ZWS Series

ZWS5-ZWS50

Instruction Manual

BEFORE USING THE POWER SUPPLY UNIT

Pay attention to all cautions and warnings before using the unit. Incorrect usage could lead to an electrical shock, damage to the unit or a fire hazard.

WARNING

- Do not touch the internal components, they may have high voltage or high temperature. You may get electrical shock or burned.
- When the unit is operating, keep your hands and face away from it, you may get injured by an accident.

CAUTION

- This power supply is primarily designed and manufactured to be used and enclosed in other equipment. Stick the WARNING label for users on the system equipment and describe the notice in the instruction manual.
- Never operate the unit under over current or shorted condition for 30 seconds or more which could result in damage or insulation failure. There is no possibility for fire or burning.
- This power supply has a possibility that hazardous voltage may occur in output terminal depending on failure mode.
  The outputs of these products must be earthed in the end use equipment to maintain SELV.
  If the outputs are not earthed, they must be considered hazardous and must not be made user accessible.

Note: CE MARKING

CE Marking, when applied to a product covered by this handbook indicates compliance with the low voltage directive (73/23/EEC) as modified by the CE Marking Directive (93/68/EEC) in that it complies with EN60950.

DWG NO. : A152-04-11B		
APPD	CHK	DWG
Fukuda 5. Feb. '08	M. Kondo 1. Feb. '08	M. Hada 1. Feb. '08

1. BEFORE USING

- Ensure the wiring to input terminal is connected correctly according to this instructic manual.
- This is PC board type power supply.Please hold on the board side while mounting,and not to touch the component side.In using for the apparatus,please lift the power supply with a spacer.

2. SPECIFICATIONS

2-1 Input Voltage Range

100 ~ 240 VAC (50/60 Hz)

2-2 Operating Temperature

-10 ℃ ~ +50 ℃ : 100% load, +60 ℃ : 70% load (Convection Cooling)

2-3 Safety Standards

Approved by UL60950-1,CSA60950-1,EN60950-1, Built to meet DENAN

2-4 Input Voltage[VAC] and Current(Typ)[A]

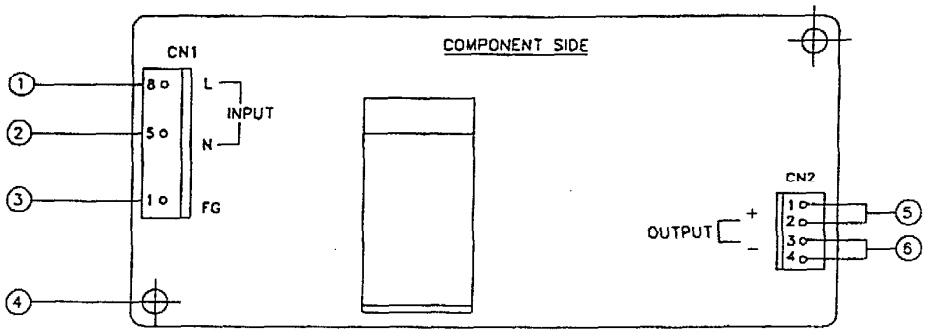
MODEL / INPUT	ZWS5	ZWS10	ZWS15	ZWS30	ZWS50
100VAC	0.14	0.30	0.45	0.83	1.4
200VAC	0.07	0.15	0.23	0.42	0.7

2-5 Nominal Output Voltage[V] and Maximum Output Current[A]

OUTPUT / MODEL	3.3	5	12	15	24	36	48
ZWS5	1.0	1.0	0.42	0.34	0.22	-	-
ZWS10	2.0	2.0	0.85	0.70	0.45	-	-
ZWS15	3.0	3.0	1.25	1.00	0.65	-	-
ZWS30	6.0	6.0	2.50	2.00	1.30	0.90	0.70
ZWS50	10.0	10.0	4.30	3.50	2.10	1.40	1.10

