

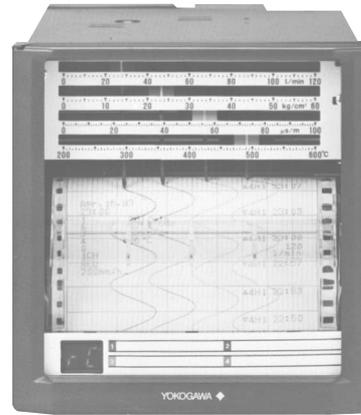
# General Specifications

## μRS1000 Recorders



GS 04D06B01-00E

μRS1000 recorders are compact recorder with 100mm recording width, available as standard in 1-pen, 2-pen, 3-pen, 4-pen, and 6-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. μRS1000 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.



Measuring range: Specifying range code at ordering

### STANDARD SPECIFICATIONS

#### General Specifications

##### Construction

Mounting: Flush Panel Mounting (Vertical), mounting next to each other (horizontal and vertical). Mounting may be inclined up to 30°, rear below front (with horizontal base).

Allowable panel thickness: 2 to 26 mm

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: 144×144×220mm (see dimensional drawings)

Weight (approx.): 1 pen 3.1 kg, 2 pen 3.3 kg, 3 pen 3.5 kg, 4 pen 3.7 kg, 6 dot 3.4 kg

##### Model

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

##### Input

DCV: Direct Current Voltage input 20m V to 20 V range.

TC: Thermo couple.

RTD: Resistance Temperature Detector.

DCA: Direct Current Input (using external shunt resistor (10 Ω, 100 Ω, 250 Ω))

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 1760 °C 32 to 3200 °F
	11	S*1	0 to 1760 °C 32 to 3200 °F
	12	B*1	0 to 1820 °C 32 to 3308 °F
	13	K*1	-200 to 1370 °C -328 to 2498 °F
	14	E*1	-200 to 800 °C -328 to 1472 °F
	15	J*1	-200 to 1100 °C -328 to 2012 °F
	16	T*1	-200 to 400 °C -328 to 752 °F
	17	N*2	0 to 1300 °C 32 to 2372 °F
	18	W*3	0 to 2315 °C 32 to 4199 °F
	19	L*4	-200 to 900 °C -328 to 1652 °F
	1A	U*4	-200 to 400 °C -328 to 752 °F
	1B	PR20-40	0 to 1900 °C 32 to 3452 °F
	1C	Platine1	0 to 1400 °C 32 to 2552 °F
RTD	20	JPt100*5	-200 to 550 °C -328 to 1022 °F
	21	Pt100*5	-200 to 600 °C -328 to 1112 °F
	22	Pt50*5	-200 to 600 °C -328 to 1112 °F
	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	

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- \*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 α=0.00392 @ 20 °C
- \*7 α=0.00393 @ 20 °C

Measurement interval:

Pen model: 125ms/channel  
 Dot printing model: 2.5s/6dot

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: 100 mm

Chart: Plain-paper Z-fold chart (16 m)

Step response time (pen): Less than 1sec (acc. to IEC TC85 method).

Recording period:

Pen model: Continuous for each channel.  
 Dot printing model: 6 channel/10 sec (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	Printout	Printout
1800 to 12000 mm/h	No printout	No Printout

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Dot printing model:

Chart Speed	Channel No.	Periodic Printout	Alarm Printout
10 to 100 mm/h	Printout	Printout	Printout
120 to 1500 mm/h	No printout	No 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
10, 15mm/h	Every 8 hours
20, 25, 30mm/h	Every 4 hours
40, 50, 60, 75mm/h	Every 2 hours
80, 90, 100mm/h	Every hour
120 to 1500mm/h	No printout

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Recording colors:

Pen model: pen1=red, pen2=green, pen3= blue, pen4=violet, plotter pen= purple

Dot printing mode: ch.1=purple, ch.2=red, ch.3= green, ch.4=blue, ch.5=brown, ch.6=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 240 VAC, automatically selected depending on the power supply voltage.

Usable power voltage range: 90 to 132, 180 to 250 VAC  
Rated power frequency: 50/60 Hz, automatically selected.

Power consumption: (approx.)

	100 VAC Power Source	240 VAC Power Source	Maximum
4 pen	19 VA*	25 VA*	70 VA*
6 dot	14 VA*	21 VA*	50 VA*

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\*: In Balance

### 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:  $\pm 100$ ppm, 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 20M $\Omega$  (measured at 500 VDC).

