1 Functions

1.1 Input Voltage Range

■If output voltage value doesn't fall within specifications, a unit may not operate in accordance with specifications and/or fail.

1.2 Overcurrent Protection

■Overcurrent Operation

An overcurrent protection circuit is built-in and activated over 105% of the rated current or above. It prevents the unit from short circuit and overcurrent for less than 20 seconds. The output voltage of the power supply will recover automatically if the fault causing over current is corrected.

When the output voltage drops after OCP works, the power supply enters a "hiccup mode" where it repeatedly turns on and off at a certain frequency.

1.3 Overvoltage Protection (STMGFS30/STMGFW30/STMGFS80)

■Over Voltage Protection (OVP) is built in. When OVP works, output voltage can be recovered by shutting down DC input for at least one second or by turning off the remote control switch for one second without shutting down the DC input. The recovery time varies according to input voltage and input capacitance.

Remarks :
Note that devices inside the power supply may fail when a voltage greater than the rated output voltage is applied from an external power supply to the output terminal of the power supply. This could happen in in-coming inspections that include OVP function test or when voltage is applied from the load circuit.

1.4 Isolation

■When you run a Hi-Pot test as receiving inspection, gradually increase the voltage to start. When you shut down, decrease the voltage gradually by using a dial. Please avoid a Hi-Pot tester with a timer because, when the timer is turned ON or OFF, it may generate a voltage a few times higher than the applied voltage.

■Do not test high humidity enviroment.

1.5 Output Voltage Adjustment (STMGFS15/STMGFS30/STMGFS80)

■To increase an output voltage, turn a built-in potentiometer clockwise. To decrease the output voltage, turn it counterclockwise.

■We are offering an Option -V, which doesn't have a built-in potentiometer but instead enables you to adjust the output voltage by using an external potentiometer (please see 8 Options).

1.6 Remote ON/OFF

■The remote ON/OFF function is incorporated in the input circuit and operated with RC(+) and RC(-). If positive logic control is required, order the power supply with "-R" option.

Table 1.1 Remote ON/OFF Specifications (STMGF□15/STMGF□30)

	ON/OFF logic	Between RC(+) and RC(-)	Output voltage
Standard	Negative	L level (0 - 1.2V) or short	ON
		H level (3 - 12V) or open	OFF
Optional -R	Positive	L level (0 - 1.2V) or short	OFF
		H level (3 - 12V) or open	ON

Table 1.2 Remote ON/OFF Specifications (STMGFS80)

	ON/OFF logic	Between RC(+) and RC(-)	Output voltage
Standard	Negative	L level (0 - 0.8V) or short	ON
		H level (3 - 12V) or open	OFF
Optional -R	Positive	L level (0 - 0.8V) or short	OFF
		H level (3 - 12V) or open	ON

■When RC is at low level, a current of 1mA typ will flow out. (STMGF□15/STMGF□30)

When RC is at low level, a current of 0.05mA typ will flow out. (STMGFS80)

RC(-) terminal is connected to the -VIN internally.

■A short piece for remote ON/OFF function is installed on CN4＊ when power supply is shipped from factory.

Please remove the short piece on CN4＊ to enable remote ON/OFF function (Option -R does not come with the short piece).

＊STMGFS80 has a short piece mounted on CN3.

RC(+)   RC(+)   Vcc

RC(-)   RC(-)

Opto coupler   Transistor
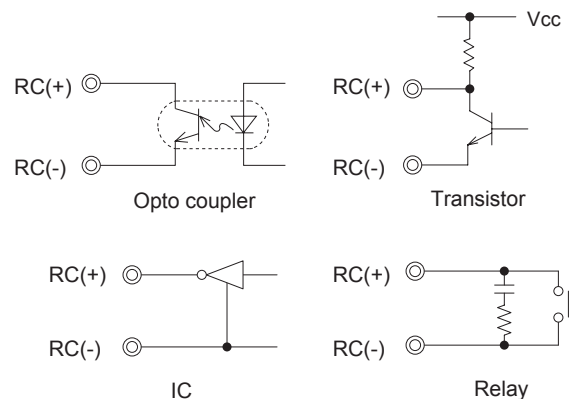
RC(+)   RC(+)