3. EXPLANATION ON TERMINALS

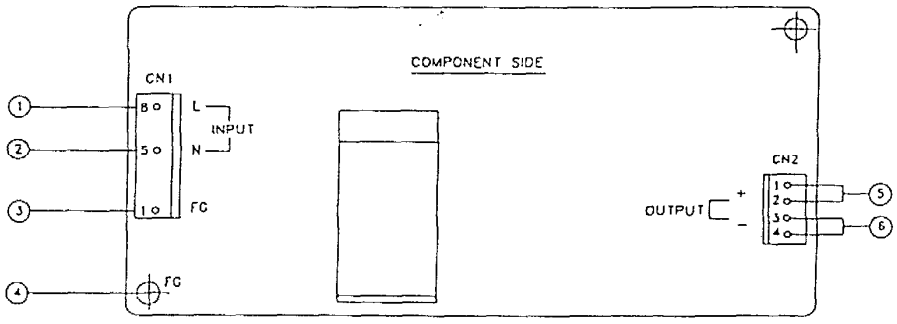
ZWS5



① input terminal (pin 8 of CN 1)
L:Live line with a fuse inside
② input terminal(pin 5 of CN 1)
N : Neutral line
③ input terminal (pin 1 of CN 1)
FG:Frame Ground

④ Frame Ground (FG)
connected to pin 1 of CN 1
Please ground to the apparatus with a spacer of conductive material.
(The mounting surface of the spacer should be within MAXϕ8.)
⑤ + output terminal (pin 1,2 of CN 2)
⑥ - output terminal (pin 3,4 of CN 2)

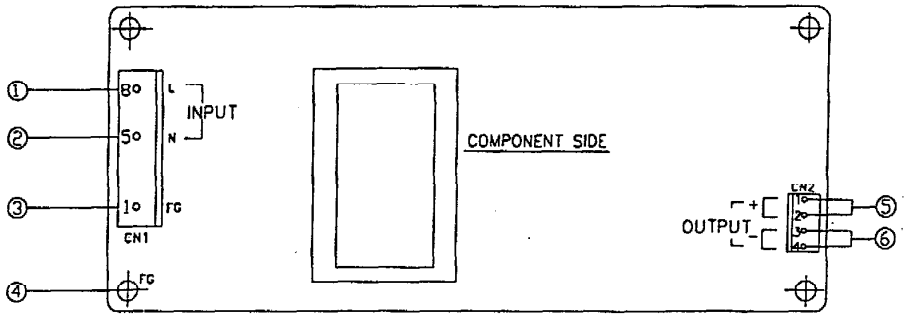
ZWS10



① input terminal (pin 8 of CN 1)
L:Live line with a fuse inside
② input terminal(pin 5 of CN 1)
N : Neutral line
③ input terminal (pin 1 of CN 1)
FG:Frame Ground

④ Frame Ground (FG)
connected to pin 1 of CN 1
Please ground to the apparatus with a spacer of conductive material.
(The mounting surface of the spacer should be within MAXϕ8.)
⑤ + output terminal (pin 1,2 of CN 2)
⑥ - output terminal (pin 3,4 of CN 2)

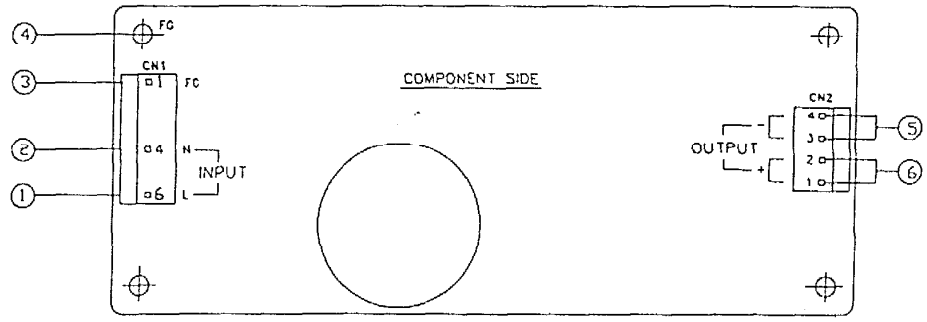
ZWS15



① input terminal (pin 8 of CN 1)
L:Live line with a fuse inside
② input terminal(pin 5 of CN 1)
N : Neutral line
③ input terminal (pin 1 of CN 1)
FG:Frame Ground

④ Frame Ground (FG)
connected to pin 1 of CN 1
Please ground to the apparatus with a spacer of conductive material.
(The mounting surface of the spacer should be within MAXϕ8.)
⑤ + output terminal (pin 1,2 of CN 2)
⑥ - output terminal (pin 3,4 of CN 2)

