Solid State Contactor for 3-phase Motors with Built-in Soft Start/Stop and Monitor Output

G3J-T-C

CSM_G3J-T-C_DS_E_4_1

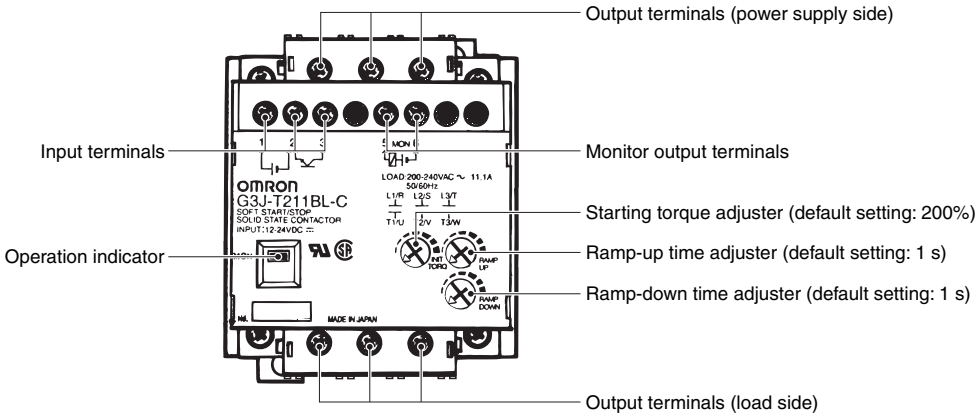
New Models with AC Power Supply Input and Monitor Output Equivalent to Non-contact SPST-NO Join the G3J-T Series

- Limiting the starting current saves energy.
- Certified for UL and CSA.
- Mounts with screws or to DIN Track.
- Compact design with heat sinks (3.7-kW models: 100 × 100 × 130 mm (W × H × D)).
- Built-in snubber circuit and thyristor.
- Built-in operation indicator.

⚠ Refer to *Safety Precautions for All Solid State Relays*.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Appearance



Ordering Information

■ List of Models

Number of elements	Isolation method	Rated power supply voltage	Input method	Applicable monitor capacity (AC3)		Monitor output	Model
3	Phototriac coupler	100 to 240 VAC	No-voltage input (open and short-circuited input)	3.7 kW (17.4 A)	200 to 220 VAC	AC switching output	G3J-T217BL-C AC100-240
				2.2 kW (11.1 A)			G3J-T211BL-C AC100-240
				0.75 kW (4.8 A)			G3J-T205BL-C AC100-240
		12 to 24 VDC		3.7 kW (17.4 A)		DC switching output	G3J-T217BL-C DC12-24
				2.2 kW (11.1 A)			G3J-T211BL-C DC12-24
				0.75 kW (4.8 A)			G3J-T205BL-C DC12-24

Specifications

■ Certified Standards

UL 508, CSA 22.2 No. 14

■ Ratings (at an Ambient Temperature of 25°C)

Power Supply

Item / Operating input power supply specifications	AC Model	DC Model
Rated power supply voltage	100 to 240 VAC	12 to 24 VDC
Operating voltage range	85 to 264 VAC	10.2 to 26.4 VDC
Current consumption	40 mA max. (at 100 to 240 VAC)	70 mA max. (at 12 to 24 VDC)

Operating (Input) Circuit

AC Model

Input method	**No-voltage input**	Short-circuiting/opening terminals 3 and 1 or terminals 3 and 2
		SSR input short-circuited: Maximum impedance of 1 kΩ, Maximum residual voltage of 1 V
		SSR input open: Minimum impedance of 100 kΩ
		Relay input: For minute signals

DC Model

Input current		10 mA max. (at 12 to 24 VDC)
Input method	**No-voltage input**	Short-circuiting/opening terminals 3 and 1 or terminals 3 and 2
		SSR input turned ON: Maximum residual voltage of 2 V between short-circuited terminals
		SSR input turned OFF: Maximum leakage current of 0.15 mA
		Relay input: For minute signals

