

PS241 / PS242

24V Power Supply

Instruction Manual

Second Edition





Please Read Before Use

Thank you for purchasing our product.

This Instruction Manual describes all necessary information to operate this product safely such as the operation procedure, structure and maintenance procedure.

Before operation, read this manual carefully and fully understand it to operate this product safely. The enclosed CD in this product package includes the Instruction Manual for this product.

For the operation of this product, print out the necessary sections in the Instruction Manual or display them using the personal computer.

After reading through this manual, keep this Instruction Manual at hand so that the operator of this product can read it whenever necessary.

[Important]

- This Instruction Manual is original.
- The product cannot be operated in any way unless expressly specified in this Instruction Manual. IAI shall assume no responsibility for the outcome of any operation not specified herein.
- Information contained in this Instruction Manual is subject to change without notice for the purpose of product improvement.
- If you have any question or comment regarding the content of this manual, please contact the IAI sales office near you.
- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

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Safety Guide

"Safety Guide" has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it before the operation of this product.

Safety Precautions for Our Products

The common safety precautions for the use of any of our robots in each operation.

No.	Operation Description	Precautions
1	Model Selection	<ul style="list-style-type: none">• This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications.<ol style="list-style-type: none">1) Medical equipment used to maintain, control or otherwise affect human life or physical health.2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility)3) Important safety parts of machinery (Safety device, etc.)• Do not use it in any of the following environments.<ol style="list-style-type: none">1) Location where there is any flammable gas, flammable object or explosive2) Place with potential exposure to radiation3) Location with the ambient temperature or relative humidity exceeding the specification range4) Location where radiant heat is added from direct sunlight or other large heat source5) Location where condensation occurs due to abrupt temperature changes6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid)7) Location exposed to significant amount of dust, salt or iron powder8) Location subject to direct vibration or impact• Do not use the product outside the specifications. Failure to do so may considerably shorten its life and cause a product breakdown or facility operation stop.
2	Transportation	<ul style="list-style-type: none">• Consider well so that it is not bumped against anything or dropped during the transportation.• Transport it using an appropriate transportation measure.• Do not step or sit on the package.• Do not put any heavy thing that can deform the package, on it.• When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work.• When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit.• Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength.• Do not get on the load that is hung on a crane.• Do not leave a load hung up with a crane.• Do not stand under the load that is hung up with a crane.



No.	Operation Description	Precautions
3	Storage and Preservation	<ul style="list-style-type: none"> The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation.
4	Installation and Start	<p>(1) Installation of Robot Main Body and Controller, etc.</p> <ul style="list-style-type: none"> Make sure to securely hold and fix the product (including the work). A fall, drop or abnormal motion of the product may cause damage or injury. Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life. When using the product in any of the places specified below, provide a sufficient shield. <ol style="list-style-type: none"> Location where electric noise is generated Location where high electrical or magnetic field is present Location with the mains or power lines passing nearby Location where the product may come in contact with water, oil or chemical droplets
		<p>(2) Cable Wiring</p> <ul style="list-style-type: none"> Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. Do not scratch the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire.
		<p>(3) Grounding</p> <ul style="list-style-type: none"> Make sure to perform the grounding of type D (Former Type 3) for the controller. The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation.



No.	Operation Description	Precautions
4	Installation and Start	<p>(4) Safety Measures</p> <ul style="list-style-type: none"> • When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot's movable range. When the robot under operation is touched, it may result in death or serious injury. • Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. • Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product. • Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input. • When the installation or adjustment operation is to be performed, give clear warnings such as "Under Operation; Do not turn ON the power!" etc. Sudden power input may cause an electric shock or injury. • Take the measure so that the work is not dropped in power failure or emergency stop. • Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. • Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.
5	Teaching	<ul style="list-style-type: none"> • Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign "Under Operation" at the position easy to see. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>



No.	Operation Description	Precautions
6	Trial Operation	<ul style="list-style-type: none"> • After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. • When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation. • Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc. • Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.
7	Automatic Operation	<ul style="list-style-type: none"> • Before the automatic operation is started up, make sure that there is nobody inside the safety protection fence. • Before the automatic operation is started up, make sure that all the related peripheral machines are ready for the automatic operation and there is no error indication. • Make sure to perform the startup operation for the automatic operation, out of the safety protection fence. • In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product. • When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.
8	Maintenance and Inspection	<ul style="list-style-type: none"> • Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well. • When the work is to be performed inside the safety protection fence, turn OFF the power switch. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign "Under Operation" at the position easy to see. • For the grease for the guide or ball screw, use appropriate grease according to the Instruction Manual for each model. • Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. <p>* Safety Protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>







No.	Operation Description	Precautions
9	Modification	<ul style="list-style-type: none">• Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.• In such case, the warranty is not applied.
10	Disposal	<ul style="list-style-type: none">• When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste.• Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.



Alert Indication

The safety precautions are divided into “Danger”-“Warning”-“Caution”-“Notice” according to the warning level, as follows, and described in the Instruction Manual for each model.

