



Sysmac Catalogue

One Machine Control





Sysmac Catalogue

This document is a selection and design guide helping you to create fast, flexible and reliable machines. Sysmac Automation Platform provides an integrated solution consisting of the best in class machine controller working seamlessly with the best in class field devices across the fastest machine network in the market - EtherCAT. Sysmac Automation Platform is programmed, configured and simulated by one software - Sysmac Studio, and accessed through one connection, EtherNet/IP.

CONTENT

- One Machine Control**
002 Motion, Logic and Vision in one
- One connection**
004 One machine network
- 006 EtherCAT the optimal machine network
- One software**
008 Sysmac Studio for machine creators
010 Sysmac Studio to develop machines
- NJ-Series Machine Automation Controller**
012 Complete and robust machine automation
- G5 Servo system**
014 At the heart of every great machine
- MX2 Inverter**
016 Born to drive machines
- FQ-M Vision Sensor**
018 Designed for object tracking
- 020 **Service and Support**

Main content

One Machine Control

Motion, Logic and Vision in one

Complete machine control through one connection and one software is how we define the new Sysmac machine control. Our new machine automation controller - NJ - that integrates motion, sequencing and network, a new software - Sysmac Studio - that includes configuration, programming, simulation and monitoring plus a fast machine network -EtherCAT - to control motion, vision, sensors and actuators, Sysmac is a powerful and robust ONE automation platform.



EtherCAT®

EtherNet/IP

One machine controller: NJ-Series

For complete control and management of your machine.
Logic and advanced motion control in one

One factory automation network : EtherNet/IP

For local or remote access to the complete machine

One machine network: EtherCAT

For real time control of servo drive, inverter, vision system and I/O



One software: Sysmac Studio

For configuration, programming, simulation and monitoring

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One connection

One machine network

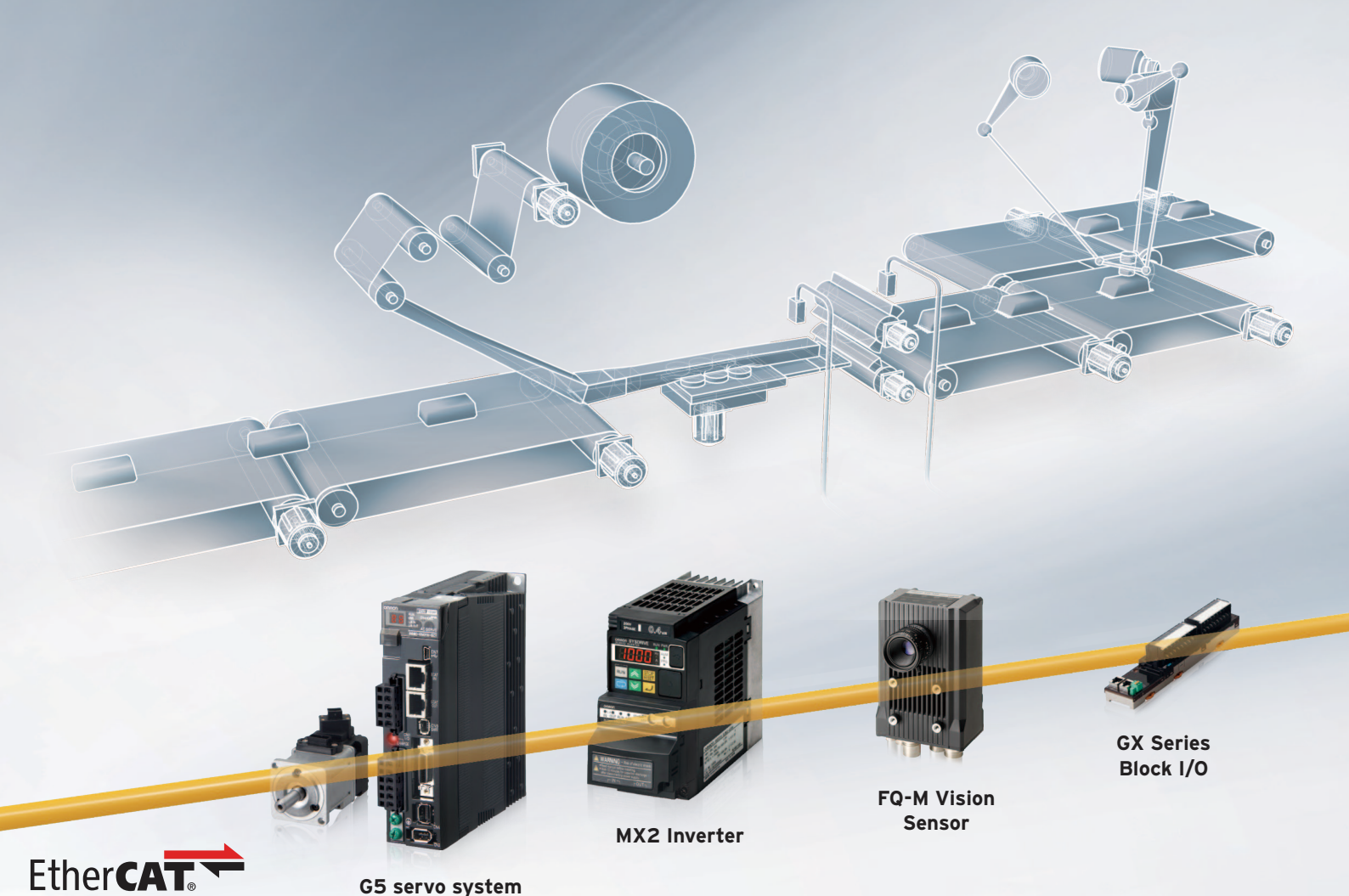
One connection via the NJ-Series controller allows seamless control and communication with both the machine and the factory. The new NJ-Series controllers join the world standard factory automation network, EtherNet/IP, with the best Ethernet-based machine control network, EtherCAT.



EtherNet/IP: the ONE factory automation network

- » Peer-to-Peer controller communication
- » Interface with NS HMI series or SCADA software
- » Interface to Sysmac Studio

IMAGE



EtherCAT

G5 servo system

MX2 Inverter

FQ-M Vision Sensor

GX Series Block I/O

EtherCAT: the ONE machine network

- » Up to 192 slaves
- » Fastest machine network on the market
- » Noise immunity to stringent Omron standards
- » Embedded in Omron servo drive, inverter, vision sensor and I/O
- » Uses standard STP Ethernet cable with RJ45 connectors



DATA

PROGRAM

One connection

EtherCAT the optimal machine network

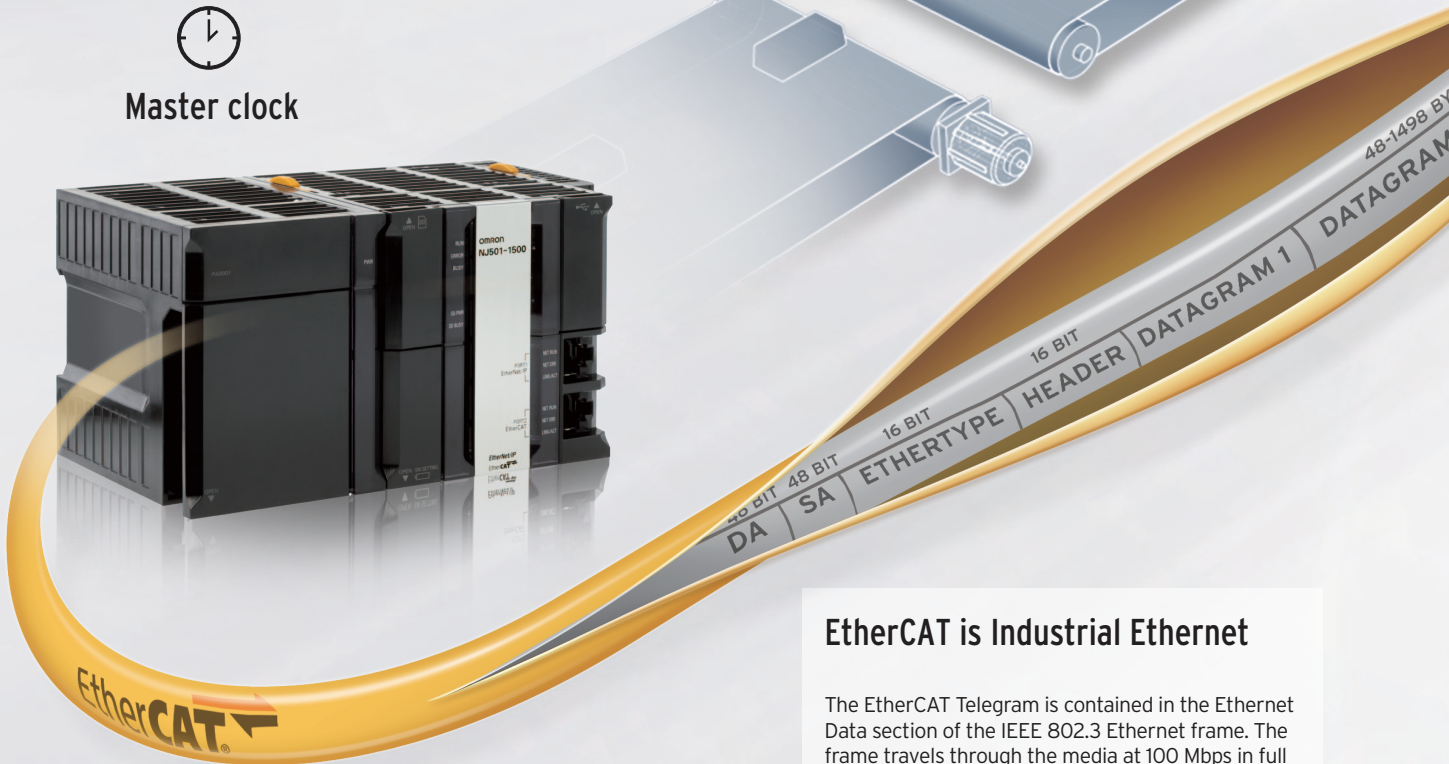
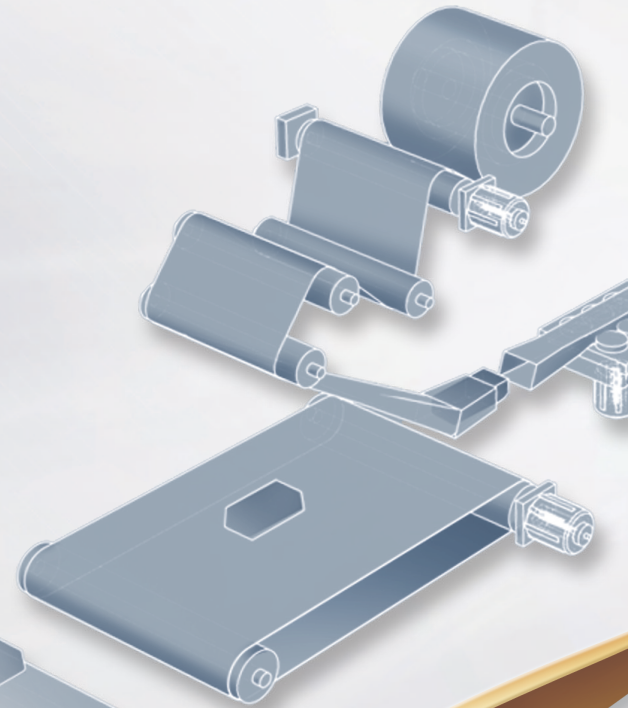
EtherCAT is the fastest emerging network for machine automation. It is Omron's de-facto machine network for our wide range of field and motion devices. It is Ethernet based, fast, accurate and highly efficient in terms of data transmission. All our EtherCAT devices have been designed and tested to meet Omron's stringent requirements on noise immunity.

Key features

- It is industrial Ethernet and uses standard IEEE 802.3 frames.
- It achieves high synchronisation accuracy by using a distributed clock mechanism.
- It is the fastest network on the market with 100 μ s refresh time and less than 1 μ s jitter
- It is simple to set up with automatic address assignment for nodes
- It uses standard Ethernet cables and connectors



Master clock

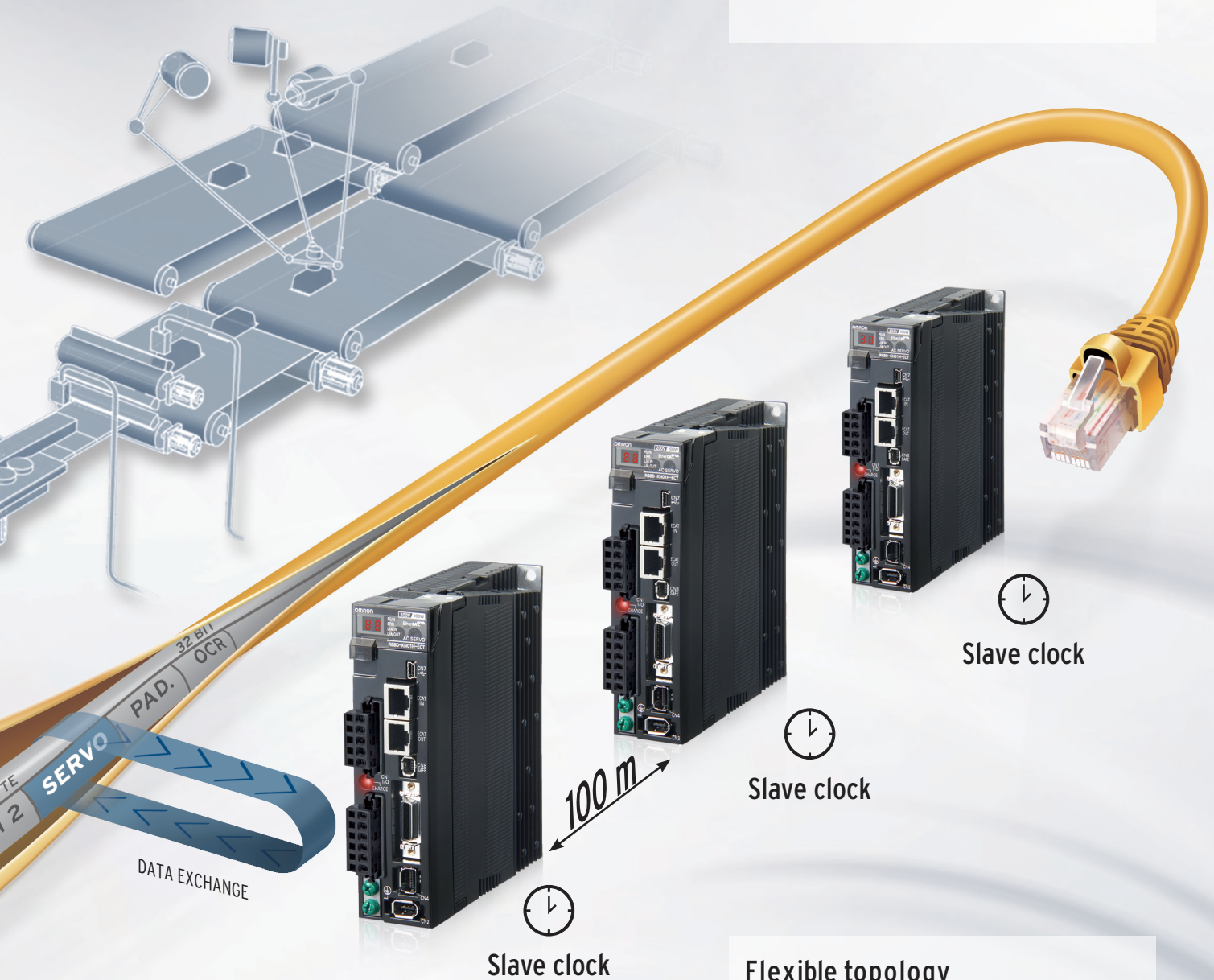


EtherCAT is Industrial Ethernet

The EtherCAT Telegram is contained in the Ethernet Data section of the IEEE 802.3 Ethernet frame. The frame travels through the media at 100 Mbps in full duplex mode.

Simple cabling: 100Base-TX

EtherCAT uses standard 100BASE-TX Ethernet communication very efficiently, over standard shielded Ethernet cables and connectors. No need for network switches.



Flexible topology

With two EtherCAT ports on all devices, no additional switches are required to create a linear network. EtherCAT Junction Slave can be used to build tree and star topologies, which can reduce the amount of cabling.

"On-the-fly" data exchange

The slave devices extract and/or insert data on the fly. This method assures the highest possible throughput.

Distributed clocks

The EtherCAT node slave measures the time difference between incoming and returning frame - timestamp-. With these timestamps the master can determine the propagation delay offset to the individual slave accurately. This mechanism ensures accurate synchronisation between devices within less than 1 μ s jitter.

One software

Sysmac Studio for machine creators

Turning machine programmers into machine creators is the driving vision behind Sysmac Studio. Cutting programming, debugging and set-up time while maximising the functionality and performance of your machine is our ultimate goal. For this Sysmac Studio aims to offer ONE software for the complete machine. A software tool that only needs to be learned once, programmed, tested and tuned as one and secured as a whole.

Learn it ONCE
Develop it FAST
Test it in ONE
Secure it ALL



Learn it ONCE

- » One software for motion, drives and vision
- » Fully compliant with open standard IEC 61131-3
- » One design and operation environment for configuration, programming and monitoring

Develop it FAST

- » Supports Ladder, Structured Text and Function Block programming with a rich instruction set
- » CAM editor for easy programming of complex motion profiles
- » Intuitive editor with auto-complete assistance for Ladder and Structured Text programming

Test it in ONE

- » One simulation tool for sequence and motion in a 3D environment
- » Complete or partial program can be simulated and debugged
- » Data trending for tuning and debugging

Secure it ALL

- » Advanced security function with 32 digit security password.
- » Complete project or single Function Block can be protected
- » Machine cloning prevention



One software

Sysmac Studio to develop machines

Created to give you complete control over your automation system, Sysmac Studio integrates configuration, programming and monitoring. Graphics-oriented configuration allows quick set-up of the controller, field devices and networks while machine and motion programming based on IEC standard and PLCopen Function Blocks for Motion Control cuts programming time. Smart Editor with On-line debugging helps quick and error free programming. Advanced simulation of sequence and motion control, data trace reduce machine tuning and set-up.

Design and operability

Unified design environment is provided for programming, configuration and monitoring. It also offers intuitive navigation between control modes.

Motion control

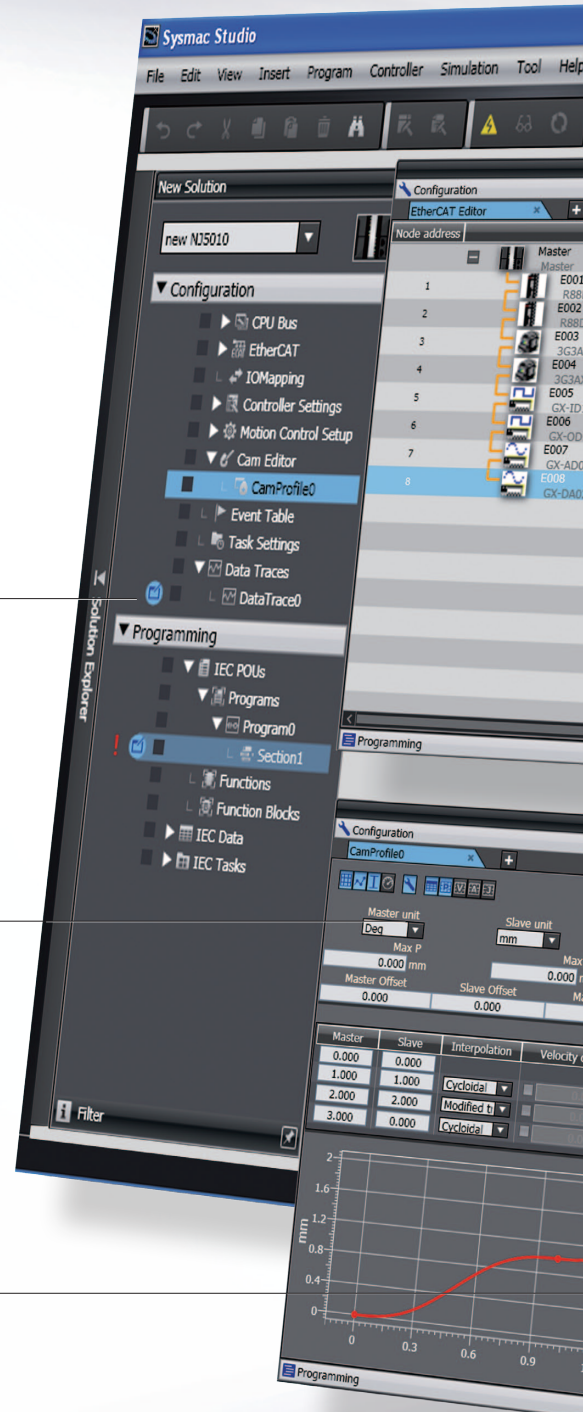
The graphical CAM editor allows quick implementation of complex motion profiles. CAM tables can be modified on the fly. A PLCopen Function Blocks for the Motion Control library are available to implement general purpose motion control.

Simulation

Motion trajectories in 3D can be pre-tested with advanced simulation of sequence and motion control. Simulation of single Function Blocks, POU's or the entire program can be performed. In addition all standard features such as Break & Step are available.

Data tracing

Easy system tuning thanks to integrated and synchronised data tracing of motion commands, position and speed feedback and I/O status and values.



Configuration

Simple drag & drop configuration for controller, network, servo-axis and other field devices.

Programming

Multi-tasking and fully compliant with IEC61131-3 standard. The program editor includes smart support functions such as syntax error check and clear colour segregation of variables and symbols. ST instructions can be directly written in Ladder programs thanks to in-line ST function.



NJ-Series Machine Automation Controller

Complete and robust machine automation

The NJ-Series Machine Automation Controller is at the heart of the new Sysmac platform. One integrated machine controller that offers speed, flexibility and scalability of software centric architecture without compromising on the traditional reliability and robustness that you have come to expect from Omron PLCs. The NJ-Series is designed to meet extreme machine control requirements in terms of motion control speed and accuracy, communication, security and robustness. You just create...

Hardware design

- Architecture Based on new Intel® Atom™ Processor
- The most compact controller in its class (According to January 2012)
- Built-in USB port and SD card slot
- Fan-less cooling

- Motion control
- Up to 64 axis control
- Single axis moves and axes interpolation
- Electronic cams and gearboxes

System robustness

- One event log for controller, field devices and networks
- Standard PLC system check: Watch-Dog Timer, memory check, network topology check, etc.

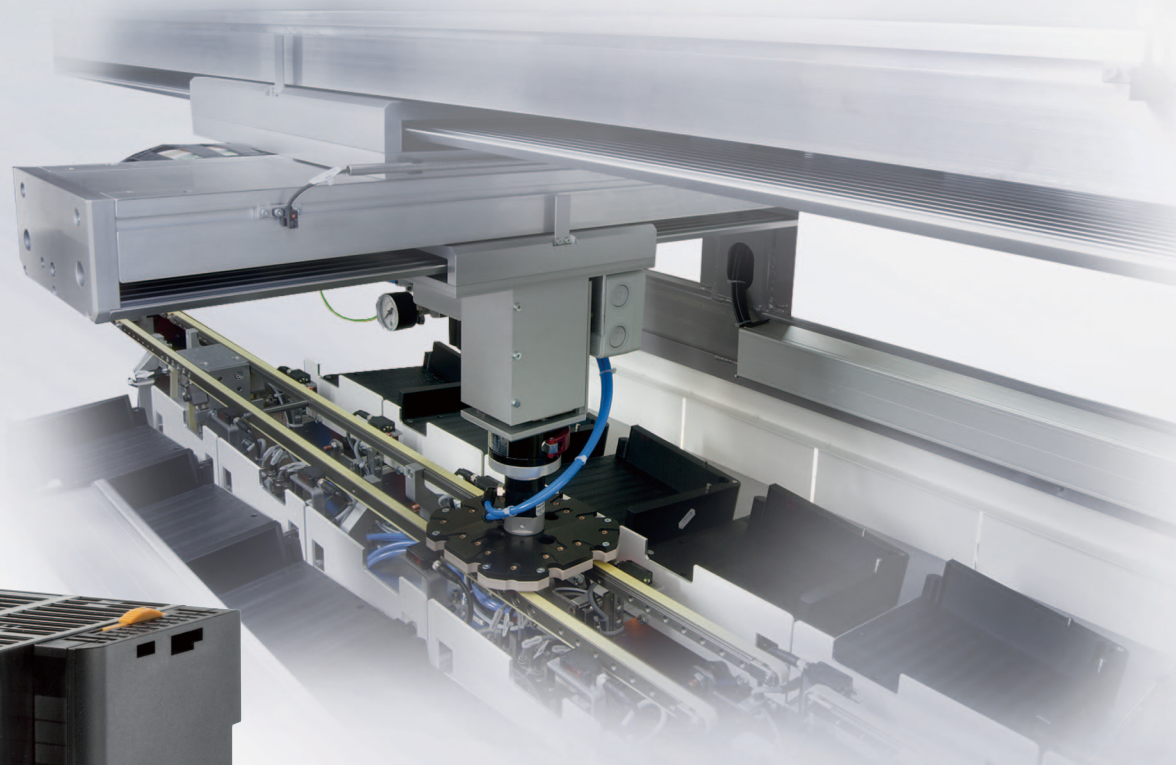
NJ-Series controller features

- Scalable CPUs for 4, 8, 16, 32 and 64 axes
- Motion controller supporting up to 64 servo axes
- EtherNet/IP and EtherCAT ports embedded
- Up to 192 EtherCAT Slaves (64 axes)
- Standard IEC 61131-3 programming
- Certified PLCopen Function Blocks for Motion Control
- Linear and circular interpolation
- Linear and infinite axes management
- Electronic Gear and CAM synchronisation
- Global standards CE, cULus, NK, LR

Machine control

- Seamless integration of Logic and Motion
- Synchronous control of all machine network devices
- Works with most CJ PLC series modules





Standard Factory network

- Programming
- Other Machine controllers
- HMI / SCADA
- IT systems



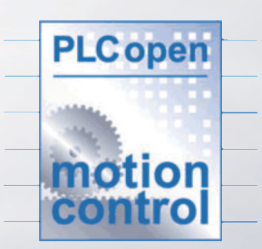
Standard Machine network

- Servos
- Inverters
- Vision systems
- Distributed I/O



Standard programming

- Fully conforms IEC 61131-3 standards
- PLCopen Function Blocks for Motion Control



This product incorporates certain third party software. The license and copyright information associated with this software is available at http://www.fa.omron.co.jp/hj_info_e/

G5 Servo system

At the heart of every great machine

Great machines are born from a perfect match between control and mechanics. G5 gives you that extra edge to build more accurate, faster, smaller and safer machines.



EtherCAT connectivity

- Compliant with CoE -CiA402 Drive profile-
- Cyclic synchronous Position, Velocity and Torque modes
- Embedded Gear Ratio, Homing and Profile Position mode
- Distributed clock to ensure high precision synchronisation

G5 servo system features

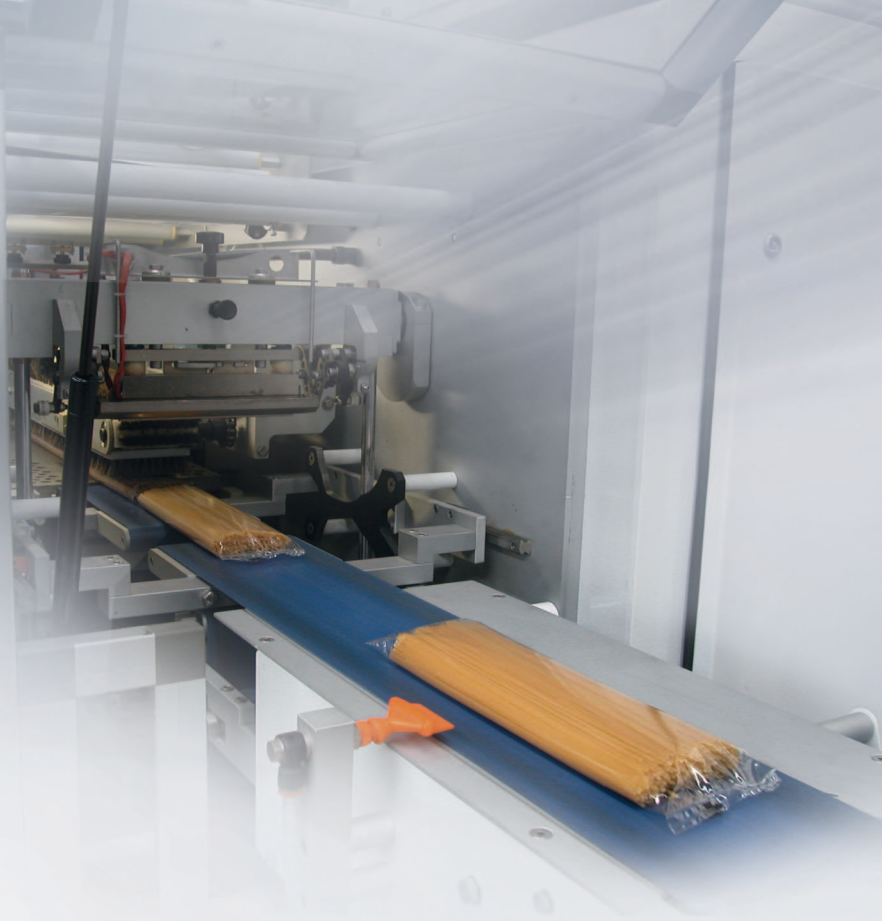
- Compact size servo drives with EtherCAT connectivity built-in
- High-response frequency of 2 kHz
- Load vibration suppression
- Embedded Safety conforming ISO13849-1 Performance Level c,d
- Advanced tuning algorithms (Anti-vibration function, torque feedforward, disturbance observer)
- Wide range of linear and rotary servo motors





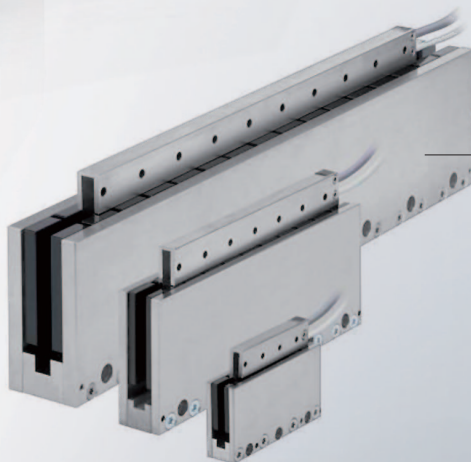
Safety conformance

- PLc,d according ISO13849-1
- STO: IEC61800-5-2
- SIL2 according to EN61508



Improved rotary motors

- Low cogging torque servo motors
- High accuracy provided by 20 bit encoder
- IP67 for all motors and connectors
- Large range of motors from 0.16 Nm up to 96 Nm nominal torque (224 Nm peak)

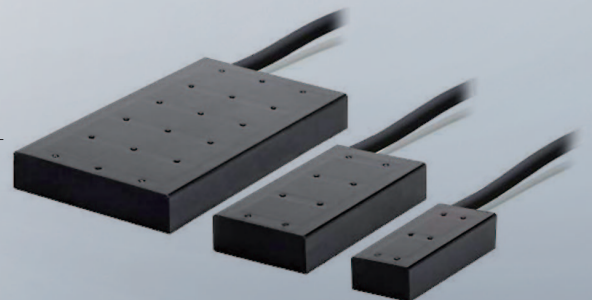


Ironless linear motors*

- Compact, efficient design
- Excellent force-to-weight ratio
- No latching force

Iron-core linear motors*

- Compact, flat design
- Optimum ratio between force and volume
- Weight-optimized magnetic track



* Available as of spring 2012

MX2 Inverter

Born to drive machines

Thanks to its advanced design and algorithms, the MX2 provides smooth control down to zero speed, plus precise operation for cyclic operations and torque control capability in open loop. The MX2 is fully integrated within the Omron Sysmac automation platform.

Torque control in open loop

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

EtherCAT®

EtherCAT connectivity

- Compliant with CoE -CiA402 Drive profile-
- Velocity mode



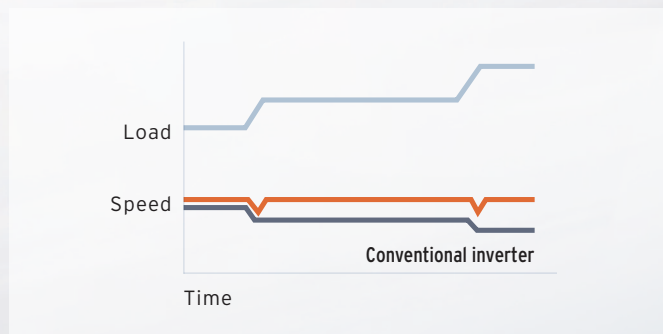
MX2 features

- Torque control in open loop, ideal for low to medium torque applications.
- 200% starting torque near stand-still operation (0.5Hz)
- Double rating VT 120%/1 min and CT 150%/1 min



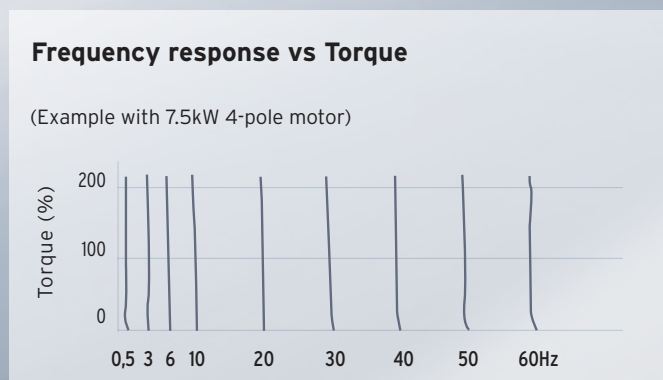
Quick response to load fluctuation

- MX2 provides accurate speed control with less than 2% error at 1 Hz
- Stable control without decreasing machine speed improves quality and productivity



200% starting torque

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



FQ-M Vision Sensor

Designed for object tracking

The new FQ-M series is a vision sensor designed specifically for Pick & Place applications. It comes with EtherCAT embedded and can be configured and monitored from Sysmac Studio software. The FQ-M series is compact, fast and includes an incremental encoder input for easy tracking and calibration.



Connectivity

- EtherCAT port for object tracking
- Ethernet port for advanced configuration and monitoring
- Encoder input for accurate "on the fly tracking" and easy calibration
- Automatic strobe timing control

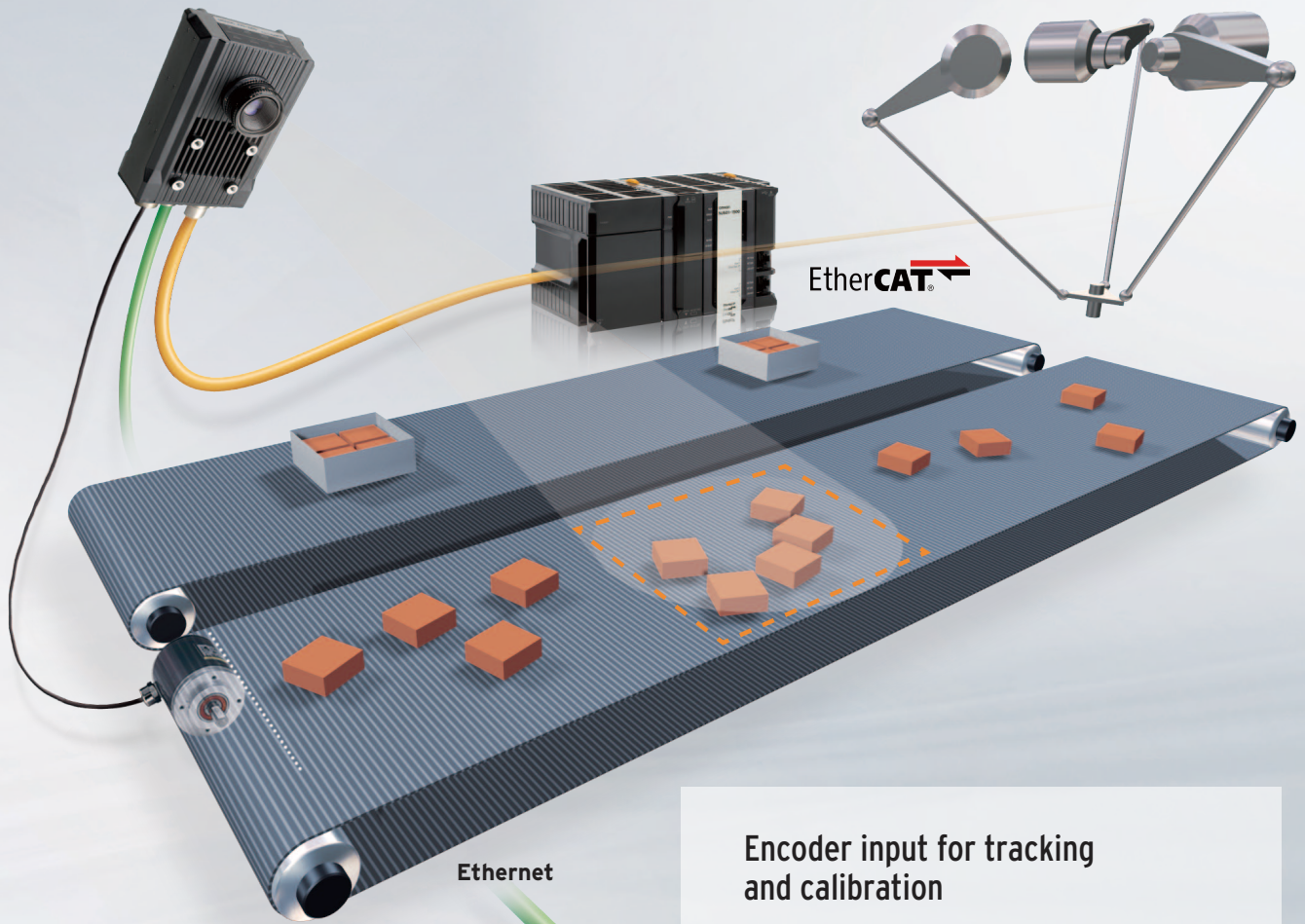
Detection

- Up to 5000 pieces per minute with 360 degree rotation
- Stable and robust detection under changeable environmental conditions

Key features

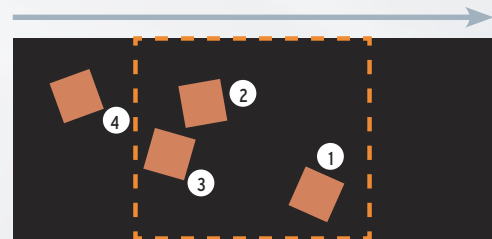
- Made specifically for tracking applications
- Designed to work within Sysmac integrated automation with embedded EtherCAT and integrated software tool
- Smart camera with EtherCAT: camera, image processing and connectivity in one
- Vision sensor with encoder input for tracking function
- Calibration function of the complete system
- Can inspect small and large objects
- Sysmac Studio software for vision system operation and setting



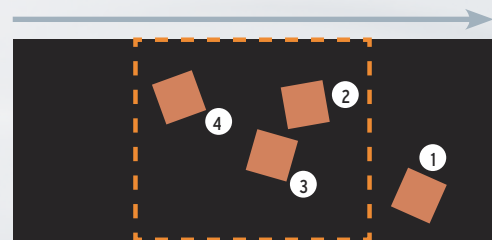


Encoder input for tracking and calibration

- » The assisted calibration procedure simplifies the overall system set-up.
- » Objects that overlap within more than one field of view are segregated and its data is ignored.



First shot: The position and orientation data of pieces 1, 2 and 3 are sent to the controller.



Next shot: Only the position and orientation data of piece 4 are sent to the controller.

Design

- Camera and image processing in one
- Standard C-mount lenses; choose the field of view and focus distance you need
- Variety of industrial connector types (angled, straight) for correct mounting

Software tool

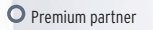
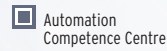
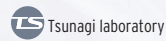
- Fully integrated within the Sysmac Studio software tool
- Intuitive and icon driven set-up and configuration
- Trending and logging function

Service and Support



OMRON technical offices across the World

PRESENCE



COMPETENCE

Design

OMRON



Our wide network of machine automation specialists will help you to select the right automation architecture and products to meet your requirements. Our flat structure based on expert-to-expert contact ensures that you will have ONE accountable and responsible expert to deal with on your complete project.

Proof of concept



As your project matures make use of our Automation centers to test and catch-up with technology trends in motion, robotics, networking, safety, quality control etc. Make use of our Tsunagi (connectivity) laboratory to interface, test and validate your complete system with our new machine network (EtherCAT) and factory network (EtherNet/IP).

We will assign a dedicated application engineer to assist with initial programming and proof testing of the critical aspects of your automation system. Our application engineers have in-depth expertise in and knowledge of networks, PLCs, motion, safety and HMIs when applied to machine automation.



CONFIDENCE

ASSURANCE

Development



During your prototyping phase you will need flexibility in technical support, product supply and exchange. We will assign an inside sales contact to help you with you source the correct products fast during your prototyping phase.

Commissioning



With our world-wide network for service and support the export of your product is made simple, we will support you on-site with your customer, anywhere in the world. We can arrange a liaison sales engineer to facilitate training, spare parts supply or even machine commissioning. All this in a localised language with localised documentation - giving you complete peace of mind.

Serial production



As your production increases we will engage in supplying you within 24hrs and repairing within 3 days. All our products are global products meeting global standards - CE, cULus, NK, LR -



System Design Guide

System Configuration

| | |
|-------------------------------------|---|
| EtherCAT Network Configuration..... | 2 |
| Network Configuration..... | 3 |

Machine Automation Controller NJ-Series

| | |
|--|----|
| Features | 5 |
| Unit Configuration..... | 6 |
| Power Supply Units Current Consumption | 11 |
| Dimensions..... | 12 |
| General Specifications | 15 |
| Performance Specifications | 16 |
| Function Specifications | 18 |
| Version Information..... | 24 |
| Components and Functions | 24 |

Automation software Sysmac Studio

| | |
|-------------------------------|----|
| Features | 25 |
| System Requirements | 26 |
| Function Specifications | 27 |
| Applicable Models | 33 |
| Web Support Services..... | 33 |

AC Servomotors/Drives G5-Series

| | |
|----------------------------|----|
| System Configuration | 34 |
|----------------------------|----|

G5-Series AC Servo Drives with Built-in EtherCAT Communications

| | |
|--|----|
| General Specifications | 36 |
| Performance Specifications | 37 |
| EtherCAT Communications Specifications | 39 |
| Version Information..... | 39 |
| Components and Functions | 40 |
| Dimensions..... | 41 |

G5-Series AC Servomotors

| | |
|--|----|
| General Specifications | 46 |
| Performance Specifications / Torque and Rotation Speed Characteristics | 47 |
| Encoder Specifications | 58 |
| Dimensions..... | 59 |
| Combination table..... | 73 |

Multi-function Compact Inverter MX2-Series

| | |
|----------------------------------|----|
| Performance Specifications | 80 |
| Function Specifications | 83 |
| Version Information..... | 84 |
| Components and Functions | 85 |
| Connection Diagram..... | 86 |
| Dimensions..... | 87 |

Vision Sensor FQ-M-Series

| | |
|--|----|
| System configuration | 91 |
| Specifications | 92 |
| FQ-M Series EtherCAT Communications Specifications | 94 |
| Version Information..... | 94 |
| Components and Functions | 95 |
| Dimensions..... | 96 |
| Optical Chart | 98 |

Photoelectric Sensors E3X-HD0

| | |
|--------------------------------|-----|
| General Specifications | 99 |
| Version Information..... | 101 |
| Components and Functions | 101 |
| Dimensions..... | 102 |

EtherCAT Remote I/O Terminals GX-Series

| | |
|--|-----|
| General Specifications | 103 |
| EtherCAT Communications Specifications | 104 |
| Version Information..... | 104 |

Digital I/O Terminal 2-tier Terminal Block Type

Digital I/O Terminal 3-tier Terminal Block Type

Digital I/O Terminal e-CON Connector Type

Analog I/O Terminal 2-tier Terminal Block Type

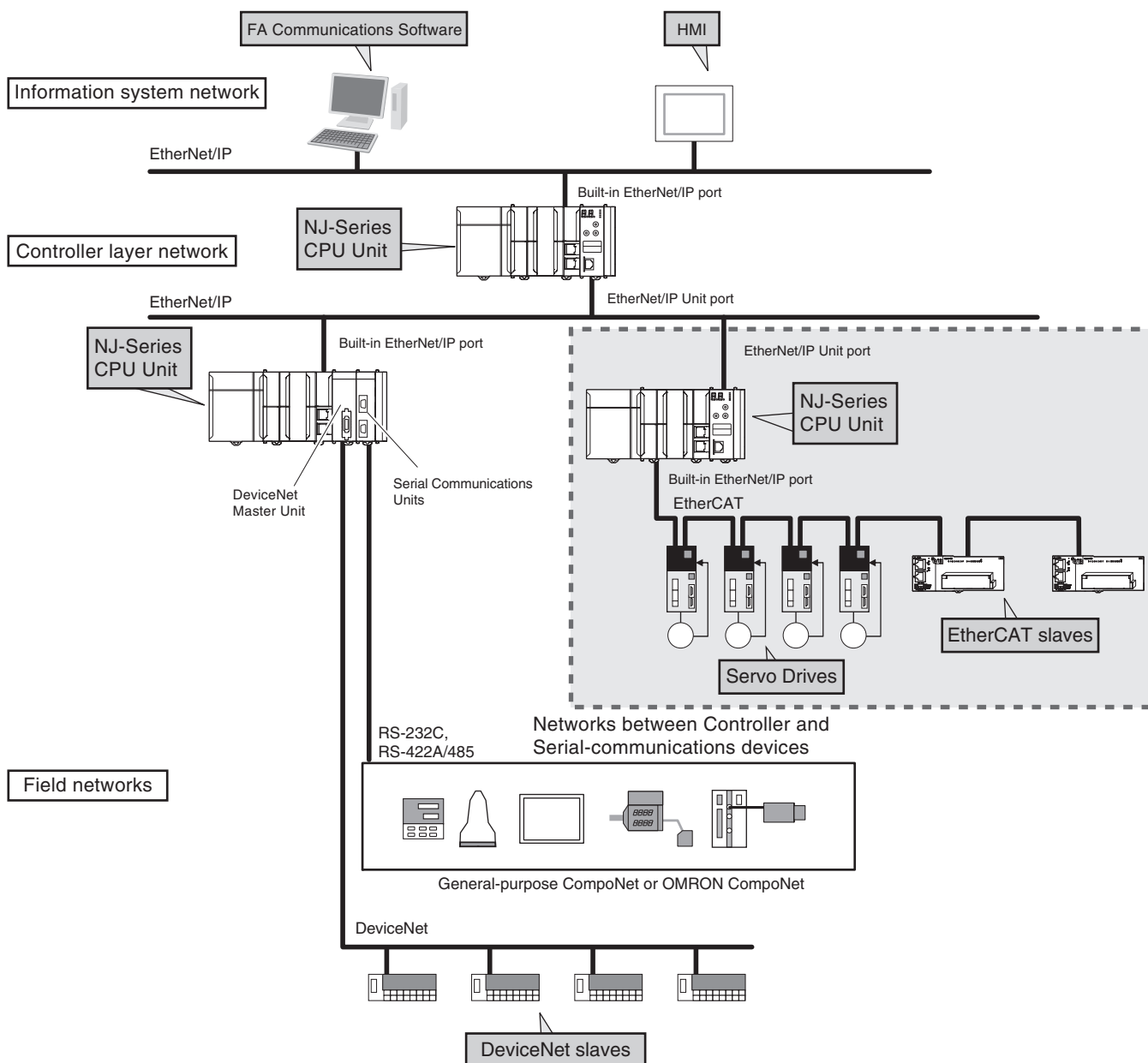
Encoder Input Terminal 3-tier Terminal Block Type.....

Expansion Units

System Configuration

EtherCAT Network Configuration

With an NJ-Series, you can use an EtherCAT network as a basic system.

