PAPERLESS RECORDER

DATA SHEET PHR

This is a paperless recorder that displays measured data on the LCD in real time and stores data in CompactFlash.

The type of input such as thermocouple, resistance bulb, D.C. voltage (current), etc. can be arbitrarily set to 18 channels at the maximum.

The data stored in CompactFlash can be regenerated on the screen, and the use of supplied support software allows the data to be regenerated on a PC screen.

The data recorded in ASCII format can be directly read in a spreadsheet such as Excel, which facilitates the processing on a PC. (The data recorded in binary format cannot be read in.)

FEATURES

1. Large capacity storage by CompactFlash
   Measured data is periodically stored in CompactFlash. In case of 512 MB, for example, display files for about 3 year and a half (display refresh cycle 30 sec) can be taken up (in case of ASCII data format, 9 channels, maximum/minimum recording).
2. Quick search and display of past data
   Data stored in CompactFlash can be displayed in succession by scrolling the screen.
3. Various display capability
   Depending on the object of measurement, the most suitable display format can be selected from a variety of formats including bar graph display, trend display, digital display, etc.
4. PC support software supplied as standard
   Loader software that enables easy display and change of set data and data viewer software that regenerates the data stored in CompactFlash are supplied as standard.
5. Compact size
   160 (W) × 144 (H) × 185 (D) mm(Panel mounting), Compact and as light as about 1.5 kg (9-point input, without option).
6. 18-point recording (Option)
   12 types of thermocouples, 2 types of resistance bulbs and DC voltage/current input can be recorded up to 18 points
7. Communication function (Option)
   RS485 MODBUS communication is available.
8. LCD extinguishing function
   Automatically extinguishes the LCD if nothing is operated for certain time. You can set the time after a lapse of which the LCD is extinguished via parameter "LCD extinguishing time". The settable range is 0 to 60 minutes. Setting at 0 minute overrides the function, whereby the LCD will never extinguish.
   This function prevents the backlight life from shortening uselessly. During the extinguishment, the power consumption can be reduced.
9. Ethernet function (Option)
   FTP, Web server, e-mail and MODBUS-TCP are available using 10Base-T.

SPECIFICATIONS

Input system

Number of input points:9 points or 18 points (Can be selected at the time of purchase)

Input circuit: Input mutual isolation (See "Others" on page 5 for the withstand voltage)
Resistance bulb measured current: about. 1 mA

Measuring cycles:9 or 18 points....100ms cycles

Recording cycle: 1 second to 12 hours

Input types: Thermocouple, resistance bulb, DC voltage, and DC current (Shunt resistors are fitted in input terminals).
Note) Provide a shunt resistor (type: PHZP0101) separately.

Measuring range

Input types		Reference range
Thermocouple	B	400.0 to 1760.0°C
	R	0.0 to 1760.0°C
	S	0.0 to 1760.0°C
	K	–200.0 to 1370.0°C
	E	–200.0 to 800.0°C
	J	–200.0 to 1100.0°C
	T	–200.0 to 400.0°C
	N	0.0 to 1300.0°C
	W	0.0 to 1760.0°C
	L	–200.0 to 900.0°C
	U	–200.0 to 400.0°C
	PN	0.0 to 1300.0°C
Resistance bulb	JPt100	–200.0 to 600.0°C
	Pt100	–200.0 to 600.0°C
DC voltage	50mV	0.00 to 50.00mV
	500mV	0.0 to 500.0mV
	1-5V	1.000 to 5.000V
	0-5V	0.000 to 5.000V

Note) B, R, S, K, E, J, T : JIS C 1602, DIN IEC 584-1
N : NICOSIL-NISIL (IEC 584)
W : 5%Re-26%Re · W (Hoskins Mfg. Co. USA)
L : Fe-Cu · Ni (DIN 43710)
U : Cu-Cu · Ni (DIN 43710)
PN: Platinel
JPt100 : JIS C 1604-1989 (Old JIS Pt 100)
Pt100 : JIS C 1604, DIN IEC 751

Selection of input types:
By key operation on the front panel. Note that the same input type (thermocouple, resistance bulb, voltage) should be set every 2 channels. Refer to "Setting method of input types" for details.

Burn-out function:
Provided as standard for thermocouple and resistance bulb inputs. If the input has been open-circuited, the recording level swings over 100%.
Thermocouple burn-out current: approx. 0.2 μA

Input filter function:
Settable for each channel (primary delay filter)
Time constants are settable in the range from 0 to 900 sec.

Scaling function: Possible by DC voltage (current) input
Scaling range: -32767 to 32767
Decimal position: settable at any point
Unit symbol: Selectable out of 125 different units or 12 user units of up to 7 characters.

Subtraction function:
Subtraction between each channel is allowed.

Totalizing function:
The measured value of each channel can be totalized. Applicable to daily, monthly, annual or external input totalizing.

F value calculation function:
F value (extinction value of bacteria by sterilization by heating) can be calculated from the measured temperature by each channel.
F value and measured temperature can be displayed and recorded using 2 channels.

Square rooter function:
Square rooter can be performed against the input value per each channel.

Logarithmic calculation function:
The measured value of each channel can be displayed in exponent form.

Mathematics function:
The following calculation is available with the math function.

1) Computation function
Addition, subtraction, multiplication, division, absolute value, exponential, square-root extraction, LOG, LN, EXP, humidity, maximum, minimum, average, and integration.

2) Computation input enable
Channel input (1 to 30 CH), Total input (1 to 30 CH), DI (DI to DI10), Communication input (No.1 to No.12), Constant (No.1 to No.20).

Indication system

Indicator: 5.7" TFT color LCD (320 × 240 dots) with backlight, no contrast adjustment. On the LCD, certain picture elements remain lit or extinguished. On account of the nature inherent to LCD, the brightness may be non-uniform. But, such are not troubles.

Color of indication:
14 colors

Applicable language:
English, Japanese

Life of backlight: 50,000 hours (20°C) in terms of total lighting time.
(Replace the backlight as a set of display unit. If the LCD extinguishing function is resorted to, the LCD can be used longer as much.)

Trend display: Direction: vertical and horizontal
Number of channels: 10 or 4 channels per screen group. (select from up to 30 channels).
Display refreshment cycles: select from 1 second to 12 hours
Scale display or no-display can be selected.

Bar graph display:
Number of channels: 10 or 4 channels per screen group. (select from up to 30 channels).
Display refreshment cycles: 1 second.

Analog meter display:
For 4 inputs per screen group. (input from 1 to 4). Display in bar graphs or in analog meters can be selected.
Display refresh cycle: 1 second

Digital display: Number of channels: 10 or 4 channels per screen group. (select from up to 30 channels).
Display refreshment cycles: 1 second.

Totalizing data display:
Number of channels: 10 or 4 channels per screen group. (select from up to 30 channels)
Display refresh cycle: 1 second.

