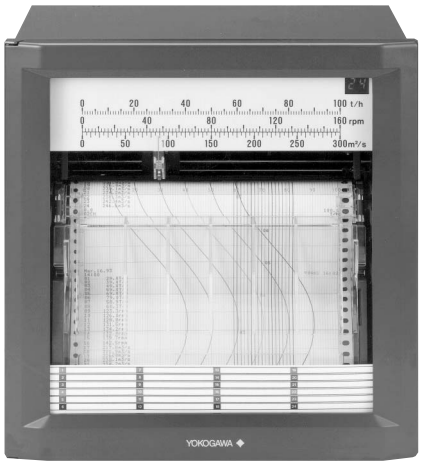
General Specifications

µRS1800 Recorders

GS04H04B01-00E

µRS1800 recorders are compact recorder with 180mm recording width, available as standard in 1, 2, 3, 4-pen, and 6, 12, 18, 24-point dot-printing models. These recorders are supplied with inputs permanently configured as specified by range codes at time of order. Available input types are DC voltage, thermocouple, and RTD. Scale plates will be created with the customer-specified scale and units, allowing measurement values and recording positions to be discerned at a glance. In addition to analog recording, these recorders can also provide digital printout of measured values, date and time, units, scale values, chart speed, and other information. µRS1800 recorders can be used for monitoring and for recording of administrative evidence, in process temperature monitoring, pollution measurement, civil engineering measurement, furnace instrumentation, medical measurement, food refrigeration instrumentation, and many other fields.



STANDARD SPECIFICATIONS

General Specifications

Construction

Mounting: Flush Panel Mounting (Vertical)
Mounting may be inclined up to 30º, rear below front (with horizontal base).

Allowable panel thickness: 2 to 26mm

Material: Case: drawn steel, front door: aluminium die casting.

Finish: Case and door-frame: lamp black (Mansell 0.8Y2.5/0.4 or equivalent)

Door: Splash and dust-proof (based on DIN 40050-IP54).

Dimensions: 288×288×220mm (see dimensional drawings)

Weight (approx.): 1 pen 8.7kg, 2 pen 8.8kg, 3 pen 9.0kg, 4 pen 9.2kg, 6 dot 8.9kg, 12 dot 9.2kg, 18 dot 9.3kg, 24 dot 9.4kg

Model

1, 2, 3, and 4 pen, 6, 12, 18, and 24 dot-model.

Input

Inputs: DCV: Direct Current Voltage input 20mV to 20V range.
TC: Thermo couple.
RTD: Resistance Temperature Detector.
DCA: Direct Current Input (using external shunt resistor (10Ω, 100Ω, 250Ω))

Measuring range: Specifiying range code at ordering

Input Type	Range Code	Measuring Range		
DCV	00	-20.00 to 20.00 mV		
	01	-200.0 to 200.0 mV		
	02	-2.000 to 2.000 V		
	03	-6.000 to 6.000 V		
	04	-20.00 to 20.00 V		
DCV (Linear scaling)	30	-20.00 to 20.00 mV		
	31	-200.0 to 200.0 mV		
	32	-2.000 to 2.000 V		
	33	-6.000 to 6.000 V		
	34	-20.00 to 20.00 V		
DCV (Square root)	40	-20.00 to 20.00 mV		
	41	-200.0 to 200.0 mV		
	42	-2.000 to 2.000 V		
	43	-6.000 to 6.000 V		
	44	-20.00 to 20.00 V		
TC	10	R*1	0 to 1760ºC	32 to 3200ºF
	11	S*1	0 to 1760ºC	32 to 3200ºF
	12	B*1	0 to 1820ºC	32 to 3308ºF
	13	K*1	-200 to 1370ºC	-328 to 2498ºF
	14	E*1	-200 to 800ºC	-328 to 1472ºF
	15	J*1	-200 to 1100ºC	-328 to 2012ºF
	16	T*1	-200 to 400ºC	-328 to 752ºF
	17	N*2	0 to 1300ºC	32 to 2372ºF
	18	W*3	0 to 2315ºC	32 to 4199ºF
	19	L*4	-200 to 900ºC	-328 to 1652ºF
	1A	U*4	-200 to 400ºC	-328 to 752ºF
	1B	PR20-40	0 to 1900ºC	32 to 3452ºF
	1C	Platinel	0 to 1400ºC	32 to 2552ºF
RTD	20	JPt100*5	-200 to 550ºC	-328 to 1022ºF
	21	Pt100*5	-200 to 600ºC	-328 to 1112ºF
	22	Pt50*5	-200 to 600ºC	-328 to 1112ºF
	23	Cu10 (GE)	-200 to 300° C -328 to 572° F	
	24	Cu10 (L&N)		
	25	Cu10 (WEED)		
	26	Cu10 (BAILEY)		
	27	Cu10 (*6)		
	28	Cu10 (*7)		
	29	Cu25		

*1 R, S, B, K, E, J, T: ANSI, IEC 584, DIN IEC 584, JIS C 1602-1981
*2 N : Nicrosil-Nisil, IEC 584, DIN IEC 584
*3 W : W • 5%Re-W • 26%Re (Hoskins Mfg Co)
*4 L : Fe-CuNi, DIN 43710, U: Cu-CuNi, DIN 43710
*5 Pt100 : JIS C 1604-1989, JIS C 1606-1989, IEC 751, DIN IEC 751
JPt100 : JIS C 1604-1981, JIS C 1606-1989
Pt50 : JIS C 1604-1981, JIS C 1606-1986
*6 : a=0.00392@20˚C
*7 : a=0.00393@20˚C

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Measurement interval:

Pen model: 125ms / channel
Dot printing model: 2.5s / 6dot, 5s / 12dot, 10s / 18dot, 10s / 24dot

Calculation:

Linear scaling (specifying at ordering):
Available for DCV range.
Scaling limits: -20000 to 20000
Printout range: -19999 to 20000
Decimal point : selectable at ordering.
Unit : settable at ordering, up to 6 characters (alphanumerical & special characters).

