

PC Recorders Series

PC RECORDER
(portable all-in-one module with IC card)

MODEL **50HR**

MODEL & SUFFIX CODE SELECTION

MODEL _____ **50HR-□-MR**
I/O TYPE _____
GH1 : DC and T/C input, 32 points
U2 : DC, T/C and RTD input, 16 points
U3 : DC, T/C and RTD input, 8 points
POWER INPUT _____
MR : 100 – 240V AC (AC adaptor)

ORDERING INFORMATION

Specify code number. (e.g. 50HR-U2-MR)

PACKAGE INCLUDES...

- PC Recorder Software CD (model: MSRPAC-2005)
- AC adaptor (1)
- Terminal cover (1)
- Screwdriver (1)

OPTIONS

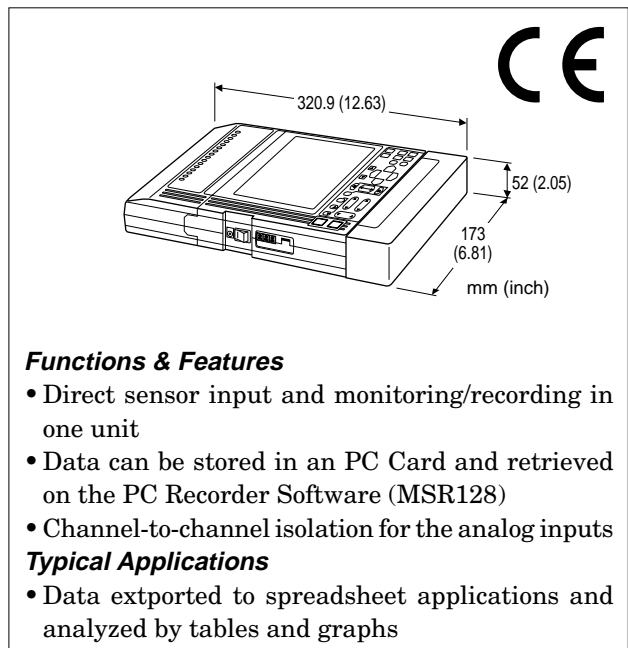
- Printer unit (model: 50HR-PR)
- Recording paper (model: 50HR-KAM)
- Digital I/O unit (model: 50HR-DIO)
- Battery pack (model: 50HR-BAT)
- Connection cable (model: 50HR-PIC)
- RS-232C straight cable (model: 50HR-RSS)
- Terminal unit (model: 50HR-T1)
- Instruction manual (model: EM-6305-A)
- Instruction manual for communications (model: EM-6305-B)

GENERAL SPECIFICATIONS

Memory capacity: 8 MB internal
(= 4,194,304 samples);
Up to 528MB external flash ATA card

Real time saving: Waveforms saved in binary to the PC card in real time; stored data can be recalled to the main module memory in 8 MB unit

File exporting: PC Card Type II × 1 slot; flash ATA (up to 528 MB); binary (custom format), text (MS Excel format), BMP (image), calculation results; Partial data can be manually selected with A-B cursor and saved.



Backup memory (at 23°C / 73.4°F)

Clock and setup data: Min. 10 years

Measured data: Max. 1 hour after the power has been turned on and maintained for at least 2 minutes and then removed.

Display: 5.7-inch STN color LCD (240 × 320 pixels); Display modes selectable: waveform / waveform + numerical / numerical / calculation result + waveform

Additional functions: waveform scroll; data cutout; scaling; automatic saving; startup condition hold; configuration saving; comment input; event marking (for searching); automatic setup; numerical calculation (up to four simultaneous calculations of average, peak, maximum/minimum, timing of maximum/minimum value, RMS value), E-Mail*, FTP*

*Not supported with the 50HR-U2/U3, Ver. 7.00.

INPUT & OUTPUT

Input configuration / number of channels

Analog: 8, 16 or 32 chs.; isolated by photo MOSFET relays; Each channel can be configured to different settings for temperature and DC voltage inputs.

Pulse: 4 chs.

Logic: 16 chs.; Optional Digital I/O Unit (model: 50HR-DIO) required.

Input terminal

Temperature & DC voltage: Screw-type terminal block (4 terminals per channel); removable terminal block; terminal cover (isolated between each channel, between input to enclosure)

Pulse & rotation: Special connector; optional cable (model: 50HR-PIC) available for up to 4 chs.)

