TM-4000 series

Digital Tachometers

ONO SOKKI

With improved accuracy and network connectivity,
Enabling high-precision rotation measurement

TM-4000 series

Digital Tachometers

Introducing the New Standard for Tachometers, "TM-4000 Series"

Renewal of digital tachometer lineup.
Pursued high precision and high response while maintaining the functions and performance of the existing models. It also supports Ethernet communication*, which is fundamental for factory automation and realizes smart factories. *Optional function

TM-4100 series

1-channel input for basic measurement, successor model of TM-3100 series

TM-4200 series

2- channel input for measurement of rotation speed differences/rotation speed ratio, successor model of TM-5100

TM-4300 series

Reversible Counter for multiplication /addition/subtraction, successor model of RV-3150

TM-4400 series

Passing Time/Passing Speedometer, successor model of ST-1210

High accuracy, high response Achieves the rotation speed measurement over a wide range

For analog output, the linearity has been improved to 0.1% FS and the refresh time to1 ms.
Realizes highly accurate equipment monitoring and highly responsive control.
Input signals are compatible with sine waves from 1 Hz to 100 kHz and square wave pulses from 0.05 Hz to 100 kHz.
Square waves can be detected with a minimum pulse width of 4 µs.

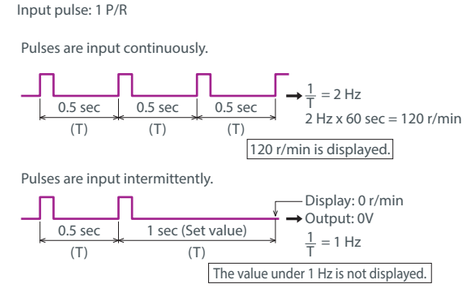
Clearly visible on the organic EL display

Main display　　Setup screen

The design of the display has been renewed. Visibility has been improved by adopting organic EL. The menu is displayed in a list on the setting screen, making it easier to use.

The set time range of the auto zero function expanded

Ex) If the set time for Auto zero function is 1 second,



The setting time range of the Auto zero function has been expanded to 0.0 (OFF) to 20.0 s. 0.5 second intervals can be set. (Equipped as standard on the TM-4100 and TM-4200 series)

Ethernet selectable Customized according to the connected device

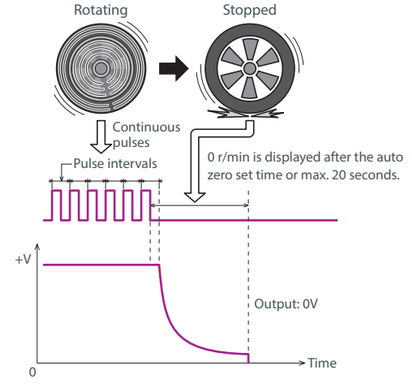
The TM-4000 series can be customized according to the external device to be connected. Various functions such as voltage input, comparator output, and DC power supply can be combined. Ethernet* is available for external communication functions, which supports the construction of factory networks.

*Optional function

Low-pass filter with improved noise immunity

The low-pass filter of the input unit can be selected from OFF/100 Hz/20 kHz. 100Hz is added to improve noise immunity. (Equipped as standard on all models)

Renewed the rapid deceleration follow-up function



While the measurement value is zero at the auto zero set time, the deceleration calculation is performed every 1 ms, or the measurement value is held.
(Equipped as standard on the TM-4100 and TM-4200 series)

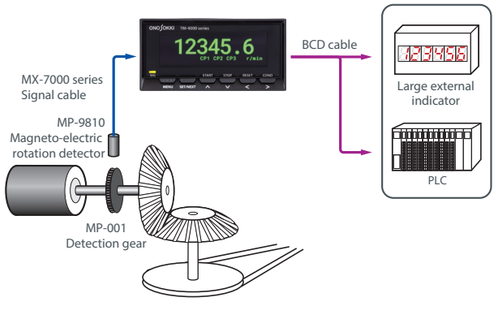
TM-4100 series

Digital Tachometer

1-channel input type for rotation speed measurement Achieves improvement of basic performance and compatibility with the existing models

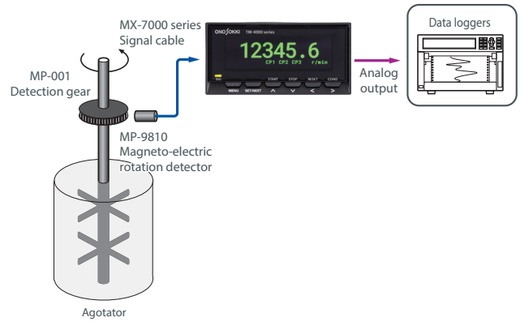
Since it follows the input/output specifications and external dimensions of the existing models (TM-3100 series), you can use your current detectors, cables, and mounting jigs as they are.

Measuring the rotation speed of the roller shaft on the load side from the gear on the drive side



Measures the rotational speed of a motor shaft. By setting the gear ratio to the tachometer, it enables to calculate and display the rotation speed of a roller shaft (r/min) and the velocity (m/min) even though it is away from the detection position.

Measuring the rotational speed of agitators, centrifuges and mixers



By attaching a rotational detector to gear on a main rotational shaft of agitators, centrifuges, mixers, etc., it can measure and display the shaft rotation speed. In addition, it can output analog signals to a data logger to capture the rotational fluctuation.

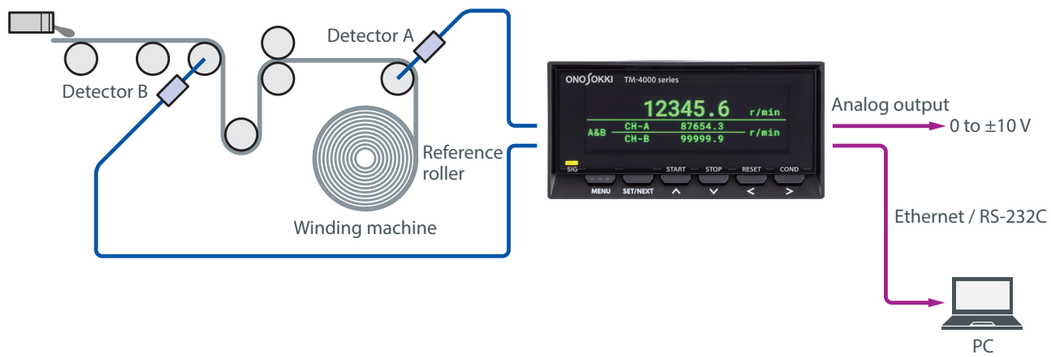
TM-4200 series

2-channel Digital Tachometer

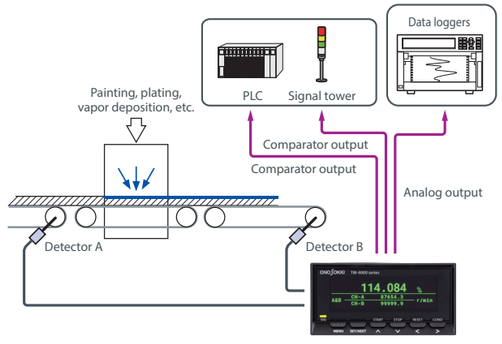
Renewed in a compact body Accurate quality inspection and machine control with 1ms high speed sampling

Measures the line speed ratio, speed difference, rolling reduction, etc. from two rotation speeds. Effective for improving the quality of production lines.

