PORTABLE HYBRID RECORDER

Portable Hybrid Recorder
DR130

DR130
338 × 221 × 335mm 9.3 kg
(13-3/8 × 8-3/4 × 13-1/4" 20.5 lbs)

CE

RS-232-C
RS-422-A/485

GP-IB
Ethernet

★
Safety Standards : CSA22.2 No.1010.1 (CSA NRTL/C)
EN61010-1
EMC Standards :   Emission   EN61326 Class A
EN61000-3-2 Class D
EN61000-3-3
Immunity EN61326

The DR130 portable hybrid recorder comes with a large VFD monitor, and has a wide range of functions including multi-point, high speed, precision measurement and recording, and the ability to save data to a floppy disk. It has excellent mobility, enabling it to be used anywhere at all.

The measurement data can be effectively utilized by a personal computer via a general purpose communication interface or a memory device (floppy disk). A wealth of application software provides powerful support for PC measurement.

The new DR130 hybrid recorder, which was developed to meet the demands of the downsizing era, is the latest addition to the DARWIN series.

FEATURES

● **Small, light-weight and portable**
The DR130 is smaller and lighter (9.3 kg) than the popular HR1300, and is considerably more portable. The mobility of this instrument is noticeably superior.
● **Data can be saved to a floppy disk**
You can transfer settings and measurement data to a personal computer or save them to a memory device (floppy disk).
The saved measurement data can also be converted to the Excel or Lotus 1-2-3 format by means of DAQ32 software (standard).
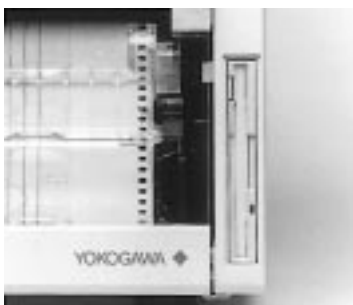
● **A wealth of PC-based application software**
The DR130 comes with various drivers for commercially available software in addition to configuration and data logging software. This enables you to easily configure a personal computer-based data recording environment.
● **Network data acquisition**
Real-time data logging and remote monitoring via Ethernet is available.
● **Mutually isolated channels, and universal inputs**
The input section, in which each channel is isolated from the other, contains a signal conditioner function, permitting universal measurement of various inputs including voltage, thermocouple (TC), resistance temperature detector (RTD), and contact signals.
● **High environmental toughness and high reliability to withstand severe field environments**
The DR130 uses high breakdown voltage solid state relays developed by YOKOGAWA and also conforms to world safety standards, ensuring high reliability.
The instrument comes with complete filter functions, resulting in greater immunity to field noise.
● **Comes with a large display, and is designed for ease of operation.**
The DR130 has a large, 3-line VFD display for improved visual recognition of data. Also, various messages are displayed when you operate the instrument, thus making for improved operability.
● **Number of input channels: 10 channels or 20 channels (specify when ordering)**
● **Measurement intervals: Max 2 seconds**
● **Effective recording width: 150 mm**

SPECIFICATIONS

Input section

■ Measurement interval
2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60 seconds
Maximum of 2 seconds/20 channels
■ A/D integration period
Munual selection: 20 ms (50 Hz), 16.7 ms (60 Hz) and 100 ms (10 Hz) or Automatic switchover between 50 and 60 Hz

Filter ON/OFF Cutoff frequency Number of channels	Low pass filter OFF		Low pass filter ON	
	20 ms (50 Hz) 16.7 ms (60 Hz)	100 ms (10 Hz)	20 ms (50 Hz) 16.7 ms (60 Hz)	100 ms (10 Hz)
10	2 sec	4 sec	3 sec	12 sec
20	2 sec	5 sec	4 sec	15 sec