Recording intervals: Scanning through all channels and records data every 100 msec. – 1 hour (200 msec. – 1 hour for recording 17 and later channels, or scanning with RTD input); The data recorded in intervals shorter than 500 msec. are thinned down on the MSR32 or MSR128.

■DC VOLTAGE INPUT

Range v.s. resolution

100mV f.s.	: -100 to +100mV	5 μ V
1V f.s.	: -1 to +1V	50 μ V
10V f.s.	: -10 to +10V	500 μ V
100V f.s.	: -60 to +60V	5mV
1 – 5V f.s.	: 1 – 5V	500 μ V

Input resistance: 1M Ω

■THERMOCOUPLE INPUT

Range v.s. resolution

100°C f.s.	: -100 to +100°C	0.01°C
500°C f.s.	: -200 to +500°C	0.1°C
2000°C f.s.	: -200 to +2000°C	0.5°C

Thermocouples: K -200 to +1350°C,
E -200 to +1000°C, J -200 to +1200°C,
T -200 to +400°C, N -200 to +1300°C,
W (WRe 5-26) 400 to 2000°C,
R 400 to 1700°C, S 400 to 1700°C,
B 400 to 1800°C

Cold junction compensation: Internal/external reference point selectable

Input resistance: 1M Ω

■PLATINUM RTD INPUT (50HR-U2, U3)

Range v.s. resolution

100°C f.s.	: -100 to +100°C	0.01°C
500°C f.s.	: -200 to +500°C	0.1°C
2000°C f.s.	: -200 to +2000°C	0.5°C

RTDs: Pt 100 -200 to +800°C (JIS '97, IEC751)
JPt 100 -200 to +500°C (JIS C 1604-1989)

Connection: 3-wire / 4-wire

Input resistance: 1M Ω (sensing)

■**PULSE TOTALIZER INPUT:** Dry contact (N.O.), open collector or voltage pulse

Max. voltage: 15V DC

Hi/Lo levels: $\geq 1.0V$ for Hi; $\leq 0 - 0.5V$ for Lo

Waveform cycle: $\geq 200 \mu\text{sec.}$; Both Hi and Lo must be 100 $\mu\text{sec.}$ or longer.

Sensing: Rise or sink selectable per each channel.

Range v.s. resolution

50,000 pulses f.s.	: 0 – 50,000 pulses	1 pulse
500,000 pulses f.s.	: 0 – 500,000 pulses	10 pulses
5M pulses f.s.	: 0 – 5M pulses	100 pulses
100M pulses f.s.	: 0 – 100M pulses	2,000 pulses
2,500M pulses f.s.	: 0 – 2,500M pulses	50,000 pulses

■**ROTATION RATE INPUT:** See Pulse Totalizer Input.

Range v.s. resolution

5,000 / n (r/s) f.s.:	0 – 5,000 / n (r/s)	1 / n (r/s) **
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**n : Number of pulses per revolution; 1 – 1,000

■ANALOG INPUT FILTERS

Average: Averaging data scanned every 100 msec. within the recording interval.

Hardware filter: Low-pass filter with a cutoff frequency 1.5 Hz (Used for the recording intervals longer than 1 minute; each channel scanned every 2 seconds.)

■TRIGGER FUNCTION

Trigger sources (Conditions can be set for each channel):

All analog input channels, pulse totalizer input P1 thr. P4, logic input LI-1 thr. LI-16 (with Digital I/O Unit), external trigger input, timer, logical product (AND) or logical sum (OR) of all channels

Trigger types (analog or pulse)

Level: At the rise or sink of the specified source.

Window: When the specified source goes into or out of the window range preset with Hi and Lo thresholds.

Setpoint resolution: 0.5%

Logic trigger: Pattern setting by 1, 0, or \times (ignore) (with Digital I/O Unit installed)

External trigger input: Initiated by shorting the external trigger terminal to ground, or at the transition from a HI logic level to ON level. Refer to the instruction manual for detail.

Other functions: Pretrigger (selectable also for real time saving mode); trigger output (open collector at the terminal block)

INSTALLATION

Power input: Operational voltage range 100 – 240V $\pm 10\%$; 50/60 ± 2 Hz; 6VA (voltage input with the main unit only) or 20VA (maximum load with the printer unit)

Battery pack: Ni-MH; AC adaptor has priority when both are used.