- **Measurement of drawing on paper and glass manufacturing lines**

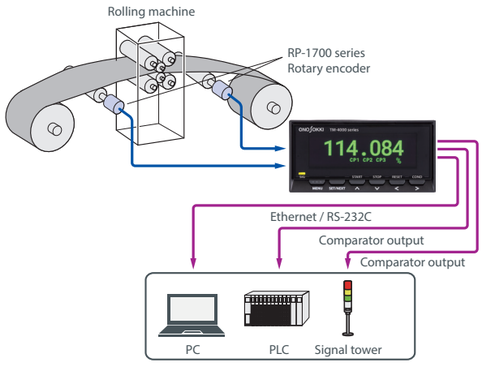


Measurement of change rate of line speed



Measures the line speed before and after the painting, plating and vapor deposition processes. By checking the change before and after, the pass/fail judgment of the process is performed.

Rolling reduction measurement of steel plate, aluminum and paper manufacturing



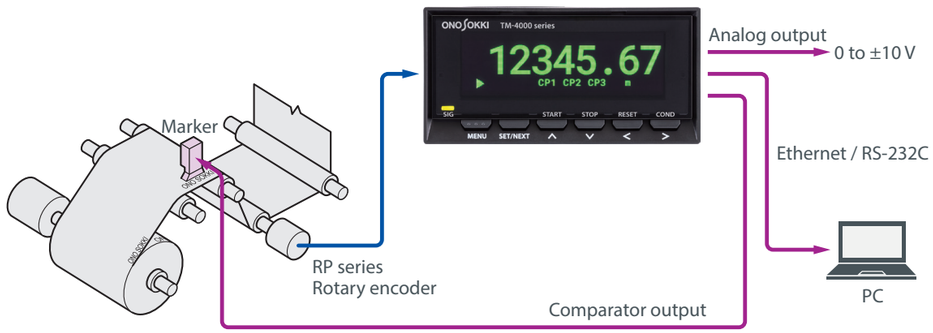
By attaching the rotary encoders to the roll shafts before and after rolling process of film, steel plate, paper, etc., measures the reduction rate (elongation rate) from the rotation speed and roll diameter. It also can output the cut command signals from the PLC using the comparator output function.

TM-4300 series

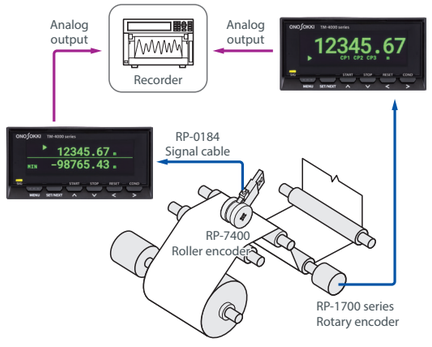
Reversible Counter

Increased the accumulated pulse counts significantly and the display digits to 7 digits
Useful for accurate positioning and line control of winding length

By controlling the length and distance of materials and finished products flowing through the production line, the surplus generated during manufacturing can be minimized.



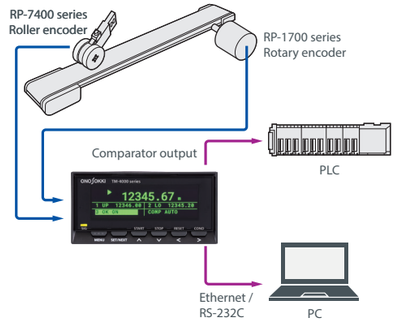
Winding length measurement of films, steel plates, papers



By combining with a 2-phase signal output type Roller Encoder (RP-7400), it measures the winding length of films, steel plates, papers, etc. in units of 0.1 mm* without missing even the minute rewinding amount at startup or just before stopping.

* The value may vary depending on conditions such as the number of output pulses of the encoder and the shaft diameter of the equipment.

Measuring the length and speed of films, steel plates, papers



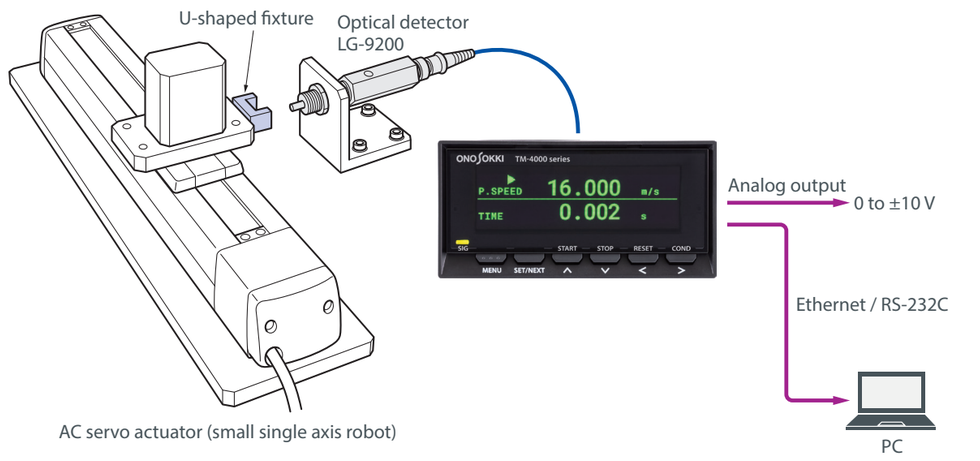
Measures the length and distance of materials and finished products flowing through the production line. Also, it can send command to cut the object by connecting to PLC via comparator output.

TM-4400 series

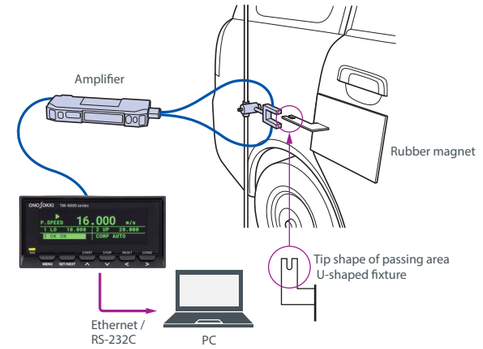
Passing Time/Passing Speedometer

Measureable cycle from 0.1 ms to 3600 s
Simultaneous measurement of passing time and passing speed between two points

Measures the passing time and passing speed between two points with a minimum resolution of 1 µs.

