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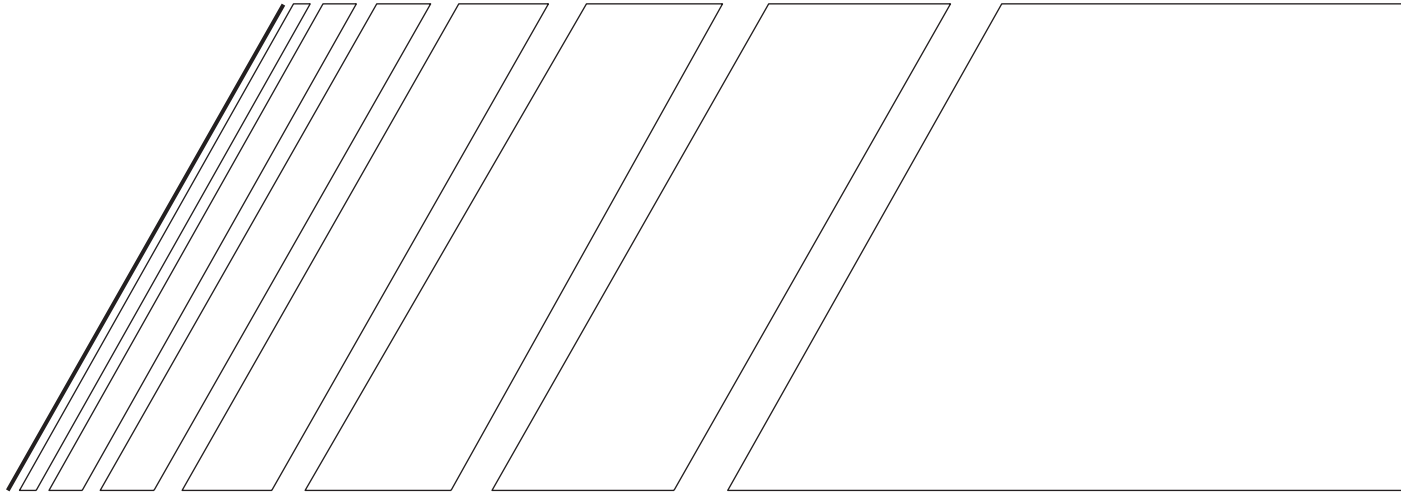
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**USER'S MANUAL**

**SYSDRIVE MX** SERIES

**Multi-function Compact Inverter**



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# Introduction

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Thank you for choosing the general-purpose Inverter 3G3MX. This User's Manual (hereinafter called "this manual") describes the parameter setting methods required for installation/wiring and operation of the 3G3MX model, as well as troubleshooting and inspection methods.

- This manual should be delivered to the actual end user of the product.
- After reading this manual, keep it handy for future reference.
- This manual describes the specifications and functions of the product as well as the relations between them. You should assume that anything not described in this manual is not possible with the product.
- Intended readers  
This manual is intended for:  
Those with knowledge of the workings of electricity (qualified electric engineers or the equivalent), and also in charge of:
  - Introducing the control equipment
  - Designing the control system
  - Installing and/or connecting the control equipment
  - Field management

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# Read and Understand this Manual

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Please read and understand this manual before using the product. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

<b>WARRANTY</b>
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<p>OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.</p>
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<p>OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.</p>
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<b>LIMITATIONS OF LIABILITY</b>
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<p>OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.</p>
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<p>In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.</p>
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<p>IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.</p>
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## Application Considerations

### SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

**NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.**

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

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## Disclaimers

### **CHANGE IN SPECIFICATIONS**

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

### **DIMENSIONS AND WEIGHTS**

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### **PERFORMANCE DATA**

Performance data given in this manual is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### **ERRORS AND OMISSIONS**

The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.



# Safety Precautions

## ■ Indications and Meanings of Safety Information









In this user's manual, the following precautions and signal words are used to provide information to ensure the safe use of the 3G3MX Inverter.

The information provided here is vital to safety. Strictly observe the precautions provided.









