

### ■ Single-phase Models

#### EUN Series

**AC Power Controller with Phase-control System Allows Precise Temperature Control**

**Models with Base-up and Soft-start Functions Available**

#### EH Series

**Phase Control System Makes It Possible to Detect Disconnection of Heaters**

#### EC Series

**Optimum Device for Controlling Input Power for Pure Metal Heater, and Incorporates Overcurrent Detecting and Single Heater Burnout Detecting Functions**

- OMRON's unique design and carefully-selected materials made it possible to produce a compact and lightweight Power Controller.
- Replaceable, easy-to-install Power Device Cartridge assures ease of maintenance.
- Detecting component failures and operating errors.
- Approved by UL, CSA.



## Ordering Information

### EUN Series

Phase	Applicable load	Level indicator	Base-up function (see note 1)	Soft-start time	Carry current	Rated voltage	Model
Single	Resistive load Heater	Yes	Yes	Approx. 0.5 to 10 sec	20 A	100/110 VAC	G3PX-220EUN
					40 A	200/230 VAC (see note 2)	G3PX-240EUN
					60 A		G3PX-260EUN

- Note:**
1. The base-up output with a 0-mA temperature controller output (i.e. the temperature controller is OFF) differs from that with a 4-mA temperature controller output. Refer the *Characteristics data* on page 66.
  2. When ordering, make sure that the rated voltage is 200/230 VAC because the 200/220-VAC G3PX exists as well.

## EH Series

Phase	Applicable load	Level indicator	Single heater burnout detection	Multiple heater burnout detection	Carry current	Rated voltage	Model (see note 1)
Single	Resistive load Heater	Yes	Yes	No	20 A	100/110 VAC 200/230 VAC (see note 3)	G3PX-220EH-CT03
					40 A		G3PX-220EH-CT10
					60 A		G3PX-240EH-CT03
							G3PX-240EH-CT10
					20 A		G3PX-260EH-CT03
							G3PX-260EH-CT10
			Yes (see note 2)	Yes	20 A		G3PX-220EHN-CT03
							G3PX-220EHN-CT10
					40 A		G3PX-240EHN-CT03
							G3PX-240EHN-CT10
					60 A		G3PX-260EHN-CT03
							G3PX-260EHN-CT10

- Note:**
- EH- and EHN-series models are provided with a CT incorporating 30- or 100-cm-long lead wires and Power Device Cartridge. When ordering, specify the length of the lead wires by adding a code to the model number as shown below.  
G3PX-2□0EH-CT03: CT with 30-cm-long lead wires  
G3PX-2□0EH-CT10: CT with 100-cm-long lead wires
  - Adjusts the multiple heater burnout detection sensitivity of EHN-series models. Enables single heater burnout detection in control of a maximum of five heaters.
  - When ordering, Rated voltage should be made sure if it is for 200/230 VAC. Otherwise 200/220 VAC G3PX is existing.

## EC Series

Phase	Applicable load	Level indicator	Constant-current function	Single heater burnout detection	Carry current	Rated voltage	Model (see note 1)
Single	Resistive load Heater	Yes	Yes	Yes	20 A	100/110 VAC 200/230 VAC (see note 2)	G3PX-220EC-CT03
					40 A		G3PX-220EC-CT10
					60 A		G3PX-240EC-CT03
							G3PX-240EC-CT10
					G3PX-260EC-CT03		
							G3PX-260EC-CT10

- Note:**
- EC-series models are provided with a CT Unit with lead wires (30- or 100- cm in length). When ordering, specify the length of the lead wires by adding a code to the model number as shown below.  
G3PX-2□0EC-CT03: CT with 30-cm-long lead wires  
G3PX-2□0EC-CT10: CT with 100-cm-long lead wires
  - When ordering, Rated voltage should be made sure if it is for 200/230 VAC. Otherwise 200/220 VAC G3PX is existing.

## ■ Accessories (Order Separately)

### CT Unit

Name	Length of lead wires	Solderless terminals	Applicable models	Model
CT Unit	0.3 m	Yes	G3PX-2□□EH	G32X-CT03
	1 m			G32X-CT10
	0.3 m		G3PX-2□□EHN	G32X-CT03HN
	1 m			G32X-CT10HN
	0.3 m		G3PX-2□□EC	G32X-CT03C
	1 m			G32X-CT10C

### Power Device Cartridge

Name	Carry current	Applicable models	Model
Power Device Cartridge	20 A	G3PX-220E□□	G32X-A20
	40 A	G3PX-240E□□	G32X-A40
	60 A	G3PX-260E□□	G32X-A60

- Note:** The G32X-A is a dedicated Power Device Cartridge for the G3PX.  
Refer to *Replacement Parts* on page 74.

# Specifications

## ■ Ratings

### Control

Item		G3PX-220EUN/ 240EUN/ 260EUN	G3PX-220EH/ 240EH/ 260EH	G3PX-220EHN/ 240EHN/ 260EHN	G3PX-220EC/ 240EC/ 260EC
Rated voltage		100/110, 200/230 VAC			
Frequency		50/60 Hz (see note 1)			
Input signal for control	External main setting	2 k $\Omega$ (type B, 2 W min.)	3 k $\Omega$ (type B, 2 W min.)	2 k $\Omega$ (type B, 2 W min.)	
	Current input	4 to 20 mA (at 1 to 5 V) (Input impedance: 250 $\Omega$ ) (see note 3)			
	Voltage ON/OFF input	5 to 24 VDC (Input impedance: approx. 20 k $\Omega$ )			
	External duty setting	3 k $\Omega$ (type B)			
Relay output for alarm		---	SPDT: 8 A at 250 VAC/30 VDC		

- Note:**
- 50/60 Hz (no selector required) (EUN Series)  
Terminals 18 and 19 of EHN/EC-series models must be open when the supply frequency is 50 Hz. These terminals must be short-circuited when the supply frequency is 60 Hz.
  - Use the G32X-V2K 2-k $\Omega$  Variable Resistor for external main setting on EUN, EC, and EHN (G32X-V3K 3-k $\Omega$  for EN-series models).
  - Input 4 to 20 mA or 1 to 5 VDC linear input to the 4 to 20 mA current input terminal.

### Output

Model	Applicable load			
	Load voltage range	Load current	Inrush current	Number of phase
G3PX-220E□ G3PX-220E□N	100/110, 200/230 VAC (50/60 Hz)	1 to 20 A (see note)	220 A (60 Hz, 1 cycle)	Single
G3PX-240E□ G3PX-240E□N		1 to 40 A (see note)	440 A (60 Hz, 1 cycle)	
G3PX-260E□ G3PX-260E□N		1 to 60 A (see note)	440 A (60 Hz, 1 cycle)	

- Note:** The G3PX-2□□EHN (model with multiple heater burnout detecting function) and G3PX-2□□EC (constant-current model) require 20% min. of the rated current to detect a short mode failure. EC-series models detect an open mode failure if the load current has dropped to 80% of the rated value. A short mode failure will be detected if the current has risen to 20% of the rated value.

