#### **Autonics**

### PANEL METER MT4Y SERIES

( € c**FL** us



Thank you very much for selecting Autonics products For your safety, please read the following before using.

#### Caution for your safety

XPlease keep these instructions and review them before using this unit.

↑ Warning Serious injury may result if instructions are not followed.

↑ Caution Product may be damaged, or injury may result if instructions are not followed.

\*The following is an explanation of the symbols used in the operation manual

▲ caution:Injury or danger may occur under special conditions.

#### **⚠** Warning

I. In case of using this unit with machinery(Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury or damage to property.

2. It must be mounted on Panel.

It may give an electric shock.

3. Do not connect, inspect and repair terminals when it is power on.

It may give an electric shock.

4. Do not disassemble and modify this unit, when it is required. Please contact us.

- at may give an electric shock.

  4. Do not disassemble and modify this unit, when it is required. Please contact us. It may cause an electric shock and a fire.

  5. Please check the number of terminal when connecting power line or measured input. It may cause a fire.

#### ▲ Caution

- A Caution

  1. This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock.

  2. When connecting wire, 20AWG(0.50mm²) should be used and tighten screw bolt on terminal block with 0.74N-m to 0.90N-m strength.

  It may cause a maifunction or fire due to contact failure.

  3. Please observe the rated specification.

  It might shorten the life cycle of the product and cause a fire.

  It may cause insulation failure, contact melt, contact failure, relay broken and fire etc.

  5. In cleaning the unit, do not use water or an oil-based detergent.

  It might cause an electric shock or fire.

  6. Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray the sun, radiant heat, vibration and impact etc.

  It may cause a fire or explosion.

  7. Do not inflow dust or wire dregs into the unit.

  It may cause a fire or mechanical malfunction.

  8. Please the resulting the contact of the contact is the contact of the contact

- It may cause a fire or mechanical malfunction.

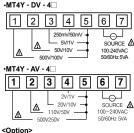
  8. Please connect properly after checking the polarity of measuring terminals. It may cause a fire or explosion.

### ■ Front panel identification 19999

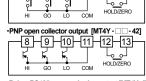
1 HI: High output indication of prese -(i) HI: High output indication of preset
(ii) 2 GO: Co output indication of preset
(iii) LO: Low output indication of preset
(iii) MODE: Mode Key
(iii) Mic Control key
(iii) Unit label part

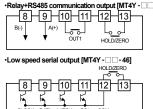
#### ■ Panel cut-out Min. 91 \$1.5<sup>+0</sup> 68-07 (Unit mm)

#### \*There are no 1, 2, 3 output indication in Indicator type ■ Terminal connection

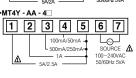


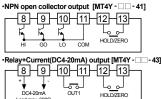
SOURCE ▲ 100-240VAC 50/60Hz 5VA •Relay output [MT4Y - . . . 40] 8-9-10-11-12-13

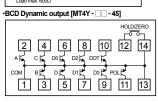




## 1 2 3 4 5 6 7 •MT4Y - AA - 4

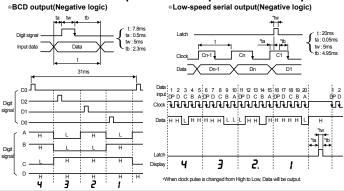






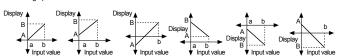
### ■ Time chart of Low-speed serial output and BCD output

- 44]



#### ■ Prescale function[PA1: H-5[/L-5[ mode]

This function is to display setting(-1999 to 9999) of particular High/Low-limit value in order to display High/Low-limit value of measured input. If measured inputs are 'a' or 'b' and particular values are 'A' or 'B', it will display a=A, b=B as below graphs.