Level	Degree of Danger and Damage	Symbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	 Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	 Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	 Caution
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	 Notice

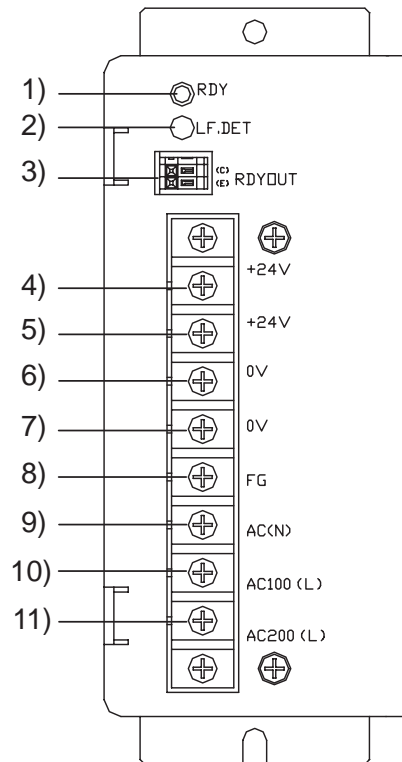


Precautions in Handling

- PS-24 Power Supply is a power supply unit dedicated for IAI controllers which utilizes 24V DC as a power source.
- There are 2 types, 100V AC and 200V AC specifications, for the input power.
- Even when lack of the power capacity is occurred, this power supply does not need to be replaced with another power supply with a bigger capacity. Another unit of this product can be added to the connection to perform a parallel operation. 5 units maximum can be connected.
- This power supply unit is designed to accept some voltage fluctuation ($24V \pm 10\%$) so that the unit can be used in a parallel operation. ($24V \pm 10\%$)
- This power supply cannot be connected together with products not made by IAI.
- Make sure that the connection to the I/O terminals is correctly established as shown in this Instruction Manual.
- When wiping off the dirt on the product, use a neutral detergent. Do not use alcohol otherwise it may damage the paint and silk print on the surface.



1. Name and Function of Each Part



- 1) RDY display
It is illuminated in normal operation.
[Refer to "2. RDY Display and RDY Output Signal".]
- 2) Variable dial to set over load detection level
For manufacturer's use only. Do not remove the seal.
- 3) RDY output signal
It turns ON (electrically conducted) in normal operation.
[Refer to "2. RDY Display and RDY Output Signal".]
- 4) 5) +24V output terminal
* 4) and 5) are connected internally.
- 6) 7) 0V output terminal
* 6) and 7) are connected internally.
- 8) Frame ground terminal
It is the ground terminal that is connected to the power supply main housing.
- 9) AC input terminal
Input terminal common for 100V AC and 200V AC types.



- 10) AC input terminal (for 100V AC)
Input terminal for 100V AC type.



Note : Do not connect the unit to a power source that is not specified.

- 11) AC input terminal (for 200V AC)
Input terminal for 200V AC type.



Note : Do not connect the unit to a power source that is not specified.

(Note) Connect the power supply as follows;
for 100V AC input specification, 9) and 10), and
for 200V AC input specification, 9) and 11).
They cannot be used in common for each specification.



2. RDY Display and RDY Output Signal

In a normal operation, RDY display should be illuminated and RDY output signal should be turned ON (electrically conducted). In case this RDY display is not illuminated and RDY output signal is turned OFF, lower the load or add another unit of this power supply.

Take note that there are also other considerable causes that the RDY display light and RDY output signal are OFF as listed below.

- Output is stopped due to the effect of the over temperature protection circuit, over voltage protection circuit, etc.
- Input power is OFF or low

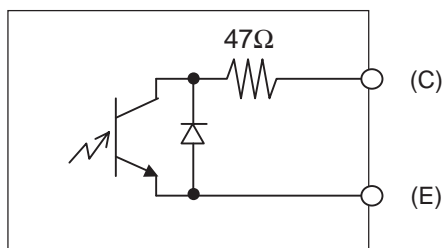
Also, there will be a failure in normal operation when the over current protection is working. RDY display and RDY output signal are linked to each other.

Power Status	RDY Output Signal	RDY Display
<ul style="list-style-type: none"> • In normal operation (When the load is under the specified value) 	ON	Illuminating
<ul style="list-style-type: none"> • Duty ratio exceeds the setting value • Output is stopped • Power is not input or low (• Over current detection circuit is working) 	OFF	OFF

Please make sure the power supply cable to use satisfies the following specifications:

Item	Specification
Applicable wire	<p>Twisted wire: AWG size 22 (0.3 mm²) (copper wire) (Note) Pay attention to terminal treatment to avoid a short circuit resulting from chips. If the wire path is long, install a relay terminal block and change the wire size.</p>
Insulating sheath temperature rating	60°C or more
Stripped wire length	

RDY output signal is insulated with a photocoupler and is an open collector output.