Main Circuit (for Both AC and DC Models)

Item / Model		G3J-T217BL-C	G3J-T211BL-C	G3J-T205BL-C
Rated load voltage		200 to 240 VAC		
Rated voltage range		180 to 264 VAC		
Rated carry current (See note 1.)		17.4 A (at 40°C)	11.1 A (at 40°C)	4.8 A (at 40°C)
Minimum load current		0.5 A		
Inrush current resistance (peak value)		500 A (60 Hz, 1 cycle)	350 A (60 Hz, 1 cycle)	150 A (60 Hz, 1 cycle)
Overload resistance		Refer to *Engineering Data* on page 5		
Closed current (effective value)	**AC3**	174 A	111 A	48 A
	AC4	208.8 A	133.2 A	57.6 A
Breaking current (effective value)	**AC3**	139.2 A	88.8 A	38.4 A
	AC4	174 A	111 A	48 A
Applicable load	**3-phase inductive motor (See note 2.) (AC3, AC4, AC53-a)**	200 to 220 VAC 3.7 kW (17.4 A)	200 to 220 VAC 2.2 kW (11.1 A)	200 to 220 VAC 0.75 kW (4.8 A)
	Resistive load (AC1) (See note 3.)	200 to 240 VAC 17.4 A	200 to 240 VAC 11.1 A	200 to 240 VAC 4.8 A

Note: 1. The rated carry load depends on the ambient temperature. For details, refer to the Load Current vs. Ambient Temperature graph in *Engineering Data*.

2. Satisfies switching test conditions of AC3, AC4, and AC53-a. (Refer to *Engineering Data* on page 5 for the test conditions.)

3. Single-phase loads cannot be used.

Monitor Output

Item / Operating input power supply specifications	AC model	DC model
Rated power supply voltage	100 to 240 VAC	12 to 24 VDC
Operating voltage range	85 to 264 VAC	10.2 to 26.4 VDC
Rated carry current	50 mA	0.2 A
Minimum load current	3 mA	3 mA

■ Characteristics (for Both AC and DC Models)

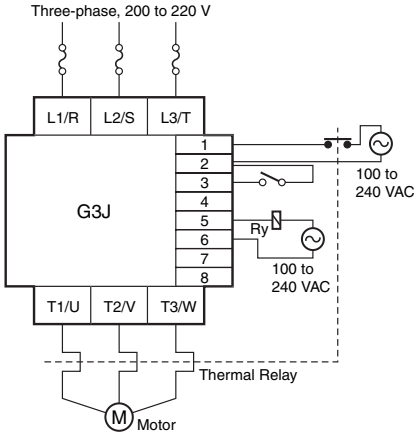
Item / Model	G3J-T217BL-C	G3J-T211BL-C	G3J-T205BL-C
Ramp-up time	Set within a range of approx. 1 to 25 s.		
Ramp-down time	Set within a range of approx. 1 to 25 s.		
Starting torque (See note 1.)	Set within a range of 200% to 450% In.		
Monitor output operate time (See note 2.)	After control signal input: AC model: 300 ms max. (TYP 50 ms), DC model: 50 ms max.		
Monitor output release time (See note 2.)	After ramp-down time completion (after main circuit current turns OFF): 60 ms max.		
Output ON voltage drop (main circuit)	1.6 V (RMS) max.		
Output ON voltage drop (monitor output)	AC model: 3.5 VAC max., DC model: 2.0 VDC max.		
Leakage current (main circuit)	10 mA max. (at 200 VAC)		
Leakage current (monitor output)	AC model: 1.5 mA max. (at 200 VAC), DC model: 0.15 mA max. (at 24 VDC)		
Insulation resistance	100 MΩ min. (at 500 VDC)		
Dielectric strength	2,500 VAC, 60 Hz for 1 min		
Vibration resistance	10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)		
Shock resistance	294 m/s^2		
Storage temperature	–30 to 70°C (with no icing or condensation)		
Ambient operating temperature	–20 to 60°C (with no icing or condensation)		
Ambient operating humidity	45 to 85 %		
Weight	Approx. 890 g	Approx. 760 g	Approx. 760 g

Note: 1. Provided that the starting torque is 600% In when the motor is started at full voltage.
2. The monitor output will be ON while load current is flowing to the main circuit.

