

# Paperless Recorder



Type: PHL

PAPERLESS RECORDER PAPERLESS RECORDER PAPERLESS RECORDER



### Long Term Record Data Saving

1.5years in Compact Flash  
(In case of using 256MB Compact Flash)



### Saved Data playback

Saved data in Memory card can be easily called out and played back on display



### Math and totalization

These functions are available as standard.



### Communication

RS485, MODBUS RTU protocol is available.



### Screen saver

Period of non-operation exceeds the setting value of parameter, recorder turns off the backlight of LCD.



### PC support softwares (Data Viewer/Parameter Loader)

Supplied in a CD-ROM as a part of standard accessory



### Compact size

160 (W) X 144 (H) X 185 (D) mm (Panel mount) 1.5 kg compact size



### 9-point recording and 18-point max. recording

12 types of thermocouples, 5 types of resistance bulbs and voltage/current input are available

PAPERLESS RECORDER

# Memory Card Data Saving

Provides, flexibility and variety in the handing of record data.



## Status Display

Allows you to display screen name, calendar, alarm information, recording status, writing status of measured data in Compact Flash, and fitting status of the card into the recorder slot.

## Time display

Indicates the time and time scale of recorded data.

## Trend Display

Allows you to view measured result in waveforms.

## Digital Display

Allows you to view measured values in a digital form.

## Key panel

Allows you to perform the recording start/stop, selection of display, setting, data display/change.

## Power indicator

During power on, LED turns on.  
While screen saver is working, it flickers.

About 1.5 years' worth of data can be recorded in Compact Flash (256 MB).



## Mathematics function (programming formula) as standard

You can program formula using below operand.

Addition, Subtraction, Multiplication, Division Absolute value, X to the power of Y, Logarithm, Natural logarithm, Exponential function, Humidity, Average value, Maximum value, Minimum value.

## Communication

RS485, MODBUS RTU protocol is available. Communication rate is 9600 or 19200 bps and multi-drop/up to 32 recorders connectable including master station. Total extension is 500m or less.

## Calculation function offered as standard

### Subtraction

Difference between the values of each channel can be calculated.

### F value calculation

Extinction rate of bacteria by heat sterilization can be calculated per channel according to the measured temperature.

### Totalization

Measured value of each channel can be totalized.

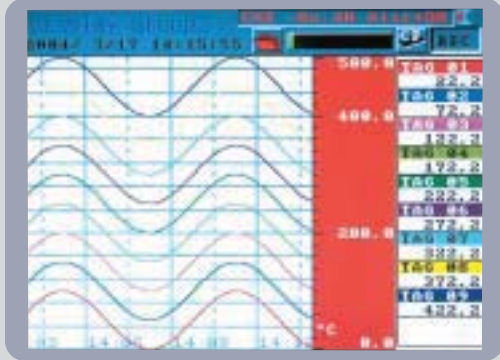
Reference time can be selected from day, hour, minute and second.

### Square root extraction

Square root extraction of the input value of each channel can be performed.

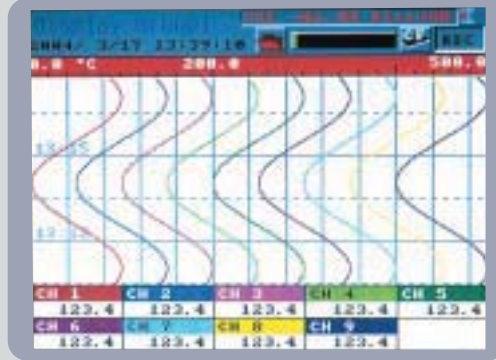


# Wide variety of display mode



**Trend recording (horizontal)**

Measured result is horizontally displayed in real time.



**Trend recording (vertical)**

Measured result is vertically displayed in real time.



**Bar graph**

Measured values are displayed in bar graph.



**Analog meter**

Measured values are displayed in analog meters.



