Fuji Electric

Innovating Energy Technology

Paperless Recorder

Type:PHR

Long term record data saving
3years in Compact Flash

Saved Data playback
Saved data in Memorry card can be easily called out and played back on display

PC support softwares (Data Viewer/Parameter Loader)
Supplied in a CD-ROM as a part of standard accessory

Communication function
RS485 MODBUS RTU communication is available (optional).
Ethernet (10 Base-T) communication is available (optional).

Screen saver
Automatically turns off the LCD backlight when the time without any operation exceeds the time entered in the parameter.

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

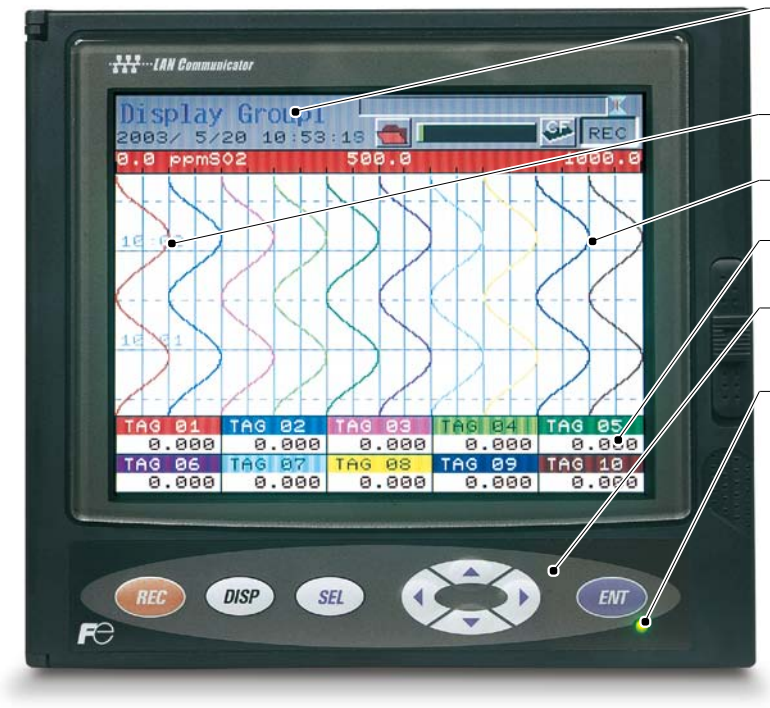
9 point recording and 18 point max. recording
12 types of thermocouples, resistance bulbs and voltage/current input are available

21B1-E-0072

Memory Card Data Saving

Provides easiness, flexibility and variety in the handling of record data.

Employs a 5.7-inch TFT display for a bright, clear and legible screen.
The screen saver function reduces power consumption and prolongs LCD life.



Status Display
Allows 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 to view measured result in waveforms.

Digital Display
Allows to view measured values in a digital form.

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

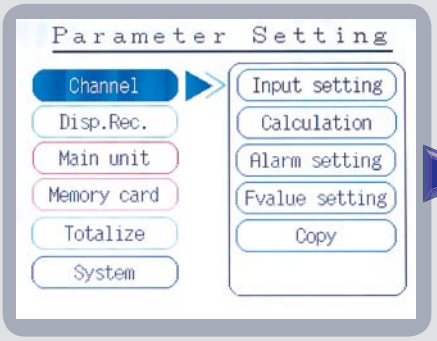
Status Lamp
Power on : Lighting, LCD off : Flickering.

About 3 years' worth of data can be recorded in Compact Flash (512 MB).

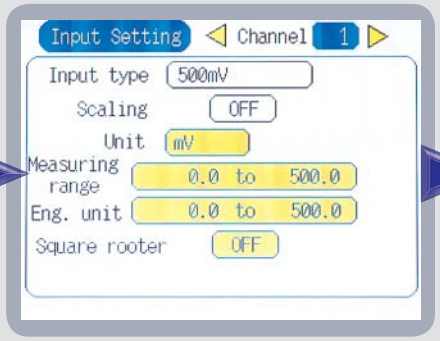
When recorded in ASCII mode, for 9 channels, and with a recording cycle of 30 seconds.

Easy operation without the help of the instruction manual

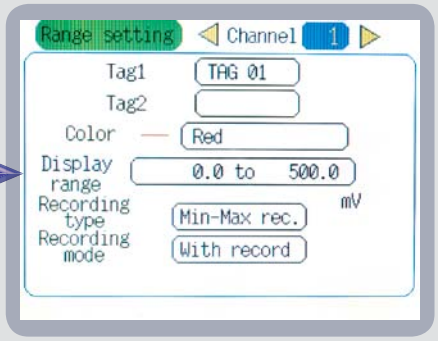
The onscreen guidance enables you to set/change various parameter data easily.



Setting Menu screen



Input Setting screen



Record Range Setting screen

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.

Daily, monthly and annual data totalization
Each channel's integrated data can be digitally displayed in daily, monthly and annual units.

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

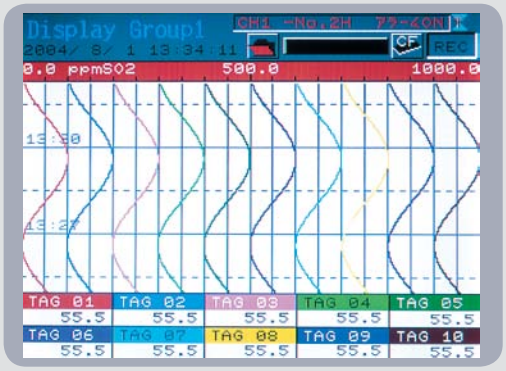
Portable type available

Portable type

1.9kg

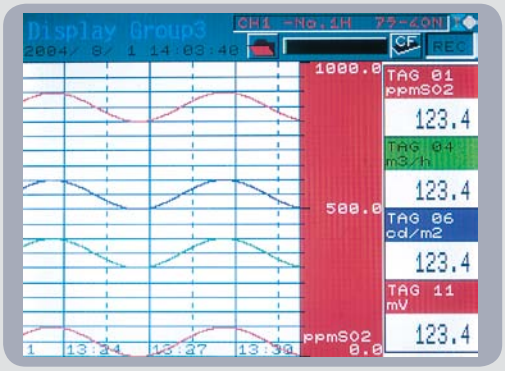
*Ethernet is not available for this model.