Battery charge: Charged when the AC adaptor is connected and the module's power switch is off. Rapid charge in approx. 2.5 hours. After rapid charging has been completed, carry out trickle charging to prevent discharge of the battery.

Continuous operation with single battery pack:
(with voltage input)
2.5 hours (with the backlight saver OFF; after a rapid charge cycle);
5 hours (with the backlight saver ON; additional 10-hour charging after a rapid charge cycle)

Operating temperature: 0 to 40°C (32 to 104°F)

Operating humidity: 30 to 80% RH (non-condensing)

Dimensions (except the battery pack)

Main unit: W234×H170×D52 mm
(9.21"×6.69"×2.05")

With the printer unit: W310.5×H170×D52 mm
(12.22"×6.69"×2.05")

With the digital input unit: W302.5×H170×D52 mm
(11.91"×6.69"×2.05")

With the terminal unit: W327.5×H170×D52 mm
(12.89"×6.69"×2.05")

Weight

Main unit: 1.3 kg (2.9 lbs)

With the printer unit: 1.6 kg (3.5 lbs)

With the digital input unit: 1.6 kg (3.5 lbs)

With the terminal unit: 2.1 kg (4.6 lbs)

PERFORMANCE

■ACCURACY

DC voltage input: $\pm 0.1\%$ f.s. (1 – 5V: 10V f.s.)

Thermocouple input

K, E, J, T, N: $\pm 0.05\%$ f.s. $\pm 1^\circ\text{C}$ ($\pm 1.8^\circ\text{F}$)

R, S, B, W: $\pm 0.05\%$ f.s. $\pm 2^\circ\text{C}$ ($\pm 3.6^\circ\text{F}$) at over 400°C or 752°F

Cold junction compensation: $\pm 1^\circ\text{C}$ ($\pm 1.8^\circ\text{F}$) at 23 $\pm 5^\circ\text{C}$ / 73 $\pm 9^\circ\text{F}$ (internal reference junction; The accuracy is to be added with the accuracy.)

Platinum RTD input: $\pm 0.05\%$ f.s. $\pm 0.5^\circ\text{C}$ ($\pm 0.9^\circ\text{F}$)

Withstand voltage (max. safe voltage applied without dielectric breakdown)

Input (DC and T/C): 30V rms or 60V DC
(between input terminals)

Ground: 30V rms or 60V DC
(between each input ch. to enclosure and between each input ch.)

Insulation resistance: $\geq 20\text{M}\Omega$ with 100V DC
(each input ch. to enclosure)

Dielectric strength: 350V AC @5 seconds
(between each input ch.)

STANDARDS & APPROVAL

CE conformity:

EMC Directive (89/336/EEC)

EN61326-1

EN61000-3-2

EN61000-3-3

Low Voltage Directive (73/23/EEC)