General specifications

■ External dimensions
Approx. 338 (W) × 221 (H) × 335 (D) mm
The DC power supply option adds 45 mm to the depth.
■ Weight
9.3 kg (when 20 input channels and an alarm output are installed)
The DC power supply option adds 1.5 kg(f) to the weight.
■ Materials
Steel plate, aluminum alloy, plastic moldings
■ Paint color
Display: Slate Gray light (equivalent to Munsell 0.1 PB 4.6/0.2)
Core: Ice White (equivalent to Munsell 6.6Y 7.9/0.5)

■ Measurement range

Kind of input	Range	Measurement range	Measurement (digital display and recording)	
			Measurement accuracy	Min. resolution
DC voltage	20 mV	-20.000 to 20.000 mV	±(0.05% of rdg + 5 digits)	1µV
	60 mV	-60.00 to 60.00 mV	±(0.05% of rdg + 2 digits)	10µV
	200 mV	-200.00 to 200.00 mV	±(0.05% of rdg + 2 digits)	10µV
	2 V	-2.0000 to 2.0000 V	±(0.05% of rdg + 2 digits)	100µV
	6 V	-6.000 to 6.000 V	±(0.05% of rdg + 2 digits)	1 mV
	20 V	-20.000 to 20.000 V	±(0.05% of rdg + 2 digits)	1 mV
	50 V	-50.00 to 50.00 V	±(0.05% of rdg + 2 digits)	10 mV
Thermocouple; (Does not include the reference junction compensation accuracy.)	R[*1]	0.0 to 1760.0°C	±(0.05% of rdg + 1°C) However 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
	S[*1]	0.0 to 1760.0°C		
	B[*1]	0.0 to 1820.0°C		
	K[*1]	-200.0 to 1370.0°C	±(0.05% of rdg + 0.7°C) However, K attains an accuracy of ±(0.05% of rdg + 1°C) within the range between -200 and -100°C.	
	E[*1]	-200.0 to 800.0°C	±(0.05% of rdg + 0.5°C) However, J and L attain an accuracy of ±(0.05% of rdg + 0.7°C) within the range between -200 and -100°C.	
	J[*1]	-200.0 to 1100.0°C		
	T[*1]	-200.0 to 400.0°C		
	L[*2]	-200.0 to 900.0°C		
	U[*2]	-200.0 to 400.0°C		
	N[*3]	0.0 to 1300.0°C	±(0.05% of rdg + 0.7°C)	
	W[*4]	0.0 to 2315.0°C	±(0.05% of rdg + 1°C)	
	KPvsAu7Fe	0.0 to 300.0K	±(0.05% of rdg + 0.7K)	0.1K
RTD	Pt100 (1 mA)[*5]	-200.0 to 600.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
	Pt100 (2 mA)[*5]	-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
	JPt100 (1 mA)[*5]	-200.0 to 550.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
	JPt100 (2 mA)[*5]	-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
	Pt50 (2 mA)[*5]	-200.0 to 550.0°C	±(0.05% of rdg + 0.3°C)	
	Ni100 (1 mA)[*6] SAMA	-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	
	Ni100 (1 mA)DIN[*6]	-60.0 to 180.0°C	±(0.05% of rdg + 0.3°C)	
	Ni120 (1 mA)[*7]	-70.0 to 200.0°C		
	J263[*]B	0.0 to 300.0K	±(0.05% of rdg + 0.3K)	0.1K
	Cu10 GE	-200.0 to 300.0°C	±(0.2% of rdg + 0.7°C)	0.1°C
	Cu10 L&N			
	Cu10 WEED			
	Cu10 BAILEY			
High resolution RTD	Pt100 (1 mA)[*5]	-140.00 to 150.00°C	±(0.05% of rdg + 0.3°C)	0.01°C
	Pt100 (2 mA)[*5]	-70.00 to 70.00°C	±(0.05% of rdg + 0.3°C)	
	JPt100 (1 mA)[*5]	-140.00 to 150.00°C	±(0.05% of rdg + 0.3°C)	
	JPt100 (2 mA)[*5]	-70.00 to 70.00°C	±(0.05% of rdg + 0.3°C)	
Contact	Voltage input	Less than 2.4 V OFF, 2.4 or more ON detection (TTL)		
	Contact input	Contact ON/OFF		

