

Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

The R series RDM/RDH has realized a compact size by developing a high frequency of the oscillation frequency 300kHz. These products are high-reliability and multi-function power supplies having full auxiliary functions such as RC, RS, RV or the like as well as failure safeties of the overvoltage and overcurrent protections.



FEATURES

- DC.24V input (RDM) and 48V input (RDH), compact, and single-output power supply.
- High-reliability and long-life design.
- Remote ON-OFF function.
- Remote sensing function.
- Adjustable external output voltage function.
- Indicator display function.

PART NUMBERS AND RATINGS

RDM

Output voltage(V)	30W Type		60W Type		100W Type		150W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.
5	6	RDM05-6R0	12	RDM05-12R	20	RDM05-20R	30	RDM05-30R
12	2.5	RDM12-2R5	5	RDM12-5R0	8.3	RDM12-8R3	12	RDM12-12R
15	2	RDM15-2R0	4	RDM15-4R0	6.6	RDM15-6R6	10	RDM15-10R
24	1.3	RDM24-1R3	2.5	RDM24-2R5	4.2	RDM24-4R2	6	RDM24-6R0

RDH

Output voltage(V)	30W Type		60W Type		100W Type		150W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.
5	6	RDH05-6R0	12	RDH05-12R	20	RDH05-20R	30	RDH05-30R
12	2.5	RDH12-2R5	5	RDH12-5R0	8.3	RDH12-8R3	12	RDH12-12R
15	2	RDH15-2R0	4	RDH15-4R0	6.6	RDH15-6R6	10	RDH15-10R
24	1.3	RDH24-1R3	2.5	RDH24-2R5	4.2	RDH24-4R2	6	RDH24-6R0

Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

RDM/RDH30W TYPE

SPECIFICATIONS AND STANDARDS

Part No.	RDM: DC.24V input	RDM05-6R0	RDM12-2R5	RDM15-2R0	RDM24-1R3
	RDH: DC.48V input	RDH05-6R0	RDH12-2R5	RDH15-2R0	RDH24-1R3
Rated output voltage and current*1		5V • 6A	12V • 2.5A	15V • 2A	24V • 1.3A
Maximum output power		W	30	30	30
					31.2
Input conditions					
Input voltage	RDM: 24V input	V	20 to 30[Rating: 24]		
E _{dc}	RDH: 48V input	V	40 to 56[Rating: 48]		
Input current	RDM: 24V input	A	2.2max.(1.6typ.)[Built-in fuse rating: 4A]		
	RDH: 48V input	A	1.1max.(0.8typ.)[Built-in fuse rating: 2.5A]		
Surge current		A	200typ.[Input and output ratings]		
Efficiency		%	77typ.[Input and output ratings]		
Output characteristics					
Output voltage E _{dc}		V	5	12	15
					24
Voltage variable range*2 E _{dc}		V	4 to 5.5	8.4 to 13.2	12 to 16.5
					16.8 to 26.4
Maximum output current		A	6	2.5	2
					1.3
Minimum output current		A	0	0	0
					0
Overvoltage threshold E _{dc}		V	6 to 6.9	13.7 to 15.7	17 to 19.5
					27 to 30.5
Overcurrent threshold		A	6.6 to 7.1	2.8 to 3.1	2.3 to 2.6
					1.5 to 1.8
Voltage stability	Source effect	%	0.8max.(0.2typ.)[Within the input voltage range]		
	Load effect	%	1max.(0.3typ.)[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 E _{p-p}		mV	50max.	80max.	80max.
					100max.
Ripple noise E _{p-p}		mV	100max.	170max.	200max.
					290max.
Auxiliary functions					
Indicator display		LED(Green) indicates when voltage output is ON.			
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 5s).			
Overcurrent protection		Rectangular type, automatic recovery, set value fixed.			
Remote ON-OFF		Yes(Floating)			
Remote sensing		Yes			
Output voltage external variable function		Yes			
Standards					
Safety standards		UL1950-3, CSA950-95(C-UL) certified.			
Constructions					
External dimensions		mm	95×35×130[H×W×L]		
Weight		g	400max.		
Mounting method		Can be attached to 3 sides.			
Case material		Aluminum			

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

*2 The output voltage is variable by using a trimmer V.ADJ. In addition it is externally controllable by using an RV terminal..

Power Supplies

DC Input

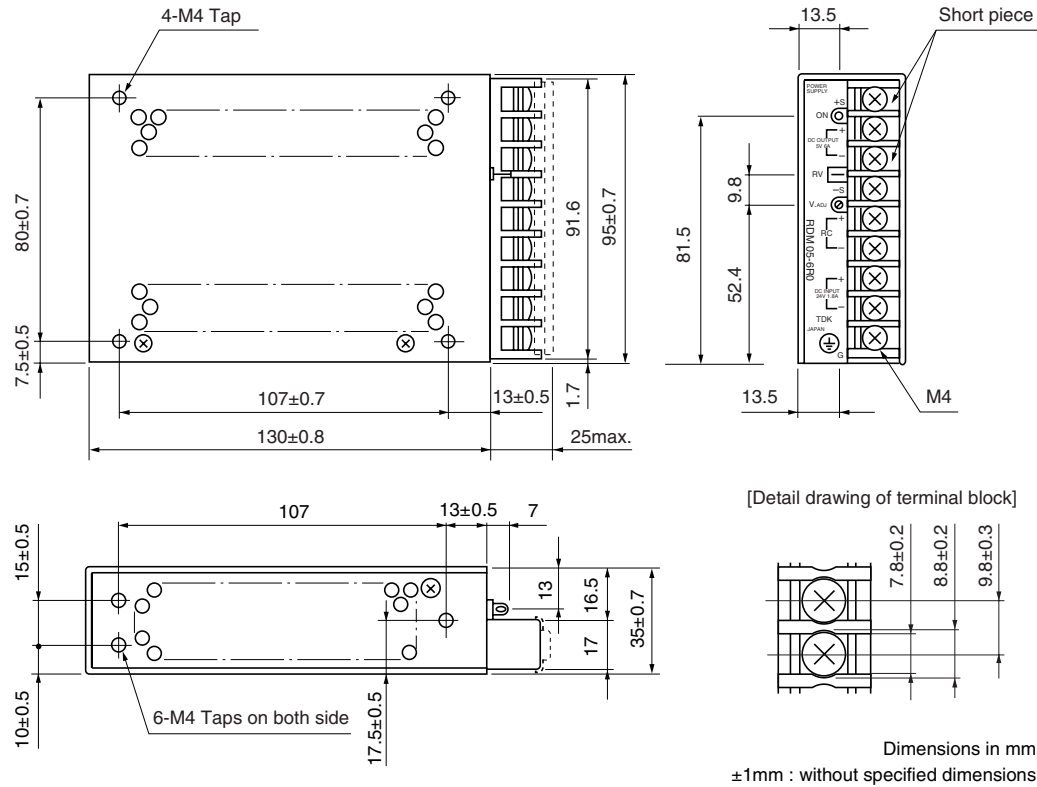
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

