View Recorder Wide-View Model

VR200

The VR200 wide-view recorder delivers outstanding screen clarity in the field, and is a model of perfection among panel-mounting paper-free recorders. Save the measured data onto a 3.5-inch floppy disk, then upload and process it with the optional application software on a PC. This true paper-free recorder—no recording chart, no ink—dramatically reduces routine inspection and maintenance work.

R E C O R D I N G   E V O L U T I O N

[Great Screen Clarity & Improved Functions! The New View Recorder Wide-View Model]

VR200

The new view recorder from **YOKOGAWA is a radical develop-ment. In response to market demands, the VR200 view recorder wide-view model delivers even better screen clarity and functionality—a model of perfection among panel-mounted paper-free recorders.**
Enjoy the benefits that only true paper-less recorders can pro-vide: computer-friendly, reduced cost of spare parts and con-sumables, easy operation, etc.
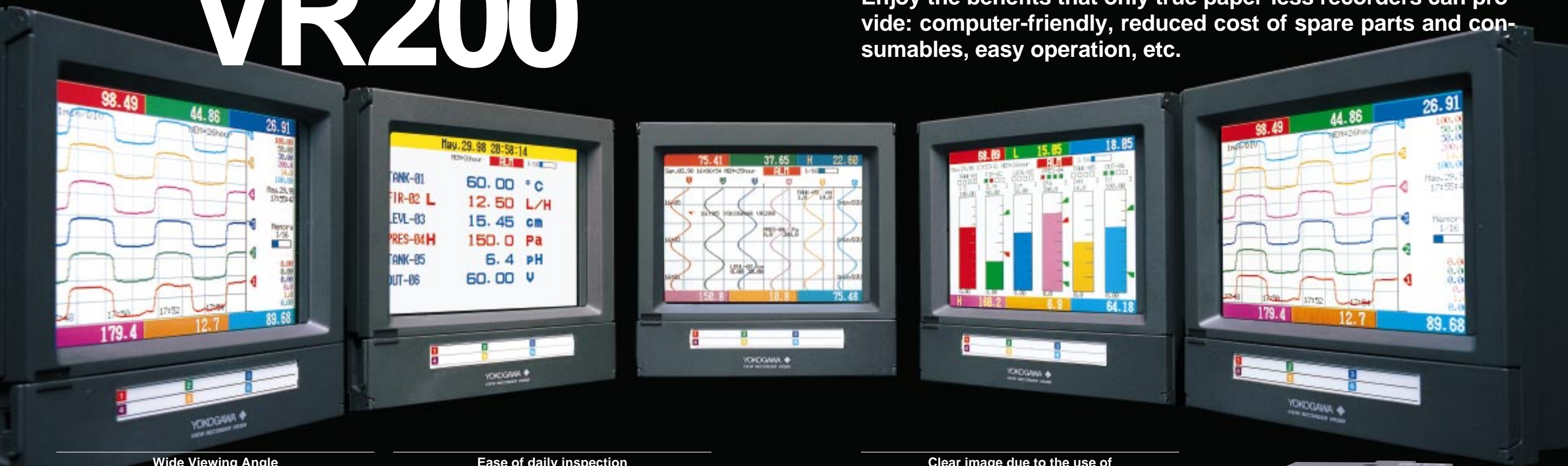
Wide Viewing Angle
Powerful Display Functions

The VR200 offers a wide angle of view from both sides and outstanding screen clarity. This ultimate panel-mounted paper-free recorder offers many new display functions such as vari-able-width trend trace lines and trip lines as well as bar-graph display and large digital display modes. Simply set your display preferences as needed, such as to monitor data from a distance.

Computer-friendly

Four/six channel's worth of measurement data can be saved on a floppy disk for up to about one month at sampling intervals of 60 seconds*. Also, by using the data conversion/viewer software provided, you can easily recall and process measurement data on a personal computer.*For display data file.

Ease of daily inspection
and maintenance work

A low cost 3.5-inch floppy disk is used as the recording medium, which greatly reduces running costs compared to the use of recording paper, ink, and other consumables. In addition, there is no recording servo section or paper feed section, hence daily maintenance can be done easily.

Simple operation

The measurement data is saved continuously in the built-in memory. You can save data automatically whenever necessary by simply inserting a floppy disk. Also, you can easily make various settings using a interactive programming dialogue.

Clear image due to the use of
a high resolution display

The display section uses a high resolution (320 x 240 pixels) 5.5-inch TFT color LCD, realizing clear, easy-to-read analog waveforms.

Covering diverse applications
with 2,4-channel and 6-channel models

Three models for 2,4 channels (measurement period 125 ms) and 6 channels (measurement period 1 sec fastest) are provided. This enables the VR200 recorder to be applied to diverse applications. In addition, either the panel mounting type or the desk top type can be selected for each model.

Paper-less recorder
Enables measurement data to be saved to a computer.

VR200

See the Whole Picture Clearly. The Ideal Pa per-less Recorder!

From allocating display elements to assigning colors, the robust VR200 paper-less recorder is for professionals.

[Display & Operation Keys]

The high-resolution, 5.5-inch, TFT color LCD (320 x 240 pixels) offers a clear display and wide viewing angle, allowing you to monitor data easily from almost any position.

Flexible Setting of Display Preferences

The direction of the waveform (trend graph) display can be switched between horizontal and vertical, and the background color can be selected from bright white, white, or black. Set up the display to suit your application.
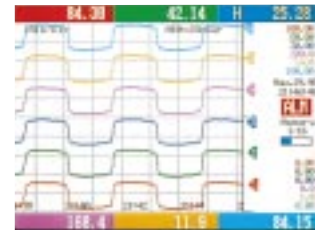
Horizontal waveform display

Background: black; grid: 4 divisions; width of trace lines for waveforms: 3 pixels
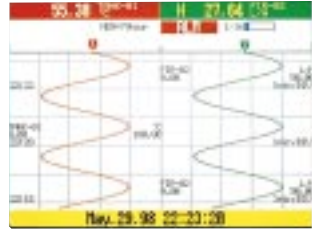
2ch input model

① Ultra clear analog waveform display
The width of the trace lines for waveforms can be selected from 1, 2, and 3 pixels. Whether you prefer fine waveform traces or thick traces for visibility from a distance, you can freely select the setup.

