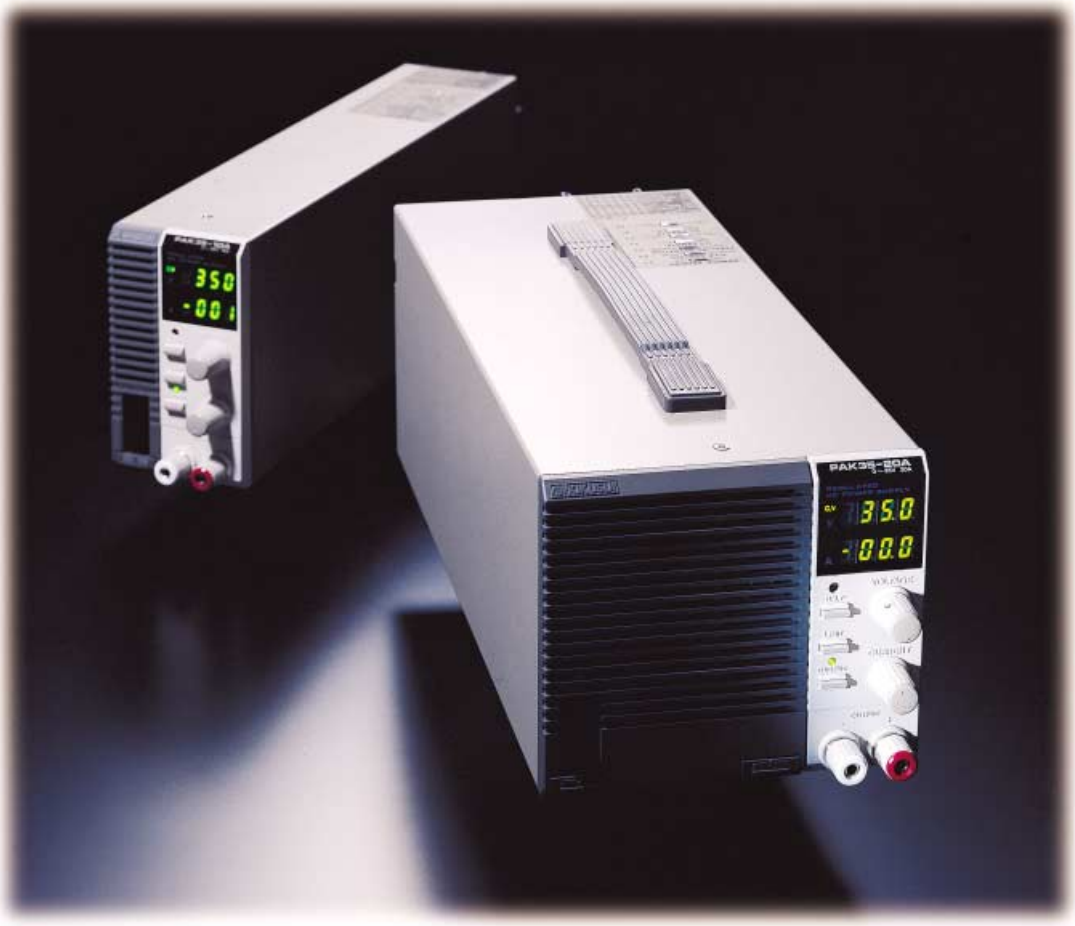


Compact & Light Weight DC Power Supplies PAK-A Series

0 to 60V DC, 0 to 160A, 14 models
Variable Switching Regulated Type
Expanded as System of Programmable Power Supply

KIKUSUI

High Reliability

CV and CC Regulated DC Power Supplies of Variable-Output Switching Type For the ultimate in track record and reliability the PAK-A Series.

The PAK-A Series is series of variable output, switching power supplies that feature excellent electrical characteristics as well as unmatched reliability. This series features a wide output operating range for both constant voltage (CV) and constant current (CC). This series offers a wide range of variation consisting of 14 different models combining 3 types of capacities at 350W, 700W, and 1000W with 5 types of voltage of 0 to 6V, 10V, 20V, 35V and 60V. This series is designed particularly with the concepts of compact size and light weight plus high reliability, and is portable with an improved space factor making them suitable for system mounting. Naturally, these power supplies have a high level of general-purpose applicability on abundant applications, such as computer control, or a system power supply, plus a newly-designed rack mounting mechanism for added convenience during maintenance. Especially in case of connecting with the optional power supply controller PIA 4800 series, feature of this series will be expanded as system of programmable power supply.

- Reliability testing of electronic components
- Semiconductor burn-in equipment
- Durability testing of rotating equipment such as motors
- Testing installed printed boards
- Operational testing of HIC
- Alternate power supply for batteries
- Testing electrical components
- Testing secondary batteries
- Constant-current power supply for synthesizing electrolytic capacitors
- Constant-current power supply for plating and other constant-voltage and constant-current power supplies

CV/CC 350W to 1000W
Full lineup of 14 models in all!

	6V	10V	20V	35V	60V
350W types	PAK6-60A	P[redacted]A	PAK20-18A	PAK35-10A	PAK60-6A
700W types	PAK6-120A	P[redacted]A		PAK35-20A	PAK60-12A
1000W types	PAK6-160A	P[redacted]A	P[redacted]A	PAK35-30A	PAK60-18A

Front-side Output Terminals: No auxiliary output terminal on the front panel of model PAK6-60A/6-120A/6-160A, PAK10-35A/10-70A/10-100A, PAK20-50A.

