

INSTRUCTION MANUAL

REGULATED DC POWER SUPPLY PR-A SERIES

PR18-1.2A PR18-3A
PR18-5A PR36-3A

■ **About Brands and Trademarks**

“TEXIO” is the product brand name of our industrial electronic devices.

All company names and product names mentioned in this manual are the trademark or the registered trademark of each company or group in each country and region.

■ **About the Instruction Manual**

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Note.

This instruction manual is described for four models.
(PR18-1.2A,PR18-3A,PR18-5A,PR36-A)
Refer to item applied to your product.




USING THE PRODUCT SAFELY

■ Preface

To use the product safely, read instruction manual to the end. Before using this product, understand how to correctly use it. If you read the manuals but you do not understand how to use it, ask us or your local dealer. After you read the manuals, save it so that you can read it anytime as required.

■ Pictorial indication

The manuals and product show the warning and caution items required to safely use the product. The following pictorial indication is provided.

| Pictorial indication | |
|--|---|
|  | Some part of this product or the manuals may show this pictorial indication. In this case, if the product is incorrectly used in that part, a serious danger may be brought about on the user's body or the product. To use the part with this pictorial indication, be sure to refer to the manuals. |
|   | If you use the product, ignoring this indication, you may get killed or seriously injured. This indication shows that the warning item to avoid the danger is provided. If you incorrectly use the product, ignoring this indication, you may get slightly injured or the product may be damaged. This indication shows that the caution item to avoid the danger is provided. |

Please be informed that we are not responsible for any damages to the user or to the third person, arising from malfunctions or other failures due to wrong use of the product or incorrect operation, except such responsibility for damages as required by law.

USING THE PRODUCT SAFELY



■ Do not remove the product's covers and panels

Never remove the product's covers and panels for any purpose. Otherwise, the user's electric shock or fire may be incurred.

■ Warning on using the product

Warning items given below are to avoid danger to user's body and life and avoid the damage or deterioration of the product. Use the product, observing the following warning and caution items.

■ Warning items on power supply

● Power supply voltage

The rated power supply voltages of the product are 100, 120, 220 and 240VAC. The rated power supply voltage for each product should be confirmed by reading the label attached on the back of the product or by the "rated" column shown in the instruction manual. The specification of power cord attached to the products is rated to 125VAC for all products which are designed to be used in the areas where commercial power supply voltage is not higher than 125VAC. Accordingly, you must change the power cord if you want to use the product at the power supply voltage higher than 125VAC. If you use the product without changing power cord to 250VAC rated one, electric shock or fire may be caused. When you used the product equipped with power supply voltage switching system, please refer to the corresponding chapter in the instruction manuals of each product.

● Power cord

(IMPORTANT) The attached power cord set can be used for this device only.

If the attached power cord is damaged, stop using the product and call us or your local dealer. If the power cord is used without the damage being removed, an electric shock or fire may be caused.

● Protective fuse

If an input protective fuse is blown, the product does not operate. For a product with external fuse holder, the fuse may be replaced. As for how to replace the fuse, refer to the corresponding chapter in the instruction manual. If no fuse replacement procedures are indicated, the user is not permitted to replace it. In such case, keep the case closed and consult us or your local dealer. If the fuse is incorrectly replaced, a fire may occur.

USING THE PRODUCT SAFELY

■ **Warning item on Grounding**

If the product has the GND terminal on the front or rear panel surface, be sure to ground the product to safely use it.

■ **Warnings on Installation environment**

● **Operating temperature and humidity**

Use the product within the operating temperature indicated in the “rating” temperature column. If the product is used with the vents of the product blocked or in high ambient temperatures, a fire may occur. Use the product within the operating humidity indicated in the “rating” humidity column. Watch out for condensation by a sharp humidity change such as transfer to a room with a different humidity. Also, do not operate the product with wet hands. Otherwise, an electric shock or fire may occur.