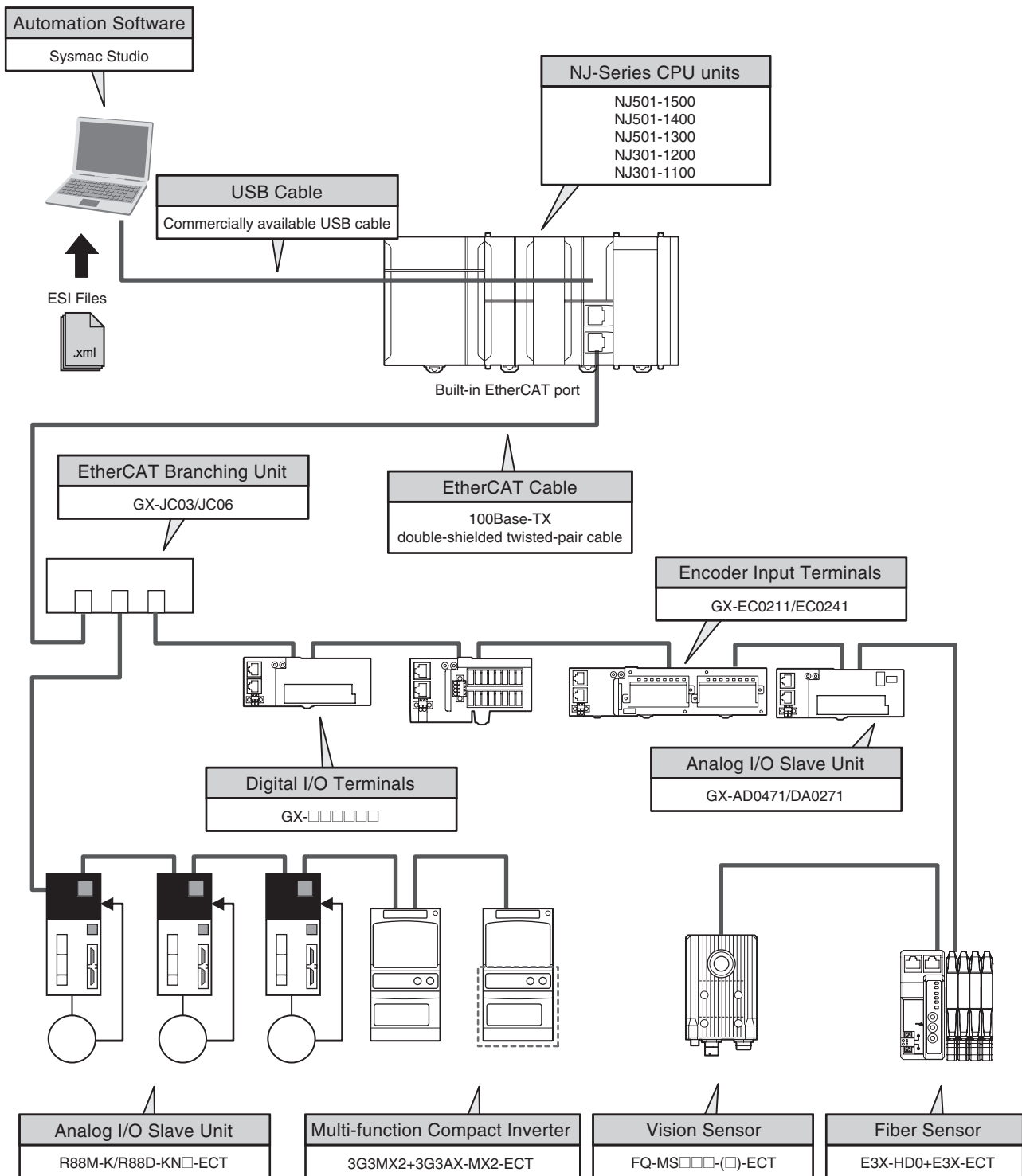


| Level | Features | Network type | Protocols | Required devices |
|--|--|-----------------------|--|---|
| Information networks | Various communications with host computer | EtherNet/IP | <ul style="list-style-type: none"> • CIP message communications • FTP server • Socket service • NTP client | Built-in EtherNet/IP port EtherNet/IP Unit * |
| Networks between Controllers | High-speed communication between Controllers | EtherNet/IP | <ul style="list-style-type: none"> • Tag data link communications • CIP message communications • Socket service | |
| Networks between Controllers and serial-communications devices | Wide range of protocol selections | Serial Communications | Protocol Macro, No-protocol, CompoWay/F, Modbus, NT Link, and Host Link | Serial Communications Units |
| Field networks | High-speed, highprecision communications with Servo Drives and generalpurpose slaves | EtherCAT | EtherCAT protocol | Built-in EtherCAT port |
| | High-speed, multipoint, multi-node connection with different types of slaves | DeviceNet | DeviceNet protocol | DeviceNet Master Unit |

* Supported only by the EtherNet/IP Units with unit version 2.1 or later , CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

Network Configuration

You can make networks in the following layers with an NJ-Series Controller.



System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
EtherCAT Network Configuration
Network Configuration
Multi-function Compact Inverter
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

Machine Automation Controller

NJ-Series

Machine Automation Controller

NJ-Series

New controller that covers functions and high-speed processing required for machine control and safety, reliability and maintainability that are the features of industrial controllers.



NJ501-1500

Features

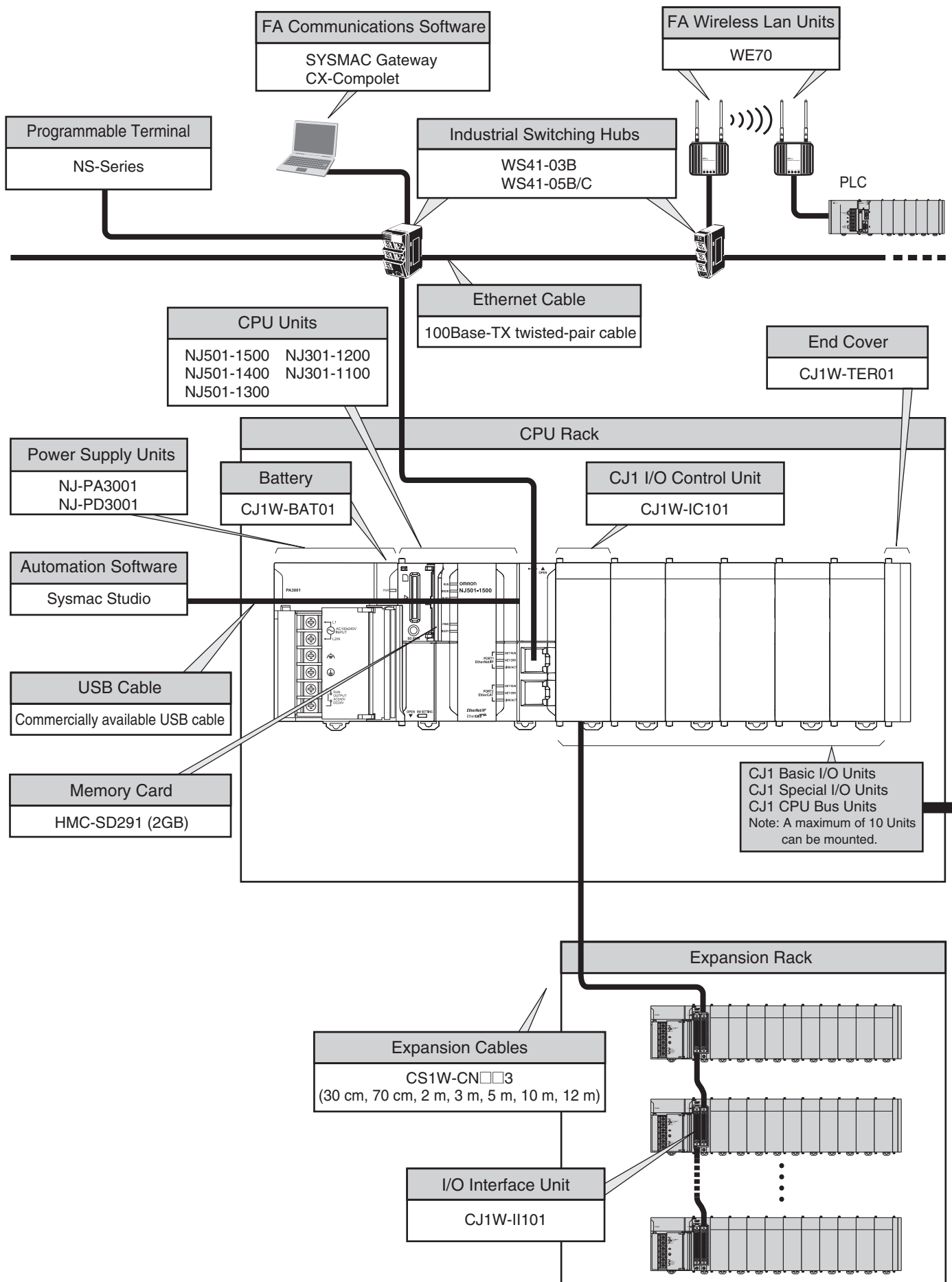
- Architecture based on the Intel® Atom™ processor achieves high-speed processing.
 - The user program including the double precision floating point arithmetic instruction that is necessary for the coordinates correction, ST language and Function Blocks is executed fast, as well as the basic instructions and the special instructions.
- Integration of Logic and Motion in one CPU.
- Scalable CPUs for 4, 8, 16, 32 and 64 axes.
- Synchronous control of all machine network devices : vision sensors, servo drives and field devices with the machine control network, EtherCAT.
Synchronize the PLC Engine and the Motion Engine with the EtherCAT control period. Fast and highly-accurate control is possible.
- Standard programming : Conforms IEC 61131-3 standards, variable-based instructions including the PLCopen Motion function blocks
- Complete and robust machine automation: fast control performance and basic functions and reliability of industrial controllers.
 - Fan-free operation in ambient temperature between 0 to 55°C.
 - Complete RAS functions: Transmission frame error check, timeout, bus diagnosis, Watchdog (WDT), memory check, and topology check, etc.

This product incorporates certain third party software.

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Unit Configuration

Basic System



Configuration Units

| CJ1 Basic I/O Units | | | |
|---|---|---|---|
| 8-point Units | 16-point Units | 32-point Units | 64-point Units |
| Input Units | | | |
| <ul style="list-style-type: none"> ● DC Input Unit CJ1W-ID201 ● AC Input Unit CJ1W-IA201 | <ul style="list-style-type: none"> ● DC Input Unit CJ1W-ID211 ● CJ1W-ID212 <small>High-speed type</small> ● AC Input Unit CJ1W-IA111 | <ul style="list-style-type: none"> ● DC Input Unit CJ1W-ID231 ● CJ1W-ID232 ● CJ1W-ID233 <small>High-speed type</small> | <ul style="list-style-type: none"> ● DC Input Unit CJ1W-ID261 ● CJ1W-ID262 |
| Output Units | | | |
| <ul style="list-style-type: none"> ● Relay Contact Output Unit (independent commons) CJ1W-OC201 ● Triac Output Unit CJ1W-OA201 ● Transistor Output Units CJ1W-OD201 CJ1W-OD203 CJ1W-OD202 CJ1W-OD204 | <ul style="list-style-type: none"> ● Relay Contact Output Unit CJ1W-OC211 ● Transistor Output Units CJ1W-OD211 ● CJ1W-OD213 <small>High-speed type</small> ● CJ1W-OD212 | <ul style="list-style-type: none"> ● Transistor Output Units CJ1W-OD231 ● CJ1W-OD233 ● CJ1W-OD234 <small>High-speed type</small> ● CJ1W-OD232 | <ul style="list-style-type: none"> ● Transistor Output Units CJ1W-OD261 ● CJ1W-OD263 ● CJ1W-OD262 |
| I/O Units | | | |
| --- | --- | (16 inputs, 16 outputs) ● DC Input/Transistor Output Units CJ1W-MD231 CJ1W-MD233 CJ1W-MD232 | 32 inputs, 32 outputs ● DC Input/Transistor Output Units CJ1W-MD261 CJ1W-MD263 32 inputs, 32 outputs ● TTL I/O Unit CJ1W-MD563 |
| Other Units | | | |
| --- | <ul style="list-style-type: none"> ● Quick-response Input Unit CJ1W-IDP01 | --- | <ul style="list-style-type: none"> ● B7A Interface Units (64 inputs) CJ1W-B7A14 (64 outputs) CJ1W-B7A04 (32 inputs, 32 outputs) CJ1W-B7A22 |

| CJ1 Special I/O Units and CPU Bus Units | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> ■ Process I/O Units ● Isolated-type Units with Universal Inputs CJ1W-PH41U CJ1W-AD04U ● Isolated-type DC Input Unit CJ1W-PDC15 ■ Analog I/O Units ● Analog Input Units CJ1W-AD042 <small>High-speed type</small> ● CJ1W-AD081-V1 ● CJ1W-AD041-V1 ● Analog Output Units CJ1W-DA042V <small>High-speed type</small> ● CJ1W-DA08V ● CJ1W-DA08C ● CJ1W-DA041 ● CJ1W-DA021 ● Analog I/O Units CJ1W-MAD42 ■ Temperature Control Units CJ1W-TC003, CJ1W-TC004 CJ1W-TC103, CJ1W-TC104 | <ul style="list-style-type: none"> ■ High-speed Counter Units CJ1W-CT021 | <ul style="list-style-type: none"> ■ Serial Communications Units CJ1W-SCU22 <small>High-speed type</small> ● CJ1W-SCU32 <small>High-speed type</small> ● CJ1W-SCU42 <small>High-speed type</small> ■ EtherNet/IP Unit CJ1W-EIP21 *1 ■ DeviceNet Unit CJ1W-DRM21 ■ CompoNet Master Unit CJ1W-CRM21 *2 | <ul style="list-style-type: none"> ■ ID Sensor Units CJ1W-V680C11 CJ1W-V680C12 |

*1. Supported only by the EtherNet/IP Units with unit version 2.1 or later, CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

*2. Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

Features

Unit Configuration

Power Supply Units Current Consumption

Dimensions

General Specifications

Performance Specifications

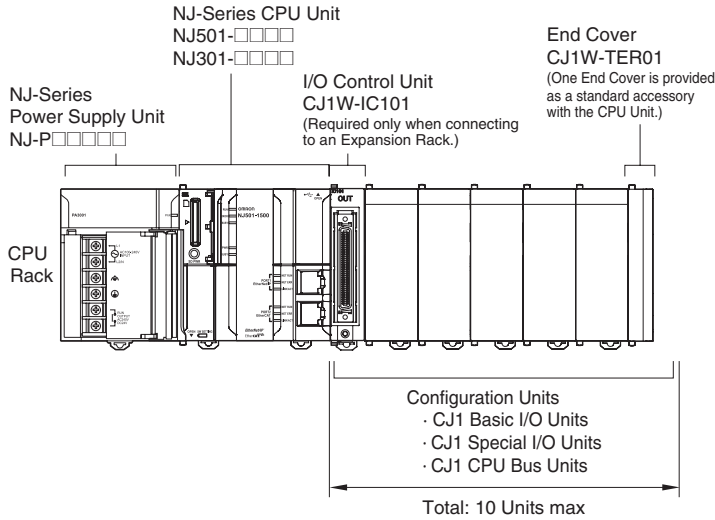
Function Specifications

Version Information

Components and Functions

NJ-Series CPU Racks

A NJ-Series CPU Rack consists of a CPU Unit, Power Supply Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.



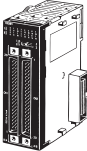
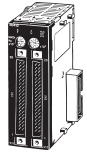
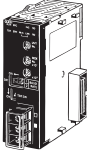
Even though the NJ-Series Controllers do not have Backplanes, the term “slot” still used to refer to the location of Units. Slot numbers are assigned in order to Units from left to right on the CPU Rack (slot 0, slot 1, slot 2, etc.).

● Required Units

| Rack | Unit name | Required number of Units |
|----------|-------------------------------|--|
| CPU Rack | NJ-Series Power Supply Unit | 1 |
| | NJ-Series CPU Unit | 1 |
| | I/O Control Unit | Required only for mounting to an Expansion Rack. Mount the I/O Control Unit immediately to the right of the CPU Unit. |
| | Number of Configuration Units | 10 max. (Same for all models of CPU Unit.) (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. The number does not include the I/O Control Unit.) |
| | End Cover | 1 (Included with CPU Unit.) |

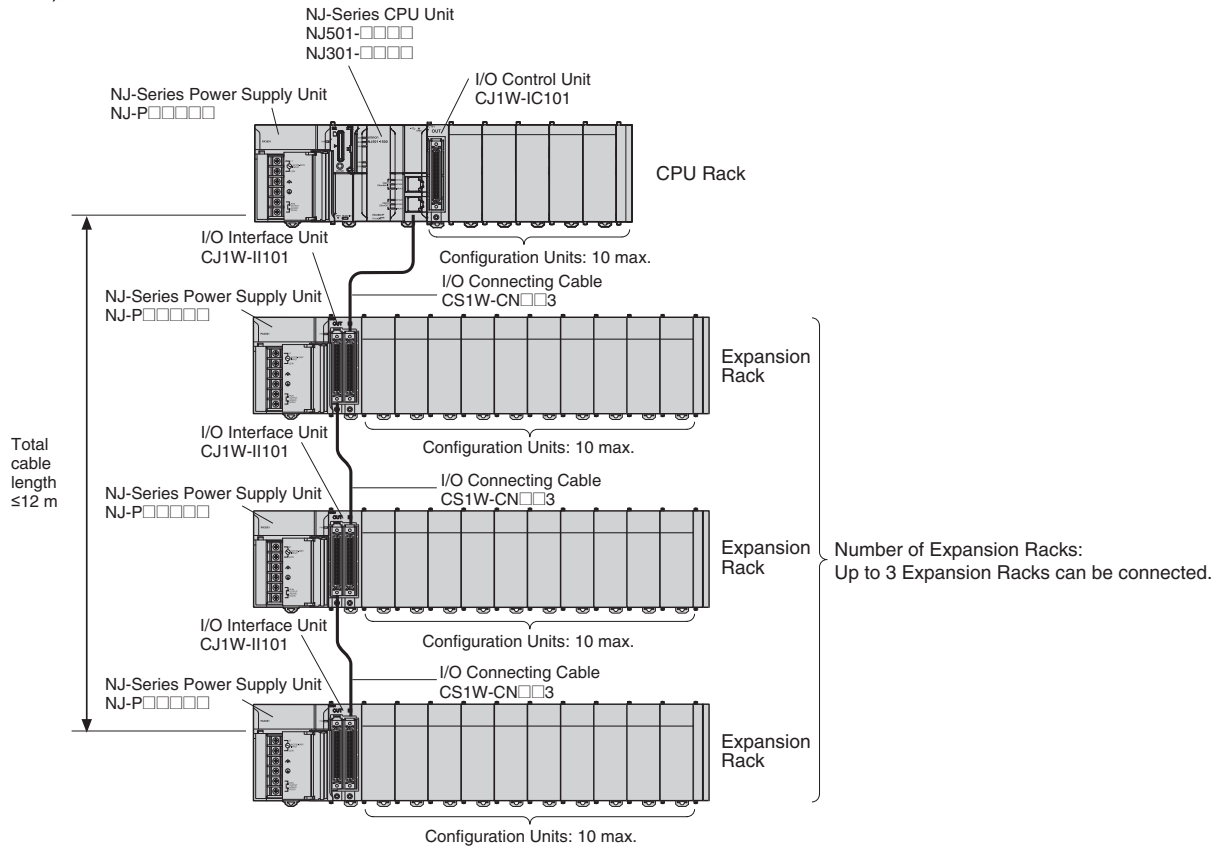
● Types of Configuration Units

In the NJ-Series, Configuration Units are classified into the following three types. The number of Racks differs depending on the type.

| Type | Appearance (example) | Description | Unit recognition method | Max. Units mountable per CPU Unit |
|-------------------|---|--|--|--|
| Basic I/O Units |  | Units with contact inputs and contact outputs. | Recognized by the CPU Unit according to the position of the Rack and slot. | A maximum of 40 Units can be mounted. |
| Special I/O Units |  | Special I/O Units provide more advanced functions than do Basic I/O Units, including I/O other than contact inputs and contact outputs. Examples of Special I/O Units are Analog I/O Units and High-speed Counter Units. They differ from CPU Bus Units (including Network Communications Units) in having a smaller area for exchanging data with the CPU Unit. | Recognized by the CPU Unit according to the unit number (0 to 95) set with the rotary switches on the front panel. | A maximum of 40 Units can be connected. (Multiple unit numbers are allocated per Unit, depending on the model and settings.) |
| CPU Bus Units |  | CPU Bus Units exchange data with the CPU Unit via the CPU Bus. Examples of CPU Bus Units are Network Communications Units and Serial Communications Units. They differ from Special I/O Units in having a larger area for exchanging data with the CPU Unit. | Recognized by the CPU Unit according to the unit number (0 to F) set with the rotary switch on the front panel. | A maximum of 16 Units can be mounted. |

NJ-Series Expansion Racks

A NJ-Series Expansion Rack consists of a Power Supply Unit, an I/O Interface Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.



● Required Units

| Rack | Unit name | Required number of Units |
|----------------|-------------------------------|--|
| CPU Rack | I/O Control Unit | One Unit. Required only when an Expansion Rack is used. Mount the I/O Control Unit immediately to the right of the CPU Unit. *1 |
| Expansion Rack | Power Supply Unit | One Unit |
| | I/O Interface Unit | One Unit. Mount the I/O Interface Unit immediately to the right of the Power Supply Unit. *2 |
| | Number of Configuration Units | Ten Units max. (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. This number does not include the I/O Interface Unit.) |
| | End Cover | One (Included with the I/O Interface Unit.) |

*1 Mounting the I/O Control Unit in any other location may cause faulty operation.

*2 Mounting the I/O Interface Unit in any other location may cause faulty operation.

Configuration Units

● Maximum Number of Configuration Units That Can Be Mounted

| CPU Unit | Model | Total Units | No. of Units on CPU Rack | No. of Expansion Racks |
|--------------------|------------|-------------|--------------------------|------------------------|
| NJ-Series CPU Unit | NJ501-1500 | 40 | 10 per Rack | 3 Racks x 10 Units |
| | NJ501-1400 | | | |
| | NJ501-1300 | | | |
| | NJ301-1200 | | | |
| | NJ301-1100 | | | |

Note: It may not be possible to mount the maximum number of configuration Units depending on the specific Units that are mounted. Refer to the next page for details.

● Number of mountable units per Configuration Unit

Basic I/O Units, Special I/O Units, and CPU Bus Units of the CJ-Series are used as Configuration Units of the NJ-Series. All Basic I/O Units are useable. Not all Special I/O Units and CPU Bus Units can be used. Units that can be used are shown in the list. In addition, note that the number of units that can be connected to one CPU vary depending on the units.

CJ-Series Special I/O Units

| Type | Name | Specifications | Model | Unit No. | Number of words allocated | Words allocated in DM Area | Number of mountable Units | Current consumption (A) | | Weight | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|-------------------------------------|----------------------------------|-------------------------|--------|--|------------|----------|----------|------|-----|------|----------|----------|------|-----|------|----------|----------|------|-----|
| | | | | | | | | 5 VDC | 24 VDC | | | | | | | | | | | | | | | | |
| Special I/O Units | General-purpose Universal Analog Input Unit | 4 inputs, fully universal | CJ1W-AD04U | 0 to 95 | 10 words | 100 words | 40 Units | 0.32 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | Analog Input Units | 8 inputs (4 to 20 mA, 1 to 5 V, etc.) 4 inputs (4 to 20 mA, 1 to 5 V, etc.) 4 inputs (4 to 20 mA, 1 to 5 V, etc.) | CJ1W-AD081-V1 CJ1W-AD041-V1 CJ1W-AD042 | 0 to 95 0 to 95 0 to 95 | 10 words 10 words 10 words | 100 words 100 words 100 words | 40 Units 40 Units 40 Units | 0.42 0.42 0.52 | --- | 140 g max. 140 g max. 150 g max. | | | | | | | | | | | | | | | |
| Analog Output Units | | 4 outputs (1 to 5 V, 4 to 20 mA, etc.) | CJ1W-DA041 | 0 to 95 | 10 words | 100 words | 40 Units | 0.12 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 2 outputs (1 to 5 V, 4 to 20 mA, etc.) | CJ1W-DA021 | 0 to 95 | 10 words | 100 words | 40 Units | 0.12 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 8 outputs (1 to 5 V, 0 to 10 V, etc.) | CJ1W-DA08V | 0 to 95 | 10 words | 100 words | 40 Units | 0.14 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 8 outputs (4 to 20 mA) | CJ1W-DA08C | 0 to 95 | 10 words | 100 words | 40 Units | 0.14 | --- | 150 g max. | | | | | | | | | | | | | | | |
| Analog I/O Unit | | 4 outputs (1 to 5 V, 0 to 10 V, etc.) | CJ1W-DA042V | 0 to 95 | 10 words | 100 words | 40 Units | 0.40 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 4 inputs (1 to 5 V, 4 to 20 mA, etc.) 2 outputs (1 to 5 V, 4 to 20 mA, etc.) | CJ1W-MAD42 | 0 to 95 | 10 words | 100 words | 40 Units | 0.58 | --- | 150 g max. | | | | | | | | | | | | | | | |
| Isolated-type High-resolution Universal Input Unit | | 4 inputs, fully universal Resolution: 1/256,000, 1/64,000, 1/16,000 | CJ1W-PH41U | 0 to 95 | 10 words | 100 words | 40 Units | 0.30 | --- | 150 g max. | | | | | | | | | | | | | | | |
| Direct Current Input Unit | | DC voltage or DC current, 2 inputs | CJ1W-PDC15 | 0 to 95 | 10 words | 100 words | 40 Units | 0.18 | --- | 150 g max. | | | | | | | | | | | | | | | |
| Temperature Control Units | | 2 control loops, thermocouple inputs, NPN outputs, heater burnout detection | CJ1W-TC003 | 0 to 94 (uses words for 2 unit numbers) | 20 words | 200 words | 40 Units | 0.25 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 2 control loops, thermocouple inputs, PNP outputs, heater burnout detection | CJ1W-TC004 | 0 to 94 (uses words for 2 unit numbers) | 20 words | 200 words | 40 Units | 0.25 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 2 control loops, temperature-resistance thermometer inputs, NPN outputs, heater burnout detection | CJ1W-TC103 | 0 to 94 (uses words for 2 unit numbers) | 20 words | 200 words | 40 Units | 0.25 | --- | 150 g max. | | | | | | | | | | | | | | | |
| | | 2 control loops, temperature-resistance thermometer inputs, PNP outputs, heater burnout detection | CJ1W-TC104 | 0 to 94 (uses words for 2 unit numbers) | 20 words | 200 words | 40 Units | 0.25 | --- | 150 g max. | | | | | | | | | | | | | | | |
| ID Sensor Units | | V680-Series single-head type | CJ1W-V680C11 | 0 to 95 | 10 words | 100 words | 40 Units | 0.26 | 0.13 | 120 g max. | | | | | | | | | | | | | | | |
| | | V680-Series two-head type | CJ1W-V680C12 | 0 to 94 (uses words for 2 unit numbers) | 20 words | 200 words | 40 Units | 0.32 | 0.26 | 130 g max. | | | | | | | | | | | | | | | |
| High-speed Counter Unit | | Number of counter channels: 2, Maximum input frequency: 500 kHz, line driver compatible | CJ1W-CT021 | 0 to 92 (uses words for 4 unit numbers) | 40 words | 400 words | 24 Units | 0.28 | --- | 100 g max. | | | | | | | | | | | | | | | |
| CompoNet Master Unit | | CompoNet remote I/O | | CJ1W-CRM21 * | 0 to 94 (uses words for 2 unit numbers) | None | 20 words | 40 Units | 0.40 | --- | 130 g max. | | | | | | | | | | | | | | |
| | | Communications mode No. 0: 128 inputs/ 128 outputs for Word Slaves | 0 to 92 (uses words for 4 unit numbers) | | None | | | | | | | 40 words | 24 Units | 0.40 | --- | | | | | | | | | | |
| | | Communications mode No. 1: 256 inputs/ 256 outputs for Word Slaves | 0 to 88 (uses words for 8 unit numbers) | | | | | | | | | | | | | None | 80 words | 12 Units | 0.40 | --- | | | | | |
| | | Communications mode No. 2: 512 inputs/ 512 outputs for Word Slaves | 0 to 88 (uses words for 8 unit numbers) | | | | | | | | | | | | | | | | | | None | 80 words | 12 Units | 0.40 | --- |
| | | Communications mode No. 3: 256 inputs/ 256 outputs for Word Slaves and 128 inputs/ 128 outputs for Bit Slaves | 0 to 95 uses words for 1 unit number) | | | | | | | | | | | | | | | | | | | | | | |
| Communications mode No. 8: 1,024 inputs/ 1,024 outputs for Word Slaves and 256 inputs/ 256 outputs for Bit Slaves maximum | | | | | | | | | | | | | | | | | | | | | | | | | |

* Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

CJ-Series CPU Bus Units

| Type | Name | Specifications | Model | Unit No. | Number of words allocated | Maximum number of Units | Current consumption (A) | | Weight |
|----------------|---|--|---------------|----------|---------------------------|-------------------------|-------------------------|---------------|------------|
| | | | | | | | 5 VDC | 24 VDC | |
| CPU Bus Units | Serial Communications Units | Two RS-232C ports High-speed models | CJ1W-SCU22 | 0 to F | 25 words | 16 Units | 0.29 *1 | --- | 160 g max. |
| | | Two RS-422A/485 ports High-speed models | CJ1W-SCU32 | | | | 0.46 | | 120 g max. |
| | | One RS-232C port and one RS-422A/485 port High-speed models | CJ1W-SCU42 | | | | 0.38 *1 | | 140 g max. |
| | EtherNet/IP Unit | Tag data links, CIP message communications, FTP server, etc. | CJ1W-EIP21 *2 | 0 to F | 25 words | 4 Units | 0.41 | --- | 94 g max. |
| DeviceNet Unit | DeviceNet remote I/O, 2,048 points; Both Master and Slave functions, Automatic allocation possible without Configurator | CJ1W-DRM21 | 0 to F | 25 words | 16 Units | 0.29 | --- | 118 g max. *3 | |

*1 Increases by 0.15 A/Unit when an NT-AL001 RS-232C/RS-422A Link Adapter is used. Increases by 0.04 A/Unit when a CJ1W-CIF11 RS-422A Converter is used. Increases by 0.20 A/Unit when an NV3W-M□20L Programmable Terminal is used.

*2 Supported only by the EtherNet/IP Units with unit version 2.1 or later, CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

*3 Includes the weight of accessory connectors.

Power Supply Units Current Consumption

Checking Current Consumption and Power Consumption

After selecting a Power Supply Unit based on considerations such as the power supply voltage, calculate the current and power requirements for each Rack.

Condition 1: Current Requirements

There are two voltage groups for internal power consumption: 5 V and 24 V.

Current consumption at 5 V (internal logic power supply)

Current consumption at 24 V (relay driving power supply)

Condition 2: Power Requirements

For each Rack, the upper limits are determined for the current and power that can be provided to the mounted Units. Design the system so that the total current consumption for all the mounted Units does not exceed the maximum total power or the maximum current supplied for the voltage groups shown in the following tables.

The maximum current and total power supplied for CPU Racks and Expansion Racks according to the Power Supply Unit model are shown below.

Note: 1. For CPU Racks, include the CPU Unit current and power consumption in the calculations. When expanding, also include the current and power consumption of the I/O Control Unit in the calculations.

2. For Expansion Racks, include the I/O Interface Unit current and power consumption in the calculations.

| Power Supply Units | Max. current supplied | | | (C) Max. total power supplied |
|--------------------|-----------------------|-------------------------|------------|-------------------------------|
| | (A) 5-VDC CPU Racks* | (A)5-VDC Expansion Rack | (B) 24 VDC | |
| NJ-PA3001 | 6.0 A | 6.0 A | 1.0 A | 30 W |
| NJ-PD3001 | 6.0 A | 6.0 A | 1.0 A | 30 W |

* Including supply to the CPU Unit.

Example: Calculating Total Current and Power Consumption

Example: When the Following Units are Mounted to a NJ-Series CPU Rack Using a NJ-PA3001 Power Supply Unit

| Unit type | Model | Quantity | Voltage group | |
|--------------------------------|------------|----------|--|--|
| | | | 5 V | 24 V |
| CPU Unit | NJ501-1500 | 1 | 1.90 A | --- |
| I/O Control Unit | CJ1W-IC101 | 1 | 0.02 A | --- |
| Basic I/O Units (Input Units) | CJ1W-ID211 | 2 | 0.08 A | --- |
| | CJ1W-ID231 | 2 | 0.09 A | --- |
| Basic I/O Units (Output Units) | CJ1W-OC201 | 2 | 0.09 A | 0.048 A |
| Special I/O Unit | CJ1W-DA041 | 1 | 0.12 A | --- |
| CPU Bus Unit | CJ1W-SCU22 | 1 | 0.29 A | --- |
| Current consumption | Total | | $1.9\text{ A} + 0.02\text{ A} + 0.08\text{ A} \times 2 + 0.09\text{ A} \times 2 + 0.09\text{ A} \times 2 + 0.12\text{ A} + 0.29$ | $0.048\text{ A} \times 2$ |
| | Result | | 2.85 A ($\leq 6.0\text{ A}$) | 0.096 A ($\leq 1.0\text{ A}$) |
| Power consumption | Total | | $2.85\text{ A} \times 5\text{ V} = 14.25\text{ W}$ | $0.096\text{ A} \times 24\text{ V} = 2.3\text{ W}$ |
| | Result | | $14.25\text{ W} + 2.3\text{ W} = 16.5\text{ W} (\leq 30\text{ W})$ | |

Note: For details on Unit current consumption, refer to Ordering Information.

Using the Sysmac Studio to Display Current Consumption and Width

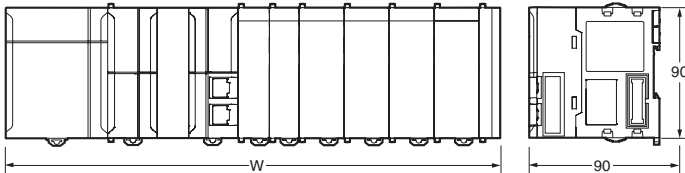
CPU Rack and Expansion Rack current consumption and width can be displayed by selecting **CPU/Expansion Racks** from the **Configurations and Setup** in the Multiview Explorer. If the capacity of the Power Supply Unit is exceeded, an error icon is displayed in the power supply unit of a corresponding rack. For details, refer to Sysmac Studio Version 1 Operation manual (W504).

Dimensions

Note: Units are in mm unless specified otherwise.

Product Dimensions

● Dimensions



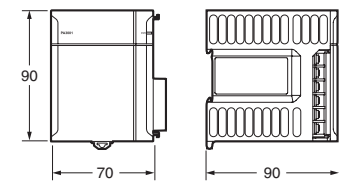
Example Rack Widths using NJ-PA3001 Power Supply Unit (AC)

| No. of Units mounted with 31-mm width | Rack width (mm) |
|---------------------------------------|-----------------|
| | With NJ501-1500 |
| 1 | 205.7 |
| 2 | 236.7 |
| 3 | 267.7 |
| 4 | 298.7 |
| 5 | 329.7 |
| 6 | 360.7 |
| 7 | 391.7 |
| 8 | 422.7 |
| 9 | 453.7 |
| 10 | 484.7 |

● Power Supply Units, CPU Units, and End Covers

| Unit/product | Model | Width |
|-------------------|--------------------------|-------|
| Power Supply Unit | NJ-PA3001 | 70 |
| | NJ-PD3001 | 70 |
| CPU Unit | NJ501-□□□□ NJ301-□□□□ | 90 |
| End Cover | CJ1W-TER01 | 14.7 |

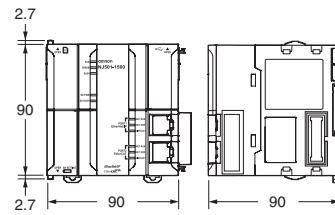
● Power Supply Units



W=70 :NJ-PA3001

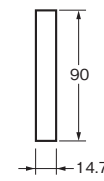
● CPU Units

NJ501-□□□□
NJ301-□□□□



● End Cover

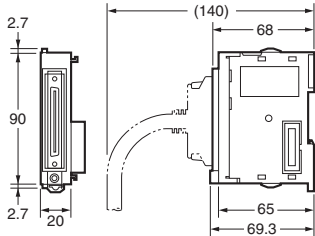
(included with CPU Units)



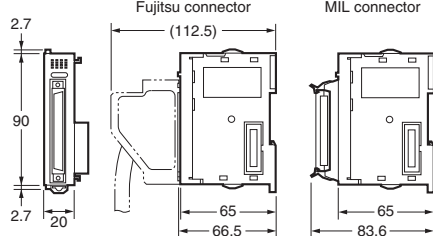
● Units of Width 20 mm

| Unit/product | Model | Width |
|--------------------------|--|-------|
| I/O Control Unit | CJ1W-IC101 | 20 |
| 32-point Basic I/O Units | CJ1W-ID231/232/233 | |
| | CJ1W-OD231/232/233/234 | |
| B7A Interface Unit | CJ1W-B7A22 CJ1W-B7A14 CJ1W-B7A04 | |

● I/O Control Unit



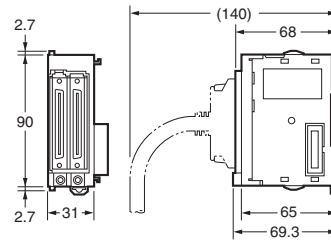
● 32-Point I/O Units (CJ1W-ID23□/OD23□)



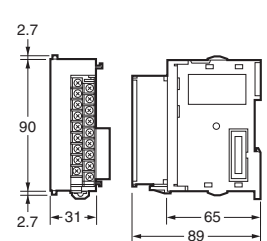
● Units of Width 31 mm

| Unit | Model | Width |
|-----------------------------|--------------------|-------|
| I/O Interface Unit | CJ1W-II101 | 31 |
| 8/16-point Basic I/O Units | CJ1W-ID201 | |
| | CJ1W-ID211/212 | |
| | CJ1W-IA111/201 | |
| | CJ1W-OD20□ | |
| | CJ1W-OD211/212/213 | |
| | CJ1W-OC201/211 | |
| 32-point Basic I/O Units | CJ1W-MD231 | |
| | CJ1W-MD232/233 | |
| 64-point Basic I/O Units | CJ1W-ID261 | |
| | CJ1W-OD261 | |
| | CJ1W-MD261 | |
| | CJ1W-ID262 | |
| Quick-response Input Unit | CJ1W-AD□□□ (-V1) | |
| | CJ1W-DA□□□ (□) | |
| | CJ1W-MAD42 | |
| | CJ1W-AD04U | |
| Process Input Units | CJ1W-PH41U | |
| | CJ1W-AD04U | |
| | CJ1W-PDC15 | |
| Temperature Control Units | CJ1W-TC□□□ | |
| High-speed Counter Unit | CJ1W-CT021 | |
| ID Sensor Units | CJ1W-V680C11 | |
| | CJ1W-V680C12 | |
| Serial Communications Units | CJ1W-SCU22 | |
| | CJ1W-SCU32 | |
| | CJ1W-SCU42 | |
| EtherNet/IP Unit | CJ1W-EIP21 | |
| DeviceNet Unit | CJ1W-DRM21 | |
| CompoNet Master Unit | CJ1W-CRM21 | |

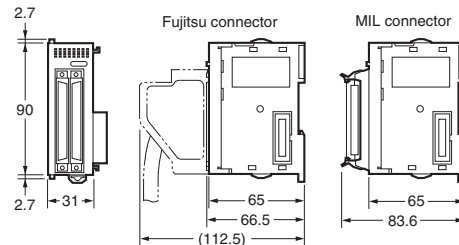
● I/O Interface Unit



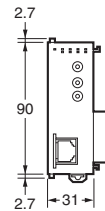
● 8/16-point Basic I/O Units, and High-speed Input Unit



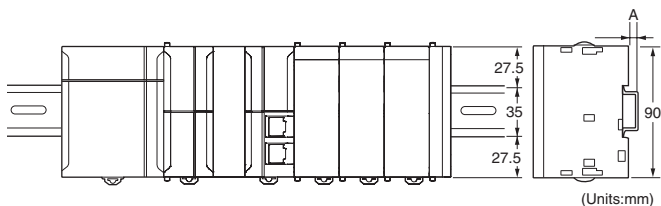
● 64-point Basic I/O Units and 32-point Basic I/O Units (CJ1W-MD23□)



● Special I/O Units and CPU Bus Units



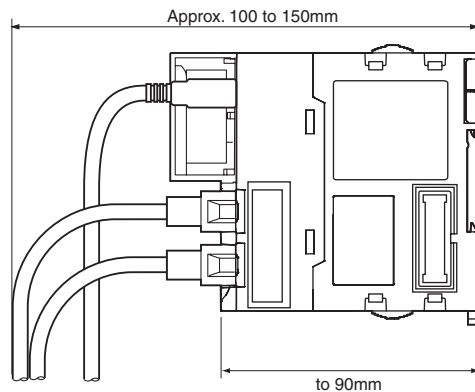
Mounting Dimensions



| DIN Track model number | A |
|------------------------|--------|
| PFP-100N2 | 16 mm |
| PFP-100N | 7.3 mm |
| FPP-50N | 7.3 mm |

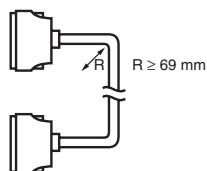
Mounting Height

With a height of 90.0 mm, the CPU Unit is the highest component in an NJ-Series CPU Rack. It is also higher than any Units on an Expansion Rack. When a cable is connected (such as a connecting cable to Support Software), however, even greater height is required. Allow sufficient depth in the control panel containing the Controller.



Note: Consider the following points when expanding the configuration:
 The total length of I/O Connecting Cable must not exceed 12 m.
 I/O Connecting Cables require the bending radius indicated below.

Expansion Cable



Note: Outer diameter of cable: 8.6 mm.

General Specifications

| Item | | NJ501-□□□□ | NJ301-□□□□ |
|--|---|--|------------|
| Enclosure | | Mounted in a panel | |
| Grounding Method | | Ground to less than 100 Ω | |
| Dimensions (height×depth×width) | | 90 mm × 90 mm × 90 mm | |
| Weight | | 550 g (including the End Cover) | |
| Current Consumption | | 5 VDC, 1.90 A (including SD Memory Card and End Cover) | |
| Operation Environment | Ambient Operating Temperature | 0 to 55°C | |
| | Ambient Operating Humidity | 10% to 90% (with no condensation) | |
| | Atmosphere | Must be free from corrosive gases. | |
| | Ambient Storage Temperature | -20 to 75°C (excluding battery) | |
| | Altitude | 2,000 m or less | |
| | Pollution Degree | 2 or less: Conforms to JIS B3502 and IEC 61131-2. | |
| | Noise Immunity | 2 kV on power supply line (Conforms to IEC 61000-4-4.) | |
| | Overvoltage Category | Category II: Conforms to JIS B3502 and IEC 61131-2. | |
| | EMC Immunity Level | Zone B | |
| Vibration Resistance | Conforms to IEC 60068-2-6. | | |
| | 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s ² for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total) | | |
| Shock Resistance | Conforms to IEC 60068-2-27. | | |
| | 147 m/s ² , 3 times in X, Y, and Z directions (100 m/s ² for Relay Output Units) | | |
| Battery | Life | 5 years at 25°C | |
| | Model | CJ1W-BAT01 | |
| Applicable Standards | | Conforms to cULus, NK, LR and EC Directives. | |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multi-Function Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

Features

Unit Configuration

Power Supply
Units Current
Consumption

Dimensions

General
SpecificationsPerformance
SpecificationsFunction
Specifications

Version Information

Components
and Functions

Performance Specifications

| Item | | | NJ501- | | | NJ301- | | |
|---------------------------------------|---|--|---|---------------------------------|---|----------------|----------------|--|
| | | | 1500 | 1400 | 1300 | 1200 | 1100 | |
| Processing Time | Instruction Execution Times | Ladder Diagram Instructions (LD, AND, OR, and OUT) | 1.9 ns or more | | | 3.0 ns or more | | |
| | | Math Instructions (for Long Real Data) | 26 ns or more | | | 42 ns or more | | |
| Programming | Program capacity*1 | | 20 MB | | | 5 MB | | |
| | Memory Capacity for Variables | Retain Attribute*2 | 2 MB | | | 0.5 MB | | |
| | | No Retain Attribute*3 | 4 MB | | | 2 MB | | |
| | Memory for CJ-Series Units (Can be Specified with AT Specifications for Variables.) | CIO Area | | 6,144 words (CIO 0 to CIO 6143) | | | | |
| | | Work Area | | 512 words (W0 to W511) | | | | |
| | | Holding Area | | 1,536 words (H0 to H1535) | | | | |
| | | DM Area | | 32,768 words (D0 to D32767) | | | | |
| EM Area | | 32,768 words × 25 banks (E0_00000 to E18_32767) | | | 32,768 words × 4 banks (E0_00000 to E3_32767) | | | |
| Unit Configuration | Maximum Number of Connectable Units | Maximum per CPU Rack or Expansion Rack | 10 Units | | | | | |
| | | Entire Controller | 40 Units | | | | | |
| | Maximum number of Expansion Racks | | 3 max. | | | | | |
| | I/O Capacity | Maximum number of I/O Points on CJ-series Units | | 2,560 points max. | | | | |
| | Power Supply Unit for CPU Rack and Expansion Racks | Model | | NJ-P□3001 | | | | |
| | | Power OFF Detection Time | AC Power Supply | 30 to 45 ms | | | | |
| DC Power Supply | 22 to 25 ms | | | | | | | |
| Motion Control | Number of Controlled Axes | Maximum Number of Controlled Axes | 64 axes | 32 axes | 16 axes | 8 axes | 4 axes | |
| | | Maximum Number of Axes for Single-axis Control | 64 axes max. | 32 axes max. | 16 axes max. | 8 axes max. | 4 axes max. | |
| | | Maximum Number of Axes for Linear Interpolation Axis Control | 4 axes per axes group | | | | | |
| | | Number of Axes for Circular Interpolation Axis Control | 2 axes per axes group | | | | | |
| | Maximum Number of Axes Groups | | 32 groups | | | | | |
| | Motion Control Period | | The same control period as that is used for the process data communications cycle for EtherCAT. | | | | | |
| | Cams | Number of Cam Data Points | Maximum Points per Cam Table | 65,535 points | | | | |
| | | | Maximum Points for All Cam Tables | 1,048,560 points | | | 262,140 points | |
| | | Maximum Number of Cam Tables | | 640 tables | | | 160 tables | |
| | Position Units | | Pulses, millimeters, micrometers, nanometers, degrees or inches | | | | | |
| Override Factors | | 0.00% or 0.01% to 500.00% | | | | | | |
| Peripheral USB Port | Supported Services | | Sysmac Studio connection | | | | | |
| | Physical Layer | | USB 2.0-compliant B-type connector | | | | | |
| | Transmission Distance between Hub and Node | | 5 m max. | | | | | |
| Built-in EtherNet/IP Port | Physical Layer | | 10Base-T or 100Base-TX | | | | | |
| | Media Access Method | | CSMA/CD | | | | | |
| | Modulation | | Baseband | | | | | |
| | Topology | | Star | | | | | |
| | Baud Rate | | 100 Mbps (100Base-TX) | | | | | |
| | Transmission Media | | STP (shielded, twisted-pair) cable of Ethernet category 5, 5e or higher | | | | | |
| | Maximum Transmission Distance between Ethernet Switch and Node | | 100m | | | | | |
| Maximum Number of Cascade Connections | | There are no restrictions if Ethernet switch is used. | | | | | | |

*1 This is the capacity for the execution objects and variable tables (including variable names).

*2 Words for CJ-series Units in the Holding, DM, and EM Areas are not included.

*3 Words for CJ-series Units in the CIO and Work Areas are not included.

| Item | | NJ501- | | | NJ301- | |
|----------------------------|---|---|---|--|----------------------|------|
| | | 1500 | 1400 | 1300 | 1200 | 1100 |
| Built-in EtherNet/IP Port | CIP service: Tag Data Links (Cyclic Communications) | Maximum Number of Connections | | 32 | | |
| | | Packet interval*4 | | 10 to 10,000 ms in 1.0-ms increments Can be set for each connection. (Data will be refreshed at the set interval, regardless of the number of nodes.) | | |
| | | Permissible Communications Band | | 1,000 pps*5 (including heartbeat) | | |
| | | Maximum Number of Tag Sets | | 32 | | |
| | | Tag types | | Network variables, CIO, Work, Holding, DM, and EM Areas | | |
| | | Number of tags per connection (i.e., per tag set) | | 8 (7 tags if Controller status is included in the tag set.) | | |
| | | Maximum Link Data Size per Node (total size for all tags) | | 19,200 bytes | | |
| | | Maximum Data Size per Connection | | 600 bytes | | |
| | | Maximum Number of Registrable Tag Sets | | 32 (1 connection = 1 tag set) | | |
| | | Maximum Tag Set Size | | 600 bytes (Two bytes are used if Controller status is included in the tag set.) | | |
| | Multi-cast Packet Filter*6 | | Supported. | | | |
| | Cip Message Service: Explicit Messages | Class 3 (number of connections) | | 32 (clients plus server) | | |
| UCMM (non-connection type) | | Maximum Number of Clients that Can Communicate at One Time | 32 | | | |
| | | Maximum Number of Servers that Can Communicate at One Time | 32 | | | |
| Built-in EtherCAT Port | Communications Standard | | IEC 61158 Type12 | | | |
| | EtherCAT Master Specifications | | Class B (Feature Pack Motion Control compliant) | | | |
| | Physical Layer | | 100BASE-TX | | | |
| | Modulation | | Baseband | | | |
| | Baud Rate | | 100 Mbps (100Base-TX) | | | |
| | Duplex mode | | Auto | | | |
| | Topology | | Line, daisy chain, and branching | | | |
| | Transmission Media | | Twisted-pair cable of category 5 or higher (double-shielded straight cable with aluminum tape and braiding) | | | |
| | Maximum Transmission Distance between Nodes | | 100m | | | |
| | Maximum Number of Slaves | | 192 | | | |
| | Maximum Process Data Size | | Inputs: 5,736 bytes Outputs: 5,736 bytes (However, the maximum number of process data frames is 4.) | | | |
| | Maximum Process Data Size per Slave | | Inputs: 1,434 bytes Outputs: 1,434 bytes | | | |
| | Maximum Communications Cycle | | 500/1,000/2,000/4,000 μs | | 1,000/2,000/4,000 μs | |
| Sync Jitter | | 1 μs max. | | | | |
| Internal Clock | | At ambient temperature of 55°C: -3.5 to +0.5 min error per month At ambient temperature of 25°C: -1.5 to +1.5 min error per month At ambient temperature of 0°C: -3 to +1 min error per month | | | | |

*4 Data is updated on the line in the specified interval regardless of the number of nodes.