*1 R, S, B, K, E, J, T: ANSI, IEC 584, DIN IEC 584, JIS C 1602-1981
*2 L: Fe-CuNi, DIN-43710, U: Cu-CuNi, DIN 43710
*3 N: Nicrosil-Nisil, IEC584, DIN IEC 584
*4 W: W.5%Re-w.26%Re (Hoskins Mfg.Co.)

*5 P150: JIS C 1604-1981, JIS C 1606-1986 P1100: JIS C 1604-1989, JIS C1606-1989, IEC 751, DIN IEC 751JP1100: JIS C 1604-1981, JIS C 1606-1989
*6 SAMA/DIN
*7 McGRAW EDISON *8 Accuracy guarantee range

■ Input method
floating unbalanced input, each channel mutually isolated(channel independent)
The RTD range has a common potential (terminal b).
■ A/D resolution
±20000
■ The standard operating conditions
23 ±2°C, 55 ±10% RH, warming-up time 30 minutes or more, vibration and others not affecting instrument operation
■ Compensation for the reference junction
Switchable internally or externally for each channel
■ Compensation accuracy for the reference junction
(measured at 0°C, used for a bundle line of thermocouple at Ø0.5 or less when the input terminals are balanced; Frontwards: 0˚ Backwards: 0˚ horizontal)
Type R, S, B, W: ±1°C
Type K, J, E, T, N, L, U: ±0.5°C
■ Maximum allowable input voltage
2V DC range or lower, thermocouple, RTD, DI (CONT): ±10 V DC
6V DC range or greater, DI (LEVEL): ±60 V DC
■ Normal mode voltage
voltage, thermocouple: 1.2 times or less (at peak value, including 50 or 60Hz signal component)
RTD: 50 mV or lower (at peak value)
■ Normal mode rejection ratio
40 dB or greater (50/60 Hz ±0.1%)
■ Common mode noise voltage
250 V AC rms (50/60 Hz)
■ Common mode rejection ratio
120 dB or greater (50/60 Hz ±0.1%, 500 Ω unbalanced, between the negative measurement terminal and ground)
■ Maximum noise between channels
150 V AC rms (50/60 Hz) (except for RTD)
■ Noise rejection
rejection by integration type A/D, lowpass filter, or moving averaging
■ Lowpass filter
50/60/10 Hz

■ Input resistance
Min. 10 MΩ at 2 V DC or lower, thermocouple range
Approx. 1 MΩ at 6 V DC or higher (Power off: 10 MΩ or more)
■ Insulation resistance
Min. 20 MΩ at 500 V DC between the input terminal and ground
■ Input bias current   max.:   10 nA
■ Dielectric strength
1,000 V AC (50/60 Hz) for 1 minute:between input terminals, (except for RTD)
1,500 V AC (50/60 Hz) for 1 minute:between an input terminal and ground
■ Input source resistance
DCV, thermocouple: 2 kΩ or lower
RTD: 10 Ω or lower per line (Pt100 Ω)
            5 Ω or lower per line (Pt50 Ω)
            1 Ω or lower per line (Cu10 Ω)
            the same resistance including 3-line
■ Temperature coefficient
zero: 0.01% of range/°C
full span: 0.01% of range/°C (0.02% of span/°C for Cu10 Ω)
■ Thermocouple burn out:
Detected in a thermocouple range (On/Off enabled), current of 4 µA, detectable pulse width of approx. 5 ms
2 kΩ or lower is considered to be 'Normal'.
100 kΩ or greater is considered to be 'Disconnected'.