Features and functions

■ Compact and Lightweight

As weight and volume have been reduced by 1/2 to 1/3 compared to our previous power supplies, the result is excellent portability for effective utilization of installation space.

■ System Adaptation

In addition to a status signal, this series is also provided with a control signal connector output and a remote / local selector switch. They can also be optionally made to adapt to GPIB control.

■ Low Acoustic Noise

The use of a temperature-responding fan motor results in the motor speed being lowered during light load operation and low surrounding temperatures for prevention of deterioration of the noise environment.

■ Front Air Intake

The front air intake design eliminates the need for heat radiation space above and below of the main unit that was required in previous models. That result is a dramatic increase in the mounting density during rack mounting. In addition, the design also gives full consideration to the task of preventing accumulation of dust inside the instrument in the form of a forced air cooler, incorporating an air filter inside the louver.

■ Digital Display

The features a 3-1/2 digit displays for its voltmeter and ammeter using legible, easy-to-read, green LED as standard equipment. In contrast to the 2.5% accuracy of conventional analog meters, the delivers voltmeter accuracy of 0.1% ± 2 dig. and ammeter accuracy of 0.5% ± 3 dig., for accurate measurement.

■ Combination Circuit Protector and Power Switch

In the handing of electrical power, you can never have enough security in the power supply when it comes to burn in and long-term endurance and service life testing conducted continuously both day and night. Based on the concept of "cut the power switch when there is an abnormality", all of this series is commonly provided with a circuit protector. Of course, the user's contact signal can be used to cut the power switch, also.

■ Pre-set OVP(Overvoltage protector)

The OVP trip voltage is displayed on the voltmeter when the switch on the panel is pushed adding considerable convenience to setting of values. In addition, the set values can be checked during operation without having to interrupt the protector.

■ Output Switch

The output switch is an electronic switch free from chattering and noise. It is automatically set at off state when the power is turned on without any inadvertent application of output. Besides being able to turned on and off with an external contact signal, this switch can also be deactivated by a corresponding DIP switch selection.

■ Limit Switch

Pushing this switch displays the voltage limiting value (constant voltage set value) on the voltmeter and the current limiting value (constant current set value) on the ammeter.

■ Circuit protector (also used as power switch)

Long term durability, life, and aging test are conducted day and night.
Based on the fool-proof concept, the power switch will be turned off in the event of abnormality.
All the PAK-A series DC power supplies are equipped with a circuit protector in common. The power switch can be turned off in response to the user's contact signal.

Reliability and safety

[Reliability]

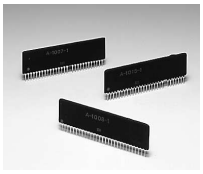
■ Double-Ended Forward Convertor Free from Magnetic Bias Phenomenon

In order to realize a wide operating range for both constant voltage and constant current (resulting in guaranteeing of output from zero and continuous usage when the output is shorted), a main circuit system, in which magnetic bias does not occur in the switching transformer even when changes over time and sudden changes in the load are excessive, along with a drive circuit, which is able to implement a stable OFF drive even when the PMM pulse is at its lowest level, are adapted.

■ Input/Output Electrolytic Capacitors

All electrolytic capacitors are adaptable to a temperature of 105°C. Adequate derating is secured since ambient temperature and ripple current, which are accurate parameters of service life, have an influence on reliability. In addition, both input and output capacitors are protected from overvoltage by the OVP mechanism.

■ Control Circuit Employs HIC Using Ceramic Bases



The control circuit is integrated with SMT on ceramic bases, known for their superior heat transfer properties. Further, materials with a low degree of stress have been selected for the molded materials of the HIC.

■ Temperature-Proportional Thermosensitive Fan Motor

As the fan motor increase or decreases in speed in proportion to the heat sink temperature, the sound produced by the fan during light loads is so low, it is hard to tell its existence. The system also contributes to improved reliability by employing a speed controlled fan motor to maintain the internal environment clean and keep the air filter free from dirt when the load is light. Another advantage is due to the introduction of a control system which minimizes temperature changes of the heat sink, there is little temperature stress on power devices, and in the case of intermittent loads, dependence on reliability is particularly effective. (As the fan motor is a product that is subject to failure due to wearing out, it can be replaced from the rear panel with the main unit still mounted in place.)

■ Environmental Resistance Characteristics

- Static Electricity Testing: 15kV, ESD Simulator
- Noises Simulator Testing: 1.5kV at pulse widths from 50ns to 1ms
- Vibration Testing: EIAJ MEA-25A, JISC 0911
  (15 Sweeps of 10 Hz to 55 Hz to 10 Hz with 3mm amplitude for X,Y and Z axies. One sweep per one minute.)
- Dropping Testing: Dropped from a height of 60cm while packaged

[Safety]

■ Flame-Proof Design

Glass epoxy (FR-4) is used for the boards and self-extinguishing, heat resistant wiring is used for the wiring materials. In addition, the selection of flame retardant plastic equivalent to 94 VO for the panels and louvers allows you to use these power supplies without worry about the occurrence of potentially dangerous fires.