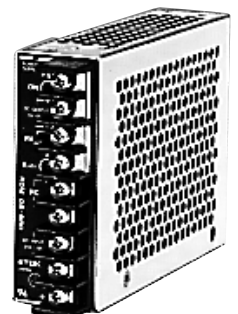
UL/CSA Approved

RDM/RDH30W TYPE

SHAPES AND DIMENSIONS



- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

RDM/RDH60W TYPE

SPECIFICATIONS AND STANDARDS

Part No.	RDM: DC.24V input	RDM05-12R	RDM12-5R0	RDM15-4R0	RDM24-2R5
	RDH: DC.48V input	RDH05-12R	RDH12-5R0	RDH15-4R0	RDH24-2R5
Rated output voltage and current* ¹		5V • 12A	12V • 5A	15V • 4A	24V • 2.5A
Maximum output power		W	60	60	60
Input conditions					
Input voltage	RDM: 24V input	V	20 to 30[Rating: 24]		
E _{dc}	RDH: 48V input	V	40 to 56[Rating: 48]		
Input current	RDM: 24V input	A	4.3max.(3.3typ.)[Built-in fuse rating: 6.3A]		
	RDH: 48V input	A	2.1max.(1.6typ.)[Built-in fuse rating: 4A]		
Surge current		A	200typ.[Input and output ratings]		
Efficiency		%	79typ.[Input and output ratings]		
Output characteristics					
Output voltage E _{dc}		V	5	12	15
Voltage variable range* ² E _{dc}		V	4 to 5.5	8.4 to 13.2	12 to 16.5
Maximum output current		A	12	5	4
Minimum output current		A	0	0	0
Overvoltage threshold E _{dc}		V	6 to 6.9	13.7 to 15.7	17 to 19.5
Overcurrent threshold		A	13.2 to 13.8	5.6 to 6	4.5 to 4.9
Voltage stability	Source effect	%	0.8max.(0.2typ.)[Within the input voltage range]		
	Load effect	%	1max.(0.3typ.)[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 E _{p-p}		mV	50max.	80max.	80max.
Ripple noise E _{p-p}		mV	100max.	170max.	200max.
Auxiliary functions					
Indicator display		LED(Green) indicates when voltage output is ON.			
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 5s).			
Overcurrent protection		Rectangular type, automatic recovery, set value fixed.			
Remote ON-OFF		Yes(Floating)			
Remote sensing		Yes			
Output voltage external variable function		Yes			
Standards					
Safety standards		UL1950-3, CSA950-95(C-UL) certified.			
Constructions					
External dimensions		mm	95×43×160[H×W×L]		
Weight		g	550max.		
Mounting method		Can be attached to 3 sides.			
Case material		Aluminum			

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

*² The output voltage is variable by using a trimmer V_{ADJ}. In addition it is externally controllable by using an RV terminal..

Power Supplies

DC Input

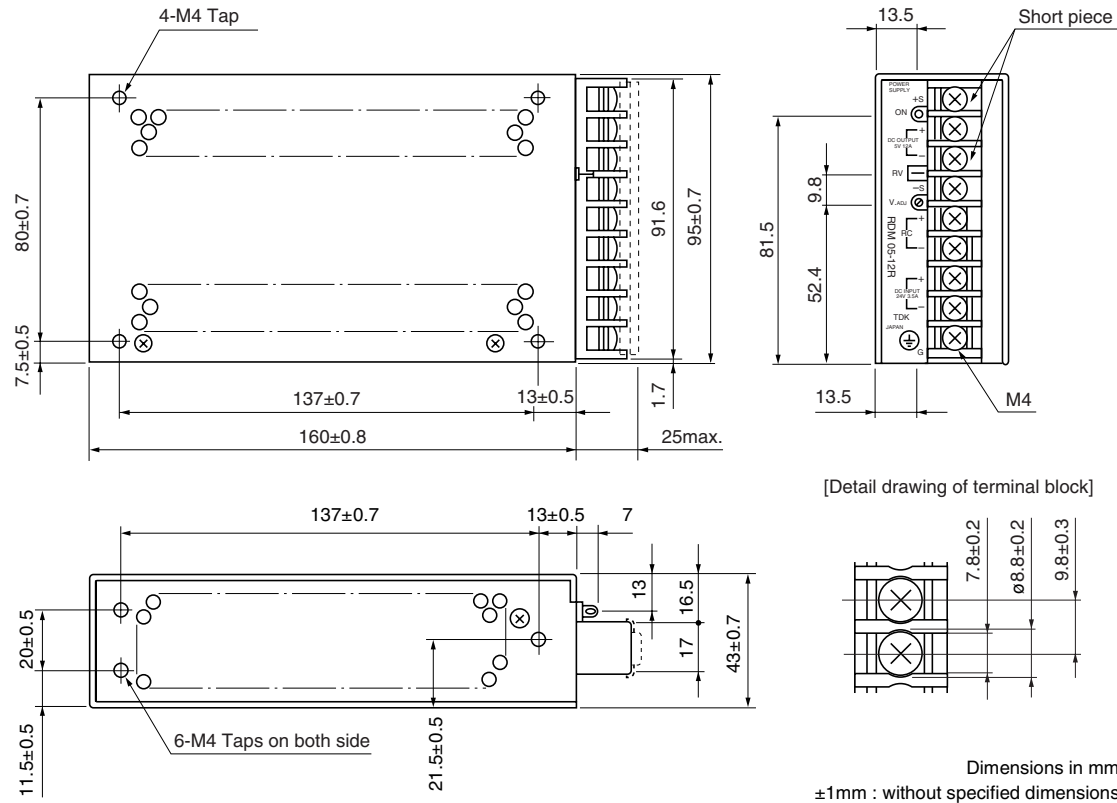
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

