

**RM10L****HYBRID RECORDER****OUTLINE**

THE RM10L IS HYBRID RECORDER ALLOWS PEN TRACES ON 100 mm WIDE CHART PAPER. THE RM10L THAT HAS SIMPLE, FLEXIBLE AND RELIABLE FUNCTIONS IN A 144 x 144 mm DIN SIZE CASE OFFERS YOU:

FEATURES

- RECORDING OF UP TO 4 PENS
- CONTACT FREE FEEDBACK POTENTIOMETER AND INPUT SELECTOR
- UNIVERSAL INPUTS AND RANGES
- WIDE RANGE OF POWER INPUT VOLTAGE
- INDIVIDUAL SCALE PLATE
- BOTH TREND & DATA LOGGING PRINTOUTS
- OPTIONAL COMMUNICATION INTERFACE RS-232C AND RS-422A

SPECIFICATIONS

Number of inputs: 3, 4 pen

Type of input:

DC Voltage: 4mVDC min., 20VDC max.

Direct thermocouple: K, T, J, E, B, S, R, G, C, N, PR40-20, PLII, U, L, Au-Fe

RTD: Pt100Ω, Pt50Ω, JPt100Ω, Cu10Ω (at 0°C), Cu10Ω (at 25Ω)

Current: 4 ~ 20mA

Recording width: 100mm calibrated

Recording accuracy: ± 0.5% max.

Open input protection (Burn-out protection): Up scale with mV or TC input

Chart Speed: 1 ~ 3600mm/h
1 ~ 300mm/min.

Chart paper: 12m long, 114mm width, 16m chart (option, except 4 pen mode) or Clean chart (option)

Pen response: 1.0 sec max. to 90% of step-wise input

Recording color: 4 colors of Red, Blue, Green, Purple

Data print color: Purple (Red on alarm for multipoint model)

Input sampling: 120 msec.

Print head: Wire dot 1 color ribbon cartridge



Cartridge pen: Disposable felt pen

Alarm: 4 Set points per channel

Alarm output (option): 1 relays drive per setting. Form-C 250VAC 3A/125VDC 0.5A/30VDC 3A max., Hysteresis $0.5 \pm 0.2\%$, Setting accuracy $\pm 0.5\%$
Nos. of output: 4 relays

Input impedance: 10MΩ min. In mV/TC input. 200kΩ min. In mV/TC Input with open input protection, 1MΩ min. In Volt Input and 100Ω min. In mA Input

Source impedance: 10kΩ max. in mV/TC input, 200Ω max. in mV/TC Input with open input protection, 1kΩ max. In Volt input and 10Ω max. per wire in RTD input.

CMRR: 140dB min. in 50/60 ± 0.5Hz

NMRR: 60dB min. in 50/60 ± 0.5Hz

Isolation resistance: Input/ground 500VDC, 20MΩ min.

Dielectric strength: Power supply voltage/ ground 1500VAC, 1 minute duration. supply voltage /ground 500VAC, 1 minute duration

Power Supply voltage: 85 ~ 264VAC, 45 ~ 65Hz ± 5%

Allowable instant power failure: 50ms max.

Power consumption: 50VA max. in pen models; 35VA max. in multipoint model

Vibration resistance: 1m/s^2 max., 10 ~ 60Hz

Shock resistance: 2m/s^2 max.

Operating conditions: 0 ~ 50°C. 35 ~ 85%RH

Chart feed accuracy: ± 0.1% max.

Clock precision: ± 50ppm

Dimensions: 144 x 144 x 340 mm.

Case structure: Dust-proof

Mounting: Panel-mount

(Allowable backward inclination : 30°)

Weight: 5.5 kg max. (3 pen model);
6.0kg max. (4 pen model);
Material: Polycarbonate resin (Front bezel)
Steel plate (Case)
Color: Case — Metallic silver
Door frame — Black(Standard)

MAXIMUM RANGE & ACCURACY

The junction compensation accuracy is not added to digital readout accuracy and recording accuracy. The junction compensation accuracy is based on operating conditions:

23 ± 2°C temperature:
55 ± 10%RH humidity:
85 ~ 264VAC power source:
30 minutes min. warm-up time :
no effect of vibration resistance
and shock resistance.

