TD-500A

OPERATION MANUAL

TEAC INSTRUMENTS CORPORATION

Rev.1.00-00

TEAC

DIGITAL TRANSDUCER INDICATOR
TD SERIES

TD-500A
Instruction manual

Thank you very much for purchasing the TD-500A.
Please read this instruction manual before use and keep this instruction manual always at hand after reading so that it can be read over again any time.

Features of this product

■ Easy setting and operation

With this TD-500A, weights and loads, etc can be digitally displayed by only connecting the load cell.

■ Compliant with various strain gauge sensors

The TD-500A is suitable for and connectable with almost all of pressure, torque, displacement and, flow rate, sensors etc. if they are strain gauge type like the load cell.

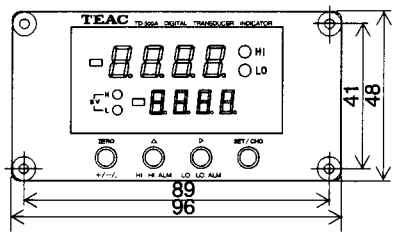
■ Possible to equip with the optional top upper limit and bottom lower limit

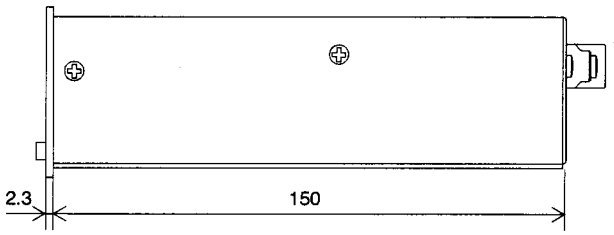
TD-500A can respond to a wide variety of needs by adding the optional top upper limit and bottom lower limit output in addition to the standard specification of the indicated purpose.

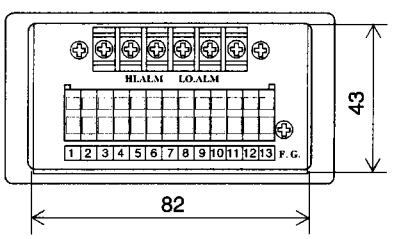
■ Speedy calibration

The TD-500A can greatly simplify the calibration work by the equivalent input calibration that can calibrate only by inputting the rated value of the sensor from the keys.

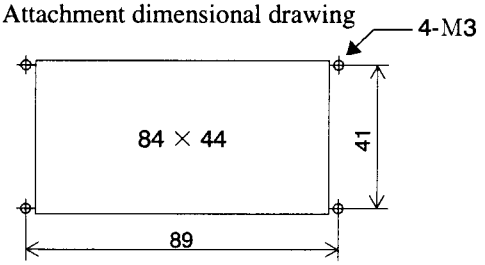
Appearance and outside dimensions



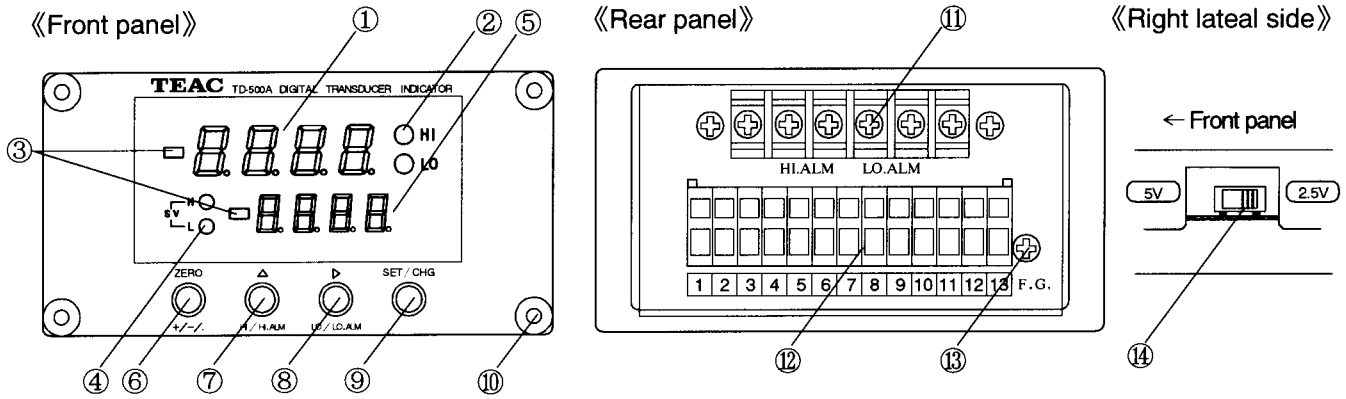




Attachment dimensional drawing



Name and function of each part



① Indication display
Display unit to display the input value from the sensor (load cell type) digitally.