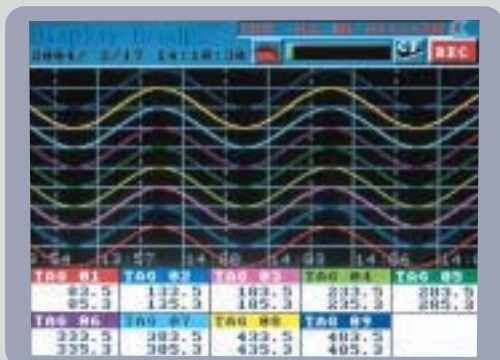
**Digital display**

Channel No., Tag No. engineering unit, and alarm information are displayed in digital form, in addition to measured values.



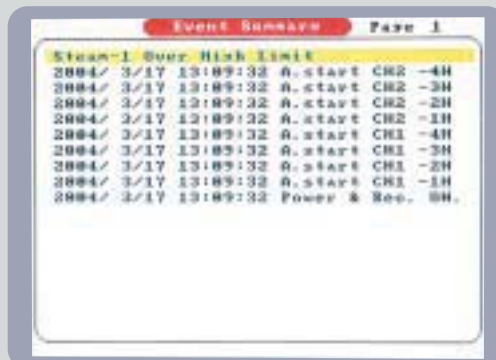
**Totalized data display**

Totalized data of each channel is digitally displayed. (If power failure occurs while in totalizing operation and the power is restored later, the data being totalized is cleared.)



**Historical trend display**

Past data saved to Compact Flash can be viewed. Scroll function is usable.



**Event summary display**

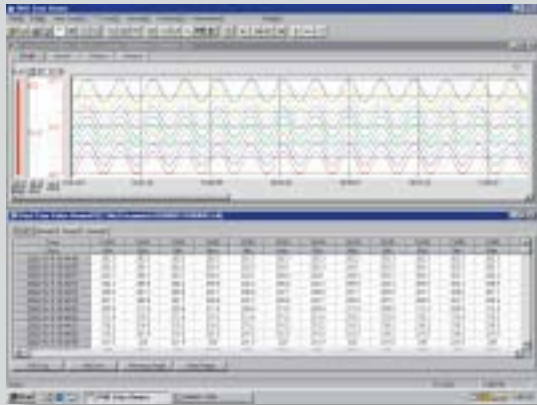
Alarm status and external control input status for each channel are displayed.

