

SPECIFICATIONS

General specifications

■ Construction

Mounting method: Flush panel mounting (in the vertical plane)
(VR10□P) The recorder may be inclined up to 30° to the rear with respect to the vertical. It must be installed horizontally in the left-right direction.

Allowable panel thickness: 2 to 26 mm

(VR10□P)

Material: Case ... Drawn steel, Bezel ... Polycarbonate

External dimensions: (Refer to the exterior drawing.)

■ Input section

Number of inputs: Up to 4 channels (can be set with 1 to 4) or up to 6 channels (can be set with 1 to 4 and 6)

Measurement interval: 4-ch model ... 125 ms; 6-ch model ... 1s (In case of A/D 100 ms for integration, measurement interval is 2s)

Inputs: DC V (DC voltage), TC (thermocouple), RTD (resistance temperature detector), DI (digital input for event recording), DC A (DC current, with external shunt resistor attached)

Range setting and measuring range

Input Type	Range	Measuring Range
DC Voltage (DCV)	20 mV	-20.00 to 20.00 mV
	60 mV	-60.00 to 60.00 mV
	200 mV	-200.0 to 200.0 mV
	2 V	-2.000 to 2.000 V
	6 V	-6.000 to 6.000 V
	20 V	-20.00 to 20.00 V
Thermocouple (TC)	R* ¹	0.0 to 1760.0°C
	S* ¹	0.0 to 1760.0°C
	B* ¹	0.0 to 1820.0°C
	K* ¹	-200.0 to 1370.0°C
	E* ¹	-200.0 to 800.0°C
	J* ¹	-200.0 to 1100.0°C
	T* ¹	-200.0 to 400.0°C
	N* ²	0.0 to 1300.0°C
	W* ³	0.0 to 2315.0°C
	L* ⁴	-200.0 to 900.0°C
U* ⁴	-200.0 to 400.0°C	
Resistance temperature detector (RTD)	Pt100* ⁵	-200.0 to 600.0°C
	JPt100* ⁵	-200.0 to 550.0°C
Operation recording (DI)	Voltage input	OFF: Less than 2.4 V
		ON: 2.4 V or more
	Contact input	Contact ON/OFF

*¹ R,S,B,K,E,J,T: ANSI, IEC584, DIN IEC584, JIS C 1602-1981

*² N: Nicrosil-Nisil, IEC584, DIN IEC584

*³ W: W-5% Re/W-26% Re (Hoskins Mfg. Co.)

*⁴ L: Fe-CuNi, DIN43710

U: Cu-CuNi, DIN43710

*⁵ Pt100: JIS C 1604-1989, JIS C 1606-1989, IEC751, DIN IEC751

JPt100: JIS C 1604-1981, JIS C 1606-1989

Computation:

<Linear scaling> Available for DC V, TC, and RTD ranges.
 Scaling limits ... -20000 to 20000
 Decimal point ... User-selectable
 Engineering unit: User-definable, up to 6 characters

<Differential computation> Between any two channels; however, the channel number of the reference channel must be smaller than that of the channel being measured)

<Square root> Available for DC V, TC, and RTD
 Available for the DC V range
 Scaling limits: -20000 to 20000
 Decimal point: User-selectable
 Engineering unit: User-definable, up to 6 characters

■ Display

Display unit: 5.5-inch TFT color LCD (320 × 240 pixels)

Analog display: Line width of waveform are user selectable from 1, 2 and 3 pixels.

Analog display color (default): 4-ch model ... Red for channel 1, green for channel 2, blue for channel 3, violet for channel 4
 (The above colors as well as brown are user-selectable for each channel.)

6-ch model ... Red, green, blue, magenta, orange, and cyan for channel 1, 2, 3, 4, 5, and 6 respectively (The above colors as well as brown and gray are user-selectable.)

Display span rate: User-selectable from 1, 5, 10, 20, 30, and 60 min/div

Digital indication: Measured values (updated every second), engineering units (up to 6 characters), tag (up to 7 characters)

Memory status display: The memory status is displayed when sampling the event input signals and storing them in an event file in the trigger mode.

Other display items: Scale values (0 and 100%, display on/off selectable), grid (number of divisions are selectable from 4, 5, 8 and 10 divisions), current time, trip levels (line width of trip levels are selectable from 1, 2 and 3 pixels, event mark, alarm (ALM))

Data referencing function: By horizontally splitting the waveform display area into two, the current and reference waveforms can be compared on the display.

Data magnification/reduction function: The time scale of the analog display can be magnified or reduced.

LCD backlight saver function: The LCD backlight automatically dims if no key is touched for a certain preset time (can be set from 1 to 60 minutes).