■ Fail-Safe Function

These power supplies are equipped with protective circuits that operate reliably for increased safety in anticipation of abnormalities and failures.

- Output Overvoltage Protector (OVP)
  This protector interrupts switching operation with an excess of output voltage for 1.5ms and cuts off the power switch.
- Input Overvoltage Protector
  The power switch is cut off when a voltage of 200V is applied to models with an input voltage of 100V.
- Overheat Protector (OHP)
  Switching operation is interrupted when the temperature of the semiconductor heat sink exceeds 90°C.
- Overcurrent Protector (OCP)
  The output current is restricted to within 110% of the rated current, while monitoring this current separately from the constant current amplifier.
- Sub-Power Supply Error Signal
  When there is a drop in the sub-power supply voltage due to drop in the input power or an internal error, switching operation is interrupted.
- Power Switch Cutoff Signal
  The power switch can be off by an external contact when a problem occurs outside the power supply itself.
- Temperature Fuse
  A cement resistor to prevent rush current has a built-in temperature fuse.
- Fuse

■ Rush Current Prevention Circuit

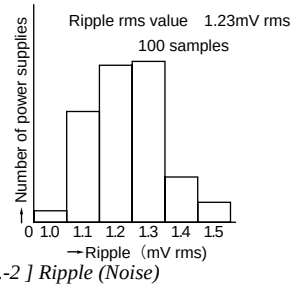
The activation of the rush current prevention circuit whenever the power is ON, even if the power switch is repeatedly switched on and off, eliminates problems caused by power surges.

Electric performance

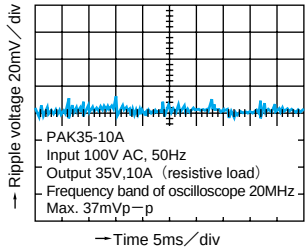
■ Ripple and noise (constant voltage)

There are two frequency components in the ripple. One is synchronized to switching frequency and another one is AC line frequency. This component is specified in the specifications as rms value (5 Hz to 1 MHz). There are also noise signals in addition to this ripple. When power switching is carried out, a power transformer is driven using pulses with short rise and fall times, resulting in transient waveforms that cause noise. Fig.-1 shows the distribution of rms values of the PKA35-10A (data obtained in the production line), while Fig.-2 shows peak-to-peak waveform.
If a capacitor with good high-frequency characteristics is inserted at the shortest possible distance from the point where wiring from the power supply is connected to a load, the ripple value at that point becomes smaller than that at the output end.

[Fig.-1] Distribution of Ripple (CV Characteristics)



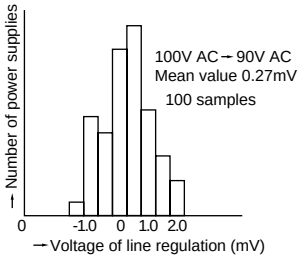
[Fig.-2] Ripple (Noise)



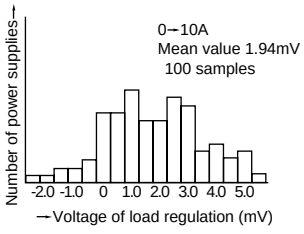
■ Stability (constant voltage)

Line regulation is fluctuation in the output voltage when the rated input voltage is abruptly changed in the range of –10% to +10%. Load regulation is fluctuation in the output voltage when the rated output current is abruptly changed in the range of 0% to 100%. The distributions of measured values in line and load regulations of the PAK35-10A are shown in Fig.-3 and Fig.-4 respectively.

[Fig.-3] Distribution of Line Regulation (CV Characteristics)



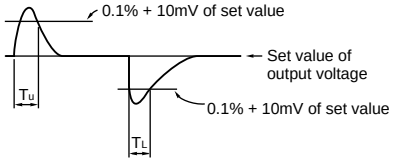
[Fig.-4] Distribution of Load Regulation (CV Characteristics)



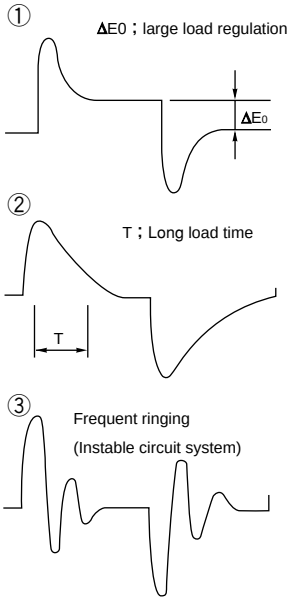
■ Transient response

Transient response is the time required by an output voltage that has changed as shown in Fig.-5 to return to within 0.1% + 10 mV of the set value when the output current is abruptly changed in the range of 20% to 100% of the rating. Generally, the output filter of a switching regulator is composed of LC and is a second-order lag system. Thus, its recovery time is longer than that of a first-order lag system of the series control type. Since lag is phase-compensated to ensure stability in the PAK-A series, a transient response waveform as shown in Fig.-7 is obtained. For loads that turn the output on/off, installation of a dummy load of approximately 10% of the rated current improves the response waveform.