## ■ Characteristics

### EU/EH Series

Item	G3PX-220EUN/ 240EUN/260EUN	G3PX-220EH/240EH/260EH	G3PX-220EHN/ 240EHN/260EHN
Operating voltage range	$\pm$ 10%		
Operating frequency range	$\pm$ 1 Hz		
Output voltage adjustable range	0% to 95%		
Internal duty setting range	0% to 100%	10% to 100% (see note 1)	0% to 100%
External duty setting range	0% to 100%	10% to 100% (see note 1)	0% to 100%
Start-up time (see note 2)	Approx. 0.5 to 10 s (see note 3)	Approx. 0.1 to 1 s (see note 3)	Approx. 0.5 to 10 s (see note 3)
Base-up range	0% to 90%	---	
Multiple heater burnout detection	---		20% max. (see note 4)

Item	G3PX-220EUN/ 240EUN/260EUN	G3PX-220EH/240EH/260EH	G3PX-220EHN/ 240EHN/260EHN
Min. phase detection	---	Approx. $1/6 \pi$	
Min. phase setting	---	---	Approx. $1/6 \pi$
Min. load current for ON error detecting	---	1 A	30% max. of rated current (see note 5)
Abnormality detection time	---	0.1 s max.	1 s max.
Voltage drop with output ON	1.6 V max. (RMS)		
Leakage current	10 mA max. at 100/110 VAC, 20 mA max. at 200/230 VAC		
Insulation resistance	100 M $\Omega$ min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min.		
Vibration resistance	Malfunction: 10 to 55 Hz, 10G		
Shock resistance	Malfunction: 300 m/s <sup>2</sup>		
Ambient temperature	Operating: -25°C to 65°C (with no icing or condensation) Storage: -10°C to 55°C (with no icing or condensation)		
Ambient humidity	Operating: 45% to 85%		
Weight	G3PX-220EUN: approx. 1.1 kg G3PX-240EUN: approx. 1.4 kg G3PX-260EUN: approx. 1.7 kg	G3PX-220EH: approx. 1.1 kg G3PX-240EH: approx. 1.4 kg G3PX-260EH: approx. 1.7 kg	G3PX-220EHN: approx. 1.2 kg G3PX-240EHN: approx. 1.5 kg G3PX-260EHN: approx. 1.8 kg

- Note:**
1. Duty setting does not complete to the OFF state (i.e. 10% remains).
  2. The start-up time is factory-set to 1 s on the EH Series, approx. 0.5 s on the EHN and EC Series.
  3. This is the initial start-up time with a 100% duty setting.
  4. Detection is effective when the set current is reduced by 20% or more.
  5. The minimum set value in the G3PX-220EHN is 6 A. If a lower value is required, increase the number of wiring turns around the CT.

### EC Series

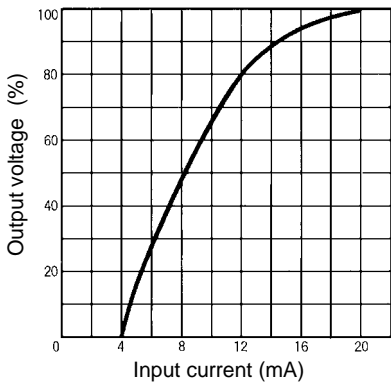
Item	G3PX-220EC	G3PX-240EC	G3PX-260EC
Operating voltage range	$\pm 10\%$		
Operating frequency range	$\pm 1$ Hz		
Output voltage adjustable range	0% to 95%		
Internal duty setting range	0% to 100%		
External duty setting range	0% to 100%		
Start-up time	Approx. 0.5 to 10 s		
Min. load current for ON error detecting	20% max. of rated current		
Current limit range	0% to 100%		
Excess current detection	Peak current of 110 A within 1 cycle	Peak current of 220 A within 1 cycle	Peak current of 330 A within 1 cycle
Constant current	$\pm 3\%$ max. with 10-time increment of load value $\pm 3\%$ max. with $\pm 10\%$ change of voltage		
Abnormality detection time	1 s max.		
Voltage drop with output ON	1.6 V max. (RMS)		
Leakage current	10 mA max. at 100/110 VAC, 20 mA max. at 200/220 VAC		
Insulation resistance	100 M $\Omega$ min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min.		
Vibration resistance	Malfunction: 10 to 55 Hz, 10G		
Shock resistance	Malfunction: 300 m/s <sup>2</sup>		
Ambient temperature	Operating: -25°C to 65°C (with no icing or condensation) Storage: -10°C to 55°C (with no icing or condensation)		
Ambient humidity	Operating: 45% to 85%		
Weight	G3PX-220EC: approx. 1.1 kg G3PX-240EC: approx. 1.4 kg G3PX-260EC: approx. 1.7 kg		

# Engineering Data

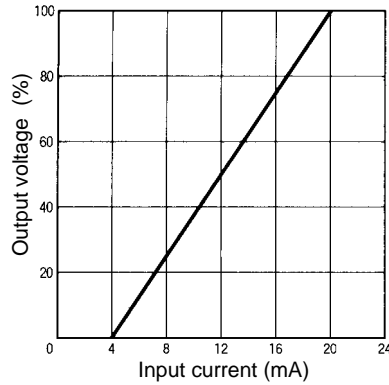
The following data is for an ambient temperature of 25°C.