EN 61010-1

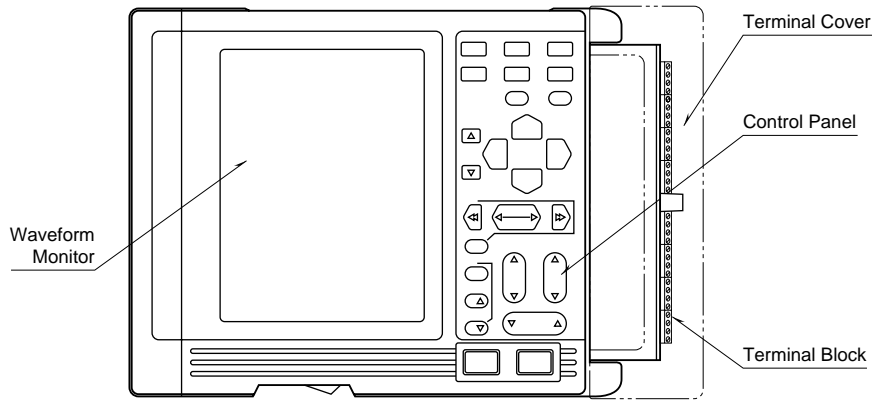
Installation category I

Pollution degree 2

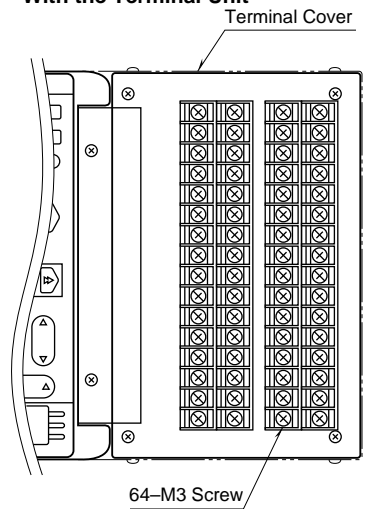
Transient over-voltage 330V

COMPONENT IDENTIFICATIONS

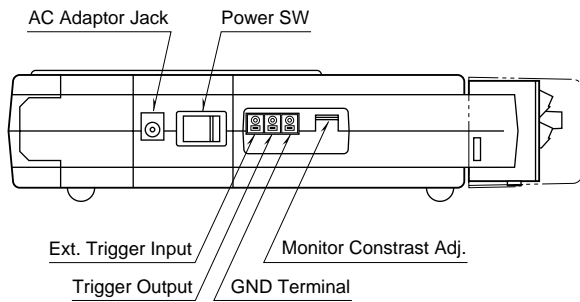
■TOP VIEW
•50HR Main Unit



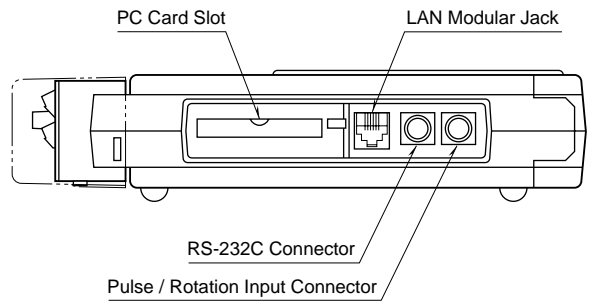
•With the Terminal Unit



■FRONT VIEW

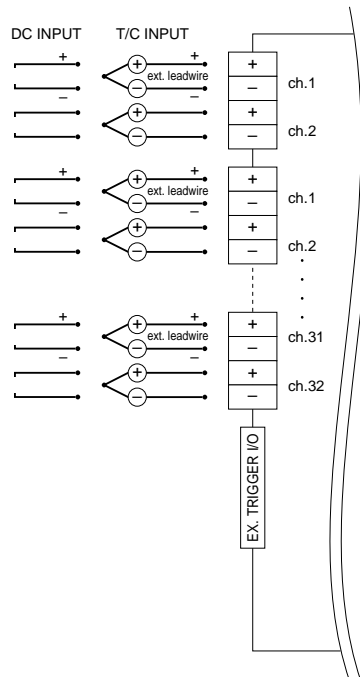


■REAR VIEW

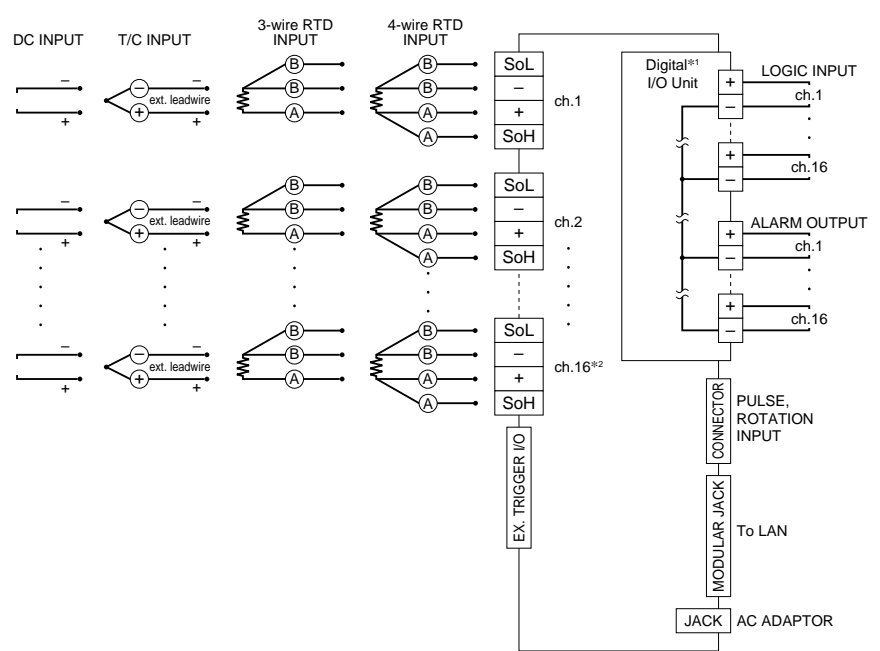


CONNECTION DIAGRAM

■50HR-GH1



■50HR-U2, U3



*1. Optional Digital I/O Unit.
*2. Up to Ch. 8 with 8-input type units.