② Condition display (HI、LO)
Indicator to display the comparative result of upper limit and lower limit.

LED	HI/LOW lighting conditions	Condition
HI	Indicated values > High limit value	ON
HI	Indicated values ≦ High limit value	OFF
LO	Indicated values < LOW limit value	ON
LO	Indicated values ≧ LOW limit value	OFF

③ Polarity display
Minus of the indicated value and the set value is displayed.

④ Set value (SV)
Displays whether the indicated value displayed on the setting display unit is one of upper limit, top upper limit, lower limit, bottom lower limit.

LED	Conditon	value displayed on the setting display
SV-H	ON	High limit value
SV-H	Blnking	top upper limit
SV-L	ON	LOW limit value
SV-L	Blnking	bottom lower limit

The top upper limit and the bottom lower limit set values are valid in the case where the option is equipped.

⑤ Setting display
Displays one of the upper limit, top upper limit, lower limit, bottom lower limit. In the case where the optional is not equipped, ・---・ is displayed for the top upper limit and the bottom lower limit. Minus is also displayed.

⑥ [Zero] key / [+/-/.] key
Used to execute the one touch zero.
And also used to set the reversing polarity and a decimal point at the time of inputting the set value.

⑦ [Up direction movement] key / [HI / HI.ALM] key
Used to move the item upward at the time of setting change.And also used to display the upper limit and top upper limit.

⑧ [Right direction movement] key / [LO / LO.ALM] key
Used to move the item to the right at the time of setting change.And also used to display the lower limit and bottom lower limit.

⑨ [Set value change] key
Used to determine the changed item at the time of setting change.

⑩ Panel attaching screw hole
Screw hole used to attach the TD-500A to the panel. M3 flat countersunk head screw is used.

⑪ Space for the optional them
Space to equip the option item to enhance the function of the TD-500A. The option upper limit and bottom lower limit output can be equipped on the TD-500A.

⑫ Input and output terminal block.
Input and output terminal block to connect a sensor, comparator and power. Terminal block is cage clamp type.

Number	name and function
1	+EXC
2	-SIG
3	-EXC
4	+SIG
5	SHIELD
6	VOL OUT
7	GND
8	Comparator output (HI COM)
9	Comparator output (HI N/O)
10	Comparator output (LO COM)
11	Comparator output (LO N/O)
12	AC100V
13	AC100V

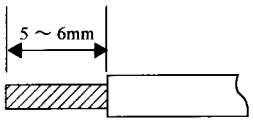
⑬ Frame ground (F.G.)
Ground terminal.Always ground the F.G. terminal to prevent electric shock, accident and effects from static electricity.

⑭ Applied voltage change switch (In main body)
Changes the applied voltage. Can be selected from 2.5V or 5V.Remove the main body cover and change with the switch on the right lateral side.

■ Connecting method to the terminal block

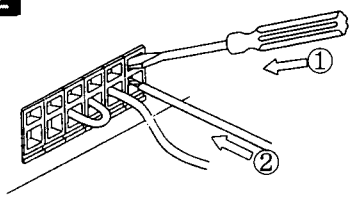
Follow the procedure below to connect to a cage clamp type terminal block.

1



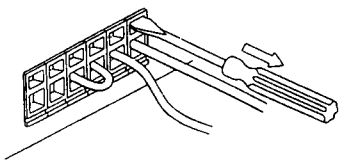
Remove 5 - 6 mm of the coating of the connected wire and twist the tip to prevent separation of the strands.

2



Insert a slotted screwdriver strongly to the top hole pressing up slightly. Insert the wire to the bottom hole with the tip unseparated.

3

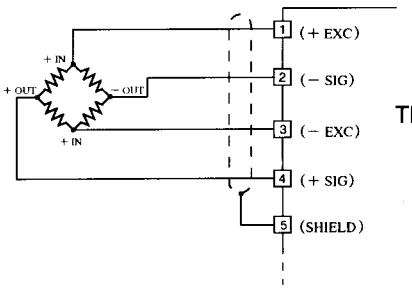


Pull out the screwdriver. Lightly pull the wire to check it is securely clamped.