RC(-)   RC(-)

IC   Relay

Fig1.1 Rc Connection Example

1.7 Output ripple and ripple noise

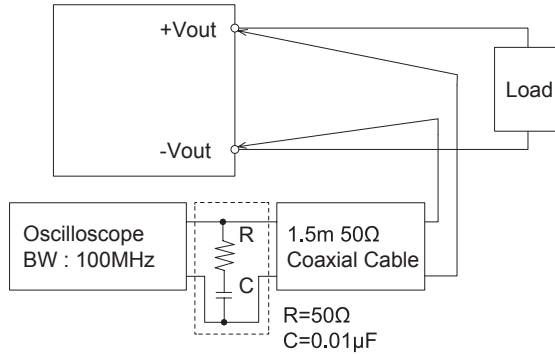■The specified ripple and ripple noise are measured by the method introduced in Fig 1.2.

Fig1.2 Method of Measuring Output Ripple and Ripple Noise

1.8 Thermal protection (STMGFS80)

■When the power supply temperature is kept above the values determined by the derating curve, the thermal protection will be activated and simultaneously shut down the output.
In this case, the unit should be cool down, and then recovery from thermal protection is accomplished by cycling the DC input power off for at least 1 second, or toggling Remote ON/OFF signal.

2 Wiring Input terminal

■If the power supply is to be turned ON/OFF directly with a switch, inductance from the input line will induce a surge voltage several times that of the input voltage and it may damage the power supply. Make sure that the surge is absorbed, for example, by connecting an electrolytic capacitor between the input terminals.

■If an external filter containing L (inductance) is added to the input line or a wire from the input source to the STMG series is long, not only the reflected input noise becomes large, but also the output of the converter may become unstable. In such case, connecting Ci to the input terminal is recommended.

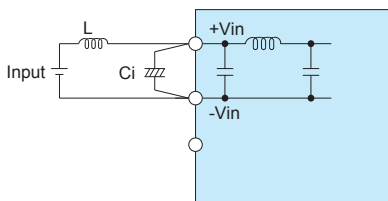■If you use an aluminum electrolytic capacitor, please pay attention to the ripple current rating.

Fig.2.1 Connecting an External Capacitor to the Input Side

■If a reverse polarity voltage is applied to the input pin, the power supply will fail.
If there is a possibility that a reverse polarity voltage is applied, connect a protection circuit externally as described below.
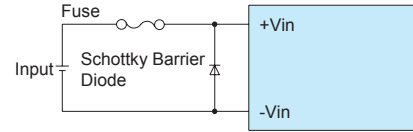
Fig.2.2 Connecting a Reverse Voltage Protection Circuit

3 Input Voltage/ Current Range

■If you use a non-regulated power source for input, please check and make sure that its voltage fluctuation range and ripple voltage do not exceed the input voltage range shown in specifications.

■Please select an input power source with enough capacity, taking into consideration of the start-up current (Ip), which flows when a DC-DC converter starts up.
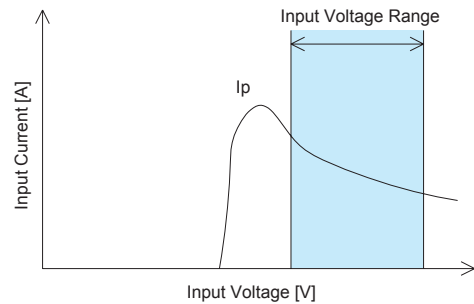
Fig.3.1 Input Current Characteristics