Recording section

■ Recording method
Raster scan method, 10-color wire dot recording
■ Number of recording points
Measurement result: 20 points + AC 6 points* or 2 points*
Computation results: 30 points
* To be released later
■ Recording paper
Effective recording width: 150 mm (for dot recording)

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YOKOGAWA

■ Recording accuracy
Dot: ±(0.2% of recording span + measurement accuracy)
Digital value: Determined by the measurement accuracy.
■ Maximum recording resolution
Dot: 0.1 mm
Digital value: Depends upon the measurement resolution.
■ Recording colors
Analog trend mode
  Dot recording: Purple, red, green, blue, brown, black, navy blue, yellow-green, red-purple, orange (Color can be specified separately for each channel.)
  Digital printout: Black
  Alarm printout: Red (Alarm cancel mark: Blue)
Logging mode
  Logging recording: Purple

■ Recording interval
Analog recording interval in analog trend mode
  FIX: Recording takes place in synchronism with the measurement interval between 2 and 60 seconds.
  AUTO: Recording takes place in synchronism with the measurement interval and the recording paper feed speed.
Recording interval for digital printing in the analog trend mode
  MULTIPLE: Specify from six kinds for each channel (1 minute to 24 hours, specify in 1-minute units).
  SINGLE: Automatically determined from the paper feed speed, the number of recording channels whose numerical values are to be printed, and the number of rows.
Digital value recording interval in the logging mode:
  MULTIPLE: Specify from six kinds for each channel (1 minute to 24 hours, specify in 1-minute units).
  SINGLE: Common to all points (between 1 minute and 24 hours, specify in 1-minute intervals)
  Recording interval switchover: 2 kinds
Switched over according to event/action function

■ Recording paper feed
Paper feed speed: 1 to 1,500 mm/h
Recording paper speed change: 2 kinds
Switched over according to the event/action function
Recording paper feed method: Pulse motor
Paper feed accuracy: ±0.1% of the feed distance (Does not include the elongation or contraction of the recording paper when continuous recording is performed over a distance of at least 1000 mm.)

■ Recording mode
NORMAL: Starting and stopping recording by pressing a key
Alarm generation channel trend: TRIGGER ... Recording starts only for a channel in which an alarm is detected.
Stopping recording by pressing a key.
LEVEL ... Recording of only a channel in which an alarm is generated takes place.
(Recording starts when an alarm is detected, and stops when the alarm is canceled.)
Group trend: The measurement channels are divided into groups, and recording takes place only for channels belonging to the specified group. The selection of the group to be recorded can be made using the event/action function.

■ Auxiliary printing functions
Common: Printing takes place in the analog trend mode.
Chart speed (mm/h) × dot recording interval (s) must be no greater than 3000 (≤ 3000).
Time printing: Hours, minutes
Unit printing (UNIT): Arbitrary setting within 6 characters
Channel No./TAG printing: Arbitrary setting between 7 and 16 characters
Alarm printing: Channel No., kind of alarm, ON/OFF time (hours, minutes)
Scale printing: 0, 100%/0, 50, 100%/every 20%
Message printing: 20 kinds of messages (16 characters) and the time are printed. Periodic printing. Printed is started by a key operation or the event/action function.

■ Others
Setting the recording time: The recording start/stop times can be set.
Manual printing: One scan's worth of data can be digitally printed by means of a key operation or the event/action function. Analog trend recording is interrupted.
List printing: The set contents are printed (printing is started by a restart).
Header printing: A character array consisting of 80 characters x 5 lines is printed (the measurement value recording is interrupted). Printing is started by a key operation or the event/action function.
Recording zone: The recording width and the recording positions (0% and 100% positions) can be set in mm units for each channel.
Partial compression: Can be set for each channel (Only one boundary value can be set).
Event/action function: Alarm detection/remote control signal input/Chart end signal/Timer/Recording starts by means of a key operation/The chart speed can be changed, etc.

