µR10000 ™

Intelligent Industrial Recorders

The µR10000 is a small compact industrial recorder with a recording width of 100mm.
The model family consists of 1,2,3,4 pen and a 6 dot model.

A Yokogawa Commitment to Industry

vigilance®

YOKOGAWA ◆

Multi-Display (Displays a Variety of Screens) for On-Site Monitoring

6 1000.0°C

1ch Digital + Bar graph display

6 1000.0°C
Nov.09.04 10:00:00

Digital + Date and Time display

6 1000.0°C

1ch Digital display

DI:
DO:□□□□□□

DI/DO display

Flag display

◄)):123456
ALARM 1 2 3 4 5 6

Alarm display

5 500.0 6 1000.0

2ch Digital + Bar graph display

100.0 200.0 300.0
400.0 500.0 600.0

6ch Digital display

µR10000™

The Information You Need: Easier to Acquire, Easier to Read

Get reliable, high quality output with the "power of paper!"
Recorders with the Reliability of YOKOGAWA

Leading-Edge Technology Offers High Reliability and High Quality

► Fully contact-less technology
► Actuators reduced in size through high precision manufacturing technology
► High degree of integration using custom ICs
► Dust-and splashproof front door (conforms to IP54)

Superior Ease-of-Operation

► Large, VFD 101 x 16 full dot matrix display
► Easily navigable interactive settings
► New Chart Cassette (Enables historical trend review during recording)
► Internal illumination comes standard (high intensity white LED)

Multiple Functions Meet a Variety of Needs

► Broad lineup (1-, 2-, 3-, or 4-pen models, and a 6-dot model)
► Dot model achieves one second measurement intervals
► Universal input
► Supports a wide range of input sensors
  Supports thirty-five types including Pt50, PR40-20, and NiNiMo (including options)

► Mathematical functions
  No. of channels: Pen models (8 ch), dot model (12 ch)
  Computation types: Offers general, logic, relational, and statistical computations.
  Assign/analog record computed results to any channel.
► Supports Ethernet or RS-422A/485 interfaces

4 1000.0°C

2

3

μR10000™

Delivers Confidence

The critical factor in continuous recording using industrial recorders is reliability. Leveraging the latest technology, **YOKOGAWA** brings you that reliability in a compact, lightweight unit that embodies all the breakthroughs and know-how that Yokogawa has cultivated over the years.

Bringing You the Highest Reliability

Servo Unit

The pen servo takes advantage of an ultra-small, rack-and-pinion stepping motor. By eliminating the drive belt, transfer-related loss load is reduced, allowing a smaller servo. The motor is controlled digitally, yielding reductions in power consumption. Also, the position of the pen is detected by an optical encoder.
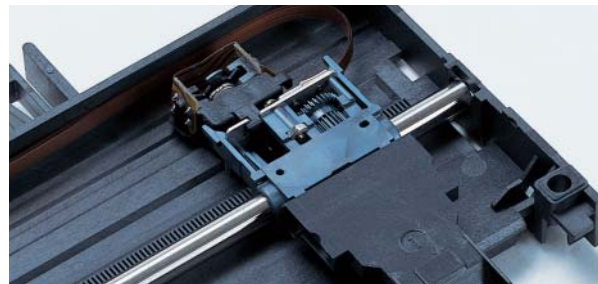
Splash-proof Front Door

(conforms to DIN 40050-IP54) The front door meets DIN 40050-IP54 standards in panel-mount installations.

Safety/EMC Standards

Yokogawa's highly reliable industrial recorders support safety and EMC (electromagnetic compatibility) standards. And of course, the μR conforms to the European CE marking standard.

C E

High-voltage solid-state scanner

For scanners that switch the input signal, Yokogawa's proprietary high withstand voltage, low leakage current MOS FETs and high voltage output photocouplers have been combined into a high withstand voltage semiconductor relay offering high speed (6 points per second) scanning, longer scanner life, and noiseless operation.