Event summary display:
Alarm summary and message summary can be displayed. The message occurrence information and message display can be switched.

Ethernet log display:
E-mail sending, FTP server log in/off and MODBUS TCP/IP communication start/stop can be displayed.

Parameter display/set:
Already-set Data Display and Set Change Display screen

TAG indication: Number of characters to be displayed:
Up to 8 characters
Up to 8 characters (Note 1) at 10-channel display.
Up to 16 characters at 4 channel display.
Note 1: Up to 7 characters only can be displayed on certain screens.

Characters to be displayed:
Alphanumerics, hiraganas and katakanas.

Tag, unit and channel No. display:
Which can be displayed depends on the particular screen. Refer to the table below.
(Keywords only are extracted.)

Screen	Channnels per screen		Item			
			Tag 1	Tag 2	Unit	ch Np.
Trend	4 or less		+	+	+	+
	5 or more		x	–	x	x
Bar graph	4 or less		+	+	+	+
	5 or more		x	–	x	x
Analog meter	4 or less		All			
	5 or more	No. 1 to 4	All except tag 2			
		Others	x	–	x	
Instantaneous value	4 or less		All			
	5 or more		All except tag 2			

x: 1 item only can be displayed
+: 2 items only can be displayed
–: Nothing can be displayed

Historical trend display:
Displays past recording data read from compact flash, currently recording data or just recorded data. The recording chart can be scrolled or, via time designation, the control can jump to an arbitrary recording chart.

Number of screen groups:
Four groups (Up to 10 channels per 1 group can be registered.)

Keyboard

No. of Keys: 8

Function: Use to select various screens and set various parameters.

Recording function

External memory media:
Compact Flash card
Format according to FAT32, FAT16 or FAT. Otherwise, reading and saving are impossible.

Recording capacity:
2GB maximum (compact flash). Limiting the recording file to 64 MB is recommended (for 112 hours if display refresh cycle is 1 second. See Table 1 (p. 7).)
(When the size of the recording file comes to be 256MB or more, a new file is created automatically and recording is maintained.)
* Please change the compact flash every six month to prevent the data losing.

Recording method:
Turning ON the REC key allows measured data to be written at fixed cycles. Recorded as a new file whenever the recording starts.

Data save cycles: Linked to the display refreshment cycles on the "Real Time Trend" screen. However, they are automatically set to about 1 minute if the refreshment cycles are set to less than 1 minute.

Trend data: Measurement data sampled at measurement cycle is saved in terms of mean value, instantaneous value or maximum/minimum value.

Event data: Saves alarm data and message data. Further saves power ON and OFF, if any, after starting recording.

Totalizing value data:
Records the totalized data according to the totalizing type selected by channels. Values by totalizing types or total from the beginning of totalizing, whichever selected, can be recorded. For each channel, the input value totalizing, number of DI inputs or measurement at times when DI inputs have occurred can be selected. Input values to be totalized are selected from daily report, monthly report, yearly report and external input.
If power has been turned off and on while totalizing, the totalizing is resumed at last value. (Last value remains saved, but data during power OFF is not totalized.)

Configuration data:
Configuration data can be saved. And this data can also download to recorder.

Storage capacity:
Approximately 3 years when the display refresh cycle is 30 seconds (in case of 9-channel recording in ASCII data format, and 512 MB compact flash used). Refer to Table 1.

Residual capacity of memory:
Indicates how much of the memory card has been used on the screen. When all the memory is used up, you can stop recording or delete the oldest recording file to save the newest data.

Compact flash card form: PHZP2801
(CF card) (If a card other than the above is used, no operation assurance is ensured. Meanwhile, as for other CF cards for which operation check will have been completed, the results will be posted on our company's homepage sequentially. Please refer to this website.)

Data format: Either of ASCII or binary format can be selected. (Switching cannot be made while the recording is in progress. In the case of ASCII format, the data can be directly read on Excel, etc.)
Note: The data recorded in binary format cannot be read directly.
Approximately 166 bytes per sampling for maximum/minimum recording of 9-channel input in ASCII format, or approximately 40 bytes for maximum/minimum recording of 9-channel input in binary format.

Alarm function

No. of settings: Up to 4 alarms for each channel are settable.

Type of alarm: High/Low limits

Indication: Status (alarm types) is displayed on digital display unit when an alarm occurs. Historical display on alarm summary (Alarm start/cancel time and alarm types)

Hysteresis: Set within the recording range of 0 to 100%
Acts on high or low limit alarm, and does not affect the battery alarm nor memory full alarm.

Relay output: Number of points; 10 (option: Cannot be selected if the number of input points is 18.)

Transistor output (open collector output):
18 points (option)

Alarm latch function:
Holds alarm indication and alarm output even after measurement value has left the alarm range.
ON/OFF operation is performed according to key setting.

Power supply

Rated power voltage: 100 to 240V AC
Range of operating voltage: 90 to 264V AC
Supply frequency: 50/60Hz ±2% (both employable)
Power consumption:

Power voltage	Consumption
100V AC	About 36VA
240V AC	About 47VA

Structure

Mounting method:
Panel-mounted (vertical panel) or portable (desktop type)

Thickness of panel:
2 to 26 mm

Materials: PC-ABS for case and bezel
Color: Black

External dimensions:
Panel-mounted: 160 (W) × 144 (H) × 185 (D) mm
Portable: 160 (W) × 171.5 (H) × 206.6 (D) mm

Mass: About 1.5 kg (9-point input, without option)

External terminal board:
Screw terminals (M3 thread)
RJ45: Ethernet terminal (option)

Operating condition

Ambient temperature:
Panel-mounted(without Ethernet function): **0 to 50°C***1
Portable: **0 to 40°C**
Panel mount (with Ethernet function): **0 to 40°C***2

Ambient humidity: 20 to 80%RH
Vibration: 10 to 60Hz 0.2m/s^2 or less
Shock: None
Magnetic field: 400 A/m or less

Signal source resistance:
Thermocouple input .... 1kohm or less
Resistance bulb input... 10ohm/wire or less (resistance of each wire of 3-wire system should be balanced).
Voltage input... 0.1% or less of input resistance

Mounting posture:
Forward tilt 0°, backward tilt within 30°, horizontal 0°

Warm-up time: One hour or more after power ON
Environmental protection:
IEC IP50 (Front)/20 (Terminal)
Installation category: II
Pollution degree: 2
Operating altitude: 2000m max.

*1: In case of the 12th digit of ordering code is "Y" or "R".
*2: In case of the 12th digit of ordering code is "E" or "W".