Dielectric strength:

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

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

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

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

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

Machine noise:

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

The maximum sound pressure level is equal or less than 60 dB (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 250 VAC

Power Frequency: 50 Hz $\pm 2\%$ , 60 Hz $\pm 2\%$

Ambient temperature: 0 to 50 °C

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

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

Shock: Not permissible

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

Noise:

Normal mode (50/60 Hz):

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 50 mV.

Common mode (50/60 Hz):

Less than 250 VAC rms for the whole range.

Maximum differential noise between channels (50/60 Hz): Less than 250 VAC rms.

Operating position: Frontwards: 0°

Backwards: Within 30° 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±2 °C, humidity 55±10%RH, power supply voltage 90 to 132 V, 180 to 250 VAC, power supply frequency 50/60 Hz ±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+3 digits)	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+2 digits)	100 µV		
	2 V	±(0.1% of rdg+2 digits)	1 mV		
	6 V	±(0.3% of rdg+2 digits)	1 mV		
	20 V	±(0.3% of rdg+2 digits)	10 mV		
TC	R S B	±(0.15% of rdg+1 °C) but R, S: 0 to 100 °C, ±3.7 °C 100 to 300 °C, ±1.5 °C B: 400 to 600 °C, ±2 °C accuracy less than 400 °C is not specified	0.1 °C	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+0.7 °C) but -200 to -100 °C ±(0.15% of rdg+1 °C)			
	E	±(0.15% of rdg+0.5 °C)			
	J T	±(0.15% of rdg+0.5 °C) but J: -200 to -100 °C ±(0.15% of rdg+0.7 °C)	0.1 °C		
	N	±(0.15% of rdg+0.7 °C)			
	W	±(0.15% of rdg+1 °C)	0.1 °C		
	L U	±(0.15% of rdg+0.5 °C) but L: -200 to -100 °C ±(0.15% of rdg+0.7 °C)	0.1 °C		
	PR20-40	0 to 450 °C: Not specified 450 to 750 °C: ±(0.9% of rdg+3.2 °C) 750 to 1100 °C : ±(0.9% of rdg+1.3 °C) 1100 to 1900 C : ±(0.9% of rdg+0.4 °C)	0.1 °C		
	Platinel	±(0.25% of rdg+2.3 °C)	0.1 °C		
	RTD	Pt100 JPt100	±(0.15% of rdg+0.3 °C)		
Pt50		±(0.3% of rdg+0.6 °C)			
Cu10 (All)		±(0.4% of rdg+1.0 °C)			
Cu25		±(0.3% of rdg+0.8 °C)			

Note: Recording span is 100mm.  
 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:  
 ±10 VDC (cont.)  
 6 to 20VDC ranges: ±30 VDC (cont.)  
 Reference junction compensation accuracy (above 0 °C):  
 Type R, S, B, W: ±1 °C  
 Type K, J, E, T, N, L, U: ±0.5 °C  
 Input resistance:  
 Less than 2 VDC ranges and TC ranges: More than 10MΩ  
 6 to 20 VDC 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: 100 nA)  
 Maximum common mode voltage:  
 250 VAC rms (50/60 Hz)  
 Maximum differential noise between channels:  
 250 VAC rms (50/60 Hz)  
 Interference between channels:  
 120 dB (500 Ω, the deviation in the case that 30 V is applied to another channel)  
 Common mode rejection ratio:  
 120 dB (50/60 Hz ±0.1%, 500 Ω imbalance between minus terminal and ground.  
 Normal mode rejection ratio: 40 dB (50/60 Hz ±0.1%)

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**Effect of Operating Conditions**

Effect of ambient temperature:

Effect of ambient temperature variation of 10 °C:

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

Effect of power supply:

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

Digital print: within  $\pm 1$ digitRecording: within  $\pm 0.1\%$  of recording spanEffect of rated power frequency variation of  $\pm 2$  Hz (100 VAC is reference):Digital print: within  $\pm(0.1\%$  of rdg+1digit)

Recording: same as digital print

Effect of magnetic field:

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

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

Effect of radio-frequency Electromagnetic Field:

Effect of 27-500 MHz 10 V/m field

Digital display: within  $\pm(5\%$  of range +1digit)Recording: within  $\pm(5\%$  of range)

Effect of input source resistance:

Effect of input source resistance variation of +1k $\Omega$ :