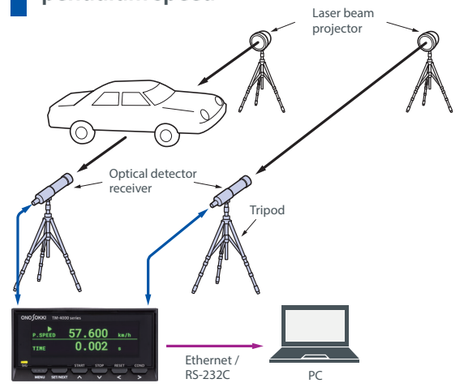


Measurement of vehicle door opening /closing speed



Measures the opening and closing speed of a vehicle door attaching a sensor. It achieves highly accurate evaluation and quality confirmation of target vehicle with RS-232C and Ethernet communication.

Vehicle passing speed, falling speed, pendulum speed



Sensors are installed at two locations to measure the passing speed of vehicle. Digital data can be recorded and managed by communication functions such as RS-232C and Ethernet. In addition to passing speed, it can also measure falling speed and the speed of objects such as pendulums.

Product Lineup

Standard models

A new standard digital tachometer with exactly the functions you want. It is also recommended for those want to quickly consider a replacement for an existing model.

Product type	Model name	Output type*2	Power supply type	Previous model
1-ch input	**TM-4110**	For display	AC (TM-0400)	TM-3110
	TM-4111		DC (TM-0401)	—
	TM-4120	BCD output (TM-0421)	AC (TM-0400)	TM-3120
	TM-4121		DC (TM-0401)	—
	TM-4130	Analog output (TM-0431)	AC (TM-0400)	TM-3130
	TM-4131		DC (TM-0401)	—
	TM-4140	Comparator output (TM-0440)	AC (TM-0400)	TM-3140
	TM-4141		DC (TM-0401)	—
2-ch input	**TM-4270***1	Analog output (TM-0432) Comparator output (TM-0440) 2-ch Voltage input (TM-0406)	AC (TM-0400)	TM-5100
Reversible counter	**TM-4370***1			RV-3150
Passing time Passing speedometer	**TM-4470***1			ST-1210

*1 BCD output is not supported.
*2 The name in parentheses is the model name of the board installed.

Overview of Standard models

TM-4110/4111
- Standard models for display only

TM-4120/4121
- 6-digit BCD output
- Open collector output that can be directly connected to a PLC
- In addition to the normal mode that refreshes the output at regular intervals, the output mode includes the request mode that refreshes the output on demand.

TM-4130/4131
- Select voltage output or current output.
- Only 1 ms rapid output refresh time
- Highly accurate linearity of 0.1%/FS for voltage output and 0.1% of span for current output.

TM-4140/4141
- Equipped with three contact outputs, and evaluation conditions can be set for each.
- Can be used for alarm control, etc.
- Comparison cycle every 1 ms
- Equipped with diverse output functions.

TM-4270
- Wide input frequency range: 0.05 Hz to 100 kHz
- 2 ch calculation function (rotation speed difference /rotation speed ratio/rate of change/rotation direction)

TM-4370
- Reversible counter that measures linear position, displacement, dimensions, etc.
- Wide input frequency range: DC to 100 kHz
- Reversible Counter function (±2,000,000,000 counts)
- Multiplication function (×1/×2/×4) and counting direction switching function are equipped.

TM-4470
- Calculates the passing speed from the distance and the passing time between two points.
- The distance between two points can be set arbitrarily.
- Enables passing time measurement at a minimum resolution of 1 µs.
- Pulse detection condition setup function (HIGH/LOW level, rising edge/falling edge)

Customized models

You can customize the tachometers according to the connected sensors and external devices.
These are made to order products by combining 7 types of signal input/output boards and 2 types of power supply boards.

Selectable measurement functions
- **1-channel input for measurement of rotation speed**
- **2-channel input for measurement of rotation speed differences /rotation speed ratio**
- **Reversible Counter for multiplication/addition/subtraction**
- **Passing Time/Passing Speedometer**

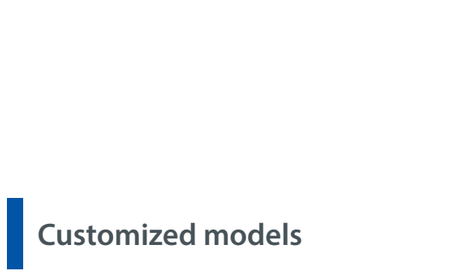
Selectable signal input /output types
- **Input: Voltage/Line driver**
- **Output: Analog/Comparator/BCD**
- **Communication: RC-232C/Ethernet**

Calculation functions (optional software)
- **Achieved speed/time measurement mode**
  Calculates the time required from the start condition to the stop instruction measurement value. (TM-4100, 4300 only)

STEP ❶ Select measurement functions

1-ch input	2-ch input	Reversible counter	Passing time/Passing speedometer
TM-4100	**TM-4200**	**TM-4300**	**TM-4400**

STEP ❷ Select boards



TM-4000 series Rear panel

- Only one board can be installed in each slot.
- Be sure to install a board in slot POWER and slot D.
- BCD output board can be installed in only TM-4100.

POWER slot	A slot Comparator output	B slot External communication	C slot Analog output	D slot Signal input
AC power supply board **TM-0400** DC power supply board **TM-0401**	Comparator output board **TM-0440**	BCD output board (Voltage output) **TM-0421** BCD output board (Open collector output) **TM-0422** RS-232C communication board **TM-0450** Ethernet communication board **TM-0460**	Analog output board (For TM-4100) **TM-0431** Analog output board (For TM-4200/4300/4400) **TM-0432**	1-ch Voltage input board (For TM-4100) **TM-0405** 2-ch Voltage input board (For TM-4200/4300/4400) **TM-0406** Line driver input board (For TM-4200/4300) **TM-0407**

STEP ❸ Select optional software

Calculation function for TM-4100	Calculation function for TM-4300
TM-0470	**TM-0480**

■ Specifications

Common specifications

● Input unit

TM-4100/TM-4200		
Number of channels	[TM-4100] 1ch [TM-4200] 2ch, 1ch (2-phase)	
Input format	Voltage input or no-voltage input (open collector residual voltage less than 1 V)	
Input amplification format	Selectable from AC or DC	
AC amplifier	Sine wave input	0.2 to 30 Vrms
	Square wave input	0.6 to 42 Vp-p
	Input frequency	1 Hz to 100 kHz
DC amplifier	Input signal	Square waveform having a pulse width of 4 µs or more
	Input voltage range	Hi: 4 to 30 V / Lo: -1 to 1 V
	Input frequency	0.05 Hz to 100 kHz
	Time measurement	[TM-4100] 10 ms to 3600 s
Input impedance	10 kΩ or more	
Low-pass filter	[TM-4100] Selectable from OFF/100 Hz/20 kHz [TM-4200] Selectable from OFF/100 Hz/20 kHz (CH-A/CH-B common setups)	
Input connector	[TM-4100] Terminal block (D slot SIG-COM1 terminal) [TM-4200] Phoenix Contact terminal block (D slot SIG-A-COM1 terminal/SIG-B-COM1 terminal)	

