Electronic Test
Instruments &
Power Supplies

TERMINAL UNIT
TU01-PIA
OPERATION MANUAL

KIKUSUI

About This Manual

If you find any incorrectly arranged or missing pages in this manual, they will be replaced. If the manual it gets lost or soiled, a new copy can be provided for a fee. In either case, please contact Kikusui distributor/agent, and provide the "Kikusui Part No." given on this page.

This manual has been prepared with the utmost care; however, if you have any questions, or note any errors or omissions, please contact Kikusui distributor/agent.

⚠Safety Symbols

For the safe use and safe maintenance of this product, the following symbols are used throughout this manual and on the product. Understand the meanings of the symbols and observe the instructions they indicate (the choice of symbols used depends on the products).

⚡ **OR** ⚡	Indicates that a high voltage (over 1,000 V) is used here. Touching the part causes a possibly fatal electric shock. If physical contact is required by your work, start work only after you make sure that no voltage is output here.
DANGER	Indicates an imminently hazardous situation which, if ignored, will result in death or serious injury.
⚠WARNING	Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.
⚠CAUTION	Indicates a potentially hazardous situation which, if ignored, may result in damage to the product and other property.
🚫	Shows that the act indicated is prohibited.
⚠	Is placed before the sign "DANGER," "WARNING," or "CAUTION" to emphasize these. When this symbol is marked on the product, see the relevant sections in this manual.
⏚ **OR** ⏚	Indicates an earth ground terminal.
⏛ **OR** ⏛	Indicates a chassis ground terminal.

TABLE OF CONTENTS

To the user of TU01-PIA:

Immediately after unpacking TU01-PIA, inspect it for visible damage and confirm the accessories.

Before using TU01-PIA, be sure to read the operation manual of the regulated DC power supply unit to which TU01-PIA is to be connected.

⚠WARNING · Incorrect handling of TU01-PIA will not only damage itself and the connected instrument but also bring danger to the user.

· Before installing TU01-PIA, be sure to disconnect the AC plugs of PIA series and regulated DC power supply unit from the wall outlets.

CHAPTER 1 GENERAL DESCRIPTION

1-1   Outline

The Terminal Unit TU01-PIA is attached to the regulated DC power supply unit of PAB-A, PAD-L, PAE, or PAL series produced by KIKUSUI and is connected to the Power Supply Controller PIA series (PIA3200 or PIA4810/4820) also produced by us. With TU01-PIA, the PIA series can control the power supply unit through GPIB and in sequence operation mode.

Functions of a DC power supply unit which PIA series can control vary with the type of DC power supply unit.

See the follwing operation manual.

Using PIA3200

PIA3200 operation manual Chapter2 table2-1

"PIA3200 Functions by connected Equipments"

Using PIA4810/4820

PIA4800 series operation manual Chapter2 table2-1

"Control Parameters for OP01-PIA"

1-2　Features

1) By connecting TU01-PIA to the remote control terminal on the rear panel of a regulated DC power supply unit, the DC power supply unit can be incorporated into a system easily.

2) TU01-PIA can be connected to the PIA series easily by only one cable (per power supply unit).

3) TU01-PIA has a built-in circuit that generates the ID of the connected power supply unit, and the ID is to be set when TU01-PIA is installed. Once the ID is set, the PIA3200 will read it automatically.
   (For PIA4810/4820, you do not need to set the ID by using TU01-PIA, because it is set with the software is attached to the controller.)

4) The local/remote state of the power supply unit can be determined by a switch on TU01-PIA. (For some types of power supply units, however, the internal setting need be modified.)

5) If a shunt unit of SH Series (sold separately) is used with TU01-PIA, the value of output current can be read (monitored) with high accuracy.

1-3   External Appearance (Names and Functions)
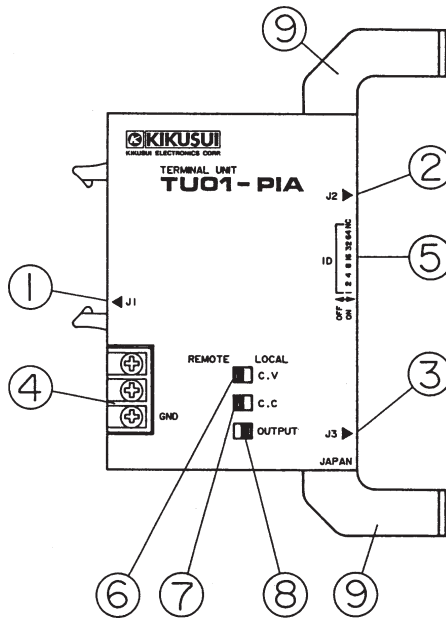
J1   Connector for the connection to PIA series
J2   Connector for the connection to regulated DC power
            supply unit
J3   Connector for the connection to regulated DC power
            supply unit
GND   Ground terminal
ID switch
            DIP switch for setting ID
 C.V switch
            Local/remote switch for C.V operation
C.C switch
            Local/remote switch for C.C operation
OUTPUT switch
            Local/remote switch for OUTPUT operation
Stay   Metal fitting for attaching TU01-PIA to power
            supply unit

CHAPTER 2 SPECIFICATIONS

2-1 Connector Functions and Specifications

J1 26P flat cable connector (to PIA series)

Refer to PIA series operation manual.

