temperature -10 to 50°C, Storage: -20 to 60°C Ambient humidity 35 to 85%RH, Storage: 35 to 85%RH
Insulation type	Double insulation or reinforced insulation (Mark: , dielectric strength between the measuring input part and the power part: 1kV)
Approval	
Weight	213.5g (approx. 134g)

※1: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

Measurement Input [PA 1: i n r]

Type	Measured input and range	Input impedance	Display range [S t n d]	Prescale Display range [S C R L]
DC Volt	0-500V [500V]	4.33MΩ	0.0 to 500.0 (fixed)	0.0 to 500.0 (fixed)
	0-100V [100V]	4.33MΩ	0.0 to 100.0 (fixed)	0.0 to 100.0 (fixed)
	0-50V [50V]	4.33MΩ	0.0 to 50.0 (fixed)	0.0 to 50.0 (fixed)
	0-10V [10V]	4.33MΩ	0.0 to 10.0 (fixed)	0.0 to 10.0 (fixed)
	0-5V [5V]	4.33MΩ	0.0 to 5.00 (fixed)	0.0 to 5.00 (fixed)
	0-1V [1V]	4.33MΩ	0.00 to 1.00 (fixed)	0.00 to 1.00 (fixed)
	0-250mV [250V]	2.15kΩ	0.0 to 250.0 (fixed)	0.0 to 250.0 (fixed)
	0-50mV [50V]	2.15kΩ	0.00 to 50.00 (fixed)	0.00 to 50.00 (fixed)
	0-5A [5A]	0.01Ω	0.00 to 5.00 (fixed)	0.00 to 5.00 (fixed)
	0-2A [2A]	0.01Ω	0.00 to 2.00 (fixed)	0.00 to 2.00 (fixed)
DC Ampere	0-500mA [500A]	1.0Ω	0.0 to 500.0 (fixed)	0.0 to 500.0 (fixed)
	0-200mA [200A]	1.0Ω	0.0 to 200.0 (fixed)	0.0 to 200.0 (fixed)
	0-50mA [50A]	1.0Ω	0.0 to 50.00 (fixed)	0.0 to 50.00 (fixed)
	4-20mA [4-20]	1.0Ω	4.00 to 20.00 (fixed)	4.00 to 20.00 (fixed)
	0-5mA [5A]	1.0Ω	0.00 to 5.00 (fixed)	0.00 to 5.00 (fixed)
	0-2mA [2A]	1.0Ω	0.00 to 2.00 (fixed)	0.00 to 2.00 (fixed)
	0-500V [500V]	4.98MΩ	0.0 to 500.0 (fixed)	0.0 to 500.0 (fixed)
	0-250V [250V]	4.98MΩ	0.0 to 250.0 (fixed)	0.0 to 250.0 (fixed)
	0-110V [110V]	1.08MΩ	0.0 to 440.0 (fixed)	0.0 to 440.0 (fixed)
	0-50V [50V]	1.08MΩ	0.00 to 50.00 (fixed)	0.00 to 50.00 (fixed)
AC Volt	0-20V [20V]	200kΩ	0.00 to 20.00 (fixed)	0.00 to 20.00 (fixed)
	0-10V [10V]	200kΩ	0.00 to 10.00 (fixed)	0.00 to 10.00 (fixed)
	0-2V [2V]	20kΩ	0.00 to 2.00 (fixed)	0.00 to 2.00 (fixed)
	0-1V [1V]	20kΩ	0.00 to 1.00 (fixed)	0.00 to 1.00 (fixed)
	0-5A [5A]	0.01Ω	0.000 to 5.000 (fixed)	0.000 to 5.000 (fixed)
	0-2.5A [2.5A]	0.01Ω	0.000 to 2.500 (fixed)	0.000 to 2.500 (fixed)
	0-1A [1A]	0.05Ω	0.000 to 1.000 (fixed)	0.000 to 1.000 (fixed)
	0-500mA [500A]	0.1Ω	0.0 to 500.0 (fixed)	0.0 to 500.0 (fixed)
	0-250mA [250A]	0.1Ω	0.0 to 250.0 (fixed)	0.0 to 250.0 (fixed)
	0-100mA [100A]	0.5Ω	0.0 to 100.0 (fixed)	0.0 to 100.0 (fixed)
AC Ampere	0-50mA [50A]	0.5Ω	0.00 to 50.00 (fixed)	0.00 to 50.00 (fixed)
	0-250V [250V]	4.98MΩ	0.0 to 250.0 (fixed)	0.0 to 250.0 (fixed)
	0-110V [110V]	1.08MΩ	0.0 to 440.0 (fixed)	0.0 to 440.0 (fixed)
	0-50V [50V]	1.08MΩ	0.00 to 50.00 (fixed)	0.00 to 50.00 (fixed)
	0-20V [20V]	200kΩ	0.00 to 20.00 (fixed)	0.00 to 20.00 (fixed)
	0-10V [10V]	200kΩ	0.00 to 10.00 (fixed)	0.00 to 10.00 (fixed)
	0-2V [2V]	20kΩ	0.00 to 2.00 (fixed)	0.00 to 2.00 (fixed)
	0-1V [1V]	20kΩ	0.00 to 1.00 (fixed)	0.00 to 1.00 (fixed)
	0-5A [5A]	0.01Ω	0.000 to 5.000 (fixed)	0.000 to 5.000 (fixed)
	0-2.5A [2.5A]	0.01Ω	0.000 to 2.500 (fixed)	0.000 to 2.500 (fixed)

(Display range is variable according to decimal point position.)