1. DCV range

Ranges less than 2V: within  $\pm 10\mu\text{V}$ Ranges more than 6V: within  $-0.1\%$  of rdg

2. TC range

within  $\pm 10\mu\text{V}$  (However  $\pm 100\mu\text{V}$  when TC burnout protection is specified)

3. RTD range

Effect of 10 $\Omega$  per wire (resistances of 3 wires must be equal):Digital print: within  $\pm(0.1\%$  of rdg+1digit)Recording: within  $\pm(0.1\%$  of rdg+1digit)  $\pm 0.1\%$  of recording span

Effect of difference of 3 wires:

Digital print: 0.1 °C per 40m $\Omega$  (approx.)

Effect of operating position:

Digital print: within  $\pm(0.1\%$  of rdg+1digit) (within 30° backwards)Recording: within  $\pm(0.1\%$  of rdg+1digit)  $\pm 0.1\%$  of recording span (within 30° backwards)

Effect of Vibration:

Effect when sine-wave motion of frequency 10 to 60 Hz and acceleration of 0.02 G (0.196 m/s<sup>2</sup>) is applied to the instrument in the direction of three axes for two hours:Digital print: within  $\pm(0.1\%$  of rdg+1digit)Recording: within  $\pm(0.1\%$  of rdg+1digit)  $\pm 0.1\%$  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:  $-25$  °C to  $60$  °C

Humidity: 5 to 95% RH (no condensation)

Vibration: 10 to 60 Hz, 0.5 G (4.9 m/s<sup>2</sup>)Shock: less than 40 G (392 m/s<sup>2</sup>) (inside packing)**SPECIFICATIONS OF OPTIONAL FUNCTIONS****Alarm Output Relay (/A1, /A2, /A3):**

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

1. Relay contact rating: 250 VDC/0.1 A (resistive load), 250 VAC/3 A (50 or 60 Hz)
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 2k $\Omega$ Burnout: More than 10M $\Omega$ 

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, 9600 bps
  5. Data length: 7 or 8bit
  6. Stop bit: 1 or 2bit
  7. Parity: ODD, EVEN or NONE
  8. Communication distance: Up to 500 m
  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: 250 VDC/0.1 A (resistive load), 250 VAC/3 A (50 or 60 Hz)

**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:

LED for digital display (7 segments, 7 characters)

LED for status display (3 LED's)

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)

**24VDC Power Supply (/P1):**

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

**Remote Control (/R1):**

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

**Temperature Unit Change (/D2):** Using “°F” as Temperature unit

**MODEL AND SUFFIX CODES**

Model	Suffix Codes	Description																																																																																																																																																																																			
436501 436502 436503 436504 436506		μRS1000 1-pen model μRS1000 2-pen model μRS1000 3-pen model μRS1000 4-pen model μRS1000 6-point dot-printing model																																																																																																																																																																																			
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T10.EPS

## OPTION CODES

Option	Option Code	Description
Alarm output relay; 2 points Alarm output relay; 4 points Alarm output relay; 6 points	/A1 /A2 /A3	Relay contact rating: 250 VAC and 3 A, or 250 VDC 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 "°F" 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
24VDC power supply	/P1	24VDC power supply
Remote Control	/R1	Enables the following control functions: <ul style="list-style-type: none"> <li>• recording start/stop,</li> <li>• chart speed change,</li> <li>• manual printout start.</li> </ul>
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

T11.EPS

\*1: /A1, /A2 and /3 cannot be specified together.

\*2: If /F1 is installed, only up to four (/A1 or /A2) alarm output relay can be installed.

\*3: No option code need be specified for a pen model or single scale with single marking for dot-printing model.

## STANDARD ACCESSORIES

Name	1 Pen	2 Pen	3 Pen	4 Pen	6 Dot	
Z-fold chart	1	1	1	1	1	
6 color ribbon cassette	–	–	–	–	1	
Disposable felt-pen cartridge	Red	1	1	1	–	
	Green	–	1	1	–	
	Blue	–	–	1	1	–
	Violet	–	–	–	1	–
Plotter pen	Purple	1	1	1	–	
Mounting brackets	2	2	2	2	2	
Fuse (250 V 800 mA Timelag) (24 VDC 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	

