

AC Input

Conformity to RoHS Directive

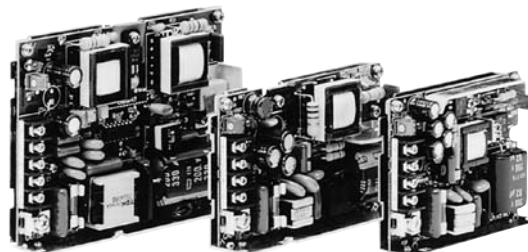
Single Output, General-Purpose, UL/C-UL Approved

F Series FAK(25 to 150W)

The F series FAK is a device-embedded type power supply that has realized a thin type having a thickness of 25 to 40mm. This series of products satisfy various requirements such as low price, safety standards, and EMI countermeasures as well as the thin and compact configuration.

FEATURES

- AC.100V input thin-type single output power supply.
- Compact open frame type (A cover is available as option).
- Low price.
- LED indicator display function.
- Low noise (FCC class B compliant).
- Remote sensing function (100W, 150W).
- It is a product conforming to RoHS directive.



PART NUMBERS AND RATINGS

Output voltage(V)	25W Type		50W Type		100W Type		150W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.
5	5	FAK05-5R0	10	FAK05-10R	20	FAK05-20R	30	FAK05-30R
12	2.1	FAK12-2R1	4.2	FAK12-4R2	8.3	FAK12-8R3	12	FAK12-12R
15	1.7	FAK15-1R7	3.4	FAK15-3R4	6.6	FAK15-6R6	10	FAK15-10R
24	1.1	FAK24-1R1	2.1	FAK24-2R1	4.2	FAK24-4R2	6	FAK24-6R0
48					2	FAK48-2R0	3	FAK48-3R0

- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

- All specifications are subject to change without notice.

FAK25W Type

SPECIFICATIONS AND STANDARDS

Part No.		FAK05-5R0*4	FAK12-2R1	FAK15-1R7	FAK24-1R1
Rated output voltage and current*1		5V • 5A	12V • 2.1A	15V • 1.7A	24V • 1.1A
Maximum output power	W	25	25.2	25.5	26.4
Input conditions					
Input voltage	V	Eac: 85 to 132V[Rating: 100 to 120] /Edc: 110 to 175V			
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)			
Input current	A	0.65max.[AC.100/120V]			
Fuse rating	A	2.5[Built-in]			
Surge current*2	A	36 to 43max.[AC.100 to 120V, 25°C, cold start]			
Leakage current	mA	0.5max.[Input and output ratings]			
Efficiency	%	70typ.[Input and output ratings]			
Output characteristics					
Output voltage Edc	V	5	12	15	24
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4
Maximum output current	A	5	2.1	1.7	1
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5
Overcurrent threshold	A	5.5 to 7.5	2.3 to 3.3	1.9 to 2.8	1.2 to 1.8
Voltage stability	Source effect	%	±1max.(±0.3typ.)[Within the input voltage range]		
	Load effect	%	±1.5max.(±0.6typ.)[10 to 100% load]		
	Temperature effect	%	±1.5max.(±0.3typ.)[Ambient temperature: 0 to +60°C]		
	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]		
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]		
Ripple Ep-p	mV	80max.	80max.	80max.	100max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.
Start up time	ms	100max.			
Hold up time	ms	20min.			
Auxiliary functions					
Indicator display		LED(Green) indicates when voltage output is ON.			
Overvoltage protection		Voltage shut-down type, recovers upon reset, set value fixed(interval approx. 40s).			
Overcurrent protection		Fixed threshold, higher overcurrent detection point at low load, automatic recovery.			
Remote ON-OFF		No			
Remote sensing		No			
Current balance		No			
Standards					
Safety standards		UL1950, CSA C22.2 No.950-95(C-UL) approved.			
Noise terminal voltage		FCC class B meet.			
Constructions					
External dimensions	mm	25×70×115[H×W×L] / With cover(Option)*3: 28.5×70×115[H×W×L]			
Weight	g	220max.			
Mounting method		Can be attached to 2 sides.			
Case material		Frame: Aluminum / Cover(Option: 2JC0ZB146-FAK25CA): Iron			