SPECIFICATIONS OF OPTIONAL DEVICES

■PRINTER UNIT (model: 50HR-PR)	
Print width	10 divisions full-scale, 1 division = 10 mm (.39 inch), 80 pixels
Feed density	8 rows/mm (203 rows/inch)
Feed speed	Max. 2 mm/sec (with either AC adaptor or battery pack)
Functions	Logging: numerical data print Hybrid: waveform plus numerical value reading at selected intervals Real time: automatic printing simultaneously to the measuring; effective with 5 sec. or longer waveform display span and 5 sec. or longer numerical value reading intervals
Dimensions	W76.5×H170×D52 mm (3.01"×6.69"×2.05")
Weight	300 g (0.66 lbs)

■RECORDING PAPER (model: 50HR-KAM)
Rolled thermal paper; 112 mm wide × 18 meter long
10 rolls packed

■DIGITAL I/O UNIT (model: 50HR-DIO)	
Input terminal	Screw type terminal block (2 terminals per channel); non-removable; w/o terminal cover
Input channel	1 ch. 16-bit logic (common GND for all inputs and enclosure)
Input signal	Voltage input: range 0 – 50V DC; max. input voltage 50V DC; Hi ≥ 2.5V; Lo ≤ 0 – 1.5V
Input resistance	1.1MΩ
Response time	Recording interval
Output channel	16 channels (isolated between output channels, output to enclosure); Alarm output for any 16 of analog inputs (16 ch.), pulse inputs (4 ch.) and logic inputs (16 ch.)
Withstand voltage	Ground: 30V rms or 60V DC between each output ch. and enclosure, between each output channels
Output signal	Open collector, active low (sink current 10mA)
Alarm output	Level: Trips at the rise or sink of the specified source. Window: Trips when the specified source goes into or out of the window range preset with Hi/Lo thresholds. Logic pattern: Trips when the specified logic pattern 1, 0 or × (ignore) is true or untrue.
Other functions	Output hold: enable/disable selectable Alarm sound: ON or OFF selectable
Dimensions	W92×H170×D52 mm (3.62"×6.69"×2.05")
Weight	350 g (0.77 lbs) without battery 600 g (1.32 lbs) with battery

■BATTERY PACK (model: 50HR-BAT)
7.2V, 2400 mAh

■CONNECTION CABLE (model: 50HR-PIC)
Cable length 1.5 meters

■RS-232C STRAIGHT CABLE (model: 50HR-RSS)
Cable length 1.5 meters

■TERMINAL UNIT (model: 50HR-T1) Attached to the Main Unit	
Input terminal	M3 screw terminals; 4 terminals per channel for the 50HR-U2, U3; 2 terminals per channel for the 50HR-GH1; Pitch 8.89 mm, Max. applicable solderless terminal width 7.2 mm
Dimensions	W171.2×H126.2×D48.3 mm (6.74"×4.97"×1.90")
Weight	750 g (1.65 lbs)

SYSTEM REQUIREMENTS PROVIDED BY THE USER

■HARDWARE ENVIRONEMNTS FOR PC RECORDER SOFTWARE
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	MSR128-V4
PC	IBM PC/AT or compatible
Operating system	Microsoft Windows 2000 or Windows XP SP1, SP2
CPU	Pentium III 800 MHz or higher
Screen area	1024 by 768 pixels or better resolution
Display color	65000 colors (16 bits)
Video memory	2 MB minimum; 4 MB recommended
Main memory	128 MB minimum; 256 MB recommended for Windows XP
Hard disk area	Use an internal hard disk. *1 Max. approx. 100 MB required per day.
I/O hardware	R1M-GH2, R1MS-GH3, R1M-J3, R1M-D1, R1M-A1, R1M-P4, R2M-2H3, R2M-2G3, 50HR, 73ET, 74ET, 75ET, R5-NM1, R5-NE1, R3-NM1, R3-NE1, RZMS-U9, RZUS-U9
Printer	Use a printer for Windows. The programs use Standard System Fonts used in Windows. Use a printer driver for Standard System Fonts.
CD-ROM drive	Used when installing the software program.
Card reader drive	Used when reading data from Compact Flash Card (50HR*2, 73ET, 74ET, 75ET)
Communication port	RS-232C port (COM1 through COM5) supported by Windows, LAN card

*1. External (e.g. SCSI) devices may impair appropriate performance.