$V_{ceMAX} = 30V$

$I_{cMAX} = 20mA$

Residual voltage: approx. 1.6V (at $I_c = 20mA$)

(Note) If connecting this terminal in series, consider the residual voltage.

3. Product Check

This product is comprised of the following parts if it is of standard configuration.
If you find any fault in the contained model or any missing parts, contact us or our distributor.

3.1 Parts (The option is excluded.)

No.	Part Name	Model
1	24V Power Supply Main Unit	Refer to “How to read the model plate”, “How to read the model No.”
Accessories		
2	First Step Guide	
3	Instruction Manual (CD)	
4	Safety Guide	

3.2 Instruction Manuals related to this product, which are contained in the instruction manual (CD)

No.	Name	Manual No.
1	PS241/PS242 24V Power Supply Instruction Manual	ME0129

3.3 How to read the model plate

Model	MODEL PS241
Serial number	SERIAL No. 800061910 A1
	MADE IN JAPAN

3.4 How to read the model No.

PS-241

└─ [Input Power]
1 : 100V AC
2 : 200V AC

4. Basic Specifications

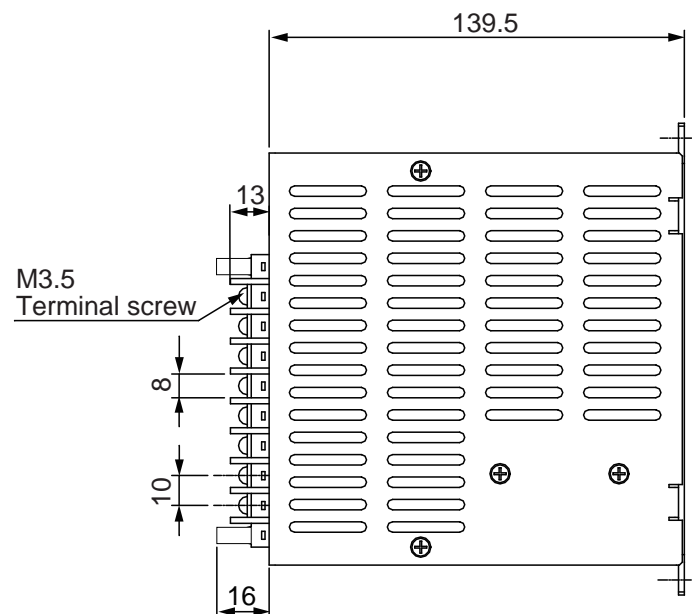
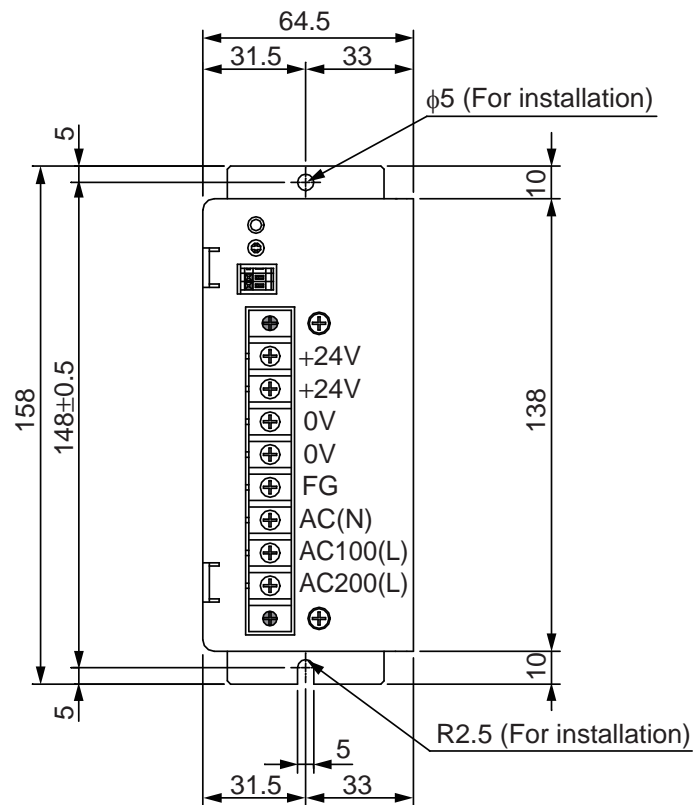
Specifications