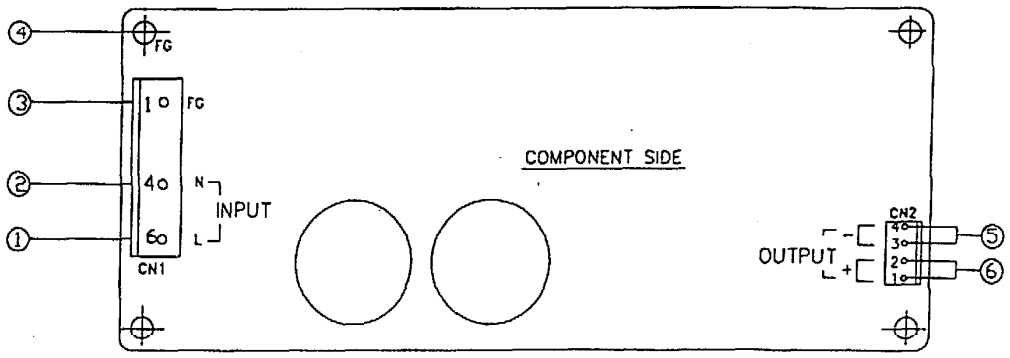
ZWS30



① input terminal (pin 6 of CN 1)
L:Live line with a fuse inside
② input terminal(pin 4 of CN 1)
N : Neutral line
③ input terminal (pin 1 of CN 1)
FG:Frame Ground

④ Frame Ground (FG)
connected to pin 1 of CN 1
Please ground to the apparatus with a spacer of conductive material.
(The mounting surface of the spacer should be within MAXϕ8.)
⑤ - output terminal (pin 3,4 of CN 2)
⑥ + output terminal (pin 1,2 of CN 2)

ZWS50



① input terminal (pin 6 of CN 1)
L:Live line with a fuse inside

② input terminal(pin 4 of CN 1)
N : Neutral line

③ input terminal (pin 1 of CN 1)
FG:Frame Ground

④ Frame Ground (FG)
connected to pin 1 of CN 1
Please ground to the apparatus with a spacer of conductive material.
(The mounting surface of the spacer should be within MAXϕ8.)

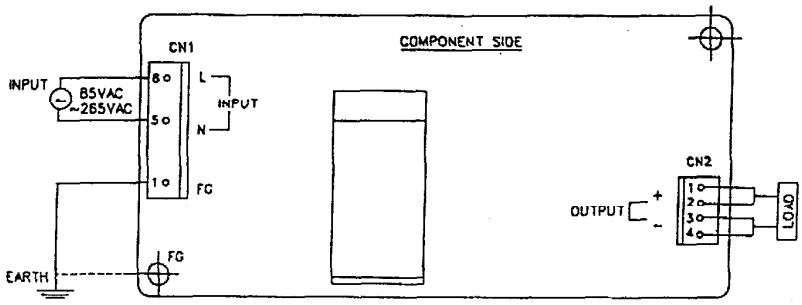
⑤ - output terminal (pin 3,4 of CN 2)

⑥ + output terminal (pin 1,2 of CN 2)

4. TERMINAL CONNECTION

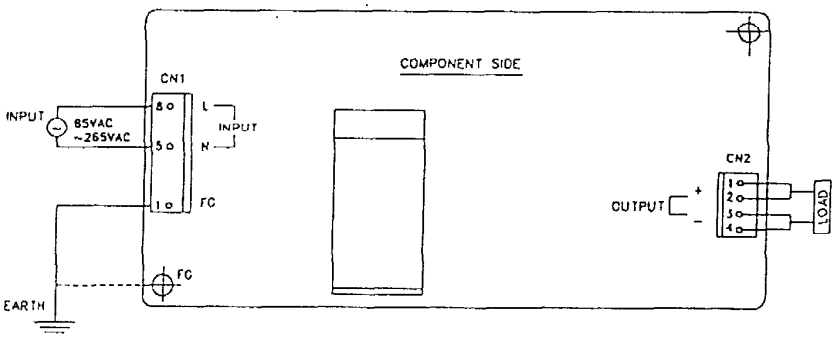
● Pay attention to the input wiring .If it is connected with wrong terminal,the power supply will be damaged.