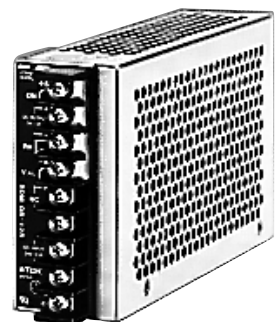
UL/CSA Approved

RDM/RDH60W TYPE

SHAPES AND DIMENSIONS



- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

RDM/RDH100W TYPE

SPECIFICATIONS AND STANDARDS

Part No.	RDM: DC.24V input RDH: DC.48V input	RDM05-20R RDH05-20R	RDM12-8R3 RDH12-8R3	RDM15-6R6 RDH15-6R6	RDM24-4R2 RDH24-4R2	
Rated output voltage and current* ¹		5V • 20A	12V • 8.3A	15V • 6.6A	24V • 4.2A	
Maximum output power		W	100	99.6	99	100.8
Input conditions						
Input voltage	RDM: 24V input	V	20 to 30[Rating: 24]			
E _{dc}	RDH: 48V input	V	40 to 56[Rating: 48]			
Input current	RDM: 24V input	A	6.8max.(5.3typ.)[Built-in fuse rating: 10A]			
	RDH: 48V input	A	3.3max.(2.6typ.)[Built-in fuse rating: 6.3A]			
Surge current		A	200typ.[Input and output ratings]			
Efficiency		%	79typ.[Input and output ratings]			
Output characteristics						
Output voltage E _{dc}		V	5	12	15	24
Voltage variable range* ² E _{dc}		V	4 to 5.5	8.4 to 13.2	12 to 16.5	16.8 to 26.4
Maximum output current		A	20	8.3	6.6	4.2
Minimum output current		A	0	0	0	0
Overvoltage threshold E _{dc}		V	6 to 6.9	13.7 to 15.7	17 to 19.5	27 to 30.5
Overcurrent threshold		A	22 to 24	9.3 to 9.9	7.4 to 7.9	4.7 to 5.1
Voltage stability	Source effect	%	0.8max.(0.2typ.)[Within the input voltage range]			Total effect 2max.(0.6typ.)
	Load effect	%	1max.(0.3typ.)[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 E _{p-p}		mV	50max.	80max.	80max.	100max.
Ripple noise E _{p-p}		mV	100max.	170max.	200max.	290max.
Auxiliary functions						
Indicator display			LED(Green) indicates when voltage output is ON.			
Overvoltage protection			Voltage shut-down type, recovers upon reset(interval approx. 5s).			
Overcurrent protection			Rectangular type, automatic recovery, set value fixed.			
Remote ON-OFF			Yes(Floating)			
Remote sensing			Yes			
Output voltage external variable function			Yes			
Standards						
Safety standards			UL1950-3, CSA950-95(C-UL) certified.			
Constructions						
External dimensions		mm	95×60×220[H×W×L]			
Weight		kg	1max.			
Mounting method			Can be attached to 3 sides.			
Case material			Aluminum			

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

*² The output voltage is variable by using a trimmer V_{ADJ}. In addition it is externally controllable by using an RV terminal..