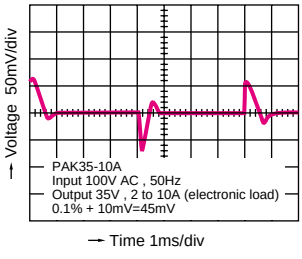
[Fig.-5]



[Fig.-6] Example of Waveform with Poor Transient Response Characteristics



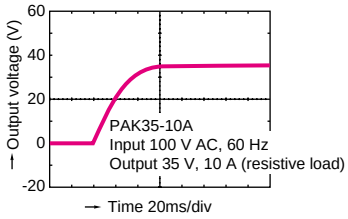
[Fig.-7] Transient Response Waveform



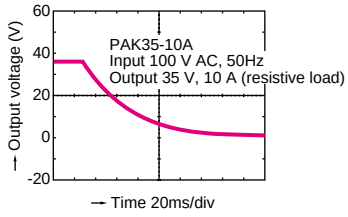
■ Rising and falling edge of the output waveforms

Since the rising and falling edge of the output waveforms are very smooth (Fig.-8 and 9), the PAK-A series can be used to test IC memories and other devices.

[Fig.-8] Rising Characteristics



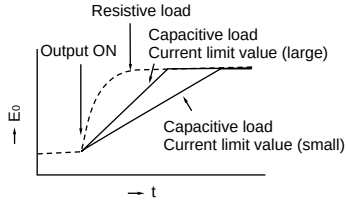
[Fig.-9] Falling Characteristics



■ Rise

If a capacitive load is connected to the PAK-A series, rise time becomes longer than the value shown in the specifications. The rise time also depends on the value of current limit (position of the current setting knob). (Fig.-10)

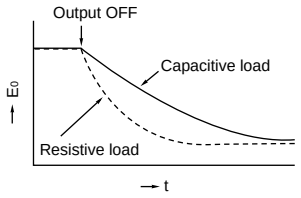
[Fig.-10]



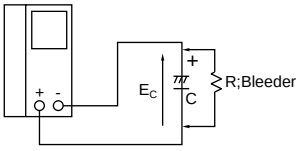
■ Fall

If a capacitive load is connected to the PAK-A series, fall time becomes longer than the value given in the specifications (Fig-11). To reduce the fall time for light load, a bleeder resistor is connected as shown in Fig.-12. Further, Ec of [C(F) × R (Ω)] after time T is attenuated by approximately 37% with respect to the output voltage value Ec when output is turned off (Fig.-13).

[Fig.-11]

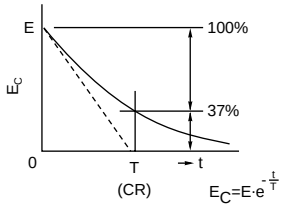


[Fig.-12]



E_C ; Voltage of capacitive LOAD
E ; Voltage value of Ec when output is turned off
T ; time constant

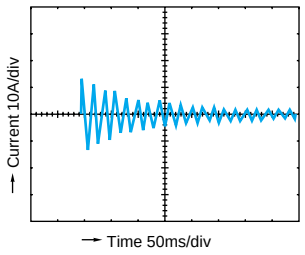
[Fig.-13]



■ Rush current

Fig.-14 shows the waveform of a rush current when the power switch is turned on at an input line voltage of 132 V. The current is limited to approximately 15 A peak (standard value: 33 A). The rush current prevention circuit is always activating when the power switch is turned on even when the on/off frequency of the power switch is very high allowing usage on a desk.

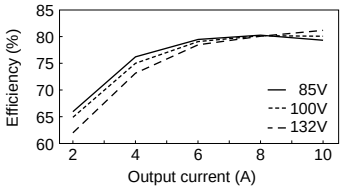
[Fig.-14] Waveform of Rush Current



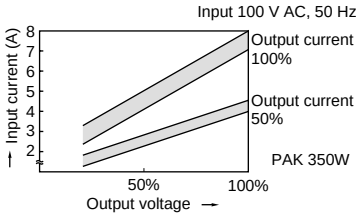
■ Efficiency

Fig.-15 shows changes in the efficiency when the output current is increased from 2 A to 10 A with the output voltage of the PAK35-10A fixed at 35 V. A total efficiency of around 80% not only improves the power consumption of the entire system, but also reduces internal heat generation. This in turn reduces the power costs and heat radiation design costs of the system. Fig.-16 shows the input current – output voltage characteristics of the PAK-A series.

[Fig.-15] Changes in Input Voltage-Basis Efficiency



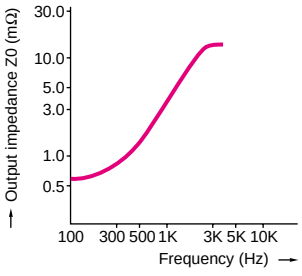
[Fig.-16]



■ Output impedance

Fig.-17 shows the characteristics of the output terminals of the PAK35-10A. Because the inductance of wiring is present in series at the load end actually used, it is recommended that an electrolytic capacitor or the like with good high-frequency performance always be installed at the shortest possible distance from the load end to reduce output impedance.