TM-4300/TM-4400		
Number of channels	[TM-4300] 1ch (2-phase) [TM-4400] 2ch	
Input format	Voltage input or no-voltage input (open collector residual voltage less than 1 V)	
Input amplification format	DC	
DC amplifier	Input signal	Square waveform having a pulse width of 4 µs or more (When the lowpass filter is OFF)
	Input voltage range	Hi: 4 to 30 V/ Lo: -1 to 1 V
	Input frequency	DC to 100 kHz
Input waveform	[TM-4300] Square wave signal with 90° phase difference or single-phase square wave signal	
Duty	[TM-4300] 50±10 %	
Input impedance	10 kΩ or more	
Low-pass filter	Selectable from OFF/100 Hz/20 kHz (CH-A/CH-B common setups)	
Input connector	Phoenix Contact terminal block (D slot SIG-A-COM1 terminal/SIG-B-COM1 terminal)	

● Function calculation method

TM-4100	
Calculation method	Periodic calculation method
Measurement accuracy	Within displayed value x (±0.01 %) ± 1 count (count value excluding decimal point)
Measurement time	Within 1 ms + 1 cycle time
Auto zero function	Sets the total measurement value to zero if no input signal is detected for a specified time. • Selectable between 0.0 s (OFF) and 20.0 s (However, up to 3600 s can be measured when measuring time)
Rapid deceleration follow-up function	• Function ON: Deceleration calculation is performed while the measurement value is zero at the auto zero set time. • Function OFF: Measurement value is held while the measurement value is zero at the auto zero set time.
Moving average function	1 to 1280
Start-stop measurement function	Calculates the average/maximum/minimum values from start to stop.
Measurement items	Selectable from rotation speed/circumferential speed/moving speed/period/ number of times/frequency/flow rate/passing time/user-defined engineering unit

TM-4200		
Calculation method	Periodic calculation method	
Measurement accuracy	Single CH (CH-A or CH-B)	Within displayed value × (±0.01 %) ± 1 count (count value excluding decimal point)
	B/A or (B-A)/A	2 × (Single CH measurement accuracy)
	B-A	± (CH-B measurement accuracy) ± (CH-A measurement accuracy)
Measurement time	Within 1 ms + 1 cycle time	
Auto zero function	Sets the total measurement value to zero if no input signal is detected for a specified time. • Selectable from 0.0 (OFF) to 20.0 s	
Rapid deceleration follow-up function	• Function ON: Deceleration calculation is performed while the measurement value is zero at the auto zero set time. • Function OFF: Measurement value is held while the measurement value is zero at the auto zero set time.	
Moving average function	1 to 1000	
Start-stop measurement function	Calculates the maximum/minimum values from start to stop and the average value over the most recent set time.	
Measurement items	Selectable from rotation speed/circumferential speed/moving speed/ frequency/user-defined engineering unit	

TM-4300	
Counting range (internal counter)	0 to ±2 000 000 000

TM-4400	
Measurable cycle	0.1 ms to 3600 s
Minimum resolution	1 µs
Measurement range	10 s/1000 s/3600 s
Display accuracy	Within displayed value × (± 0.05 %) ± 1 count (When measuring passing time)

● Setup section

TM-4100/TM-4200	
Measurement condition preset function	Up to four measurement settings can be saved and loaded for use.
Pulse setup	1 to 999 999 P/R
Rotating body diameter setup	0.1 to 99 999.9 mm
Distance between pulses setup	0.1 to 99 999.9 mm
Process length setup	[TM-4100] 0.1 to 99 999.9 mm
Pulse factor	0.00001×10E-3 to 9.99999×10E+3 EU/Pulse

TM-4300	
Measurement condition preset function	Up to four measurement settings can be saved and loaded for use.
Multiplication	×1/×2/×4
Offset function	0 to ±9 999 999
Counting direction switching function	+/-
Pulse factor	0.00001×10E-3 to 9.99999×10E+3 EU/Pulse

TM-4400	
Measurement condition preset function	Up to four measurement settings can be saved and loaded for use.
Measurement mode	Single / Dual
Measurement conditions	When the measurement mode is Single: • High level • Low level • Rising edge to rising edge • Falling edge to falling edge
	When the measurement mode is Dual: • Rising edge to rising edge • Falling edge to falling edge • Rising edge to falling edge • Falling edge to rising edge
Measurement item	Selectable from passing time/passing speed
Measurement distance	0.1 to 99 999.9 mm
Prescale function	0.00001×10E-3 to 9.99999×10E+3 EU/Pulse

● Display section

TM-4100		
Display unit	OLED Display	
Display refresh cycle	0.2 s/0.4 s/0.5 s/0.6 s/0.8 s/1.0 to 10 s (1.0 s increments)	
Unit display	Rotation speed	r/s, r/min, r/h
	Circumferential speed	mm/s, m/s, mm/min, m/min
	Moving speed	mm/s, m/s, mm/min, m/min, km/min mm/h, m/h, km/h
	Cycle	s, min
	Count	1/s, 1/min, 1/h
	Frequency	Hz, kHz
	Flow rate	mL/s, mL/min, mL/h, L/s, L/min, L/h
	Passing time	s, min
	User-defined engineering unit	EU/s, EU/min, EU/h
Number of display digits	6 digits	
Number of decimal points	Selectable from OFF/1/2/3	
Number of zero-fixed display digits	Selectable from OFF/1/2 digits	
SIG indicator	Blinks in synchronization with the input signal.	
Error display	Backup memory error/board error/input frequency over/display digit over	
Brightness selection	Selectable from LO/MID/HI	

TM-4200		
Display unit	OLED Display	
Display refresh cycle	0.2 s/0.5 s/1 s	
Unit display	Rotation speed	r/s, r/min, r/h
	Circumferential speed	mm/s, m/s, mm/min, m/min
	Moving speed	mm/s, m/s, mm/min, m/min, km/min mm/h, m/h, km/h
	Frequency	Hz, kHz
	User-defined engineering unit	EU/s, EU/min, EU/h
Number of display digits	6-digit + sign	
Number of decimal points	Selectable from OFF/1/2/3/4/5 digits	
Number of zero-fixed display digits	Selectable from OFF/1/2 digits	
SIG indicator	Blinks in synchronization with the input signal.	
Error display	Backup memory error/board error/input frequency over/display digit over	
Brightness selection	Selectable from LO/MID/HI	

