

Inverters

JX/MX2-V1/RX-V1 Series

Fast Response Inverter for Machine Control

AC PIC » Wide lineup

» Harmonized motor and machine control » Support for open network



Optimal performance for your application

Our Products come with new features and functionality to meet your application.

JX Series Easy-to-use

JX provides a compact solution to a whole range of simple applications, such as conveyor control.

MX2 Series V1 type <u>NEW</u> Born to drive machines

The MX2 gives you better function "Simple Position Control" and "Speed Control". The combination of the NJ and MX2 give you more advantage.

RX Series V1 type <u>NEW</u> Wide range of applications

OMRON provides high level of quality and reliability, and quick customize your inverter to match your precise requirement.

OMRON keep advancing development of new products to meet your needs, in addition to quality and reliability that are commonly required.

MX2 Series V1 type

Page 4

UN STOP

RX Series V1 type

100V

Page 6









Harmonized motor and machine control

Thanks to its advanced design and algorithms, the Inverters provide smooth control down to zero speed, plus precise operation for cyclic operations and torque control capability in open loop.

Open network

Standard industrial networks, such as EtherCAT, and CompoNet or DeviceNet allow you to connect devices, such as Controller, Inverters, I/O Slaves to the same network, which enables faster startup time. Management of devices and networks with a Controller improves the debugging efficiency.

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Wide lineup

Easy-to-use JX Series, born to drive machines MX2 Series V1 type, and RX series V1 type with wide lineup. They offer the best performance for various needs.







Care-se

(and

Easy network integration



The RS-485 Modbus is built into the RS-485 port in the inverter front, making it very easy to add inverters into the network without any extra option boards. Therefore, saving money and space.





Modbus commands are implemented even in low end CP1 PLC family by Modbus-RTU Easy Master functionality, making it easier than ever to integrate the inverters into the network.

Noise Measures for **Peripheral Equipment**



As a noise measure, a built-in radio noise filter is a standard feature on every model* that saves on costs and space compared with the standard external filter solution. *Excluding single-phase/three-phase 200-V models.

No additional devices required



Even advanced functionality such as PID control is standard with the JX inverter making it a convenient solution for applications such as pumps & fans where pressure, flow and other processes need controlling.

Automatic Energy-saving Function



This function automatically minimizes the Inverter output power during constant speed operation. It has a large energy-saving effect when used with fans and pumps.



Side-by-side Mounting **Saves Space**



Mounting the 3G3JX-A2002 to 3G3JX-A2007

When several Inverters are to be mounted in a control panel, side-by-side mounting makes it possible to mount them closely together, thus saving space.

Note: Some models have restrictions in the ambient temperature, carrier frequency, and output current.

Harmonised motor and machine control

Simple positioning control with feedback



Position can be controlled by receiving a feedback pulse from the encoder. Up to 8 positions can be set in the Inverter. Sensors for positioning and Limit Switches can be reduced.

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. Built-in RS-485 Modbus communications.

Free to program <u>NEW</u>



Drive Programming enables you to make your own programs to suit your machine, e.g. for an unwinding application. Up to 1000 lines of code and 5 tasks running in parallel in 2 programming modes. (CX-Drive version 2.80 or higher is required.)

MOTOR CONTROL <u>NEW</u> **Permanent magnet motors**



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

Torque master

Frequency response vs Torque variation Example with 7.5 kW 4-pole motor 200 (%) n 100 ē 0

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





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loop AC vector drives were previously used.

Safety embedded



A contactor to stop the motor is not required, and it is possible to use our Safety Controller reliably together. EN IS013849-1:2008 (Cat.3/PLd)* IEC60204-1 Stop Category 0* *Approval pending



Free to program <u>NEW</u>



Drive Programming enables you to make your own programs to suit your machine, e.g. for an unwinding application. Up to 1000 lines of code and 5 tasks running in parallel in 2 programming modes. (CX-Drive version 2.72 or higher is required.)

