EH3000 SERIES 180mm chart PEN TYPE
ANALOG RECORDER

PERFORMANCE SPECIFICATION CHINO

EH 3000 series is a pen type analog recorder sized 288x288mm with 180mm width chart. Recording points are 3 kinds; 1 pen, 2 pen, 3 pen and records temperature, pressure, flow, level and etc. clearly at regular interval.

■FEATURES

●High accuracy ±0.25%

By large scale plate and sharp pointer location, it is easy to see the indication and high accuracy of ±0.25% (DC voltage input).

●Universal power supply

Universal power supply with voltage range of 100 to 240 V AC (50/60Hz) is applied.

●Linearized temperature scale prepared

Temperature scale of thermocouple and resistance thermometer input is a linear scale that is excellent in reading value.

●6 chart speeds

6 chart speeds (12.5, 25, 50, 75, 100, 150mm/h) are switchable as standard. 5 chart speed and hour/minute change are prepared as option.

●Alarm setting as standard

High and low limit alarm can easily programmed by pointer location. Also you can check the alarm by front LED.

●Easy operation and robust structure

Operation switch and setting switch are separate arranged for easy operation and robust structure that adopted steel casing and die-cast door.

●Chart paper illumination

White LED illumination is adopted for to read the indication in the dark places. You can also adjust the brightness.

●Flat front chart chassis

Front chart feeding part is flat so easy to read the recorded result and also to take note.

●Unit structure and light-weight

Light-weight (60% of the previous unit weight) is realized by easy maintenance structure.

●CE approval

■MODELS

EH3□□□□-□□

Input point
- P : 1 pen
- F : 2 pen
- G : 3 pen

1st pen input and scale plate
- 0 : Standard input
- 1 : Non-standard input*1

2nd pen input and scale plate
- N : None
- 0 : Standard input
- 1 : Non-standard input*1

3rd pen and scale plate
- N : None
- 0 : Standard input
- 1 : Non-standard input*1

Alarm output
- 0 : None
- 2 : 2, 4, 6 points*2 (1 pen type: 2 points, 2 pen type: 4 points, 3 pen type 6 points)

Chart speed and burnout
- 0 : Standard 6-speed+ burnout disabled
- 1 : Standard 6-speed + up-scale burnout*3
- 2 : Standard 6-speed + down-scale burnout*3
- A : Standard 5-speed hour/ minute change + burnout disabled*3
- B : Standard 5-speed hour/ minute change + up-scale burnout*3
- C : Standard 5-speed hour/ minute change + down-scale burnout*3

*1 : Including current input and built-in voltage divider
If including the thermocouple input, make sure to specify the thermocouple input to the 1st pen.

*2 : Option

*3 : Burnout on all channels is programmed together for thermo-couple/resistance thermometer input.

INPUT SPECIFICATIONS

Input types: DC voltage ---±13.8mV, ±27.6mV, ±69mV ±200mV, ±500mV, ±2V, ±5V
Built-in voltage divider (option): ±10V, ±25V, ±50V
DC current: External shunt resistor (250Ω) required (option)
Thermocouple ---K, E, J, T, R (option B, S, N, U, L)
Resistance Thermometer --- Pt100, JPt100 (option)
*Linear scale for thermocouple and resistance thermometer

Input designation: Specified at ordering.

Accuracy ratings: DC voltage input --- ±0.25% of input scan
Thermocouple and resistance thermometer
--- ±0.5% of input span (except were indicated)

Indicating dead band:
±0.2% of input span

Reference junction compensation accuracy:
K, E, J, T --- ±1.0℃ or better (23℃±10℃)
±2.0℃ or better (0℃ to 50℃)
(For internal reference junction compensation, the errors above are added to the accuracy rating)

Temperature drift: ±0.02%FS / ℃ (Converted into reference ranges)

Indicating resolution:
Approximately 1/3,600

Allowable signal source resistance:
DC voltage inputs, thermocouple inputs
--- 1kΩ or less (no burnout).
Resistance thermometer inputs
--- per wire 10Ω or less (same resistance for 3 wires)

Input resistance: DC voltage inputs (±5V or less), thermocouple inputs
--- approximately 8MΩ
DC voltage inputs (voltage divider built-in)
--- approximately 1MΩ

Maximum input voltage:
DC voltage inputs, thermocouple inputs,
--- ±10V DC or less
DC voltage inputs (voltage divider built-in)
--- ±60V DC or less
Resistance thermometer --- ±6V DC or less