Reference standard

Accuracy/resolution:
Measuring conditions (23±2°C, 65±10% RH, power voltage, frequency fluctuation within ±1%, no external noise, warm-up time of 1 hour or more, vertical mounting, standard values of signal source resistance and wiring resistance... within 1%)

Input types		Digital indication accuracy Note 1	Digital indication resolution
Thermocouple	B R S K E J T N W L U PN	±(0.15%+1 digit) ±(0.3%+1 digit) for the range shown below Thermocouple B : 400 to 600°C Thermocouples R and S : 0 to 300°C Thermocouples K, E, J, T, L and U : –200 to –100°C	0.1°C
Resistance bulb	JPt100 Pt100	±(0.15%+1 digit)	0.1°C
DC voltage	50mV 500mV 5V	±(0.15%+1 digit)	10µV 100µV 1mV

Note 1) Digital indication accuracy is a percentage (%) with respect to input range of 1 page.
Note 2) No error of reference contact compensation of thermocouple is included.

Error of reference contact compensation:
K, E, J, T, N, L, U, PN: ±0.5°C
R, S, B, W: ±1.0°C
(when measured at 0°C or more)

Max. input voltage:
Thermocouple, resistance bulb, dc voltage: ±10V DC (continuous)

Input impedance: Thermocouple, DC voltage:
About 1MΩ

Others

Clock: With calendar function (Christian era)
Accuracy: ±100 ppm or less (monthly error: about 4 minutes)
However, time error at ambient temperature 23±2°C and power ON/OFF is not included.

Memory backup: Parameters are saved to the internal non-volatile flash memory.
The clock is backed up with built-in lithium battery.
Trend data is not backed up.

Insulation resistance:
100Ω or more (when measured between each terminal and ground by using a 500V DC megger)

Withstand voltage:
Input terminal – input terminal: 500 V AC, 1 min
Power terminal – ground: 2000V AC, 1 min
Input terminal – ground:500V AC, 1 min
Alarm terminal (contact output) – ground: 2000 V AC, 1 min
Alarm terminal (contact output) – alarm

terminal (contact output):
750 V AC, 1 min
Communication terminal – ground:
500 V AC, 1 min
Alarm terminal (open collector) – ground:
500 V AC, 1 min
Power terminal – input terminal:
500 V AC, 1 min

Effect on operation

Effect of power supply fluctuation conditions:
For the fluctuation in the range from 90 to 264V AC (frequeucy: 50/60Hz)
Reading change (100V AC base): ±(0.2%+1 digit) or lower.
For the fluctuation in the range from 47 to 63Hz (power voltage: 100V AC)
Reading change (50Hz base): ±(0.2%+1 digit) or lower.

Effect of input signal resistance:
Thermocouple input: (0.5μV/Ω)+1digit or less
DC voltage: Fluctuation for resistance value equivalent to 0.1% of the input resistance: ±(0.2%+1 digit) or lower.
Reistance bulb (for wiring resistance of 10Ω for 1 line (the same for 3 lines))
Reading change: ±(0.2%+1 digit) or lower.

Effect of ambient temperature:
Reading change: ±(0.3%+1 digit)/10°C or lower.

Effect of Mounting position:
For the backward 30° slant
Reading change: ±(0.2%+1 digit) or lower.

Effect of vibration:
When sine wave of 10 to 60Hz with the acceleration of 0.2m/s^2 is applied in each direction for 2 hours.
Reading change: ±(0.2%+1 digit) or lower.

Effect of external noise:
Normal mode noise (50, 60Hz±0.1Hz) ···20dB or more
Common mode noise (50, 60Hz±0.1Hz) ···120dB or more
(Thermocouple input: minus terminal-ground)
(Resistance bulb input: b Line-ground)

Transportation/storage conditions

Temperature: –10 to +60°C
Humidity: 5 to 90%RH
Vibration: 10 to 60Hz, 2.45 m/s^2 or lower
Shock: 294m/s^2 or lower (packed state)

Additional function (Option)

■ Alarm relay output/DI (11th digit of code symbols: "1")
A card with 10-point relay output and 5-point DI input can be mounted.
Cannot be mounted if the number of input points is 18.

Terminal structure:
M3 screw terminal

Alarm relay output:
1a contact output (10 points),
Individual channel or common output (OR output) allowed.
DO1: Contact capacity;150V/3A AC, 30V/3A DC (resistive load)
DO2-10: Contact capacity; 240V/3A AC, 30V/3A DC (resistive load)

DI input: No-voltage contact input (5 points)
The following control is allowed by contact input.
(1) Recording start/stop
(2) Message set
(3) F value calculation reset
(4) Totalizing start/stop
(5) Totalized value reset
(6) LCD (backlight) lighting
(7) E-mail sending
ON pulse width: 200 msec or more
OFF pulse width: 200 msec or more

■ Communication, alarm (open collector output), DI input (12 digit of code symbols is "R" or "W")
RS485 communication. Card having 18 alarm points (open collector output) and 5 DI input points can be installed.

Terminal structure:
M3 thread terminal (DO11 (alarm open collector output), DI6, DIO source terminal and communication terminal)
D-Sub 25 pin female terminal (DO12 to DO28 (alarm open collector output)) and DI7 to DI10

Communication: Physical specifications: EIA RS485
Communication protocol:
Modbus (RTU)
Communication method:
2 wire method. Half duplex bit serial, start-stop sync type.
Data type:
8 bits. Parity: odd/even/none.
Stop bit: 1 bit.
Communication rate: 9600, 19200bps
Connection aspect:
multi-drop/up to 32 recorders connectable including master station
Communication distance:
Total extension 500m or less
RS232C/RS485 Signal converter (recommendation):
Isolated type
Manufacture: OMRON Corporation
Model: K3SC-10

Alarm output: Open-collector transistor output (18 points)
Electrical Rate: 30Vdc, 100mA (resistive load)

DI input: No-voltage contact input (5 points).
Contact input allows following controls.
(1) Recording start/stop
(2) Message set
(3) F value calculation reset
(4) Totalizing start/stop
(5) Totalized value reset
(6) LCD (backlight) lighting
(7) E-mail sending
ON pulse width: 200 msec or more
OFF pulse width: 200 msec or more

Ethernet (Option)

The following can be performed through the Ethernet function.

■ HTTP server (Internet Explorer 6 is available) Note 1

Measurement display:
Digitally displays the measurement of each channel of the recorder and alarm occurrence status.

Event summary display:
Displays event summary including alarm ON/OFF and issuance of messages.

Main unit information display:
Displays memory use conditions and information on the main unit such as the battery end warning.

Integrated value display:
Digitally displays the integrated value of each channel of the recorder.

■ FTP server (Internet Explorer 6 available.) Note 1

File download: Record files stored in compact flash (CF) can be downloaded from the browser.

File delete: Record files stored in CF can be deleted from the browser.

Access authentication:
Authenticates access authority to FTP server.