IN
Q_1
R_S
Control Signal
Q_2
photocoupler
OUT
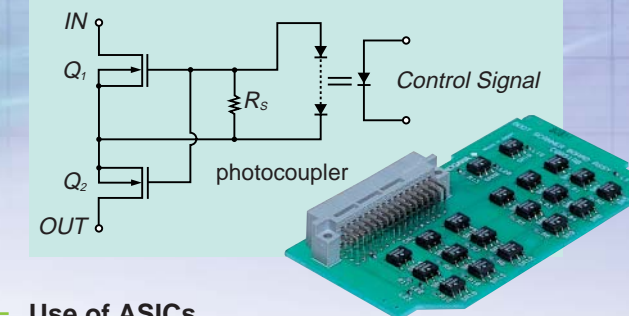
Use of ASICs

High integration is achieved with none other than Yokogawa ASICs (application specific integrated circuits or custom ICs). For example, the instrument features a signal conditioner chip (mixed analog and digital IC) that combines signal input circuits, a programmable gain amp, an A/D converter, digital filters, and controllers all on a single chip. This and other ASICs increase integration while reducing power consumption, suppressing heat emissions, and increasing the lifespan of components.

Temp. Sensor
RJC Amp | BiCMOS Analog | CMOS Digital
Multiplexer
Volt, TC
PGA
UART
A/D | Digital Filter
RTD
Vref
RTD Amp
Controller
Scanner Control
EEPROM

Lightweight

The latest molding techniques have been employed to decrease the number of parts by approximately 30% (compared to our previous 4-pen) or 20% (compared to our dot model). Also, through the use of ASICs and the new servo unit, we have achieved high efficiencies and low heat emissions in all of the 1-, 2-, 3-, and 4-pen and 6-dot models while simultaneously limiting the weight to approximately 2.5 kg (6-dot model), and approximately 2.4 kg (4-pen model).

Navigational display Makes Setup a Snap

The instrument features a simple configuration, with Operation mode for normal use, and Setting mode for use during setup. In Operation mode, measured values, time, and alarms are updated, and lists are printed. In Setting mode, you can enter measuring ranges, alarm values, and other parameters. Also, Setting mode offers a navigational display that eases entry of settings.

Navigational display to support the settings (Example: Range Setting)

Set=RANGE
Input range and recording span

Key Panel: Upper; Used in Setting mode, the Basic setting mode Lower; Used in Operation mode

Range Settings

1. Hold down the MENU key for three seconds or more to change from Operation mode to Setting mode. In Set mode, the upper level shows the setting parameter, and the lower level shows the SetNav(scrolls for 18 characters or more).
2. Select a parameter using the ▽△key, and press ↵ key to advance to the next setting.
3. Follow on-screen prompts using the ▽△ and ◁▷ keys to enter settings.
4. When finished entering settings, hold down **MENU** for three seconds to return to Operation mode.

Increased On-Site Productivity

Internal Illumination

By using a high intensity white LED and light-diffusing rod for the internal illumination, the visibility of the chart section has been greatly increased.

100.0 200.0 300.0
400.0 500.0 600.0

Chart Cassette

The chart cassette is equipped with a chart-ejection function. You can write memos on the chart and check the historical trend during recording.
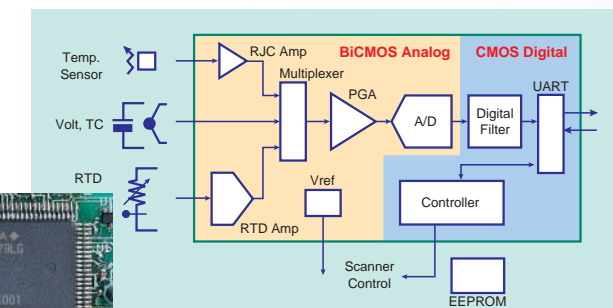
Easier Settings

Uses a large, easy-to-view VFD 101 x 16 full dot matrix display. All settings are interactive, and supported by the navigational display, offering superior ease of operation.