Specification Item	100V AC Specification PS241	200V AC Specification PS242
Rated Voltage DC Output	24V±10% (fluctuates depending on duty)	
Rated DC Current Output	8.5A	
Peak Maximum DC Current Output	17A	
Rated Output Wattage	204W	
Efficiency	80%	
Rated Input Voltage (frequency)	100 to 115V AC (50/60Hz)	200 to 230V AC (50/60Hz)
Input Voltage Range	90 to 125V AC	180 to 250V AC
Input Current	3.5A (when total duty of 100V AC is applied)	1.8A (when total duty of 200V AC is applied)
Output Holding Time	20 [msec] (Condition; ambient temp. 25°C, rated input and output)	
Protection Circuit	Over current protection, over voltage protection, over temperature protection, over load protection	
Parallel Operation	Applicable	
Operation Ambient Temp.	0 to 50°C (with derating*1)	
Operation Ambient Humidity	30 to 85%RH (non-condensing)	
Cooling Method	Natural air-cooling	
Voltage Durability	Output – input ... 2000V AC 1min. Input – housing ... 2000V AC 1min.	
Insulation Strength	Output – housing ... 100MΩ min. at 500V DC	
Circuit System	Line-commutated flyback converter	
Mass	Approx. 0.9kg	

*1 Derating: it is a method to use a device with a load lower than the rated value for the purpose to decrease a risk of malfunction.



5. External Dimensions





6. Installation Environment

Do not use this product in the following environment.

- Location where the surrounding air temperature exceeds the range of 0 to 50°C
- Location where condensation occurs due to abrupt temperature changes
- Relative humidity less than 30%RH or greater than 85%RH
- Location exposed to corrosive gases or combustible gases
- Location exposed to significant amount of dust, salt or iron powder
- Location subject to direct vibration or impact
- Location exposed to direct sunlight
- Location where the product may come in contact with water, oil or chemical droplets

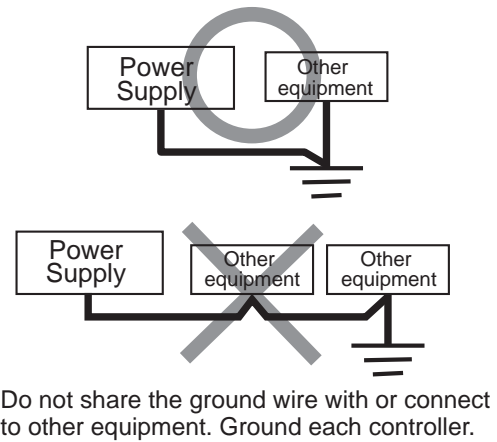
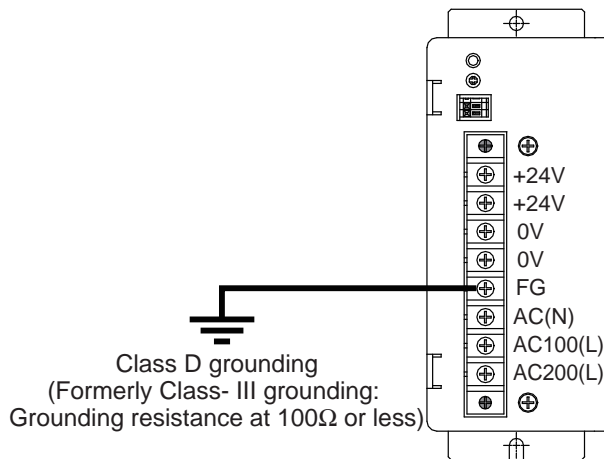
When using the product in any of the locations specified below, provide a sufficient shield.

- Location subject to electrostatic noise
- Location where high electrical or magnetic field is present
- Location with the mains or power lines passing nearby