② Large pointers for easy identification of channels
The pointers for indicating the changing data are large and marked with the corresponding channel numbers, so you can see the changes of data and identify individual channels easily.

③ Handy scale indication for readout of analog waveforms
Channel numbers or tag numbers, units, and scale values are indicated in the analog waveform display area. When the analog waveform display is separated into zones, these indications are displayed in the zones of the corresponding channels.
(Note: Only when the direction of the waveform display is set as vertical)

④ Variable grid
The grid can be selected from 4 to 12 divisions.

⑤ Digital indications
Measured values of all channels (2,4 or 6) are displayed as digital numbers simultaneously for detailed monitoring of changes in the measured values of individual channels. Units and tag numbers can also be displayed.
(The display must be switched for the 6-channel model.)

⑥ Alarm indication
The alarm indication appears when an alarm occurs on any channel.

⑦ Indication of remaining time until the display data file becomes full
The remaining time until the display data file begins to be overwritten is displayed after the remaining time reduces to 99 hours.

⑧ Event file status indication
When the measured data are saved to an event file in the trigger mode, the status of the event file is displayed.

⑨ Trip lines and message displays
Conventionally, critical levels are marked on the scale plate with adhesive tape or the like and a specific point in time is marked on the recording chart with a corresponding comment using a pen by hand. With the VR200, these lines and comments are displayed [1] as graphic symbols by a remote contact signal or by operating the panel keys. Up to five different messages of up to sixteen characters can be set as the comments for specific time points; the messages on the trend are stored in the internal memory with the times at which they occurred, and can be retrieved on a personal computer. [2]
[1] Messages can be displayed only when the waveform display direction is vertical.
[2] Using the VA200-02 VR data viewer for Windows 95

⑩ Operation keys
These five keys are used for all the settings and operations.

⑪ Floppy disk drive
Simply insert a floppy disk to save data. Disks can also be formatted.

Flexible data monitoring features —
Choose the display mode to suit your application

Bargraph display
The measured values are displayed as easy-to-read bar graphs, so the current measured value and alarm status of each channel can be seen at a glance.
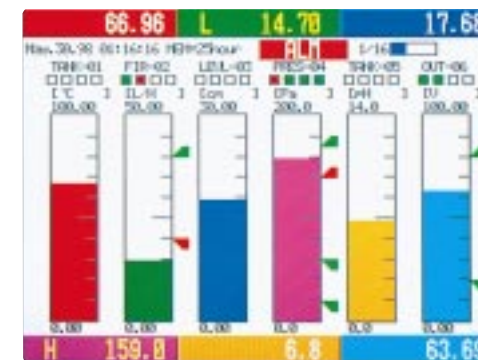
Large digital display
The measured values are displayed as large digits—ideal for monitoring precise measured values.

Alarm summary display
This display shows up to the fifty most recent alarm events—occurrences and recoveries of alarms. The numbers of samples stored in the display data file and event file, as well as the percentage of memory currently used are also displayed.
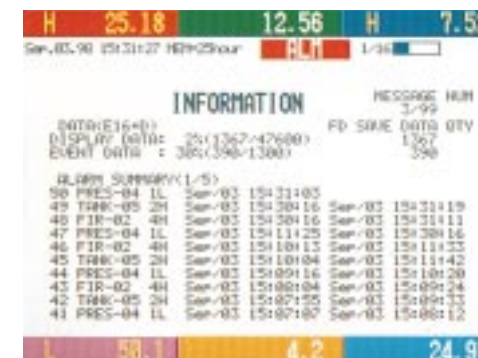

Versatile features unique to the VR200

Historical Data Reference
At the touch of a button, waveforms of past data can be displayed in the lower half (or left half for horizontal waveform display) of the analog waveform display area. The times and digital values are displayed also for these past waveforms, making it easy to compare the current data with the past data.

This figure shows an example: past data are displayed in the lower half, and digital readings of the past data are displayed at the bottom.

Present data

Past data (can be scrolled using the ←→keys.)
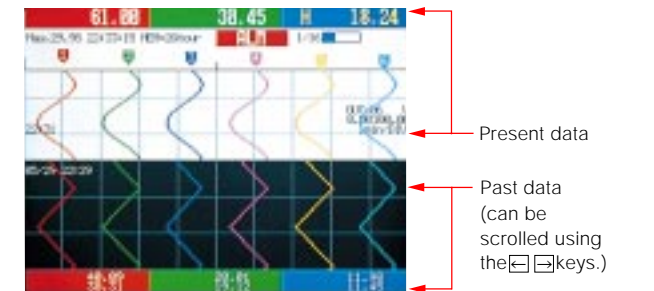
Compressed/Expanded Data Display
The waveform display can be compressed or expanded along the time axis--ideal for analyzing waveforms in detail or assessing long-term trends at a glance.

The span of the time axis for the display area can be selected from 5.5*, 16.5, and 27.5 minutes (or from 8*, 24, and 40 minutes for horizontal waveform display).
*If the mathematical functions or large memory is specified, only 5.5 minutes (only 8 minutes for horizontal waveform display) can be selected.

(Standard) (Expanded)
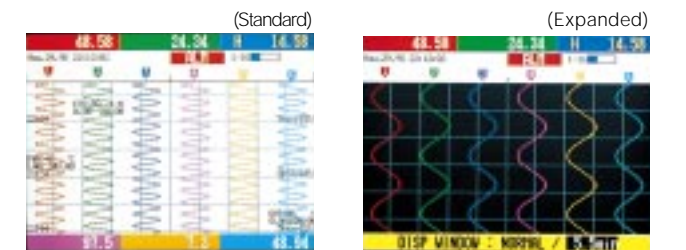
Ultra Precise Analog Display
Unlike conventional recorders, the accuracy does not depend on the response speed of the pen; the VR200 securely captures any sudden phenomena.

