

# Connection to PAD-L Series

## 1. Control Parameters

Four different method (PAD-1 through PAD-4) can be used for connection to the PAD-L series, depending on the control parameters.

The following parameters can be controlled.

Table 1 Control Parameters

✓ : Can be controlled No mark : Uncontrollable ✕ : Subject to certain conditions

Connection	PAD-1	PAD-2	PAD-3	PAD-4
Control board	OP01-PIA *1			OP02-PIA
Peripheral option	TU01+SH	TU01	—	—
Output voltage setting	✓	✓	✓	✓
Output current setting	✕*2	✕*2	✓	✕*2
Output voltage readback	✓	✓		
Output current readback (accuracy 0.3% of full scale)	✓			
Output ON/OFF*3	✕*2	✕*2		✕*2
Power switch OFF	✕*4	✕*4		
Power switch OFF monitoring	✕*5,*6	✕*5,*6		
C.V mode monitoring	✕*5	✕*5		
C.C mode monitoring	✕*5	✕*5		

\*1. OP01-PIA cannot control models with a rated output voltage exceeding 500 V.

\*2. Select between “Output Current Settings”and”Output ON/OFF”

\*3. The output ON/OFF function facilitates setting of the CV reference for Types 0 and I2,and setting of the CC referece for types other than those above,to 0.

\*4. Type 0, I2, and I3 of the PAD-L series are uncontrollable.

\*5. Installation by us of a DIN connector is required (some types are not supported).

\*6. For types 0 and I2 of the PAD-L series, rectifier circuit is monitored instead of POWER switch.

## 2. PAD-1

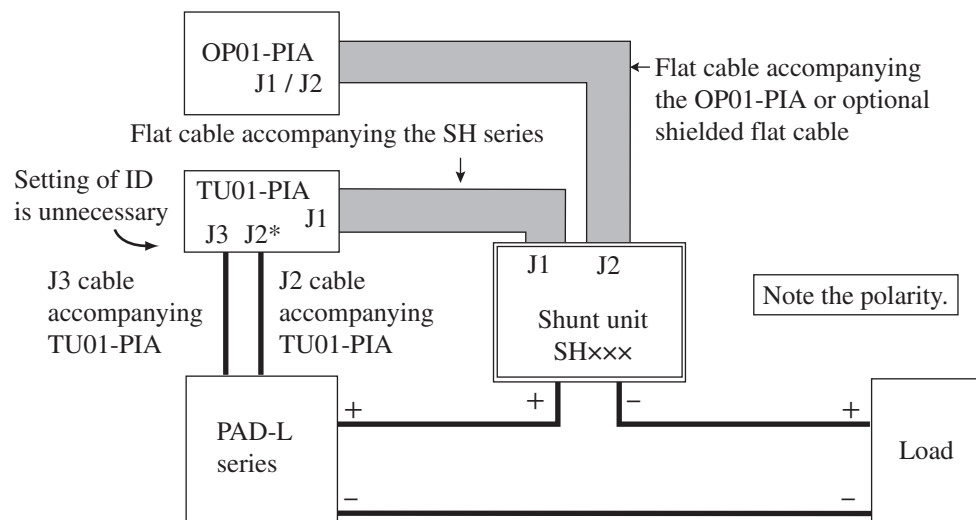
When the OP01-PIA and the terminal unit TU01-PIA are used in combination with the shunt unit SH series. OP01-PIA cannot control models with a rated output voltage exceeding 500 V.

If parameter C.V/C.C-mode monitoring or power switch OFF monitoring are to be performed, modifying by Kikusui is necessary for installation of a DIN connector.

The application of the SH series allows readback of accurate current values (with an accuracy 0.3% of full scale).

To connect the OP01-PIA to the SH series, use the flat cable accompanying the OP01-PIA. To connect the SH series to the TU01-PIA, use the flat cable accompanying the SH series.

To connect the TU01-PIA to the PAD-L series, use the cable accompanying the TU01-PIA. For details, see the operation manual for each device.



