NEWINS

하이브리드 기록계

RM 100C

Hybrid Recorder

RM100C is 100mm calibrated hybird recorder in a 144x144 DIN front panel and short depth of 150mm case housing.

The recorder has versatility of universal input and scale in wide ranges and flexibility of user-reconfigurable unique functions. RM100C offers 1, 2 continuous pen and 6 dot point models.

- Short case depth size of 150mm
- IP65: Dust-proof, Water-proof
- Wide LED with 18mm heights display
- Allows user-selected consumables
- RS-232C communication interface in standard specifications
- UL, C-UL, CE approved
- Weights only 1.5kg(Multipoint type)
- Optional portable housing case available

SPECIFICATIONS

● Input signal

DC voltage :

$\pm$10, 0 to 20, 0 to 50, $\pm$200mV DC, 1, 0 to 5,

$\pm$10V DC

Thermocouple :

B, R, S, K, E, J, T, C, Au-Fe, N, PR40-20, PL II , U, L

Resistance temperature detector : Pt100, JPt100

DC current : 4 to 20mA DC

(with extemal shunt resistor 250Ω

⟨Charged : HMSU3081A11⟩)

● Performance

Accuracy : See RANGE TABLE

Dead band : Within 0.2%

Input impedance :

10MΩ min in mV, TC input.

200kΩ min in mV, TC input(with bumout protection).

1MΩ min in Voltage input.

250Ω (Extemal shunt resister) in mA input.

Allowable signal source resistance :

10kΩ max in mV, TC input.

100Ω max in mV, TC input(with bumout protection)

1kΩ max in Voltage input.

10Ω max perline in RTD input.

Normal mode reduction ratio : 60dB min(50/60$\pm$0, 1Hz)

Common mode reduction ratio : 140dB min(50/60$\pm$0, 1Hz)

Isolation resistance : 0.5kV DC 20MΩ min between the each terminal and grounding terminal

Dielectric strength :

1.5kV AC for 1 minute between power terminal and grounding terminal.

0.5kV AC for 1 minute between input termial and grounding terminal.

0.2kV AC for 1 minute between the input terminals

Inter channel maximum noise voltage :

200V AC at 50/60 Hz

Vibration resistance : 10 to 60Hz 1m/s^2 max

Shock resistance : 2m/s^2 max

Clock precision : $\pm$50ppm max

Chart feed accuracy : $\pm$0.1% max

● Structure

Mounting : Panel mount Allowable backward inclination Within 30

Material(Color) :

Case Polycarbonate(Black), Glass 10% UL94-V2

Door, Polycarbonate, UL94-V2(Clear)

Dust-proof, Wate-proof

(Complies with the IEC529-IP65)

● Power Supply

Power voltage(rated) : 100 to 240V AC

Power voltage : 85 to 264V AC

Frequency(rated) : 50/60Hz

Frequency : 45 to 65Hz

● Normal Operating Conditions

Ambient temperature : 0 to 50℃

Ambient humidity : 20 to 80%RH

Supply voltage : 85 to 264V AC

● Alarm(Relay output is optional)

Ouput :

　　Pen Model, 3 point(Built-in option, normally open) ;

　　Multipoint Model, 6 point(Built-in option, normally open)

Alarm types : 2 types(H, L), total 4 levels / channel

Contact point capacity :

　　250V AC, 3A max. loaded;

　　30V AC, 3A max. loaded ;

　　125V AC, 0.5A max. loaded

Hysteresis : 0.5%

Setting accuracy : Digital readout accracy

● Safety Standard and EMI Standard

Electrical safety :

　　IEC1010-1, UL3101-1 installation category Ⅱ and

　　pollution degree 2.

　　UL3101-1

Emissions : EN55011 Group1 Class A

Immunity : EN50082-2

● Communication Interface

RS-232C(Standard) : 1200, 2400, 4800, 9600

RS-485(Option) : 1200, 2400, 4800, 9600

● DI function

Function	Description
Chart Feed Start / Stop	Close : Starts Open : Stops
Change Chart Speed	Close : Chart speed 1 Open : Chart speed 2
Comment Print	Prints programmed characters (up to 16 characters per line)
Manual Print	Close : Start to print
Date and Time Print	Close : Start to print

Up to 3 functions among above can be selected in one recorder.