TM-4300	
Display unit	OLED Display
Display refresh cycle	0.2 s/0.5 s/1 s
Unit display	OFF/mm/m/Count/s
Number of display digits	7 digits + sign
Number of decimal points	Selectable from OFF/1/2/3/4/5/6 digits
SIG indicator	Blinks in synchronization with the input signal.
Error display	Backup memory error/board error/ pulse count over/display digit over
Brightness selection	Selectable from LO/MID/HI

TM-4400	
Display unit	OLED Display
Unit display	Passing time (TIME): ms, s Passing speed (P.SPEED): m/s, km/h
Number of display digits	6 digits
Number of decimal points	Selectable from OFF/1/2/3 digits
SIG indicator	Blinks in synchronization with the input signal.
Error display	Backup memory error/board error/ display digit over/time measurement range over
Brightness selection	Selectable from LO/MID/HI

● Pulse output (TM-4100 only)

Output voltage	Hi: 4.5 V or more / Lo: 0.5 V or less
Output logic	Negative logic
Load resistance	100 kΩ or more

● Power supply for detector

Output voltage	12 VDC ± 10 %
Maximum output current	[TM-4100] 100 mA [TM-4200/4400] Total of 2 channels 180 mA [TM-4300] 180 mA

● General specifications

Equipment type	Built-in type	
AC power supply model	Power rating	100 to 240 VAC ± 10 %, 50/60 Hz, 30 VA max.
	Power consumption	TM-4110: 19 VA max. TM-4120: 21 VA max. TM-4130: 25 VA max. TM-4140: 21 VA max. TM-4100 Other configurations: 30 VA max. TM-4270: 27 VA max. TM-4370: 27 VA max. TM-4470: 27 VA max. TM-4200/4300/4400 Other configurations: 30 VA max.
DC power supply model	Power rating	12 to 24 VDC ± 5%, 1.25 A max.
	Power consumption	TM-4111: 7 W max. TM-4121: 7 W max. TM-4131: 9 W max. TM-4141: 7 W max. TM-4100 Other configurations: 15 W max. TM-4200/4300/4400: 15 W max
Safety	Overvoltage category II	
Insulation	Double insulation structure	
Insulation resistance	Between power supply +/- terminals and FG terminal: 10 MΩ or more (at 500 VDC)	
Operating environment	Indoor use only	
	Operating temperature and humidity	0 to 50 ºC/30 to 80 %RH (no condensation)
	Storage temperature and humidity	-10 to 60 ºC/30 to 85 %RH (no condensation)
	Degree of contamination	2
	Altitude	2000 m max.
Outer dimensions	96 (W) x 48 (H) x 140 (D) mm max.	
Weight	[TM-4110] Approx. 340 g [TM-4270/4370/4470] Approx. 400 g	

● Applicable standards

CE marking	Low Voltage Directive	2014/35/EU Standard EN 61010-1
	EMC Directive	2014/30/EU Standard EN 61326-1
	RoHS Directive	2011/65/EU Standard EN IEC 63000
FCC/Canada	FCC part 15B	
	ICES-003(A)/NMB-003(A)	

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. canada: CAN ICES-003(A) / NMB-003(A)

● Accessories

TM-4100	
Mounting jig	1 set (2 pcs)
Instruction manual	1 pcs

TM-4200/4300/4400	
Input connector for D slot 1 pcs made by Phoenix contact FMC 1,5/10-ST-3,5 1952348 (packed in the D slot)	
Mounting jig	1 set (2 pcs)
Instruction manual	1 pcs

■ Specifications

Power supply, Signal input/output boards

TM-0400/TM-0401 Power Supply Board

TM-0400	
Power rating	AC100 V to 240 V ± 10 %, 50/60 Hz, 30 VA max
Power consumption	30 VA max

TM-0401	
Power rating	DC12 V to 24 V ± 5 %, 1.25 A max
Power consumption	TM-4200/4300/4400: 15 W max

TM-0405/0406 Input Voltage Board

Voltage input specification	Same as Input unit
Input connector	[TM-0405] Terminal block (D slot SIG-COM1 terminal) [TM-0406] Phoenix Contact terminal block (D slot SIG-A-COM1 terminal/SIG-B-COM1 terminal)

TM-0407 Line Driver Signal Input Board

Line driver signal input1 specification	Equivalent to RS-422A
Connector	FMC 1,5/10-ST-3,5 1952348x1 (made by Phoenix contact, accessory for TM-0407)

TM-0421/0422 BCD Output Board (TM-4100 series only)

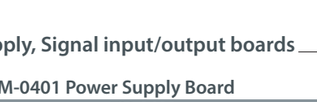
● **Output specifications**

Output form	6-digit parallel output
Output format	[TM-0421] 5 V internal pull-up output [TM-0422] NPN open collector output
Sink current	32 mA max.
Output withstand voltage	24 V max.
Output logic	Positive logic
Data refresh time	100 ms or less

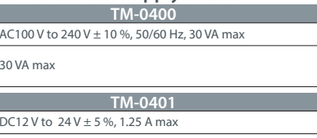
● **Operation modes**

Normal mode	Continuously refresh output every 100 ms (continuous print command output every 100 ms).
Request mode	Refresh output when request signal is received.

Normal (CONTINUE) mode



Request mode



● **Request signal input specifications**

Input form	Negative logic (pulse width 10 µs or more)
Operating edge	Falling edge
Input voltage	Hi: +4.2 to +5.25 V/Lo: 0 to +0.9 V

● **Pin number and Signal name**

BCD terminal pin assignment

HDRA-E36MA+ (Connector)
HDRA-E36LPTH (Case)
36 pin half pitch

Pin	Signal	Pin	Signal
1	BCD output $1x10^0$	19	$4x10^4$
2	$2x10^0$	20	$8x10^4$
3	$4x10^0$	21	BCD output $1x10^5$
4	$8x10^0$	22	$2x10^5$
5	BCD output $1x10^1$	23	$4x10^5$
6	$2x10^1$	24	$8x10^5$
7	$4x10^1$	25	Start input
8	$8x10^1$	26	Stop input
9	BCD output $1x10^2$	27	Reset input
10	$2x10^2$	28	NC
11	$4x10^2$	29	NC
12	$8x10^2$	30	NC
13	BCD output $1x10^3$	31	NC
14	$2x10^3$	32	NC
15	$4x10^3$	33	Data request
16	$8x10^3$	34	NC
17	BCD output $1x10^4$	35	Print command
18	$2x10^4$	36	GND