\*: Connects only when monitoring of the "C.V/C.C-mode" or "power switch OFF"

Fig.1 PAD-1 connections

### 3. PAD-2

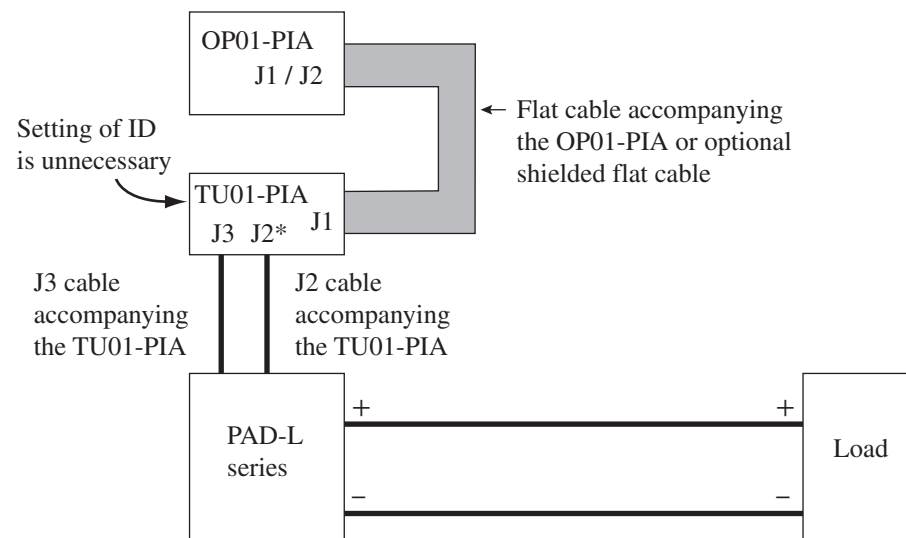
When the OP01-PIA is used together with the terminal unit TU01-PIA, OP01-PIA cannot control models with a rated output voltage exceeding 500 V.

If parameter C.V/C.C-mode monitoring or power switch OFF monitoring are to be performed, modifying by Kikusui is necessary for installation of a DIN connector.

To connect the OP01-PIA to the TU01-PIA, use the flat cable accompanying the OP01-PIA.

To connect the TU01-PIA to the PAD-L series, use the cable accompanying the TU01-PIA.

For details, see the operation manual for each device.



\*: Connects only when monitoring of the “C.V/C.C-mode” or “power switch OFF”

Fig.2 PAD-2 connections

## 4. PAD-3/PAD-4

### ■ PAD-3

The OP01-PIA is required to be installed in the PIA4800 series. Connect the OP01-PIA and the PAD-L series (at the terminal block on the rear panel) according to the pin layout described in Table 2 / Table 3 with the cable J1 / J2 as it is prepared in the Chapter 8 "OP01-PIA" of PIA4800 series operation manual. This type of connection can not control models with rated output voltage exceeding 500 V.

### ■ PAD-4

The OP02-PIA is required to be installed in the PIA4800 series. Connect the OP02-PIA and the PAD-L series (at the terminal block on the rear panel) according to the pin layout described in Table 2 / Table 3 with the installed OP02-PIA as referred to the Chapter 9 "OP02-PIA" of PIA4800 series operation manual. In case the TYPE I3 is used, the output current control and the output ON/OFF use the same terminal (Terminal 10), so please select either parameter.