*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

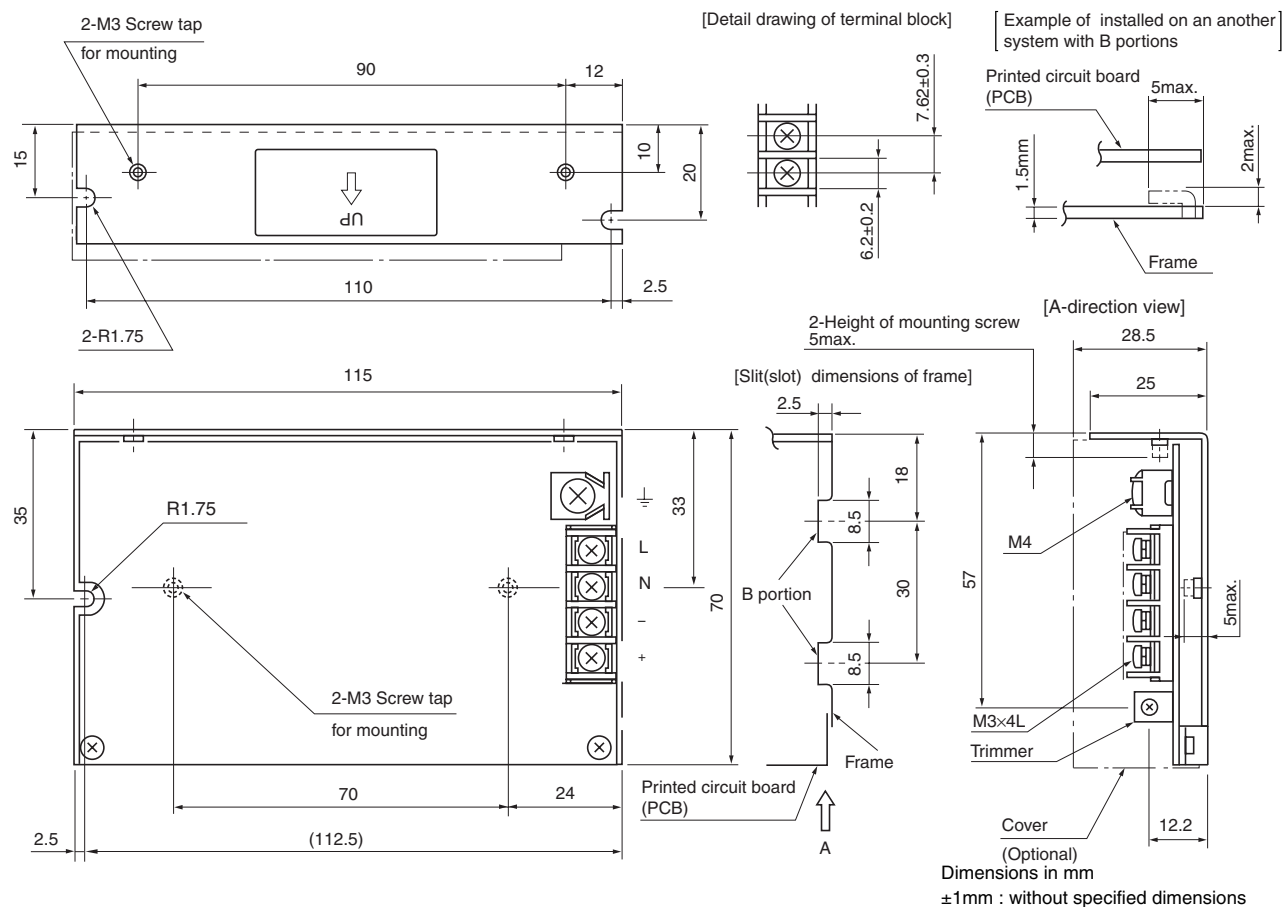
*2 The surge current suppression element is a power thermistor.

*3 Derating is required when the optional cover is attached.

*4 Output may fail to come on when operated in series.

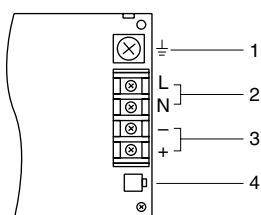
FAK25W Type

SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.

FAK50W Type

SPECIFICATIONS AND STANDARDS

Part No.		FAK05-10R	FAK12-4R2	FAK15-3R4	FAK24-2R1
Rated output voltage and current*1		5V • 10A	12V • 4.2A	15V • 3.4A	24V • 2.1A
Maximum output power	W	50	50.4	51	50.4
Input conditions					
Input voltage	V	Eac: 85 to 132V[Rating: 100 to 120] /Edc: 110 to 175V			
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)			
Input current	A	1.2max.[AC.100/120V]			
Fuse rating	A	3.15[Built-in]			
Surge current*2	A	36 to 43max.[AC.100 to 120V, 25°C, cold start]			
Leakage current	mA	0.5max.[Input and output ratings]			
Efficiency	%	80typ.[Input and output ratings]			
Output characteristics					
Output voltage Edc	V	5	12	15	24
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4
Maximum output current	A	10	4.2	3.4	2.1
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5
Overcurrent threshold	A	10.5 to 12	4.4 to 5.1	3.6 to 4.1	2.2 to 2.6
Voltage stability	Source effect	%	±1max.(±0.3typ.)[Within the input voltage range]		
	Load effect	%	±1.5max.(±0.6typ.)[10 to 100% load]		
	Temperature effect	%	±1max.(±0.3typ.)[Ambient temperature: 0 to +60°C]		
	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]		
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]		
Ripple Ep-p	mV	60max.	80max.	80max.	100max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.
Start up time	ms	100max.			
Hold up time	ms	20min.			
Auxiliary functions					
Indicator display		LED(Green) indicates when voltage output is ON.			
Overvoltage protection		Voltage shut-down type, recovers upon reset, set value fixed(interval approx. 40s).			
Overcurrent protection		Fixed current and voltage threshold type, automatic recovery, set value fixed.			
Remote ON-OFF		No			
Remote sensing		No			
Current balance		No			
Standards					
Safety standards		UL1950, CSA C22.2 No.950-95(C-UL) approved.			
Noise terminal voltage		FCC class B meet.			
Constructions					
External dimensions	mm	25×95×130[H×W×L] / With cover(Option)*3: 28.5×95×130[H×W×L]			
Weight	g	300max.			
Mounting method		Can be attached to 2 sides.			
Case material		Frame: Aluminum / Cover(Option: 2JC00B147-FAK50CA): Iron			