## Output Characteristics

G3PX-EUN/EH/EHN Models

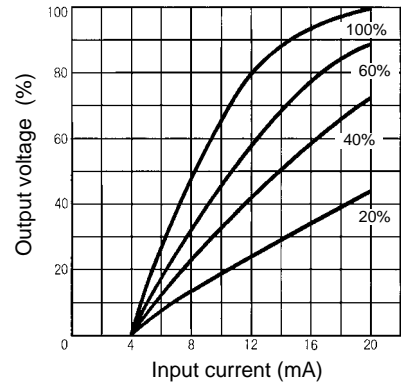


G3PX-EC



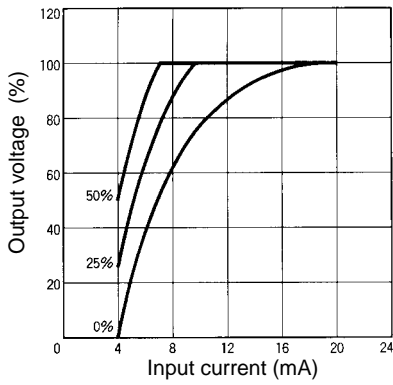
## Duty Setting

G3PX-EUN/EH/EHN Models



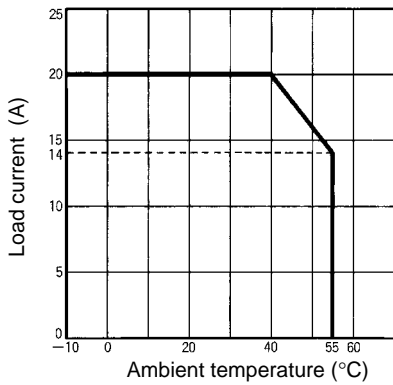
## Base-up Characteristics

G3PX-2□0EUN Models

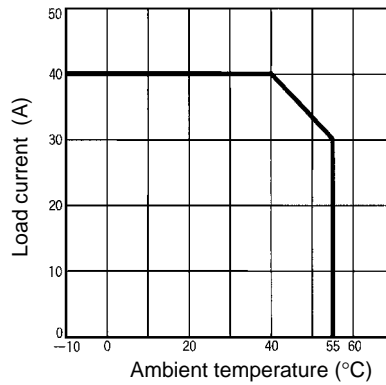


## Load Current vs. Ambient Temperature

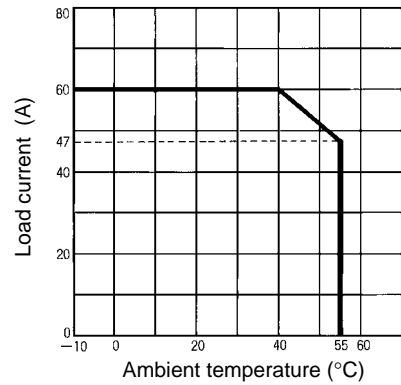
G3PX-220E□ Models



G3PX-240E□ Models

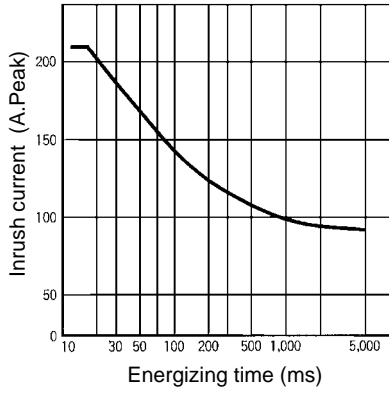


G3PX-260E□ Models

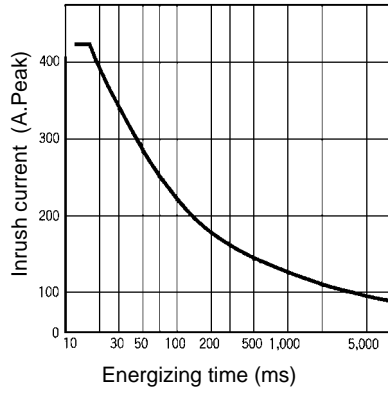


**Withstand Inrush Current**

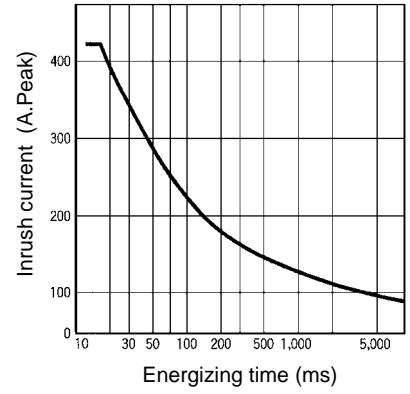
**G3PX-220E Models**



**G3PX-240E Models**



**G3PX-260E Models**

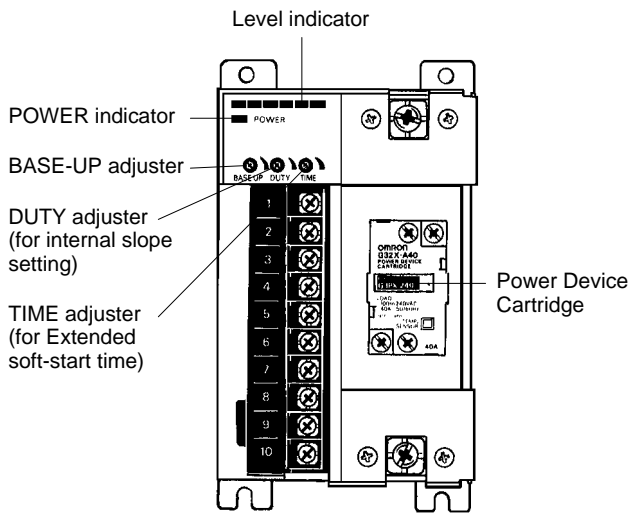


**Note:** The above are possible on condition that the G3PX is in non-repetitive operation. If the G3PX is in repetitive operation, reduce the applied current to half.

# Nomenclature

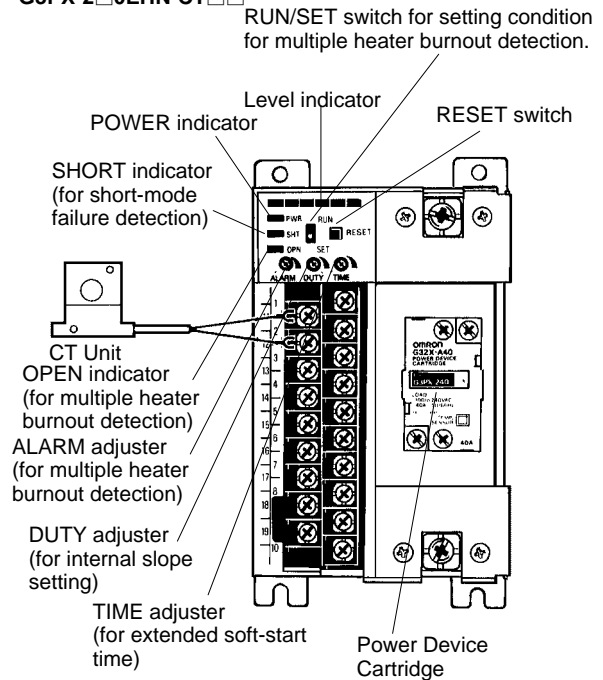
## Single-function Model (EUN-series Model)

G3PX-2□0EUN



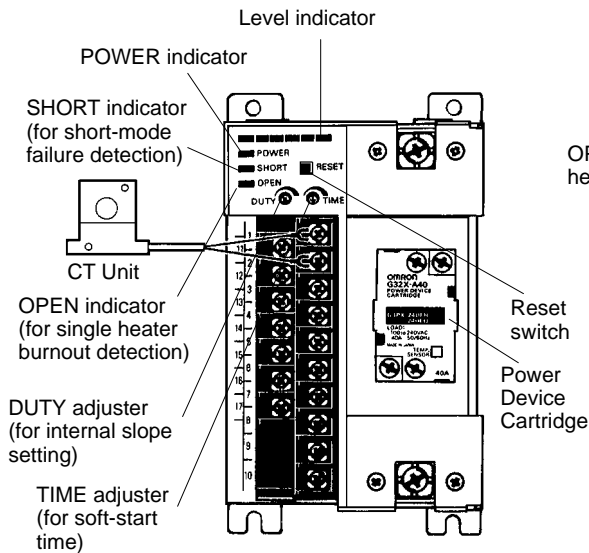
## Multiple Heater Burnout Detection (EHN-series Model)

G3PX-2□0EHN-CT□□



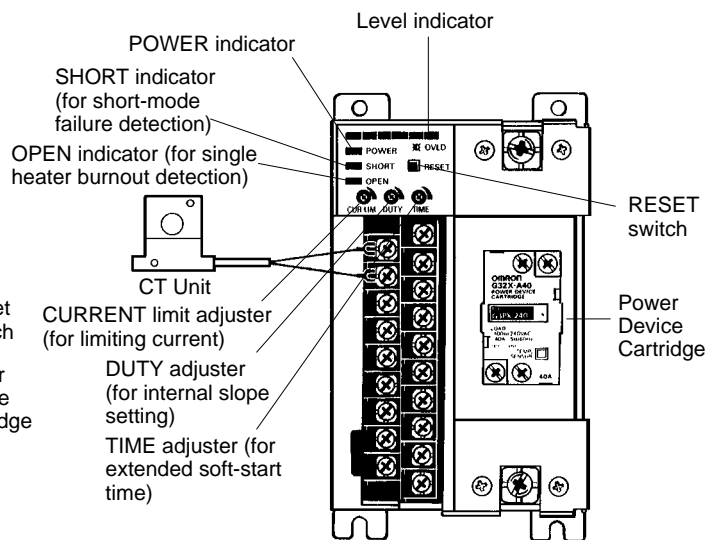
## Single Heater Burnout Detection (EH-series Model)

