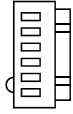

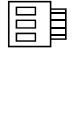
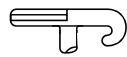
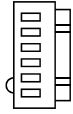

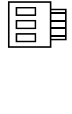

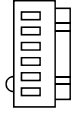
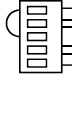
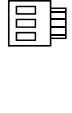



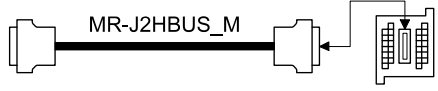



# 11. OPTIONS AND PERIPHERAL EQUIPMENT

No.	Product name	Model	Description	Remark
1)	Servo amplifier power connector set		   CNP1 Connector: 06JFAT-SAXGDK-H7.5 (JST) CNP2 Connector: 05JFAT-SAXGDK-H5.0 (JST) CNP3 Connector: 03JFAT-SAXGDK-H7.5 (JST) Applicable wire size: 0.8 mm <sup>2</sup> to 2.1 mm <sup>2</sup> (AWG 18 to 14) Insulator OD: to 3.9 mm  Open tool J-FAT-OT (JST)	Supplied with 200 V class and 100 V class servo amplifiers of 1 kW or less
			   CNP1 Connector: 06JFAT-SAXGFK-XL (JST) CNP2 Connector: 05JFAT-SAXGDK-H5.0 (JST) CNP3 Connector: 03JFAT-SAXGFK-XL (JST) Applicable wire size: 1.25 mm <sup>2</sup> to 5.5 mm <sup>2</sup> (AWG 16 to 10) Insulator OD: to 4.7 mm Applicable wire size: 0.8 mm <sup>2</sup> to 2.1 mm <sup>2</sup> (AWG 18 to 14) Insulator OD: to 3.9 mm  Open tool Quantity: 1 Model: J-FAT-OT-EXL (JST)	Supplied with 200 V class servo amplifiers of 2 kW and 3.5 kW
			   CNP1 connector: 06JFAT-SAXGDK-HT10.5 (JST) CNP2 connector: 05JFAT-SAXGDK-HT7.5 (JST) CNP3 connector: 03JFAT-SAXGDK-HT10.5 (JST) Applicable wire size: 1.25 mm <sup>2</sup> to 2.1 mm <sup>2</sup> (AWG 16 to 14) Insulator OD: to 3.9 mm  Open tool J-FAT-OT-XL (JST)	Supplied with 400 V class servo amplifiers of 3.5 kW or less
2)	USB cable	MR-J3USBCBL3M Cable length: 3 m	CN5 connector mini-B connector (5 pins) Personal computer connector A connector 	For connection with PC-AT compatible personal computer
3)	Connector set	MR-CCN1	 Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M or equivalent)	
4)	Junction terminal block (recommended)		 PS7DW-20V14B-F (Toho Technology Corp. Yoshida Terminal Block Division) MR-J2HBUS_M Junction terminal block PS7DW-20V14B-F is not option. For using the junction terminal block, option MR-J2HBUS_M is necessary. Refer to section 11.6 for details.	

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

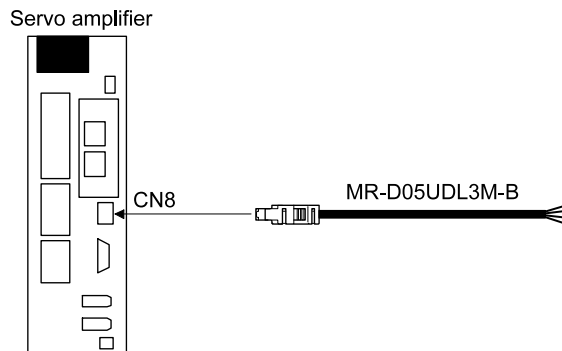
No.	Product name	Model	Description	Remark
5)	STO cable	MR-D05UDL3M-B	Connector set: 2069250-1 (TE Connectivity)	Connection cable for the CN8 connector
6)	Short-circuit connector			Supplied with servo amplifier
7)	Battery cable	MR-BT6V1CBL_M Cable length: 0.3/1 m (Refer to section 11.1.3.)	Housing: PAP-02V-0 Contact: SPHD-001G0-P0.5 (JST) Connector: 10114-3000PE Shell kit: 10314-52F0-008 (3M or equivalent)	For connection with battery unit
8)	Junction battery cable	MR-BT6V2CBL_M Cable length: 0.3/1 m (Refer to section 11.1.3.)	Housing: PAP-02V-0 Contact: SPHD-001G0-P0.5 (JST) Housing: PALR-02VF Contact: SPAL-001T-P0.5 (JST) Housing: PAP-02V-0 Contact: SPHD-001G0-P0.5 (JST)	For battery junction

## 11.1.2 MR-D05UDL3M-B STO cable

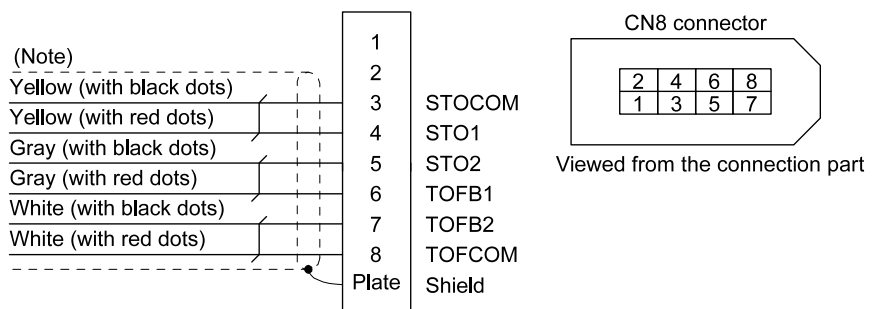
This cable is for connecting an external device to the CN8 connector.

