

DC Input

Single Output, Long Life, UL/C-UL Approved

R Series RDL(30 to 50W)

The R series RDL products are high-reliability and multi-function power supplies equipped with a wide variety of functions such as the overvoltage and overcurrent protections. The input voltages 12V(RDL), 24V(RDM), and 48V(RDH) are supported newly, thus providing full lineup.

FEATURES

- DC.9V to 16V input 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

| Output voltage(V) | 30W Type | | 50W Type | |
|----------------------|------------|-----------|------------|-----------|
| | Current(A) | Part No. | Current(A) | Part No. |
| 5 | 6 | RDL05-6R0 | 10 | RDL05-10R |
| 12 | 2.5 | RDL12-2R5 | 4.2 | RDL12-4R2 |
| 24 | 1.3 | RDL24-1R3 | 2.1 | RDL24-2R1 |

- The above products are only produced upon receipt of order.
Please check a delivery date.

RDL30W Type

SPECIFICATIONS AND STANDARDS

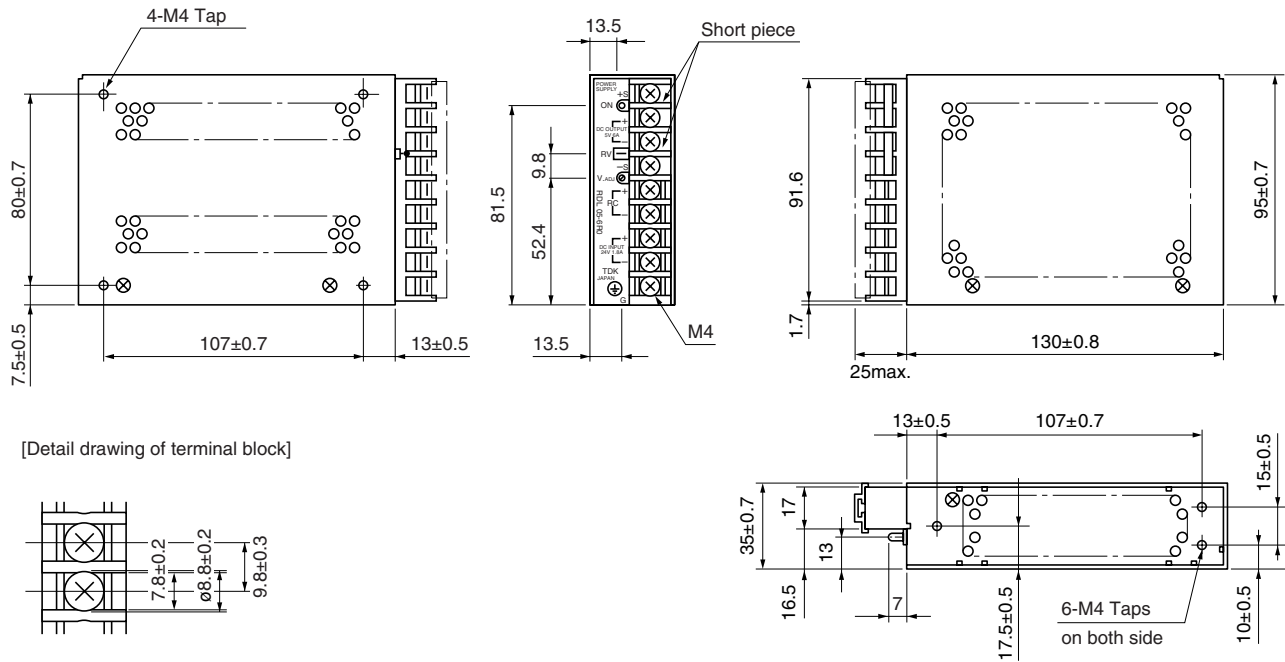
| | | | | |
|---|--------------------|---|--|--------------|
| Part No. | | RDL05-6R0 | RDL12-2R5 | RDL24-1R3 |
| Rated output voltage and current*1 | | 5V • 6A | 12V • 2.5A | 24V • 1.3A |
| Maximum output power | W | 30 | 30 | 31.2 |
| Input conditions | | | | |
| Input voltage E _{dc} | V | 9 to 16[Rating: 12] | | |
| Input current | A | 5max./3.8max.[DC.9/12V] | | |
| | A | 3V:3.5max./2.8max.[DC.9/12V] | | |
| Fuse rating | A | 6.3[Built-in] | | |
| Surge current | A | 150typ.[Input and output ratings] | | |
| Efficiency | % | 77typ. | 79typ. | 82typ. |
| Output characteristics | | | | |
| Output voltage E _{dc} | V | 5 | 12 | 24 |
| Voltage variable range E _{dc} | V | 4 to 5.5 | 8.4 to 13.2 | 16.8 to 26.4 |
| Maximum output current | A | 6 | 2.5 | 1.3 |
| Overvoltage threshold E _{dc} | V | 6 to 6.9 | 13.7 to 15.7 | 27 to 30.5 |
| Overcurrent threshold | A | 6.6 to 7.8 | 2.75 to 3.25 | 1.43 to 1.63 |
| Voltage stability | Source effect | % | 0.8max.(0.2typ.)(Within the input voltage range] | |
| | Load effect | % | 1max.(0.3typ.)(0 to 100% load] | |
| | Temperature effect | % | 1.5max.(0.8typ.)(Ambient temperature: -10 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*2 E _{p-p} | mV | 50max. | 80max. | 100max. |
| Ripple noise*2 E _{p-p} | mV | 100max. | 170max. | 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, CSA C22.2 No.950-95(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 -10 to +50°C. Derating is required when used outside this temperature range.

