NEW

T-ZACCS BOX
EX-50H

High-accuracy, High-speed,
Multi-Point Measurement

Measurement Box

T-ZACCS UNIT
EU-10H

NEW

High-accuracy, High-speed,
Compact

Measurement Unit

EX-50H / EU-10H Features

Measurement units for 50 channels / 10 channels as standard specifications

Measurement units for 50 channels (EX-50H) and 10 channels (EU-10H) are incorporated as the standard specifications.

Highly stable measurement in high accuracy

Due to the usage of our unique next-generation A/D conversion method that satisfies both high-speed measurement and high accuracy and stability, highly stable measurement in high accuracy is achieved eliminating the influence of various thermoelectromotive forces, thermal zero shift of amplifier, and power line noise.

Measurement interval not influenced by the number of measuring points

Owing to the adoption of ultra high-speed field network, measurement of 1000 points is possible in 0.1 seconds at the fastest.
In high-speed mode, measurement is possible every 100 milliseconds. Even in high-accuracy mode that reduces dispersion of measured values, measurement is possible every 400 milliseconds.

High resolution mode (0.1×10^{-6} strain) provided

Measurement with resolution of 0.1×10^{-6} strain is possible using the full bridge high resolution mode or full bridge constant current 350Ω high resolution mode.

Complete compensation method of strain (Comet) provided

The complete compensation method of strain is applicable for the sensor mode of quarter bridge 3-wire.

Temperature-integrated strain gauge applicable

Both strain and temperature can be measured in one channel using a temperature-integrated strain gauge.

Various check functions

Various check functions are available such as insulation / sensitivity / dispersion of sensor, thermocouple burnout, leadwire resistance and bridge output.

Tokyo Measuring Instruments Lab.

EX-50H / EU-10H Specifications

Measuring performance

Common to all mode		
Number of measuring point	EX-50H (50 points) / EU-10H (10 points)	
Input terminal	Accepts both screwing and soldering	
Quick connection terminal	NDIS connector receptacle	
Compensation mode	Comet NON, Comet A, Comet B	
Check function	During measurement	Open check
	Sensor	Insulation check, Sensitivity check, Dispersion check, Thermocouple burnout check, Leadwire resistance check, Bridge output check

Connection with data logger

Number of connection	EX-50H : 20 units at maximum / EU-10H : 100 units at maximum (including the TS-960 built-in)
Extension distance	100 m (between instruments)
Connection cable	EX connection cable (CR-89**)

Power supply

Power supply voltage	AC100～240V 50/60Hz
Maximum power consumption	104VA MAX

Environment

Operating environment	0～+50℃ 85%RH or less (No condensation)

Others

External dimensions (Excluding rubber protectors and projecting parts)	EX-50H:320 (W)×130 (H)×490 (D) mm EU-10H:328 (W)×98 (H)×183 (D) mm
Weight	EX-50H: Approx. 10kg / EU-10H: Approx. 3kg

Standard accessories

Operation manual (CD)	EX-50H : 1 ／ EU-10H : 1
AC power cable (CR-01)	EX-50H : 1 ／ EU-10H : 1
Ground wire (CR-20)	EX-50H : 1 ／ EU-10H : 1
Connection cable (CR-892M)	EX-50H : 1 ／ EU-10H : 1
Phillips screwdriver	EX-50H : 1 ／ EU-10H : 1

High-speed mode

Measuring speed	0.1 seconds (0.2 seconds when temperature-integrated strain gauge is used)	
Strain measurement		
Applicable connection method and Gauge resistance	Quarter bridge 3-wire	120,240,350Ω
	Half bridge	60～1000Ω
	Half bridge common dummy	60～1000Ω
	Full bridge	60～1000Ω
	Full bridge constant current	350Ω
	Full bridge 0-2V mode	60～1000Ω
	Temperature-integrated strain gauge mode (quarter bridge 3-wire)	120,240,350Ω T (JIS C1602:2015、IEC 60584-1:2013)
Sensor cable extension range	Full bridge constant current 350Ω	Cable loop resistance 400Ω or less
Sensitivity variation	Full bridge constant current 350Ω	+0.1 ～ -0.5% / Cable loop resistance 100Ω
Compensation range of leadwire resistance Comet B (quarter bridge 3-wire)	Approx. 100Ω or less for gauge resistance 120Ω	
	Approx. 200Ω or less for gauge resistance 240Ω	
	Approx. 300Ω or less for gauge resistance 350Ω	
Stability on zero	±1.0×10^{-6} strain/°C or less (quarter bridge) ±0.5×10^{-6} strain/°C or less (half bridge)	
Initial unbalance	±750×10^{-6} strain or less (quarter bridge) ±500×10^{-6} strain or less (half bridge)	
DC voltage measurement		
V1/1	DC±640mV	
V1/100	DC±64V	
Input impedance	1 MΩ or more	
Allowable input voltage between B and D	DC±70V MAX	
Thermocouple temperature measurement		
Applicable thermocouple	T,K,J,B,S,R,E,N JIS C1602:2015、IEC 60584-1:2013	
Pt-RTD temperature measurement		
Applicable Pt-RTD	Pt100 (500μA constant current 3-wire) JIS C1604:2013, IEC60751:2008	