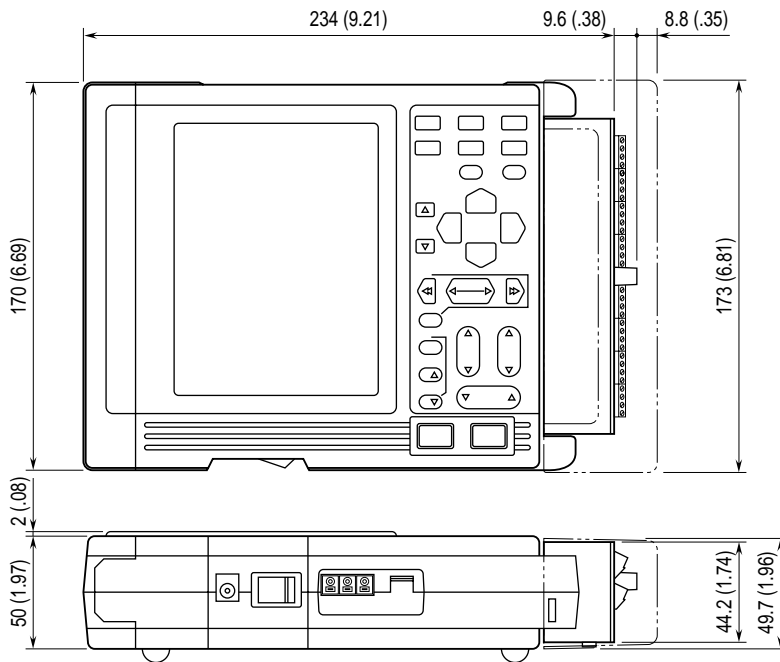
*2. Use the following type of CF Card.

CF Card: Hagiwara Sys-Com, CJC-***MBA (H00A*)

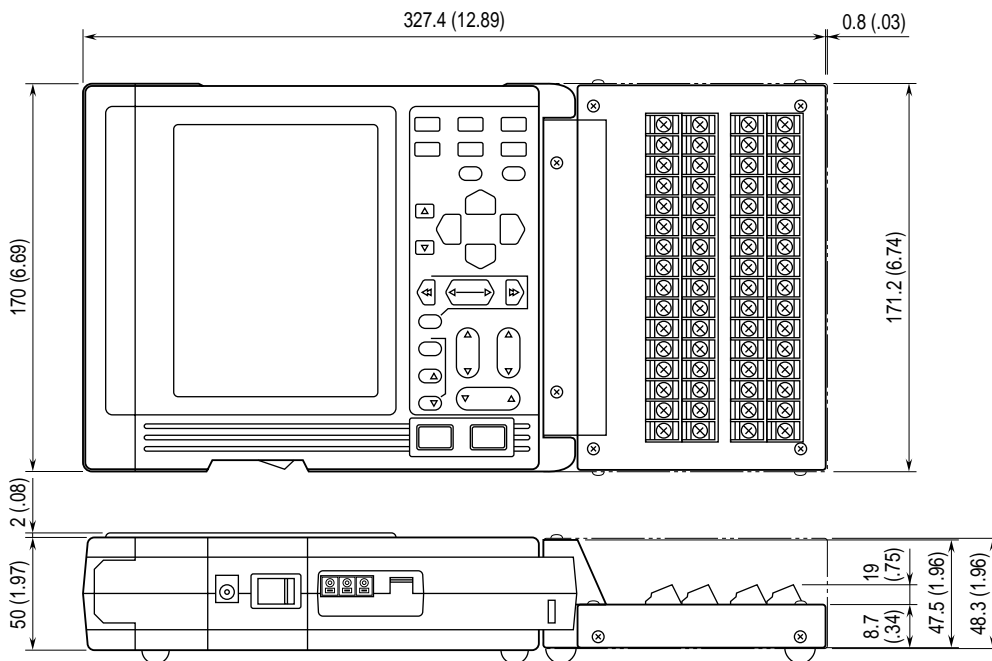
CF Card Adaptor: Hagiwara Sys-Com, CJC-ADP02

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS mm (inch)