Positioning functionality



Simple positioning is handled by the inverter itself without the need for an external motion controller. Functions include pulse trace position control mode, homing and position teaching.

Network Integration <u>NEW</u>



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. Built-in RS-485 Modbus communications.

Vector Control

Space and cost saving



In addition to V/f control, the following control methods are included. This enables a 200% starting torque at 0.3 Hz. -Sensorless vector control -Sensorless vector control in 0-Hz domain -Vector control with a PG



The RX-V1 has built-in radio noise filter/ EMC filter* that saves on costs and space compared with the standard external filter solution. *Selectable

LCD 5 line Digital Operator



The LCD 5 line Digital Operator provides the copy function in addition to setting of various parameters of the Inverter and monitoring frequency and current*. Setup time and maintenance time are reduced. This allows you to operate the Inverter remotely via a special cable*. *Optional

Select the most suitable Inverter by choosing the functions you need for your application.

Selection Based Serie Easy-to-use Inverters f V/f control Side-by-side mounting (standard feature) simple applications Standard-feature Built-in radio noise filter emergency shutoff function uding single-phase/three-phase 200-V n PID function Automatic Energy-saving Modbus-RTU With Machine Automation **RoHS** compliant Side-by-side mounting Sensorless vector control (standard feature) Mentality MOTOR CONTROL Standard-feature emergency shutoff function High starting torque (0.5Hz 200%) Permanent magnet motors Automatic Energy-saving PID function MX2 Series Modbus-RTU Double Rating **V1**type Drive Programming*1 Versatile for a Wide Range of **RoHS** compliant Vector control with a PG (standard feature) Applications 0-Hz domain sensorless vector control Standard-feature Built-in radio noise filter/EMC filter High starting torque emergency shutoff function (selectable) (0.3 Hz 200%) Removable control Automatic Energy-saving PID function terminal block **RX** Series Modbus-RTU Double Rating V1_{type} Drive Programming*2

*1 CX-Drive version 2.80 or higher is required. *2 CX-Drive version 2.72 or higher is required.

Capacity

Sorios	Power supply											Ca	рас	ity (l	kW)									
Series	i ower suppry	0.1	0.2	0.4	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	400
	Three-phase 200 V		•	•	٠	•	•		•	•	•													
JX Series	Single-phase/ three-phase 200 V		•	•	•	•	•																	
	Three-phase 400 V			•	٠	•	•		•	•	٠													
11/2	Three-phase 200 V	٠	٠	•	٠	•	•		•	•	•	•	•											
	Single-phase 200 V	٠	٠	٠	•	•	•																	
V I type	Three-phase 400 V			•	•	•	٠	•	•*	•		•	•											
	Three-phase 200 V			•		•	•		•	•	•	•	•		•	•	•	•	•					
V1 type	Three-phase 400 V			•	•	•	•		•	•	•	٠	•	•	•	•	•	•	•	٠	•	•	•	