## ■ Meanings of Signal Words

 <b>WARNING</b>	Indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or may result in death. Additionally there may be severe property damage.
 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

## ■ Alert Symbols in this Document

 <b>WARNING</b>	
	Turn off the power supply and implement wiring correctly. Not doing so may result in a serious injury due to an electric shock.
	Wiring work must be carried out only by qualified personnel. Not doing so may result in a serious injury due to an electric shock.
	Do not put on or take off the Digital Operator control circuit terminal block terminal block cover while the input power is being supplied. Doing so may result in a serious injury due to an electric shock.
	Be sure to ground the unit. Not doing so may result in a serious injury due to an electric shock or fire. (200-V class: type-D grounding, 400-V class: type-C grounding)
	Do not remove the terminal block cover during the power supply and 5 minutes after the power shutoff. Doing so may result in a serious injury due to an electric shock.
	Do not operate the Digital Operator or switches with wet hands. Doing so may result in a serious injury due to an electric shock.
	Do not change wiring, mode change switches, optional devices or replace cooling fans while power is being supplied. Doing so may result in a serious injury due to an electric shock.



 <b>CAUTION</b>	
	<p>Do not connect resistors to the terminals (+1, P/+2, N/-) directly. Doing so might result in a small-scale fire, heat generation or damage to the unit.</p>
	<p>Install a stop motion device to ensure safety. Not doing so might result in a minor injury. (A holding brake is not a stop motion device designed to ensure safety.)</p>
	<p>Be sure to use a specified type of braking resistor/regenerative braking unit. In case of a braking resistor, install a thermal relay that monitors the temperature of the resistor. Not doing so might result in a moderate burn due to the heat generated in the braking resistor/regenerative braking unit. Configure a sequence that enables the Inverter power to turn off when unusual overheating is detected in the braking resistor/regenerative braking unit.</p>
	<p>The Inverter has high voltage parts inside which, if short-circuited, might cause damage to itself or other property. Place covers on the openings or take other precautions to make sure that no metal objects such as cutting bits or lead wire scraps go inside when installing and wiring.</p>
	<p>Do not touch the Inverter fins, braking resistors and the motor, which become too hot during the power supply and for some time after the power shutoff. Doing so may result in a burn.</p>
	<p>Take safety precautions such as setting up a molded-case circuit breaker (MCCB) that matches the Inverter capacity on the power supply side. Not doing so might result in damage to property due to the short circuit of the load.</p>
	<p>Do not dismantle, repair or modify this product. Doing so may result in an injury.</p>

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# Precautions for Safe Use

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## ■ Installation and Storage

Do not store or use the product in the following places.

- Locations subject to direct sunlight.
- Locations subject to ambient temperature exceeding the specifications.
- Locations subject to relative humidity exceeding the specifications.
- Locations subject to condensation due to severe temperature fluctuations.
- Locations subject to corrosive or flammable gases.
- Locations subject to exposure to combustibles.
- Locations subject to dust (especially iron dust) or salts.
- Locations subject to exposure to water, oil, or chemicals.
- Locations subject to shock or vibration.

## ■ Transporting, Installation, and Wiring

- Do not drop or apply strong impact on the product. Doing so may result in damaged parts or malfunction.
- Do not hold by the terminal block cover, but hold by the fins during transportation.
- Do not connect an AC power supply voltage to the control input/output terminals. Doing so may result in damage to the product.
- Be sure to tighten the screws on the terminal block securely.  
Wiring work must be done after installing the unit body.
- Do not connect any load other than a three-phase inductive motor to the U, V, and W output terminals.
- Take sufficient shielding measures when using the product in the following locations. Not doing so may result in damage to the product.
  - Locations subject to static electricity or other forms of noise.
  - Locations subject to strong magnetic fields.
  - Locations close to power lines.

## ■ Operation and Adjustment

- Be sure to confirm the permissible range of motors and machines before operation because the Inverter speed can be changed easily from low to high.
- Provide a separate holding brake if necessary.

## ■ Maintenance and Inspection

- Be sure to confirm safety before conducting maintenance, inspection or parts replacement.

# Precautions for Correct Use

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## ■Installation

- Mount the product vertically on a wall with the product's longer sides upright.  
The material of the wall has to be nonflammable such as a metal plate.

## ■Main Circuit Power Supply

- Confirm that the rated input voltage of the Inverter is the same as AC power supply voltage.