G3PX-2□0EH-CT□□



## Constant-current Model (EC-series Model)

G3PX-2□0EC-CT□□



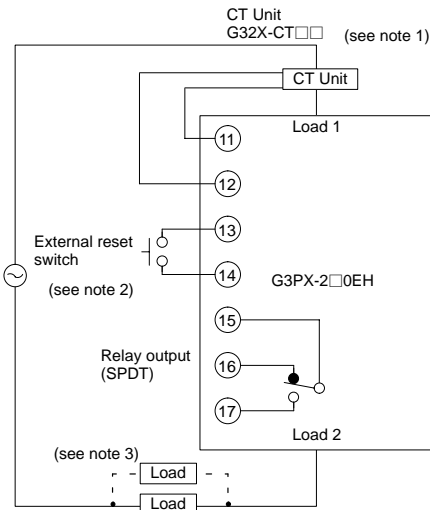
# Operation

## ■ Error Detecting Function

### Wiring

#### Single-phase Models

All G3PX-2□0EH/EHN/EC-series models incorporate terminals 11 and 12 for the CT Unit, 13 and 14 for the external reset switch, and 16 and 17 for relay output as well as power/input terminals 1 through 10.



- Note:**
1. Connect either the black or white lead wire of the CT Unit to terminal 11 and the other lead wire to terminal 12. The G3PX will malfunction if you do not connect the CT Unit to the G3PX.
  2. The rated current and voltage of G3PX models when reset are as follows:  
EH-series models: 12 mA at 12 VDC  
EHN- and EC-series models: 1 mA at 12 VDC
  3. For more than one heater.

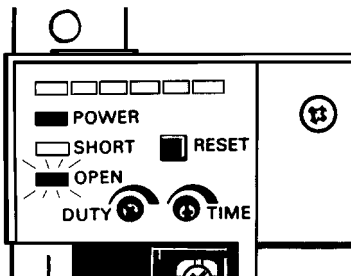
### Output

#### Single-phase Models

The following illustrations show the condition of the G3PX LED indicators when the G3PX detects heater burnout, a short-mode failure (ON failure of components), or overcurrent (EC-series constant-current models only). The indicator and relay output signals are reset with the internal or external reset switch provided that the error condition has been remedied.

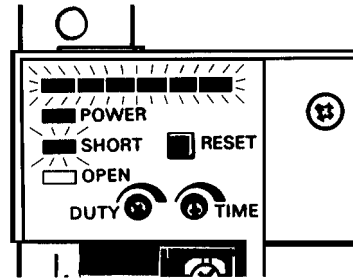
1. When EH/EHN/EC-series models detect single or multiple heater burnout, the OPEN indicator is lit and the SPDT relay output is ON.

**Note:** When the G3PX detects heater burnout, the Level indicator will be OFF regardless of the G3PX input condition. The red OPEN indicator will be lit. EHN-series models, however, will continue operating with level indication.

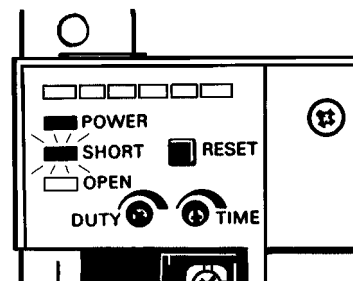


2. When EH/EHN/EC-series models detect a short-mode failure, the SHORT indicator is lit and the SPDT relay output is ON.

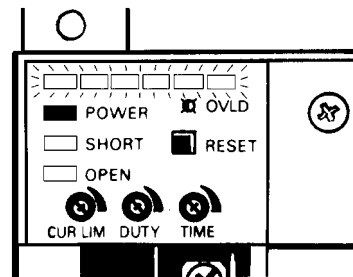
With continuous load current.



With load current shut off.



- Note:** When the G3PX detects a short-mode failure, all LEDs of the Level indicator and red SHORT indicator are lit. When you use a breaker to disconnect the load with the relay output, all LEDs of the Level indicator will be OFF regardless of the input to the G3PX.
3. When EC-series models detect an overcurrent, the Level indicator will flash and the SPDT relay output is ON. The input signal will be shut off.



**Note:** When resetting, leave power supply terminals 10 to 9 or 8 ON.

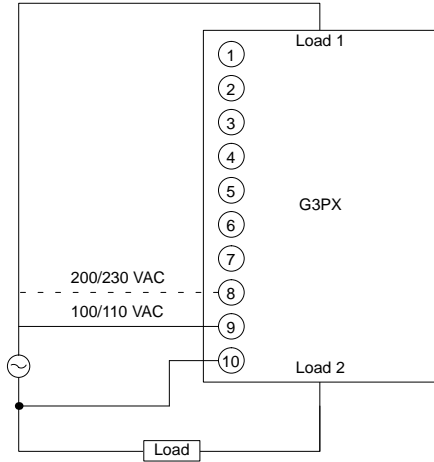


■ Wiring

Main Circuit

Single-phase Models

The following illustrations show connection examples:



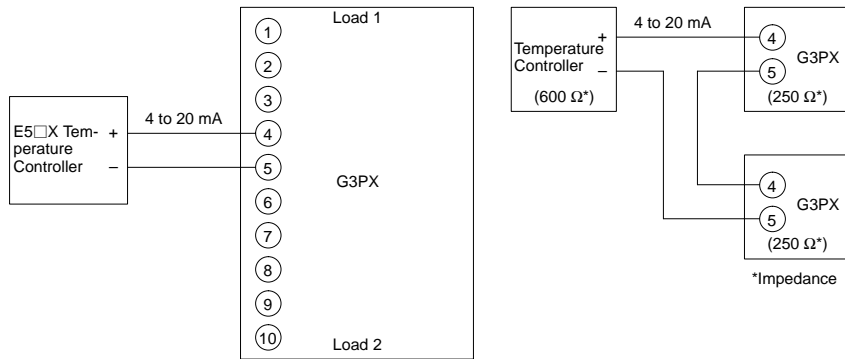
**Note:** Use a single power supply for the G3PX and the load.

Setting Circuit

Analog Control

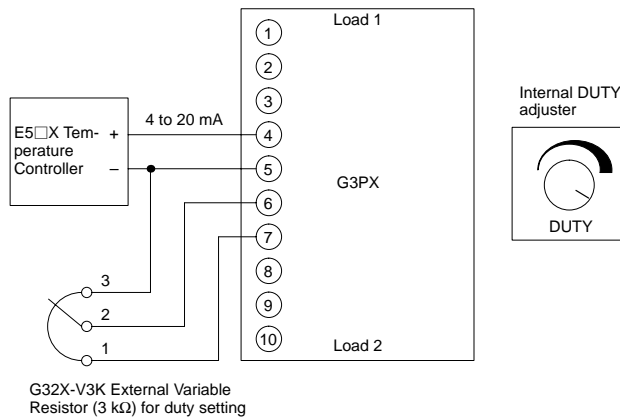
Single-phase Models

1. A Temperature Controller with 4- to 20-mA output is used to control the G3PX.



**Note:** Two G3PX models can be connected in series to OMRON's single Temperature Controller (with an internal impedance of 600 Ω) with a current output.