● **Use in gas**

Use in and around a place where an inflammable or explosive gas or steam is generated or stored may result in an explosion and fire. Do not operate the product in such an environment. Also, use in and around a place where a corrosive gas is generated or spreading causes a serious damage to the product. Do not operate the product in such an environment.

● **Installation place**

Do not insert metal and inflammable materials into the product from its vent and spill water on it. Otherwise, electric shock or fire may occur.

■ **Do not let foreign matter in**

Do not insert metal and inflammable materials into the product from its vent and spill water on it. Otherwise, electric shock or fire may occur.

■ **Warning item on abnormality while in use**

If smoke or fire is generated from the product while in use, stop using the product, turn off the switch, and remove the power cord plug from the outlet. After confirming that no other devices catch fire, ask us or your local dealer.

USING THE PRODUCT SAFELY

■ **Input / Output terminals**

Maximum input to terminal is specified to prevent the product from being damaged. Do not supply input, exceeding the specifications that are indicated in the "Rating" column in the instruction manual of the product. Also, do not supply power to the output terminals from the outside. Otherwise, a product failure is caused.

■ **Calibration**

Although the performance and specifications of the product are checked under strict quality control during shipment from the factory, they may be deviated more or less by deterioration of parts due to their aging or others.

It is recommended to periodically calibrate the product so that it is used with its performance and specifications stable. For consultation about the product calibration, ask us or your local dealer.

■ **Daily Maintenance**

When you clean off the dirt of the product covers, panels, and knobs, avoid solvents such as thinner and benzene. Otherwise, the paint may peel off or resin surface may be affected. To wipe off the covers, panels, and knobs, use a soft cloth with neutral detergent in it.

During cleaning, be careful that water, detergents, or other foreign matters do not get into the product.

If a liquid or metal gets into the product, an electric shock and fire are caused.

During cleaning, remove the power cord plug from the outlet.

Use the product correctly and safely, observing the above warning and caution items. Because the instruction manual indicates caution items even in individual items, observe those caution items to correctly use the product.

If you have questions or comments about the manuals, ask us or E-Mail us.

1. OUTLINE

The PR-A Series is a serial control type regulated DC power supply. It is a constant voltage/current power supply whose output can be varied from 0 up to the rated values.

It is a compact unit which, provided with both voltage and current calibrated meters, allows both voltage and current to be monitored simultaneously. In terms of operability, the unit enables high precision, continues variability via coarse and fine adjust knobs.

We are confident that the unit's design conceived with the user's convenience in mind to enable advantages such as arrangement in easy-to-use configurations and its reliability will satisfy your needs very well.

With the PR-A Series, multiple units of the same model can be connected in parallel to set up a "one- control" master/slave configuration having increased current output.

2. FEATURES

- The PR-A Series is a constant voltage/current supply which features extremely low voltage and load fluctuation and ripple noise.
- Controls the output on and off by using output switch.
- The unit features separate voltage and current meters so that both voltage and current can be monitored simultaneously.
- Output voltage and current can be adjusted continuously to any desired values. Furthermore, the voltage can be preset easily and precisely using coarse and fine adjust knobs.
- The constant current circuit operators to protect against overload and output shorting. The limiting current can be preset from 0 up to the rated current, and the unit can also be used as a constant current supply.
- The units enables "one-control" operation via connection in series, or via parallel connection in a master/slave configuration.
- Using an optional rack-mounting adapter (RK-604), the PR Series can be installed on a EIA or JIS rack.