## ■Error Retry Function

- Do not come close to the machine when using the error retry function because the machine may abruptly start when stopped by an alarm.
- Be sure to confirm the RUN signal is turned off before resetting the alarm because the machine may abruptly start.

## ■Operation Stop Command

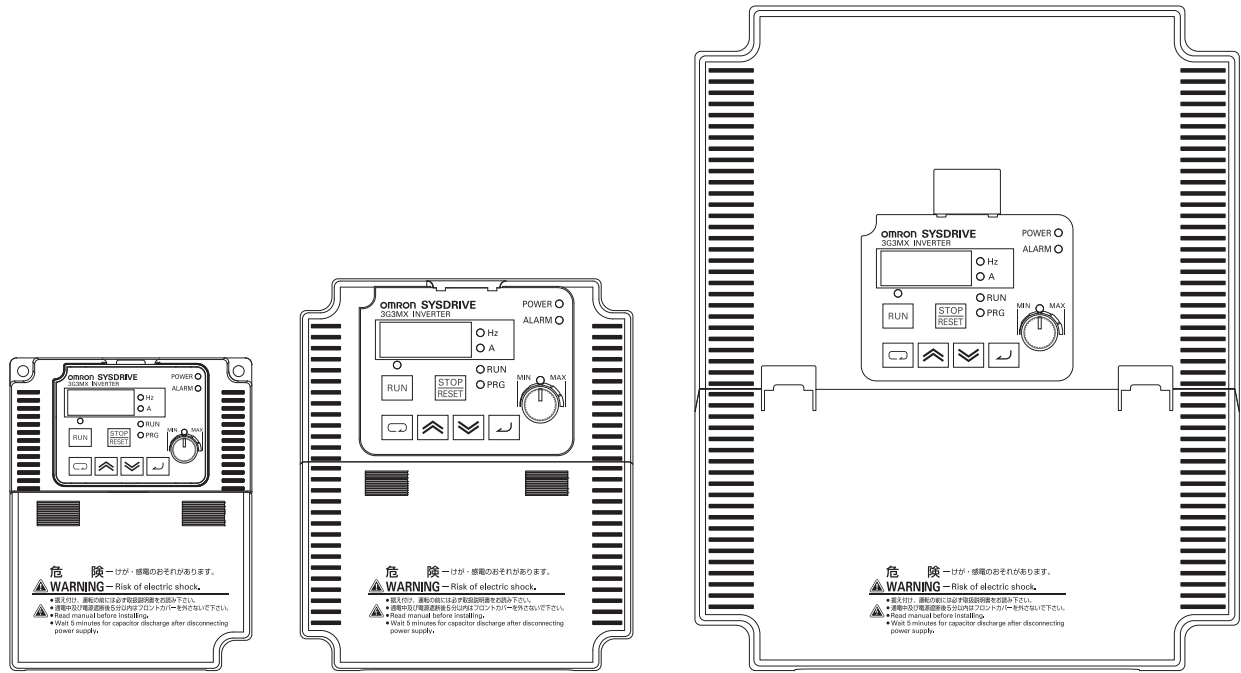
- Provide a separate emergency stop switch because the STOP key on the Digital Operator is valid only when function settings are performed.
- When checking a signal during the power supply and the voltage is erroneously applied to the control input terminals, the motor may start abruptly. Be sure to confirm safety before checking a signal.

## ■Product Disposal

- Comply with the local ordinance and regulations when disposing of the product.

## Warning Labels

Warning labels are located on the Inverter as shown in the following illustration.  
Be sure to follow the instructions.



## Warning Description

**危険** — けが・感電のおそれがあります。

**WARNING** — Risk of electric shock.

- 据え付け、運転の前には必ず取扱説明書をお読み下さい。
- 通電中及び電源遮断後5分以内はフロントカバーを外さないで下さい。
- Read manual before installing.
- Wait 5 minutes for capacitor discharge after disconnecting power supply.

# Checking Before Unpacking

## ■Checking the Product

On delivery, be sure to check that the delivered product is the Inverter 3G3MX model that you ordered.

Should you find any problems with the product, immediately contact your nearest local sales representative or OMRON sales office.