T12.EPS

**■ SPARES**

Name	Parts No.	Order Q'ty (units)	Description
Z-fold chart	B9565AW	10	1 chart/unit
6 color ribbon cassette	B9901AX	1	1 piece/unit
6 color ribbon cassette (for TAIWAN)	B9901AY*	1	1 piece/unit
Disposable felt-pen cartridge	Red	B9930BP	1
	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 VDC model (250 V 5 A Timelag)	A1513EF	1	3 pieces/unit

T13.EPS

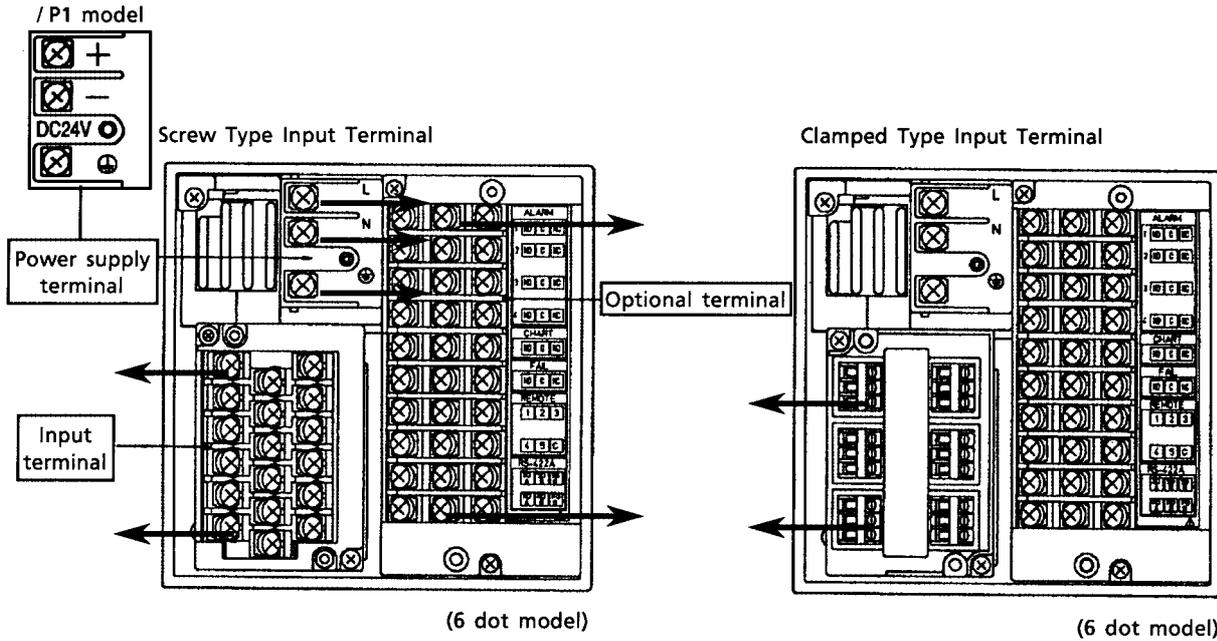
\* In case of orders for spares for TAIWAN, please order this part No.

**■ OPTIONAL ACCESSORIES**

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

T14.EPS

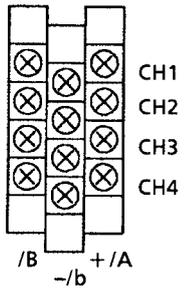
**REAR TERMINAL ARRANGEMENTS**



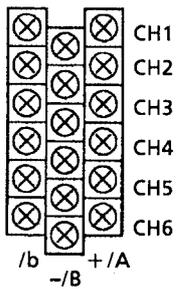
Note: The arrows show the direction in which the wires will be running when connected to the terminal.