4 Series/Parallel Operation

4.1 Series Operation

■You can use the power supplies in series operation by wiring as shown below. In the case of (a) below, the output current should be lower than the rated current for each power supply with the lowest rated current among power supplies that are serially connected. Please make sure that no current exceeding the rated current flows into a power supply.
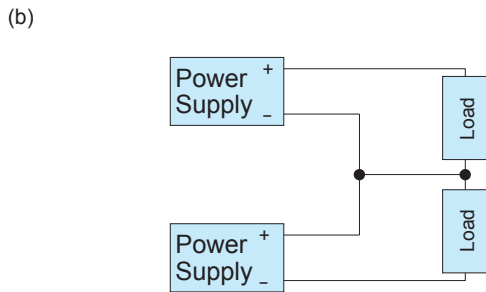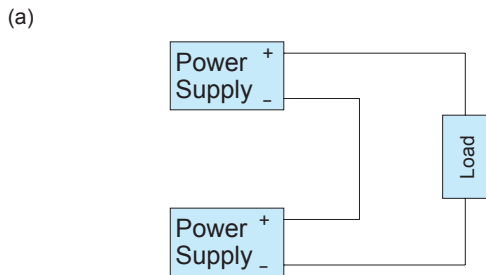
(a)

(b)

Fig.4.1 Series Operation

4.2 Parallel Operation

■Parallel operation is not possible.
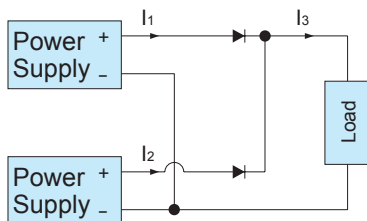■You can use the power supplies in redundancy operation by wiring as shown below.

Fig.4.2 Redundancy Operation

■Even a slight difference in output voltage can affect the balance between the values of I_1 and I_2.
Please make sure that the value of I_3 does not exceed the rated current for each power supply.

$$I_3 \leqq \text{Rated Current Value}$$

5 Temperature Measuring Point

5.1 STMGFS15/STMGFW15

■In case of forced air cooling, please have sufficient ventilation to keep the temperature of point A in Fig.5.1 at 105℃ or below.
Please also make sure that the ambient temperature does not exceed the range shown in "Derating".

＊Specifications for ripple and ripple noise changese in the shaded area.

Point A
(A center point of DC-DC converter case.)

Fig.5.1 STMGFS15/STMGFW15 Temperature Measuring Point

5.2 STMGFS30/STMGFW30

■In case of forced air cooling, please have sufficient ventilation to keep the temperature of point A in Fig.5.2 at 110℃ or below.
Please also make sure that the ambient temperature does not exceed the range shown in "Derating".

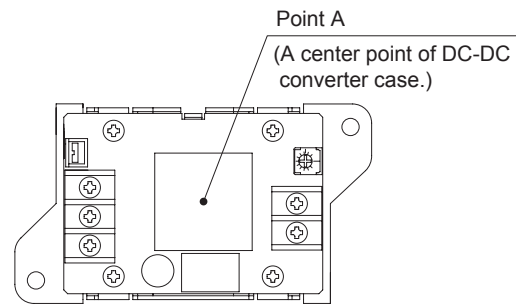＊Specifications for ripple and ripple noise changese in the shaded area.
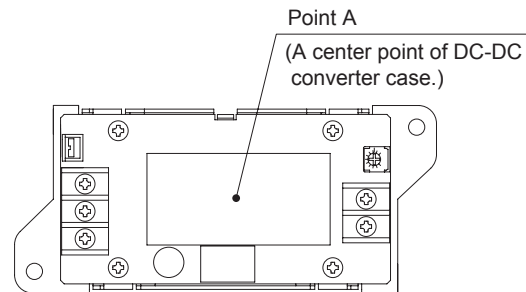
Point A
(A center point of DC-DC converter case.)

Fig.5.2 STMGFS30/STMGFW30 Temperature Measuring Point

5.3 STMGFS80

■Please have sufficient ventilation to keep the temperature of point A at Table 5.4 or below.

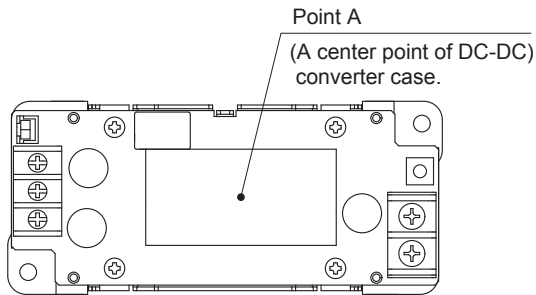Please also make sure that the ambient temperature does not exceed 70℃.