■ SMTP (e-mail client)
Transmits e-mails to specified address under the following conditions.
(1) When an alarm turns on or off
(2) When DI is set to ON or OFF
(3) When an error occurs to the main unit (such as low battery or no memory space)
(4) At specified intervals

■ MODBUS TC/IP

Data read: Settings can be read through MODBUS TCP/IP communication.

Data write: Settings can be written through MODBUS TCP/IP communication.

Note1: Netscape is not available.

Support software

Note:
Applicable PC: 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.

The following software is provided as standard.

■ Loader software for PC

Major function: Performs various parameter setting/change of the main unit
O/S: Windows 2000/XP/7
Required memory:
64MB or larger
Disk drive: Windows 2000/XP/7-capable CD-ROM
Hard disk capacity:
Free capacity of 30MB or larger required
Printer: Windows 2000/XP/7-capable printer and printer driver

Note) PC loader communication cable (type PHZP1801) is separately required.

■ Data viewer software

Major function: Regenerates the past trend record on the PC from the data in the compact flash. Provided with historical trend display and event display functions.
Data can be changed to CSV file.
O/S: Windows 2000/XP/7
Required memory:
64MB or larger
Disk drive: Windows 2000/XP/7-capable CD-ROM drive
Hard disk drive: Free capacity of 30MB or larger required
Printer: Windows 2000/XP/7-capable printer and printer driver

Standard functions

Function	Description
Record range voluntary setting	Recording range can be set by channel.
Input type setting	Input type can be set by channel. (Key operation on the front face) Set the same input type for every 2 channels.
Skip function	Skips arbitrary channel display/recording.
Trend display	Time display: Time is displayed at the top of the trend display screen. Alarm display: On occurrence of an alarm and the restoration, alarm is displayed in the alarm display field. The compact flash usage is displayed with a bargraph at the top.
TAG name display	By channel, Maximum of 8 characters.
Screen name display	Displays the screen name (maximum of 16 characters).
Unit creation	Industrial units can be arbitrarily created, Maximum of 7 digits, 12 types.
Scaling function	Arbitrary scaling is allowed in the case of DC voltage input. Decimal point position can also be arbitrarily set in the range from -32767 to 32767.
PV shift	Shift the zero point and slant of the reading.
Input filter	Prevents sudden fluctuation of input for each channel (primary delay filter). Time constant: 0 to 900 seconds.
Burnout function	Displays the break of thermocouple/resistance bulb input by scaling out to 100% side.
Historical trend display	Regenerates and displays the data stored in the compact flash by scrolling the screen. Displays data of a designated time.

EU Directive Compliance CE

LVD (2014/35/EU)
EN 61010-1
EN 61010-2-030
EMC (2014/30/EU)
EN 61326-1 (Table 3)
EN 55011 (Group 1 Class A)
EN 61000-3-2 (Class A)
EN 61000-3-3
RoHS (2011/65/EU)
EN 50581

*Portable type is non-compliant with CE marking.

Table 1. Recording capacity

The recording can be made for the period of time listed in the tables shown below under the following conditions.

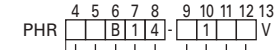
- 9 input points
- Recording data format: ASCII
- Recording type: Maximum/minimum recording
- No alarm, nor message, nor other events.

CompactFlash size	256MB			
Display upgrade cycle	1 sec	10 sec	30 sec	1 min
Recordable capacity(about)	18 days	187 days	1.5 years	3 years

- When the number of input points is 18, the period is approximately one half of those listed in the table.
- In binary format, the period is approximately 4 times as long as those listed in the table.
- For recording type of mean or instantaneous value, the number of days is approximately 2 times as long.

While compact flash is not in use, recorded date and event date can be stored approximately 600KB in the main unit
When recording 9-channel in MAX-MIN recording, approximately 15300 data can be stored.
For 4 hours at the display refresh cycle of 1 second.
The number of the save data varies depending on the number of the event data.

ORDERING CODE



Digit	Specifications	Note
4	<Number of input points> 9 channel 18 channel	 1 2
5	<Mounting> Panel mounting Portable (desktop)	 1 2 Note 3
6	<Case color> Black	 B
7	<Compact flash> Without (not furnished)	 1 Note 2
8	<Version No.> Version No.	 4
9	<Display> Japanese English	 N E
10	<Power supply> 100 to 240 V AC	 1
11	<Alarm (relay) output/DI input> Without With	 0 1 Note 1
12	<Communication, alarm (open collector) output/DI input> Without Communication (RS485), alarm output, Di input Ethernet Ethernet, communication (RS485), alarm output, Di input	 Y R E W Note 4 Note 5 Note 4,5

Note 1 : Cannot be selected if 2 is selected for the forth digit (the number of input points is 18).
Note 2 : The compact flash is optional. Refer to the section of "Optional items" below.
Note 3 : Portable mounting type doesn't comply with UL and CE.
Note 4 : Alarm output; transistor (open collector) output
Note 5 : Cannot be specified when "2" is selected for the 5th digit.

SCOPE OF DELIVIRY

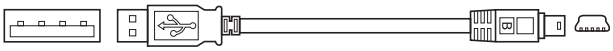
Item		Quantity: Panel mounting	Quantity: Portable
Recorder (PHR)		1	1
Panel mounting bracket		2	—
CD-ROM	PC support software instruction manual	1	1
Panel packing for the front face		1	—
Noise filter for the power supply		1	1
AC power cord (2m)		—	1

OPTIONAL ITEMS

Item	Code	Specification
Shunt resistor for DC current input	PHZP0101	10Ω ±0.1%
PC loader communication cable	PHZP1801	Length 3m with connector USB-A/USB miniB terminal *
CD-ROM with instruction manual and support software	PHZP0301	
Terminating resistor for communication	PHZP0701	100Ω
D-Sub light type 25 pin connector with male terminal for alarm output (without cable)	PHZP0801	
Transmission cable	PHZP0901 PHZP1001	For PHR to PC For PHR to PHR
Compact flash	PHZP2801-512 PHZP2801-01G	512MB 1GB