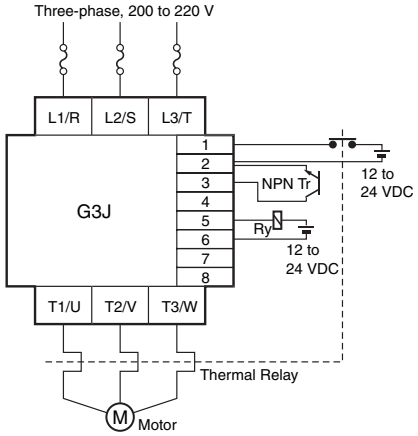
Connections

■ Connection Examples

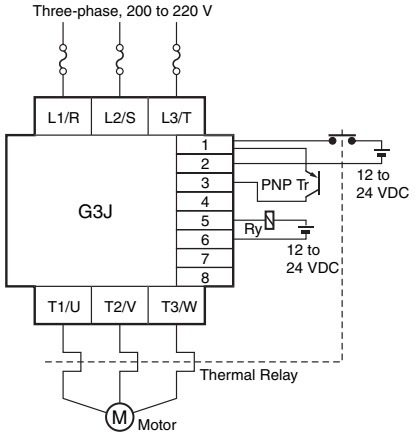
AC Model G3J-T□BL-C



DC Model G3J-T□BL-C (NPN transistor input)



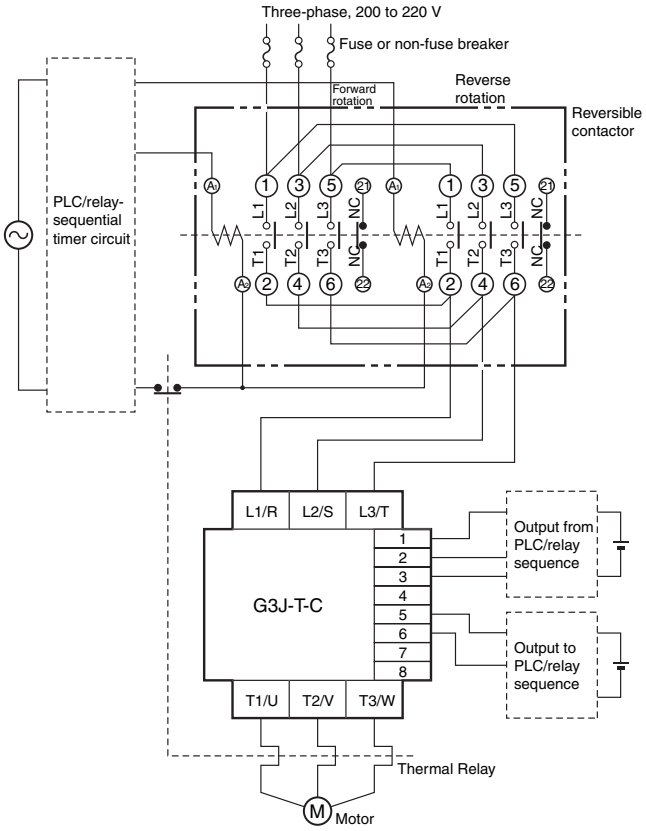
(PNP transistor input)



Note: Harmonized protection for motor overload is ensured by using a thermal relay. Be sure, however, to install protective devices on the power supply side, such as fuses and non-fuse breakers, as protection against accidents due to short-circuiting.