**Input Terminals**

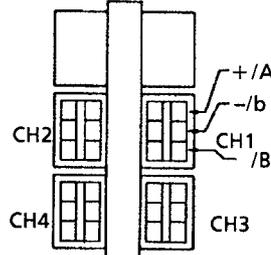
4 Pen Screw Type



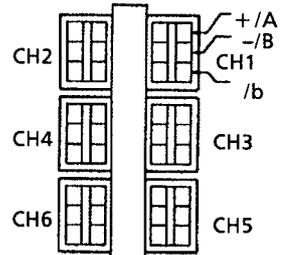
6 Dot Screw Type



4 Pen Clamped Type (/H2)

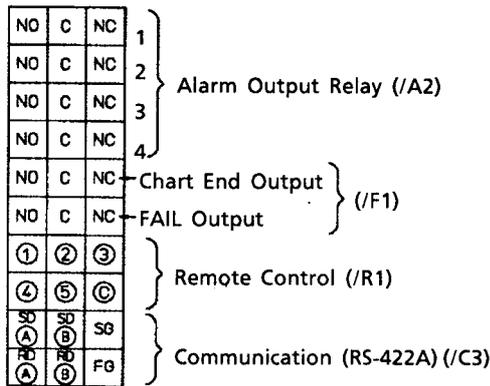


6 Dot Clamped Type (/H2)

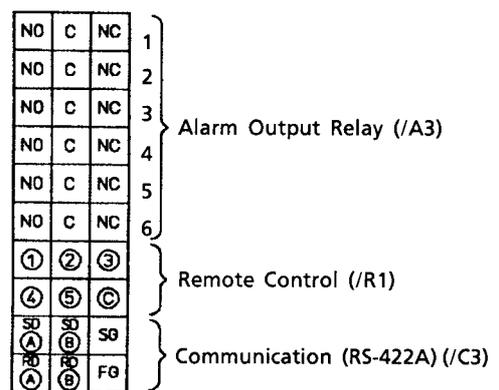


**Option Terminals**

/A2/C3/F1/R1 Combination



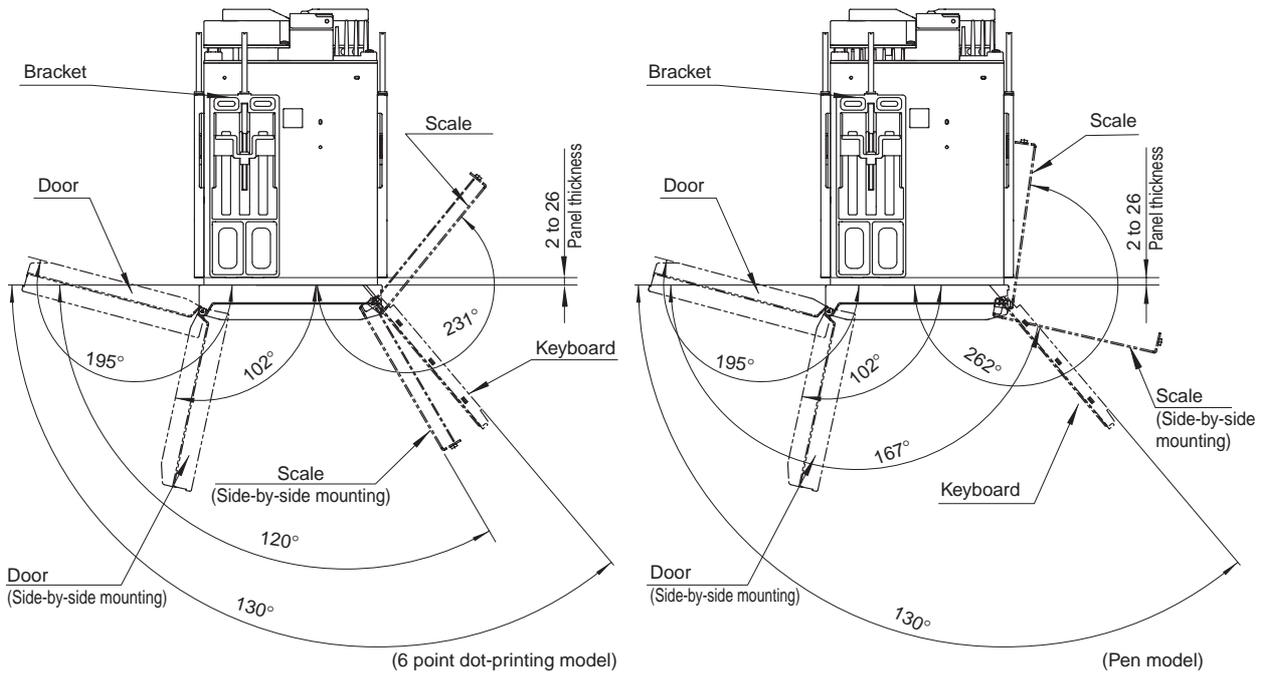
/A3/C3/R1 Combination



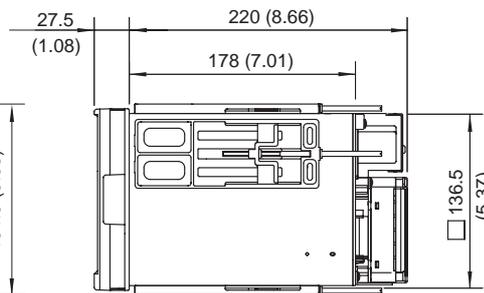
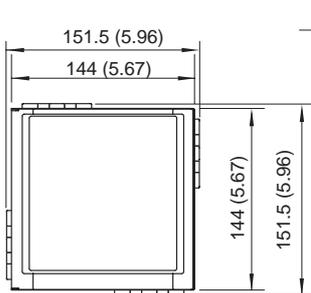
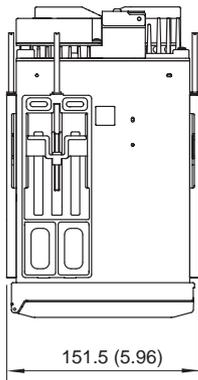