The VR200 2,4-channel model displays the waveform of digital data sampled at 125-ms intervals and thus securely captures and displays peak values.

Conventional chart recorder	VR200
Analog recording — True input level	Waveform display — True input level
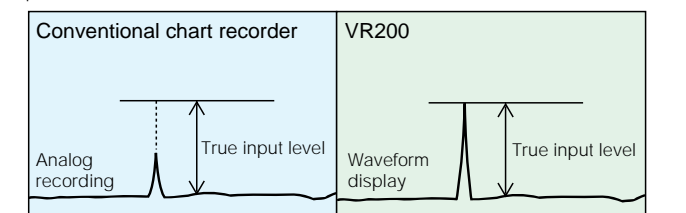
(Concept)

The Ideal Industrial Recorder - Simple yet Precise

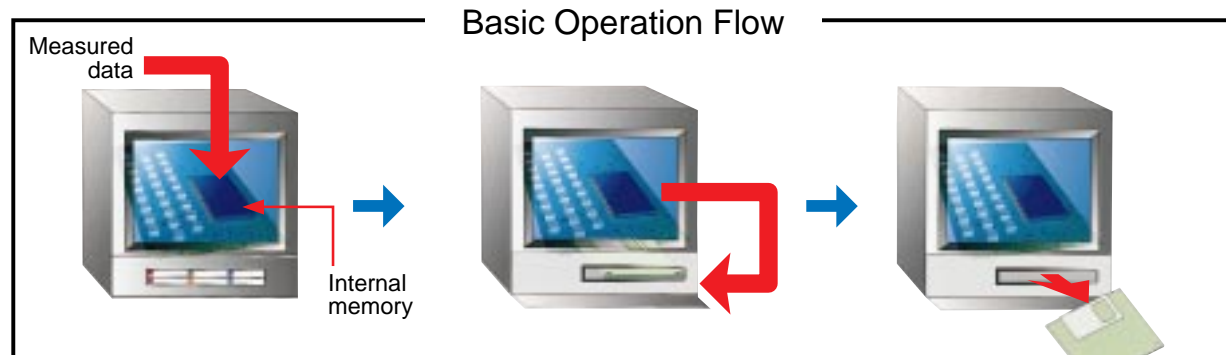**Ease of use is the common denominator of all Yokogawa's recorders.**

[Safe Recording]

Measured data are always written to the internal flash memory, thus preventing data loss in case of a power failure or the like.

Basic Operation Flow

Since measured data are saved in flash memory, data are not lost if the power fails, and no battery is needed for backing up the measured data memory.

Simply insert a floppy disk to start copying the data from the internal flash memory to the floppy disk. Minimum use of the floppy disk drive enhances reliability.

Data saved to a floppy disk can be viewed and processed on a personal computer using the data conversion and viewer software.

[Flexible Recording]

The VR200 uses a 3.5-inch floppy disk as the recording medium instead of recording paper used in conventional recorders. Recording of data in electronic form allows versatility in recording (file) formats.

Versatile file formats

The VR200 has two file formats for measurement data, a display data file and an event file. The features of each are set out below.

1. Display data file ··· A file for observing long-term trends

The data save period is directly proportional to the analog waveform span rate (selectable from 1, 5, 10, 20, 30, and 60 min/div). The maximum and minimum values of data measured every 125 ms(fastest 1s for 6-ch model) are saved for the duration of the data save period.

Relation between the analog waveform span rate and the data save period

Analog waveform span rate	Corresponding data save period
60min / div	120sec
30min / div	60sec
20min / div	40sec
10min / div	20sec
5min / div	10sec
1min / div	2sec
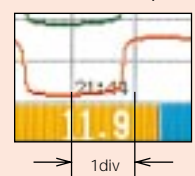
* If the analog waveform span rate is set to "30 min/div", the maximum and minimum values (of data measured in the measurement period) over a period of 60 seconds are saved, and the data displayed (updated) as a waveform every 60 seconds.

2. Event file ··· File intended for analyzing data in detail

All data is saved at the specified sampling intervals (selectable from 125 ms, 250 ms, 500 ms, and 1s for 2,4-ch model, and 1, 2, 10, 30, 60, and 120s for 6-ch model).
You can combine these two files in the following ways to suit the particular application.

①Display data file + event file
②Display data file + event file x 16
③Event file only

Event recording for a wider range of applications

The VR200 can perform event recording (saving data in an event file) using a trigger, to permit a detailed analysis of measurement data in the event of an alarm or other trouble. Needless to say, you can set a pre-trigger as well, enabling you to analyze the data before and after the trigger.

By using both kinds of files together with the event recording function, you can perform the following measurement.
(for 6-ch model)

Desired application

I want to record the bearing temperature of the turbine of an electrical generator. Normally, I want to obtain data at 1-minute intervals, and in addition I wish to perform a detailed analysis of the data obtained for a 5-minute period when the turbine is being started up and also when it is being shut down, twice a day.

Solution

Save the data obtained under normal conditions in a display data file using a display span rate of 30 minutes/div (6 channels' worth of data can be saved for a period of about 33 days).
Save the data obtained when the turbine is being started up and also shut down in an event file divided into 16 parts, using a remote contact as a trigger and 1-second sampling intervals (6 channels' worth of data can be saved for a period of about 20 minutes in one of the divided files).
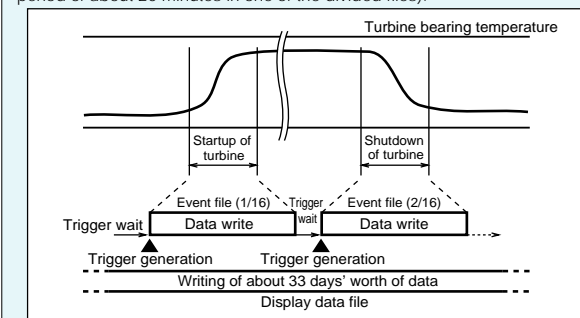
[Easy Operation]

Nothing could be easier. To save data, just insert a floppy disk!