# Specifications

General specifications		Storage capacity	•About 1.5 years at display refresh cycle of 30 seconds (ASCII) •About 6 years (Binary) (9-channel recording, 256MB compact flash used)
Mounting method	Panel flush mounted	Amount of memory used	The display unit displays how much the memory card has been used via bar graphs. The recording will stop if the amount of recorded data exceeds the capacity.
Material	Molding resin (case, bezel)		
External dimensions and mass	<Panel mount> 160 x 144 x 185 mm, about 1.5 kg (9-point input)		
Power supply voltage	100V to 240V AC, 50/60 Hz		
Power consumption	About 42VA (at 200VAC)		
External terminals	Screw terminals (M3 thread)	Alarm function	
Input unit		No. of settings	Up to 4 alarms are settable for each channel.
No. of inputs	9 or 18 points	Type of alarm	High/Low limits
Measuring cycles	100ms/9, 18 points	Indication	Alarm status is displayed on digital display unit when an alarm occurs. Histories are displayed in the alarm summary.
Input signal	Thermocouple: 12 types (B, R, S, K, E, J, T, N, W, L, U, PN) Resistance bulb: 5 types (Pt100, JPt100, Ni100, Pt50, Cu50) DC voltage: (0 to 50mV, 0 to 500mV, 0 to 5V or 1 to 5V) DC current: (connecting optional shunt resistor to input terminal)	Output	10 points as relay output (option) 18 points as open-collector transistor output (option)
Input types	Selected from the key panel (the same type should be set for every 2 channels)	Reference performance	
Burn-out function	Equipped with thermocouple and resistance bulb inputs as standard.	Indication accuracy	±(0.15%+1 digit) of input range Accuracy of the next range is ±(0.3%+1 digit). Thermocouple B: 400°C to 600°C, thermocouples R and S: 0°C to 300°C, thermocouples K, E, J, T, L, and U: -200°C to -100°C
Calculation function	Primary delay filter, scaling, calculation of difference between channels, F value calculation, totalization, and square root extraction	Indication resolution	0.1°C
Mathematics function		Reference junction	±0.5°C
Formula	It can be set 1 main formula and 3 temporary one. Addition, Subtraction, Multiplication, Division Absolute value, X to the power of Y, Logarithm, Natural logarithm, Exponential function, Humidity, Average value, Maximum value, Minimum value.	Compensation accuracy	Thermocouples R, S, B and W: ±1.0°C
Input signal	DI (DI1 to DI10), Totalize (ch1 to ch30), Analog input (ch1 to ch30), Constant (No.1 to No.20), Communication input (No.1 to No.12)	Input resistance	About 1MΩ
Display unit		Others	
Display	5.7" TFT color LCD (320 X 240 dots) (The LCD may have some pixels that do not stay on or off. Due to the characteristics of liquid crystal, the brightness may not be uniform, which is not a failure.)	Clock	With calendar function
Life of backlight	50,000 hours	Memory backup	Parameter settings are saved to the internal non-volatile memory. The clock is backed up by a built-in lithium battery. Trend data is back up only 400 samplings.
Display contents	•Trend display (in vertical and horizontal direction) selected in the refreshment cycles of 1 sec to 12 hours. Scale display/non-display selectable •Bar graph or analog meter display (refresh cycle: 1 second) •Digital display (in refreshment cycle of 1 sec) •Event summary display (alarm and message summary) •Historical trend display (Compact Flash memory data.) •Totalized data display •Group setting (4 groups at the maximum)	Memory full alarm	When the amount of recorded data exceeds the capacity of memory card, recorder can energize the alarm output.
Recording function		Low battery alarm	When the battery for backup of clock and SRAM becomes low, recorder can energize the alarm output.
Recording medium	Compact Flash card (Format as FAT16 or FAT, or recorder can't read and write.)	Optional specifications	
Memory capacity	256MB, max.	Alarm (relay) output/DI (Cannot be mounted to 18-point input type.)	10 relay outputs and 5 DI are added. Alarm output: SPST Output for each channel or common channel is possible. DI input: 5 no-voltage contact input points, Recording start/stop, message setting, F value calculation resetting, Totalizing start/stop, Totalizing reset or LCD turning on functions can be performed.
Recording method	Writing starts in fixed cycles by turning ON the REC key on the front panel. Data is recorded in a new file every time the recording starts.	Alarm (open-collector) output/DI	18 open-collector outputs and 5 DI are added as option. Alarm output: Open-collector transistor output for each channel or common channel is possible. DI input: 5 no-voltage contact input points, Recording start/stop, message setting, F value calculation resetting, Totalizing start/stop, Totalizing reset or LCD turning on functions can be performed.
Data save cycles	Links to refreshment cycle of the trend display	Communication (RS485, MODBUS)	Bourate/parity: 9600, 19200bps/none, odd or even Length/Unit: 500m (total) /32units max (include master) Recommended converter: K3SC-10/Omron Corp.
Data format	•ASCII About 166 bytes per sampling (at 9 channel inputs) •Binary (Data cannot be read directly into Excel, etc.) About 40 bytes per 1 sampling (9-channel input)	PC support software (standard-supplied CD-ROM)	
Trend data	Maximum value and minimum value are saved from the data that are sampled in measuring cycles.	O/S	Windows 98/XP/2000
Event data	Alarm data and message data are saved.	PC/AT-compatible machine	Operation on PC98-series machines by NEC is not guaranteed. Operation on self-made or shop-brand PCs is not guaranteed.
Totalized data	Stores data totalized during specified period of time.	Required memory capacity	64 MB or more
		Contents	The following types are included as standard. 1) Data viewer software It allows you to view the past trend recorded data from the data saved to the Compact Flash on PC. Historical trend and event display functions are provided. 2) Parameter loader software It allows you to perform setting/change of various parameters on PC.