■ MAIN UNIT

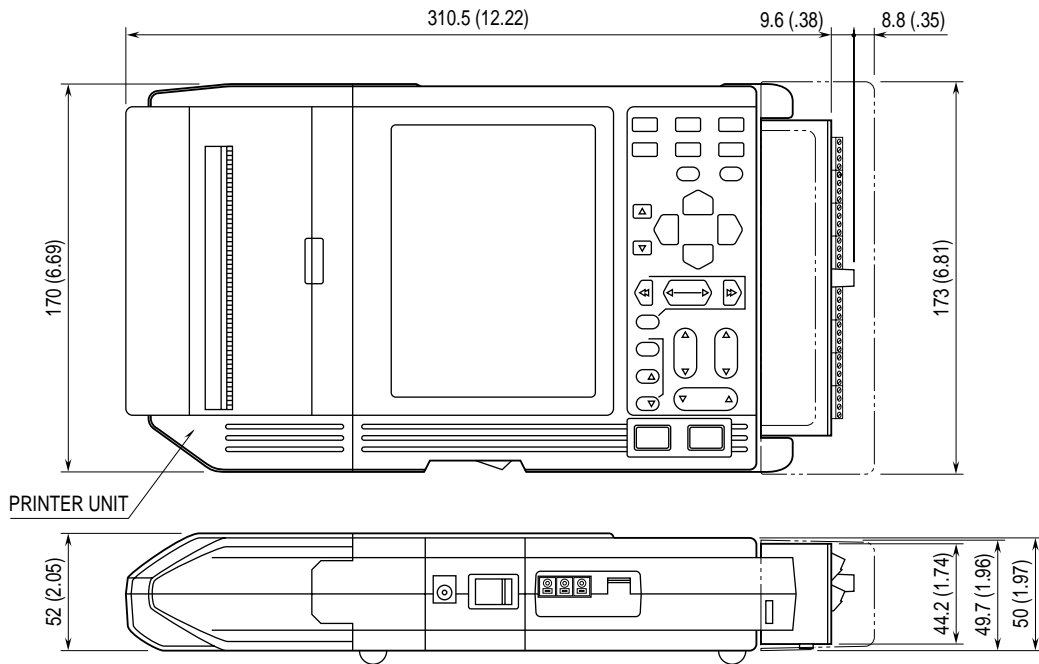


■ MAIN UNIT + 50HR-T1 TERMINAL UNIT

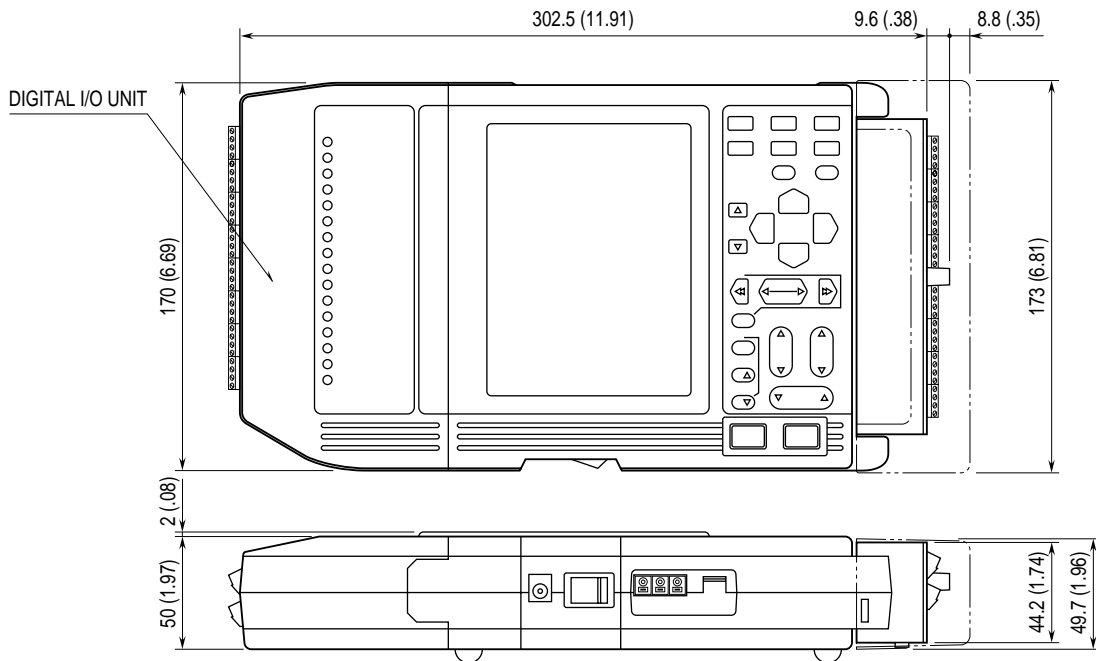


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS mm (inch)