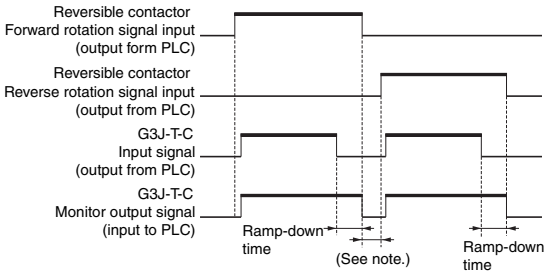
Example of Forward/Reverse Rotation Using Monitor Output

G3J-T-C



Note: Be sure to use a fuse or non-fuse breaker to protect the G3J.

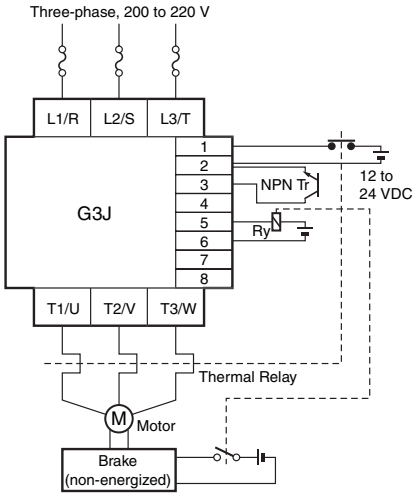
Time Chart Example



Note: Switch between forward and reverse rotation only after the motor rotation has come to a complete stop.

Monitor Output Usage Example (Motor Stop Hold)

DC Model G3J-T□BL-C



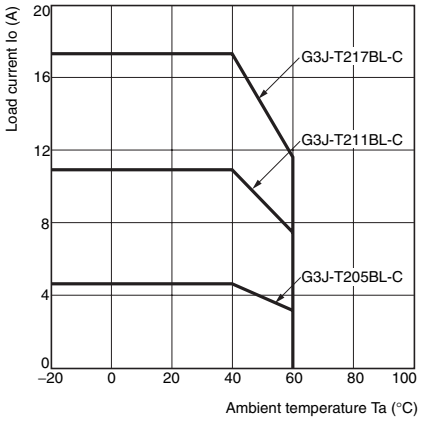
Monitor Output Applications

- The monitor output will be ON while current is flowing to the main circuit. Use the monitor output, e.g., to switch the operation indicator, or to switch control signals during forward/reverse rotation or when a mechanical brake is used.
- Be sure to use a surge absorber when connecting an inductive load to the monitor output.

Do not use two G3J-T or G3J-C Contactors together for reversible operation.

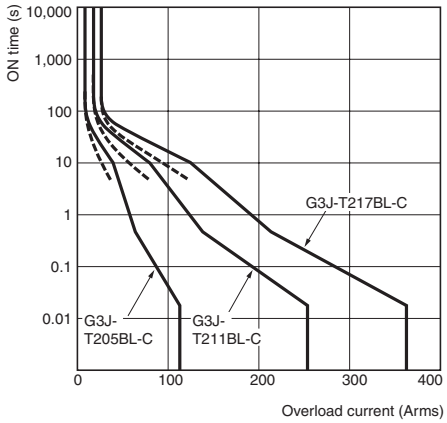
Engineering Data

Load Current vs. Ambient Temperature (at Continuous Power)



Overload Resistance

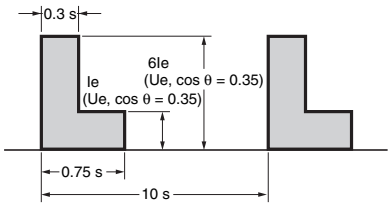
60 Hz, Ta of 25°C, non-repetitive (1/2 max. for repetitive application)



Note: dotted lines are for hot start.