## ●Checking the Nameplate

Inverter model	→	<b>OMRON INVERTER 3G3MX-A2002</b>
Input specifications	→	KW/(HP) : 0.2/(1/4) INPUT: 50Hz, 60Hz V 1Ph A
Output specifications	→	INPUT: 50Hz, 60Hz 200-240 V 3Ph 2.0A OUTPUT: 0.5-400Hz 200-240 V 3Ph 1.6A
		LOT NO: ***** Date: ****
		S/N: ***** NE*****-**
		OMRON Corporation MADE IN JAPAN

## ●Checking the Model

3 G 3 M X - A 2 0 0 2

Maximum applicable motor capacity

002	0.2 kW
004	0.4 kW
007	0.75 kW
015	1.5 kW
022	2.2 kW
037	3.7 kW
055	5.5 kW
075	7.5 kW

Voltage class

2	3-phase 200 V AC (200-V class)
E	1/3-phase 200 V AC (200-V class)
4	3-phase 400 V AC (400-V class)

Enclosure rating

A	Panel-mounting (IP10 min.) or closed wall-mounting models
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## ■Checking the Accessories

Note that this manual is the only accessory included with the 3G3MX model. Mounting screws and other necessary parts must be provided by the user.

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# Revision History

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■ A manual revision code appears as a suffix to the catalog number located at the lower left of the front and back covers.

**Cat. No. I559-E1-02**

↑  
Revision code

Revision code	Revision date	Changes and revision pages
01	December 2007	First printing
02	December 2008	Revisions made to correct errors 8, 1-1 2-3, 2-4, 2-11, 2-12, 2-14, 2-16 to 2-22, 2-24, 3-31, 3-33 4-14, 4-19, 4-25, 4-26, 4-53, 4-57, 4-60, 4-67, 4-71 to 77, 4-79 to 4-90 6-2, 7-1, 7-2, 7-4, 7-6 to 7-12, 7-17, 7-22, 7-29, 7-31, 7-32 App-13, App-15

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# About This Manual

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This User's Manual is compiled chapter by chapter for user's convenience as follows. Understanding the following configuration ensures more effective use of the product.

	Overview
Chapter 1 Overview	Describes features and names of parts.
Chapter 2 Design	Provides external dimensions, installation dimensions, peripheral device design/selection instructions, and other information necessary for design.
Chapter 3 Operation	Describes names of parts, the Inverter's operations, including how to use the keys on the Digital Operator, and the monitor function.
Chapter 4 Functions	Describes the functions of the Inverter.
Chapter 5 Maintenance Operations	Describes the causes and their countermeasures if the Inverter fails, including the solutions to possible troubles (troubleshooting).
Chapter 6 Inspection and Maintenance	Describes items for periodical inspection and/or maintenance for the Inverter.
Chapter 7 Specifications	Provides Inverter specifications, as well as the specifications and dimensions of peripheral devices.
Appendix	Describes the summarized parameter settings as a reference for users who have used this Inverter and understood the functions.

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# Chapter 1

## Overview

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# 1-1 Functions

## 3G3MX Inverter Models

Rated voltage	Enclosure rating	Max. applicable motor output	Model
3-phase 200 V AC	IP20 (Complies with JEM1030)	0.2 kW	3G3MX-A2002
		0.4 kW	3G3MX-A2004
		0.75 kW	3G3MX-A2007
		1.5 Kw	3G3MX-A2015
		2.2 kW	3G3MX-A2022
		3.7 kW	3G3MX-A2037
		5.5 kW	3G3MX-A2055
7.5 kW		3G3MX-A2075	
3-phase 400 V AC		0.4 kW	3G3MX-A4004
		0.75 kW	3G3MX-A4007
		1.5 kW	3G3MX-A4015
		2.2 kW	3G3MX-A4022
		3.7 kW	3G3MX-A4037
		5.5 kW	3G3MX-A4055
1/3-phase 200 V AC	7.5 kW	3G3MX-A4075	
	0.2 kW	3G3MX-AE002	
	0.4 kW	3G3MX-AE004	
	0.75 kW	3G3MX-AE007	
	1.5 kW	3G3MX-AE015	
		2.2 kW	3G3MX-AE022

## International Standards Models (EC Directives and UL/cUL Standards)

The 3G3MX Inverter meets the EC Directives and UL/cUL standard requirements for worldwide use.

