

# Power Supplies

## R Series TDR-M

### DC Input

### Multi-output, Long-Life

The R series TDR-M type are 3-output power supplies with combinations of +5V,  $\pm 12V$  or  $\pm 15V$  so as to be suitable for various devices using a microcomputer. These products are available for a wide variety of devices such as an electronic exchange, a vehicle-mounted device, and uninterruptible device.



### FEATURES

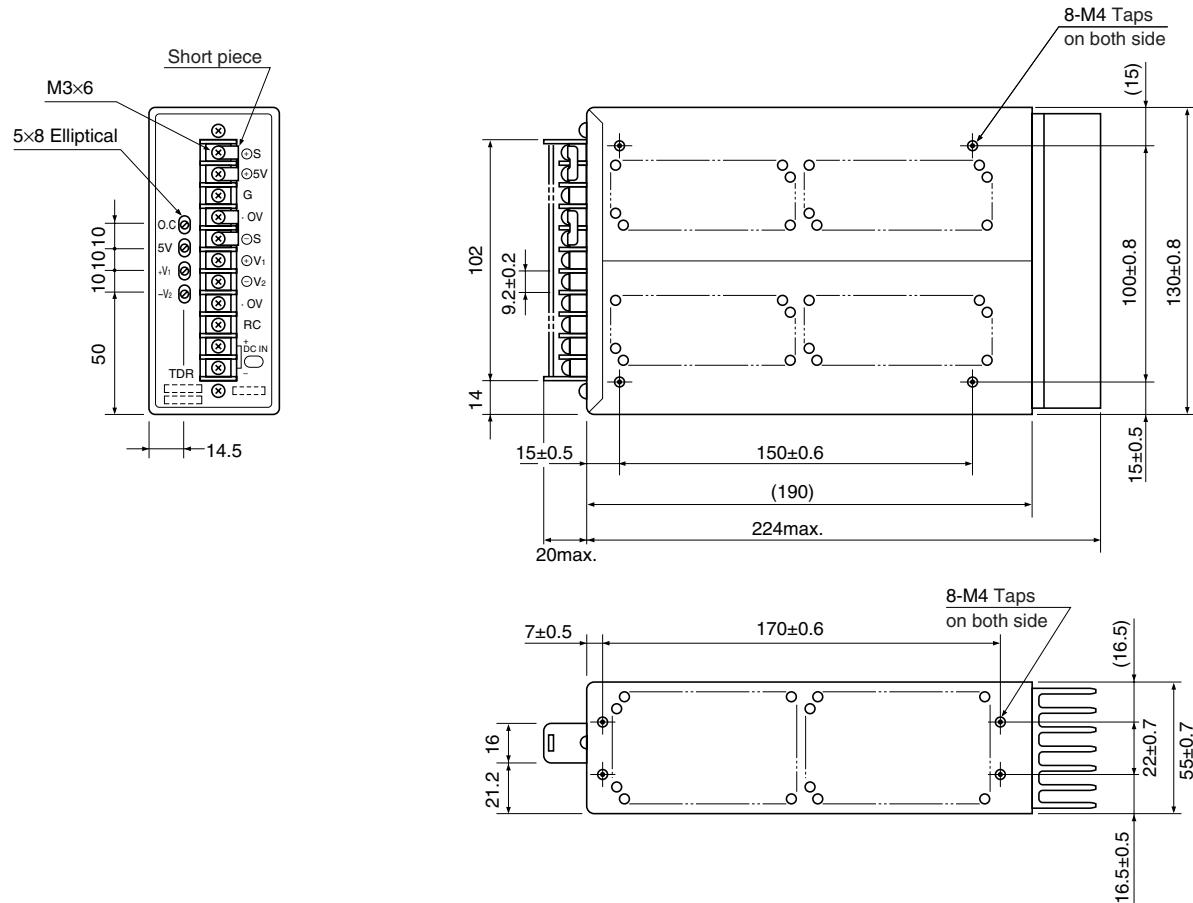
- DC.24V input.  
High-reliability 3-outputs power supply.
- Compact, lightweight, and high efficiency.
- Remote ON-OFF function.
- Remote sensing function (5V only).

### PART NUMBERS AND RATINGS

| Part No. | Input voltage | Output current(A) |      |      |      |      |
|----------|---------------|-------------------|------|------|------|------|
|          |               | +5V               | +12V | -12V | +15V | -15V |
| TDR-001M | 20 to 30V     | 10                | 1    | 1    |      |      |
| TDR-002M | 20 to 30V     | 10                |      |      | 1    | 1    |

### TDR75W 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.

- All specifications are subject to change without notice.