■ Data saving function
 Storage medium: 3.5-inch floppy disk (2HD) (Can be formatted for 1.2 or 1.44 MB but in 6-ch model, 1.44 MB only.)
 Saving method: Copying of data from the internal memory to a floppy disk
 Data saving period: Linked to the sampling period (for an event file) or the waveform span period (for a display data file)
 Event file sampling rate: Selectable from 125, 250, 500 ms, and 1 s for 4-ch model, and from 1, 2, 10, 30, 60, or 120 s for 6-ch model.

Files can be created in the following combinations:
 (1) Event file + display data file
 (2) Event file × 16 + display data file
 (3) Event file only

Sampling time:
 4-ch model:
 For cases (1) and (2) above,
 Display data file (when using all four channels)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	Approx. 26 hours	Approx. 5 days	Approx. 11 days	Approx. 22 days	Approx. 33 days	Approx. 66 days

Event file (for four channel inputs)

Sampling period	125 ms	250 ms	500 ms	1 s
Sampling time	Approx. 1 hour	Approx. 2.1 hours	Approx. 4.2 hours	Approx. 8.3 hours

* In case (2) above, the total sampling time for 16 event files is the same as the above sampling time.

For case (3) above,
 Event file (for four channel inputs)

Sampling period	125 ms	250 ms	500 ms	1 s
Sampling time	Approx. 4.1 hours	Approx. 8.3 hours	Approx. 16.6 hours	Approx. 33.3 hours

6-ch model:
 For cases (1) and (2) above,
 Display data file (when using all six channels)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	Approx. 26 hours	Approx. 5 days	Approx. 11 days	Approx. 22 days	Approx. 33 days	Approx. 66 days

Event file (for six channel inputs)

Sampling period	1 s	2 s	10 s	30 s	60 s	120 s
Sampling time	Approx. 5.5 hours	Approx. 11 hours	Approx. 2 days	Approx. 6 days	Approx. 13 days	Approx. 27 days

* In case (2) above, the total sampling time for 16 event files is the same as the above sampling time.

For the case (3) above,
 Event file (for six channel inputs)

Sampling period	1 s	2 s	10 s	30 s	60 s	120 s
Sampling time	Approx. 31 hours	Approx. 2 days	Approx. 12 days	Approx. 38 days	Approx. 77 days	Approx. 155 days

Other files: Setup list file (setup data), information file (event, power failure, and alarm information)
 Event recording: Starting by a remote contact/panel/alarm
 Pre-trigger function (The trigger point is set in increments of 10% of the memory length.)

■ Alarm functions
 Number of alarm levels: Up to four levels for each channel
 Alarm types: High and low limits, differential high and low limits, and high and low rate-of-change limits
 Display: The alarm status (type) is displayed in the digital value area when an alarm occurs. A common alarm is also displayed.

Outputs: 2, 4 or 6 points (optional)
 Memory: The times at which alarms occurred/were canceled, the types of alarms, etc., are stored in the memory (Up to 50 alarm events common to all channels are stored).

■ Power supply
 Rated supply voltage: 100 to 240 V AC (automatic switching)
 Allowable supply voltage range: 90 to 132 or 180 to 250 V AC
 Rated supply frequency: 50/60 Hz (automatic switching)
 Power consumption:

4 ch model/6ch model

Supply voltage	When LCD saver is used	Normal operation	Max
100 V AC	Approx. 25 VA	Approx. 30 VA	Approx. 60 VA
240 V AC	Approx. 35 VA	Approx. 40 VA	Approx. 70 VA

■ Others
 Memory backup: The setup parameters are backed up by a built-in lithium battery (battery life: approx. 10 years at room temperature).
 The measured values are stored in the flash memory, hence the backup time is not limited.
 Insulation resistance: At least 20 MΩ between each terminal to ground (at 500 V DC)
 Dielectric strength: Power supply to ground: 1500 V AC (50/60 Hz), 1 minute
 Contact output terminal to ground: 1500 V AC (50/60 Hz), 1 minute
 Measuring input terminal to ground: 1000 V AC (50/60 Hz), 1 minute
 Between measuring input terminals: 1000 V AC (50/60 Hz), 1 minute
 Remote control terminal to ground: 500 V DC, 1 minute

Normal operating conditions

Supply voltage: 90 to 132 or 180 to 250 V
 Supply frequency: 50 Hz±2%, 60 Hz±2%
 Ambient temperature: 0 to 50°C (when using FDD: 5 to 40°C)
 Ambient humidity: 20 to 80% RH (at 5 to 40°C)
 Mounting position: The recorder may be inclined up to 30° to the rear with respect to the vertical. It must be installed horizontally in the left-right direction.