Power Supplies

DC Input

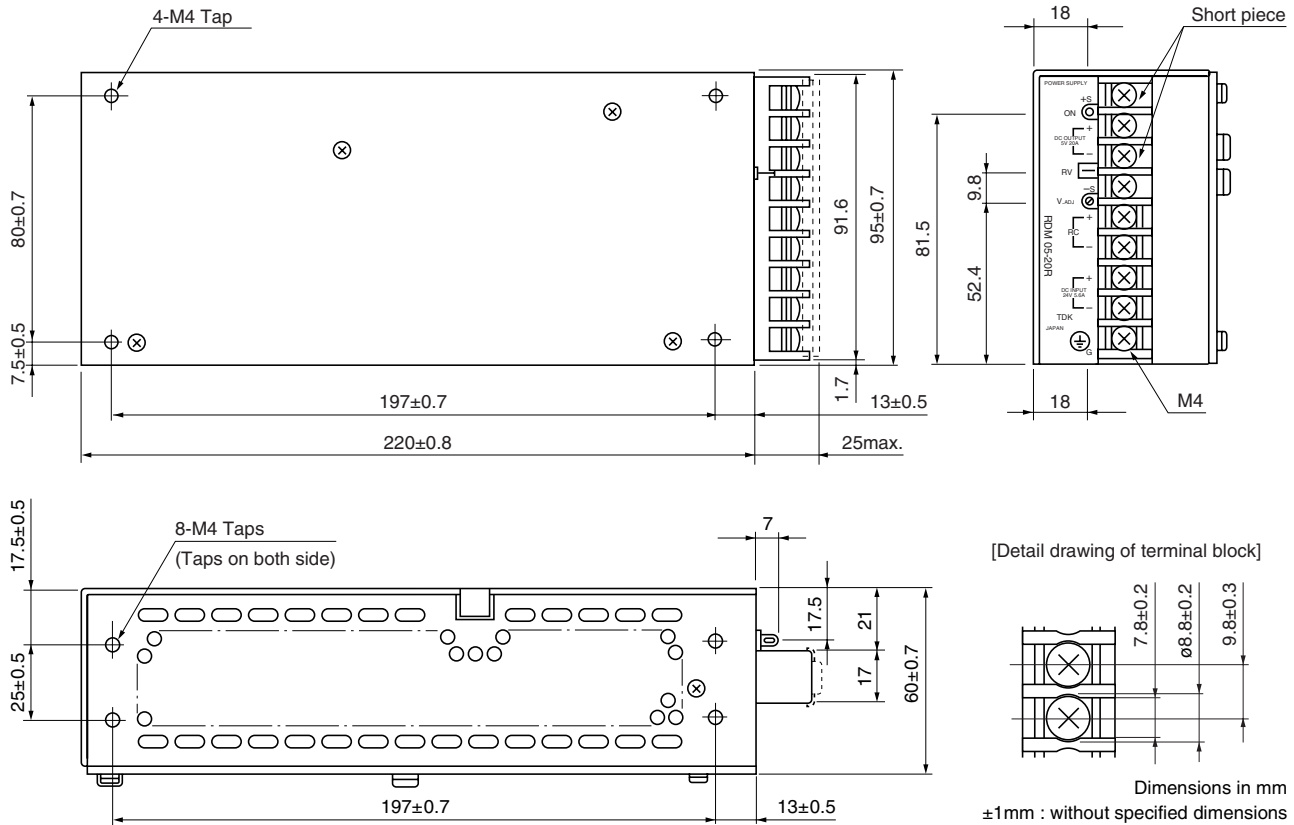
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

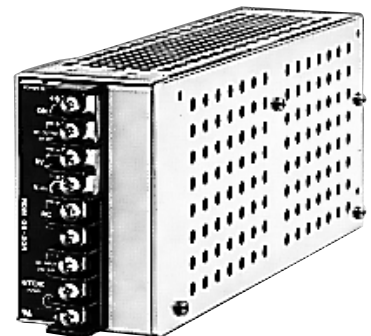
UL/CSA Approved

RDM/RDH100W TYPE

SHAPES AND DIMENSIONS



- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

RDM/RDH150W TYPE

SPECIFICATIONS AND STANDARDS

Part No.	RDM: DC.24V input RDH: DC.48V input	RDM05-30R RDH05-30R	RDM12-12R RDH12-12R	RDM15-10R RDH15-10R	RDM24-6R0 RDH24-6R0
Rated output voltage and current*1		5V • 30A	12V • 12A	15V • 10A	24V • 6A
Maximum output power		W	150	144	150
144					
Input conditions					
Input voltage	RDM: 24V input	V	20 to 30[Rating: 24]		
Edc	RDH: 48V input	V	40 to 56[Rating: 48]		
Input current	RDM: 24V input	A	10.5max.(8typ.)(Built-in fuse rating: 15A)		
	RDH: 48V input	A	5max.(3.8typ.)(Built-in fuse rating: 8A)		
Surge current		A	200typ.[Input and output ratings]		
Efficiency		%	79typ.[Input and output ratings]		
Output characteristics					
Output voltage Edc		V	5	12	15
Voltage variable range*2 Edc		V	4 to 5.5	8.4 to 13.2	12 to 16.5
Maximum output current		A	30	12	10
Minimum output current		A	0	0	0
Overvoltage threshold Edc		V	6 to 6.9	13.7 to 15.7	17 to 19.5
Overcurrent threshold		A	33 to 35	13.4 to 14.4	11.2 to 12
Voltage stability	Source effect	%	0.8max.(0.2typ.)(Within the input voltage range)		
	Load effect	%	1max.(0.3typ.)(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	50max.	80max.	80max.
Ripple noise Ep-p		mV	100max.	170max.	200max.
290max.					
Auxiliary functions					
Indicator display		LED(Green) indicates when voltage output is ON.			
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 5s).			
Overcurrent protection		Rectangular type, automatic recovery, set value fixed.			
Remote ON-OFF		Yes(Floating)			
Remote sensing		Yes			
Output voltage external variable function		Yes			
Standards					
Safety standards		UL1950-3, CSA950-95(C-UL) certified.			
Constructions					
External dimensions		mm	95×80×220[H×W×L]		
Weight		kg	1.2max.		
Mounting method		Can be attached to 3 sides.			
Case material		Aluminum			

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

*2 The output voltage is variable by using a trimmer V.ADJ. In addition it is externally controllable by using an RV terminal..