Maximum common mode voltage:
30V AC

Common mode rejection ratio:
120dB or more

Normal mode rejection ratio:
50dB or more

RECORDING SPECIFICATIONS

Chart paper: Fan-fold type
--- effective chart width 180mm (total width 200mm), total length of 20m

Recording points: 1, 2, 3 points

Dotting interval: 125ms

Recording system: Cartridge pen continuous recording
Recording color ---1 red, 2 green, 3 blue

Balancing time: Input span movement --- about 2 seconds

Pen lift: Manual (all the pens collectively UP/DOWN)

Chart speed: 12.5,25,50,75,100,150mm/h

Chart speed accuracy:
±0.1% (based on chart paper scale)

GENERAL SPECIFICATIONS

Rated power voltage:
100 to 240V AC, 50/60Hz

Power voltage fluctuation:
Indication fluctuation 0.2% or less
(converted into reference ranges at 90 to 264V AC)

Power consumption:
1 pen type --- Maximum 20VA (100VAC) 26VA (240VAC)
2 pen type --- Maximum 27VA (100VAC) 35VA (240VAC)
3 pen type --- Maximum 34VA (100VAC) 44VA (240VAC)

Environmental conditions:
Reference operation condition---
Ambient temperature range: 21 to 25℃
Ambient humidity range: 45 to 65%RH
Power voltage: 100V AC ±1%
Power frequency: 50/60Hz ±0.5%
Attitude: left/right 0℃, forward tilting 0℃, backward tilting 0℃
Warm-up time: longer than 30 minutes

Normal operation condition---
Ambient temperature range: 0 to 50℃ (20 to 65%)
Ambient humidity range: 20 to 80%RH (5 to 40℃)
Power voltage: 90 to 264V AC
Power frequency: 50/60Hz ±2%
Attitude: left/right 0 to 10°, forward tilting 0°, backward tilting 0 to 30°

Transportation condition:
(At the packed condition on shipment from our factory)---
Ambient temperature range: -20 to 60℃
Ambient humidity range: 5 to 90%RH (No dew condensation)
Vibration: 10 to 60Hz, 4.9m / s² (0.5G) or less
Impact: 392m / s² (40G) or less

Storage condition: Ambient temperature and humidity range
-20 to 40℃ : 5 to 90%RH, 40 to 60℃ : 5 to 65%RH

Insulation resistance:
Primary terminals and protective conductor terminals
--- 20MΩ or more at 500V DC
Secondary terminals and protective conductor terminals
--- 20MΩ or more at 500V DC
Primary and secondary terminals
--- 20MΩ or more at 500V DC

Dielectric strength:
Primary terminals and protective conductor terminals
--- 1 minute at 1500V AC
Secondary terminals and protective conductor terminals
--- 1 minute at 500V AC
Primary and secondary terminals --- 1 minute at 1500V AC

Illumination: White LED lamp, 3 levels of brightness, and lights can be OFF.

Case: Door frame --- aluminum die-cast,
Door window --- glass,
Back case --- steel
Color: door frame --- Gray (equivalent to Mussel N3)
Back case ---- Gray (equivalent to Mussel N7)
Door window --- transparent

Mounting: Panel mounting

Weight: 1 pen: Approximately 7.6kg, 2 pen: Approximately 8.2kg, 3 pen: Approximately 8.4kg

Terminal screws: Power terminals / protective conductor terminals / alarm terminals --- M4.0, measuring terminal --- M4.0

INDICATING SPECIFICATIONS

Analog indication: Scale plate, pointer and index

Scale plate: Single scale (minimum division: 150)

ALARM SPECIFICATIONS

Alarm display: Pointer and alarm-point seal pasted on scale.
Alarm LED lamp lightens for alarming. (All channels common display).

Alarm setting: Individual setting of higher and lower alarm

Alarm dead band: 0.4% of input span

OPERATION / PROGRAMMING SPECIFICATIONS

Switches: POWER --- ON/OFF the recorder power supply
FEED --- Feed chart paper
MODE --- Select setting mode
ENTRY --- Parameter / Adjusted value confirmed
CAL --- User indication adjustment, shift adjustment
KEY LOCK --- Setting key locked
INDICATE --- Indication/ Recording operation/ Stop

Indication: LED (green) --- Power ON monitor
LED (red) --- Alarm monitor (All channels common OR output monitor)
LED (white) --- Chart speed, Unit indication

STANDARD

CE approval: EMC directive, low voltage directive conformity, EN61326-1, EN61010-1
*Under EMC directive test condition, indication equivalent to maximum 500μV might fluctuate.