2. A Temperature Controller with an output of 7 to 20 mA is used with the G3PX to change the duty.



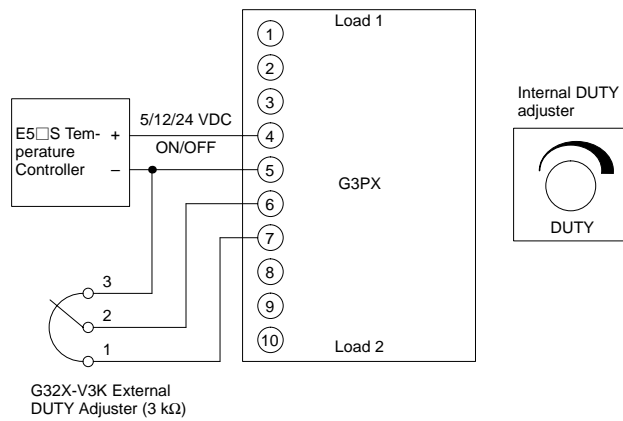
G32X-V3K External Variable Resistor (3 kΩ) for duty setting

**Note:** You can change the duty with the external or internal ramp adjuster.

**ON/OFF Control**

**Single-phase Models**

1. A Temperature Controller is used to change the duty of G3PZ.

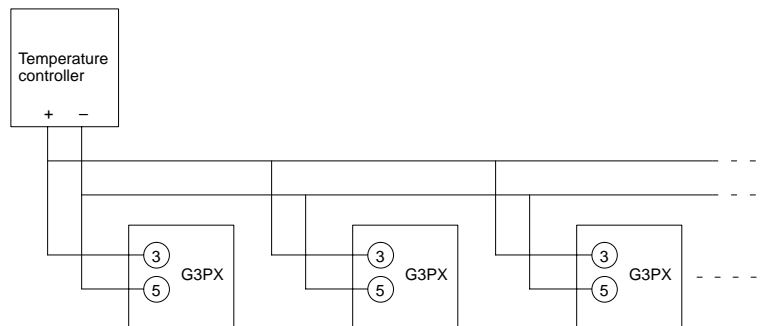


**Note:** You can change the duty with the external or internal variable resistor.

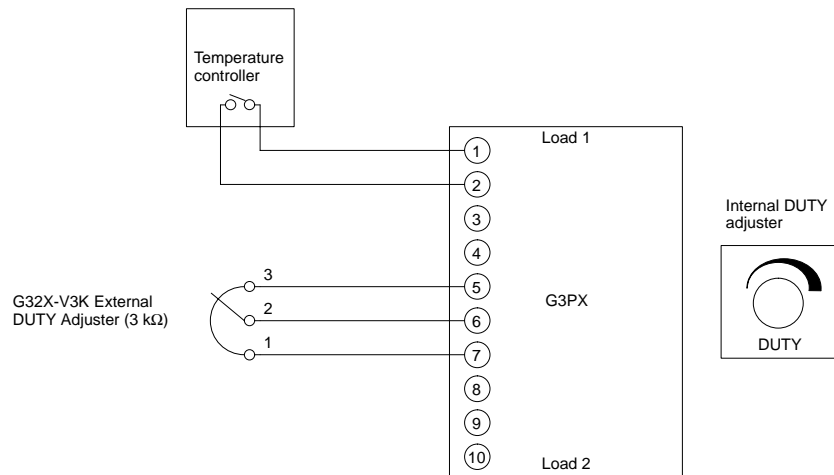
2. A Temperature Controller (with a voltage output) is used to control several G3PXs.

Temperature Controller specifications	No. of G3PX
E5□X: 40 mA at 12 V	20 sets
E5□S: 20 mA at 12 V	20 sets
20 mA at 5 V	20 sets
10 mA at 5 V	20 sets

**Connection Example**

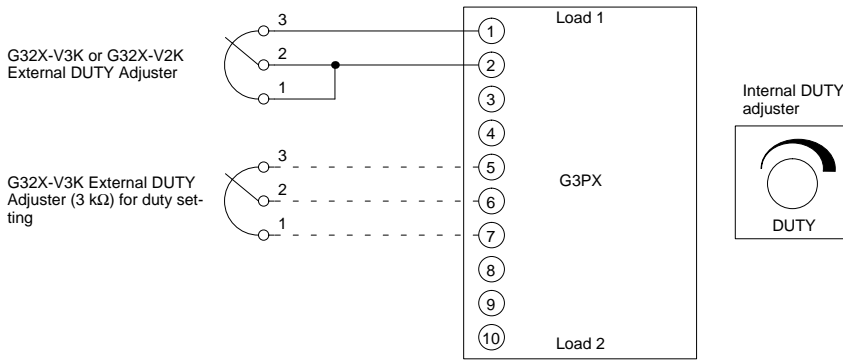


3. A Temperature Controller (with a relay output) is used to vary the duty of G3PX.



**Manual Control**

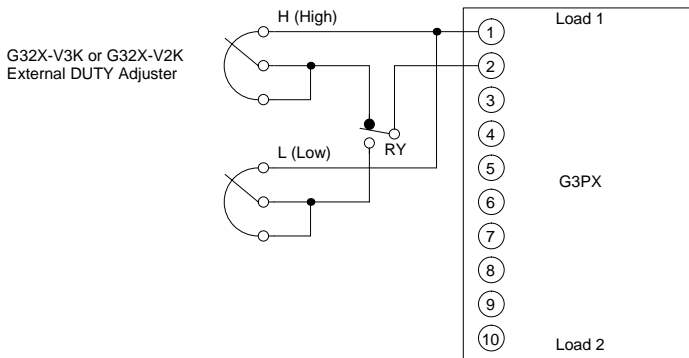
**Single-phase Models**



**Note:** Delicate duty adjustment is possible with the external or internal resistor. Use a right DUTY adjuster (2- or 3-kΩ type) according to the G3PX model as follows:  
 G32K-V3K (3 kΩ) for EH-series models  
 G32X-V2K (2 kΩ) for EUN-, EHN-, and EC-series models

**Two-position Control**

**Single-phase Models**



**Note:** 1. A temperature controller with relay output or a single relay can be used with the G3PX in two-position (high-and low-position) control, in which case the relay contact current is 30 mA at 12 VDC with the External DUTY Adjuster set to 0 Ω.  
 2. Use a right DUTY adjuster (2- or 3-kΩ type) according to the G3PX model as follows:  
 G32X-V3K (3 kΩ) for EH-series models  
 G32X-V21K (2 kΩ) for EUN-, EHN-, and EC-series models.