Classification		Applicable standard
EC Directives	EMC Directive	EN61800-3: 2004
	Low-voltage Directive	EN61800-5-1: 2003
UL/cUL Standards		UL508C

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## Easy-to-use General-purpose Inverter with Vector Control Functions

### ■Advanced Functions

#### High Starting Torque

With its vector control, the 3G3MX Series has achieved high starting torque in excess of 200% at 1 Hz.

#### Trip Suppression

This Inverter features two trip suppression functions: "Overcurrent suppression function" to suppress overcurrent trip during acceleration, and "Overvoltage LAD stop function" to suppress overvoltage trip during deceleration. Therefore, the 3G3MX Series provides tough operational capabilities regardless of the severe time setting of acceleration and deceleration.

#### Equipped with Communication Function

ModBus-RTU communication allows you to perform network operation at low cost.

### ■Easy Operation

#### Adoption of Removable Control Circuit Terminal Block

Adoption of a removable control circuit terminal block substantially reduces onerous task of wiring during the maintenance work.

#### Removable Digital Operator

The 3G3MX Series features a removable Digital Operator as a standard. By removing the Digital Operator and connecting with the dedicated cable, you can operate the Inverter at hand and mount it on the surface of the control panel.

#### Side-by-side Mounting

Side-by-side mounting contributes to space saving.

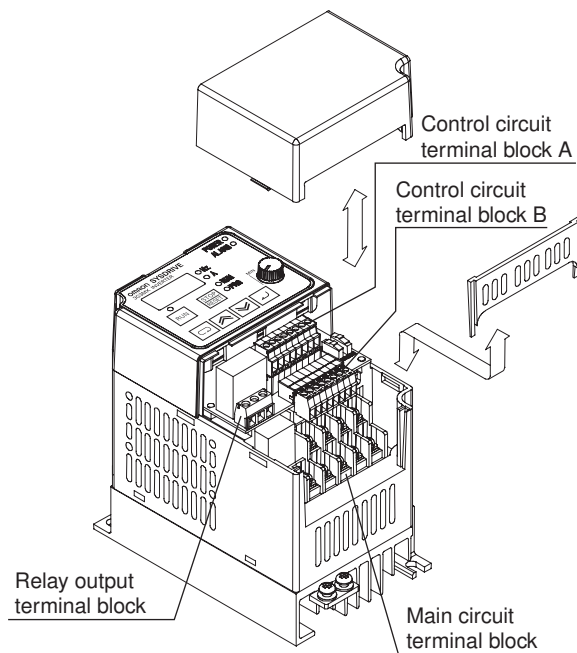
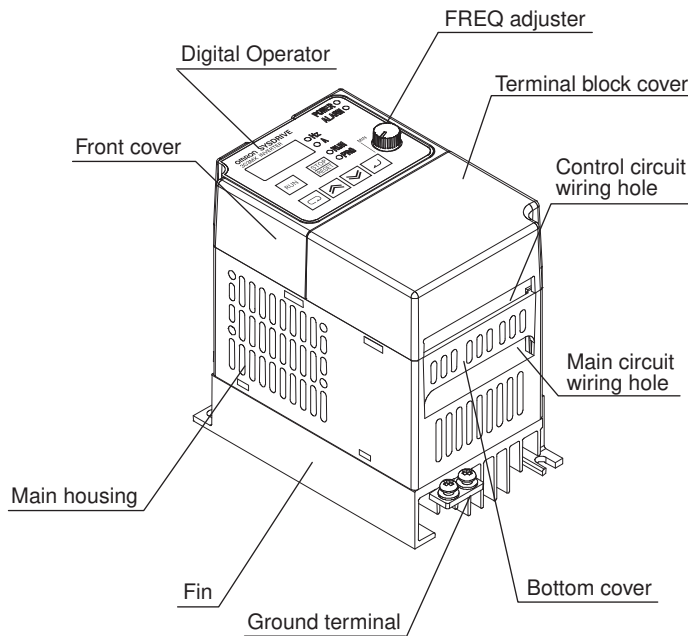
#### Built-in Braking Circuit

All models are equipped with a braking transistor, which is capable of handling applications with rapid acceleration and stop.