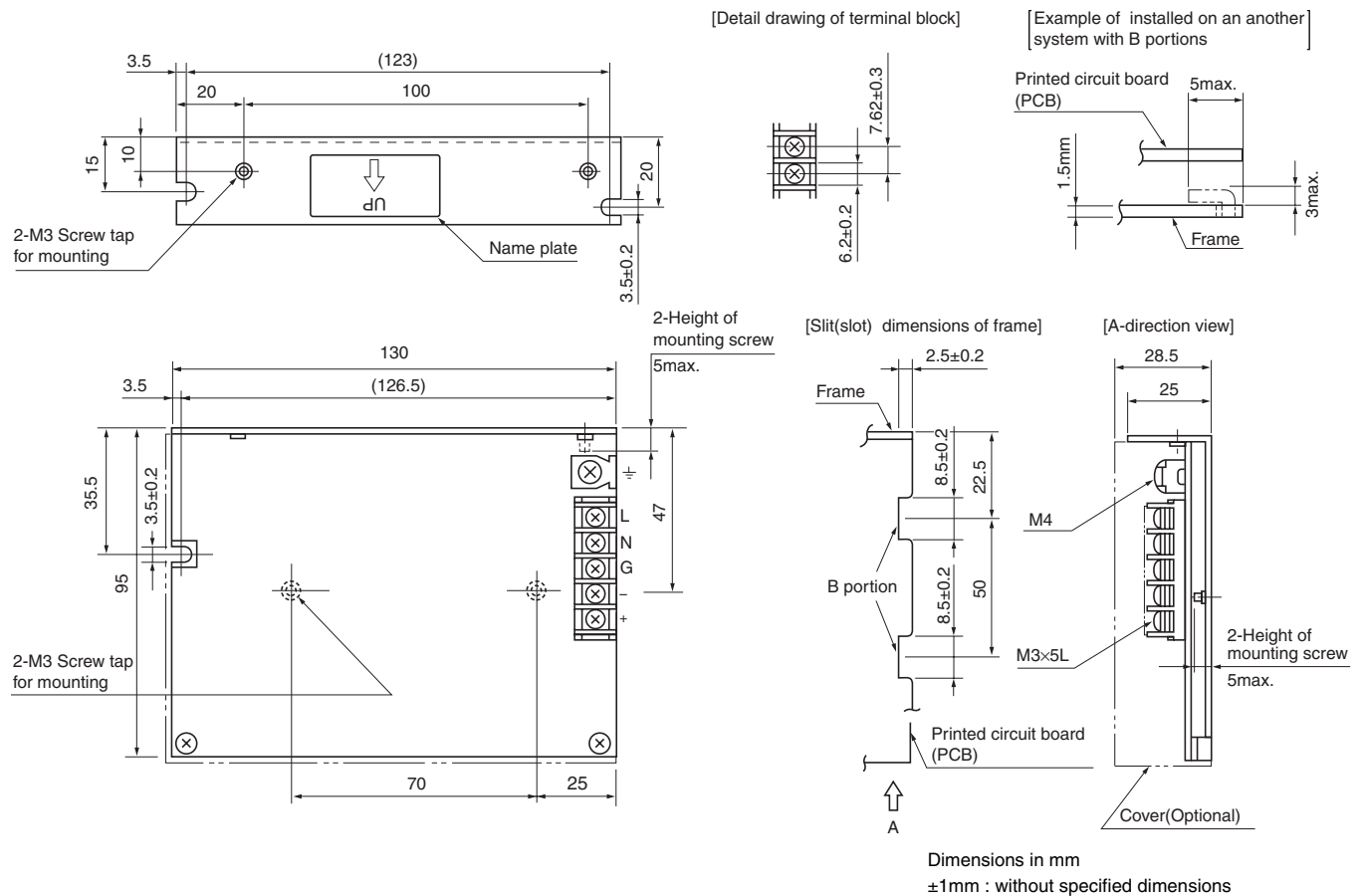
*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

*2 The surge current suppression element is a power thermistor.

*3 Derating is required when the optional cover is attached.

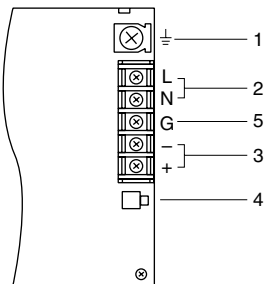
FAK50W Type

SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.
5	Ground terminal(G)	Connected to the frame ground terminal 1.