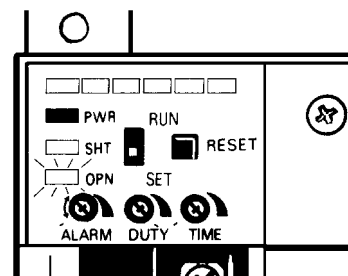
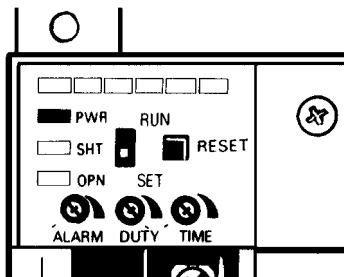
**Setting of Base-up Output (G3PX-2□0EUN Series)**

The base-up output can be adjusted with the base-up adjuster knob. It is also possible to control the base-up output for the full scale of 4 to 20-mA input current by adjusting the duty adjuster. Refer to *Engineering Data* on page 66 for the base-up characteristics.

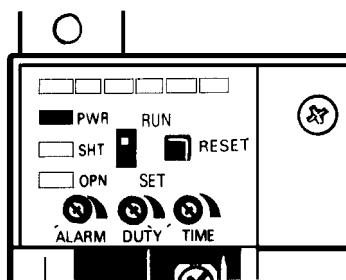
**G3PX-2□0EHN Series (Multiple Heater Burnout Detection Model)**

**Setting**

1. Use the G32X-CT□□HN CT Unit and make sure that the G3PX is wired correctly.
2. The G3PX initially set is shown in the following illustration. Make sure that the RUN/SET switch has been set to SET. Make sure that the DUTY adjuster has been turned clockwise to the maximum.
3. Adjust the sensitivity. Turn the ALARM adjuster and set to the position where the OPEN indicator is lit. Stop turning the ALARM adjuster as soon as the indicator is lit to complete the setting.



4. Set the RUN/SET switch to RUN.  
When all settings have been finished, the OPEN indicator is OFF.



- Note:**
1. The G3PX can control any part of the phase as long as the controlled phase is approximately  $1/6\pi$  or more in width.
  2. Be sure to prepare terminals 18 and 19 corresponding to the supply frequency of 50 Hz or 60 Hz. Otherwise, a setting error will result in a malfunction regardless of the RUN/SET switch setting.  
When the error has occurred, turn the ALARM adjuster counterclockwise to the minimum setting, reset the G3PX, and readjust.

## ■ Replacement Parts

### G32X-A Power Device Cartridge

The temperature indicator will be lit in red if the power element is damaged. If the power element is damaged due to overcurrent or other reasons, the power element and its peripheral parts can be replaced.

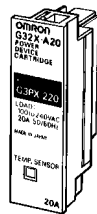
The power element and its peripheral parts can be replaced without disconnecting the wires of the G3PX.

Improve the heat radiation of the G3PX before replacing the Cartridge.

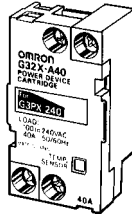
The temperature indicator will not be lit in red if the G3PX has overcurrent due to load short-circuiting or other reasons over a short time.

#### Appearance

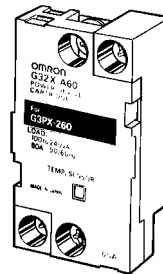
G32X-A20



G32X-A40



G32X-A60



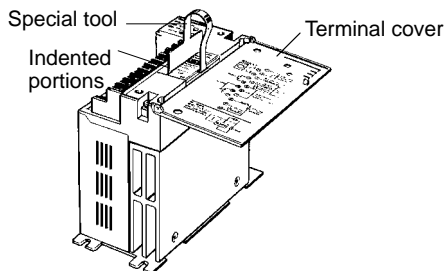
### Replacement of G32X-A20 Power Device Cartridge

Use the special tool (provided) to extract the Cartridge for replacement with a new one.

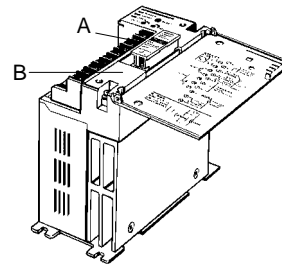
#### Extraction

Follow the procedures below to dismount the Power Device Cartridge from the G3PX.

1. Switch off the power.
2. Remove the terminal cover.
3. Hook the tool on the indented portions of the Power Device Cartridge as shown in the illustration below and pull up the Power Device Cartridge vertically.



3. Insert the Cartridge into the opening of the G3PX so that the letters on the Cartridge and those on the G3PX are in the same direction and sides A and B are even.



4. Attach the terminal cover.
5. Switch on the power and check the G3PX to be sure it works properly.

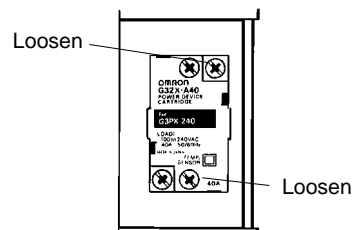
### G32X-A40/60

The G32X-A40 and G32X-A60 are secured with screws.

#### Extraction

The procedures for dismounting the Power Device Cartridge are as follows:

1. Switch off the G3PX.
2. Remove the terminal cover.
3. Be sure to turn off the G3PX and loosen the screws located in the upper center and lower center. These screws are connected to terminals 1 and 2.

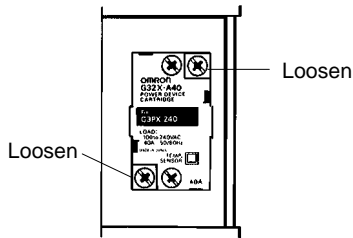


#### Mounting

The procedures for mounting the Power Device Cartridge are as follows:

1. Apply silicone grease (provided with the G32X-A) to the entire surface of the heat radiator.
2. Make sure there is no dust or pieces of wire on the heat radiators of the G32X-A or the G3PX.

4. Loosen the screws on both corners.

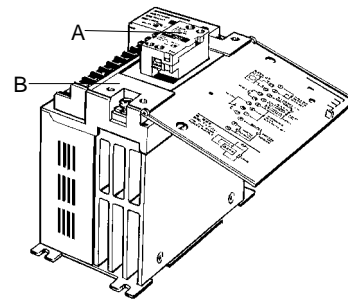


5. Hold the indented part of both corners to dismount the Cartridge.

**Mounting**

1. Apply silicone grease (provided with the G32X-A) to the entire surface of the heat radiator.
2. Make sure there is no dust or pieces of wire on the heat radiators of the G32X-A or the G3PX.

3. Insert the Cartridge into the opening of the G3PX so that the letters on the Cartridge and those on the G3PX are in the same direction and sides A and B are even.



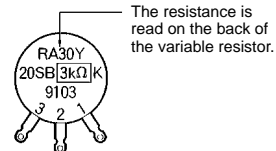
4. Tighten the screws on both corners with a tightening torque of 0.59 to 0.78 N • m.
5. Tighten the center screws of the G3PX with a tightening torque of 0.59 to 0.78 N • m.
6. Attach the terminal cover.
7. Switch on the power and check the G3PX to be sure it works properly.

**External Variable Resistor**

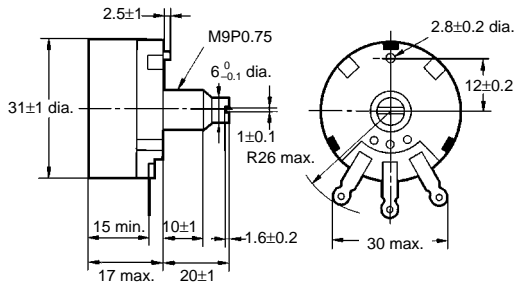
The G32X-V3K and G32X-V2K are provided with a set consisting of adjuster, knob, and nameplate.