Strain measurement (High-speed mode)		
Bridge excitation	DC2V 4ms(50Hz)	
Initial value memory range	±160000×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 40000×10^{-6} strain	1×10^{-6} strain
	± 80000×10^{-6} strain	2×10^{-6} strain
	±160000×10^{-6} strain	4×10^{-6} strain
	±320000×10^{-6} strain	8×10^{-6} strain
	±640000×10^{-6} strain	16×10^{-6} strain
Accuracy (23°C±5°C)	±(0.08%rdg+3digit) (Quarter bridge, Half bridge, Full bridge) ±(0.08%rdg+6digit) (Full bridge 0 - 2V mode)	

Strain measurement with constant current method (Full bridge only) (High-speed mode)		
Bridge excitation	DC6mA 4ms (50Hz)	
Bridge resistance	350Ω	
Initial value memory range	±160000×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 40000×10^{-6} strain	1×10^{-6} strain
	± 80000×10^{-6} strain	2×10^{-6} strain
	±160000×10^{-6} strain	4×10^{-6} strain
	±320000×10^{-6} strain	8×10^{-6} strain
	±640000×10^{-6} strain	16×10^{-6} strain
Accuracy (23°C±5°C)	±(0.08%rdg+3digit)	

DC voltage measurement (High-speed mode)			
Initial value memory range			
V1/1		±160.000mV	
V1/100		±16.0000V	
Temperature coefficient of accuracy		±0.0024%rdg/℃	
Secular change of accuracy		±0.024%rdg/year	
Measuring range and resolution		Measuring range	Resolution
	V1/1	± 40.000mV	0.001mV
		± 80.000mV	0.002mV
		±160.000mV	0.004mV
		±320.000mV	0.008mV
		±640.000mV	0.016mV
	V1/100	± 4.0000V	0.0001V
		± 8.0000V	0.0002V
		±16.0000V	0.0004V
		±32.0000V	0.0008V
		±64.0000V	0.0016V
Accuracy (23°C±5°C) When moving average is used	V1/1	±(0.08%rdg+6digit)	
	V1/100	±(0.08%rdg+6digit)	
Accuracy (23°C±5°C) When moving average is not used	V1/1	±(0.08%rdg+50digit)	
	V1/100	±(0.08%rdg+50digit)	

Pt-RTD temperature measurement (JIS C1604:2013, IEC 60751-1:2008 Pt100) (High-speed mode)	
Applicable Pt-RTD	Pt100
Measuring method	3-wire (Pt3W)
Linearization	Digital processing
Temperature coefficient of accuracy	±0.0020%rdg/℃
Secular change of accuracy	±0.05%rdg/year
Measuring range	-200～+850℃
Resolution	0.1℃
Accuracy (23°C±5°C)	±(0.1%rdg+0.3℃)

Thermocouple temperature measurement (JIS C1602:2015, IEC 60584-1:2013) (High-speed mode)