● Option

Chart sensor : Detects paper-out to output an alam.

INDIVIDUAL SPECIFICATIONS

Block	Item	Pen Model	Multi point Model
Input Unit	Measuring Point	1, 2	6
	Input Sampling	120ms	10s/6ch
	Disply Interval	2.4s	2.5s
Record & Printer	Recording Form	Disposable felt pen	Wire dot with 6-color ink ribbon
	Printing Form	Wire dot(one color ink ribbon)	
	Recording Width	100mm	
	Step Response	1.0s max. to 95% of step-wise input	-
	Dot Print Interval	-	10s/ch (Note 2)
	Chart Paper	Length :16m, Width : 114mm, Folding width : 40mm (Note 3)	
	Chart Speed	5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 90, 100, 120, 150, 160, 180, 200, 240, 300, 360, 375, 450, 600, 720, 750, 900, 1200, 1500, 1800, 2400, 3000, 3600, 4500, 4800, 5400, 6000, 7200, 9000, 10800, 12000mm/h	5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 90, 100, 120, 150, 160, 180, 200, 240, 300, 360, 375, 450, 600, 720, 750, 900, 1200, 1500, 1800, 2400, 3000, 3600, 4500, 4800, 5400, 6000, 7200, 9000, 10800, 12000mm/h
	Recording Color (Note1)	1 pen(Red), 2 pen(Green)	No. 1(Purple), No. 2(Red), No. 3(Green), No. 4(Blue), No. 5(Brown), No. 6(Black)
	Printing Color	Purple	Purple, Red, Green, Blue, Brown, Black
	Weight	1 pen: 2.0kg max, 2pen : 2.5kg max,	1.5kg max.
Power Consumption		30VA max. (at 100VAC)	25VA max. (at 100VAC)

(Note 1) User-changeable arbitrary colors with set-up configuration.

(Note 2) User-selective interval from 10, 20, 30 and 60 seconds.

(Note 3) Clean Chart Paper. Length 12m

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MEASUREMENT RANGE

The junction compensation accuracy is not calculated into digital readout accuray and recording accuracy. The junction compensation accuracy is based on operating conditions: Temperature, $23\pm2°C$; Humidity, $55\pm10\%$RH; Power source 85 to 264V AC; Frequency, 50/60Hz 1%

Wam-up time 30 minutes min., No effect of vibration and shock of over recorder's resistibility.

Junction compensation accuracy:
B, R, S, Au-Fe, PR40-20 $\pm1°C$
K, E, J, T, C, N, PL II , U, L $\pm0.5°C$