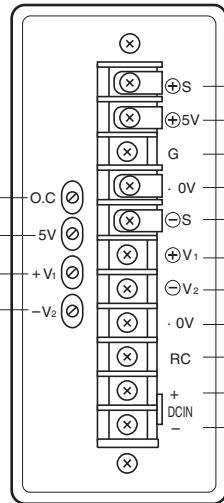
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### TERMINAL DESIGNATIONS AND FUNCTIONS



| Terminal No. | Designations and functions                   |   |
|--------------|--|---|
| 1            | 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.         |
| 2            | +5V DC output terminals(+5V, 0V)             | Connect to load.  |
| 3            | Frame ground terminal(G)                     | Connect to earth ground. This is connected to the case.   |
| 4            | +NV DC output terminal(+V1)                  | Connect to load.  |
| 5            | -NV DC output terminal(-V2)                  | Connect to load.  |
| 6            | Ground terminal(0V)                          | Ground terminal for +NV and -NV.  |
| 7            | Remote ON-OFF terminals(+RC, -RC)            | The output can be turned on or off by an open or close control between the RC terminal and the ground terminal 6 (when open, output is on). |
| 8            | DC input terminals(DC INPUT, +, -)           | Connected to DC input line.   |
| 9            | +5V overcurrent value adjustment trimmer(OC) | Capable of adjusting a setting value of the +5V output overcurrent.   |
| 10           | +5V output voltage adjustment trim(5V)       | +5V adjusts output voltage.   |
| 11           | +NV output voltage adjustment trim(+V1)      | +NV adjusts output voltage.   |
| 12           | -NV output voltage adjustment trim(-V2)      | -NV adjusts output voltage.   |

### SPECIFICATIONS AND STANDARDS

| Part No.                          | TDR-001M           |   |   |              |              |              | TDR-002M                  |
|-----------------------------------|--------------------|---|---|--------------|--------------|--------------|---------------------------|
| Rated output voltage and current* | +5V • 10A          | +12V • 1A   | -12V • 1A   | +5V • 10A    | +15V • 1A    | -15V • 1A    |                           |
| Input conditions                  |                    |   |   |              |              |              |                           |
| Input voltage Edc                 | V                  | 20 to 30[Rating: 24]  |   |              |              |              |                           |
| Input current                     | A                  | 6.5max.[Fuse rating: 7A]  |   |              |              |              |                           |
| Efficiency                        | %                  | 74typ.[25°C, input and output ratings]                              |   |              |              |              |                           |
| Output characteristics            |                    |   |   |              |              |              |                           |
| Output voltage Edc                | V                  | +5  | +12   | -12          | +5           | +15          | -15                       |
| Maximum output current            | A                  | 10  | 1   | 1            | 10           | 1            | 1                         |
| Maximum output power              | W                  | 74  |   |              |              |              |                           |
| Voltage variable range Edc        | V                  | 4 to 5.5  | 9.6 to 13.2   | 9.6 to 13.2  | 4 to 5.5     | 12 to 16.5   | 12 to 16.5                |
| Overvoltage threshold Edc         | V                  | 6 to 6.9  | 13.7 to 15.5  | 13.7 to 15.5 | 6 to 6.9     | 17 to 19     | 17 to 19                  |
| Overcurrent threshold             | A                  | 11.4 to 13.2  | 1.08 to 1.32  | 1.08 to 1.32 | 11.4 to 13.2 | 1.08 to 1.32 | 1.08 to 1.32              |
| Voltage stability                 | Source effect      | %   | 0.8max.(0.4typ.)[Within the input voltage range]                                |              |              |              |                           |
|                                   | Load effect        | %   | 1max.(0.4typ.)[10 to 100% load]   |              |              |              | Total effect 2max.(1typ.) |
|                                   | Temperature effect | %   | 1.3max.(0.6typ.)[Ambient temperature: 0 to +50°C]                               |              |              |              |                           |
|                                   | Drift(Time effect) | %   | 0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h] |              |              |              |                           |
| Ripple Ep-p                       | mV                 | 5V: 40max. ±NV: 50max.  |   |              |              |              |                           |
| Ripple noise Ep-p                 | mV                 | Output voltage×1%+50max.  |   |              |              |              |                           |
| Auxiliary functions               |                    |   |   |              |              |              |                           |
| Overvoltage protection            |                    | Voltage shut-down type, recovers upon reset(interval approx. 20s).  |   |              |              |              |                           |
| Overcurrent protection            |                    | Rectangular type, automatic recovery.                               |   |              |              |              |                           |
| Remote ON-OFF                     |                    | Yes(RC terminal and 0V terminal of ±NV are shorted and turned OFF.) |   |              |              |              |                           |
| Remote sensing                    |                    | Only 5V   |   |              |              |              |                           |
| Constructions                     |                    |   |   |              |              |              |                           |
| External dimensions               | mm                 | 130×55×224[H×W×L]   |   |              |              |              |                           |
| Weight                            | kg                 | 1.4max.   |   |              |              |              |                           |
| Mounting method                   |                    | Can be attached to 4 sides.   |   |              |              |              |                           |
| Case material                     |                    | Aluminum(Phosphoric acid anodized surface)                          |   |              |              |              |                           |