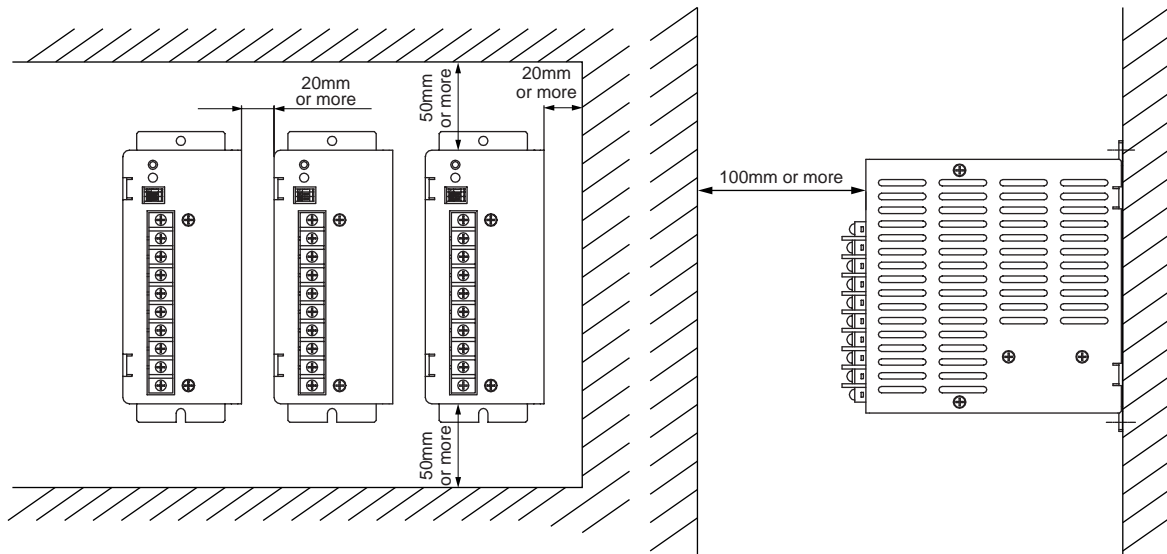
7. Installation and Noise Elimination

1. Grounding



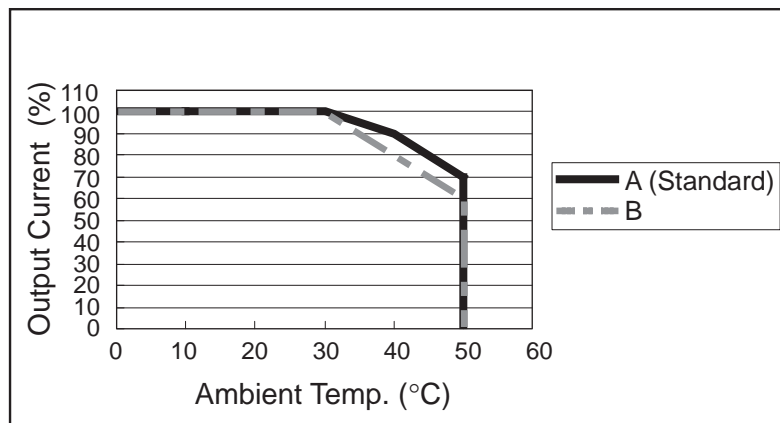
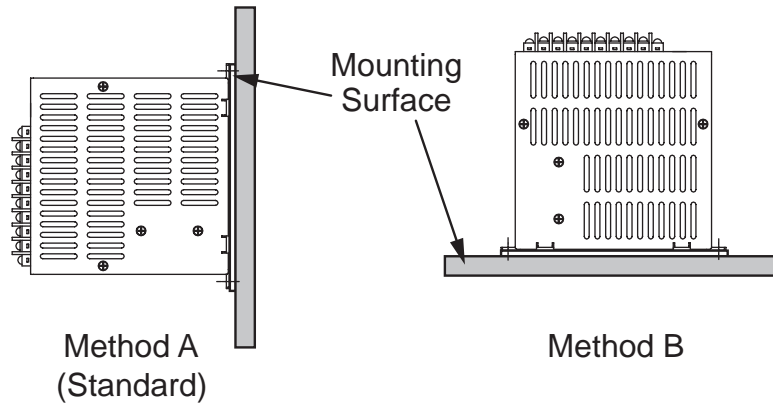
2. Heatsink and Mounting Method

This is a natural air-cooling type power supply. Mount the unit on a wall to make it vertical as shown in the picture below.





Both methods A (standard) and B below are available as a mounting method, however, the characteristics for the output current relevant to the temperature will differ for each way. Use within the range of its characteristics for each method.



Note : The main housing of the product gets so hot that it sometimes gives you a burn as it works as a heat sink.

Do not touch while the power is ON, or even after the power is OFF until the heat calms down.