Square root:
Available for DCV range.
Scaling limit : -20000 to 20000
Printout range : -19999 to 20000
Decimal point : selectable at ordering.
Unit: settable at ordering, up to 6 characters (alphanumerical & special characters).

Recording and Printing

Recording method:

Pen model: Disposable felt pens, Plotter pen.
Dot printing model: 6 color wire dot.

Effective recording width: 180mm

Chart: Plain-paper Z-fold chart (20m)

Step response time (pen): Less than 1.5sec (acc. to IEC TC85 method).

Recording period:

Pen model: Continuous for each channel.
Dot printing model: 10s / 6dot, 15s / 12dot, 20s / 18dot, 30s / 24dot (max.) Analog recording interval is depending on the chart speed.

Chart speed: User can select the chart speed which is mentioned below by front panel key.

Pen model (40 speeds): (mm / h)

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	12000		

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Dot printing model (28 speeds): (mm / h)

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

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Chart speed change: speed 1, speed 2 change by remote control signals (option).
Chart speed accuracy: within ±0.1% (for recordings longer than 1000mm, related to the grid of the chart paper)

Relation between chart speed and printout:

Pen model:

Chart Speed	Periodic Printout	Alarm Printout
10 to 1500 mm/h 1800 to 12000 mm/h	Printout No Printout	Printout No Printout

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6, 12dot model:

Chart Speed	Channel No.	Periodic Printout	Alarm Printout
10 to 100 mm/h 120 to 1500 mm/h	Printout No Printout	Printout No Printout	Printout No Printout

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18, 24dot model:

Chart Speed	Channel No.	Periodic Printout	Alarm Printout
10 to 50 mm/h 60 to 1500 mm/h	Printout No Printout	Printout No Printout	Printout No Printout

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Relation between chart speed and printing intervals of periodic printout:

Pen model:

Chart Speed	Printing Interval of Periodic Printout
10, 15 mm/h	Every 8 hours
20, 25, 30 mm/h	Every 4 hours
40, 50, 60 mm/h	Every 2 hours
75, 80, 90, 100, 120 mm/h	Every hour
150, 160, 180 mm/h	Every 30 minutes
200, 240, 300 mm/h	Every 20 minutes
360 to 1500 mm/h	Every 10 minutes
1800 to 12000 mm/h	No printout

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Dot printing model:

Chart Speed	Printing Interval of Periodic Printout			
	6 dot Model	12 dot Model	18 dot Model	24 dot Model
10, 15 mm/h	Every 8 hours	Every 12 hours	Every 12 hours	Every 24 hours
20, 25, 30 mm/h	Every 4 hours	Every 8 hours	Every 8 hours	Every 12 hours
40, 50 mm/h	Every 2 hours	Every 4 hours	Every 4 hours	Every 8 hours
60, 75 mm/h	Every 2 hours	Every 4 hours	No printout	No printout
80, 90, 100 mm/h	Every hour	Every 2 hours	No printout	No printout
120 to 1500 mm/h	No printout	No printout	No printout	No printout

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Recording colors:

Pen model: pen1=red, pen2=green, pen3= blue, pen4=violet, plotter pen= purple
Dot printing model: ch.1, 7, 13, 19=purple, ch.2, 8, 14, 20=red, ch.3, 9, 15, 21= green,, ch.4, 10, 16, 22=blue, ch.5, 11, 17, 23=brown, ch.6, 12, 18, 24=black

Digital printout:

Channel (dot model only): Channel number will be printed during analog recording. Approx. every 25mm this print will occur.

Alarm: At the right side of the chart, Ch. No., type of alarm, ON / OFF time (h / m) will be printed.

Periodic printout: At the left side of the chart, date (m / d), time (h / m), chart speed, and measured data of every channel will be printed
1. Channel No.
2. Measuring printout
3. Scale printout
   At 0% and 100% values will be printed.
4. Printout of recording colors (pen model only)
5. Date, time and chart speed

List printout: Listings of range and alarm setting, etc. will be printed.

Manual printout: Using panel key or remote control option, measured values of that moment will be printed, while trend recording will be interrupted.

SET UP list printout: Listings of settings in SET UP Mode will be printed.

Display

Display method: LED (7 segments, 2 characters)

Digital display: At recording, Recording channel No. (dot printing model only), Alarm, Chart end (optional), Low battery.

Analog scale: User specified equally divided graduation.

Background ; White, Letters / lines / symbol ; Black.

Power Supply

Rated power voltage: 100 to 240VAC, automatically selected depending on the power supply voltage.

Usable power voltage range:

90 to 132, 180 to 250VAC

Rated power frequency: 50 / 60Hz, automatically selected.

Power consumption: (approx.)

	100 V AC Power Source	240 V AC Power Source	Maximum
4 pen	23 VA*	32 VA*	70 VA*
Dot model	14 VA*	20 VA*	70 VA*

* : In Balance

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Alarm

Number of levels: Up to four levels for every channel (High or Low)

Display:

In case of an alarm: The digital display will show alarm.

Other Specifications

Clock: With calendar function.

Clock accuracy: ±100ppm, however not including error due to turning ON / OFF power.

Memory backup: Lithium battery to protect setting parameters.

Life is approx.10 years (at room temperature, and for standard model).

Insulation resistance:

Each terminal to ground terminal:
More than 20MΩ (measured at 500VDC).

Dielectric strength:

Power supply to ground terminal:
1500VAC (50 / 60Hz), 1 min.