Memory function section

■ Memory media
3.5" floppy disk drive
When measurement data is saved to a floppy disk, it is first stored in the buffer memory (512 KB, SRAM).
■ Applicable data
Set values, measurement values, computed values (except /M3 report value)
■ Data length
10 items of data/channel to 50 k items of data/channel
However, the total memory length must be within the capacity of the vacant memory.
■ Memory format
Binary
However, when copying the data in the buffer memory to a floppy disk, it is possible to convert the data into ASCII (CSV) format.
■ Sample rate
In synchronism with the measurement interval of the recorder, or 1/2/5/10 minutes, or when an event occurs

Display section

■ Display section
Display: VFD display (5x7 dot matrix, 3 lines)
Number of characters: 22 characters (Large/1 line), 40 characters (2 lines)
■ Display contents
Digital value display: The data for an arbitrary channel is displayed on one line (1 ch/1 line, max 5 ch).
CH No./TAG(7 characters), alarm search, measurement value, and unit are displayed with respect to time.
Measurement value bar graph display: Values are displayed as 0 to 100%.
Auxiliary information: Clock, alarm status, alarm relay status, recording format, recording ON/OFF, key lock ON/OFF, and recorder operation (print format)

Alarms

■ Number of settings
Up to four alarm settings can be made for each channel.
Kinds of alarms: Select from upper and lower limits, difference between upper and lower limits, and percentage change rising and falling limits.
Percentage change alarm time interval: Measurement interval × 1 to 15 settings are possible (common to rising and falling limits).
■ Output mode
AND/OR mode selection, and output hold/non-hold designation are possible.
Re-breakdown re-alarm output 6 contacts are available.
■ Number of alarm output points
Max. 12 points (when /A4 or /R1 optional specifications are specified)
■ Alarm information recording
Trend mode: Channel No., TAG, kind of alarm, and ON/OFF time (hours, minutes) are printed in the right margin.
Logging mode: The kind of alarm and ON/OFF time (hours, minutes) are printed when the measurement values are recorded.
■ Displaying alarm information
Alarm status display: Lights when an alarm is detected. A flashing display can also be set.
Alarm acknowledge display: The alarm point flashing display stops when a key is pressed.

Standard computation functions

■ Kinds of computation
Difference between arbitrarily selected channels, linear scaling (scaling), moving average
■ Linear scaling
Scalable range: DC voltage, thermocouple, RTD, contact
Scaling range: -30,000 to +30,000
Decimal point: Arbitrarily set
Measurement accuracy during scaling: Measurement accuracy during scaling (digits) = Measurement accuracy (digits) × Scaling span (digits)/Measurement span (digits) + 2 digits (Digits below the decimal point are discarded.)
■ Moving average
The moving average result for 2 to 64 scans is computed.

Power supply section

■ AC power supply
Rated supply voltage: 100 to 240 VAC
Usable supply voltage range: 90 to 250 VAC
Rated supply frequency: 50/60 Hz
Power consumption: Approx. 130 VA max. (when 20 input channels are selected)
■ DC power supply
Rated supply voltage: 12 to 28 VDC
Usable supply voltage: 10 to 32 VDC
Terminal: Dedicated connector
Power consumption: Max. 80 VA (when 20 input channels are selected)
Note: When both AC and DC power are connected to a DC power supply model, which of the power supplies is used depends on the voltage of the DC power supply connected as follows.