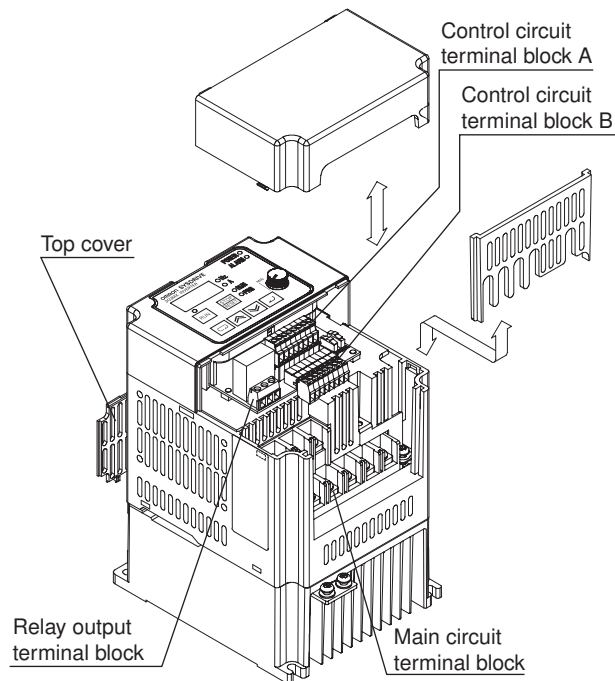
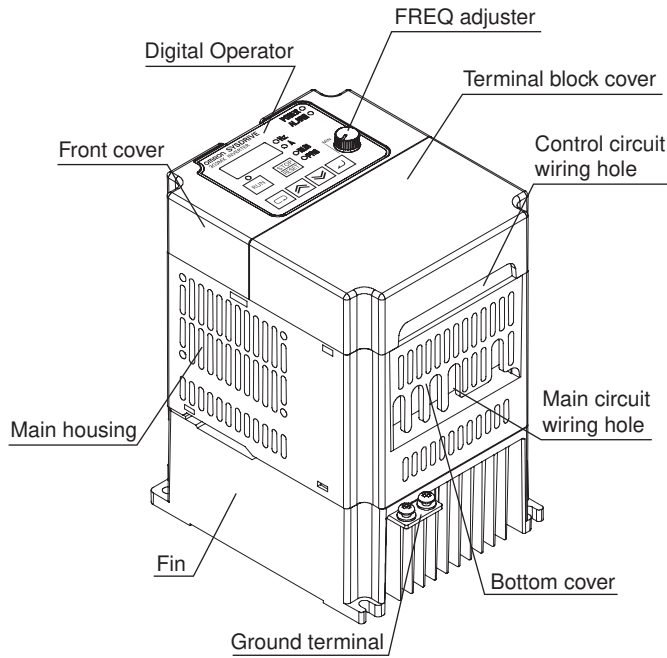
# 1-2 Appearance and Names of Parts

You can open and close the terminal block cover by hand, without using any tool. When the terminal block cover is removed as illustrated below, you can operate the mode selector and perform wiring to the control circuit terminal block, the main circuit terminal block, and the relay output terminal block.