J2 8P connector

Pin No.	Singnal name	command		connector pin No.
		STS?	DIN?	
1	C.V (IN, Low true) *1	D1	D10	18 (D10)
2	C.C (IN, Low true) *1	D2	D11	19 (D11)
3	POW (IN, Low true) *1	D5	D14	22 (D14)
4	DON'T USE			
5	GND			10 (DG1)
6	GND			10 (DG1)
7	DON'T USE			
8	DON'T USE			

Correspondence to PIA series

*1   These signals are pulled up to +5V through 4.7k Ω (COMOS input)

J3 15P connector

Pin No.	Signal name	Command	connector pin No.
1	DA1 (CV ANALOG) *2	VSET	4 (DA1)
2	VREM *3		
3	AG1 (COMMON 1)		2 (AG1)
4	DA4 (CC ANALOG) *2	ISET	6 (DA4)
5	IREM *3		
6	AG2		3 (AG2)
7	VMON20V Zin 40k Ω	VOUT?	8 (AD4)
8	VMON100V Zin 200k Ω	VOUT?	8 (AD4)
9	N.C		
10	VMON500V Zin 1M Ω	VOUT?	8 (AD4)
11	N.C		
12	RLY1C Contact rating *4	OUT	11 (DO0)
13	RLY1NC DC30V, 500mA		
14	RLY2C Contact rating *4	POW	12 (DO0)
15	RLY2NO DC30V, 500mA		

Correspondence to PIA series

*2   Conforms to the I/O connector of PIA3200 or OP01-PIA.

*3   These signals must be connected according to the description in this manual.

*4   RLY1C-RLY1NC and RLY2C-RLY2NO are relay contacts.

2-2　Functions

1. The remote/local mode for output voltage, output current, and output on/off is determined by the respective slide switches.
2. The ID code of the connected power supply unit can be set by a DIP switch.

2-3　External Dimensions

85W × 105H × 25D mm (Maximum 110W × 142H × 37D mm)

(3.35W × 4.13H × 0.95D in. (Maximum 4.33W × 5.59H × 1.46D in))
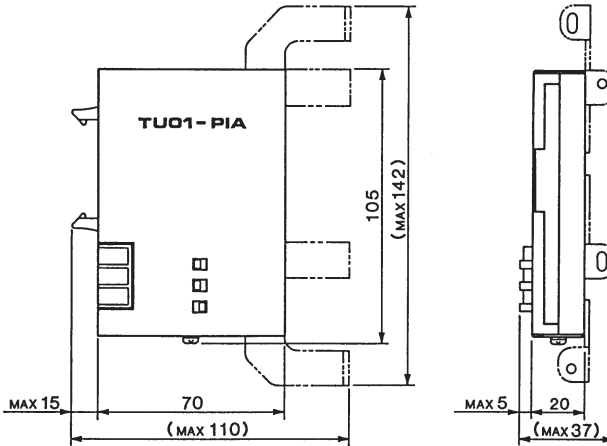
2-4　Other Specifications

1. Operating environment
   Operating temperature :0　to 40
   Humidity　　　　　　:10% to 90% RH (with no condensation)
2. Insulation
   (between case and each signal and between relay contact and each signal)
   Insulation　　　　　　:More than 30M　with 500V DC
3. Weight
   Approx. 250g (0.55 lbs.) (excluding cables)

2-5   Accessories

1.Connection cable for J2:1   6.Binding wire:2

2.Connection cable for J3:1   7.Stay:1 pair

3.Extension cable:4   8.Screw (M3 $\times$ 0.5 $\times$ 8):4

4.M4 terminal:10   9.Operation Manual:1 copy

5.M5 terminal:2

① Connection cable for J2
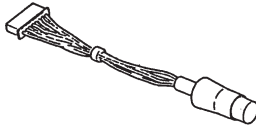
② Connection cable for J3
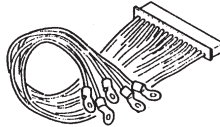
③ Extension cable
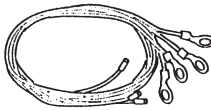
④ terminal

CHAPTER 3 CONNECTION METHOD

3-1   Precautions for connection

The methods of attaching TU01-PIA to a regulated DC power supply unit and connecting them by wires vary with the type of the power supply unit. Connect TU01-PIA to the power supply unit correctly, referring to Appendixes A, B and C. The important points in connecting TU01-PIA to the power supply unit are listed below.

• For some types of power supply units, the internal switches and connectors need be modified. Therefore, be sure to read the operating instructions of the power supply unit to which this instrument is to be connected.

• The connection pins for monitoring voltage vary with the type of power supply unit. See Appendix A (table of IDs and connection methods by power supply units).

• Depending on the type of power supply unit, some connection wires are unnecessary. Pull out the unnecessary wires from the connector for the purpose of safety.
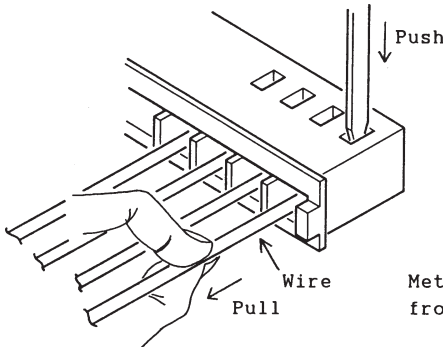
Method of removing wire from connector for J3.

⚠ **CAUTION**
- To determine the ID of the power supply unit, set the ID switch (   ) of this instrument correctly by referring to Appendix A (table of IDs and connection methods by power supply units). For PIA4810/4820, you do not need to set the ID by using TU01-PIA, because it is set with the software is attached to the controller.
- Since the terminals of the following power supply unit do not match the terminals of connection cable for J3, replace them with the accessory terminals.