TM-0431/0432 Analog Output Board

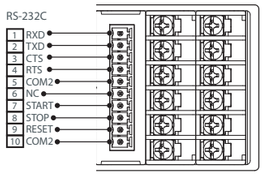
TM-0431		
Number of channel	1 ch	
Output type	Selectable from voltage or current	
Output method	16-bit D/A conversion	
Output refresh time	Selectable from 1 ms/10 ms/20 ms/50 ms/100 ms/200 ms/500 ms/1 s	
Voltage output	Output range	Selectable from 0 to 10 V/0 to 5V/1 to 5 V
	Load resistance	100 kΩ or more
	Linearity	±0.1 % FS
	Zero temperature drift	±0.05 % FS/°C
	Span temperature drift	±0.05 % FS/°C
Current output	Output range	Selectable from 4 to 20 mA or 0 to 16 mA
	Load resistance	500 Ω or less
	Linearity	±0.1 % of span
	Zero temperature drift	±0.05 % of span/°C
	Span temperature drift	±0.05 % of span/°C
Output format	Terminal block	

TM-0432		
Number of channel	1 ch	
Output type	Voltage	
Output method	16-bit D/A conversion	
Output refresh time	1 ms	
Voltage output	Output range	±10 V
	Load resistance	100 kΩ or more
	Linearity	±0.1 % FS
	Zero temperature drift	±0.05 % FS/°C
	Span temperature drift	±0.05 % FS/°C
Output format	Terminal block	

TM-0440 Comparator Output Board

Contact output	1 make contact output × 3 (COMP1/COMP2/COMP3) • Evaluation conditions can be set individually.	
Evaluation conditions	UPPER	[TM-4100/4200/4400] 6-digit setup [TM-4300] 7-digit setup • Relay turns ON when UPPER ≤ main measurement value
	LOWER	[TM-4100/4200/4400] 6-digit setup [TM-4300] 7-digit setup • Relay turns ON when LOWER > main measurement value
	OK	Relay turns ON when all comparators set to UPPER or LOWER are OFF.
	ERROR	Relay turns ON when non-communication error occurs.
Contact operation modes	Automatic ecover mode	After the relay turns ON, the relay returns to OFF when the evaluation conditions are no longer satisfied (0 to 20% hysteresis can be set for the UPPER and LOWER evaluation conditions).
	Hold mode	[TM-4100/4200/4300] Once the relay turns ON, it remains ON even if the evaluation conditions are no longer met.
	Shot output mode	When the relay ON condition is met, it remains ON for the specified time and then returns to OFF. (Settable time: 10 to 2000 ms, in 10 ms increments)
Output delay function	[TM-4100/4200/4300] Relay turns ON when the setup value is exceeded continuously for the set time. (Settable time: 0 to 1000 ms, in 10 ms increments)	
Reset function	[TM-4100/4200/4300] Resets the relay to OFF in the hold mode.	
Maximum contact capacity	30 VDC/1 A 250 VAC/1 A	
Output refresh time	Approx. 10 ms	
Output format	Terminal block	

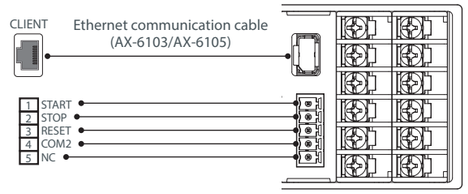
TM-0450 RS-232C Board



● **Communication specifications**

Baud rate	9 600 bps/19 200 bps/115 200 bps
Data bits	8-bit
Parity	None
Stop bits	1-bit
Flow control	Hardware
Terminator	CR+LF

TM-0460 Ethernet Board

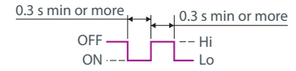


● **Ethernet communication specifications**

Electrical specifications	IEEE802.3 compliant
Transmission method	10BASE-T/100BASE-T automatically selected
Communication protocol	Socket communication by TCP/IP (IPv4)

Gate Signal Input

(Valid when any of the BCD output, RS-232C communication, or Ethernet communication board is installed)

Gate function	[TM-4100/4200] START/STOP/RESET [TM-4300] START•STOP/OFFSET/RESET [TM-4400] START/RESET
Voltage input	Hi: +4.2 to +5.25 V/Lo: 0 to +0.9 V
Non-voltage input	Open voltage: 5 V ± 0.25 V Short-circuit current: 1 mA max. Contact resistance: 50 Ω or less
Gate signal timing	 [TM-4300] When the START/STOP terminal is at low level, measurement is stopped. [TM-4400] When the START terminal is at low level, measurement is in progress.

Optional software

TM-0470/0480 Calculation function*

● **Achieved speed/time measurement mode**

TM-0470	
Calculation details	Calculate the time required from the start condition to the stop instruction measurement value.
Calculation item	Selectable from rotation speed/circumferential speed/moving speed
Unit of measurement	s (fixed display)
Start instruction value	0 to 999 999 *Decimal point position follows the setting.
Stop instruction value	0 to 999 999 *Decimal point position follows the setting.

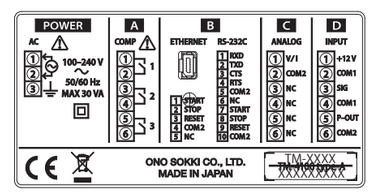
TM-0480	
Calculation details	Calculate the time required from the start condition to the stop instruction measurement value.
Calculation item	Pulse accumulated value
Unit of measurement	s (fixed display)
Start instruction value	Start the time measurement when reaching to the measurement start state.
Stop instruction value	-9 999 999 to 9 999 999 *Decimal point position follows the setting.

*Function added to the main unit as an option.

Table of optional boards/software combination

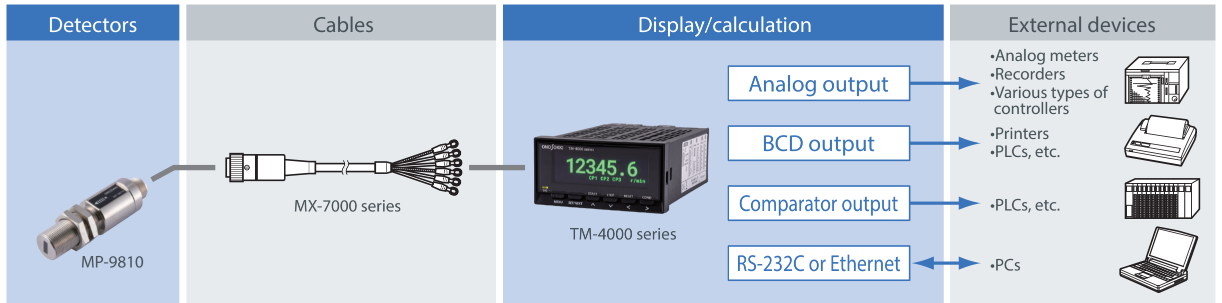
Slot	POWER		A	B				C		D			Software	
Specifications	Power		Comparator output	BCD output		RS-232C communication	Ethernet communication	Analog output		Voltage input		Line driver inputt	Calculation function	
	AC	DC		Voltage output	Open collector output					1ch	2ch	2ch		
Model name	TM-0400	TM-0401	TM-0440	TM-0421	TM-0422	TM-0450	TM-0460	TM-0431	TM-0432	TM-0405	TM-0406	TM-0407	TM-0470	TM-0480
TM-4100	○	○	○	○	○	○	○	○		○			○	
TM-4200	○	○	○			○	○		○		○	○		
TM-4300	○	○	○			○	○		○		○	○		○
TM-4400	○	○	○			○	○		○		○			

- Only one board can be installed in each slot.
- Be sure to install a board in slot POWER and slot D.