DC Power Supply Voltage	Power Supply Used
< 20 V	AC power supply
20 to 28 V	Indeterminate
28 to 32 V	DC power supply

Others

Clock: Comes with calendar function (Western calendar).
Clock accuracy: ±100 ppm. However, this does not include the delay when the power is switched ON/OFF once (no more than 1 second).
Fail: Contact output (when the /R1 option is specified)
Key lock: The set condition is locked with software.
Set value backup: Lithium battery backup (approx. 10 years)
Insulation resistance: Between the power supply terminal and ground, between each terminal and ground, and between input terminals
At least 20 MΩ (measured with 500 VDC)
Withstand voltage: Between power supply terminal and ground of DR130 ... 1,500 VAC (50/60 Hz) for 1 minute
Between input terminal and ground of DR130 ...1,500 VAC (50/60 Hz) for 1 minute
Between output terminal and ground of DR130 ... 2,300 VAC (50/60 Hz) for 1 minute

Normal operating conditions

Supply voltage: 90 to 250 VAC or 10 to 32 VDC
Supply frequency: 50 Hz ±2%, 60 Hz ±2%
Ambient temperature: 0 to 50°C (5 to 40°C when FDD is installed)
Ambient humidity:

Ambient temperature	Ambient humidity
0 to 40°C	20 to 80% RH
40 to 50°C	10 to 50% RH
* Condensation is not allowed.	

Vibration: 10 to 60 Hz 0.2 m/s²
Impact: Not allowed
Magnetic field: 400 A/m max. (50/60 Hz)
Position: The instrument must be installed left-right horizontally, or vertically.

Optional specifications

Computation functions (/M1)
■ Kinds of computations

Four arithmetic operations, SQR (square root), ABS (absolute value), LOG (common logarithm), LN (natural logarithm), EXP (exponent, statistic computations, logic computations (AND/OR/NOT/XOR), relative computations, power, previous measurement value reference, hold, reset, remote RJC computations

Number of channels on which computations can be performed:	Max. 30
Computation interval:	Each measurement interval (However, if computation processing becomes difficult to perform during each measurement interval because of the kind of computation or the number of channels, a warning is output.)
Computation range:	$\pm 10^{308}$
Display range:	-9,999,999 to +99,999,999 (Decimal point can be set to have 1 to 4 digits on the right of the decimal point.)
Communication input:	The digital value (ASCII number row) input due to the communication interface is recorded as an analog trend.
Starting and stopping computation:	Can be controlled by communication commands, function keys, the event/action function (key operation, remote control signal, time setting, alarm status, etc.).
Computation value hold:	Computation can be temporarily interrupted or the computation result can be temporarily held by means of the event/action function (key operation, remote control signal, time specification, alarm status, etc.). Statistical computations restart from the hold point after computation is restarted.

■ Statistical computations

CLOG:	Computation processing in groups specified at the same time (total, maximum, minimum, average, maximum - minimum)
TLOG:	Computation processing of a time system concerning a certain channel (total, maximum, minimum, average, maximum - minimum)
Statistical computation interval:	Interval setting by means of the event/action function

■ Remote RJC

Range:	Thermocouple (TC)
Accuracy:	(Standard thermocouple input measurement accuracy × 2) + (Difference in temperature between the terminal of the remote terminal and the remote terminal temperature measurement thermocouple)
Thermocouple burnout:	Cannot be selected.

Report Function (/M3)
Instantaneous values of measured data, as well as maximum, minimum, average and total, for each hour, day or month are printed in tabular form on recording paper. Analog recording is interrupted while a report is being made.
Report calculation channels: Up to 30 channels.

Power monitor option (/N7 or /N8)
■ Outline specifications

Number of channels:	For single phase: (voltage 1 channel, current 1 channel) For 3 phase: (voltage 3 channels, current 3 channels)
Terminal shape:	Clamp
Measurement interval:	2 s
Input method:	Transformer-isolated input
Measurement items:	Six items can be selected from the following: RMS value of AC voltage/current, active power, apparent power, reactive power, frequency, power factor and phase angle (There is a restriction in combining selected items.)

Measurement range (resolution):

Voltage:	250 V (0.1 Vrms), 25 V (0.01 Vrms)
Current:	5 A (0.001 Arms), 0.5 A (0.0001 Arms)
Measurement accuracy:	±(0.5% of span when RMS V or A is measured)
Measurement frequency:	45 to 65 Hz (Must be the same frequency for all channels.)
Crest factor:	3 max.
Power integration:	Calculated by /M1 (computation functions) option. /M1 must be specified for the DR130.