## 3G3MX-A2002 to A2007, 3G3MX-AE002 to AE004

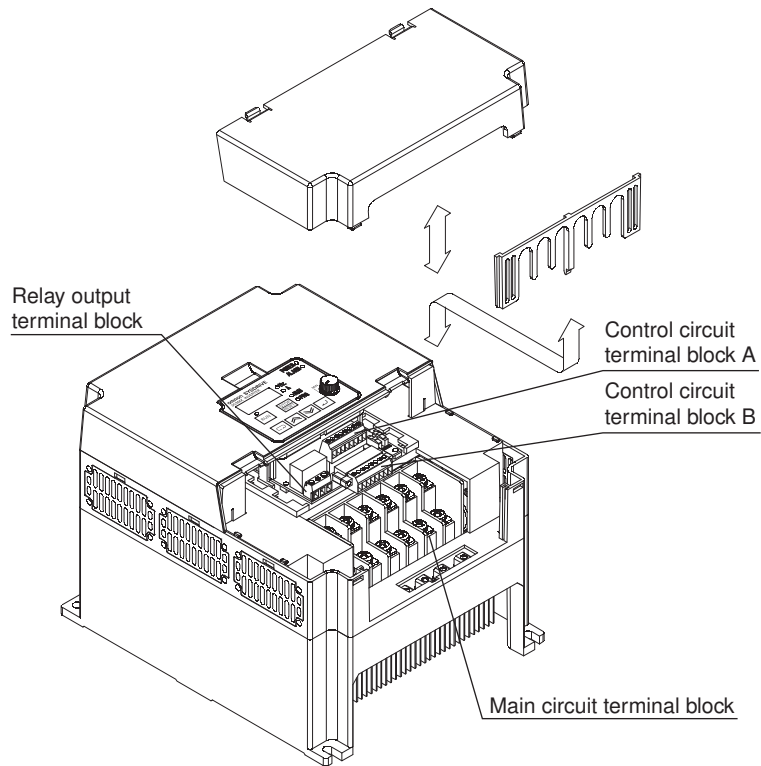
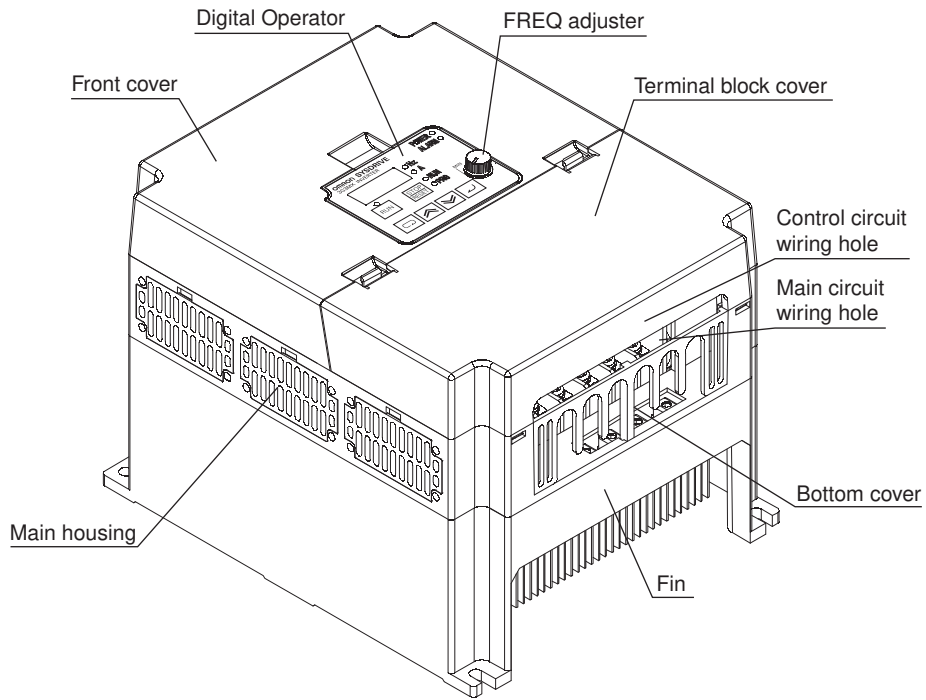