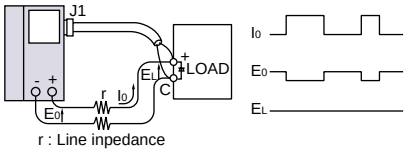
[Fig.-17] Output Impedance Characteristics of PAK35-10A



Applications

Remote Sensing

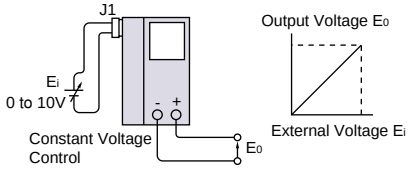
- The output terminal on the rear panel compensates for voltage drops on the order of 1V on one side within the rated voltage range as a method for prevention of voltage drops due to resistance of the load line and loss of stability due to contact resistance.
- Connect an electrolytic capacitor of several thousand mF to the sensing terminal at the shortest distance as possible paying close attention to polarity and withstand voltage.
- Remote sensing is possible even at an one-control parallel operation.



Remote Control by External Voltage

Controlled Item	Control Resistance	Current Flowing to Resistor
Output Voltage	0 to Approx. 10V	Arrpox. 10kΩ
Output Current	0 to Approx. 10V	Approx. 10kΩ

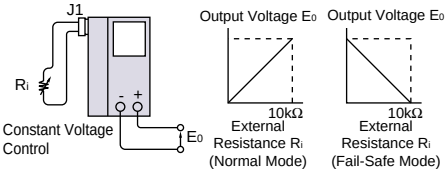
- Excellent output voltage linearity with respect to external voltage on the order of approx. 0.1%.
- The control voltage should be floating from the ground level, because the negative output of PAK-A Series is connected with common level.



Remote Control by External Resistance

Controlled Item	Control Resistance	Current Flowing to Resistor
Output Voltage	0 to Approx. 10kΩ	Approx. 1mA
Output Current	0 to Approx. 10kΩ	Approx. 1mA

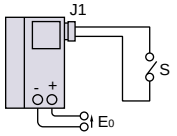
- It is recommended to use of a metal film resistor or wire wound resistor of at least 1/2 W having a low temperature coefficient with little change over time.
- A normal mode, which is effective when there is a danger of shorting such as the resistor becoming wet, as well as a fail-safe mode, which is effective when there is the possibility of the creation of an open circuit due to the wire connecting the external resistor being cut, are provided.
- In either the normal mode or fail-safe mode, it is recommended to use over protection circuit (OVP) to protect the load.



Output ON/OFF Control

Contact	Output
Close	OFF
Open	ON

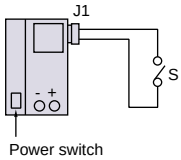
- The switching on and off of the output can be controlled with a contact signal from the outside. As an added safety feature, since the OFF state is given priority during operation of ON/OFF output switching, unless all of the switches on the front panel are in the ON state, no output will be produced.
- The current applied to switch S is about 1 mA and its open voltage is 15 V DC.



Power Switch OFF Control

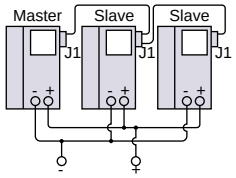
Contact	Power Switch
Close	OFF

- The input power switch can be cut off with a contact signal from the outside.
- The current applied to switch S is about 1 mA and its open voltage is 15 V DC.



One-Control Parallel Operation (Applicable for Identical Models Only)

- The current capacity can be increased by connecting two units of the same model in parallel. Control of output is done with 1 of the 2 units (the master unit).
- Use the master unit when using remote sensing, remote control, output ON/OFF and other functions.



* Up to three 350W type, three 700W type or two 1000W type power supplies can be connected in this manner.

CV/CC Monitor

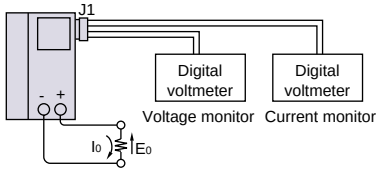
- The voltage monitor delivers a monitor output of approx. 0V to approx. 10V for an output voltage of 0V up to the rated voltage.
- The current monitor delivers a monitor output of approx. 0V to approx. 1V for an output current of 0A up to the rated current.
- The linearity of monitor output is approximately 0.1% under the conditions of 100 V AC input and room temperature.

Various Signal Outputs

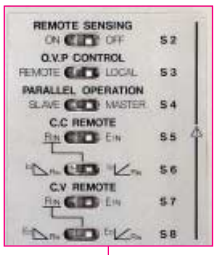
- Various output signals are provided. Those signals are isolated from the common level and open-collector.

Type of Signal Output	Output Operation
CC Mode Signal	ON during CC operation
CV Mode Signal	ON during CV operation
Power Switch ON Signal	ON when power switch is ON
Alarm Signal	ON for approx. 1s during OVP and OHP operation

- The PAK35-10A uses the Toshiba TLP521-1 photo-coupler as an open collector.



The PAK-A series does not require operations such as removing the main unit cover and then switching internal switches. It has a rear control terminal J1, rear control switch S1, and top control switches S2 to S8 to allow a variety of remote control modes. The control terminal is a 20P MIL-base standard plug.



S2 REMOTE SENSING
- Compensates for deterioration of output stability due to a voltage drop caused by the wiring material up to a load or connections.

S3 O.V.P CONTROL
- Used in LOCAL mode under normal conditions.
- When the PAK-A series is controlled in GPIB mode, either setting on the front control panel (local) or setting through the GPIB terminal (remote) can be selected.