Power supply		IV		
Power supply		JX Series	MXZ Series V1 type	KX Series V1 type
Power supply	Three-phase 200 V	0.2 to 7.5kW	0.1kW to 15kW (CT)	0.4 to 55kW(CT)
had been a sile .	Three-phase 400 V	0.4 to 7.5kW	0.4kW to 15kW(CT)	0.4 to 132kW(CT)
and capacity	Single-phase/three-phase 200 V	0.2 to 2.2kW	No	No
	Single-phase 200 V	No	0.1kW to 2.2kW (CT)	No
	V/f control	Yes	Yes	Yes
Control method	Sensorless vector control	No	Yes	Yes
	Vector control with a PG	No	No	Yes
	No. of multi-function I/O points	5 inputs1 transistor output1 relay output	7 inputs2 transistor outputs1 relay output	 9 inputs (1 KUN (FWD) input + 8 multi-function inputs) 5 transistor outputs 1 relay output
Input/output	Analog I/O	 1 input (0 to 10 V, 4 to 20 mA) 1 output (0 to 10 V) 	 2 input (0 to 10 V, 4 to 20 mA) 1 output (0 to 10 V) 	 2 inputs (1) 0 to 10 V, 4 to 20 mA (2) 0 to ±10 V 2 outputs (1) 0 to 10 V (2) 4 to 20 mA 1 PWM voltage output
	Braking resistor connection	No	Yes	Yes (22 kW max.)
Proking	Regenerative Braking Unit connection	Yes	Yes	Yes
braking	Regenerative Braking Unit + braking resistor connection	Yes	Yes	Yes
	Frequency setting range	0.5 to 400 Hz	0.1 to 400 Hz	0.1 to 400 Hz
requency	Frequency output method	Line-to-line sine wave PWM	Line-to-line sine wave PWM	Line-to-line sine wave PWM
un et el le tie e	Side-by-side mounting	Yes	Yes	No
installation	Removable terminal block	No	No	Yes
and writing	Power supply and motor wiring	Top/bottom wiring	Bottom wiring	Bottom wiring
	Radio noise filter	Standard feature (built-in)	Optional (external)	Standard feature (built-in)
NOISe	I/O noise filter	Optional (external)	Optional (external)	Optional (external)
Journermeasures	EMC filter *1	Optional (external)	Optional (external)	Optional (external)
Operation	Digital Operator	Fixed Digital Operator (with adjustment dial)	Removable Digital Operator (with adjustment dial)	Removable Digital Operator (without adjustment dial)
	Autotuning	No	No	Yes
	Multistep speed control	16 steps + jog	16 steps + jog	16 steps + jog
	Carrier frequency setting	2 to 12 kHz (default setting: 3 kHz)	2 to 15 kHz (default setting: 5 kHz)	2 to 15 kHz (default setting: 5 kHz)
	Torque assist function	Manual + auto torque assist	Auto/manual torque assist	Auto/manual torque assist
	PID function	Yes	Yes	Yes
	Absolute value positioning	No	No	Yes
	Emergency shutoff	Yes	Yes	Yes
viain functions	0-Hz domain sensorless vector control	No	No	Yes
	Tripless function	Yes	Yes	Yes
	Momentary power interruption restart	Yes	Yes	Yes
	Double Rating	No	Yes	Yes
	Automatic energy saving	Yes	Yes	Yes
	MOTOR CONTROL Permanent magnet motors	No	Yes	No
	Modbus-RTU	Yes	Yes	Yes
	EtherCAT	No	with Communications Unit attached	with Communications Unit attached
communications	CompoNet	No	with Communications Unit attached	with Communications Unit attached
	DeviceNet	No	with Communications Unit attached	with Communications Unit attached
RoHS		Yes	Yes	Yes
	CE	Yes	Yes	Yes
Safety		Yes	Yes	Yes
Juility	EN IS013849-1:2008 (Cat 3/PL d) *2	No	Yes	No
standards		NU	100	100

1	When	specifications	equivalent to	CE	mark is	required,	use	an	opt	ti
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on Functions		
es	Environmental Consideration	Ease of Use
or	RoHS compliant	

*Three-phase 400V of MX2 Series V1 type: 4.0kW

▲ Under Planning

onal EIVIC flitter. 2 Approval pending

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Option / Tool 12

The following optional items and peripheral devices can be used with the Inverter. Select them according to the application.