Cable model	Cable length	Application
MR-D05UDL3M-B	3 m	Connection cable for the CN8 connector

### (1) Configuration diagram



### (2) Internal wiring diagram



Note. Do not use the two core wires with orange insulator (with red or black dots).

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## 11.1.3 Battery cable/junction battery cable

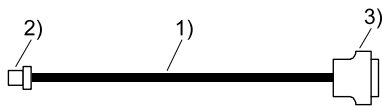
### (1) Model explanations

The numbers in the cable length field of the table indicate the symbol filling the underline "\_" in the cable model. The cables of the lengths with the symbols are available.

Cable model	Cable length		Bending life	Application/remark
	0.3 m	1 m		
MR-BT6V1CBL_M	03	1	Standard	For connection with MR-BT6VCASE
MR-BT6V2CBL_M	03	1	Standard	For junction

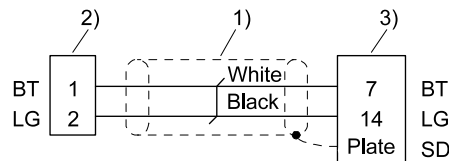
### (2) MR-BT6V1CBL\_M

#### (a) Appearance



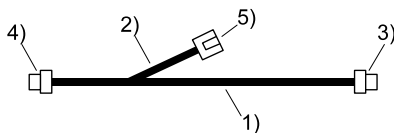
Components	Description
1) Cable	VSVC 7/0.18 × 2C
2) Connector	Housing: PAP-02V-0 Contact: SPHD-001G0-P0.5 (JST)
3) Connector	Connector: 10114-3000PE Shell kit: 10314-52F0-008 (3M or equivalent)

#### (b) Internal wiring diagram



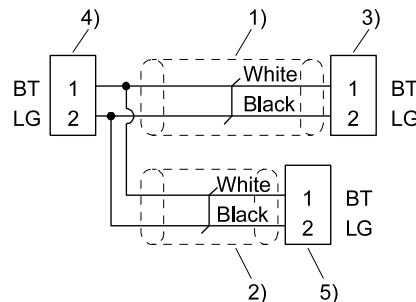
### (3) MR-BT6V2CBL\_M

#### (a) Appearance




Components	Description
1) Cable	VSVC 7/0.18 × 2C
2) Cable	VSVC 7/0.18 × 2C
3) Connector	Housing: PAP-02V-0
4) Connector	Contact: SPHD-001G0-P0.5 (JST)
5) Connector	Housing: PALR-02VF Contact: SPAL-001T-P0.5 (JST)

#### (b) Internal wiring diagram



# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## 11.2 Regenerative options

 <b>CAUTION</b>	<p>● Do not use servo amplifiers with regenerative options other than the combinations specified below. Otherwise, it may cause a fire.</p>
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### 11.2.1 Combination and regenerative power

The power values in the table are resistor-generated powers and not rated powers.

#### (1) 200 V class

Servo amplifier	Regenerative power [W]									
	Built-in regenerative resistor	MR-RB032 [40 Ω]	MR-RB12 [40 Ω]	MR-RB30 [13 Ω]	MR-RB3N [9 Ω]	MR-RB31 [6.7 Ω]	MR-RB32 [40 Ω]	(Note 1) MR-RB50 [13 Ω]	(Note 1) MR-RB5N [9 Ω]	(Note 1) MR-RB51 [6.7 Ω]
MR-J4-10TM		30								
MR-J4-20TM	10	30	100							
MR-J4-40TM	10	30	100							
MR-J4-60TM	10	30	100							
MR-J4-70TM	20	30	100				300			
MR-J4-100TM	20	30	100				300			
MR-J4-200TM	100			300				500		
MR-J4-350TM	100				300				500	
MR-J4-500TM	130					300				500
MR-J4-700TM	170					300				500

Servo amplifier	(Note 2) Regenerative power [W]			
	External regenerative resistor (accessory)	MR-RB5R [3.2 Ω]	MR-RB9F [3 Ω]	MR-RB9T [2.5 Ω]
MR-J4-11KTM	500 (800)	500 (800)		
MR-J4-15KTM	850 (1300)		850 (1300)	
MR-J4-22KTM	850 (1300)			850 (1300)

- Note 1. Always install a cooling fan.  
2. Values in parentheses assume the installation of a cooling fan.

## 11. OPTIONS AND PERIPHERAL EQUIPMENT

### (2) 400 V class

Servo amplifier	Regenerative power [W]								
	Built-in regenerative resistor	MR-RB1H-4 [82 Ω]	(Note 1) MR-RB3M-4 [120 Ω]	(Note 1) MR-RB3G-4 [47 Ω]	(Note 1) MR-RB5G-4 [47 Ω]	(Note 1) MR-RB34-4 [26 Ω]	(Note 1) MR-RB54-4 [26 Ω]	(Note 1) MR-RB3U-4 [22 Ω]	(Note 1) MR-RB5U-4 [22 Ω]
MR-J4-60TM4	15	100	300						
MR-J4-100TM4	15	100	300						
MR-J4-200TM4	100			300	500				
MR-J4-350TM4	100			300	500				
MR-J4-500TM4	130					300	500		
MR-J4-700TM4	170							300	500

Servo amplifier	(Note 2) Regenerative power [W]		
	External regenerative resistor (accessory)	MR-RB5K-4 [10 Ω]	MR-RB6K-4 [10 Ω]
MR-J4-11KTM4	500 (800)	500 (800)	
MR-J4-15KTM4	850 (1300)		850 (1300)
MR-J4-22KTM4	850 (1300)		850 (1300)

- Note 1. Always install a cooling fan.  
 Note 2. Values in parentheses assume the installation of a cooling fan.

