# Multi-function Compact Inverter MX2-Series V1 type

### With Machine Automation Mentality

- Positioning functionality.
- Fieldbus communications with optional unit \*1 EtherCAT, CompoNet and DeviceNet
- Drive Programming.
- Current vector Control.
- High Starting torque: 200% at 0.5 Hz.
- Safety function \*2 EN ISO13849-1:2008 (Cat.3/PLd) \*3 IEC60204-1 Stop Category 0 \*3
- \*1 Optional communication unit can be used with the inverter 3G3MX2 of unit version 1.1 or higher.
- \*2 When optional communication unit is mounted onto the MX2, the inverter will not conform to the safety standards.
- \*3 Approval pending.

### **Performance Specifications**

#### Inverter 3G3MX2

#### 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	kW	СТ	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
	KVV	VT	0.2	0.4	0.75	1.1	2.2	3.0	5.5	7.5	11	15	18.5
motor capacity	НР	СТ	1/8	1/4	1/2	1	2	3	5	7 1/2	10	15	20
	nr	VT	1/4	1/2	1	1 1/2	3	4	7 1/2	10	15	20	25
Rated	200 V	СТ	0.2	0.5	1.0	1.7	2.7	3.8	6.0	8.6	11.4	16.2	20.7
output	200 V	VT	0.4	0.6	1.2	2.0	3.3	4.1	6.7	10.3	13.8	19.3	23.9
capacity	240 V	СТ	0.3	0.6	1.2	2.0	3.3	4.5	7.2	10.3	13.7	19.5	24.9
[kVA]	240 V	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	СТ	1.0	1.6	3.3	6.0	9.0	12.7	20.5	30.8	39.6	57.1	62.6
[A]		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	3-phase 200 to 240 V (The output cannot exceed the incoming voltage).												
Rated outpu	ıt	СТ	1.0	1.6	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0
current [A]		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 of braking toro (Discharge R connected)	ue (%)		50	50	50	50	50	20	20	20	20	10	10
Braking Besistor		ative		Built-in Braking Resistor circuit (separate Discharge Resistor)									
circuit *	Min. cor resistan	nectable ce [ $\Omega$ ]	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]	1(	09	122.5	145.5	17	0.5	170.5	15	55	1	75

\* The BRD usage is 10%.

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

#### 3-phase 400 V Class

Fun	ction na	ne	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	kW	СТ	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
	KVV	VT	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
motor capacity	НР	СТ	1/2	1	2	3	4	5	7 1/2	10	15	20
	пР	VT	1	2	3	4	5	7 1/2	10	15	20	25
Rated	380 V	СТ	1.1	2.2	3.1	3.6	4.7	6.0	9.7	11.8	15.7	20.4
output	360 V	VT	1.3	2.6	3.5	4.5	5.7	7.3	11.5	15.1	20.4	25.0
capacity	480 V	СТ	1.4	2.8	3.9	4.5	5.9	7.6	12.3	14.9	19.9	25.7
[kVA]	400 V	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	СТ	1.8	3.6	5.2	6.5	7.7	11.0	16.9	18.8	29.4	35.9
[A] · V		VT	2.1	4.3	5.9	8.1	9.4	13.3	20.0	24.0	38.0	44.0
Rated outpu	ut voltag	e	3-phase 380 to 480 V (The output cannot exceed the incoming voltage).									
Rated outpu	ıt	СТ	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
current [A]		VT	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
Short-time o braking toro (Discharge R connected)	que (%)		50	50	50	20	20	20	20	20	10	10
Braking Resistor	Regener braking	ative	Built-in Braking Resistor circuit (separate Discharge Resistor)									
circuit *	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 [mm]	(width ×	height)			108 × 128	1		140 × 128	140 >	× 260	180 :	× 296
Dimensions	(depth)	[mm]	143.5		143.5 170.5					55	17	75

\* The BRD usage is 10%.

#### 1-phase 200 V Class

Fun	ction nan	ne			1-phas	e 200 V			
Model name	e (3G3MX	2-)	AB001-V1	AB002-V1	AB004-V1	AB007-V1	AB015-V1	AB022-V1	
	kW	СТ	0.1	0.2	0.4	0.75	1.5	2.2	
Applicable motor	ĸvv	VT	0.2	0.4	0.55	1.1	2.2	3.0	
capacity	нр	СТ	1/8	1/4	1/2	1	2	3	
	пР	VT	1/4	1/2	3/4	1 1/2	3	4	
Rated	200 V	СТ	0.2	0.5	1.0	1.7	2.7	3.8	
output	200 V	VT	0.4	0.6	1.2	2.0	3.3	4.1	
capacity	240 V	СТ	0.3	0.6	1.2	2.0	3.3	4.5	
[kVA]	240 V	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%						
nated input current		СТ	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	ut voltage	)	3-phase 200 to 240 V (The output cannot exceed the incoming voltage).						
Rated output	ut	СТ	1.0	1.6	3.0	5.0	8.0	11.0	
current [A]		VT	1.2	1.9	3.5	6.0	9.6	12.0	
Short-time of braking toro (Discharge R connected)	que (%)		50	50	50	50	50	20	
Braking Resistor	Regener braking	ative	Built-in Braking Resistor circuit (separate Discharge Resistor)						
circuit *	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]	1(	09	122.5		170.5		

\* The BRD usage is 10%.

## **Function Specifications**

_	Function name	Specifications			
Enc	losure ratings *1	Open type (IP20)			
	Control method	Phase-to-phase sinusoidal modulation PWM			
	Output frequency range *2	0.10 to 400 Hz			
	Frequency precision *3	Digital command: ±0.01% of the max. frequency, Analog command: ±0.2% of the max. frequency (25±10°C)			
	Frequency setting resolution	Digital setting: 0.01 Hz, Analog setting: One-thousandth of the maximum frequency			
_	Voltage/Frequency characteristics	V/f characteristics (constant/reduced torque) Sensorless vector control, V/f control with speed feedback			
Control	Overload current rating	Heavy load rating (CT): 150%/60 s Light load rating (VT): 120%/60 s			
Ŭ	Instantaneous overcurrent protection	200% of the value of heavy load rating (CT)			
	Acceleration/Deceleration time	0.01 to 3600 s (linear/curve selection), acceleration/deceleration 2 setting available			
	Carrier frequency adjustment range	2 to 15 kHz (with derating)			
	Starting torque	200%/0.5 Hz (sensorless vector control)			
	External DC injection braking	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).			
Pro	tective functions	Overcurrent, overvoltage, undervoltage, electronic thermal, temperature error, ground fault overcur- rent at power-on status, rush current prevention circuit, overload limit, incoming overvoltage, exter- nal trip, memory error, CPU error, USP error, communication error, overvoltage suppression during deceleration, protection upon momentary power outage, emergency cutoff, etc.			
le	Frequency settings	Digital Operator External analog input signal: 0 to 10 VDC/4 to 20 mA, Modbus communication (Modbus-RTU)			
signal	RUN/STOP command	Digital Operator External digital input signal (3-wire input supported), Modbus communication (Modbus-RTU)			
Input	Multi-function input	7 points (Selectable from 59 functions)			
<u> </u>	Analog input	2 points (Voltage FV terminal: 10 bits/0 to 10 V, Current FI terminal: 10 bits/4 to 20 mA)			
	Pulse input	1 point (RP terminal: 32 kHz max., 5 to 24 VDC)			
nal	Multi-function output	2 points (P1/EDM, P2; selectable from 43 functions)			
t siç	Relay output	1 point (1c contact: MC, MA, MB; selectable from 43 functions)			
Output signal	Analog output (Frequency monitor)	1 point (AM terminal: Voltage 10 bits/0 to 10 V) (Frequency, current selectable)			
õ	Pulse output	1 point (MP terminal: 32 kHz max., 0 to 10 V)			
ations	RS-422	RJ45 connector (for Digital Operator)			
Communications	RS-485	Control circuit terminal block, Modbus communication (Modbus-RTU)			
Com	USB	USB1.1, mini-B connector			
Driv	ve Programming *4	Calculate, Logic, Control I/O and so on			
Oth	er functions	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.			
ment	Ambient operating temperature	-10 to 50°C (However, derating is required).			
iron	Ambient storage temperature	-20°C to 65°C			
Operating environment	Ambient operating humidity	20% to 90% RH (with no condensation)			
ratin	Vibration resistance	5.9 m/s² (0.6G), 10 to 55 Hz			
Ope	Application environment	At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)			
	EtherCAT Communication Unit	3G3AX-MX2-ECT			
ons	CompoNet Communication Unit	3G3AX-MX2-CRT-E			
Options	DeviceNet Communication Unit	3G3AX-MX2-DRT-E			
	I/O Unit	3G3AX-MX2-EI015-E			
		1			

	F	unction name	Specifications
Oth	er option		DC reactor, AC reactor, radio noise filter, input noise filter, output noise filter, regenerative braking unit, Braking Resistor, EMC noise filter, etc.
standard	EMC directive		EN61800-3: 2004
	EC directive	Low voltage directive	EN61800-5-1: 2003
JUD/CUL		Machinery directives	IEC60204-1 Stop Category 0, EN IEC61800-5-2 (STO), EN ISO13849-1: 2008 (PLd), ISO13849-1: 2006 (PLd)
nterı	UL/cUL		UL508C

\*1 Protection method complies with JEM 1030

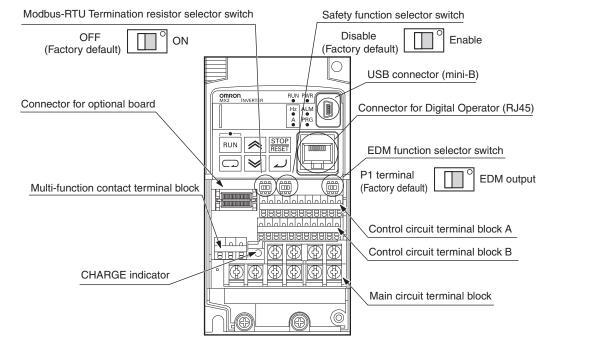
\*2 To operate the motor at over 50/60 Hz, contact the motor manufacturer to find out the maximum allowable speed of revolution.
\*3 For the stable control of the motor, the output frequency may exceed the maximum frequency set in A004 (A204) by 2 Hz max.
\*4 Refer to the Drive Programming USER'S MANUAL (No. 1580).

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.
 Output voltage decreases according to the level of the power supply voltage.
 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.

### **Components and Functions**

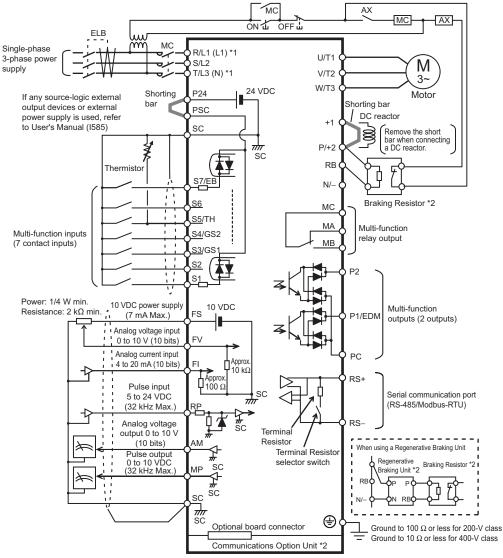
#### Inverter 3G3MX2



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 $\Omega$ 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**



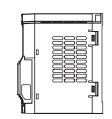
\*1 Connect to terminals L1 and N on a single-phase, 200-V Inverter (3G3MX2-AB - V1). \*2 Optional.