## Connecting to the PAD-L Series

### ■ PAD-L TYPE0, I2 series

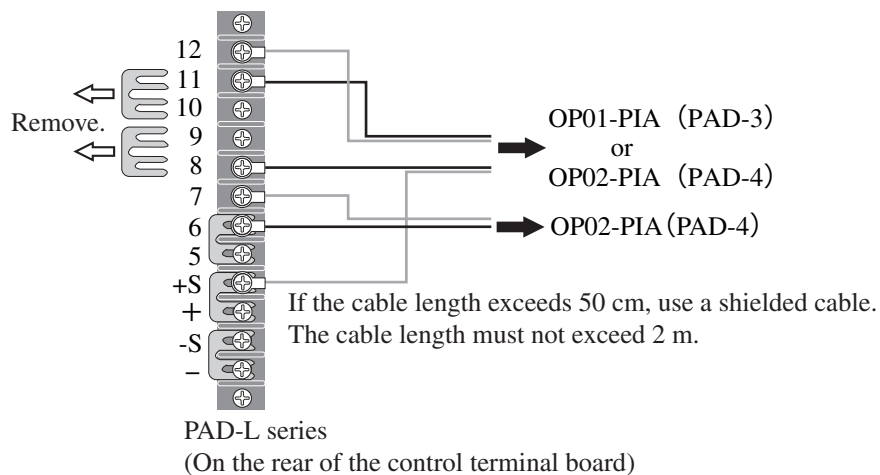


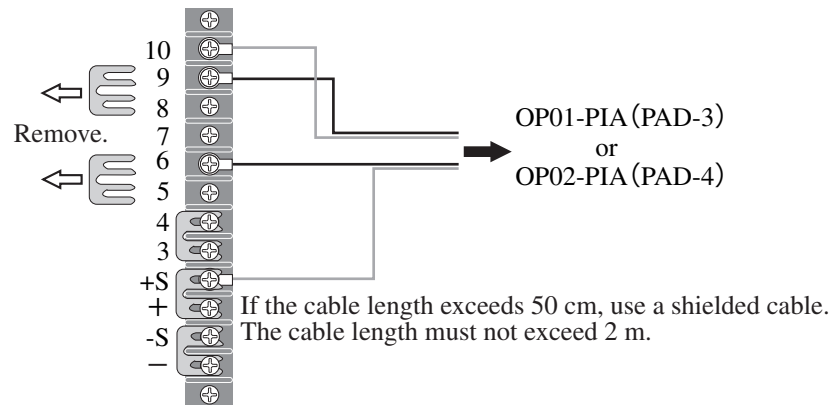
Fig.3 PAD-3/PAD-4 (TYPE0, I2) connections

Table 2 Pin layout for PAD-3 and PAD-4 (TYPE0, I2)

PAD-L TYPE0, I2			
PAD-L series Control terminal board	OP01-PIA J1/J2	OP02-PIA CH1/CH2	Remarks
Terminal 8	4	A	Output voltage control
Terminal +S	2	B	Common for output voltage control
Terminal 11	6	C	Output current control
Terminal 12	3	D	Common for output current control
Terminal 6	—	E	Output ON/OFF
Terminal 7	—	F	Common for output ON/OFF

### ■ PAD-L TYPE-I3 series

“Output Current Control” and “Output ON/OFF” use the same terminal. Select between the two.



PAD-L series  
(On the rear of the control terminal board)

Fig.4 PAD-3/PAD-4 (TYPE I3) connections

Table 3 Pin layout for PAD-3 and PAD-4 (TYPE I3)

PAD-L TYPE I3			
PAD-L series Control terminal board	OP01-PIA J1/J2	OP02-PIA CH1/CH2	Remarks
Terminal 6	4	A	Output voltage control
Terminal +S	2	B	Common for output voltage control
Terminal 9	6	C	Output current control
Terminal 10	3	D	Common for output current control
Terminal 9	—	E	Output ON/OFF
Terminal 10	—	F	Common for output ON/OFF

■ PAD-L TYPE II, III, IV, V, VI

“Output Current Control” and “Output ON/OFF” use the same terminal. Select between the two.