*5 Means packets per second, i.e., the number of communications packets that can be sent or received in one second.

*6 An IGMP client is mounted for the EtherNet/IP port. If an ethernet switch that supports IGMP snooping is used, filtering of unnecessary multicast packets is performed.

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
Multi-Function Compact Inverter
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

Features
Unit Configuration
Power Supply Units Current Consumption
Dimensions
General Specifications
Performance Specifications
Function Specifications
Version Information
Components and Functions

Function Specifications

| Item | | NJ501-□□□□ | NJ301-□□□□ | |
|---------------------------------------|----------------------------------|---|---|---|
| Tasks | Function | Maximum Number of Primary Periodic Tasks | I/O refreshing and the user program are executed in units that are called tasks. Tasks are used to specify execution conditions and execution priority. | |
| | | Maximum Number of Periodic Tasks | 1 | |
| | Setup | System Service Monitoring Settings | 3 | |
| Programming | POU (program organization units) | Programs | POUs that are assigned to tasks. | |
| | | Function Blocks | POUs that are used to create objects with specific conditions. | |
| | | Functions | POUs that are used to create an object that determine unique outputs for the inputs, such as for data processing. | |
| | Programming Languages | Types | Ladder diagrams *1 and structured text (ST) | |
| | Variables | External Access of Variables | Network Variables | The function which allows access from the HMI, host computers, or other Controllers |
| | Data Types | Basic Data Types | Boolean | BOOL |
| | | | Bit Strings | BYTE, WORD, DWORD, LWORD |
| | | | Integers | INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT |
| | | | Real Numbers | REAL, LREAL |
| | | | Durations | TIME |
| | | | Dates | DATE |
| | | | Times of Day | TIME_OF_DAY |
| | | | Date and Time | DATE_AND_TIME |
| | | | Text Strings | STRING |
| | | Derivative Data Types | Direct Derivative Types | Structures, unions, enumerations |
| | | | Member Data Types | Basic data types, structures, unions, enumerations, array variables |
| | | Structures | Function | A derivative data type that groups together data with different variable types. |
| | | | Maximum Number of Members | 2048 |
| | | | Nesting Maximum Levels | 8 |
| | Specifying Member Offsets | | You can use member offsets to place structure members at any memory locations.*2 | |
| | Unions | Function | A derivative data type that groups together data with different variable types. | |
| | | Maximum Number of Members | 4 | |
| | | Member Data Types | BOOL, BYTE, WORD, DWORD, LWORD | |
| | Enumerations | Function | A derivative data type that uses text strings called enumerators to express variable values. | |
| | Data Type Attributes | Array Specifications | Function | An array is a group of elements with the same data type. You specify the number (subscript) of the element from the first element to specify the element. |
| | | | Maximum Number of Dimensions | 3 |
| | | | Maximum Number of Elements | 65535 |
| Array Specifications for FB Instances | | | Supported. | |
| Range Specifications | | You can specify a range for a data type in advance. The data type can take only values that are in the specified range. | | |

*1 Inline ST is supported. (Inline ST is ST that is written as an element in a ladder diagram.)

*2 Supported only by the CPU Units with unit version 1.01 or later.

| Item | | NJ501-□□□□ | NJ301-□□□□ | |
|--|--|---|--|--|
| Motion Control | Control Modes | | position control, velocity control, torque control | |
| | Axis Types | | Servo axes, virtual servo axes, encoder axes, and virtual encoder axes | |
| | Positions that can be managed | | Command positions and actual positions | |
| | Single-axis | Single-axis Position Control | Absolute Positioning | Positioning is performed for a target position that is specified with an absolute value. |
| | | | Relative Positioning | Positioning is performed for a specified travel distance from the command current position. |
| | | | Interrupt Feeding | Positioning is performed for a specified travel distance from the position where an interrupt input was received from an external input. |
| | | Single-axis Velocity Control | Velocity Control | Velocity control is performed in Position Control Mode. |
| | | | Cyclic Synchronous Velocity Control | A velocity command is output each control period in Velocity Control Mode. |
| | | Single-axis Torque Control | Torque Control | The torque of the motor is controlled. |
| | | Single-axis Synchronized Control | Starting Cam Operation | A cam motion is performed using the specified cam table. |
| | | | Ending Cam Operation | The cam motion for the axis that is specified with the input parameter is ended. |
| | | | Starting Gear Operation | A gear motion with the specified gear ratio is performed between a master axis and slave axis. |
| | | | Positioning Gear Operation | A gear motion with the specified gear ratio and sync position is performed between a master axis and slave axis. |
| | | | Ending Gear Operation | The specified gear motion or positioning gear motion is ended. |
| | | | Synchronous Positioning | Positioning is performed in sync with a specified master axis. |
| | | | Master Axis Phase Shift | The phase of a master axis in synchronized control is shifted. |
| | | Single-axis Manual Operation | Combining Axes | The command positions of two axes are added or subtracted and the result is output as the command position. |
| | | | Powering the Servo | The Servo in the Servo Drive is turned ON to enable axis motion. |
| | Auxiliary Functions for Single-axis Control | Jogging | An axis is jogged at a specified target velocity. | |
| | | Resetting Axis Errors | Axes errors are cleared. | |
| | | Homing | A motor is operated and the limit signals, home proximity signal, and home signal are used to define home. | |
| | | High-speed Homing | Positioning is performed for an absolute target position of 0 to return to home. | |
| | | Stopping | An axis is decelerated to a stop. | |
| | | Immediately Stopping | An axis is stopped immediately. | |
| | | Setting Override Factors | The target velocity of an axis can be changed. | |
| | | Changing the Current Position | The command current position or actual current position of an axis can be changed to any position. | |
| | | Enabling External Latches | The position of an axis is recorded when a trigger occurs. | |
| Disabling External Latches | | The current latch is disabled. | | |
| Zone Monitoring | | You can monitor the command position or actual position of an axis to see when it is within a specified range (zone). | | |
| Monitoring Axis Following Error | | You can monitor whether the difference between the command positions or actual positions of two specified axes exceeds a threshold value. | | |
| | Resetting the Following Error | The error between the command current position and actual current position is set to 0. | | |
| | Torque Limit | The torque control function of the Servo Drive can be enabled or disabled and the torque limits can be set to control the output torque. | | |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multi-Function Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

Features
Unit Configuration
Power Supply Units Current Consumption
Dimensions
General Specifications
Performance Specifications
Function Specifications
Version Information
Components and Functions

| Item | | | NJ501-□□□□ | NJ301-□□□□ | |
|----------------|---------------------|--|---|--|---|
| Motion Control | Axes Groups | Multi-axes Coordinated Control | Absolute Linear Interpolation | Linear interpolation is performed to a specified absolute position. | |
| | | | Relative Linear Interpolation | Linear interpolation is performed to a specified relative position. | |
| | | | Circular 2D Interpolation | Circular interpolation is performed for two axes. | |
| | | | Axes Group Cyclic Synchronous Absolute Positioning | A positioning command is output each control period in Position Control Mode.*2 | |
| | | Auxiliary Functions for Multi-axes Coordinated Control | Resetting Axes Group Errors | Axes group errors and axis errors are cleared. | |
| | | | Enabling Axes Groups | Motion of an axes group is enabled. | |
| | | | Disabling Axes Groups | Motion of an axes group is disabled. | |
| | | | Stopping Axes Groups | All axes in interpolated motion are decelerated to a stop. | |
| | | | Immediately Stopping Axes Groups | All axes in interpolated motion are stopped immediately. | |
| | | | Setting Axes Group Override Factors | The blended target velocity is changed during interpolated motion. | |
| | | | Reading Axes Group Positions | The command current positions and actual current positions of an axes group can be read.*2 | |
| | | Changing the Axes in an Axes Group | The Composition Axes parameter in the axes group parameters can be overwritten temporarily.*2 | | |
| | | Common Items | Cams | Setting Cam Table Properties | The end point index of the cam table that is specified in the input parameter is changed. |
| | | | | Saving Cam Tables | The cam table that is specified with the input parameter is saved in non-volatile memory in the CPU Unit. |
| | Parameters | | Writing MC Settings | Some of the axis parameters or axes group parameters are overwritten temporarily. | |
| | Auxiliary Functions | Count Modes | | You can select either Linear Mode (finite length) or Rotary Mode (infinite length). | |
| | | Unit Conversions | | You can set the display unit for each axis according to the machine. | |
| | | Acceleration/Deceleration Control | Automatic Acceleration/Deceleration Control | Jerk is set for the acceleration/deceleration curve for an axis motion or axes group motion. | |
| | | | Changing the Acceleration and Deceleration Rates | You can change the acceleration or deceleration rate even during acceleration or deceleration. | |
| | | In-position Check | | You can set an in-position range and in-position check time to confirm when positioning is completed. | |
| | | Stop Method | | You can set the stop method to the immediate stop input signal or limit input signal. | |
| | | Re-execution of Motion Control Instructions | | You can change the input variables for a motion control instruction during execution and execute the instruction again to change the target values during operation. | |
| | | Multi-execution of Motion Control Instructions (Buffer Mode) | | You can specify when to start execution and how to connect the velocities between operations when another motion control instruction is executed during operation. | |
| | | Continuous Axes Group Motions (Transition Mode) | | You can specify the Transition Mode for multi-execution of instructions for axes group operation. | |

*2 Supported only by the CPU Units with unit version 1.01 or later.

| Item | | | NJ501-□□□□ | NJ301-□□□□ | | |
|----------------------------|-----------------------------|---|---|--|---|--|
| Motion Control | Auxiliary Functions | Monitoring Functions | Software Limits | The movement range of an axis is monitored. | | |
| | | | Following Error | The error between the command current value and the actual current value is monitored for an axis. | | |
| | | | Velocity, Acceleration Rate, Deceleration Rate, Torque, Interpolation Velocity, Interpolation Acceleration Rate, And Interpolation Deceleration Rate | You can set warning values for each axis and each axes group to monitor them. | | |
| | | Absolute Encoder Support | You can use an OMRON G5-Series Servomotor with an Absolute Encoder to eliminate the need to perform homing at startup. | | | |
| External Interface Signals | | | The Servo Drive input signals listed on the right are used. Home signal, home proximity signal, positive limit signal, negative limit signal, immediate stop signal, and interrupt input signal | | | |
| Unit (I/O) Management | EtherCAT Slaves | Maximum Number of Slaves | 192 | | | |
| | | Basic I/O Units | Chattering and Noise Countermeasures | Input response times are set. | | |
| | CJ-Series Units | Maximum number of Units | 40 | | | |
| | | Basic I/O Units | Chattering and Noise Countermeasures | Input response times are set. | | |
| | | Load Short-circuit Protection and I/O Disconnection Detection | Alarm information for Basic I/O Units is read. | | | |
| Communications | Peripheral USB Port | | | A port for communications with various kinds of Support Software running on a personal computer. | | |
| | EtherNet/IP Port | Communications protocol | | TCP/IP, UDP/IP | | |
| | | CIP Communications Service | Tag Data Links | Programless cyclic data exchange is performed with the devices on the EtherNet/IP network. | | |
| | | | Message Communications | CIP commands are sent to or received from the devices on the EtherNet/IP network. | | |
| | | TCP/IP Applications | Socket Services | Data is sent to and received from any node on Ethernet using the UDP or TCP protocol. Socket communications instructions are used. | | |
| | | | FTP Server | Files can be read from or written to the SD Memory Card in the CPU Unit from computers at other Ethernet nodes. | | |
| | | | Automatic Clock Adjustment | Clock information is read from the NTP server at the specified time or at a specified interval after the power supply to the CPU Unit is turned ON. The internal clock time in the CPU Unit is updated with the read time. | | |
| | | SNMP Agent | Built-in EtherNet/IP port internal status information is provided to network management software that uses an SNMP manager. | | | |
| | Supported Services | Process Data Communications | Control information is exchanged in cyclic communications between the EtherCAT master and slaves. | | | |
| | | SDO Communications | Control information is exchanged in noncyclic event communications between the EtherCAT master and slaves. SDO communications that are defined in the CANopen standard are used. | | | |
| | Network Scanning | | | Information is read from connected slave devices and the slave configuration is automatically generated. | | |
| | DC (Distributed Clock) | | | Time is synchronized by sharing the EtherCAT system time among all EtherCAT devices (including the master). | | |
| | EtherCAT Port | Packet Monitoring | | The frames that are sent by the master and the frames that are received by the master can be saved. The data that is saved can be viewed with WireShark or other applications. | --- | |
| | | Enable/disable Settings for Slaves | | | The slaves can be enabled or disabled as communications targets. | |
| | | Disconnecting/Connecting Slaves | | | Temporarily disconnects a slave from the EtherCAT network for maintenance, such as for replacement of the slave, and then connects the slave again. | |
| | | Supported Application Protocol | CoE | SDO messages that conform to the CANopen standard can be sent to slaves via EtherCAT. | | |
| | Communications Instructions | | | The following instructions are supported. CIP communications instructions, socket communications instructions, SDO message instructions, no-protocol communications instructions, and protocol macro instructions | | |
| Operation Management | RUN Output Contacts | | | The output on the NJ-P□3001 Power Supply Unit turns ON in RUN mode. | | |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Features

Unit Configuration

Multi-Function Compact Inverter

Power Supply Units Current Consumption

Dimensions

Vision Sensor

General Specifications

Fiber Sensor

Performance Specifications

Function Specifications

Remote I/O Terminals

Version Information

Ordering Information

Components and Functions

| Item | | | NJ501-□□□□ | NJ301-□□□□ | |
|-----------------------|--------------------------|---|--|---|---|
| System Management | Event Logs | Categories | Events are recorded in the following logs. System event log Access event log User-defined event log | | |
| | | Maximum Number of Events per Event Log | 1,024 | 512 | |
| Debugging | Online Editing | | Programs, function blocks, functions, and global variables can be changed online. Different operators can change different POU's across a network. | | |
| | Forced Refreshing | | The user can force specific variables to TRUE or FALSE. | | |
| | | Maximum Number of Forced Variables | Device Variables for EtherCAT Slaves | 64 | |
| | | | Device Variables for CJ-series Units and Variables with AT Specifications | 64 | |
| | MC Test Run | | Motor operation and wiring can be checked from the Sysmac Studio. | | |
| | Synchronizing | | The project file in the Sysmac Studio and the data in the CPU Unit can be made the same when online. | | |
| | Data Tracing | Types | Single Triggered Trace | When the trigger condition is met, the specified number of samples are taken and then tracing stops automatically. | |
| | | | Continuous Trace | Data tracing is executed continuously and the trace data is collected by the Sysmac Studio. | |
| | | Maximum Number of Simultaneous Data Trace | | 4 | 2 |
| | | Maximum Number of Records | | 10,000 | |
| | | Sampling | Maximum Number of Sampled Variables | 192 variables | 48 variables |
| | | Timing of Sampling | | Sampling is performed for the specified task period, at the specified time, or when a sampling instruction is executed. | |
| | | Triggered Traces | | Trigger conditions are set to record data before and after an event. | |
| | | | | Trigger Conditions | When BOOL variable changes to TRUE or FALSE Comparison of non-BOOL variable with a constant Comparison Method: Equals (=), Greater than (>), Greater than or equals (≥), Less Than (<), Less than or equals (≤), Not equal (≠) |
| | | | Delay | Trigger position setting: A slider is used to set the percentage of sampling before and after the trigger condition is met. | |
| Simulation | | The operation of the CPU Unit is emulated in the Sysmac Studio. | | | |
| Maintenance | Connections to HMIs | Connected Port | Built-in EtherNet/IP port | | |
| | Sysmac Studio Connection | Connected Port | Peripheral USB port or built-in EtherNet/IP port | | |
| Reliability Functions | Self-diagnosis | Controller Errors | Levels | Major fault, partial fault, minor fault, observation, and information | |
| | | | Maximum Number of Message Languages | 2 | |
| | | User-defined errors | | User-defined errors are registered in advance and then records are created by executing instructions. | |
| | | | | Levels | 8 levels |
| | | Maximum number of message languages | 9 | | |

| Item | | NJ501-□□□□ | NJ301-□□□□ | |
|---|---|--|--|---|
| Security | Protecting Software Assets and Preventing Operating Mistakes | CPU Unit Names and Serial IDs | When going online to a CPU Unit from the Sysmac Studio, the CPU Unit name in the project is compared to the name of the CPU Unit being connected to. | |
| | | Protection | User Program Transfer with No Restoration Information | You can prevent reading data in the CPU Unit from the Sysmac Studio. |
| | | | CPU Unit Write Protection | You can prevent writing data to the CPU Unit from the Sysmac Studio or SD Memory Card. |
| | | | Overall Project File Protection | You can use passwords to protect .smc files from unauthorized opening on the Sysmac Studio. |
| | | | Data Protection | You can use passwords to protect POU's on the Sysmac Studio.*2 |
| | Verification of Operation Authority | Online operations can be restricted by operation rights to prevent damage to equipment or injuries that may be caused by operating mistakes. | | |
| | Number of Groups | 5 *3 | | |
| Verification of User Program Execution ID | The user program cannot be executed without entering a user program execution ID from the Sysmac Studio for the specific hardware (CPU Unit). | | | |
| SD Memory Card Functions | Storage Type | SD Memory Card (2 GB max.), SDHC Memory Card | | |
| | Application | SD Memory Card Operation Instructions | You can access SD Memory Cards from instructions in the user program. | |
| | | File Operations from the Sysmac Studio | You can perform file operations for Controller files in the SD Memory Card and read/write standard document files on the computer. | |
| | | SD Memory Card Life Expiration Detection | Notification of the expiration of the life of the SD Memory Card is provided in a systemdefined variable and event log. | |

*2 Supported only by the CPU Units with unit version 1.01 or later.

*3 When the NJ501 CPU Units with unit version 1.00 is used, this value becomes two.

- System Configuration
- Machine Automation Controller
- Automation Software
- AC Servomotors / Servo Drives
- Power Supply Units Current Consumption
- Dimensions
- General Specifications
- Performance Specifications
- Function Specifications
- Version Information
- Components and Functions
- Ordering Information

Version Information

Unit Versions

| Units | Models | Unit Version |
|-----------------|------------|--|
| NJ501 CPU Units | NJ501-□□□□ | Unit version 1.01 Unit version 1.00 |
| NJ301 CPU Units | NJ301-□□□□ | Unit version 1.01 |

Unit Versions and Programming Devices

The following tables show the relationship between unit versions and Sysmac Studio versions.

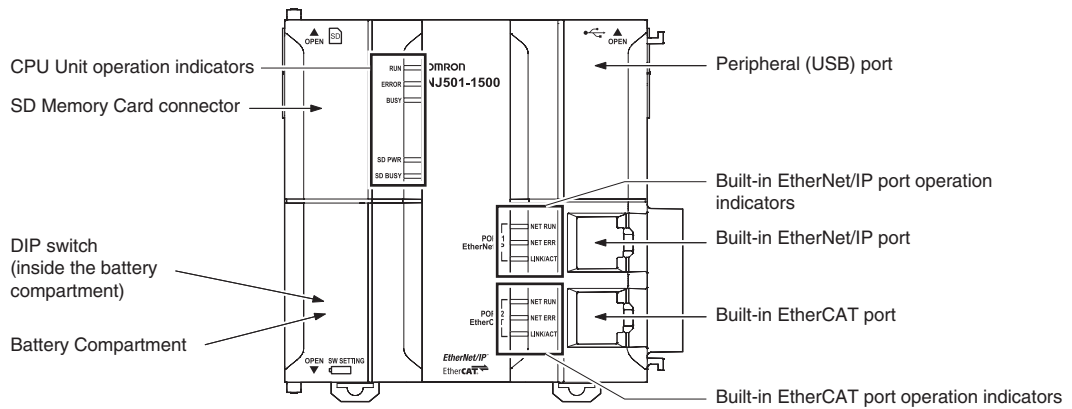
Unit Versions and Programming Devices

| CPU Unit | Unit Version | Version of Sysmac Studio | | |
|------------|--------------|--------------------------|---------------|---------------|
| | | Ver.1.02 | Ver.1.01 | Ver.1.00 |
| NJ501-□□□□ | Ver. 1.01 | O | O* | Not available |
| | Ver. 1.00 | O | O | O |
| NJ301-□□□□ | Ver. 1.01 | O | Not available | Not available |

* It is necessary to upgrade Sysmac Studio when functions added for CPU Unit version 1.01 or higher are used.

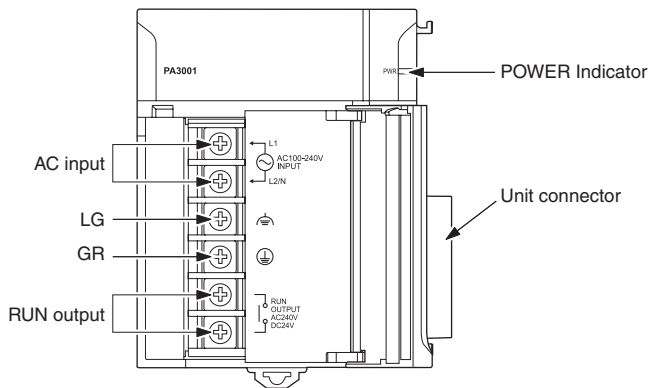
Components and Functions

●NJ501/NJ301 CPU Unit

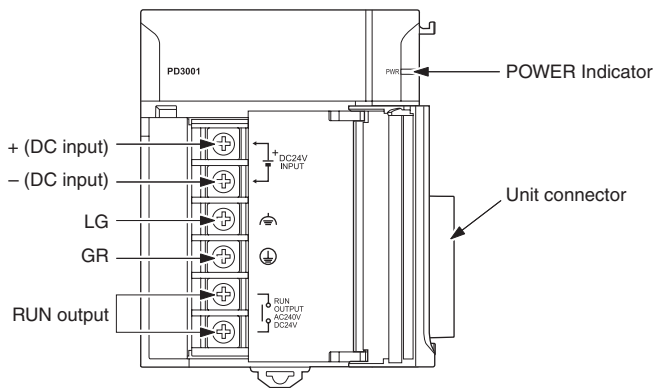


●Power Supply Unit

NJ-PA3001



NJ-PD3001



Sysmac Studio

Sysmac Studio for machine creators

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.



Features

- One software for motion, drives and vision
- Fully compliant with open standard IEC 61131-3
- Supports Ladder, Structured Text and Function Block programming with a rich instruction set
- CAM editor for easy programming of complex motion profiles
- One simulation tool for sequence and motion in a 3D environment
- Advanced security function with 32 digit security password.

System Requirements

| Item | Requirement |
|--|--|
| Operating System (OS) *1 *2 | Windows XP (Service Pack 3 or higher, 32-bit version)/Vista(32-bit version)/7(32-bit/64-bit version) |
| CPU | Windows computers with Celeron 540 (1.8 GHz) or faster CPU. Core i5 M520 (2.4 GHz) or equivalent or faster recommended |
| Main Memory *3 | 2 GB min. |
| Recommended Video Memory / Video Card for Using 3D Motion Trace | Video memory: 512 MB min. Video card: Either of the following video cards: <ul style="list-style-type: none"> • NVIDIA® GeForce® 200 Series or higher • ATI RadeonHD5000 Series or higher |
| Hard Disk | At least 1.6 GB of available space |
| Display | XGA 1024 × 768, 16 million colors. WXGA 1280 × 800 min. recommended |
| Disk Drive | DVD-ROM drive |
| Communications Ports | USB port corresponded to USB 2.0, or Ethernet port *4 |
| Supported Languages *5 | Japanese, English, German, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean |

*1 Sysmac Studio Operating System Precaution: System requirements and hard disk space may vary with the system environment.

*2 The following restrictions apply when Sysmac Studio is used with Microsoft Windows Vista or Windows 7.

1) Some Help files cannot be accessed.

The Help files can be accessed if the Help program distributed by Microsoft for Windows (WinHlp32.exe) is installed. Refer to the Microsoft homepage listed below or contact Microsoft for details on installing the file. (The download page is automatically displayed if the Help files are opened while the user is connected to the Internet.)

<http://support.microsoft.com/kb/917607/en-us>

2) The following restrictions apply to some application operations.

| Application | Restriction |
|---|--|
| CX-Designer | If a new Windows Vista or Windows 7 font (e.g., Meiryo) is used in a project, the font size on labels may be bigger and protrude from the components if the project is transferred from CX-Designer running on a Windows XP or earlier OS to the NS/NSJ. |
| CX-Integrator/Network Configurator | Although you can install CPS files, EDS files, Expansion Modules, and Interface Modules, the virtual store function of Windows Vista or Windows 7 imposes the following restrictions on the use of the software after installation. <ul style="list-style-type: none"> • If another user logs in, the applications data will need to be installed again. • The CPS files will not be automatically updated. These restrictions will not exist if application data is installed using Run as Administrator. |

*3 The amount of memory required varies with the Support Software used in Sysmac Studio for the following Support Software. Refer to user documentation for individual Support Software for details.

CX-Designer, CX-Protocol, and Network Configurator

*4 Refer to the hardware manual for your Controller for hardware connection methods and cables to connect the computer and Controller.

*5 Supported only by the Sysmac Studio version 1.01 or higher about German, French, Italian and Spanish.

Supported only by the Sysmac Studio version 1.02 or higher about simplified Chinese, traditional Chinese and Korean.

Function Specifications

Common Specifications

| Category | Function | |
|------------------------------------|--|--|
| Setting Parameters | EtherCAT Configuration and Setup | You create a configuration in the Sysmac Studio of the EtherCAT slaves connected to the built-in EtherCAT port of the Controller, and setup the EtherCAT masters and slaves in that configuration. |
| | Registering Slaves | You can set up devices by dragging slaves from the device list displayed in the Toolbox Pane to the locations where you want to connect them. |
| | Setting Master Parameters | You set the common parameters of the EtherCAT network (e.g., the fail-soft operation and wait time for slave startup settings). |
| | Setting Slave Parameters | You set the standard slave parameters and assign PDOs (process data objects). |
| | Comparing and Merging Network Configuration Information | The EtherCAT network configuration information in the NJ-series CPU Unit and in the Sysmac Studio are compared and the differences are displayed. |
| | Transferring the Network Configuration Information | The EtherCAT network configuration information is transferred to the NJ-series CPU Unit. Or, the EtherCAT network configuration information in the NJ-series CPU Unit is transferred to the Sysmac Studio and displayed in the EtherCAT Editor. |
| | Importing ESI Files | ESI (EtherCAT slave information) files are imported. |
| | CPU/Expansion Rack Configuration and Setup | You create the configuration in the Sysmac Studio of the Units mounted in the NJ-series CPU Rack and Expansion Racks and the Special Units. You can build a Rack by dragging Units from the device list displayed in the Toolbox Pane to the locations where you want to mount them. |
| | Registering Units | A Rack is built by dragging Units from the device list displayed in the Toolbox Pane to the locations where you want to mount them. |
| | Creating Racks | An Expansion Rack (Power Supply Unit, I/O Interface Unit, and End Cover) is added. |
| | Switching Unit Displays | The model number, unit number, and slot number are displayed. |
| | Setting Special Units | The input time constants are set for Input Units and parameters are set for Special Units. |
| | Displaying Rack Widths, Current Consumption, and Power Consumption | The Rack widths, current consumption, and power consumption are displayed based on the Unit configuration information. |
| | Comparing the CPU/Expansion Rack Configuration Information with the Physical Configuration | When online, you can compare the configuration information in the project with the physical configuration. You can also select the missing Units and add them. |
| | Transferring the CPU/Expansion Rack Configuration Information | The Unit configuration information is transferred to the CPU Unit. The synchronize function is used. |
| | Printing the Unit Configuration Information | The Unit configuration information is printed. |
| | Controller Setup | The Controller Setup is used to change settings related to the operation of the Controller. The Controller Setup contains PLC Function Module operation settings and built-in EtherNet/IP Function Module port settings. |
| | Operation Settings | The Startup Mode, SD Memory Card diagnosis at Startup, Write Protection at Startup, and other settings are made. |
| | Transferring Operation Settings | Use the synchronize operation to transfer the operation settings to the Controller. |
| | Built-in EtherNet/IP Port Settings | These settings are made to perform communications using the built-in EtherNet/IP port of the Controller. |
| | Transferring Built-in EtherNet/IP Port Settings | Use the synchronize operation to transfer the Built-in EtherNet/IP Port Settings to the Controller. |
| | Motion Control Setup | The Motion Control Setup is used to create the axes to use in motion control instructions, assign those axes to Servo Drives and encoders, and set axis parameters. |
| | Axis Settings | Axes are added to the project. |
| | Axis Setting Table | The Axis Setting Table is a table of all registered axis parameters. You can edit any axis parameters here just as you can on the Axis Settings Tab Page. |
| | Axes Group Settings | You can set up axes to perform interpolated motions as an axes group. |
| | Axes Group Basic Settings | Set the axes group number, whether to use the axes group, the composition, and the composition axes. |
| | Operation Settings | Set the interpolated velocity, the maximum interpolated acceleration and deceleration, and the interpolated operation settings. |
| Cam Data Settings | The curve that defines the relationship between the phases and displacements of the cam data is called the cam profile curve. You can create cam profile curves with the Cam Editor. | |
| Creating Cam Data | Cam data is added to the project. | |
| Editing Cam Data | The profile data is set. | |
| Transferring Cam Data | You can select to transfer all or part of the cam data. | |
| Importing Cam Data Settings | You can import cam data settings from a CSV file. | |
| Exporting Cam Data Settings | You can export cam data to a CSV file. | |
| Exporting Cam Tables | You can export cam data in the data format of the master and slave axes that is used by the Controller. | |

| Category | | Function | |
|--|--|---|--|
| Setting Parameters | Cam Data Settings | Transferring Cam Data from the Controller to Files | You can save a cam table that was transferred to the Controller to a file in the data format of the master and slave axes. |
| | | Transferring Cam Data from Files to the Controller | You can transfer the data from a cam data file in the data format of the master and slave axes to update the contents of the cam data that is already in the Controller. |
| | Task Setup | | Programs are executed in tasks in an NJ-series CPU Unit. The Task Settings define the execution period, the execution timing, the programs executed by the task, the I/O refreshing performed by the task, and which variables to share between tasks. |
| | | Registering Tasks | The tasks, which are used to execute programs, are registered. |
| | | Setting Task I/O | The task I/O settings define what Units the task should perform I/O refreshing for. |
| | | Assigning Programs | Program assignments define what programs a task will execute. |
| | | Setting Exclusive Control of Variables in Tasks | You can specify if a task can write to its own values (known as a refreshing task) or if it can only access them (an accessing task) for global variables. This ensures concurrency for global variable values from all tasks that reference them. |
| | I/O Map Settings | | The I/O ports that correspond to the registered EtherCAT slaves and to the registered Units on the CPU Rack and Expansion Racks are displayed. The I/O Map is edited to assign variables to I/O ports. The variables are used in the user program. |
| | | Displaying I/O Ports | I/O ports are displayed based on the configuration information of the devices (slaves and Units). |
| | | Assigning Variables | Variables are assigned to I/O ports. |
| | | Creating Device Variables | Device variables are created in the I/O Map. You can either automatically create a device variable or manually enter the device variable to create. |
| | | Checking I/O Assignments | The assignments of external I/O devices and variables are checked. |
| | Setting Vision Sensor *1 | | You can set and calibrate the Vision Sensor. Refer to " Vision Sensor Functions ". |
| | Programming | Instruction List (Toolbox) | |
| Programming Ladder Diagrams | | | Ladder diagram programming involves connecting rung components with connecting lines to build algorithms. Rung components and connecting lines are entered in the Ladder Editor. |
| | | Starting the Ladder Editor | The Ladder Editor for the program is started. |
| | | Adding and Deleting Sections | You can divide your ladder diagrams into smaller units for easier management. These units of division are called sections. |
| | | Inserting Rung Components | You insert rung components in the Ladder Editor to create an algorithm. |
| | | Inserting and Deleting Function Blocks | You can insert a function block instruction or user-defined function block into the Ladder Editor. |
| | | Inserting and Deleting Functions | You can insert a function instruction or user-defined function into the Ladder Editor. |
| | | Inserting and Deleting Inline ST | You can insert a rung component in a ladder diagram to enable programming in ST. This allows you to include ST in a ladder diagram. |
| | | Editing Rung Components | You can copy and paste rung components. |
| | | Inserting and Deleting Jump Labels and Jumps | You can insert a jump label in the rung to jump to and then specify that jump label when you insert a jump. |
| | | Inserting and Deleting Bookmarks | You can add bookmarks to the beginning of rungs and move between them. |
| | | Rung Comments | You can add comments to rungs. |
| | | Displaying Rung Errors | When you enter a rung component, the format is always checked and any mistakes are displayed as errors. If there are any errors, a red line is displayed between the rung number and the left bus bar. |
| | | Entry Assistance | When you enter instructions or parameters, each character that you enter from the keyboard narrows the list of candidates that is displayed for selection. |
| Displaying Variable Comments *1 | | A specified variable comment can be displayed with each variable of rung components on the ladder diagrams. | |
| Programming Structured Text | | | You combine different ST statements to build algorithms. |
| | | Starting the ST Editor | The ST Editor for programs or for functions/function blocks is started. |
| | | Editing ST | You combine different ST statements to build algorithms. |
| | | Entering Calls to Functions and Function Blocks | You can enter the first character of the instance name of the function or the function block in the ST Editor to call and enter a function or function block. |
| | | Entering Constants | You can enter constants in the ST Editor. |
| | | Entering Comments | Enter "(" at the beginning and ")" at the end of any text to be treated as a comment in the ST Editor. If you only want to comment out a single line, enter a double forward slash (//) at the beginning of the line. |
| | | Copying, Pasting, and Deleting ST Elements | You can copy, paste, and delete text strings. |
| | Indenting | You can indent nested statements to make them easier to read. | |
| | Moving to a Specified Line | You can specify a line number to jump directly to that line. | |
| | Bookmarks | You can add bookmarks to any lines and move between them. | |
| Entry Assistance | When you enter instructions or parameters, each character that you enter from the keyboard narrows the list of candidates that is displayed for selection. | | |

*1 Supported only by the Sysmac Studio version 1.01 or higher.

| Category | | Function | |
|---|--------------------------------------|---|--|
| Programming | Finding and Replacing | You can search for and replace strings in the data of a project. | |
| | Retrace Searching *1 | You can search for the program inputs and the input parameters to functions or function blocks that use the selected variable if the selected variable is used as a program output or as the output parameter of a function or function block. Also, you can search for the program outputs and the output parameters to functions or function blocks that use the selected variable if the selected variable is used as a program input or as the input parameter of a function or function block. | |
| | Jumping | You can jump to the specified rung number or line number in the program. | |
| | Building | Building | The programs in the project are converted into a format that is executable in the Controller. |
| | | Rebuilding | A rebuild is used to build project programs that have already been built. |
| Aborting a Build Operation | | You can abort a build operation. | |
| Reuse Functions #2 | Library | You can create functions, function block definitions, and data types in a library file to use them as objects in other projects. | |
| | | Creating Libraries | You can create library files to enable using functions, function block definitions, and data types in other projects. |
| | | Using Libraries | You can access and reuse objects from library files that were created in other projects. |
| File Operations | File Operations | Creating a Project File | A project file is created. |
| | | Opening a Project File | A project file is opened. |
| | | Saving the Project File | The project file is saved. |
| | | Saving a Project File under a Different Name | A project file is saved under a different name. |
| | | Exporting a Project File | You can convert a project file to a .smc file and export it. |
| | | Importing a Project File | You can import a project file that was saved in .txs format. |
| | | Offline Comparison *2 | Compares the data for an open project with the data for a project file and displays the results. |
| | Cutting, Copying, and Pasting | You can cut, copy, or paste items that are selected in the Multiview Explorer or any of the editors. | |
| | Synchronize | The project file in the computer is compared with the data in the online NJ-series CPU Unit and any differences are displayed. You can specify the transfer direction for any type of data and transfer all of the data. | |
| | Printing | You can print various data. You can select the items to print. | |
| | Clear All Memory | The Clear All Memory Menu command is used to initialize the user program, Controller Configurations and Setup, and variables in the CPU Unit to the defaults from the Sysmac Studio. | |
| | SD Memory Cards | The following procedures are used to execute file operations for the SD Memory Card mounted in the Controller and to copy files between the SD Memory Card and computer. | |
| | | Formatting the SD Memory Card | The SD Memory Card is formatted. |
| | | Displaying Properties | The properties of the selected file or folder in the SD Memory Card are displayed. |
| | | Copying Files and Folders in the SD Memory Card | The selected file or folder in the SD Memory Card is copied to the SD Memory Card. |
| | | Copying Files and Folders between the SD Memory Card and the Computer | The selected file or folder in the SD Memory Card is copied to the computer. Or, the selected file or folder in the computer is copied to the SD Memory Card. |
| | Debugging | Monitoring | Variables are monitored during ladder program execution. You can monitor the TRUE/FALSE status of inputs and outputs and the present values of variables in the Controller. You can monitor operation on the Ladder Editor, ST Editor, Watch Tab Page, or I/O Map. |
| Changing Present Values and TRUE/FALSE | | You can change the values of variables that are used in the user program and settings to any desired value, and you can change program inputs and outputs to TRUE or FALSE. This allows you to check the operation of the user program and settings. | |
| Changing the Present Values of Variables | | You can change the present values of user-defined variables, system-defined variables, and device variables as required. You can do this in the Watch Tab Page or I/O Map. | |
| Forced Refreshing | | You select a BOOL variable and make the assigned I/O port or AT specification bit in memory for CJ-series Units change to TRUE or FALSE to force refreshing with external devices. The specified value is retained even if the value of the variable is overwritten from the user program. You can use forced refreshing to force BOOL variables to TRUE or FALSE in the Ladder Editor, Watch Tab Page, or I/O Map. | |
| Online Editing | | Online editing allows you to edit programs on systems that are currently in operation. Online editing can be used to edit only POUs and global variables. User-defined data types cannot be edited with online editing. | |
| Cross Reference Tab Page | | Cross references allow you to see the programs and locations where program elements (variables, data types, I/O ports, functions, or function blocks) are used. You can view all locations where an element is used from this list. | |

*1 Supported only by the Sysmac Studio version 1.01 or higher.

*2 Supported only by the Sysmac Studio version 1.02 or higher.

| Category | | Function | |
|---------------------------|--|--|---|
| Debugging | Data Tracing | Data tracing allows you to sample the specified variables and store the values of the variables in trace memory without any programming. You can choose between two continuous trace methods: a triggered trace, where you set a trigger condition and data is saved before and after that condition is met, or a continuous trace, in which continuous sampling is performed without any trigger and the results are stored in a file on your computer. However, you can still display data retrieved on the Sysmac Studio and save those results to a file even if you use a triggered trace. These same functions can be used with the Simulator as well. | |
| | | Setting Sampling Intervals | The interval to perform sampling on the target data is set. Sampling is performed for the specified task period, at the specified time, or when a trace sampling instruction is executed. |
| | | Setting Triggers | To perform a triggered trace, you set a condition to trigger sampling. A suitable trigger condition is set to record data before and after an event. |
| | | Setting a Continuous Trace | The method to save the data traced during a continuous trace is set. |
| | | Setting Variables to Sample | The variables to store in trace memory are registered. The sampling intervals can also be set. |
| | | Starting and Stopping Tracing | The data trace settings are transferred to the Controller and the tracing starts. If you selected <i>Trigger (Single)</i> as the trace type, tracing waits for the trigger to begin sampling. If you selected Continuous, sampling begins immediately and all traced data is transferred to the computer as it is gathered and saved to a file. |
| | | Displaying Trace Results | You view the results of the traced data in either a chart or in 3D Motion Trace Display Mode. After sampling begins, sample data is immediately transferred and drawn on the graph. The trace target variable table shows the maximum, minimum, and average values for each variable. You can change the line colors on the graph. *1 |
| | | Exporting Trace Results | Trace results are saved within your project automatically when you save the project on the Sysmac Studio. If you want to save this data as a separate file, you can export the data to a CSV file. |
| | | Printing Trace Results | You can print out data trace settings along with digital and analog charts. |
| | | Debugging Vision Sensors *1 | You can debug the Vision Sensor offline. Refer to " Vision Sensor Functions ". |
| Simulation | Programs for Debugging | | You can create programs for debugging that are used only to execute simulations and specify virtual inputs for simulation. |
| | Executing a Simulation | Selecting What to Simulate | You can select the programs to simulate from all of the programs in the Sysmac Studio. Programs can be dragged to select them. |
| | | Setting Breakpoints | You can set breakpoints to stop the simulation in the Program Editor. |
| | | Executing and Stopping Simulations | You can control simulation execution to monitor the user program or to check operation through data tracing. Step execution and pausing are also possible. |
| | | Changing the Simulation Speed | You can change the execution speed. |
| | | Task Period Simulation | You can display the task periods. |
| | | Batch transfer of the present values of variables *2 | You can save the values of variables at specific times during simulations in a file, or you can write the values of variables that were saved in a file back to the Simulator. This allows you to write the initial values of variables, e.g., for test applications, before you start a simulation. |
| | | Integrated NS-series PT simulation *2 *3 | You can simulate the linked operation of a sequence program and an NS-series Programmable Terminal to debug the sequence program and screen data offline. |
| | Setting the Virtual Equipment | Creating 3D Device Models | You can create a 3D device model at the control target to monitor with the 3D motion trace function. |
| | | Displaying 3D Motion Traces | You set the axis variables for each element of the 3D device model, and then set the 3D device into motion according to those axis motions. |
| Displaying 2D Paths | | You can display the 2D paths of the markers for the projections in the 3D display. | |
| Monitoring Information | Displaying Unit Production Information | | You can display the production information of the Controller and Special Units, including the models of the Units and unit versions. |
| | Monitoring Task Execution Times | | You can monitor the execution time of each task when the user program is executed on a Controller or in the Simulator. When you are connected to the Simulator, you can also monitor the real processing time of tasks. This allows you to perform a Controller performance test. |
| | Troubleshooting | | You can use troubleshooting to check the errors that occurred in the Controller, display corrections for the errors, and clear the errors. |
| | | Controller Errors | Any current Controller errors are displayed. (Observations and information are not displayed.) |
| | | User-defined Errors | Information is displayed on current errors. |
| | | Controller Event Log | You can display a log of Controller events (including Controller errors and Controller information). (You cannot display logs from EtherCAT slaves.) |
| | | User-defined Event Log | The log of user-defined events that were stored for the Create User-defined Error (SetAlarm) instruction and the Create User-defined Information (SetInfo) instruction is displayed. |
| | | Event Settings Table | The Event Setting Table is used to register the contents displayed on the Sysmac Studio and on HMI for userdefined events that occur for execution of the Create Userdefined Error (SetAlarm) instruction and the Create Userdefined Information (SetInfo) instruction. |
| | User Memory Usage Monitor | | The space that is used by the project file you are editing in the Sysmac Studio is displayed in relation to the size of the Controller's memory. The file cannot be transferred to the Controller if the files size exceeds the available space. |
| Setting Clock Information | | You can read and set the Controller's clock. The computer's clock information is also displayed. | |

*1 Supported only by the Sysmac Studio version 1.01 or higher.

*2 Supported only by the Sysmac Studio version 1.02 or higher.

*3 Supported only by the CX-Designer version 3.41 or higher.

| Category | | Function | |
|-------------------|---|--|---|
| Communications | Going Online with a Controller | An online connection is established with the Controller. | |
| | Checking for Forced Refreshing | When you go offline, any forced refreshing is cleared. | |
| Maintenance | Changing the Operating Mode of the Controller | There are two operating modes for NJ-series Controllers, depending on if control programs are executed or not. These are RUN mode and PROGRAM mode. | |
| | Resetting the Controller | The operations and status when the power supply to the Controller is cycled are emulated. This can be performed only in PROGRAM mode. You cannot reset the Controller in RUN mode. | |
| | Backing Up Variables and Memory | When you replace an NJ-series Controller, you can back up the retained memory in the Controller to a file and restore the backed up data from the file to the new Controller. | |
| Security Measures | Prevention of Incorrect Connections | Confirming Controller Names and Serial IDs | If the name or the serial ID is different between the project and the Controller when an online connection is established, a confirmation dialog box is displayed. |
| | | Prevention of Incorrect Operation | Operation Authority Verification |
| | Prevention of the Theft of Assets | | Controller Write Protection |
| | | Authentication of User Program Execution IDs | You can ensure that a user program cannot be operated on another CPU Unit even if copied. |
| | | User Program Transfer with No Restoration Information | The program source code is not transferred. If this option is selected, programs are not displayed even if uploaded from another computer. However, variables and settings are transferred even if this option is selected. |
| | | Password Protection for Project Files | You can place a password on the file to protect your assets. |
| | Data Protection *2 | You can set passwords for individual POU's (programs, functions, and function block definitions) to prohibit displaying, changing, and copying them. | |
| Online Help | Sysmac Studio Help System | | You can access Sysmac Studio operating procedures. |
| | Instructions Reference | | Information is provided on how to use the instructions that are supported by the NJ-series CPU Units. |
| | System-defined Variable Reference | | You can display a list of descriptions of the system-defined variables that you can use on the Sysmac Studio. |
| | Keyboard Mapping Reference | | You can display a list of convenient shortcut keys that you can use on the Sysmac Studio. |

*2 Supported only by the Sysmac Studio version 1.02 or higher.

Vision Sensor Functions

| Item | | Description |
|--|---|--|
| Setting Parameters | | |
| Main Edit | General Settings | Displays and sets basic information of the sensor. |
| | Sensor Connection | Changes the connection status of the Sensor, and sets the conditions for communications with the Sensor. |
| | Sensor Control in Online | Performs various controls for the sensor mode change, data transfer/save, and monitoring. |
| | Sensor Error History | Displays and clears the error history of an online Sensor. |
| | Tool | Restarts and initializes the sensor, updates the firmware of the sensor, reads sensor data from a file, saves sensor data to a file, prints the sensor parameters, and displays help. |
| Scene Data Edit | Image Condition Settings | Adjusts the image condition. |
| | Specifies the Calibration Pattern | Sets a registered calibration pattern. |
| | Registers Inspection Item | Registers the inspection item to use in the measurement. You can select from the following inspection items: Edge position, Search, Labeling, Shape search |
| | Calculation Settings | Makes a setting for basic arithmetic operations and function operations using inspection item judgment results and measurement data. |
| | Logging Settings | Makes a setting for logging measurement results of inspection items and calculation results. |
| | Output Settings | Makes a setting for data to output to external devices. |
| | Run Settings | Switch Sensor modes or monitors measurement results. |
| Sensor System Data Edit | Trigger Condition Settings | Sets the trigger type and image timing. |
| | I/O Settings | Sets the conditions of output signals. You can check the status of I/O signal while online. |
| | Encoder Settings | Make settings for the encoder such as common encoder settings, ring counter settings, and encoder trigger settings. |
| | Ethernet Communication Settings | Makes Ethernet communication settings. You can select data communication from no-protocol data, PLC link data, and programmable no-protocol data. |
| | EtherCAT Communication Settings | Makes the EtherCAT communication settings according to the communication settings of the EtherCAT master. |
| | Logging Condition Settings | Sets the conditions to log to the internal memory of sensor. |
| | Sensor Settings | Makes the settings for startup scene control function, password setting function, and adjustment judgment function. |
| Calibration Scene Data Settings | | Calculates, views, and edits the calibration parameters. The Vision Sensor supports general-purpose calibration and calibration for conveyor tracking. |
| Debugging | Offline Debugging of Sensor Operation | Simulates measurements offline without connecting to the Vision Sensor. You can use external image files and perform measurements under the conditions set in the offline settings, then display the results of those measurements. |
| | Offline Debugging of the Sensor Control Program and Sensor Operation | Performs a linked simulation between the sequence control of an NJ-series Controller and the operation of an FQ-M Sensor in EtherCAT configuration systems. This allows you to debug operation offline from when measurements and other processing are performed for control signals such as measurement triggers through the output of processing results. |

Note: Supported only by the Sysmac Studio version 1.01 or higher.

Applicable Models

| Series | | Unit version | Model |
|-----------------------------|-------------------|---|--|
| CPU | NJ-series | – | NJ501-1500/1400/1300 NJ301-1200/1100 |
| Servo Drives | G5-series | Servo Drives with unit version 2.1 or higher recommended | R88D-KNA5L-ECT/KN01L-ECT/KN02L-ECT/KN04L-ECT R88D-KN01H-ECT/KN02H-ECT/KN04H-ECT/KN08H-ECT/KN10H-ECT/KN15H-ECT/ KN20H-ECT/KN30H-ECT/KN50H-ECT/KN75H-ECT/KN150H-ECT R88D-KN06F-ECT/KN10F-ECT/KN15F-ECT/KN20F-ECT/KN30F-ECT/KN50F-ECT/ KN75F-ECT/KN150F-ECT |
| Inverters | MX2-series | Inverters with version 1.1 or higher *1 | 3G3MX2-A2001/A2002/A2004/A2007/A2015/A2022/A2037/A2055/A2075/A2110/A2150 3G3MX2-A4004/A4007/A4015/A4022/A4030/A4040/A4055/A4075/A4110/A4150 3G3MX2-AB001/AB002/AB004/AB007/AB015/AB022 |
| Vision Sensors | FQ-series | – | FQ-MS120/125 FQ-MS120-M/125-M FQ-MS120-ECT/125-ECT FQ-MS120-M-ECT/125-M-ECT |
| Fiber Sensors *2 | E3X-HD0 | – | E3X-HD0 |
| Remote I/O Terminals | GX-series | Remote I/O Terminals with unit version 1.1 or higher recommended | GX-ID1611/1612/1621/1622/1618/1628/3218/3228 GX-OD1611/1612/1621/1622/1618/1628/3218/3228 GX-MD1611/1612/1621/1622/1618/1628/3218/3228 GX-OC1601 GX-AD0471 GX-DA0271 GX-EC0211/0241 |
| HMI's | NS-series | To connect the NJ5 Controller : NS system version 8.5 or higher CX-Designer version 3.3 or higher To connect the NJ3 Controller : NS system version 8.61 or higher CX-Designer version 3.4 or higher | NS5-MQ11-V2/MQ11B-V2 NS5-SQ11-V2/SQ11B-V2 NS5-TQ11-V2/TQ11B-V2 NS8-TV01-V2/TV01B-V2 NS10-TV01-V2/TV01B-V2 NS12-TS01-V2/TS01B-V2 NS15-TX01S-V2/TX01B-V2 |

*1 A communications unit for connecting to EtherCAT network (3G3AX-MX2-ECT with unit version 1.1 or higher) is additionally required.