Wide variety of display mode



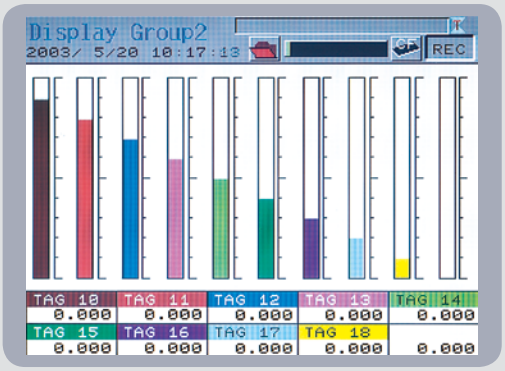
Trend recording (vertical)

Measured result is vertically displayed in real time.



Trend recording (horizontal)

When a group of registered channels includes 4 channels or less, the TAG No. and industrial value are both displayed at the same time.



Bar graph display

Measured values are displayed in bar graph.

Analog meter display

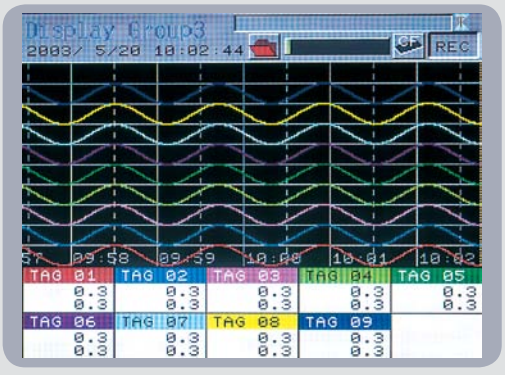
Measured values are displayed in analog meters.

Digital display

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

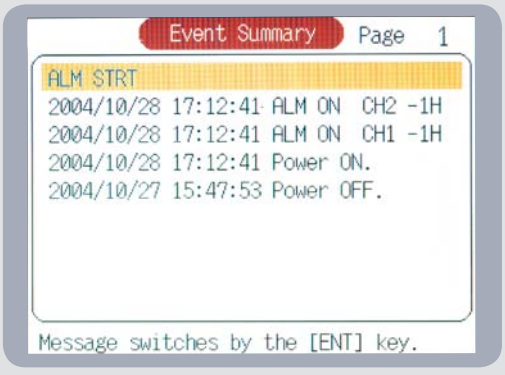
Totalized data display

Totalized data of each channel is digitally displayed.



Historical trend display

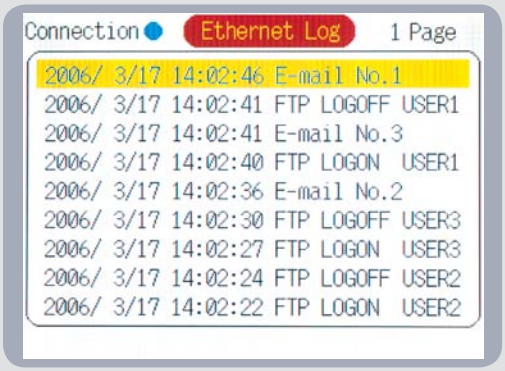
Past data saved to Compact Flash can be viewed. Scroll function is usable.



Event summary display

Alarm status and external control input status for each channel are displayed. Messages can be sent by pre-setting the function.

Ethernet log display



■Ethernet log display

Displays logged Ethernet data of the following events: sending E-mail, error occurrence, log on/off to FTP, and starting MODBUS communication. This information is deleted when the recorder's power is turned off.

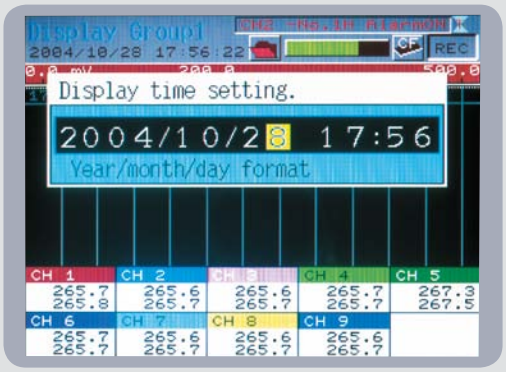
Other functions

■Daily, Monthly, Annual Totalization Function

Totalized data of each channel can be digitally displayed.

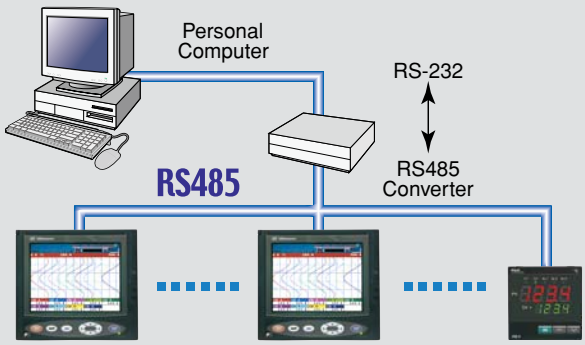
■Historical Jump

This function is convenient to trace past data saved to Compact Flash memory. Scroll function is available.



■RS485 (MODBUS) communication

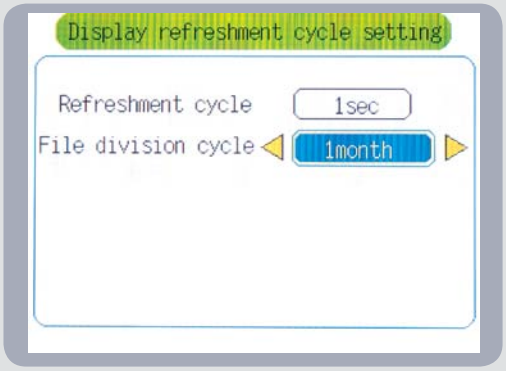
Programs for displaying real-time trends on a PC can be easily written by using a general-purpose SCADA software.