Evolving for Easier Use

This new μR reflects advances in the chart cassette and internal illumination. Also, we use the same pens, plotter pen (pen models), cassette ribbon (dot models), and chart paper as our previous models.

A Wealth of Recording and Printing Functions to Meet Every Need

The instrument comes with a full set of functions to cover the many needs of our customers and support their applications.
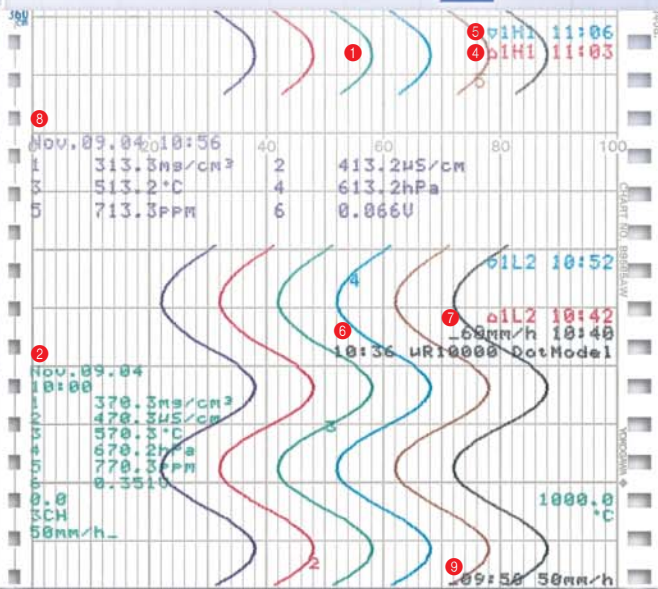
μR10000™

Specifications

See the general specifications (GS 04P01B01-01E) for the detailed specifications.

## A Wealth of Recording and Printing Functions

(4 pen model)

(6 dot model)

❶ Analog recording ❷ Periodic printouts* ❸ Report printout *
❹ Alarm printouts (occurring) ❺ Alarm printouts (cleared)
❻ Message printouts ❼ Chart speed change printout
❽ Manual printout ❾ Chart start time printout

*: In Set mode, you can select periodic printout, report printout, or "None."
Select from the following report printout contents: AVE (average) by channel only,
MIN (minimum) only, MAX (maximum) only, MIN/MAX/AVE, SUM, or INST
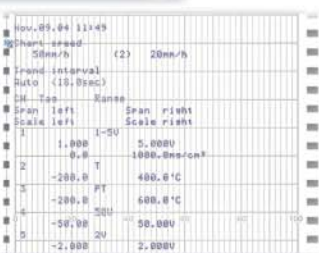(instantaneous value).
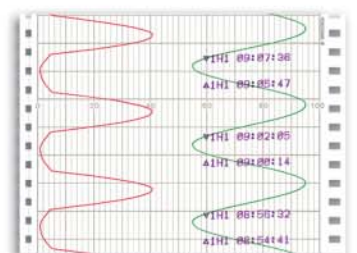
Partial expanded recording
Any important portion within the full scale can be expanded for recording.
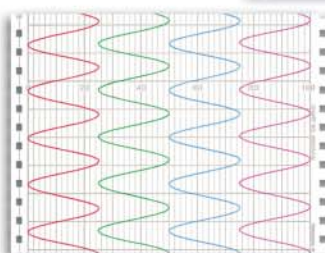
Zone recording
Recording areas (zones) for each channel can be recorded separately.
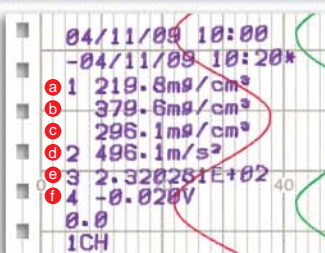
❸Detail of report printout sample
ⓐ MIN ⓑ MAX ⓒ AVE
ⓓ MAX ⓔ SUM ⓕ INST

List printout

Broad Functionality for a Wide Range of Applications

### Numerous Computation Functions for Data Management and Analysis

Let you perform real time computations internally without a PC. Computed results can be recorded to paper (dot model: analog recording of all computation channels possible). Also, you can assign measured or computed results to an arbitrary pen for recording.