### Dimensions

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

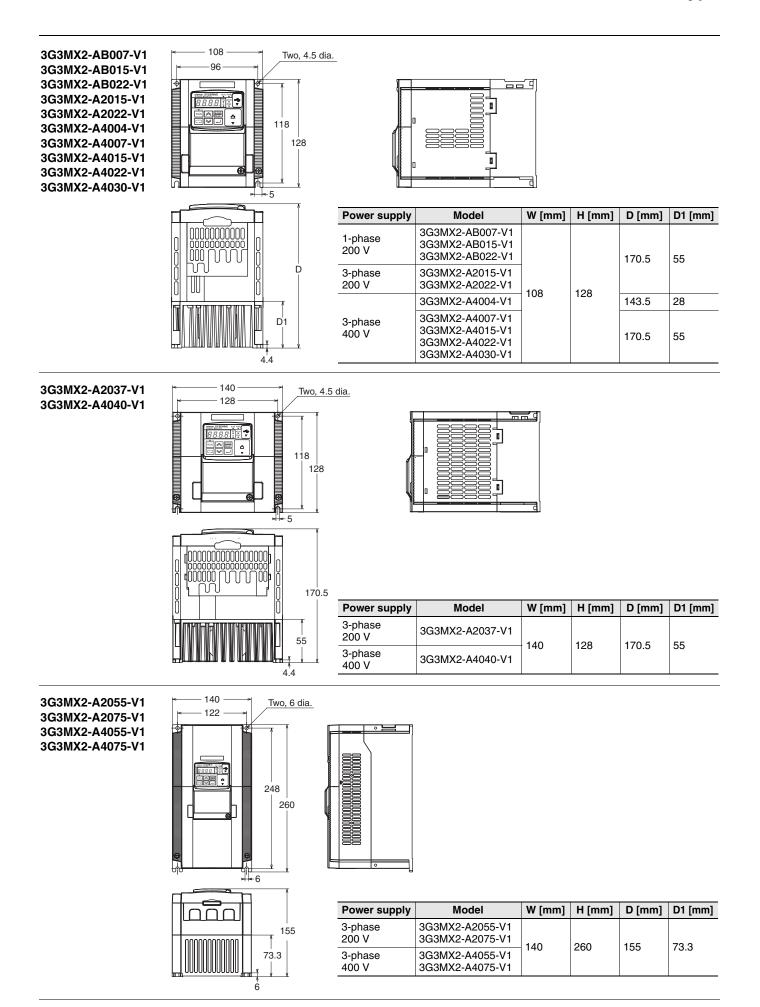
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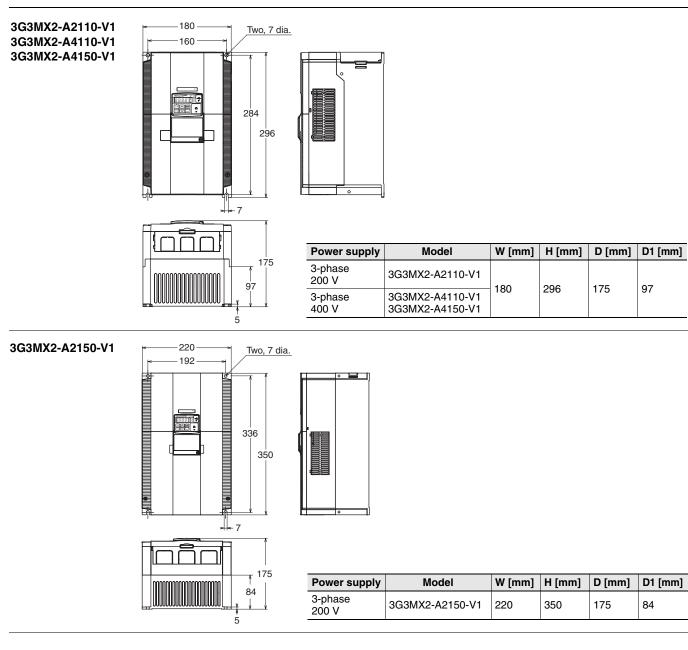


Power supply	Model	W [mm]	H [mm]	D [mm]	D1 [mm]
1-phase 200 V	3G3MX2-AB001-V1 3G3MX2-AB002-V1			109	13.5
	3G3MX2-AB004-V1		128	122.5	27
3-phase	3G3MX2-A2001-V1 3G3MX2-A2002-V1	68		109	13.5
200 V	3G3MX2-A2004-V1			122.5	27
	3G3MX2-A2007-V1			145.5	50

(Unit: mm)



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



### **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. **Note:** EtherCAT Communication Unit 3G3AX-MX2-ECT can be used with the inverter 3G3MX2 of unit version 1.1 or higher.

#### **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 enviro	onment	At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust)				
Weight		100 g max.				
International	UL/cUL	UL508C				
standard	EC directive	EMC Directive :EN61800-3: 2004 Low Voltage Directive :EN61800-5-1: 2003				

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 recommende			
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) $\times$ 1 L/A OUT (Link/Activity OUT) $\times$ 1 RUN $\times$ 1 ERR $\times$ 1			
CiA402 drive profile	Velocity mode			

#### **EtherCAT Communications Specifications**

#### **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 series and the automation software Sysmac Studio. Sysmac Device is a generic term for OMRON control devices such as an EtherCAT Slave, designed with unified communications specifications and user interface specifications.

#### **Unit Versions**

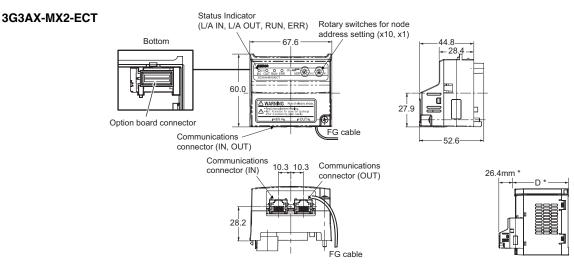
Unit	Model	Unit version			
biin	Model	Ver.1.0	Ver1.1		
EtherCAT Communication Unit for MX2-Series	3G3AX-MX2-ECT	Supported	Supported		
Compatible Sysmac Studio version	•	Version1.00 or higher*	Version1.00 or higher		

\* The function that was enhanced by the upgrade for Unit version 1.1 can not be used. For detail, refer to "Function Support by Unit Version".

#### **Function Support by Unit Version**

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

#### **Dimensions (Unit: mm)**



\*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 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. **Note:** CompoNet Communication Unit 3G3AX-MX2-CRT-E can be used with the inverter 3G3MX2 of unit version 1.1 or higher.

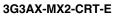
#### **Common Specification**

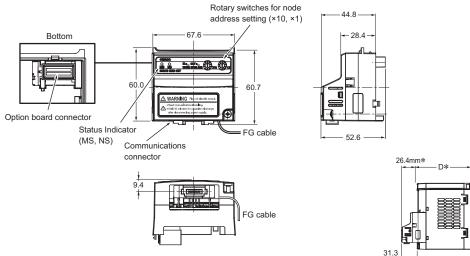
Item		Specification				
Power supply		Supplied from the inverter				
Protective structure		IP20				
Ambient operating tempe	rature	– 10 to 50 °C				
Ambient storage tempera	ture	– 20 to 65 °C				
Ambient operating humidi	ity	20 to 90%RH (with no condensation)				
Vibration resistance		5.9m/s <sup>2</sup> (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				
	UL/cUL	UL508				
International standard	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)**





- \* 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 USER'S MANUAL (Cat.No.I585))

#### 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. **Note:** DeviceNet Communication Unit 3G3AX-MX2-DRT-E can be used with the inverter 3G3MX2 of unit version 1.1 or higher.

#### **Common Specification**

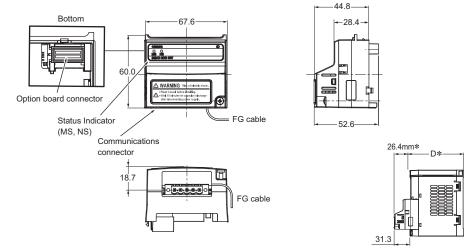
Item		Specification				
Power supply		Supplied from the inverter				
Protective structure		IP20				
Ambient operating tempe	erature	– 10 to 50 °C				
Ambient storage tempera	ature	– 20 to 65 °C				
Ambient operating humid	lity	20 to 90%RH (with no condensation)				
Vibration resistance		5.9m/s <sup>2</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				
	UL/cUL	UL508				
International standard		EN61800-3: 2004 (2004/108/EC) Second environment, Category C3				
	EC directive	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
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 USER'S MANUAL (Cat.No.I585))

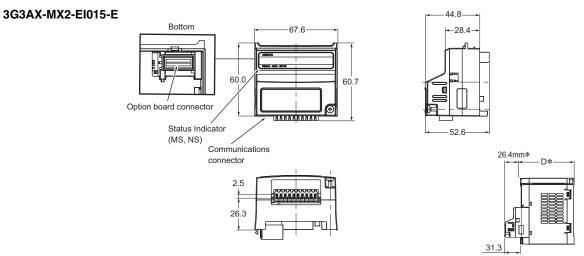
#### MX2-Series I/O Unit 3G3AX-MX2-EI015-E

This is the expanded IO unit to connect the Multi-function Compact Inverter MX2.

#### **Common Specification**

Item		Specification				
Power supply Supplied from the inverter						
Protective structure		IP20				
Ambient operating temp	erature	– 10 to 50 °C				
Ambient storage temperation	ature	– 20 to 65 °C				
Ambient operating humic	dity	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. 160g				
	UL/cUL	UL508				
International standard	50 K K	EN61800-3: 2004 (2004/108/EC) Second environment, Category C3				
	EC directive	EN61800-5-1: 2007 (2006/95/EC) SELV				

#### Dimensions (Unit: mm)



\* After the I/O Unit is installed, dimension D of the inverter increases by 26.4 mm.