Point A
(A center point of DC-DC) converter case.

Fig.5.3 STMGFS80 Temperature Measuring point
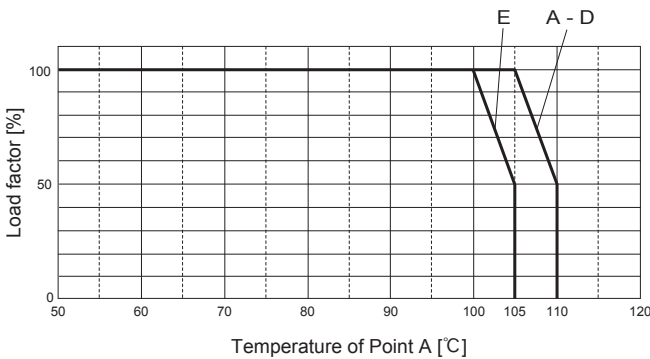
Fig.5.4 The temperature of Point A

■Temperature measurement of Case cover type

(Top)　　Case cover
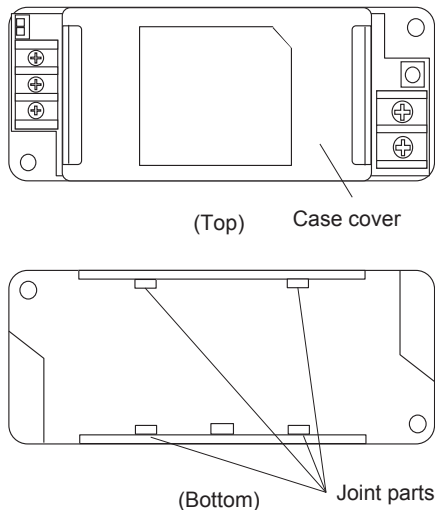

(Bottom)　　Joint parts

Fig.5.5 Installation removing case cover

Thermocouple for temperature checking must be added into temperature measuring point after removing case cover.

Case cover are fixed in 4 parts which are shown in the figure.

Then assembling case cover again, the temperature can be measured.

Please contact us about detail.

6 Warranty

Table 6.1 Warranty STMGFS15/STMGFW15 Standard type (No Case cover type)

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A - E	Convection	Ta = 50℃ or less	5years	5years
		Ta = 60℃	5years	3years
A - E	Forced air	Ta = 60℃ or less	5years	5years
		Ta = 70℃	3years	3years

Table 6.2 Warranty STMGFS15/STMGFW15 Case cover type

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A - E	Convection	Ta = 40℃ or less	5years	5years
	Forced air	Ta = 50℃	5years	3years

Table 6.3 Warranty STMGFS30/STMGFW30 Standard type (No Case cover type)

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A	Convection	Ta = 50℃ or less	5years	5years
		Ta = 60℃	3years	3years
B, C, D	Convection	Ta = 30℃ or less	5years	5years
		Ta = 40℃	5years	3years
E	Convection	Ta = 40℃ or less	5years	5years
		Ta = 50℃	5years	3years
A - E	Forced air	Ta = 60℃ or less	5years	5years
		Ta = 70℃	3years	3years

Table 6.4 Warranty STMGFS30/STMGFW30 Case cover type

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A	Convection	Ta = 30℃ or less	5years	5years
	Forced air	Ta = 40℃	5years	3years
B, D	Convection	Ta = 20℃ or less	5years	5years
	Forced air	Ta = 30℃	5years	3years
C	Convection	Ta = 15℃ or less	5years	5years
	Forced air	Ta = 25℃	5years	3years
E	Convection	Ta = 25℃ or less	5years	5years
	Forced air	Ta = 35℃	5years	3years

Table 6.5 Warranty STMGFS80 Standard type (No Case cover type)

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A - C	Convection	Ta = 50℃ or less	5years	5years
		Ta = 60℃	3years	3years
D, E	Convection	Ta = 40℃ or less	5years	5years
		Ta = 50℃	5years	3years
A - E	Forced air	Ta = 60℃ or less	5years	5years
		Ta = 70℃	3years	3years