(Recording example for models with Mathematical functions:
measurement channel + computation channel recording example)
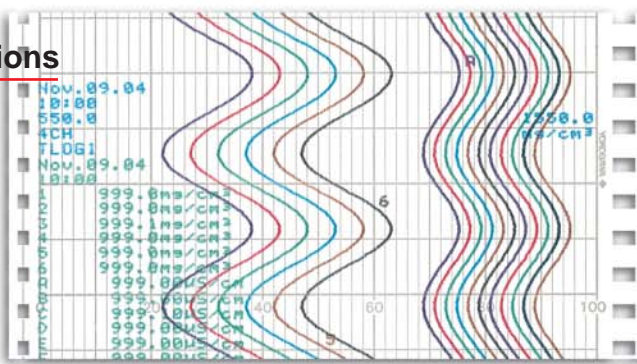
Robust Network Functions

The unit includes an RS422A/485 serial communications interface, and up to thirty-two units can be multidrop-connected to a single host computer. Ethernet is also included for support of high speed communications and LAN environments.

Personal computer
RS422A/485 converter
RS-422A/485 communication
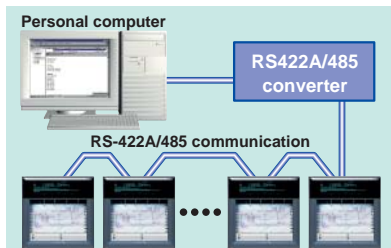
Parameter Setting Software is available (sold separately).

Entry and management of settings for measurement and computation channels is easier than ever. Also, settings can be entered via communication interface.

Input

■ **Measurement Inputs**
1, 2, 3, 4 (pen) and 6 (dot) points
■ **Inputs**
Universal input
DCV: 20, 60, 200mV 2, 6, 20, 50V, 1-5 V
TC: R, S, B, K, E, J, T, N, W, L, U, WRe
RTD: Pt100, JPt100
DI: Digital Input (contact or DC Voltage, TTL level).
DCA: Direct Current Input (using external shunt resistor (10Ω, 100Ω, 250Ω))
■ **Measurement Interval**
Pen model: 125ms/channel
Dot model: 1s/6dot or 2.5s/6dot
■ **Burnout**
Available on TC and DCV (1 to 5V) range
ON/OFF selectable (per channel)
1-5V Burnout: less than 0.2V
■ **Filter**
Pen model: Signal damping
              ON/OFF selectable (per channel), Time constant (2, 5, 10sec)
Dot model: Moving average
              ON/OFF selectable (per channel), Moving average cycle (2 to 16)
■ **Computation**
Differential computation, Linear scaling, Square root, Bias addition

Recording and Printing

■ **Recoring Method**
Pen model: Disposable felt pens, Plotter pen
Dot model: 6 color wire dot.
■ **Pen Offset Compensation:**
ON / OFF selectable (Pen model only)
■ **Effective Recording Width**
100mm
■ **Chart**
Plain-paper Z-fold chart (16m)
■ **Recording Period**
Pen model: Continuous for each channel
Dot model: Max. 6 channel/10sec
■ **Chart Speed**
Pen model: 5 to 12000mm/h (82 increments)
Dot model: 1 to 1500mm/h (1mm step)
■ **Chart Speed Change**
speed 1, speed 2 change by remote control signals (option).
■ **Recording Colors**
Pen model: pen1=red, pen2=green, pen3=blue, pen4=violet, plotter pen=purple
Dot model: ch1=purple, ch2=red, ch3=green, ch4=blue, ch5=brown,
              ch6=black (color can be assigned to any channel)
■ **Recording Format**
Analog recording: Zone recording, Partial expanded recording
Digital printout: Channel number or TAG (Dot model only), Alarm, Periodic
                 printout or Report printout, Message printout, Record start
                 time, Chart speed printout, List printout, Manual printout,
                 SET UP List printout