Power Supplies

DC Input

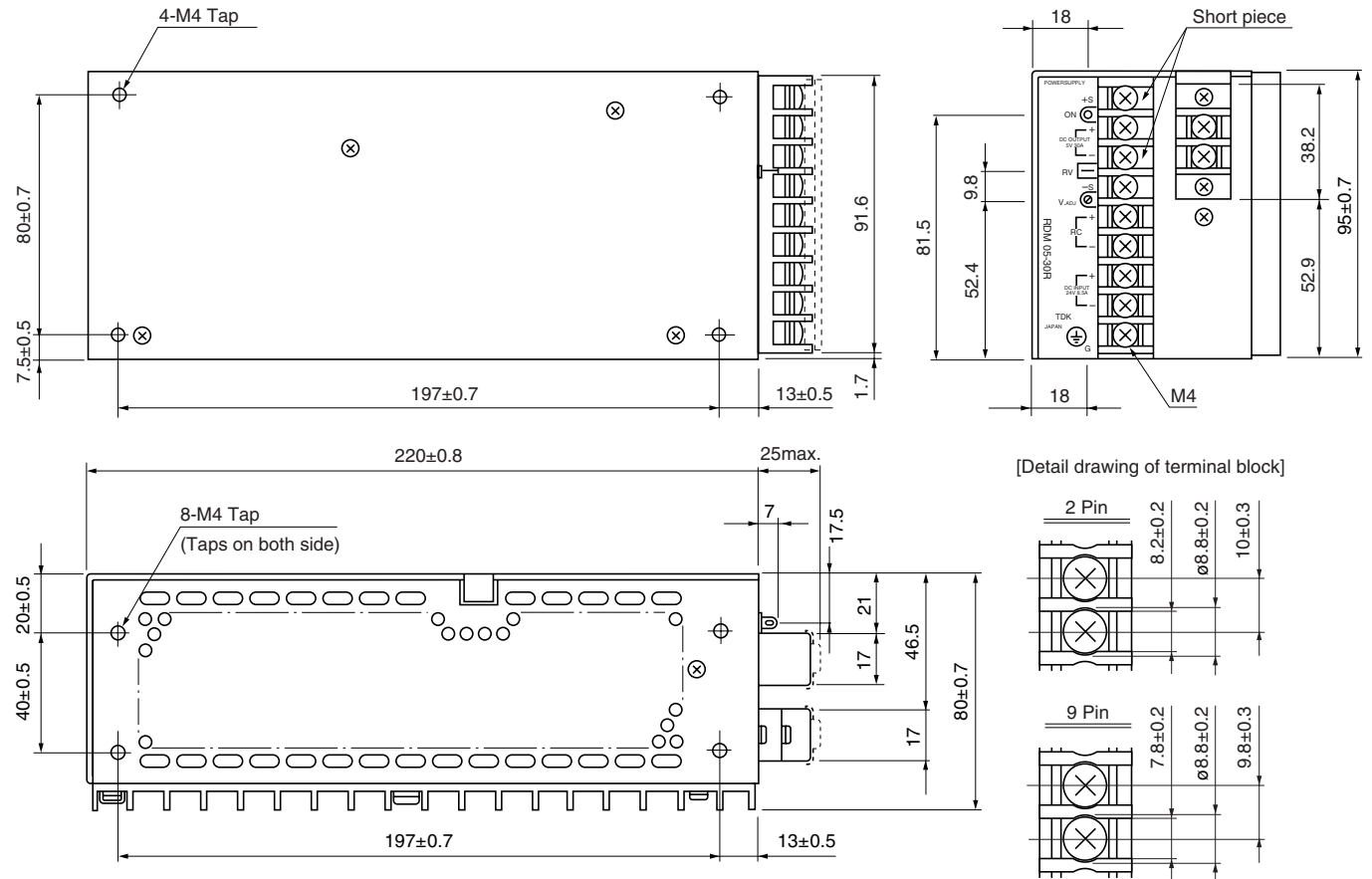
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

RDM/RDH150W TYPE

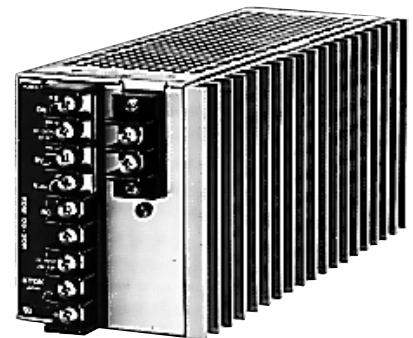
SHAPES AND DIMENSIONS



Dimensions in mm

±1mm : without specified dimensions

- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

DC Input

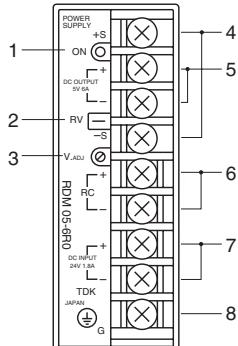
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