3. SPECIFICATION

| Item | PR18-1.2A | PR18-3A | PR18-5A | PR36-3A |
|--|----------------------|---------------------|---------------------|---------------------|
| Output Voltage (continuously variable, coarse and fine adjusts) | 0V to 18V | | | 0V to 36V |
| Output current(continuously variable) | 0A to 1.2A | 0A to 3A | 0A to 5A | 0A to 3A |
| Constant voltage characteristics | | | | |
| Input fluctuation (for surge of AC±100%) | 0.01%+2mV(3.8mV) | | | 0.01%+2mV(5.6mV) |
| Load fluctuation(for surge of 0% to 100%) | 0.01%+2mV(3.8mV) | | 0.01%+3mV(4.8mV) | 0.01%+2mV(5.6mV) |
| Ripple noise, rms (10Hz to 1MHz)※1 | 0.5mV rms | | | |
| Ripple peak(peak-to-peak)※1 | 2mVp-p | | | |
| Transient response (Output current 5% to 100%) | 100μs Typical | | | |
| Temperature coefficient | 150ppm/°C Typical | | | |
| Constant current characteristics | | | | |
| Input fluctuation (for surge of AC±100%) | 2mA | | | |
| Load fluctuation(for surge of 0% to 100%) | 15mA | | | |
| Ripple noise, rms (10Hz to 1MHz) ※1 | 2.4mArms | 6.0mArms | 10mArms | 6.0mArms |
| Ripple peak(peak-to-peak)※1 | 3.6mA _{p-p} | 12mA _{p-p} | 15mA _{p-p} | 12mA _{p-p} |
| Temperature coefficient | 500ppm/°C Typical | | | |
| Instrumentation | | | | |
| Voltmeter(2.5-level-F.S.) | 18V | | | 36V |
| Ammeter(2.5-level-F.S.) | 1.2A | 3A | 5A | 3A |
| Constant-voltage operation indicator | Green CV LED goes on | | | |
| Constant-current operation indicator | Red CC LED goes on | | | |

| Item | PR18-1.2A | PR18-3A | PR18-5A | PR36-3A |
|--|--|-------------------|--------------------|--------------------|
| Function | | | | |
| OUTPUT ON / OFF switching | Turn the output on and off. | | | |
| Serial connection (independent control mode) | Can be connected in series (within limits of ground proof voltage.) | | | |
| Parallel operation (master-slave mode) | Can be operated in "one - control" parallel configuration (only with other machines of same model) | | | |
| OUTPUT | | | | |
| Polarity | Positive or negative ground possible | | | |
| Output terminal (color) | + (red) 、 - (white) 、 GND (black) | | | |
| Ground proof voltage | ±250VDC | | | |
| Operating conditions | | | | |
| Operating Temperature/Humidity Range | 0 °C to 40 °C、 10% to 85%R.H. | | | |
| Storage Temperature/Humidity Range | -20 °C to 60 °C、 10% to 85%R.H. | | | |
| Cooling mechanism | Natural convection | | | |
| Power consumption | | | | |
| VA / W (For rated load of AC 100V) | Approx. 60VA/45W | Approx.125VA/100W | Approx. 200VA/165W | Approx. 225VA/170W |
| Input Voltage | AC100V/120V/200V/220V/240V ±10%、 50Hz/60Hz | | | |
| Dimensions and weight | | | | |
| Dimensions mm (hight×width×depth) | 147×104×180 | 147×104×215 | 147×138×230 | 147×138×230 |
| Max. Dimensions mm (hight×width×depth) | 161×108×200 | 167×108×265 | 167×142×290 | 167×142×290 |
| Weight | Approx. 3.8kg | Approx. 5.7kg | Approx. 8.1kg | Approx. 8.6kg |
| Accessory items | CD-ROM (Instruction manual) | | | |

※1 Measured with positive or negative grounded

Circuit and ratings subject to change without notice due to development in technology.

4. PERCAUTION FOR USE



1) Confirming the supply voltage

- * Use this unit within the specified range. The unit's rated voltage is single-phase 100/120/200/220/240VAC $\pm 10\%$ at 50/60Hz.
- * The rated voltage is indicated on the specification and name plate located beside the input connector on the rear panel.

2) Do not remove cover or panel

The user never open the case panel whatever may happen.

If the user needs to open case for replacing the fuse, changing the source voltage or repairing the internal circuit or parts, please contact your dealer or our distributor.



1) Precautions for connection of output terminals.

- * This units is a floating type power supply. For ordinary use, be sure that the MASTER/SLAVE switch on the rear panel is set to MASTER, and that either the (+) output terminal or the (-) output terminal is connected to the GND terminal (case GND) via the shorting bar.