### **■** Error display function

Display	Description	
нннн	Flashes when measured input is exceeded the max.allowable input (110%)	
LLLL	Flashes when measured input is exceeded the min.allowable input (-10%)	
d-HH	Flashes when display input is exceeded H-5C setting value	
d-LL	Flashes when display input is exceeded L -5[ setting value	
F-HH	Flashes when input frequency is exceeded the max. display value of measuring range	
ouEr	Flashes when it exceeds zero range (±99)	

\*"LLLL" is displayed when the measured input is 4-20mA. \*\*After flashing " au Er " 2 times when it exceeds the zero range, it returns to RUN mode

#### ■ Monitoring peak display value function [PA 0: H.PEY/L.PEY mode, PA 2: PEY. E mode]

It monitors max/min. value of display value based on current display value and then display the data in H.PEŁ mode and L.PEI mode of parameter 0. Set delay time(0 to 30 sec.) in PEŁŁ mode of parameter 2 in order to avoid caused by initial overcurrer 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 🐼 🖾 keys are pressed at H.PEŁ and L.PEŁ mode of parameter 0, it will be initialized. \*Monitoring function is not indicated when setting the PERL of parameter 2 as " 00 5".

 $\ensuremath{\mathsf{X}}\xspace$  The above specifications are subject to change without notice.

#### Specifications

Series		IVI 14 T			
Power supply		100-240VAC 50/60Hz (90 to 110% of rated voltage)			
Power co	onsumption	5VA			
Display m	nethod	7Segment LED Display(Red)			
Display accuracy		23°C±5°C => DC Type: FS±0.1% rdg±2digit /AC Type: FS±0.3% rdg±3digit (Frequency: FS±0.1% rdg±2digit) FS=40.3% rdg +3digit max. only for 5A terminal10°C to 50°C => DC/AC Type: FS±0.5% rdg±3digit			
Input		DC Voltage/Current, AC Voltage/Current, AC Frequency			
Max. allow	vable input	110% F.S. for input spec.			
A/D conv	ersion method	Practical oversampling using successive approximation ADC			
Sampling	cycle	50ms (DC), 16.6ms (AC 60Hz) (1/12,000)			
Max. india	ation 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)			
Sub output (Transmission output)		RS485 communication output == Baud rate: 1200/2400/4800/9600, Transmission method: 2 wires half duplex, Tuning method: Asynchronous method. Protocol: Modbus typ - Serial/BCD output == NPN Open collector output, 12-24VDC Max. 50mA(Resistive load) - DC4-20mA output == Resolution: 12.000division (Load resistance max. 6000.), Response time:Max. 450ms			
AC measuring function		Selectable RMS or AVG			
Frequency measuring function		Measurement range:0.100 to 9999Hz(Fixed decimal point type)			
Hold function <sup>×1</sup>		Includes(Outer hold function)			
Environ- ment	Ambient temperature	-10 to 50°C, Storage: -20 to 60°C			
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH			
Insulation type <sup>×2</sup>					
Approval		.44. 3)			
Unit weight		Approx. 134g			