※ Wire that can be connected to the cage clamp type terminal block is 0.2 - 2.5 mm2.
※ Do not crimp contact the tip of the wire or solder the tip.
※ When connecting more than one wire, twist them together beforehand.

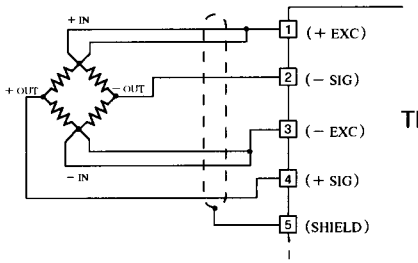
■ Connection of straingage sensor

·4 line type sensor



TD500A

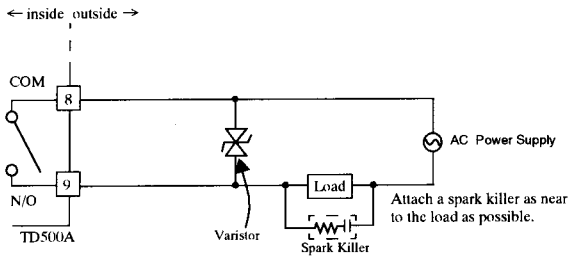
·6 line type sensor

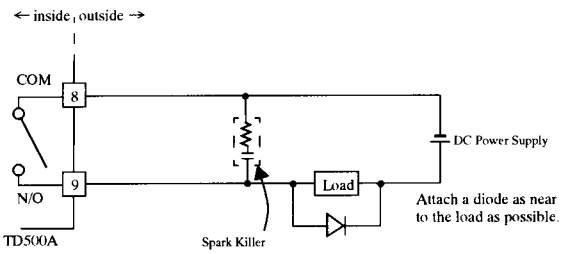


TD500A

When connecting a 6 line type straingage sensor, short-circuit +EXC and +S, -EXC and -S each.

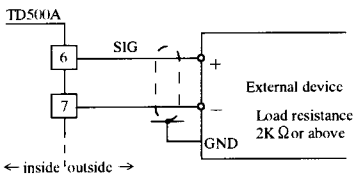
■ Connection of upper and lower limit relay





※ Overvoltage and overcurrent shorten the life of the relay and at the same time becomes the cause of a breakdown.
※ The attachment of a noise killer is recommended, etc according to the AC/DC of the connected load (refer to the connection example.) It will become resistant to noise and at the same time the life of the relay will be longer.
※ Never short-circuit the load. It will be broken.

■ Connection of voltage output (V-OUT)



Outputs the voltage in proportion to the sensor input.

The output voltage is about 2V par sensor input 1mV/V.

Function and operating method

■ Operation to change set value

The table below is the setting item list for the TD-500A. Set referring to the operating method as necessary.

● Mode 0 (F0X)

Function No.	Name	Initial value	LOCK	Remarks
0	High limit value	07.50	◎ (Set value)	
1	Low limit value	02.50	◎ (Set value)	
2	top upper limit	00.00	◎ (Set value)	When no option is equipped, 「---」 is displayed.
3	bottom lower limit	00.00	◎ (Set value)	When no option is equipped, 「---」 is displayed.

※ The position of the decimal point is at the same position set at the time of the calibration.

※ The top upper limit and the bottom lower limit are set at the time of equipping the option.

● Mode 1 (F1X)

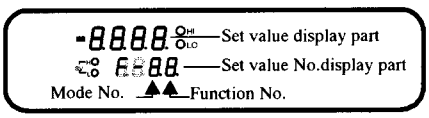
Function No	Name	Initial value	LOCK	Remarks
0	LOCK	000		from left, Zero key、setting value、calibration 0 : LOCK OFF 1 : LOCK ON
1	Setting display select	0	◎ (Set value)	0 : HI 1 : LO
2	Digital tera	00.00	◎ (Set value)	

※ Numeric value inputs other than 0, 1 on LOCK, setting display selection becomes 1 after determination.

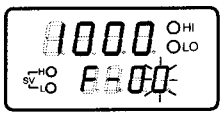
● Mode 2 (F2X)

Function No.	Name	Initial value	LOCK	Remarks
0	Zero calibration		◎ (Calibration)	
1	Equivalent input calibration	3.000	◎ (Calibration)	Input the rated output and rated value.
2	Actual load calibration	10.00	◎ (Calibration)	
9	for maintenance	0000		Do not change the setting.