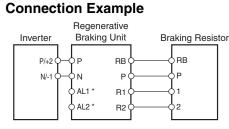
(Dimension D of the inverter varies depending on the capacity. Refer to the MX2-series USER'S MANUAL (Cat.No.I585))

### 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 3G3MX2.





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 2	3-phase 400-V class				
N	Iodel name (3G3AX-)	RBU21	RBU22	RBU41*1			
Connection res	sistance	17 Ω min.	17 Ω min.	34 Ω min.			
Operating volta ON/OFF	age	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 indic	cation	LED ON (Lit)		I			
Parallel interlo	cking operation function*2	5 units max.					
	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.			
Built-in resistor	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	Cooling fin temperatureRelay ope Recovers at approximately 170°C of Built-in temperature fuse (recover Rating of contact250 V AC 200m/ 12 V DC 500mA (R load) 42 V DC 200mA (R load) • Minimum load1mA (R load)	or lower. y impossible)* <sup>3</sup>	igher.			
	Ambient temperature	-10 to 50°C					
•	Ambient storage temperature	-20 to 65°C					
Operating environment	Ambient operating humidity	20% to 90% (with no condensation)					
christinent	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: alumir	num ground color)				

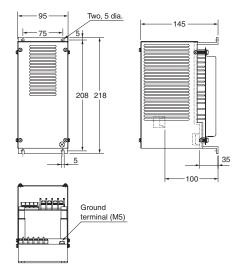
To use the braking resistor (Model: 3G3AX-RAB/RBB/RBC) for the 400-V class regenerative braking unit, be sure to remove the built-in resistor and connect two resistors of the same model in series. Using a 400-V class regenerative braking unit with only a single braking resistor connected may cause damage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

\*2 \*3

Use DIP switches to set the number of connected units. 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.

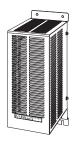
#### **Dimensions (Unit: mm)**

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



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

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





Inverter	Braking Resist	tor
P/+2 C	,, Р	
RBC	на н	
	01* 02*	
	Y² I	

**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.

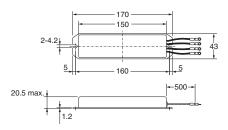
#### Specifications

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
Desistance	Capacity		120	W		200	W	300 W	400 W	400 W	600 W	1200 W
Resistance	Resistance (W)	180	100	50	35	180	100	50	35	50	35	17
Allowable braki	ngfrequency (%)	5	2.5	1.5	1.0	10	7.5	7.5	7.5		10	
Allowable conti	nuousbraking 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	Minimur Normally	n current y ON (NO	: 5 mA, C contact	)	240 V AC		x.)		Built-in temperature relay, Normally ON (NC contact) Contact capacity:240 V AC 3 A (F load), 0.2 A (L load), 36 V DC 2 A (R load)		
	Ambient operating temperature	-10 to 50°C										
	Ambient storage temperature	-20 to 65°C										
General specifications	Ambient operating humidity	20% to 90% (RH) with no condensation										
	Vibration	5.9 m/s	(0.6 G) 1	0 to 55 ⊦	Iz Compl	ies with J	ISC0911					
	Location	At a ma	ximum al	titude of	1,000 m (	(without c	corrosive	gases or	dust)			
	Cooling method	Self-coo	ling									

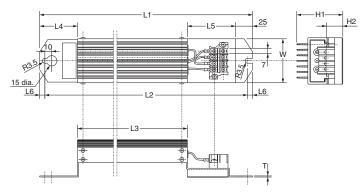
\* Built-in resistors are equipped with thermal fuses. If the alarm is not connected, the fuse may blow to prevent burnout due to overheating. If the fuse blows, the built-in resistor will need to be replaced.

#### **Dimensions (Unit: mm)**

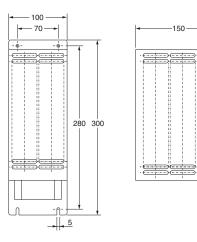
#### 3G3AX-RBA



3G3AX-RBB

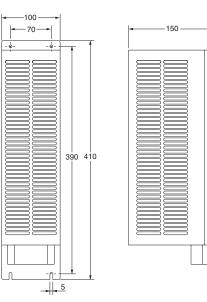


3G3AX-RBC4001

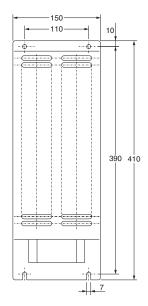


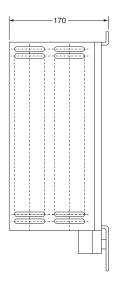
Model		Dimensions (mm)								
Model	L1	L2	L3	L4	L5	L6				
3G3AX-RBB2001	310	295	160	55	70	7.5				
3G3AX-RBB2002	310	295	160	55	70	7.5				
3G3AX-RBB3001	470	455	320	55	70	7.5				
3G3AX-RBB4001	435	422	300	50	60	6.5				
Model	[	Dimensi	ons (mm	)	Weight	Screw				
Model	H1	Dimensio H2	ons (mm W	) T	Weight (kg)	Screw size				
Model 3G3AX-RBB2001			· · · ·	í –	•					
	H1	H2	Ŵ	Т	(kg)	size				
3G3AX-RBB2001	<b>H1</b> 67	<b>H2</b> 12	<b>W</b> 64	<b>T</b> 1.6	(kg) 0.97					

#### 3G3AX-RBC6001



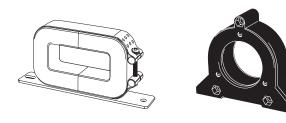
#### 3G3AX-RBC12001



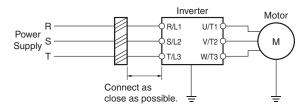


#### Radio Noise Filter 3G3AX-ZCL□

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-ZCL2

Applicable		200 V	class		400 V class			
Inverter	In	put	output		Input		output	
capacity (kW)	Quan- tity	No. of turns						
0.1	1	4	1	4				
0.2	1	4	1	4		_		_
0.4	1	4	1	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		-		-		4	1	4
5.5					1	4	1	4

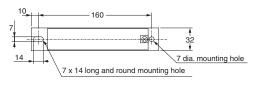
Specifications 3G3AX-ZCL1

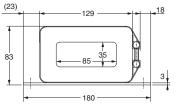
Applicable		200 V	class		400 V class				
Inverter	In	put	ou	tput	In	put	ou	output	
capacity (kW)			No. of turns	Quan- tity	No. of turns	Quan- tity	No. of turns		
0.4					1	4	1	4	
0.75				1	4	1	4		
1.5				1	4	1	4		
2.2					1	4	1	4	
3.0				1	4	1	4		
3.7	1	4	1	4		_		_	
4.0		_		_	1	4	1	4	
5.5	1	4	1	4	1	4	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	

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

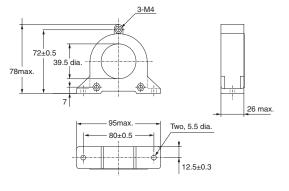
#### Dimensions (Unit: mm)

3G3AX-ZCL1



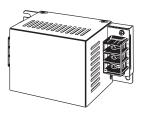


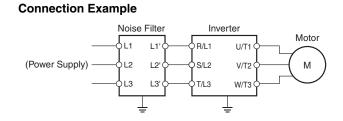
3G3AZ-ZCL2



#### 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.





#### Specifications

Power supply	Model	Inverter model	Rated input current In (A) at an ambient temperature of 50°C	Power loss (W)	Leakage current (mA/phase) at 60 Hz
	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)
3-phase 200 VAC	3G3AX-NFI23	3G3MX2-A2022-V1	3 × 20 A	6	< 1.5 (250 V)
VAC	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)
_	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)
1	3G3AX-NFI22	3G3MX2-AB004-V1	3 × 10 A	4	< 1.5 (250 V)
1-phase 200 – VAC	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)
	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)
3-phase 400	3G3AX-NFI42	3G3MX2-A4030-V1	3 × 10 A	4	< 7.5 (480 V)
VÁC	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-AB001-V1 $3 \times 6 A$ 3           3G3MX2-AB002-V1 $3 \times 6 A$ 3           3G3MX2-AB002-V1 $3 \times 6 A$ 3           3G3MX2-AB004-V1 $3 \times 10 A$ 4           3G3MX2-AB007-V1 $3 \times 20 A$ 6           3G3MX2-AB015-V1 $3 \times 20 A$ 6           3G3MX2-AB015-V1 $3 \times 30 A$ 9           3G3MX2-AB022-V1 $3 \times 30 A$ 9           3G3MX2-AB022-V1 $3 \times 30 A$ 9           3G3MX2-A4004-V1 $3 \times 7 A$ 2           3G3MX2-A4007-V1 $3 \times 10 A$ 4           3G3MX2-A4002-V1 $3 \times 10 A$ 4           3G3MX2-A4030-V1 $3 \times 20 A$ 6           3G3MX2-A4040-V1 $3 \times 20 A$ 6	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.

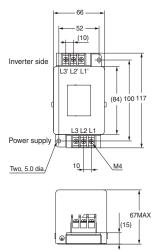
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#### **Dimensions (Unit: mm)**

#### 3G3AX-NFI21 3G3AX-NFI22



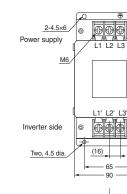
#### 3G3AX-NFI25/3G3AX-NFI26 3G3AX-NFI45/3G3AX-NFI46

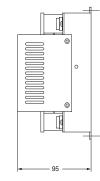
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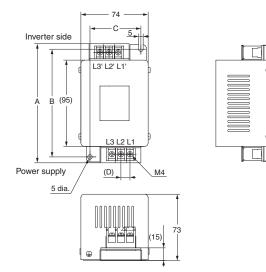
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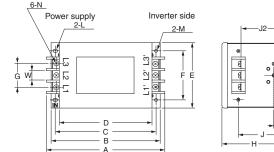


3G3AX-NFI23/3G3AX-NFI24 3G3AX-NFI41/3G3AX-NFI42 3G3AX-NFI43/3G3AX-NFI44



#### Dimensions (mm) Model в D Α С 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



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Model	Dimensions (mm)															
woder	Α	В	С	D	Е	F	G	Н	J	J2	К	L	М	Ν	Р	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

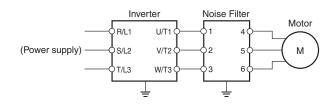
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**Connection Example** 

#### Output Noise Filter 3G3AX-NFO

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



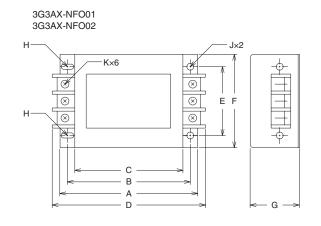


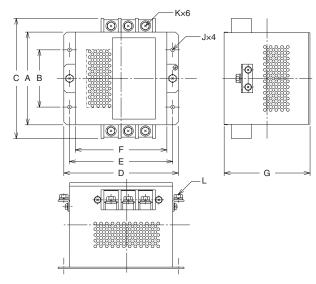
#### Specifications

		Rated		Inverter model							
Power supply	Model	current (A)	3-phase AC 200 V class	1-phase AC 200 V class	3-phase AC 400 V class	Weight (kg)					
	3G3AX-NFO01	6	3G3MX2-A2001-V1 /-A2002-V1/-A2004-V1	3G3MX2-AB001-V1 /-AB002-V1	3G3MX2-A4004-V1 /-A4007-V1	0.7					
-	3G3AX-NFO02	12	3G3MX2-A2007-V1 /-A2015-V1	3G3MX2-AB004-V1 /-AB007-V1	3G3MX2-A4015-V1 /-A4022-V1/-A4030-V1	0.9					
3-phase, 3-wire Rated voltage 500 VAC	3G3AX-NFO03	25	3G3MX2-A2022-V1 /-A2037-V1	3G3MX2-AB015-V1 /-AB022-V1	3G3MX2-A4040-V1 /-A4055-V1/-A4075-V1	2.1					
500 VAC	3G3AX-NFO04	50	3G3MX2-A2055-V1 /-A2075-V1	_	3G3MX2-A4110-V1 /-A4150-V1	3.7					
-	3G3AX-NFO05	75	3G3MX2-A2110-V1	-	-	5.7					
	3G3AX-NFO06	100	3G3MX2-A2150-V1	-	-	8.4					

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

#### Dimensions (Unit: mm)





Model	Α	В	С	D	E	F	G	Н	J	К	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
3G3AX-NFO06	182	100	237	220	200	180	170	-	6.5 mm dia.	M8	M8

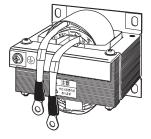
#### 3G3AX-NF003/3G3AX-NF004/3G3AX-NF005 3G3AX-NF006

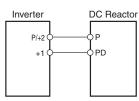
#### DC Reactor 3G3AX-DL

Used to suppress harmonic current generated from the Inverter.