OPTION SPECIFICATIONS

Alarm output: Alarm contact output is available
Each pens individual mechanical relay 1 'a' contact, 1 'b' contact, 2 outputs (high and low)
Maximum contact rating ---
250V AC 2A, 30V DC 2A (resistive load)
250V AC 1A, 30V DC 1A (inductive load)

Non-standard input:
Minimum width of scale---
DC voltage ---10mV DC width or more
DC current --- 10mA DC width or more
Thermocouple --- K; 200℃ width or more,
E, J, T; 150℃ width or more
R; 600℃ width or more
Resistance thermometer ---100℃ width or more

Non-standard scale plate:
Scale plate for non-standard input

Chart speed: 5-speed change, 12.5,25,50,100,200mm/minute, hour change

Dotting interval: 3 seconds/point

DC current input: 250Ω of shunt resistor is applied to measure voltage input (max 20mA)

Built-in-voltage divider:
Built-in voltage divider (1/1000) measures DC voltage input of ±10V, ±25V, ±50V

Burnout: Function for detecting disconnection of sensor with thermocouple or resistance thermometer input
Upper and lower scale burnout on all channels can be programmed, parallel operation is unavailable

Standard input and chart paper Nos.

Input type		Scales	Minimum scales	Chart paper Nos.	Input code
DC voltage*		0 to 10mV	1	EH01001	M1
		0 to 20mV			M8
		0 to 50mV			M9
		-5 to 5mV			M6
		0 to 5V			V5
		1 to 5V			V6
T/C	K	0 to 200℃	2℃	EH05043	KG
		0 to 250℃	2℃	EH05042	K2
		0 to 300℃	2℃	EH05041	K3
		0 to 400℃	5℃	EH05040	K4
		0 to 600℃	5℃	EH05038	K6
		0 to 800℃	10℃	EH05037	K8
		0 to 1000℃	10℃	EH05036	KA
		0 to 1200℃	10℃	EH05035	KC
	E	0 to 200℃	2℃	EH05043	E2
	J	0 to 300℃	2℃	EH05041	J3
		0 to 400℃	5℃	EH05040	J4
	T	0 to 150℃	1℃	EH05044	TF
		0 to 200℃	2℃	EH05043	T2
		0 to 300℃	2℃	EH05041	T3
		-50 to 150℃	2℃	EH05052	T5
	R	0 to 1200℃	10℃	EH05035	R2
		0 to 1400℃	10℃	EH05031	R4
		0 to 1600℃	20℃	EH05034	R6
RTD		0 to 100℃	1℃	EH05001	31
		0 to 150℃	1℃	EH05044	3A
		0 to 200℃	2℃	EH05043	32
		0 to 250℃	2℃	EH05042	37
		0 to 300℃	2℃	EH05041	33
		-20 to 80℃	1℃	EH05056	38
		-50 to 50℃	1℃	EH05054	3E

K、E、J、T、R：IEC584. JIS C1602-1995
Pt100：IEC751. JIS C1604-1997
*Scale plate will be standard plate of 0 to 100 equally divided (no unit).
Please specify for other range.

Standard range and minimum width of scale

Input type		Standard range	Minimum width of scale
DC voltage		-13.8 to 13.8mV	10mV
		-27.6 to 27.6mV	17mV
		-69 to 69mV	35mV
		-200 to 200mV	100mV
		-500 to 500mV	250mV
		-2 to 2V	1V
		-5 to 5V	2.5V
		-10 to 10V	5V
		-25 to 25V	13V
		-50 to 50V	25V
DC current		0 to 20mA	10mA
T/C	K	-200 to 330℃	200℃
		-200 to 660℃	400℃
		-200 to 1370℃	700℃
	E	-200 to 200℃	150℃
		-200 to 380℃	250℃
		-200 to 720℃	380℃
		-200 to 900℃	720℃
	J	-200 to 250℃	150℃
		-200 to 500℃	300℃
		-200 to 1200℃	500℃
	T	-200 to 280℃	150℃
		-200 to 400℃	300℃
	R	0 to 1240℃	600℃
		0 to 1760℃	1300℃
	B	0 to 1820℃	900℃
	S	0 to 1350℃	700℃
		0 to 1760℃	1400℃
	N	-200 to 420℃	240℃
		-200 to 770℃	430℃
		-200 to 1300℃	870℃
	U	-200 to 280℃	160℃
		-200 to 500℃	280℃
		-200 to 600℃	530℃
	L	-200 to 250℃	150℃
		-200 to 490℃	280℃
		-200 to 900℃	500℃
RTD	Pt100	-140 to 150℃	100℃
		-200 to 300℃	200℃
		-200 to 650℃	400℃
	JPt100	-140 to 150℃	100℃
		-200 to 300℃	200℃
		-200 to 500℃	400℃