### (3) 100 V class

Servo amplifier	Regenerative power [W]		
	Built-in regenerative resistor	MR-RB032 [40 Ω]	MR-RB12 [40 Ω]
MR-J4-10TM1		30	
MR-J4-20TM1	10	30	100
MR-J4-40TM1	10	30	100

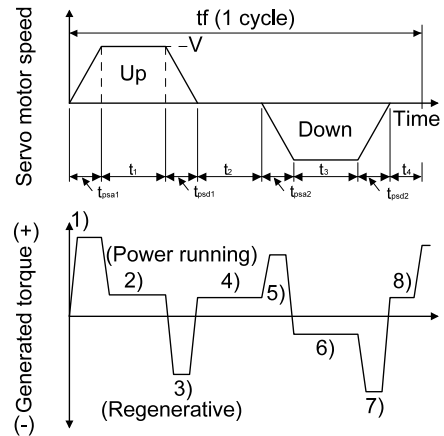
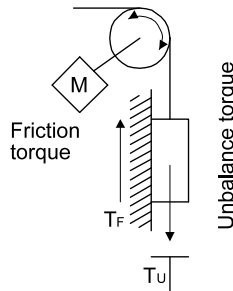
# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## 11.2.2 Selection of regenerative option

### (1) Rotary servo motor and direct drive motor

Use the following method when regeneration occurs continuously in vertical motion applications or when it is desired to make an in-depth selection of the regenerative option.

#### (a) Regenerative energy calculation



Formulas for calculating torque and energy in operation

Regenerative power	Torque applied to servo motor [N·m]	Energy E [J]
1)	$T_1 = \frac{(J_L/\eta + J_M) \cdot V}{9.55 \cdot 10^4} \cdot \frac{1}{t_{psa1}} + T_U + T_F$	$E_1 = \frac{0.1047}{2} \cdot V \cdot T_1 \cdot t_{psa1}$
2)	$T_2 = T_U + T_F$	$E_2 = 0.1047 \cdot V \cdot T_2 \cdot t_1$
3)	$T_3 = \frac{-(J_L \cdot \eta + J_M) \cdot V}{9.55 \cdot 10^4} \cdot \frac{1}{t_{psa2}} + T_U + T_F$	$E_3 = \frac{0.1047}{2} \cdot V \cdot T_3 \cdot t_{psa2}$
4), 8)	$T_4, T_8 = T_U$	$E_4, E_8 \geq 0$ (No regeneration)
5)	$T_5 = \frac{(J_L/\eta + J_M) \cdot V}{9.55 \cdot 10^4} \cdot \frac{1}{t_{psd2}} - T_U + T_F$	$E_5 = \frac{0.1047}{2} \cdot V \cdot T_5 \cdot t_{psd2}$
6)	$T_6 = -T_U + T_F$	$E_6 = 0.1047 \cdot V \cdot T_6 \cdot t_3$
7)	$T_7 = \frac{-(J_L \cdot \eta + J_M) \cdot V}{9.55 \cdot 10^4} \cdot \frac{1}{t_{psd2}} - T_U + T_F$	$E_7 = \frac{0.1047}{2} \cdot V \cdot T_7 \cdot t_{psd2}$

From the calculation results in 1) to 8), find the absolute value (Es) of the sum total of negative energies.

## 11. OPTIONS AND PERIPHERAL EQUIPMENT

(b) Losses of servo motor and servo amplifier in regenerative mode

The following table lists the efficiencies and other data of the servo motor and servo amplifier in the regenerative mode.

Servo amplifier	Inverse efficiency [%]	Capacitor charging [J]	Servo amplifier	Inverse efficiency [%]	Capacitor charging [J]
MR-J4-10TM	55	9	MR-J4-60TM4	85	12
MR-J4-20TM	75	9	MR-J4-100TM4	85	12
MR-J4-40TM	85	11	MR-J4-200TM4	85	25
MR-J4-60TM	85	11	MR-J4-350TM4	85	43
MR-J4-70TM	85	18	MR-J4-500TM4	90	45
MR-J4-100TM	85	18	MR-J4-700TM4	90	70
MR-J4-200TM	85	36	MR-J4-11KTM4	90	120
MR-J4-350TM	85	40	MR-J4-15KTM4	90	170
MR-J4-500TM	90	45	MR-J4-22KTM4	90	250
MR-J4-700TM	90	70	MR-J4-10TM1	55	4
MR-J4-11KTM	90	120	MR-J4-20TM1	75	4
MR-J4-15KTM	90	170	MR-J4-40TM1	85	10
MR-J4-22KTM	90	250			

Inverse efficiency ( $\eta$ ): Efficiency including some efficiencies of the servo motor and servo amplifier when rated (regenerative) torque is generated at rated speed. Since the efficiency varies with the servo motor speed and generated torque, allow for about 10%.