Contact output terminal to ground:
1500VAC (50 / 60Hz), 1 min.

Measuring input terminal to ground:
1000VAC (50 / 60Hz), 1 min.

Between measuring input terminal:
1000VAC (50 / 60Hz), 1 min. (except for RTD, since b-terminal is common).

Between remote control terminal to ground:
500VDC, 1 min.

Machine noise: Machine Noise Information Ordinance 3. GSGV, Jan. 18, 1991:

The maximum sound pressure level is equal or less than 60dB (A) according to ISO7779.

CSA

CSA22.2 No1010.1(NRTL/C*) installation category II, pollution degree 2

* For marking that includes NRTL, a mark with “US” (USA) printed on the right side of the CSA mark, and “C” (Canada) printed on the left side appears on this instrument.

CE

EMC directive: EN61326 compliance (Emission: Class A, Immunity: Annex A)

EN61000-3-2 compliant

EN61000-3-3 compliant

EN55011 compliant, Class A Group 1

Low voltage directive: EN61010-1 compliant, measurement category II, pollution degree 2

C-Tick

AS/NZS 2064 compliant, Class A Group 1

Normal Operating Conditions

Power Voltage: 90 to 132, 180 to 250VAC

Power Frequency: 50Hz ±2%, 60Hz ±2%

Ambient temperature: 0 to 50ºC

Ambient humidity: 20 to 80% RH (at 5 to 40 ºC)

Vibration: 10 to 60Hz, less than 0.02G (0.196m/s^2)

Shock: Not permissible

Magnetic Field: Less than 400A/m (DC and 50, 60Hz)

Noise:

Normal mode (50 / 60Hz):
- DCV: Peak value including signal must be less than 1.2 times the measuring range.
- TC: Peak value including signal must be less than 1.2 times the measuring thermal electromotive force.
- RTD: Less than 50mV.

Common mode (50 / 60Hz):
Less than 250VAC rms for the whole range.

Maximum differential noise between channels (50 / 60Hz):
Pen model, 6, 12dot model:
Less than 250VAC rms.
18, 24dot model: Less than 200VAC rms.

Operating position:
Frontwards: 0º
Backwards: Within 30º from horizontal.
Warm-up time: Min. 30 minutes after power has been turned ON.

■ STANDARD PERFORMANCE

Measuring and recording accuracy:

(following specifications apply to operation of the recorder under standard operation conditions ; temperature 23 ±2ºC, humidity 55 ±10%RH, power supply voltage 90 to 132V, 180 to 250V AC, power supply frequency 50 / 60Hz ±1%, warm-up time at least 30 minutes, other ambient conditions like vibration should not adversely affect the recording operation).

Input	Range	Measuring (digital print)		Recording (analog)	
		Measurement Accuracy	Max. Resolution	Recording Accuracy	Resolution
DCV	20 mV	± (0.2% of rdg+3digits)	10 µV	Measurement accuracy ±(0.3% of recording span)	Pen model dead band: 0.2% of recording span Dot printing model resolution: 0.1 mm
	200 mV	± (0.2% of rdg+2digits)	100 µV		
	2 V	± (0.1% of rdg+2digits)	1 mV		
	6 V	± (0.3% of rdg+2digits)	1 mV		
	20 V	± (0.3% of rdg+2digits)	10 mV		
TC	R S B	±(0.15% of rdg+1ºC) but R, S: 0 to 100ºC, ±3.7ºC 100 to 300ºC, ±1.5ºC B: 400 to 600ºC, ±2ºC accuracy less than 400ºC is not specified	0.1ºC	Measurement accuracy ±(0.3% of recording span)	Pen model dead band: 0.2% of recording span Dot printing model resolution: 0.1 mm
	K	±(0.15% of rdg+0.7ºC) but -200 to -100ºC ±(0.15% of rdg+1ºC)			
	E	±(0.15% of rdg+0.5ºC)			
	J T	±(0.15% of rdg+0.5ºC) but J: -200 to -100ºC ±(0.15% of rdg+0.7ºC)	0.1ºC		
	N	±(0.15% of rdg+0.7ºC)			
	W	±(0.15% of rdg+1ºC)	0.1ºC		
	L U	±(0.15% of rdg+0.5ºC) but L: -200 to -100ºC ±(0.15% of rdg+0.7ºC)	0.1ºC		
	PR20-40	0 to 450ºC: Not specified 450 to 750ºC: ±(0.9% of rdg+3.2ºC) 750 to 1100ºC: ±0.9% of rdg+1.3ºC) 1100 to 1900ºC: ±(0.9% of rdg+0.4ºC)	0.1ºC		
	Platinel	±(0.25% of rdg+2.3ºC)			
RTD	Pt100 JPt100	±(0.15% of rdg+0.3ºC)	0.1ºC	Measurement accuracy ±(0.3% of recording span)	Pen model dead band: 0.2% of recording span Dot printing model resolution: 0.1 mm
	Pt50	±(0.3% of rdg+0.6ºC)			
	Cu10 (All)	±(0.4% of rdg+1.0ºC)			
	Cu25	±(0.3% of rdg+0.8ºC)			

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Note: Recording span is 180 mm.

Accuracy in case of scaling:

accuracy during scaling (digits) =
measuring accuracy (digits) × multiplier+2 digits (rounded up)
where the multiplier = scaling span digits / recording span digits

Maximum allowable input voltage:

Less than 2VDC ranges and TC ranges:	±10VDC (cont.)
6 to 20VDC ranges:	±30VDC (cont.)

Reference junction compensation accuracy (above 0ºC):

Type R, S, B, W:	±1ºC
Type K, J, E, T, N, L, U:	±0.5ºC

Input resistance:

Less than 2VDC ranges and TC ranges:	More than 10MΩ
6 to 20VDC ranges:	1MΩ (approx.)