ZWS5



● Please use the following housings & pins to connect the input terminal.
Connectors in use (Molex made)
input side CN1 : 6373-A8A(102)52 output side CN2 : 6373-A04A-102
Matching housings & pins (Not included with the product)(Molex made)
Input socket housing (use for CN1) : 40136A-D08・・・・1 piece
Output socket housing (use for CN2) : 40136A-D04・・・・1 piece
Terminal pin (use for CN1,2) : 7879-2-P912・・・ 7 pieces
Pressing Tools (Molex made) Hand Crimping Tool : 11-01-0037

ZWS10



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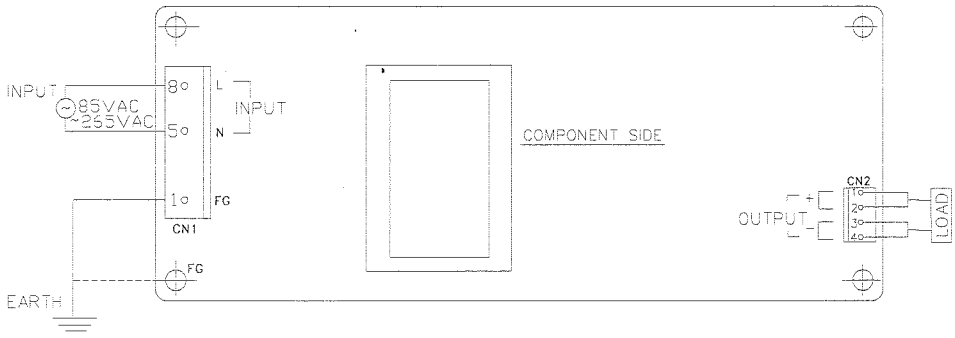
Output socket housing (use for CN2) : 40136A-D04・・・・1 piece
Terminal pin (use for CN1,2) : 7879-2-P912・・・ 7 pieces
Pressing Tools (Molex made) Hand Crimping Tool : 11-01-0037

ZWS15



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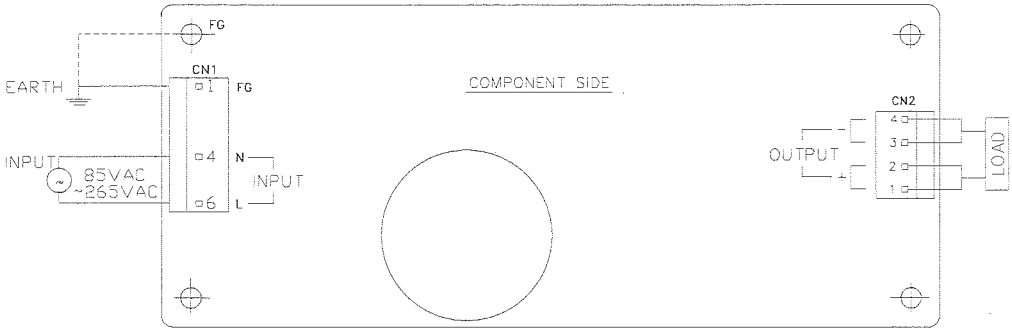
Output socket housing (use for CN2) ：40136A-D04・・・・1 piece
Terminal pin (use for CN1,2) ：7879-2-P912・・・ 7 pieces
Pressing Tools (Molex made) Hand Crimping Tool：11-01-0037