Capacitor charging ( $E_c$ ): Energy charged into the electrolytic capacitor in the servo amplifier

Subtract the capacitor charging from the result of multiplying the sum total of regenerative energies by the inverse efficiency to calculate the energy consumed by the regenerative option.

$$ER [J] = \eta \cdot E_s - E_c$$

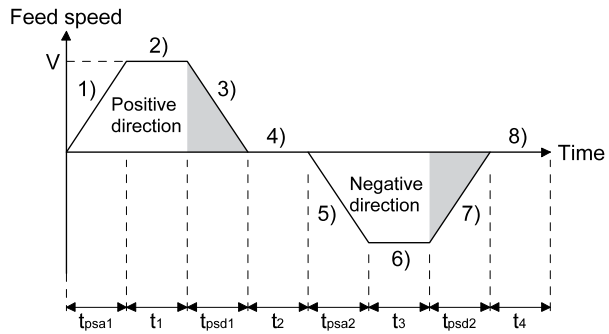
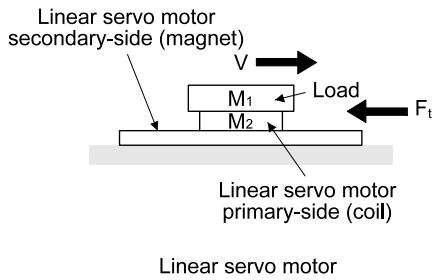
Calculate the power consumption of the regenerative option on the basis of single-cycle operation period  $t_f$  [s] to select the necessary regenerative option.

$$PR [W] = ER/t_f$$

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## (2) Linear servo motor

### (a) Thrust and energy calculation



The following shows equations of the linear servo motor thrust and energy at the driving pattern above.

Section	Thrust F of linear servo motor [N]	Energy E [J]
1)	$F_1 = (M_1 + M_2) \cdot V/t_{psa1} + F_t$	$E_1 = V/2 \cdot F_1 \cdot t_{psa1}$
2)	$F_2 = F_1$	$E_2 = V \cdot F_2 \cdot t_1$
3)	$F_3 = -(M_1 + M_2) \cdot V/t_{psd1} + F_t$	$E_3 = V/2 \cdot F_3 \cdot t_{psd1}$
4), 8)	$F_4, F_8 = 0$	$E_4, E_8 = 0$ (No regeneration)
5)	$F_5 = (M_1 + M_2) \cdot V/t_{psa2} + F_t$	$E_5 = V/2 \cdot F_5 \cdot t_{psa2}$
6)	$F_6 = F_t$	$E_6 = V \cdot F_6 \cdot t_3$
7)	$F_7 = -(M_1 + M_2) \cdot V/t_{psd2} + F_t$	$E_7 = V/2 \cdot F_7 \cdot t_{psd2}$

From the calculation results in 1) to 8), find the absolute value (Es) of the sum total of negative energies.

#### (b) Losses of servo motor and servo amplifier in regenerative mode

For inverse efficiency and capacitor charging energy, refer to (1) (b) of this section.

#### (c) Regenerative energy calculation

Subtract the capacitor charging from the result of multiplying the sum total of regenerative energies by the inverse efficiency to calculate the energy consumed by the regenerative resistor.

$$ER [J] = \eta \cdot E_s - E_c$$

From the total of ER's whose subtraction results are positive and one-cycle period, the power consumption PR [W] of the regenerative option can be calculated with the following equation.

$$PR [W] = \text{total of positive ER's/one-cycle operation period (tf)}$$

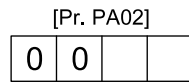
Select a regenerative option from the PR value. Regenerative option is not required when the energy consumption is equal to or less than the built-in regenerative energy.



# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## 11.2.3 Parameter setting

Set [Pr. PA02] according to the option to be used.



- Regenerative option selection
- 00: Regenerative option is not used.
    - For servo amplifier of 100 W, regenerative resistor is not used.
    - For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used.
    - Supplied regenerative resistors or regenerative option is used with the servo amplifier of 11 kW to 22 kW.
  - 01: FR-BU2/FR-BU2-H/FR-RC/FR-RC-H/FR-CV/FR-CV-H
  - 02: MR-RB032
  - 03: MR-RB12
  - 04: MR-RB32
  - 05: MR-RB30
  - 06: MR-RB50 (Cooling fan is required)
  - 08: MR-RB31
  - 09: MR-RB51 (Cooling fan is required)
  - 0B: MR-RB3N
  - 0C: MR-RB5N (Cooling fan is required)
  - 80: MR-RB1H-4
  - 81: MR-RB3M-4 (Cooling fan is required.)
  - 82: MR-RB3G-4 (Cooling fan is required.)
  - 83: MR-RB5G-4 (Cooling fan is required.)
  - 84: MR-RB34-4 (Cooling fan is required.)
  - 85: MR-RB54-4 (Cooling fan is required.)
  - 91: MR-RB3U-4 (Cooling fan is required.)
  - 92: MR-RB5U-4 (Cooling fan is required.)
  - FA: When the supplied regenerative resistors or the regenerative option is cooled by the cooling fan to increase the ability with the servo amplifier of 11 kW to 22 kW.

## 11.2.4 Selection of regenerative option

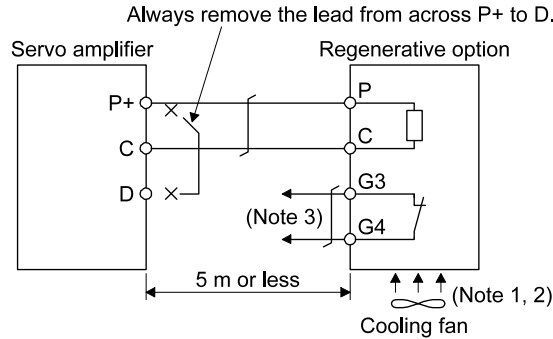
POINT
● When MR-RB50, MR-RB51, MR-RB5N, MR-RB3M-4, MR-RB3G-4, MR-RB5G-4, MR-RB34-4, MR-RB54-4, MR-RB5K-4, or MR-RB6K-4 is used, a cooling fan is required to cool it. The cooling fan should be prepared by the customer.
● For the wire sizes used for wiring, refer to section 11.9.