  M4 terminals for PAD250-15L (ID 72)
  M5 terminals(J3-3 and J3-10) for PAD500-2L (ID73)
- Be sure to turn off the power switch of the power supply unit before changing its mode from remote to local and vice versa.
- For the method of calibration after connection, refer to the PIA operating instructions.
- Before moving or transporting the power supply unit, remove this instrument from the power supply unit.
- For the method of connecting a shunt unit of SH Series (sold separately), refer to the shunt unit operating instructions.

NOTE
- After connecting the wires, bind them up suitably by the accessory binding wires.
- For attaching this instrument to a power supply unit, a Phillips screwdriver and something with a sharp tip like tweezers are required. Also, a soldering tool is required for PAD-L Series.

3-2   Connection to PAB-A Series

Outlines of functions

1. For the PAB-A Series, the control of either CV or CC must be selected.
2. The PIA3200 controls the PAB-A Series in the mode of "control of output voltage/current by external voltage".

Internal modification of power supply unit

1. On the printed circuit board "A-650 (A-505A)", pull out the connector from "D(D) " and insert it into "E(G) ". Then, pull out the connector from "H(E)" and insert it into "D (D) " .
2. Set the CV/CC control switch on the printed circuit board "A-650 (A-505A)" as follows:
      For CV control ..... V side (with white mark)
      For CC control ..... C side (without white mark)
3. Turn the dial for output voltage or output current adjustment (including fine adjustment) on the front panel clockwise up to the maximum.
4. Slide the R-L switch on the front panel to the "R" side.
5. Remove the jumper from   -   on the rear panel terminal board.

   *: The items in parentheses are for old model.

Attaching method

See Attaching Method [1] in Appendix B.

Wiring method

CV control: Wiring Diagram [1] in Appendix C

CC control: Wiring Diagram [2] in Appendix C

Functions added to PIA3200

1. Automatic reading of power supply unit ID
2. Voltage (or current) control by VSET (or ISET) command
3. Output ON/OFF control by OUT command
4. Output ON/OFF status read back by STS? read back command
5. Monitored voltage read back by VOUT? read back command

Checking operation

Command	Read back command	Operation to be checked
	ID?	The correct ID code is read.
OUT 1		The output is turned on.
	STS?	The ON state of output is read.
VSET		The output voltage can be controlled.
ISET		The output current can be controlled.
	VOUT?	The output voltage can be read.
OUT 0		The output is turned off.
	STS?	The OFF state of output is read.

NOTE
• For VSET ISET and VOUT?, approximate values are output because the calibration has not been executed yet.

3-3   Connection to Types 0 and I2 of PAD-L Series

Outlines of functions

The PIA series controls the PAD-L Series in the mode of "control
of output voltage/current by external positive voltage ".

Internal modification of power supply unit

1. Slide the switch S1 on the following printed circuit board :
        Type 0 .... PCB A-181
        Type I2 ....PCB A-141
2. Remove short-circuit bars from   -   and   -   on the rear
   panel terminal board.
3. Turn the dial for output voltage and output current adjustment
   (including fine adjustment) on the front panel clockwise up to
   maximum.

Attaching method

See Attaching Method [2] in Appendix B.

Wiring method

See Wiring Diagram [3] in Appendix C.

(For the power supply unit of P specification, see Wiring Diagram
[8] also and refer to Section 3-7.)

Functions added to PIA series

1. Automatic reading of power supply unit ID (To only PIA3200)
2. Control of output voltage by VSET command
3. Control of output current by ISET command
4. Overvoltage protection by OVSET command (To only
   PIA3200)
5. Undervoltage protection by UVSET command (To only
   PIA3200)
6. Monitored voltage read back by VOUT? read back command
7. Output ON/OFF control by OUT command
8. Output ON/OFF status read back by STS? read back command
9. Output stop by POW command

Checking operation

Command	Read back command	Operation to be checked
	ID? *1	The correct ID code is read.
OUT 1		The output is turned on.
	STS?	The ON state of output is read.
VSET		The output voltage can be controlled.
ISET		The output current can be controlled.
	VOUT?	The output voltage can be read.
OUT 0		The output is turned off.
	STS?	The OFF state of output is read.
POW		The power supply unit is powered off.

*1   For PIA4810/4820, check the ID code to send the NODE? command.

NOTE • For VSET, ISET and VOUT?, approximate values are output because the calibration has not been executed yet.

3-4 Connection to Types I3, II, III, IV, V and VI of PAD-L Series

Outlines of functions

1. The PIA series controls the power supply unit in the mode of "control of output voltage/current by external positive voltage ".

Internal modification of power supply unit

1. Slide the switch S1 on the following printed circuit board:
   Types I3, II(except PAD500-2L), III, IV and V
   .... PCB A-200
   Type VI .... PCB A-266
   PAD500-2L .... PCB A-240

2. Remove short-circuit bars from the following terminals on the rear panel terminal board:
   Type I3 .... ⑤ - ⑥ and ⑧ - ⑨
   Types II, III, IV and V .... ⑩ - ① and ⑤ - ⑥

3. Turn the dial for output voltage and output current adjustment (including fine adjustment) on the front panel clockwise up to the maximum.

Attaching method

Types I3, II and III .... Attaching Method [2] in Appendix B

Types IV, V and VI .... Attaching Method [3] in Appendix B

(For PAD500-2L, see Attaching Method [4] in Appendix B.)

Wiring method

Type I3 .... Wiring Diagram [4] in Appendix C

Types II, III, IV, V and VI... Wiring Diagram [5] in Appendix C

(For the power supply unit of P specification, see Wiring Diagram [8] also and refer to Section 3-7.)