* Shape of this cable is shown below

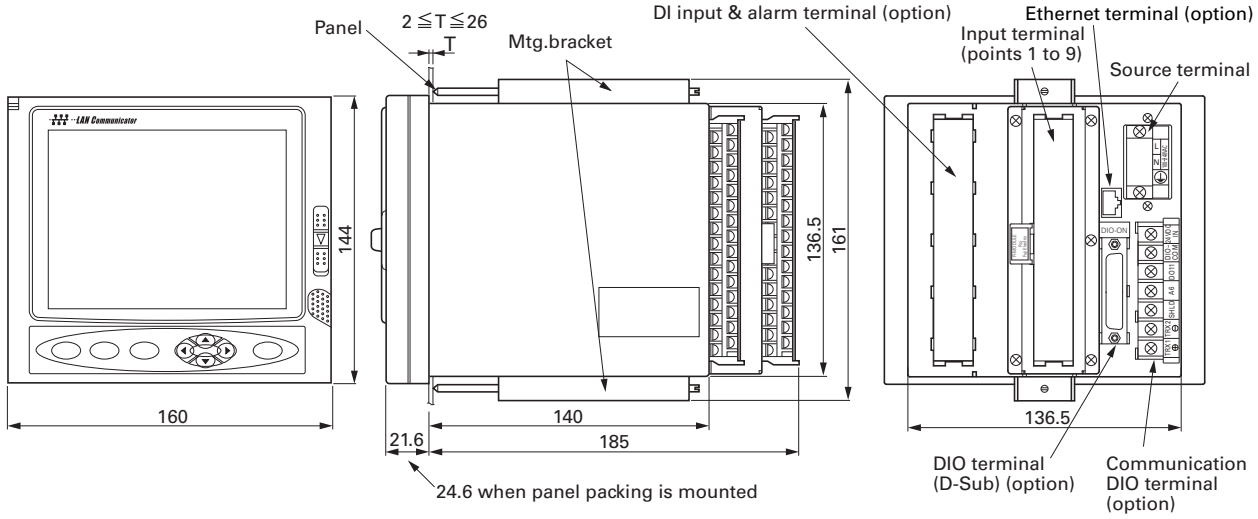
USB (A) Plug – USB (Mini-B) Plug



OUTLINE DIAGRAMS (Unit : mm)

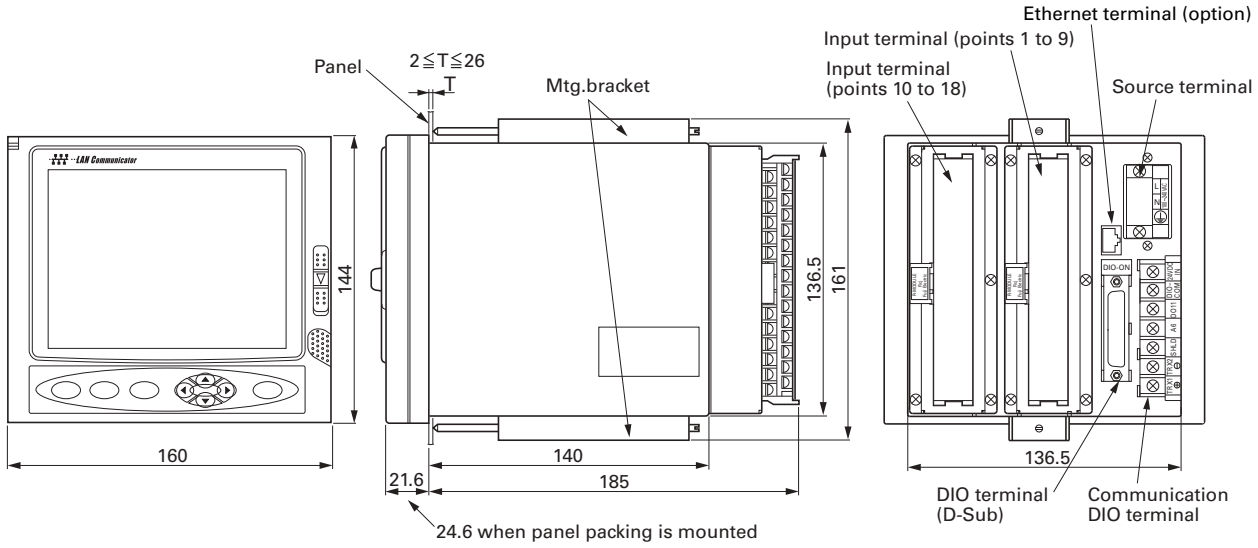
PANEL MOUNTING TYPE

In the case of 9-point input



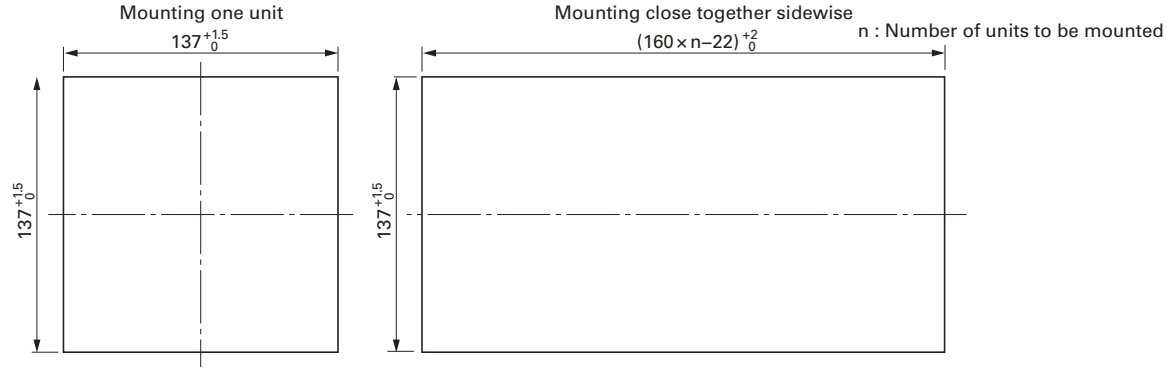
(Note) When placing the main unit on another instrument or on the floor, allow a space of 100mm or more between the unit and instrument or the floor.

In the case of 18-point input



(Note) When placing the main unit on another instrument or on the floor, allow a space of 100mm or more between the unit and instrument or the floor.