Limit of compensation error:

± 1°C at R,S,B,PR40-20
± 0.5°C at K,E,J,T,G,C,N

Digital readout accuracy: ± (0.2% + 1digit)

Recording accuracy: ± 0.5%

NOTE:

(*1): Extension scaling up to 3 times among each ranges: ± (0.3% + 1digit)

(*2): Extension scaling up to 4 times among ranges for voltage input: ± (0.3% + 1digit)

(*3): Ranges under a span of 0 ~ 400°C: Accuracy is out of guarantee

(*4): Ranges of 0 ~ 300°C: ± 2%,
300 ~ 800°C: ± 1%

(*5): Ranges of 0 ~ 200°C: ± (0.3% + 1digit)

(*6): ± (0.5% + 1digit)

(*7): ± (0.8% + 1digit)

(*4 ~ *7):

Digital readout accuracy ± 0.3%

GROUP	RANGE CODE	INPUT	UNIT	Max. RESOLUTION	RANGE(*1)	
Volt (*2)	000	mV		10μV	-10.0 ~ +10.0mV	
	001	mV		10μV	-50.0 ~ +50.0mV	
	002	mV		100μV	-200.0 ~ +200.0mV	
	003	V		1mV	-1.0 ~ +1.0V	
	004	V		1mV	-5.0 ~ +5.0V	
	005	V		10mV	-20.0 ~ +20.0V	
	006	V		1mV	0.0 ~ +5.0V	
	007	V		1mV	+1.0 ~ +5.0V	
Current	008					
	009	mA		0.01mA	4.0 ~ 20.0mA	
TC	010	R	°C	0.1°C	0.0 ~ 1450.0°C	
	011	R	°C	0.1°C	0.0 ~ 1760.0°C	
	012	S	°C	0.1°C	0.0 ~ 1760.0°C	
	013	B	°C	0.1°C	0.0 ~ 1830.0°C (*3)	
	014	K	°C	0.1°C	0.0 ~ 100.0°C	
	015	K	°C	0.1°C	0.0 ~ 700.0°C	
	016	K	°C	0.1°C	0.0 ~ 900.0°C	
	017	K	°C	0.1°C	-200.0 ~ 100.0°C	
	018	K	°C	0.1°C	-200.0 ~ 400.0°C	
	019	K	°C	0.1°C	-200.0 ~ 650.0°C	
	020	K	°C	0.1°C	-200.0 ~ 1370.0°C	
	021	K	°C	0.1°C	0.0 ~ 1000.0°C	
	022	E	°C	0.1°C	0.0 ~ 150.0°C	
	023	E	°C	0.1°C	0.0 ~ 400.0°C	
	024	E	°C	0.1°C	-200.0 ~ 500.0°C	
	025	E	°C	0.1°C	-200.0 ~ 600.0°C	
	026	E	°C	0.1°C	-200.0 ~ 900.0°C	
	027	E	°C	0.1°C	-200.0 ~ 250.0°C	
	028	E	°C	0.1°C	-200.0 ~ 400.0°C	
	029	E	°C	0.1°C	-200.0 ~ 700.0°C	
	030	J	°C	0.1°C	0.0 ~ 150.0°C	
	031	J	°C	0.1°C	0.0 ~ 500.0°C	
	032	J	°C	0.1°C	-200.0 ~ 650.0°C	
	033	J	°C	0.1°C	-200.0 ~ 300.0°C	
	034	J	°C	0.1°C	-200.0 ~ 500.0°C	
	035	J	°C	0.1°C	-200.0 ~ 900.0°C	
	036	J	°C	0.1°C	-200.0 ~ 750.0°C	
	037	T	°C	0.1°C	0.0 ~ 150.0°C	
	038	T	°C	0.1°C	0.0 ~ 400.0°C	
	039	T	°C	0.1°C	-200.0 ~ 350.0°C	
	040	T	°C	0.1°C	-200.0 ~ 400.0°C	
	041	G	°C	0.1°C	0.0 ~ 2320.0°C	
	042	C	°C	0.1°C	0.0 ~ 2320.0°C	
	043	N	°C	0.1°C	0.0 ~ 900.0°C	
	044	N	°C	0.1°C	0.0 ~ 1260.0°C	
	045	PR40-20	°C	0.1°C	0.0 ~ 1880.0°C (*4)	
	046	U	°C	0.1°C	-200.0 ~ 400.0°C (*5)	
	047	L	°C	0.1°C	-200.0 ~ 900.0°C (*5)	
	048	Au-Fe	K	0.1K	0.0 ~ 300.0°C (*6)	
	RTD	049	JPt100	°C	0.1°C	-50.0 ~ 100.0°C
		050	JPt100	°C	0.1°C	-200.0 ~ 600.0°C
		051	Pt100	°C	0.1°C	-50.0 ~ 100.0°C
		052	Pt100	°C	0.1°C	-200.0 ~ 600.0°C
		053	JPt50	°C	0.1°C	-50.0 ~ 100.0°C
		054	JPt50	°C	0.1°C	-100.0 ~ 250.0°C
		055	JPt50	°C	0.1°C	-200.0 ~ 550.0°C
		056	Cu10 at25°C	°C	0.1°C	-50.0 ~ 200.0°C (*7)
		057	Cu10 at 0°C	°C	0.1°C	-50.0 ~ 200.0°C (*7)
TC	058	PLII	°C	0.1°C	0.0 ~ 1360.0°C	