Applicable thermocouple: T,K,J,B,S,R,E,N

Linearization: Digital processing

Type	Measuring range	Resolution	Accuracy (23°C±5°C) (External RJC)	Accuracy (23°C±5°C) (Internal RJC)
T	- 250 ～ - 200℃	0.1℃	±(0.31%rdg+1.9℃)	±(0.31%rdg+5.2℃)
	- 200 ～ - 100℃	0.1℃	±(0.14%rdg+0.8℃)	±(0.14%rdg+2.1℃)
	- 100 ～ 0℃	0.1℃	±(0.11%rdg+0.5℃)	±(0.11%rdg+1.2℃)
	0 ～+ 400℃	0.1℃	±(0.08%rdg+0.4℃)	±(0.08%rdg+0.9℃))
K	- 210 ～ - 160℃	0.1°C	±(0.17%rdg+0.9℃)	±(0.17%rdg+2.5℃)
	- 160 ～ 0℃	0.1°C	±(0.12%rdg+0.6℃)	±(0.12%rdg+1.5℃)
	0 ～+ 960℃	0.1°C	±(0.09%rdg+0.4℃)	±(0.09%rdg+0.9℃)
	+ 960 ～+1370℃	0.1°C	±(0.10%rdg+0.9℃)	±(0.10%rdg+1.5℃)
J	- 200 ～ - 160℃	0.1°C	±(0.15%rdg+0.6℃)	±(0.15%rdg+1.8℃)
	- 160 ～ 0℃	0.1°C	±(0.11%rdg+0.4℃)	±(0.11%rdg+1.3℃)
	0 ～+ 700℃	0.1°C	±(0.09%rdg+0.3℃)	±(0.09%rdg+0.8℃)
	+ 700 ～+1200℃	0.1°C	±(0.09%rdg+0.6℃)	±(0.09%rdg+1.0℃))
B	+ 200 ～+ 280℃	0.5~0.4°C	±(0.03%rdg+6.0℃)	±(0.03%rdg+6.0℃)
	+ 280 ～+ 800℃	0.3~0.1°C	±(0.03%rdg+2.4℃)	±(0.03%rdg+2.4℃)
	+ 800 ～+1760℃	0.1°C	±(0.04%rdg+2.6℃)	±(0.04%rdg+2.6℃)
S	- 10 ～+ 200℃	0.1°C	±(0.06%rdg+2.4℃)	±(0.06%rdg+3.1℃)
	+ 200 ～+1760℃	0.1°C	±(0.05%rdg+0.4℃)	±(0.05%rdg+2.0℃)
R	- 10 ～+ 150℃	0.1°C	±(0.06%rdg+2.4℃)	±(0.06%rdg+3.1℃)
	+ 150 ～+1760℃	0.1°C	±(0.05%rdg+1.5℃)	±(0.05%rdg+1.8℃)
E	- 210 ～+ 550℃	0.1°C	±(0.16%rdg+0.6℃)	±(0.16%rdg+2.0℃)
	+ 550 ～+1000℃	0.1°C	±(0.09%rdg+0.4℃)	±(0.09%rdg+0.9℃)
N	- 200 ～ 0℃	0.1°C	±(0.11%rdg+1.3℃)	±(0.11%rdg+2.7℃)
	0 ～+1090℃	0.1°C	±(0.09%rdg+0.5℃)	±(0.09%rdg+1.0℃)
	+1090 ～+1300℃	0.1°C	±(0.06%rdg+0.9℃)	±(0.06%rdg+1.3℃)

Note: Accuracy of sensor is not included. Thermocouple B does not use reference junction.
High-accuracy mode

Measuring speed	0.4 seconds (50Hz) / 0.34 seconds (60Hz) When temperature-integrated strain gauge is used, it is as follows. 0.8 seconds (50Hz) / 0.67 seconds (60Hz)	
Strain measurement		
Applicable connection method and Gauge resistance	Quarter bridge 3-wire	120,240,350Ω
	Half bridge	60～1000Ω
	Half bridge common dummy	60～1000Ω
	Full bridge	60～1000Ω
	Full bridge constant current	350Ω
	Full bridge high resolution mode	120～1000Ω
	Full bridge constant current high resolution mode	350Ω
	Full bridge 0-2V mode	60～1000Ω
	Temperature-integrated strain gauge mode (quarter bridge 3-wire)	120,240,350Ω T(JIS C1602:2015、IEC 60584-1:2013)
Sensor cable extension range	Full bridge constant current 350Ω	Cable loop resistance 400Ω or less
	Full bridge constant current high resolution 350Ω	Cable loop resistance 160Ω or less
Sensitivity variation	Full bridge constant current 350Ω	+0.1～-0.5%/ Cable loop resistance 100Ω
	Full bridge constant current high resolution 350Ω	
Compensation range of leadwire resistance Comet B (quarter bridge 3-wire)	Approx. 100Ω or less for gauge resistance 120Ω	
	Approx. 200Ω or less for gauge resistance 240Ω	
	Approx. 300Ω or less for gauge resistance 350Ω	
Stability on zero	±1.0×10^{-6} strain/°C or less (quarter bridge) ±0.5×10^{-6} strain/°C or less (half bridge)	
Initial unbalance	±750×10^{-6} strain or less (quarter bridge) ±500×10^{-6} strain or less (half bridge)	
DC voltage measurement		
V1/1	DC±640mV	
V1/100	DC±64V	
Input impedance	1MΩ以上	
Allowable input voltage between B and D	DC±70V MAX	
Thermocouple temperature measurement		
Applicable thermocouple	T,K,J,B,S,R,E,N JIS C1602:2015、IEC 60584-1:2013	
Pt-RTD temperature measurement		
Applicable Pt-RTD	Pt100 (500μA constant current 3-wire) JIS C1604:2013, IEC60751:2008	