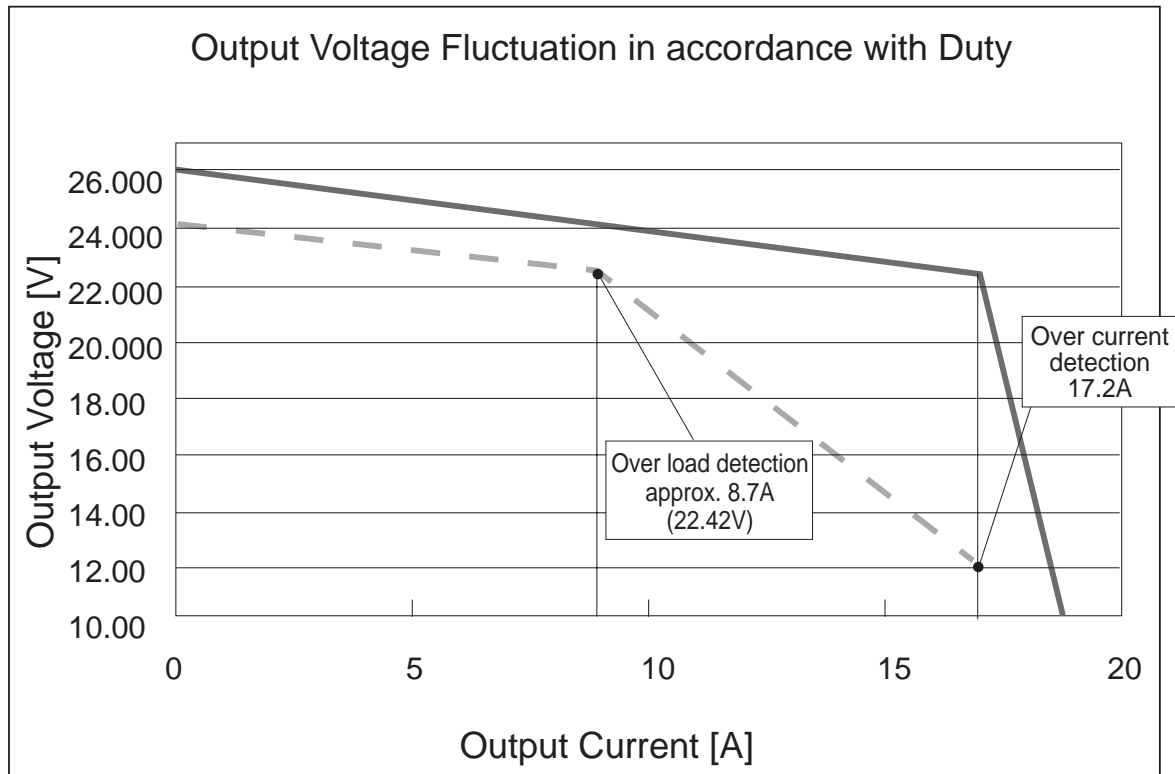


8. Output Voltage

This power supply is able to be used in a parallel operation, and the output voltage fluctuates within the range of $24V \pm 10\%$ even in a normal operation.

The voltage is set to around 25.8V at no duty. This voltage fluctuation does not influence the operation of IAI 24V controller at all.

This power supply changes the voltage within the area between the solid line and the broken line below in response to the load.





9. Protective Functions

There are 4 patterns of circuits prepared as a protection function.

(1) Over Current Protection Circuit

The voltage suddenly drops when the current more than the rated value is output (includes short circuit). Power output automatically recovers when the over current condition is cancelled.

There is a case that the over current protection circuit works due to the in-rush current caused by turning ON multiple controllers at the same time.

Described above is concerned as the cause of the phenomenon of sudden voltage drop occurring when turning ON each actuator controller, emergency stop being cancelled, and so on.

(What happens as the influence of the voltage drop is that it takes comparatively long time at the start-up of the controllers or canceling the emergency stop.)

In the case this is occurred, it is necessary to boost the controllers one by one, or add another power supply.

(2) Over Voltage Protection Circuit

The over voltage protection circuit works when the output voltage rises abnormally high. If the voltage continues to rise, it shuts down the output. To recover, shut down the input power first, leave it for approximately 2 minutes, and then input the power again.

When the over voltage protection works, internal devices may break. If output does not work properly even though trying to turn ON the power several times, it may require a repair. (Please contact us.)

(3) Over Temperature Protection Circuit

The over temperature protection circuit detects an abnormal rise of the ambient temperature and internal temperature (approx. 80°C), and shuts down the output.

To recover, shut down the input power first, leave it for a while till it cools down, and then input the power again. If the over temperature protection works often, lower the ambient temperature and the duty ratio.

(4) Over Load Detection

When the over load detection circuit works, the output drops with accordance with the duty. Output will recover with a lower duty. It operates when the current of approximately 8.7A or more continues to flow.



10. Parallel Operation

Parallel operation is available under the following conditions.

- Parallel operation is allowed up to 5 units. Do not connect a different type power supply unit from PS-24 Power Supply in parallel.
- 2 terminals for each of positive side and negative side as the output terminals are provided. Use one terminal for the parallel connection, and the other for the connection to the load.
- When performing a parallel operation, turn ON the power for all the connected PS-24 Power Supply units at the same time. If the duty on one unit is too high, the over current detection circuit starts to work and may cause a failure in operation.
- Consider the connection of the power supplies to distribute the duty evenly to all the units so that a high duty is not applied on a single unit. Output voltage may drop with the in-rush current when the power is turned ON.
- Select a cable which has AWG18 (0.75sq) or more thickness for the load and transfer cables and the same thickness for all the cables considering the current. And, layout as short as possible.
- When connecting multiple units of power supply in parallel, the derating of output current is approximately 90%. Perform a parallel connection with confirming the current capacity.