FAK100W Type

SPECIFICATIONS AND STANDARDS

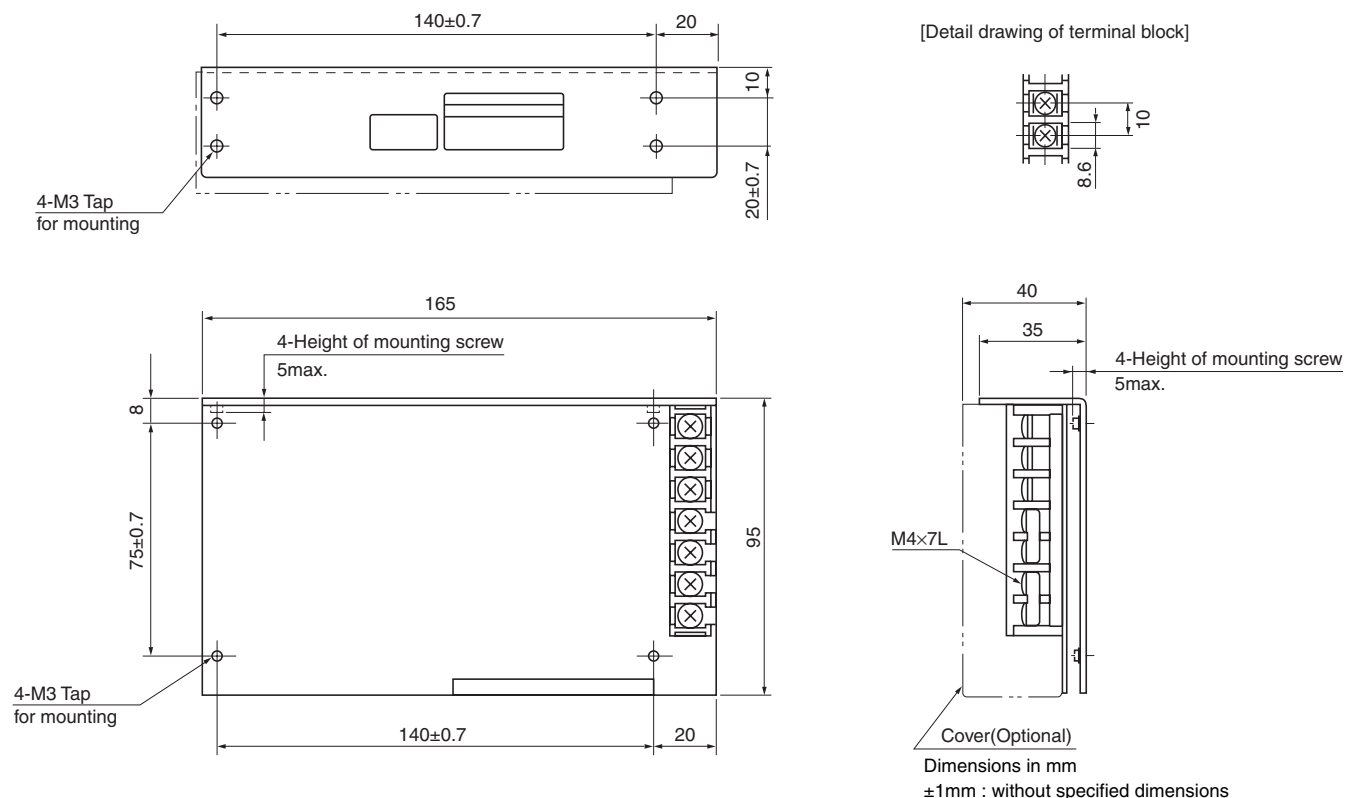
Part No.		FAK05-20R	FAK12-8R3	FAK15-6R6	FAK24-4R2	FAK48-2R0
Rated output voltage and current*1		5V • 20A	12V • 8.3A	15V • 6.6A	24V • 4.2A	48V • 2A
Maximum output power	W	100	99.6	99	100.8	96
Input conditions						
Input voltage Eac	V	85 to 132[Rating: 100 to 120]				
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)				
Input current	A	2.5max.[AC.100/120V]				
Fuse rating	A	5[Built-in]				
Surge current	A	25max.[Input and output ratings, 1st surge current, reset after 30s minimum.]				
Leakage current	mA	0.5max.[Input and output ratings]				
Efficiency	%	82typ.	84typ.	85typ.	86typ.	87typ.
Output characteristics						
Output voltage Edc	V	5	12	15	24	48
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4	43.2 to 52.8
Maximum output current	A	20	8.3	6.6	4.2	2
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5	53.5 to 60
Overcurrent threshold	A	21 to 24	8.7 to 10	7 to 8	4.4 to 5.2	2.1 to 2.4
Voltage stability	Source effect	%	2max.(1typ.)[Within the input voltage range]			
	Load effect	%	2max.(1typ.)[10 to 100% load]			
	Temperature effect	%	2max.(1typ.)[Ambient temperature: 0 to +50°C]			
	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]			
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]			
Ripple Ep-p	mV	60max.	80max.	80max.	100max.	200max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.	400max.
Start up time	ms	200max.				
Hold up time	ms	20min.				
Auxiliary functions						
Indicator display		LED(Green) indicates when voltage output is ON.				
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 40s).				
Overcurrent protection		Fixed current and voltage threshold type, automatic recovery.				
Remote ON-OFF		No				
Remote sensing		Yes				
Output voltage external variable function		No				
Standards						
Safety standards		UL1950, CSA C22.2 No.950-95(C-UL) approved.				
Noise terminal voltage		FCC class B meet.				
Constructions						
External dimensions	mm	35×95×165[H×W×L] / With cover(Option)*2: 40×95×165[H×W×L]				
Weight	g	600max.				
Mounting method		Can be attached to 2 sides.				
Case material		Frame: Aluminum / Cover(Option: 2JC0ZB390-FAK100CA): Iron				

*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

*2 Derating is required when the optional cover is attached.

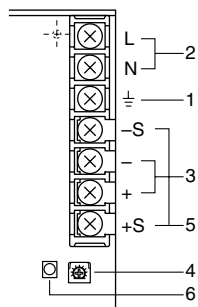
FAK100W Type

SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage. The output voltage increases by rotating it clockwise.
5	Remote sensing terminals(+S, -S)	These terminals are used to compensate voltage loss from the output terminal to a load. Normally they are shorted with a metal bar.
6	Operation indicator LED	This Green LED becomes indicated when voltage is output.