Type	Range	Measurement range	Measurement			Analog
			Digital			
			Accuracy		Max. Resolution	Accuracy
DC Voltage/ Current Input		− 10 to mV	$\pm$(0.2% of rdg + 3digits)		10μV	Digital accuracy $\pm$(0.3% of span)
		0 to 20mV	$\pm$(0.2% of rdg + 3digits)		10μV	
		0 to 50mV	$\pm$(0.2% of rdg + 2digits)		10μV	
		− 200 to 200mV	$\pm$(0.2% of rdg + 3digits)		100μV	
		− 1 to 1V	$\pm$(0.1% of rdg + 3digits)		1mV	
		0 to 5V	$\pm$(0.2% of rdg + 2digits)		1mV	
		− 10 to 10V	$\pm$(0.3% of rdg + 3digits)		10mV	
		4 to 20mA	$\pm$(0.2% of rdg + 2digits)		0.01mA	
Themo- couple	B	0.0 to 1820.0°C	$\pm$(0.15% of rdg + 1°C)	(Note 1)	0.1°C	Digital accuracy $\pm$(0.3% of span)
	R1	0.0 to 1760.0°C	$\pm$(0.15% of rdg + 1°C)	(Note 2)		
	R2	0.0 to 1200.0°C	$\pm$(0.15% of rdg + 0.8°C)	(Note 2)		
	S	0.0 to 1760.0°C	$\pm$(0.15% of rdg + 1°C)	(Note 1)		
	K1	− 200.0 to 1370.0°C	$\pm$(0.15% of rdg + 0.7°C)	(Note 3)		
	K2	− 200.0 to 600.0°C	$\pm$(0.15% of rdg + 0.4°C)	(Note 3)		
	K3	− 200.0 to 300.0°C	$\pm$(0.15% of rdg + 0.3°C)	(Note)		
	E1	− 200.0 to 800.0°C	$\pm$(0.15% of rdg + 0.5°C)			
	E2	− 200.0 to 300.0°C	$\pm$(0.15% of rdg + 0.4°C)			
	E3	− 200.0 to 150.0°C	$\pm$(0.15% of rdg + 0.3°C)			
	J1	− 200.0 to 1100.0°C	$\pm$(0.15% of rdg + 0.5°C)	(Note 4)		
	J2	− 200.0 to 400.0°C	$\pm$(0.15% of rdg + 0.4°C)	(Note 4)		
	J3	− 200.0 to 200.0°C	$\pm$(0.15% of rdg + 0.3°C)	(Note 4)		
	T1	− 200.0 to 400.0°C	$\pm$(0.15% of rdg + 0.5°C)	(Note 4)		
	T2	− 200.0 to 200.0°C	$\pm$(0.15% of rdg + 0.4°C)	(Note 4)		
	C	0.0 to 2320.0°C	$\pm$(0.15% of rdg + 1°C)			
	Au-Fe	1.0 to 300.0k	$\pm$(0.15% of rdg + 1K)	(Note 5)	0.1K	
	N	0.0 to 1300.0°C	$\pm$(0.15% of rdg + 0.7°C)		0.1°C	
	PR40-20	0.0 to 1880.0°C	$\pm$(0.15% of rdg + 1°C)	(Note 6)		
	PL II	0.0 to 1390.0°C	$\pm$(0.15% of rdg + 0.7°C)			
	U	− 200.0 to 400.0°C	$\pm$(0.15% of rdg + 0.5°C)	(Note 7)		
	L	− 200.0 to 900.0°C	$\pm$(0.15% of rdg + 0.5°C)	(Note 7)		
Resistance Temperature Detector	Pt100-1	− 200.0 to 650.0°C	$\pm$(0.15% of rdg + 0.3°C)		0.1°C	Digital accuracy $\pm$(0.3% of span)
	Pt100-2	− 200.0 to 200.0°C	$\pm$(0.15% of rdg + 0.2°C)			
	JPt100-1	− 200.0 to 630.0°C	$\pm$(0.15% of rdg + 0.3°C)			
	JPt100-2	− 200.0 to 200.0°C	$\pm$(0.15% of rdg + 0.2°C)			

NOTE
(1) 400 to 600 : $\pm2°C$ A range under a span of 400: Accuracy is out of guarantee
(2) 0 to 100 $\pm3.7°C$ 100 to 300, $\pm1.5°C$
(3) − 200 to − 100°C: $\pm$(0.15% of rdg +1°C)
(4) − 200 to − 100°C: $\pm$(0.15% of rdg +0.7°C)
(5) 1 to 20K: ±2.4K
(6) 0 to 300°C: $\pm37.6°C$ 300 to 800°C, $\pm18.8°C$
(7) − 200 to − 100°C: $\pm$(0.15% of rdg +0.7°C)

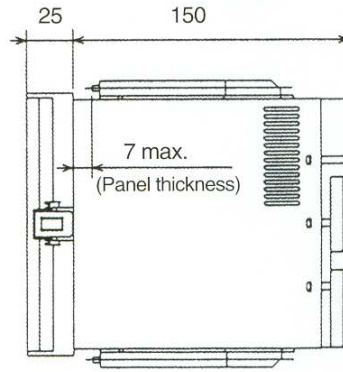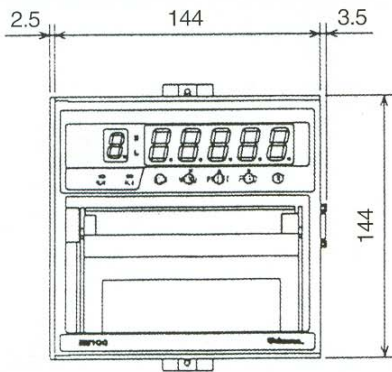**NEWINS**