Resistive value (see note 1)	Model
3 kΩ	G32X-V3K (see note 2)
2 kΩ	G32X-V2K

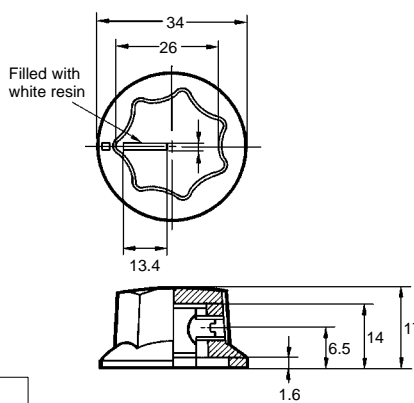
- Note:**
1. The G32X-V3K is equivalent to the conventional G32X-VR.
  2. Resistive Value



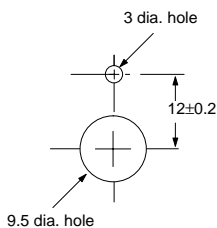
**External DUTY Adjuster**



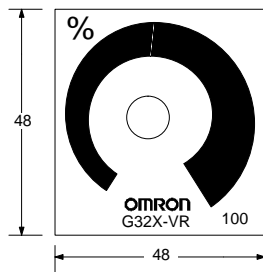
**Knob**



**Mounting Holes**



**Nameplate**

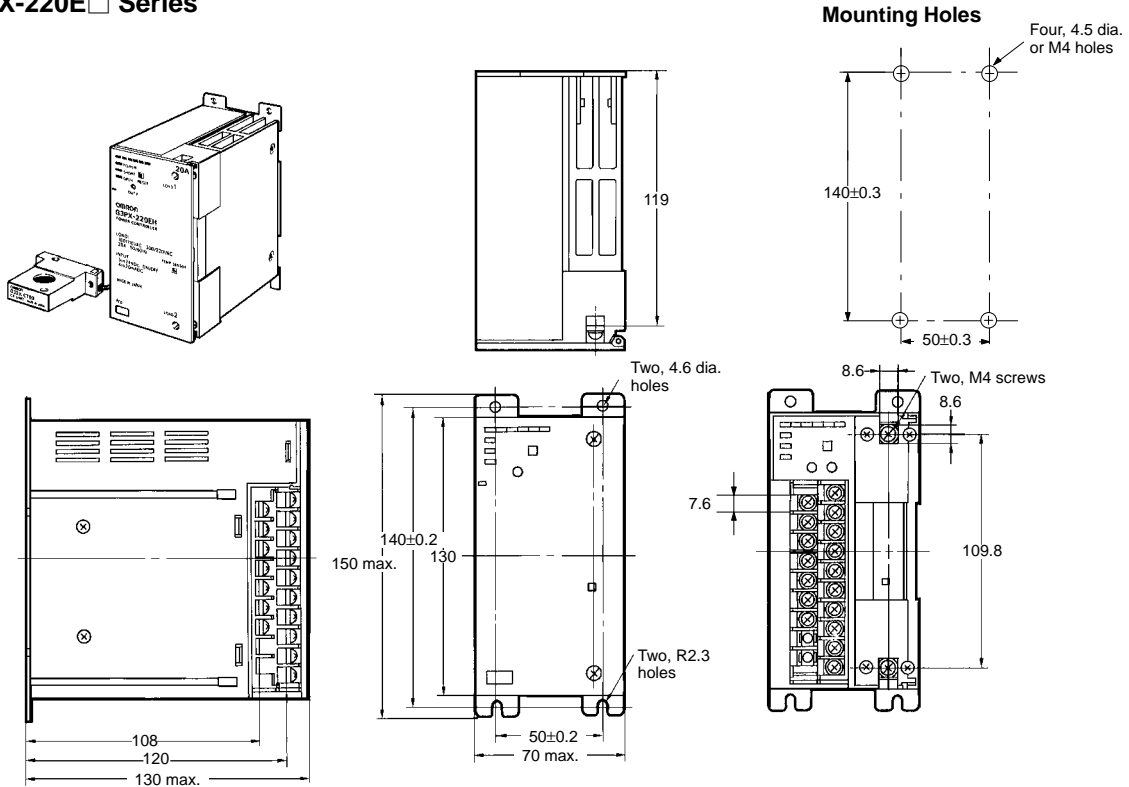


# Dimensions

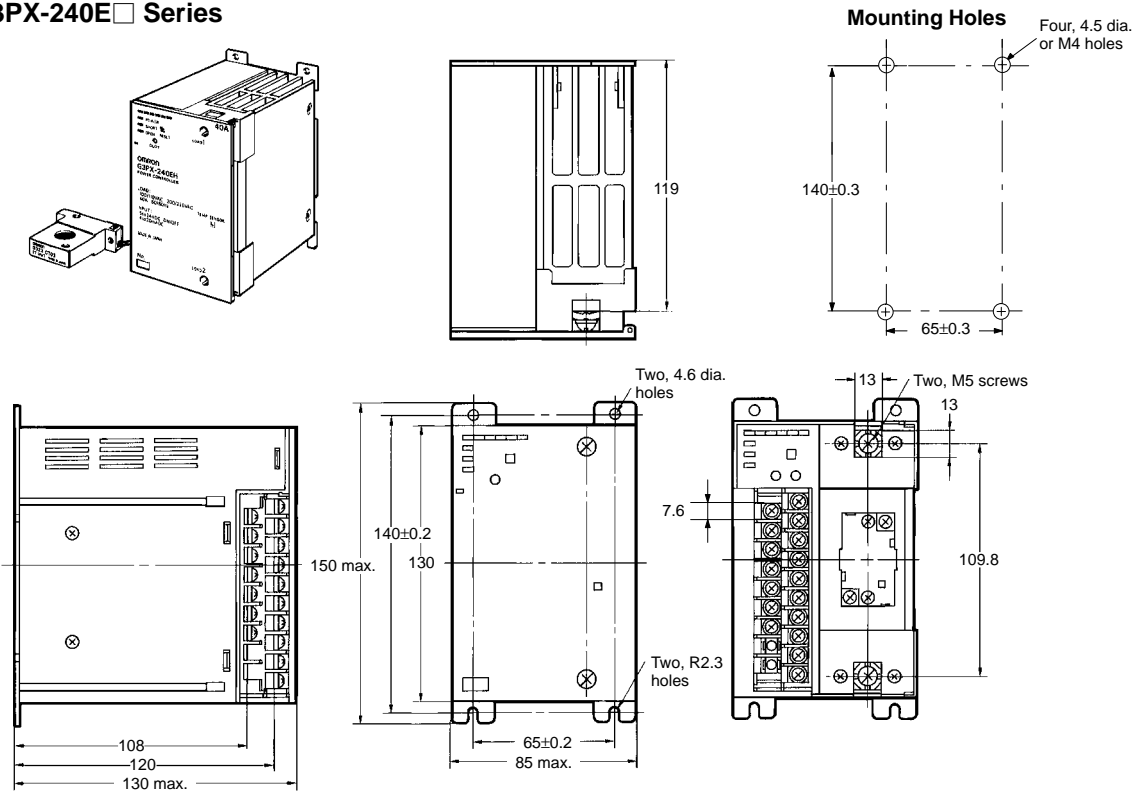
Note: All units are in millimeters unless otherwise indicated.