Operating method



1. When pressing [SET/CHG] for 1 second or longer, the function No. part of the set value No. flickers.

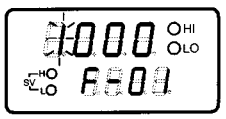


2. The mode No. and the function No. are changed over with [▶] .

3. Input the mode No. and the function No. with [▲] and select the set item.

(Example)
Lower limit value setting

4. After completing the set value No. input, press [SET/CHG].The set value part flickers and starts the change of the set value .



5. Change the digits of the set value with [▶].

6. Input the numeric value of the set value with [▲] .

※ The polarity can be changed with [+/-/.].When the key is pressed the minus code flickers. When it is pressed again , the minus code goes off.

※ When changing t he decimal point at the time of calibration, press [+/-/.] when the digit that is desired to be changed is flickering.

7. After completing the input of the set value, press [SET/CHG] to determine the numeric value. The function No. part of the set value No. flickers and returns to the selection of function.

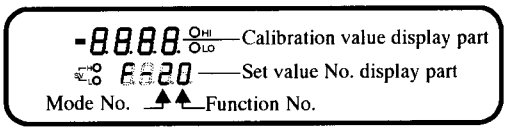
8. When [SET/CHG] is pressed for 1 second longer, it returns to the weight value display.

■ Calibration operation

There are 2 kinds of calibration methods of actual load calibration and equivalent input calibration for TD-500A.

Actual load calibration	Equivalent input calibration
This is a calibration method to apply the actual load to the straingage sensor and key in the value of the actual load. This calibration method makes little error and is accurate.	This is a calibration method only to input the rated output value of the straingage sensor (mV/V) and the rated capacity (value desired to display) with the key in and not by the actual load. This calibration method can be carried out easily even in the case where the actual load cannot be applied.

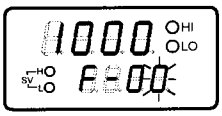
Operating method



※ Calibration after releasing the calibration LOCK. (Refer to "peration to change set value")

● Actual load calibration

1. When pressing [SET/CHG] for 1 second or longer, the function No. part of the set value No. flickers.



2. Change the mode No. toand the function No. to with [▶] and [▲] and press [SET/CHG].

3. When [SET/CHG] is pressed with the sensor in the no load condition, the zero calibration is carried out and "CALZ" is displayed.

Zero Calibration

4. When the function No. is changed to " 2(actual load calibration)" with [▲] and [SET/CHG] is pressed, it becomes the calibration value input standby.

5. When load is applied on the sensor and the calibration value is inputted with [▶] and [▲ and [SET/CHG] is pressed, it is calibrated and "CALS" is displayed.

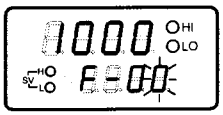
Actual load Calibration

6. When [SET/CHG] is pressed for 1 second or longer the calibration ends and returns to the weight value display.

● Equivalent input calibration

※ Before the equivalent input calibration, carry out zero calibration in the same manner as the actual load calibration. Refer to the actual load calibration on the left for the operating method.

1. When pressing [SET/CHG] for 1 second or longer, the function No. part of the set value No. flickers.



2. Change the mode No. to and the function No. to with [▶] and [▲] and press [SET/CHG].It becomes the rated output input standby.

3. Input the rated output value and press [SET/CHG].The rated output is determined and it becomes the rated capacity input standby.

4. Input the rated capacity and press [SET/CHG].The equivalent input calibration is carried out and "CALS" is displayed.

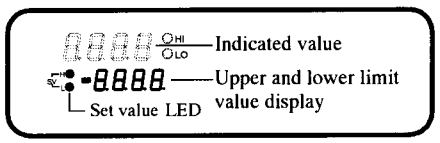
Equivalent input Calibration

5. When [SET/CHG] is pressed for 1 second or longer the calibration ends and returns to the weight value display.

■ Display operation

On the display screen of TD-500A, the upper limit, lower limit, top upper limit, bottom lower limit as well as the indicated value can be displayed. (Top upper limit and bottom lower limit can be displayed only when the option is equipped.) Refer to the followings for operation.