Functions added to PIA series

1. Automatic reading of power supply unit ID (To only PIA3200)
2. Control of output voltage by VSET command
3. Control of output current by ISET command
4. Overvoltage protection by OVSET command(To only PIA3200)
5. Undervoltage protection by UVSET command(To only PIA3200)
6. Monitored voltage read back by VOUT? read back command
7. Output stop by POW command

Checking operation

Command	Read back command	Operation to be checked
	ID? *1	The correct ID code is read.
VSET		The output voltage can be controlled.
ISET		The output current can be controlled.
	VOUT?	The output voltage can be read.
POW		The power supply unit is powered off.

*1   For PIA4810/4820, check the ID code to send the NODE? command.

NOTE   • For VSET, ISET and VOUT?, approximate values are output because the calibration has not been executed yet.

3-5   Connection to PAE Series

Outlines of functions

1. The PIA3200 controls the power supply unit in the mode of "control of output voltage/current by external positive voltage (+10V)".

Internal modification of power supply unit

1. Slide the remote/local switch on rear panel to "REMOTE" side.
2. Remove short-circuit bars from   -   and   -   on the rear panel terminal board.
3. Turn the dial for output voltage and output current adjustment (including fine adjustment) on the front panel clockwise up to the maximum.
4. Turn on the OUTPUT switch on the front panel.

Attaching method

See Attaching Method [2] in Appendix B.

Wiring method

See Wiring Diagram [6] in Appendix C.

Functions added to PIA3200

1. Automatic reading of power supply unit ID
2. Control of output voltage by VSET command
3. Control of output current by ISET command
4. Overvoltage protection by OVSET command
5. Undervoltage protection by UVSET command
6. Monitored voltage read back by VOUT? read back command
7. Output ON/OFF control by OUT command
8. Output ON/OFF status read back by STS? read back command
9. Output stop by POW command

Checking operation

Command	Read back command	Operation to be checked
	ID?	The correct ID code is read.
OUT 1		The output is turned on.
	STS?	The ON state of output is read.
VSET		The output voltage can be controlled.
ISET		The output current can be controlled.
	VOUT?	The output voltage can be read.
OUT 0		The output is turned off.
	STS?	The OFF state of output is read.
POW		The power supply unit is powered off.

NOTE • For VSET, ISET and VOUT?, approximate values are output because the calibration has not been executed yet.

Others

For the high speed sequence operation of PIA3200, the following settings are required:

Power supply unit (PAE) .. Set the MODE switch on the front panel to "FAST".

TU01-PIA .... For the Voltage high speed mode. set the CC switch to "LOCAL".

For the current high speed mode, set the CV switch to "LOCAL".

3-6   Connection to PAL Series

NOTE   • PIA4810/4820 can not control PAL series.

Outlines of functions

The PIA3200 controls the power supply unit in the mode of "control of output voltage/current by external positive voltage ".

Internal modification of power supply unit

1. Remove jumpers from   -   and   -   on the rear panel terminal board.
2. Turn the dial for output voltage and output current adjustment (including fine adjustment) on the front panel clockwise up to the maximum.
3. Turn on the OUTPUT switch on the front panel.

Attaching method

Types II_1, II_2 and III .... Attaching Method [4] in Appendix B

Types I_2 and I_3 .... Attaching Method [5] in Appendix B

Wiring method

See Wiring Diagram [7] in Appendix C.

(For the power supply unit of P specification, see Wiring Diagram [8] also and refer to Section 3-7.)

Functions added to PIA3200

1. Automatic reading of power supply unit ID
2. Control of output voltage by VSET command
3. Control of output current by ISET command
4. Overvoltage protection by OVSET command
5. Undervoltage protection by UVSET command
6. Monitored voltage read back by VOUT? read back command
7. Output ON/OFF control by OUT command
8. Output ON/OFF status read back by STS? read back command

Checking operation

Command	Read back command	Operation to be checked
	ID?	The correct ID code is read.
OUT 1		The output is turned on.
	STS?	The ON state of output is read.
VSET		The output voltage can be controlled.
ISET		The output current can be controlled.
	VOUT?	The output voltage can be read.
OUT 0		The output is turned off.
	STS?	The OFF state of output is read.

NOTE • For VSET, ISET and VOUT?, approximate values are output because the calibration has not been executed yet.

3-7 Connection to power supply unit of P Specification

Some of the power supply units of PAD-L and PAL Series have the Letter "P" at the end of their model names, and they are called " power supply units of P specification ". The P specification is an optional specification that provides a high speed overvoltage protection function and a contact signal output function.

Outlines of functions

The power supply unit of P specification has a 6-pin DIN connector on its' rear panel . By connector this DIN connector to the J2 connector of TU01-PIA by the accessory cable, various status signals can be from the power supply unit to PIA series.

Wiring method

See Wiring Diagram [8] in Appendix C.

Functions added to PIA series

The following bits in status register become effective:

CV, CC, POW

By using these status bits, some service requests can be issued and alarm operation can be performed. Note that OVP status is treated as POW status.