STANDARD FUNCTION

FUNCTION	DESCRIPTION
Analog indication	Process variable is indicated on a scale plate.
Engineering unit indication	Engineering unit is indicated on the scale plate.
Digital display	Indicates channel no., process variable, date, chart speed, alarm set point in the display 1 & 2.
Scaling	Indicates and prints process variable with set point.
Logging print	Prints each channel's process variable, engineering unit on the chart paper. Printing mode is selected from analog recording, end mode for analog recording
Date print	Prints year and date at a programmed time.
Time print	Prints time at a Programmed interval.
Calendar	Prints year and date at a programmed time.
Time print	Prints time at a programmed interval.
List print	Prints type of input, range, engineering unit, alarm setpoint, date, time, chart speed, scaling and logging print status on the chart paper.
Programming	Chart speed, alarm set point, logging print interval, skip, date and time can be programmed.
Memory backup	Back-up for clock by lithium batteries for 10 years or 5 years in unused and for program by non-volatile memory.
Key lock	If you don't use key for more than 5 minutes in a user mode, the key would be locked automatically.
Alarm	4 set points alarm per channel.
Time indicator	Indicates year, month, day, hour, minute. Adjust for leap year automatically
Self diagnostics	Indicates "ERROR", and outputs when CPU, printer, ADC are faulty.

CONFIGURABLE FUNCTIONS

FUNCTTON	DESCRIPTION
Open input protection	Sets Indicator at over 100% or 0% per Inputs when input becomes open for TC or $\pm 50\text{mV}$ max. Input.
Zone recording	Recording on the Chart track ranged per Inputs.
Alarm on print	When an alarm arises, alarm-on time, alarm-on channel, alarm setting number, and alarm mode are printed in purple color.
Alarm recovery on print	When an alarm is recovered, the time of recovery, the recovered channel, alarm setting number, and alarm mode are printed in purple color.
Damping	Digital filtering for measured data (process variable) in unsteady process. (Pen model only). Filter constant range ability: 1.0000 to 0.0001 Formula is: $k=0.64/T$, $k=$ Filter constant $T1= 99.5\%$ damping
Alarm hysteresis setting	Alarm hysteresis width can be set.

NOTE: Recording accuracy may change in a case Zone Recording is specified.

DI REMOTE OPTIONS

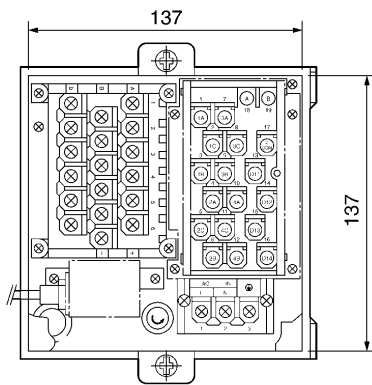
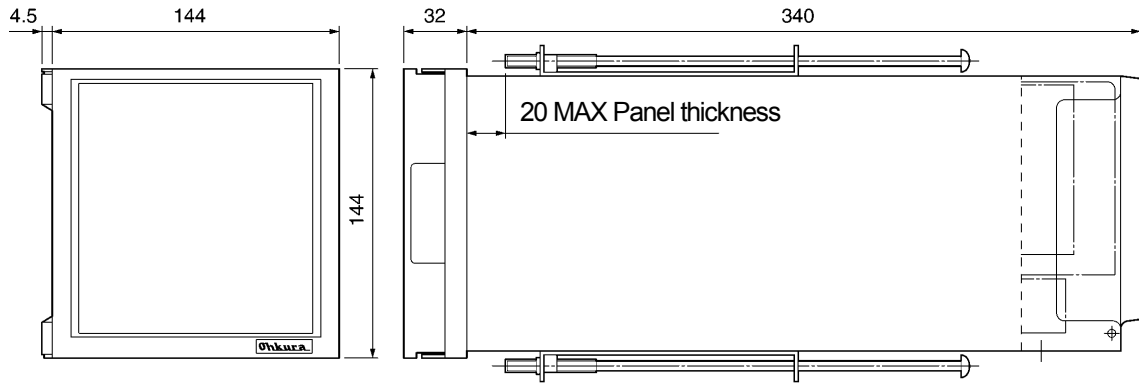
FUNCTION	DESCRIPTION
Chart start stop	Close: starts Open: stops
Change chart speed	Close: 1st Open: 2nd
Remote logging print	Close: starts to print