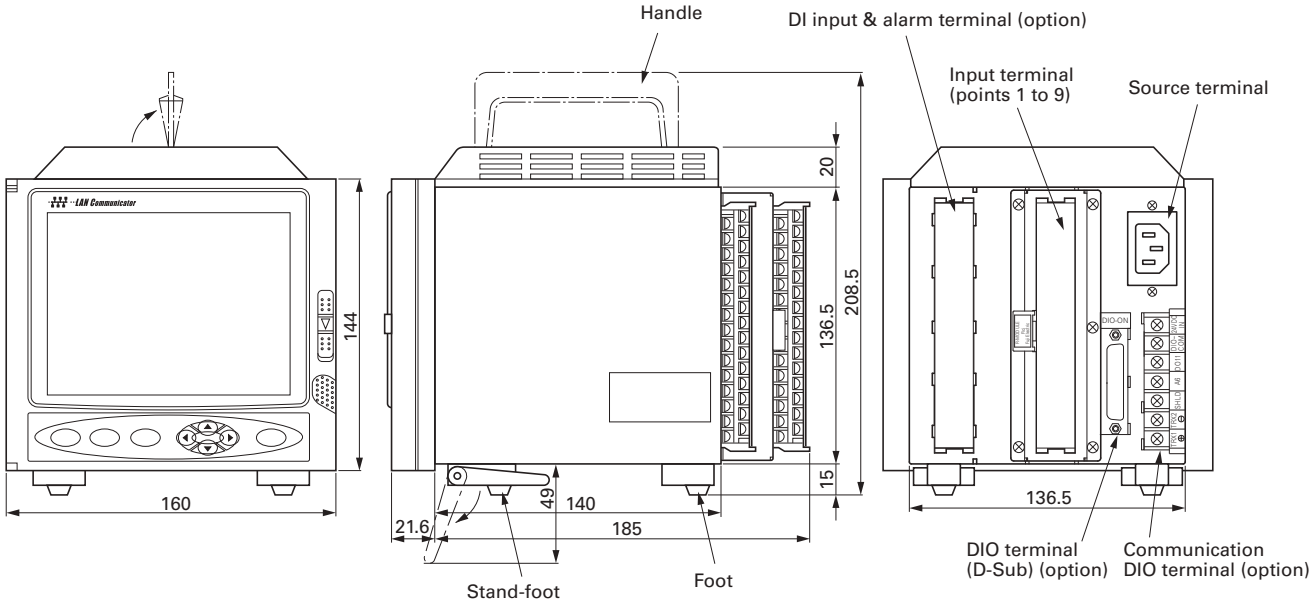
PANEL CUTOUT



Do not use the water proof pacing in case of mounting n unit

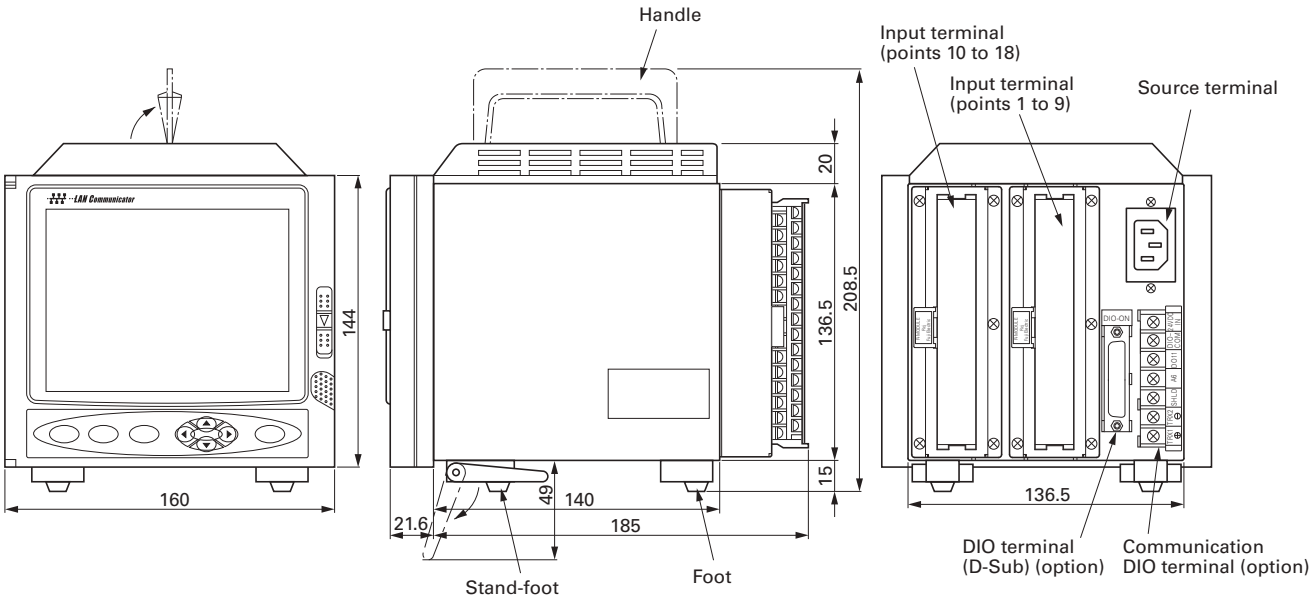
PORTABLE (TABLE TOP) TYPE

In the case of 9-point input



(Note) Please use the stand-foot upright.

In the case of 18-point input

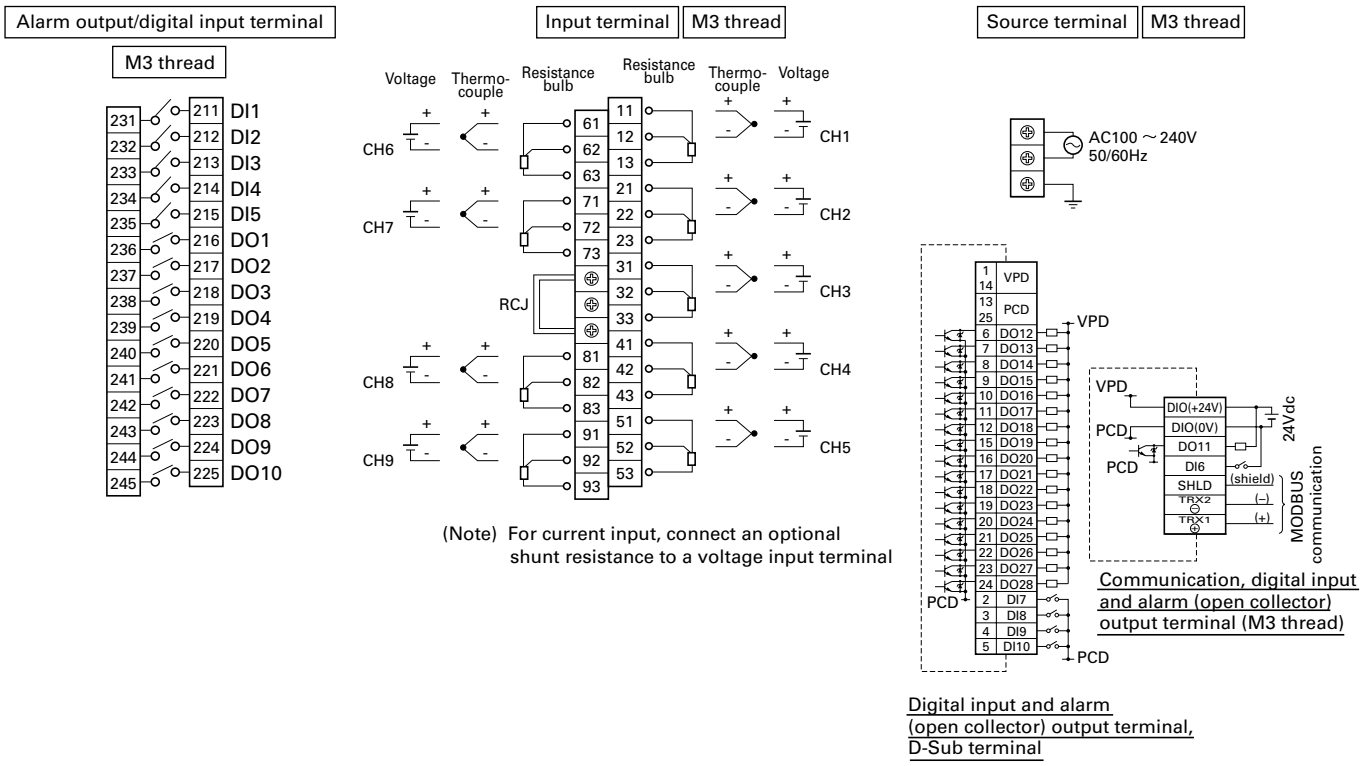


(Note) Please use the stand-foot upright.