*2 Ripple and noise are determined for 10 to 100% load and 0 to +71°C temperature range at rated inputs. Within -10 to 0°C temperature range, they are approx. 1.5 times the above values.

RDL30W Type

SHAPES AND DIMENSIONS

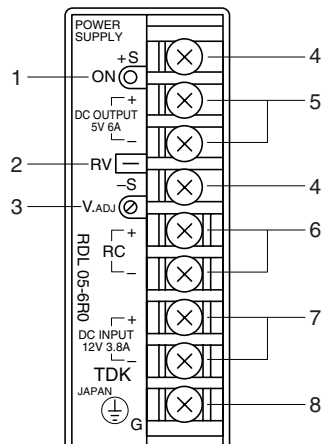


Dimensions in mm

±1mm : without specified dimensions

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

TERMINAL DESIGNATIONS AND FUNCTIONS



| 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. |
| 8 | Frame ground terminal(G) | Connect to earth ground. This is connected to the case. |

RDL50W Type

SPECIFICATIONS AND STANDARDS

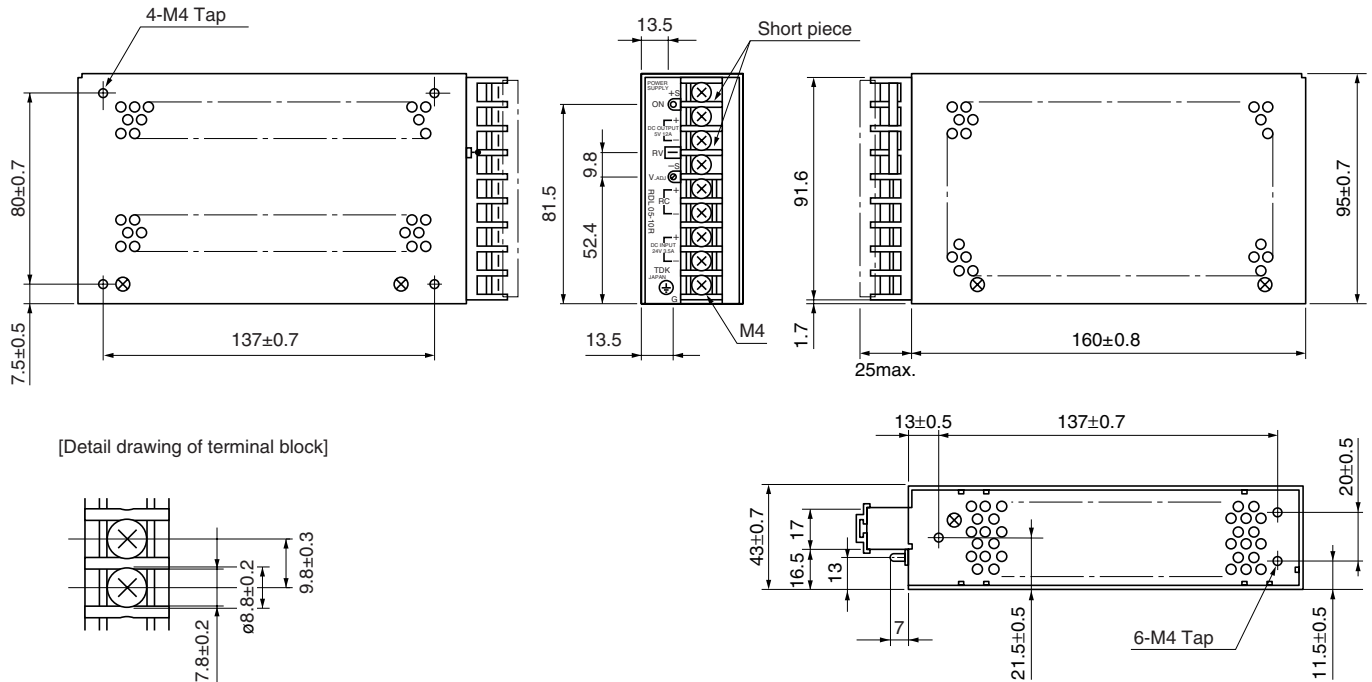
| | | | | | | | | |
|---|--------------------|---|--|------------|--------------|------------|--------------|---------------------------|
| Part No. | | RDL05-10R | | RDL12-4R2 | | RDL24-2R1 | | |
| Rated output voltage and current*1 | | 5V • 10A | | 12V • 4.2A | | 24V • 2.1A | | |
| Maximum output power | | W | 50 | 50.4 | | 50.4 | | |
| Input conditions | | | | | | | | |
| Input voltage E _{dc} | | V | 9 to 16[Rating: 12] | | | | | |
| Input current | | A | 8max./6max.[DC.9/12V] | | | | | |
| | | A | 3V: 6max./4max.[DC.9/12V] | | | | | |
| Fuse rating | | A | 10[Built-in] | | | | | |
| Surge current | | A | 150typ.[Input and output ratings] | | | | | |