FAK150W Type

SPECIFICATIONS AND STANDARDS

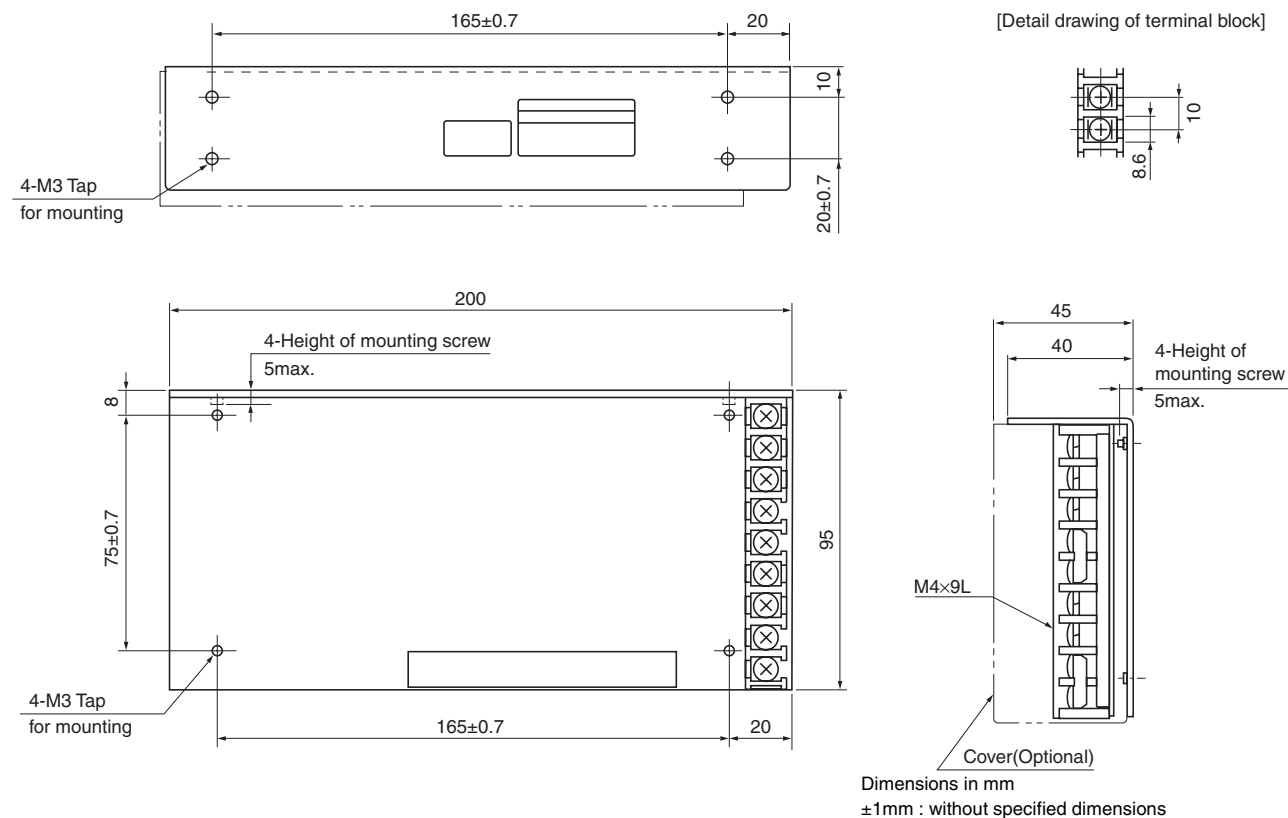
Part No.		FAK05-30R	FAK12-12R	FAK15-10R	FAK24-6R0	FAK48-3R0
Rated output voltage and current*1		5V • 30A	12V • 12A	15V • 10A	24V • 6A	48V • 3A
Maximum output power	W	150	144	150	144	144
Input conditions						
Input voltage Eac	V	85 to 132[Rating: 100 to 120]				
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)				
Input current	A	3.5max.[AC.100/120V]				
Fuse rating	A	6.3[Built-in]				
Surge current	A	25max.[Input and output ratings, 1st surge current, reset after 30s minimum.]				
Leakage current	mA	0.5max.[Input and output ratings]				
Efficiency	%	82typ.	84typ.	85typ.	86typ.	88typ.
Output characteristics						
Output voltage Edc	V	5	12	15	24	48
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4	43.2 to 52.8
Maximum output current	A	30	12	10	6	3
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5	53.5 to 60
Overcurrent threshold	A	32 to 36	13 to 15	11 to 13	6.3 to 7.5	3.3 to 3.7
Voltage stability	Source effect	%	2max.(1typ.)(Within the input voltage range]			
	Load effect	%	2max.(1typ.)(10 to 100% load]			
	Temperature effect	%	2max.(1typ.)(Ambient temperature: 0 to +50°C]			
	Drift(Time effect)	%	0.5max.(0.1typ.)(25°C, input and output ratings, after input voltage ON for 30min to 8h]			
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]			
Ripple Ep-p	mV	60max.	80max.	80max.	100max.	200max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.	400max.
Start up time	ms	200max.				
Hold up time	ms	20min.				
Auxiliary functions						
Indicator display		LED(Green) indicates when voltage output is ON.				
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 40s).				
Overcurrent protection		Fixed current and voltage threshold type, automatic recovery.				
Remote ON-OFF		No				
Remote sensing		Yes				
Output voltage external variable function		No				
Standards						
Safety standards		UL1950, CSA C22.2 No.950-95(C-UL) approved.				
Noise terminal voltage		FCC class B compliant.				
Constructions						
External dimensions	mm	40×95×200[H×W×L] / With cover(Option)*2: 45×95×200[H×W×L]				
Weight	kg	1max.				
Mounting method		Can be attached to 2 sides.				
Case material		Frame: Aluminum / Cover(Option: 2JC0ZB391-FAK150CA): Iron				

*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

*2 Derating is required when the optional cover is attached.