(Upto 31 units connectable)

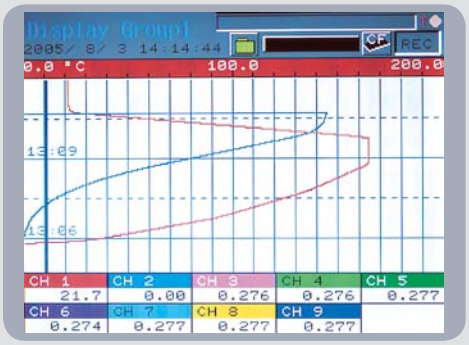
■File splitting function

A new record file is produced and saved at intervals of "File division cycle".



■F value calculation

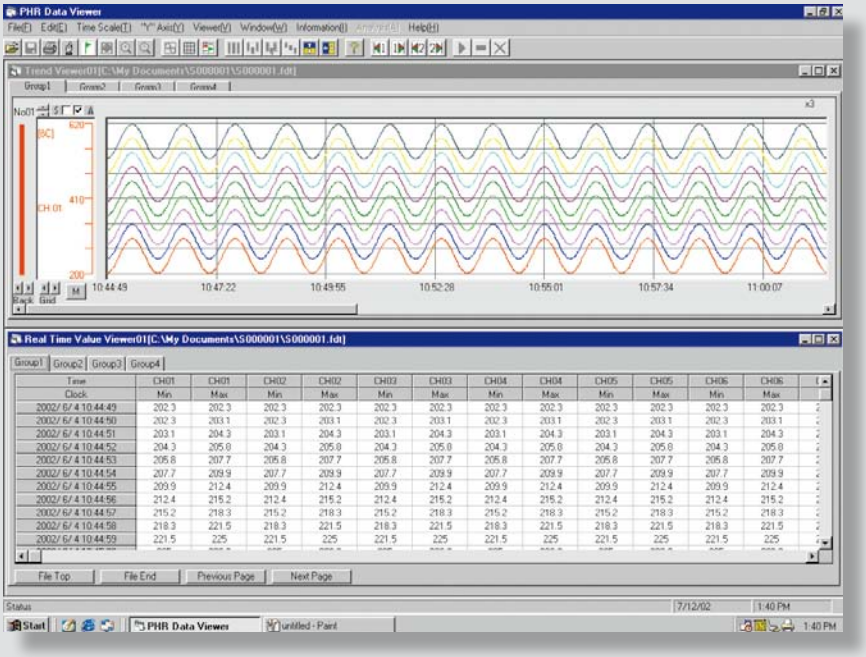
This function is optimum for temperature monitoring of retort sterilizer.



Easy-to-use PC support software packages

Data Viewer

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



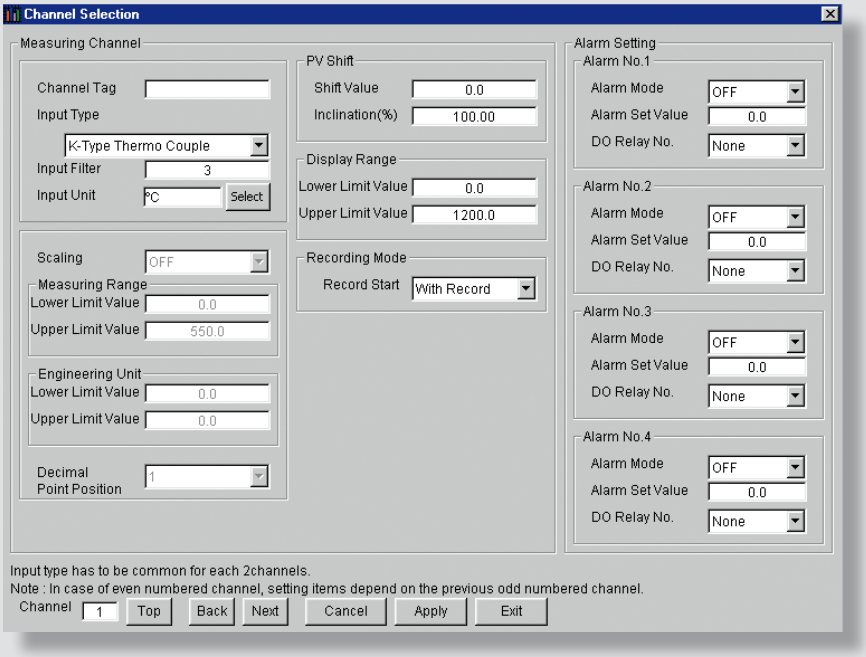
Historical trend data screen

Before use, install PC support software supplied as standard.

- O/S: Windows XP/2000/7
- Required storage capacity: 64 MB
- Provide PC card adapter separately.

Parameter Loader

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 XP/2000/7
- Required capacity of memory: 64 MB
- A communication cable between recorder and PC is optional.