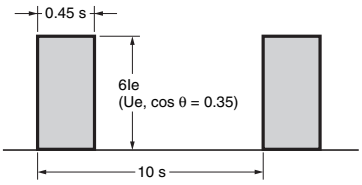
Switching Frequency Conditions (AC3/AC4/AC53-a)

AC3 Class (Immediate Start)



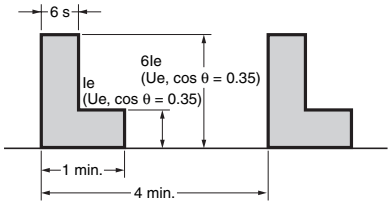
Ie: Rated carry current
Ue: Rated load voltage (200/400 V)
Testing for the soft-start model was performed at the following conditions:
Ramp-up time = 1 s
Starting torque = 450% In
Testing for the soft start/stop model was performed at the following conditions:
Ramp-up time = 1 s
Ramp-down time = 1 s
Starting torque = 450% In

AC4 Class (Inching)



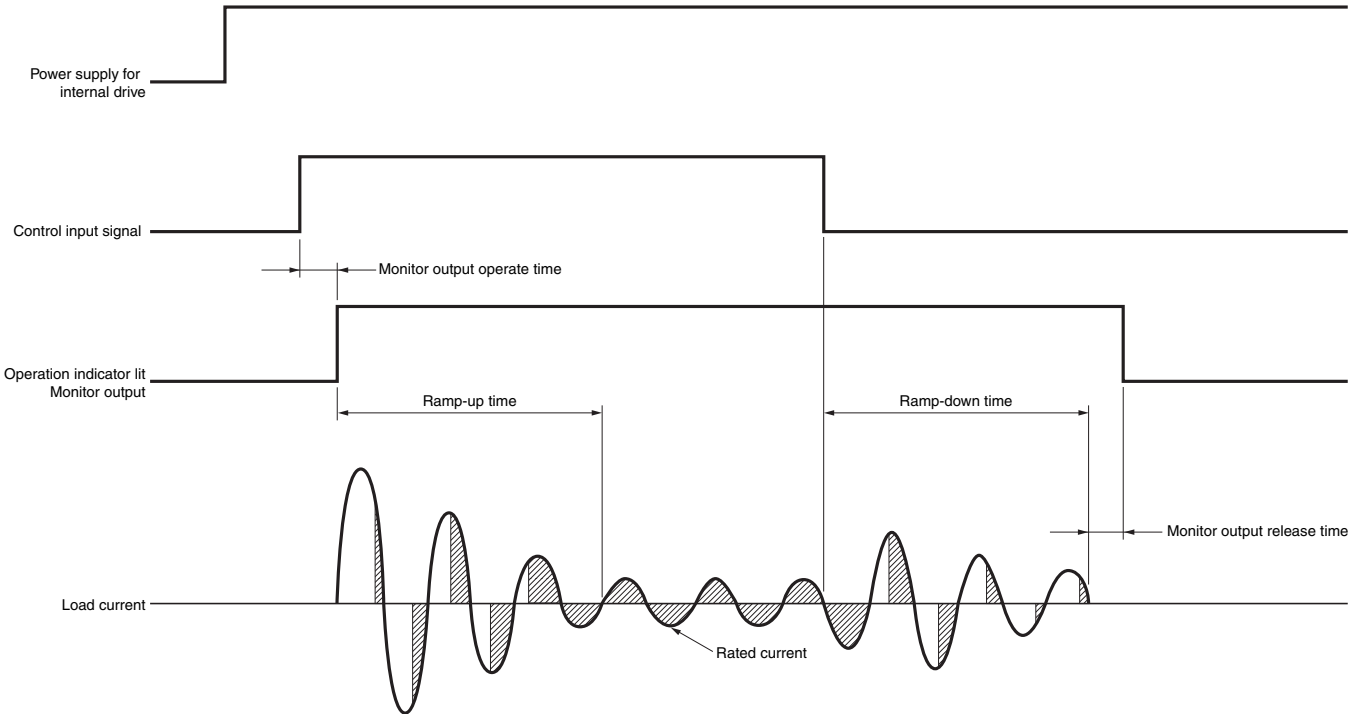
Ie: Rated carry current
Ue: Rated load voltage (200/400 V)
Testing for the soft-start model was performed at the following conditions:
Ramp-up time = 1 s
Starting torque = 450% In
Testing for the soft start/stop model was performed at the following conditions:
Ramp-up time = 1 s
Ramp-down time = 1 s
Starting torque = 450% In