Option



Improve the input power	factor of the inverter	
(1) DC Reactor (1) AC Reactor	3G3AX-DL	>
Reduce the affects of radio a	and control device noise	
(2) Radio Noise Filter	3G3AX-ZCL	>
(3) Input Noise Filter	3G3AX-NFI	>
(3) EMC-conforming Input Noise Filter	3G3AX-EFI	>
(4) Output Noise Filter	3G3AX-NFO	>
Enable stopping the ma	achine in a set time	
(5) Braking Resistor	3G3AX-RB	>
(5) Regenerative Braking Units	3G3AX-RBU□□	>
Operates the Inve	rter externally	
(6) Digital Operator	3G3AX-OP□□	>
(7) Digital operator extension cable	3G3AX-OPCN□	>
Control by the o	pen network	
(8) EtherCAT Communication Unit	3G3AX-MX2-ECT 3G3AX-RX-ECT	>
(8) CompoNet Communication Unit	3G3AX-MX2-CRT-E 3G3AX-RX-CRT-E	>
(8) DeviceNet Communication Unit	3G3AX-MX2-DRT-E 3G3AX-RX-DRT-E	>
Expand t	ne I/O	
(9) I/O Unit	3G3AX-MX2-El015-E	>

- Used to improve the input power factor of the Inverter. Install DC and AC reactors for applications with a large power supply capacity (600 kVA or higher).
- Reduces noise coming into the inverter from the power supply line and to reduce noise flowing from the inverter into the power supply line. Connect as close to the Inverter as possible.
- Reduces noise coming into the inverter from the power supply line and to reduce noise flowing from the inverter into the power supply line. Connect as close to the Inverter as possible.
- This input noise filter is for use in systems that must comply with the EC's EMC Directives. Select a filter appropriate for the Inverter model. (for JX series/RX series)
- Reduces noise generated by the Inverter. Connect as close to the Inverter as possible.
- Consumes the regenerative motor energy with a resistor to reduce deceleration time.
- Used with a Braking Resistor when regenerative energy is produced in the 3G3JX or the deceleration time of the motor is needed to be reduced in the 3G3MX2/3G3RX-V1.
- Remote Operator Note: RX series has this operator. It's used separated the Inverter. Extension cable to use a Digital Operator remotely.
- Cable length: 1 m or 3 m
- High-speed control of connected multiple devices with less wiring using EtherCAT communications
- Low-cost control of connected multiple devices with less wiring using CompoNet communications
- Control of connected multiple devices with less wiring using DeviceNet communications.
- Add 8DI, 4DI, 2AI and 1 AO to Use Drive Programming more flexible.





You can realize highly accurate system operation with minimum speed fluctua-

tion and position control via pulse train position command input by detecting the rotation speed of the motor with an Encoder and using the data for feedback. (for RX series)

Software

FA Integrated Tool Package CX-One

Application software to set and control data for Inverters and Servos. **CX-Drive**

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Parameters

Servo Drive or Inverter parameters can be set as easily as with a digital operator. With an EtherCAT, CompoNet or DevivceNet system, Servo Drive parameters can be set and status can be monitored through the PLC.

Use a Connecting Cable (3G3AX-PCACN2) to connect the Inverter with the computer when using the CX-Drive (for JX series/RX Series V1 type). Use a standard USB cable for MX2 series V1 type.

Automation Software Sysmac Studio

Created to give you complete control over your automation system, Sysmac Studio integrates configuration, programming and monitoring. Sysmac Studio can be used when using with NJ-series Controller.



Configuration and monitoring for servo drive and inverter.

Motion control





Network / Connection 14

Machine Control Network

EtherCAT is the fastest emerging network for machine automation. It is Omron's de-facto machine network for our wide range of field and motion devices.

Open Network

You can select the most suitable network for your application by choosing from various open networks. We offer the reliability of a proven track record with the CS/CJ-series PLCs.



Related Catalogs

For details of the JX/MX2-V1/RX-V1 series Inverters, data sheets/catalogs of each product are available.



JX Series Datasheet Cat No. : I918



MX2 Series V1 type Datasheet Cat No. : 1920



RX Series V1 type Datasheet Cat No. : I919

Terms and Conditions of Sale

- 1. Offer; Acceptance. These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms. Prices: Payment Terms, All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice. Discounts, Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
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- except in "break down" situations. b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall
 - constitute delivery to Buyer; c. All sales and shipments of Products shall be FOB shipping point (unless oth-
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 d. Delivery and shipping dates are estimates only; and
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 12. Claims. Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier received the Products
- portation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
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