Type: PHZP1801

NEW Ethernet function newly installed

Feature **Ethernet communication connects PHR recorder to industrial network and/or Internet. (Option)**

Web

FTP

E-mail

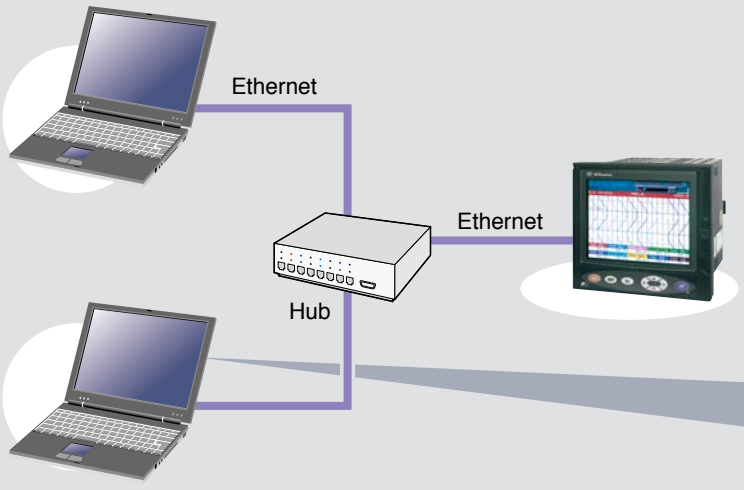
MODBUS-TCP

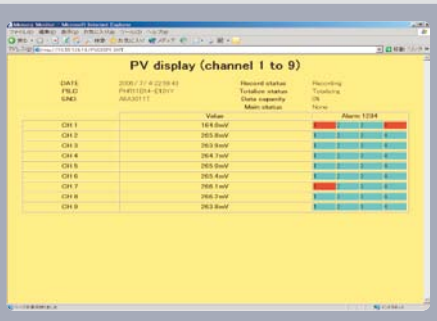
and more features such as

- Easy setup, with no need for communication converters
- Standard Loader software enables reading/writing of the PHR's parameter settings

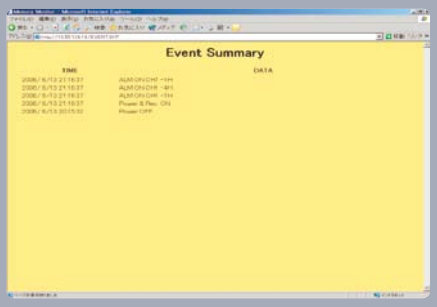
Web function

You can display process values and/or event summary using Internet Explorer.
(Netscape is not supported)





IE display (Digital value display)

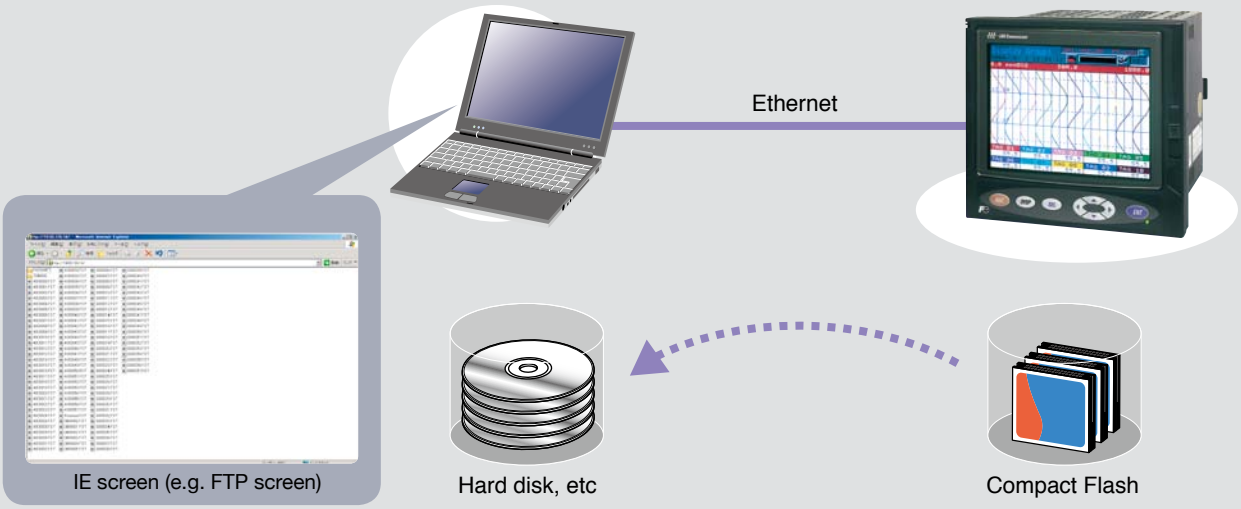


IE display (Events display)

Ethernet

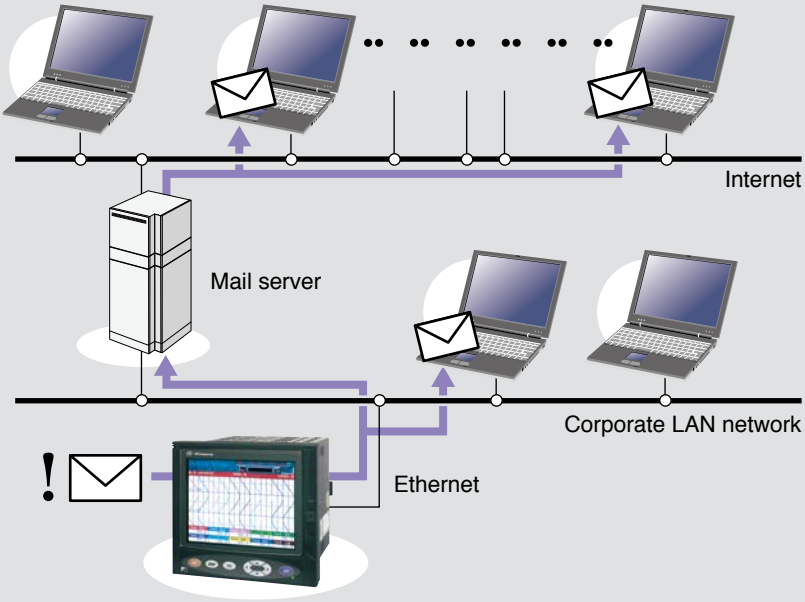
FTP function

The record files in Compact Flash can be listed, downloaded to PC and deleted from Internet Explorer. Recorder configuration can also be uploaded/downloaded.



E-mail function

PHR recorder can send E-mails to maximum 8 addresses at up to 10 trigger timings through a mail server on the same LAN.