Strain measurement (High-accuracy mode)		
Bridge excitation	DC2V 24ms(50Hz)	
Initial value memory range	±160000×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 40000×10^{-6} strain	1×10^{-6} strain
	± 80000×10^{-6} strain	2×10^{-6} strain
	±160000×10^{-6} strain	4×10^{-6} strain
	±320000×10^{-6} strain	8×10^{-6} strain
	±640000×10^{-6} strain	16×10^{-6} strain
Accuracy(23℃±5℃)	±(0.05%rdg+1digit)	

Strain measurement in high resolution mode (Full bridge only) (High-accuracy mode)		
Bridge excitation	DC6mA 24ms(50Hz)	
Bridge resistance	350Ω	
Initial value memory range	±160000×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 40000×10^{-6} strain	1×10^{-6} strain
	± 80000×10^{-6} strain	2×10^{-6} strain
	±160000×10^{-6} strain	4×10^{-6} strain
	±320000×10^{-6} strain	8×10^{-6} strain
	±640000×10^{-6} strain	16×10^{-6} strain
Accuracy(23℃±5℃)	±(0.05%rdg+1digit)	

Strain measurement in high resolution mode (Full bridge only) (High-accuracy mode)		
Bridge excitation	DC5V 24ms(50Hz)	
Initial value memory range	±16000.0×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 4000.0×10^{-6} strain	0.1×10^{-6} strain
	± 8000.0×10^{-6} strain	0.2×10^{-6} strain
	±16000.0×10^{-6} strain	0.4×10^{-6} strain
	±32000.0×10^{-6} strain	0.8×10^{-6} strain
	±64000.0×10^{-6} strain	1.6×10^{-6} strain
Accuracy(23℃±5℃)	±(0.05%rdg+3digit)	

Strain measurement with constant current method in high resolution mode (Full bridge only) (High-accuracy mode)		
Bridge excitation	DC14mA 24ms(50Hz)	
Bridge resistance	350Ω	
Initial value memory range	±16000.0×10^{-6} strain	
Temperature coefficient of accuracy	±0.002%rdg/℃	
Secular change of accuracy	±0.02%rdg/year	
Measuring range and resolution	Measuring range	Resolution
	± 4000.0×10^{-6} strain	0.1×10^{-6} strain
	± 8000.0×10^{-6} strain	0.2×10^{-6} strain
	±16000.0×10^{-6} strain	0.4×10^{-6} strain
	±32000.0×10^{-6} strain	0.8×10^{-6} strain
	±64000.0×10^{-6} strain	1.6×10^{-6} strain
Accuracy(23℃±5℃)	±(0.05%rdg+3digit)	

DC voltage measurement (High-accuracy mode)			
Initial value memory range			
V1/1		±160.000mV	
V1/100		±16.0000V	
Temperature coefficient of accuracy		±0.0024%rdg/℃	
Secular change of accuracy		±0.024%rdg/year	
Measuring range and resolution		Measuring range	Resolution
	V1/1	± 40.000mV	0.001mV
		± 80.000mV	0.002mV
		±160.000mV	0.004mV
		±320.000mV	0.008mV
		±640.000mV	0.016mV
	V1/100	± 4.0000V	0.0001V
		± 8.0000V	0.0002V
		±16.0000V	0.0004V
		±32.0000V	0.0008V
		±64.0000V	0.0016V
V1/1 Accuracy(23℃±5℃)		±(0.05%rdg+3digit)	
V1/100 Accuracy(23℃±5℃)		±(0.05%rdg+2digit)	