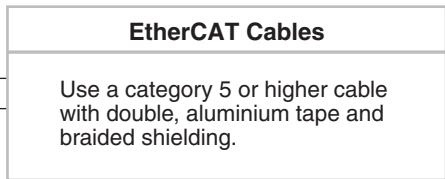
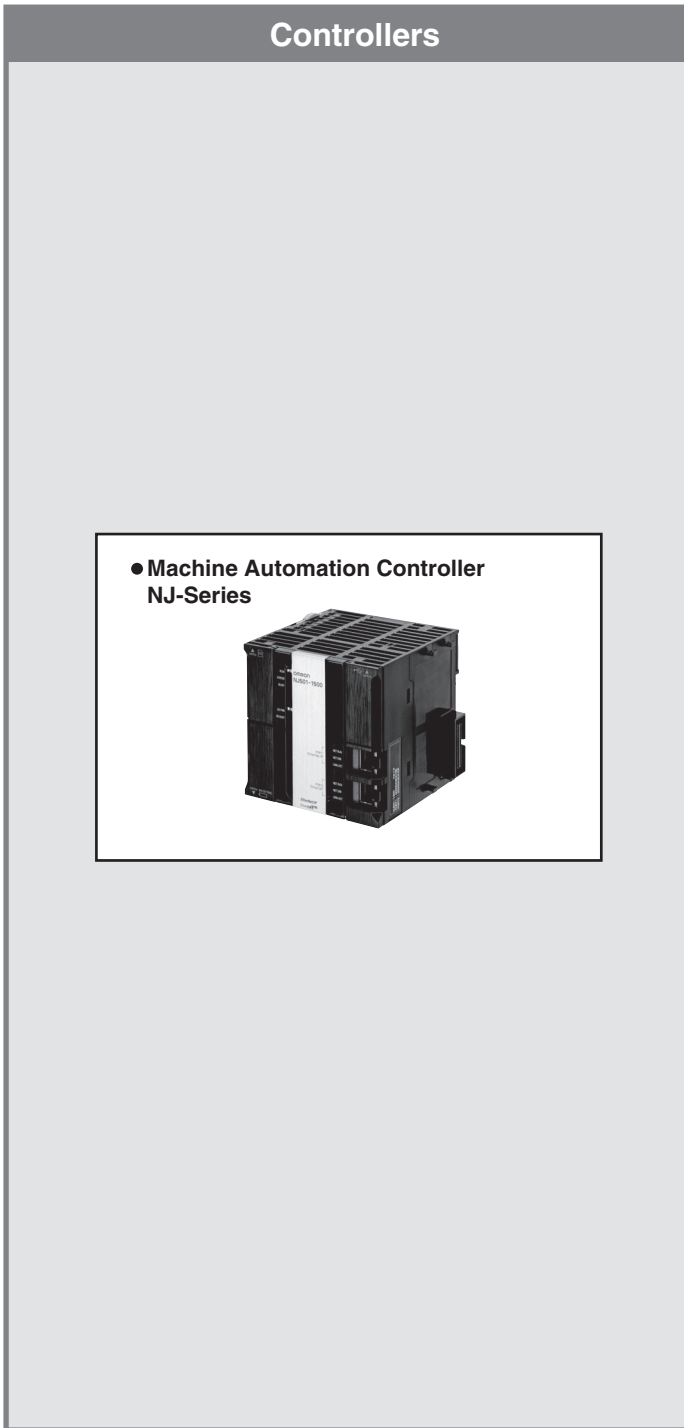
*2 A communications unit for connecting to EtherCAT network (E3X-ECT) is additionally required.

Web Support Services

| Category | Function |
|---------------------------------|---|
| Online User Registration | You can register online as a user of Sysmac Studio. |
| Automatic Update | With the automatic update function of Sysmac Studio, the latest update information for your computer environment can be searched for and applied using the Internet. Your Sysmac Studio can be constantly updated to the latest state. |

G5-Series

System Configuration



Servo Drive



• **G5-Series Drives with Built-in EtherCAT Communications R88D-KN□□-ECT**

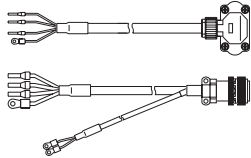
USB Communications

EtherCAT Communications

I/O signals

Power Cables

- **Non-Flexible Cables**
- **Without Brake**
R88A-CA□□□□□S
- **With Brake**
R88A-CA□□□□□B
- **Flexible Cables**
- **Without Brake**
R88A-CA□□□□□SR
- **With Brake**
R88A-CA□□□□□BR



Brake Cables (50 to 750 W max.)

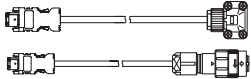
- **Non-Flexible Cables**
R88A-CAKA□□□□B
- **Flexible Cables**
R88A-CAKA□□□□BR

Motor power signals

Feedback Signals

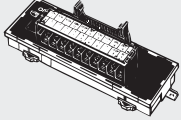
Encoder Cables

- **Non-Flexible Cables**
- **For 750W or less**
R88A-CRK□□□□□C
- **For 1.0kW or more**
R88A-CRKC□□□□N
- **Flexible Cables**
- **For 750W or less**
R88A-CRK□□□□□CR
- **For 1.0kW or more**
R88A-CRKC□□□□NR




Connector-Terminal Block Conversion Units and Cable

- **Connector-Terminal Block Conversion Unit**
XW2□-20G□



- **Cable**
XW2Z-□□□□J-B34



AC Servomotors



- **G5-Series motor R88M-K**

3000r/min
2000r/min
1500r/min
1000r/min

INC ABS INC


Peripheral Devices

- **Reactors**
3G3AX-DL
3G3AX-AL
- **External Regeneration Resistors**
R88A-RR

External scale


Absolute Encoder Battery Cable

R88A-CRGD0R3C (-BS)
(One Battery is included with model numbers ending in"BS")



Note: Not required if a battery is connected to the control connector (CN1).

Decelerators



INC **Incremental output:** When the controller power supply is turned ON, operation is always started from the origin.

ABS INC **Absolute/Incremental output:** The Servomotor can be switched between an absolute output and an Incremental output. When an absolute output is selected and the Controller power supply is turned ON, the Controller reads the Servo absolute position data to restore the absolute position.

G5-Series AC Servo Drives with Built-in EtherCAT Communications

R88D-KN□-ECT

G5-series provides both high-speed and highly-accurate control and safety



- High-accuracy positioning with fully-closed control.
- Servo Drives for 400VAC widens applicable systems and environment, including large-scale equipment and overseas facilities.
- Safe design and Safe Torque Off (STO) function (application pending)
- Vibration can be suppressed in acceleration/deceleration even in low rigidity mechanical systems.



General Specifications

| Item | | Specifications | |
|--|---------------|---|---|
| Ambient operating temperature and operating humidity | | 0 to 55°C, 90%RH max. (with no condensation) | |
| Storage ambient temperature and humidity | | -20 to 65°C, 90%RH max. (with no condensation) | |
| Operating and storage atmosphere | | No corrosive gases | |
| Vibration resistance | | 10 to 60 Hz and at an acceleration of 5.88 m/s ² or less (Not to be run continuously at a resonance point) | |
| Insulation resistance | | Between power supply terminals/power terminals and FG terminal: 0.5 MΩ min. (at 500 VDC) | |
| Dielectric strength | | Between power supply/power line terminals and FG terminal: 1,500 VAC for 1 min at 50/60 Hz | |
| Protective structure | | Built into panel | |
| International standard | EC Directives | EMC Directive | EN 55011, EN 61000-6-2, IEC 61800-3 |
| | | Low Voltage Directive | EN 61800-5-1 |
| | | Machinery Directives | EN954-1 (Category 3), EN ISO 13849-1: 2008 (Category 3) (PLc,d), ISO 13849-1: 2006 (Category 3) (PLc,d), EN61508 (SIL2), EN62061 (SIL2), EN61800-5-2 (STO), IEC61326-3-1 (SIL2) |
| | UL standards | | UL 508C |
| | CSA standards | | CSA22.2 No. 14 |

- Note:**
1. The above items reflect individual evaluation testing. The results may differ under compound conditions.
 2. Never perform dielectric strength or other megameter tests on the Servo Drive. Failure to follow this guideline may result in damaging the internal elements.
 3. Depending on the operating conditions, some Servo Drive parts will require maintenance. For details, refer to G5 Series USER'S MANUAL (Cat.No. I576)

Performance Specifications

Servo Drives with 100 VAC Input Power for Single-phase input type

| Item | | | R88D-KNA5L-ECT | R88D-KN01L-ECT | R88D-KN02L-ECT | R88D-KN04L-ECT |
|-----------------------------------|-------------------------|-----------------------|--|----------------|----------------|----------------|
| Continuous output current (rms) | | | 1.2A | 1.7A | 2.5A | 4.6A |
| Input power supply | Main circuit | Power supply capacity | 0.4KVA | 0.4KVA | 0.5KVA | 0.9KVA |
| | | Power supply voltage | Single-phase 100 to 120 VAC (85 to 132 V) 50/60 Hz | | | |
| | | Rated current | 1.7A | 2.6A | 4.3A | 7.6A |
| | | Heat value*1 | 11W | 16.6W | 21W | 25W |
| | Control circuit | Power supply voltage | Single-phase 100 to 120 VAC (85 to 132 V) 50/60 Hz | | | |
| | | Heat value*1 | 4W | 4W | 4W | 4W |
| Weight | | | Approx. 0.8kg | Approx. 0.8kg | Approx. 1.0kg | Approx. 1.6kg |
| Maximum applicable motor capacity | | | 50W | 100W | 200W | 400 W |
| Applicable Servomotor | 3,000 r/min Servomotors | INC | K05030H | K10030L | K20030L | K40030L |
| | | ABS | K05030T | K10030S | K20030S | K40030S |
| | 2,000 r/min Servomotors | ABS | - | - | - | - |
| | | ABS | - | - | - | - |

*1 The heat value is given for rated operation.

Servo Drives with 200 VAC Input Power for Single-phase/Three-phase input type

| Item | | | R88D-KN01H-ECT | R88D-KN02H-ECT | R88D-KN04H-ECT | R88D-KN08H-ECT | R88D-KN10H-ECT | R88D-KN15H-ECT |
|-----------------------------------|-------------------------|-----------------------|--|----------------|----------------|----------------|----------------|--------------------|
| Continuous output current (rms) | | | 1.2A | 1.6A | 2.6A | 4.1A | 5.9A | 9.4A |
| Input power supply | Main circuit | Power supply capacity | 0.5KVA | 0.5KVA *1 | 0.9KVA | 1.3KVA | 1.8KVA | 2.3KVA |
| | | Power supply voltage | Single-phase or 3-phase 200 to 240 VAC (170 to 264 V) 50/60 Hz | | | | | |
| | | Rated current | 1.6/0.9A *1 | 2.4/1.3A *1 | 4.1/2.4A *1 | 6.6/3.6A *1 | 9.1/5.2A *1 | 14.2/8.1A *1 |
| | | Heat value*2 | 14.3/13.7W*1 | 23/19W *1 | 33/24W *1 | 30/35.5W *1 | 57/49W *1 | 104/93W*1 |
| | Control circuit | Power supply voltage | Single-phase 200 to 240 VAC (170 to 264 V) 50/60 Hz | | | | | |
| | | Heat value*2 | 4W | 4W | 4W | 4W | 7W | 7W |
| Weight | | | Approx. 0.8kg | Approx. 0.8kg | Approx. 1.0kg | Approx. 1.6kg | Approx. 1.8kg | Approx. 1.8kg |
| Maximum applicable motor capacity | | | 100W | 200W | 400W | 750W | 1kW | 1.5kW |
| Applicable Servomotor | 3,000 r/min Servomotors | INC | K05030H K10030H | K20030H | K40030H | K75030H | - | K1K030H K1K530H |
| | | ABS | K05030T K10030T | K20030T | K40030T | K75030T | - | K1K030T K1K530T |
| | 2,000 r/min Servomotors | INC | - | - | - | - | K1K020H | K1K520H |
| | | ABS | - | - | - | - | K1K020T | K1K520T |
| | 1,000 r/min Servomotors | INC | - | - | - | - | - | K90010H |
| | | ABS | - | - | - | - | - | K90010T |

*1 The first value is for single-phase input power and the second value is for 3-phase input power.

*2 The heat value is given for rated operation.

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors/Servo Drives
General Specifications
Performance Specifications
EtherCAT Communications Specifications
Version Information
Components and Functions
Dimensions
Fiber Sensor
Remote I/O Terminals
Ordering Information

AC Servomotors/Servo Drives G5-Series

AC Servo Drives EtherCAT Communications Built-in Type

Servo Drives with 200 VAC Input Power for Three-phase input type

| Item | | | R88D-KN20H-ECT | R88D-KN30H-ECT | R88D-KN50H-ECT | R88D-KN75H-ECT | R88D-KN150H-ECT | |
|-----------------------------------|-------------------------|-----------------------|---|----------------|--------------------|----------------|--|--|
| Continuous output current (rms) | | | 13.4A | 18.7A | 33.0A | 44.0A | 66.1A | |
| Input power supply | Main circuit | Power supply capacity | 3.3KVA | 4.5KVA | 7.5KVA | 11.0KVA | 22.0KVA | |
| | | Power supply voltage | 3-phase 200 to 230 VAC (170 to 253 V) 50/60 Hz | | | | 3-phase 200 to 230VAC (170 to 253V) 50/60Hz 280 to 325VDC (238 to 357V) | |
| | | Rated current | 11.8A | 15.1A | 21.6A | 32.0A | 58.0A | |
| | | Heat value *1 | 139W | 108W | 328W | 381W | 720W | |
| | Control circuit | Power supply voltage | Single-phase 200 to 230 VAC (170 to 253 V) 50/60 Hz | | | | Single-phase 200 to 230VAC (170 to 253V) 50/60Hz 280 to 25VDC (238 to 357V) | |
| | | Heat value *1 | 10W | 13W | 13W | 15W | 17W | |
| Weight | | | Approx. 2.7kg | Approx. 4.8kg | Approx. 4.8kg | Approx. 13.5kg | Approx. 21.0kg | |
| Maximum applicable motor capacity | | | 2kW | 3kW | 5kW | 7.5kW | 15kW | |
| Applicable Servomotor | 3,000 r/min Servomotors | INC | K2K030H | K3K030H | K4K030H K5K030H | - | - | |
| | | ABS | K2K030T | K3K030T | K4K030T K5K030T | - | - | |
| | 2,000 r/min Servomotors | INC | K2K020H | K3K020H | K4K020H K5K020H | - | - | |
| | | ABS | K2K020T | K3K020T | K4K020T K5K020T | K7K515T | K11K015T K15K015T | |
| | 1,000 r/min Servomotors | INC | - | K2K010H | K3K010H | - | - | |
| | | ABS | - | K2K010T | K3K010T K4K510T | K6K010T | - | |

*1 The heat value is given for rated operation.

Servo Drives with 400 VAC Input Power for Three-phase input type

| Item | | | R88D-KN06F-ECT | R88D-KN10F-ECT | R88D-KN15F-ECT | R88D-KN20F-ECT | R88D-KN30F-ECT | R88D-KN50F-ECT | R88D-KN75F-ECT | R88D-KN150F-ECT | |
|-----------------------------------|-------------------------|-----------------------|--|----------------|--------------------|----------------|----------------|--------------------|----------------|----------------------|--|
| Continuous output current (rms) | | | 1.5A | 2.9A | 4.7A | 6.7A | 9.4A | 16.5A | 22.0A | 33.1A | |
| Input power supply | Main circuit | Power supply capacity | 1.2KVA | 1.8KVA | 2.3KVA | 3.8KVA | 4.5KVA | 6.0KVA | 11.0KVA | 22.0KVA | |
| | | Power supply voltage | Three-phase 380 to 480 VAC (323 to 528 V) 50/60 Hz | | | | | | | | |
| | | Rated current | 2.1A | 2.8A | 4.7A | 5.9A | 7.6A | 12.1A | 16.0A | 29.0A | |
| | | Heat value*1 | 32.2W | 48W | 49W | 65W | 108W | 200W | 300W | 590W | |
| | Control circuit | Power supply voltage | 24 VDC (20.4 to 27.6 V) | | | | | | | | |
| | | Heat value*1 | 7W | 7W | 7W | 10W | 13W | 13W | 15W | 22W | |
| Weight | | | Approx. 1.9kg | Approx. 1.9kg | Approx. 1.9kg | Approx. 2.7kg | Approx. 4.7kg | Approx. 4.7kg | Approx. 13.5kg | Approx. 21.0kg | |
| Maximum applicable motor capacity | | | 600W | 1kW | 1.5kW | 2kW | 3kW | 5kW | 7.5kW | 15kW | |
| Applicable Servomotor | 3,000 r/min Servomotors | INC | - | K75030F | K1K030F K1K530F | K2K030F | K3K030F | K4K030F K5K030F | - | - | |
| | | ABS | - | K75030C | K1K030C K1K530C | K2K030C | K3K030C | K4K030C K5K030C | - | - | |
| | 2,000 r/min Servomotors | INC | K40020F K60020F | K1K020F | K1K520F | K2K020F | K3K020F | K4K020F K5K020F | - | - | |
| | | ABS | K40020C K60020C | K1K020C | K1K520C | K2K020C | K3K020C | K4K020C K5K020C | K7K515C | K11K015C K15K015C | |
| | 1,000 r/min Servomotors | INC | - | - | K90010F | - | K2K010F | K3K010F | - | - | |
| | | ABS | - | - | K90010C | - | K2K010C | K3K010C K4K510C | K6K010C | - | |

*1 The heat value is given for rated operation.

EtherCAT Communications Specifications

| Item | Specification |
|--------------------------------|--|
| Communications standard | IEC 61158 Type 12, IEC 61800-7 CiA 402 Drive Profile |
| Physical layer | 100BASE-TX (IEEE802.3) |
| Connectors | RJ45 × 2 (shielded) ECAT IN: EtherCAT input ECAT OUT: EtherCAT output |
| Communications media | Category 5 or higher (cable with double, aluminum tape and braided shielding) is recommended. |
| Communications distance | Distance between nodes: 100 m max. |
| Process data | Fixed PDO mapping |
| Mailbox (CoE) | Emergency messages, SDO requests, SDO responses, and SDO information |
| Distributed clock | Synchronization in DC mode. DC cycle: 250 μs, 500 μs, 1 ms, 2 ms, 4 ms |
| LED indicators | L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1 |
| CiA402 Drive Profile | <ul style="list-style-type: none"> • Cyclic synchronous position mode • Cyclic synchronous velocity mode • Cyclic synchronous torque mode • Profile position mode • Homing mode • Touch probe function (Latch function) • Torque limit function |

Version Information

Unit Versions

| Unit | Model | Unit version | | |
|--|----------------|---------------------------|--------------------------|-----------------------|
| | | Unit version 1.0 | Unit version 2.0 | Unit version 2.1 |
| AC Servo Drives G5-Series built-in EtherCAT Communications | R88D-KN□-ECT-R | Supported | | |
| | R88D-KN□-ECT | | Supported | Supported |
| Compatible Sysmac Studio version | | Version 1.00 or higher *1 | Version1.00 or higher *2 | Version1.00 or higher |

*1 The function that was enhanced by the upgrade for Unit version2.0 can not be used. For detail, refer to "Function Support by Unit Version".

*2 The function that was enhanced by the upgrade for Unit version2.1 can not be used. For detail, refer to "Function Support by Unit Version".

Function Support by Unit Version

| Unit | | AC Servo Drives G5-Series built-in EtherCAT Communications | | |
|--|--|--|---|--|
| Model | | R88D-KN□-ECT-R | R88D-KN□-ECT | |
| Item | Unit version | Unit version 1.0 | Unit version 2.0 | Unit version 2.1 |
| | | Sysmac Products Features | Sysmac Error Status | No supported |
| | Saving the Node Address Setting | No supported | | Supported |
| | Serial Number Display *1 | No supported | | Supported |
| | ESI Specification (Version 1.0) | No supported | | Supported |
| | SII Data Check | No supported | | Supported |
| Fixed PDO mapping | | No supported | Supported | |
| Variable PDO mapping (1600 hex, 1A00 hex) | | No supported | | Supported |
| Available operation modes | csp: Cyclic synchronous position mode | Supported | | |
| | csv: Cyclic synchronous velocity mode | No supported | Supported | |
| | cst: Cyclic synchronous torque mode | No supported | Supported | |
| | pp: Profile position mode | No supported | | Supported |
| | hm: Homing mode | No supported | Supported | |
| FIR filter function | | No supported | Supported *2 (Available when the communications cycle is 1 ms or above) | |
| Error detection function | Excessive Speed Deviation Error | No supported | Supported | |
| | Interruptions Error | No supported | Supported | |
| Electronic gear function | | Supported | No supported (only to 1:1) | Supported |
| Fully-closed Control *3 | | Supported | Available when the communications cycle is 500•s or above in csp and 1 ms or above in hm. | Available when the communications cycle is 1 ms or above at an electronic gear ratio of 1:1 and 2 ms or above at a gear ratio other than 1:1. *4 |

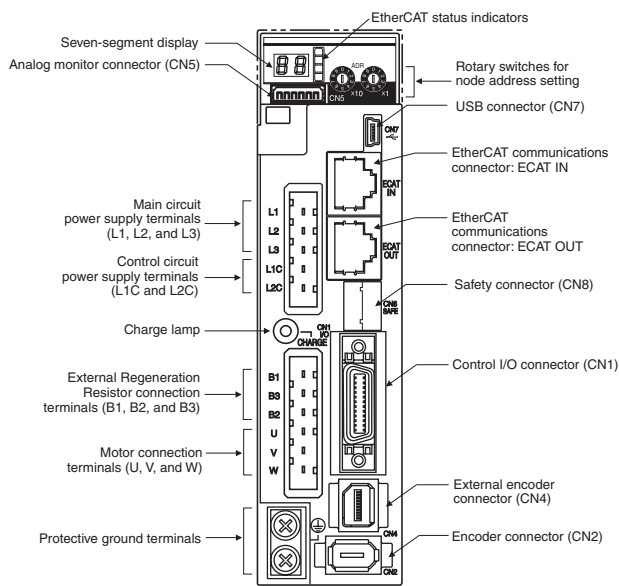
AC Servomotors/Servo Drives G5-Series

AC Servo Drives EtherCAT Communications Built-in Type

| Unit Model | AC Servo Drives G5-Series built-in EtherCAT Communications | | |
|---|--|---|------------------|
| | R88D-KN□-ECT-R | R88D-KN□-ECT | |
| Unit version | Unit version 1.0 | Unit version 2.0 | Unit version 2.1 |
| Torque limit objects | PDO mapping to 60E0/60E1 hex is not possible. | PDO mapping to 60E0/60E1 hex is possible.*5 | |
| Positioning Completion Range | No supported | Supported | |
| Reference Position for CSP (4020 hex) | No supported | Supported | |
| Data Setting Warning Detection Setting (3781) | No supported | Supported | |
| Version indication on the unit label | No supported | Supported | |

- *1 The function to show the serial number controlled by OMRON in 1018h-04 hex.
- *2 Setting the communications cycle to 500 μs or less does not enable the FIR filter function, although doing so does not cause any error.
- *3 If Fully-closed Control is not available, a Function Setting Error (Error No. 93.4) will occur.
- *4 This is applicable only when the total size of the objects mapped to RxPDO is 12 bytes or less. For details, refer to the USER'S MANUAL.
- *5 There are objects added (3013 hex/3522 hex) to or renamed (3525 hex/3526 hex) from unit version 1.0. For details of these objects, refer to Torque Limit Selection (3521 hex) in Extended Objects of each manual.

Components and Functions



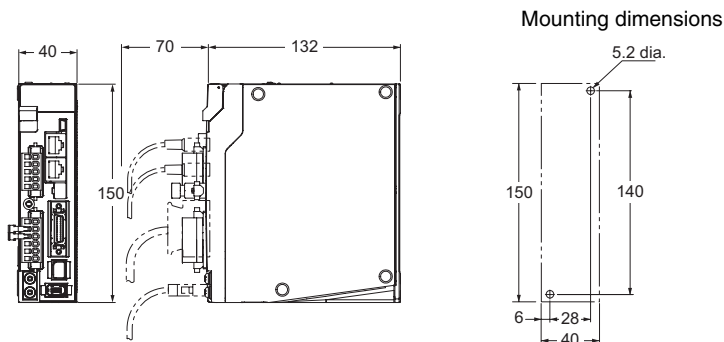
| Name | Function |
|---|--|
| Display | A 2-digit 7-segment display shows the node address, error codes, and other Servo Drive status. |
| Charge Lamp | Lights when the main circuit power supply is turned ON. |
| EtherCAT Status Indicators | These indicators show the status of EtherCAT communications. For details, refer to G5 Series USER'S MANUAL (Cat.No. I576). |
| Control I/O Connector (CN1) | Used for command input signals and I/O signals. |
| Encoder Connector (CN2) | Connector for the encoder installed in the Servomotor. |
| External Encoder Connector (CN4) | Connector for an encoder signal used during fully-closed control. |
| EtherCAT Communications Connectors (ECAT IN and ECAT OUT) | These connectors are for EtherCAT communications. |
| Analog Monitor Connector (CN5) | You can use a special cable to monitor values, such as the motor rotation speed, torque command value, etc. |
| USB Connector (CN7) | Communications connector for the computer. |
| Safety Connector (CN8) | Connector for safety devices. If no safety devices are used, keep the factory-set safety bypass connector installed. |

Dimensions

<Wall Mounting>

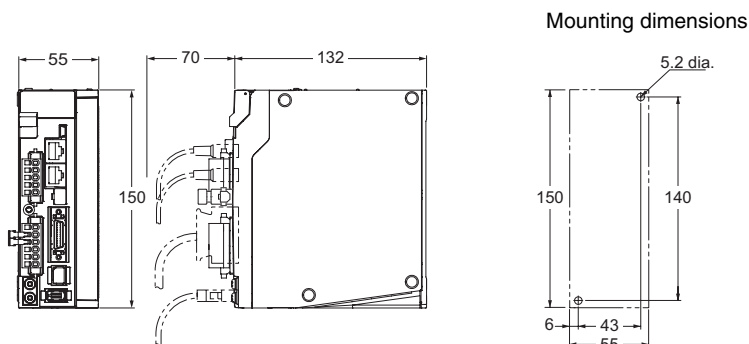
Single-phase 100 VAC R88D-KNA5L-ECT/-KN01L-ECT (50 to 100 W)

Single-phase/Three-phase 200 VAC R88D-KN01H-ECT/-KN02H-ECT (100 to 200W)



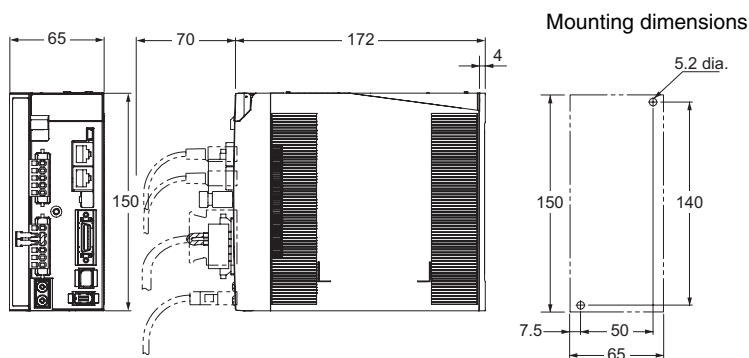
Single-phase 100 VAC R88D-KN02L-ECT (200W)

Single-phase/Three-phase 200 VAC R88D-KN04H-ECT (400W)



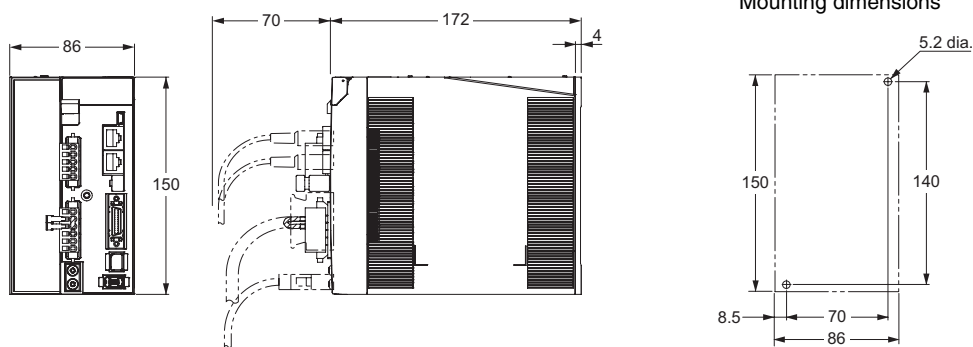
Single-phase 100 VAC R88D-KN04L-ECT (400W)

Single-phase/Three-phase 200 VAC R88D-KN08H-ECT (750W)

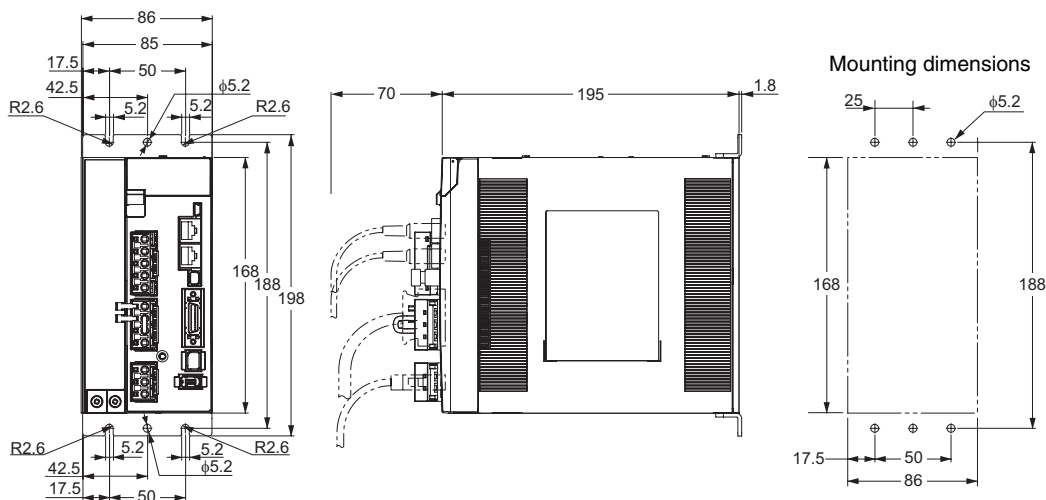


AC Servomotors/Servo Drives G5-Series
AC Servo Drives EtherCAT Communications Built-in Type

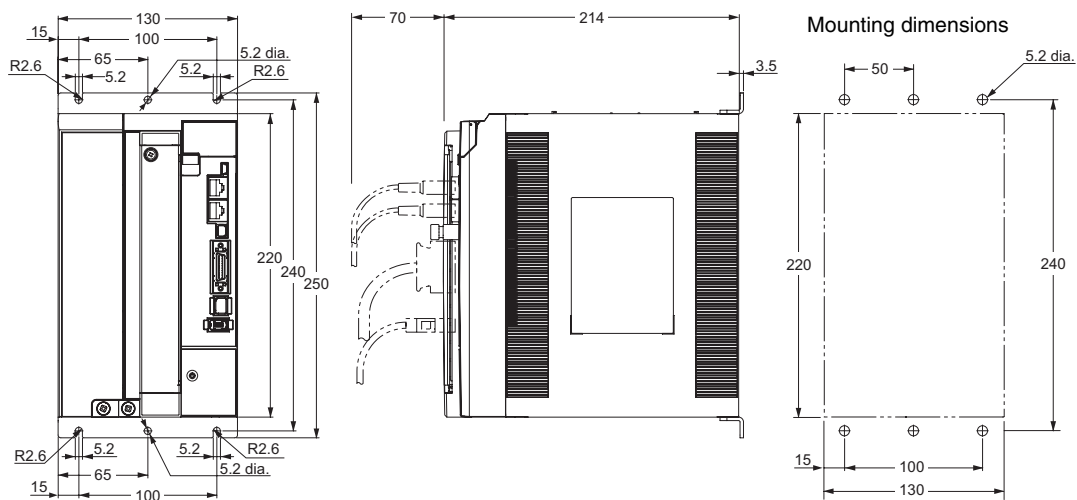
Single-phase/Three-phase 200 VAC R88D-KN10H-ECT/-KN15H-ECT (900W to 1.5kW)



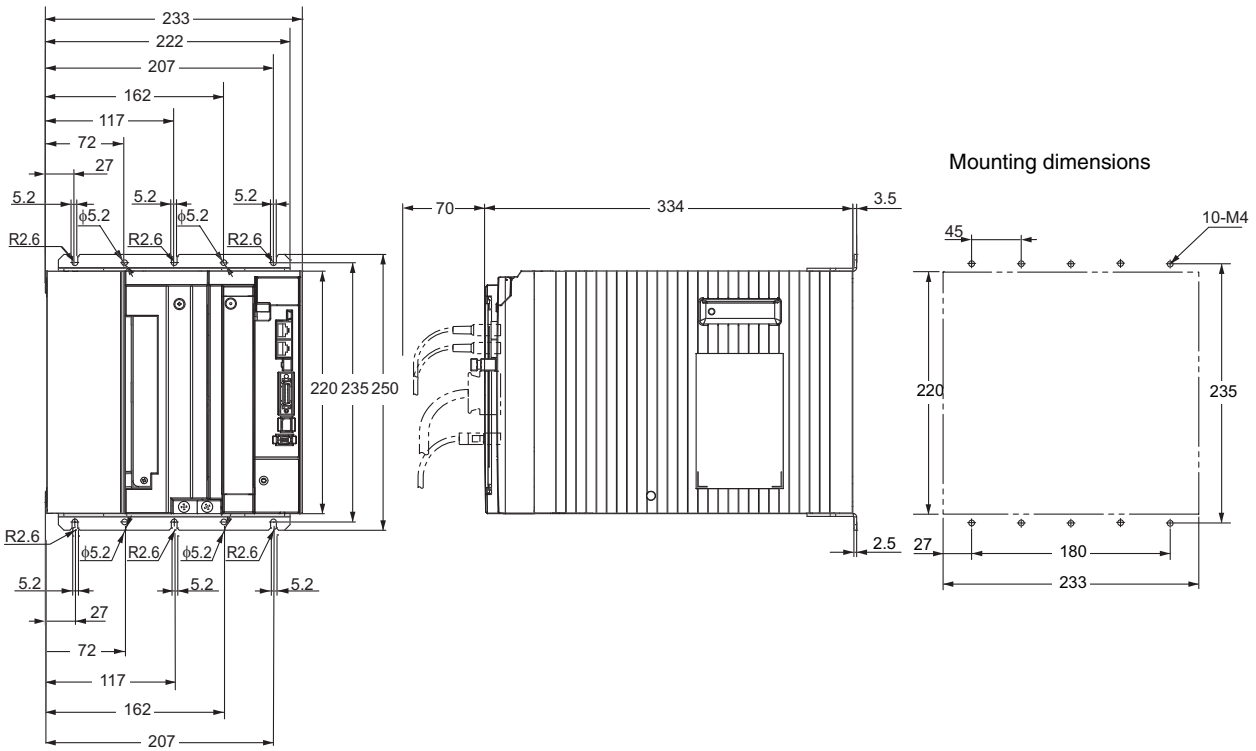
Three-phase 200 VAC R88D-KN20H-ECT (2kW)



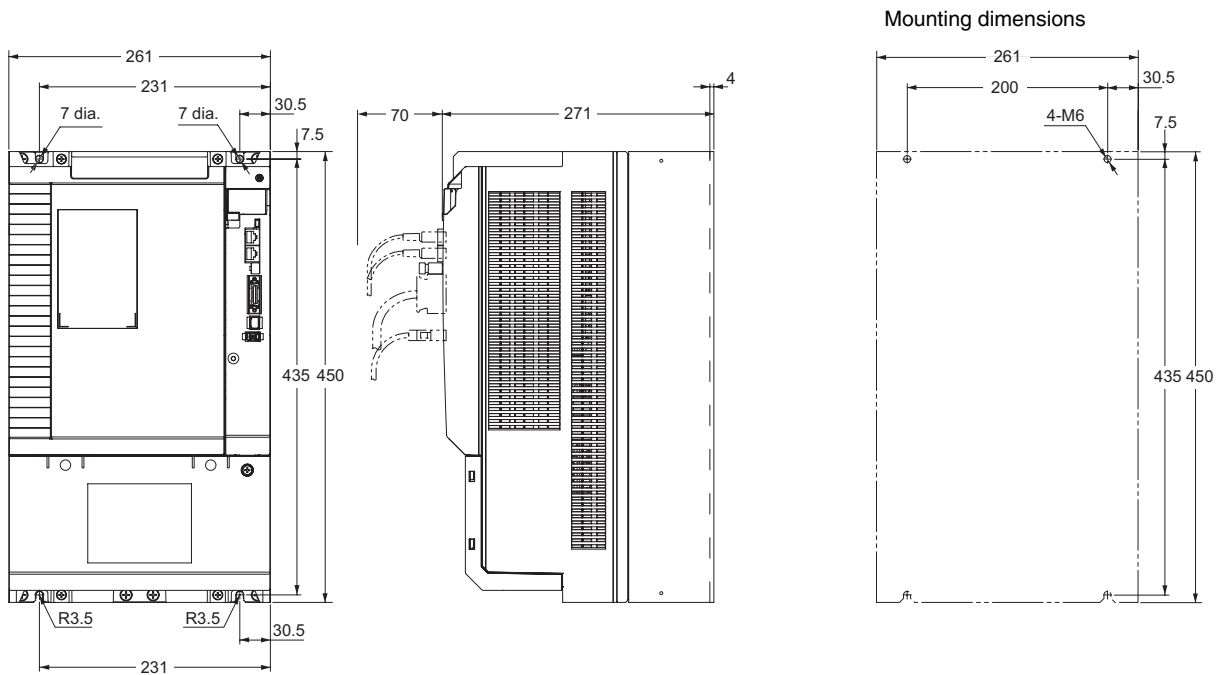
Three-phase 200 VAC R88D-KN30H-ECT/-KN50H-ECT (3 to 5kW)



Three-phase 200 VAC R88D-KN75H-ECT (7.5kW)



Three-phase 200 VAC R88D-KN150H-ECT (15kW)



System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multifunction Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

General Specifications

Performance Specifications

EtherCAT Communications Specifications

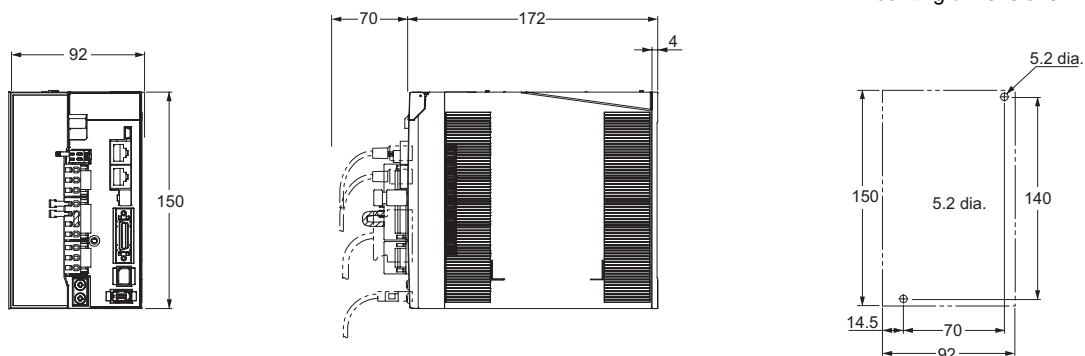
Version Information

Components and Functions

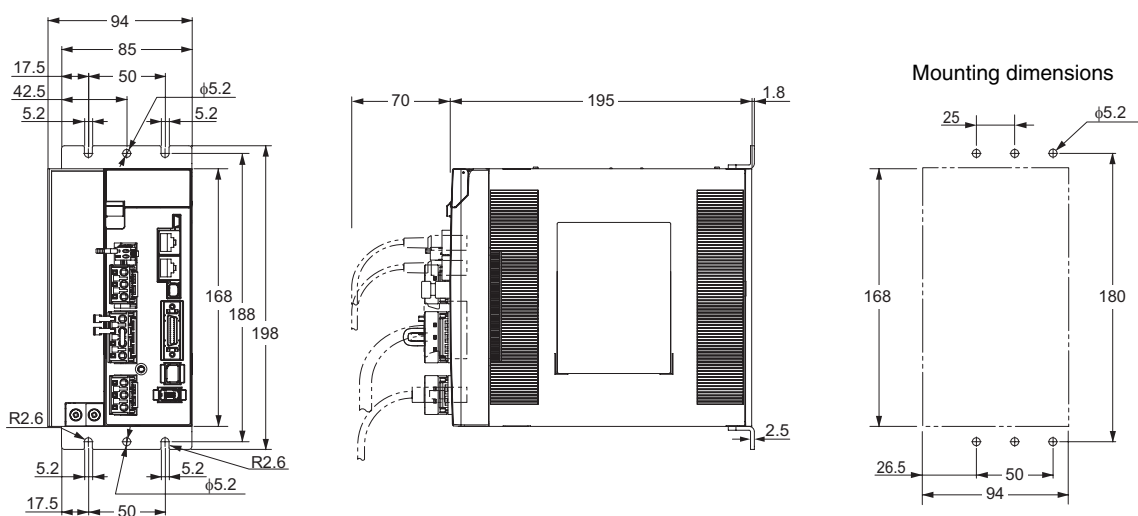
Dimensions

AC Servomotors/Servo Drives G5-Series
AC Servo Drives EtherCAT Communications Built-in Type

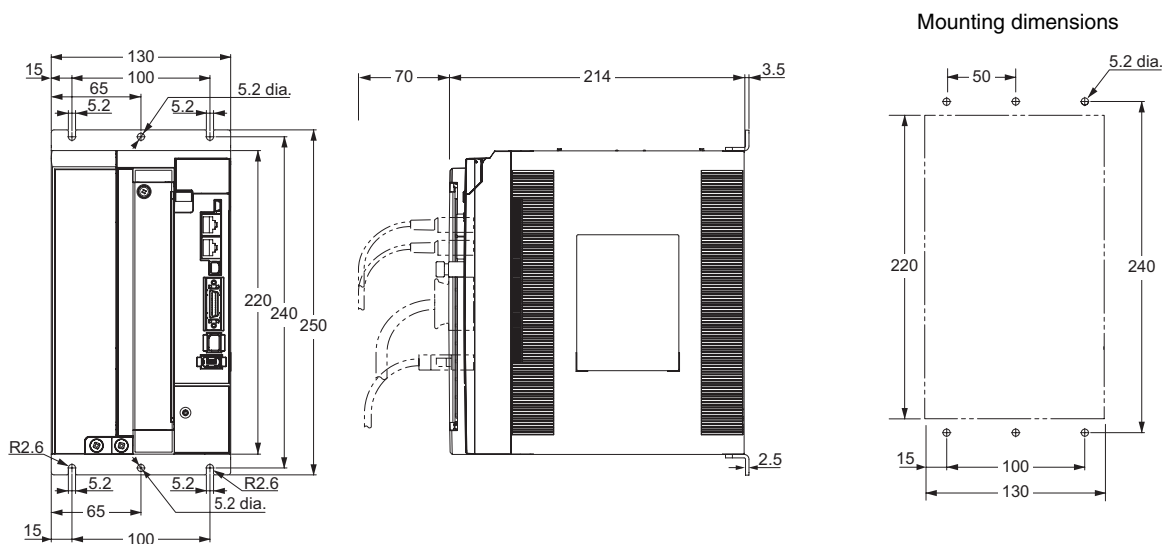
Three-phase 400 VAC R88D-KN06F-ECT/-KN10F-ECT (600W to 1.0kW)
Three-phase 400 VAC R88D-KN15F-ECT (1.5kW)



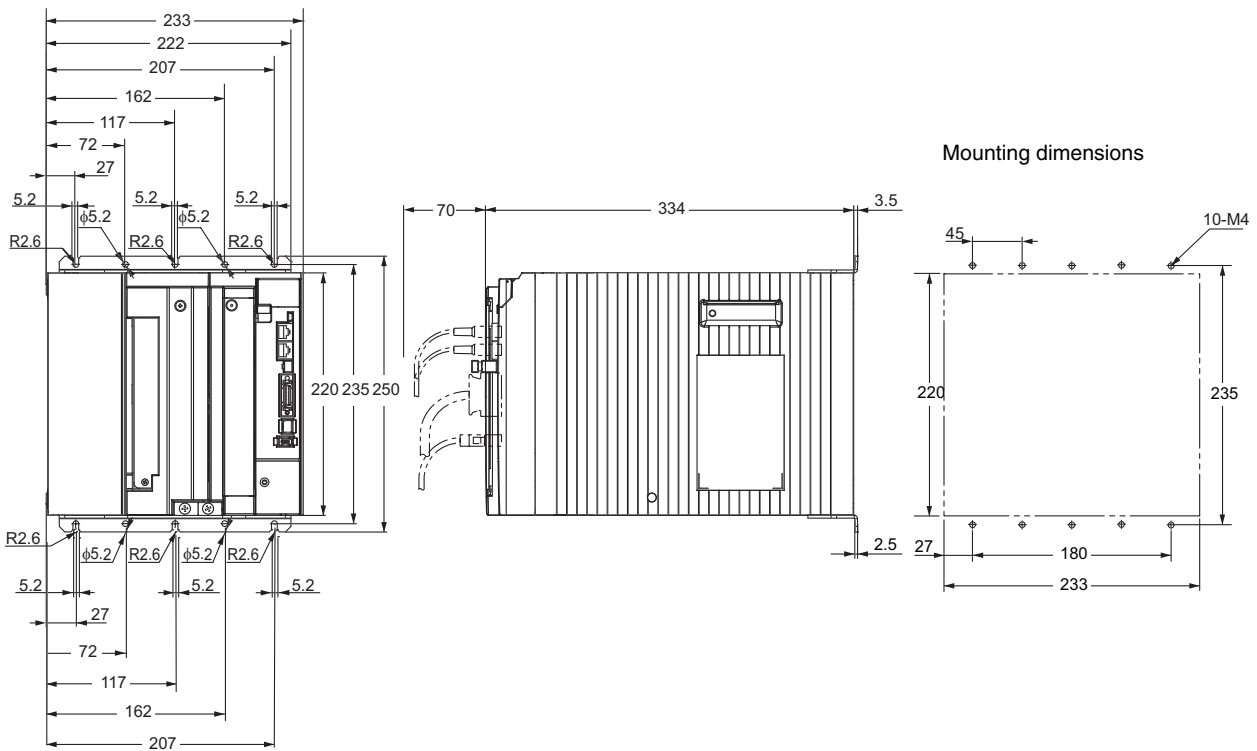
Three-phase 400 VAC R88D-KN20F-ECT (2kW)



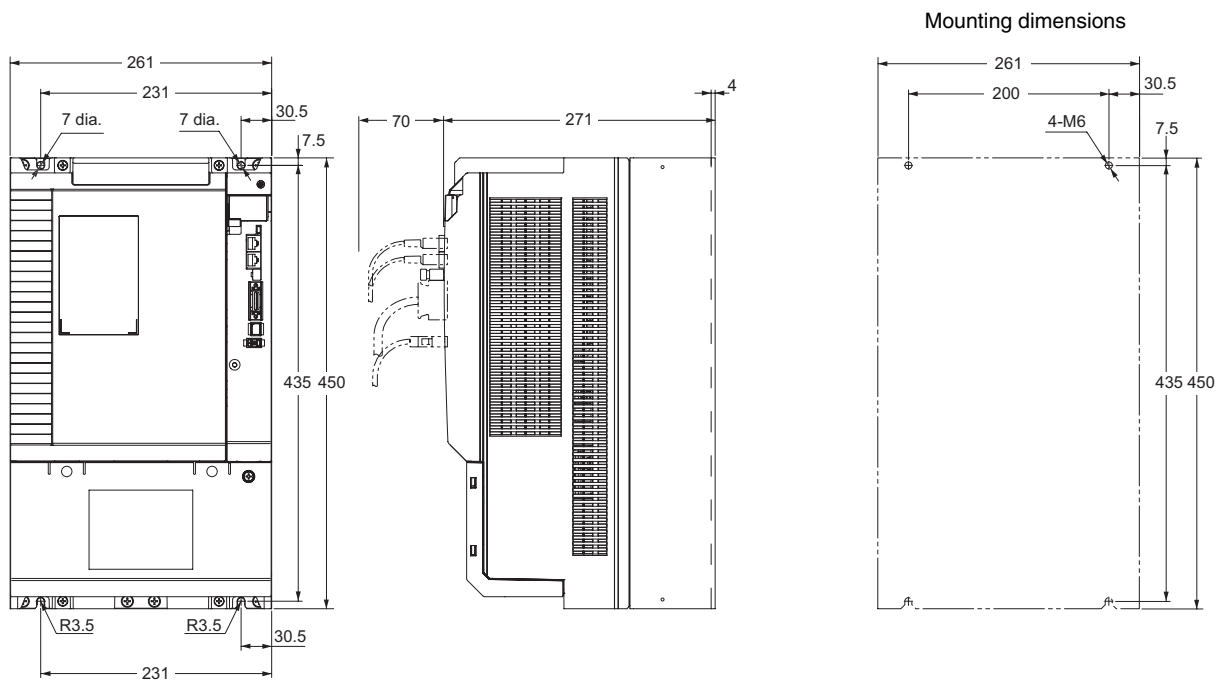
Three-phase 400 VAC R88D-KN30F-ECT/-KN50F-ECT (3 to 5kW)



Three-phase 400 VAC R88D-KN75F-ECT (7.5kW)



Three-phase 400 VAC R88D-KN150F-ECT (15kW)



System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

General Specifications

Performance Specifications

EtherCAT Communications Specifications

Version Information

Vision Sensor Components and Functions

Fiber Sensor Dimensions

Remote I/O Terminals

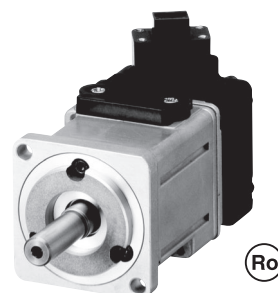
Ordering Information

G5-Series AC Servomotors

R88M-K INC ABS/INC

Servo family for accurate motion control. Power range extended up to 15kW

- Maximum rotation speed : 6,000 r/min
- Featuring a 20-bit high-resolution incremental encoder
- Servomotors Conform to IP67
- 60% cogging torque reduction



General Specifications

| Item | 3,000-r/min motors | | 1,000-r/min motors 1,500-r/min motors 2,000-r/min motors |
|--|--|-----------------------|--|
| | 50 to 750W | 1 to 5kW | 900W to 15kW |
| Ambient operating temperature and operating humidity | 0 to 40°C 20 to 85% RH (with no condensation) | | |
| Storage ambient temperature and humidity | -20 to +65°C, 20% to 85% RH (with no condensation) Guaranteed maximum temperature: 72 hours at 80°C | | |
| Operating and storage atmosphere | No corrosive gases | | |
| Vibration resistance *1 | Acceleration of 49 m/s ² 24.5 m/s ² max. in X, Y, and Z directions when the motor is stopped | | |
| Impact resistance | Acceleration of 98 m/s ² max. 3 times each in X, Y, and Z directions | | |
| Insulation resistance | Between power terminal and FG terminal: 20 MΩ min. (at 500 VDC Megger) | | |
| Dielectric strength | 1,500 VAC between power terminal and FG terminal (sensed current 10 mA) for 1 min (voltage 100 V, 200 V) 1,800 VAC between power terminal and FG terminal (sensed current 10 mA) for 1 min (voltage 400 V) 1,000 VAC between brake terminal and FG terminal (sensed current 10 mA) for 1 min | | |
| Insulation class | Type B | Type F | |
| Protective structure | IP67 (except for through-shaft parts and motor and encoder connector pins) | | |
| International standard | EC directive | EMC directive | EN55011 classA group1 EN61000-6-2, IEC61800-3, IEC61326-3-1 |
| | | Low voltage directive | EN60034-1/-5 |
| | UL standards | UL1004-1 | UL1004-1, UL1004-6 *2 |
| | CSA standards | CSA 22.2 No.100 | |

*1 The amplitude may be amplified by machine resonance. Do not exceed 80% of the specified value for extended periods of time.