Input source resistance:

DCV, TC input:	Less than 2kΩ
RTD input:	Less than 10Ω / wire (Resistance is well-balanced between 3 wires)

Input Bias Current: Less than 10nA (however, when burnout is specified for TC: 100nA)

Maximum common mode voltage:

250VAC rms (50 / 60Hz)

Maximum differential noise between channels:

Pen model, 6, 12dot model:	Less than 250VAC rms (50 / 60Hz)
18, 24dot model:	Less than 200VAC rms (50 / 60Hz)

Interference between channels:

120dB (500Ω, the deviation in the case that 30V is applied to another channel)

Common mode rejection ratio:

120dB (50 / 60Hz ±0.1%, 500Ω imbalance between minus terminal and ground.

Normal mode rejection ratio: 40dB (50 / 60Hz ±0.1%)

Effect of Operating Conditions

Effect of ambient temperature:

Effect of ambient temperature variation of 10ºC:

Digital print:	within ±(0.1% of rdg+1digit)
Recording:	within ±(0.1% of rdg+1digit) ±0.2% of recording span (excluding RJC error)

Effect of power supply:

Effect of variation within 90 to 132VAC or 180 to 250VAC in rated power supply voltage (50 or 60Hz is reference):

Digital print:	within ±1digit
Recording:	within ±0.1% of recording span

Effect of rated power frequency variation of ±2Hz (100VAC is reference):

Digital print:	within ±(0.1% of rdg+1digit)
Recording:	same as digital print

Effect of magnetic field:

Effect of AC (50 / 60Hz) or DC 400AT / m field:

Digital print:	within ±(0.1% of rdg+10digit)
Recording:	less than ±0.5% of recording span

Effect of radio-frequency Electromagnetic Field:

Effect of 80 - 1000MHz, 10V/m field

(Pen model)	Digital print:	within ±(5% of range +1 digit)
	Recording:	wihin ±(5% of range)
(Dot model)	Digital print:	within ±(20% of range +1 digit)
	Recording:	within ±(20% of range)

Effect of radio-frequency Common Mode:

Effect of 0.15 - 80MHz, 10V

Digital print:	within ±(5% of range +1 digit)
Recording:	wihin ±(5% of range)

Effect of input source resistance:

Effect of input source resistance variation of +1kΩ:

1. DCV range

Ranges less than 2V:	within ±10μV
Ranges more than 6V:	within -0.1% of rdg

2. TC range
within ±10 μV (However ±100 μV when TC burnout protection is specified)
3. RTD range
Effect of 10Ω per wire (resistances of 3 wires must be equal):

Digital print:	within ±(0.1% of rdg+1digit)
Recording:	within ±(0.1% of rdg+1digit) ±0.1% of recording span

Effect of difference of 3 wires:

Digital print :	0.1ºC per 40mΩ (approx.)

Effect of operating position:

Digital print:	within ±(0.1% of rdg+1digit) (within 30º backwards)
Recording:	within ±(0.1% of rdg+1digit) ±0.1% of recording span (within 30º backwards)

Effect of Vibration:

Effect when sine-wave motion of frequency 10 to 60Hz and acceleration of 0.02G (0.196m/s^2) is applied to the instrument in the direction of three axes for two hours:

Digital print:	within ±(0.1% of rdg+1 digit)
Recording:	within ±(0.1% of rdg+1 digit) ±0.1% of recording span

Transport and Storage Conditions

No malfunction will occur under these conditions, however when returning to normal operation conditions, calibration might be necessary.

Temperature:	-25ºC to 60ºC
Humidity:	5 to 95% RH (no condensation)
Vibration:	10 to 60Hz, 0.5G (4.9m/s^2)
Shock:	less than 40G (392m/s^2) (inside packing)

■ SPECIFICATIONS OF OPTIONAL FUNCTIONS

Alarm Output Relay (/A1, /A2, /A3, /A4, /A5):

When alarm occurs, output relay on rear terminal will be activated.

1. Relay contact rating:	250VDC / 0.1A (resistive load), 250VAC / 3A (50 or 60Hz)
2. Type of relay output:	NO-C-NC

TC Burnout Protection Up Scale Action (/B1):

TC Burnout Protection Down Scale Action (/B2):

Normal:	Less than 2kΩ
Burnout:	More than 10MΩ

Measuring current: approx. 100nA

RS-422A Communication Interface (/C3):
By using this communication function, setting and control of data can be done by a host-computer.

1. Synchronizing format:	Start-stop asynchronous transmission
2. Specification:	Conform to EIA RS-422A standard
3. Communication system:	4-wire half-duplex multi-drop connection (1: N (N=1 to 16))
4. Communication rate:	75, 150, 300, 600, 1200, 2400, 4800, 9600bps
5. Data length:	7 or 8bit
6. Stop bit:	1 or 2bit
7. Parity:	ODD, EVEN or NONE
8. Communication distance:	Up to 500m
9. Communication mode:	ASCII (control / setting / measured data) or BINARY (measured data)

NOTE) Setting of address, communication rate, data length, stop bit and parity is done by front panel key.

Pen Offset Compensation (/D1):
2, 3 or 4pen model recording with common time axis.

FAIL / Chart End Detection and Output (/F1):
If an error in the CPU board occurs, or when the chart reaches its end, output relay on the rear terminal will be activated. Besides, when the chart reaches its end, 'CA' indicator will shown on the display.

Relay contact rating: 250VDC / 0.1A (resistive load), 250VAC / 3A (50 or 60Hz)

Clamped Input Terminal (/H2):
Using clamped input terminals as input terminal.