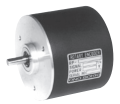
Terminal arrangement diagram (Ex.TM-4100 series)

System Configurations



Main detectors

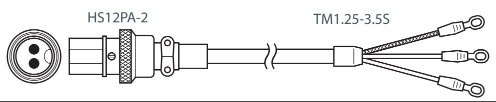
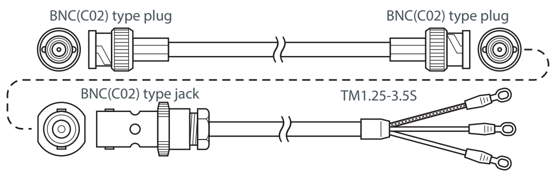
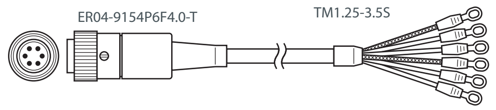
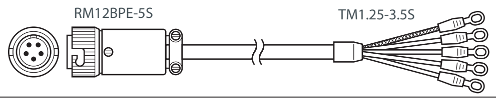
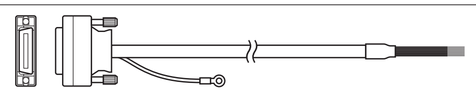
Type	Model name	Features and measurement range
Electro-magnetic type	MP-9100, etc. 	• No power requirement, excels in durability • Oil-proof, heat-resistant, and compact, various types to fulfill the requirements Measurement range (at 60 P/R) MP-9100: 200 to 35 000 r/min
Magneto-electric type	MP-9810, 9830, AP-981 	• Detection from 0 r/min (MP-9810, 9830) • Outputs stable square signal from ultra-low to high speeds • Acid-resistant, water-proof type (AP-981) Measurement range (at 60 P/R) 0 to 100,000 r/min (MP-9810, 9830)
Optical type	LG-9200, 930 	• Compact optical type detector, a unified structure of light source and receiver • Using a pulse modulation method prevents from being affected by ambient light Measurement range (LG-9200) Maximum response speed: 40 m/s Detection distance: 40 mm max.
	FS-5500+FG-1300 	• Fiber sensor allows using at narrow area. Measurement range Maximum response frequency : 10 kHz or less Detection distance : 69 mm max.

Type	Model name	Features and measurement range
Electro-magnetic type	MP-810, 820, 830 	• Rotation shaft directly attached type MP-810: Base mount type MP-820: Dual shaft type MP-830: Flange type Measurement range 5 to 5 000 r/min
Line speedometer	RP-7400 series 	• Line speed can be easily measured just applying the roller to the measurement target. Measurement range 0 to 600 m/min
Rotary encoder	RP-432Z, etc. 	• Detection form nearly 0 r/min • Models with various output pulse types are available. • 2-phase difference (90 degree) wave output Measurement range (at 600 P/R or less) 0 to 5 000 r/min

*Please refer to the exclusive brochure of each model in details.

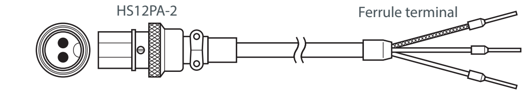
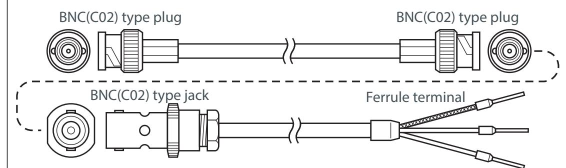
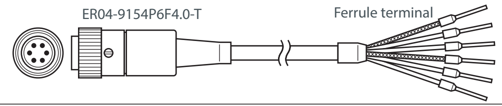
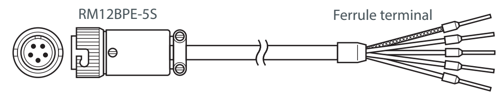
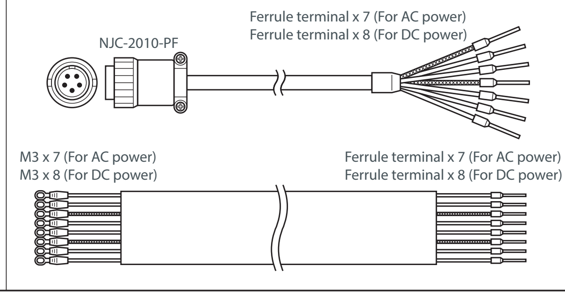
Signal cable classification table

● TM-4100 series

Applicable models	Cables	Specifications	Cable models
MP-9100/9120/9200/940A/963 MP- 810/820/830/837 (MP-081+MX-500 series)	P-2 (2-core outer shielded cable)		MX- 505 5 m 510 10 m 520 20 m
MP-930/935/936/950/954/962 FG-1300	3C-2V (High frequency coaxial cable) 3D-2V (2-core outer shielded cable)		MX- 101 1.5 m 105 5 m 110 *10 m 115 *15 m 120 *20 m MX- 603 0.3 m (junction cable)
MP-9810, 9830 LG-9200	D5-UL (Composite 5-core vinyl sheath cable)		MX- 7105 5 m 7110 10 m 7115 15 m 7120 20 m
RP-7400 series	D5-UL (Composite 5-core vinyl sheath cable)		RP-0181 5 m *10 m
MP-911, 992, AP-981 SP-405ZA		No need (Signal cable is directly attached to the detector itself. Another end is processed as open status.)	
Cable for BCD signal	30AWG×18P BIOS-E-3018-E		AA-8207 3 m

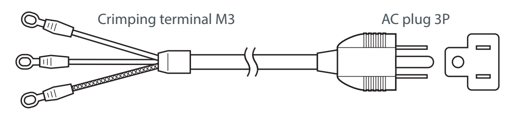
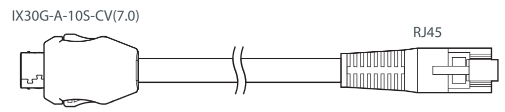
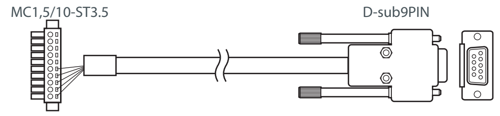
*Made to order

● TM-4200, TM-4300, TM-4400 series

Applicable models	Cables	Specifications	Cable models
MP-9100/9120/9200/940A/963 MP- 810/820/830/837 (MP-081+MX-5205)	P-2 (2-core outer shielded cable)		MX- 5205 5 m
MP-930/935/936/950/954/962 FG-1300	3C-2V (High frequency coaxial cable) 3D-2V (2-core outer shielded cable)		MX- 101 1.5 m 105 5 m 110 *10 m 115 *15 m 120 *20 m MX- 6031 0.3 m (junction cable)
MP-9810, 9830 LG-9200	D5-UL (Composite 5-core vinyl sheath cable)		MX- 7305 5 m 7310 10 m 7320 20 m
RP-7400 series	D5-UL (Composite 5-core vinyl sheath cable)		RP-0184 5 m
RP-1700 series	20276-VSV-4P		The cable type differs depending on the rotary encoder to be connected. For details, please refer to our website.