*2 UL 1004-6 applies only to 1,500-r/min Servomotors of 7.5 to 15 kW and 1,000-r/min Servomotors of 4.5 to 6 kW.

Note: 1. Do not use the cable when it is laying in oil or water.

2. Do not expose the cable outlet or connections to stress due to bending or the weight of the cable itself.

Performance Specifications

<Cylinder type>

• 3,000 r/min Servomotors (100 VAC Input Power)

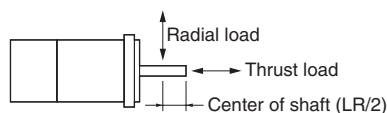
| Item | | Model (R88M-) | K05030H | K10030L | K20030L | K40030L |
|--------------------------------------|--------------------------------|---------------------|---|------------------------|-----------------------|-----------------------|
| | | Unit | K05030T | K10030S | K20030S | K40030S |
| Rated output *1 | | W | 50 | 100 | 200 | 400 |
| Rated torque *1 | | N • m | 0.16 | 0.32 | 0.64 | 1.3 |
| Rated rotation speed | | r/min | 3,000 | | | |
| Momentary maximum rotation speed | | r/min | 6,000 | | | |
| Momentary maximum torque*1 | | N • m | 0.48 | 0.95 | 1.91 | 3.8 |
| Rated current *1 | | A (rms) | 1.1 | 1.6 | 2.5 | 4.6 |
| Momentary maximum current*1 | | A (rms) | 4.7 | 6.9 | 10.6 | 19.5 |
| Rotor inertia | Without brake | kg • m ² | 0.025×10 ⁻⁴ | 0.051×10 ⁻⁴ | 0.14×10 ⁻⁴ | 0.26×10 ⁻⁴ |
| | With brake | kg • m ² | 0.027×10 ⁻⁴ | 0.054×10 ⁻⁴ | 0.16×10 ⁻⁴ | 0.28×10 ⁻⁴ |
| Applicable load inertia | | — | 30 times the rotor inertia max. *2 | | | |
| Torque constant *1 | | N • m/A | 0.11±10% | 0.14±10% | 0.20±10% | 0.21±10% |
| Power rate *1 | Without brake | kW/s | 10.1 | 19.8 | 28.9 | 62.4 |
| | With brake | kW/s | 9.4 | 18.7 | 25.3 | 37.8 |
| Mechanical time constant | Without brake | ms | 1.43 | 1.03 | 0.61 | 0.48 |
| | With brake | ms | 1.54 | 1.09 | 0.70 | 0.52 |
| Electrical time constant | | ms | 0.82 | 0.91 | 3.0 | 3.4 |
| Allowable radial load *3 | | N | 68 | 68 | 245 | 245 |
| Allowable thrust load *3 | | N | 58 | 58 | 98 | 98 |
| Weight | Without brake | kg | Approx. 0.31 | Approx. 0.45 | Approx. 0.78 | Approx. 1.2 |
| | With brake | kg | Approx. 0.51 | Approx. 0.65 | Approx. 1.2 | Approx. 1.6 |
| Radiator plate dimensions (material) | | | 100×80×t10 (Al) | | 130×120×t12 (Al) | |
| Applicable drivers (R88D-) | | | KNA5L-ECT | KN01L-ECT | KN02L-ECT | KN04L-ECT |
| Brake specifications | Brake inertia | kg • m ² | 2×10 ⁻⁷ | 2×10 ⁻⁷ | 1.8×10 ⁻⁶ | 1.8×10 ⁻⁶ |
| | Excitation voltage *4 | V | 24 VDC±10% | | | |
| | Power consumption (at 20°C) | W | 7 | 7 | 9 | 9 |
| | Current consumption (at 20°C) | A | 0.3 | 0.3 | 0.36 | 0.36 |
| | Static friction torque | N • m | 0.29 min. | 0.29 min. | 1.27 min. | 1.27 min. |
| | Attraction time *5 | ms | 35 max. | 35 max. | 50 max. | 50 max. |
| | Release time *5 | ms | 20 max. | 20 max. | 15 max. | 20 max. |
| | Backlash | | ±1° | | | |
| | Allowable work per braking | J | 39.2 | 39.2 | 137 | 137 |
| | Allowable total work | J | 4.9×10 ³ | 4.9×10 ³ | 44.1×10 ³ | 44.1×10 ³ |
| | Allowable angular acceleration | rad/s ² | 30,000 max. (Speed of 2,800 r/min or more must not be changed in less than 10 ms) | | | |
| | Brake limit | — | 10 million times min. | | | |
| Rating | — | Continuous | | | | |
| Insulation class | — | Type F | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

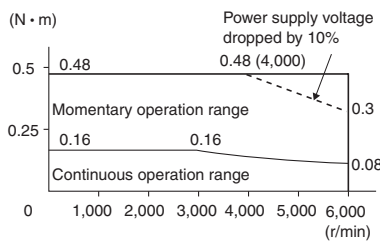
*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

Torque and Rotation Speed Characteristics

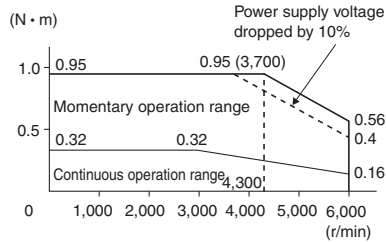
• 3,000 r/min Servomotors (100 VAC Input Power)

The following graphs show the characteristics with a 3-m standard cable and a 100 VAC input.

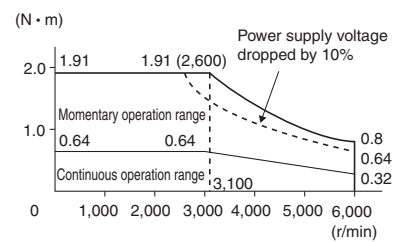
• R88M-K05030H/T (50W)



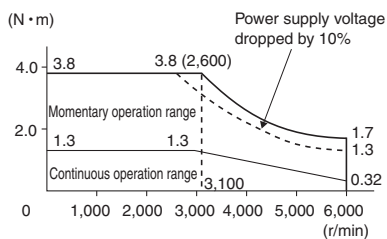
• R88M-K10030L/S (100W)



• R88M-K20030L/S (200W)



• R88M-K40030L/S (400W)



- Note: 1.** The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.
2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Performance Specifications

• 3,000 r/min Servomotors (200 VAC Input Power)

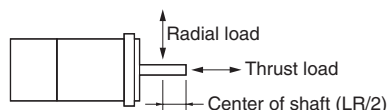
| Model (R88M-) | | K05030H | K10030H | K20030H | K40030H | K75030H | K1K030H | K1K530H | K2K030H | K3K030H | K4K030H | K5K030H | | |
|--------------------------------------|--------------------------------|---------------------|---|------------------------|-----------------------|-----------------------|------------------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|-----------------------|-----------------------|---------------------|
| Item | | Unit | K05030T | K10030T | K20030T | K40030T | K75030T | K1K030T | K1K530T | K2K030T | K3K030T | K4K030T | K5K030T | |
| Rated output *1 | W | | 50 | 100 | 200 | 400 | 750 | 1000 | 1500 | 2000 | 3000 | 4000 | 5000 | |
| Rated torque *1 | N • m | | 0.16 | 0.32 | 0.64 | 1.3 | 2.4 | 3.18 | 4.77 | 6.37 | 9.55 | 12.7 | 15.9 | |
| Rated rotation speed | r/min | | 3,000 | | | | | | | | | | | |
| Momentary maximum rotation speed] | r/min | | 6,000 | | | | 5,000 | | | | 4,500 | | | |
| Momentary maximum torque *1 | N • m | | 0.48 | 0.95 | 1.91 | 3.8 | 7.1 | 9.55 | 14.3 | 19.1 | 28.6 | 38.2 | 47.7 | |
| Rated current *1 | A (rms) | | 1.1 | 1.1 | 1.5 | 2.4 | 4.1 | 6.6 | 8.2 | 11.3 | 18.1 | 19.6 | 24.0 | |
| Momentary maximum current *1 | A (rms) | | 4.7 | 4.7 | 6.5 | 10.2 | | 28 | 35 | 48 | 77 | 83 | 102 | |
| Rotor inertia | Without brake | kg • m ² | 0.025×10 ⁻⁴ | 0.051×10 ⁻⁴ | 0.14×10 ⁻⁴ | 0.26×10 ⁻⁴ | 0.87×10 ⁻⁴ | 2.03×10 ⁻⁴ | 2.84×10 ⁻⁴ | 3.68×10 ⁻⁴ | 6.50×10 ⁻⁴ | 12.9×10 ⁻⁴ | 17.4×10 ⁻⁴ | |
| | With brake | kg • m ² | 0.027×10 ⁻⁴ | 0.054×10 ⁻⁴ | 0.16×10 ⁻⁴ | 0.28×10 ⁻⁴ | 0.97×10 ⁻⁴ | 2.35×10 ⁻⁴ | 3.17×10 ⁻⁴ | 4.01×10 ⁻⁴ | 7.85×10 ⁻⁴ | 14.2×10 ⁻⁴ | 18.6×10 ⁻⁴ | |
| Applicable load inertia | – | | 30 times the rotor inertia max. *2 | | | | 20 times the rotor inertia max. *2 | 15 times the rotor inertia max. *2 | | 15 times the rotor inertia max. *2 | | | | |
| Torque constant *1 | N • mA | | 0.11±10% | 0.21±10% | 0.32±10% | 0.40±10% | 0.45±10% | 0.37 | 0.45 | 0.44 | 0.41 | 0.49 | 0.49 | |
| Power rate *1 | Without brake | kW/s | 10.1 | 19.8 | 28.9 | 62.3 | 65.4 | 49.8 | 80.1 | 110 | 140 | 126 | 146 | |
| | With brake | kW/s | 9.4 | 18.7 | 25.3 | 57.8 | 58.7 | 43.0 | 71.8 | 101 | 116 | 114 | 136 | |
| Mechanical time constant | Without brake | ms | 1.43 | 1.07 | 0.58 | 0.43 | 0.37 | 0.61 | 0.49 | 0.44 | 0.41 | 0.51 | 0.50 | |
| | With brake | ms | 1.54 | 1.13 | 0.66 | 0.46 | 0.42 | 0.71 | 0.55 | 0.48 | 0.49 | 0.56 | 0.54 | |
| Electrical time constant | ms | | 0.82 | 0.90 | 3.2 | 3.4 | 5.3 | 5.8 | 6.3 | 6.7 | 11 | 12 | 13 | |
| Allowable radial load *3 | N | | 68 | 68 | 245 | 245 | 490 | 490 | 490 | 490 | 490 | 784 | 784 | |
| Allowable thrust load *3 | N | | 58 | 58 | 98 | 98 | 196 | 196 | 196 | 196 | 196 | 343 | 343 | |
| Weight | Without brake | kg | Approx. 0.31 | Approx. 0.46 | Approx. 0.79 | Approx. 1.2 | Approx. 2.3 | Approx. 3.5 | Approx. 4.4 | Approx. 5.3 | Approx. 8.3 | Approx. 11.0 | Approx. 14.0 | |
| | With brake | kg | Approx. 0.51 | Approx. 0.66 | Approx. 1.2 | Approx. 1.6 | Approx. 3.1 | Approx. 4.5 | Approx. 5.4 | Approx. 6.3 | Approx. 9.4 | Approx. 12.6 | Approx. 16.0 | |
| Radiator plate dimensions (material) | | | 100×80×t10 (Al) | | 130×120×t12 (Al) | | 170×160×t12 (Al) | 320×300×t20 (Al) | | 380×350×t30 (Al) | | | | |
| Applicable drives (R88D-) | | | KN01H-ECT | KN01H-ECT | KN02H-ECT | KN04H-ECT | KN08H-ECT | KN15H-ECT | KN15H-ECT | KN20H-ECT | KN30H-ECT | KN50H-ECT | KN50H-ECT | |
| Brake specifications | Brake inertia | kg • m ² | 2×10 ⁻⁷ | 2×10 ⁻⁷ | 1.8×10 ⁻⁶ | 1.8×10 ⁻⁶ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | |
| | Excitation voltage *4 | V | 24 VDC±10% | | | | | | | | | | | |
| | Power consumption (at 20°C) | W | 7 | 7 | 9 | 9 | 17 | 19 | 19 | 19 | 19 | 22 | 22 | |
| | Current consumption (at 20°C) | A | 0.3 | 0.3 | 0.36 | 0.36 | 0.70±10% | 0.81±10% | 0.81±10± | 0.81±10% | 0.81±10% | 0.90±10% | 0.90±10% | |
| | Static friction torque | N • m | 0.29 min. | 0.29 min. | 1.27 min. | 1.27 min. | 2.5 min. | 7.8 min. | 7.8 min. | 7.8 min. | 11.8 min. | 16.1 min. | 16.1 min. | |
| | Attraction time *5 | ms | 35 max. | 35 max. | 50 max. | 50 max. | 50 max. | 50 max. | 50 max. | 50 max. | 80 max. | 110 max. | 110 max. | |
| | Release time *5 | ms | 20 max. | 20 max. | 15 max. | 15 max. | 15 max. *6 | 15 max. *6 | 15 max. *6 | 15 max. *6 | 15 max. *6 | 15 max. *6 | 50 max. *7 | 50 max. *7 |
| | Backlash | | ±1° | | | | | | | | | | | |
| | Allowable work per braking | J | 39.2 | 39.2 | 137 | 137 | 392 | 392 | 392 | 392 | 392 | 1470 | 1470 | |
| | Allowable total work | J | 4.9×10 ³ | 4.9×10 ³ | 44.1×10 ³ | 44.1×10 ³ | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁶ | 4.9×10 ⁶ | 2.2×10 ⁶ | 2.2×10 ⁶ |
| | Allowable angular acceleration | rad/s ² | 30,000 max. (Speed of 2,800 r/min or more must not be changed in less than 10 ms) | | | | | 10,000 | | | | | | |
| | Brake limit | – | 10 million times min. | | | | | | | | | | | |
| | Rating | – | Continuous | | | | | | | | | | | |
| | Insulation class | – | Type F | | | | | | | | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

*6 Direct current switching with a varistor (Z15D151 by Ishizuka Electronics Co.).

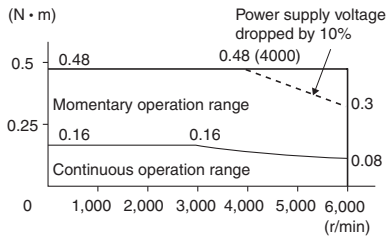
*7 Direct current switching with a varistor (TNR9G820K by Nippon Chemi-Con Corporation).

Torque and Rotation Speed Characteristics

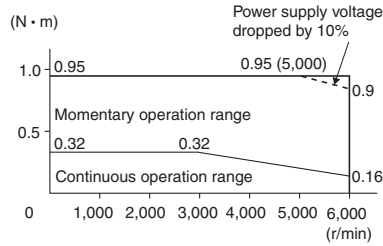
• 3,000 r/min Servomotors (200 VAC Input Power)

The following graphs show the characteristics with a 3 m standard cable and a 200 VAC input.

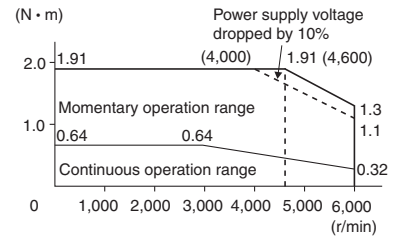
• R88M-K05030H/T (50W)



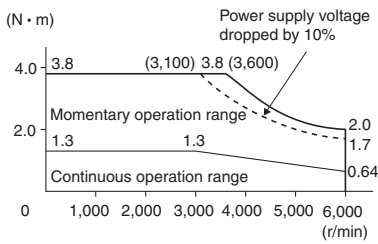
• R88M-K10030H/T (100W)



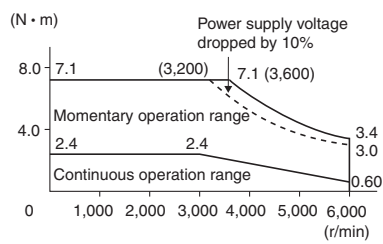
• R88M-K20030H/T (200W)



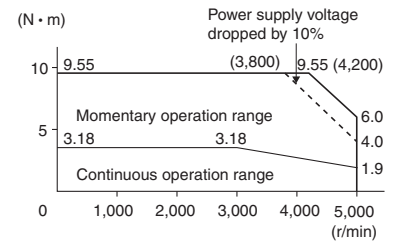
• R88M-K40030H/T (400W)



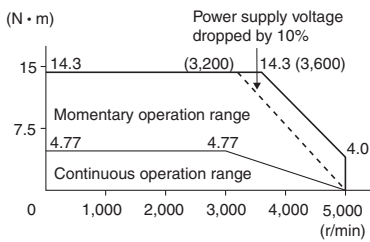
• R88M-K75030H/T (750W)



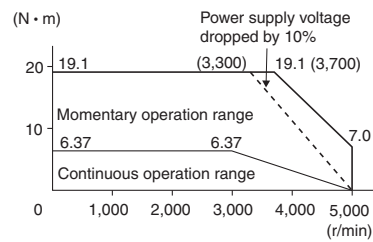
• R88M-K1K030H/T (1kW)



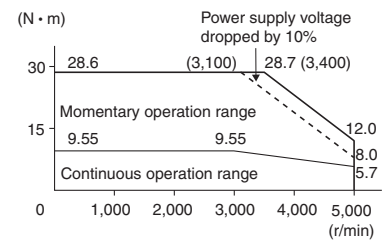
• R88M-K1K530H/T (1.5kW)



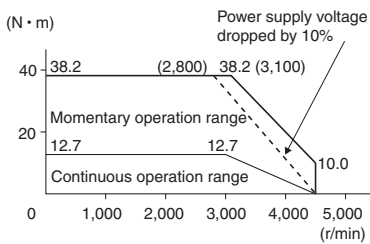
• R88M-K2K030H/T (2kW)



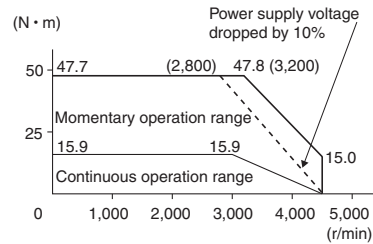
• R88M-K3K030H/T (3kW)



• R88M-K4K030H/T (4kW)



• R88M-K5K030H/T (5kW)



Note: 1. The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.

2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Performance Specifications

• 3,000 r/min Servomotors (400 VAC Input Power)

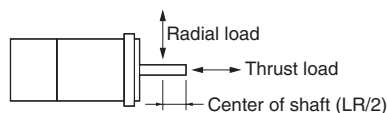
| Model (R88M-) | | K75030F | K1K030F | K1K530F | K2K030F | K3K030F | K4K030F | K5K030F | |
|---|----------------------------------|---|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Item | Unit | K75030C | K1K030C | K1K530C | K2K030C | K3K030C | K4K030C | K5K030C | |
| Rated output ^{*1} | W | 750 | 1,000 | 1,500 | 2,000 | 3,000 | 4,000 | 5,000 | |
| Rated torque ^{*1} | N • m | 2.39 | 3.18 | 4.77 | 6.37 | 9.55 | 12.7 | 15.9 | |
| Rated rotation speed | r/min | 3,000 | | | | | | | |
| Momentary maximum rotation speed | r/min | 5,000 | | | | | 4,500 | | |
| Momentary maximum torque ^{*1} | N • m | 7.16 | 9.55 | 14.3 | 19.1 | 28.6 | 38.2 | 47.7 | |
| Rated current ^{*1} | A (rms) | 2.4 | 3.3 | 4.2 | 5.7 | 9.2 | 9.9 | 12.0 | |
| Momentary maximum current ^{*1} | A (rms) | 10 | 14 | 18 | 24 | 39 | 42 | 51 | |
| Rotor inertia | Without brake | kg • m ² | 1.61×10 ⁻⁴ | 2.03×10 ⁻⁴ | 2.84×10 ⁻⁴ | 3.68×10 ⁻⁴ | 6.50×10 ⁻⁴ | 12.9×10 ⁻⁴ | 17.4×10 ⁻⁴ |
| | With brake | kg • m ² | 1.93×10 ⁻⁴ | 2.35×10 ⁻⁴ | 3.17×10 ⁻⁴ | 4.01×10 ⁻⁴ | 7.85×10 ⁻⁴ | 14.2×10 ⁻⁴ | 18.6×10 ⁻⁴ |
| Applicable load inertia | – | 20 times the rotor inertia max. ^{*2} | 15 times the rotor inertia max. ^{*2} | | | | | | |
| Torque constant ^{*1} | N • m/A | 0.78 | 0.75 | 0.89 | 0.87 | 0.81 | 0.98 | 0.98 | |
| Power rate ^{*1} | Without brake | kW/s | 35.5 | 49.8 | 80.1 | 110 | 140 | 126 | 146 |
| | With brake | kW/s | 29.6 | 43 | 71.8 | 101 | 116 | 114 | 136 |
| Mechanical time constant | Without brake | ms | 0.67 | 0.60 | 0.49 | 0.45 | 0.40 | 0.51 | 0.50 |
| | With brake | ms | 0.8 | 0.70 | 0.55 | 0.49 | 0.49 | 0.56 | 0.54 |
| Electrical time constant | ms | 5.9 | 5.8 | 6.5 | 6.6 | 12 | 13 | 13 | |
| Allowable radial load ^{*3} | N | 490 | 490 | 490 | 490 | 490 | 784 | 784 | |
| Allowable thrust load ^{*3} | N | 196 | 196 | 196 | 196 | 196 | 343 | 343 | |
| Weight | Without brake | kg | Approx. 3.1 | Approx. 3.5 | Approx. 4.4 | Approx. 5.3 | Approx. 8.3 | Approx. 11.0 | Approx. 14.0 |
| | With brake | kg | Approx. 4.1 | Approx. 4.5 | Approx. 5.4 | Approx. 6.3 | Approx. 9.4 | Approx. 12.6 | Approx. 16.0 |
| Radiator plate dimensions (material) | | 320×300×t20 (Al) | | | | 380×350×t30 (Al) | | | |
| Applicable drives (R88D-) | | KN10F-ECT | KN15F-ECT | KN15F-ECT | KN20F-ECT | KN30F-ECT | KN50F-ECT | KN50F-ECT | |
| Brake specifications | Brake inertia | kg • m ² | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 0.33×10 ⁻⁴ | 1.35×10 ⁻⁴ |
| | Excitation voltage ^{*4} | V | 24 VDC±10% | | | | | | |
| | Power consumption (at 20°C) | W | 17 | 19 | 19 | 19 | 19 | 22 | 22 |
| | Current consumption (at 20°C) | A | 0.70±10% | 0.81±10% | 0.81±10% | 0.81±10% | 0.81±10% | 0.90±10% | 0.90±10% |
| | Static friction torque | N • m | 2.5 min. | 7.8 min. | 7.8 min. | 7.8 min. | 11.8 min. | 16.1 min. | 16.1 min. |
| | Attraction time ^{*5} | ms | 50 max. | 50 max. | 50 max. | 50 max. | 80 max. | 110 max. | 110 max. |
| | Release time ^{*5} | ms | 15 max. ^{*6} | 15 max. ^{*6} | 15 max. ^{*6} | 15 max. ^{*6} | 15 max. ^{*6} | 50 max. ^{*7} | 50 max. ^{*7} |
| | Backlash | | ±1° | | | | | | |
| | Allowable work per braking | J | 392 | 392 | 392 | 392 | 392 | 1470 | 1470 |
| | Allowable total work | J | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁵ | 4.9×10 ⁵ | 2.2×10 ⁶ | 2.2×10 ⁶ |
| | Allowable angular acceleration | rad/s ² | 10,000 | | | | | | |
| | Brake limit | – | 10 million times min. | | | | | | |
| Rating | – | Continuous | | | | | | | |
| Insulation class | – | Type F | | | | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

*6 Direct current switching with a varistor (Z15D151 by Ishizuka Electronics Co.).

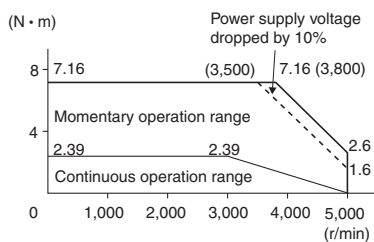
*7 Direct current switching with a varistor (TNR9G820K by Nippon Chemi-Con Corporation).

Torque and Rotation Speed Characteristics

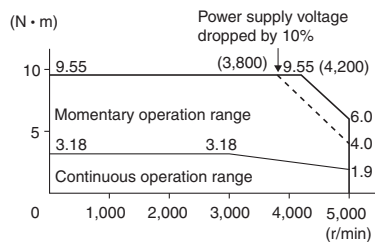
• 3,000 r/min Servomotors (400 VAC Input Power)

The following graphs show the characteristics with a 3 m standard cable and a 400 VAC input.

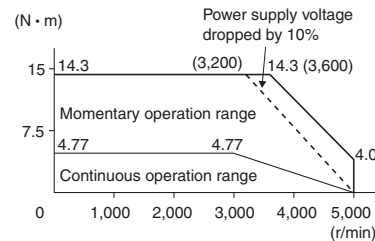
• R88M-K75030F/C (750W)



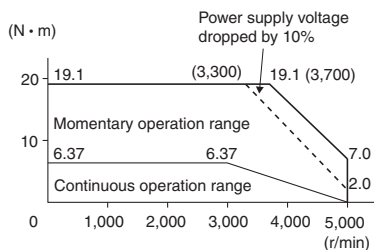
• R88M-K1K030F/C (1kW)



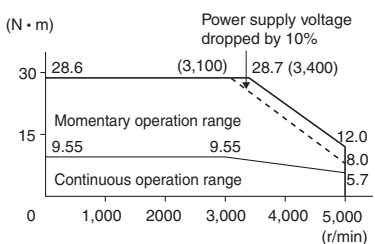
• R88M-K1K530F/C (1.5kW)



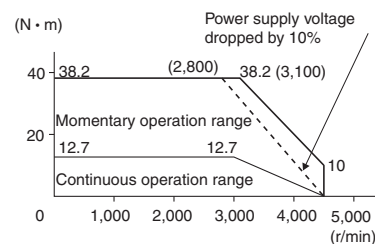
• R88M-K2K030F/C (2kW)



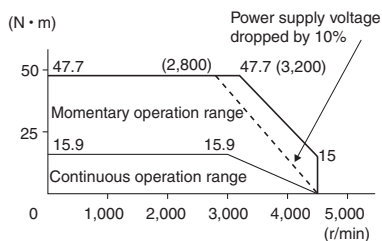
• R88M-K3K030F/C (3kW)



• R88M-K4K030F/C (4kW)



• R88M-K5K030F/C (5kW)



- Note:**
1. The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.
 2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Performance Specifications

• 1,500r/min, 2,000 r/min Servomotors (200 VAC Input Power)

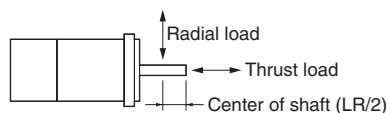
| Item | | Model (R88M-) Unit | K1K020H | K1K520H | K2K020H | K3K020H | K4K020H | K5K020H | — | — | — | |
|---|----------------------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|--|
| | | | K1K020T | K1K520T | K2K020T | K3K020T | K4K020T | K5K020T | K7K515T | K11K015T | K15K015T | |
| Rated output ^{*1} | W | | 1,000 | 1,500 | 2,000 | 3,000 | 4,000 | 5,000 | 7,500 | 11,000 | 15,000 | |
| Rated torque ^{*1} | N • m | | 4.77 | 7.16 | 9.55 | 14.3 | 19.1 | 23.9 | 47.8 | 70.0 | 95.0 | |
| Rated rotation speed | r/min | | 2,000 | | | | | | 1,500 | | | |
| Momentary maximum rotation speed | r/min | | 3,000 | | | | | | 2,000 | | | |
| Momentary maximum torque ^{*1} | N • m | | 14.3 | 21.5 | 28.6 | 43.0 | 57.3 | 71.6 | 119.0 | 175.0 | 224.0 | |
| Rated current ^{*1} | A (rms) | | 5.7 | 9.4 | 11.5 | 17.4 | 21.0 | 25.9 | 44.0 | 54.2 | 66.1 | |
| Momentary maximum current ^{*1} | A (rms) | | 24 | 40 | 49 | 74 | 89 | 110 | 165 | 203 | 236 | |
| Rotor inertia | Without brake | kg • m ² | 4.60×10 ⁻⁴ | 6.70×10 ⁻⁴ | 8.72×10 ⁻⁴ | 12.9×10 ⁻⁴ | 37.6×10 ⁻⁴ | 48.0×10 ⁻⁴ | 101×10 ⁻⁴ | 212×10 ⁻⁴ | 302×10 ⁻⁴ | |
| | With brake | kg • m ² | 5.90×10 ⁻⁴ | 7.99×10 ⁻⁴ | 10.0×10 ⁻⁴ | 14.2×10 ⁻⁴ | 38.6×10 ⁻⁴ | 48.8×10 ⁻⁴ | 107×10 ⁻⁴ | 220×10 ⁻⁴ | 311×10 ⁻⁴ | |
| Applicable load inertia | — | | 10 times the rotor inertia max. ^{*2} | | | | | | | | | |
| Torque constant ^{*1} | N • m/A | | 0.63 | 0.58 | 0.64 | 0.59 | 0.70 | 0.70 | 0.77 | 0.92 | 1.05 | |
| Power rate ^{*1} | Without brake | kW/s | 49.5 | 76.5 | 105 | 159 | 97.1 | 119 | 226 | 231 | 302 | |
| | With brake | kW/s | 38.6 | 64.2 | 91.2 | 144 | 94.5 | 117 | 213 | 223 | 293 | |
| Mechanical time constant | Without brake | ms | 0.80 | 0.66 | 0.66 | 0.57 | 0.65 | 0.63 | 0.58 | 0.80 | 0.71 | |
| | With brake | ms | 1.02 | 0.80 | 0.76 | 0.63 | 0.66 | 0.64 | 0.61 | 0.83 | 0.74 | |
| Electrical time constant | ms | | 9.4 | 10 | 10 | 12 | 20 | 19 | 21 | 31 | 32 | |
| Allowable radial load ^{*3} | N | | 490 | 490 | 490 | 784 | 784 | 784 | 1,176 | 2,254 | 2,254 | |
| Allowable thrust load ^{*3} | N | | 196 | 196 | 196 | 343 | 343 | 343 | 490 | 686 | 686 | |
| Weight | Without brake | kg | Approx. 5.2 | Approx. 6.7 | Approx. 8.0 | Approx. 11.0 | Approx. 15.5 | Approx. 18.6 | Approx. 36.4 | Approx. 52.7 | Approx. 70.2 | |
| | With brake | kg | Approx. 6.7 | Approx. 8.2 | Approx. 9.5 | Approx. 12.6 | Approx. 18.7 | Approx. 21.8 | Approx. 40.4 | Approx. 58.9 | Approx. 76.3 | |
| Radiator plate dimensions (material) | | | 275×260×t15 (Al) | | | 380×350×t30 (Al) | 470×440×t30 (Al) | | 550×520×t30 (Al) | 670×630×t35 (Al) | | |
| Applicable drives (R88D-) | | | KN10H-ECT | KN15H-ECT | KN20H-ECT | KN30H-ECT | KN50H-ECT | KN50H-ECT | KN75H-ECT | KN150H-ECT | KN150H-ECT | |
| Brake specifications | Brake inertia | kg • m ² | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 7.1×10 ⁻⁴ | 7.1×10 ⁻⁴ | |
| | Excitation voltage ^{*4} | V | 24 VDC±10% | | | | | | | | | |
| | Power consumption (at 20°C) | W | 14 | 19 | 19 | 22 | 31 | 31 | 34 | 26 | 26 | |
| | Current consumption (at 20°C) | A | 0.59±10% | 0.79±10% | 0.79±10% | 0.90±10% | 1.3±10% | 1.3±10% | 1.4±10% | 1.08±10% | 1.08±10% | |
| | Static friction torque | N • m | 4.9 min. | 13.7 min. | 13.7 min. | 16.2 min. | 24.5 min. | 24.5 min. | 58.8 min. | 100 min. | 100 min. | |
| | Attraction time ^{*5} | ms | 80 max. | 100 max. | 100 max. | 110 max. | 80 max. | 80 max. | 150 max. | 300 max. | 300 max. | |
| | Release time ^{*5} | ms | 70 max. ^{*6} | 50 max. ^{*6} | 50 max. ^{*6} | 50 max. ^{*6} | 25 max. ^{*7} | 25 max. ^{*7} | 50 max. | 140 max. | 140 max. | |
| | Backlash | | ±1° | | | | | | | | | |
| | Allowable work per braking | J | 588 | 1,176 | 1,176 | 1,470 | 1,372 | 1,372 | 1,372 | 2,000 | 2,000 | |
| | Allowable total work | J | 7.8×10 ⁵ | 1.5×10 ⁶ | 1.5×10 ⁶ | 2.2×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 4.0×10 ⁶ | 4.0×10 ⁶ | |
| | Allowable angular acceleration | rad/s ² | 10,000 | | | | | | 5,000 | | 3,000 | |
| | Brake limit | — | 10 million times min. | | | | | | | | | |
| Rating | — | Continuous | | | | | | | | | | |
| Insulation class | — | Type F | | | | | | | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

*6 Direct current switching with a varistor (Z15D151 by Ishizuka Electronics Co.).

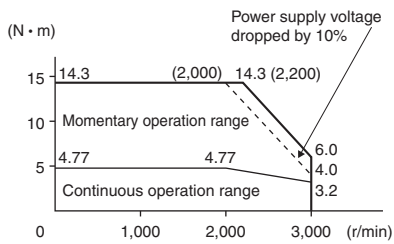
*7 Direct current switching with a varistor (TNR9G820K by Nippon Chemi-Con Corporation).

Torque and Rotation Speed Characteristics

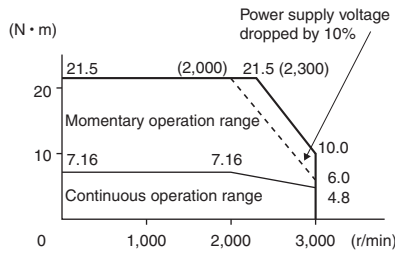
• 1,500r/min, 2,000 r/min Servomotors (200 VAC Input Power)

The following graphs show the characteristics with a 3 m standard cable and a 200 VAC input.

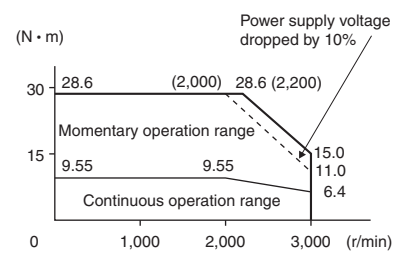
• R88M-K1K020H/T (1kW)



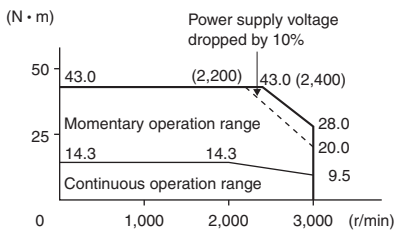
• R88M-K1K520H/T (1.5kW)



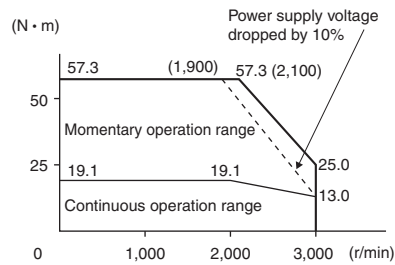
• R88M-K2K020H/T (2kW)



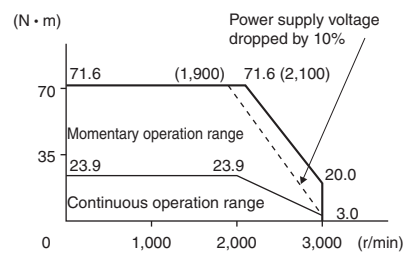
• R88M-K3K020H/T (3kW)



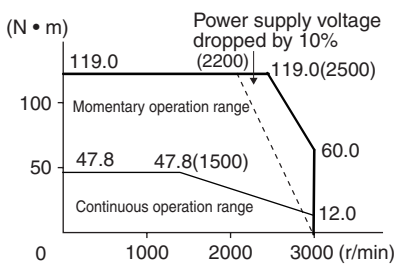
• R88M-K4K020H/T (4kW)



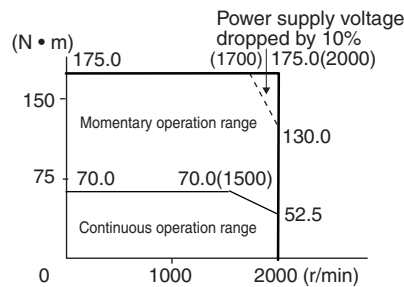
• R88M-K5K020H/T (5kW)



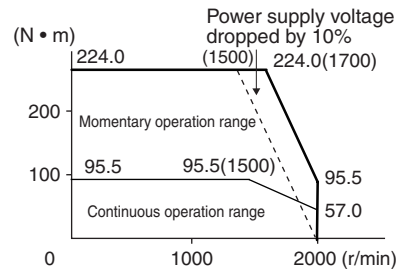
• R88M-K7K515T (7.5kW)



• R88M-K11K015T (11kW)



• R88M-K15K015T (15kW)



Note: 1. The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.

2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Performance Specifications

• 1,500r/min, 2,000 r/min Servomotors (400 VAC Input Power)

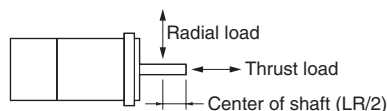
| Item | Model (R88M-) Unit | K40020F | K60020F | K1K020F | K1K520F | K2K020F | K3K020F | K4K020F | K5K020F | — | — | — | |
|---|----------------------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|
| | | K40020C | K60020C | K1K020C | K1K520C | K2K020C | K3K020C | K4K020C | K5K020C | K7K515C | K11K015C | K15K015C | |
| Rated output ^{*1} | W | 400 | 600 | 1,000 | 1,500 | 2,000 | 3,000 | 4,000 | 5,000 | 7,500 | 11,000 | 15,000 | |
| Rated torque ^{*1} | N • m | 1.91 | 2.86 | 4.77 | 7.16 | 9.55 | 14.3 | 19.1 | 23.9 | 47.8 | 70.0 | 95.9 | |
| Rated rotation speed | r/min | 2,000 | | | | | | | | | 1,500 | | |
| Momentary maximum rotation speed | r/min | 3,000 | | | | | | | | | 2,000 | | |
| Momentary maximum torque ^{*1} | N • m | 5.73 | 8.59 | 14.3 | 21.5 | 28.7 | 43.0 | 57.3 | 71.6 | 119.0 | 175.0 | 224.0 | |
| Rated current ^{*1} | A (rms) | 1.2 | 1.5 | 2.8 | 4.7 | 5.9 | 8.7 | 10.6 | 13.0 | 22.0 | 27.1 | 33.1 | |
| Momentary maximum current ^{*1} | A (rms) | 4.9 | 6.5 | 12 | 20 | 25 | 37 | 45 | 55 | 83 | 101 | 118 | |
| Rotor inertia | Without brake | kg • m ² | 1.61×10 ⁻⁴ | 2.03×10 ⁻⁴ | 4.60×10 ⁻⁴ | 6.70×10 ⁻⁴ | 8.72×10 ⁻⁴ | 12.9×10 ⁻⁴ | 37.6×10 ⁻⁴ | 48.0×10 ⁻⁴ | 101×10 ⁻⁴ | 212×10 ⁻⁴ | 302×10 ⁻⁴ |
| | With brake | kg • m ² | 1.90×10 ⁻⁴ | 2.35×10 ⁻⁴ | 5.90×10 ⁻⁴ | 7.99×10 ⁻⁴ | 10.0×10 ⁻⁴ | 14.2×10 ⁻⁴ | 38.6×10 ⁻⁴ | 48.8×10 ⁻⁴ | 107×10 ⁻⁴ | 220×10 ⁻⁴ | 311×10 ⁻⁴ |
| Applicable load inertia | — | 10 times the rotor inertia max. ^{*2} | | | | | | | | | | | |
| Torque constant ^{*1} | N • m/A | 1.27 | 1.38 | 1.27 | 1.16 | 1.27 | 1.18 | 1.40 | 1.46 | 1.54 | 1.84 | 2.10 | |
| Power rate ^{*1} | Without brake | kW/s | 22.7 | 40.3 | 49.5 | 76.5 | 105 | 159 | 97.1 | 119 | 226 | 302 | |
| | With brake | kW/s | 19.2 | 34.8 | 38.6 | 64.2 | 91.2 | 144 | 94.5 | 117 | 213 | 293 | |
| Mechanical time constant | Without brake | ms | 0.70 | 0.62 | 0.79 | 0.66 | 0.68 | 0.56 | 0.60 | 0.60 | 0.58 | 0.71 | |
| | With brake | ms | 0.83 | 0.72 | 1.01 | 0.79 | 0.78 | 0.61 | 0.61 | 0.61 | 0.61 | 0.74 | |
| Electrical time constant | ms | 5.7 | 5.9 | 10 | 10 | 10 | 12 | 21 | 19 | 21 | 31 | 32 | |
| Allowable radial load ^{*3} | N | 490 | 490 | 490 | 490 | 490 | 784 | 784 | 784 | 1,176 | 2,254 | 2,254 | |
| Allowable thrust load ^{*3} | N | 196 | 196 | 196 | 196 | 196 | 343 | 343 | 343 | 490 | 686 | 686 | |
| Weight | Without brake | kg | Approx. 3.1 | Approx. 3.5 | Approx. 5.2 | Approx. 6.7 | Approx. 8.0 | Approx. 11.0 | Approx. 15.5 | Approx. 18.6 | Approx. 36.4 | Approx. 52.7 | Approx. 70.2 |
| | With brake | kg | Approx. 4.1 | Approx. 4.5 | Approx. 6.7 | Approx. 8.2 | Approx. 9.5 | Approx. 12.6 | Approx. 18.7 | Approx. 21.8 | Approx. 40.4 | Approx. 58.9 | Approx. 76.3 |
| Radiator plate dimensions (material) | | 320×300×t20 (Al) | | | 275×260×t15 (Al) | | | 380×350×t30 (Al) | 470×440×t30 (Al) | | | 550×520×t30 (Al) | 670×630×t35 (Al) |
| Applicable drives (R88D-) | | KN06F-ECT | KN06F-ECT | KN10F-ECT | KN15F-ECT | KN20F-ECT | KN30F-ECT | KN50F-ECT | KN50F-ECT | KN75F-ECT | KN150F-ECT | KN150F-ECT | |
| Brake specifications | Brake inertia | kg • m ² | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 1.35×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 7.1×10 ⁻⁴ | 7.1×10 ⁻⁴ |
| | Excitation voltage ^{*4} | V | 24 VDC±10% | | | | | | | | | | |
| | Power consumption (at 20°C) | W | 17 | 17 | 14 | 19 | 19 | 22 | 31 | 31 | 34 | 26 | 26 |
| | Current consumption (at 20°C) | A | 0.70±10% | 0.70±10% | 0.59±10% | 0.79±10% | 0.79±10% | 0.90±10% | 1.3±10% | 1.3±10% | 1.4±10% | 1.08±10% | 1.08±10% |
| | Static friction torque | N • m | 2.5 min. | 2.5 min. | 4.9 min. | 13.7 min. | 13.7 min. | 16.2 min. | 24.5 min. | 24.5 min. | 58.8 min. | 100 min. | 100 min. |
| | Attraction time ^{*5} | ms | 50 max. | 50 max. | 80 max. | 100 max. | 100 max. | 110 max. | 80 max. | 80 max. | 150 max. | 300 max. | 300 max. |
| | Release time ^{*5} | ms | 15 max. ^{*7} | 15 max. ^{*7} | 70 max. ^{*6} | 50 max. ^{*6} | 50 max. ^{*6} | 50 max. ^{*6} | 25 max. ^{*7} | 25 max. ^{*7} | 50 max. | 140 max. | 140 max. |
| | Backlash | | ±1° | | | | | | | | | | |
| | Allowable work per braking | J | 392 | 392 | 588 | 1,176 | 1,176 | 1,470 | 1,372 | 1,372 | 1,372 | 2,000 | 2,000 |
| | Allowable total work | J | 4.9×10 ⁵ | 4.9×10 ⁵ | 7.8×10 ⁵ | 1.5×10 ⁶ | 1.5×10 ⁶ | 2.2×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 4.0×10 ⁶ | 4.0×10 ⁶ |
| | Allowable angular acceleration | rad/s ² | 10,000 | | | | | | | | | 5,000 | 3,000 |
| | Brake limit | — | 10 million times min. | | | | | | | | | | |
| | Rating | — | Continuous | | | | | | | | | | |
| Insulation class | — | Type F | | | | | | | | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

*6 Direct current switching with a varistor (Z15D151 by Ishizuka Electronics Co.).

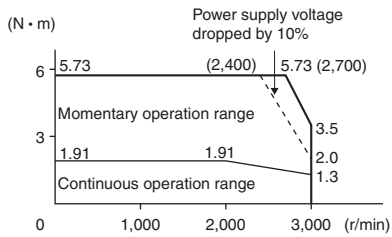
*7 Direct current switching with a varistor (TNR9G820K by Nippon Chemi-Con Corporation).