[Items sent]

- Subject
- Contents (32 characters per set × 2)
- Process values
- Name of sender and time

[Timing of sending]

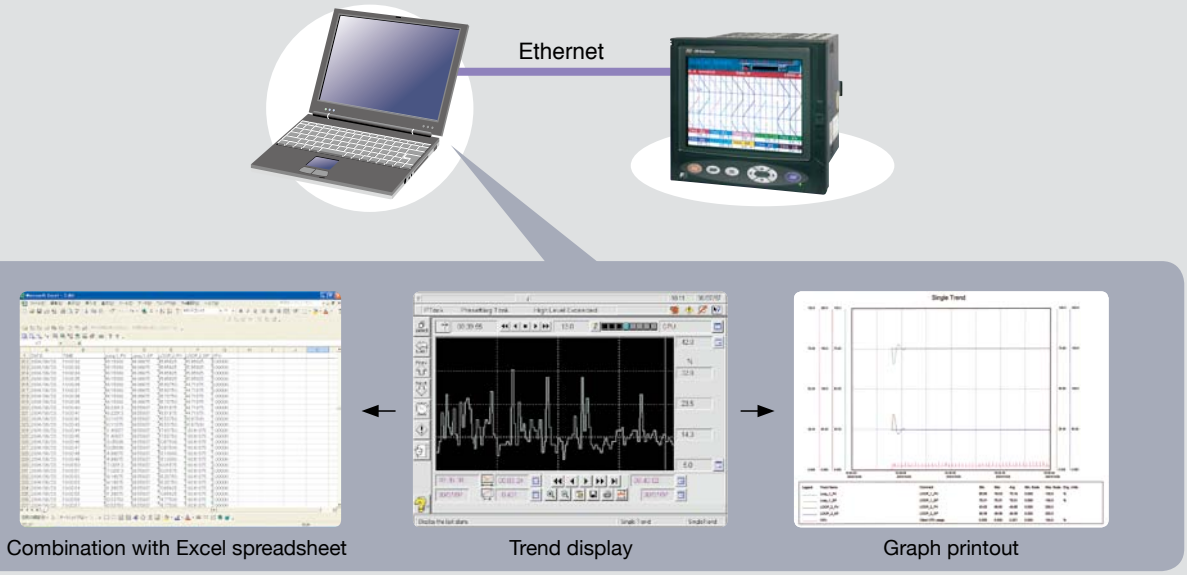
E-mail can be sent when either of the following events occurs.

- Alarm ON / Alarm OFF
- DI ON / DI OFF
- Specified intervals
  (every 1, 2, 3, 4, 6, 12, 24 hours)
- Failure of PHR
  (No battery, run out of memory, etc.)

NEW Ethernet function newly installed

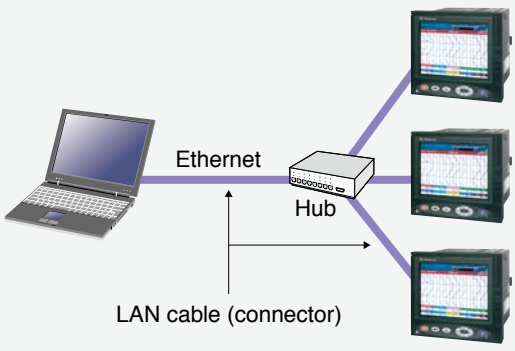
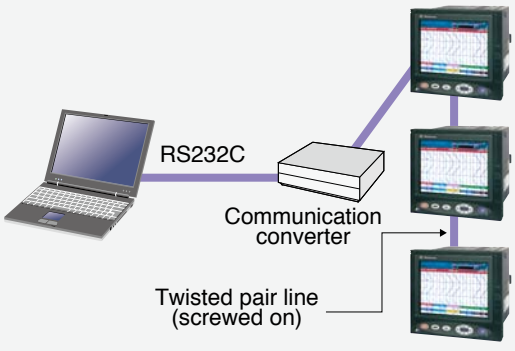
MODBUS-TCP function

You can link the recorder with all network, supervisor or SCADA system by MODBUS TCP/IP protocol.



Easy connection

Ethernet communication need no communication software.

	Ethernet	RS485
Wiring		
Software	● No communication software. Internet Explorer and Fuji standard software (Parameter loader and Data Viewer) are all you need.	● Dedicated communication software is necessary to be created.

Ethernet

Ethernet specification : Internet Explorer can be used as a browser (Netscape is not supported). Windows 2000 or XP is required.

◆Http (server)

You can browse the following screens by setting PHR's IP address on Internet Explorer (ver.6). (Change of setting value is not possible)

[Measured value display screen]

- •PV value for each channel (instantaneous value)
- •Totalized value (instantaneous value)
- •Recording condition
- •Recording condition of integrated value
- •Memory usage of Compact Flash
- •Alarm Status

[Event summary screen]

- •The information on the event summary screen of the recorder.

◆FTP (server: read only)

FTP server function allows you the followings by setting PHR's IP address on Internet Explorer.

- •Browse of file names in the Compact Flash
- •Files can be downloaded to PCs, deleted or changed their names.

It's also available to access by using command prompt.
User ID and password are needed to access to recorder. (simultaneous access by multiple users is inhibited)

◆SMTP (client)

E-mail can be sent when the mail server is available in the same LAN network. E-mail cannot be received from an external network. The items sent and timing of sending are as follows.

[Timing of sending]

- •DI ON, DI OFF •Alarm ON, Alarm OFF
- •Failure occurred in main unit (no battery, memory card is full, etc.)
- •Periodic

[Items sent]

- •Subject of E-mail (32 characters)
- •Message (32 characters × 2)
- •PV value (instantaneous value)
- •Sent time •Name of sender

[Number of registered recipient addresses]

- •8 (the items and timing can be set for each recipient)

◆MODBUS-TCP

Communication with MODBUS-TCP protocol through Ethernet is available. Reading from each parameter, and writing/reading is enabled (for details, refer to the separate communication manual).