2) Output current value setting

- * To set the constant current value, short-circuit output terminal (+) and (-) and deliver the output current

3) Set-up environment

- * Be sure to use this unit within the specified ambient temperature range of 0 to 40 °C.
- * Because the unit is cooled by natural convection, do not place objects on top, place the unit on or near any heat-emitting device, or use multiple units in any stacked configuration. Also use the unit in an environment that is as well cross-ventilated as possible.

5. EXPLANATION OF PANELS

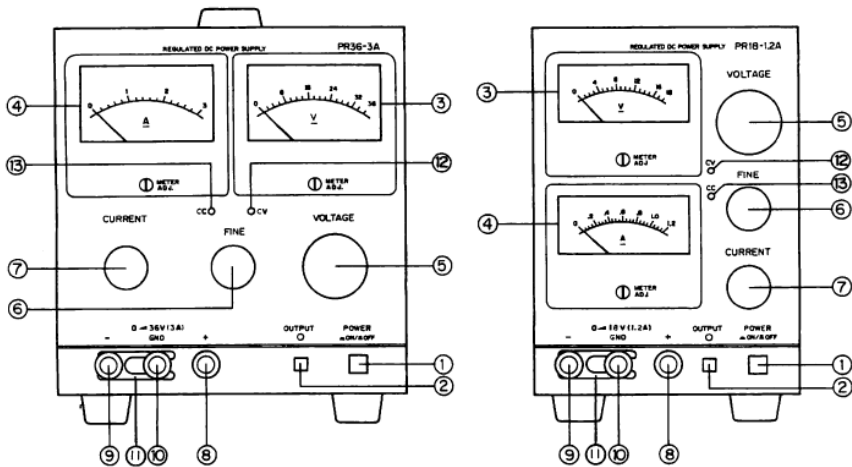


Figure1.

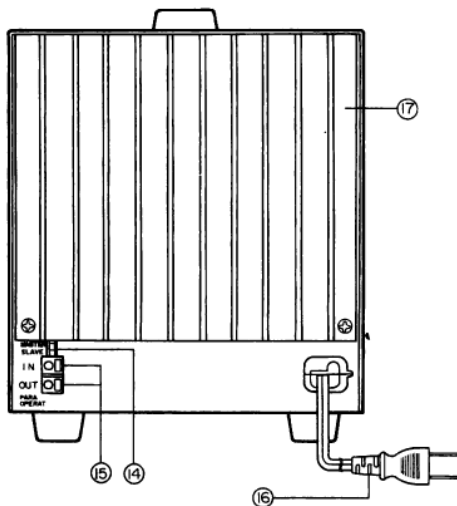


Figure2.

5-1. Front panel

①POWER ON/OFF

The power switch. The power supply should be on and operating when this switch is depressed.

②OUTPUT switch

Turns the output on and off.

When the output is turned on, the OUTPUT LED goes on.

③Voltmeter

A DC voltmeter that indicates the output voltage.

④Ammeter

A DC ammeter that indicates the output current.

⑤VOLTAGE COARSE

Coarse adjust knob for the output voltage.

⑥VOLTAGE FINE

Fine adjust knob for the output voltage.

⑦CURRENT

Knob for setting the current value in the constant current mode. It can be used to set limiting value for the output current.

⑧Output terminal (+)

Terminal for tapping of (+) output voltages.

⑨Output terminal (-)

Terminal for tapping of (-) output voltage.

⑩GND terminal

The ground terminal, it is connected to the main chassis. Normally, this terminal for connected to either the (+) or (-) terminal with short bar.

⑪Short bar

Normal use, this bar connects between GND and output(+) or output (-) terminal.

⑫CV LED(Green)

The LED keeps lighting in process of constant- voltage operation.

⑬CC LED(Red)

The LED keeps lighting in process of constant-current operation.

5-2. Rear panel

⑭ MASTER/SLAVE switch

Used during “one-control” parallel operation in the master/slave configuration. During normal operation, the switch should be set to MASTER. (For details, see section 6-3; “Parallel Operation”)

⑮ IN/OUT terminals for parallel operation

Control terminals for use in the “one-control” parallel operation mode.