x1. The inducted byte has no hold unlictor.  X2. "[g"] Mark indicated that equipment protected throughout by double insulation or reinforced insulation.  XEnvironment resistance is rated at no freezing or condensation.						
■ Spe	cificatio	n of me	asured ii	nput and range	9	
Туре	Measured in	Measured input		Standard [5 t n d]	Prescale [5 [ RL ]	
	and range		impedance	Display range [Fixed]	Display range [Variable]	
	0-500V	[5000]	4.33315ΜΩ	0.0 to 500.0(Fixed)		
	0-100V	[1000]	4.33315ΜΩ	0 .0 to 100.0(Fixed)		
	0-50V	[50]	433.15kΩ	0.00 to 50.00(Fixed)	]	
DC Volt	0-10V	[100]	433.15kΩ	0.00 to 10.00(Fixed)		
DC VOIL	0-5V	[50]	43.15kΩ	0.000 to 5.000(Fixed)		
	0-1V	[10]	43.15kΩ	0.000 to 1.000(Fixed)		
	0-250mV	[0.250]	2.15kΩ	0.00 to 250.00(Fixed)	]	
	0-50mV	[50ñu]	2.15kΩ	0.00 to 50.00(Fixed)		
	0-5A	[5R]	0.01Ω	0.000 to 5.000(Fixed)	1000 to 0000() (original)	
	0-2A	[85]	0.01Ω	0.000 to 2.000(Fixed)	-1999 to 9999(Variable) -199.9 to 999.9(Variable)	
	0-500mA	[ 0.5A]	0.1Ω	0.0 to 500.0(Fixed)	-19.99 to 99.99(Variable)	
DC	0-200mA	[85.0]	0.1Ω	0.0 to 200.0(Fixed)	-1.999 to 9.999(Variable)	
Ampere	0-50mA	[50AR]	1.0Ω	0.00 to 50.00(Fixed)	(Display point will be changed according to decimal point	
	4-20mA	[4-50]	1.0Ω	4.00 to 20.00(Fixed)	position.)	
	0-5mA	[558]	10.0Ω	0.000 to 5.000(Fixed)		
	0-2mA	[258]	10.0Ω	0.000 to 2.000(Fixed)	×Please wire proper terminal to its	
	0-500V	[5000]	4.987ΜΩ	0.0 to 500.0(Fixed)	max. input voltage within 30 to	
	0-250V	[250]	4.987ΜΩ	0.0 to 250.0(Fixed)	100% of input terminal.	
	0-110V	[110P]	1.087ΜΩ	0.0 to 440.0(Fixed)	When it is higher than input voltage, it may cause breakdown of terminal	
AC Volt	0-50V	[50]	1.087ΜΩ	0.00 to 50.00(Fixed)	and over display range and the	
	0-20V	[200]	200kΩ	0.00 to 20.00(Fixed)	accuracy is decreased when it is connected to the terminal under	
	0-10V	[100]	200kΩ	0.00 to 10.00(Fixed)	30%.	
	0-2V	[20]	20kΩ	0.000 to 2.000(Fixed)	0070.	
	0-1V	[10]	20kΩ	0.000 to 1.000(Fixed)		
	0-5A	[58]	0.01Ω	0.000 to 5.000(Fixed)		
	0-2.5A	[ 2.5R]	0.01Ω	0.000 to 2.500(Fixed)		
	0-1A	[IR]	0.05Ω	0.000 to 1.000(Fixed)		
AC Ampere	0-500mA	[ 0.5A]	0.1Ω	0.0 to 500.0(Fixed)	]	
TITIPETE I						

0.0 to 250.0(Fixed)

0.0 to 100.0(Fixed)

#### Initialization function

Current output(DC4-20mA)

[PA 2: F5-H/F5-L mode]

scale adjustment function

It sets current output for preset display value at the output current 4.20mA DC. It sets display value for 4mA in F5-L and 20mA in F5-H and set range between F5-H and F5-L should be 10% FS, (When it set as under 10% FS, L changed as over 10% FS. automatically) Preset display value is fixed to output as 4mA at under F5-L and 20mA at over F5-H.

0-250mA

0-100mA

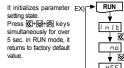
[0.25A]

[0.18]

Ampere

Output 20mA

4mA



Press C+S+S
for over 5 sec. 

0.5Ω

# until the measured input(overvoltage or inrush current) is stable at moment of power on. All outputs are off during startup compensation time setting after power is applied. Setting range: 0.0.0 to 99.9 (Unit: sec.) Factory default: 00.0

Startup compensation timer

This time function limits the operation of an output

function [PA 2:5t A t mode]

[PA 1: dl 5P mode] It measures input signal frequency when it is an AC input using fixed decimal point[PA1: dob mode]. Measuring range can be changed by setting and measuring range of decimal point position is as below chart. It is available to adjust upper gradient in [PA 1: I nb.H mode] and [PA 1: I nb.E mode]. In order to measure frequency normally, input signal, over 10% F.S. of measuring range, should be supplied. Please wire the proper measuring terminal.

Measuring AC frequency function

ivieasuring range				
Decimal point osition	0.000	0.00	0.0	0
Measurement ange	0.100 to 9.999Hz	0.10 to 99.99Hz	0.1 to 999.9Hz	1 to 9999Hz
Lab H: 0.100 to 9.999				

#### ■ Error correction function

[PA 1: Inb.H / Inb.L mode]

[PA 1: I nb H / I nb L mode]

It corrects display value error of measured input.
I nb L: 99 (Adjust deviation of low value)
I nb H: 5.000 to 0.100(Correct gradient(%) of high value)
Display value: (Measured value × i nb H)+ i nb L
EX/When the user desires measured input specification is 0 to
500V and display value is 0 to 500.0, it is able to remove the
offset of low display value. When low display value is "12" in
0V input, set -12 as offset correcting value in i nb L. Display
value for measured input(500V) is decided by offset adjustment
of low value. In case display value is "501.0" display value will
be 500.0 by adjusting the gradient of high display value if 0.998
of correcting value is set at in b H by calculating 500.0" 501.1
(Target display value/Current display value)