GP-IB communication option (/C1)
■ Functions
Control of measurement value output, set value output, setting of measurement conditions, starting/stopping of measurement, etc.
■ Outline specifications
Electrical and mechanical specifications: Conform to IEEE St'd 488-1978.

Code used:	ISO (ASCII) code
Address:	0 to 15

RS-232C communication option (/C2)
■ Functions
Control of measurement value output, set value output, setting of measurement conditions, starting/stopping of measurement, etc.
■ Outline specifications
Electrical and mechanical specifications:
Conform to EIA RS-232C.

Connection method:	Point-to-point
Communication method:	Half duplex
Synchronization method:	Start-stop synchronization (synchronization by start/stop bit)
Baud rate:	150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 bps
Start bit:	1 bit fixed
Data length:	7 or 8 bits
Parity:	EVEN, ODD or no parity
Stop bits:	1 or 2 bits
Transmission distance:	Max. 15 m
Connector:	D-sub 25-pin connector

Ethernet communication option (/C7)
■ Functions
Control of measurement value output, set value output, setting of measurement conditions, starting/stopping of measurement, etc.
■ Outline specifications

Network configuration:	Ethernet (10Base-T)
10Base-T modular connector:	1
Baud rate:	10 Mbps
Communication protocol:	TCP, UDP, IP, ARP or ICMP
Input data:	ASCII
Output data:	ASCII or binary

Alarm contact output option (/A4)
■ Outline specifications

Number of output points:	10 points
Contact mode: Make contact:	Normally open - common terminal
Terminal shape:	Screw

Output mode:	Can be switched between excited and non-exited. Can be switched between hold and non-hold.
Re-breakdown re-alarm:	Max. 6 contacts can be specified.
Contact capacity:	250 VDC/0.1 A (resistive load) 250 VAC/2 A (resistive load) 30 VDC/2 A (resistive load)
Withstand voltage:	2300 VAC (50/60 Hz) for one minute between output terminal and ground

DI/DO interface option (/R1)
■ Alarm contact output

Number of output points:	2 points
Output refresh interval:	Each measurement interval
Contact mode:	SPDT (normally open - common - normally closed contacts)
Shape of terminal:	Screw
Output mode:	Can be switched between excited and non-excited. Can be switched between hold and non-hold. Re-breakdown re-alarm can be specified.
Contact capacity:	250 VDC/0.1 A (resistive load) 250 VAC/2 A (resistive load) 30 VDC/2 A (resistive load)
Withstand voltage:	2300 VAC (50/60 Hz) for one minute between output terminal and ground

■ Recorder function remote control

Function outline:	The following functions can be controlled by a contact input.

- Starting/stopping analog recording
- Starting manual printing
- Starting digital recording of measurement values
- Starting message printing, and header printing
- Changing the recording paper feed speed
- Changing the digital recording interval
- Resetting the digital recording interval
- Starting and resetting statistical computations (when /M1 has been added)
- Temporarily holding the results of statistical computations (when /M1 has been added)
- Resetting the alarm contact hold function
- Starting measurement data save (memory write)

Input signal:	No-voltage contact open collector (TTL or transistor)
Input signal width:	1 second min.
Withstand voltage:	Between input terminal and ground 1500 VAC (50/60 Hz) 1 minute

■ Fail output

Outline of function:	If a system abnormality is detected, the fail output terminal becomes non-excited.
Contact mode:	SPDT (normally open-common-normally closed contacts) Cannot be switched between excited and non-excited.
Contact capacity:	250 VDC/0.1 A (resistive load),250 VAC/2 A (resistive load),30 VDC/2 A (resistive load)
Withstand voltage:	Between the output terminal and ground 2300 VAC (50/60 Hz) 1 minute