Non-glare Door Glass (/H3):
Adds special non-glare treatment to front door glass

Digital display (/H8):
Provides digital display

Display method:
- Pen model:
  - LED for digital display (7 segments, 7 characters)
  - LED for status display (3 LED's)
  - LED for unit display (4 LED's, mV, V, degC, spare)
- Dot printing model:
  - LED for digital display (7 segments, 8 characters)
  - LED for status display (3 LED's)
  - LED for unit display (3 LED's, mV, V, degC)

Digital display:

AUTO:	Channel No., kind of alarm, measured values, for each channel alternately.
MAN:	Channel No., kind of alarm, measured values, for one specific channel.
DATE:	Year/month/date/ will be displayed.
TIME:	Hour/min/sec. will be displayed.
OFF:	Display off except status display.

Status display:

RCD:	Recording in progress.
ALM:	Shared alarm (not corresponding to any channel).
BAT:	Low battery
Chart end:	RCD display will start blinking when chart ends (only for the /F1 option).

Unit display: Unit (mV, V, degC) of each channel will be displayed.

24 V DC Power Supply (/P1):

Rated supply voltage:	24VDC
Applicable supply volatge:	21.6 to 26.4 VDC
Maximum power consumption:	Approx. 50VA

Remote Control (/R1):

	Signal
1. Recording start / stop	Level
2. Chart speed change	Level
3. Manual print start	Trigger

Temperature Unit Change (/D2): Using 'ºF' as Temperature unit

MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
437501	.....	µRS1800 1-pen model
437502	.....	µRS1800 2-pen model
437503	.....	µRS1800 3-pen model
437504	.....	µRS1800 4-pen model
437506	.....	µRS1800 6-point dot-printing model
437512	.....	µRS1800 12-point dot-printing model
437518	.....	µRS1800 18-point dot-printing model
437524	.....	µRS1800 24-point dot-printing model
1-pen or 1st pen input of 2-, 3- or 4-pen models	-00 to -44	
Dot-printing model	-00 to -94	
2nd pen input of 2-, 3- or 4-pen model	-00 to -44	
3rd pen input of 3- or 4-pen model	-00 to -44	
4th pen input of 4-pen model	-00 to -44	
Optional features	/ □	

Measuring Range

Input Type	Range Code	Measuring Range	Range Code	Measuring Range
DCV	00	-20.00 to 20.00 mV	03	-6.000 to 6.000 V
	01	-200.0 to 200.0 mV	04	-20.00 to 20.00 V
	02	-2.000 to 2.000 V		
DCV (linear scaling)	30	-20.00 to 20.00 mV	33	-6.000 to 6.000 V
	31	-200.0 to 200.0 mV	34	-20.00 to 20.00 V
	32	-2.000 to 2.000 V		
DCV (square root scaling)	40	-20.00 to 20.00 mV	43	-6.000 to 6.000 V
	41	-200.0 to 200.0 mV	44	-20.00 to 20.00 V
	42	-2.000 to 2.000 V		
TC	10	R 0 to 1760ºC	32 to 3200ºF	
	11	S 0 to 1760ºC	32 to 3200ºF	
	12	B 0 to 1820ºC	32 to 3308ºF	
	13	K -200 to 1370ºC	-328 to 2498ºF	
	14	E -200 to 800ºC	-328 to 1472ºF	
	15	J -200 to 1100ºC	-328 to 2012ºF	
	16	T -200 to 400ºC	-328 to 752ºF	
	17	N 0 to 1300ºC	32 to 2372ºF	
	18	W 0 to 2315ºC	32 to 4199ºF	
	19	L -200 to 900ºC	-328 to 1652ºF	
	1A	U -200 to 400ºC	-328 to 752ºF	
	1B	PR20-40 0 to 1900ºC	32 to 3452ºF	
	1C	Platinel 0 to 1400ºC	32 to 2552ºF	
RTD	20	JPt100 -200 to 550ºC	-328 to 1022ºF	
	21	Pt100 -200 to 600ºC	-328 to 1112ºF	
	22	Pt50 -200 to 600ºC	-328 to 1112ºF	
	23	Cu10 (GE)		
	24	Cu10 (L&N)		
	25	Cu10 (WEED)		
	26	Cu10 (BAILEY) -200 to 300ºC	-328 to 572ºF	
	27	Cu10 (*1)		
	28	Cu10 (*2)		
	29	Cu25		
Multi-range dot printing model	62	Two measuring ranges for DCV		
	63	Three measuring ranges for DCV		
	64	Four measuring ranges for DCV		
	72	Two measuring ranges for DCV / TC		
	73	Three measuring ranges for DCV / TC		
	74	Four measuring ranges for DCV / TC		
	82	Two measuring ranges for DCV / TC / RTD (except Cu10, 25)		
	83	Three measuring ranges for DCV / TC / RTD (except Cu10, 25)		
	84	Four measuring ranges for DCV / TC / RTD (except Cu10, 25)		
	92	Two measuring ranges for DCV / TC / RTD (Cu10, 25)		
	93	Three measuring ranges for DCV / TC / RTD (Cu10, 25)		
	94	Four measuring ranges for DCV / TC / RTD (Cu10, 25)		

Pt50 : JIS C 1604-1981. JIS C 1606-1986
JPt100 : JIS C 1604-1981. JIS C 1606-1989
Pt100 : JIS C 1604-1989. JIS C 1606-1989. DIN IEC 751. IEC 751