Suppresses harmonic current better than the AC Reactor and can be used with the AC Reactor.

#### **Connection Example**





#### Specifications

Inverter Input	<b></b>	Figure	Applicable		Dir	nensio	ons (m	m) Bm	ax: co	il dime	nsions		Weight	Standard
power supply	Model	No.	Inverter	w	D	н	Α	в	х	Y	С	к	(kg)	applicable wire
	3G3AX-DL2002		3G3MX2- A2001-V1, AB001-V1	66	90	98	_	85	56	72	5.2 × 8	M4	0.8	1.25 mm <sup>2</sup> min.
	3G3AX-DL2004		3G3MX2- A2002-V1, AB002-V1	66	90	98	_	95	56	72	5.2 × 8	M4	1.0	1.25 mm <sup>2</sup> min.
	3G3AX-DL2007	Fig. 1	3G3MX2- A2004-V1, AB004-V1	66	90	98	_	105	56	72	5.2 × 8	M4	1.3	2 mm <sup>2</sup> min.
	3G3AX-DL2015	- Fig. 1	3G3MX2- A2007-V1, AB007-V1	66	90	98	_	115	56	72	5.2 × 8	M4	1.6	2 mm <sup>2</sup> min.
	3G3AX-DL2022		3G3MX2- A2015-V1, AB015-V1	86	100	116	_	105	71	80	6 × 9	M4	2.1	2 mm <sup>2</sup> min.
3/1-phase 200 VAC	3G3AX-DL2037		3G3MX2- A2022-V1, AB022-V1	86	100	118	_	120	71	80	6 × 9	M4	2.6	3.5 mm <sup>2</sup> min.
	3G3AX-DL2055		3G3MX2- A2037-V1	111	100	210	_	110	95	80	7 × 11	M5	3.6	8 mm² min.
	3G3AX-DL2075	- Fig. 2	3G3MX2- A2055-V1	111	100	212	_	120	95	80	7 × 11	M6	3.9	14 mm <sup>2</sup> min.
	3G3AX-DL2110	1 19. 2	3G3MX2- A2075-V1	146	120	252	_	110	124	96	7 × 11	M6	6.5	22 mm <sup>2</sup> min.
	3G3AX-DL2150		3G3MX2- A2110-V1	146	120	256	_	120	124	96	7 × 11	M8	7.0	38 mm² min.
	3G3AX-DL2220	Fig. 3	3G3MX2- A2150-V1	120	175	356	140	145	98	151	7 × 11	M8	9.0	60 mm² min.

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

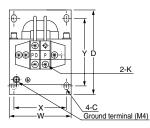
Inverter Input		Figure	Applicable		Dir	nensio	ns (m	m) Bm	ax: co	il dime	nsions		Weight	Standard
power supply	Model	No.	Inverter	w	D	Н	Α	в	х	Y	С	к	(kg)	applicable wire
	3G3AX-DL4007		3G3MX2- A4004-V1	66	90	98	-	95	56	72	5.2 × 8	M4	1.1	1.25 mm <sup>2</sup> min.
	3G3AX-DL4015		3G3MX2- A4007-V1*	66	90	98	-	115	56	72	5.2 × 8	M4	1.6	2 mm <sup>2</sup> min.
	3G3AX-DL4022		3G3MX2- A4007-V1, A4015-V1	86	100	116	_	105	71	80	6 × 9	M4	2.1	2 mm <sup>2</sup> min.
	G3AX-DL4037	Fig. 1	3G3MX2- A4022-V1 A4030-V1	86	100	116	-	120	71	80	6 × 9	M4	2.6	2 mm <sup>2</sup> min.
3-phase 400 VAC	3G3AX-DL4055		3G3MX2- A4040-V1	111	100	138	_	110	95	80	7 × 11	M4	3.6	3.5 mm <sup>2</sup> min.
	3G3AX-DL4075		3G3MX2- A4055-V1*	111	100	138	_	115	95	80	7 × 11	M4	3.9	3.5 mm <sup>2</sup> min.
	3G3AX-DL4110		3G3MX2- A4055-V1, A4075-V1*	146	120	250	_	105	124	96	7 × 11	M5	5.2	5.5 mm <sup>2</sup> min.
	3G3AX-DL4150	Fig. 2 X-DL4150	3G3MX2- A4075-V1, A4110-V1	146	120	252	-	120	124	96	7 × 11	M6	7.0	14 mm² min.
	3G3AX-DL4220	Fig. 3	3G3MX2- A4150-V1	120	175	352	140	145	98	151	7 × 11	M6	9.5	22 mm <sup>2</sup> min.

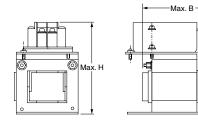
Fig. 2

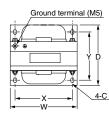
Note: Select options by the maximum applicable motor capacity of heavy and light load rating. \* Only the CT rating is supported.

#### Dimensions (Unit: mm)

Fig. 1







2-K

-@

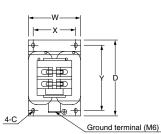
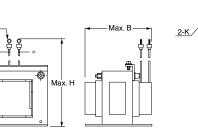
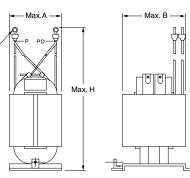


Fig. 3

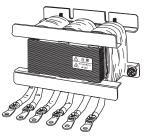


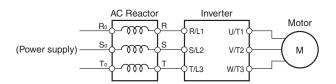


#### AC Reactor 3G3AX-AL

Connect the AC Reactor if the capacity of the power supply is much larger than that of the Inverter or the power factor is required to be improved.

**Connection Example** 





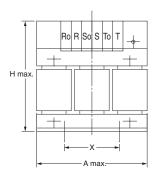
#### Specifications

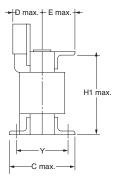
Model	Inverter model	Motor o	capacity				D	imensio	ons (m	m)				Weight
woder	inverter model	VT	СТ	Α	С	D	Е	Н	H1	J	W	Х	Y	(kg)
	3G3MX2-A2001-V1	$\checkmark$	$\checkmark$											
	3G3MX2-A2002-V1	$\checkmark$	$\checkmark$											
	3G3MX2-A2004-V1	$\checkmark$	$\checkmark$											
3G3AX-AL2025	3G3MX2-A2007-V1	$\checkmark$	$\checkmark$	120	82	60	40	150	94	-	-	50	67	2.8
	3G3MX2-AB001-V1	$\checkmark$	$\checkmark$											
	3G3MX2-AB002-V1	$\checkmark$	$\checkmark$											
	3G3MX2-AB004-V1	$\checkmark$	$\checkmark$											
	3G3MX2-A2015-V1	$\checkmark$	$\checkmark$											
	3G3MX2-A2022-V1	$\checkmark$	$\checkmark$	100	98	60	40	150	0.4			50	75	4.0
3G3AX-AL2055	3G3MX2-AB007-V1	$\checkmark$	$\checkmark$	120	98	60	40	150	94	-	-	50	75	4.0
	3G3MX2-AB015-V1*	-	$\checkmark$											
	3G3MX2-A2037-V1	$\checkmark$	$\checkmark$											
000 AV AL 0110	3G3MX2-A2055-V1*	-	$\checkmark$	150	100	70		170	100	<b>F</b> 0	10.0	<u> </u>	00	5.0
3G3AX-AL2110	3G3MX2-AB015-V1	$\checkmark$	$\checkmark$	150	103	70	55	170	108	5.3	12.0	60	80	5.0
	3G3MX2-AB022-V1	$\checkmark$	$\checkmark$											
	3G3MX2-A2055-V1	$\checkmark$	$\checkmark$											
3G3AX-AL2220	3G3MX2-A2075-V1	$\checkmark$	$\checkmark$	180	113	75	55	190	140	8.4	16.5	90	90	10.0
	3G3MX2-A2110-V1*	-	$\checkmark$											
3G3AX-AL2330	3G3MX2-A2110-V1	$\checkmark$	$\checkmark$	100	113	85	60	000	140	0.4	00.0	125	90	11.0
3G3AX-AL2330	3G3MX2-A2150-V1	$\checkmark$	$\checkmark$	180	113	60	60	230	140	8.4	22.0	125	90	11.0
3G3AX-AL4025	3G3MX2-A4004-V1	$\checkmark$	$\checkmark$	120	82	60	40	150	94	_	_	50	67	2.7
3G3AX-AL4025	3G3MX2-A4007-V1	$\checkmark$	$\checkmark$	120	62	60	40	150	94	_	-	50	67	2.7
	3G3MX2-A4015-V1	$\checkmark$	$\checkmark$											
3G3AX-AL4055	3G3MX2-A4022-V1	$\checkmark$	$\checkmark$	120	98	60	40	150	94	-	-	50	75	4.0
	3G3MX2-A4030-V1	$\checkmark$	$\checkmark$											
3G3AX-AL4110	3G3MX2-A4040-V1	$\checkmark$	$\checkmark$	150	116	75	55	170	106	_	_	60	98	6.0
3G3AX-AL4110	3G3MX2-A4055-V1*	-	$\checkmark$	150	110	75	55	170	106	_	-	60	90	0.0
	3G3MX2-A4055-V1	$\checkmark$												
3G3AX-AL4220	3G3MX2-A4075-V1	$\checkmark$		180	103	75	55	190	140	5.3	12.0	100	80	10.0
	3G3MX2-A4110-V1*	-	$\checkmark$		105 75									
3G3AX-AL4330	3G3MX2-A4110-V1	$\checkmark$	$\checkmark$	180	123	85	60	230	140	6.4	16.5	100	100	11.5
3G3AA-AL433U	3G3MX2-A4150-V1	$\checkmark$	$\checkmark$	180	123	60	00	230	140	0.4	10.5	100	100	11.5

**Note:** Select options by the maximum applicable motor capacity of heavy and light load rating. \* Only the CT rating is supported.

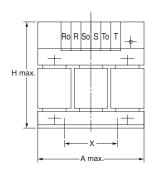
#### **Dimensions (Unit: mm)**

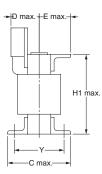
3G3AX-AL2025 3G3AX-AL2055



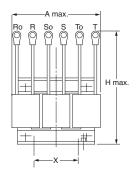


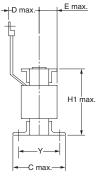
3G3AX-AL4025/3G3AX-AL4055 3G3AX-AL4110



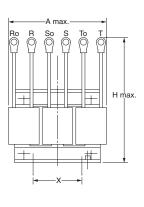


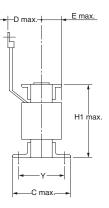
3G3AX-AL2110/3G3AX-AL2220 3G3AX-AL2330





#### 3G3AX-AL4220/3G3AX-AL4330





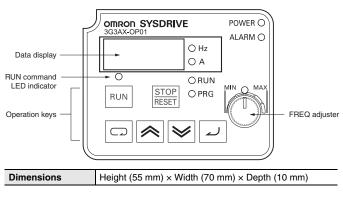
### **Digital Operator**

Used to set parameters, perform various monitoring, and start and stop the Inverter.

### 3G3AX-OP01

#### Dimensions





### Digital operator extension cable 3G3AX-OPCN□

Used to install the Digital Operator away from the Inverter.



3G3AX-OPCN1 (Cable length: 1 m) 3G3AX-OPCN3 (Cable length: 3 m)

# **Ordering Information**

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Software ■ Overview of Inverter Selection	
■ Related Manuals	39
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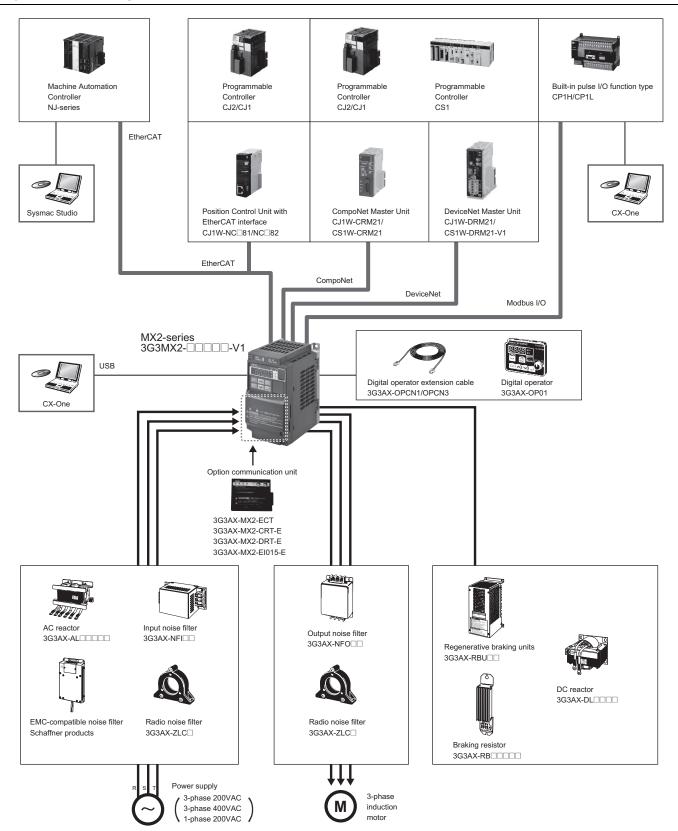
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### **System Configuration**



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### **Interpreting Model Numbers**



MX2 Series V1 type

1) Voltage class

В	1-phase 200 VAC (200-V class)
2	3-phase 200 VAC (200-V class)
4	3-phase 400 VAC (400-V class)

2) Max. a	pplicable motor capacity (CT)
001	0.1 kW
002	0.2 kW
004	0.4 kW
007	0.75 kW
015	1.5 kW
022	2.2 kW
030	3.0 kW
037	3.7 kW
040	4.0 kW
055	5.5 kW
075	7.5 kW
110	11 kW
150	15 kW

### **Ordering Information**

### **3G3MX2 Inverter Models**

Deted voltage		Max. applicable	motor capacity	Model
Rated voltage	Enclosure ratings	CT: Heavy load	VT: Light load	Model
		0.1kW	0.2 kW	3G3MX2-A2001-V1
		0.2 kW	0.4 kW	3G3MX2-A2002-V1
		0.4 kW	0.75 kW	3G3MX2-A2004-V1
		0.75 kW	1.1 kW	3G3MX2-A2007-V1
		1.5 kW	2.2 kW	3G3MX2-A2015-V1
3-phase 200 VAC	IP20	2.2 kW	3.0 kW	3G3MX2-A2022-V1
		3.7 kW	5.5 kW	3G3MX2-A2037-V1
		5.5 kW	7.5 kW	3G3MX2-A2055-V1
		7.5 kW	11 kW	3G3MX2-A2075-V1
		11 kW	15 kW	3G3MX2-A2110-V1
		15 kW	18.5 kW	3G3MX2-A2150-V1
		0.4 kW	0.75 kW	3G3MX2-A4004-V1
		0.75 kW	1.5 kW	3G3MX2-A4007-V1
		1.5 kW	2.2 kW	3G3MX2-A4015-V1
		2.2 kW	3.0 kW	3G3MX2-A4022-V1
	IP20	3.0 kW	4.0 kW	3G3MX2-A4030-V1
3-phase 400 VAC	120	4.0 kW	5.5 kW	3G3MX2-A4040-V1
		5.5 kW	7.5 kW	3G3MX2-A4055-V1
		7.5 kW	11 kW	3G3MX2-A4075-V1
		11 kW	15 kW	3G3MX2-A4110-V1
		15 kW	18.5 kW	3G3MX2-A4150-V1
		0.1 kW	0.2 kW	3G3MX2-AB001-V1
		0.2 kW	0.4 kW	3G3MX2-AB002-V1
	IP20	0.4 kW	0.55 kW	3G3MX2-AB004-V1
1-phase 200 VAC	1520	0.75 kW	1.1 kW	3G3MX2-AB007-V1
		1.5 kW	2.2 kW	3G3MX2-AB015-V1
		2.2 kW	3.0 kW	3G3MX2-AB022-V1

### **Communication Unit**

Name	Model
EtherCAT Communication Unit	3G3AX-MX2-ECT
CompoNet Communication Unit	3G3AX-MX2-CRT-E
DeviceNet Communication Unit	3G3AX-MX2-DRT-E
I/O Unit	3G3AX-MX2-EI015-E

Note: Optional communication unit can be used with the inverter 3G3MX2 of unit version 1.1 or higher.

### **Related Options**

Name		Specifications	Model
	2 phase 200 \/AC	General purpose with Braking resistor	3G3AX-RBU21
Regenerative Braking Units	3-phase 200 VAC	High Regeneration purpose with Braking resistor	3G3AX-RBU22
	3-phase 400 VAC	General purpose with Braking resistor	3G3AX-RBU41
		Resistor 120 W, 180 Ω	3G3AX-RBA1201
	Compact turns	Resistor 120 W, 100 Ω	3G3AX-RBA1202
	Compact type	Resistor 120 W, 5 Ω	3G3AX-RBA1203
		Resistor 120 W, 35 $\Omega$	3G3AX-RBA1204
	Standard type	Resistor 200 W, 180 Ω	3G3AX-RBB2001
raking Resistor		Resistor 200 W, 100 Ω	3G3AX-RBB2002
		Resistor 300 W, 50 $\Omega$	3G3AX-RBB3001
		Resistor 400 W, 35 Ω	3G3AX-RBB4001
		Resistor 400 W, 50 Ω	3G3AX-RBC4001
	Medium capacity type	Resistor 600 W, 35 Ω	3G3AX-RBC6001
		Resistor 1200 W, 17 Ω	3G3AX-RBC12001

### **Regenerative Braking Unit and Braking Resistor Combination**

	Inverter	Inverter Usage conditions		e conditions	Regenerative		Braking resi	Braking resistor		Restrictions	
Voltage	Max.applicable motor capacity (kW)	Model	%ED *1 [%]	Approximate braking torque [% *2 ]	braking u Model	Number of units	Model	Number of units	Connection configuration	Allowable continuous braking time(s)	Min. connectable resistance [Ω]
	0.1	3G3MX2-A2001	3.0%	220%	Built-in Inverter		3G3AX-RBA1201	1	1	20	100
	0.1	3G3MX2-AB001	10.0%	220%	Duilt-III IIIvertei		3G3AX-RBB2001	1	1	30	100
	0.0	3G3MX2-A2002	3.0%	220%	Duilt in Invertor		3G3AX-RBA1201	1	1	20	100
	0.2	3G3MX2-AB002	10.0%	220%	Built-in Inverter		3G3AX-RBB2001	1	1	30	100
	0.4	3G3MX2-A2004	3.0%	220%	Duilt in Incontou		3G3AX-RBA1201	1	1	20	100
	0.4	3G3MX2-AB004	10.0%	220%	Built-in Inverter		3G3AX-RBB2001	1	1	30	100
	0.75	3G3MX2-A2007	3.0%	120%	Duilt in Incontou		3G3AX-RBA1201	1	1	20	50
	0.75	3G3MX2-AB007	10.0%	120%	Built-in Inverter		3G3AX-RBB2001	1	1	30	50
	4.5	3G3MX2-A2015	2.5%	110%	Built-in Inverter		3G3AX-RBA1202	1	1	12	50
	1.5	3G3MX2-AB015	10.0%	215%			3G3AX-RBC4001	1	1	10	50
		3G3MX2-A2022	3.0%	150%	Duilt in Incontou		3G3AX-RBB3001	1	1	30	35
200-V Class	2.2	3G3MX2-AB022	10.0%	150%	Built-in Inverter		3G3AX-RBC4001	1	1	10	35
	0.7	00014120 40007	3.0%	125%	Duilt in Incontou		3G3AX-RBB4001	1	1	20	35
	3.7	3G3MX2-A2037	10.0%	125%	Built-in Inverter		3G3AX-RBC6001	1	1	10	35
		00010/0 40055	3.0%	120%			3G3AX-RBB3001	2	2	30	20
	5.5	3G3MX2-A2055	10.0%	120%	Built-in Inverter		3G3AX-RBC4001	2	2	10	20
	7.5	00010/0 40075	3.0%	125%			3G3AX-RBB4001	2	2	20	17
	7.5	3G3MX2-A2075	10.0%	125%	Built-in Inverter		3G3AX-RBC6001	2	2	10	17
			3.0%	90%			3G3AX-RBC12001	1	1	10	17
	11 3	3G3MX2-A2110	10.0%	90%	Built-in Inverter		3G3AX-RBC12001	1	1	10	17
			10.0%	125%	3G3AX-RBU23 *3	1	3G3AX-RBC6001	3	14	10	4
	45	00010/0 40470	3.0%	110%	D 111		3G3AX-RBB3001	5	7	30	10
	15	3G3MX2-A2150	10.0%	110%	Built-in Inverter		3G3AX-RBC4001	5	7	10	10

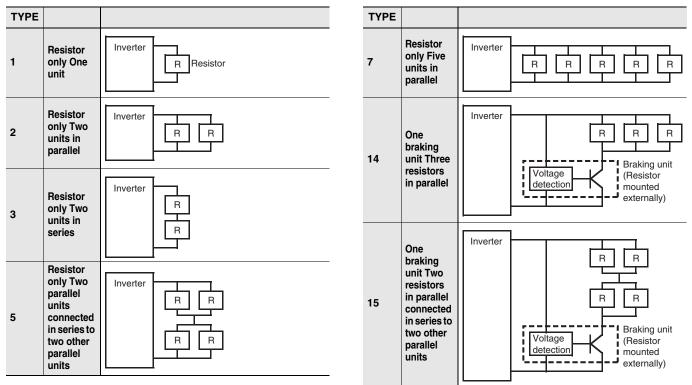
	Inverter		Usage	e conditions	Regenerative s braking unit		Braking resistor		Connection	Restrictions	
Voltage	Max.applicable motor capacity (kW)	Model	%ED *1 [%]	Approximate braking torque [% *2 ]	Model	Number of units	Model	Number of units	configuration	Allowable continuous braking time(s)	Min. connectable resistance [Ω]
	0.4	3G3MX2-A4004	3.0%	220%	Built-in Inverter		3G3AX-RBA1201	2	3	20	180
	0.4	3G3WIA2-A4004	10.0%	220%	Built-In Inverter		3G3AX-RBB2001	2	3	30	180
	0.75	3G3MX2-A4007	3.0%	220%	Built-in Inverter		3G3AX-RBA1201	2	3	20	180
	0.75	3G3WX2-A4007	10.0%	220%	Built-in inverter		3G3AX-RBB2001	2	3	30	180
	4.5	0001470 4 4045	3.0%	120%	Duilt in Jacob and		3G3AX-RBA1201	2	3	20	180
	1.5	3G3MX2-A4015	10.0%	120%	Built-in Inverter		3G3AX-RBB2001	2	3	30	180
		00004/00 4 4000	2.5%	150%			3G3AX-RBA1202	2	3	12	100
	2.2	2.2 3G3MX2-A4022 10.0%	220%	Built-in Inverter		3G3AX-RBC4001	2	3	10	100	
	3.0	3G3MX2-A4030	2.5%	110%			3G3AX-RBA1202	2	3	12	100
	3.0	36310172-84030	10.0%	215%	Built-in Inverter		3G3AX-RBC4001	2	3	10	100
400-V	4.0	0001470 4 40 40	3.0%	165%	Duilt in Jacob and		3G3AX-RBB3001	2	3	30	100
Class	4.0	3G3MX2-A4040	10.0%	165%	Built-in Inverter		3G3AX-RBC4001	2	3	10	100
		0001470 4 4055	3.0%	120%	Duilt in Jacob and		3G3AX-RBB3001	2	3	30	70
	5.5	3G3MX2-A4055	10.0%	120%	Built-in Inverter		3G3AX-RBC4001	2	3	10	70
	7.5	3G3MX2-A4075	3.0%	125%	Built-in Inverter		3G3AX-RBB4001	2	3	20	70
	7.5	3G3MX2-A4075	10.0%	125%	Built-In Inverter		3G3AX-RBC6001	2	3	10	70
			3.0%	85%			3G3AX-RBB4001	2	3	20	70
	11	3G3MX2-A4110	10.0%	85%	Built-in Inverter		3G3AX-RBC6001	2	3	10	70
		500W/Z-A4110	10.0%	120%	3G3AX-RBU41 *3	1	3G3AX-RBC4001	4	15	10	34
	15	3G3MX2-A4150	3.0%	125%	Built-in Inverter		3G3AX-RBB4001	4	5	20	35
	15	3G3WIAZ-A4150	10.0%	125%	Duilt-In Inverter		3G3AX-RBC6001	4	5	10	35

\*1 \*2 %ED shows the ratio that can be used for braking (deceleration time) among operating time of one task period.

Approximate breaking torque is shown in % of rating torque of the motor (100%).

\*3 Please remove the built-in resistor.

### **Connection configuration**



### Multi-function Compact Inverter 3G3MX2

Name		Name Specifications of Inverter				
Name	Voltage class	CT: Heavy load	VT: Light load	Model		
		0.1 kW	0.2 kW			
		0.2 kW	0.4 kW			
		0.4 kW	0.75 kW	2024X 701 0		
		0.75 kW	1.1 kW	3G3AX-ZCL2		
		1.5 kW	2.2 kW			
	3-phase 200 VAC	2.2 kW	3.0 kW	_		
		3.7 kW	5.5 kW			
		5.5 kW	7.5 kW	3G3AX-ZCL1 (3G3AX-ZCL2)		
		7.5 kW	11 kW			
		11 kW	15 kW	3G3AX-ZCL1		
		15 kW	18.5 kW			
		0.1 kW	0.2 kW			
		0.2 kW	0.4 kW			
Radio Noise Filter		0.4 kW	0.55 kW			
	1-phase 200 VAC	0.75 kW	1.1 kW			
		1.5 kW	2.2 kW			
		2.2 kW	3.0 kW			
		0.4 kW	0.75 kW			
		0.4 KW	1.5 kW			
		1.5 kW	2.2 kW			
		2.2 kW	3.0 kW	20242 7012 (20242 7011		
				3G3AX-ZCL2 (3G3AX-ZCL1		
	3-phase 400 VAC	3.0 kW	4.0 kW			
		4.0 kW	5.5 kW			
		5.5 kW	7.5 kW			
		7.5 kW	11 kW			
		11 kW	15 kW	3G3AX-ZCL1		
		15 kW	18.5 kW			
		0.1 kW	0.2 kW			
		0.2 kW	0.4 kW	3G3AX-NFI21		
		0.4 kW	0.75 kW			
		0.75 kW	1.1 kW	3G3AX-NFI22		
		1.5 kW	2.2 kW	3G3AX-NFI23		
	3-phase 200 VAC	2.2 kW	3.0 kW			
		3.7 kW	5.5 kW	3G3AX-NFI24		
		5.5 kW	7.5 kW	3G3AX-NFI25		
		7.5 kW	11 kW	3G3AX-NFI26		
		11 kW	15 kW	3G3AX-NFI27		
		15 kW	18.5 kW	3G3AX-NFI28		
		0.1 kW	0.2 kW	202AX NEI21		
		0.2 kW	0.4 kW	3G3AX-NFI21		
Input Noise Filter	1 share 000 \/AO	0.4 kW	0.55 kW	3G3AX-NFI22		
	1-phase 200 VAC	0.75 kW	1.1 kW	3G3AX-NFI23		
		1.5 kW	2.2 kW	3G3AX-NFI23 *		
		2.2 kW	3.0 kW	3G3AX-NFI24		
		0.4 kW	0.75 kW			
		0.75 kW	1.5 kW	3G3AX-NFI41		
		1.5 kW	2.2 kW			
		2.2 kW	3.0 kW			
		3.0 kW	4.0 kW	3G3AX-NFI42		
	3-phase 400 VAC	4.0 kW	5.5 kW			
		5.5 kW	7.5 kW	- 3G3AX-NFI43		
			7.3 KVV	1		
				2G2AX-NEI44		
		7.5 kW 11 kW	11 kW 15 kW	3G3AX-NFI44 3G3AX-NFI45		

\* Only the CT rating is supported.

### Multi-function Compact Inverter 3G3MX2

Nama		Specifications of Inverte	Maria		
Name	Voltage class	CT: Heavy load	VT: Light load	Model	
		0.1 kW	0.2 kW		
		0.2 kW	0.4 kW		
		0.4 kW	0.75 kW		
		0.75 kW	1.1 kW		
		1.5 kW	2.2 kW		
	3-phase 200 VAC	2.2 kW	3.0 kW		
		3.7 kW	5.5 kW		
		5.5 kW	7.5 kW		
		7.5 kW	11 kW		
		11 kW	15 kW		
		15 kW	18.5 kW		
		0.1 kW	0.2 kW		
		0.2 kW	0.4 kW	Schaffner product will be	
MC-compatible Noise Filter	1-phase 200 VAC	0.4 kW	0.55 kW	— supported in future.	
		0.75 kW	1.1 kW		
		1.5 kW	2.2 kW		
		2.2 kW	3.0 kW		
		0.4 kW	0.75 kW		
		0.75 kW	1.5 kW		
		1.5 kW	2.2 kW		
		2.2 kW	3.0 kW		
	3-phase 400 VAC	3.0 kW	4.0 kW		
		4.0 kW	5.5 kW		
		5.5 kW	7.5 kW		
		7.5 kW	11 kW		
		11 kW	15 kW		
		15 kW	18.5 kW		
		0.1 kW	0.2 kW		
		0.2 kW	0.4 kW	3G3AX-NFO01	
		0.4 kW	0.75 kW		
		0.75 kW	1.1 kW	3G3AX-NFO02	
		1.5 kW	2.2 kW		
	3-phase 200 VAC	2.2 kW	3.0 kW	3G3AX-NFO03	
		3.7 kW 5.5 kW	5.5 kW 7.5 kW		
		7.5 kW	11 kW	3G3AX-NFO04	
		11 kW	15 kW	3G3AX-NFO05	
		15 kW	18.5 kW	3G3AX-NF005	
		0.1 kW	0.2 kW		
		0.2 kW	0.2 kW		
utput Noise Filter		0.2 kW	0.55 kW		
	1-phase 200 VAC	0.75 kW	1.1 kW	3G3AX-NFO02	
		1.5 kW	2.2 kW		
		2.2 kW	3.0 kW	3G3AX-NFO03	
	<u> </u>	0.4 kW	0.75 kW		
	· · ·	0.75 kW	1.5 kW	- 3G3AX-NFO01	
	· · ·	1.5 kW	2.2 kW		
		2.2 kW	3.0 kW	3G3AX-NFO02	
		3.0 kW	4.0 kW		
	3-phase 400 VAC	4.0 kW	5.5 kW		
		5.5 kW	7.5 kW	3G3AX-NFO03	
		7.5 kW	11 kW		
		11 kW	15 kW		
	· · ·	15 kW	18.5 kW	3G3AX-NFO04	

### Multi-function Compact Inverter 3G3MX2

Name		Specifications of Inverte	r	Model
Name	Voltage class	CT: Heavy load	VT: Light load	wodel
		0.1 kW	0.2 kW	3G3AX-DL2002
		0.2 kW	0.4 kW	3G3AX-DL2004
		0.4 kW	0.75 kW	3G3AX-DL2007
		0.75 kW	1.1 kW	3G3AX-DL2015
		1.5 kW	2.2 kW	3G3AX-DL2022
	3-phase 200 VAC	2.2 kW	3.0 kW	3G3AX-DL2037
		3.7 kW	5.5 kW	3G3AX-DL2055
		5.5 kW	7.5 kW	3G3AX-DL2075
		7.5 kW	11 kW	3G3AX-DL2110
		11 kW	15 kW	3G3AX-DL2150
		15 kW	18.5 kW	3G3AX-DL2220
		0.1 kW	0.2 kW	3G3AX-DL2002
		0.2 kW	0.4 kW	3G3AX-DL2004
ctor	1-phase 200 VAC	0.4 kW	0.55 kW	3G3AX-DL2007
		0.75 kW	1.1 kW	3G3AX-DL2015
		1.5 kW	2.2 kW	3G3AX-DL2022
		2.2 kW	3.0 kW	3G3AX-DL2037
		0.4 kW	0.75 kW	3G3AX-DL4007
		0.75 kW	1.5 kW	3G3AX-DL4015 *
		1.5 kW	2.2 kW	3G3AX-DL4022
		2.2 kW	3.0 kW	3G3AX-DL4037
	3 phase 400 VAC	3.0 kW	4.0 kW	JUJAA-DE4037
	3-phase 400 VAC	4.0 kW	5.5 kW	3G3AX-DL4055
		5.5 kW	7.5 kW	3G3AX-DL4075 *
		7.5 kW	11 kW	3G3AX-DL4110 *
		11 kW	15 kW	3G3AX-DL4150
		15 kW	18.5 kW	3G3AX-DL4220
		0.1 kW	0.2 kW	
		0.2 kW	0.4 kW	3G3AX-AL2025
		0.4 kW	0.75 kW	
		0.75 kW	1.1 kW	
		1.5 kW	2.2 kW	
	3-phase 200 VAC	2.2 kW	3.0 kW	3G3AX-AL2055
		3.7 kW	5.5 kW	3G3AX-AL2110
		5.5 kW	7.5 kW	3G3AX-AL2110 *
		7.5 kW	11 kW	3G3AX-AL2220
		11 kW	15 kW	3G3AX-AL2220 *
		15 kW	18.5 kW	3G3AX-AL2330
		0.1 kW	0.2 kW	
		0.2 kW	0.4 kW	00047410005
ctor	1	0.4 kW	0.55 kW	3G3AX-AL2025
	1-phase 200 VAC	0.75 kW	1.1 kW	
		1.5 kW	2.2 kW	3G3AX-AL2055 *
		2.2 kW	3.0 kW	3G3AX-AL2110
		0.4 kW	0.75 kW	
		0.75 kW	1.5 kW	3G3AX-AL4025
		1.5 kW	2.2 kW	
		2.2 kW	3.0 kW	3G3AX-AL4055
		3.0 kW	4.0 kW	
	3-phase 400 VAC	4.0 kW	5.5 kW	3G3AX-AL4110
		5.5 kW	7.5 kW	3G3AX-AL4110 *
		7.5 kW	11 kW	3G3AX-AL4220
		11 kW	15 kW	3G3AX-AL4220 *
		15 kW	18.5 kW	3G3AX-AL4220 3G3AX-AL4330

\* Only the CT rating is supported. Note: When using the Inverter for light load rating, select the model with one size larger capacity (rated current).

Name	Cable length(m)	Model
Digital Operator	-	3G3AX-OP01
Connection coble	1m	3G3AX-OPCN1
Connection cable	3m	3G3AX-OPCN3

#### **Recommended EtherCAT Communications Cables**

Category 5 or higher (100BASE-TX) straight cable with double shielding (aluminum tape and braided shielding) is recommended.

#### **Cabel with Connectors**

#### Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Cable length(m)	Model
			0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
Cable with Connectors on Both Ends	1.5	OMRON	1	XS5W-T421-CMD-K
(RJ45/RJ45)	* 0	OMRON	2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
		OMRON	0.3	XS5W-T421-AMC-K
			0.5	XS5W-T421-BMC-K
Cable with Connectors on Both Ends			1	XS5W-T421-CMC-K
(M12/RJ45)			2	XS5W-T421-DMC-K
			5	XS5W-T421-GMC-K
			10	XS5W-T421-JMC-K
			0.3	XS5W-T422-AMC-K
			0.5	XS5W-T422-BMC-K
Cable with Connectors on Both Ends	14	OMPON	1	XS5W-T422-CMC-K
(M12 L/RJ45)		OMRON	2	XS5W-T422-DMC-K
	" V		5	XS5W-T422-GMC-K
			10	XS5W-T422-JMC-K

Note: The cable length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available. For details, refer to Cat.No.G019.

#### **Cables / Connectors**

#### Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model
	-	Hitachi Cable, Ltd.	NETSTAR-C5E SAB 0.5 x 4P *
Cables	-	Kuramo Electric Co.	KETH-SB *
	-	SWCC Showa Cable Systems Co.	FAE-5004 *
RJ45 Connectors	_	Panduit Corporation	MPS588-C *

\* We recommend you to use above cable and connector together.

#### Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	-	Kuramo Electric Co.	KETH-PSB-OMR *
Cables	-	Nihon Electric Wire&Cable Co.,Ltd.	PNET/B *
RJ45 Assembly Connector	Trans	OMRON	XS6G-T421-1 *

\* We recommend you to use above cable and connector together. **Note:** Connect both ends of cable shielded wires to the connector hoods.

#### Software

#### How to Select Required Support Software for Your Controller

The required Support Software depends on the Controller to connect. Please check the following table when purchasing the Support Software.

Item	Omron PLC System	Omron Machine Automation Controller System
Controller	CS, CJ, CP, and other series	NJ-series
Inverter	Inverter MX2-series (Unit version 1.1 or higher.) Inverter MX2-series with EtherCAT Communication Unit (Applicable to the CJ series only.) Inverter MX2-series with CompoNet Communication Unit Inverter MX2-series with DeviceNet Communication Unit	Inverter MX2-series (Unit version 1.1 or higher.) Inverter MX2-series with EtherCAT Communication Unit Inverter MX2-series with CompoNet Communication Unit Inverter MX2-series with DeviceNet Communication Unit
Software	FA Integrated Tool Package CX-One	Automation Software Sysmac Studio

#### FA Integrated Tool Package CX-One

	Specifications				
Product name		Number of licenses	Media	Model	Standards
FA Integrated Tool Package CX-One Ver. 4.⊟	The CX-One is a comprehensive software package that integrates Support Software for OMRON PLCs and components. CX-One runs on following OS. OS: Windows XP (Service Pack 3 or higher), Vista or 7 <b>Note:</b> Except for Windows XP 64-bit version. CX-One Version.4. includes CX-Drive Ver.2. For details, refer to the CX-One catalog (Cat. No. R134)	1 license *1	DVD *2	CXONE-AL01D-V4	_

\*1 Multi licenses are available for the CX-One (3, 10, 30, or 50 licenses).

\*2 The CX-One is also available on CD (CXONE-AL\_C-V4).

#### Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.

	Specifications				
Product name		Number of licenses	Media	Model	Standards
Sysmac Studio	The Sysmac Studio provides an integrated development environment to set up, program, debug, and maintain NJ-series Controllers and other Machine Automation Controllers, as well as EtherCAT slaves. Sysmac Studio runs on the following OS. Windows XP (Service Pack 3 or higher, 32-bit version)/ Vista (32-bit version) / 7 (32-bit/64-bit version)	_ (Media only)	DVD	SYSMAC-SE200D	-
Standard Edition Ver.1.	The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX- Designer). For details, refer to the Sysmac Integrated Catalogue (P072).	1 license *	_	SYSMAC-SE201L	-

\* Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

### **Overview of Inverter Selection**

For detail of Inverter selection, refer to the MX2 series V1 type User's Manual. (Man.No.I585).

### **Motor Capacity Selection**

Before selecting an invertor, first the motor should be chosen.In selecting the motor, first calculate the load inertia for the applications, and then calculate the required capacity and torque.

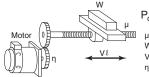
## Make a simple selection (use Formulas for the required output power)

This method of calculation helps select a motor by calculating the output (W) required by the motor to maintain its regular rotations. It does not include calculation of the effect of acceleration/deceleration. Therefore, make allowance for the calculated value to select a motor. This calculation method can be applied to applications that operate constantly such as fans, conveyers, agitators etc.

This calculation method must not be applied to the following applications:

- •Those requiring instant start-up.
- •Those that frequently repeat operation and stop.
- •Those that have a large inertia at the power transfer part.
- •Those that have an inefficient power transfer part.

#### For Straight-Line Operation: Normal Power PO (kW)



$$\begin{split} P_{o} &= \frac{\mu \cdot W \cdot V \ell}{6120 \cdot \eta} \\ \mu: \text{Friction Coefficient} \\ W: \text{Mass of Straight-Line travelling part (kg)} \\ v\ell: \text{Speed of Straight-Line Travelling part (m/min)} \\ \eta: \text{Decelerator (Transfer part) Efficiency} \end{split}$$

#### •For Rotating Operation: Normal Power PO (kW)

$$\mathsf{P}_{\mathsf{o}}\left(\mathsf{kW}\right) = \frac{2\pi \cdot \mathsf{T}\ell \cdot \mathsf{N}\ell}{60 \cdot \mathsf{\eta}} \times 10^{-3}$$

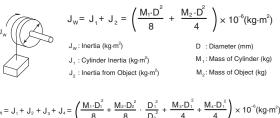
$$\begin{split} & \mathsf{T}\ell: \text{Load Torque} \ (\text{Load Shaft}) \ (N\cdot m) \\ & \mathsf{N}\ell: \text{Load Shaft Rotation Speed} \ (r/min) \\ & \eta: \text{Transfer part} \ (\eta{\leq}1) \end{split}$$

### **Detailed Selection Method (R.M.S Algorithm)**

This method helps to select a motor by calculating the effective torque and maximum torque required to achieve a certain pattern of operation for the application. It selects a motor that is optimal for a particular operation pattern.

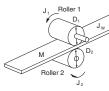
#### Calculate the inertia with a Motor Shaft Conversion Value

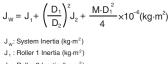
Calculate inertias of all the components with the formula for inertia calculation shown below to convert them to a motor conversion value.