S4 PARALLEL OPERATION
- This is a control method in which the outputs of two or three PAK-A series DC power supplies are connected in parallel to increase the output capacity.
- You can select one DC power supply as the master and control the other units via that power supply.

S5 C.C REMOTE
- When remote-controlling the output voltage, this switch is used to select either voltage-based control or resistance-based control.

S6
- For resistance-based control, this switch is used to select the control mode of the output current. (Proportion or inverse proportion to the resistance value)

S7 C.V REMOTE
- When remote-controlling the output voltage, this switch is used to select either voltage-based control or resistance-based control.

S8
- For resistance-based control, this switch is used to select the control mode of the output voltage. (Proportion or inverse proportion to the resistance value)

S1 OUTPUT SW DISABLE
- Disables the Output switch on the front panel.
- The Output switch is fix at ON position.

GPIB CONTROL
- Set this switch to ON when an option card is inserted into a slot and the J2 is connected to a GPIB controller for use.

C.C REMOTE
- This is the output current remote/local selector switch.
- When this switch is set to ON, control on the front panel is switched to remote control using the rear terminal J1. This switch is used together with S5 and S6.

C.V REMOTE
- This is the output voltage remote/local selector switch.
- When this switch is set to ON, control on the front panel is switched to remote control using the rear terminal J1. This switch is used together with S7 and S8.

System

■ Computer control

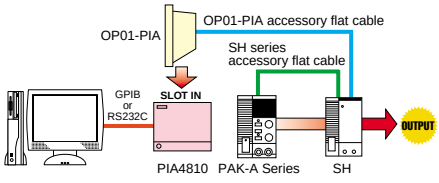
● Connection of a PIA4800 series power supply controller to the PAK-A series allows computer control via GPIB or RS-232C. The PIA4810 is an analog- and digital-compatible power supply controller that has the GPIB and RS-232C terminals and four extension slots. These slots allow four dedicated control boards to be installed. Because a single control board is capable of analog-controlling two dc power supply channels or electronic loads, one PIA4810 can control a total of eight channels.

A combination of the PAK-A series and a PIA4800 series power supply controller allows the extension of a system power supply.

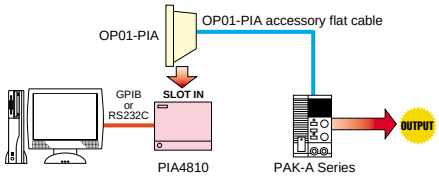
Conceptual diagrams of connection with the PIA4800 series power supply controller

■ PAK-1 connection

Addition of a shunt unit (SH series) to the PAK-2 connection set-up below allows output current to be read back at higher precision (a precision of 0.3% of F.S).



■ PAK-2 connection



[Description of Control]

Connection Type	PAK-1	PAK-2
Output Voltage setting	✔	✔
Output Current setting	✔	✔
Output Voltage readback	✔	✔
Output Current readback	✔*1	✔*2
Output ON/OFF	✔	✔
Remote/Local switching	✔	✔
Power switch OFF monitoring	✔	✔
C.V mode monitoring	✔	✔
C.C mode monitoring	✔	✔
Output ON/OFF monitoring	✔	✔
Overvoltage protection startup monitoring	✔	✔
Overheat monitoring	✔	✔

*1 : Linearity 0.3% of FS
*2 : Linearity 1.5% of FS

Notes
1. The PAK-A series requires the IF01-PAK-A (factory-installed option).
2. For the PAK-1 configuration using the PAK60-12A, the shunt unit must be custom built.
3. For more information on the PIA4800 series, see the individual catalog for that series.
4. If you have any inquiries, contact a Kikusui agent.

Specifications

Model	Output		Constant Voltage					Constant Current			Other			
	CV	CC	Ripple	Line Regulation	Load Regulation	Transient Response*1	Rise/Fall Time (At full load)	Ripple *2	Line Regulation	Load Regulation	Input Current	Rush Current	Dimmen-sions	Weight
	V	A	mV rms	0.05%+mV	0.1%+mV	ms	ms	mA rms	0.2%+mA	0.2%+mA	*3	Ap-p(MAX)	Type	kg
PAK6-60A	0 to 6	0 to 60	10	5	5	1	50/150	120	5	5	(1)	33	I	3.5
PAK6-120A		0 to 120	10	5	5	2	150/150	260	10	10	(2)	60	II	6
PAK6-160A		0 to 160	15	5	5	2	150/150	340	15	15	(3)	90	III	8.5
DISCON PAK10-35A	0 to 10	0 to 35	10	5	5	1	50/150	70	5	5	(1)	33	I	3.5
DISCON PAK10-70A		0 to 70	10	5	5	2	150/150	160	10	10	(2)	60	II	6
DISCON PAK10-100A		0 to 100	15	5	5	2	150/150	220	15	15	(3)	90	III	8.5
PAK20-18A	0 to 20	0 to 18	10	5	5	1	50/150	40	5	5	(1)	33	I	3.5
DISCON PAK20-50A		0 to 50	15	5	5	2	150/150	120	15	15	(3)	90	III	8.5
PAK35-10A	0 to 35	0 to 10	10	5	5	1	50/150	20	5	5	(1)	33	I	3.5
PAK35-20A		0 to 20	10	5	5	2	150/150	60	10	10	(2)	60	II	6
PAK35-30A		0 to 30	15	5	5	2	150/150	80	15	15	(3)	90	III	8.5
PAK60-6A	0 to 60	0 to 6	10	5	5	1	50/150	12	5	5	(1)	33	I	3.5
PAK60-12A		0 to 12	15	5	5	2	150/150	44	10	10	(2)	60	II	6
PAK60-18A		0 to 18	20	5	5	2	150/150	56	15	15	(3)	90	III	8.5

Front-side Output Terminals:
No auxiliary output terminal on the front panel of model PAK6-60A/6-120A/6-160A, PAK10-35A/10-70A/10-100A, PAK20-36A/20-50A.