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

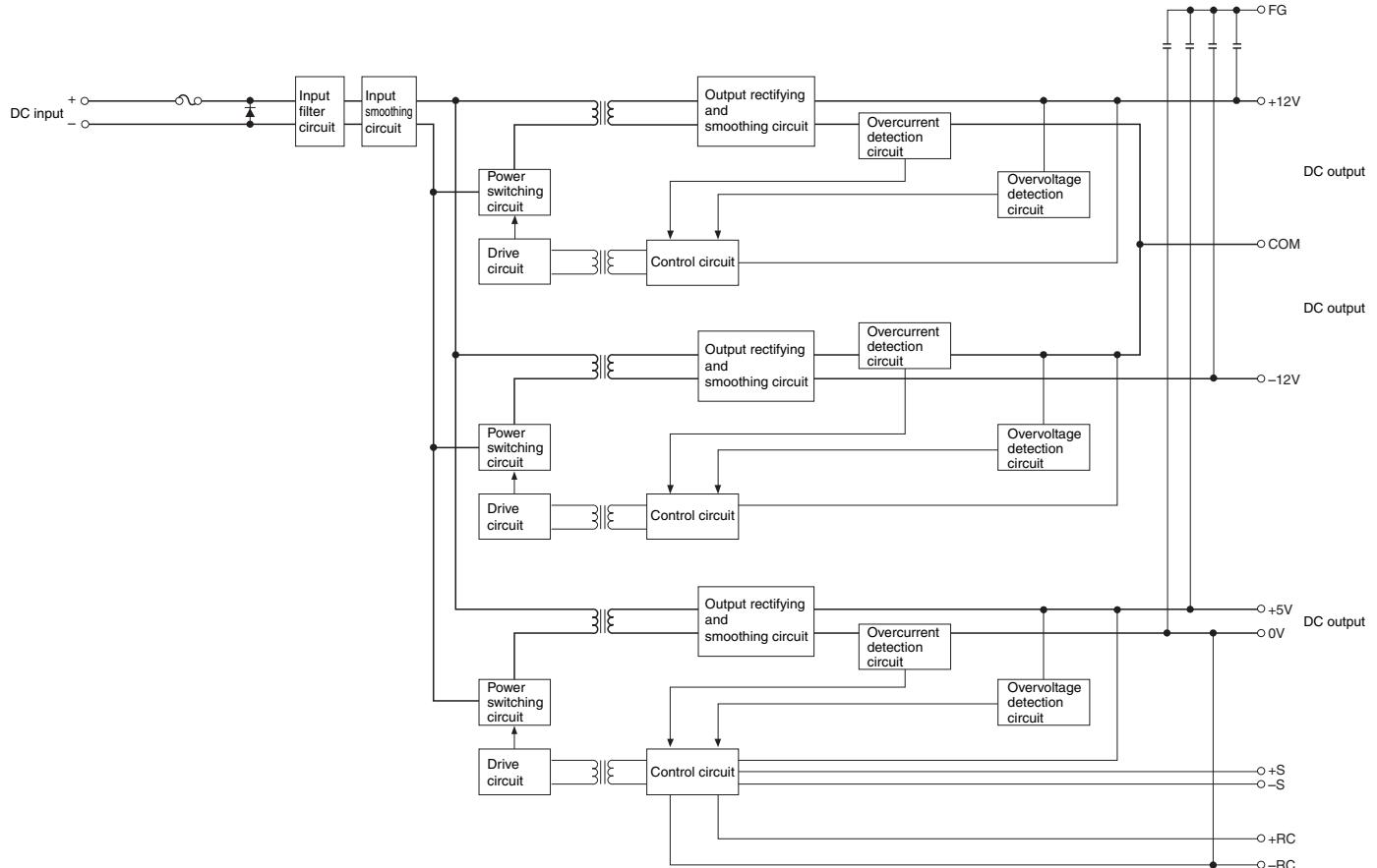
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## BLOCK DIAGRAM



## COMMON SPECIFICATIONS

Temperature and humidity

|                   |                |  |
|-------------------|----------------|--|
| Temperature range | Operating(°C)  | 0 to +60 [Derating is necessary when operating environment temperature exceed 50°C.] |
|                   | Storage(°C)    | -25 to +75   |
| 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 <sup>2</sup> (2G) [3 directions, each 1h] |
| Shock     | Acceleration   | 196m/s <sup>2</sup> (20G) [3 directions, each 3 times]         |
|           | Pulse duration | 11±5ms   |