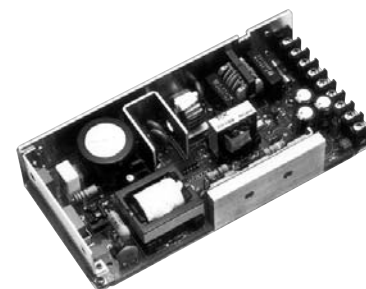
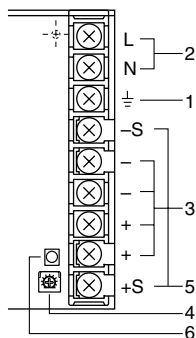
FAK150W Type

SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line (Allowable current for a single pin of the 20A max.).
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.
5	Remote sensing terminals(+S, -S)	These terminals are used to compensate voltage loss from the output terminal to a load. Normally they are shorted with a metal bar.
6	Operation indicator LED	This Green LED becomes indicated when voltage is output.

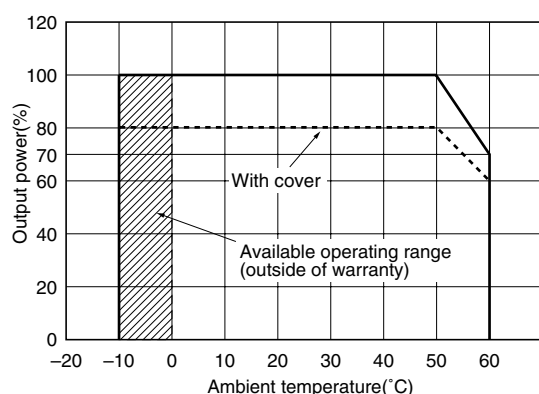
Characteristics, Functions, and Applications

COMMON SPECIFICATIONS

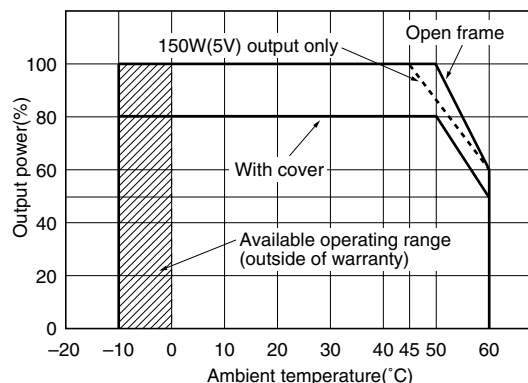
Temperature and humidity		
Temperature range	Operating(°C)	0 to +60[Derating is necessary when operating environment temperature exceed 50°C.]
	Storage(°C)	
Humidity range	Operating(%)RH	20 to 95[Maximum wet-bulb temperature: 35°C, without dewing]
	Storage(%)RH	
Vibration and shock		
Vibration	5 to 10Hz	All amplitude 10mm[3 directions, each 1h]
	10 to 55Hz	Acceleration 19.6m/s ² (2G)[3 directions, each 1h](25W and 50W Types)
		Acceleration 29.4m/s ² (3G)[3 directions, each 1h] (100W and 150W Types, 19.6m/s ² (2G) for installation with angle bracket downward.)
Shock	Acceleration	196m/s ² (20G)[3 directions, each 3 times] (25W and 50W Types)
		588m/s ² (60G)[3 directions, each 3 times] (100W and 150W Types, 19.6m/s ² (2G) for installation with angle bracket downward.)
	Pulse duration	11±5ms
Withstand voltage and insulation resistance		
Withstand voltage	Input terminal to ground terminal(G)	Eac: 2kV, 1min[Normal temperature, normal humidity, cutout current 10mA]
	Input terminal to output terminal	
Insulation resistance	Input terminal to ground terminal(G)	Edc: 500V, 100MΩ min. [Normal temperature, normal humidity]
	Input terminal to output terminal	
	Output terminal to ground terminal(G)	

OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)