# A convenient PC support software package is included as standard

Past data saved to Compact Flash can be viewed on personal computer.



Historical trend data screen

Parameters for the recorder can be easily set and changed from personal computer.



Parameter setting screen



Before use, install PC support software supplied as standard.

- O/S: Windows 98/XP/2000
- Required storage capacity: 64 MB
- Provide PC card adapter separately.
- Recommended type: SDCF-31-03 (SanDisk Co.)
- PC/AT-compatible machine
- Operation on PC98-series machines by NEC is not guaranteed.
- Operation on self-made or shop-brand PCs is not guaranteed.



Before use, install PC support software supplied as standard.

- O/S: Windows 98/XP/2000
- Required capacity of memory: 64 MB
- A communication cable between recorder and pc is optional.
- Type: PHZP0201
- PC/AT-compatible machine
- Operation on PC98-series machines by NEC is not guaranteed.
- Operation on self-made or shop-brand PCs is not guaranteed.

## Scope of supply

Item	Quantity	
	Panel mount	
Main unit	1	
Panel mounting bracket	1	
CD-ROM PC software	1	
Instruction manual		
Compact flash (16MB)	1	
Watertight panel packing for the front panel	1	
Noise filter for power cable	1	
AC power cord (2m)	-	

## Option

Item	Type	Specifications
Shunt resistor for DC current input	PHZP0101	10Ω±0.1%
PC loader communication cable	PHZP0201	With connector, Length: 3m
	PHZP0601	CD-ROM with instruction manuals and softwares
	PHZP0701	Terminating resistor (100ohm)
	PHZP0801	D-sublight 25pins connector with male terminal
	PHZP0901	Transmission cable (PHL to PC)
	PHZP1001	Transmission cable (PHL to PHL)
PC card adapter (SanDisk)	SDCF-31-03	For compact flash
Compact flash (SanDisk)	SDCF-256-801	256MB
	SDCF-192-801	192MB
	SDCF-128-801	128MB
	SDCF-96-801	96MB
	SDCF-64-801	64MB
	SDCF-32-801	32MB

## Code Symbols

Digit	Specifications	Note	PHL
4	<Number of input points>		4 5 6 7 8 9 10 11 12 13
	9		1   B   1   1   -   E   1       V
	18	Note 1	↓ 1
11	<Alarm (relay) output/DI input>		
	Without		0
	With		1
12	<Communication, Alarm (open-collector) output/DI input>		
	Without		Y
	With		R

Note 1: Cannot be selected if 1 is selected for the 11th digit.

Note 2: Input signals are classified into the following 4 groups. Make the setting so that the consecutive 2 channels (1ch and 2ch for example) are assigned the input signal categorized in the same group.

- Group 1: Thermocouple (12 kinds), 50mV
- Group 2: Pt100Ω, JPt100Ω, Ni100, Cu50, Pt50
- Group 3: 500mV
- Group 4: 1-5V, 0-5V

Input signals can be arbitrarily selected for channels 9 and 18.

Note 3: Windows and Excel are registered trademarks of Microsoft Corporation.

Note 4: SanDisk compact flash is a trademark of SanDisk.

Note 5: PC98 series are registered trademarks of NEC Corp.