Checking operation

Read back command	Operation to be checked
STS?	For CV operation
	bit0(cv)=1, bitl (cc)=0, bit5(pow)=0
	For CC operation
	bit0(cv)=0, bitl (cc)= 1, bit5(pow)=0
	For power-off
	bit0(cv)=X. bitl (cc)=X, bit5 (pow)=1

APPENDIX A   Table of IDs and connection methods by power supply units

(Table of IDs and connection methods by power supply units 1/3)

Model name	ID No.	ID switch *1 — :ON, — :OFF 1	2	4	8	16	32	64	NC	Connection method Section	Attaching method	Wiring diagram	J3—n	Remarks
PAB 18— 1A	16	—	—	—	—	—	—	—	—	3—2	1	1(2)	7(Purple)	*2
PAB 18— 1.8A	17	—	—	—	—	—	—	—	—	3—2	1	1(2)	7(Purple)	*2
PAB 18— 3A	18	—	—	—	—	—	—	—	—	3—2	1	1(2)	7(Purple)	*2
PAB 32— 1.2A	19	—	—	—	—	—	—	—	—	3—2	1	1(2)	8(Gray)	*2
PAB 32— 2A	20	—	—	—	—	—	—	—	—	3—2	1	1(2)	8(Gray)	*2
PAB 70— 1A	21	—	—	—	—	—	—	—	—	3—2	1	1(2)	8(Gray)	*2
PAB 110— 0.6A	22	—	—	—	—	—	—	—	—	3—2	1	1(2)	10(White)	*2
PAB 250— 0.25A	23	—	—	—	—	—	—	—	—	3—2	1	1(2)	10(White)	*2
PAB 350— 0.1A	24	—	—	—	—	—	—	—	—	3—2	1	1(2)	10(White)	*2
PAD 8— 20 L/LP	26	—	—	—	—	—	—	—	—	3—3	2	3	7(Purple)	Type I_2
PAD 8— 30 L/LP	27	—	—	—	—	—	—	—	—	3—4	2	4	7(Purple)	Type I_3
PAD 8— 50 L/LP	28	—	—	—	—	—	—	—	—	3—4	2	5	7(Purple)	Type II
PAD 8— 100 L	29	—	—	—	—	—	—	—	—	3—4	2	5	7(Purple)	Type II
PAD 16— 10 L/LP	30	—	—	—	—	—	—	—	—	3—3	2	3	7(Purple)	Type 0
PAD 16— 18 L/LP	31	—	—	—	—	—	—	—	—	3—3	2	3	7(Purple)	Type I_2
PAD 16— 30 L/LP	32	—	—	—	—	—	—	—	—	3—4	2	4	7(Purple)	Type I_3
PAD 16— 50 L/LP	33	—	—	—	—	—	—	—	—	3—4	2	5	7(Purple)	Type II
PAD 16— 100 L/LP	34	—	—	—	—	—	—	—	—	3—4	2	5	7(Purple)	Type III
PAD 16— 200 L	35	—	—	—	—	—	—	—	—	3—4	3	5	7(Purple)	Type IV
PAD 16— 500 L	36	—	—	—	—	—	—	—	—	3—4	3	5	7(Purple)	Type VI
PAD 35— 5 L/LC	37	—	—	—	—	—	—	—	—	3—3	2	3	8(Gray)	Type 0
PAD 35— 10 L/LP	38	—	—	—	—	—	—	—	—	3—3	2	3	8(Gray)	Type I_2
PAD 35— 20 L/LP	39	—	—	—	—	—	—	—	—	3—4	2	4	8(Gray)	Type I_3
PAD 35— 30 L/LP	40	—	—	—	—	—	—	—	—	3—4	2	5	8(Gray)	Type II
PAD 35— 50 L/LP	41	—	—	—	—	—	—	—	—	3—4	2	5	8(Gray)	Type III
PAD 35— 60 L/LP	42	—	—	—	—	—	—	—	—	3—4	2	5	8(Gray)	Type III
PAD 35— 100 L/LP	43	—	—	—	—	—	—	—	—	3—4	3	5	8(Gray)	Type IV
PAD 35— 200 L/LP	44	—	—	—	—	—	—	—	—	3—4	3	5	8(Gray)	Type V
PAD 35— 300 LPT	45	—	—	—	—	—	—	—	—	3—4	3	5	8(Gray)	Type V

Model name	ID No.	ID switch *1 —:ON, —:OFF 1	2	4	8	16	32	64	NC	Section	Connection method Attaching method	Wiring diagram	J3-n	Remarks
PAD 55- 3L	46	—	—	—	—	—	—	—	—	3-3	2	3	8(Gray)	Type 0
PAD 55- 6L	47	—	—	—	—	—	—	—	—	3-3	2	3	8(Gray)	Type I_2
PAD 55- 10L	48	—	—	—	—	—	—	—	—	3-4	2	4	8(Gray)	Type I_3
PAD 55- 20L	49	—	—	—	—	—	—	—	—	3-4	2	5	8(Gray)	Type II
PAD 55- 35L	50	—	—	—	—	—	—	—	—	3-4	2	5	8(Gray)	Type III
PAD 55- 60L	51	—	—	—	—	—	—	—	—	3-4	3	5	8(Gray)	Type IV
PAD 55-120L	52	—	—	—	—	—	—	—	—	3-4	3	5	8(Gray)	Type V
PAD 60-200LPT	53	—	—	—	—	—	—	—	—	3-4	3	5	8(Gray)	Type V
PAD 70- 2.5L	54	—	—	—	—	—	—	—	—	3-3	2	3	8(Gray)	Type 0
PAD 70- 5L	55	—	—	—	—	—	—	—	—	3-3	2	3	8(Gray)	Type I_2
PAD 70- 8L	56	—	—	—	—	—	—	—	—	3-4	2	4	8(Gray)	Type I_3
PAD 70- 15L	57	—	—	—	—	—	—	—	—	3-4	2	5	8(Gray)	Type II
PAD110- 1.5L	58	—	—	—	—	—	—	—	—	3-3	2	3	10(White)	Type 0
PAD110- 3L	59	—	—	—	—	—	—	—	—	3-3	2	3	10(White)	Type I_2
PAD110- 5L	60	—	—	—	—	—	—	—	—	3-4	2	4	10(White)	Type I_3
PAD110- 10L	61	—	—	—	—	—	—	—	—	3-4	2	5	10(White)	Type II
PAD110- 20L	62	—	—	—	—	—	—	—	—	3-4	2	5	10(White)	Type III
PAD110- 30L	63	—	—	—	—	—	—	—	—	3-4	3	5	10(White)	Type IV
PAD110- 60L	64	—	—	—	—	—	—	—	—	3-4	3	5	10(White)	Type V
PAD160- 1L	65	—	—	—	—	—	—	—	—	3-3	2	3	10(White)	Type 0
PAD160- 2L	66	—	—	—	—	—	—	—	—	3-3	2	3	10(White)	Type I_2
PAD160- 3.5L	67	—	—	—	—	—	—	—	—	3-4	2	4	10(White)	Type I_3
PAD160- 7L	68	—	—	—	—	—	—	—	—	3-4	2	5	10(White)	Type II
PAD250- 2.5L	69	—	—	—	—	—	—	—	—	3-4	2	4	10(White)	Type I_3
PAD250- 4.5L	70	—	—	—	—	—	—	—	—	3-4	2	5	10(White)	Type II
PAD250- 8L	71	—	—	—	—	—	—	—	—	3-4	3	5	10(White)	Type III
PAD250- 15L	72	—	—	—	—	—	—	—	—	3-4	3	5	10(White)	Type IV
PAD500- 2L	73	—	—	—	—	—	—	—	—	3-4	4	9	10(White)	Type II