25W AND 50W TYPES



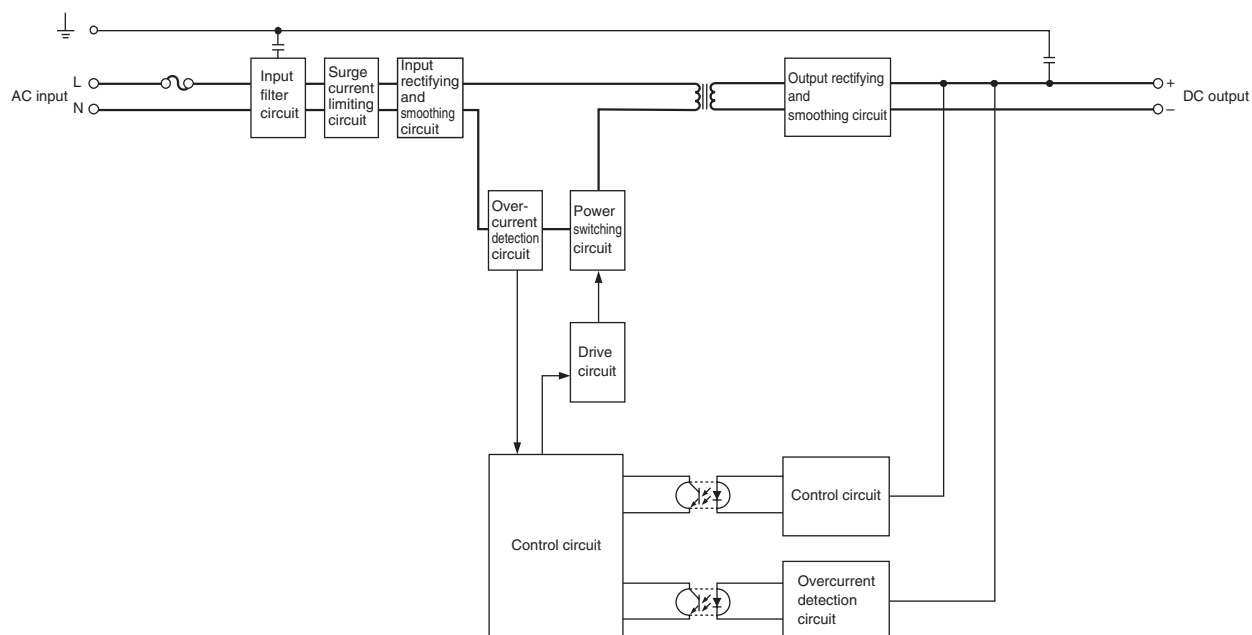
100W AND 150W TYPES



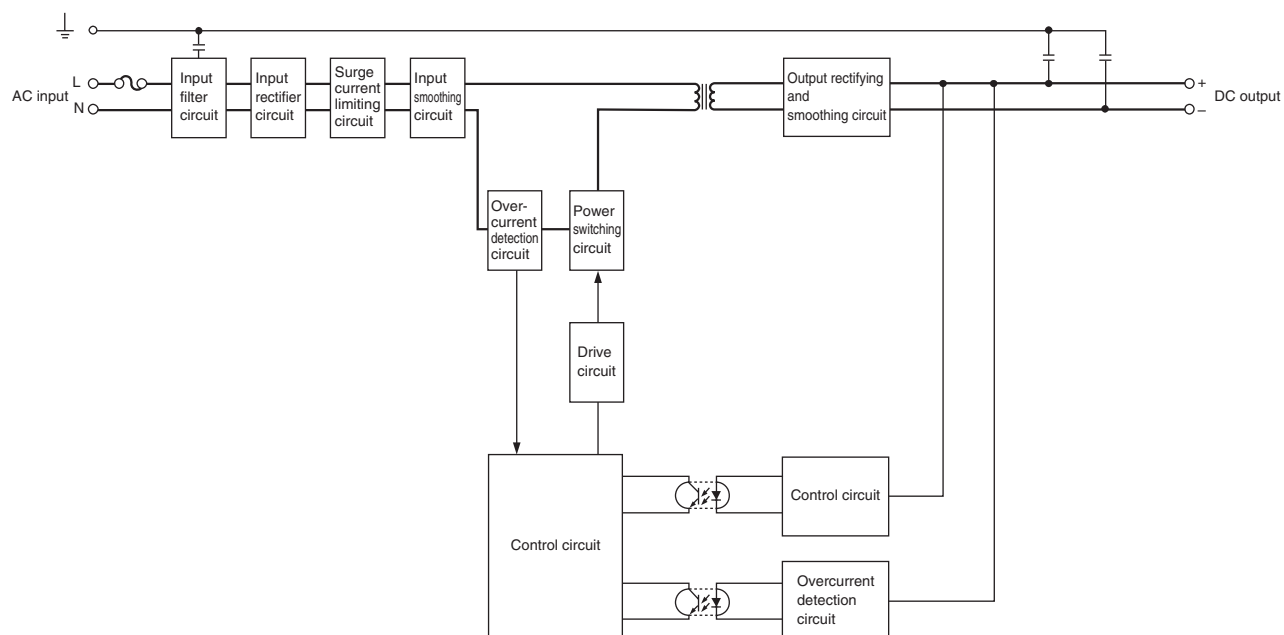
Characteristics, Functions, and Applications

BLOCK DIAGRAMS

25W TYPE



50W, 100W AND 150W TYPES



Characteristics, Functions, and Applications

INSTALLATION

For natural cooling, apply either of the following installation methods so as to provide a thermal convection:

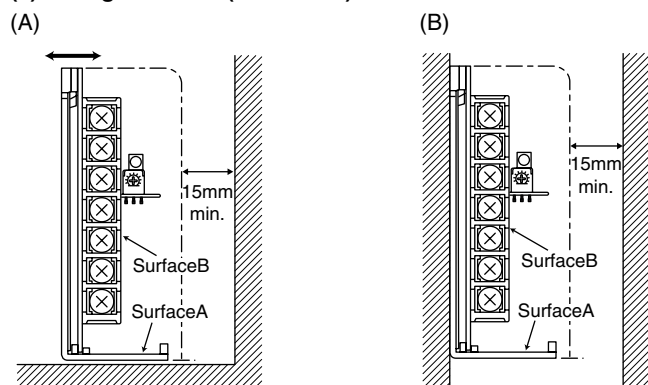
(1) Standard installation

(2) Other installations on component surface (upward).

In addition, maintain a 15mm min. distance between the component (cover) surface and surrounding equipment, etc.