ALARM BOARD: 4 RELAYS

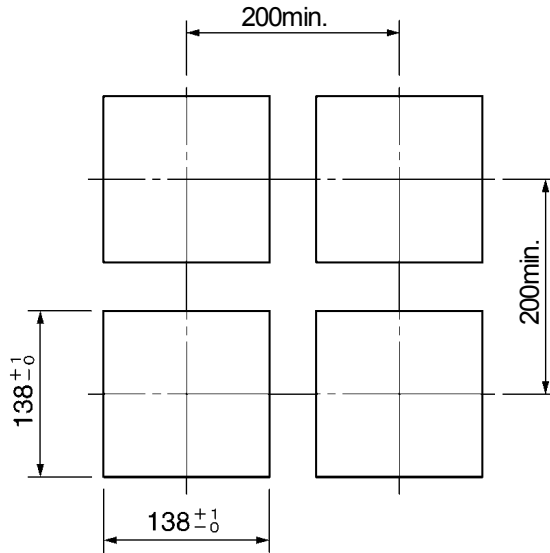
COMMUNICATION INTERFACE

Interface: RS-232C, RS-422A

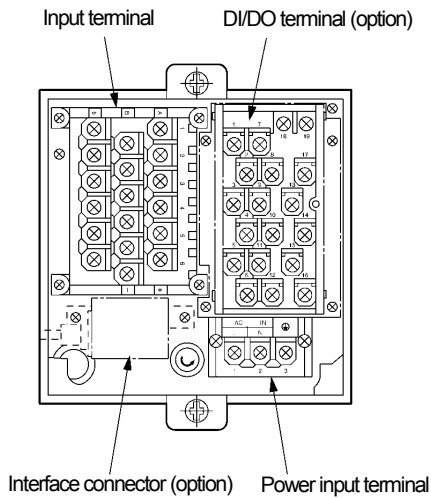
DIMENSIONS (Unit : mm)



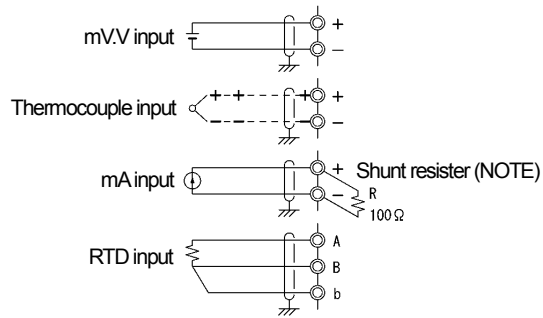
PANEL CUTOUT



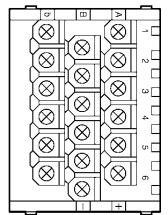
TERMINAL ARRANGEMENT



Wiring

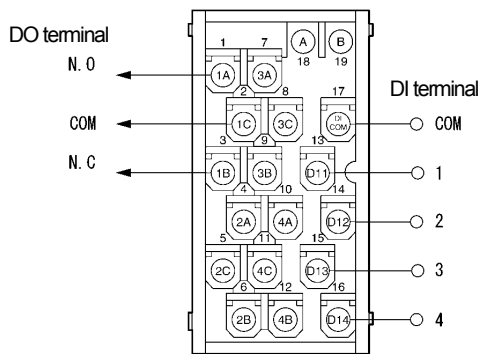


Input terminal



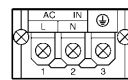
NOTE: Shunt resistor is installed on the terminal

DI/DO terminal (option)

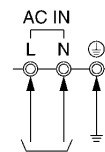


Terminal screw is M4

Power terminal



Power Wiring



MODEL CODE NUMBER

MODEL	BASE INSTRUMENT	
RM1003L	3 pen recorder	
RM1004L	4 pen recorder	
CODE	COMMUNICATION INTERFACE	
0	None	
1	RS-232C	
2	RS-422A	
CODE	D/DO	
00	None	
01	Provided	
CODE	DOOR COLOR	
01A	N1.5 (Black (Standard))	
CODE	CUSTOM SPECIFICATIONS	
00	None	
0Y	Provided (Consult factory)	

If scale ranges for inputs can be selected from among following Sub Code Table, please fill sub code.