The regenerative option generates heat of 100 °C higher than the ambient temperature. Fully consider heat dissipation, installation position, wires used, etc. before installing the option. For wiring, use flame-resistant wires or make the wires flame-resistant and keep them away from the regenerative option. Always use twisted cables of max. 5 m length for connection with the servo amplifier.

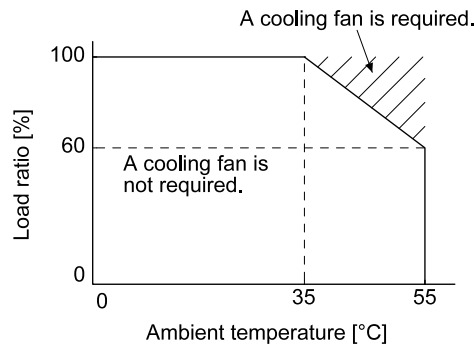
# 11. OPTIONS AND PERIPHERAL EQUIPMENT

(1) MR-J4-500TM or less/MR-J4-350TM4 or less

Always remove the wiring from across P+ to D and fit the regenerative option across P+ to C. G3 and G4 are thermal sensor's terminals. Between G3 and G4 is opened when the regenerative option overheats abnormally.



- Note 1. When using the MR-RB50, MR-RB5N, MR-RB51, MR-RB3M-4, MR-RB3G-4, or MR-RB5G-4, forcibly cool it with a cooling fan (1.0 m<sup>3</sup>/min or more, 92 mm × 92 mm).
2. When the ambient temperature is more than 55 °C and the regenerative load ratio is more than 60% in MR-RB30, MR-RB31, MR-RB32, and MR-RB3N, forcefully cool the air with a cooling fan (1.0 m<sup>3</sup>/min or more, 92 mm × 92 mm). A cooling fan is not required if the ambient temperature is 35 °C or less. (A cooling fan is required for the shaded area in the following graph.)



3. Make up a sequence which will switch off the magnetic contactor when abnormal heating occurs.

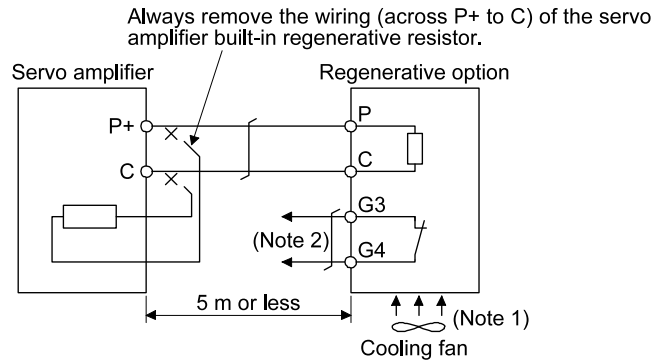
G3-G4 contact specifications

- Maximum voltage: 120 V AC/DC
- Maximum current: 0.5 A/4.8 V DC
- Maximum capacity: 2.4 VA

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## (2) MR-J4-500TM4/MR-J4-700TM/MR-J4-700TMT4

Always remove the wiring (across P+ to C) of the servo amplifier built-in regenerative resistor and fit the regenerative option across P+ to C. G3 and G4 are thermal sensor's terminals. Between G3 and G4 is opened when the regenerative option overheats abnormally.



- Note 1. When using the MR-RB51, MR-RB34-4, MR-RB54-4, MR-RB3U-4, or MR-RB5U-4, forcibly cool it with a cooling fan (1.0 m<sup>3</sup>/min or more, 92 mm × 92 mm).
- Note 2. Make up a sequence which will switch off the magnetic contactor when abnormal heating occurs.

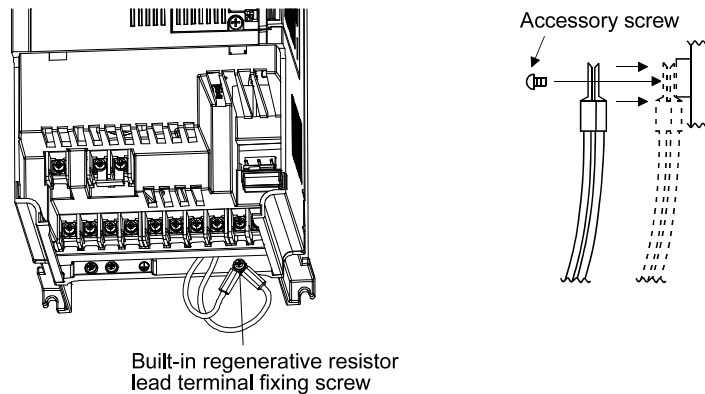
G3-G4 contact specifications

Maximum voltage: 120 V AC/DC

Maximum current: 0.5 A/4.8 V DC

Maximum capacity: 2.4 VA

When using the regenerative option, remove the servo amplifier's built-in regenerative resistor wires (across P+ to C), fit them back to back, and secure them to the frame with the accessory screw as shown below.



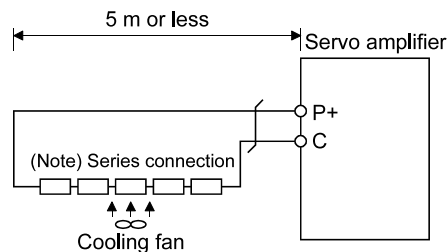
# 11. OPTIONS AND PERIPHERAL EQUIPMENT

(3) MR-J4-11KTM to MR-J4-22KTM/MR-J4-11KTM4 to MR-J4-22KTM4 (when using the supplied regenerative resistor)

## CAUTION

- The regenerative resistor supplied with 11 kW to 22 kW servo amplifiers does not have a protect cover. Touching the resistor (including wiring/screw hole area) may cause a burn injury and electric shock. Even if the power was shut-off, be careful until the bus voltage discharged and the temperature decreased because of the following reasons.
  - It may cause a burn injury due to very high temperature without cooling.
  - It may cause an electric shock due to charged capacitor of the servo amplifier.