(1) Standard Installation

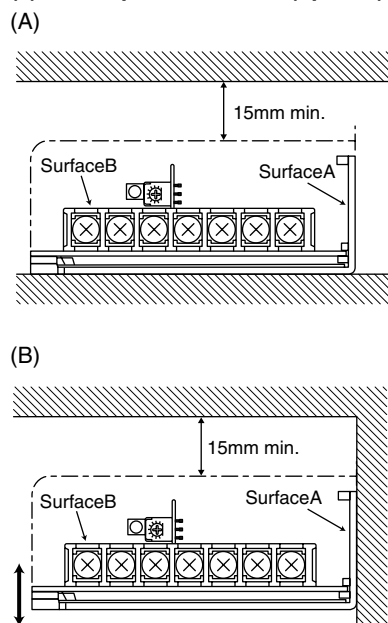
(1)-1. Angle bracket (downward)



- For the installation in (A), arrange a bearer for preventing vibrations on the surface B of the angle bracket or in a direction indicated by an arrow.

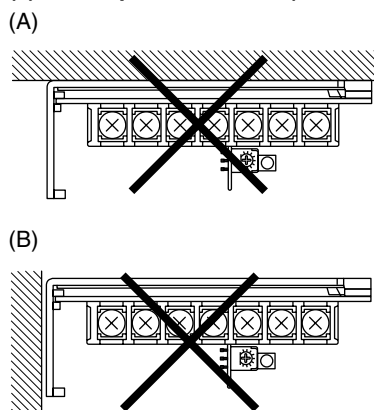
(2) Other Installations

(2)-1. Component surface (upward)



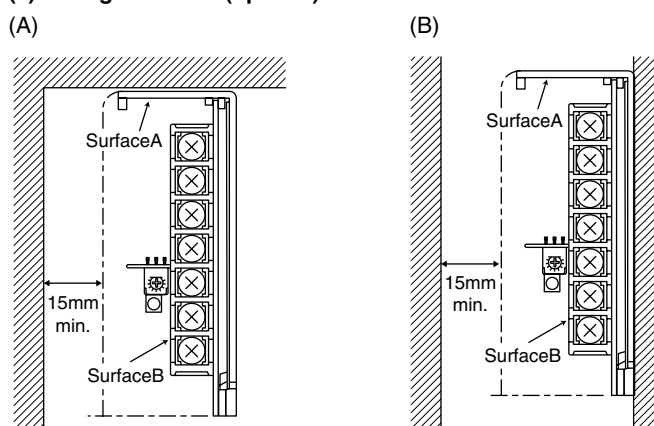
- For the installation in (B), arrange a bearer for preventing vibrations on the surface B of the angle bracket or in a direction indicated by an arrow.

(2)-2. Component surface (downward)



- This type of installation is inhibited due to a difficulty of the thermal convection.

(2)-3. Angle bracket (upward)



- This type of installation is inhibited due to a difficulty of the thermal convection.

COVER

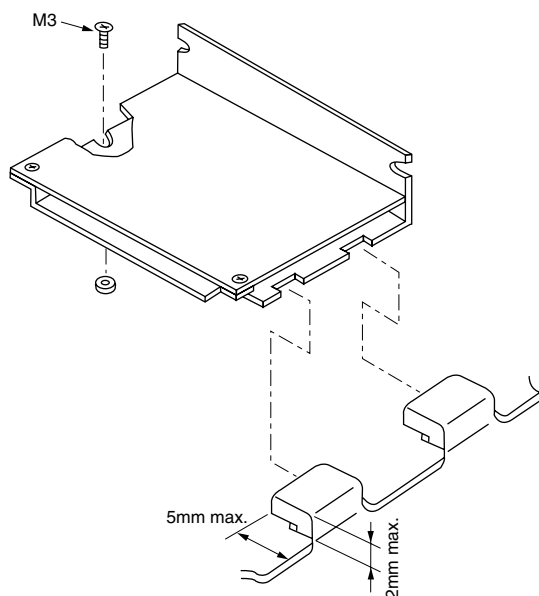
The cover is separately available. Please order it with the following model names:

Type	Cover model No.
25W	2JC0ZB146-FAK25CA
50W	2JC00B147-FAK50CA
100W	2JC0ZB390-FAK100CA
150W	2JC0ZB391-FAK150CA

Characteristics, Functions, and Applications

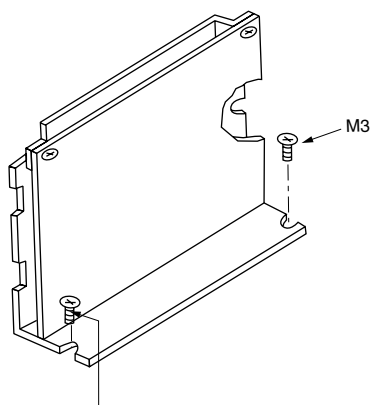
HANGING INSTALLATION (applicable to 25W and 50W types)

Recesses are provided at two places on an L-shaped frame. Use them to mount the power supply from its surface.



- Install carefully so that there is no wobbling.

Use the notched and mounting holes for stand-up installation of the power supply.



A screwdriver may touch a component on the PC board when rotating the M3 screw.
Be careful not to apply any excessive force.

OTHER CONDITIONS

- Unless conditions are otherwise specified in the specifications or standards, 25°C and rated input-output should be applied.
- Ripple and noise (50MHz max.) were determined for 0 to +50°C temperature range and 10 to 100% load.