EXTERNAL CONNECTION DIAGRAMS

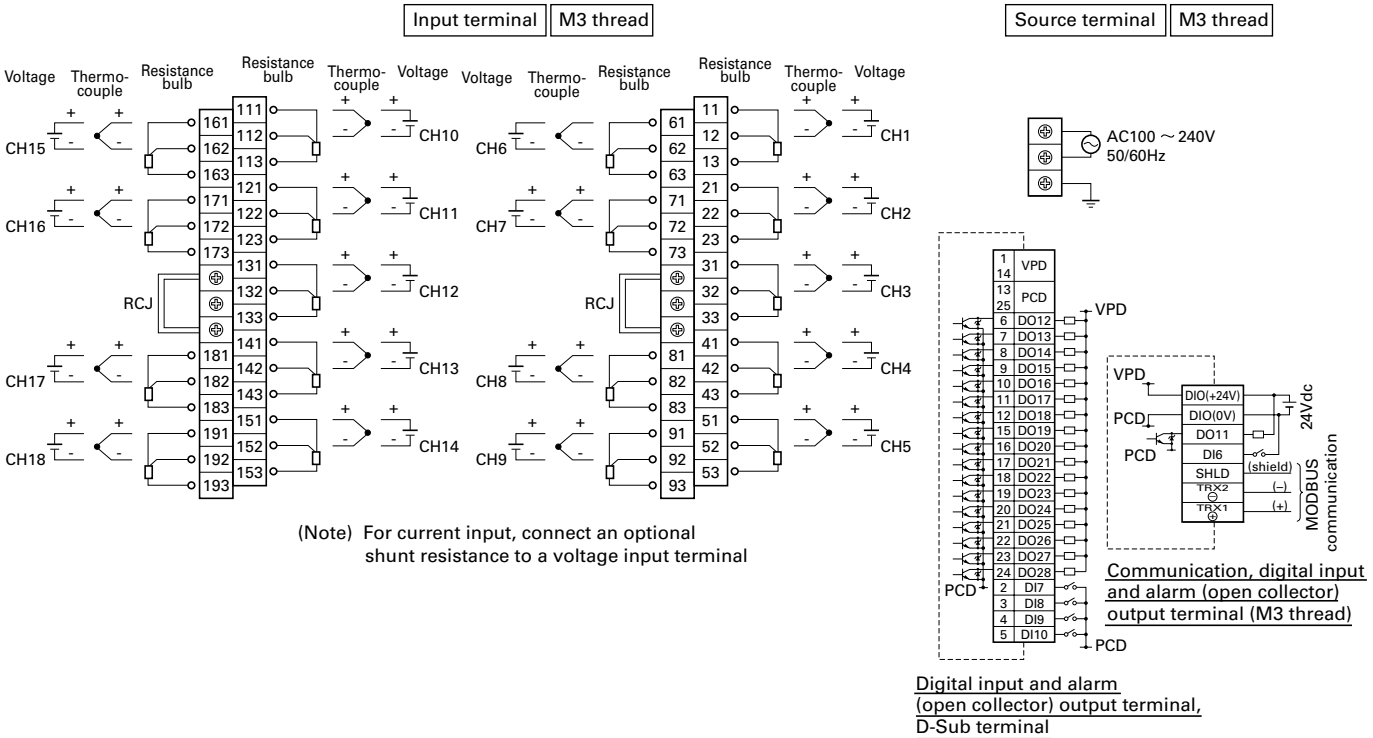
PANEL MOUNTING TYPE

In the case of 9-point input



(Note) For current input, connect an optional shunt resistance to a voltage input terminal

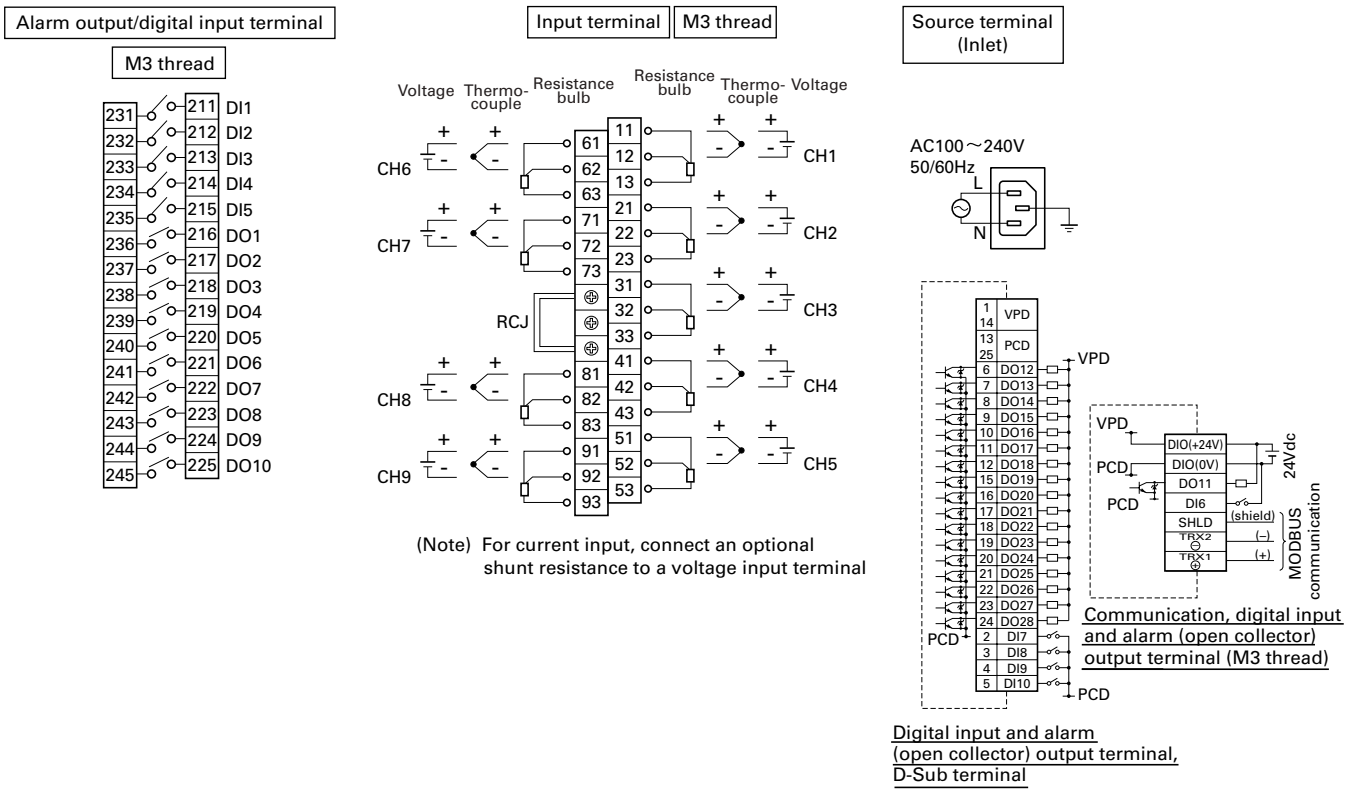
In the case of 18-point input



(Note) For current input, connect an optional shunt resistance to a voltage input terminal