| Efficiency | | % | 76typ. | | 77typ. | | 81typ. | |
| Output characteristics | | | | | | | | |
| Output voltage E _{dc} | | V | 5 | | 12 | | 24 | |
| Voltage variable range E _{dc} | | V | 4 to 5.5 | | 8.4 to 13.2 | | 16.8 to 26.4 | |
| Maximum output current | | A | 10 | | 4.2 | | 2.1 | |
| Overvoltage threshold E _{dc} | | V | 6 to 6.9 | | 13.7 to 15.7 | | 27 to 30.5 | |
| Overcurrent threshold | | A | 11 to 13 | | 4.62 to 5.46 | | 2.31 to 2.73 | |
| Voltage stability | Source effect | % | 0.8max.(0.2typ.)(Within the input voltage range] | | | | | Total effect 2max.(1typ.) |
| | Load effect | % | 1max.(0.3typ.)(0 to 100% load] | | | | | |
| | Temperature effect | % | 1.5max.(0.8typ.)(Ambient temperature: -10 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*2 E _{p-p} | | mV | 50max. | | 80max. | | 100max. | |
| Ripple noise*2 E _{p-p} | | mV | 100max. | | 170max. | | 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, CSA C22.2 No.950-95(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 -10 to +50°C. Derating is required when used outside this temperature range.

*2 Ripple and noise are determined for 10 to 100% load and 0 to +71°C temperature range at rated inputs. Within -10 to 0°C temperature range, they are approx. 1.5 times the above values.