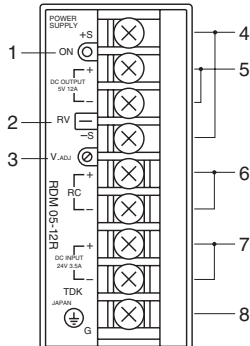
UL/CSA Approved

TERMINAL DESIGNATIONS AND FUNCTIONS

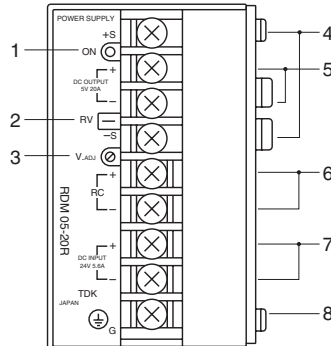
30W TYPE



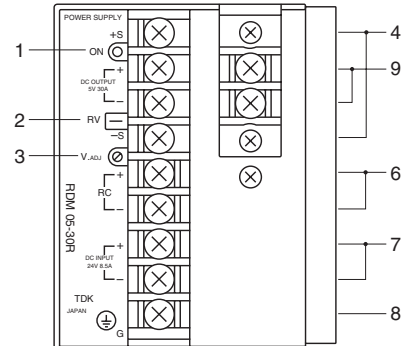
60W TYPE



100W TYPE

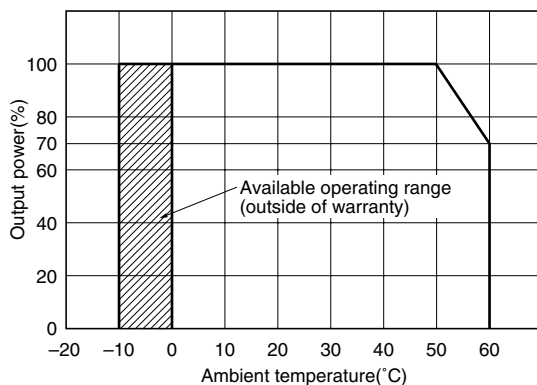


150W TYPE



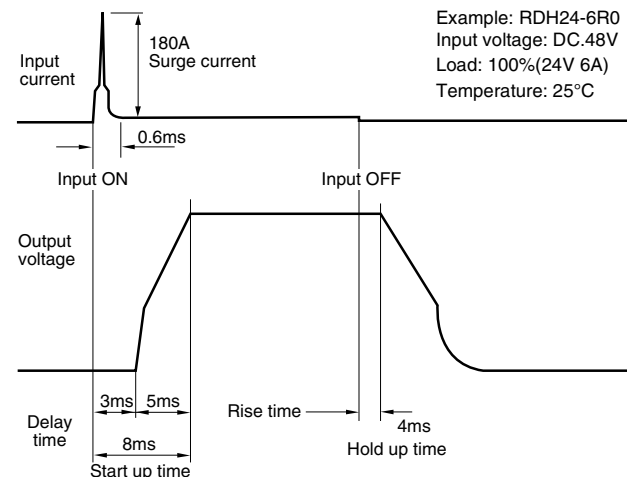
Terminal No.	Designations and functions	
1	Operation indicator LED(ON)	This Green LED becomes indicated when voltage is output.
2	Output voltage external variable terminal(RV)	The output voltage can be controlled by connecting a resistance between the RV terminal and the output +. In this case, remove a short piece between the +S and the output +.
3	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.
4	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.
5	DC output terminals(DC OUTPUT, +, -)	Connect to load.
6	Remote ON-OFF terminals(RC, +, -)	Output is turned ON-OFF by disconnecting-connecting the RC terminals(output ON when open). RC terminals are floating.
7	DC input terminals(DC INPUT, +, -)	Connected to DC input line. RDM: DC.24V input RDH: DC.48V input
8	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
9	Direct output terminals (DC OUTPUT, +, -, +, -) 150W Type	Connect a load line to this terminal. Allowable current per pin is 25A max. A use of two pins each is recommended.

OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)



SURGE CURRENT, START UP / HOLD UP TIMES

The input surge current is to be charged to a capacitor of an input smoothing circuit. This type of power supply is not provided with any special circuit for protection from surge current since surge current continues only for a short time in case of its occurrence. The magnitude of surge current depends upon a capacity (internal resistance) of the power supply for an input to this power supply and therefore an input source having a sufficiently large capacity is used at measurement. In a practical use, the surge current is lower than the value shown in the specifications.



Power Supplies

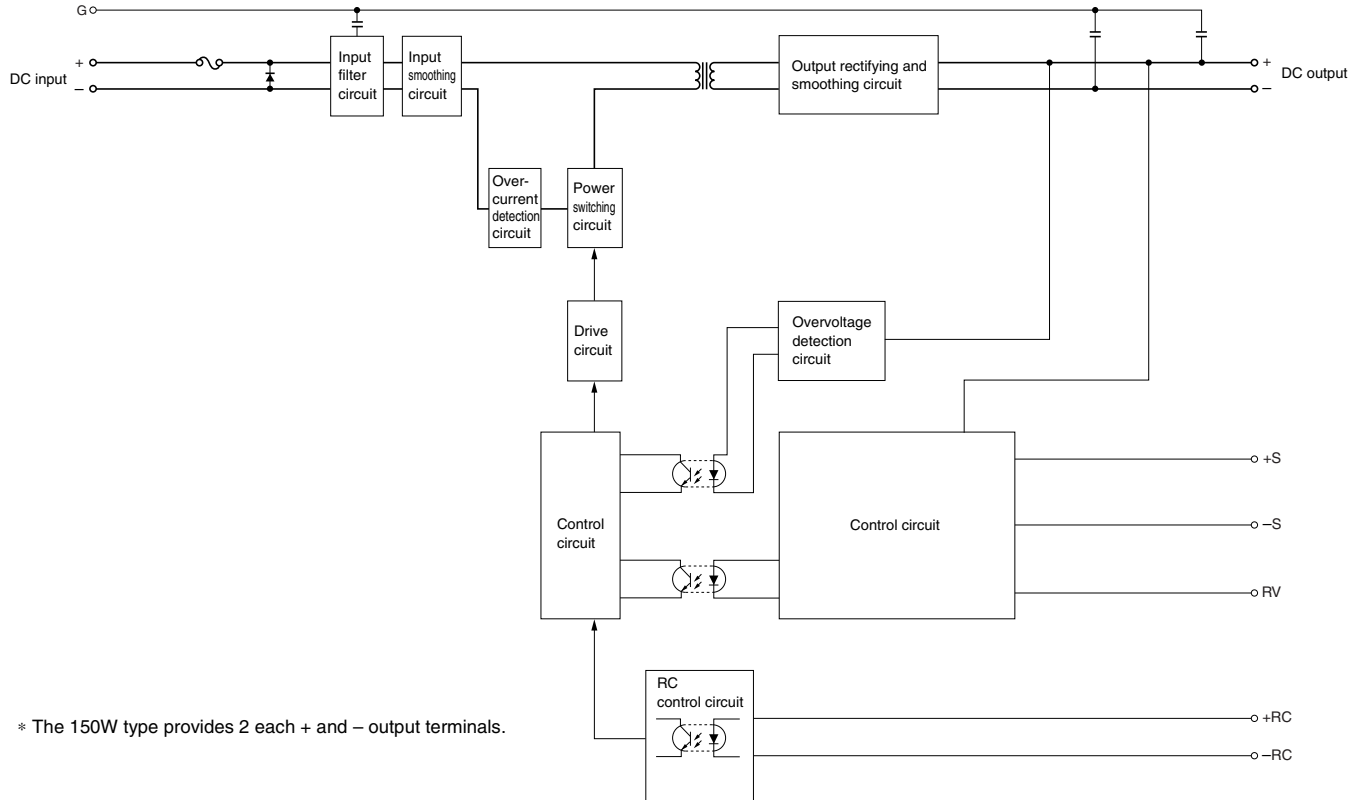
DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