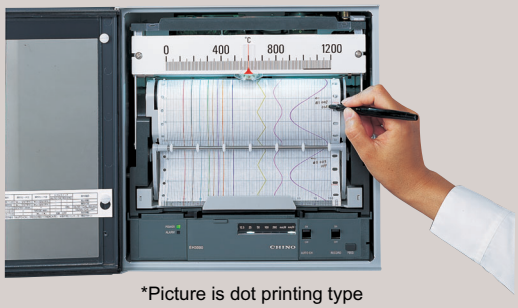
Exceptions of accuracy ratings

Input types	Measuring range	Accuracy ratings
K	-200 to -50℃	±1.0%
E,J,T,L	-200 to -50℃	±1.0%
R,S	0 to 100℃	±1.5%
B	0 to 400℃	None
U,L	-200 to -50℃	±1.5%

Note) The accuracy ratings are converted into the measuring range

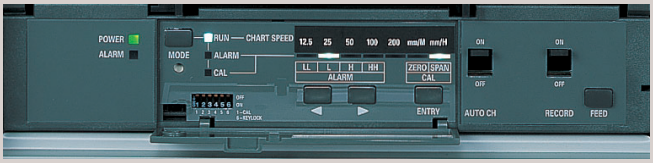
Easy operation — EH3000Series

Flat front chart chassis enables easy memo writing.

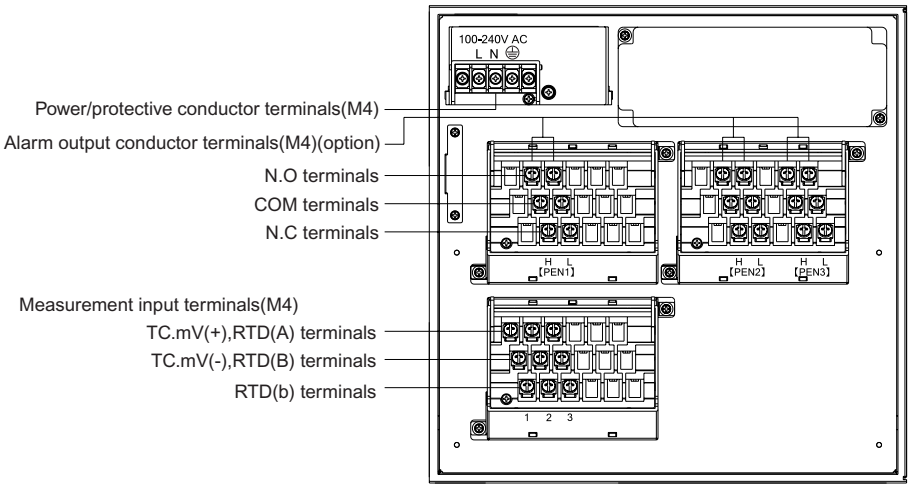


*Picture is dot printing type

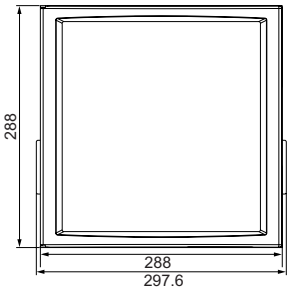
All operations and settings adjustable.

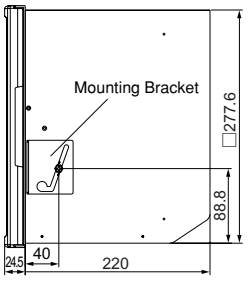


■TERMINAL BOARD

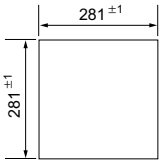


■DIMENSIONS

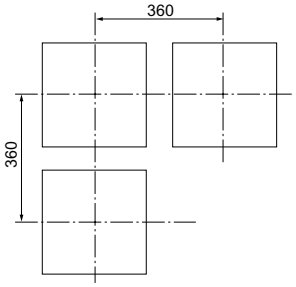




●Panel cutout



●Minimum clearance for plural installation



Unit : mm

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