RDL50W Type

SHAPES AND DIMENSIONS

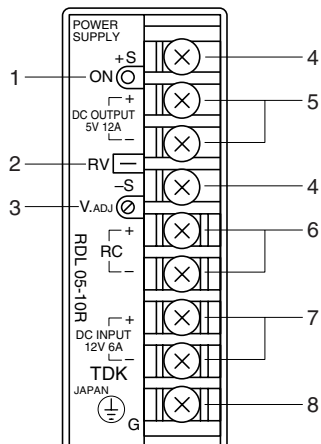


Dimensions in mm

±1mm : without specified dimensions

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

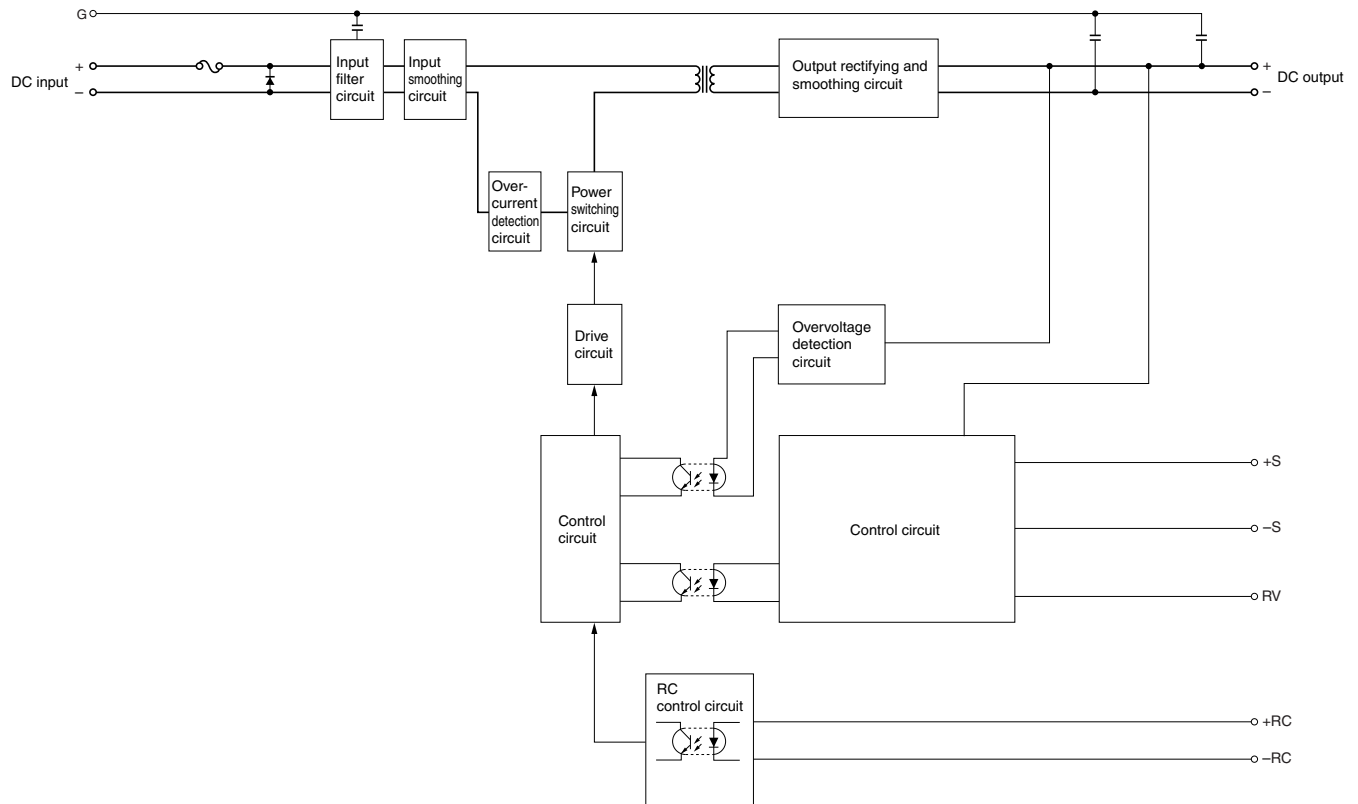
TERMINAL DESIGNATIONS AND FUNCTIONS



| Terminal No. | Designations and functions | |
|--------------|---|---|
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| 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. |
| 8 | Frame ground terminal(G) | Connect to earth ground. This is connected to the case. |

Characteristics, Functions, and Applications

BLOCK DIAGRAM

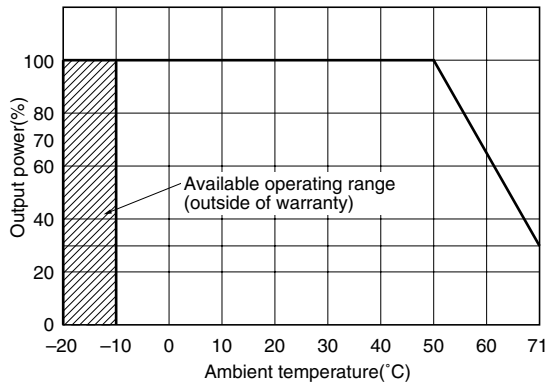


COMMON SPECIFICATIONS

| | | |
|---|-----------------------------------|---|
| Temperature and humidity | | |
| Temperature range | Operating(°C) | -10 to +71[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 39.2m/s²(4G)[3 directions, each 1h] |
| | 55 to 200Hz | Acceleration 19.6m/s²(2G)[3 directions, each 1h] |
| Shock | Acceleration | 588m/s²(60G)[3 directions, each 3 times] |
| | Pulse duration | 11±5ms |
| Withstand voltage and insulation resistance | | |
| Withstand voltage | Input terminal to case(G) | Eac: 2kV, 1min[Normal temperature, normal humidity, cutout current 10mA] |
| | Input terminal to output terminal | |
| 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) | |