Input Voltage: Single-phase AC 85 to 132V, 47 to 63 Hz (Single-phase) / AC 170 to 250V, 47 to 63 Hz: Factory Option)

Power Modifications:
The input voltage to the PAK-A Series can be either a range of 85V to 132V or 170V to 250V. Specify the voltage range required when ordering.
The range can only be switched at factory. Please consult us for further details.

(*1) The amount of time required for the output voltage to return to within 0.1% + 10mV of the set value when output current changed from 20 to 100%

(*2) Measured with the output voltage at 10% to 100% of the rating

(*3) Input Current: (1):8A (AC 100V), 5A (AC 200V), (2):16A (AC 100V), 10A (AC 200V), (3):24A (AC 100V), 15A (AC 200V)

■ Common specifications

● Input Voltage .. Single-phase AC 85 to 132V, 47 to 63 Hz
(Single-phase)(AC 170 to 250V, 47 to 63 Hz: Factory Option)

● Input Current (*3)
..... (1):8A (AC 100V), 5A (AC 200V)
(2):16A (AC 100V), 10A (AC 200V)
(3):24A (AC 100V), 15A (AC 200V)

● Meters ..... Voltmeter
Display: 3-1/2 digit, green LED display
Accuracy: 0.1% rdg ± 2 digits (23±5°C)
Temperature Coefficient: ± 200ppm / °C (0 to 50°C)
Ammeter
Display: 3-1/2 digit, green LED display
Accuracy: 0.5% rdg ± 3 digits (23±5°C)
Temperature Coefficient: ±400ppm / °C (0 to 50°C)

● Protective Devices
..... • Overvoltage Protector
Voltage Setting Range: Approx. 10% to 110% of output voltage, Protective Operation: Cutting off of input switch
• Overcurrent Protector
Restricts output to approx. 110% of rated current
• Overheat Protector
Interrupts switching operation at 85 ± 5°C or 90 ± 5°C at the heat sink

● Power Modifications:
..... The input voltage to the PAK-A Series can be either a range of 85V to 132V or 170V to 250V. Specify the voltage range required when to purchase.
The range can only be switched at factory.
Please consult us for further details.
• Temperature Fuse
139°C (with a cement resistor incorporated in the temperature fuse)
• Input Fuse
• Cutting off of power switch

● Environmental Conditions
..... • Operating Ambient Temperature Range 0 to 50°C
• Operating Ambient Humidity Range 30 to 80% RH
• Storage Temperature Range -20 to 70°C
• Storage Humidity Range 20 to 80% RH

● Cooling System
..... Forced air cooling system with speed controlled fan

● Functions ..... • output Switch, Automatic Reset Type
• Voltage / Current Limit Switch
• Pre-Set OVP

● External Dimensions
..... TypeI:71W × 124H × 350Dmm
TypeII:142.5W × 124H × 350Dmm
TypeIII:214W × 124H × 350Dmm

*Line voltage change
The input line voltage set before factory shipment is 100 V AC. This allows the PAK-A series to be used in the range from –15% of 100 V AC (85 V) to +10% of 120 V AC (132 V).
Conversion to an input line voltage of 200 V AC (170 V to 250 V) should be performed only at our factory; contact a Kikusui agent.
As a rule, the line voltage cannot be modified by the user.

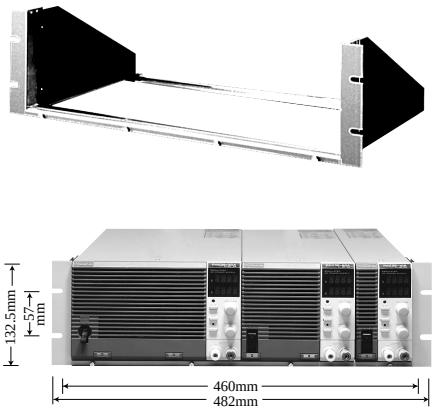
(*3) Input Current: (1):8A (AC 100V), 5A (AC 200V), (2):16A (AC 100V), 10A (AC 200V), (3):24A (AC 100V), 15A (AC 200V)

Rack adapter

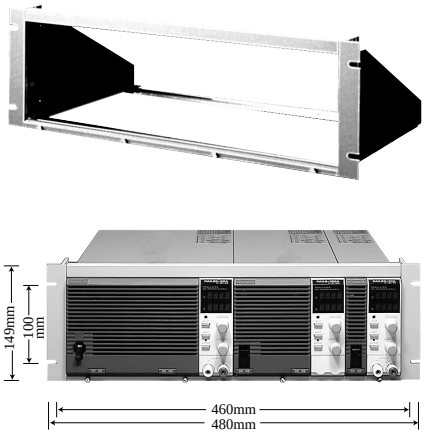
■ Rack Adapter

KRA3 and KRA150 are rack adapters designed according to EIA and JIS standards for use with standard racks.
The PAK-A Series power supplies can be mounted snugly in the rack mounting frame without having to leave any openings for air intake.