⑯ Power cable

Approx. 2 meter-long power cable, equipped with standard wall plug.

⑰ Heat sink

A heat dissipater for the transistors, be careful as this area can become quite hot during operation.

6. OPERATION PROCEDURES

6-1. Stand-alone operation

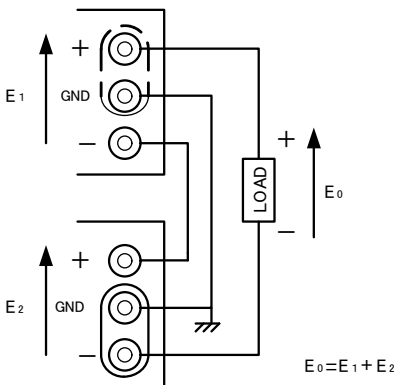
* When using the power supply in stand-alone, simply operate by manipulation of the panel switches as needed. However, be sure that the MASTER/SLAVE switch is set to MASTER.

6-2. Serial connection

* Two or more units of the power supply can be hooked up in series to achieve an increase in output voltage. The final output will be the sum of the outputs of the individual units. In this situation, however, care must be taken that the voltage of neither of the terminals with respect to the chassis GND exceeds the ground proof voltage.

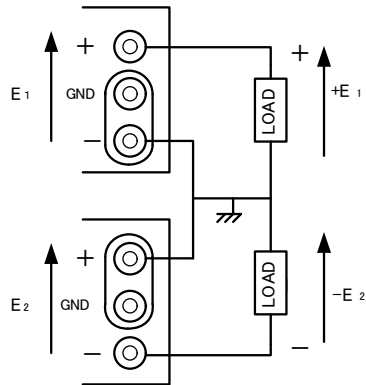
* In the case of serial operation of two units (both same model);

- For connection as in Fig. 4, the output voltage, but output current will be limited to within the value specified for a single unit.
- For connection as in Fig. 5, where an intermediate point is hooked up to ground, the configuration can be used as a plus/minus power supply.



{
 Connection of GND
 For positive ground (dotted line)
 For Negative ground (solid line)
 }

Figure3.



{
 Intermediate point is
 hooked up to ground.
 }

Figure4.

6-3. Parallel operation (master-slave control)

- * Two or more units of the same machine can be hooked up in parallel to give an increase in output current. The total output current will be the sum of the output currents of the individual machines.
- * In parallel operation, one machine will act as the master and all others will act slaves. The output voltages and output currents are all set from the master machine.
- * When hooking the machines up in parallel, be sure that all the power ON/OFF switches are OFF.

HOOK-UP PROCEDURE;

- 1) Turn the power switches of the master unit and slave unit(s) all to "OFF".
 - 2) Turn the MASTER/SLAVE switch (located on the back panel) on all the slave units from "MASTER" to "SLAVE".
 - 3) Hook up the parallel operation-use terminals (IN/OUT, located on the rear panel) of the master and slave(s) as shown in Figure 5.
 - 4) For connecting the output terminals of each of the machines to the load, use all cords of the same length.
 - 5) For (+) and (-) grounding to the GND terminal, hook up the master and slave machines via the terminals on the panels.
Figure 7 shows the output connection scheme for (-) grounding.
 - 6) Set the voltage and current knobs of all the slave unit(s) to the maximum setting.
 - 7) Turn the power switches of the master unit and slave unit(s) all to "ON". Control the output voltage and current as desired via the voltage and current knobs on master unit.
- * When the output goes to 0 amperes in the parallel operation mode, output voltage can no longer be controlled by the master machine. Be sure to keep a current flowing that is several % of the rated current.