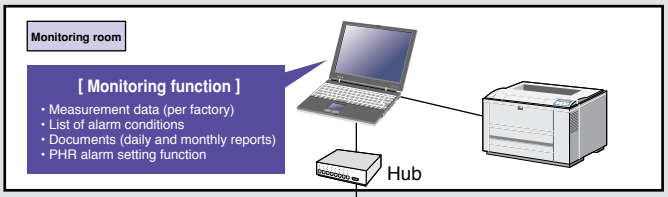
◆Loader software

Loader software installed as standard enables parameter settings to be read and written, but writing is not allowed during recording.

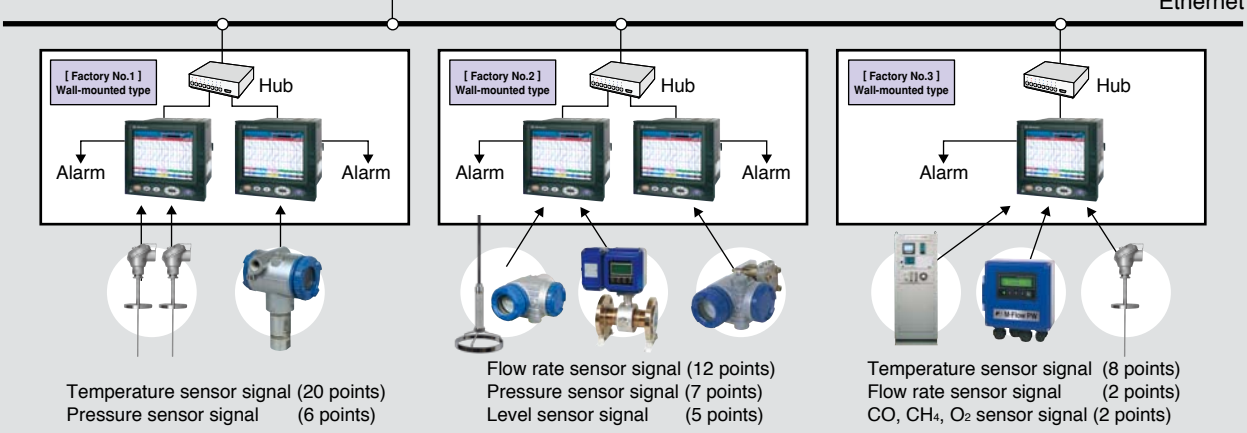
◆Communication medium

Ethernet (10BASE-T)

Application example



The monitoring system carries out remote acquisition of temperature, pressure, flow rate, level, and gas concentration data at all three factories.
Monitors the temperature at 28 points, pressure at 13 points, flow rate at 14 points, gas concentration at 2 points, for the three factories, and prints out daily and monthly reports.
PHR alarms can be set through the LAN network.



Temperature sensor signal (20 points)
Pressure sensor signal (6 points)

Flow rate sensor signal (12 points)
Pressure sensor signal (7 points)
Level sensor signal (5 points)

Temperature sensor signal (8 points)
Flow rate sensor signal (2 points)
CO, CH_4, O_2 sensor signal (2 points)

Specifications

General specifications

Mounting method	Panel flush mounted
Material	Molding resin (case, bezel)
External dimensions and mass	<Panel mount> 160 x 144 x 185 mm, about 1.5 kg (9-point input) <Portable> 160 x 179 x 206.6 mm, about 1.9 kg (9-point input)
Power supply voltage	100 to 240V AC, 50/60 Hz
Power consumption	About 47VA (at 240VAC)
External terminals	Screw terminals (M3 thread)
Ambient operating temperature	0 to 50°C (When "1" is selected for the 5th digit of the type code, and when "Y" or "R" is selected for the 12th digit of the type code) 0 to 40°C (When "2" is selected for the 5th digit of the type code, or when "E" or "W" is selected for the 12th digit of the type code)

Input unit

No. of inputs	9 or 18 points.
Measuring cycles	100ms/9 or 18 points.
Record cycle	1 sec to 12 hour
Write cycle	1 min to 12 hour
Input signal	Thermocouple: 12 types (B, R, S, K, E, J, T, N, W, L, U, PN) Resistance bulb 2 types (Pt100, JPt100) DC voltage (50mV, 500mV, 5V) DC current (connecting optional shunt resistor to input terminal)
Input types	Selected from the key panel (the same type should be set for every 2 channels)
Burn-out function	Equipped with thermocouple and resistance bulb inputs as standard.
Calculation function	Primary delay filter, scaling, calculation of difference between channels, F value calculation, totalization, and square root extraction

Display unit

Display	5.7" TFT color LCD (320 X 240 dots) (Some of the pixels in the LCD may always be lit or unlit, and the brightness may be uneven. This is not a failure, but is a characteristic of liquid crystal displays.)
Life of backlight	50,000 hours
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 (Record file can be read.) •Totalized data display •Group setting (4 groups at the maximum) •Ethernet log display

Recording function

Recording medium	Compact Flash card (Perform FAT or FAT16 formatting to read and write with the recorder.)
Memory capacity	2GB max.
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.
Data save cycles	Links to refreshment cycle of the trend display
Data format	•ASCII (Able to directly read with Excel, etc.) About 166 bytes per sampling (at 9 channel inputs, Max./Min. record.) •Binary (Data cannot be read directly into Excel, etc.) About 40 bytes per sampling (9-channel input, Max./Min. record.)
Trend data	Save any of the listed data that was sampled during the measurement cycle: minimum and maximum value, instantaneous value, average value.
Event data	Alarm data and message data are saved.
Totalized data	Stores data totalized during specified period of time.
Storage capacity	•About 3 years at display refresh cycle of 30 seconds (ASCII) •About 12 years (Binary) (9-channel recording, 512MB compact flash used)
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.

Alarm function

No. of settings	Up to 4 alarms are settable for each channel.
Type of alarm	High/Low limits
Indication	Alarm status is displayed on digital display unit when an alarm occurs. Histories are displayed in the event summary display. Battery Alarm : Display when Battery end Memory Full Alarm : Display when Memory capacity is empty.
Relay output (option)	Relay 10 points, Open collector 18 points or Relay 10 points + Open collector 18 points.