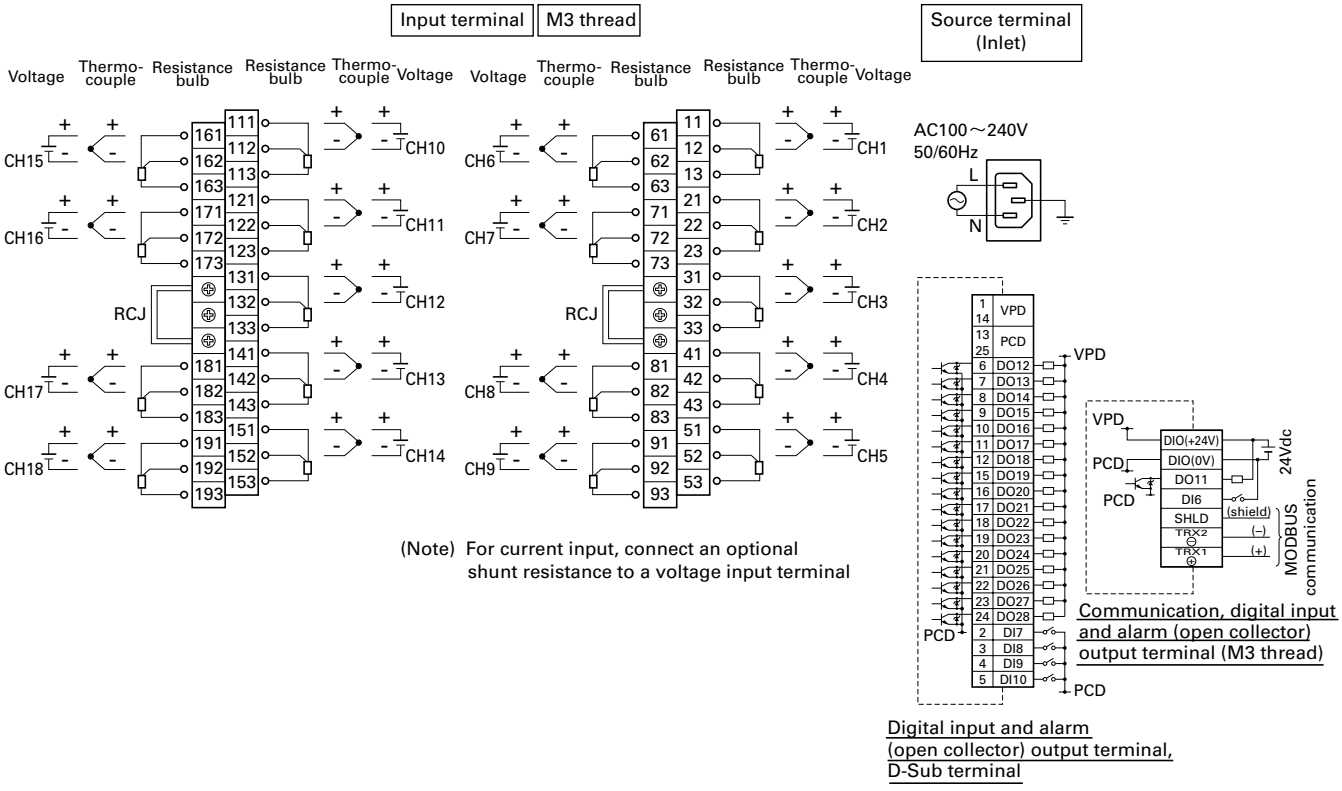
PORTABLE (TABLE TOP) TYPE

In the case of 9-point input



(Note) For current input, connect an optional shunt resistance to a voltage input terminal

In the case of 18-point input



(Note) For current input, connect an optional shunt resistance to a voltage input terminal

SELECTING INPUT TYPE

The input type is the same every 2 channels.
The input type of channel 2, 4, 6, 8, 11, 13, 15 and 17 can only be set in the same category of previous channel.
The following input types are available.

Input type	Details
Thermocouple, 50mV	K, E, J, T, R, S, B, N, W, L, U, and PN thermocouples, 50mV
Resistance bulb	Pt100, JPt100
500mV	500mV
5V	1 to 5V, 0 to 5V
Other channels	Other channels (*1)

Note, however, that input type can be arbitrarily selected only for channels 9 and 18 irrespective of the type allocated to other channels.

*1: Used for F value calculation, for example. If an input type is allocated to another channel, or, if the input type of channel 2 is allocated to other channels and several settings are made when the temperature is being measured by connecting K thermocouple to channel 1, it is possible to display a temperature measured by K thermocouple on channel 2. F value calculation is available on channel 1, and the temperature recording is available on channel 2.
For setting method, refer to the instruction manual.

Example of channel input type selection

	Input type	Input type	Description
Channel 1	K thermocouple	Thermocouple, 50mV	The type of thermocouple can be arbitrarily selected for each channel.
Channel 2	T thermocouple		
Channel 3	1-5V	5V	
Channel 4	0-5V		
Channel 5	Pt100	Resistance bulb	The type of resistance bulb can be arbitrarily selected for each channel.
Channel 6	JPt100		
Channel 7	500mV	500mV	
Channel 8	500mV		
Channel 9	J thermocouple	Thermocouple, 50mV	Input type can be arbitrarily selected for channel 9.
Channel 10	K thermocouple	Thermocouple, 50mV	The input type of the thermocouple and 50mV is the same.
Channel 11	50mV		
Channel 12	Skip	5V	Skip and other channel can arbitrarily be selected irrespective of the input type.
Channel 13	1-5V		
Channel 14	Pt100	Resistance bulb	
Channel 15	Skip		
Channel 16	Other channels	500mV	
Channel 17	500mV		
Channel 18	50mV	Thermocouple, 50mV	Input type can be arbitrarily selected for channel 18.

⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual.

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