Torque and Rotation Speed Characteristics

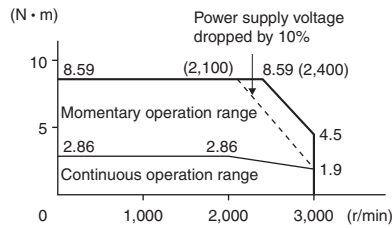
• 1,500r/min, 2,000 r/min Servomotors (400 VAC Input Power)

The following graphs show the characteristics with a 3 m standard cable and a 400 VAC input.

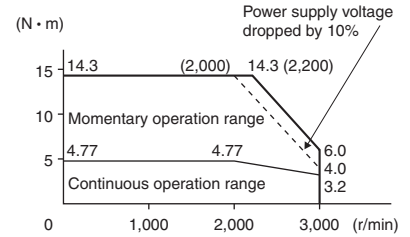
• R88M-K40020F/C (400W)



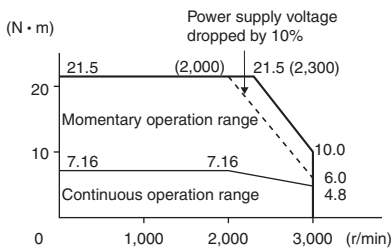
• R88M-K60020F/C (600W)



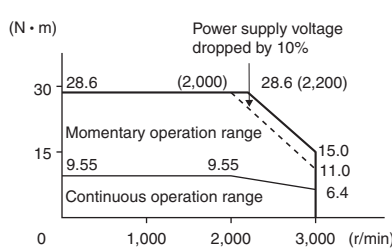
• R88M-K1K020F/C (1kW)



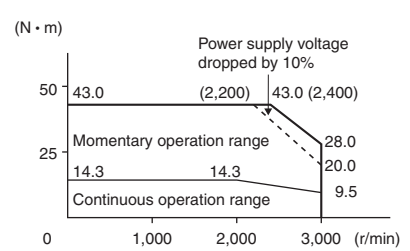
• R88M-K1K520F/C (1.5kW)



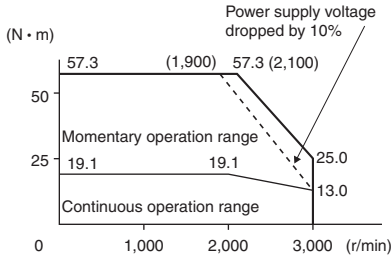
• R88M-K2K020F/C (2kW)



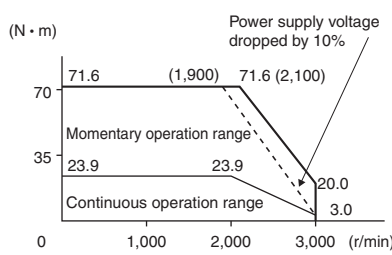
• R88M-K3K020F/C (3kW)



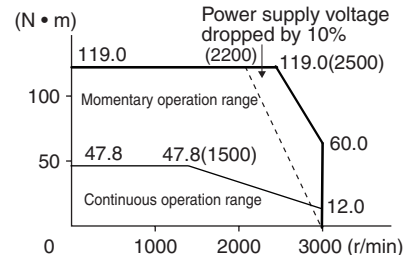
• R88M-K4K020F/C (4kW)



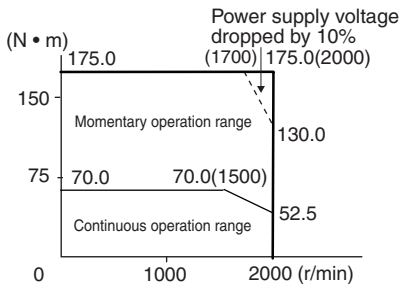
• R88M-K5K020F/C (5kW)



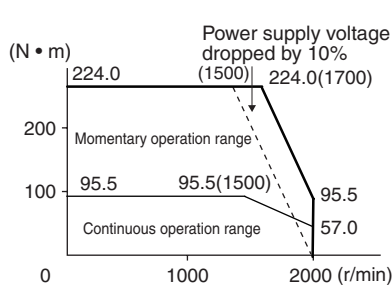
• R88M-K7K515C (7.5kW)



• R88M-K11K015C (11kW)



• R88M-K15K015C (15kW)



Note: 1. The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.
 2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Performance Specifications

• 1,000 r/min Servomotors (200/400 VAC Input Power)

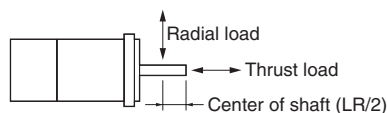
| Model (R88M-) Unit | | | 200 VAC | | | | | 400 VAC | | | | |
|---|----------------------------------|---------------------|---|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| | | | K90010H | K2K010H | K3K010H | — | — | K90010F | K2K010F | K3K010F | — | — |
| Item | | | K90010T | K2K010T | K3K010T | K4K510T | K6K010T | K90010C | K2K010C | K3K010C | K4K510C | K6K010C |
| Rated output ^{*1} | W | | 900 | 2,000 | 3,000 | 4,500 | 6,000 | 900 | 2,000 | 3,000 | 4,500 | 6,000 |
| Rated torque ^{*1} | N • m | | 8.59 | 19.1 | 28.7 | 43.0 | 57.0 | 8.59 | 19.1 | 28.7 | 43.0 | 57.3 |
| Rated rotation speed | r/min | | 1,000 | | | | | | | | | |
| Momentary maximum rotation speed | r/min | | 2,000 | | | | | | | | | |
| Momentary maximum torque ^{*1} | N • m | | 19.3 | 47.7 | 71.7 | 107.0 | 143.0 | 19.3 | 47.7 | 71.7 | 107.0 | 143.0 |
| Momentary maximum current ^{*1} | A (rms) | | 7.6 | 17.0 | 22.6 | 29.7 | 38.8 | 3.8 | 8.5 | 11.3 | 14.8 | 19.4 |
| Momentary maximum current ^{*1} | A (rms) | | 24 | 60 | 80 | 110 | 149 | 12 | 30 | 40 | 55 | 74 |
| Rotor inertia | Without brake | kW/s | 6.70×10 ⁻⁴ | 30.3×10 ⁻⁴ | 48.4×10 ⁻⁴ | 79.1×10 ⁻⁴ | 101×10 ⁻⁴ | 6.70×10 ⁻⁴ | 30.3×10 ⁻⁴ | 48.4×10 ⁻⁴ | 79.1×10 ⁻⁴ | 101×10 ⁻⁴ |
| | With brake | kW/s | 7.99×10 ⁻⁴ | 31.4×10 ⁻⁴ | 49.2×10 ⁻⁴ | 84.4×10 ⁻⁴ | 107×10 ⁻⁴ | 7.99×10 ⁻⁴ | 31.4×10 ⁻⁴ | 49.2×10 ⁻⁴ | 84.4×10 ⁻⁴ | 107×10 ⁻⁴ |
| Applicable load inertia | — | | 10 times the rotor inertia max. ^{*2} | | | | | | | | | |
| Torque constant ^{*1} | N • m/A | | 0.86 | 0.88 | 0.96 | 1.02 | 1.04 | 1.72 | 1.76 | 1.92 | 2.05 | 2.08 |
| Power rate ^{*1} | Without brake | kW/s | 110 | 120 | 170 | 233 | 325 | 110 | 120 | 170 | 233 | 325 |
| | With brake | kW/s | 92.4 | 116 | 167 | 219 | 307 | 92.4 | 116 | 167 | 219 | 307 |
| Mechanical time constant | Without brake | ms | 0.66 | 0.75 | 0.63 | 0.55 | 0.54 | 0.66 | 0.76 | 0.61 | 0.55 | 0.54 |
| | With brake | ms | 0.78 | 0.78 | 0.64 | 0.63 | 0.57 | 0.79 | 0.78 | 0.62 | 0.63 | 0.57 |
| Electrical time constant | ms | | 11 | 18 | 21 | 20 | 23 | 11 | 18 | 22 | 20 | 23 |
| Allowable radial load ^{*3} | N | | 686 | 1176 | 1470 | 1470 | 1764 | 686 | 1176 | 1470 | 1470 | 1764 |
| Allowable thrust load ^{*3} | N | | 196 | 490 | 490 | 490 | 588 | 196 | 490 | 490 | 490 | 588 |
| Weight | Without brake | kg | Approx. 6.7 | Approx. 14.0 | Approx. 20.0 | Approx. 29.4 | Approx. 36.4 | Approx. 6.7 | Approx. 14.0 | Approx. 20.0 | Approx. 29.4 | Approx. 36.4 |
| | With brake | kg | Approx. 8.2 | Approx. 17.5 | Approx. 23.5 | Approx. 33.3 | Approx. 40.4 | Approx. 8.2 | Approx. 17.5 | Approx. 23.5 | Approx. 33.3 | Approx. 40.4 |
| Radiator plate dimensions (material) | | | 270×260×t15 (Al) | | | 470×440×t30 (Al) | 550×520×t30 (Al) | 270×260×t15 (Al) | 470×440×t30 (Al) | | | 550×520×t30 (Al) |
| Applicable drives (R88D-) | | | KN15H-ECT | KN30HF-ECT | KN50H-ECT | KN50H-ECT | KN75H-ECT | KN15F-ECT | KN30F-ECT | KN50F-ECT | KN50F-ECT | KN75F-ECT |
| Brake specifications | Brake inertia | kg • m ² | 1.35×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 1.35×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ | 4.7×10 ⁻⁴ |
| | Excitation voltage ^{*4} | V | 24 VDC±10% | | | | | | | | | |
| | Power consumption (at 20°C) | W | 19 | 31 | 34 | 34 | 34 | 19 | 31 | 34 | 34 | 34 |
| | Current consumption (at 20°C) | A | 0.79±10% | 1.3±10% | 1.4±10% | 1.4±10% | 1.4±10% | 0.79±10% | 1.3±10% | 1.4±10% | 1.4±10% | 1.4±10% |
| | Static friction torque | N • m | 13.7 min. | 24.5 min. | 58.8 min. | 58.8 min. | 58.8 min. | 13.7 min. | 24.5 min. | 58.8 min. | 58.8 min. | 58.8 min. |
| | Attraction time ^{*5} | ms | 100 max. | 80 max. | 150 max. | 150 max. | 150 max. | 100 max. | 80 max. | 150 max. | 150 max. | 150 max. |
| | Release time ^{*5} | ms | 50 max. ^{*6} | 25 max. ^{*7} | 50 max. ^{*7} | 50 max. | 50 max. | 50 max. ^{*6} | 25 max. ^{*7} | 50 max. ^{*7} | 50 max. | 50 max. |
| | Backlash | | ±1° | | | | | | | | | |
| | Allowable work per braking | J | 1,176 | 1,372 | 1,372 | 1,372 | 1,372 | 1,176 | 1,372 | 1,372 | 1,372 | 1,372 |
| | Allowable total work | J | 1.5×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 1.5×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ | 2.9×10 ⁶ |
| | Allowable angular acceleration | rad/s ² | 10,000 | | | 5,000 | | | 10,000 | | | 5,000 |
| | Brake limit | — | 10 million times min. | | | | | | | | | |
| | Rating | — | Continuous | | | | | | | | | |
| | Insulation class | — | Type F | | | | | | | | | |

*1 These are the values when the motor is combined with a driver at normal temperature (20°C, 65%). The momentary maximum torque indicates the standard value.

*2 Applicable load inertia.

- The operable load inertia ratio (load inertia/rotor inertia) depends on the mechanical configuration and its rigidity. For a machine with high rigidity, operation is possible even with high load inertia. Select an appropriate motor and confirm that operation is possible.
- If the dynamic brake is activated frequently with high load inertia, the Dynamic Brake Resistor may burn. Do not repeatedly turn the servo ON/OFF while the dynamic brake is enabled.
- The dynamic brake is designed only for emergency stops. Design the system so that the Servomotor remains stopped for at least 3 minutes after applying the dynamic brake. Otherwise the dynamic brake circuits may fail.

*3 The allowable radial and thrust loads are the values determined for a limit of 20,000 hours at normal operating temperatures. The allowable radial loads are applied as shown in the following diagram.



*4 This is a non-excitation brake. (It is released when excitation voltage is applied.)

*5 The operation time is the value (reference value) measured with a surge suppressor (CR50500 by Okaya Electric Industries Co., Ltd.).

*6 Direct current switching with a varistor (Z15D151 by Ishizuka Electronics Co.).

*7 Direct current switching with a varistor (TNR9G820K by Nippon Chemi-Con Corporation).

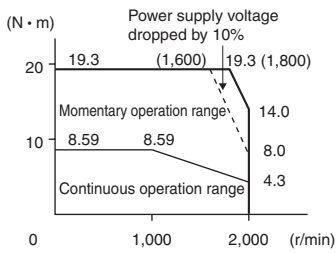
Torque and Rotation Speed Characteristics

• 1,000 r/min Servomotors (200/400 VAC Input Power)

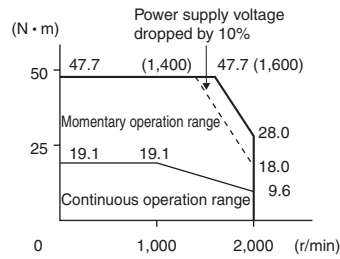
cable and a 200 VAC input.

The following graphs show the characteristics with a 3 m standard

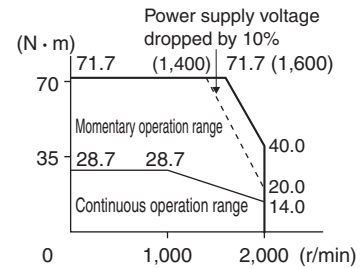
• R88M-K90010H/T/F/C (900W)



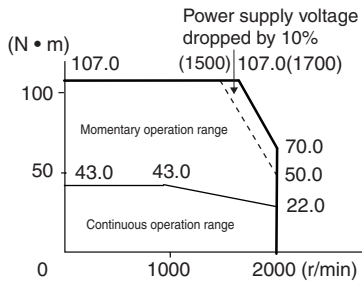
• R88M-K2K010H/T/F/C (2kW)



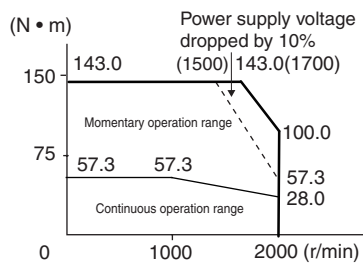
• R88M-K3K010H/T/F/C (3kW)



• R88M-K4K510T/C (4.5kW)



• R88M-K6K010T/C (6kW)



- Note:**
1. The continuous operation range is the range in which continuous operation is possible. Continuous operation at the maximum speed is also possible. However, doing so will reduce the output torque.
 2. If the motor power cable exceeds 20 m, the voltage drop will increase and the momentary operation range will become narrower.

Encoder Specifications

Incremental Encoders

| Item | Specifications |
|----------------------|---|
| Encoder system | Optical encoder 20 bits |
| No. of output pulses | Phases A and B: 262, 144 pulses/rotation Phase Z: 1 pulse/rotation |
| Power supply voltage | 5 VDC±5% |
| Power supply current | 180 mA (max.) |
| Output signals | +S, -S |
| Output interface | RS-485 compliance |

Absolute Encoders

| Item | Specifications |
|--------------------------------|--|
| Encoder system | Optical encoder 17 bits |
| No. of output pulses | Phases A and B: 32,768 pulses/rotation Phase Z: 1 pulse/rotation |
| Maximum rotations | -32,768 to +32,767 rotations |
| Power supply voltage | 5 VDC±5% |
| Power supply current | 110 mA (max.) |
| Applicable battery voltage | 3.6 VDC |
| Current consumption of battery | 265 µA for a maximum of 5 s right after power interruption 100 µA for operation during power interruption 3.6 µA when power is supplied to Servo Drive |
| Output signals | +S, -S |
| Output interface | RS-485 compliance |

Note: Multi-rotation Data Backup

- The multi-rotation data will be lost if the battery cable connector is disconnected at the motor when connecting the battery cable for the absolute encoder and battery.
- The multi-rotation data will be lost if CN2 is disconnected when connecting the battery to CN1.

Dimensions

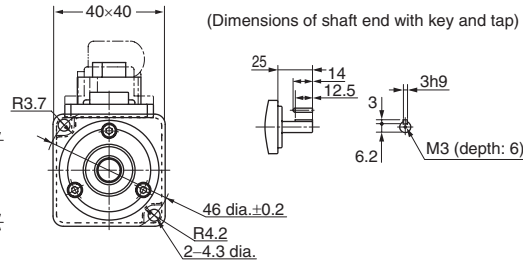
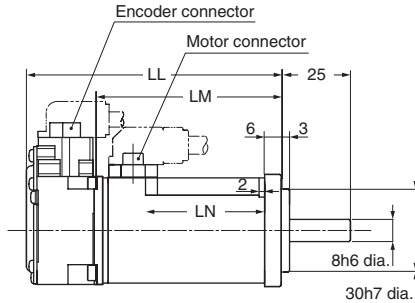
<Cylinder type>

• 3,000 r/min Servomotors (100/200 VAC)

50W/100W

• Without brake

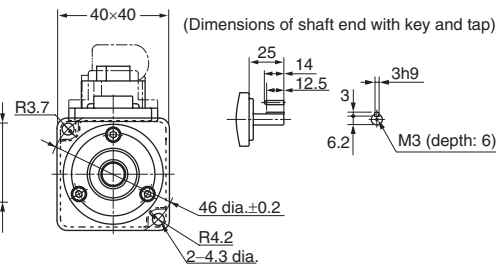
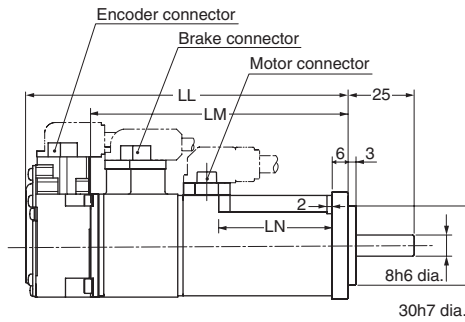
- R88M-K05030H (-S2)/-K10030□ (-S2) **INC**
- R88M-K05030T (-S2)/-K10030□ (-S2) **ABS**



| Model | Dimensions (mm) | | |
|--------------|-----------------|----|----|
| | LL | LM | LN |
| R88M-K05030□ | 72 | 48 | 23 |
| R88M-K10030□ | 92 | 68 | 43 |

• With brake

- R88M-K05030H-B (S2)/-K10030□-B (S2) **INC**
- R88M-K05030T-B (S2)/-K10030□-B (S2) **ABS**

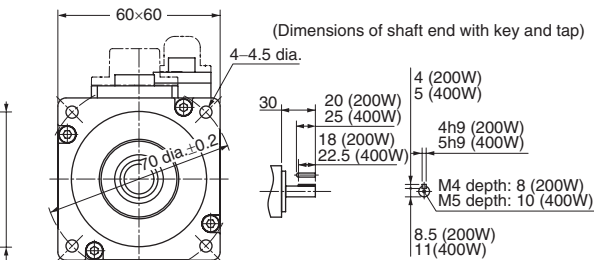
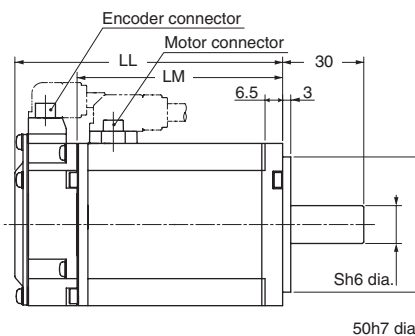


| Model | Dimensions (mm) | | |
|-----------------|-----------------|----|----|
| | LL | LM | LN |
| R88M-K05030□-B□ | 102 | 78 | 23 |
| R88M-K10030□-B□ | 122 | 98 | 43 |

200W/400W

• Without brake

- R88M-K20030□ (-S2)/-K40030□ (-S2) **INC**
- R88M-K20030□ (-S2)/-K40030□ (-S2) **ABS**



| Model | Dimensions (mm) | | |
|--------------|-----------------|------|----|
| | LL | LM | LN |
| R88M-K20030□ | 79.5 | 56.5 | 11 |
| R88M-K40030□ | 99 | 76 | 14 |

Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

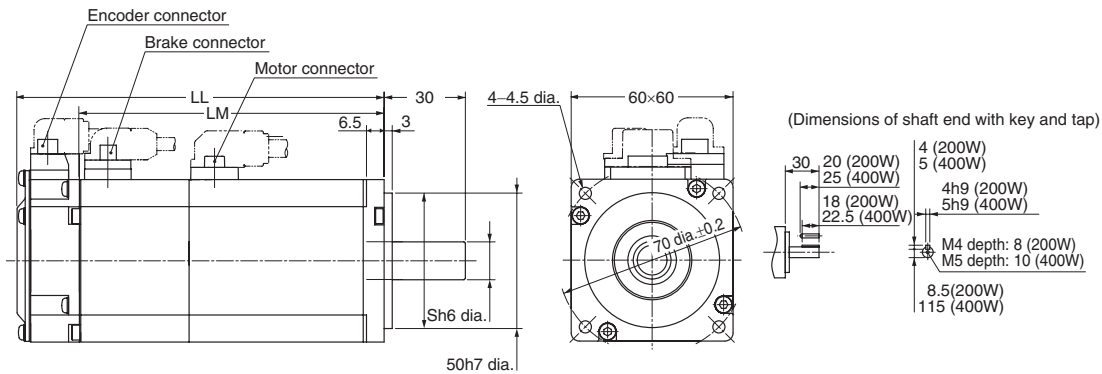
AC Servomotors/Servo Drives G5-Series

AC Servomotors

• With brake

- R88M-K20030□-B (S2)/-K40030□-B (S2) **INC**
- R88M-K20030□-B (S2)/-K40030□-B (S2) **ABS**

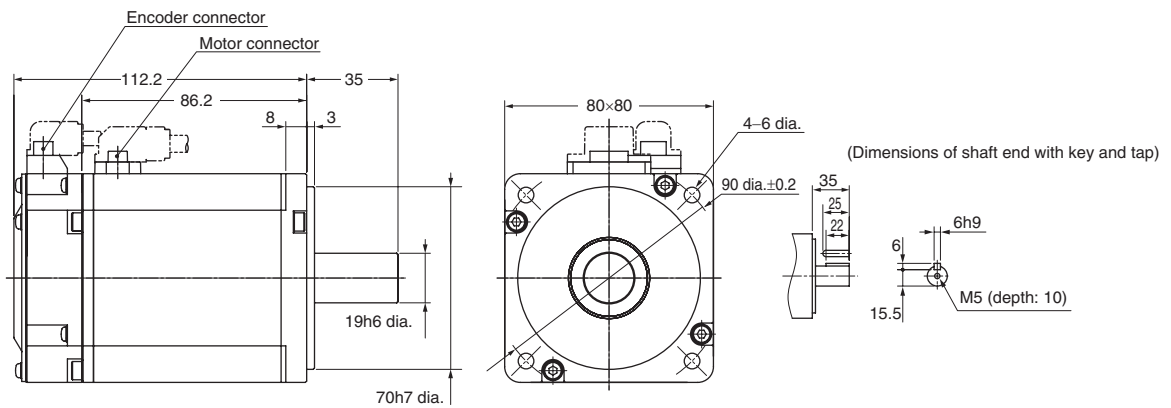
| Model | Dimensions (mm) | | |
|-----------------|-----------------|-------|----|
| | LL | LM | S |
| R88M-K20030□-B□ | 116 | 93 | 11 |
| R88M-K40030□-B□ | 135.5 | 112.5 | 14 |



750W

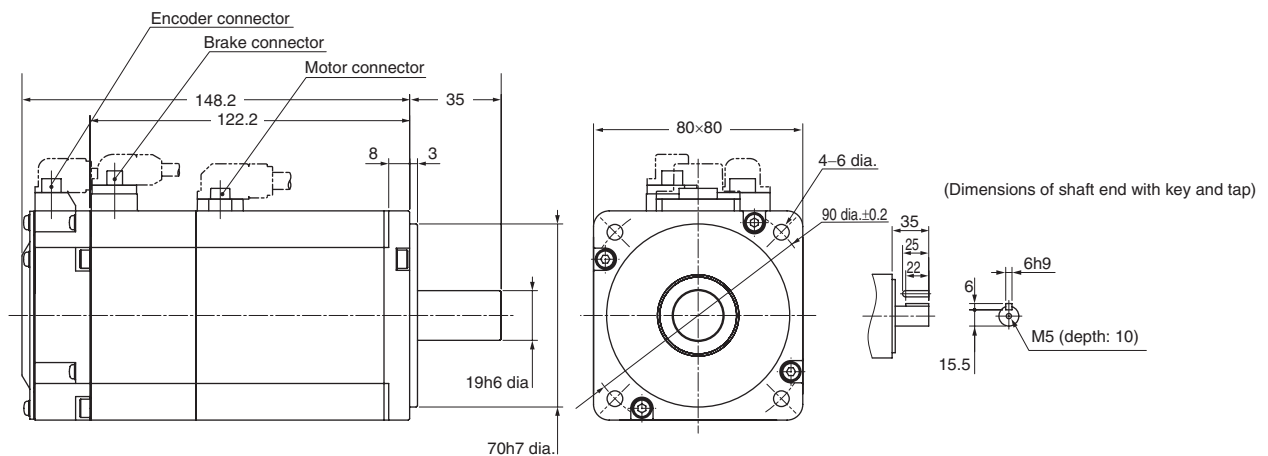
• Without brake

- R88M-K75030H (-S2) **INC**
- R88M-K75030T (-S2) **ABS**



With brake

- R88M-K75030H-B (S2) **INC**
- R88M-K75030T-B (S2) **ABS**



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

1kW/1.5kW/2kW

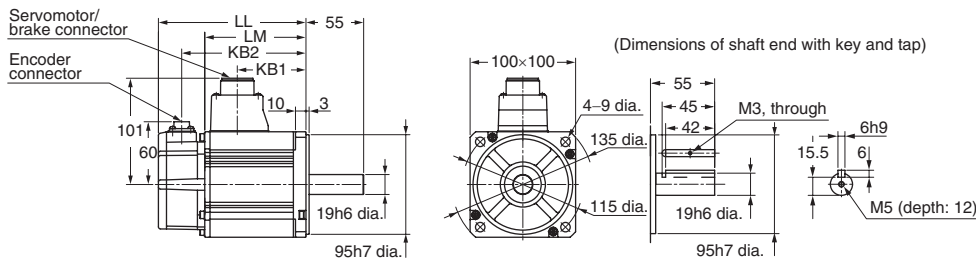
• Without brake

- R88M-K1K030H (-S2)/-K1K530H (-S2)/-K2K030H (-S2) **INC**
- R88M-K1K030T (-S2)/-K1K530T (-S2)/-K2K030T (-S2) **ABS**

• With brake

- R88M-K1K030H-B (S2)/-K1K530H-B (S2)/-K2K030H-B (S2) **INC**
- R88M-K1K030T-B (S2)/-K1K530T-B (S2)/-K2K030T-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|-------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K1K030□ | 141 | 97 | 66 | 119 |
| R88M-K1K530□ | 159.5 | 115.5 | 84.5 | 137.5 |
| R88M-K2K030□ | 178.5 | 134.5 | 103.5 | 156.5 |
| R88M-K1K030□-B□ | 168 | 124 | 66 | 146 |
| R88M-K1K530□-B□ | 186.5 | 142.5 | 84.5 | 164.5 |
| R88M-K2K030□-B□ | 205.5 | 161.5 | 103.5 | 183.5 |



3kW

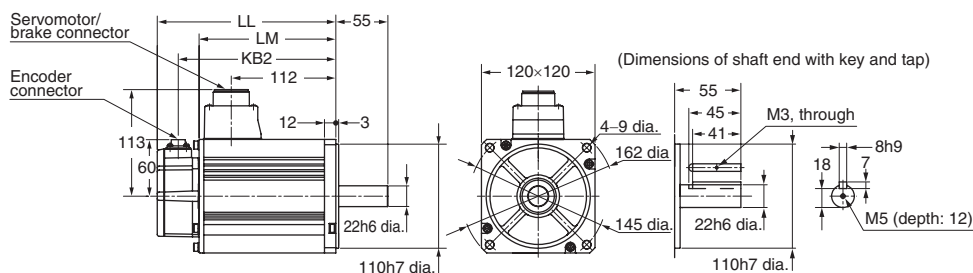
• Without brake

- R88M-K3K030H (-S2) **INC**
- R88M-K3K030T (-S2) **ABS**

• With brake

- R88M-K3K030H-B (S2) **INC**
- R88M-K3K030T-B (S2) **ABS**

| Model | Dimensions (mm) | | |
|-----------------|-----------------|-----|-----|
| | LL | LM | KB2 |
| R88M-K3K030□ | 190 | 146 | 168 |
| R88M-K3K030□-B□ | 215 | 171 | 193 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

4kW/5kW

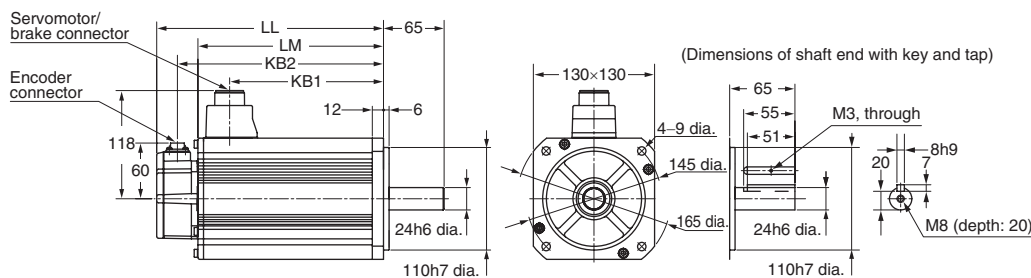
• Without brake

- R88M-K4K030H (-S2)/-K5K030H (-S2) **INC**
- R88M-K4K030T (-S2)/-K5K030T (-S2) **ABS**

• With brake

- R88M-K4K030H-B (S2)/-K5K030H-B (S2) **INC**
- R88M-K4K030T-B (S2)/-K5K030T-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-----|-----|-----|
| | LL | LM | KB1 | KB2 |
| R88M-K4K030□ | 208 | 164 | 127 | 186 |
| R88M-K5K030□ | 243 | 199 | 162 | 221 |
| R88M-K4K030□-B□ | 233 | 189 | 127 | 211 |
| R88M-K5K030□-B□ | 268 | 224 | 162 | 246 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors/Servo Drives
General Specifications
Performance Specifications/Torque and Rotation Speed Characteristics
Encoder Specifications
Dimensions
Combination Table
Multi-Function Compact Inverter
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

• 3,000 r/min Servomotors (400 VAC)

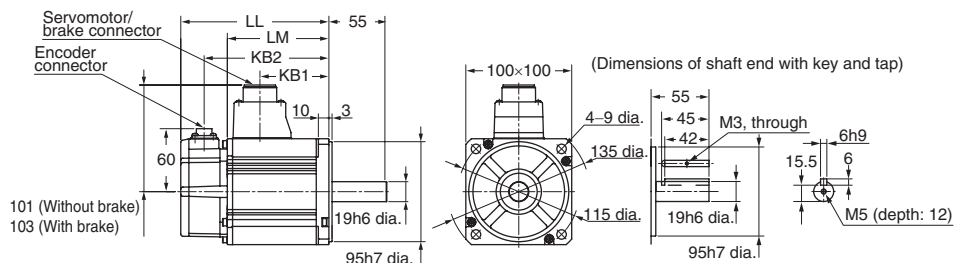
750W/1kW/1.5kW/2kW

• Without brake

- R88M-K75030F (-S2)/-K1K030F (-S2)/-K1K530F (-S2)/-K2K030F (-S2) **INC**
- R88M-K75030C (-S2)/-K1K030C (-S2)/-K1K530C (-S2)/-K2K030C (-S2) **ABS**

• With brake

- R88M-K75030F-B (S2)/-K1K030F-B (S2)/-K1K530F-B (S2)/-K2K030F-B (S2) **INC**
- R88M-K75030C-B (S2)/-K1K030C-B (S2)/-K1K530C-B (S2)/-K2K030C-B (S2) **ABS**



| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|-------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K75030□ | 131.5 | 87.5 | 56.5 | 109.5 |
| R88M-K1K030□ | 141 | 97 | 66 | 119 |
| R88M-K1K530□ | 159.5 | 115.5 | 84.5 | 137.5 |
| R88M-K2K030□ | 178.5 | 134.5 | 103.5 | 156.5 |
| R88M-K75030□-B□ | 158.5 | 114.5 | 53.5 | 136.5 |
| R88M-K1K030□-B□ | 168 | 124 | 63 | 146 |
| R88M-K1K530□-B□ | 186.5 | 142.5 | 81.5 | 164.5 |
| R88M-K2K030□-B□ | 205.5 | 161.5 | 100.5 | 183.5 |

3kW

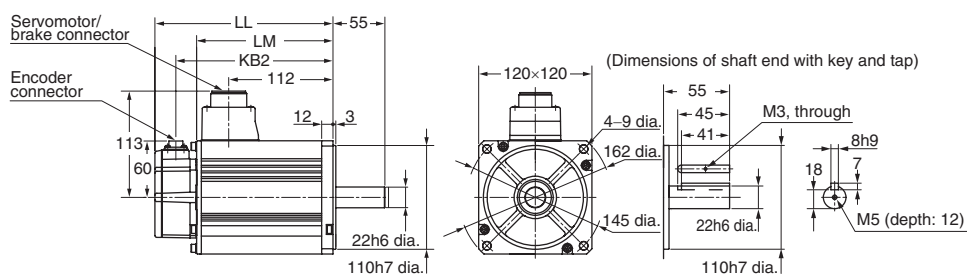
• Without brake

- R88M-K3K030F (-S2) **INC**
- R88M-K3K030C (-S2) **ABS**

• With brake

- R88M-K3K030F-B (S2) **INC**
- R88M-K3K030C-B (S2) **ABS**

| Model | Dimensions (mm) | | |
|-----------------|-----------------|-----|-----|
| | LL | LM | KB2 |
| R88M-K3K030□ | 190 | 146 | 168 |
| R88M-K3K030□-B□ | 215 | 171 | 193 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

4kW/5kW

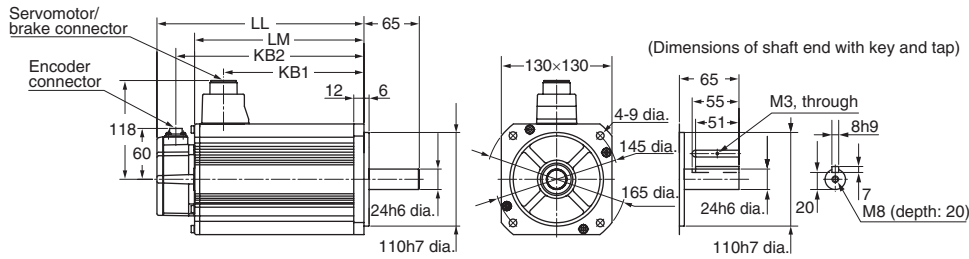
• Without brake

- R88M-K4K030F (-S2)/-K5K030F (-S2) **INC**
- R88M-K4K030C (-S2)/-K5K030C (-S2) **ABS**

• With brake

- R88M-K4K030F-B (S2)/-K5K030F-B (S2) **INC**
- R88M-K4K030C-B (S2)/-K5K030C-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-----|-----|-----|
| | LL | LM | KB1 | KB2 |
| R88M-K4K030□ | 208 | 164 | 127 | 186 |
| R88M-K5K030□ | 243 | 199 | 162 | 221 |
| R88M-K4K030□-B□ | 233 | 189 | 127 | 211 |
| R88M-K5K030□-B□ | 268 | 224 | 162 | 246 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding “S2” to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

AC Servomotors/Servo Drives G5-Series

AC Servomotors

• 1,500r/min, 2,000 r/min Servomotors (200 VAC)

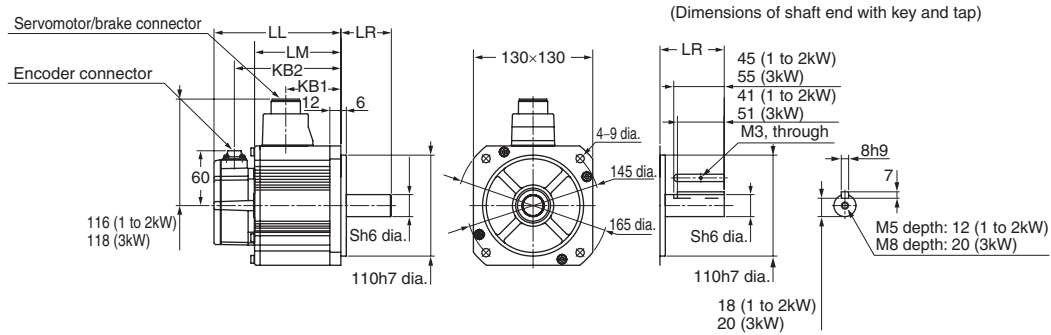
1kW/1.5kW/2kW/3kW

• Without brake

- R88M-K1K020H (-S2)/-K1K520H (-S2)/-K2K020H (-S2)/-K3K020H (-S2) **INC**
- R88M-K1K020T (-S2)/-K1K520T (-S2)/-K2K020T (-S2)/-K3K020T (-S2) **ABS**

• With brake

- R88M-K1K020H-B (S2)/-K1K520H-B (S2)/-K2K020H-B (S2)/-K3K020H-B (S2) **INC**
- R88M-K1K020T-B (S2)/-K1K520T-B (S2)/-K2K020T-B (S2)/-K3K020T-B (S2) **ABS**



| Model | Dimensions (mm) | | | | | |
|-----------------|-----------------|----|-------|----|------|-------|
| | LL | LR | LM | S | KB1 | KB2 |
| R88M-K1K020□ | 138 | 55 | 94 | 22 | 60 | 116 |
| R88M-K1K520□ | 155.5 | 55 | 111.5 | 22 | 77.5 | 133.5 |
| R88M-K2K020□ | 173 | 55 | 129 | 22 | 95 | 151 |
| R88M-K3K020□ | 208 | 65 | 164 | 24 | 127 | 186 |
| R88M-K1K020□-B□ | 163 | 55 | 119 | 22 | 60 | 141 |
| R88M-K1K520□-B□ | 180.5 | 55 | 136.5 | 22 | 77.5 | 158.5 |
| R88M-K2K020□-B□ | 198 | 55 | 154 | 22 | 95 | 176 |
| R88M-K3K020□-B□ | 233 | 65 | 189 | 24 | 127 | 211 |

4kW/5kW

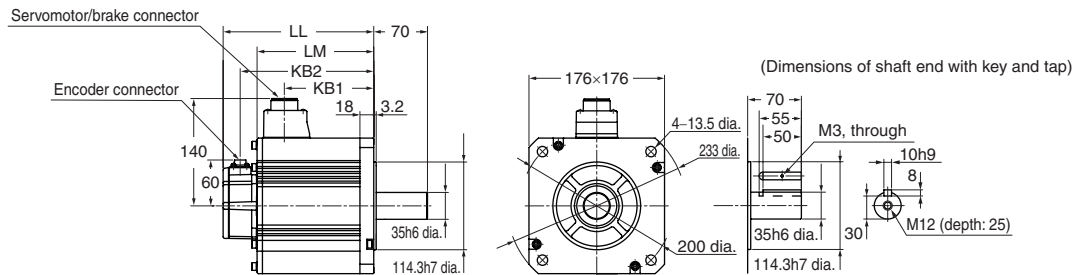
• Without brake

- R88M-K4K020H (-S2)/-K5K020H (-S2) **INC**
- R88M-K4K020T (-S2)/-K5K020T (-S2) **ABS**

• With brake

- R88M-K4K020H-B (S2)/-K5K020H-B (S2) **INC**
- R88M-K4K020T-B (S2)/-K5K020T-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-----|-----|-----|
| | LL | LM | KB1 | KB2 |
| R88M-K4K020□ | 177 | 133 | 96 | 155 |
| R88M-K5K020□ | 196 | 152 | 115 | 174 |
| R88M-K4K020□-B□ | 202 | 158 | 96 | 180 |
| R88M-K5K020□-B□ | 221 | 177 | 115 | 199 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

7.5kW

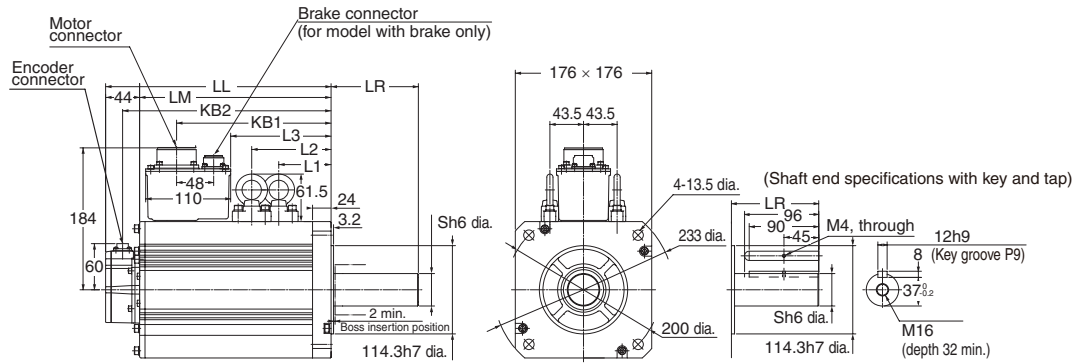
• **Without brake**

- R88M-K7K515T (-S2) **ABS**

• **With brake**

- R88M-K7K515T-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | | |
|-----------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K7K515T□ | 312 | 113 | 268 | 42 | 219 | 290 | 117.5 | 117.5 | 149 |
| R88M-K7K515T-B□ | 337 | 113 | 293 | 42 | 253 | 315 | 117.5 | 152.5 | 183 |



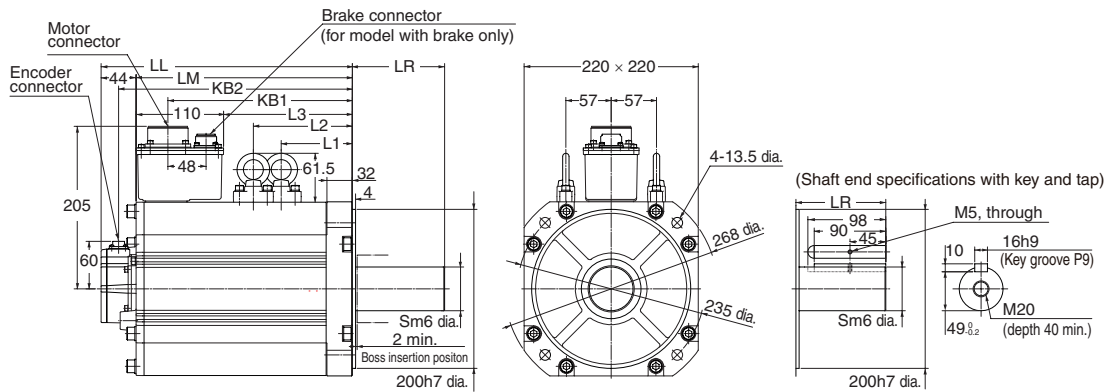
11kW/15kW

• **Without brake**

- R88M-K11K015T (-S2)/-K15K015T (-S2) **ABS**

• **With brake**

- R88M-K11K015T-B (S2)/R88M-K15K015T-B (S2) **ABS**



| Model | Dimensions (mm) | | | | | | | | |
|------------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K11K015T□ | 316 | 116 | 272 | 55 | 232 | 294 | 124.5 | 124.5 | 162 |
| R88M-K15K015T□ | 384 | 116 | 340 | 55 | 300 | 362 | 158.5 | 158.5 | 230 |
| R88M-K11K015T-B□ | 364 | 116 | 320 | 55 | 266 | 342 | 124.5 | 159.5 | 196 |
| R88M-K15K015T-B□ | 432 | 116 | 388 | 55 | 334 | 410 | 158.5 | 193.5 | 264 |

Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

AC Servomotors/Servo Drives G5-Series

AC Servomotors

• 1,500 r/min, 2,000 r/min Servomotors (400 VAC)

400W/600W

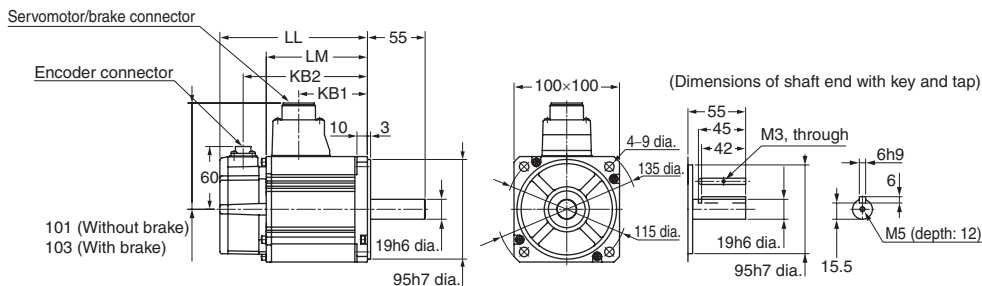
• Without brake

- R88M-K40020F (-S2)/-K60020F (-S2) **INC**
- R88M-K40020C (-S2)/-K60020C (-S2) **ABS**

• With brake

- R88M-K40020F-B (S2)/-K60020F-B (S2) **INC**
- R88M-K40020C-B (S2)/-K60020C-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K40020□ | 131.5 | 87.5 | 56.5 | 109.5 |
| R88M-K60020□ | 141 | 97 | 66 | 119 |
| R88M-K40020□-B□ | 158.5 | 114.5 | 53.5 | 136.5 |
| R88M-K60020□-B□ | 168 | 124 | 63 | 146 |



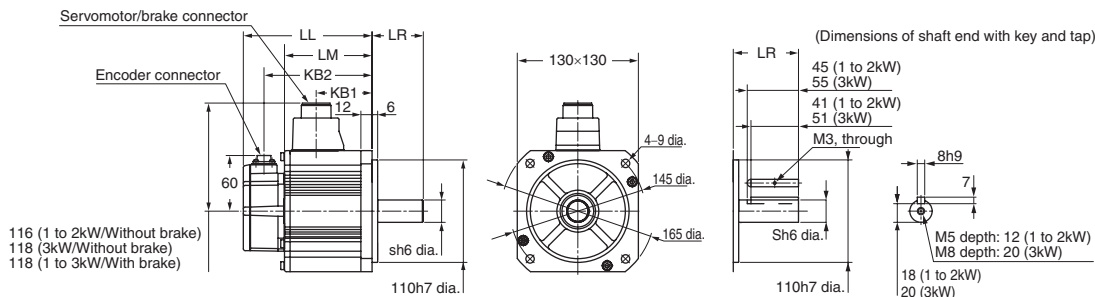
1kW/1.5kW/2kW/3kW

• Without brake

- R88M-K1K020F (-S2)/-K1K520F (-S2)/-K2K020F (-S2)/-K3K020F (-S2) **INC**
- R88M-K1K020C (-S2)/-K1K520C (-S2)/-K2K020C (-S2)/-K3K020C (-S2) **ABS**

• With brake

- R88M-K1K020F-B (S2)/-K1K520F-B (S2)/-K2K020F-B (S2)/-K3K020F-B (S2) **INC**
- R88M-K1K020C-B (S2)/-K1K520C-B (S2)/-K2K020C-B (S2)/-K3K020C-B (S2) **ABS**



| Model | Dimensions (mm) | | | | | |
|-----------------|-----------------|----|-------|----|------|-------|
| | LL | LR | LM | S | KB1 | KB2 |
| R88M-K1K020□ | 138 | 55 | 94 | 22 | 60 | 116 |
| R88M-K1K520□ | 155.5 | 55 | 111.5 | 22 | 77.5 | 133.5 |
| R88M-K2K020□ | 173 | 55 | 129 | 22 | 95 | 151 |
| R88M-K3K020□ | 208 | 65 | 164 | 24 | 127 | 186 |
| R88M-K1K020□-B□ | 163 | 55 | 119 | 22 | 57 | 141 |
| R88M-K1K520□-B□ | 180.5 | 55 | 136.5 | 22 | 74.5 | 158.5 |
| R88M-K2K020□-B□ | 198 | 55 | 154 | 22 | 92 | 176 |
| R88M-K3K020□-B□ | 233 | 65 | 189 | 24 | 127 | 211 |

Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

4kW/5kW

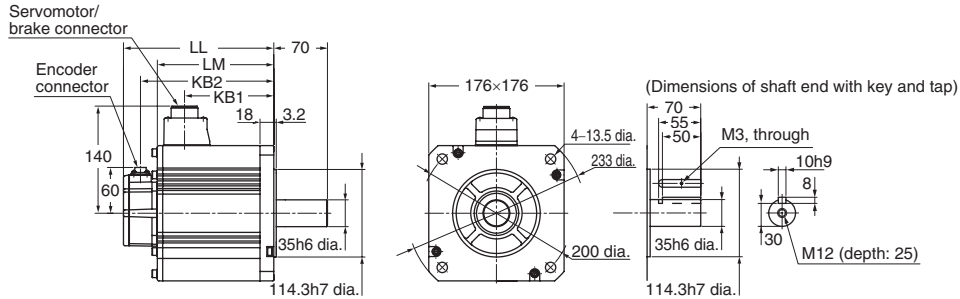
• **Without brake**

- R88M-K4K020F (-S2)/-K5K020F (-S2) **INC**
- R88M-K4K020C (-S2)/-K5K020C (-S2) **ABS**

• **With brake**

- R88M-K4K020F-B (S2)/-K5K020F-B (S2) **INC**
- R88M-K4K020C-B (S2)/-K5K020C-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|------------------------|-----------------|-----|-----|-----|
| | LL | LM | KB1 | KB2 |
| R88M-K4K020□ | 177 | 133 | 96 | 155 |
| R88M-K5K020□ | 196 | 152 | 115 | 174 |
| R88M-K4K020□-B□ | 202 | 158 | 96 | 180 |
| R88M-K5K020□-B□ | 221 | 177 | 115 | 199 |