When using the regenerative resistors supplied to the servo amplifier, the specified number of resistors (4 or 5 resistors) must be connected in series. If they are connected in parallel or in less than the specified number, the servo amplifier may become faulty and/or the regenerative resistors burn. Install the resistors at intervals of about 70 mm. Cooling the resistors with two cooling fans (1.0 m<sup>3</sup>/min or more, 92 mm × 92 mm) improves the regeneration capability. In this case, set " \_\_ F A" in [Pr. PA02].



Note. The number of resistors connected in series depends on the resistor type. The thermal sensor is not mounted on the attached regenerative resistor. An abnormal heating of resistor may be generated at a regenerative circuit failure. Install a thermal sensor near the resistor and establish a protective circuit to shut off the main circuit power supply when abnormal heating occurs. The detection level of the thermal sensor varies according to the settings of the resistor. Set the thermal sensor in the most appropriate position on your design basis, or use the thermal sensor built-in regenerative option. (MR-RB5R, MR-RB9F, MR-RB9T, MR-RB5K-4, or MR-RB6K-4)

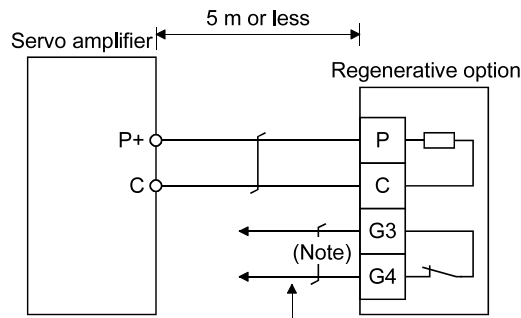
Servo amplifier	Regenerative resistor	Regenerative power [W]		Resultant resistance [Ω]	Number of resistors
		Normal	Cooling		
MR-J4-11KTM	GRZG400-0.8Ω	500	800	3.2	4
MR-J4-15KTM	GRZG400-0.6Ω	850	1300	3	5
MR-J4-22KTM	GRZG400-0.5Ω			2.5	
MR-J4-11KTM4	GRZG400-2.5Ω	500	800	10	4
MR-J4-15KTM4	GRZG400-2Ω	850	1300	10	5
MR-J4-22KTM4					

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

(4) MR-J4-11KTM-PX to MR-J4-22KTM-PX/MR-J4-11KTM4-PX to MR-J4-22KTM4-PX (when using the regenerative option)

The MR-J4-11KTM-PX to MR-J4-22KTM-PX and MR-J4-11KTM4-PX to MR-J4-22KTM4-PX servo amplifiers are not supplied with regenerative resistors. When using any of these servo amplifiers, always use the regenerative option MR-RB5R, MR-RB9F, MR-RB9T, MR-RB5K-4, and MR-RB6K-4.

Cooling the regenerative option with cooling fans improves regenerative capability. G3 and G4 are thermal sensor's terminals. Between G3 and G4 is opened when the regenerative option overheats abnormally.



Configure up a circuit which shuts off main circuit power when thermal protector operates.

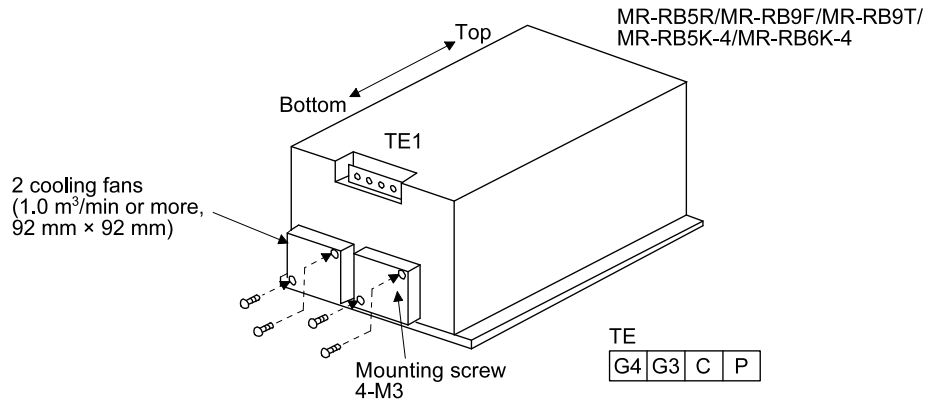
Note. G3-G4 contact specifications

- Maximum voltage: 120 V AC/DC
- Maximum current: 0.5 A/4.8 V DC
- Maximum capacity: 2.4 VA

Servo amplifier	Regenerative option	Resistance [Ω]	Regenerative power [W]	
			Without cooling fans	With cooling fans
MR-J4-11KTM-PX	MR-RB5R	3.2	500	800
MR-J4-15KTM-PX	MR-RB9F	3	850	1300
MR-J4-22KTM-PX	MR-RB9T	2.5	850	1300
MR-J4-11KTM4-PX	MR-RB5K-4	10	500	800
MR-J4-15KTM4-PX	MR-RB6K-4	10	850	1300
MR-J4-22KTM4-PX				