Standard performance

Measuring and recording accuracy:
 The following specifications apply to operation of the recorder under standard operation conditions: temperature of 23±2°C, humidity of 55±10% RH, supply voltage of 90 to 132 or 180 to 250 V, supply frequency of 50/60 Hz±1%, and warm-up time of at least 30 minutes. Other ambient conditions, such as vibration, should not affect the operation of the recorder.

Type of input	Range	Measurement accuracy (digital display)	Max resolution of digital display
DC voltage	20 mV	±(0.2% of rdg + 3 digits)	10 μV
	60 mV	±(0.2% of rdg + 2 digits)	10 μV
	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 + 3 digits)	1 mV
	20 V	±(0.3% of rdg + 2 digits)	10 mV
Thermocouple (excluding the reference junction compensation accuracy)	R	±(0.15% of rdg + 1°C)	0.1°C
	S	However, R, S: ±3.7°C at 0 to 100°C ±1.5°C at 100 to 300°C	
	B	B: ±2°C at 400 to 600°C; Accuracy at less than 400°C is not guaranteed.	
	K	±(0.15% of rdg + 0.7°C) However, ±(0.15% of rdg + 1°C) between -200 and -100°C	
	E	±(0.15% of rdg + 0.5°C)	
	J	±(0.15% of rdg + 0.5°C)	
	T	However, ±(0.15% of rdg + 0.7°C) between -200 and -100°C	
	N	±(0.15% of rdg + 0.7°C)	
	W	±(0.15% of rdg + 1°C)	
	U	±(0.15% of rdg + 0.5°C) However, ±(0.15% of rdg + 0.7°C) between -200 and -100°C	
Resistance temperature detector	Pt100	±(0.15% of rdg + 0.3°C)	
	JPt100		

Maximum resolution of analog display:
 Waveform display area Amplitude (vertical): 280 dots (97 mm)
 Time axis (horizontal): 180 dots (62 mm)
 Dot pitch: 0.348 (vertical) mm × 0.348 (horizontal) mm
 Reference junction compensation accuracy (for measurement at 0°C or above):
 Types R, S, B, W: ±1°C
 Types K, J, E, T, N, L, U: ±0.5°C
 Maximum allowable input voltage: ±10 V DC (continuous) for less than 2 V DC ranges and TC ranges
 ±30 V DC (continuous) for 6 V and 20 V ranges
 Input resistance: Approx. 10 MΩ or more for DC V ranges or 2 V or less and TC
 Input source resistance: Approx. 1 MΩ for 6 V and 20 V DC V ranges
 DC voltage, TC: 2 kΩ or less
 RTD: 10Ω or less per wire (The resistance of all three wires must be equal.)
 Input bias current: 10 nA or less (approximately 100 nA when the burnout upscale/downscale function is switched on)
 Maximum common mode voltage: 250 Vrms AC (50/60 Hz)
 Common mode rejection ratio: 120 dB (50/60 Hz±0.1%, 500 Ω unbalanced, between negative terminal and ground)
 Normal mode rejection ratio: 40 dB (50/60 Hz±0.1%)

Optional specifications

■ Alarm relay contact output (/A1, /A2, /A3)

An alarm signal is output from the rear panel as a relay contact signal.
Relay contact rating: 250 V DC/0.1 A (for resistive load), 250 V AC (50/60 Hz)/3A

Output configuration: NO-C-NC

■ RS-422A communication interface (/C3)

This interface allows the host computer to control and make settings for the recorder as well as receive data from the recorder.

Synchronization method: Start-stop asynchronous transmission

Communication level: Conforms to the EIA RS-422A standard.

Connection method: 4-wire half-duplex multi-drop connection (1:N where N = 1 to 16)

Transmission speed: 1200, 2400, 4800 or 9600 bps

Data length: 7 or 8 bits

Stop bit: 1 or 2 bits

Parity: Odd, even, or none

Communication distance: Up to 500 m

Communication mode: ASCII for input/output for control and setting

ASCII or binary for output of measured data

■ Deg F Display (/D2)

Uses deg F as the temperature unit

■ Fail/memory end output (/F1)

The relay contact output on the rear panel indicates the occurrence of a system error and the time specified until end of memory (1 to 100 hours) before the display data file is overwritten.

Relay contact rating: 250 V DC/0.1 A (for resistance load), 250 V AC (50/60 Hz)/3 A

■ Clamped input terminal (/H2)

Clamped terminals are used as the input terminals.

■ French/German display, winter/summer time

French or German display can be selected. winter and summer time can be set.

■ Cu10, Cu25 RTD input (/N1)

This option permits Cu10 and Cu25 inputs to be added to the standard input types.