ZWS30

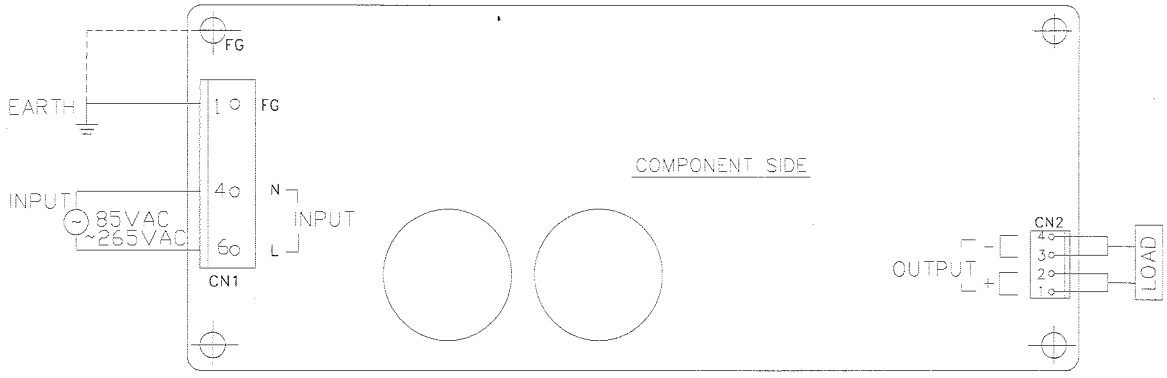


● The output current on one terminal is limited to 5A.
If the necessary current is more,please use the terminals together appropriately.

● Please use the following housings & pins to connect the input termina
Connectors in use (Molex made)
input side CN1：5414-30B output side CN2：5273-04A
Matching housings & pins (Not included with the product)(Molex made)
Input socket housing (use for CN1) ：5195-06・・・・1 piece
Output socket housing (use for CN2) ：5195-04・・・・1 piece
Terminal pin (use for CN1,2) ：5194 PBTL・・ 7 pieces
Pressing Tools (Molex made) Hand Crimping Tool：JHTR5904

Note:
1. Over voltage category II
Not for direct connection to the mains if used in industrial machines
2. Radio interference suppression test is not performed.

ZWS50



- The output current on one terminal is limited to 5A.
  If the necessary current is more,please use the terminals together appropriately.
- Please use the following housings & pins to connect the input terminal.
  Connectors in use (Molex made)
  input side CN1 : 5414-30B output side CN2 : 5273-04A
  Matching housings & pins (Not included with the product)(Molex made)
  Input socket housing (use for CN1) : 5195-06・・・・1 piece
  Output socket housing (use for CN2) : 5195-04・・・・1 piece
  Terminal pin (use for CN1,2) : 5194 PBTL・・ 7 pieces
  Pressing Tools (Molex made) Hand Crimping Tool : JHTR5904

Note:

1. Over voltage category II
   Not for direct connection to the mains if used in industrial machines.
2. Radio interference suppression test is not performed.

5. FUNCTIONS AND CAUTIONS

5-1 Over Voltage Protection(OVP)

ZWS5~ZWS30 :

These models are provided by zener-clamp method. If the output voltage is shutdown by the overvoltage protection (between 140~210% of output voltage), the zener diode must be replaced in order for the output to recover.

ZWS50 :

This model is provided with a built-in,handy reset OVP circuit of output shutdown method. The output will be down when the output voltage is up to 115~135% of the rated.Once OVP circuit shut the output down, the output can only be recovered by turning off the input line and re-input the power after interval time . The value of OVP is fixed.

5-2 Over Current Protection(OCP)

ZWS Series are provided with a built-in primary side OCP circuit with automatic recovery.OCP is workable when the load is over 125% of the rated. The power supply will automatically recover when the overload or short conditions are cleared. Please do not let the unit work under overload or short conditions over 30 seconds, or the power supply is feared to be damaged.

5-3 Ripple

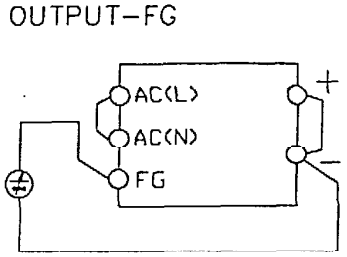
The rated maximum ripple value is the test result measuring by the instructed ripple measuring circuit ,using EIAJ probe or other equavalent. If the load cable is too long, please connect a capacitor(electrolytic,film,etc) to the load terminals to reduce the ripple on the load terminal.

5-4 In-Rush Current

ZWS Series are provided with a built-in inrush current protecting circuit. ZWS5~ZWS50 are limited by method using Power Thermistor. The limit current changes depending on the temperature,it is large at high temperature or while re-input after period of operation. Be care to select the switch and the outside fuse.

5-5 Insulation Resistance Test

The insulation resistance value is above 100M Ω at 500VDC. Considering the safety,please set the voltage value of DC insulation meter before the test, and well discharge the insulation meter after the test.