BLOCK DIAGRAM



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]
Shock	Acceleration	196m/s ² (20G)[3 directions, each 3 times]
	Pulse duration	11±5ms
Withstand voltage and insulation resistance		
Withstand voltage	Input terminal to case(G)	Eac: 2kV, 1min
	Input terminal to output terminal	[Normal temperature, normal humidity, cutout current 10mA, 150W: cutout current 20mA]
Insulation resistance	Input terminal to case(G)	Edc: 500V, 100MΩ min. [Normal temperature, normal humidity]
	Input terminal to output terminal	
	Output terminal to case(G)	

Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

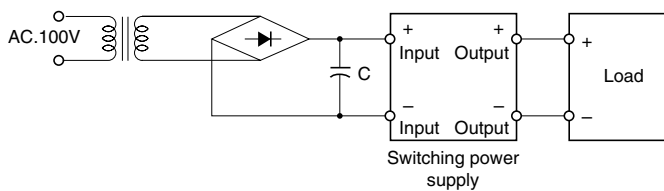
UL/CSA Approved

INPUT VOLTAGE RANGE

A stable DC input is intrinsically ideal for an input voltage of a switching power supply. Actually, however, a voltage of the power supply may vary with an elapse of a time in use like a battery. This kind of variation is covered by an input voltage width of the switching power supply. The specification for the input voltage range DC.40 to 56V (RDH type) means that the DC.48V input voltage is required ideally while there is no effect on an output in case of fluctuation within DC.40 to 56V range.

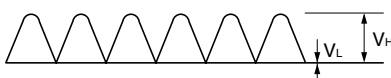
In addition some power supplies are used as input power supplies to lower a voltage from an AC line by using a transformer for using the rectified current at the voltage as an input of the power supplies (Refer to the diagram shown below). In this condition the lower limit V_L of the voltage of the rectified current need be within the input voltage range of the power supply. Therefore, it is necessary to arrange a smoothing circuit such as a capacitor in order to adjust the circuit so that the V_H and V_L levels are within the input voltage range of the power supply even if there is a little derivative current as shown in the diagram 2.

EXAMPLE OF USING GENERAL RECTIFIER CIRCUIT



Input voltage waveform of power supply

1. Without smoothing capacitor



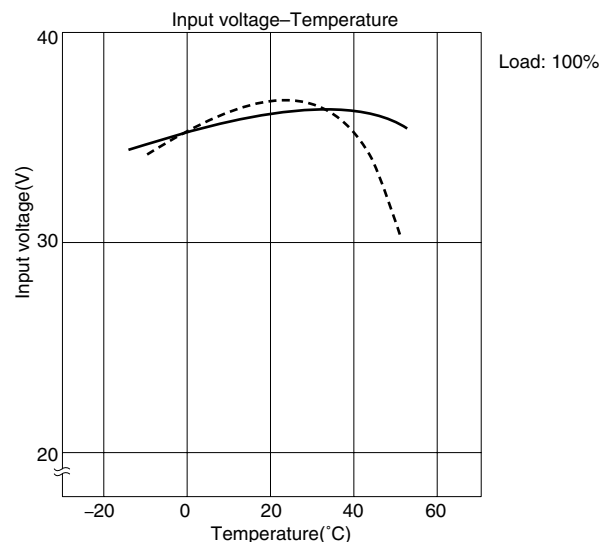
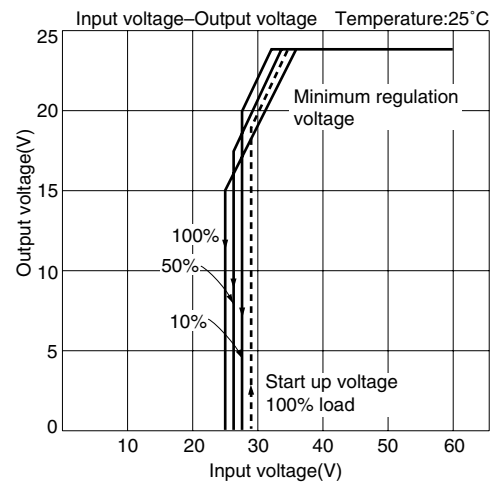
The input voltage of the power supply is insufficient since V_L is too low, thus causing an erroneous operation.

2. With smoothing capacitor



If V_H and V_L are within the input voltage range, the voltage is stable.