**3G3MX-A2015 to A2037, 3G3MX-A4004 to A4037,  
3G3MX-AE007 to AE022**

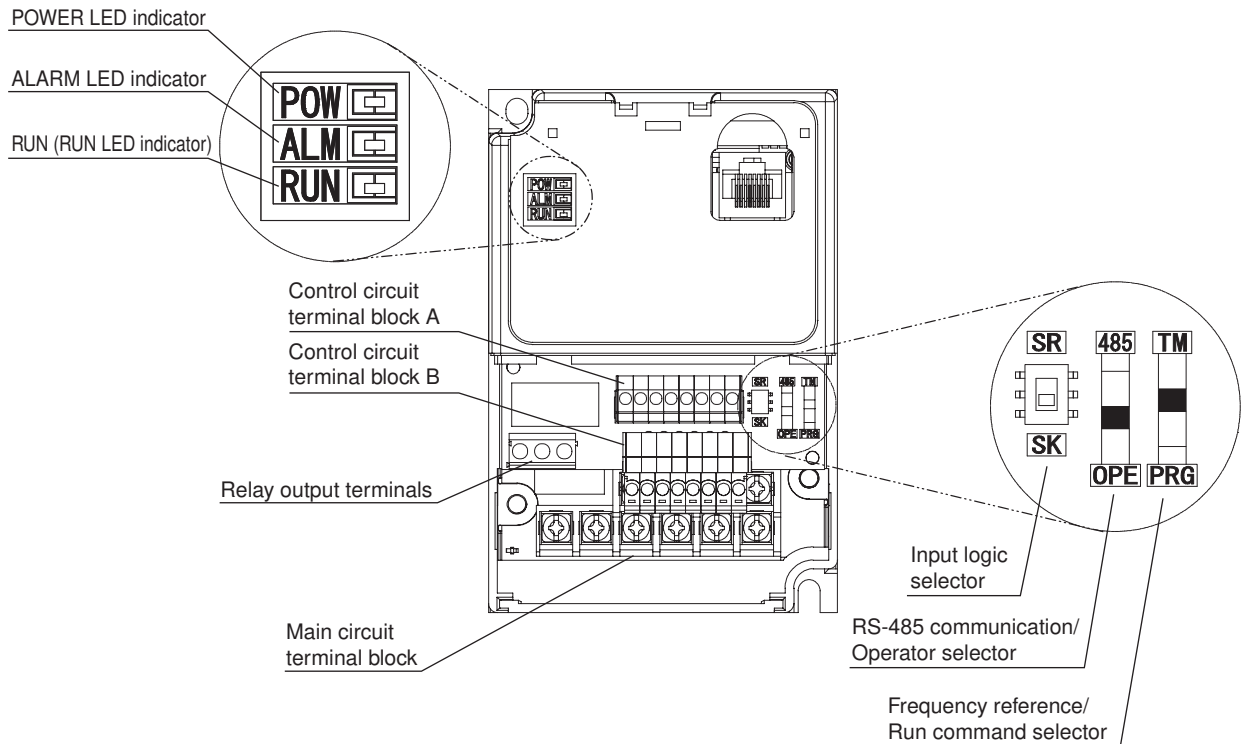
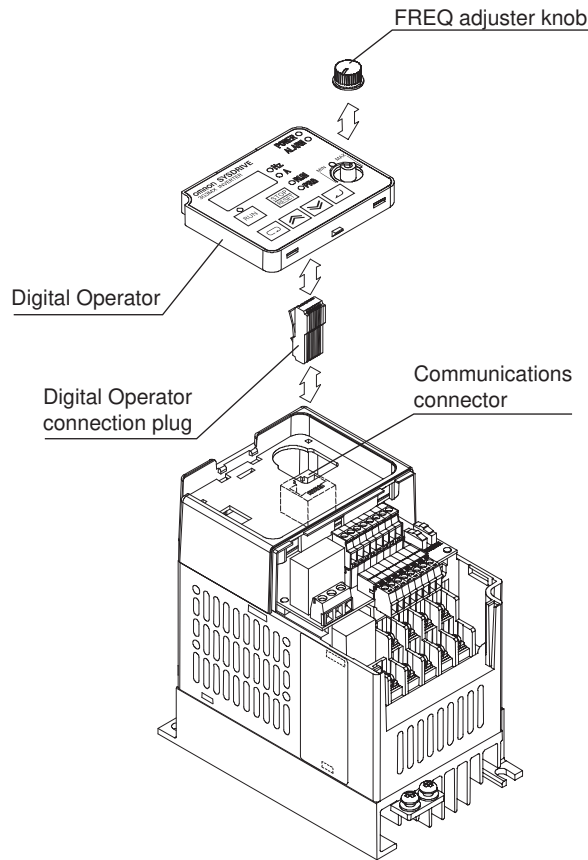


Note: The top cover is intended for maintenance use only. Do not remove the top cover.

### 3G3MX-A2055 to A2075, 3G3MX-A4055 to A4075



## Names of Parts (When the Digital Operator is Removed)







# Chapter 2

## Design

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