■ Chart end output

Outline of function:	When the end of the recording paper is detected, the chart end output terminal is excited.
Contact mode:	SPDT (normally open-common-normally closed contacts) Cannot be switched between excited and non-excited.
Contact capacity:	250 VDC/0.1 A (resistive load),250 VAC/2 A (resistive load),30 VDC/2 A (resistive load)
Withstand voltage:	Between the output terminal and ground 2300 VAC (50/60 Hz) 1 minute

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AVAILABLE MODELS

● DR130 Portable Hybrid Recorder

Model	Suffix code		Description	
DR130			Portable hybrid recorder	
Memory	-0		No memory	
	-1		3.5-inch FD	
Software	0		No DAQ32 software	
	2		DAQ32 software included	
Input channel	-1		10channels	
	-2		20channels	
Input		1	Universal input, screw	
		2	Universal input, clamp	
		3	DCV/TC/DI input screw	
		4	DCV/TC/DI input clamp	
Power supply voltage	-1		100 to 240 VAC	
Power inlet, power cable		D	3-pin power inlet w/UL, CSA cable	
		F	3-pin power inlet w/VDE cable	
		R	3-pin power inlet w/AS cable	
		S	3-pin power inlet w/BS cable	
Optional specifications		/M1	Computation functions (including RRJC)	
		/M3	Report function	
		/C1	GP-IB interface	Must not coexist
		/C2	RS232C interface	
		/C7	Ethernet interface	
		/N7	Power monitor for single phase	Must not coexist
		/N8	Power monitor for 3 phase	
		/A4	Alarm output module (A type 10 contacts)	
		/R1	2-point alarm output, remote control signal input, fail output, and chart end output	
		/D2	°F display	
		/P6	DC power supply (AC power supply is also available.)	

• Options
The maximum allowable number for the /N□, /C□, /A4 and /R1 options is determined according to the specified number of input channels, as shown below.
10 channels: Three kinds of options can be specified.
20 channels: Two kinds of options can be specified.
• Standard accessories
One fold of recording paper, one ink ribbon, instruction manual

● Consumables

Part No	Part name	Minimum ordering quantity
B9627AZ	10-color ribbon	1
B9855AY	Foldable recording paper (20 m)	10

● Accessories

Model	Description
DV300-011	Shunt resistor 10 Ω, screw type
DV300-012	Shunt resistor 10 Ω, clamp type
DV300-101	Shunt resistor 100 Ω, screw type
DV300-102	Shunt resistor 100 Ω, clamp type
DV300-251	Shunt resistor 250 Ω, screw type
DV300-252	Shunt resistor 250 Ω, clamp type
DV400-015	Rack mounting kit, for DR130, conforms to ANSI/EIA standard.
DV400-025	Rack mounting kit, for DR130, conforms to JIS standard.

● Software

Model Code	Description	Applicable Operating System
DP120-13	DARWIN DAQ32 software (Supports setup, simplified data logging and viewing, and diagnosis and calibration functions. One package of this software comes standard with the purchased DR130 recorder if you specify the model code specification for "software included.")	Windows 95, Windows 98, Windows 2000 or Windows NT4.0
DP320-13	DARWIN DAQ32Plus software. (Supports setup, data logging and viewing, diagnosis and calibration and tag setting functions.)	Windows 95, Windows 98, Windows 2000 or Windows NT4.0
DP350-13	Enhanced multifunctional data logging software	Windows 3.1, Windows 95 or Windows 98

The DP120 (DAQ32) and DP320 (DAQ32Plus) data acquisition software cannot be run simultaneously, and neither can the combination of the DP350 enhanced multi-functional data logging software.

DIMENSIONS

Unit: mm (inch)

Unless otherwise specified, the tolerance is ±3%.
(However, if a dimension is less than 10 mm, the tolerance is ±0.3 mm.)