

# 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  
Manual 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	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)
Number of channels				
10	2 sec	4 sec	3 sec	12 sec
20	2 sec	5 sec	4 sec	15 sec

## ■ 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 <sup>1</sup>	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 <sup>1</sup>	0.0 to 1760.0°C		
	B <sup>1</sup>	0.0 to 1820.0°C		
	K <sup>1</sup>	-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 <sup>1</sup>	-200.0 to 800.0°C	±(0.05% of rdg + 0.5°C)	
	J <sup>1</sup>	-200.0 to 1100.0°C	However, J and L attain an accuracy of ±(0.05% of rdg + 0.7°C) within the range between -200 and -100°C.	
	T <sup>1</sup>	-200.0 to 400.0°C		
	L <sup>2</sup>	-200.0 to 900.0°C		
	U <sup>2</sup>	-200.0 to 400.0°C		
	N <sup>3</sup>	0.0 to 1300.0°C	±(0.05% of rdg + 0.7°C)	
	W <sup>4</sup>	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) <sup>5</sup>	-200.0 to 600.0°C	±(0.05% of rdg + 0.3°C)
Pt100 (2 mA) <sup>5</sup>		-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
JPt100 (1 mA) <sup>5</sup>		-200.0 to 550.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
JPt100 (2 mA) <sup>5</sup>		-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	0.1°C
Pt50 (2 mA) <sup>5</sup>		-200.0 to 550.0°C	±(0.05% of rdg + 0.3°C)	
Ni100 (1 mA) <sup>6</sup> SAMA		-200.0 to 250.0°C	±(0.05% of rdg + 0.3°C)	
Ni100 (1 mA)DIN <sup>6</sup>		-60.0 to 180.0°C	±(0.05% of rdg + 0.3°C)	
Ni120 (1 mA) <sup>7</sup>		-70.0 to 200.0°C		
J263 <sup>8</sup> 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)	-84.4 to 170.0°C <sup>8</sup>
Cu10 L&N				-75.0 to 150.0°C <sup>8</sup>
Cu10 WEED				-20.0 to 250.0°C <sup>8</sup>
Cu10 BAILEY				-20.0 to 250.0°C <sup>8</sup>
High resolution RTD	Pt100 (1 mA) <sup>5</sup>	-140.00 to 150.00°C	±(0.05% of rdg + 0.3°C)	0.01°C
	Pt100 (2 mA) <sup>5</sup>	-70.00 to 70.00°C	±(0.05% of rdg + 0.3°C)	
	JPt100 (1 mA) <sup>5</sup>	-140.00 to 150.00°C	±(0.05% of rdg + 0.3°C)	
	JPt100 (2 mA) <sup>5</sup>	-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.)

## ■ 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 0.5 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)

## 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)

\*5 P150: JIS C 1604-1981, JIS C 1606-1986 P1100: JIS C 1604-1989, JIS C 1606-1989, IEC 751, DIN IEC 751JP1100: JIS C 1604-1981, JIS C 1606-1989

\*6 SAMA/DIN

\*7 McGRAW EDISON \*8 Accuracy guarantee range  
50 mV or lower (at peak value)

## RTD:

■ 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)
- 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:  
Alarm printout:  
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:  
Alarm generation channel trend: Starting and stopping recording by pressing a key 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).  
Hours, minutes  
Time printing: Arbitrary setting within 6 characters  
Unit printing (UNIT): Arbitrary setting between 7 and 16 characters  
Channel No./TAG printing: Arbitrary setting  
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  
Scaleable 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
Withstand voltage:	At least 20 MΩ (measured with 500 VDC) 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:	<table border="1"> <thead> <tr> <th>Ambient temperature</th> <th>Ambient humidity</th> </tr> </thead> <tbody> <tr> <td>0 to 40°C</td> <td>20 to 80% RH</td> </tr> <tr> <td>40 to 50°C</td> <td>10 to 50% RH</td> </tr> <tr> <td colspan="2">* Condensation is not allowed.</td> </tr> </tbody> </table>	Ambient temperature	Ambient humidity	0 to 40°C	20 to 80% RH	40 to 50°C	10 to 50% RH	* Condensation is not allowed.	
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/s <sup>2</sup>								
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: ±10<sup>308</sup>

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.

Note: This function does not allow the results of the report and computing function to be saved on floppy disks. (Thus, to be able to transfer the results to a personal computer, the DP380 report software is needed. Note that the DP380 software cannot be run simultaneously with the DAQ32 or DAQ32Plus software package.)

#### 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 Std 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-excited.  
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.

Contact capacity: Re-breakdown re-alarm can be specified.  
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)

Contact capacity: Cannot be switched between excited and non-excited.  
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)

Contact capacity: Cannot be switched between excited and non-excited.  
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