\*\*The offset correction range of I nb L is within -99 to +99
regardless of dob.\*\*

#### ③ I nb.E: 10<sup>-2</sup>, 10<sup>-1</sup>, 10<sup>0</sup>, 10<sup>1</sup> (Index adjustment of I nb.H) Zero adjustment function

(Gradient adjustment of high value)

It sets the preset indication value as zero when min. input is supplied into the measuring terminal, zero error can be adjusted with 3 ways as below.

When zero adjustment adjustment with front key and Hold terminal is finished normally, zero of measuring terminal is displayed and the adjusted value is saved in the Lautomatically.

Operation	Input correction value	Front key	Input external signal	
D	input correction	keys for 3 sec. at the measuring	Short-circuit external Hold terminal no.12, 13 over min.50m.	

### ■ Gradient correction function [PA1:/ nb.// mode]

It corrects a gradient of prescale value and display value. (Figure 1)Display value Y can be adjusted as  $\alpha$ ,  $\beta$  times against X input value by correction function (1 - bA) and used as correction function of max. display value [H-SE]. Adjustment range is 0.100 to 5.000 and multiply current gradient by the value.

Ex)Input:200mVDC, Display:3.000 for MT4Y-DV type | Select 0-1VDC for measured input in Parameter 1.
| Standard specification in input 0-1VDC and 1.000 therefore it has to be 15.000(H-5E) for 1VDC(Input) in order to display 3.000 for 200mVDC(Input).

But it is unable due to setting range is 9.999.

③In this case, please check below chart. Please set as Inb.H×H-5[ = 15.000

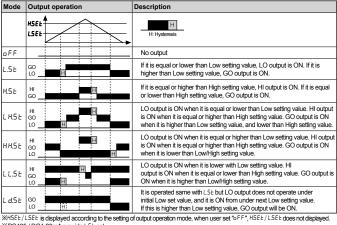
(Example of gradient correction) 15.000 9.000 6.000 Display value for measured input 3.000

Input value Setting method L-SE Inb.H Remark Unavailable 0.000 1.000 7.500 0.000 2.000 0.000 3.000 In this case, any setting methods display same display value. 5.000 0.000 5.000

#### ■ Preset output mode [PA 2: all bl. b. mode]

※RS485 / DC4-20mA provide L.5 t only.

※BCD Dynamic output / Low speed sérial output are not available



#### ■ Display cycle delay function [PA 2: dl 5.b mode]

In some applications the measured input may fluctuate which in turn causes the display to fluctuate. By adjusting the display cycle delay function time in the  $d^{\dagger}$  5.E mode in parameter 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 displayed will be the average input value over 4 sec. and also will show any changes if any every 4 sec.