Automatic Data Saving upon Inserting a Floppy Disk

Measured data are continuously stored in the internal memory. Just insert a floppy disk when necessary, and the measured data will be saved to it.

Interactive Setting

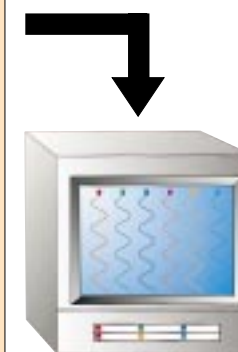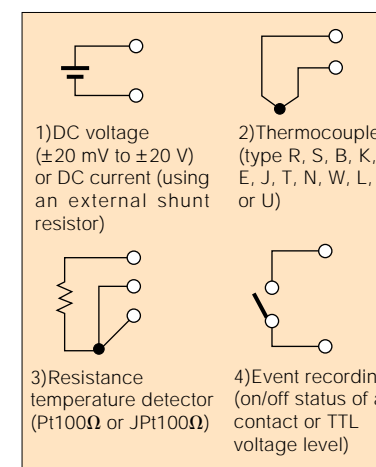The interactive system for making various settings lets you try different features.

Range setting

Engineerring unit setting

Universal Input Handles Any Signals.

The input signal can be selected arbitrarily from a DC voltage, thermocouple, resistance temperature detector, and event recording (DI on/off status) for each channel.

1)DC voltage (±20 mV to ±20 V) or DC current (using an external shunt resistor)

2)Thermocouple (type R, S, B, K, E, J, T, N, W, L, or U)

3)Resistance temperature detector (Pt100Ω or JPt100Ω)

4)Event recording (on/off status of a contact or TTL voltage level)

VR200

[Extensive Functions]

Versatile functions enhance all applications.

Mathematical Functions

Various optional Mathematical functions allow calculated values such as totalized flow rates to be displayed as trend graphs or digital values, and to be saved to a floppy disk. The data of each channel, regardless of whether a measured value or calculated value is assigned to it, can be saved as binary data at set intervals (1 minute to 24 hours). The calculated data can thus be easily viewed and manipulated on a personal computer.*

* To view calculated data on a personal computer, VA200-02 (VR data viewer for Windows 95) is required.

Channels assignable to calculated data:
Up to 4 channels for 2- or 4-channel model
Up to 6 channels for 6-channel model

Operations:
General arithmetic operations: four arithmetic operations, square root, absolute, common logarithm, exponential, relational operations (<,>,=,≠), logic operations (AND,OR,NOT,XOR)
Statistical operations: average, maximum, minimum, and total of time-series data
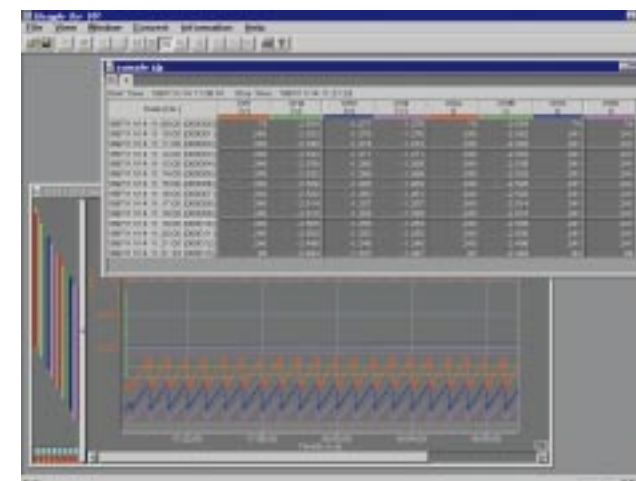
The calculated data can be viewed on a personal computer.

Optional Large Memory

For long-term data storage, the internal memory can be expanded, which is useful when using the mathematical functions or when using the VR200 for data acquisition at monitoring stations that are left unmanned for a long time. The data stored in the expanded memory is saved to three floppy disks for the 4-channel model, and four floppy disks for the 6-channel model. The following shows examples of sampling times when the optional large memory is installed.

4-channel model; event file + display data file

Display data file (when using all four channels) (approx.)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	3 days	16 days	33 days	66 days	100 days	200 days

Event file (for four channel inputs) (approx.)

Sampling period	125 ms	250ms	500ms	1 s
Sampling time	3.1 hours	6.2 hours	12.4 hours	25 hours

Display data file (when using all four input channels and four computed-value channels) (approx.)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	26.6 hours	5 days	11 days	22 days	33 days	66 days

Event file (for four channel inputs and four computed-value channels) (approx.)

Sampling period	250 ms	500 ms	1 s
Sampling time	2 hours	4.1 hours	8.3 hours

4-channel model; event file only

Event file (for four channel inputs) (approx.)

Sampling period	125 ms	250ms	500ms	1 s
Sampling time	12.5 hours	25 hours	2 days	4 days

Event file (for four channel inputs and four computed-value channels) (approx.)

Sampling period	250 ms	500 ms	1 s
Sampling time	8.3 hours	16.6 hours	33.3 hours

6-channel model; event file + display data file

Display data file (when using all six channels) (approx.)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	3 days	16 days	33 days	66 days	99 days	198 days

Event file (for six channel inputs) (approx.)

Sampling period	1 s	2 s	10 s	30 s	60 s	120 s
Sampling time	16.6 hours	33.2 hours	6 days	20 days	41 days	83 days

Display data file (when using all six input channels and six computed-value channels) (approx.)