AC53-2: 6-6: 25-15, Actual Load Service Life Test



Ie: Rated carry current
Ue: Rated load voltage (200/400 V)
Testing for the soft-start model was performed at the following conditions:
Ramp-up time = 1 s
Starting torque = 450% In
Testing for the soft start/stop model was performed at the following conditions:
Ramp-up time = 1 s
Ramp-down time = 1 s
Starting torque = 450% In

Time Chart



Note: 1. The soft-start time and soft-stop time depend on the load characteristics (e.g., inertia and friction factor) in addition to the starting torque, ramp-up time, and ramp-down time. Therefore, the soft-start time or soft-stop time will not increase beyond a certain point if the ramp-up time and ramp-down time are increased.

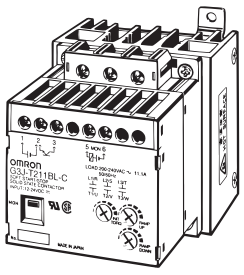
2. Due to the soft-stop control characteristics, the load current continues flowing even after the motor stops. Set to the optimum value according to the application.

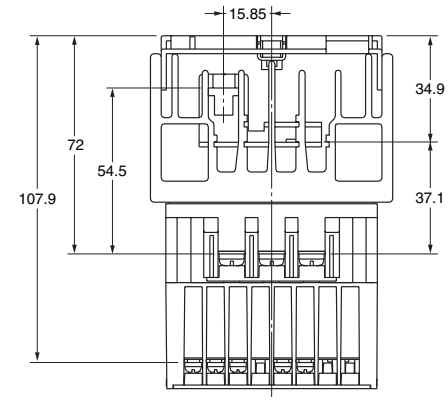
3. The operation indicator will light synchronized with the monitor output.

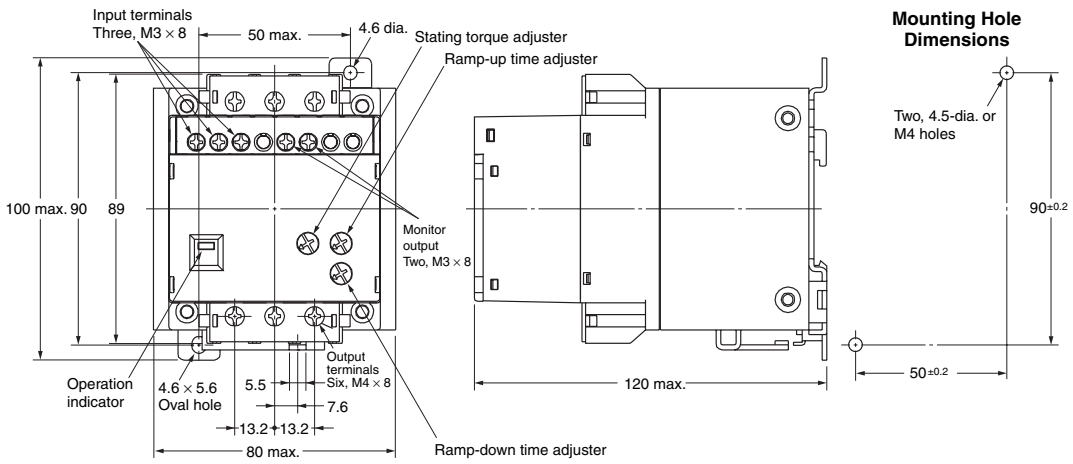
Dimensions

Note: All units are in millimeters unless otherwise indicated.