Display

■ **Display method**
VFD (101×16 dot matrix)
■ **Display types**
Multiple displays
Digital , bar, flag, DI/DO display etc. can be displayed.
15 display types can be selected from approx. 80 display types.
■ **Status display**
Recording in progress (RECORD), Shared alarm (ALARM), Channel No.
display of occuring alarm (1 2 3 4 or 1 2 3 4 5 6), Chart end display (CHART
END) For the model with option (FAIL/chart end detection and output), Math
(MATH)
■ **Setting**
μR10000 settings display by interactive mode.In setting, navigator method is
used.
Display updated interval can be selected from AUTO/MAN.
■ **Bar gragh display**
Resolution: 1%
Measurment value: left/right (%) reference or center zero reference display
(each channel selectable).
Alarm: Alarm setting level display and flashing display of occuring alarm.
■ **Display brightness setting**
Display brightness level: 1 to 8

Alarm

■ **Number of Levels**
Up to 4 level for each channel.
■ **Alarm type**
High and low limits, differential high and low limits, high and low rate-of-
change limits and delay high and low Interval time of rate-of-change alarms:
The measurement interval times 1 to 15
■ **Display**
Set value is indicated as a point on the bar gragh (only for bar gragh display)
In case of an alarm: - For digital display: Alarm type indicator
                     - Shared alarm display
                     - Alarm occuring channel No. is displayed
                     - For bar gragh display: Flashing point indicator

Power supply

■ **Rated power voltage**
100-240VAC (automatically selected)
■ **Power voltage range**
90-132VAC, 180-264VAC
■ **Rated power flequency**
50Hz/60Hz (sutomatically selectable)
■ **Power consumption**   (Approx.)

	100VAC power source	240VAC power source	Maximum
1 to 4 pen model	12VA*	17VA*	40VA*
6 dot model	13VA*	18VA*	40VA*

* In balance

General Specification

■ **Ambient temperature and humidity**
0 to 50 °C, 20 -80 %RH (at 5 to 40°C)
■ **Memory backup**
Litium battery to save settings parameters
Approx. 10 years (at room temperature, for standard model)
■ **Settings protection function**
Password method
■ **Internal light**
White LED
■ **Operation position**
0° Frontwards: Within 30° from horizontal

Optional Specification

■ **Alarm output relay (/A1, /A2, /A3)**
Number of output: 2, 4, 6
Relay contact rating: 250VDC/0.1A (resistance load), 250VAC (50/60Hz) /3A
■ **RS-422A/485 communication interface (/C3)**
Measurment value output and setting parameter input/output
Conforms to EIA-422A (RS-422A) and EIA-485 (RS-485) standard
■ **Ethernet (/C7)**
Measurment value output and setting parameter input/output
Transmission media:10 Base-T
Protocol: TCP, IP, UDP, ICMP, ARP
■ **FAIL/chart end detection and output (/F1)**
In CPU error occurence or the chart end, output relay is activated.
Relay contact rating: 250VDC/0.1A (resistance load), 250VAC (50/60Hz) /3A
■ **Clampted input (/H2)**
Clampted input
■ **Non-glare door glass (/H3)**
Non-glare door glass for front door
■ **Computation function (/M1)**
Number of computation channel: 8 channels (pen model), 12 channels (dot
model)
Arithmetic operation (+, −, ×, ÷), Square, Absolute, Common logarithm
(y=log10x), Exponential (eX), Power (Xn), Relational operator (<, ≤, >, ≥, =,
≠), Logic (AND, OR, NOT, XOR)
Statistical computation: Statistical type: MAX, MIN, AVE, SUM, MAX-MIN
Comutation channel can be recorded
■ **Cu10, Cu25 RTD input (/N1)**
Cu10, Cu25 RTD input
Pt100 and JPt100 inputs can be used together.
■ **3 leg isolated RTD (/N2)**
A, B, b legs of RTD are isolated for dot model
■ **Expansion input (/N3)**
Following input types can be supported besides standard inputs.
TC: PR40-20, PLATINEL, NiNiMo, W/WRe26, Type N (AWG14), Kp vs
Au7Fe)
RTD: Pt25, Pt50, Ni100 (SAMA), Ni100 (DIN), Ni120, J263*B, Cu53, Cu100
*Cu100 : α=0.00425 at 0°C
■ **Remote control (/R1)**
Below actions can be assigned to up to 5 points
Recording start/stop, Chart speed change, Message printout start, Manual
printout start, Alarm ACK, Time set, Math start/stop, Math reset