Reference performance

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
Indication resolution	0.1°C
Reference junction Compensation accuracy	±0.5°C (0°C and above during measurement. ±1.0°C for R.S.B.W. thermocouple)
Input resistance	About 1MΩ Approx. 100 KΩ when power is off

Others

Clock	With calendar function
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 not backed up, but saved to Compact Flash.

Optional specifications

Alarm Output/DI (Cannot be mounted to 18-point input type)	10 relay outputs and 5 DI are added. Alarm output : 1a contact Alarm setting method : Output for each channel or common channel is possible. DI Input : Non-voltage contact input Record start/stop, message setting, F value calculation resetting, Totalizing start/stop, Totalizing resetting and LCD lighting can be performed.
Alarm Output/DI/ Communication	18 open collector outputs, 5 DI and RS485 PC interface are added. Alarm output : Open collector Alarm setting method : Output for each channel or common channel is possible. DI Input : Non-voltage contact input 5 points Record start/stop, message setting, F value calculation resetting, Totalizing start/stop, Totalizing resetting and LCD lighting can be performed. Communication (RS485) Transmission of instantaneous value and receiving of parameter can be performed. Protocol : MODBUS(RTU) Communication method : Half-duplex bit serial Synchronizing method : Start-stop synchronizing Code Format : Binary, Data Length : 8 bit, Parity : Odd/Even/None, Stop bit : 1 bit Bourate : 9600 bps, 19200 bps Number of connectable units : Up to 31 units Communication distance : Max. 500m in total Note : in case of connection via RS-232C, RS232C/RS485 converter should be provided separately. (Recommended converter : Model:K3SC-10/omron)

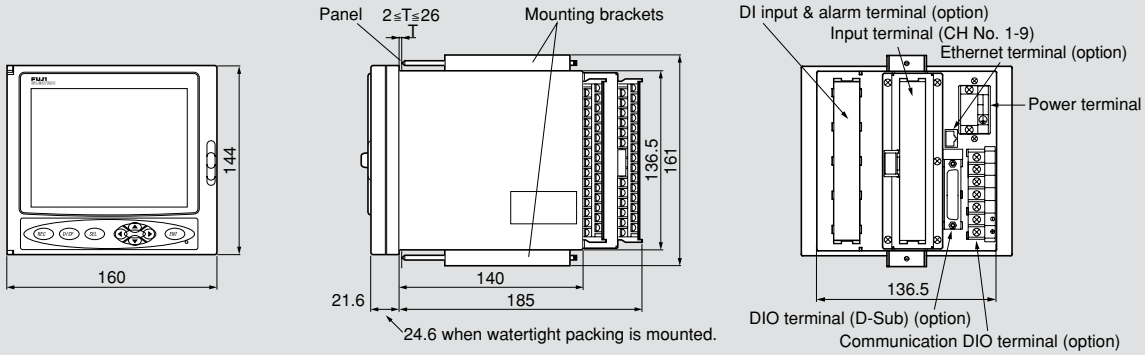
PC support software (standard-supplied CD-ROM)

O/S	Windows XP/2000/7
Required memory capacity	64 MB or more
Contents	The followings are included as standard. 1)Data viewer software It allows 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 to perform setting/change of various parameters on PC.

Outline Diagram and Panel Cut (Unit: mm)

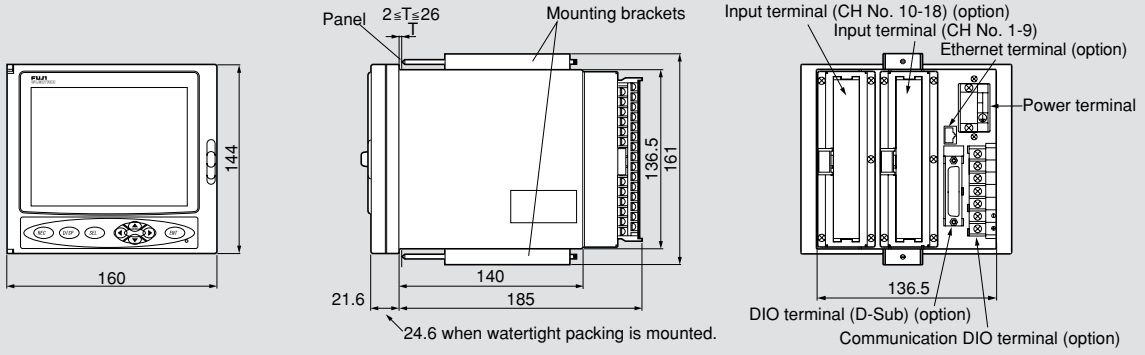
Panel mount type

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.

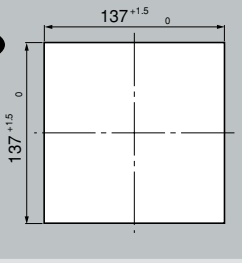
18 input points



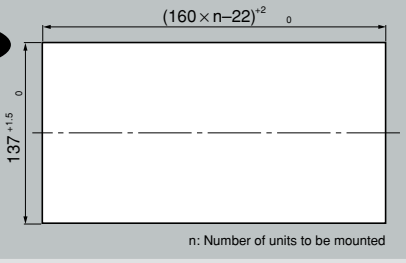
Note: When another instrument or a floor surface is under the bottom of this unit, allow a space of 100mm or larger between them and the bottom of this unit.