7.5kW

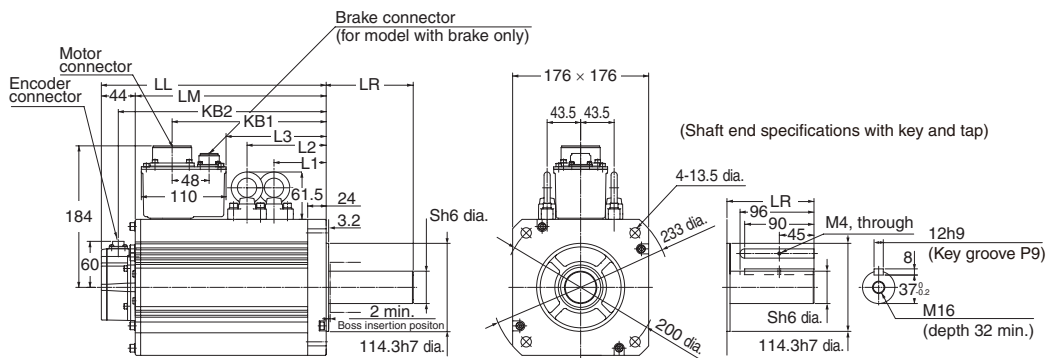
• **Without brake**

- R88M-K7K515C (-S2) **ABS**

• **With brake**

- R88M-K7K515C-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | | |
|------------------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K7K515C□ | 312 | 133 | 268 | 42 | 219 | 290 | 117.5 | 117.5 | 149 |
| R88M-K7K515C-B□ | 337 | 113 | 293 | 42 | 253 | 315 | 117.5 | 152.5 | 183 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

General Specifications

Performance Specifications/Torque and Rotation Speed Characteristics

Encoder Specifications

Dimensions

Combination Table

AC Servomotors/Servo Drives G5-Series

AC Servomotors

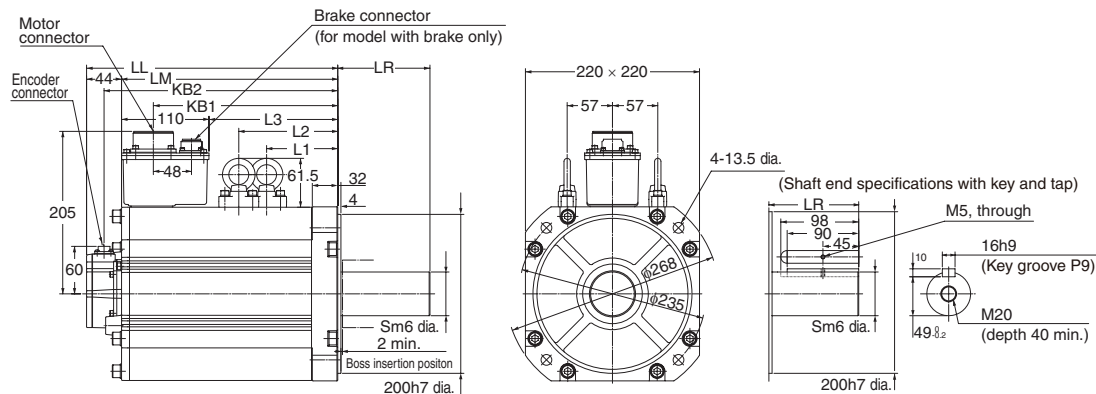
11kW/15kW

• Without brake

- R88M-K11K015C (-S2)/-K15K015C (-S2) **ABS**

• With brake

- R88M-K11K015C-B (S2)/R88M-K15K015C-B (S2) **ABS**



| Model | Dimensions (mm) | | | | | | | | |
|------------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K11K015C□ | 316 | 116 | 272 | 55 | 232 | 294 | 124.5 | 124.5 | 162 |
| R88M-K15K015C□ | 384 | 116 | 340 | 55 | 300 | 362 | 158.5 | 158.5 | 230 |
| R88M-K11K015C-B□ | 364 | 116 | 320 | 55 | 266 | 342 | 124.5 | 159.5 | 196 |
| R88M-K15K015C-B□ | 432 | 116 | 388 | 55 | 334 | 410 | 158.5 | 193.5 | 264 |

Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

• 1,000 r/min Servomotors (200 VAC)

900W

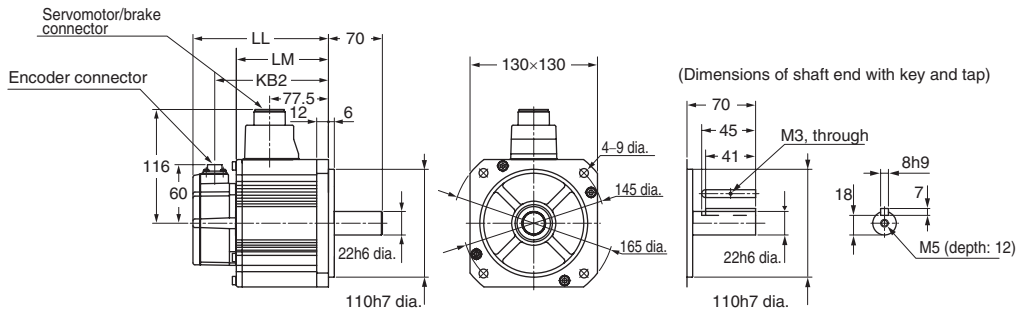
• Without brake

- R88M-K90010H (-S2) **INC**
- R88M-K90010T (-S2) **ABS**

• With brake

- R88M-K90010H-B (S2) **INC**
- R88M-K90010T-B (S2) **ABS**

| Model | Dimensions (mm) | | |
|-----------------|-----------------|-------|-------|
| | LL | LM | KB2 |
| R88M-K90010□ | 155.5 | 111.5 | 133.5 |
| R88M-K90010□-B□ | 180.5 | 136.5 | 158.5 |



2kW/3kW

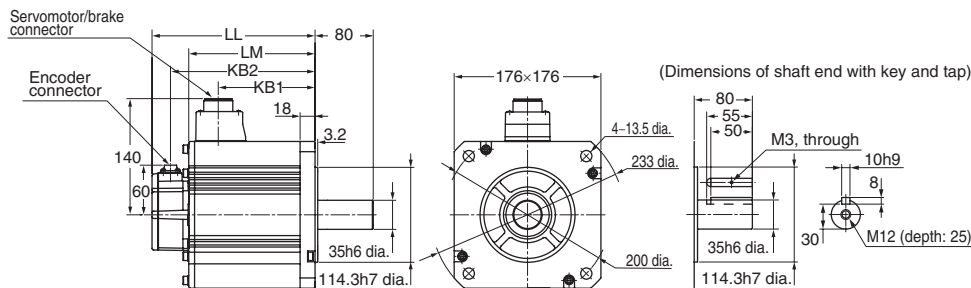
• Without brake

- R88M-K2K010H (-S2)/-K3K010H (-S2) **INC**
- R88M-K2K010T (-S2)/-K3K010T (-S2) **ABS**

• With brake

- R88M-K2K010H-B (S2)/-K3K010H-B (S2) **INC**
- R88M-K2K010T-B (S2)/-K3K010T-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|-------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K2K010□ | 163.5 | 119.5 | 82.5 | 141.5 |
| R88M-K3K010□ | 209.5 | 165.5 | 128.5 | 187.5 |
| R88M-K2K010□-B□ | 188.5 | 144.5 | 82.5 | 166.5 |
| R88M-K3K010□-B□ | 234.5 | 190.5 | 128.5 | 212.5 |



4.5kW

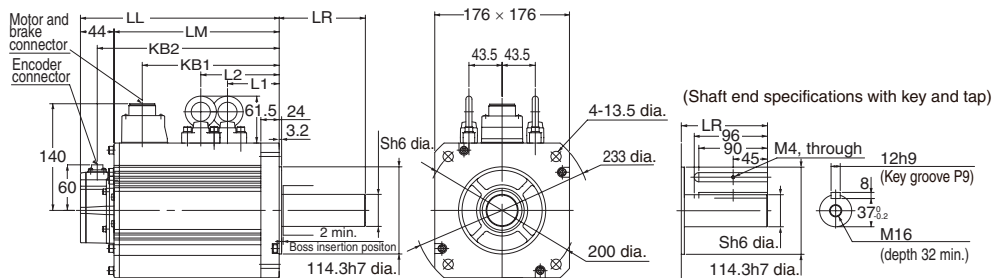
• Without brake

- R88M-K4K510T (-S2) **ABS**

• With brake

- R88M-K4K510T-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | |
|-----------------|-----------------|-----|-----|----|-----|-----|----|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 |
| R88M-K4K510T□ | 266 | 113 | 222 | 42 | 185 | 244 | 98 | 98 |
| R88M-K4K510T-B□ | 291 | 113 | 247 | 42 | 185 | 269 | 98 | 133 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

AC Servomotors/Servo Drives G5-Series

AC Servomotors

6kW

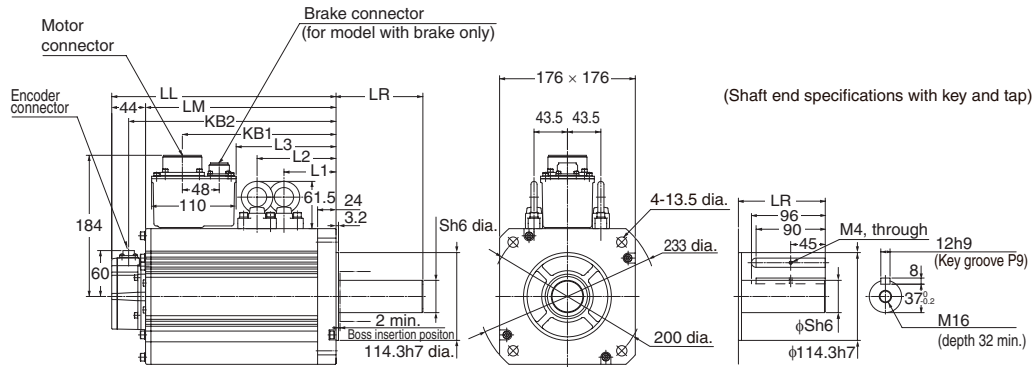
• Without brake

- R88M-K6K010T (-S2) **ABS**

• With brake

- R88M-K6K010T-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | | |
|------------------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K6K010T□ | 312 | 113 | 268 | 42 | 219 | 290 | 117.5 | 117.5 | 149 |
| R88M-K6K010T-B□ | 337 | 113 | 293 | 42 | 253 | 315 | 117.5 | 152.5 | 183 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

• 1,000 r/min Servomotors (400 VAC)

900W

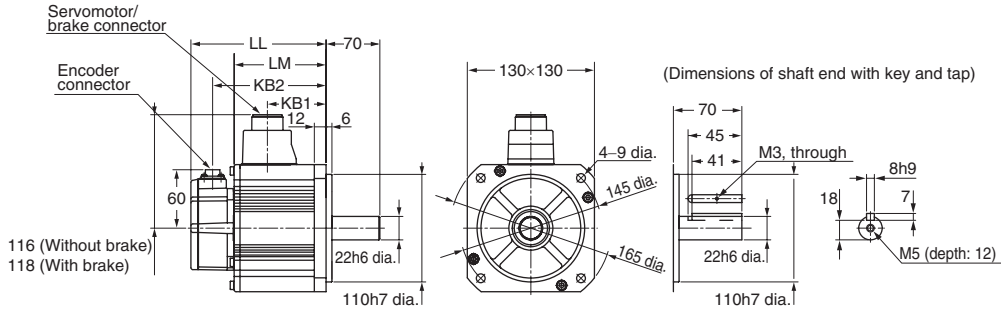
• Without brake

- R88M-K90010F (-S2) **INC**
- R88M-K90010C (-S2) **ABS**

• With brake

- R88M-K90010F-B (S2) **INC**
- R88M-K90010C-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K90010□ | 155.5 | 111.5 | 77.5 | 133.5 |
| R88M-K90010□-B□ | 180.5 | 136.5 | 74.5 | 158.5 |



2kW/3kW

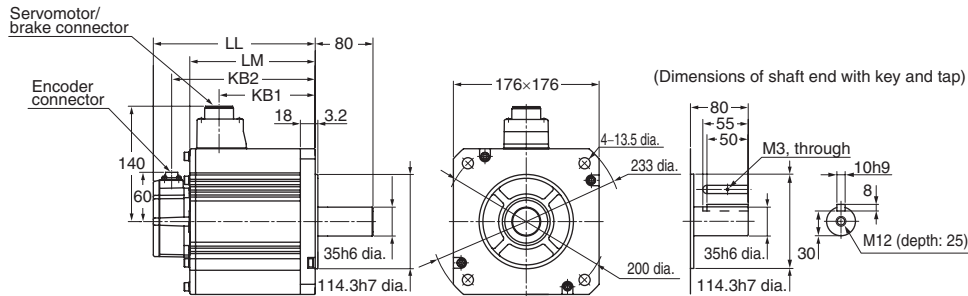
• Without brake

- R88M-K2K010F (-S2)/-K3K010F (-S2) **INC**
- R88M-K2K010C (-S2)/-K3K010C (-S2) **ABS**

• With brake

- R88M-K2K010F-B (S2)/-K3K010F-B (S2) **INC**
- R88M-K2K010C-B (S2)/-K3K010C-B (S2) **ABS**

| Model | Dimensions (mm) | | | |
|-----------------|-----------------|-------|-------|-------|
| | LL | LM | KB1 | KB2 |
| R88M-K2K010□ | 163.5 | 119.5 | 82.5 | 141.5 |
| R88M-K3K010□ | 209.5 | 165.5 | 128.5 | 187.5 |
| R88M-K2K010□-B□ | 188.5 | 144.5 | 82.5 | 166.5 |
| R88M-K3K010□-B□ | 234.5 | 190.5 | 128.5 | 212.5 |



4.5kW

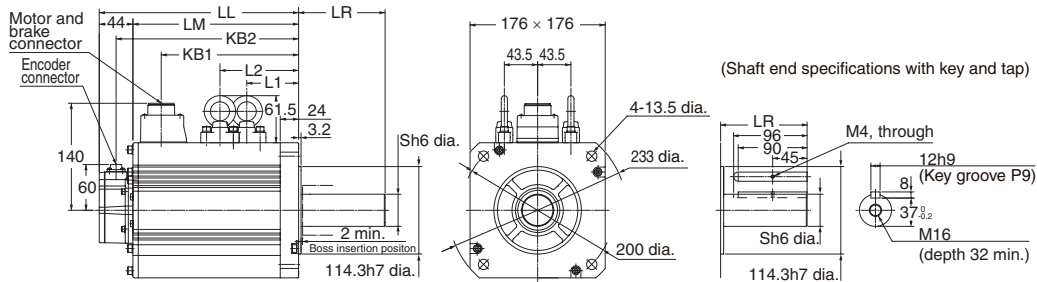
• Without brake

- R88M-K4K510C (-S2) **ABS**

• With brake

- R88M-K4K510C-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | |
|-----------------|-----------------|-----|-----|----|-----|-----|----|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 |
| R88M-K4K510T□ | 266 | 113 | 222 | 42 | 185 | 244 | 98 | 98 |
| R88M-K4K510T-B□ | 291 | 113 | 247 | 42 | 185 | 269 | 98 | 133 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

AC Servomotors/Servo Drives G5-Series

AC Servomotors

6kW

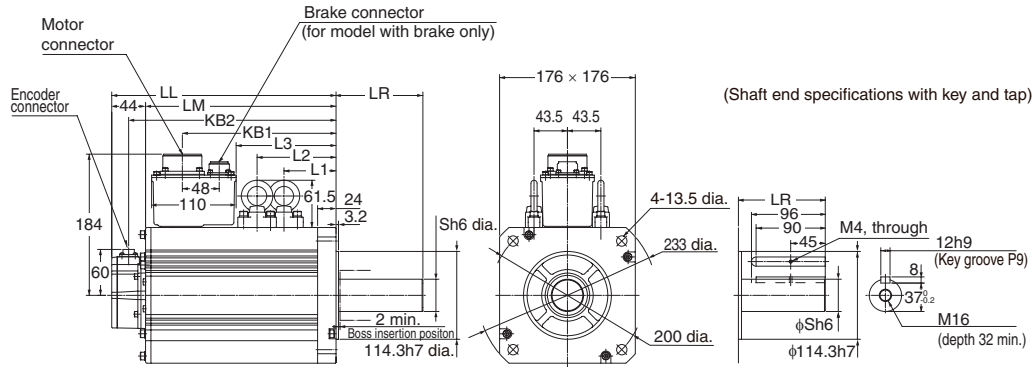
• Without brake

- R88M-K6K010C (-S2) **ABS**

• With brake

- R88M-K6K010C-B (S2) **ABS**

| Model | Dimensions (mm) | | | | | | | | |
|-----------------|-----------------|-----|-----|----|-----|-----|-------|-------|-----|
| | LL | LR | LM | S | KB1 | KB2 | L1 | L2 | L3 |
| R88M-K6K010C□ | 312 | 113 | 268 | 42 | 219 | 290 | 117.5 | 117.5 | 149 |
| R88M-K6K010C-B□ | 337 | 113 | 293 | 42 | 253 | 315 | 117.5 | 152.5 | 183 |



Note: The standard models have a straight shaft. A model with a key and tap is indicated by adding "S2" to the end of the model number. Models with an oil seal are indicated with O at the end of the model number. The motor dimensions do not change.

Combination table

Servo Drive and Servomotor Combinations (3,000 r/min, 2,000 r/min, 1,500r/min, 1,000 r/min)

<Cylinder Type> 3,000-r/min servomotors

| Power Supply Voltage | Servo Drive Model Numbers | Servomotor Model Numbers | | |
|--|---------------------------|--------------------------|--------------------------|-----------------------|
| | EtherCAT | Output | With incremental encoder | With absolute encoder |
| Single-phase 100 to 115 VAC | R88D-KNA5L-ECT | 50 W | R88M-K05030H-□ | R88M-K05030T-□ |
| | R88D-KN01L-ECT | 100 W | R88M-K10030L-□ | R88M-K10030S-□ |
| | R88D-KN02L-ECT | 200 W | R88M-K20030L-□ | R88M-K20030S-□ |
| | R88D-KN04L-ECT | 400 W | R88M-K40030L-□ | R88M-K40030S-□ |
| Single-phase/ three-phase 200 to 240 VAC | R88D-KN01H-ECT * | 50 W | R88M-K05030H-□ * | R88M-K05030T-□ * |
| | R88D-KN01H-ECT | 100 W | R88M-K10030H-□ | R88M-K10030T-□ |
| | R88D-KN02H-ECT | 200 W | R88M-K20030H-□ | R88M-K20030T-□ |
| | R88D-KN04H-ECT | 400 W | R88M-K40030H-□ | R88M-K40030T-□ |
| | R88D-KN08H-ECT | 750 W | R88M-K75030H-□ | R88M-K75030T-□ |
| | R88D-KN15H-ECT * | 1 kW | R88M-K1K030H-□ * | R88M-K1K030T-□ * |
| Three-phase 200 to 240 VAC | R88D-KN15H-ECT | 1.5 kW | R88M-K1K530H-□ | R88M-K1K530T-□ |
| | R88D-KN20H-ECT | 2 kW | R88M-K2K030H-□ | R88M-K2K030T-□ |
| | R88D-KN30H-ECT | 3 kW | R88M-K3K030H-□ | R88M-K3K030T-□ |
| | R88D-KN50H-ECT * | 4 kW | R88M-K4K030H-□ * | R88M-K4K030T-□ * |
| Three-phase 400 to 480 VAC | R88D-KN50H-ECT | 5 kW | R88M-K5K030H-□ | R88M-K5K030T-□ |
| | R88D-KN10F-ECT * | 750 W | R88M-K75030F-□ * | R88M-K75030C-□ * |
| | R88D-KN15F-ECT * | 1 kW | R88M-K1K030F-□ * | R88M-K1K030C-□ * |
| | R88D-KN15F-ECT | 1.5 kW | R88M-K1K530F-□ | R88M-K1K530C-□ |
| | R88D-KN20F-ECT | 2 kW | R88M-K2K030F-□ | R88M-K2K030C-□ |
| | R88D-KN30F-ECT | 3 kW | R88M-K3K030F-□ | R88M-K3K030C-□ |
| | R88D-KN50F-ECT * | 4 kW | R88M-K4K030F-□ * | R88M-K4K030C-□ * |
| R88D-KN50F-ECT | 5 kW | R88M-K5K030F-□ | R88M-K5K030C-□ | |

1,500r/min, 2,000-r/min servomotors

| Power Supply Voltage | Servo Drive Model Numbers | Servomotor Model Numbers | | |
|--|---------------------------|--------------------------|--------------------------|-----------------------|
| | EtherCAT | Output | With incremental encoder | With absolute encoder |
| Single-phase/ three-phase 200 to 240 VAC | R88D-KN10H-ECT | 1 kW | R88M-K1K020H-□ | R88M-K1K020T-□ |
| | R88D-KN15H-ECT | 1.5 kW | R88M-K1K520H-□ | R88M-K1K520T-□ |
| Three-phase 200 to 240 VAC | R88D-KN20H-ECT | 2 kW | R88M-K2K020H-□ | R88M-K2K020T-□ |
| | R88D-KN30H-ECT | 3 kW | R88M-K3K020H-□ | R88M-K3K020T-□ |
| | R88D-KN50H-ECT * | 4 kW | R88M-K4K020H-□ * | R88M-K4K020T-□ * |
| | R88D-KN50H-ECT | 5 kW | R88M-K5K020H-□ | R88M-K5K020T-□ |
| | R88D-KN75H-ECT | 7.5 kW | – | R88M-K7K515T-□ |
| | R88D-KN150H-ECT * | 11 kW | – | R88M-K11K015T-□ * |
| Three-phase 400 to 480 VAC | R88D-KN150H-ECT | 15 kW | – | R88M-K15K015T-□ |
| | R88D-KN06F-ECT * | 400 W | R88M-K40020F-□ * | R88M-K40020C-□ * |
| | R88D-KN06F-ECT | 600 W | R88M-K60020F-□ | R88M-K60020C-□ |
| | R88D-KN10F-ECT | 1 kW | R88M-K1K020F-□ | R88M-K1K020C-□ |
| | R88D-KN15F-ECT | 1.5 kW | R88M-K1K520F-□ | R88M-K1K520C-□ |
| | R88D-KN20F-ECT | 2 kW | R88M-K2K020F-□ | R88M-K2K020C-□ |
| | R88D-KN30F-ECT | 3 kW | R88M-K3K020F-□ | R88M-K3K020C-□ |
| | R88D-KN50F-ECT * | 4 kW | R88M-K4K020F-□ * | R88M-K4K020C-□ * |
| | R88D-KN50F-ECT | 5 kW | R88M-K5K020F-□ | R88M-K5K020C-□ |
| | R88D-KN75F-ECT | 7.5 kW | – | RR88M-K7K515C-□ |
| R88D-KN150F-ECT * | 11 kW | – | R88M-K11K015C-□ * | |
| R88D-KN150F-ECT | 15 kW | – | R88M-K15K015C-□ | |

* Please note the capacity of Servo Drive and Servomotor are not same in this combination.

AC Servomotors/Servo Drives G5-Series

AC Servomotors

1,000-r/min servomotors

| Power Supply Voltage | Servo Drive Model Numbers | Servomotor Model Numbers | | |
|-------------------------------|---------------------------|--------------------------|--------------------------|-----------------------|
| | EtherCAT | Output | With incremental encoder | With absolute encoder |
| Single-phase/ | R88D-KN15H-ECT * | 900 W | R88M-K90010H-□ * | R88M-K90010T-□ * |
| Three-phase 200 to 240 VAC | R88D-KN30H-ECT * | 2 kW | R88M-K2K010H-□ * | R88M-K2K010T-□ * |
| | R88D-KN50H-ECT * | 3 kW | R88M-K3K010H-□ * | R88M-K3K010T-□ * |
| | R88D-KN50H-ECT * | 4.5 kW | – | R88M-K4K510T-□ * |
| | R88D-KN75H-ECT * | 6 kW | – | R88M-K6K010T-□ * |
| Three-phase 400 to 480 VAC | R88D-KN15F-ECT * | 900 W | R88M-K90010F-□ * | R88M-K90010C-□ * |
| | R88D-KN30F-ECT * | 2 kW | R88M-K2K010F-□ * | R88M-K2K010C-□ * |
| | R88D-KN50F-ECT * | 3 kW | R88M-K3K010F-□ * | R88M-K3K010C-□ * |
| | R88D-KN50F-ECT * | 4.5 kW | – | R88M-K4K510C-□ * |
| | R88D-KN75F-ECT * | 6 kW | – | R88M-K6K010C-□ * |

* Please note the capacity of Servo Drive and Servomotor are not same in this combination.

Servomotor and Decelerator Combinations (3,000 r/min, 2,000 r/min, 1,000 r/min)

<Cylinder Type> 3,000-r/min servomotors

| Motor model | 1/5 | 1/11 (1/9 for flange size No.11) | 1/21 | 1/33 | 1/45 |
|---------------------------|---|---|--|--|---|
| R88M-K05030□ | R88G-HPG11B05100B□ (Also used with R88M-K10030□) | R88G-HPG11B09050B□ (Gear ratio 1/9) | R88G-HPG14A21100B□ (Also used with R88M-K10030□) | R88G-HPG14A33050B□ | R88G-HPG14A45050B□ |
| R88M-K10030□ | R88G-HPG11B05100B□ | R88G-HPG14A11100B□ | R88G-HPG14A21100B□ | R88G-HPG20A33100B□ | R88G-HPG20A45100B□ |
| R88M-K20030□ | R88G-HPG14A05200B□ | R88G-HPG14A11200B□ | R88G-HPG20A21200B□ | R88G-HPG20A33200B□ | R88G-HPG20A45200B□ |
| R88M-K40030□ | R88G-HPG14A05400B□ | R88G-HPG20A11400B□ | R88G-HPG20A21400B□ | R88G-HPG32A33400B□ | R88G-HPG32A45400B□ |
| R88M-K75030H/T (200 V) | R88G-HPG20A05750B□ | R88G-HPG20A11750B□ | R88G-HPG32A21750B□ | R88G-HPG32A33750B□ | R88G-HPG32A45750B□ |
| R88M-K75030F/C (400 V) | R88G-HPG32A052K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A112K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A211K5B□ (Also used with R88M-K1K5030□) | R88G-HPG32A33600SB□ (Also used with R88M-K60020□) | R88G-HPG50A451K5B□ (Also used with R88M-K1K530□) |
| R88M-K1K030□ | R88G-HPG32A052K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A112K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A211K5B□ (Also used with R88M-K1K5030□) | R88G-HPG50A332K0B□ (Also used with R88M-K2K030□) | R88G-HPG50A451K5B□ (Also used with R88M-K1K530□) |
| R88M-K1K530□ | R88G-HPG32A052K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A112K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A211K5B□ | R88G-HPG50A332K0B□ (Also used with R88M-K2K030□) | R88G-HPG50A451K5B□ |
| R88M-K2K030□ | R88G-HPG32A052K0B□ | R88G-HPG32A112K0B□ | R88G-HPG50A212K0B□ | R88G-HPG50A332K0B□ | - |
| R88M-K3K030□ | R88G-HPG32A053K0B□ | R88G-HPG50A113K0B□ | R88G-HPG50A213K0B□ | - | - |
| R88M-K4K030□ | R88G-HPG32A054K0B□ | R88G-HPG50A115K0B□ (Also used with R88M-K5K030□) | - | - | - |
| R88M-K5K030□ | R88G-HPG50A055K0B□ | R88G-HPG50A115K0B□ | - | - | - |

2,000-r/min servomotors

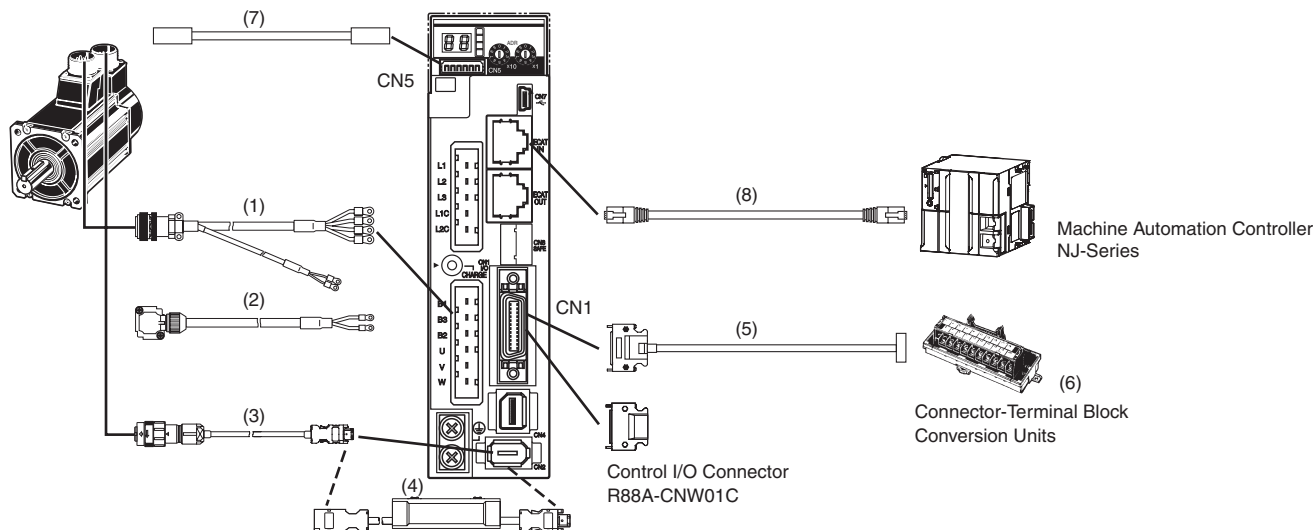
| Motor model | 1/5 | 1/11 | 1/21 (1/20 for flange size No.65) | 1/33 (1/25 for flange size No.65) | 1/45 |
|------------------------------|--|--|--|--|--------------------------------------|
| R88M-K40020□ (Only 400 V) | R88G-HPG32A052K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A112K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A211K5B□ (Also used with R88M-K1K5030□) | R88G-HPG32A33600SB□ (Also used with R88M-K60020□) | R88G-HPG32A45400SB□ |
| R88M-K60020□ (Only 400 V) | R88G-HPG32A052K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A112K0B□ (Also used with R88M-K2K030□) | R88G-HPG32A211K5B□ (Also used with R88M-K1K5030□) | R88G-HPG32A33600SB□ | R88G-HPG50A451K5B□ (R88M-K1K530□) |
| R88M-K1K020□ | R88G-HPG32A053K0B□ (Also used with R88M-K3K030□) | R88G-HPG32A112K0SB□ (Also used with R88M-K2K020□) | R88G-HPG32A211K0SB□ | R88G-HPG50A332K0SB□ (Also used with R88M-K2K020□) | R88G-HPG50A451K0SB□ |
| R88M-K1K520□ | R88G-HPG32A053K0B□ (Also used with R88M-K3K030□) | R88G-HPG32A112K0SB□ (Also used with R88M-K2K020□) | R88G-HPG50A213K0B□ (Also used with R88M-K3K030□) | R88G-HPG50A332K0SB□ (Also used with R88M-K2K020□) | - |
| R88M-K2K020□ | R88G-HPG32A053K0B□ (Also used with R88M-K3K030□) | R88G-HPG32A112K0SB□ | R88G-HPG50A213K0B□ (Also used with R88M-K3K030□) | R88G-HPG50A332K0SB□ | - |
| R88M-K3K020□ | R88G-HPG32A054K0B□ (Also used with R88M-K4K030□) | R88G-HPG50A115K0B□ (Also used with R88M-K5K030□) | R88G-HPG50A213K0SB□ | R88G-HPG65A253K0SB□ | - |
| R88M-K4K020□ | R88G-HPG50A055K0SB□ (Also used with R88M-K5K020□) | R88G-HPG50A115K0SB□ (Also used with R88M-K3K030□) | R88G-HPG65A205K0SB□ (Also used with R88M-K3K030□) | R88G-HPG65A255K0SB□ (Also used with R88M-K5K020□) | - |
| R88M-K5K020□ | R88G-HPG50A055K0SB□ | R88G-HPG50A115K0SB□ | R88G-HPG65A205K0SB□ | R88G-HPG65A255K0SB□ | - |

1,000-r/min servomotors

| Motor model | 1/5 | 1/11 | 1/21 (1/20 for flange size No.65) | 1/33 (1/25 for flange size No.65) |
|--------------|--|--|--|--|
| R88M-K90010□ | R88G-HPG32A05900TB□ (Also used with R88M-K5K020□) | R88G-HPG32A11900TB□ (Also used with R88M-K2K020□) | R88G-HPG50A21900TB□ (Also used with R88M-K3K030□) | R88G-HPG50A33900TB□ (Also used with R88M-K2K020□) |
| R88M-K2K010□ | R88G-HPG32A052K0TB□ | R88G-HPG50A112K0TB□ | R88G-HPG50A212K0TB□ (Also used with R88M-K5K020□) | R88G-HPG65A255K0SB□ (Also used with R88M-K5K020□) |
| R88M-K3K010□ | R88G-HPG50A055K0SB□ (Also used with R88M-K5K020□) | R88G-HPG50A115K0SB□ (Also used with R88M-K5K020□) | R88G-HPG65A205K0SB□ (Also used with R88M-K5K020□) | R88G-HPG65A255K0SB□ (Also used with R88M-K5K020□) |

Cable Combinations

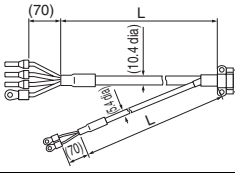
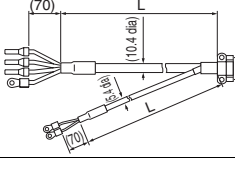
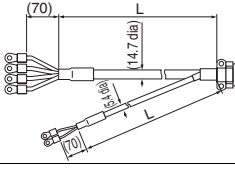
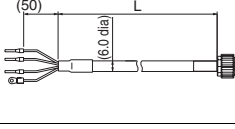
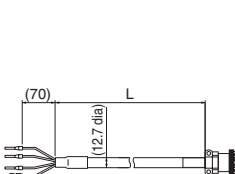
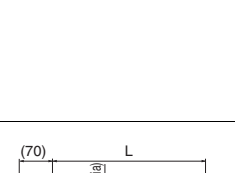
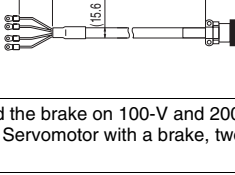
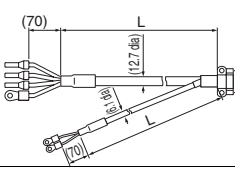
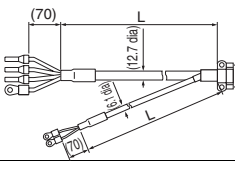
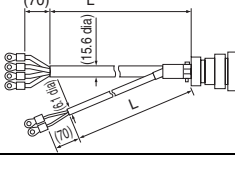
● EtherCAT Communications



Servomotor Power Cables (For CNB)

| Symbol | Name | Connected to | Model | Description |
|--------|--|---|---|--|
| (1) | Standard Cables Without Brakes Standard Servomotor Power Cables for Servomotors without Brakes | [100 V] [200 V] Cylindrical Servomotors, 3,000 r/min, 50 to 750 W | R88A-CAKA□□□S The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. | <p>[Servomotor Connector] Angle plug: JN8FT04SJ1 (Japan Aviation Electronics Industry, Ltd.) Contact pins: ST-TMH-S-C1B-3500-A534G (Japan Aviation Electronics Industry, Ltd.)</p> |
| | | [200 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 1 to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGB□□□S The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. | <p>[Servomotor Connector] Straight plug: N/MS3106B20-4S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.)</p> |
| | | [400 V] Cylindrical Servomotors, 3,000 r/min, 750 W to 2 kW Cylindrical Servomotors, 2,000 r/min, 400 W to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGD□□□S The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. | <p>[Servomotor Connector] Straight plug: N/MS3106B22-22S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.)</p> |
| | | [200 V] [400 V] Cylindrical Servomotors, 3,000 r/min, 3 to 5 kW Cylindrical Servomotors, 2,000 r/min, 3 to 5 kW Cylindrical Servomotors, 1,000 r/min, 2 to 4.5 kW | R88A-CAGE□□□S The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. | <p>[Servomotor Connector] Straight plug: N/MS3106B32-17S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-20A (Japan Aviation Electronics Industry, Ltd.)</p> |
| | | [200 V] [400 V] Cylindrical Servomotors, 1,500 r/min, 7.5 kW Cylindrical Servomotors, 1,000 r/min, 6 kW | | |

Note: Insert the cable length into the boxes in the model number of cables. (3 m: 003, 5 m: 005, 10 m: 010)

| Symbol | Name | Connected to | Model | Description | | |
|--------|--|--------------|--|--|--|--|
| (1) | Standard Cables With Brakes Standard Servomotor Power Cables for Servomotors with Brakes | | Note: Different connectors are used for the motor power and the brake on 100-V and 200-V, 3,000-r/min Servomotors of 50 to 750 W and Servomotors of 6 to 15 kW. When using a Servomotor with a brake, two cables are required: a Power Cable without Brake and a Brake Cable. | | | |
| | | | [200 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 1 to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGB□□□B The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B20-18S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.) |
| | | | [400 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 400 W to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAKF□□□B The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B24-11S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-16A (Japan Aviation Electronics Industry, Ltd.) |
| | Without Brakes Robot Servomotor Power Cables for Servomotors without Brakes | | [200 V] [400 V] Cylindrical Servomotors, 3,000 r/min, 3 to 5 kW Cylindrical Servomotors, 2,000 r/min, 3 to 5 kW Cylindrical Servomotors, 1,000 r/min, 2 to 3 kW | R88A-CAGD□□□B The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B24-11S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-16A (Japan Aviation Electronics Industry, Ltd.) |
| | | | [100 V] [200 V] Cylindrical Servomotors, 3,000 r/min, 50 to 750 W | R88A-CAKA□□□SR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Angle plug: JN8FT04SJ1 (Japan Aviation Electronics Industry, Ltd.) Connector pins: ST-TMH-S-C1B-3500-A534G (Japan Aviation Electronics Industry, Ltd.) |
| | | | [200 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 1 to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGB□□□SR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B20-4S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.) |
| | Robot Cables Without Brakes Robot Servomotor Power Cables for Servomotors without Brakes | | [400 V] Cylindrical Servomotors, 3,000 r/min, 750 W to 2 kW Cylindrical Servomotors, 2,000 r/min, 400 W to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGD□□□SR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B22-22S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.) |
| | | | [200 V] [400 V] Cylindrical Servomotors, 3,000 r/min, 3 to 5 kW Cylindrical Servomotors, 2,000 r/min, 3 to 5 kW Cylindrical Servomotors, 1,000 r/min, 2 to 4.5 kW | R88A-CAGD□□□SR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B22-22S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.) |
| | | | Note: Different connectors are used for the motor power and the brake on 100-V and 200-V, 3,000-r/min Servomotors of 50 to 750 W and Servomotors of 6 to 15 kW. When using a Servomotor with a brake, two cables are required: a Power Cable without Brake and a Brake Cable. | | | |
| | With Brakes Robot Servomotor Power Cables for Servomotors with Brakes | | [200 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 1 to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAGB□□□BR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B20-18S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-12A (Japan Aviation Electronics Industry, Ltd.) |
| | | | [400 V] Cylindrical Servomotors, 3,000 r/min, 1 to 2 kW Cylindrical Servomotors, 2,000 r/min, 400 W to 2 kW Cylindrical Servomotors, 1,000 r/min, 900 W | R88A-CAKF□□□BR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B24-11S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-16A (Japan Aviation Electronics Industry, Ltd.) |
| | | | [200 V] [400 V] Cylindrical Servomotors, 3,000 r/min, 3 to 5 kW Cylindrical Servomotors, 2,000 r/min, 3 to 5 kW Cylindrical Servomotors, 1,000 r/min, 2 to 3 kW | R88A-CAGD□□□BR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  | [Servomotor Connector] Straight plug: N/MS3106B24-11S (Japan Aviation Electronics Industry, Ltd.) Cable clamp: N/MS3057-16A (Japan Aviation Electronics Industry, Ltd.) |

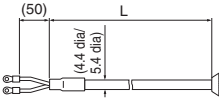
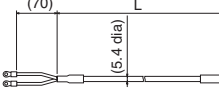
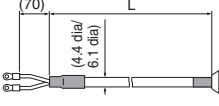
Note: Insert the cable length into the boxes in the model number of cables. (3 m: 003, 5 m: 005, 10 m: 010)

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
General Specifications
Performance Specifications / Torque and Rotation Speed Characteristics
Encoder Specifications
Dimensions
Combination table
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

AC Servomotors/Servo Drives G5-Series

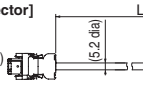
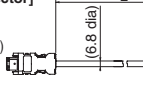
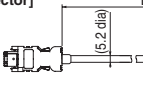
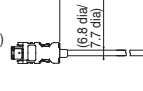
AC Servomotors

Brake Cables

| Symbol | Name | Connected to | Model | Description |
|--------|--|---|--|--|
| (2) | Standard Cables Brake Cables (Standard Cables) | [100 V] [200 V] Cylindrical Servomotors, 3,000 r/min, 50 to 750 W | R88A-CAKA□□□B The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (3 to 20 m: 4.4 dia, 30 to 50 m: 5.4 dia) |  [Servomotor Connector] Angle plug: JN4FT02SJ1-R (Japan Aviation Electronics Industry, Ltd.) Connector pins: ST-TMH-S-C1B-3500-(A534G) (Japan Aviation Electronics Industry, Ltd.) |
| | | [200 V] [400 V] Cylindrical Servomotors, 1,500 r/min, 7.5 to 15 kW 1,000 r/min, 6 kW | R88A-CAGE□□□B The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (5.4 dia) |  [Servomotor Connector] Angle plug: N/MS3106B14S-2S (Japan Aviation Electronics Industry, Ltd.) Connector pins: N/MS3057-6A (Japan Aviation Electronics Industry, Ltd.) |
| | Robot Cables Brake Cables (Robot Cables) | [100 V] [200 V] Cylindrical Servomotors, 3,000 r/min, 50 to 750 W | R88A-CAKA□□□BR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (3 to 20 m: 4.4 dia, 30 to 50 m: 6.1 dia) |  [Servomotor Connector] Angle plug: JN4FT02SJ1-R (Japan Aviation Electronics Industry, Ltd.) Connector pins: ST-TMH-S-C1B-3500-(A534G) (Japan Aviation Electronics Industry, Ltd.) |

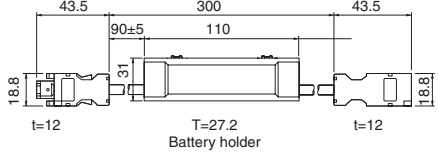
Note: Insert the cable length into the boxes in the model number of cables. (3 m: 003, 5 m: 005, 10 m: 010)

Encoder Cables (for CN2)

| Symbol | Name | Connected to | Model | Description |
|--------|---|---|--|---|
| (3) | Standard Encoder Cables with Connectors | Cylindrical Servomotors, 3,000 r/min, 50 to 750 W (Absolute encoder/ Incremental encoder) | R88A-CRKA□□□C The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (3 to 20 m: 5.2 dia, 30 to 50 m: 6.8 dia) |  [Servo Drive Connector] Connector: 55100-0670 (Molex Japan Co., Ltd.) [Servomotor Connector] Angle clamp: JN6FR07SM1 (Japan Aviation Electronics Industry, Ltd.) Connector pins: LY10-C1-A1-10000 (Japan Aviation Electronics Industry, Ltd.) |
| | | Cylindrical Servomotors, 3,000 r/min, For 1 kW (200 V) For 750 W (400 V) Cylindrical Servomotors, 2,000 r/min, Cylindrical Servomotors, 1,000 r/min, (Absolute encoder/ Incremental encoder) | R88A-CRKC□□□N The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. |  [Servo Drive Connector] Connector: 55100-0670 (Molex Japan Co., Ltd.) [Servomotor Connector] Straight plug: JN2DS10SL2-R (Japan Aviation Electronics Industry, Ltd.) Contact: JN1-22-20S-10000 (Japan Aviation Electronics Industry, Ltd.) |
| | Robot Encoder Cables with Connectors | Cylindrical Servomotors, 3,000 r/min, 50 to 750 W (Absolute encoder/ Incremental encoder) | R88A-CRKA□□□CR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (3 to 20 m: 5.2 dia, 30 to 50 m: 6.8 dia) |  [Servo Drive Connector] Connector: 55100-0670 (Molex Japan Co., Ltd.) [Servomotor Connector] Angle clamp: JN6FR07SM1 (Japan Aviation Electronics Industry, Ltd.) Connector pins: LY10-C1-A1-10000 (Japan Aviation Electronics Industry, Ltd.) |
| | | Cylindrical Servomotors, 3,000 r/min, For 1 kW (200 V) For 750 W (400 V) Cylindrical Servomotors, 2,000 r/min, Cylindrical Servomotors, 1,000 r/min, (Absolute encoder/ Incremental encoder) | R88A-CRKC□□□NR The empty boxes in the model number are for the cable length. The cable can be 3, 5, 10, 15, 20, 30, 40, or 50 m long. (3 to 20 m: 6.8 dia, 30 to 50 m: 7.7 dia) |  [Servo Drive Connector] Connector: 55100-0670 (Molex Japan Co., Ltd.) [Servomotor Connector] Straight plug: JN2DS10SL2-R (Japan Aviation Electronics Industry, Ltd.) Cable clamp: JN1-22-22S-10000 (Japan Aviation Electronics Industry, Ltd.) |

Note: Insert the cable length into the boxes in the model number of cables. (3 m: 003, 5 m: 005, 10 m: 010)

Absolute Encoder Backup Battery and Absolute Encoder Battery Cable

| Symbol | Name | Specifications | Model | Description |
|--------|---------------------------------|-----------------------------------|------------------------|---|
| (4) | Absolute Encoder Battery Cable | Battery not included | 0.3 m R88A-CRGD0R3C |  |
| | | One R88A-BAT01G Battery included. | 0.3 m R88A-CRGD0R3C-BS | |
| | Absolute Encoder Backup Battery | - | R88A-BAT01G | - |

Control Cables (for CN1)

| Symbol | Name | Connected to | Model |
|--------|------------------------------|---|---|
| (5) | For Connector Terminal Block | Connector Terminal Block Cables | Cable for EtherCAT Communications XW2Z-□□□J-B34 The empty boxes in the model number are for the cable length. The cable can be 1, or 2 m long. |
| (6) | | Connector-Terminal Block Conversion Units | Cable for EtherCAT Communications |
| | | | M3 screws XW2B-20G4 |
| | | | M3.5 screws XW2B-20G5 |
| | | | M3 screws XW2D-20G6 |

Note: Insert the cable length into the boxes in the model number of cables. (3 m: 003, 5 m: 005, 10 m: 010)

Monitor Connector (for CN5)

| Symbol | Name | Lengths | Model |
|--------|----------------------|---------|--------------|
| (7) | Analog Monitor Cable | 1 m | R88A-CMK001S |

EtherCAT Communication Cable

| Symbol | Name | Description |
|--------|----------------|--|
| (8) | Ethernet Cable | EtherCAT Communication Cables <ul style="list-style-type: none"> Use a category 5 or higher cable with double, aluminum tape and braided shielding. Connector (Modular Plug) Specifications <ul style="list-style-type: none"> Use a category 5 or higher, shielded connector. |

Connectors

| Connectors | Name | Model |
|------------|---|-------------|
| CN1 | Control I/O Connector (EtherCAT Communications) | R88A-CNW01C |
| CN2 | Encoder Connector | R88A-CNW01R |
| CN4 | External scale connector | R88A-CNK41L |
| CN8 | Safety connector | R88A-CNK81S |

Servomotor Connector

| Connectors | Name | Connected to | Model |
|------------|-----------------------------------|--|-------------|
| - | Motor connector for encoder cable | 3,000 r/min, 50 to 750 W | R88A-CNK02R |
| | | 3,000 r/min, 1 to 5 kW (200 V)/750 W to 5 kW (400 V) 2,000 r/min, 1,000 r/min | R88A-CNK04R |
| - | Power cable connector | 750 W max. (100 V/200 V) | R88A-CNK11A |
| - | Brake cable connector | 750 W max. (100 V/200 V) | R88A-CNK11B |

General Specifications
Performance Specifications/Torque and Rotation Speed Characteristics
Encoder Specifications
Dimensions
Combination Table

Multi-function Compact Inverter MX2-Series

With Machine Automation Mentality

- Current vector Control.
- High Starting torque: 200% at 0.5 Hz.
- Double rating VT 120%/1 min and CT 150% /1 min.
- Speed range up to 1,000 Hz.
- Positioning functionality.
- Safety function *2 EN ISO13849-1:2008 (Cat.3/PLd) IEC60204-1 Stop Category 0
- Fieldbus communications with optional unit: EtherCAT, CompoNet and DeviceNet *1
- Modbus communications.

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

*2 When the EtherCAT communication unit is mounted onto the MX2, the inverter will not conform to the safety standards.