Example: RM1004L00001A00 304 – 502 – 010 - 003

No.1: Input TC; Scale range 0 ~ 200°C

No.2: Input 4 ~ 20mA; Scale range 0 ~ 14 pH

No.3: Input 4 ~ 20mA; Scale range 0 ~ 100%

No.4: Input 1 ~ 5V; Scale range 0 ~ 100

SUB CODE TABLE

CODE	SCALE	UNIT	INPUT
001	0 ~ 100	—	-10 ~ 10mV
002	0 ~ 100	—	0 ~ 5V
003	0 ~ 100	—	1 ~ 5V
004	0 ~ 100	—	-10 ~ 10V
005	0 ~ 100	—	4 ~ 20mA
006	0 ~ 100	%	-10 ~ 10mV
007	0 ~ 100	%	0 ~ 5V
008	0 ~ 100	%	1 ~ 5V
009	0 ~ 100	%	-10 ~ 10V
010	0 ~ 100	%	4 ~ 20mA
101	0 ~ 1800	°C	B
102	0 ~ 1600	°C	S
103	0 ~ 1400	°C	S
104	0 ~ 1600	°C	R
105	0 ~ 1400	°C	R
106	0 ~ 1200	°C	R
107	0 ~ 1000	°C	R
108	1250 ~ 1750	°C	R
201	0 ~ 1200	°C	K
202	0 ~ 1000	°C	K
203	0 ~ 800	°C	K
204	0 ~ 600	°C	K
205	0 ~ 400	°C	K
206	0 ~ 300	°C	K
301	0 ~ 600	°C	E
302	0 ~ 400	°C	E
303	0 ~ 400	°C	J
304	0 ~ 200	°C	J
305	0 ~ 150	°C	J
306	0 ~ 100	°C	J
307	0 ~ 400	°C	T
308	0 ~ 200	°C	T
309	0 ~ 150	°C	T

CODE	SCALE	UNIT	INPUT
310	0 ~ 100	°C	T
311	0 ~ 2200	°C	C
312	0 ~ 1850	°C	PR ₄₀₋₂₀
313	0 ~ 1300	°C	PLII
314	0 ~ 1000	°C	PLII
401	0 ~ 300	°C	JPt100
402	0 ~ 150	°C	JPt100
403	-50 ~ 150	°C	JPt100
404	-50 ~ 50	°C	JPt100
405	0 ~ 100	°C	JPt100
406	0 ~ 300	°C	Pt100
407	0 ~ 150	°C	Pt100
408	-50 ~ 150	°C	Pt100
409	-50 ~ 50	°C	Pt100
410	0 ~ 100	°C	Pt100
501	0 ~ 14	pH	1 ~ 5V
502	0 ~ 14	pH	4 ~ 20mA
503	0 ~ 8	pH	4 ~ 20mA
504	6 ~ 14	pH	4 ~ 20mA
505	4 ~ 10	pH	4 ~ 20mA
506	2 ~ 12	pH	4 ~ 20mA
601	0 ~ 1	μS/cm	4 ~ 20mA
602	0 ~ 2	μS/cm	4 ~ 20mA
603	0 ~ 5	μS/cm	4 ~ 20mA
604	0 ~ 10	μS/cm	4 ~ 20mA
605	0 ~ 20	μS/cm	4 ~ 20mA
606	0 ~ 50	μS/cm	4 ~ 20mA
607	0 ~ 100	μS/cm	4 ~ 20mA
608	0 ~ 500	μS/cm	4 ~ 20mA
609	0 ~ 20	mS/cm	4 ~ 20mA
610	0 ~ 2	MΩ	4 ~ 20mA
901	0 ~ 15	ppm	4 ~ 20mA
902	N.E. S.W.N.E.S	—	4 ~ 20mA
903	0 ~ 30	m/s	4 ~ 20mA

STANDARD ACCESSORIES

DESCRIPTION	MODEL	MODEL / NUMBERS		NOTE
		3PEN	4PEN	
Box	H4H10711	1	1	
Lubricating oil	H4A12290	1	1	
Fuse	WPSJ011D000001A	1	1	
Chart paper	HZCGA0105AF001	1	1	50 division
Cartridge pen No.1	HPSR001K0001	1	1	Red
Cartridge pen No.2	HPSR001K0002		1	Blue
Cartridge pen No.3	HPSR001K0003			Green
Cartridge pen No.4	HPSR001K0004			Purple
Ribbon cartridge	HPSR001H0002	1	1	Purple
Angle	H4P17841	2	2	for panel mount
Screw	H4S10218	2	2	for panel mount
Instruction manual	HXPRM10mnL0001	1	1	

CAUTION

Do not install this device before consulting instruction manual

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Specifications are subject to change without notice.

For further information, a quotation or a demonstration please contact to: