



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





Multi-function Compact Inverter

## MX2-Series V1 type

Born to drive machines



- » Permanent magnet motors
- » EtherCAT®
- » Built-in safety

# Harmonised motor and machine control

## **MOTOR CONTROL**

### **200% starting torque**

- Near stand-still operation (0.5 Hz)
- Smooth control of high inertia loads
- Control of fast cyclic loads

### **Torque control in open loop**

- Ideal for low to medium torque applications
- Can replace a flux vector or servo drive in suitable systems

### **Motor control**

- Surface Permanent Magnet Motor
- Interior Permanent Magnet Motor
- Induction Motor

### **One parameter auto-tuning**

- Just by entering the kW rating of the motor the MX2-V1 gives you smooth and safe operation





## MACHINE CONTROL

### Safety inside

- Conforms to safety norm ISO 13849-1 Cat. 3 performance level PLd
- 2 Safety inputs
- External device monitoring (EDM)

### Drive Programming

- Flow chart programming
- Text editor
- Intuitive - up to 5 tasks in parallel

### Positioning

- Up to 8 pre-set positions with "Homing"
- Speed synchronisation

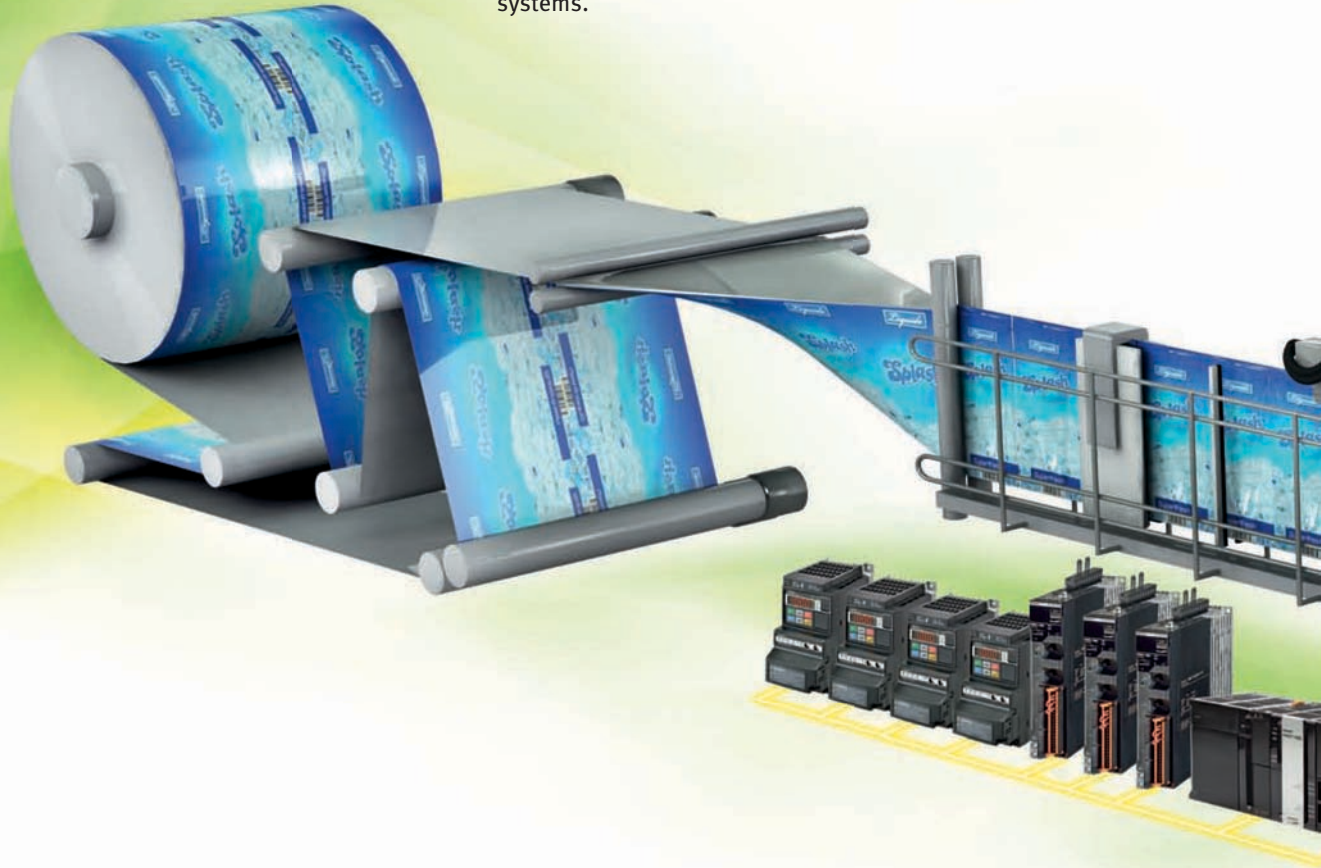
### Network Integration

- Modbus RS485 built-in
- Option units for EtherCAT, CompoNet, DeviceNet

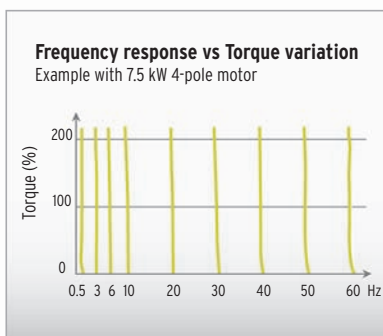
**危険** 一ツが、感電のおそれがあります。  
**WARNING** - Risk of electric shock.  
• 取付け、運転の前には必ず取扱説明書をお読み下さい。  
• 運転中及び電源切断後10分以内はフロントカバーを外さないで下さい。  
• Read manual before installing.  
• Wait 10 minutes for capacitor discharge after disconnecting power supply.

# Amazing in Control

High starting torque and torque control capability in open loop mode give you full control of your machine dynamics and performance. Options for all of the major open network systems.



## Torque master



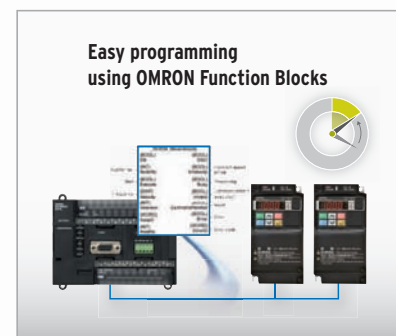
The MX2-V1 delivers 200% starting torque near stand-still (0.5 Hz) and can operate in torque control in open loop mode. This allows the MX2-V1 to be used in applications where closed loop AC vector drives were previously used.

## Easy network integration



Standard industrial networks, such as EtherCAT, CompoNet or DeviceNet as options. High-speed EtherCAT provides solutions for the entire system from input to output with Sysmac Series.

## Easy communications setting



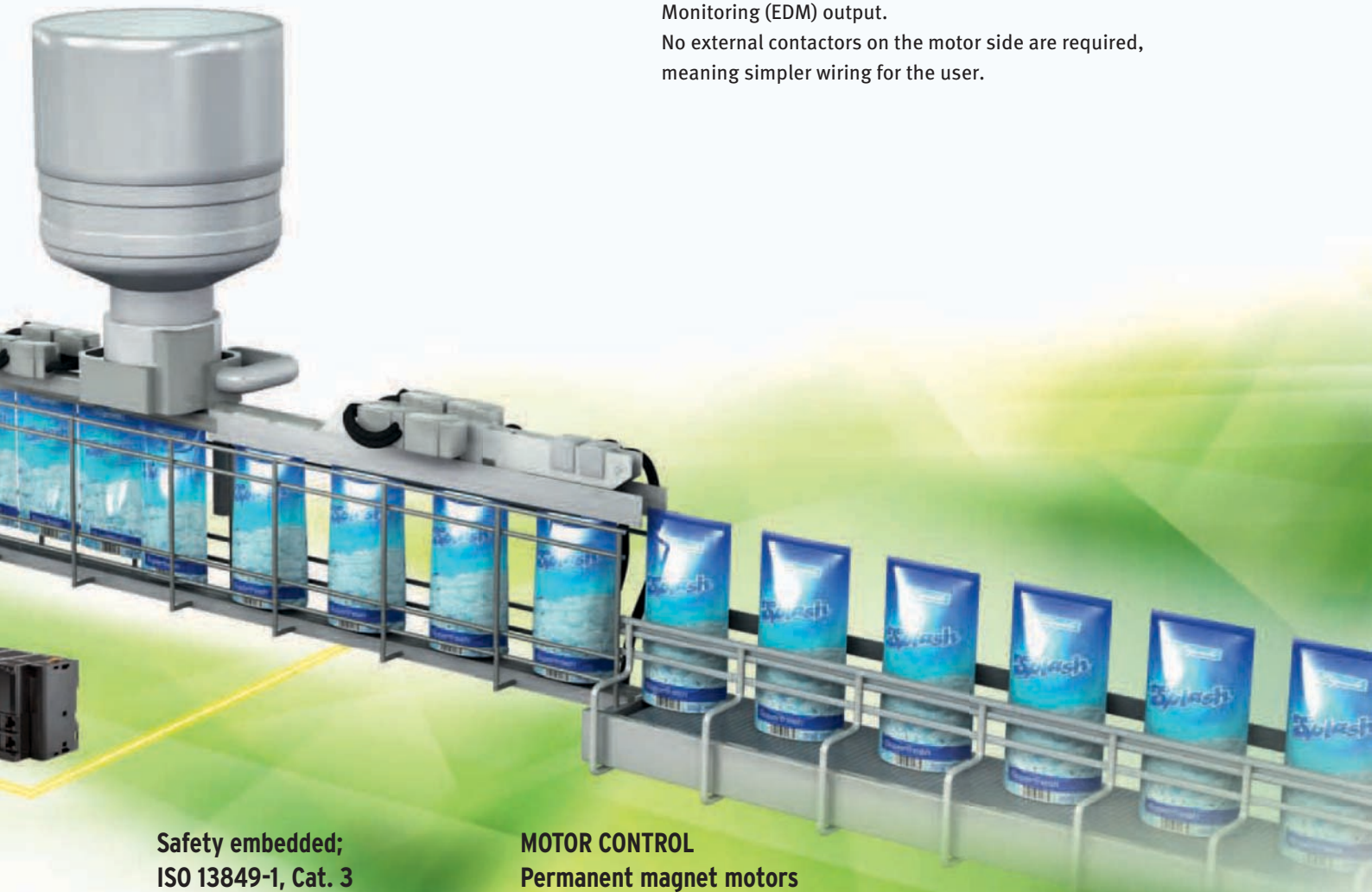
Built-in RS-485 Modbus communications. OMRON Function Blocks are available for the CP H/L and CJ-series PLCs. Those control the MX2-V1 via Modbus communications easily.



# Safety in Control

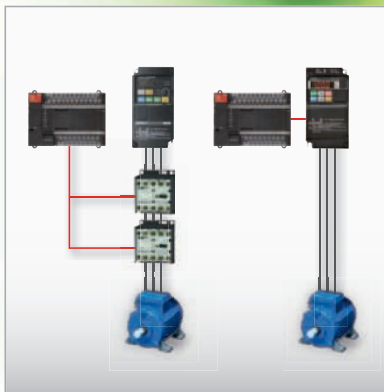
Safety is embedded in the MX2-V1, according to ISO 13849-1, Cat. 3, with two safety inputs and an External Device Monitoring (EDM) output.

No external contactors on the motor side are required, meaning simpler wiring for the user.



**Safety embedded;  
ISO 13849-1, Cat. 3**

**MOTOR CONTROL  
Permanent magnet motors**



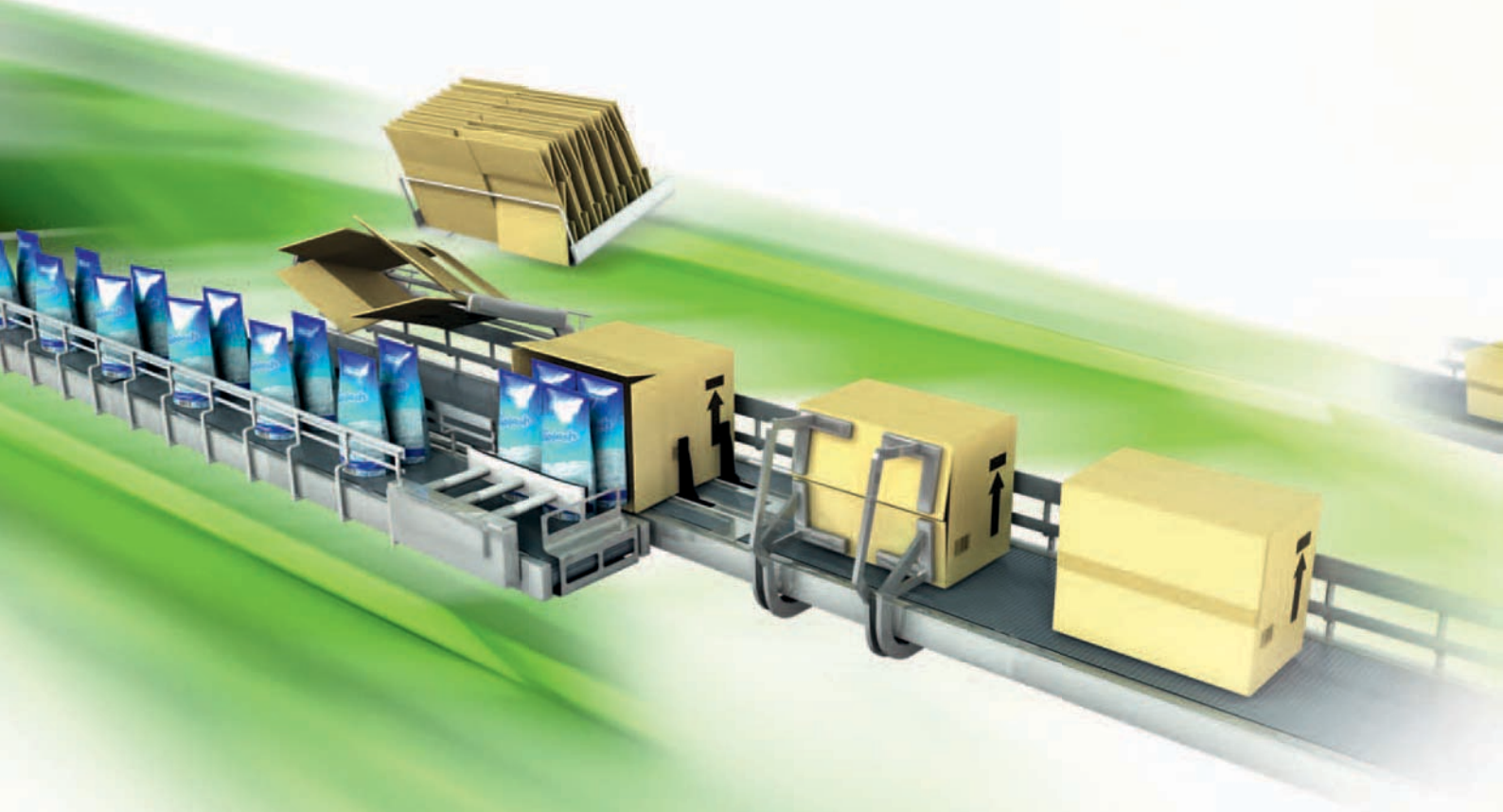
Dual contactors at the output of the inverter are no longer required. Direct connection to a safety controller ensures compliance to ISO 13849-1, Cat. 3.



The PM motor conforming to high-efficiency regulations can be controlled. The PM motor promotes further energy saving and achieves earth-friendly machine control.

# Position and run!

The MX2-V1 is a drive and position controller in one, ideal for modular machines where moderate positional accuracy is required. Speed synchronisation is also possible, with no additional programming required.



## Speed synchronisation



With no external hardware required, and via standard parameter settings, speed synchronisation can be achieved. The MX2-V1 will act as a speed follower to an external pulse generator/encoder signal up to 32 KHz.

## Positioning functionality

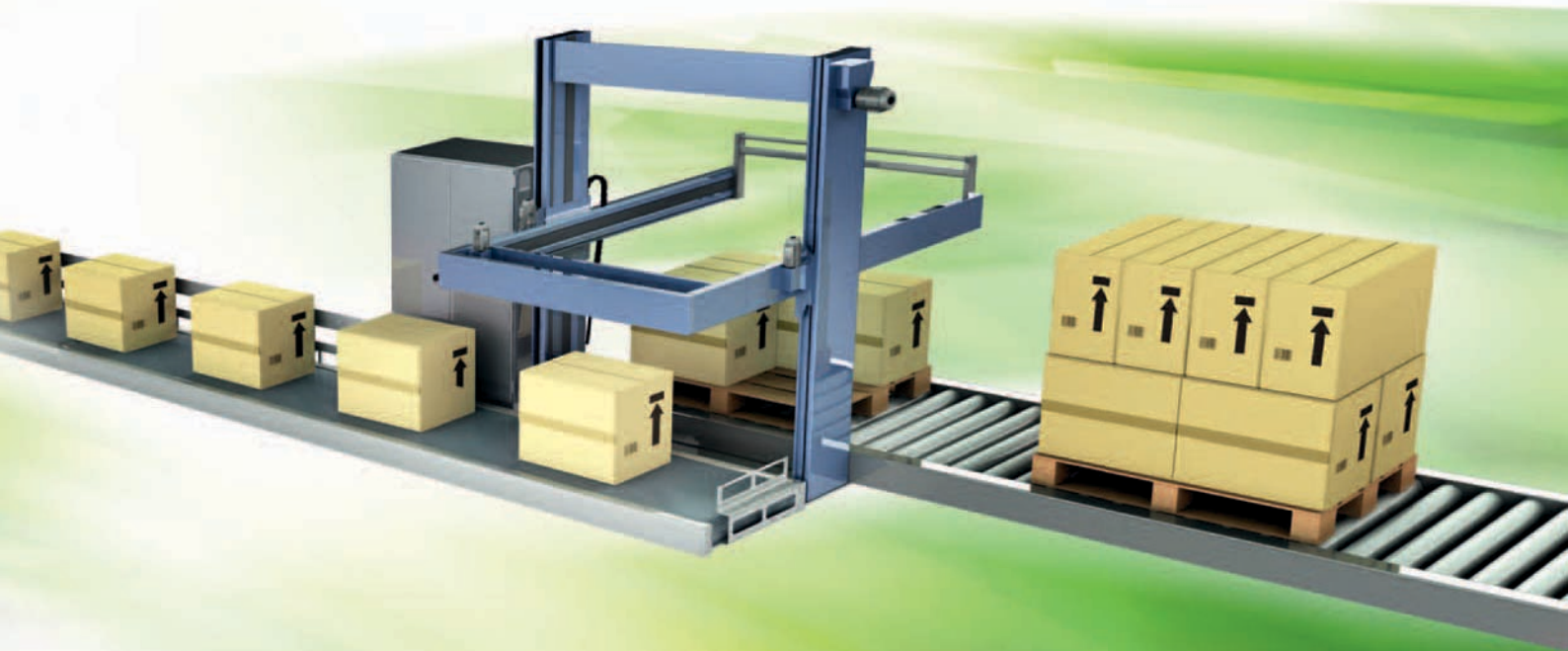


Specially developed application functionality enables the MX2-V1 to solve simple positioning tasks without the need for an external controller. Up to 8 positions, plus home, can be selected by the user, and furthermore, the MX2-V1 can be switched between speed and position mode.



# Program and play!

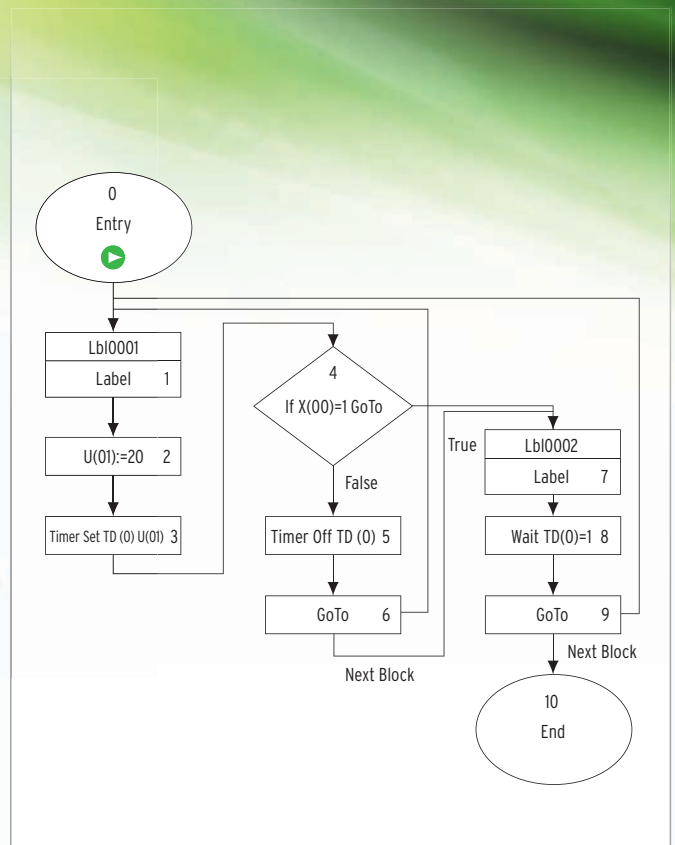
The MX2-V1 gives you the power to create smart solutions using PLC functionality, as standard. Via an intuitive flow chart programming tool, you can create programs with up to 1000 lines of code and with 5 tasks running in parallel.



## Free to program



- Intuitive and user friendly flow chart programming
- Integrated in CX-Drive
- Up to 1000 lines in a program
- 5 tasks can run in parallel  
(CX-Drive version 2.80 or higher is required.)





## Multi-function Compact Inverter

# MX2-Series V1 type

### Born to drive machines

- Positioning functionality.
- Fieldbus communications with optional unit  
EtherCAT, CompoNet and DeviceNet
- Drive Programming.
- Current vector Control.
- High Starting torque: 200% at 0.5 Hz.
- Safety function \* EN ISO 13849-1:2008 (Cat.3/PLd)  
IEC 60204-1 Stop Category 0
- Speed range up to 580 Hz.

\* When optional DeviceNet communication unit or CompoNet communication unit is mounted onto the MX2-series V1 type, the inverter will not conform to the safety standards.



### Performance Specifications

#### Inverter MX2-series V1 type

##### 3-phase 200 V Class

Function name			3-phase 200 V										
Model name (3G3MX2-)			A2001-V1	A2002-V1	A2004-V1	A2007-V1	A2015-V1	A2022-V1	A2037-V1	A2055-V1	A2075-V1	A2110-V1	A2150-V1
Applicable motor capacity	kW	CT	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
		VT	0.2	0.4	0.75	1.1	2.2	3.0	5.5	7.5	11	15	18.5
	HP	CT	1/8	1/4	1/2	1	2	3	5	7 1/2	10	15	20
		VT	1/4	1/2	1	1 1/2	3	4	7 1/2	10	15	20	25
Rated output capacity [kVA]	200 V	CT	0.2	0.5	1.0	1.7	2.7	3.8	6.0	8.6	11.4	16.2	20.7
		VT	0.4	0.6	1.2	2.0	3.3	4.1	6.7	10.3	13.8	19.3	23.9
	240 V	CT	0.3	0.6	1.2	2.0	3.3	4.5	7.2	10.3	13.7	19.5	24.9
		VT	0.4	0.7	1.4	2.4	3.9	4.9	8.1	12.4	16.6	23.2	28.6
Rated input voltage			3-phase 200 V - 15% to 240 V + 10%, 50/60 Hz ± 5%										
Rated input current [A]	CT		1.0	1.6	3.3	6.0	9.0	12.7	20.5	30.8	39.6	57.1	62.6
	VT		1.2	1.9	3.9	7.2	10.8	13.9	23.0	37.0	48.0	68.0	72.0
Rated output voltage			3-phase 200 to 240 V (The output cannot exceed the incoming voltage).										
Rated output current [A]	CT		1.0	1.6	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0
	VT		1.2	1.9	3.5	6.0	9.6	12.0	19.6	30.0	40.0	56.0	69.0
Short-time deceleration braking torque (%) (Discharge Resistor not connected)			50	50	50	50	50	20	20	20	20	10	10
Braking Resistor circuit *	Regenerative braking		Built-in Braking Resistor circuit (separate Discharge Resistor)										
	Min. connectable resistance [Ω]		100	100	100	50	50	35	35	20	17	17	10
Weight [kg]			1.0	1.0	1.1	1.2	1.6	1.8	2.0	3.3	3.4	5.1	7.4
Dimensions (width × height) [mm]			68 × 128			108 × 128		140 × 128	140 × 260		180 × 296	220 × 350	
Dimensions (depth) [mm]			109	122.5	145.5	170.5		170.5	155		175		

\* The BRD usage is 10%.

3-phase 400 V Class

Function name			3-phase 400 V									
Model name (3G3MX2-)			A4004-V1	A4007-V1	A4015-V1	A4022-V1	A4030-V1	A4040-V1	A4055-V1	A4075-V1	A4110-V1	A4150-V1
Applicable motor capacity	kW	CT	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
		VT	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
	HP	CT	1/2	1	2	3	4	5	7 1/2	10	15	20
		VT	1	2	3	4	5	7 1/2	10	15	20	25
Rated output capacity [kVA]	380 V	CT	1.1	2.2	3.1	3.6	4.7	6.0	9.7	11.8	15.7	20.4
		VT	1.3	2.6	3.5	4.5	5.7	7.3	11.5	15.1	20.4	25.0
	480 V	CT	1.4	2.8	3.9	4.5	5.9	7.6	12.3	14.9	19.9	25.7
		VT	1.7	3.4	4.4	5.7	7.3	9.2	14.5	19.1	25.7	31.5
Rated input voltage			3-phase 380 V - 15% to 480 V + 10%, 50/60 Hz ± 5%									
Rated input current [A]	CT		1.8	3.6	5.2	6.5	7.7	11.0	16.9	18.8	29.4	35.9
	VT		2.1	4.3	5.9	8.1	9.4	13.3	20.0	24.0	38.0	44.0
Rated output voltage			3-phase 380 to 480 V (The output cannot exceed the incoming voltage).									
Rated output current [A]	CT		1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
	VT		2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
Short-time deceleration braking torque (%) (Discharge Resistor not connected)			50	50	50	20	20	20	20	20	10	10
Braking Resistor circuit *	Regenerative braking		Built-in Braking Resistor circuit (separate Discharge Resistor)									
	Min. connectable resistance [Ω]		180	180	180	100	100	100	70	70	70	35
Weight [kg]			1.5	1.6	1.8	1.9	1.9	2.1	3.5	3.5	4.7	5.2
Dimensions (width × height) [mm]			108 × 128				140 × 128	140 × 260			180 × 296	
Dimensions (depth) [mm]			143.5	170.5			170.5	155		175		

\* The BRD usage is 10%.

1-phase 200 V Class

Function name			1-phase 200 V					
Model name (3G3MX2-)			AB001-V1	AB002-V1	AB004-V1	AB007-V1	AB015-V1	AB022-V1
Applicable motor capacity	kW	CT	0.1	0.2	0.4	0.75	1.5	2.2
		VT	0.2	0.4	0.55	1.1	2.2	3.0
	HP	CT	1/8	1/4	1/2	1	2	3
		VT	1/4	1/2	3/4	1 1/2	3	4
Rated output capacity [kVA]	200 V	CT	0.2	0.5	1.0	1.7	2.7	3.8
		VT	0.4	0.6	1.2	2.0	3.3	4.1
	240 V	CT	0.3	0.6	1.2	2.0	3.3	4.5
		VT	0.4	0.7	1.4	2.4	3.9	4.9
Rated input voltage			1-phase 200 V - 15% to 240 V + 10%, 50/60 Hz ± 5%					
Rated input current [A]	CT		1.3	3.0	6.3	11.5	16.8	22.0
	VT		2.0	3.6	7.3	13.8	20.2	24.0
Rated output voltage			3-phase 200 to 240 V (The output cannot exceed the incoming voltage).					
Rated output current [A]	CT		1.0	1.6	3.0	5.0	8.0	11.0
	VT		1.2	1.9	3.5	6.0	9.6	12.0
Short-time deceleration braking torque (%) (Discharge Resistor not connected)			50	50	50	50	50	20
Braking Resistor circuit *	Regenerative braking		Built-in Braking Resistor circuit (separate Discharge Resistor)					
	Min. connectable resistance [Ω]		100	100	100	50	50	35
Weight [kg]			1.0	1.0	1.1	1.6	1.8	1.8
Dimensions (width × height) [mm]			68 × 128			108 × 128		
Dimensions (depth) [mm]			109	122.5		170.5		

\* The BRD usage is 10%.



## Function Specifications

Function name		Specifications
<b>Enclosure ratings *1</b>		Open type (IP20)
<b>Control</b>	<b>Control method</b>	Phase-to-phase sinusoidal modulation PWM
	<b>Output frequency range *2</b>	0.10 to 400 Hz (or 580 Hz in the high-frequency mode; restrictions apply)
	<b>Frequency precision *3</b>	Digital command: $\pm 0.01\%$ of the max. frequency, Analog command: $\pm 0.2\%$ of the max. frequency ( $25 \pm 10^\circ\text{C}$ )
	<b>Frequency setting resolution</b>	Digital setting: 0.01 Hz, Analog setting: One-thousandth of the maximum frequency
	<b>Voltage/Frequency characteristics</b>	V/f characteristics (constant/reduced torque) Sensorless vector control, V/f control with speed feedback
	<b>Overload current rating</b>	Heavy load rating (CT): 150%/60 s Light load rating (VT): 120%/60 s
	<b>Instantaneous overcurrent protection</b>	200% of the value of heavy load rating (CT)
	<b>Acceleration/Deceleration time</b>	0.01 to 3600 s (linear/curve selection), acceleration/deceleration 2 setting available
	<b>Carrier frequency adjustment range</b>	2 to 15 kHz (with derating)
	<b>Starting torque</b>	200%/0.5 Hz (sensorless vector control)
	<b>External DC injection braking</b>	Starts at a frequency lower than that in deceleration via the STOP command, at a value set lower than that during operation, or via an external input. (Level and time settable).
<b>Protective functions</b>		Overcurrent, overvoltage, undervoltage, electronic thermal, temperature error, ground fault overcurrent at power-on status, rush current prevention circuit, overload limit, incoming overvoltage, external trip, memory error, CPU error, USP error, communication error, overvoltage suppression during deceleration, protection upon momentary power outage, emergency cutoff, etc.
<b>Input signal</b>	<b>Frequency settings</b>	Digital Operator External analog input signal: 0 to 10 VDC/4 to 20 mA, Modbus communication (Modbus-RTU)
	<b>RUN/STOP command</b>	Digital Operator External digital input signal (3-wire input supported), Modbus communication (Modbus-RTU)
	<b>Multi-function input</b>	7 points (Selectable from 59 functions)
	<b>Analog input</b>	2 points (Voltage FV terminal: 10 bits/0 to 10 V, Current FI terminal: 10 bits/4 to 20 mA)
	<b>Pulse input</b>	1 point (RP terminal: 32 kHz max., 5 to 24 VDC)
<b>Output signal</b>	<b>Multi-function output</b>	2 points (P1/EDM, P2; selectable from 43 functions)
	<b>Relay output</b>	1 point (1c contact: MC, MA, MB; selectable from 43 functions)
	<b>Analog output (Frequency monitor)</b>	1 point (AM terminal: Voltage 10 bits/0 to 10 V) (Frequency, current selectable)
	<b>Pulse output</b>	1 point (MP terminal: 32 kHz max., 0 to 10 V)
<b>Communications</b>	<b>RS-422</b>	RJ45 connector (for Digital Operator)
	<b>RS-485</b>	Control circuit terminal block, Modbus communication (Modbus-RTU)
	<b>USB</b>	USB1.1, mini-B connector
<b>Drive Programming *4</b>		Calculate, Logic, Control I/O and so on
<b>Other functions</b>		AVR function, V/f characteristics switching, upper/lower limit, 16-step speeds, starting frequency adjustment, jogging operation, carrier frequency adjustment, PID control, frequency jump, analog gain/bias adjustment, S shape acceleration/deceleration, electronic thermal characteristics, level adjustment, restart function, torque boost function, fault monitor, soft lock function, frequency conversion display, USP function, motor 2 control function, UP/DWN, overcurrent control function, etc.
<b>Operating environment</b>	<b>Ambient operating temperature</b>	-10 to 50°C (However, derating is required).
	<b>Ambient storage temperature</b>	-20°C to 65°C
	<b>Ambient operating humidity</b>	20% to 90% RH (with no condensation)
	<b>Vibration resistance</b>	5.9 m/s <sup>2</sup> (0.6G), 10 to 55 Hz
	<b>Application environment</b>	At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)
<b>Options</b>	<b>EtherCAT Communication Unit</b>	3G3AX-MX2-ECT
	<b>CompoNet Communication Unit</b>	3G3AX-MX2-CRT-E
	<b>DeviceNet Communication Unit</b>	3G3AX-MX2-DRT-E

Function name		Specifications	
<b>Other option</b>		DC reactor, AC reactor, radio noise filter, input noise filter, output noise filter, regenerative braking unit, Braking Resistor, etc.	
<b>International standard</b>	<b>EC directive</b>	<b>EMC directive</b>	EN61800-3: 2004
		<b>Low voltage directive</b>	EN61800-5-1: 2007
		<b>Machinery directives</b>	IEC 60204-1 Stop Category 0, EN IEC 61800-5-2 (STO), EN ISO 13849-1: 2008 (PLd)
	<b>UL/cUL</b>		UL508C

\*1 Protection method complies with JEM 1030.

\*2 To operate the motor at over 50/60 Hz, contact the motor manufacturer to find out the maximum allowable speed of revolution.

\*3 For the stable control of the motor, the output frequency may exceed the maximum frequency set in A004 (A204) by 2 Hz max.

\*4 Refer to the Drive Programming USER'S MANUAL (No. I580).

**Note:**

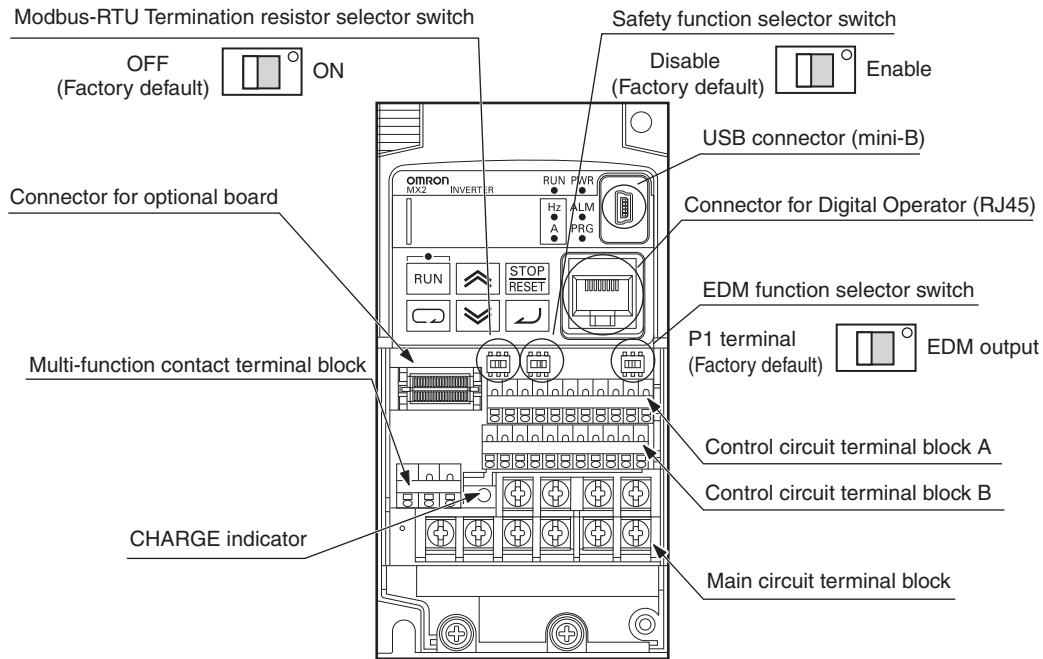
1. The applicable motor is a 3-phase standard motor. For using any other type, be sure that the rated current does not exceed that of the Inverter.
2. Output voltage decreases according to the level of the power supply voltage.
3. The braking torque at the time of capacitor feedback is an average deceleration torque at the shortest deceleration (when it stops from 50 Hz). It is not a continuous regeneration torque. Also, the average deceleration torque varies depending on the motor loss. The value is reduced in operation over 50 Hz.



# Multi-function Compact Inverter MX2-Series V1 type

## Components and Functions

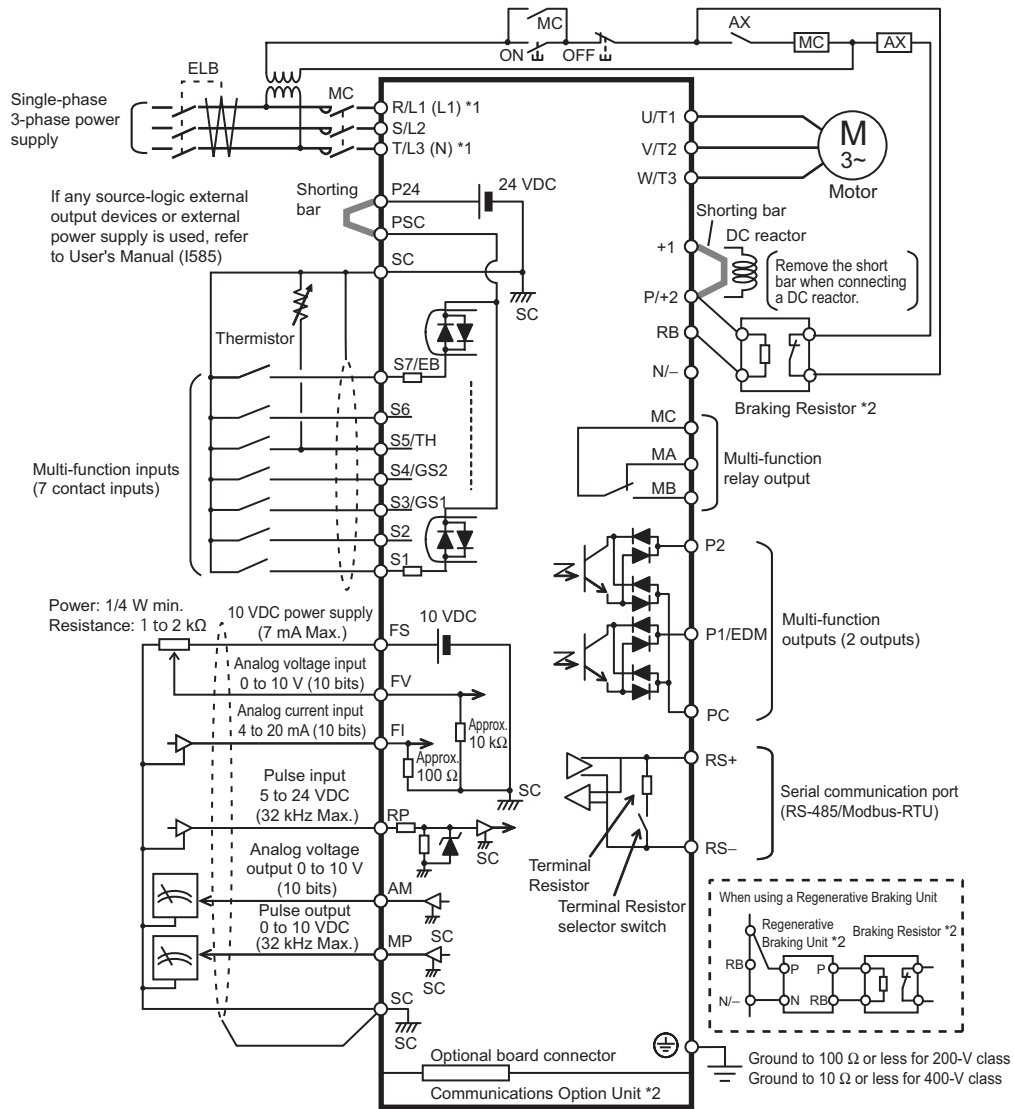
### Inverter MX2-series V1 type



Name	Function
Modbus-RTU Termination resistor selector switch	Use this Terminal Resistor selector switch for RS-485 terminals on the control circuit terminal block. When this switch is turned ON, the internal 200 Ω Resistor is connected.
Safety function selector switch	Turn this switch ON when using the safety function. Turn OFF the power before turning this switch ON/OFF. For details, refer to USER'S MANUAL (Cat.No.I585).
EDM function selector switch	Turn this switch ON when using the EDM output of the safety function. Turn OFF the power before turning this switch ON/OFF. For details, refer to USER'S MANUAL (Cat.No.I585).
USB connector	Use this mini-B USB connector to connect a PC. Even when the Inverter is being operated by a PC, etc., via USB connection, it can still be operated using the Digital Operator.
Connector for Digital Operator	Use this connector to connect the Digital Operator.
Connector for optional board	Use this connector to mount the optional board. (Communications Units and other options can be connected.)
Control circuit terminal blocks A and B	These terminal blocks are used to connect various digital/analog input and output signals for inverter control, etc.
Multi-function contact terminal block	Use this SPDT contact terminal block for relay outputs.
Main circuit terminal block	Use this terminal block to connect an output to the motor and Braking Resistor, etc. Also, use this terminal block to connect the inverter to the main power supply.
CHARGE indicator (Charge indicator LED)	This LED indicator is lit if the DC voltage of the main circuit (between terminals P/+2 and N/-) remains approx. 45 V or above after the power has been cut off. Before wiring, etc. confirm that the Charge LED indicator is turned OFF.

**Note:** This illustration shows the terminal block with the front cover removed.

Connection Diagram

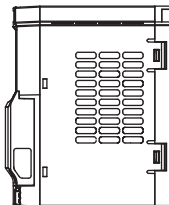
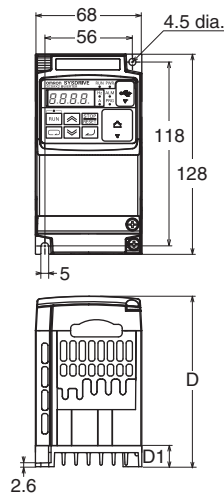


\*1 Connect to terminals L1 and N on a single-phase, 200-V Inverter (3G3MX2-AB□□□-V1).  
 \*2 Optional.

Dimensions

(Unit: mm)

- 3G3MX2-AB001-V1
- 3G3MX2-AB002-V1
- 3G3MX2-AB004-V1
- 3G3MX2-A2001-V1
- 3G3MX2-A2002-V1
- 3G3MX2-A2004-V1
- 3G3MX2-A2007-V1

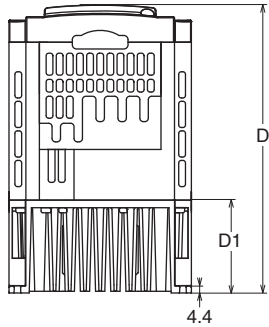
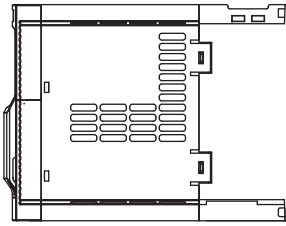
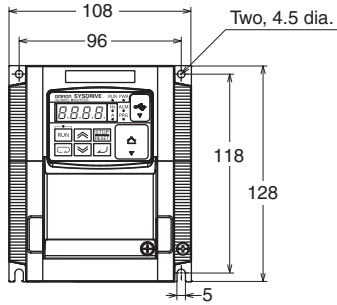


Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
1-phase 200 V	3G3MX2-AB001-V1	68	128	109	13.5
	3G3MX2-AB002-V1			122.5	27
	3G3MX2-AB004-V1				
3-phase 200 V	3G3MX2-A2001-V1	68	128	109	13.5
	3G3MX2-A2002-V1			122.5	27
	3G3MX2-A2004-V1				
	3G3MX2-A2007-V1				



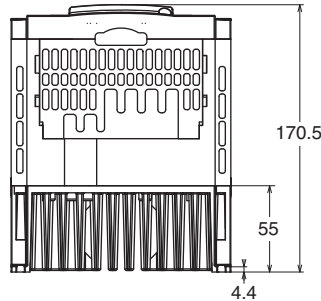
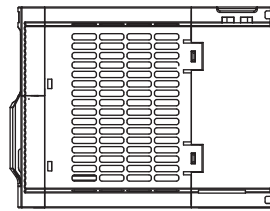
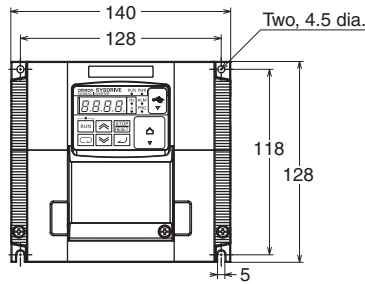
# Multi-function Compact Inverter MX2-Series V1 type

- 3G3MX2-AB007-V1
- 3G3MX2-AB015-V1
- 3G3MX2-AB022-V1
- 3G3MX2-A2015-V1
- 3G3MX2-A2022-V1
- 3G3MX2-A4004-V1
- 3G3MX2-A4007-V1
- 3G3MX2-A4015-V1
- 3G3MX2-A4022-V1
- 3G3MX2-A4030-V1



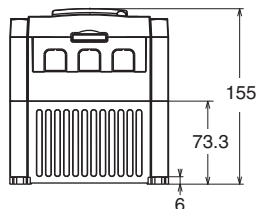
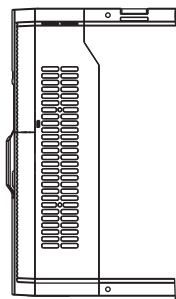
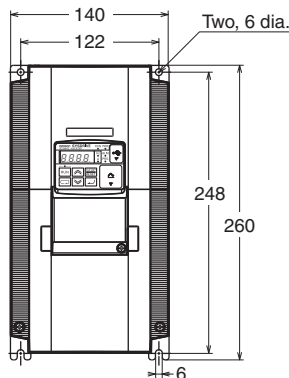
Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
1-phase 200 V	3G3MX2-AB007-V1	108	128	170.5	55
	3G3MX2-AB015-V1				
	3G3MX2-AB022-V1				
3-phase 200 V	3G3MX2-A2015-V1			143.5	28
	3G3MX2-A2022-V1				
	3G3MX2-A4004-V1				
3-phase 400 V	3G3MX2-A4007-V1	170.5	55		
	3G3MX2-A4015-V1				
	3G3MX2-A4022-V1				
	3G3MX2-A4030-V1				

- 3G3MX2-A2037-V1
- 3G3MX2-A4040-V1



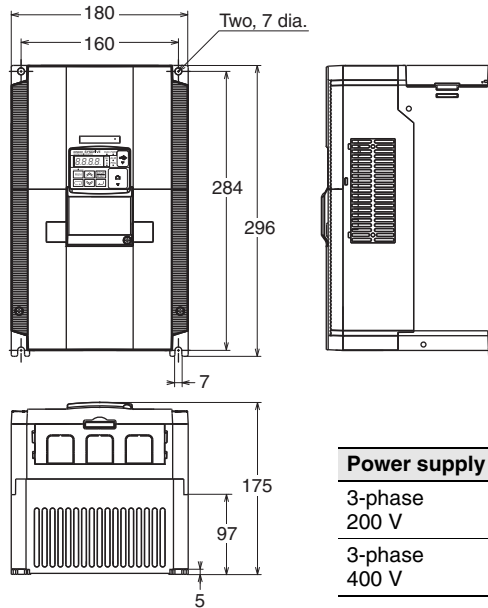
Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
3-phase 200 V	3G3MX2-A2037-V1	140	128	170.5	55
3-phase 400 V	3G3MX2-A4040-V1				

- 3G3MX2-A2055-V1
- 3G3MX2-A2075-V1
- 3G3MX2-A4055-V1
- 3G3MX2-A4075-V1



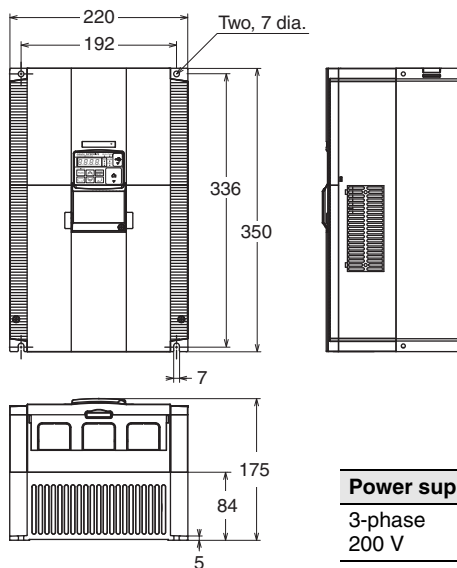
Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
3-phase 200 V	3G3MX2-A2055-V1	140	260	155	73.3
	3G3MX2-A2075-V1				
3-phase 400 V	3G3MX2-A4055-V1				
	3G3MX2-A4075-V1				

3G3MX2-A2110-V1  
 3G3MX2-A4110-V1  
 3G3MX2-A4150-V1



Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
3-phase 200 V	3G3MX2-A2110-V1	180	296	175	97
3-phase 400 V	3G3MX2-A4110-V1				
	3G3MX2-A4150-V1				

3G3MX2-A2150-V1



Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
3-phase 200 V	3G3MX2-A2150-V1	220	350	175	84

## Communication Unit

### MX2-Series EtherCAT Communication Unit 3G3AX-MX2-ECT

This is the communication unit to connect the Multi-function Compact Inverter MX2 to EtherCAT network.  
 This communication unit passed the conformance test of EtherCAT.

#### Common Specifications

Item	Specifications	
Power supply	Supplied from the inverter	
Protective structure	Open type (IP20)	
Ambient operating temperature	-10 to +50°C	
Ambient storage temperature	-20 to +65°C	
Ambient operating humidity	20% to 90% RH (with no condensation)	
Vibration resistance	5.9 m/s <sup>2</sup> (0.6 G), 10 to 55 Hz	
Application environment	At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)	
Weight	100 g max.	
International standard	UL/cUL	UL508C
	EC directive	EMC Directive :EN61800-3: 2004 Low Voltage Directive :EN61800-5-1: 2003



# Multi-function Compact Inverter **MX2-Series V1 type**

## EtherCAT Communications Specifications

Item	Specifications
Communications standard	IEC 61158 Type12, IEC 61800-7 CiA 402 drive profile
Physical layer	100BASE-TX (IEEE802.3)
Connector	RJ45 × 2 (shielded type) ECAT IN : EtherCAT input ECAT OUT : EtherCAT output
Communications media	Category 5 or higher (cable with double, aluminum tape and braided shielding) is recommended.
Communications distance	Distance between nodes: 100 m max.
Process data	Fixed PDO mapping PDO mapping
Mailbox (CoE)	Emergency messages, SDO, SDO responses, and information
Distributed clock	FreeRun mode (asynchronous)
LED display	L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1
CiA402 drive profile	Velocity mode

## EtherCAT Communication Unit Version Information

As a Sysmac Device, the MX2-series Multi-function Compact Inverter is designed to provide optimal functionality and enhanced operability when used in conjunction with a Machine Automation Control such as NJ/NX series and the automation software Sysmac Studio.

## Unit Versions

Unit	Model	Unit version	
		Ver.1.0	Ver1.1
EtherCAT Communication Unit for MX2-Series	3G3AX-MX2-ECT	Supported	Supported
Compatible Sysmac Studio version (To connect the NJ Controller)		Version1.05 or higher*	Version1.05 or higher
Compatible Sysmac Studio version (To connect the NX Controller)		Version1.13 or higher*	Version1.13 or higher

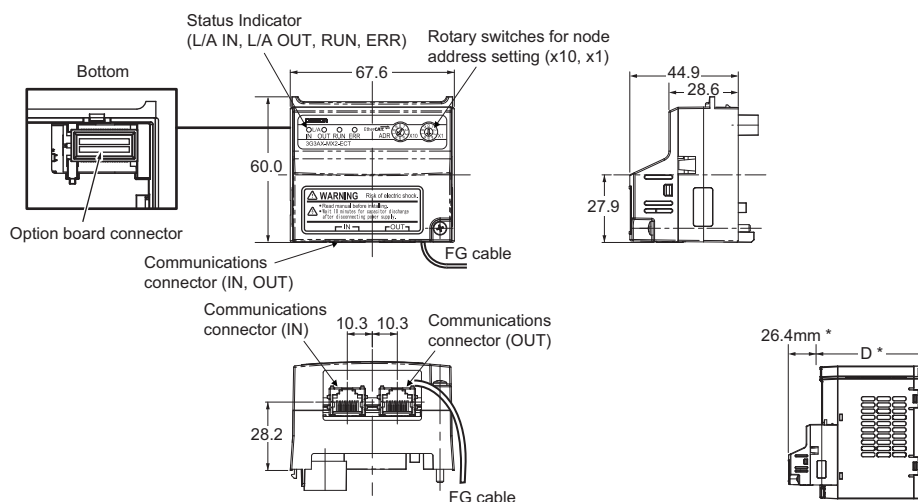
\* The function that was enhanced by the upgrade for Unit version1.1 can not be used. For detail, refer to "Function Support by Unit Version".

## Function Support by Unit Version

Unit	Unit version	Unit version 1.0	Unit version 1.1
Model			
Item			
Store-function of back-up number of parameters		Not supported	Supported
Initializing function as parameters.		Not supported	Supported

## Dimensions (Unit: mm)

### 3G3AX-MX2-ECT



\*After the EtherCAT Communication Unit is installed, dimension D of the inverter increases by 26.4 mm.  
(Dimension D of the inverter varies depending on the capacity. Refer to the MX2-series V1 type USER'S MANUAL (Cat.No.I585))

## MX2-Series CompoNet Communication Unit 3G3AX-MX2-CRT-E

This is the communication unit to connect the Multi-function Compact Inverter MX2 to CompoNet network.

### Common Specification

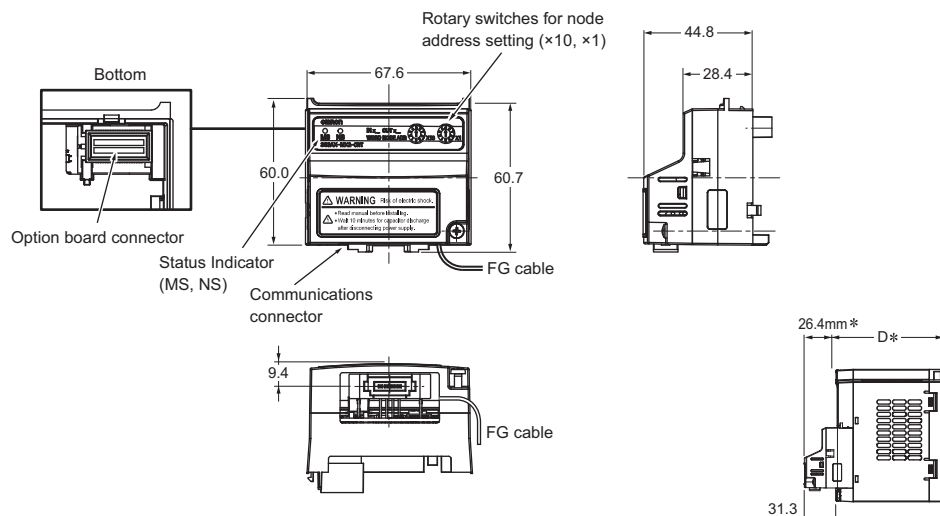
Item		Specification
Power supply		Supplied from the inverter
Protective structure		IP20
Ambient operating temperature		- 10 to 50 °C
Ambient storage temperature		- 20 to 65 °C
Ambient operating humidity		20 to 90%RH (with no condensation)
Vibration resistance		5.9m/s <sup>2</sup> (0.6G), 10 to 55Hz
Application environment		At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)
Insulation resistance		500VAC (between isolated circuits)
Weight		Approx. 170g
International standard	UL/cUL	UL508
	EC directive	EN61800-3: 2004 (2004/108/EC) Second environment, Category C3 EN61800-5-1: 2007 (2006/95/EC) SELV

### CompoNet Communications Specifications

Item	Specification
Slave type	Word Slave Unit (Mixed)
Certification	CompoNet Conformance Tested
CompoNet Profile	AC Drive (0x02)
Node Address	0 to 63, set with inverter parameter P190 or the rotary switches.
Communication power supply	- (External power not required)
Baud rates supported	4 Mbps, 3 Mbps, 1.5 Mbps, 93.75 kbps. Automatically detecting baud rate of Master Unit
Default Connection path	Supported, set with inverter parameter P046
Supported Assemblies	Basic Remote IO (Output assembly 20, Input assembly 70) Extended Speed IO (21, 71) Extended Speed and Torque Control (123, 173) Special IO (100, 150) Extended Control IO (101, 151) Extended Control IO and Multi function IO monitor (101, 153) Flexible Format (139, 159) Extended Speed and Acceleration Control (110, 111)
EDS file	Depending on the MX2 inverter model

### Dimensions (Unit: mm)

#### 3G3AX-MX2-CRT-E



\* After the CompoNet Communication Unit is installed, dimension D of the inverter increases by 26.4 mm. (Dimension D of the inverter varies depending on the capacity. Refer to the MX2-series V1 type USER'S MANUAL (Cat.No.I585))



## Multi-function Compact Inverter MX2-Series V1 type

### MX2-Series DeviceNet Communication Unit 3G3AX-MX2-DRT-E

This is the communication unit to connect the Multi-function Compact Inverter MX2 to DeviceNet network.

#### Common Specification

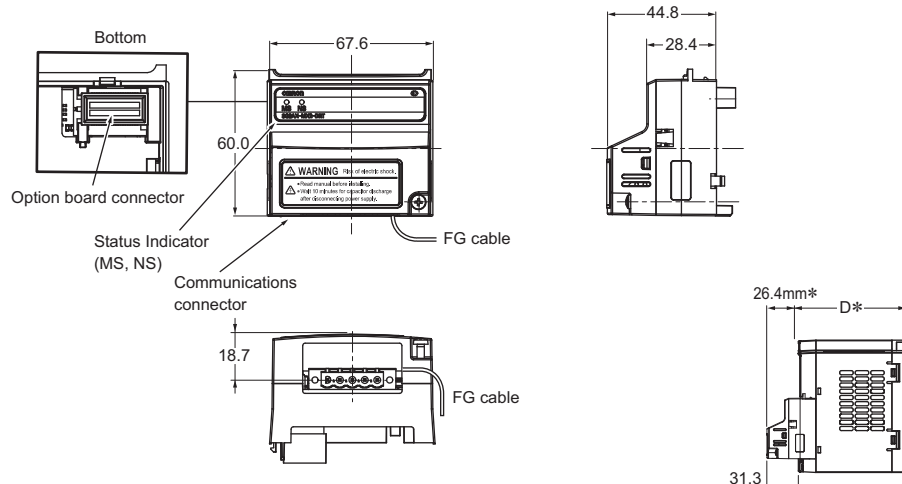
Item	Specification	
Power supply	Supplied from the inverter	
Protective structure	IP20	
Ambient operating temperature	- 10 to 50 °C	
Ambient storage temperature	- 20 to 65 °C	
Ambient operating humidity	20 to 90%RH (with no condensation)	
Vibration resistance	5.9m/s <sup>2</sup> (0.6G), 10 to 55Hz	
Application environment	At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)	
Insulation resistance	500VAC (between isolated circuits)	
Weight	Approx. 170g	
International standard	UL/cUL	UL508
	EC directive	EN61800-3: 2004 (2004/108/EC) Second environment, Category C3
		EN61800-5-1: 2007 (2006/95/EC) SELV

#### DeviceNet Communications Specifications

Item	Specification
Certification	DeviceNet Conformance Tested
DeviceNet Profile	AC Drive (0x02)
Supported connections	Remote I/O: Master-Slave connection Poll Bit-Strobe COS Cyclic Explicit Messages Conform to DeviceNet specifications
Communication power supply	11 to 25VDC (MAX 50 mA, type 20 mA)
Unit device address range	MAC ID 0 to 63, set with inverter parameter P192
Baud rates supported	125, 250, or 500kbps. Automatically detects baud rate of Master Unit.
Default Connection path	Supported, set with inverter parameter P046
Supported Assemblies	Basic Remote IO (Output assembly 20, Input assembly 70) Extended Speed IO (21, 71) Extended Speed and Torque Control (123, 173) Special IO (100, 150) Extended Control IO (101, 151) Extended Control IO and Multi function IO monitor (101, 153) Flexible Format (139, 159) Extended Speed and Acceleration Control (110, 111) In case the DeviceNet master is configured using user allocation, only the input / output pairs can be configured.
EDS file	Depending on the MX2 Inverter model

#### Dimensions (Unit: mm)

##### 3G3AX-MX2-DRT-E

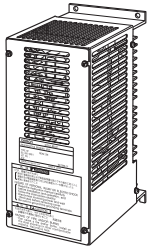


\* After the DeviceNet Communication Unit is installed, dimension D of the inverter increases by 26.4 mm. (Dimension D of the inverter varies depending on the capacity. Refer to the MX2-series V1 type USER'S MANUAL (Cat.No.I585))

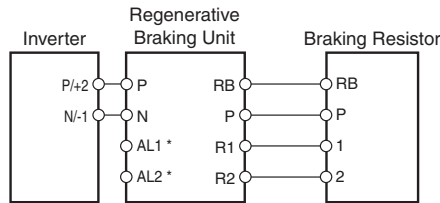
## Options

### Regenerative Braking Unit 3G3AX-RBU□□

Used with a Braking Resistor when the deceleration time of the motor is needed to be reduced in the MX2.



#### Connection Example



\* The alarm output terminals for the Regenerative Braking Unit. Provide a circuit to turn off the primary power supply for the Inverter when the temperature relay of the built-in resistor or optional Braking Resistor is activated.

## Specifications

### Built-in Resistance Type (3G3AX-RBU21/-RBU22/-RBU41)

Class		3-phase 200-V class		3-phase 400-V class
Model name (3G3AX-)		RBU21	RBU22	RBU41*1
Connection resistance		17 Ω min.	17 Ω min.	34 Ω min.
Operating voltage ON/OFF		ON : 362.5 ± 5 V OFF: 355 ± 5 V (-5% or -10% setting available)		ON : 725 ± 5 V OFF: 710 ± 5 V (-5% or -10% setting available)
Operation indication		LED ON (Lit)		
Parallel interlocking operation function*2		5 units max.		
Built-in resistor	Internal resistance	120 W, 180 W	120 W, 20 W	120 W, 180 W × 2 in series
	Allowable consecutive ON time	10 s max.	0.5 s max.	10 s max.
	Allowable operation cycle	Cycle 1/10 (ON for 10 s, OFF for 90 s)	Cycle 1/80 (ON for 0.5 s, OFF for 40 s)	Cycle 1/10 (ON for 10 s, OFF for 90 s)
	Power consumption	Instantaneous 0.73 kW Short-time rating 120 W	Instantaneous 6.6 kW Short-time rating 120 W	Instantaneous 1.46 kW Short-time rating 240 W
Protective function	Built-in resistor overheat protection	<ul style="list-style-type: none"> <li>• Cooling fin temperature Relay operates at approximately 200°C or higher. Recovers at approximately 170°C or lower.</li> <li>• Built-in temperature fuse (recovery impossible)*3</li> <li>• Rating of contact 250 V AC 200mA (R load) 12 V DC 500mA (R load) 42 V DC 200mA (R load)</li> <li>• Minimum load 1mA (R load)</li> </ul>		
Operating environment	Ambient temperature	-10 to 50°C		
	Ambient storage temperature	-20 to 65°C		
	Ambient operating humidity	20% to 90% (with no condensation)		
	Vibration	5.9 m/s <sup>2</sup> (0.6G) 10 to 55 Hz		
	Location	At a maximum altitude of 1,000 m (without corrosive gases or dust)		
Paint color		Munselle 5Y7/1 (cooling fan: aluminum ground color)		

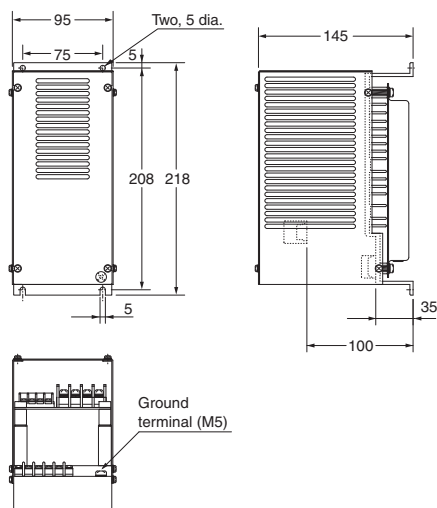
\*1 To use the braking resistor (Model: 3G3AX-RAB/RBB/RBC) for the 400-V class regenerative braking unit, be sure to remove the built-in resistor and connect two resistors of the same model in series. Using a 400-V class regenerative braking unit with only a single braking resistor connected may cause damage to the braking resistor.

\*2 Use DIP switches to set the number of connected units.

\*3 The built-in resistor has a thermal fuse. If the alarm terminals are not connected, the fuse may blow out in order to prevent the resistor from burning due to overheating. If the fuse blows out, the built-in resistor must be replaced.

## Dimensions (Unit: mm)

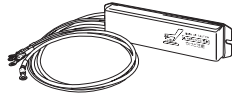
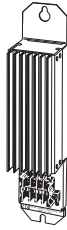
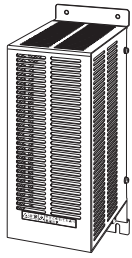
### 3G3AX-RBU21/-RBU22/-RBU41



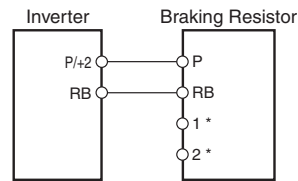
## Multi-function Compact Inverter MX2-Series V1 type

### Braking Resistor 3G3AX-RBA/-RBB/-RBC□□□□

Consumes the regenerative motor energy with a resistor to reduce deceleration time.



#### Connection Example



\* The alarm output terminals for the Braking Resistor. Provide a circuit to turn off the primary power supply for the Inverter when the temperature relay of the Braking Resistor is activated.

### Specifications

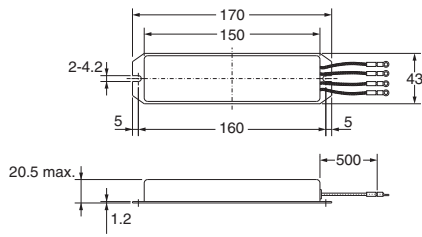
Model		Compact type (3G3AX-RBA□□□□)				Standard type (3G3AX-RBB□□□□)				Medium capacity type (3G3AX-RBC□□□□)		
		1201	1202	1203	1204	2001	2002	3001	4001	4001	6001	12001
Resistance	Capacity	120 W				200 W		300 W	400 W	400 W	600 W	1200 W
	Resistance (W)	180	100	50	35	180	100	50	35	50	35	17
Allowable braking frequency (%)		5	2.5	1.5	1.0	10	7.5	7.5	7.5	10		
Allowable continuous braking time (s)		20	12	5	3	30			20	10		
Weight (kg)		0.27				0.97	1.68	2.85	2.5	3.6	6.5	
Fault detection function		Built-in thermal (Contact capacity: 240 V AC 2 A max.) Minimum current: 5 mA, Normally ON (NC contact) Built-in temperature fuse (recovery impossible)*							Built-in temperature relay, Normally ON (NC contact) Contact capacity: 240 V AC 3 A (R load), 0.2 A (L load), 36 V DC 2 A (R load)			
General specifications	Ambient operating temperature	-10 to 50°C										
	Ambient storage temperature	-20 to 65°C										
	Ambient operating humidity	20% to 90% (RH) with no condensation										
	Vibration	5.9 m/s (0.6 G) 10 to 55 Hz Complies with JISC0911										
	Location	At a maximum altitude of 1,000 m (without corrosive gases or dust)										
Cooling method		Self-cooling										

\* Built-in resistors are equipped with thermal fuses. If the alarm is not connected, the fuse may blow to prevent burnout due to overheating. If the fuse blows, the built-in resistor will need to be replaced.

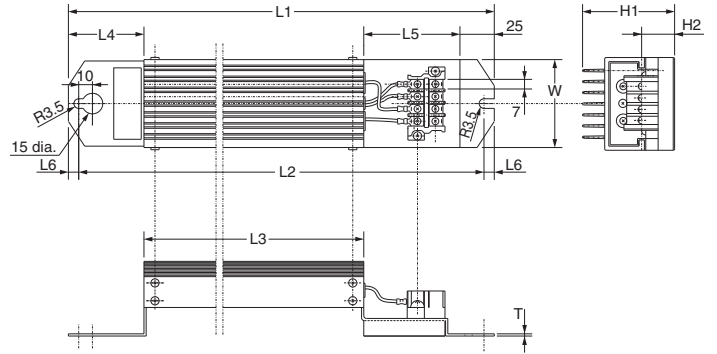


## Dimensions (Unit: mm)

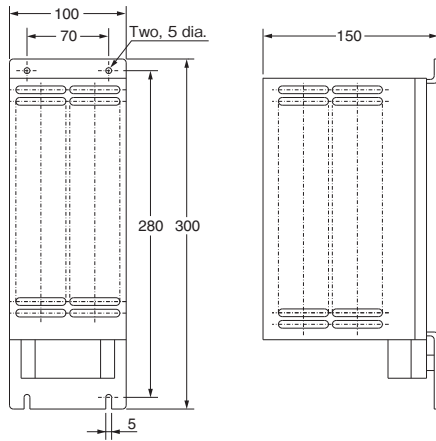
### 3G3AX-RBA



### 3G3AX-RBB



### 3G3AX-RBC4001

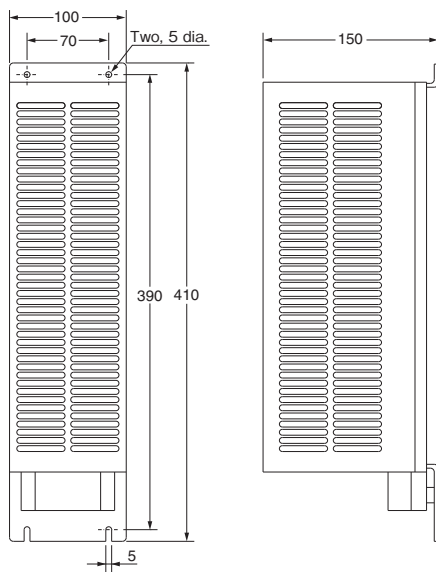


Model	Dimensions (mm)					
	L1	L2	L3	L4	L5	L6
3G3AX-RBB2001	310	295	160	55	70	7.5
3G3AX-RBB2002	310	295	160	55	70	7.5
3G3AX-RBB3001	470	455	320	55	70	7.5
3G3AX-RBB4001	435	422	300	50	60	6.5

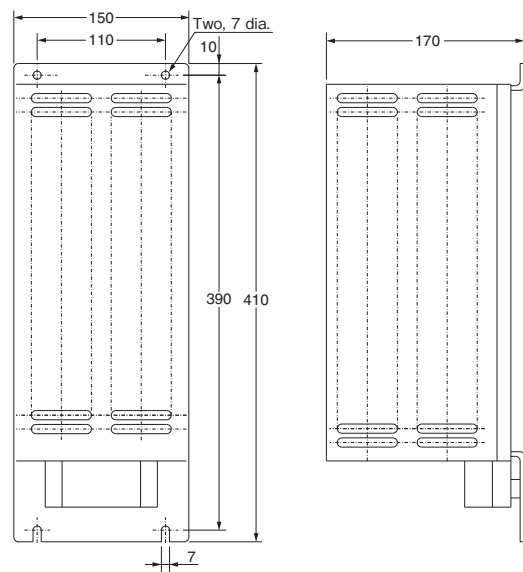
  

Model	Dimensions (mm)				Weight (kg)	Screw size
	H1	H2	W	T		
3G3AX-RBB2001	67	12	64	1.6	0.97	M3.5
3G3AX-RBB2002	67	12	64	1.6	0.97	
3G3AX-RBB3001	67	12	64	1.6	1.68	
3G3AX-RBB4001	94	15	76	2	2.85	

### 3G3AX-RBC6001



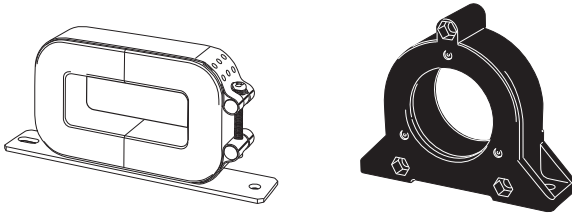
### 3G3AX-RBC12001



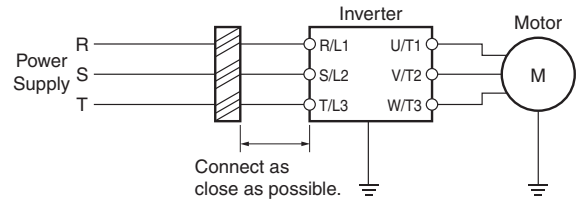
# Multi-function Compact Inverter MX2-Series V1 type

## Radio Noise Filter 3G3AX-ZCL□

Connected to the inverter input/output cables to reduce noise coming into the inverter from the power supply line and noise flowing from the inverter into the power supply line.



### Connection Example



- Note 1: Wind each of three phase wires in the same direction.
- 2: Can be used on both the input and output sides of the Inverter.

### Specifications 3G3AX-ZCL1

Applicable Inverter capacity (kW)	200 V class				400 V class			
	Input		output		Input		output	
	Quantity	No. of turns	Quantity	No. of turns	Quantity	No. of turns	Quantity	No. of turns
0.4	-	-	-	-	1	4	1	4
0.75					1	4	1	4
1.5					1	4	1	4
2.2					1	4	1	4
3.0					1	4	1	4
3.7					1	4	1	4
4.0	-	-	-	-	1	4	1	4
5.5	1	4	1	4	1	4	1	4
7.5	1	4	1	4	1	4	1	4
11	1	4	1	4	1	4	1	4
15	1	4	1	4	1	4	1	4

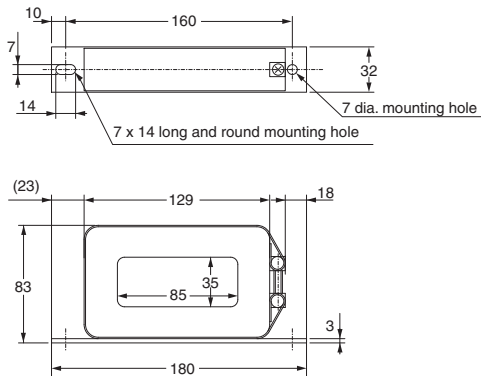
### Specifications 3G3AX-ZCL2

Applicable Inverter capacity (kW)	200 V class				400 V class			
	Input		output		Input		output	
	Quantity	No. of turns	Quantity	No. of turns	Quantity	No. of turns	Quantity	No. of turns
0.1	1	4	1	4	-	-	-	-
0.2	1	4	1	4				
0.4	1	4	1	4				
0.75	1	4	1	4	1	4	1	4
1.5	1	4	1	4	1	4	1	4
2.2	1	4	1	4	1	4	1	4
3.0	-	-	-	-	1	4	1	4
4.0					1	4	1	4
5.5					1	4	1	4
					1	4	1	4

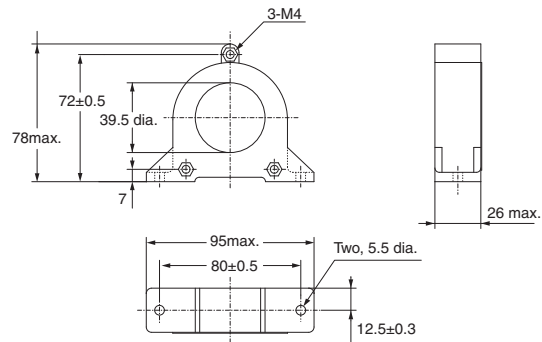
Note: Select options by the maximum applicable motor capacity of heavy and light load rating.

### Dimensions (Unit: mm)

#### 3G3AX-ZCL1

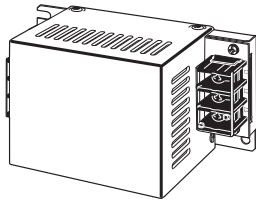


#### 3G3AZ-ZCL2

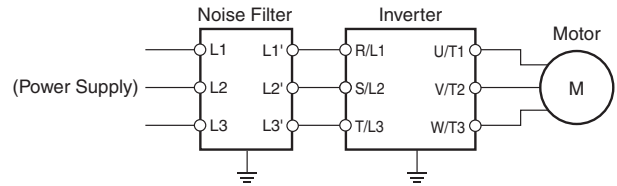


## Input Noise Filter 3G3AX-NFI□□

Reduces noise coming into the inverter from the power supply line and noise flowing from the inverter into the power supply line. Connect as close to the Inverter as possible.



### Connection Example



## Specifications

Power supply	Model	Inverter model	Rated input current I <sub>n</sub> (A) at an ambient temperature of 50°C	Power loss (W)	Leakage current (mA/phase) at 60 Hz
3-phase 200 VAC	3G3AX-NFI21	3G3MX2-A2001-V1	3 × 6 A	3	< 1.5 (250 V)
	3G3AX-NFI21	3G3MX2-A2002-V1	3 × 6 A	3	< 1.5 (250 V)
	3G3AX-NFI21	3G3MX2-A2004-V1	3 × 6 A	3	< 1.5 (250 V)
	3G3AX-NFI22	3G3MX2-A2007-V1	3 × 10 A	4	< 1.5 (250 V)
	3G3AX-NFI23	3G3MX2-A2015-V1	3 × 20 A	6	< 1.5 (250 V)
	3G3AX-NFI23	3G3MX2-A2022-V1	3 × 20 A	6	< 1.5 (250 V)
	3G3AX-NFI24	3G3MX2-A2037-V1	3 × 30 A	9	< 1.5 (250 V)
	3G3AX-NFI25	3G3MX2-A2055-V1	3 × 40 A	12	< 1.5 (250 V)
	3G3AX-NFI26	3G3MX2-A2075-V1	3 × 60 A	17	< 1.5 (250 V)
	3G3AX-NFI27	3G3MX2-A2110-V1	3 × 80 A	21	< 1.5 (250 V)
	3G3AX-NFI28	3G3MX2-A2150-V1	3 × 100 A	23	< 1.5 (250 V)
1-phase 200 VAC	3G3AX-NFI21	3G3MX2-AB001-V1	3 × 6 A	3	< 1.5 (250 V)
	3G3AX-NFI21	3G3MX2-AB002-V1	3 × 6 A	3	< 1.5 (250 V)
	3G3AX-NFI22	3G3MX2-AB004-V1	3 × 10 A	4	< 1.5 (250 V)
	3G3AX-NFI23	3G3MX2-AB007-V1	3 × 20 A	6	< 1.5 (250 V)
	3G3AX-NFI24 3G3AX-NFI23*	3G3MX2-AB015-V1	3 × 30 A 3 × 20 A	9 6	< 1.5 (250 V)
	3G3AX-NFI24	3G3MX2-AB022-V1	3 × 30 A	9	< 1.5 (250 V)
3-phase 400 VAC	3G3AX-NFI41	3G3MX2-A4004-V1	3 × 7 A	2	< 7.5 (480 V)
	3G3AX-NFI41	3G3MX2-A4007-V1	3 × 7 A	2	< 7.5 (480 V)
	3G3AX-NFI41	3G3MX2-A4015-V1	3 × 7 A	2	< 7.5 (480 V)
	3G3AX-NFI42	3G3MX2-A4022-V1	3 × 10 A	4	< 7.5 (480 V)
	3G3AX-NFI42	3G3MX2-A4030-V1	3 × 10 A	4	< 7.5 (480 V)
	3G3AX-NFI43	3G3MX2-A4040-V1	3 × 20 A	6	< 7.5 (480 V)
	3G3AX-NFI43	3G3MX2-A4055-V1	3 × 20 A	6	< 7.5 (480 V)
	3G3AX-NFI44	3G3MX2-A4075-V1	3 × 30 A	9	< 7.5 (480 V)
	3G3AX-NFI45	3G3MX2-A4110-V1	3 × 40 A	12	< 7.5 (480 V)
	3G3AX-NFI46	3G3MX2-A4150-V1	3 × 50 A	15	< 7.5 (480 V)

\* With the 3G3AX-NFI23, only the CT rating is supported.