Model name	ID No.	ID switch *1 ON,— :OFF 1 2 4 8 16 32 64 NC								Connection method Section method	Attaching method	Wiring diagram	J3-n	Remarks
PAE 35- 10	75								—	3-5	2	6	8 (Gray)	
PAE 35- 20	76								—	3-5	2	6	8 (Gray)	
PAE 35- 30	77								—	3-5	2	6	8 (Gray)	
PAL 10- 100P	79								—	3-6	4	7	7 (Purple)	Type II_2
PAL 16- 20	80								—	3-6	5	7	7 (Purple)	Type I_2
PAL 16- 40	81								—	3-6	5	7	7 (Purple)	Type I_3
PAL 16- 60	82								—	3-6	4	7	7 (Purple)	Type I_1
PAL 20- 50	83								—	3-6	4	7	7 (Purple)	Type II_1
PAL 35- 10	84								—	3-6	5	7	8 (Gray)	Type II_2
PAL 35- 20	85								—	3-6	5	7	8 (Gray)	Type I_3
PAL 35- 30	86								—	3-6	4	7	8 (Gray)	Type II_1
PAL 35- 50P	87								—	3-6	4	7	8 (Gray)	Type III

* ID switch setting example

For PAB 18-1A ··········

OFF / ON

1 2 4 8 16 32 64 NC
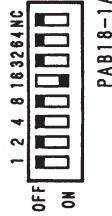
PAB18-1A (ID16)

*1 Setting ID switch is necessary to use PIA3200 (Setting ID switch is not necessary to use PIA4810/4820).

*2 To lengthen the wire, replace J3-n with the wire of the same color provided with TU01-PIA as accessory.
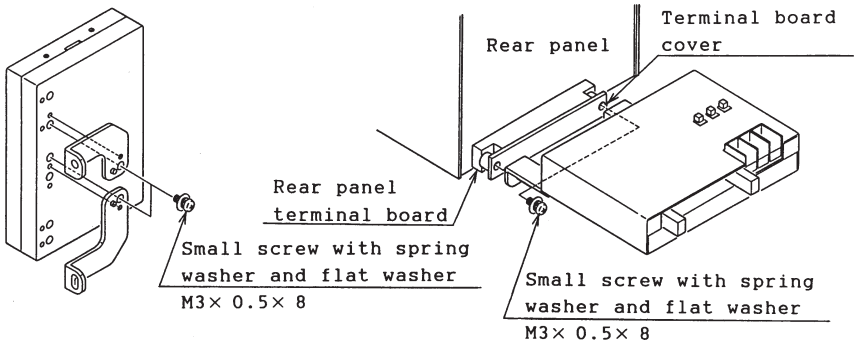
APPENDIX B   Attaching method

Attach TU01-PIA to the rear panel terminal board of the power supply unit.

⚠WARNING · For the purpose of safety, use the specified screws correctly, Especially, the specified screws (screws provided as accessories) must be used for fixing the stays because the insulation space must be secured.
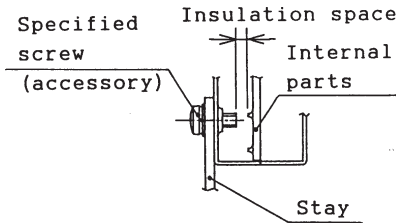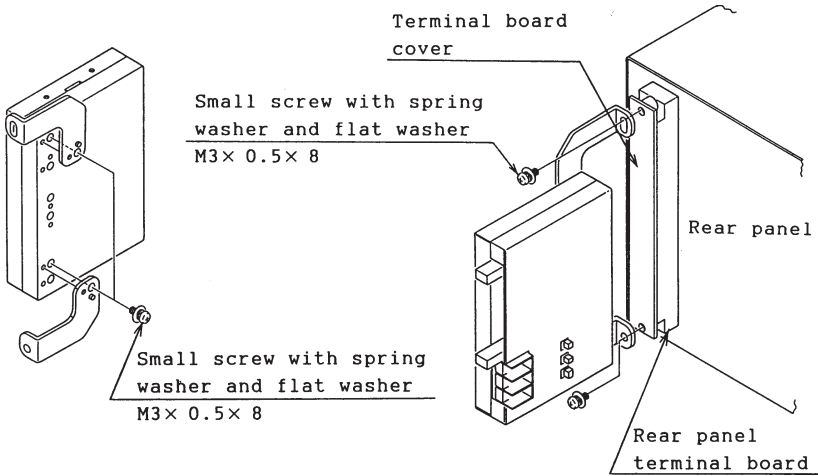