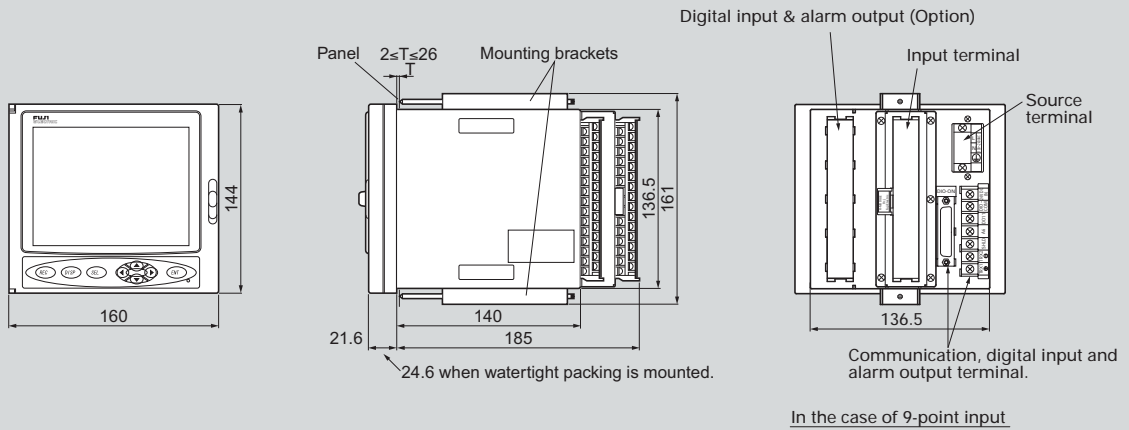
Note 6: MODBUS® is the registered trademark of Gould Modicon.



# Outline Diagram and Panel Cut (Unit: mm)

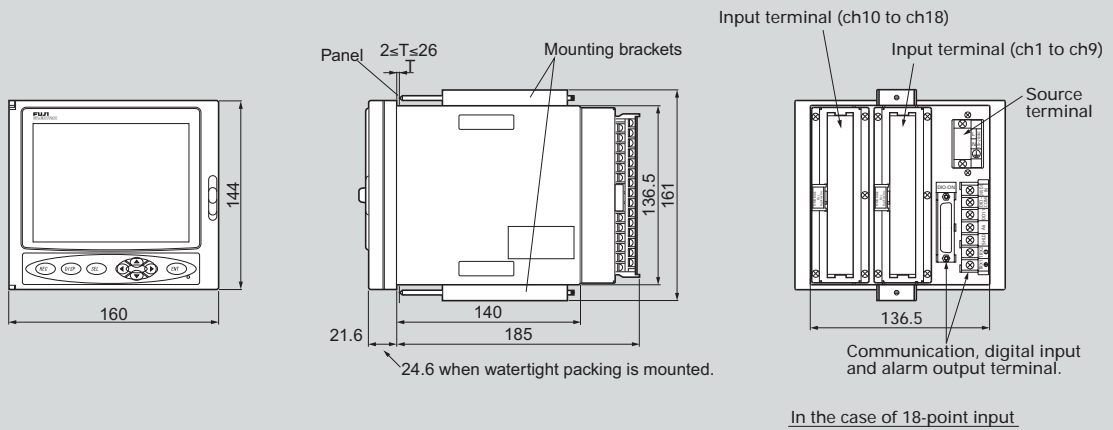
## Panel mount type

### 9 input points



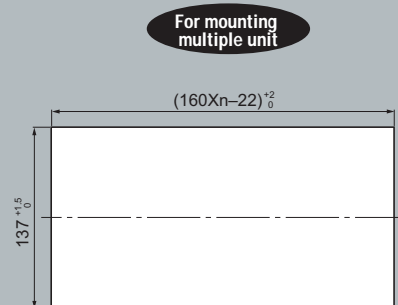
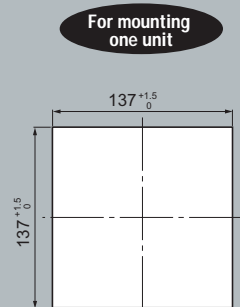
Note: When another instrument or a floor surface is under the bottom of this unit, allow a space of 100mm or larger between them and the bottom of this unit.