μR10000 INTELLIGENT INDUSTRIAL RECORDERS

Model Codes

Model Code	Suffix Code	Option Code	Description
436101			μR10000 1 pen recorder
436102			μR10000 2 pen recorder
436103			μR10000 3 pen recorder
436104			μR10000 4 pen recorder
436106			μR10000 6 dot recorder
Language	-2		English, degF & summer/winter time
Option		/A1	Alarm output relay (2 contacts) *1
		/A2	Alarm output relay (4 contacts) *1
		/A3	Alarm output relay (6 contacts) *1, *2
		/C3	RS-422A/485 communication interface *3
		/C7	Ethernet communication interface *3
		/F1	FAIL/chart end detection and output *2
		/H2	Clamped input terminal *4
		/H3	Non-glare door glass
		/M1	Computation function
		/N1	Cu10, Cu25 inputs
		/N2	3 legs Isolated RTD *4, *5
		/N3	Expansion inputs *6
		/R1	Remote control 5 contacts

*1: Only one of /A1, /A2, /A3 can be selected
*2: /A3 and /F1 can not be specified together
*3: /C3 and /C7 can not be specified together
*4: /H2 and /N2 can not be specified togoether
*5: /N2 can be specified only for dot model
*6: 14 types inputs: Pt50 RTD, PR40-20, PLTINEL TC etc.

Model Code	Description	OS
RXA10-01	μR10000 Configuration software	Windows 98/Me/NT4.0/2000/XP
RXA10-02	μR10000 Configuration software (With interface unit)	Windows 98/Me/NT4.0/2000/XP