- Jw: Inertia (kg·m<sup>2</sup>) J<sub>1</sub> : Cylinder 1 Inertia (kg·m<sup>2</sup>) J<sub>2</sub> : Inertia from Cylinder 2 (kg·m<sup>2</sup>) J<sub>3</sub> : Inertia from Object (kg·m<sup>2</sup>) J<sub>4</sub> : Inertia from Belt (kg·m<sup>2</sup>)
- D<sub>1</sub>: Cylinder 1 Diameter (mm) D<sub>2</sub>: Cylinder 2 Diameter (mm)
- M<sub>1</sub>: Mass of Cylinder 1 (kg) M<sub>2</sub>: Mass of Cylinder 2 (kg)
- M<sub>2</sub>: Mass of Cylinder 2 (kg M<sub>3</sub>: Mass of Object (kg)
- M<sub>3</sub>: Mass of Object (kg) M<sub>4</sub>: Mass of Belt (kg)





 $\begin{array}{l} J_1: \text{Roller 1 Inertia (kg.m^2)}\\ J_2: \text{Roller 2 Inertia (kg.m^2)}\\ D_1: \text{Roller 1 Diameter (mm)}\\ D_2: \text{Roller 2 Diameter (mm)}\\ M: Work Equivalent Mass (kg) \end{array}$ 

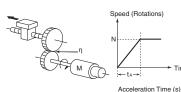
#### $J_{L} = J_{1} + G^{2}(J_{2} + J_{W}) (kg \cdot m^{2})$

- $J_{\,_L}$  : Load Inertia of Motor Shaft Conversion (kg·m²)
- J<sub>w</sub>: Load Inertia (kg⋅m²)
- $J_{_1}$  : Gear Inertia on Motor Side (kg  $\cdot$  m²)
- J2: Gear Inertia on Load Side (kg·m2)
- $\boldsymbol{Z}_1$  : Number of Gear Teeth on Motor Side
- $\rm Z_{_2}$  : Number of Gear Teeth on Load Side
- Gear Ratio G = Z<sub>1</sub>/Z<sub>2</sub>

#### •Calculate Motor Shaft Conversion Torque and Effective Torque

Calculate the acceleration torque from the load torque calculated from both the motor shaft conversion value and the motor rotor inertia. Then Combine this acceleration torque and the Load torque calculated from the friction force and the external force that are applied to the load. Now you get the required torque to operate a motor.

#### Acceleration Torque

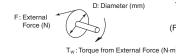


 $T_{A} = \frac{2\pi N}{60t_{A}} \left( J_{M} + \frac{J_{L}}{\eta} \right) (N \cdot m)$ 

Acceleration Torque (T<sub>A</sub>)

- $$\begin{split} T_A &: Acceleration/Deceleration Torque (N\cdotm) \\ P & J_L &: Motor Shaft Conversion Load Inertia (kg·m^2) \\ J_M &: Inertial of Motor Itself (kg·m^2) \end{split}$$
- η : Gear Transmission Efficiency
- N : Motor Rotation Speed (r/min)

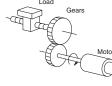
#### Motor Shaft Conversion Load Torque (External Force/Friction)



n: Gear Transmission Efficiency  $T_{L} = T_{W} \cdot \frac{G}{n} (N \cdot m)$ 

 $T_w = F \cdot \frac{D}{2} \times 10^{-3} (N \cdot m)$ 

$$\label{eq:response} \begin{split} &T_1: \text{Motor Shaft Conversion Load Torque (N-m)} \\ &T_W: \text{Load Torque (N-m)} \\ &Z_1: \text{Number of Gear Teeth on Motor Side} \\ &Z_2: \text{Number of Gear Teeth on Load Side} \\ &Gear (Deceleration) \text{Ratio G} = Z_Y/Z_2 \end{split}$$

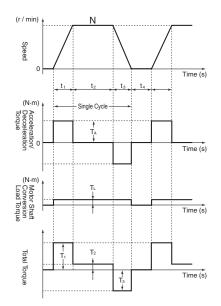


#### Calculation of Total Torque and Effective Torque

Effective Torque: TRMS (N·m)

$$= \sqrt{\frac{\Sigma(T_i)^2 \cdot t_i}{\Sigma t_i}} = \sqrt{\frac{T_1^2 \cdot t_1 + T_2^2 \cdot t_2 + T_3^2 \cdot t_3 + T_4^2 \cdot t_4}{t_1 + t_2 + t_3 + t_4}}$$

Maximum Torque:  $T_{MAX} = T_1 = T_A + T_L$ 



Note: Please make use of the Servo Motor selection software, which can calculate the motor shaft conversion inertia and effective/ maximum torque, as above.

#### Motor Selection

Use the formula below to calculate the motor capacity from the effective torque and the maximum torque that were obtained above. Select the larger of the two generated values as the motor capacity. Select a motor the capacity of which is larger than the calculated value and makes allowance for an error.

- Motor Capacity corresponding to Effective Torque Motor Capacity (kW) = 1.048·N·T<sub>RMS</sub>·10<sup>-4</sup> N: Maximum Rotations (r/min)
- Motor Capacity capable of Providing Maximum Torque

Motor Capacity (kW) =  $1.048 \cdot N \cdot T_{MAX} \cdot 10^{-4}/1.5$ N: Maximum Rotations (r/min)

#### **Inverter Capacity Selection**

Select an inverter that can be used for the selected motor in the process of "Motor Selection".

Generally, select an inverter which fits the maximum applicable motor capacity of the selected motor.

After selecting an inverter, check if it meets with all of the following conditions. If it does not, select an inverter that has a one class larger capacity and check the feasibility again.

# Motor Rated Current $\leq$ Inverter Rated Output Current Maximum Time of Continuous Torque Output Time in an Application $\leq$ 1 minute

Note: 1. Where the inverter overload capacity is "120% of Rated

Output Current for 1 minute", check it for 0.8 minute.
Where a 0 Hz sensor-less vector control is being used, or where torque must be maintained for 0 (r/min) rotation speed and where 150% of the rated torque is frequently required, use an invertor which is one rank larger than the one selected by the above method.

#### **Outline of Braking Resistor Selection**

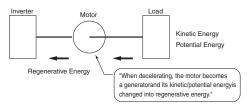
#### **Importance of Braking Resistor**

If the regenerative energy generated in deceleration or descent in an application is too great, the main circuit of an inverter may have an increased voltage and it may be damaged.

Because the inverter usually contains the overvoltage LAD stop function, it is not actually damaged. However, the motor stops detecting an error, making a stable and continuous operation disabled. Therefore, you must discharge the regenerative energy outside of the inverter.

#### What is Regenerative Energy?

A load connected to a motor has kinetic energy when rotating, and potential energy when it is located in a high position. When the motor decelerates, or when the load descends, the energy is returned to an inverter. It is known as regeneration, and the energy generated by the phenomenon is known as regenerative energy.



#### Preventing Breaking Resistence

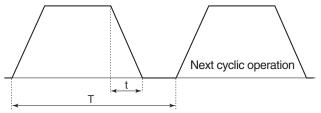
The following are methods to prevent the connection of braking resistance.

These methods will make the deceleration time increase, so check if it will not cause problems.

- Enable the deceleration stall prevention (enabled in factory settings) (It will automatically increase deceleration time not to cause an overvoltage to stop the motor).
- Set a longer deceleration time. (Cause the regenerative energy to decrease per unit of time.)
- Disable Free-Run. (Prevent the regenerative energy from returning to an inverter.)

#### Make a Simple Selection for Braking Resistors

It can be a simple selecting method by using the ratio of time in which regenerative energy is produced in a normal operating pattern. Calculate the usage ratio from the following operating pattern.



Usage Rate =  $t/T \times 100$  (% ED)

t : Deceleration Time (Regenerative Time) T : Single Cycle Operation Time

%ED is the unit used for a usage rate.

The usage rate is used as the ratio of deceleration time (regenerative operation time) to simplify the selection of the braking options.

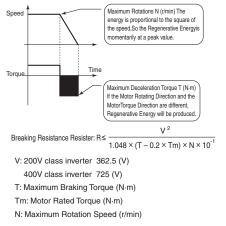
#### For Models with a Built-in Braking Circuit (3G3MX2 Max. 22 kW)

Select the braking resistor based on the usage rate calculated from the operation patterns.

Refer to the braking resistor list described in the User's manual and catalog, and connect it according to your Inverter.

When the usage ratio for the braking resistor selected on the previous page exceeds 10% ED, or when an extremely large braking torque is required, use the method below to calculate a regenerative energy and make your selection.

#### Calculation of Required Braking Resistor

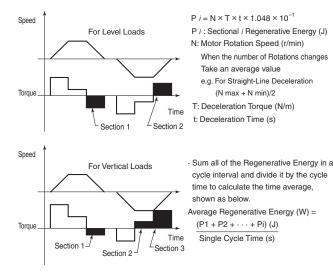


Note: Calculate a braking torque using the above "Motor Capacity Selection".

#### Calculation of Average Regenerative Energy

Regenerative Energy is produced when the motor rotation direction and the torque direction are opposite.

Use the following formula to calculate a regenerative energy per cycle interval.



- Note: 1. Forward rotation direction is forward for the speed, and the torque in the forward rotation direction is forward for the torque.
  - 2. Calculate a braking torque using the above "Motor Capacity Selection".

#### Braking Resistor Selection

Select a Braking Resistor from the required braking resistance and average regenerative energy on the left.

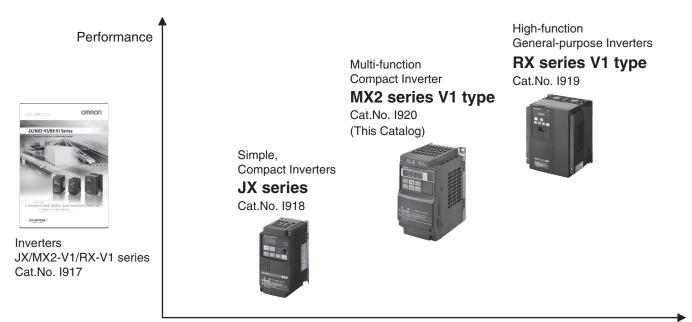
- Required Braking Resistence ≥ Resistence of Braking Resistor ≥ Minimum Connection Resistence of Invertor or Regenerative Braking Unit
- Average Regenerative Energy  $\leq$  Permissible Power for Braking Resister
- Note: 1. If a resistance that has a less then the minimum connectable value is connected on an inverter or regenerative braking resistor unit, the internal breaking transistor can be damaged. When the required braking resistance is less than the minimum connectable resistance, change the inverter or regenerative energy braking to the one having a larger capacity and a minimum connection resistance less than the required braking resistance.
  - Two or more regenerative braking units can be operated in parallel. Refer to the following formula to know the braking resistance value in such a case.
     Braking Resistence(Ω) = (Required Braking Resistance as calculated above) × (No. of Units in use)
  - **3.** Do not use the above formula to select a generative braking resistance value. 150W does not reflect a permissible power capacity, but the maximum rated power per unit of resistance. The actual permissible power varies according to a resistance.

### **Related Manuals**

Man. No.	Model	Manual		
1585		Multi-function Compact Inverter MX2 series V1 type USER'S MANUAL		
1580	3G3MX2-□□□□-V1	Drive Programming USER'S MANUAL		
1570	3G3MX2-000	Multi-function Compact Inverter MX2-series USER'S MANUAL		
1574	3G3AX-MX2-ECT	MX2 series / MX2 series V1 type/ RX series V1 type EtherCAT Communication Unit USER'S MAN		
1581	3G3AX-MX2-DRT-E	MX2 series / MX2 series V1 type/ RX series V1 type DeviceNet Communication Unit USER'S MANUA		
1582	3G3AX-MX2-CRT-E	MX2 series / MX2 series V1 type/ RX series V1 type CompoNet Communication Unit USER'S MANUAL		
W463	CXONE-AL	CX-One FA Integrated Tool Package Setup Manual		
W453	CXONE-AL C/D-V /WS02-DRVC01	CX-Drive OPERATION MANUAL		
W504	SYSMAC-SE2	Sysmac Studio Version 1 Operation Manual		

### **Other Products in the Inverter Series**

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Capacity

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