Panel cutout

For mounting one unit



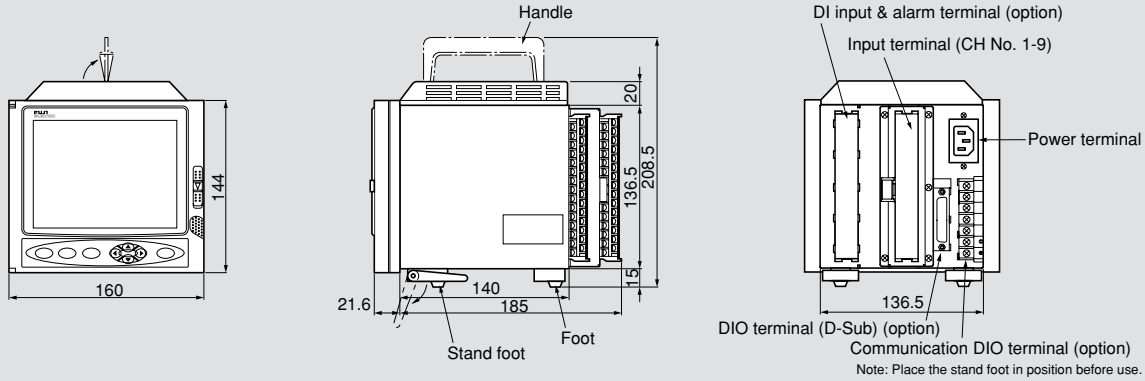
For mounting multiple unit



n: Number of units to be mounted

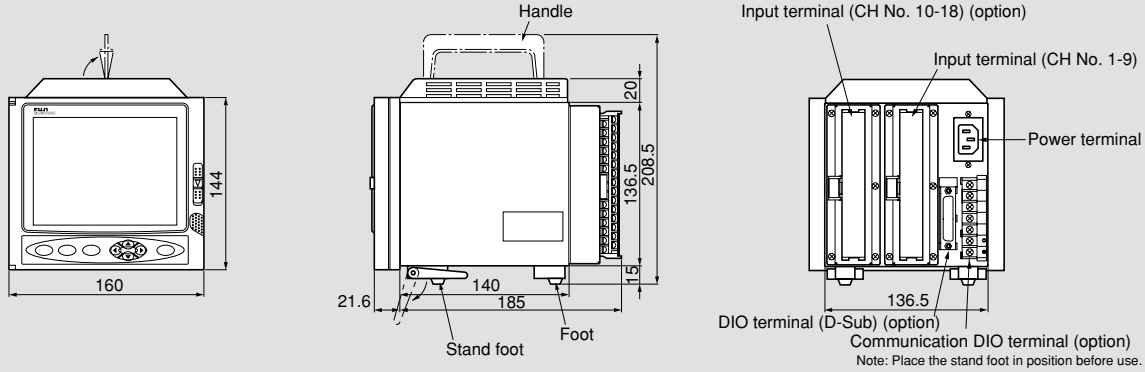
Portable type

9 input points



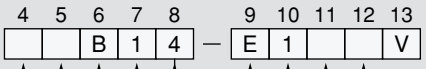
Note: Place the stand foot in position before use.

18 input points



Note: Place the stand foot in position before use.

Code Symbols



Didit	Specification		Note1
4	Number of input point	9 channel 18 channel	
5	Mounting	Panel Mount Portable (Desktop)	
6	—	—	
7	—	—	
8	Version No.		
9	Display	Japanese English	
10	Power supply	100 to 240V AC 50/60Hz	
11	Alarm (relay) output/DI input	Without Alarm output (Relay 10 points) + DI (5 points)	 Note2
12	Communication, Alarm (open-collector) output/DI input	None DI input (5 points) + communication function (RS485) + alarm output (open collector 18 points) Ethernet communication Ethernet communication + alarm output (open collector 18 points) + DI input (5 points) + communication function (RS485)	 Note3 Note3

Note 1) Input signals are classified into the following 4 groups. Make the setting so that the consecutive 2 channels (1ch + 2ch, for example) are assigned the input signal categorized in the same group.
Group 1: thermocouple (12 types), 50 mV DC
Group 2: Pt100Ω, JPt100Ω
Group 3: 500mV DC
Group 4: 1 – 5V DC, 0 – 5 V DC
9, 18ch can be set freely.
Note 2) When 4th code is "2" (18 channel type), alarm output (relay 10 points) + DI (5 points) cannot be selected. Alarm output/DI should be selected in 12th code.
Note 3) Ethernet communication can not selected when 5th code is specified as "2" (portable type).

Scope of supply

Item	Quantily	
	Panel mount	Portable
Main unit	1	1
Panel mounting bracket	2	—
CD-ROM PC software, Instruction manual	1	1
Panel packing for the front panel	1	—
Noise filter for power cable	1	1
AC power cord (2m)	—	1

Option

Item	Type	Specifications
Shunt resistor for DC current input	PHZP0101	10Ω±0.1%
PC loader communication cable (USB (A) plug - USB (miniB) plug)	PHZP1801	Length : 3m
CD-ROM (Instruction manual + PC support software)	PHZP0301	
Terminator	PHZP0701	100Ω
D sub right type 25 pin connector with male connector for Alarm output	PHZP0801	Without cable
Communication cable (Between PHR recorder ~ PC)	PHZP0901	
Communication cable (Between PHR recorder)	PHZP1001	
Compact Flash (512MB)	PHZP2801-512	
Compact Flash (1GB)	PHZP2801-01G	

Note 1) Windows, Excel and Internet Explorer are registered trademarks of Microsoft Corporation.
Note 2) Sandisk and Compact Flash are a trademark of Sandisk Corporation.
Note 3) Pentium is a trademark or registered trademark of Intel Corporation and related companies.
Note 4) Ethernet is a registered trademark of Xerox Co., Ltd.
Note 5) MODBUS is a trademark of AEG Schneider Automation International Corporation.
Note 6) Netscape is a registered trademark of Netscape Communications, Inc.

The product specifications are subject to change as it is under development.

Fuji Electric Co., Ltd.

Grobal Sales Section
Instrumentation & Sensors Planning Dept.
Gate City Ohsaki, East Tower, 11-2, Osaki 1-chome,
Shinagawa-ku, Tokyo 141-0032, Japan
http://www.fujielectric.com
Phone: 81-3-5435-7280, 7281 Fax: 81-3-5435-7425
http://www.fujielectric.com/products/instruments/

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