Standard Accessories

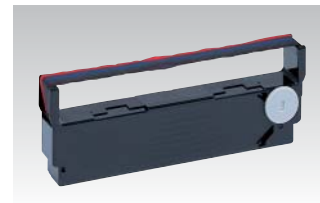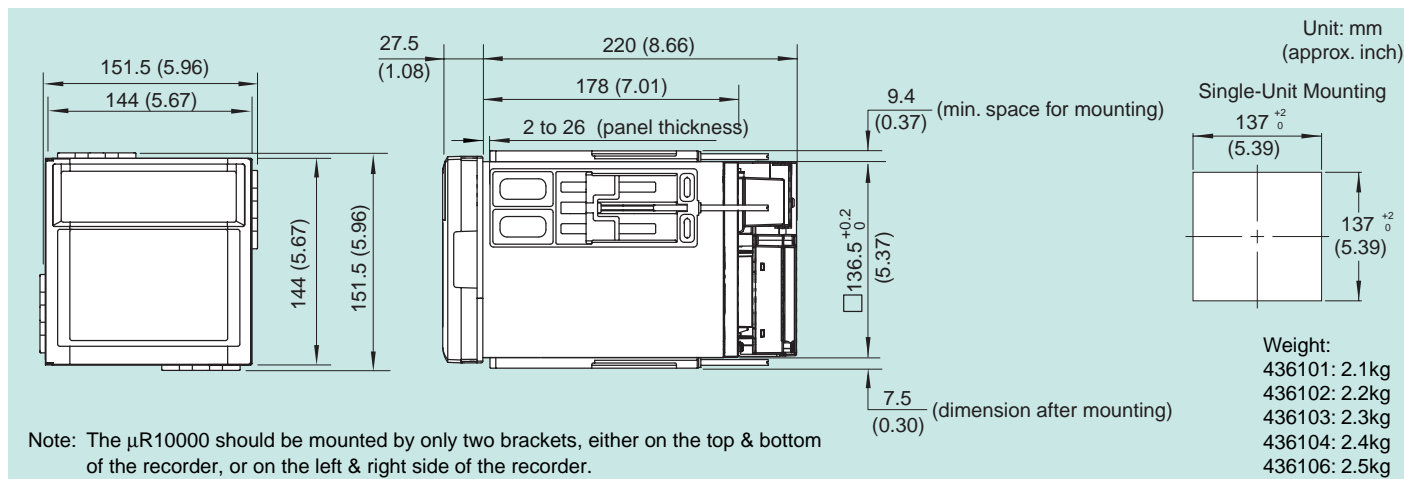| Name		1 pen	2 pen	3 pen	4 pen	6 dot
Z-fold chart		1	1	1	1	1
6 color ribbon cassette		–	–	–	–	1
Disposable felt-pen cartridge	Red	1	1	1	1	–
	Green	–	1	1	1	–
	Blue	–	–	1	1	–
	Violet	–	–	–	1	–
Plotter pen	Purple	1	1	1	1	–
Mounting brackets		2	2	2	2	2
Instruction Manual(CD-ROM)		1	1	1	1	1
Operation Manual		1	1	1	1	1

Spares/Optional Accessories

Name		Model Code (Parts No.)	Specification
Z-fold chart		B9565AW	10 (sales unit)
6 color ribbon cassette		B9901AX	1 (sales unit)
Disposable felt-pen cartridge	Red	B9902AM	1 (sales unit, 3 piece/unit)
	Green	B9902AN	1 (sales unit, 3 piece/unit)
	Blue	B9902AP	1 (sales unit, 3 piece/unit)
	Violet	B9902AQ	1 (sales unit, 3 piece/unit)
Plotter pen	Purple	B9902AR	1 (sales unit, 3 piece/unit)
Mounting brackets		B9900BX	2 (sales unit)
Shunt resistor	(for screw input terminal)	415920	250Ω ± 0.1%
		415921	100Ω ± 0.1%
		415922	10Ω ± 0.1%
Shunt resistor	(for clamped input terminal)	438920	250Ω ± 0.1%
		438921	100Ω ± 0.1%
		438922	10Ω ± 0.1%

Disposable felt-pen

6 color ribbon cassette

Dimensions

Unit: mm (approx. inch)

151.5 (5.96)
144 (5.67)
144 (5.67)
151.5 (5.96)

27.5 (1.08)
220 (8.66)
178 (7.01)
2 to 26 (panel thickness)

9.4 (0.37) (min. space for mounting)
□136.5 +0.2/0 (5.37)
7.5 (0.30) (dimension after mounting)

Single-Unit Mounting
137 +2/0 (5.39)
137 +2/0 (5.39)

Weight:
436101: 2.1kg
436102: 2.2kg
436103: 2.3kg
436104: 2.4kg
436106: 2.5kg

Note: The μR10000 should be mounted by only two brackets, either on the top & bottom of the recorder, or on the left & right side of the recorder.

NOTICE
● Before operating the product, read the instruction manual thoroughly for proper and safe operation.
● If this product is for use with a system requiring safeguards that directly involve personnel safety, please contact the Yokogawa sales offices.

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