## ■ Single-phase Models

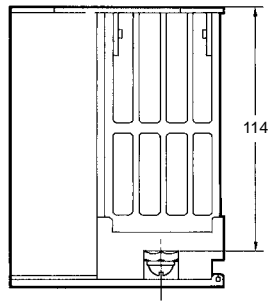
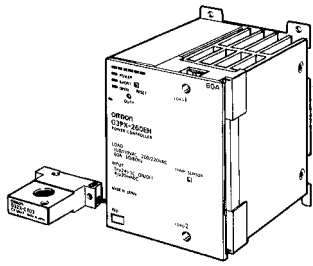
### G3PX-220E□ Series



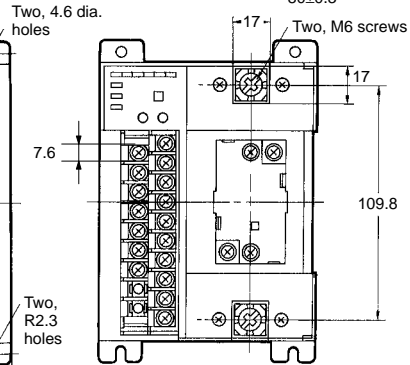
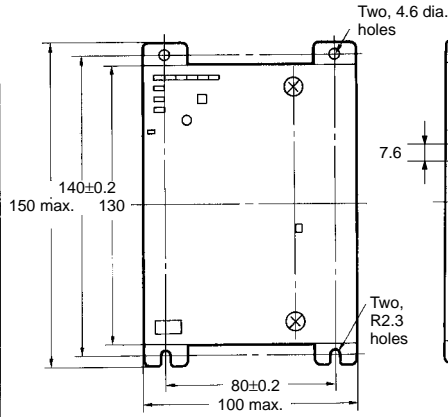
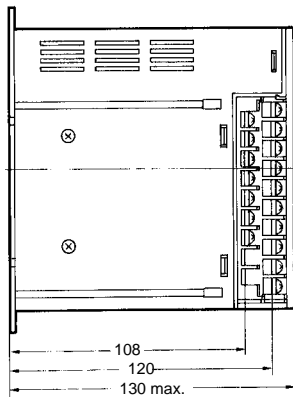
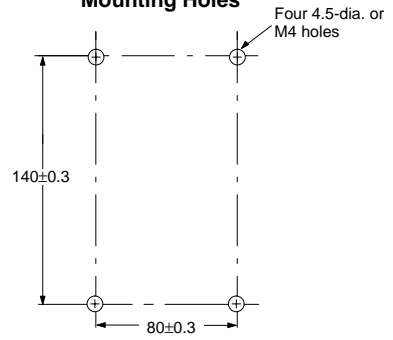
### G3PX-240E□ Series



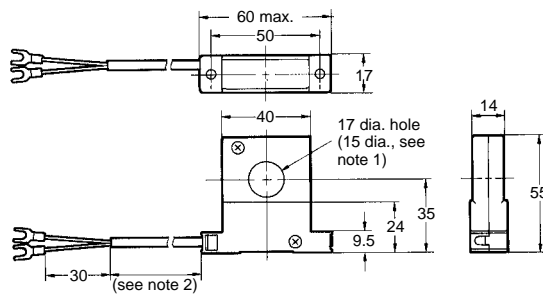
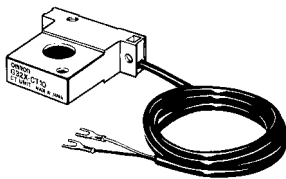
**G3PX-260E□ Series**



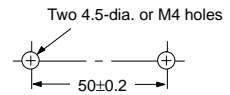
**Mounting Holes**



**G32X-CT03□ Series**  
**G32X-CT10□ Series**



**Mounting Holes**



- Note:**
1. Color of the hole  
 EH Series: Black  
 EHN Series: White  
 EC Series: Light gray  
 The size of the hole of CT Units for EC- and EHN-series models is 15 dia.
  2. The G32X-CT03□ incorporates 30-cm solderless terminals and the G32X-CT10□ incorporates 100-cm solderless terminals.

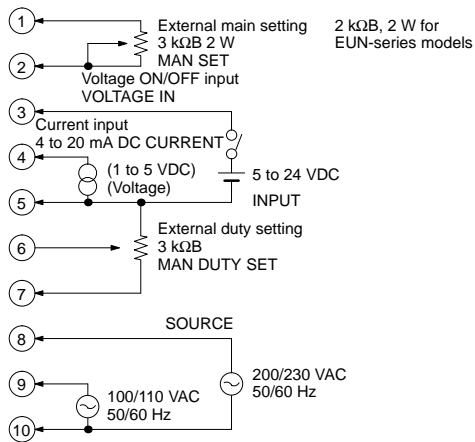


# Installation

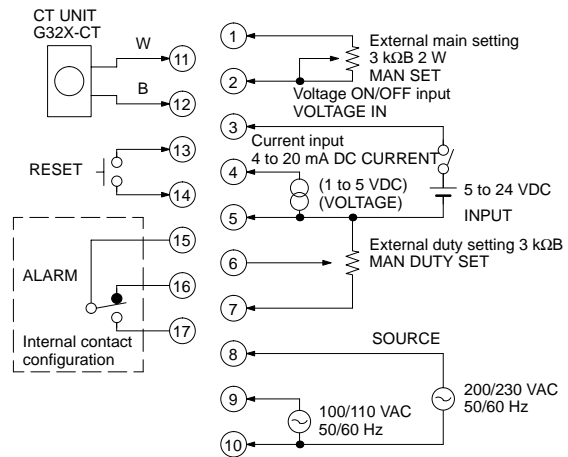
## Terminal Arrangement

### Single-phase Models

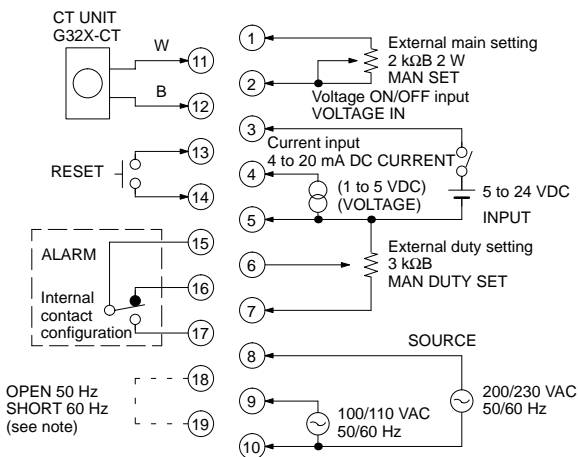
**G3PX-220EUN  
G3PX-240EUN  
G3PX-260EUN**



**G3PX-220EH  
G3PX-240EH  
G3PX-260EH**



**G3PX-220EHN/220EC  
G3PX-240EHN/240EC  
G3PX-260EHN/260EC**



**Note:** Open the terminals for 50 Hz or short-circuit the terminals for 60 Hz. When the product is shipped, the terminals are short-circuited using a short-circuiting bar to set to 60 Hz. When using at 50 Hz, remove the short-circuiting bar.