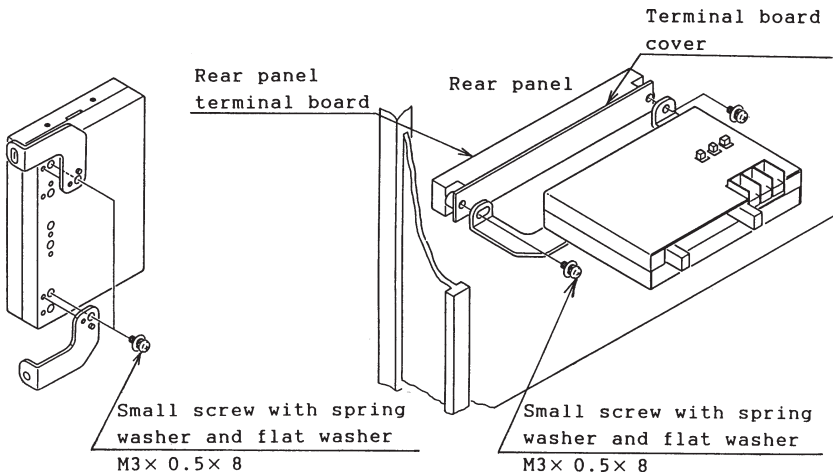· Attach the terminal board cover with TU01-PIA.
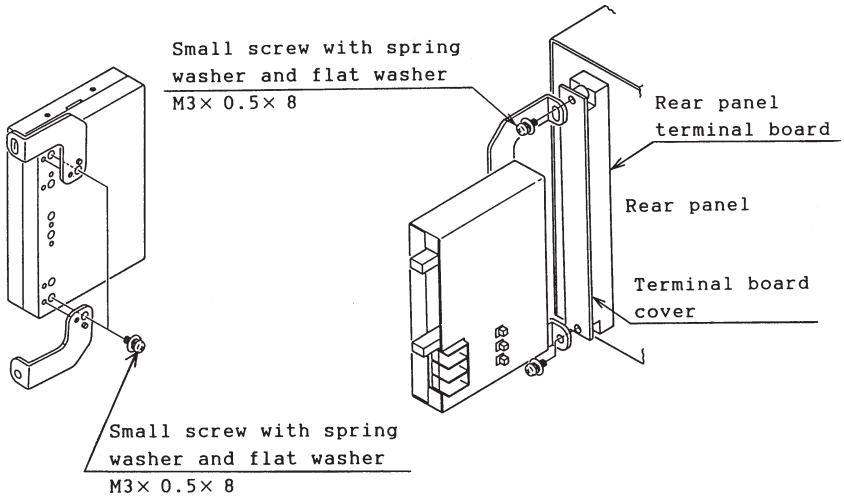

Attaching Method [1]
<PAB-A Series>

Attaching Method [2]
\<Types 0, I2, I3, II and III of PAD-L Series\>
\<PAE Series\>

Terminal board cover

Small screw with spring washer and flat washer
M3× 0.5× 8

Rear panel

Small screw with spring washer and flat washer
M3× 0.5× 8

Rear panel terminal board

Attaching Method [3]
\<Types IV, V and VI of PAD-L Series\>

Terminal board cover

Rear panel terminal board

Rear panel

Small screw with spring washer and flat washer
M3× 0.5× 8

Small screw with spring washer and flat washer
M3× 0.5× 8

Attaching Method [4]
<Types II₂, II₃ and III of PAL Series>
<Type500-2L>

Small screw with spring
washer and flat washer
M3× 0.5× 8

Rear panel
terminal board

Rear panel

Terminal board
cover

Small screw with spring
washer and flat washer
M3× 0.5× 8

Attaching Method [5]
<Types I₂ and I₃ of PAL Series>

Small screw with spring
washer and flat washer
M3× 0.5× 8

Rear panel
terminal board

Rear panel

Terminal board
cover

Small screw with spring
washer and flat washer
M3× 0.5× 8

APPENDIX C   Wiring method

The wiring diagrams in this appendix show how the wiring should be done for J2 (for the power supply unit of P specification) and J3. The colors of the wires in the diagrams correspond to the colors of the wires of the accessory cable.

Connector J1 of TU01-PIA should be connected below.

PIA3200 .... J1 should be connected to CH1 or CH2 of PIA3200 by a 26P flat cable(PIA3200 option).

PIA4810/4820 .... J1 should be connected to CH1(J1) or CH2(J2) of control board OP01-PIA by a 26P flat cabel(OP01-PIA option).

Connection cable for J3

BRN	Brown
RED	Red
ORN	Orange
YEL	Yellow
GRN	Green
BLU	Blue
PRP	Purple
GRA	Gray
WHT	White
BLK	Black

Wiring Diagram[1]
<PAB-A Series for CV control>

(CV control)

*1 Since the connection pin varies with the power supply unit, see Appendix A.