*1: a=0.00392 @20ºC
*2: a=0.00393 @20ºC

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OPTION CODES

Option	Option Code	Description
Alarm output relay; 2 points Alarm output relay; 4 points Alarm output relay; 6 points Alarm output relay; 12 points Alarm output relay; 24 points	/ A1 / A2 / A3 / A4 / A5	Relay contact rating: 250 V AC and 3 A, or 250 V DC and 0.1 A*1
TC burnout protection (upscale) TC burnout protection (downscale)	/ B1 / B2	Open-circuiting of input causes indication to drive upscale. Open-circuiting of input causes indication to drive downscale.
RS-422A communication interface	/ C3	A host computer can control and set parameters or receive the data.
Pen offset compensation	/ D1	Eliminates the offset of time-phase (phase difference) between the pen traces in 2-, 3-, and 4-pen recorders.
Temperature unit change	/ D2	Uses 'ºF' for temperature unit
FAIL / chart-end detection / output	/ F1	Detecting failure in the CPU or when the chart paper reaches its end, displays the detection and outputs transfer contacts. *2
Clamped input terminals	/ H2	Uses clamps for input terminals
Non-glare glass door	/ H3	Provides specially treated non-glare glass for front door
Digital display	/ H8	Provides digital display
24 V DC power supply	/ P1	24 V DC power supply
Remote Control	/ R1	Enables the following control functions: • recording start / stop, • chart speed change, • manual printout start.
Scale plate	/ SC12 / SC13 / SC22 / SC23 / SC33	Single scale and double marking for dot-printing model *3 Single scale and triple marking for dot-printing model Double scale and double marking for dot-printing model Double scale and triple marking for dot-printing model Triple scale and triple marking for dot-printing model

*1: /A1 to /A5 cannot be specified together.
/A4 and /A5 only for dot recorders.
*2: /F1 cannot be combined with /A5
In case of 6-dot model, /F1 cannot be combined with /A4
*3: No option code need be specified for a pen model or single scale with single marking for dot-printing model.

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STANDARD ACCESSORIES

Name		1 Pen	2 Pen	3 Pen	4 Pen	6, 12, 18, 24, Dot
Z-fold cart		1	1	1	1	1
6 color ribbon cassette		—	—	—	—	1
Disposable felt-pen cartridge	Red	1	1	1	1	—
	Green	—	1	1	1	—
	Blue	—	—	1	1	—
	Violet	—	—	—	1	—
Plotter pen	Purple	1	1	1	1	—
Mounting brackets		2	2	2	2	2
Fuse (250 V 800 mA Timelag) (24 V DC model: 250 V 5 A Timelag)		1	1	1	1	1
Instruction manual		1	1	1	1	1
Reference sheet (Quick operation guide)		1	1	1	1	1

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■ SPARES

Name		Parts No.	Order Q'ty (Units)	Description
Z-fold cart		B9573AN	10	1 chart / unit
6 color ribbon cassette		B9906JA	1	1 piece / unit
6 color ribbon cassette (for TAIWAN)		B9906JF*	1	1 piece / unit
Disposable felt-pen cartridge	Red	B9930BP	1	3 pieces / unit
	Green	B9930BQ	1	
	Blue	B9930BR	1	
	Violet	B9930BS	1	
Plotter pen	Purple	B9902AR	1	
Mounting brackets		B9900BX	2	1 piece / unit
Fuse (250 V 800 mA Timelag)		A1512EF	1	4 pieces / unit
Fuse for 24 V DC model (250 V 5 A Timelag)		A1513EF	1	3 pieces / unit
Lubricating oil (for dot printing model)		B9901AZ	1	1 piece / unit

* In case of orders for spares for TAIWAN, please order this part No.

Name	Model Code	Specification
Shunt resistor (for screw input terminal)	4159 20	250Ω ± 0.1%
	4159 21	100Ω ± 0.1%
	4159 22	10Ω ± 0.1%
Shunt resistor (for clamped input terminal)	4389 20	250Ω ± 0.1%
	4389 21	100Ω ± 0.1%
	4389 22	10Ω ± 0.1%

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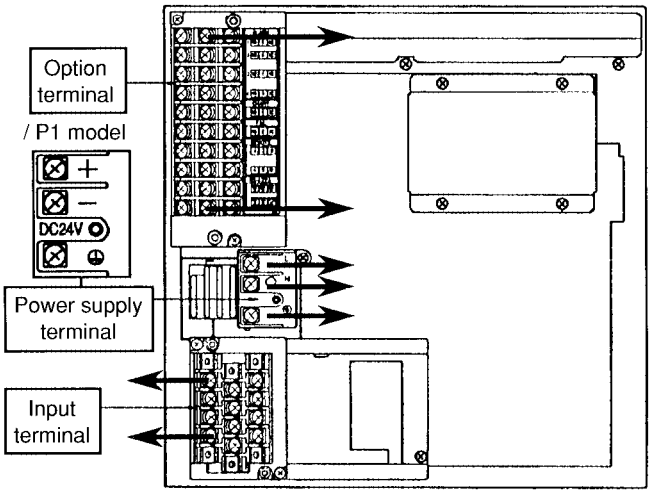
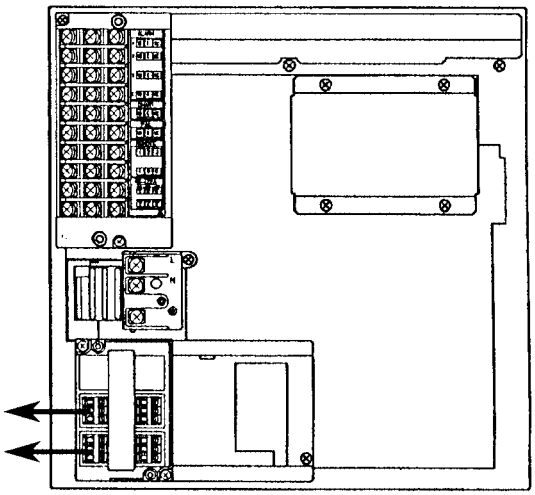
■ REAR TERMINAL ARRANGEMENTS