Pt-RTD temperature measurement (JIS C1604:2013, IEC 60751-1:2008 Pt100) (High-accuracy mode)	
Applicable Pt-RTD	Pt100
Measuring method	3-wire (Pt3W)
Linearization	Digital processing
Temperature coefficient of accuracy	±0.0020%rdg/℃
Secular change of accuracy	±0.05%rdg/year
Measuring range	-200～+850℃
Resolution	0.1℃
Accuracy(23℃±5℃)	±(0.05%rdg+0.3℃)

Thermocouple temperature measurement (JIS C1602:2015, IEC 60584-1:2013) (High-accuracy mode)

Applicable thermocouple: T,K,J,B,S,R,E,N

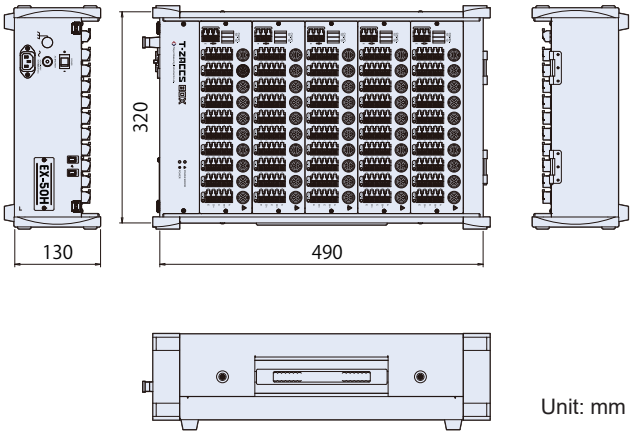
Linearization: Digital processing

Type	Measuring range	Resolution	Accuracy(23°C±5°C) (External)	Accuracy(23°C±5°C) (Internal RJC)
T	- 250 ～ - 200℃	0.1℃	±(0.19%rdg+0.5℃)	±(0.19%rdg+3.8℃)
	- 200 ～ - 100℃	0.1℃	±(0.09%rdg+0.2℃)	±(0.09%rdg+1.6℃)
	- 100 ～+ 400℃	0.1℃	±(0.06%rdg+0.2℃)	±(0.06%rdg+0.9℃)
K	- 210 ～ - 160℃	0.1°C	±(0.11%rdg+0.3℃)	±(0.11%rdg+1.8℃)
	- 160 ～ 0℃	0.1°C	±(0.08%rdg+0.2℃)	±(0.08%rdg+1.1℃)
	0 ～+ 960℃	0.1°C	±(0.06%rdg+0.1℃)	±(0.06%rdg+0.7℃)
	+ 960 ～+1370℃	0.1°C	±(0.06%rdg+0.6℃)	±(0.06%rdg+1.2℃)
J	- 200 ～ - 160℃	0.1°C	±(0.09%rdg+0.2℃)	±(0.09%rdg+1.4℃)
	- 160 ～ 0℃	0.1°C	±(0.07%rdg+0.1℃)	±(0.07%rdg+1.0℃)
	0 ～+ 700℃	0.1°C	±(0.05%rdg+0.1℃)	±(0.05%rdg+0.6℃)
	+ 700 ～+1200℃	0.1°C	±(0.06%rdg+0.4℃)	±(0.06%rdg+0.8℃)
B	+ 200 ～+ 280℃	0.5~0.4°C	±(0.03%rdg+1.5℃)	±(0.03%rdg+1.5℃)
	+ 280 ～+ 800℃	0.3~0.1°C	±(0.03%rdg+0.6℃)	±(0.03%rdg+0.6℃)
	+ 800 ～+1760℃	0.1°C	±(0.04%rdg+0.4℃)	±(0.04%rdg+0.4℃)
S	- 10 ～+ 200℃	0.1°C	±(0.06%rdg+0.6℃)	±(0.06%rdg+1.3℃)
	+ 200 ～+1760℃	0.1°C	±(0.05%rdg+0.4℃)	±(0.05%rdg+0.8℃)
R	- 10 ～+ 150℃	0.1°C	±(0.06%rdg+0.6℃)	±(0.06%rdg+1.3℃)
	+ 150 ～+1760℃	0.1°C	±(0.05%rdg+0.4℃)	±(0.05%rdg+0.8℃)
E	- 210 ～+ 550℃	0.1°C	±(0.10%rdg+0.2℃)	±(0.10%rdg+1.6℃)
	+ 550 ～+1000℃	0.1°C	±(0.06%rdg+0.3℃)	±(0.06%rdg+0.7℃)
N	- 200 ～ 0℃	0.1°C	±(0.11%rdg+0.4℃)	±(0.11%rdg+1.8℃)
	0 ～+1090℃	0.1°C	±(0.05%rdg+0.2℃)	±(0.05%rdg+0.7℃)
	+1090 ～+1300℃	0.1°C	±(0.06%rdg+0.6℃)	±(0.06%rdg+0.9℃)

Note: Accuracy of sensor is not included. Thermocouple B does not use reference junction.