■ MAIN UNIT + 50HR-PR PRINTER UNIT



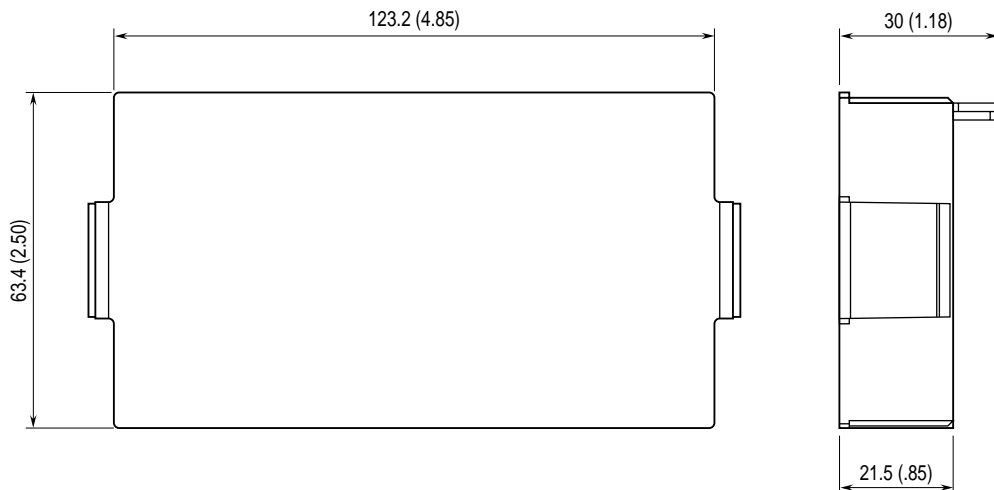
■ MAIN UNIT + 50HR-DIO DIGITAL I/O UNIT



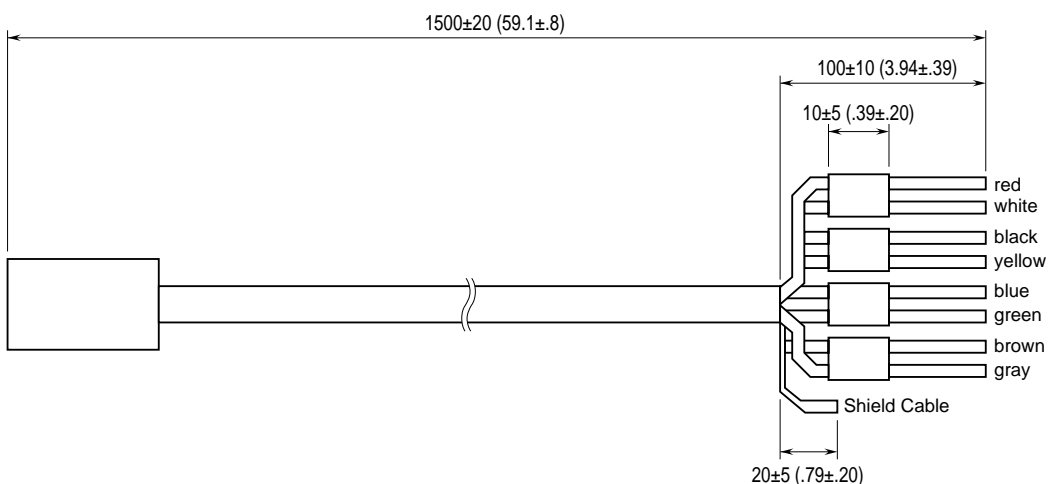
Specifications subject to change without notice.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS mm (inch)

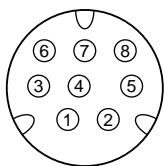
■50HR-BAT BATTERY PACK



■50HR-PIC CONNECTION CABLE



• Connector Pin Assignments



• Wire Assignments

Pin No.	Wire Color
1	red
2	white
3	black
4	yellow
5	blue
6	green
7	brown
8	gray
Shield	Shield

SYSTEM CONFIGURATION EXAMPLE