Screw Type Input Terminal



(4 pen model)

Clamped Type Input Terminal

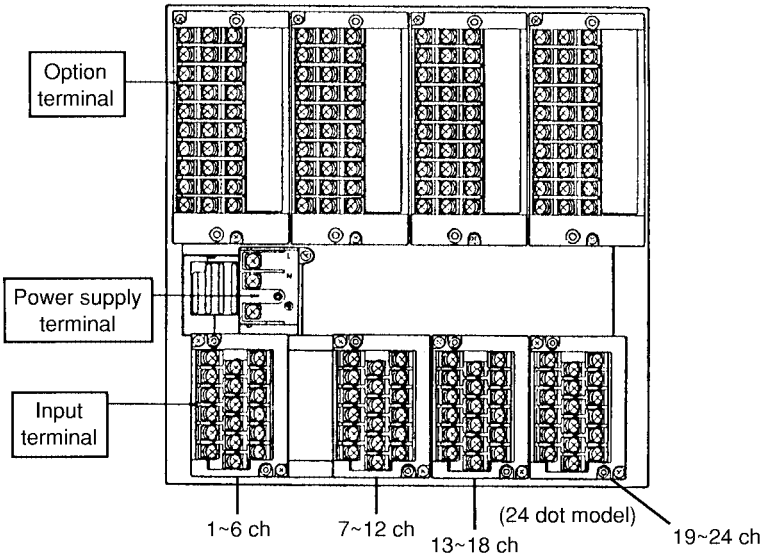


(4 pen model)

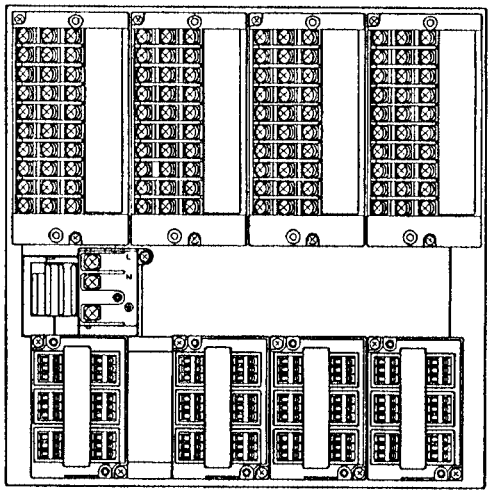
Note: The arrows show the direction in which the wires will be running when connected to the terminal.

Weight 4375 01 : Approx. 8.7 kg
4375 02 : Approx. 8.8 kg
4375 03 : Approx. 9.0 kg
4375 04 : Approx. 9.2 kg

Screw Type Input Terminal



Clamped Type Input Terminal



(24 dot model)

Weight 4375 06 : Approx. 8.9kg
4375 12 : Approx. 9.2kg
4375 18 : Approx. 9.3kg
4375 24 : Approx. 9.4kg

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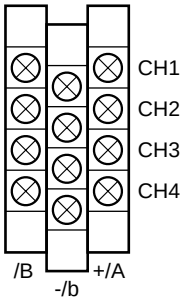
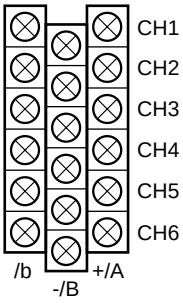
Input Terminals