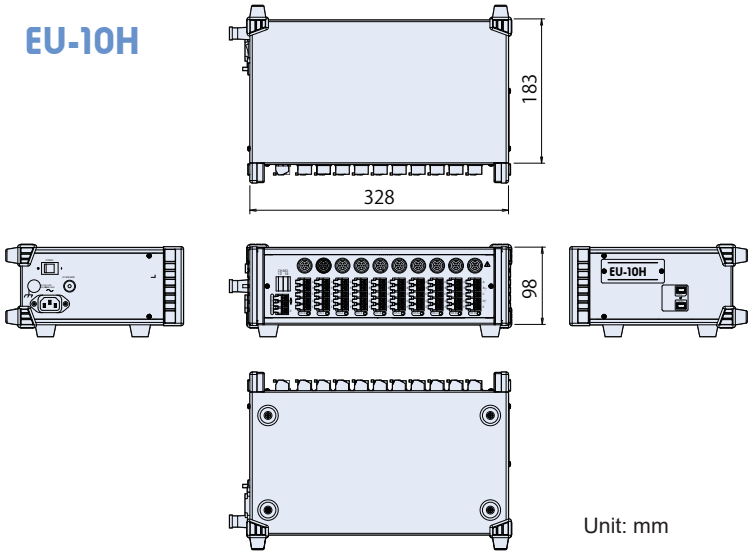
External dimensions

EX-50H

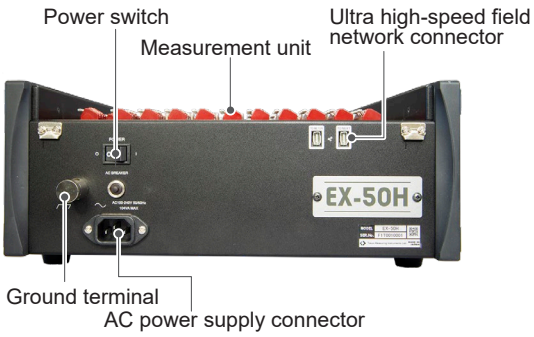


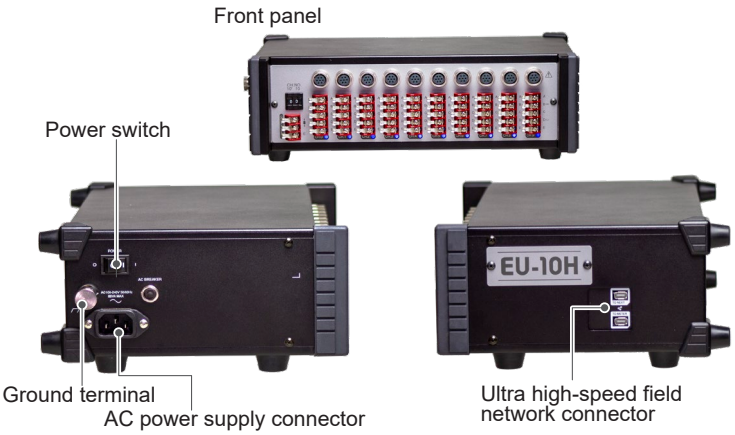
Unit: mm

EU-10H



Unit: mm





Related products

Fast connecting terminal SB-OT1B

These terminals enable fast connection and disconnection of leadwires. They are mounted on the input terminal of a switching box. (One set contains five terminals.)

Connection cable CR-89XX

These are connection cables used for the connection between measurement box EX-50H, measurement unit EU-10H and data logger TS-960, or between two measurement boxes.

The contents of this catalog are subject to change without prior notice.
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Approval Certificate **ISO9001**
Design and manufacture of strain gauges, strain measuring equipment and transducers

Tokyo Measuring Instruments Lab.

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