Withstand voltage and insulation resistance

|                       |                                   |   |
|-----------------------|-----------------------------------|---|
| Withstand voltage     | Input terminal to case(G)         |   |
|                       | Input terminal to output terminal | Eac: 1.5kV, 1min [Normal temperature, normal humidity, cutout current 10mA] |
| Insulation resistance | Input terminal to case(G)         |   |
|                       | Input terminal to output terminal | Edc: 500V, 100MΩ min. [Normal temperature, normal humidity]                 |

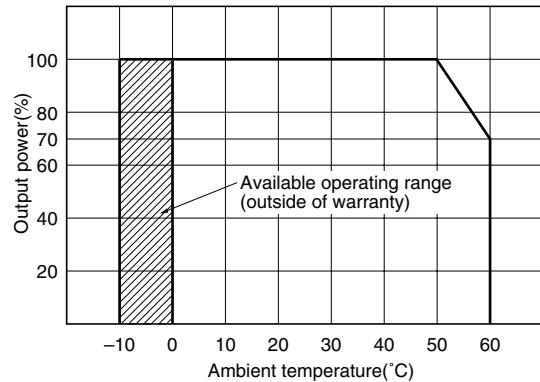
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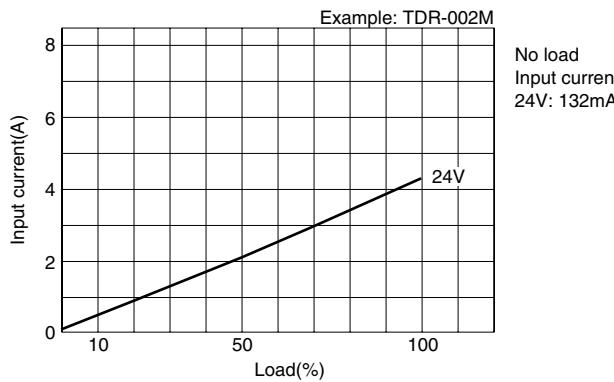
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#### OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)

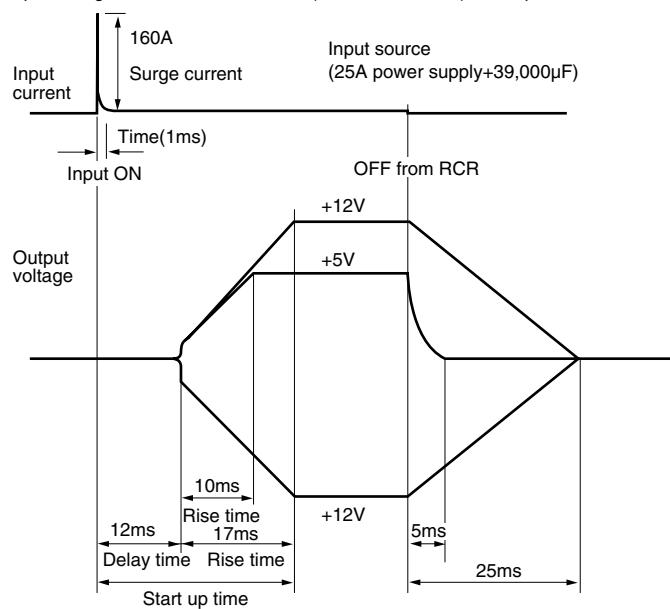


#### INPUT CURRENT



#### SURGE CURRENT, START UP / HOLD UP TIMES

Example: TDR-001M  
Input voltage: DC.24V Load: 100%(5V/10A, ±12V/1A) Temperature: 25°C



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.

#### REMOTE ON-OFF

Power supply output voltage can be turned on/off by this terminal for a power supply sequence or the like.

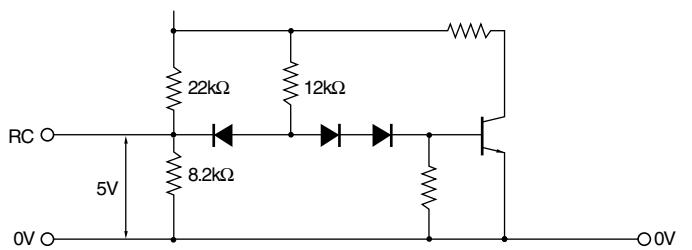
Between +RC and -RC: Turned on upon setting to high level (2.4 to 24V) or being open.

Between +RC and -RC: Turned off upon setting to low level (0 to 0.4V) or shorted.

The -RC terminal has the same level as 0V of an output of the DC output terminal.

Keep the +RC terminal open when not in use since it is internally pulled up.

#### REMOTE ON-OFF CIRCUIT



#### 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.