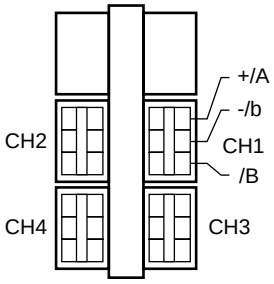
4 pen Screw Type



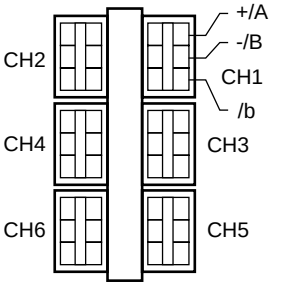
6 Dot Screw Type



4 Pen Clamped Type (/H2)

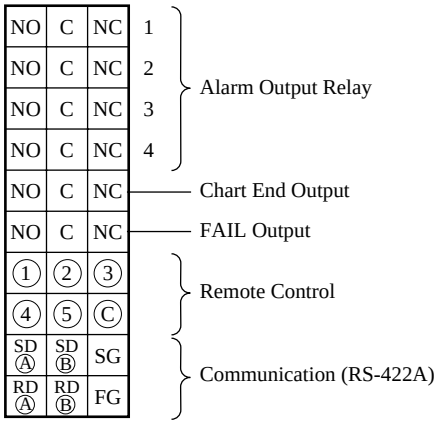


6 Dot Clamped Type (/H2)

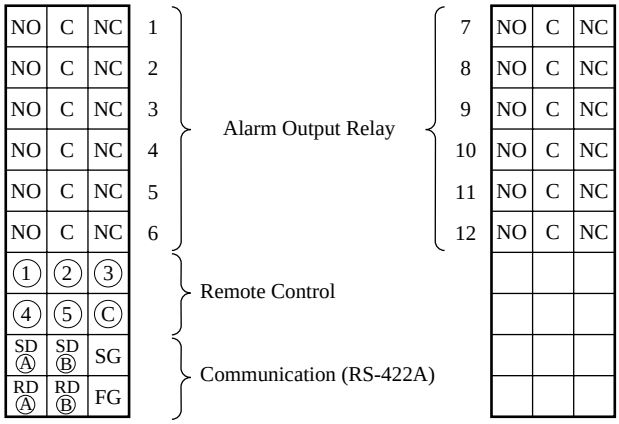


Option Terminals

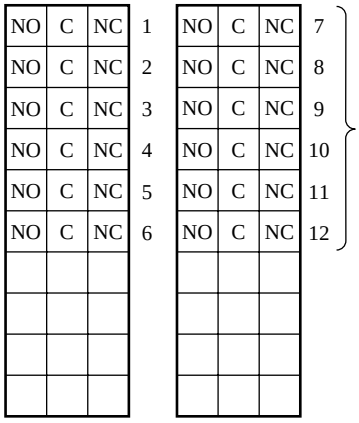
/ A2 /C3 / F1 / R1 Combination



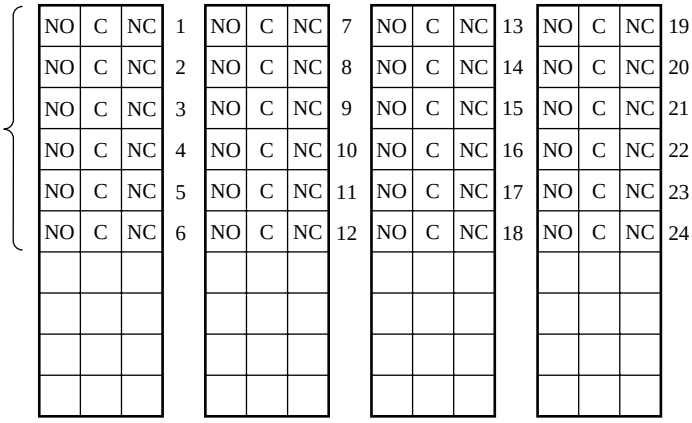
/ A4 /C3 / R1 Combination



/ A4



/ A5



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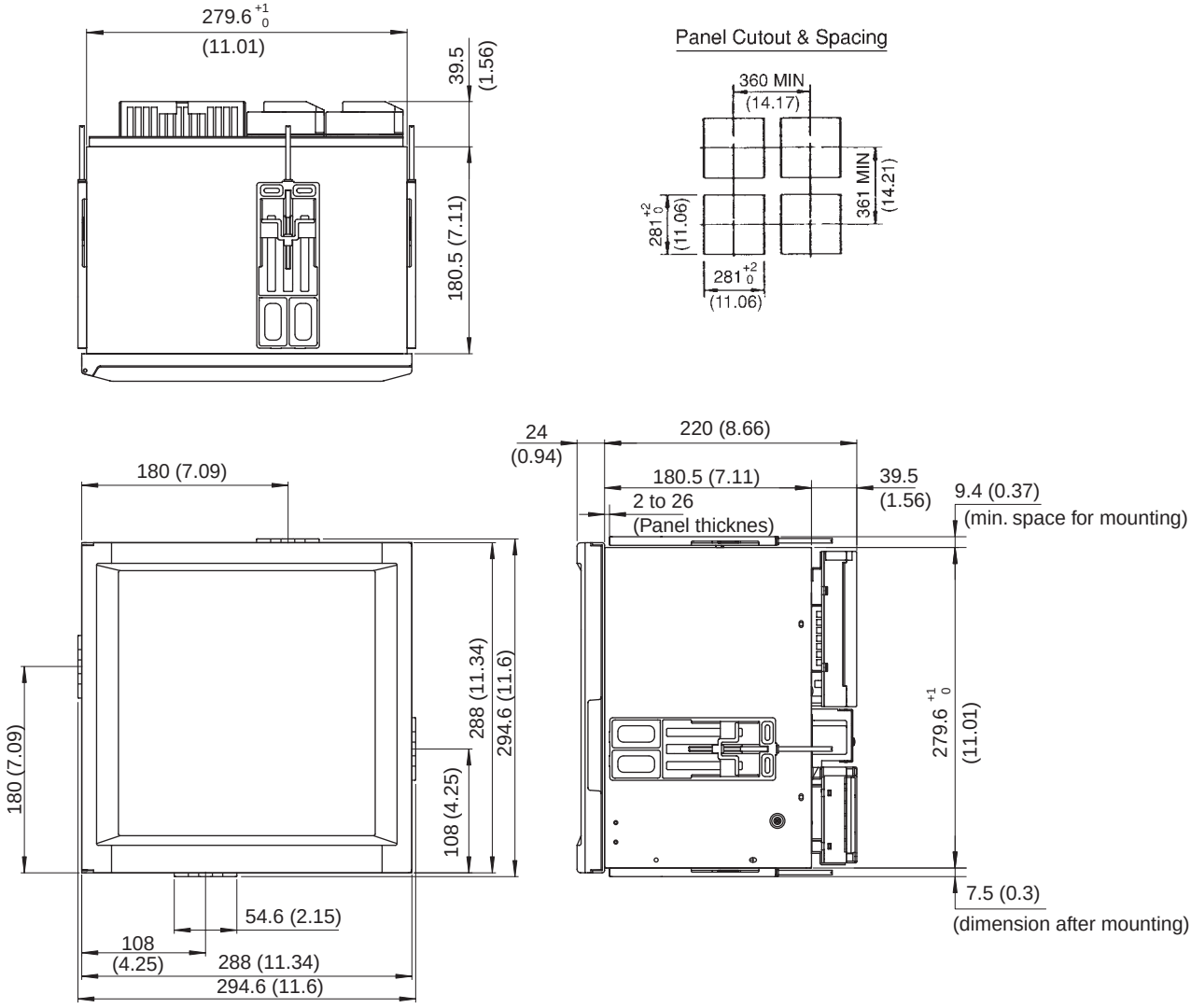
■ DIMEMSION

unit: mm
(approx. inch)



Note: The μRS1800 should be mounted by only two brackets, either on the top & bottom of the recorder, or on the left & right side of the recorder.
If not specified, the tolerance is ±3%. However, in case of less than 10 mm, the tolerance is ±0.3 mm.

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