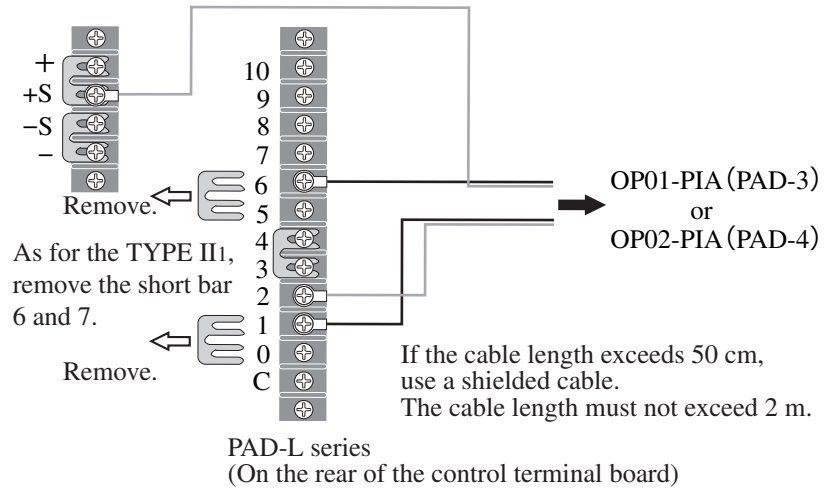


Fig.5 PAD-3/PAD-4 (TYPE II, III, IV, V, VI) connections

Table 4 Pin layout for PAD-3 and PAD-4 (TYPE II, III, IV, V, VI)

PAD-L TYPE I, III, IV, V, VI			
PAD-L series Control terminal board	OP01-PIA J1/J2	OP02-PIA CH1/CH2	Remarks
Terminal 6	4	A	Output voltage control
Terminal +S	2	B	Common for output voltage control
Terminal 1	6	C	Output current control
Terminal 2	3	D	Common for output current control
Terminal 1	—	E	Output ON/OFF
Terminal 2	—	F	Common for output ON/OFF



## 5. Preparation for Starting Control

### Settings of the PAD-L unit

Before starting control operation, turn the output setting knob on the PAD-L series clockwise until it comes to a stop.

#### NOTE

- To prevent the output setting knob from rotating, use of a guard cap is recommended. Note that the calibration value changes if the output setting knob is turned following calibration.

### Setting and checking PAD-L Model ID

The newest version of ID list can be downloaded from download service of Kikusui website (<http://www.kikusui.co.jp/en/download/>).

Table 5 ID list

ID No	Model	Output-current setting range [V]	Output-current setting range [A]	SH series	Switch setting position on <sup>*1</sup> the control board	
					100/200 <sup>*2</sup>	101/201 <sup>*2,*3</sup>
026	PAD8-20L/LP	0-8.000	0-20.000	SH50	M	L/NC
027	PAD8-30L/LP	0-8.000	0-30.000	SH50	M	L/NC
028	PAD8-50L/LP	0-8.000	0-50.00	SH50	M	L/NC
029	PAD8-100L	0-8.000	0-100.00	Special orders	L	L/NC
030	PAD16-10L/LP	0-16.000	0-10.000	SH10	M	L/NC
031	PAD16-18L/LP	0-16.000	0-18.000	SH50	M	L/NC
032	PAD16-30L/LP	0-16.000	0-30.000	SH50	M	L/NC
033	PAD16-50L/LP	0-16.000	0-50.00	SH50	M	L/NC
034	PAD16-100L/LP	0-16.000	0-100.00	Special orders	L	L/NC
035	PAD16-200L	0-16.000	0-200.00	Special orders	L	L/NC
036	PAD16-500L	0-16.000	0-500.0	Special orders	L	L/NC
037	PAD35-5L	0-35.000	0-5.000	SH10	M	L/NC
038	PAD35-10L/LP	0-35.000	0-10.000	SH10	M	L/NC
039	PAD35-20L/LP	0-35.000	0-20.000	SH50	M	L/NC
040	PAD35-30L/LP	0-35.000	0-30.000	SH50	M	L/NC
041	PAD35-50L/LP	0-35.000	0-50.00	SH50	M	L/NC
042	PAD35-60L/LP	0-35.000	0-60.00	Special orders	M	L/NC
043	PAD35-100L/LP	0-35.000	0-100.00	Special orders	M	L/NC
044	PAD35-200L/LP	0-35.000	0-200.00	Special orders	L	L/NC
045	PAD35-300LPT	0-35.000	0-300.00	Special orders	L	L/NC
046	PAD55-3L	0-55.00	0-3.0000	SH10	M	L/NC
047	PAD55-6L	0-55.00	0-6.000	SH10	M	L/NC
048	PAD55-10L	0-55.00	0-10.000	SH10	M	L/NC
049	PAD55-20L	0-55.00	0-20.000	SH50	M	L/NC