*Made to order

● TM-4000 series (common)

Applicable models	Cables	Specifications	Cable models
TM-4000 series	General power cable		AX-2050N 3 m AC100 V
Ethernet cable	R-OKTP-E5-P-SASB		AX- 6103 3 m AX- 6105 5 m
RS-232C cable	R6 (3 pairs of twisted, 2 of 3 pairs shielded cables)		PE3532908 2 m (PS-D10502)

JCSS*1 Calibration Service

Under JCSS, Ono Sokki is an accredited calibration laboratory officially certified by NITE*2. The calibration certificates issued by Ono Sokki are acceptable in the world through the ilac-MRA. For details, please refer to our website.

*1: Japan Calibration Service System
*2: National Institute of Technology and Evaluation

Calibration field-Rotational speed

Tachometer
Value: Rotational speed (r/min)
Range: 0.5 r/min to 100000 r/min

Product list

Standard models

Model	Product name
TM-4110	Digital Tachometer (Display only/AC power supply)
TM-4111	Digital Tachometer (Display only/DC power supply)
TM-4120	Digital Tachometer (BCD output/AC power supply)
TM-4121	Digital Tachometer (BCD output/DC power supply)
TM-4130	Digital Tachometer (Analog output/AC power supply)
TM-4131	Digital Tachometer (Analog output/DC power supply)
TM-4140	Digital Tachometer (Comparator output/AC power supply)
TM-4141	Digital Tachometer (Comparator output/DC power supply)
TM-4270	2-channel Digital Tachometer (Analog output/Comparator output/AC power supply/2-ch input)
TM-4370	Reversible Counter (Analog output/Comparator output/AC power supply/2-ch input)
TM-4470	Passing Time/Passing Speedometer (Analog output/Comparator output/AC power supply/2-ch input)

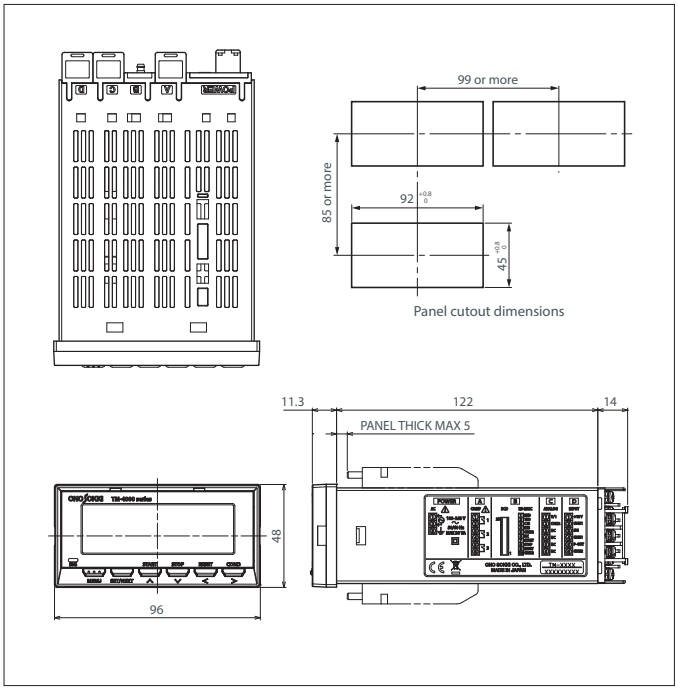
* Installation of optional boards after delivery needs to be done in our factory, please ask for further information to our sales staff or the distributor.

Customized models

Model	Product name
TM-4100	TM-4100 series base
TM-4200	TM-4200 series base
TM-4300	TM-4300 series base
TM-4400	TM-4400 series base
TM-0400	AC power board
TM-0401	DC power board
TM-0405	1-ch input board for TM-4100
TM-0406	2-ch input board for TM-4200/4300/4400
TM-0407	Line driver signal input board
TM-0421	BCD output board (voltage output)
TM-0422	BCD output board (open collector output)
TM-0431	Analog output board for TM-4100
TM-0432	Analog output board for TM-4200/43004400
TM-0440	Comparator output board
TM-0450	RS-232C board
TM-0460	Ethernet board
TM-0470	Calculation function for TM-4100
TM-0480	Calculation function for TM-4300

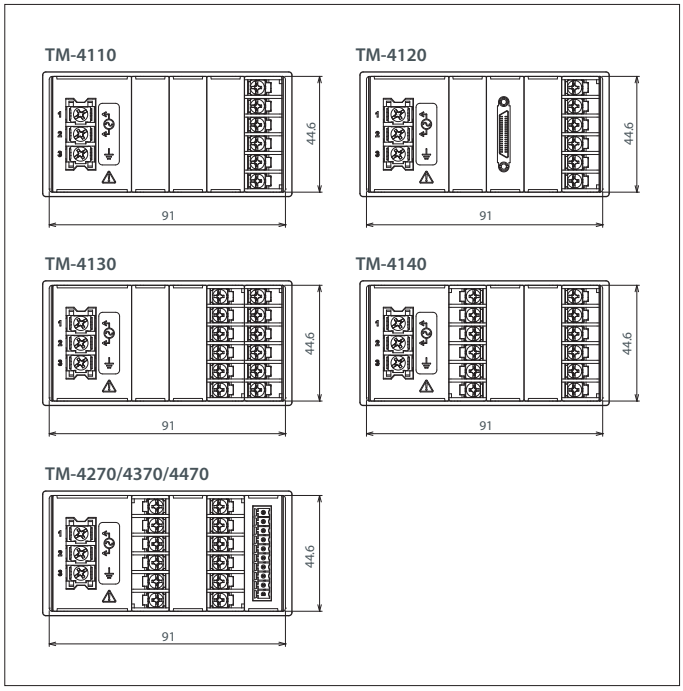
Outer dimensions

(Unit: mm)



Rear panel dimensions

(Unit: mm)



* Outer appearance and specifications are subject to change without prior notice.

URL: https://www.onosokki.co.jp/English/english.htm

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