STANDARD FUNCTIONS

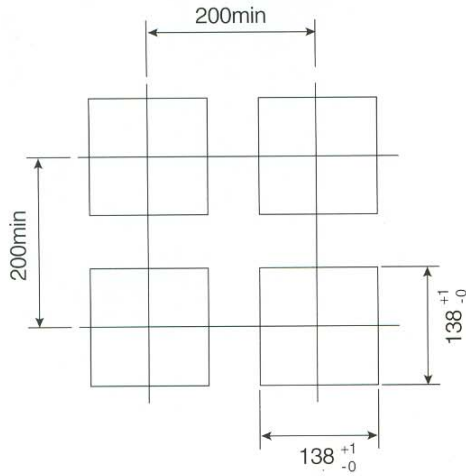| Item	Description
Analog recording	Pen Models: Continuous pen tracing Multi point Model: Dot printing with 6-color ribbon cartridge
Digital display	Indicates channel no., process variable, date, chart speed, alam stepoint if front display.
Logging print	Prints date, time, scale, chart speed, each channel's process variable and engineering unit at a programmed interval.
List print	Prints chart speed, type of input, range, engineering unit, alar, setpoint, comment print status, Printing description, logging print ON/OFF configuration, ZONE recording configuration, point focus configuration
Engineering list print	Prints configuration of channel/tag print switch, alam print, logging print ON/OFF, reference time, interval, alam hysteresis, bumout protection, scaling print ON/OFF, DI function (option)
Affix print (Multipoint Model)	Prints Channel number besides analog recording line.
Manual print	Prints measured data by the front key operation. Analog recording stops during manual printing.
Skip (Multipoint Model)	Abandon dot print of inputs as required
Programming	Programs chart speed, alam setpoint, logging print interval, skip, date and time.
Memory Backup	Back-up for clock by built-in lithium battery for 10 years, 5 years in unpowered state. A non-volatile memory stores configuration and calibration data.
Alarm	Sets 2 types(H, L) of alarms per channel. Sets a total of 4 level.
Chart Speed	Selects Chart speed from 41 types.
Clock Indication	Indicates Year, Month, Day, Hour and Minute. Sets the year in A.D, and adjusts leap year automatically.
Self Diagnostics	Occuming some type of the defect to indicate "ERROR"
Scaling	Indicates and record the input of a unification signal etc. is changed into the engineering scales.

CONFIGURABLE FUNCTIONS

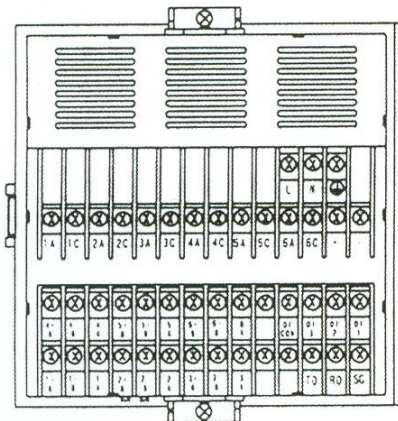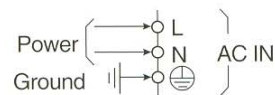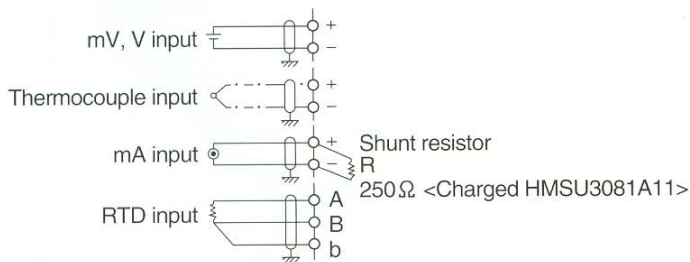| Function	Description
Burnout protection	Sets pointer at over 100% per input when input becomes open for T/C or $\pm$50mV max. input.
Tag Number	Tag number up to 5 characters for pen models/7 characters for multipoint model per channel can be programmed, and prints at logging print.
Temperature Compensation	Inside / outside of reference junction compensation(DE/DH connection) can be specified.
Copy Function	Channel configuration data can be copied to another channel.
Input offset	Input offset per channel can be programmed.
ZONE Recording	Recording on the chart track in specified range per channel.
Point focus recording	Recording by point focus to 1-crease line per channel.
Decade Recording Indicating	Records and indicates up to 5 decades. 2 figures of effective number to indicate and print.
Alarm print	Prints time, channel number, setting number and type of alarm in alarming.
Alarm recovery print	Prints recovery time, recovery channel number, setting number and type of alarm at recovery.
Square root	Square root available.
Integration	Sum, balance, average among channels can be integrated.
Damping (Pen Model)	Digital filtering for measured data(PV) in unsteady process. Filter constant rangeability: 1,0000 to 0.0001 Formula is: $k = 0.64 / T_1$ k = Filter constant T_1 = 99.5% damping
Alarm Hysteresis Width	Alam hysteresis width can be programmed at 0% FS or 0.5% FS.