Parameter	Display		Function	Note
	In-E	Input type	Selectable RMS/AVG in AC type	Available AC type only.
	In-r	Input range	Selection of input range	-
	di SP	Display	Selection of display type	Selectable: 5End/5ERL/FrE9
	Stnd	Standard	Standard scale range	Display max. display value of 5 t nd
	FrE9	Frequency	Frequency display	Available AC type only.
	SERL	Scale	Scale range	These are displayed in 5ERL only and set max/min.
PR I	H-5E	High scale	Set max. value of display range	display value(-1999 to 9999).
(Parameter 1)	L-5E	Low scale	Set min. value of display range	display value(=1555 to 5555).
(i didiricici i)	dot	Dot	Set decimal point position	It is displayed in 5[AL/FrE9 only and set the position.
	H.dn l	Input bias high	Correct high-limit value of display value	5End/5ERL: Correction range: 0.100 to 5.000 Fr E9: Correction range: 0.100 to 9.999
	InbL	Input bias low	Correct low-limit value of display value	Set range:-99 to +99
	I nb.E	Input bias exponent	Set display index of frequency mode	Set range: 10 <sup>-2</sup> /10 <sup>-1</sup> /10 <sup>0</sup> /10 <sup>1</sup>
	oUt.t	Out type	Set operation mode of preset output	Selectable of F/L.SE/H.SE/L.H.SE/H.H.SE/L.L.SE/L.d.S
	H95	Hysteresis	Set hysteresis value	Set range: 1 to 10% F.S.
	SERE	Startup compensation time	Set startup compensation time	Set range: 0.0 to 99.9 sec.
	PELF	Peak time	Set monitoring delay time for peak value(sec)	Set range:00sec to 30sec
	di S.E	Display time	Set sampling time(sec.)	0.1 to 5.0 sec.(Variable by 0.1 sec.)
	EEro	Zero key	Set usage of front side zero adjustment key	no: Set usage of front side zero adjustment key 965: Usage of front side zero adjustment key
PR2 (Parameter 2)	Euln	Event input	Set external terminal(12, 13) function	HoLd: Use external terminal as Hold terminal  EEro: Use external terminal as zero point adjustment terminal
,	FS-H	Full scale high	Set the upper value output point or PV output	Min. set range: Min. 10% F.S.
	F5-L	Full scale low	Set the lower value output point or PV output	Max. set range: Max. F5-H 10%
	AdrS	Address	Set communication address	Set range:01 to 99
	ьР5	Bit per second	Set baud rate(bps)	Selectable 1200/2400/4800/9600
	Prty	Parity bit	Set parity bit	Selectable nonE / EuEn / odd
	SEP	Stop bit	Set stop bit	Selectable 1 / 2
	-52.E	Response waiting time	Set response wating time	Set range: 5 to 99
	LoC	Lock	Set lock function	Selectable o FF / L o E 1 / L o E 2 / L o E 3
	H.SEŁ	High set	Set high setting value	Setting range can be set within
PRO	L.SEE	Low set	Set low setting value	indication range of 5 t nd / 5 E R L
(Parameter 0)	нрег	High peak	Max. value by data monitoring	
,	I PFF	Low peak	Min. value by data monitoring	Return to initial status by pressing 🖳 🖾 or 🛣 ke

#### Parameter setting



PRI When MODE key is pressed continually, it stops displaying at [PR] parameter yeare yeare yeare neleasing MoDE key at [PR I] or [PR2].

\*\*Press MODE key for 3 sec., it is returned to RUN mode at any position.

\*\*After returning to RUN mode, if MODE key is pressed within about 2 seconds again, it is entered into [PR I] or [PR 2] again. (Refer to the below each parameter setting description.)

MODE Set preset High-limit value. (When set the preset only) ※Change to set with ⟨⟨⟨ ⋈ ⋈ ⋈ ⋈ ⋈ keys. HSEL MODE Set preset Low-limit value. (When set the preset only)

\*\*Change to set with \*\* \*\*Example 10 keys. LSEE 

►RUN

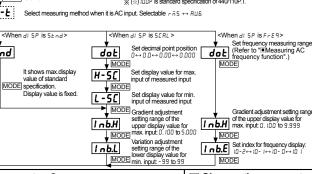
#### Parameter 1



Item Range of measured input MT4Y-DV 500u \$\frac{100u}{250u}\$\frac{10u}{250u}\$\frac{10u}{25 MT4Y-DA 58=28=0.58=0.28=25078=24-20=2578=278=288 MT4YAV |5000 ≠2500 ≠1 10P(☆)≠500 ≠200 ≠ 100 ≠20 ≠ 10 ≠2000 MT4YAA 5R⊋2.5R⊋1R⊋0.5R⊋0.25R⊋0.1R⊋50⊼R⊋5R ※ (☆) IBBP is standard specification of 440/110P.T.

function is not displayed.

I n-t Select measuring method when it is AC input. Selectable r ñ 5 ↔ RU5



#### ■ Parameter 2

Stnd

ľ	= i didiliotoi 2				
	PR 2				
		Set it when executing preset function it and there are 6 typ of preset mode. oFF ↔ LSE ↔ HSE ↔ LHSE ↔ HHSE ↔ LLSE I dSE ↔ oFF			
	MODE	Refer to "■Preset output mode."			
		It is only displayed when selecting preset function			

Set preset hysteresis. Set range : 10% F.S. Set startup compensation time. Set range: 0.0 to 99.9 sec.