■ 24V DC power supply (/P1)

Rated power voltage: 24V DC

Usable power voltage ranges: 21.6 to 26.4 V DC

Maximum power consumption: 50 VA(approx.)

■ Remote control (/R1)

This option allows the following functions to be controlled remotely by a contact input: Trigger for event file, writing of event marks, and time adjustment

Application software (accessories)

■ VR100 application software package

● File conversion software

Operating environment

P C: IBM PC-AT compatible models

Memory: 640 KB or more (free area of at least 400 KB)

O S: MS-DOS Ver.5.0 or later

Disk: 3.5-inch FD (1.44 MB format)

● File conversion/Data viewer software

Operating environment

P C: A personal computer that can run MS-Windows Ver.3.1

CPU: 80386SX or later

Memory: 8 MB or more

O S: MS-Windows Ver.3.1

Disk: 3.5-inch FD (1.44 MB format)

Hard disk (free area of at least 2 MB)

CRT: Compatible with MS-Windows Ver.3.1

(16 colors or higher recommended)

Printer: A printer and printer driver compatible with MS-Windows Ver.3.1

■ VR enhanced data viewer software

Operating environment

P C: A personal computer that can run MS-Windows Ver.3.1 or Windows95

CPU: 80486DX2 or later (Pentium90 or higher recommended)

Memory: 16MB or more

O S: MS-Windows Ver.3.1 or Windows95

Disk: 3.5-inch FD (1.44MB format)

Hard disk (free area of at least 2 MB)

CRT: Compatible with MS-Windows Ver.3.1 or Windows95

Can display analog RGB 256 colors or higher (64,000 colors or higher recommended)

Printer: A printer and printer driver compatible with MS-Windows Ver.3.1 or Windows95

● VR data viewer for Windows95

Operating environment

P C: A personal computer that can run or Windows95

CPU: 80486DX4 or later (Pentium120 or higher recommended)

Memory: 16 MB or more

O S: Windows95

Disk: 3.5-inch FD (1.44 MB format)

Hard disk (free area of at least 15 MB)

CRT: Compatible with Windows95

Can display analog RGB 256 colors or higher (64,000 colors or higher recommended)

Printer: A printer and printer driver compatible with Windows95

AVAILABLE MODELS

● VR100

Model Code	Suffix Code	Option Code	Description
VR104P			View recorder VR100 (panel mount, 4-ch input)
VR104D			View recorder VR100 (desk top, 4-ch input)
VR106P			View recorder VR100 (panel mount, 6-ch input)
VR106D			View recorder VR100 (desk top, 6-ch input)
Application Software	-0		No application software
	-2		With application software (VP100-02)
Power supply cord	-D		Power cord, UL or CSA std. *1
	-F		Power cord, VDE std. *1
	-R		Power cord, SAA std. *1
	-J		Power cord, BS std. *1
	-W		Screwed power terminals (w/o power cord) *2
Optional feature		/A1	Alarm output relay (2 points)*3
		/A2	Alarm output relay (4 points)*3
		/A3	Alarm output relay (6 points)*3
		/C3	RS-422A interface
		/D3	degF display
		/F1	FAIL/memory end detection and output relay *4
		/H2	Clamped input terminal
		/L1	French/German display, winter/summer time
		/N1	Cu10 or Cu25 RTD input
	/P1	24 V DC power supply *5	
	/R1	Remote control	

● Application software

Model Code	Description	OS Environment
VP100-02	VR100 application software package	MS-DOS, Windows 3.1
VA100-02	VR enhanced data viewer software	Windows 3.1, Windows95
VA200-02	VR data viewer for Windows 95	Windows95

● Optional accessories

Item	Part No.	Specifications	
3.5-inch floppy disk	705900	2 HD (10 disks)	
Shunt resistors	For screw input terminal	415920	250 Ω±0.1%
		415921	100 Ω±0.1%
		415922	10 Ω±0.1%
	For clamped input terminal	438920	250 Ω±0.1%
		438921	100 Ω±0.1%
		438922	10 Ω±0.1%
Fuse	A1360EF	250 V, 500 mA (time lag)	
	A1102EF	250 V, 5A (time lag, for /P1)	
Mounting bracket	B9900CW	-	

*1 A power cord (-D, -F, -R, or -J) can only for the **VR104D** or **VR106D**.

*2 Screwed power terminals (-W) must be specified for the **VR104P** or **VR106P**.

*3 Only one of /A1, /A2 and /A3 can be specified at a time.

*4 If /F1 is specified, /A3 cannot be specified.

*5 If /P1 is specified, screwed power terminals (-W) must be specified.