Model	Case enclosure rating	Terminal size	Wire dia.	Weight (kg)
3G3AX-NFI21	Plastic, IP00	M4	1.25 mm <sup>2</sup>	0.5
3G3AX-NFI22	Plastic, IP00	M4	2 mm <sup>2</sup>	0.6
3G3AX-NFI23	Plastic, IP00	M4	2 mm <sup>2</sup> , 3.5 mm <sup>2</sup>	0.7
3G3AX-NFI24	Plastic, IP00	M4	5.5 mm <sup>2</sup>	0.8
3G3AX-NFI25	Plastic, IP00	M5	8 mm <sup>2</sup>	1.4
3G3AX-NFI26	Plastic, IP00	M5	14 mm <sup>2</sup>	1.8
3G3AX-NFI27	Metal, IP00	M6	22 mm <sup>2</sup>	3.6
3G3AX-NFI28	Metal, IP00	M8	30 mm <sup>2</sup>	4.6
3G3AX-NFI41	Plastic, IP00	M4	1.25 mm <sup>2</sup> , 2 mm <sup>2</sup>	0.7
3G3AX-NFI42	Plastic, IP00	M4	2 mm <sup>2</sup>	0.7
3G3AX-NFI43	Plastic, IP00	M4	2 mm <sup>2</sup> , 3.5 mm <sup>2</sup>	0.7
3G3AX-NFI44	Plastic, IP00	M4	5.5 mm <sup>2</sup>	0.8
3G3AX-NFI45	Plastic, IP00	M5	8 mm <sup>2</sup>	1.4
3G3AX-NFI46	Plastic, IP00	M5	14 mm <sup>2</sup>	1.6

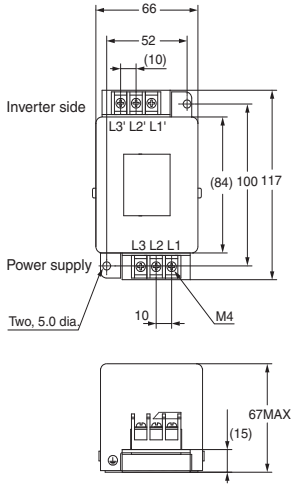
**Note:** Select options by the maximum applicable motor capacity of heavy and light load rating.



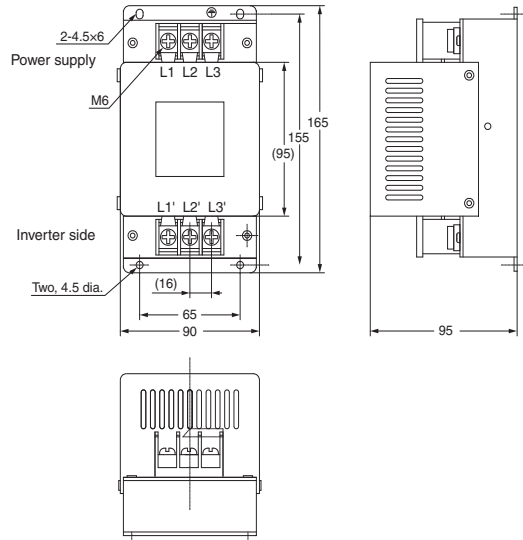
# Multi-function Compact Inverter MX2-Series V1 type

## Dimensions (Unit: mm)

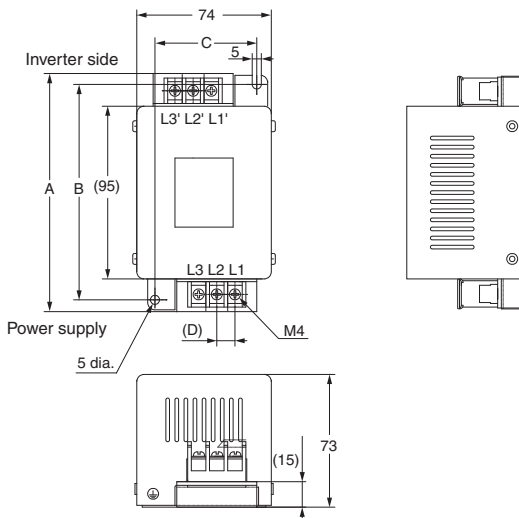
3G3AX-NFI21  
3G3AX-NFI22



3G3AX-NFI25/3G3AX-NFI26  
3G3AX-NFI45/3G3AX-NFI46

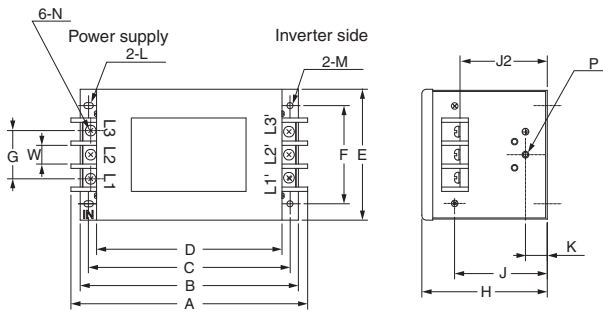


3G3AX-NFI23/3G3AX-NFI24  
3G3AX-NFI41/3G3AX-NFI42  
3G3AX-NFI43/3G3AX-NFI44



Model	Dimensions (mm)			
	A	B	C	D
3G3AX-NFI23	128	118	56	10
3G3AX-NFI24	144	130	56	11
3G3AX-NFI41	144	130	56	11
3G3AX-NFI42	144	130	56	11
3G3AX-NFI43	144	130	56	11
3G3AX-NFI44	144	130	56	11

3G3AX-NFI27/3G3AX-NFI28

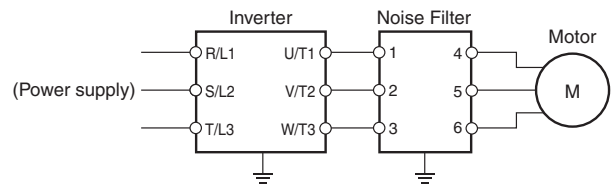
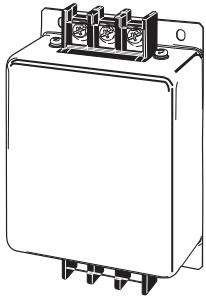


Model	Dimensions (mm)															
	A	B	C	D	E	F	G	H	J	J2	K	L	M	N	P	W
3G3AX-NFI27	217	200	185	170	120	90	44	115	85	82	20	R2.75 Length 7	5.5 dia.	M6	M4	17
3G3AX-NFI28	254	230	215	200	150	120	57	115	80	75	30	R3.75 Length 8	6.5 dia.	M8	M6	23

## Output Noise Filter 3G3AX-NFO□□

Reduces noise generated by the Inverter. Connect as close to the Inverter as possible.

### Connection Example



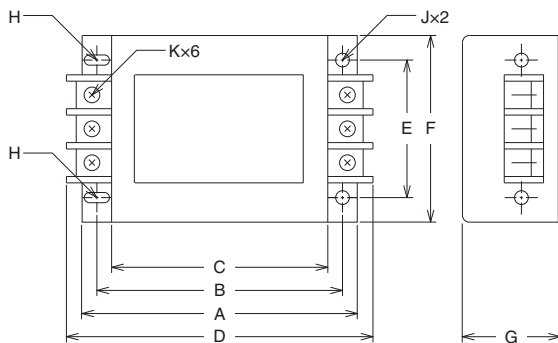
### Specifications

Power supply	Model	Rated current (A)	Inverter model			Weight (kg)
			3-phase AC 200 V class	1-phase AC 200 V class	3-phase AC 400 V class	
3-phase, 3-wire Rated voltage 500 VAC	3G3AX-NFO01	6	3G3MX2-A2001-V1 /-A2002-V1/-A2004-V1	3G3MX2-AB001-V1 /-AB002-V1 /-AB004-V1	3G3MX2-A4004-V1 /-A4007-V1	0.7
	3G3AX-NFO02	12	3G3MX2-A2007-V1 /-A2015-V1	3G3MX2-AB007-V1 /-AB015-V1	3G3MX2-A4015-V1 /-A4022-V1/-A4030-V1	0.9
	3G3AX-NFO03	25	3G3MX2-A2022-V1 /-A2037-V1	3G3MX2-AB022-V1	3G3MX2-A4040-V1 /-A4055-V1/-A4075-V1	2.1
	3G3AX-NFO04	50	3G3MX2-A2055-V1 /-A2075-V1	-	3G3MX2-A4110-V1 /-A4150-V1	3.7
	3G3AX-NFO05	75	3G3MX2-A2110-V1 /-A2150-V1	-	-	5.7

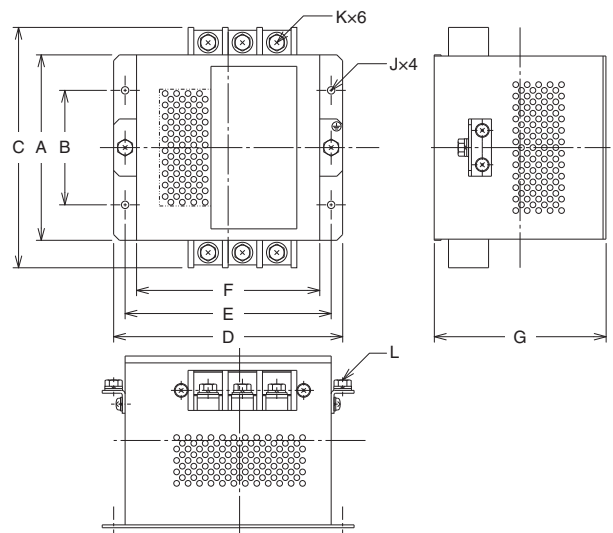
**Note:** Select options by the maximum applicable motor capacity of heavy and light load rating.

### Dimensions (Unit: mm)

3G3AX-NFO01  
3G3AX-NFO02



3G3AX-NFO03/3G3AX-NFO04/3G3AX-NFO05



Model	A	B	C	D	E	F	G	H	J	K	L
3G3AX-NFO01	140	125	110	156	70	95	50	R: 2.25mm Length: 6mm	4.5 mm dia.	M4	-
3G3AX-NFO02	160	145	130	176	80	110	70	R: 2.75mm Length: 7mm	5.5 mm dia.	M4	-
3G3AX-NFO03	112	80	154	160	145	130	120	-	6.5 mm dia.	M4	-
3G3AX-NFO04	162	100	210	200	180	160	150	-	6.5 mm dia.	M5	M5
3G3AX-NFO05	182	100	230	220	200	180	170	-	6.5 mm dia.	M6	M6