### 18 input points



Note: When another instrument or a floor surface is under the bottom of this unit, allow a space of 100mm or larger between them and the bottom of this unit.

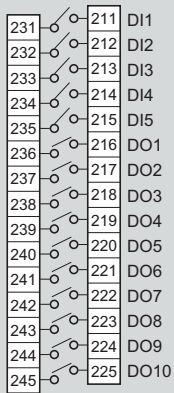
## Panel cutout



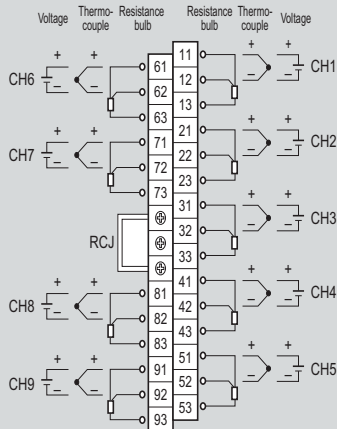
# External connection diagram

## 9-point input

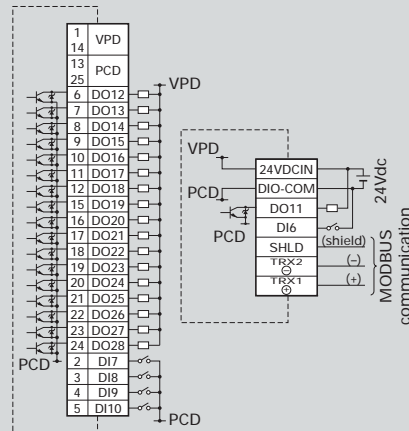
### Alarm output/ DI input terminal



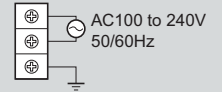
### Input terminal



### Communication, digital input and alarm output terminal.

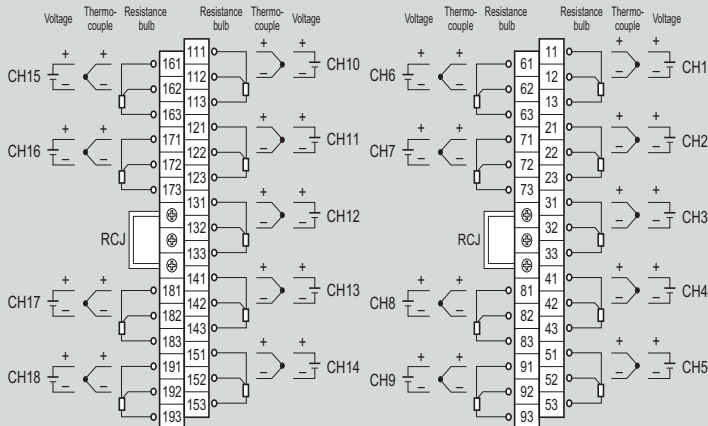


### Power terminal

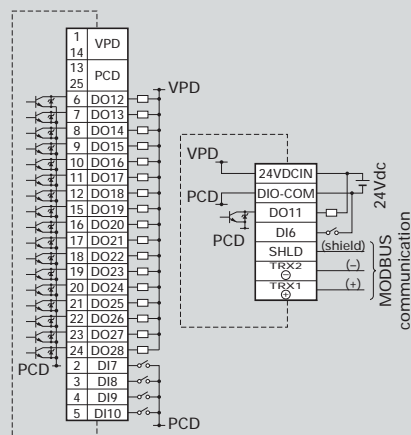


## 18-point input

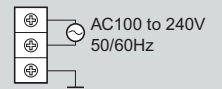
### Input terminal



### Communication, digital input and alarm output terminal.



### Power terminal



Note: In the case of current input, connect the optional shunt resistor to the voltage input terminal.

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## Fuji Electric

Your distributor:

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Printed in Japan 2004-5/30FIS