Characteristics, Functions, and Applications

OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)



SURGE CURRENT, START UP / HOLD UP TIMES

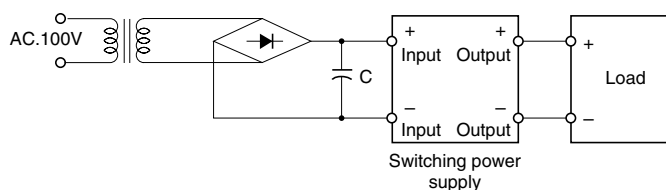
The input surge current is to be charged to a capacitor of an input smoothing circuit. This type of power supply is not provided with any special circuit for protection from surge current since surge current continues only for a short time in case of its occurrence. The magnitude of surge current depends 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.

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.

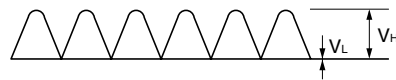
In addition some power supplies are used as input power supplies to lower a voltage from an AC line by using a transformer for using the rectified current at the voltage as an input of the power supplies (Refer to the diagram shown below). In this condition the lower limit V_L of the voltage of the rectified 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 even if there is a little derivative current as shown in the diagram 2.

EXAMPLE OF USING GENERAL RECTIFIER CIRCUIT



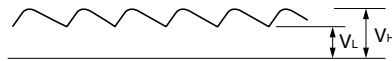
Input voltage waveform of power supply

1. Without smoothing capacitor



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

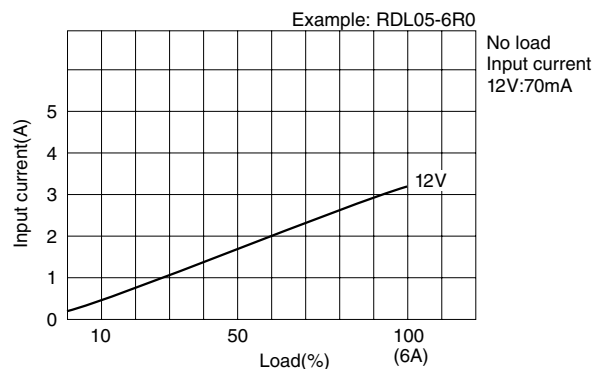
2. With smoothing capacitor



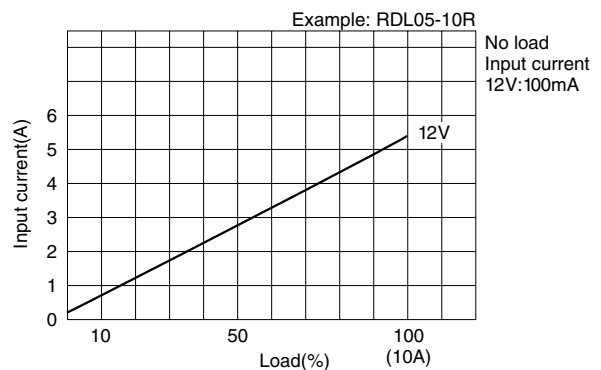
If V_H and V_L are within the input voltage range, the voltage is stable.

INPUT CURRENT

30W TYPE



50W TYPE



Characteristics, Functions, and Applications

REMOTE ON-OFF

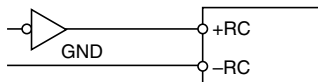
The RC circuit is provided so that a sequence can be easily prepared for a power supply output in the case of a use of multiple power supplies. The power supply output can be sent out or stopped by an open or close control of this signal (+RC, -RC).

Electric characteristics of RC circuit

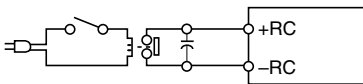
Input condition for high level (Power supply output ON): 2.4 to 24V or open

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

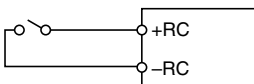
1. Equivalent to IC control(IC7404/74LS04)



2. Control with relay

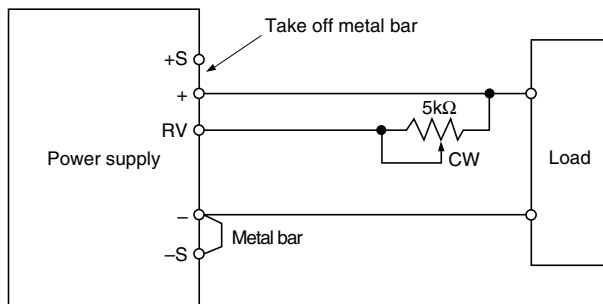


3. Control with switch



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.

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.