Table 6.6 Warranty STMGFS80 Case cover type

Mounting Method	Cooling Method	Average ambient temperature (year)	Warranty	
			Io≦75%	75%<Io≦100%
A	Convection	Ta = 10℃ or less	5years	5years
		Ta = 20℃	5years	3years
B - E	Convection	Ta = 20℃ or less	5years	5years
		Ta = 30℃	5years	3years
A - E	Forced air	Ta = 30℃ or less	5years	5years
		Ta = 40℃	5years	3years

7 Note to use ±5V output

■If an output current is 0% to 5% of the rated current, the output is influenced by the other output load condition.
20% output voltage fluctuation may occer.
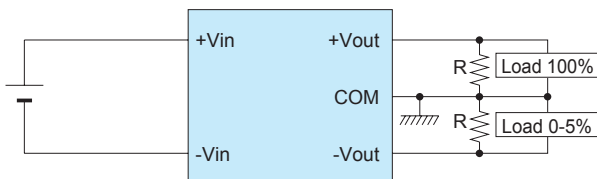To avoid the fluctuation, external bleeding resister is required to draw sufficient current.

Fig.7.1 Example of decreasing the fluctuation of output voltage.

8 Options

8.1 Outline of Options

＊Please inquire us for details of specifications and delivery timing.
＊You can combine multiple options. Some options, however, cannot be combined with other options. Please contact us for details.

● -G (STMGFS15/STMGFW15/STMGFS30/STMGW30)

■Option -G models, removed the capacitor located in between input and output.

● -R

■Option -R models, a reversed logic (positive logic) for remote ON/OFF function (Refer to 1.6).

● -J (STMGFS15/STMGFW15/STMGFS30/STMGW30)

■Option -J models , the INPUT AND OUTPUT terminal block are changed to connector.
■Please do not apply more than 2.5A per 1 pin (STMGFS15/STMGFW15).
Please do not apply more than 5A per 1 pin (STMGFS30/STMGFW30).
■Ripple, ripple noise, the capacitor located within 150mm from output terminal
It is the value measured by the measuring plate provided 22μF.

● -N1

■Option -N1 models come with a cover (plastic).
■Only connector type is available in STMGFS15/STMGFW15 (Option -J).

● -N2

■Option -N2 models come with a dedicated DIN rail attachment.

● -N3

■Option -N3 models come with a cover (plastic) and DIN rail attachment.
■Only connector type is available in STMGFS15/STMGFW15 (Option -J).

● -V (STMGFS15/STMGFS30)

■Option -V models have connector (CN5) for external potentiometer instead of a built-in potentiometer.
■The output voltage is adjustable through an external potentiometer VR. Adjust only within the range of ±10% of the rated voltage.
■To increase the output voltage, turn the potentiometer clockwise and connect in such a way that the resistance value between 2 and 3 becomes small.
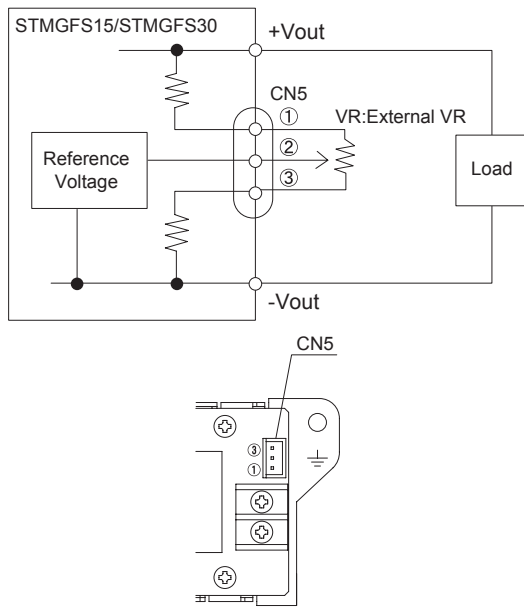To decrease the output voltage, turn the potentiometer counterclockwise.

Fig.8.1 Connecting External Potentiometer

Table 8.1 List of External Potentiometer

Output Voltage	External VR
3.3V, 5V	1 [kΩ]
12V, 15V	5 [kΩ]