Hook-up of rear panel terminals in the parallel operation mode

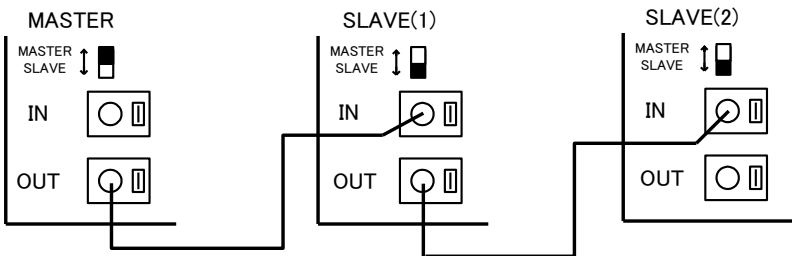
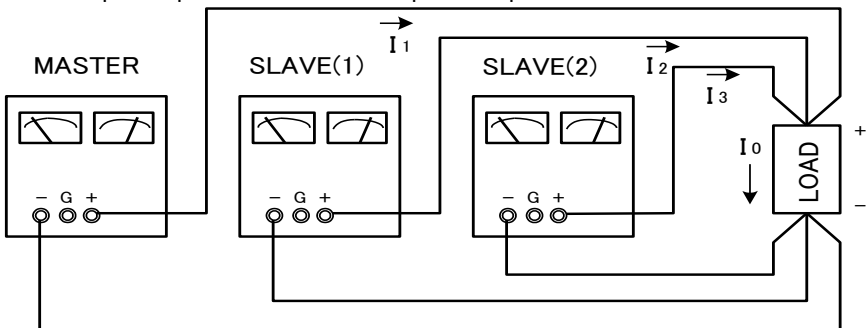


Figure5.

Hook-up front panel terminals in the parallel operation modes.



Note ; $I_0 = I_1 + I_2 + I_3$

The voltage presets on all the slave machines are set to maximum. The master operates in constant voltage mode and the slaves operate in constant current mode.

Figure 6.

For instruction on how to achieve parallel operation of multiple machines of different models, please contact your dealer or our distributor.

*** Connection of Terminal on Rear Panel**

While pressing on the slit portion of the terminal with an ordinary (-) screwdriver, insert the connecting cable into the round jack. When insertion is complete, remove the screwdriver.

The cable will remain locked into the terminal even after the screwdriver is removed.

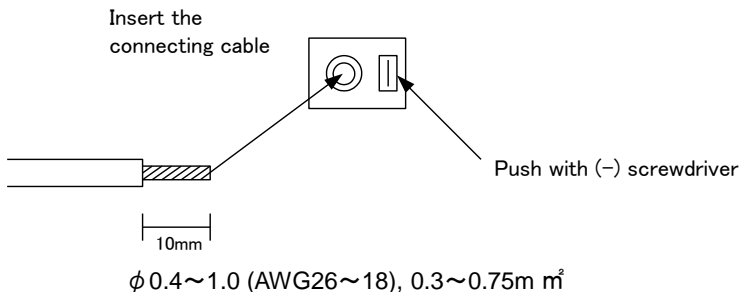


Figure7.

Note : When using stranded (twisted) cable, the connector should be attached by soldering.

7. TROUBLESHOOTING

| Problem | Indicators or Areas to check | Cause |
|------------------------------|---|---|
| Power supply will not go on. | Power ON lamp does not light up. | <ul style="list-style-type: none"> * Poor connection of power cord, or broken wire. * Bad power switch. * Fuse meltdown. |
| No output voltage. | Voltmeter does not move. | * Circuit malfunction. |
| No output current. | Ammeter does not move. | * Circuit malfunction. |
| Excessively large output. | Output voltmeter and ammeter readings do not decrease. | <ul style="list-style-type: none"> * Bad power transistor or control mechanism. * Circuit malfunction. |
| Unstable output. | Input voltage is wrong. Machine is vibrating. Strong magnetic or electrical field nearby. | <ul style="list-style-type: none"> * Operating outside the rated voltage range. * Oscillations due to special load type. * Remove from source of oscillations. |



The user never open the case panel whatever may happen.

If the user needs to open the case for replacing the fuse, changing the source voltage or repairing the internal circuit or parts, please contact your dealer or our distributor.



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