1 unit..... Rated 8.5A

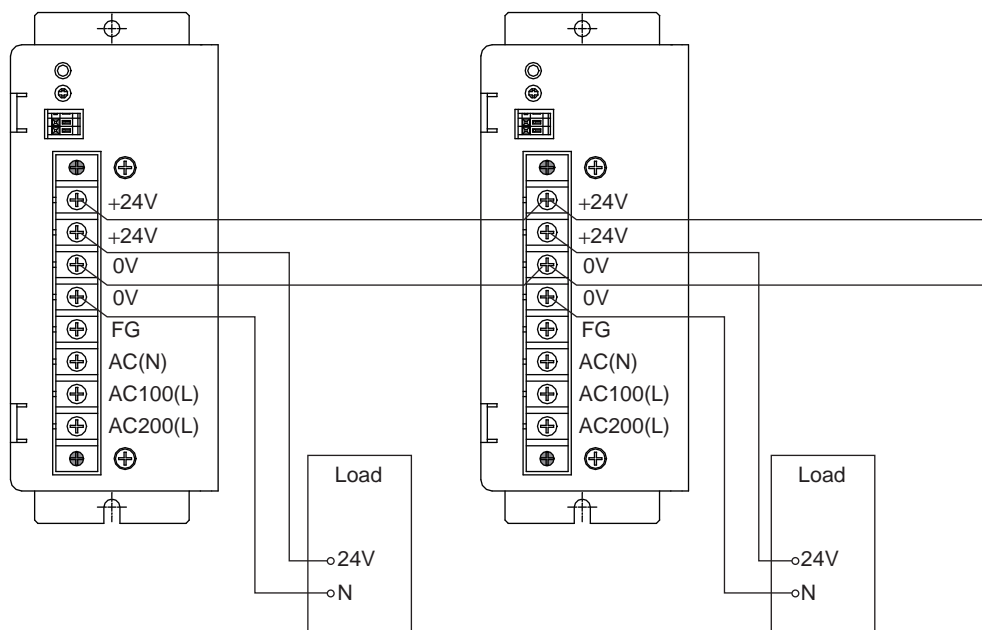
2 units..... Rated 15.3A ($8.5A \times 2 \times 0.9$)

3 units..... Rated 22.95A ($8.5A \times 3 \times 0.9$)



Note : 1. When turning ON the power with no load, there is a case that a power supply does not turn ON the RDY display and RDY output signal. The power supply will operate in normal by connecting the load.
2. Series connection is not available.

- Make sure to separate the cables for the parallel connection of the power supply units from those connected to the load. Also, twisting the cables will improve the noise durability.



Parallel Connection



11. Simple Troubleshooting

Contents	Treatment
Voltage does not output.	<ul style="list-style-type: none">• Is the connected input voltage within the specification?• Any short circuit or grounding fault on the output circuit?• Time delay too short after over voltage or over temp protection activated.• Did you turn ON the power supply units at the same time for parallel operation?• Did you check that the ambient temperature is not high?• Is the load too big?
Output voltage is low.	<ul style="list-style-type: none">• Is the load too big?
RDY display does not illuminate.	<ul style="list-style-type: none">• Is the load too big?



Appendix 1

Power Supply Unit PS241/PS242 and Number of Connectable Controllers

Table:1 Relation of Actuator and Power Supply Current

Controller Type	Actuator Type	Motor Power Capacity	Power Supply Current [A]		
ACON ASEL ASEP	RCA	SA4, SA5, RA4 (20W) type	Rated	1.3	
			Max	4.4	
		SA6, RA4 (30W) type	Rated	1.3	
			Max	4.0	
		RA3 (20W) type	Rated	1.7	
			Max	5.1	
	RCA2	SA3 (10W) type	Rated	1.3	
			Max	4.4	
		SA5, TA6 (20W) type	Rated	1.3	
			Max	4.4	
		RN3N, RP3N, GS3N, GD3N, SA3N TC3N, TW3N, TF3N, TA4C, TA4R (10W) type	Rated	1.3	
			Max	4.4	
		SA6, TA7 (30W) type	Rated	1.3	
			Max	4.4	
		RA4, TA5 (20W) type	Rated	1.7	
			Max	5.1	
		RN4N, RP4N, GS4N, GD4N SD4N, TC4N, TW4N, TF4N (20W) type	Rated	1.7	
			Max	5.1	
	RCL	RA1L, SA1L (2W) type	Rated	0.8	
			Max	4.6	
		RA2L, SA2L (5W) type	Rated	1.0	
			Max	6.4	
		RA3L, SA3L (10W) type	Rated	1.3	
			Max	6.4	
PCON PSEL PSEP	RCP2 RCP3	20P	Rated	0.4	
			Max	2.0	
		28P	Rated	0.4	
			Max	2.0	
		35P	Rated	1.2	
			Max	2.0	
		42P	Rated	1.2	
			Max	2.0	
		56P	Rated	1.2	
			Max	2.0	
		PCON	86P	Rated	4.2
				Max	6.0



Number of Power Supply Units

Table:2 Power Supply Rated Current and Allowable Peak Maximum Current

No. of Connectable Units	Rated Current [A]	Peak Maximum Current [A]
1 unit	8.5	17
2 units	15.3	30.6
3 units	22.95	45.9
4 units	30.6	61.2
5 units	38.25	76.5

* For the 2nd unit or more, 10% safety factor (loss) is considered.



Appendix 2

Determination for Number of Connectable Units

Referring to Tables 1 and 2, determine the number of units to connect considering that the rated current of load is within the rated current value of the power supply.

There is the RDY display to detect the duty ratio on the power supply. Also, this product is available for parallel operation. It would be recommended, for the best selection of the number of power supply units to apply, that checking the actual operation first and see if;

- RDY display turns OFF, or
- over current circuit starts working

If either of the above phenomena occurs, then try to add another unit in the parallel operation.