*2 The wire to the front panel should be replaced with the accessory wire of the same color.
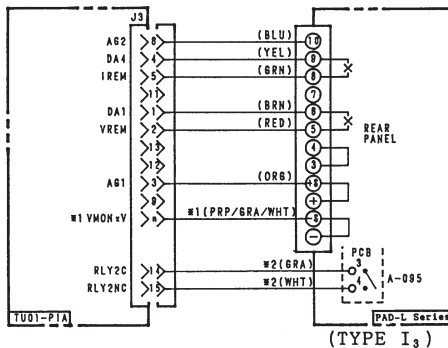

Wiring Diagram[2]
<PAB-A Series for CC control>

(CC control)
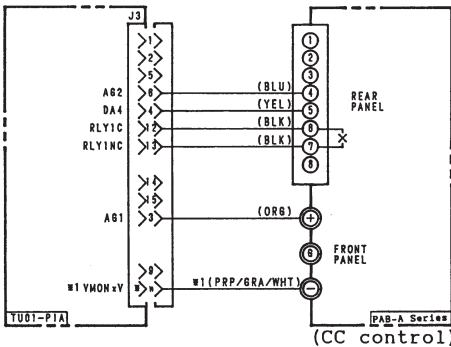
*1 Since the connection pin varies with the power supply unit, see Appendix A.

*2 The wire to the front panel should be replaced with the accessory wire of the same color.

Wiring Diagram[3]
<Types 0 and I2 of PAD-L Series>

(TYPE 0, I₂)
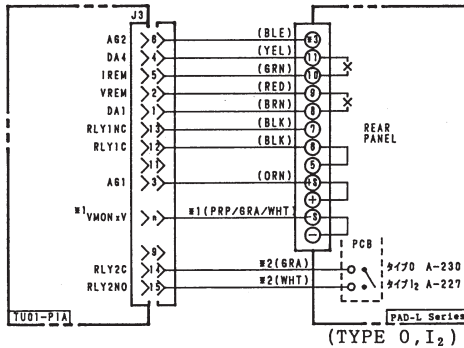
*1 Since the connection pin varies with the power supply unit, see Appendix A.

*2 Replace the cable with the accessory extension cable. Since the extension cable must be connected to the power supply unit by solder, cut off the terminal from it.

*3 For Type 0 PAD-L Series, terminal 12 is used; for type I2, terinal 12A is used

Wiring Diagram[4]
<Types I3 of PAD-L Series>

(TYPE I₃)

*1 Since the connection pin varies with the power supply unit, see Appendix A.

*2 Replace the cable with the accessory extension cable. Since the extension cable must be connected to the power supply unit by solder, cut off the terminal from it.
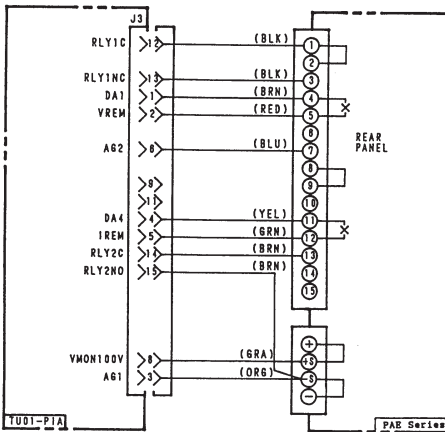
Wiring Diagram[5]
<Types II, III, IV, V and VI of PAD-L Series (except PAD500-2L, see Wiring Dagram[9]) >

(TYPE II, III, IV, V, VI)
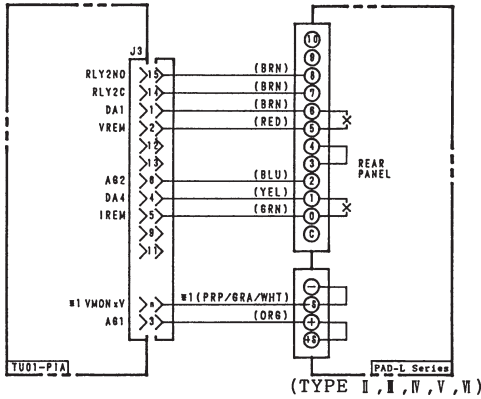
*1 Since the connection pin varies with the power supply unit, see Appendix A.
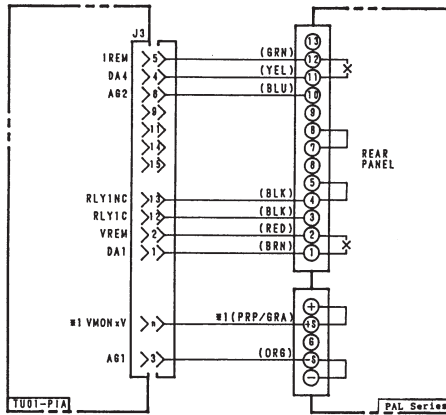
Wiring Diagram[6]
<PAE Series>

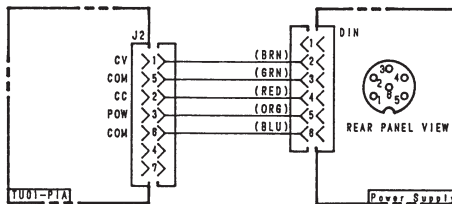## Wiring Diagram[7]
<PAL Series>

*1 Since the connection pin varies with the power supply unit, see Appendix A.

Wiring Diagram[8]
<Power supply unit of P specification>

*1 These wires are connected to the power supply unit collectively by a DIN connector.

Wiring Diagram[9]
<PAD500-2L>