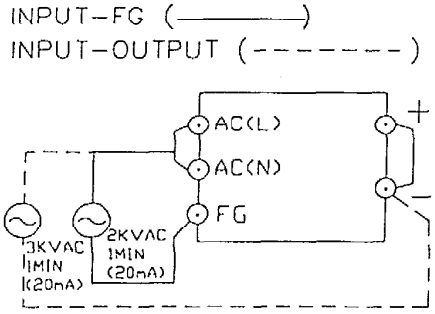
5-6 Withstand Voltage Test

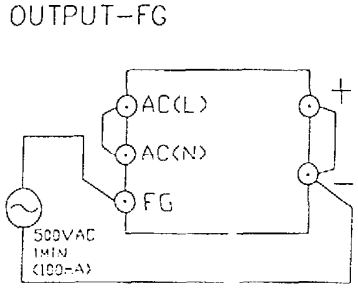
ZWS series are designed to be able to withstand 3KVAC (20mA) 1minute between input-output, 2KVAC (20mA) 1minute between input-FG,and 500VAC (100mA) 1 minute between output-FG.

Please set the limit current value of the withstand voltage tester as mentioned above before doing test.

Please elevate the applying voltage gradually,and lower it gradually,too,when shutdown.

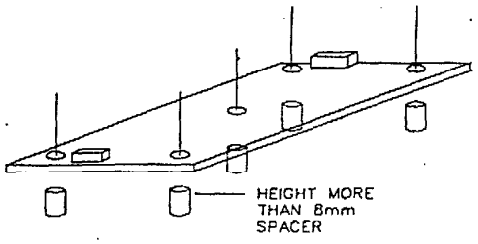
Please do not use a timer in the test.Because when the test voltage is supplied or shut down,a impulse high voltage may be generated which will break the power supply unit.



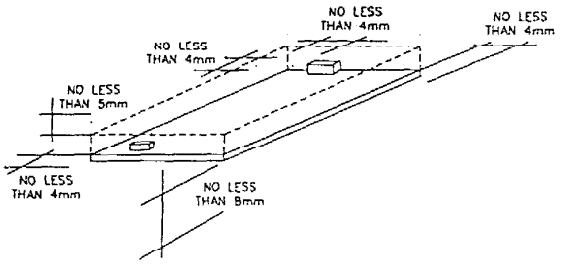


6.MOUNTING

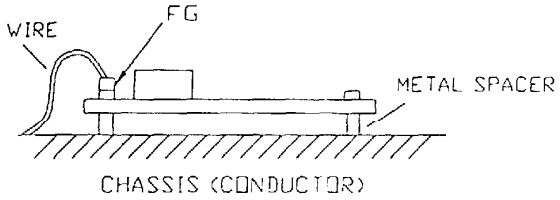
Please use the mounting hole as:
ZWS5,ZWS10: 2 holes of ϕ 3.5
ZWS15~ZWS50: 4 holes of ϕ 3.5
and insert the spacer (MAX ϕ 8) of height over 8mm to lift the unit. The vibration spec. is the value taken when the unit is raised by 8mm spacers.



Please left 4mm space from the surfaces and the sides of PCB, especially from the solder surface ,8mm space is neccessary. If the space is not enough,the specification of insulation and withstand will not be satisfied.



FG should be connected to the earth terminal of the apparatus. If not, the conducted noise and output noise will increase.



7.WIRING

In order to improve the noise property, please set the input wire far from the output wire, and twist the wires.
It is effective to clear the noise by connecting a small capacitor on the output terminal.
Please select the wire materials to adapt the connector as follows.

Input : ZWS5~ZWS15 : AWG#30~#22
ZWS30,ZWS50 : AWG#22~#18

Output : ZWS5~ZWS15 : AWG#30~#22
ZWS30,ZWS50 : AWG#22~#18

8.EXTERNAL FUSE RATED CURRENT

When using a outside fuse,please select the fuse capacity as follows. Moreover, please do not use the fast blow fuse.

Rated Current of Fuse

Model No.	Rated Current of Fuse
ZWS5	2 A
ZWS10	2 A
ZWS15	2 A
ZWS30	3.15 A
ZWS50	3.15 A

9. CHECK BEFORE THINKING OF TROUBLE

- Check the rated input voltage is connected.
- Check the wiring of input and output is correct.
- Ensure the input and output connectors are completely inserted, and the pressing of the connector pins are exactly fixed.
- Check the wire material is not too thin.