F01.RPS

**DIMENSION**

unit: mm  
(approx. inch)



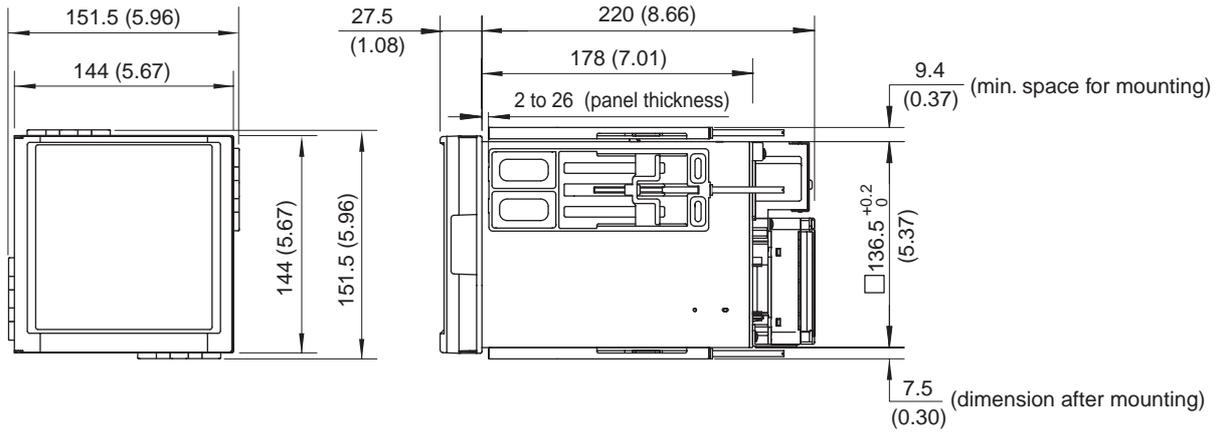
F02.EPS



F03.EPS

Note: If not specified, the tolerance is  $\pm 3\%$ . However, in cases of less than 10mm, the tolerance is  $\pm 0.3\text{mm}$ .

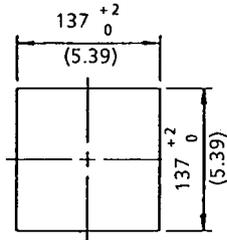
**■ PANEL CUTOUT & SPACING**



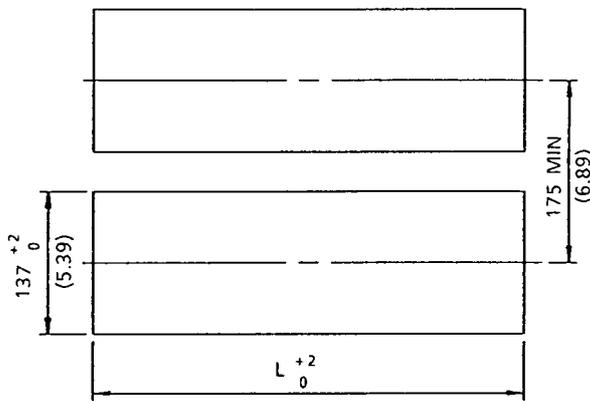
F04.EPS

Note: The  $\mu$ RS1000 should be mounted by only two brackets, either on the top & bottom of the recorder, or on the left & right side of the recorder.