Waveform span rate (min/div)	1 min	5 min	10 min	20 min	30 min	60 min
Sampling time	26.4 hours	5 days	11 days	22 days	33 days	66 days

Event file (for six channel inputs and six computed-value channels) (approx.)

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

6-channel model; event file only

Event file (for six channel inputs) (approx.)

Sampling period	1 s	2 s	10 s	30 s	60 s	120 s
Sampling time	3 days	7 days	38 days	116 days	233 days	466 days

Event file (for six channel inputs and six computed-value channels) (approx.)

Sampling period	1 s	2 s	10 s	30 s	60 s	120 s
Sampling time	31.1 hours	2 days	12 days	38 days	77 days	155 days

[True Reliability Is Born of Technical Genius]

The skills honed in the development of no fewer than 800,000 industrial recorders have been concentrated in the VR200. Invisible to the eye, Yokogawa's unparalleled technical capabilities run throughout the ultra-reliable VR200.

High Breakdown Solid-state Relay

For the 6-channel model of the VR series, Yokogawa's original high breakdown solid-state relay is employed for the scanner that switches the input signals. This high breakdown solid-state relay, which is composed of a MOSFET having a high breakdown voltage of 1500 V DC and low leakage current of just 3 nA and a voltage-output photocoupler, delivers a blistering scanning speed of just 1 second for 6 channels, longer life scanner, and silent operation!
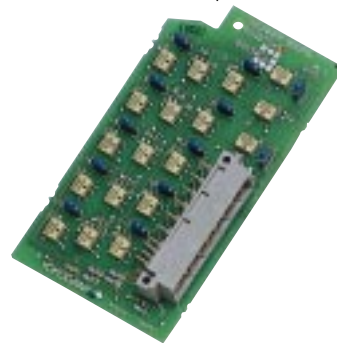
ASIC

The VR series incorporates Yokogawa's original application-specific integrated circuits (ASICs). For example, its A/D converter uses a one-chip A/D LSI in which the programmable-gain amplifier, A/D converter, etc. are integrated. These ASICs allow the circuits to be densely integrated, thus minimizing power consumption and heat dissipation to prolong the life of parts.

Compliance with Safety Standards and EMC Standards

As proof of its supreme reliability, the VR series has cleared the strict international standards for safety and electromagnetic compatibility. And of course, the VR series has been certified for the CE mark that has been mandatory in Europe since 1996.

Safety standards:
Certified for CSA22.2 No. 1010.1.
Complies with EN61010-1.

EMC standards:
Complies with EN55011 Group 1 Class A (EMI).
Complies with EN50082-2 (immunity).

CE

8

User-friendly application software enables the VR200 to exhibit its full performance.

Instantly retrieve Images from data saved on a VR200 recorder and convert to a Lotus 1-2-3 or Microsoft Excel spreadsheet!

[Application software]

Windows 3.1 or Windows 95 data viewer and file conversion software for the VR200 lets you manipulate data on your existing PC.

### ■ VR application software package (for MS-DOS and Windows 3.1)

The file-conversion software runs under MS-DOS while the file conversion and data viewer software runs under Windows 3.1-ideal for processing data saved to floppy disk from the VR200 using spreadsheet software such as Lotus 1-2-3 or Microsoft Excel.

Display of data waveforms/digital values

By using this file conversion/viewer software, you can easily recall measurement data that has been saved from the VR200 on a floppy disk and display waveforms and digital values on a personal computer. In addition, you can output the displayed results in graphic form to a printer, thus enabling you to leave a record of data on recording paper.
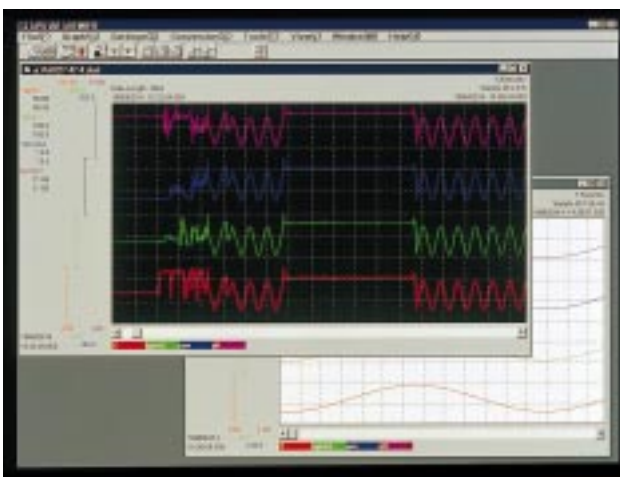
Data analysis using commercially available display calculation software

You can convert measurement data to Lotus 1-2-3, Excel or ASCII format files. You can easily convert data using a mouse, while verifying the measurement data on-screen, thus permitting efficient data analysis. Once you have done this, you can carry out a variety of data processing using the functions of the tabular software that you normally use.
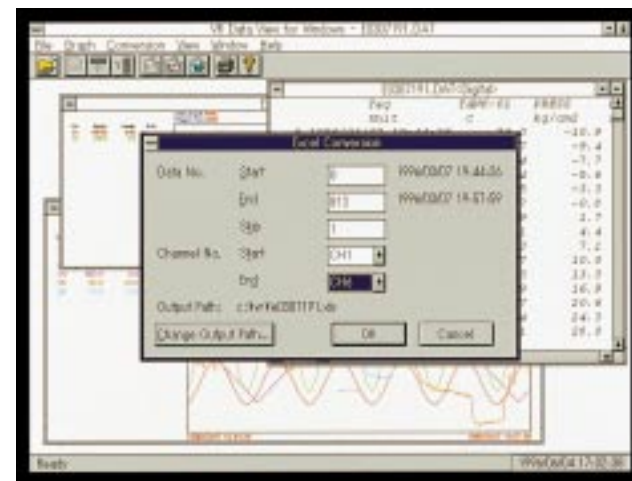
■ VR enhanced data viewer software (for Windows 3.1, Windows 95)

This file conversion and data viewer software for Windows 3.1 and Windows 95 offers versatile functions for viewing data. Waveform chart image retrieval and other invaluable data viewing functions make this the perfect choice for Windows 3.1 users.