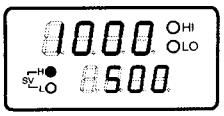
Operating method



LED	Condition	Display item
SV-H	Light on	Displays the upper limit
SV-L	Light on	Displays the lower limit
SV-H	Flickering	Displays the top upper limit set value (valid when option is equipped, temporary display)
SV-L	Flickering	Displays the bottom lower limit set value (valid when option is equipped, temporary display)

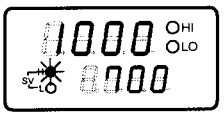
● In the case where displaying the upper limit and the top upper limit setting

1. When [H/HLALM] is pressed SV-H LED lights up and displays the upper limit value.



(Example) Upper limit value 500

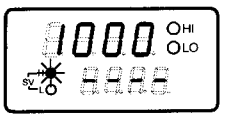
2. When [H/HLALM] is pressed again SV-H LED flickers and displays the top upper limit value.



(Example) Top upper limit 700

3. Returns to the upper limit value display after time out (3 seconds) or with [SET/CHG].

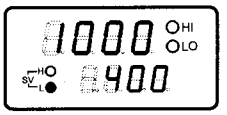
※. [---] is displayed in the case where the top upper limit display is selected when the option is not equipped.



(Example) Option not equipped

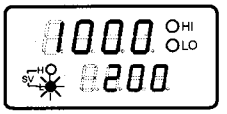
● In case to display the lower limit and the bottom lower limit setting

1. When [LO/LOALM] is pressed SV-L LED lights on and displays the lower limit value.



(Example) Lower limit value 400

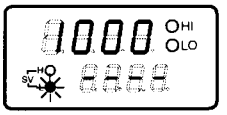
2. When [LO/LOALM] is pressed again SV-L LED flickers and displays the bottom lower limit value.



(Example) Bottom lower limit 200

3. Returns to the lower limit value display after time out (3 seconds) or with [SET/CHG].

※. [---] is displayed in the case of selecting the bottom lower display when the option is not equipped.

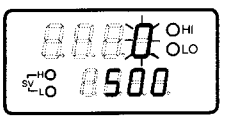


(Example) Option not equipped

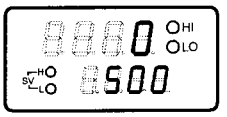
■ One touch zero operation

The indicated value can be changed to zero with one touch key operation.

1. Press [ZERO]. When [ZERO] is pressed one more time, the one touch zero operation is cancelled.



2. When [SET/CHG] is pressed the one touch zero is executed and the indicated value is returned to zero.



Over-scale display and error display

■ Over-scale display

A/D converter minus over (for ± SIG - 3.2mV/V or more)	− LOAD
A/D converter plus over (for ± SIG + 3.2mV/V or more)	LOAD
Display over When exceeding - 9999	oFL1
Display over When exceeding 9999	oFL2