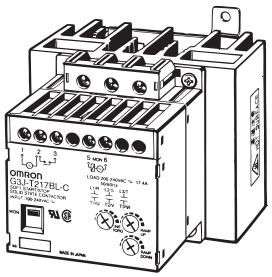
G3J-T205BL-C
G3J-T211BL-C

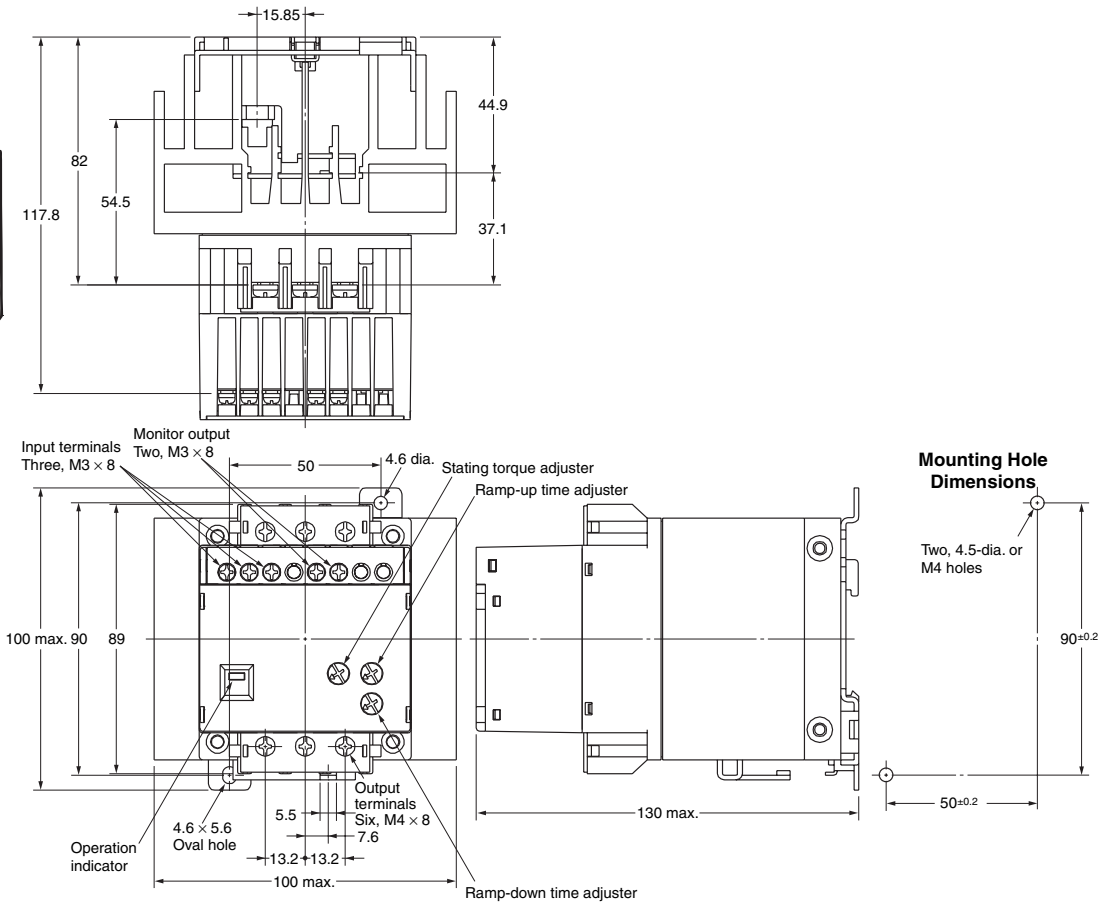






G3J-T217BL-C





Safety Precautions

Refer to *Safety Precautions for All Solid State Relays*.

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To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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