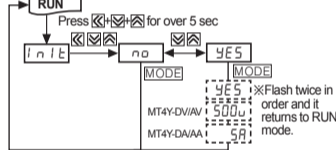
※Connect to the input terminals whose 30% to 100% of the input range includes the max. value of the input range to measure. When the max. input value is under the 30% of the input terminal range, display accuracy is degraded. When the max. input value is over the 100%, it may result in input terminal damage.

※In case of 0 to 110V (110V) of AC voltage range and using P.T (potential transformer) for 440V/110VAC, if 110V is input, and the unit displays 440V automatically by preset value for P.T user's convenient.

※When "HI/HH" or "L/LL" is flashes with a certain measurement input, disconnect power supply and then check the cables.

Initialization Function

This function is to initialize parameter as factory default.



Startup Compensation Timer Function [PA 2: S t R t]

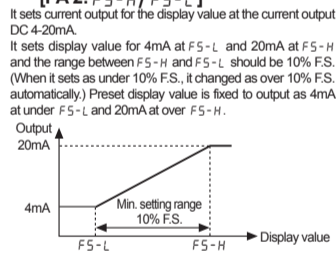
This time function limits the operation of a unit until the measured input (overvoltage or inrush current) is stable at moment of power on. All outputs are off of during startup compensation time setting after power is supplied.

Setting range: 0.0 to 99.9 (unit: sec)
Factory default: 00.0

Current Output (DC4-20mA) Scale Adjustment Function [PA 2: F 5 - H / F 5 - L]

It sets current output for the display value at the current output DC 4-20mA.

It sets display value for 4mA at F5-L and 20mA at F5-H and the range between F5-H and F5-L should be 10% F.S. (When it sets as under 10% F.S., it changed as over 10% F.S. automatically.) Preset display value is fixed to output as 4mA at under F5-L and 20mA at over F5-H.



AC Frequency Measurement Function [PA 1: d i S P]

It measures input signal frequency when it is AC input. It uses fixed decimal point (PA1: dot), measured range can be changed by setting and measured range of decimal point position is as below chart. It is available to adjust the upper gradient at [PA 1: i n b H] and [PA 1: i n b L]. 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	Decimal point position	Measurement range
0.000 to 0.000	0.0	0.100 to 0.10 to 0.1 to 1 to 9.999Hz
0.000 to 0.000	0.1	0.999Hz to 9.999Hz
0.000 to 0.000	1.0	9.999Hz to 99.99Hz
0.000 to 0.000	10.0	99.99Hz to 999.9Hz

※Accuracy of frequency measurement: Below 1kHz, F.S. ±0.1rdg ±2digit. From 1kHz to 10kHz, F.S. ±0.3rdg ±2digit.
① n b H: 10¹, 10⁰, 10⁻¹, 10⁻²
(Index adjustment of i n b H)

Error Correction Function [PA 1: i n b H / i n b L]

It corrects display value of measured input. i n b L: +99 [Adjust deviation of low value]
i n b H: 5.000 to 0.100 [Correct gradient (% of high value)]
Display value = (Measured value × i n b H) ÷ i n b L

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 the i n b L value to display "0.0" by adjusting the offset of the low value. The display value to the 500V measured input varies by adjusting the offset of the low value. If this display value is "50.0", calculate 500.0/50.0 (the desired display value/the display value), and set the 0.999 correction value as the i n b H to display "500.0" by adjusting the gradient of the high value.

※The offset correction range of i n b L is within -99 to 99 for D⁰, D¹ digit regardless of decimal point.

Zero Adjustment Function

It adjusts the indication value of the optional configured input value as zero by force, zero point error can be adjusted with 3 ways as below.

When zero adjustment adjustment with front key and Hold terminal is finished normally, zero of measurement terminal is displayed and the adjusted value is saved at i n b L automatically.

Operation	Input correction value	Front key	Input external signal
PR 1	Direct input method at the RUN mode.	Press both keys for 3 sec at the RUN mode.	Short-circuit external Hold terminal No.12, 13 over min. 50ms.
Description			

※Refer to description "Error correction function", "Error display function", "Parameter 2" for function and error.

Gradient Correction Function [PA 1: i n b H]

It corrects the gradient of prescale value and display value. (Figure 1) Display value Y can be adjusted as α, β times against X input value by correction function [i n b H] and used as correction function of max. display value [H-5C]. Adjustment range is 0.100 to 5.000 and multiply current gradient.

Ex) Input: 200mVDC, Display: 3.000 for MT4Y-DV type
① Select 0-1VDC for measured input in Parameter 1.
② Standard specification in input: 0-1VDC and 1.000 therefore it has to be 15.000 [H-5C] for 1VDC (Input) in order to display 3.000 for 200mVDC (Input). But it is unable due to setting range is 9.999.
③ In this case, please check below chart. Please set as i n b H × H-5C = 15.000