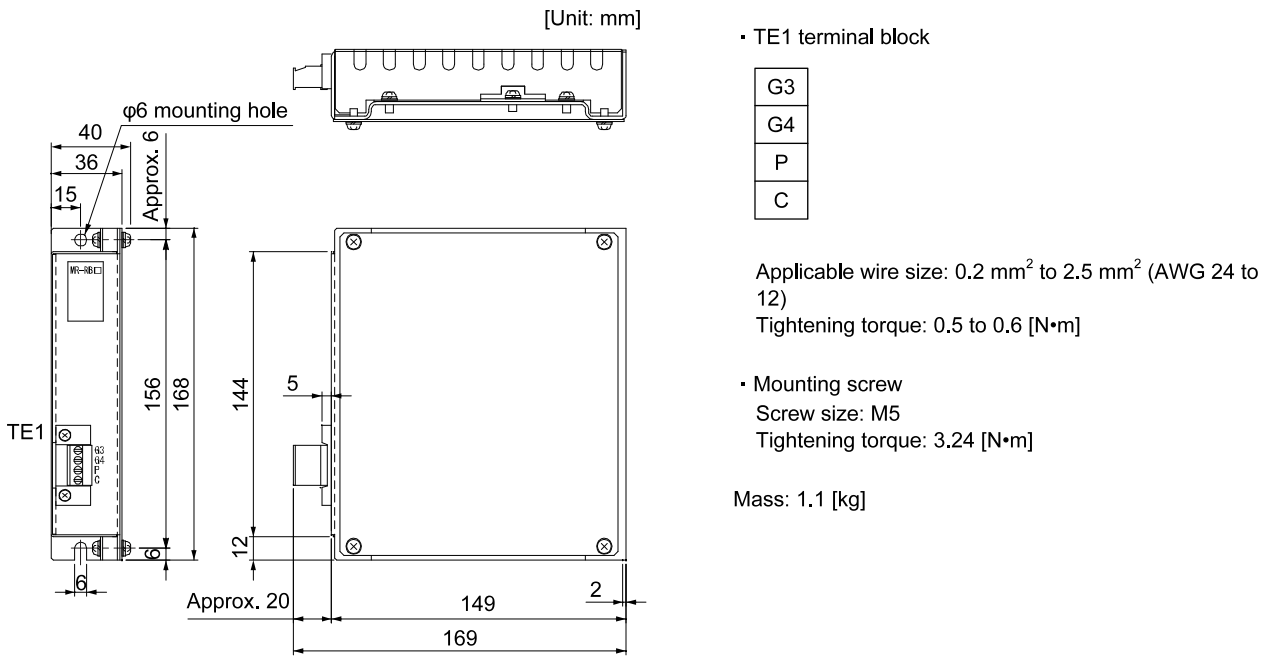
# 11. OPTIONS AND PERIPHERAL EQUIPMENT

When using cooling fans, install them using the mounting holes provided in the bottom of the regenerative option.



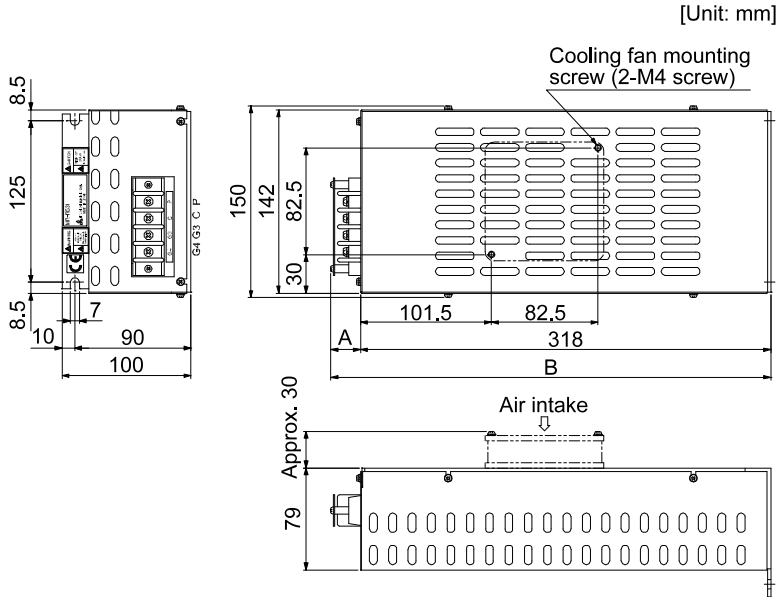
## 11.2.5 Dimensions

### (1) MR-RB12



# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## (2) MR-RB30/MR-RB31/MR-RB32/MR-RB3N/MR-RB34-4/MR-RB3M-4/MR-RB3G-4/MR-RB3U-4



• Terminal block

P
C
G3
G4

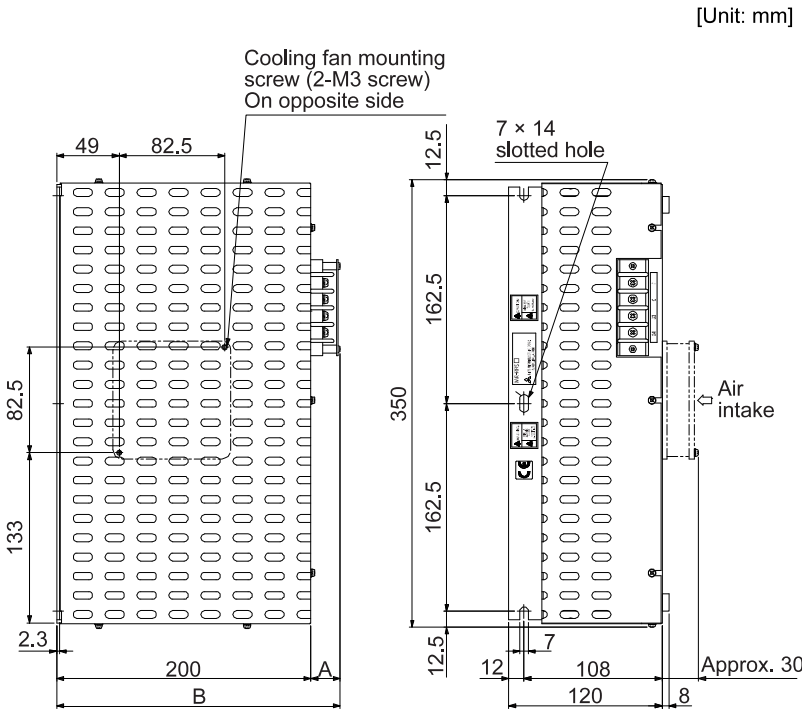
Terminal screw size: M4  
Tightening torque: 1.2 [N•m]