ID No	Model	Output-current setting range [V]	Output-current setting range [A]	SH series	Switch setting position on the control board <sup>*1</sup>	
					100/200 <sup>*2</sup>	101/201 <sup>*2,*3</sup>
050	PAD55-35L	0-55.00	0-35.000	SH50	M	L/NC
051	PAD55-60L	0-55.00	0-60.00	Special orders	M	L/NC
052	PAD55-120L	0-55.00	0-120.00	Special orders	M	L/NC
122	PAD60-35L	0-60.00	0-35.000	SH50	M	L/NC
123	PAD60-60L	0-60.00	0-60.00	Special orders	M	L/NC
124	PAD60-120L	0-60.00	0-120.00	Special orders	M	L/NC
053	PAD60-200LPT	0-60.00	0-200.00	Special orders	L	L/NC
054	PAD70- 2.5L	0-70.00	0-2.5000	SH10	M	L/NC
055	PAD70-5L	0-70.00	0-5.000	SH10	M	L/NC
056	PAD70-8L	0-70.00	0-8.000	SH10	M	L/NC
057	PAD70-15L	0-70.00	0-15.000	SH50	M	L/NC
058	PAD110-1.5L	0-110.00	0-1.5000	Special orders	M	L/NC
059	PAD110-3L	0-110.00	0-3.0000	SH10	M	L/NC
060	PAD110-5L	0-110.00	0-5.000	SH10	M	L/NC
061	PAD110-10L	0-110.00	0-10.000	SH10	M	L/NC
062	PAD110-20L	0-110.00	0-20.000	SH50	M	L/NC
063	PAD110-30L	0-110.00	0-30.000	SH50	M	L/NC
064	PAD110-60L	0-110.00	0-60.00	Special orders	M	L/NC
065	PAD160-1L	0-160.00	0-1.0000	Special orders	M	L/NC
066	PAD160-2L	0-160.00	0-2.0000	Special orders	M	L/NC
067	PAD160-3.5L	0-160.00	0-3.5000	SH10	M	L/NC
068	PAD160-7L	0-160.00	0-7.000	SH10	M	L/NC
069	PAD250-2.5L	0-250.00	0-2.5000	SH10	M	L/NC
070	PAD250-4.5L	0-250.00	0-4.500	SH10	M	L/NC
071	PAD250-8L	0-250.00	0-8.000	SH10	M	L/NC
072	PAD250-15L	0-250.00	0-15.000	SH50	M	L/NC
073	PAD500-2L	0-500.0	0-2.0000	Special orders	M	L/NC
074	PAD600-1.5L	0-600.0	0-1.5000	—	M	NC

\*1. The setting positions for the switch of OP01-PIA or OP02-PIA.

\*2. The number "100" and "101" are applied for the switch of Channel 1, "200" and "201" are for the switch of Channel 2.

\*3. The setting positions of "L" is used for OP01-PIA, "NC" is used for OP02-PIA.

For the ID settings, see 3.4, "Configuration Software" of PIA4800 series operation manual.



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## Calibrating PAD-L

When a new Model ID has been set, be sure to perform calibration.

Calibration can be performed for two parameters: output voltage and output current.

For the calibration procedure, see Chapter 3, “Calibration by Device Configuration” of PIA4800 series operation manual.

## Checking PAD-L operation

Following calibration, set a voltage via the GPIB or RS232C to check the performance of the PAD-L.

### Checking procedure (example)

By sending the message “NODE 1;CH 1;VSET 12.0” to the PIA4800 series, confirm that the preset voltage on the PAD-L series is set at 12.0 V.

## 6. Commands

For the commands, see “Device Messages” of Connecting & Programming Guide.