How to Calculate Power Supply Capacity

<Rated Current>

Rated current of each actuator [A] × Number of actuators < Rated current per power supply unit [8.5A]

<Peak Maximum Current>

Max. current of each actuator [A] × Number of actuators to operate at one time < Transient max. current per power supply unit [17A]

[Refer to Table 1 for the rated current and maximum current]

[Example of selection by calculation]

(Example 1)

- When 6 units of Actuator RCA2-SA3 are connected and servo is turned ON at the same time:

<Rated Current>

$$1.3\text{A} \times 6 \text{ units} = 7.8\text{A} < 8.5\text{A} \text{ (1 unit)}$$

<Peak Maximum Current>

$$4.4\text{A} \times 6 \text{ units} = 26.4\text{A} > 17.0\text{A} \text{ (1 unit)} \\ < 30.6\text{A} \text{ (2 units)}$$

(Example 2)

- When 2 units of Actuator RCA2-RN4N, 2 units of RCL-RA3L and 2 units of RCP2-SA5C are connected and servo is turned ON at the same time:

<Rated Current>

$$1.7\text{A} \times 2 \text{ units} + 1.3\text{A} \times 2 \text{ units} + 1.2\text{A} \times 2 \text{ units} = 8.4\text{A} < 8.5\text{A} \text{ (1 unit)}$$

<Peak Maximum Current>

$$5.1\text{A} \times 2 \text{ units} + 6.4\text{A} \times 2 \text{ units} + 2.0\text{A} \times 2 \text{ units} = 27.0\text{A} > 17.0\text{A} \text{ (1 unit)} \\ < 30.6\text{A} \text{ (2 units)}$$

- 1) When multiple actuators are operated in the same operation pattern with the maximum load and maximum acceleration speed at the same time, the rated current is under 8.5A in (Example 1) and (Example 2), however, the transient maximum current exceeds 17A, thus the capacity would not be enough with only one unit.

→ It is necessary to connect 2 units in parallel.

- 2) • Have several timings to turn the servo ON.

- Do not operate multiple actuators in the same operation pattern with the maximum load and maximum acceleration speed at the same time.

→ If a satisfaction of the above 2 conditions is ensured, it is feasible to operate with one unit.

Warranty Period and Scope of Warranty

The controller you have purchased has passed IAI's shipping inspection implemented under the strictest standards. The product is covered by the following warranty:

1. Warranty Period

The warranty period expires upon elapse of one of the following periods, whichever is the shortest.

- 18 months after shipment from IAI.
- 12 months after delivery to the specified location.

2. Scope of Warranty

If a breakdown occurs within the period specified above due to defective material or poor craftsmanship, we will repair the actuator at no cost. However, the following items are not covered by this warranty:

- Faded paint or other changes that occur naturally over time.
- Consumable components that wear out with use (such as cables).
- The actuator is noisy or similar impressions that do not affect machinery performance.
- Defect caused by inappropriate handling or use by the user.
- Defect caused by inappropriate or erroneous maintenance/inspection.
- Defect caused by use of a part other than IAI's genuine part.
- Damage resulting from improper handling by the user or lack of proper maintenance.
Alteration not made by IAI or its representatives.
- Damage caused by fire or other natural disaster or due to an accident.

The warranty pertains to the purchased product itself and does not cover any damage that might arise from a breakdown of the supplied product. All repairs will be done at our factory.

3. Covered Range for Services

The price of the product does not include the cost which may be caused by creating programs or sending an engineer. Therefore, we may need to ask for an extra charge for the following cases even if it is within the guarantee period.

- Maintenance/Inspection
- Technical instruction and education for operation skills and other related skills



Change History

Revision Date	Revision Description
2008.02	First Edition
2010.12	Second Edition <ul style="list-style-type: none">• Safety Guide added• Order of sections changed• Appendix : Examples updated for [Power Supply Unit PS241 - PS242 and Number of Connectable Controllers]



IAI Corporation

Head Office: 577-1 Obane Shimizu-KU Shizuoka City Shizuoka 424-0103, Japan
TEL +81-54-364-5105 FAX +81-54-364-2589
website: www.iai-robot.co.jp/

Technical Support available in USA, Europe and China

IAI America, Inc.

Head Office: 2690 W, 237th Street Torrance, CA 90505
TEL (310) 891-6015 FAX (310) 891-0815
Chicago Office: 1261 Hamilton Parkway Itasca, IL 60143
TEL (630) 467-9900 FAX (630) 467-9912
Atlanta Office: 1220 Kennestone Circle Suite 108 Marietta, GA 30066
TEL (678) 354-9470 FAX (678) 354-9471
website: www.intelligentactuator.com

IAI Industrieroboter GmbH

Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany
TEL 06196-88950 FAX 06196-889524

IAI (Shanghai) Co., Ltd.

SHANGHAI JIAHUA BUSINESS CENTER A8-303, 808, Hongqiao Rd. Shanghai 200030, China
TEL 021-6448-4753 FAX 021-6448-3992
website: www.iai-robot.com