OUTSIDE DIMENSIONS

2.5   144   3.5

144

25   150

7 max.
(Panel thickness)

Panel Cutout(mm)

200min

200min

$138 ^{+1}_{-0}$

$138 ^{+1}_{-0}$

Unit: mm

TERMINAL ARRANGEMENT

Multipoint Model

Pen Model

mV, V input

Thermocouple input

mA input   Shunt resistor
                  R
                  250Ω <Charged HMSU3081A11>

RTD input
A
B
b

Power   L
                N   AC IN
Ground   ⏚

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MODEL CODE NUMBER

	1	2	3	4	5	6	7	8	9	10	11
	R	M	1	0			C				0

① Model

01	1 pen recorder
02	2 pen recorder
06	6 point recorder

② Communication(Note 1)

| 0 | RS-232C(Standard) |
| 1 | RS-485(Option) |

④ Chart Sensor(Option)

| 0 | None |
| 1 | Yes |

⑤ DI/DO(Option)

0	None
1	Relay output(Note2)
2	3 DI
3	3 DI + relay output(Note2)
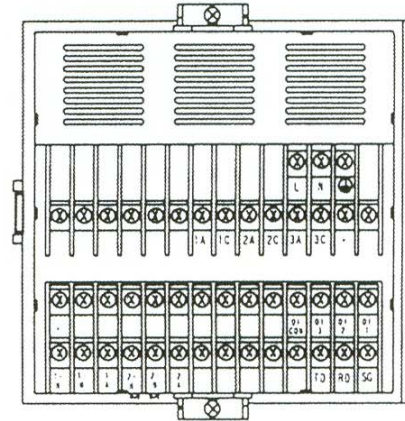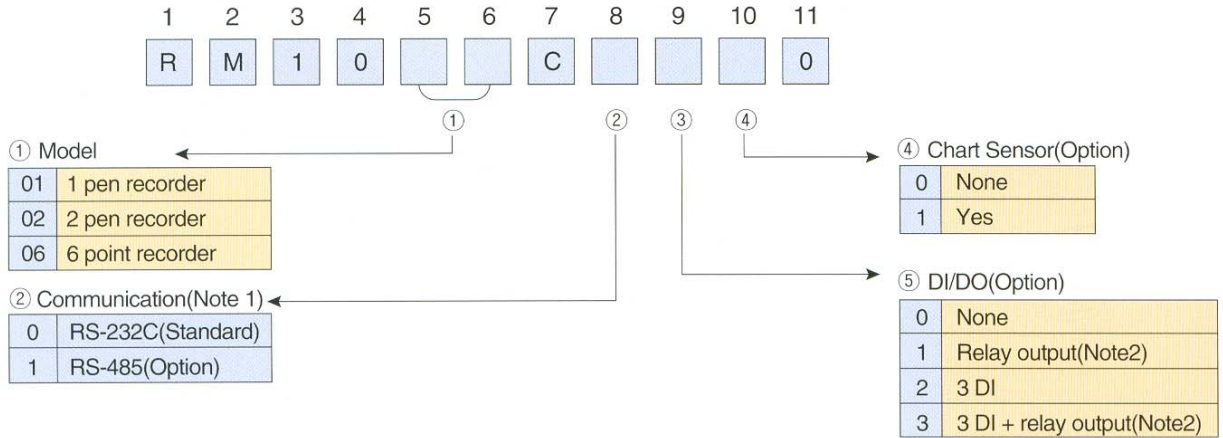
(Note 1) Combination of RS-232C and RS-485 unavailable.
(Note 2) Nos. of relay outputs:
   6 point recorder 6 relays; Pen recorder 3 relays

⚠ **CAUTION**

Do not install this device before consulting instruction manual

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NEWINS   공업용계측기 제조   CE

지시계, 기록계, 콘버터, 조절계, 압력계, 온도계, 열전대, 발브

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