Display waveforms just like on a VR200 using the enhanced data viewer software

Use the measured data saved by a VR200 to view the chart images on a personal computer.
Regardless of the display window size, waveforms are displayed just like those on a VR200.
And of course, the measured data can also be displayed digitally, allowing detailed analysis of the data.
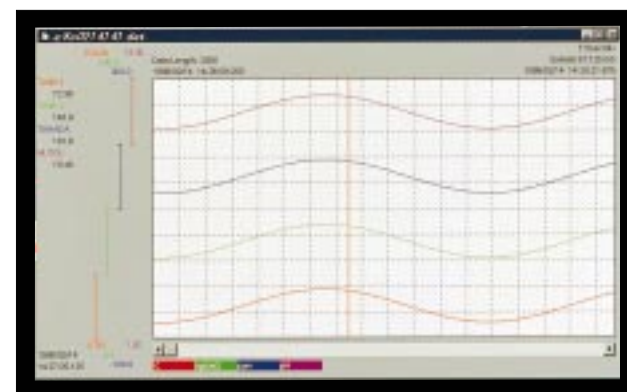
Use the cursor to read values at any point

Simply place the cursor at the desired point on the time axis to get the digital readings of the measured data at that point. Chart paper makes it hard to read the data, but with this software and VR200 together, nothing could be easier!

■ VR data viewer for Windows95 (for Windows95)

This file conversion and data viewer software is Windows 95-native, making it fast and powerful. You can magnify the displayed waveforms, read values at any point using the cursor, and convert files instantly-ideal for Windows 95 users needing a range of high-speed, easy-to-use data retrieval functions.

Extensive data viewing functions

Great enhancements were made in the display functions for measured data and alarm information. Using the mouse, users can easily magnify and reduce the waveform display as well as switch the display on or off and call up the scale for each channel. Not only this, alarm and event data and trip levels are also displayed on the waveform display, allowing the user to find data at the occurrence of an alarm or event. The user can also mark a desired point on a waveform and enter a notation.
The data pointed to by the cursor are always displayed as digital values, allowing detailed analyses of changes in measured data based on digital readings.

Waveform display magnification/reduction buttons

Just click on the buttons on the tool bar to instantly magnify and reduce the waveform display-handy for observing trend graphs and analyzing changes of data in detail.

Display of marks
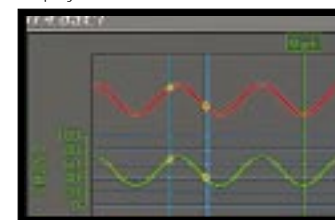
Mark desired points on a waveform and enter the corresponding notations.

Cursor-point data dialog box

Simply open the cursor-point data dialog box to display the time and data values on the waveforms at the two cursors as well as the differences between the values at these points for each waveform.

File conversion for editing and analyzing data using a popular spreadsheet application

The user can specify a range of data using the cursor, save it as a Lotus 1-2-3 or Microsoft Excel file, and then effectively process the data on a PC in any way the user likes. Also, the user can copy a range of data (up to a thousand data values) using the cursor and paste them on a Lotus 1-2-3 or Microsoft Excel worksheet, allowing instant importing of desired data without file conversion.

Improved data printout

Various functions are added to improve the functionality of waveform and digital value printouts. The print preview function allows the user to confirm before printing whether only a desired range of data is to be printed. A comment can also be given and printed with the data.
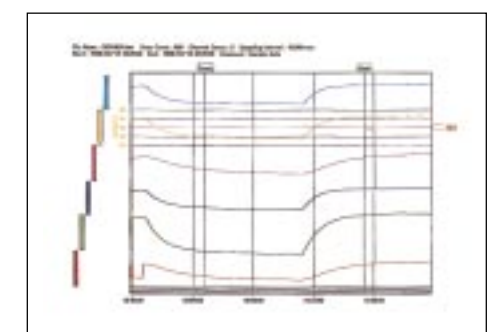
General specifications

■ Construction
Mounting method: Flush panel mounting (in the vertical plane)
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
Material: Case ... Drawn steel, Bezel ... Polycarbonate
External dimensions: (Refer to the exterior drawing.)
■ Input section
Number of inputs: Up to 2 channels (can be set with 1 or 2), 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:
2, 4-ch model ... 125 ms; 6-ch model ... 1s (In case of A/D 100 ms for integration, measurement interval is 2s)
Inputs: DCV (DC voltage), TC (thermocouple), RTD (resistance temperature detector), DI (digital input for event recording), DCA (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

	Range	Measuring range
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

	Range	Measuring range
Resistance temperature detector (RTD)	Pt100 *5	-200.0 to 600.0°C
	JPt100 *5	-200.0 to 550.0°C