• Mounting screw

Screw size: M6  
Tightening torque: 5.4 [N•m]

Regenerative option	Variable dimensions		Mass [kg]
	A	B	
MR-RB30	17	335	2.9
MR-RB31			
MR-RB32			
MR-RB3N			
MR-RB34-4	23	341	
MR-RB3M-4			
MR-RB3G-4			
MR-RB3U-4			

## (3) MR-RB50/MR-RB51/MR-RB5N/MR-RB54-4/MR-RB5G-4/MR-RB5U-4



• Terminal block

P
C
G3
G4

Terminal screw size: M4  
Tightening torque: 1.2 [N•m]

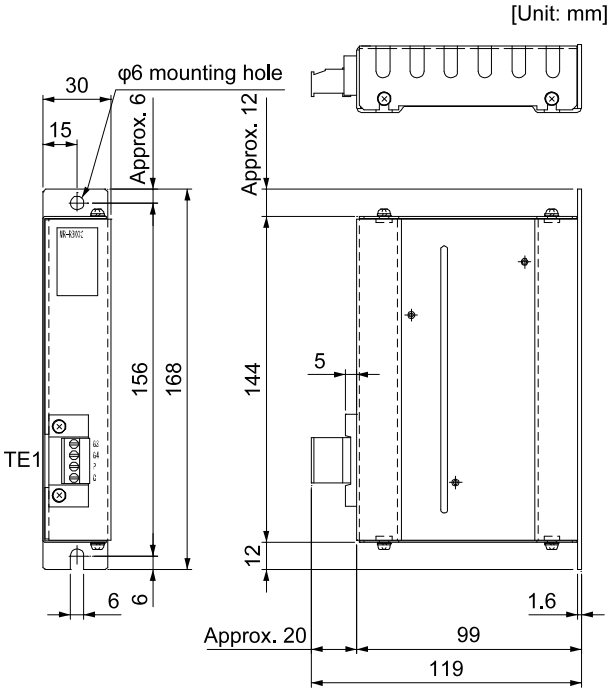
• Mounting screw

Screw size: M6  
Tightening torque: 5.4 [N•m]

Regenerative option	Variable dimensions		Mass [kg]
	A	B	
MR-RB50	17	217	5.6
MR-RB51			
MR-RB5N			
MR-RB54-4	23	223	
MR-RB5G-4			
MR-RB5U-4			

# 11. OPTIONS AND PERIPHERAL EQUIPMENT

## (4) MR-RB032



• TE1 terminal block

G3
G4
P
C

Applicable wire size: 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> (AWG 24 to 12)

Tightening torque: 0.5 to 0.6 [N•m]

• Mounting screw

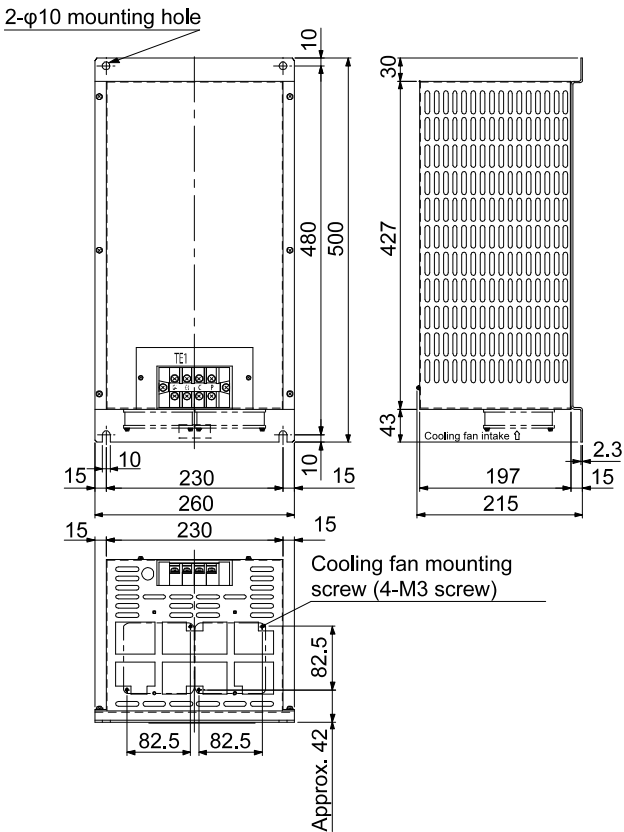
Screw size: M5

Tightening torque: 3.24 [N•m]

Mass: 0.5 [kg]

## (5) MR-RB5R/MR-RB9F/MR-RB9T/MR-RB5K-4/MR-RB6K-4

[Unit: mm]



• Terminal block

G4	G3	C	P
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Terminal screw size: M5

Tightening torque: 2.0 [N•m]

• Mounting screw

Screw size: M8

Tightening torque: 13.2 [N•m]

Regenerative option	Mass [kg]
MR-RB5R	10
MR-RB9F	11
MR-RB9T	
MR-RB5K-4	10
MR-RB6K-4	11