START UP VOLTAGE AND MINIMUM REGULATION VOLTAGE (Example: RDH24-6R0)



Power Supplies

DC Input

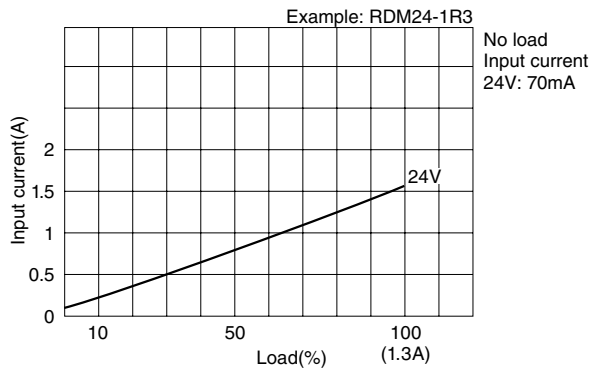
Single Output, Long Life

R Series RDM/RDH(30 to 150W)

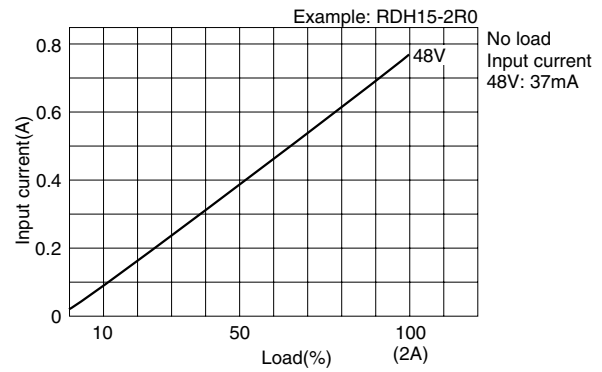
UL/CSA Approved

INPUT CURRENT

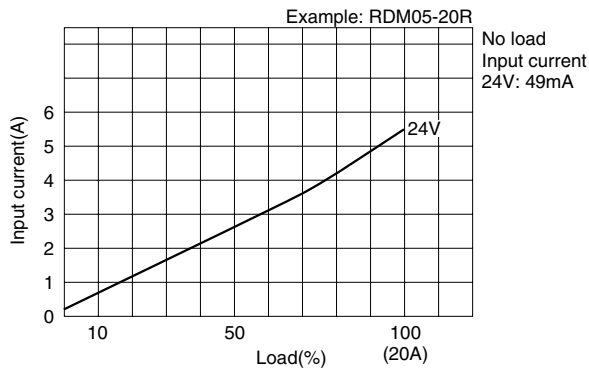
RDM 30W TYPE



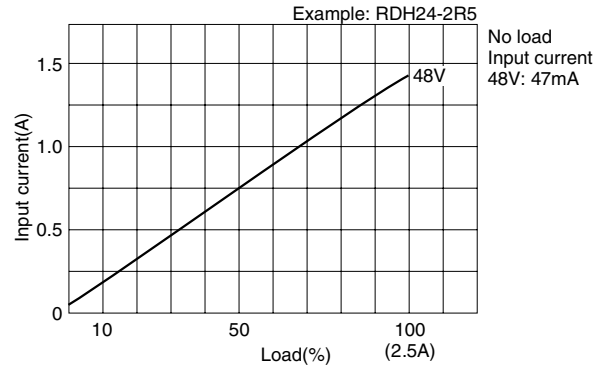
RDH 30W TYPE



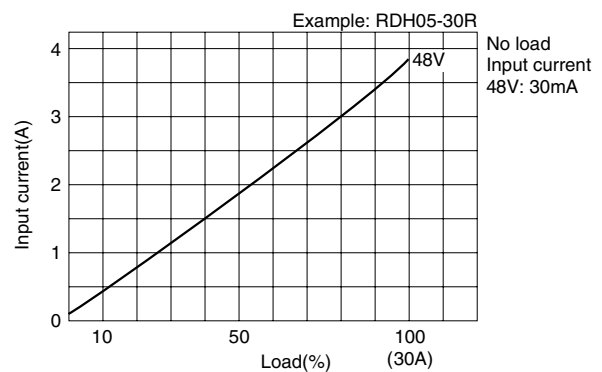
RDM 100W TYPE



RDH 50W TYPE



RDH 150W TYPE



Power Supplies

DC Input

Single Output, Long Life

R Series RDM/RDH(30 to 150W)

UL/CSA Approved

REMOTE ON-OFF

The RC circuit is provided so that a sequence can be easily prepared for a power supply output in the case of a use of multiple power supplies. The power supply output can be sent out or stopped by an open or close control of this signal (+RC, -RC).

Electric characteristics of RC circuit

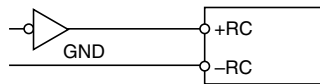
Input condition for high level (Power supply output ON): 2.4 to 24V or open

Input condition for low level (Power supply output OFF): 0 to 0.4V
IOL: 1.6mA (max.)

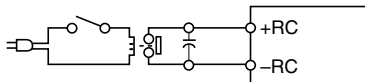
OTHER CONDITIONS

- 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.

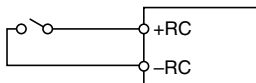
1. Equivalent to IC control(IC7404/74LS04)



2. Control with relay

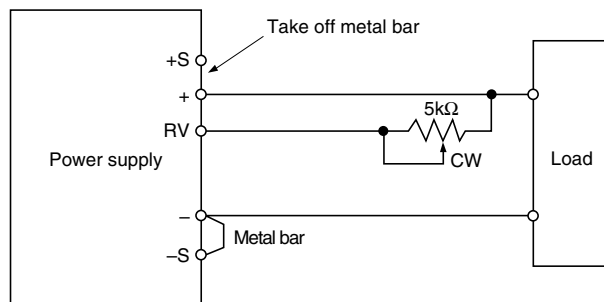


3. Control with switch



OUTPUT VOLTAGE EXTERNAL VARIABLE FUNCTION (RV)

The output voltage is enabled to be variable by using a built-in V.ADJ trimmer. An RV terminal is used for performing this operation at a place far from the power supply.



Remove a bar between +S and + terminals.

Attach one of the following trimmer between the + and RV terminals in the side of the load terminal:

3 to 15V output type: 2kΩ trimmer

24V output type: 5kΩ trimmer

A clockwise rotation of the trimmer control increases the output voltage.

The wire should be as short as possible for preventing an erroneous operation.