	Range	Measuring range
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 DCV, 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)
Available for DCV, TC, and RTD
<Square root>
Available for the DCV 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: waveform display direction is user-selectable from vertical and horizontal.
Line width of wavefrom are user selectable from 1, 2 and 3pixels.
Analog display color (default):
2-channel model … Red for channel 1, green for channel 2 (These colors as well as blue, violet, brown, cyan, orange and gray are user-selectable for each channel.)
4-channel model … Red for channel 1, green for channel 2, blue for channel 3, violet for channel 4 (These colors as well as brown, cyan, orange and gray are user-selectable for each channel.)
6-channel model … Red for channel 1, green for channel 2, blue for channel 3, violet for channel 4, orange for channel 5, cyan for channel 6 (These colors as well as brown and gray are user-selectable for each channel.)
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 lines (number of divisions selectable from 4 to 12), hour: minute on grid, trip levels (line widths are selectable from 1, 2 and 3 pixels), messages (up to five different messages of up to 16 characters for each, displayed only in the vertical waveform display mode), alarms (ALM), waveform span rate
Data referencing function:
By 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.
The span of the time axis for the display area can be selected from 5.5*, 16.5, and 27.5 minutes (or from 8*, 24, and 40 minutes for horizontal waveform display).
*If the mathematical functions or large memory is specified, only 5.5 minutes (only 8 minutes for horizontal waveform display) can be selected.
Bargraph display: The measured values are displayed as easy-to-read bar graphs. The channel or tag number, alarm status, unit, scale values, and alarm settings of each channel are displayed together.
Large digital display:
The measured values are displayed as large digits. The alarm status and unit of each channel are displayed together.
Alarm summary display:
Up to the fifty most recent alarm events—occurrences and recoveries of alarms—are displayed. The number of samples stored in each of the display data and event files and the percentage of memory currently used are also displayed.
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: Transmitting 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 ms, 250 ms, 500 ms, and 1 sec for 2,4-ch model, and from 1, 2, 10, 30, 60, or 120 sec 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:
2-ch model: approx,double the 4-ch model.
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	250ms	500ms	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 the case of (2) above, the total sampling time of 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

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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 VAC (automatic switching)
Allowable supply voltage range: 90 to 132 or 180 to 250 VAC
Rated supply frequency: 50/60 Hz (automatic switching)
Power consumption (for all models):

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 (except for RTD of VR206, since b-terminal is common)
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°C ±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 + 3digits)	10 μV
	60 mV	±(0.2% of rdg + 2digits)	10 μV
	200 mV	±(0.2% of rdg + 2digits)	100 μV
	2 V	±(0.1% of rdg + 2digits)	1 mV
	6 V	±(0.3% of rdg + 3digits)	1 mV
	20 V	±(0.3% of rdg + 2digits)	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	
	B	±1.5°C at 100 to 300°C. 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 + 1°C)	
	W	±(0.15% of rdg + 0.7°C)	
	L	±(0.15% of rdg + 0.5°C)	
	U	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		

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 DCV ranges or 2 V or less and TC
Approx. 1 MΩ for 6 V and 20 V DCV ranges

Input source resistance:
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%, 500Ω 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 VAC (50/60 Hz)/3 A
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
■ **Large memory (/E4)**
Expands the internal memory. For the sampling time when this option is used, see the tables on page 8.
■ **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.
■ **Desk top type (/H5□)**
Provides carrying handle and power code.
■ **French/German display, winter/summer time**
French or German display can be slelcted. winter and summer time can be set.
■ **Mathematical functions (/M1 and /M2)**
Used for calculating data, displaying trends and digital values, and recording calculated data assigned to channels. The data of each channel, regardless of whether a measured value or calculated value is assigned to it, can be saved as binary data at set intervals (1 minute to 24 hours).
Channels assignable to calculated data:
Up to 4 channels for 2- or 4-channel model
Up to 6 channels for 6-channel model
Operations: General arithmetic operations: four arithmetic operations, square root, absolute, common logarithm, exponential, relational operations, (<,>,=,≠) logic operations (AND, OR ,NOT, XOR) Statistical operations: average, maximum, minimum, and total of time-series data
Note: To view the calculated data on a personal computer, VA200-02 (VR data viewer for Windows 95) is required.
■ **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 V A (approx.)
■ **Remote control (/R1)**
This option allows the following five functions to be controlled remotely by a contact input:
• Trigger for event file
• Time adjustment (adjusting the time to a preset time upon contact signal)
• Start/stop of computation*
• Clearance of computation data*
• Message display (Up to five different messages can be set.)
* When the optional mathematical functions (/M1 or /M2) are equipped.

Application software (accessories)

■ VR 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 soft ware
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 Windows 95
CPU: 80486DX2 or later (Pntium 90 or higher recommended)
Memory: 16 MB or more
O S: MS-Windows Ver. 3.1 or Windows 95
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 or Windows 95
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 Windows 95
● **VR data viewer for Windows 95**
Operating environment
P C: A personal computer that can run or Windows 95
CPU: 80486DX4 or later (Pntium 120 or higher recommended)
Memory: 16 MB or more
O S: Windows 95
Disk: 3.5-inch FD (1.44 MB format)
Hard disk (free area of at least 15 MB)
CRT: Compatible with Windows 95
Can display analog RGB 256 colors or higher (64,000 colors or higher recommended)
Printer: A printer and printer driver compatible with Windows 95

Application software

Model code	Description	OS environment
VP100-02	VR application software package	MS-DOS, Windows 3.1
VA100-02	VR enhanced data viewer software	Windows 3.1, Windows 95
VA200-02	VR data viewer for Windows 95	Windows 95

Optional accessories

Item		Part No.	Specifications
3.5-inch floppy disk		7059 00	Ten 2HD disks
Shunt resistors	For screw input terminal	4159 20	250 Ω ± 0.1%
		4159 21	100 Ω ± 0.1%
		4159 22	10 Ω ± 0.1%
	For clamped input terminal	438920	250 Ω ± 0.1%
		438921	100 Ω ± 0.1%
		438922	10 Ω ± 0.1%
Mounting bracket		B9900CW	—

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Note: There are some picture elements that are always lit and others that are not on the liquid crystal display (LCD). Also, there may be areas of uneven brightness on the LCD due to its display property. However, bear in mind that these are not faulty.