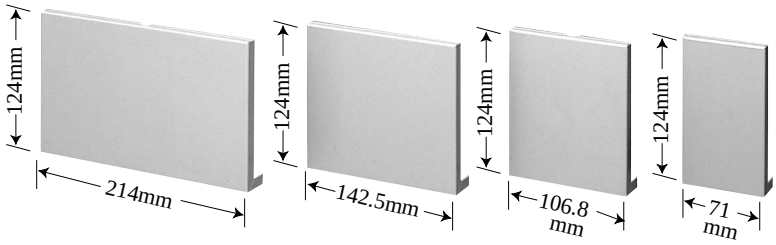
KRA3 Rack Adapter for inch type racks (EIA STANDARD)



KRA150 Rack Adapter for metric type racks (JIS STANDARD)

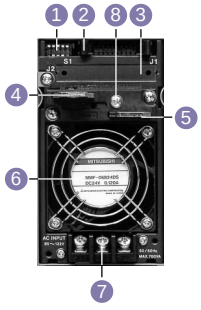


■ Blank Panel

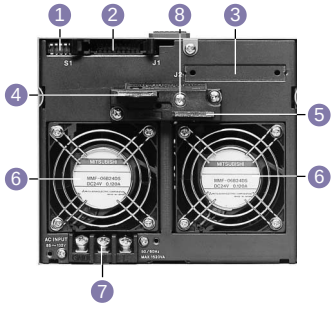


Model	KBP3-2	KBP3-3	KBP3-4	KBP3-6
Width	1/2 rack	1/3 rack	1/4 rack	1/6 rack

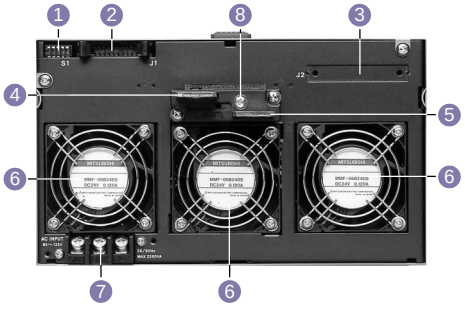
Rear panel



(350W)



(700W)



(1000W)

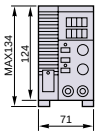
NO.	Name	Function
1	Control Switch S1	Selects functions of remote control with external voltage or resistance signal.
2	Control Signal Connector J1	Connects control signals.
3	For Control Signal Connector J2	Space for GPIB Controller connector.
4	Output Terminal "+"	Use the supplied M8 bolt and nut.
5	Output Terminal "-"	Use the supplied M8 bolt and nut.
6	Cooling Fan Motor	Cools the power supply.
7	Input Terminals	Connects the AC line input power.
8	⏚	Chassis ground

External dimensional diagrams

■ Standard Types

TYPE I (350W)

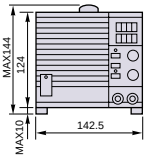
PAK6-60A ☆
PAK10-35A ☆
PAK20-18A
PAK35-10A
PAK60-6A



Output .... (rear) M6 bolt
(front) Binding post M6
Input ..... Terminal M4
Attached power cable
..... 3-wire 18AWG,
approx. 2.5 m long

TYPE II(700W)

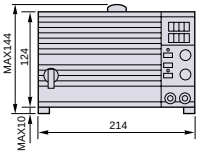
PAK6-120A ☆
PAK10-70A ☆
PAK35-20A
PAK60-12A



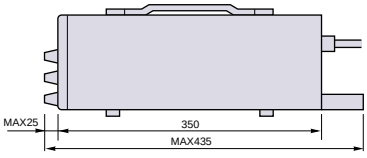
Output .... (rear) M6 bolt
(front) Binding post M6
Input ..... Terminal M4
Attached power cable
..... 3-wire 3.5mm^2,
approx. 2.5 m long

TYPE III (1000W)

PAK6-160A ☆
PAK10-100A ☆
PAK20-50A
PAK35-30A
PAK60-18A



Output .... (rear) M6 bolt
(front) Binding post M6
Input ..... Terminal M4
Attached power cable
..... 3-wire 3.5mm^2,
approx. 2.5 m long



Side face (common to all models)

*Those models indicated with a "☆" are not equipped with an output terminal on the front panel.

Options (computer control)

Item	Model	Applicable model	Remarks
Power supply controller	PIA4810	All models	User option
Interface card	IF01-PAK-A	All models	Factory-installed option
Control board	OP01-PIA	All models	Full control
Shunt units	SH-10	Models of 2.5 A to 10 A	User option
	SH-50	Models of 12.5 A to 50 A	User option
Shielded 26-conductor twisted pair cables	SC01-10	All models	approx. 1.0 m long
	SC01-20	All models	approx. 2.0 m long

*For more information on the PIA4800 series, see the individual catalog for that series.

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