PEY.L Set monitoring delay time. Set range : 00 to 30sec. d 15.E Set display period and also variable sets by 0.1s within 0.1s to 5.0s.

wMODE Enable zero adjustment by front key operation to select YES. Press both 資境 keys simultaneously in 3sec. The deviation value is saved in in bit, automatically.

Select between hold input by No. 12, 13 terminal or zero point setting by external signal.

MODE:

SEro: Zero point adjustment by hold terminal. F5-H Set high-limit value for the DC20mA output point of PV output. 

MODE Set address of RS485 communication.
Set range : 01 to 99 Select baud rate of RS485 communication. Selectable 9600 ↔ 4800 ↔ 2400 ↔ 1200

Select parity bit of RS485 communication. Selectable nank / EuEn / add ★MODE
 Selectable #8## / FEST / SS

 Selectable #1/2
 Selectable #1/2

√MODE Set response waiting time of RS485 communications Set range: 5 to 99

oFF No key lock function LoC2 Parameter 1, 2 lock LoC1 Parameter 1 lock LoC3 Parameter 0, 1, 2 lock

#### Change the parameter setting value

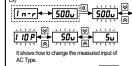
Press MODE key continuously in RUN mode, then release the MODE key at the parameter. (Refer to "Parmeter setting.")

Press[MODE] key at the parameter in order to change the mode of parameter. [Refer to "EParmeter"] Current setting value and mode in parameter flash repeatedly.

In-r ← ► 500u It shows that current measured input is 500V.

When the current setting value and mode flash, if press 🖟 🔀 key, only the current setting value flashes. 1 n-r → 500u × 500u

It shows that setting value is changeable as flashing it. When the setting value flashes, change the setting value by using or key



When confirming the setting value with MODE key, the changed setting value flashes 2 times and enters into next setting. ext setting. ms RUN mode from parameter by pressing

MODE key for 3sec

#### Caution for using

1. Allowable installation environment

Olf shall be used indoor

& Altitude Max. 2000m

Pollution Degree 2
2. Please use the terminal(M3.5, Max.7.2mm) when connectting the AC power sup.

3. Please use separated line from high voltage line or power line in order to avoid inductive noise

3. Piease use separated une from inglo rotage line or power line in order to a void in d. Please install power switch or circuit breaker in order to cut off the power supply.

5. The switch or circuit breaker should be installed near by users for safety.

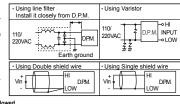
6. Be sure to avoid using the following until near by machinery making strong high fre (High frequency welder & Sewing machine, High capacity SCR unit etc.)

7. When input is applied. If "Harth "o" Litt." is displayed, there is some problem with measured input, please check the line

\*\*Using line fillt.\*\*

after power off.

8. Nolse inflowing from power line can cause serious problem for D.P.M. (Digital Panel Meter) driving by AC power supply. Even though there is condenser for protecting noise between lines at primary side of power transformer, but it is very difficult to install at primary side of power transformer, but it is very difficult to install profection components at small size product like of D-M. Therefore, please use noise absorber circuit such as line filter, varistor in external lines when voltage failure is occurred by power relay, magnet SW and high frequency equipment are operated in same line or surge is occurred by spark of high voltage or thunder etc. 9. Input line: Shield wire must be used when the measuring input line is getting longer in the place occurring lots of noise.



#### XIt may cause malfunction if above instr Major products

■ Proximity sensors
■ Area sensors
■ Door/Door side sensors

Counters Rotary encoders Power controllers Panel meters

Fraphic/Logic panels
emperature controllers
achometer/Pulse(Rate) meters
emperature/Humidity transducers
stepping motors/drivers/motion co ■ Tachometer/r-uiscu (۱۳۵۲)
■ Temperature/Humidity transducers
■ Stepping motors/drivers/motion controlle
■ Laser marking system(CO<sub>2</sub>, Nd: YAG)
■ Laser welding/soldering system

# ■ Mnotoelectric sensors ■ Fiber optic sensors ■ Pressure sensors ■ Timers ■ Display units ■ Sensor controllers

## Autonics Corporation SEAS SALES :

EP-KE-77-0008G

Max. 7.2mm