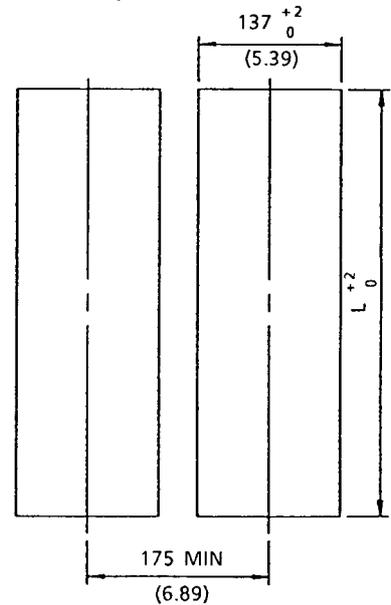
Single-Unit Mounting



Side-by-Side Mounting (horizontally)



Side-by-Side Mounting (vertically max. 3 unit)



Units	L (+2, 0) (mm)
2	282
3	426
4	570
5	714
6	858
7	1002
8	1146
9	1290
10	1434
n	(144 × n) - 6

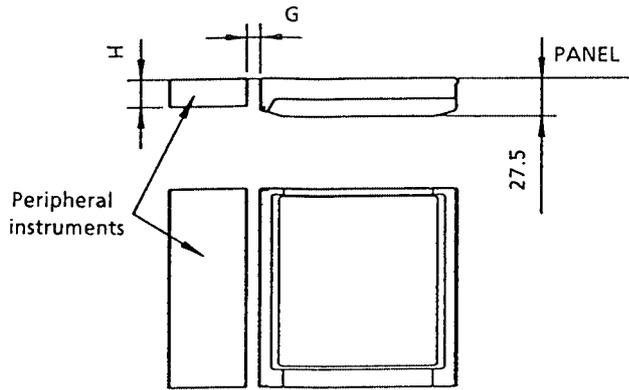
Weight:  
 4365 01: 3.1 kg  
 4365 02: 3.3 kg  
 4365 03: 3.5 kg  
 4365 04: 3.7 kg  
 4365 06: 3.4 kg

F05.EPS

Note: If not specified, the tolerance is  $\pm 3\%$ . However, in cases of less than 10mm, the tolerance is  $\pm 0.3$ mm.

**Relationship between Bezel Height of Peripheral Equipment and Space between Measurement Instruments**

(In case mounted at the left side of  $\mu$ RS1000)

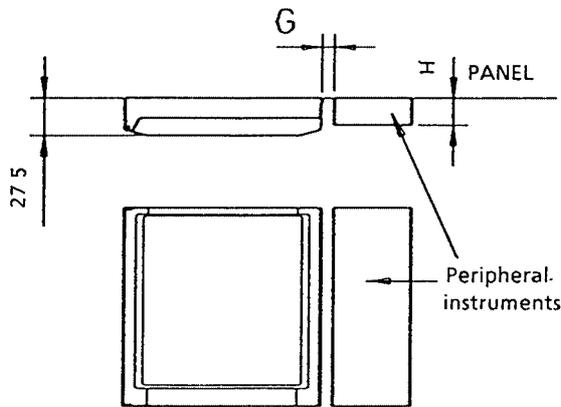


Height of Bezel from Panel Less than H (mm)	Space More than G (mm)
20	0
24	1
28	2
32	3
More than 36 unlimited	4

Note: For instruments which do not have taper and angle R

F06.EPS

(In case mounted at the right side of  $\mu$ RS1000)

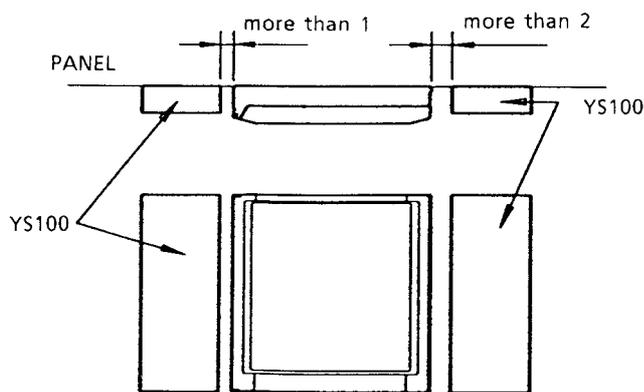


Height of Bezel from Panel ; H (mm)	Space; G (mm)
less than 23.5	0
more than 23.5	more than 3

Note: For instruments which do not have taper and angle R

F07.EPS

**Spacing for  $\mu$ RS1000 and YS100 when Mounted Together**



Mounting Place	Space; G (mm)
Mounted at the right side of YS100	more than 2
Mounted at the left side of YS100	more than 1

F08.EPS