■ Model and suffix codes

VR200

Model Code	Suffix Code	Option Code	Description
VR202			View Recorder Wide-View Model VR200 (2-channel model)
VR204			View Recorder Wide-View Model VR200 (4-channel model)
VR206			View Recorder Wide-View Model VR200 (6-channel model)
Application Software	-0		No application software
	-2		with application software package (VP100-02)
Options		/A1	Alarm output relay (2 points) *1
		/A2	Alarm output relay (4 points) *1
		/A3	Alarm output relay (6 points) *1
		/C3	RS-422A interface
		/D2	deg F as the temperature unit
		/E4	Large memory
		/F1	FAIL/memory end detection and output *2
		/H2	Clamped input terminal
		/H5□	Desk top type *3
		/M1	Mathematical functions
		/M2	Mathematical functions with VA200-02 (VR data viewer for Windows 95) *4
		/N1	Cu10, Cu25 RTD input
		/P1	24 V DC power supply
		/R1	Remote control

*1 /A1, /A2, and /A3 cannot be specified together.
*2 If /F1 is specified, /A3 cannot be specified.
*3 /H5□
   D: Power cord UL st'd
   F: Power cord VDE st'd
   R: Power cord SAA st'd
   J : Power cord BS st'd
*4 To view the calculated data on a personal computer, VA200-02 (VR data viewer for Windows 95) is required.
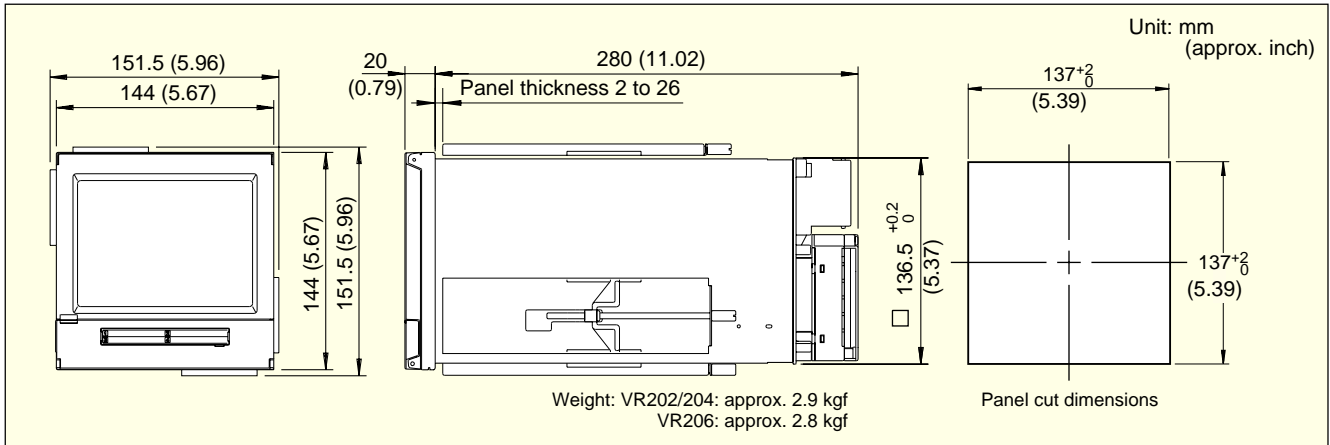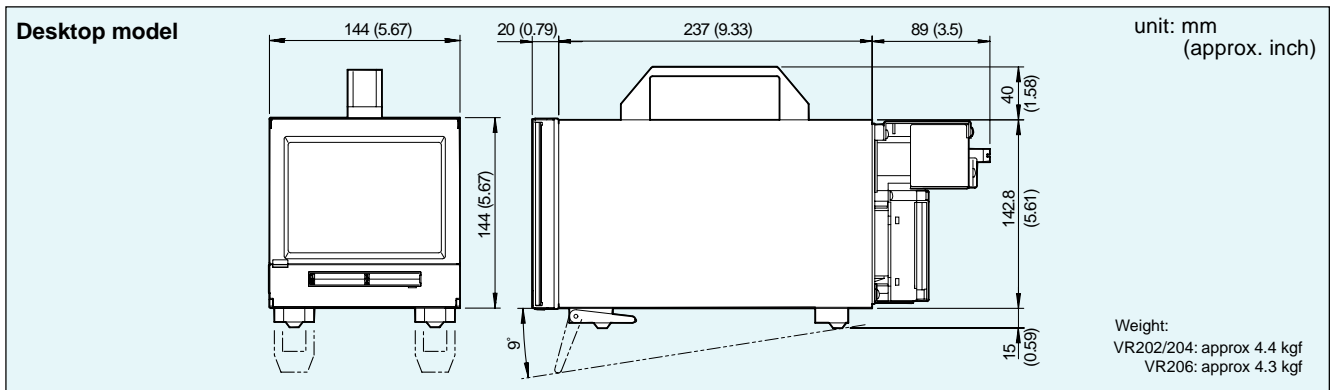
■ External drawing/panel cut dimensions

Unit: mm (approx. inch)

151.5 (5.96)
144 (5.67)
20 (0.79)
Panel thickness 2 to 26
280 (11.02)
144 (5.67)
151.5 (5.96)
136.5 $^{+0.2}_{0}$ (5.37)
137^{+2}_{0} (5.39)
137^{+2}_{0} (5.39)

Weight: VR202/204: approx. 2.9 kgf
VR206: approx. 2.8 kgf

Panel cut dimensions

Notes: Use two mounting brackets to mount the VR200 on a panel.
Install these mounting brackets at left and right, or top and bottom.
Refer to Yokogawa's General Specifications (GS 4N2A1-E) for the panel cut dimensions when you wish to install two recorders close together either side by side or one on top of the other.
Where a tolerance is not specified, use ±3% (use ±3 mm if the dimension concerned is less than 10 mm).

Desktop model

unit: mm (approx. inch)

144 (5.67)
20 (0.79)
237 (9.33)
89 (3.5)
144 (5.67)
40 (1.58)
142.8 (5.61)
15 (0.59)
9°

Weight:
VR202/204: approx 4.4 kgf
VR206: approx 4.3 kgf

Notes: Where a tolerance is not specified, use ±3% (use ±3 mm if the dimension concerned is less than 10 mm).

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