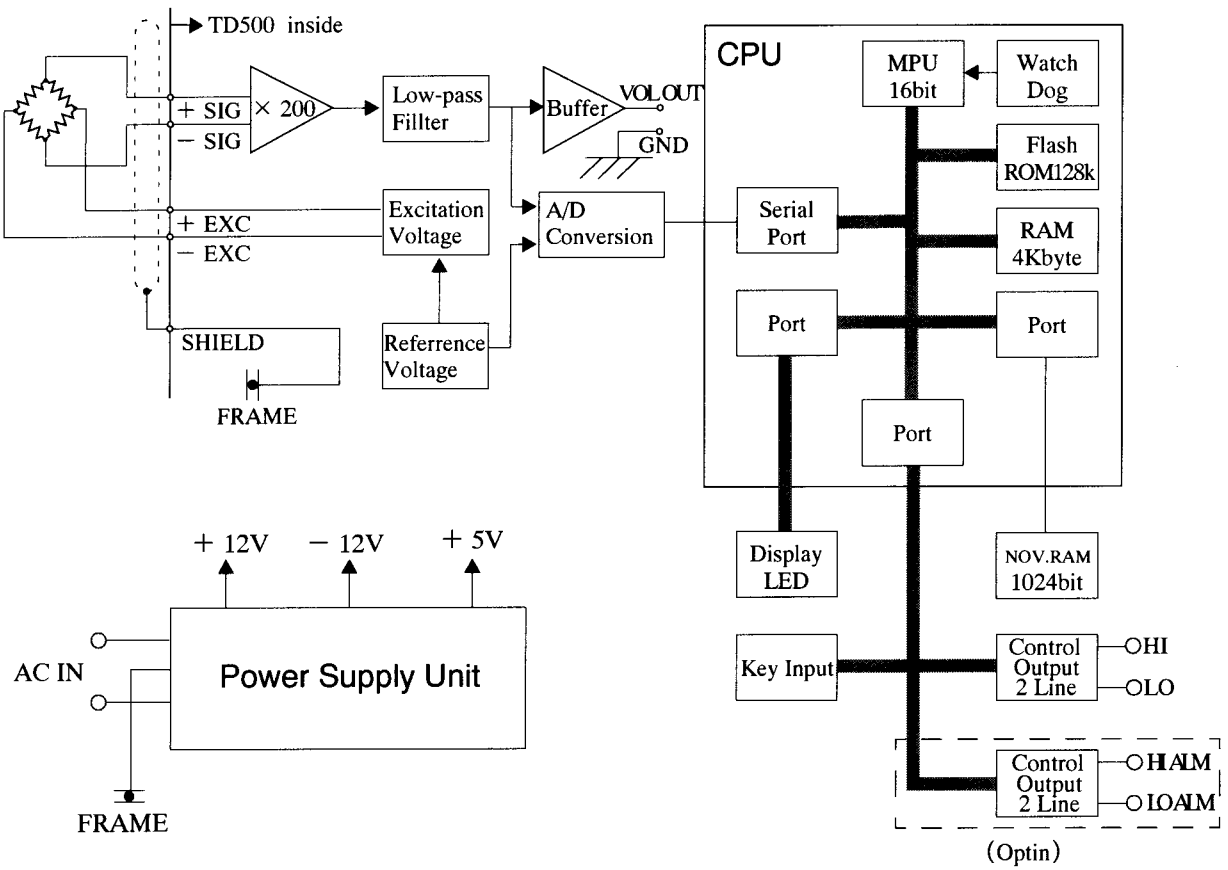
■ Calibration error display

When the span set value is set to "0000"	cEr5
When the output of the straingage sensor dose not reach the span adjustment range.	cEr6
When the output of the straingage sensor is on the negative (minus) side.	cEr7

■ Calibration display

When zero calibration is carried out.	CALZ
When span calibration is carried out.	CALS

Block diagram



Specification

1. Analog section	
Bride Voltage	DC5V、2.5V Changable by inside switch (Output current of 20mAmax)
Signal input range	0.5 ~ 3.0mV/V (Digital adjustment)
Zero adjustment range	0 ~ 2mV/V (Digital adjustment)
Accuracy	Non-linearity : < 0.02%FS (of 3mV/V input) Zero drift : < 0.5μV/℃ Gain drift : < 0.01%/℃
A / D Converter	25 times/sec. Resolution : 16bit (binary)
Displar	0 ~± 9999
Calibration	Actual load calibration or Equivalent input calibration(Digital calibration)
Analog voltage output	output level : About 2V to input 1mV/V (<Load resiatance5KΩ) converter to obtain voltage output which is linked with the signal input.
2. Display part	
Display unit	Indication display : Character height 10 mm Red LED 4 digits (with polarity display) Setting display : Character height 8 mm Red LED 4 digits (with polarity display) Displays either the upper or lower limit set value. (when the option is equipped, displays one of the top upper limit, or bottom lower limit.)
Display item	Condition display : HI、LO
3. Setting section	
Setting items	Calibration : Zero/Span calibration (actual load calibration, equivalent input calibration High limit / Low limit value、Digital tare、One touch Zero
4. External signal	
Comparator output	Number of items : 2 (upper limit,lower limit) Output : Relay contact output (Make contact) Capacity : 250V AC 0.5A (resistance load)
Analogue output	Analogue voltage output (refer to the analogue part)
5. Option	
top upper / bottom lower limit output	High limit relay (Make contact) output AC250V 0.5A (resistance load)
6. General specifications	
Power voltage	AC100V ± 10% 50/60Hz
Power condition	Approx.10VA
Ambient conditions	Temperature : Operation temperature − 10 ~ +40 ℃ : Storage temperature − 40 ~ +80 ℃ Humidity : < 85%RH (non-condnsation)
Dimensions	96 (W) × 48 (H) × 150 (D) mm (excluding protrusions)
Panelcutout dimension	84 (W) × 44 (H) mm
Installation screw dimension	89 (W) × 41 (H) 4-M3t
Weight	Approx.800g
Panel color	T − Y17

Accessories

① Power cable (3m)	1 pce.
② Flat head screwdriver for terminal block	1 pce.
③ Unit display label	1 pce.
④ Instruction manual (this manual)	1 copy