Performance Specifications

Inverter 3G3MX2

3-phase 200 V Class

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

* The BRD usage is 10%.

3-phase 400 V Class

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

* The BRD usage is 10%.

1-phase 200 V Class

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

* The BRD usage is 10%.

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 |
|-------------------------------|--------------|---|
| Model | | 3G3AX-MX2-ECT |
| 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 ² (0.6 G), 10 to 55 Hz |
| Application environment | | At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust) |
| Weight | | 100 g max. |
| International standard | UL/cUL | UL508C |
| | EC directive | EMC Directive :EN61800-3:2004 Low Voltage Directive :EN61800-5-1:2003 |

EtherCAT Communications Specifications

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

Function Specifications

| Function name | | Specifications | |
|-------------------------------|---|---|--|
| Enclosure ratings *1 | | Open type (IP20) | |
| Control | Control method | Phase-to-phase sinusoidal modulation PWM | |
| | Output frequency range *2 | 0.10 to 400 Hz (or 1,000 Hz in the high-frequency mode; restrictions apply) | |
| | Frequency precision *3 | Digital command: $\pm 0.01\%$ of the max. frequency, Analog command: $\pm 0.2\%$ of the max. frequency (25°C $\pm 10^\circ$ 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 | |
| | Overload current rating | Heavy load rating (CT): 150%/60 s Light load rating (VT): 120%/60 s | |
| | 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). | | |
| Protective functions | | Overcurrent, overvoltage, undervoltage, electronic thermal, temperature error, ground fault overcurrent at power-on status, rush current prevention circuit, overload limit, incoming overvoltage, external trip, memory error, CPU error, USP error, communication error, overvoltage suppression during deceleration, protection upon momentary power outage, emergency cutoff, etc. | |
| Input signal | Frequency settings | Digital Operator External analog input signal: 0 to 10 VDC/4 to 20 mA, Modbus communication (Modbus-RTU) | |
| | RUN/STOP command | Digital Operator External digital input signal (3-wire input supported), Modbus communication (Modbus-RTU) | |
| | Multi-function input | 7 points (Selectable from 59 functions) | |
| | 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) | |
| Output signal | Multi-function output | 2 points (P1/EDM, P2; selectable from 43 functions) | |
| | Relay output | 1 point (1c contact: MC, MA, MB; selectable from 43 functions) | |
| | Analog output (Frequency monitor) | 1 point (AM terminal: Voltage 10 bits/0 to 10 V) (Frequency, current selectable) | |
| | Pulse output | 1 point (MP terminal: 32 kHz max., 0 to 10 V) | |
| Communications | RS-422 | RJ45 connector (for Digital Operator) | |
| | RS-485 | Control circuit terminal block, Modbus communication (Modbus-RTU) | |
| | USB | USB1.1, mini-B connector | |
| Other 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. | |
| General specifications | Ambient temperature | -10 to 50°C (However, derating is required). | |
| | Ambient storage temperature | -20°C to 65°C (short-time temperature during transport) | |
| | Humidity | 20% to 90% RH (with no condensation) | |
| | Vibration | 5.9 m/s ² (0.6G), 10 to 55 Hz | |
| | Location | At a maximum altitude of 1,000 m; indoors (without corrosive gases or dust) | |
| Options | | DC reactor, AC reactor, radio noise filter, input noise filter, output noise filter, regenerative braking unit, Braking Resistor, EMC noise filter, etc. | |
| International standard | EC directive | EMC directive | EN61800-3: 2004 |
| | | Low voltage directive | EN61800-5-1: 2003 |
| | | Machinery directives | IEC60204-1 Stop Category 0, EN IEC61800-5-2 (STO), EN ISO13849-1: 2008 (PLd), ISO13849-1: 2006 (PLd) |
| | UL/cUL | UL508C | |

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

*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.

Version Information

Unit Versions

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

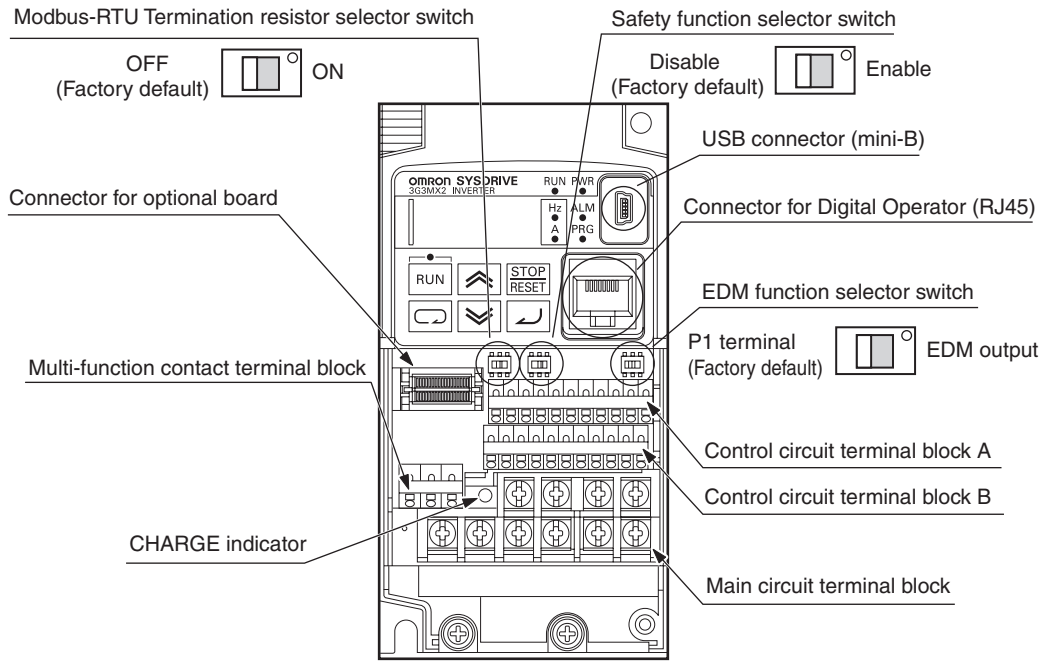
* The function that was enhanced by the upgrade for Unit version1.1 can not be used. For detail, refer to "Function Support by Unit Version".

Function Support by Unit Version

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

Components and Functions

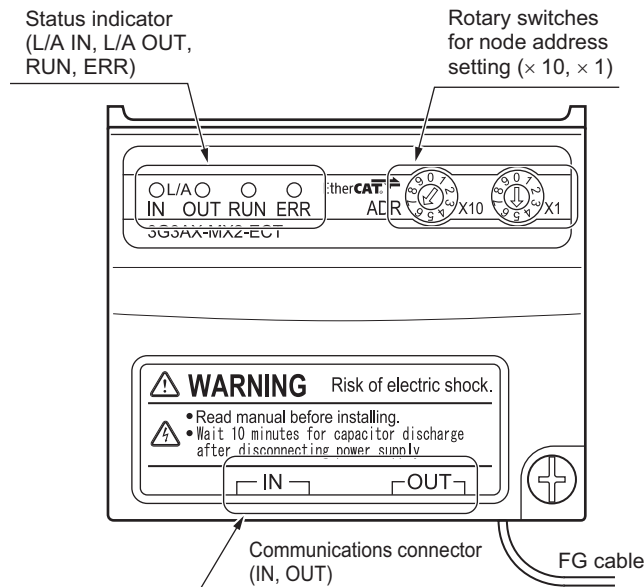
Inverter 3G3MX2



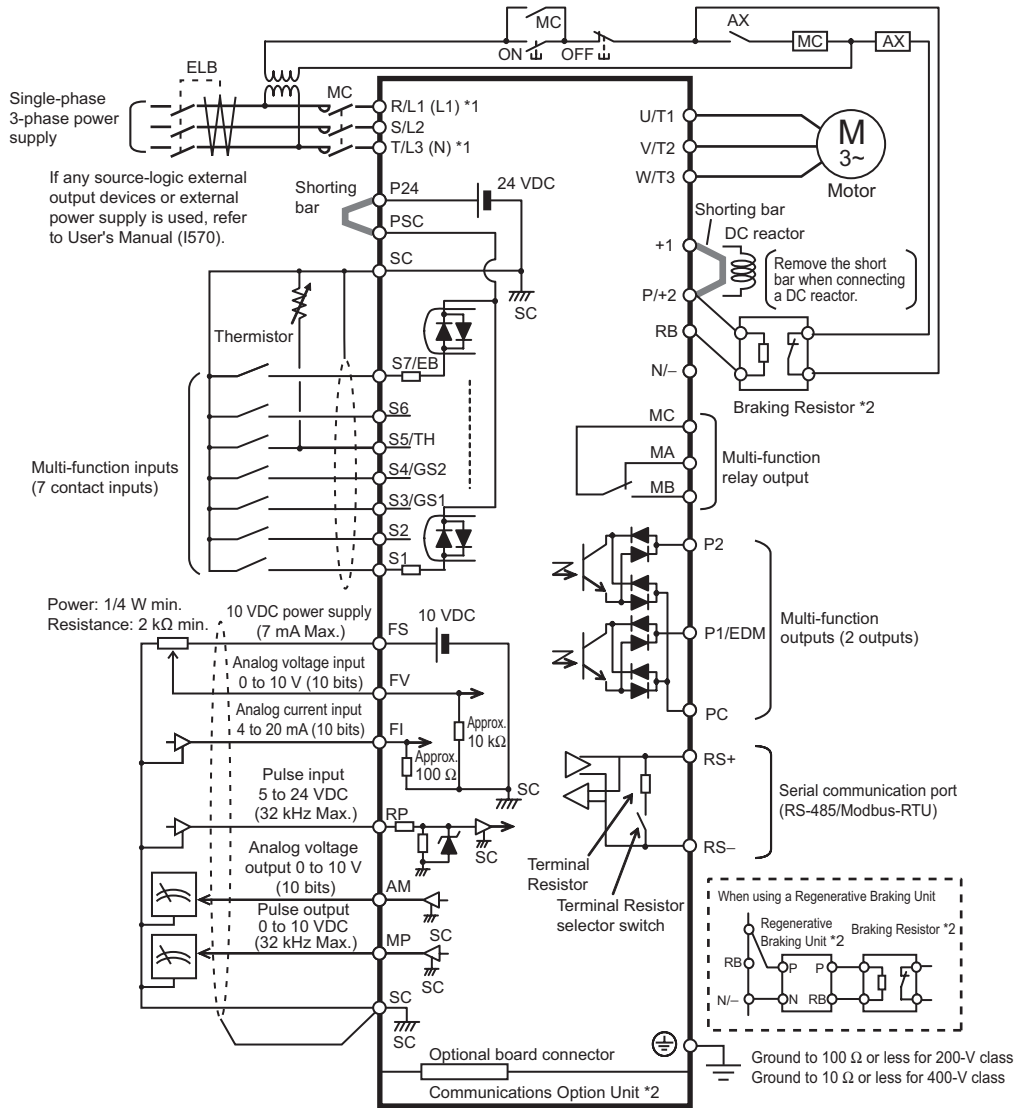
| Name | Function |
|---|---|
| Modbus-RTU Termination resistor selector switch | Use this Terminal Resistor selector switch for RS-485 terminals on the control circuit terminal block. When this switch is turned ON, the internal 200 Ω Resistor is connected. |
| Safety function selector switch | Turn this switch ON when using the safety function. Turn OFF the power before turning this switch ON/OFF. For details, refer to USER'S MANUAL (Cat.No.I570). |
| 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.I570). |
| 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.

EtherCAT Communication Unit 3G3AX-MX2-ECT



Connection Diagram

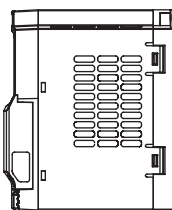
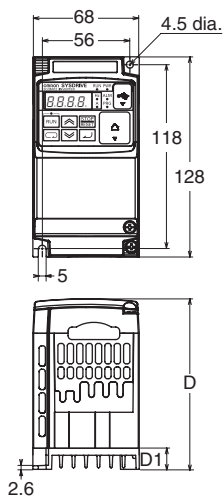


*1 Connect to terminals L1 and N on a single-phase, 200-V Inverter (3G3MX2-AB□□□).
*2 Optional.

Dimensions

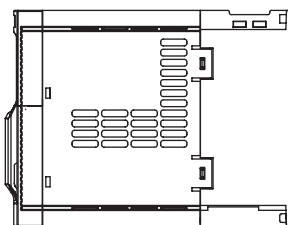
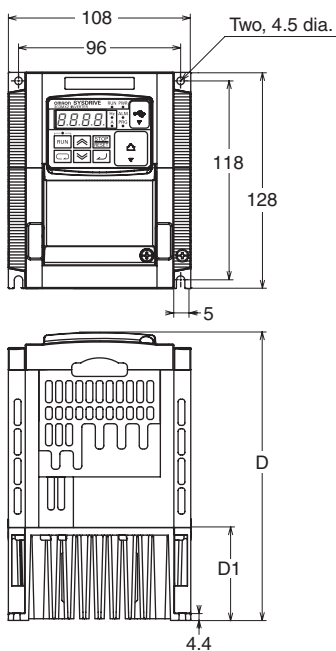
(Unit: mm)

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



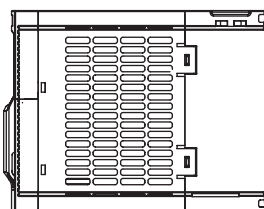
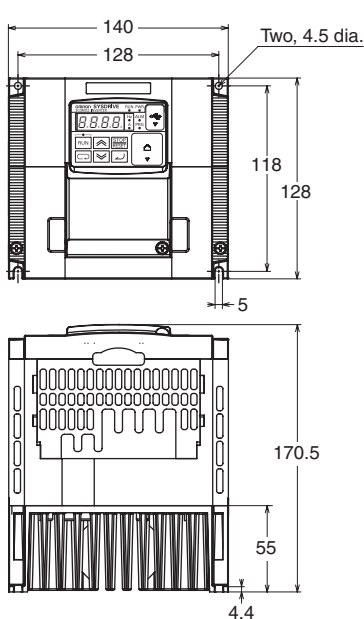
| Power supply | Model | W [mm] | H [mm] | D [mm] | D1 [mm] |
|------------------|------------------------------|--------|--------|--------|---------|
| 1-phase 200 V | 3G3MX2-AB001 3G3MX2-AB002 | 68 | 128 | 109 | 13.5 |
| | 3G3MX2-AB004 | | | 122.5 | 27 |
| 3-phase 200 V | 3G3MX2-A2001 3G3MX2-A2002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

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



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

- 3G3MX2-A2037
- 3G3MX2-A4040

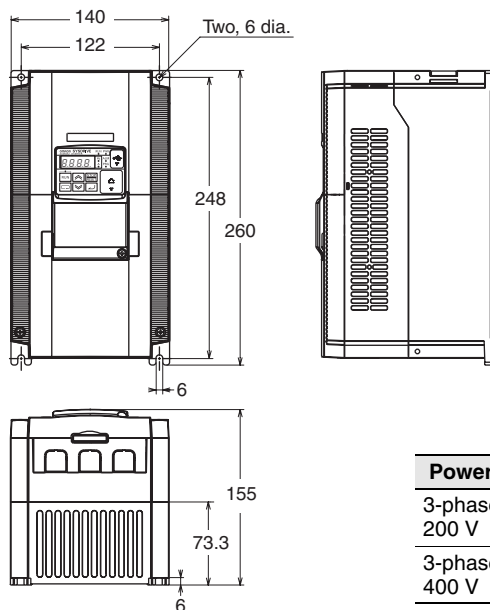


| Power supply | Model | W [mm] | H [mm] | D [mm] | D1 [mm] |
|------------------|--------------|--------|--------|--------|---------|
| 3-phase 200 V | 3G3MX2-A2037 | 140 | 128 | 170.5 | 55 |
| 3-phase 400 V | 3G3MX2-A4040 | | | | |

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
Performance Specifications
Function Specifications
Version Information
Components and Functions
Connection Diagram
Dimensions
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

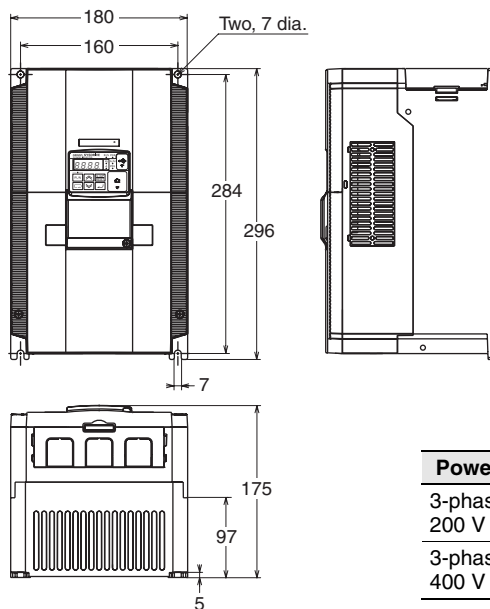
Multi-function Compact Inverter MX2-Series

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



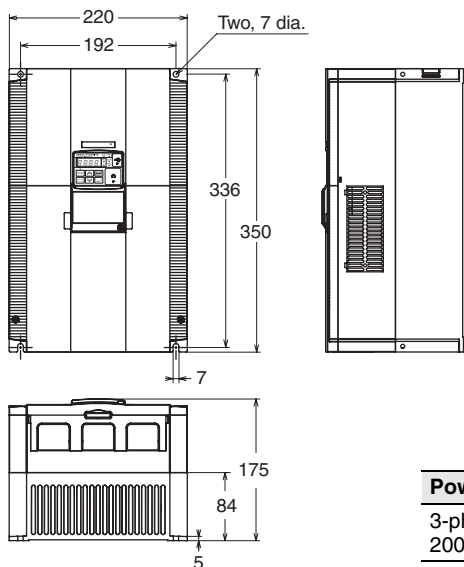
| Power supply | Model | W [mm] | H [mm] | D [mm] | D1 [mm] |
|------------------|------------------------------|--------|--------|--------|---------|
| 3-phase 200 V | 3G3MX2-A2055 3G3MX2-A2075 | 140 | 260 | 155 | 73.3 |
| 3-phase 400 V | 3G3MX2-A4055 3G3MX2-A4075 | | | | |

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



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

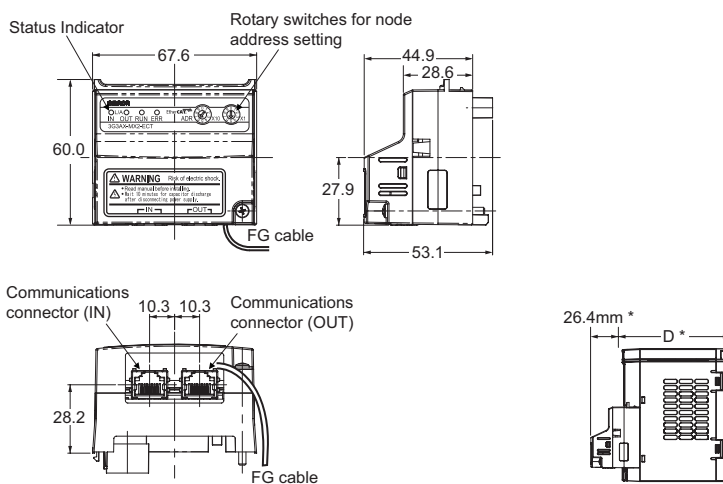
3G3MX2-A2150



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

EtherCAT Communication Unit

3G3AX-MX2-ECT



* After the EtherCAT Communication Unit is installed, dimension D of the inverter increases by 26.4 mm. (Dimension D of the inverter varies depending on the capacity. Refer to the manual for the inverter.)

Vision Sensor FQ-M-Series

Designed for motion tracking

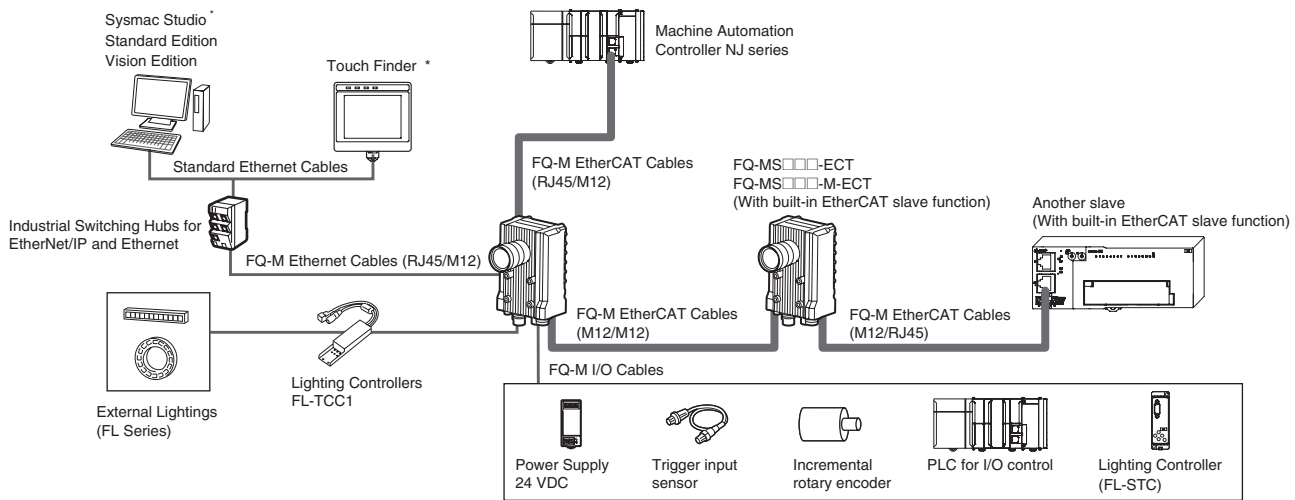
- Connectivity with EtherCAT/Ethernet
- Up to 5000 pieces per minute with 360 degree rotation*
- Vision sensor with encoder input for tracking function
- Calibration function of the complete system
- Flexible data output depending on the output devices

* The processing speed depends on setting conditions.



System configuration

EtherCAT connections



* Sysmac Studio and Touch Finder can not be used together. When both are connected, Sysmac Studio will have a priority.
When you use the Sysmac Studio Standard Edition and connect the FQ series and the Machine Automation Controller NJ-series, connect them with a general-purpose Ethernet cable or a USB cable.

- Note:**
1. EtherCAT and Ethernet (PLC Link) can not be used simultaneously.
 2. It is not possible to configure and adjust the FQ-M via an NJ-series controller, when they are connected via an EtherCAT network. For configuration and adjustment of FQ-M, connect the FQ-M and a computer or a Touch Finder via an Ethernet network.

Specifications

Sensors

| Item | | Type | EtherCAT communication function provided | |
|--|--|--|--|----------------|
| | | | Color | Monochrome |
| Model | NPN | | FQ-MS120-ECT | FQ-MS120-M-ECT |
| | PNP | | FQ-MS125-ECT | FQ-MS125-M-ECT |
| Field of vision, Installation distance | | Selecting a lens according to the field of vision and installation distance. Refer to the "Optical Chart" page. | | |
| Main functions | Inspection items | Shape search, Search, Labeling, Edge position | | |
| | Number of simultaneous inspections | 32 | | |
| | Number of registered scenes | 32 | | |
| Image input | Image processing method | Real color | Monochrome | |
| | Image elements | 1/3-inch color CMOS | 1/3-inch monochrome CMOS | |
| | Image filter | High dynamic range (HDR) and white balance | High dynamic range (HDR) | |
| | Shutter | Electronic shutter; select shutter speeds from 1/10 to 1/30000 (sec) | | |
| | Processing resolution | 752 (H) × 480 (V) | | |
| | Pixel size | 6.0 (μm) × 6.0 (μm) | | |
| | Frame rate (image read time) | 60fps (16.7ms) | | |
| External Lightings | Connecting method | Connection via a strobe light controller | | |
| | Connectable lighting | FL series | | |
| Data logging | Measurement data | In Sensor: Max. 32000 items *1 | | |
| | Images | In Sensor: 20 images *1 | | |
| Measurement trigger | | I/O trigger, Encoder trigger, Communications trigger (Ethernet No-protocol, PLC Link, or EtherCAT) | | |
| I/O specifications | Input signals | 9 signals • Single measurement input (TRIG) • Error clear input (IN0) • Encoder counter reset input (IN1) • Encoder input (A±, B±, Z±) *3 | | |
| | Output signals | 5 signals *2 • OUT0 Overall judgement output (OR) • OUT1 Control output (BUSY) • OUT2 Error output (ERROR) • OUT3 (Shutter output: SHTOUT) • OUT4 (Strobe trigger output: STGOUT) | | |
| | Ethernet specifications | 100BASE-TX/10BASE-TX | | |
| | EtherCAT specifications | Dedicated protocol for EtherCAT 100BASE-TX | | |
| | Connection method | Special connector cables • Power supply and I/O: 1 special connector I/O cable • Touch Finder, Computer and Ethernet: 1 Ethernet cable • EtherCAT: 2 EtherCAT cable | | |
| LED display | | • OR: Judgment result indicator • ERR: Error indicator • BUSY: BUSY indicator • ETN: Ethernet communications indicator | | |
| | EtherCAT display | • L/A IN (Link/Activity IN) × 1 • L/A OUT (Link/Activity OUT) × 1 • RUN × 1 • ERR × 1 | | |
| Ratings | Power supply voltage | 21.6 to 26.4 VDC (including ripple) | | |
| | Insulation resistance | Between all lead wires and case: 0.5 MΩ (at 250 V) | | |
| | Current consumption | 450mA max. (When the FL-series Strobe controller and lighting are used.) 250mA max. (When external lighting is not used.) | | |
| Environmental immunity | Ambient temperature range | Operating: 0 to 50 °C, Storage: -20 to 65 °C (with no icing or condensation) | | |
| | Ambient humidity range | Operating and storage: 35% to 85% (with no condensation) | | |
| | Ambient atmosphere | No corrosive gas | | |
| | Vibration resistance (destruction) | 10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions, 8 min each, 10 times | | |
| | Shock resistance (destruction) | 150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward) | | |
| Degree of protection | IEC60529 IP40 | | | |
| Materials | Case: aluminium die casting, Rear cover: aluminium plate | | | |
| Weight | Approx. 480 g (Sensor only) | | | |
| Accessories | Instruction Manual | | | |

*1 If a Touch Finder is used, results can be saved up to the capacity of an SD card.

*2 The five output signals can be allocated for the judgements of individual inspection items.

*3 Encoder input specifications
Pulse input Specifications (When an open collector type encoder is used.)

| Item | Specification | | |
|-------------------------------|--|-----------------------------------|----------------------------------|
| Input voltage | 24 VDC ±10% | 12 VDC ±10% | 5 VDC ±5% |
| Input current | 4.8 mA (at 24 VDC, typical value) | 2.4 mA (at 12 VDC, typical value) | 1.0 mA (at 5 VDC, typical value) |
| NPN | ON voltage *1 | 4.8 V max. | 2.4 V max. |
| | OFF voltage *2 | 19.2 V min. | 9.6 V min. |
| PNP | ON voltage *1 | 19.2 V min. | 9.6 V min. |
| | OFF voltage *2 | 4.8 V max. | 2.4 V max. |
| Maximum response frequency *3 | 50 kHz (I/O cable: when the FQ-MWD005 or FQ-MWDL005 cables is used.) 20 kHz (I/O cable: when the FQ-MWD010 or FQ-MWDL010 cables is used.) | | |
| Input impedance | 5.1 kΩ | | |

*1 ON voltage: Voltage to change from OFF to ON state. The ON voltage is the difference of voltages between the GND terminal of the encoder power terminals and each input terminal.

*2 OFF voltage: Voltage to change from ON to OFF state. The ON voltage is the difference of voltages between the GND terminal of the encoder power terminals and each input terminal.

*3 Select maximum response frequency depending on length of the encoder cable and response frequency of the encoder.

Pulse input Specifications (When a line-driver output type encoder is used.)

| Item | Specification |
|-------------------------------|---|
| Input voltage | EIA standard RS-422-A line driver level |
| Input impedance *1 | 120 Ω ±5% |
| Differential input voltage | 0.2 V min. |
| Hysteresis voltage | 50 mV |
| Maximum response frequency *2 | 200 kHz (I/O cable: when the FQ-MWD005, FQ-MWDL005, FQ-MWD010, or FQ-MWDL010 cables is used.) |

*1 When terminating resistance function is used.

*2 Select maximum response frequency depending on length of the encoder cable and response frequency of the encoder.

Touch Finder

| Item | Type Model | Model with DC power supply | | Model with AC/DC/battery power supply | |
|--|--|--|---|--|--|
| | | FQ-MD30 | | FQ-MD31 | |
| Number of connectable Sensors | | 2 max. | | | |
| Main functions | Types of measurement displays | | Last result display, Last NG display, trend monitor, histograms | | |
| | Types of display images | | Through, frozen, zoom-in, and zoom-out images | | |
| | Data logging | | Measurement results, measured images | | |
| | Menu language | | English, Japanese | | |
| Indications | LCD | Display device | 3.5-inch TFT color LCD | | |
| | | Pixels | 320 × 240 | | |
| | | Display colors | 16,777,216 | | |
| | Backlight | Life expectancy *1 | 50,000 hours at 25 °C | | |
| | | Brightness adjustment | Provided | | |
| | | Screen saver | Provided | | |
| | Indicators | Power indicator (color: green) | POWER | | |
| | | Error indicator (color: red) | ERROR | | |
| SD card access indicator (color: yellow) | | SD ACCESS | | | |
| Charge indicator (color: orange) | | --- | CHARGE | | |
| Operation interface | Touch screen | Method | Resistance film | | |
| | | Life expectancy *2 | 1,000,000 operations | | |
| | | 100 BASE-TX/10 BASE-T | | | |
| External interface | Ethernet | 100 BASE-TX/10 BASE-T | | | |
| | SD card | Omron SD card (Model: HMC-SD291) or a SDHC card of Class4 or higher rating is recommended. | | | |
| Ratings | Power supply voltage | DC power connection | 20.4 to 26.4 VDC (including ripple) | | |
| | | AC adapter connection | --- | 100 to 240 VAC, 50/60 Hz | |
| | | Battery connection | --- | FQ-BAT1 Battery (1 cell, 3.7 V) | |
| | Continuous operation on Battery *3 | --- | 1.5 h | | |
| | Current consumption | DC power connection: 0.2 A | | | |
| Insulation resistance | Between all lead wires and case: 0.5 MΩ (at 250 V) | | | | |
| Environmental immunity | Ambient temperature range | Operating: 0 to 50 °C Storage: -25 to 65 °C (with no icing or condensation) | | Operating: 0 to 50 °C when mounted to DIN Track or panel 0 to 40 °C when operated on a Battery Storage: -25 to 65 °C (with no icing or condensation) | |
| | Ambient humidity range | Operating and storage: 35% to 85% (with no condensation) | | | |

| Item | Type Model | Model with DC power supply | Model with AC/DC/battery power supply |
|------------------------|------------------------------------|---|---------------------------------------|
| | | FQ-MD30 | FQ-MD31 |
| Environmental immunity | Ambient atmosphere | No corrosive gas | |
| | Vibration resistance (destruction) | 10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times | |
| | Shock resistance (destruction) | 150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward) | |
| | Degree of protection | IEC 60529 IP20 | |
| Dimensions | | 95 × 85 × 33 mm | |
| Materials | | Case: ABS | |
| Weight | | Approx. 270 g (without Battery and hand strap) | |
| Accessories | | Touch Pen (FQ-XT), Instruction Manual | |

*1 This is a guideline for the time required for the brightness to diminish to half the initial brightness at room temperature and humidity. No guarantee is implied. The life of the backlight is greatly affected by the ambient temperature and humidity. It will be shorter at lower or higher temperatures.

*2 This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.

*3 This value is only a guideline. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

Battery Specifications

| Item | Model | FQ-BAT1 |
|---------------------------|-------|---|
| Battery type | | Secondary lithium ion battery |
| Nominal capacity | | 1800 mAh |
| Rated voltage | | 3.7 V |
| Dimensions | | 35.3 × 53.1 × 11.4 mm |
| Ambient temperature range | | Operating: 0 to 40 °C Storage: -25 to 65 °C (with no icing or condensation) |
| Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) |
| Charging method | | Charged in Touch Finder (FQ-MD31). AC adapter (FQ-AC□) is required. |
| Charging time *1 | | 2.0 h |
| Battery backup life *2 | | 300 charging cycles |
| Weight | | 50 g max. |

*1 This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.

*2 This is a guideline for the time required for the capacity of the Battery to be reduced to 60% of the initial capacity. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

FQ-M Series EtherCAT Communications Specifications

| Item | Specifications |
|-------------------------|--|
| Communications standard | IEC 61158 Type12 |
| Physical layer | 100BASE-TX (IEEE802.3) |
| Connector | M12 × 2 E-CAT IN : EtherCAT (IN) E-CAT OUT : EtherCAT (OUT) |
| Communications media | Use the cables for FQ-MWN□□, or FQ-WN□□ series. |
| Communications distance | Use the communication cable within the length of FQ-MWN□□ or FQ-WN□□ series cables. |
| Process data | Variable PDO Mapping |
| Mailbox (CoE) | Emergency messages, SDO requests, SDO responses, and SDO information |
| Distributed clock | Synchronization with DC mode 1 |
| LED display | L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1 |

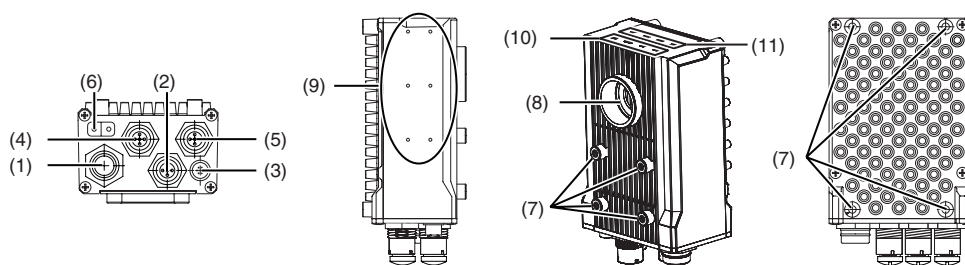
Version Information

FQ-M Series and Programming Devices

| FQ-M Series | Required Programming Device | |
|------------------|---|--------------------|
| | Sysmac Studio Standard Edition/Vision Edition | |
| | Ver.1.00 | Ver.1.01 or higher |
| FQ-MS□□□(-M)-ECT | Not supported | Supported |

Components and Functions

Sensor

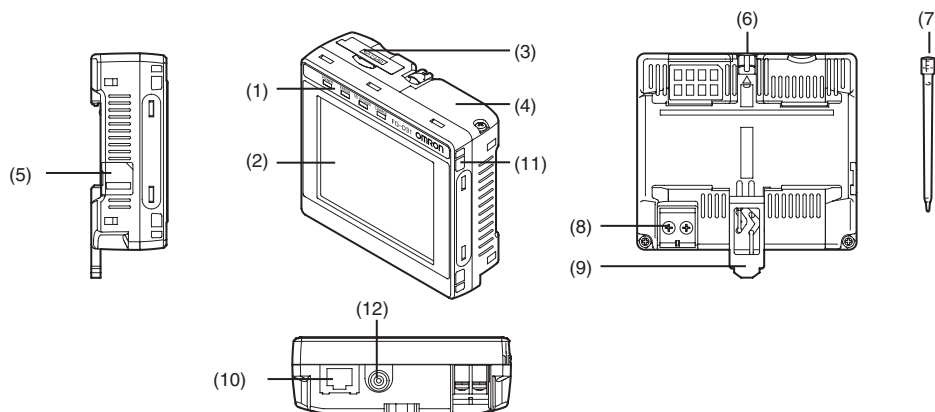


| No. | Name | Description |
|-----|------------------------------|---|
| (1) | I/O Cable connector | An I/O Cable is used to connect the Sensor to the power supply and external I/O. |
| (2) | Ethernet connector | An Ethernet cable is used to connect the Sensor to external devices such as PLCs, the Touch Finder, or computers. |
| (3) | Lighting connector | Connect an external lighting (strobe controller). |
| (4) | EtherCAT connector (IN)* | Connect an EtherCAT compatible device. |
| (5) | EtherCAT connector (OUT)* | Connect an EtherCAT compatible device. |
| (6) | Node address switch * | Set the node address for EtherCAT communications. |
| (7) | Installation holes | Holes to install and secure the camera. |
| (8) | C-mount lens connection part | Install the C-mount lens in this part. Determine the field of view depending on the measurement target and select a suitable CCTV lens (C-mounting lens). |

| No. | Name | Description | |
|------|--|---|---|
| (9) | Strobe controller connection holes | Install the strobe controller in this part. FL-TCC1 can be mounted. | |
| (10) | Measurement process Operation indicators | OR | Lit in orange while OR signal is ON. |
| | | ETN | Lit in orange while in Ethernet communications. |
| | | ERROR | Lit in red when an error occurs. |
| | | BUSY | Lit in green while the sensor is processing. |
| (11) | EtherCAT Operation indicators | L/A IN | Lit in green when Link with EtherCAT device is established and flickers in green when communicating (data IN). |
| | | L/A OUT | Lit in green when Link with EtherCAT device is established and flickers in green when communicating (data OUT). |
| | | ECAT RUN | Lit in green when EtherCAT communication is available. |
| | | ECAT ERROR | Lit in red when an EtherCAT communications error occurs. |

* FQ-MS□□□-ECT and FQ-MS□□□-M-ECT only.

Touch Finder



| No. | Name | Description | |
|-----|----------------------|--|---|
| (1) | Operation indicators | POWER | Lights green when the Touch Finder is turned ON. |
| | | ERROR | Lights red when an error occurs. |
| | | SD ACCESS | Lights yellow when an SD card is inserted. Flashes yellow when the SD card is being accessed. |
| | | CHARGE * | Lights orange when the Battery is charging. |
| (2) | LCD/touch panel | Displays the setting menu, measurement results, and images input by the camera. | |
| (3) | SD card slot | An SD card can be inserted. | |
| (4) | Battery cover * | The Battery is inserted behind this cover. Remove the cover when mounting or removing the Battery. | |
| (5) | Power supply switch | The Battery is inserted behind this cover. Remove the cover when mounting or removing the Battery. | |

| No. | Name | Description |
|------|-----------------------------|---|
| (6) | Touch pen holder | The touch pen can be stored here when it is not being used. |
| (7) | Touch pen | Used to operate the touch panel. |
| (8) | DC power supply connector | Used to connect a DC power supply. |
| (9) | Slider | Used to mount the Touch Finder to a DIN Track. |
| (10) | Ethernet port | Used when connecting the Touch Finder to the Sensor with an Ethernet cable. Insert the connector until it locks in place. |
| (11) | Strap holder | This is a holder for attaching the strap. |
| (12) | AC power supply connector * | Used to connect the AC adapter. |

* Applicable to the FQ-MD31 only.

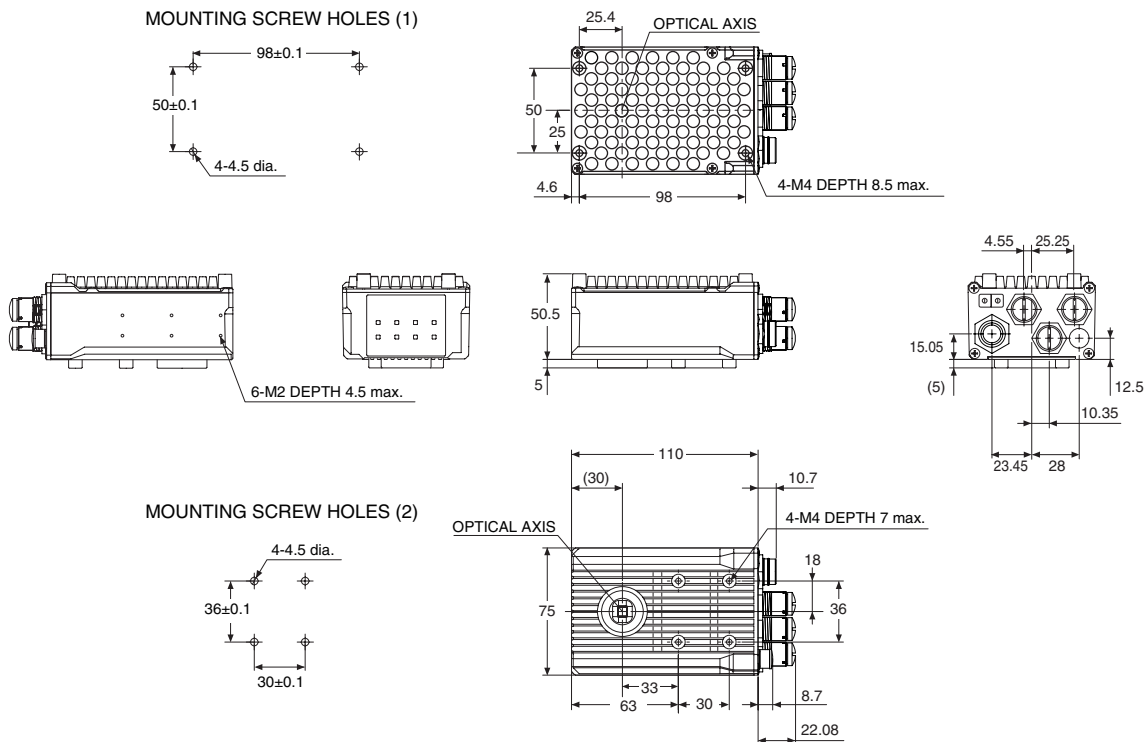
System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
System Configuration
Specifications
EtherCAT Communications Specifications
Version Information
Multi-function Compact Inverter
Vision Sensor
Components and Functions
Dimensions
Fiber Sensor
Optical Chart
Remote I/O Terminals
Ordering Information

Dimensions

(Unit: mm)

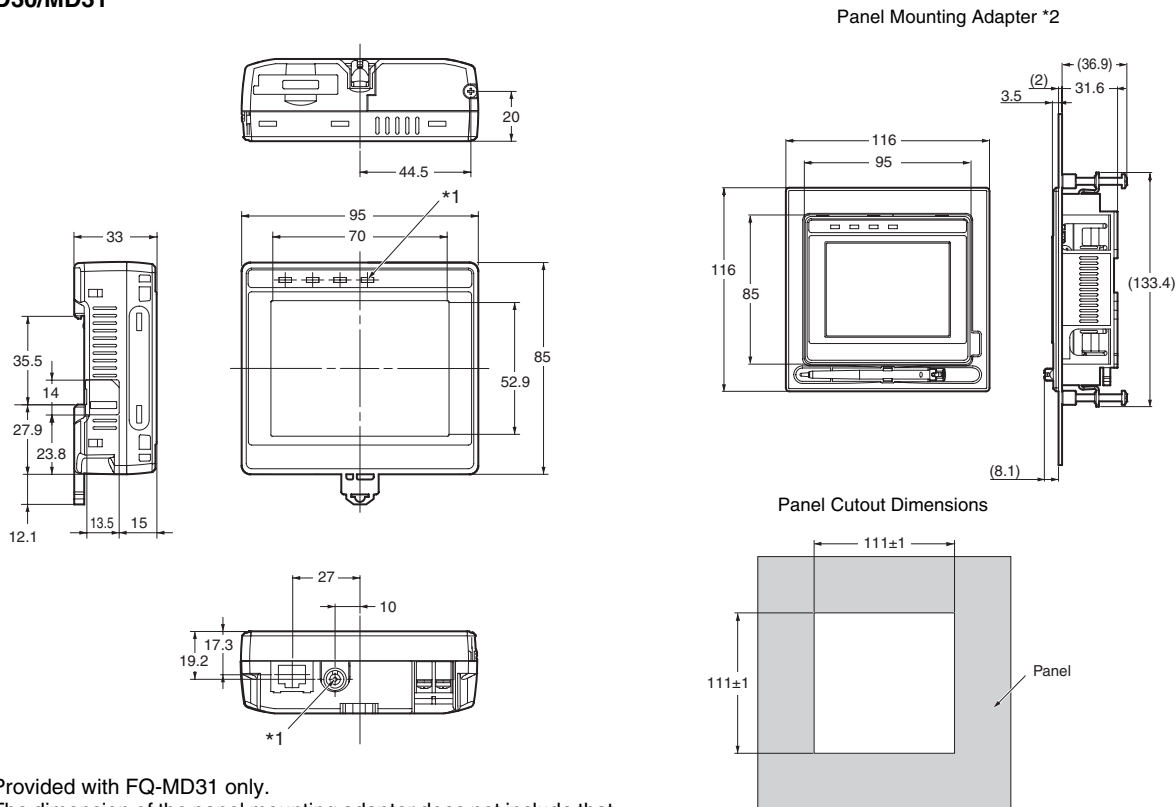
Sensor

FQ-MS120-ECT/MS120-M-ECT
FQ-MS125-ECT/MS125-M-ECT



Touch Finder

FQ-MD30/MD31

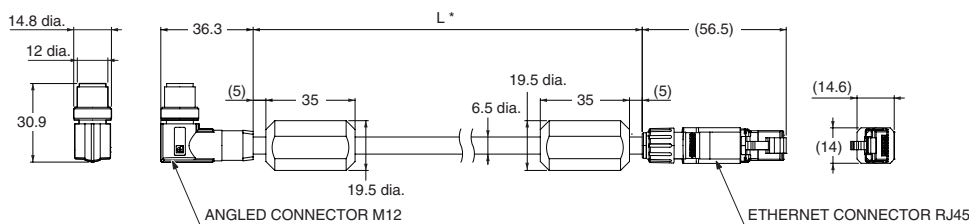


*1 Provided with FQ-MD31 only.

*2 The dimension of the panel mounting adapter does not include that of a FQ-MD□□.

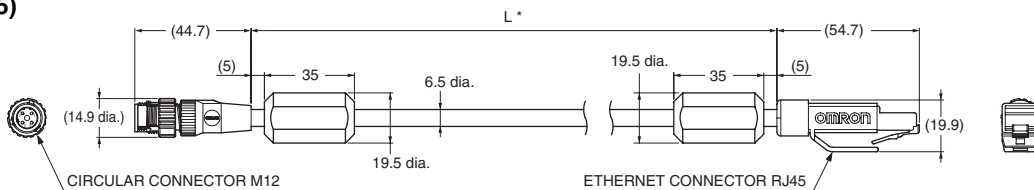
Cables

- For EtherCAT and Ethernet cable
Angle: M12/ Straight: RJ45
FQ-MWNL005/010



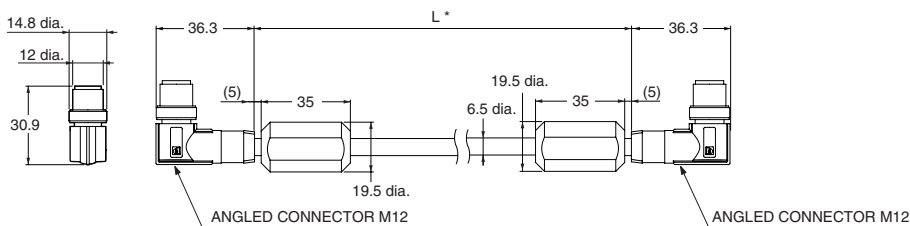
* Cable is available in 5 m/10 m.

- Straight type (M12/RJ45)
FQ-WN005/010



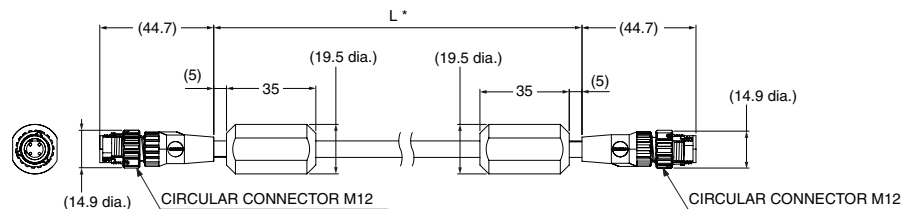
* Cable is available in 5 m/10 m.

- For EtherCAT cable
Angle type (M12/M12)
FQ-MWNE005/010



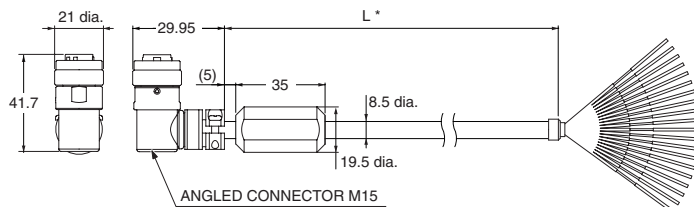
* Cable is available in 5 m/10 m.

- Straight type (M12/M12)
FQ-MWNE005/010



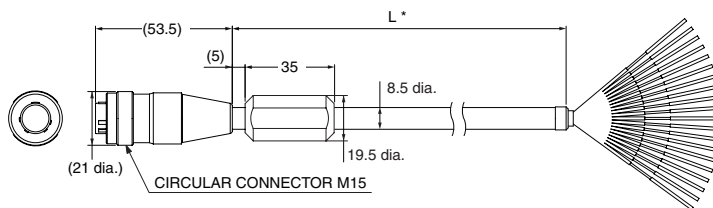
* Cable is available in 5 m/10 m.

- I/O Cables
Angle type
FQ-MWDL005/010



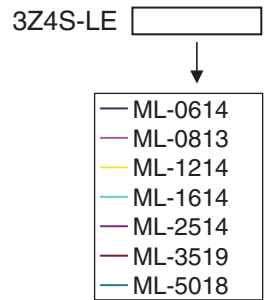
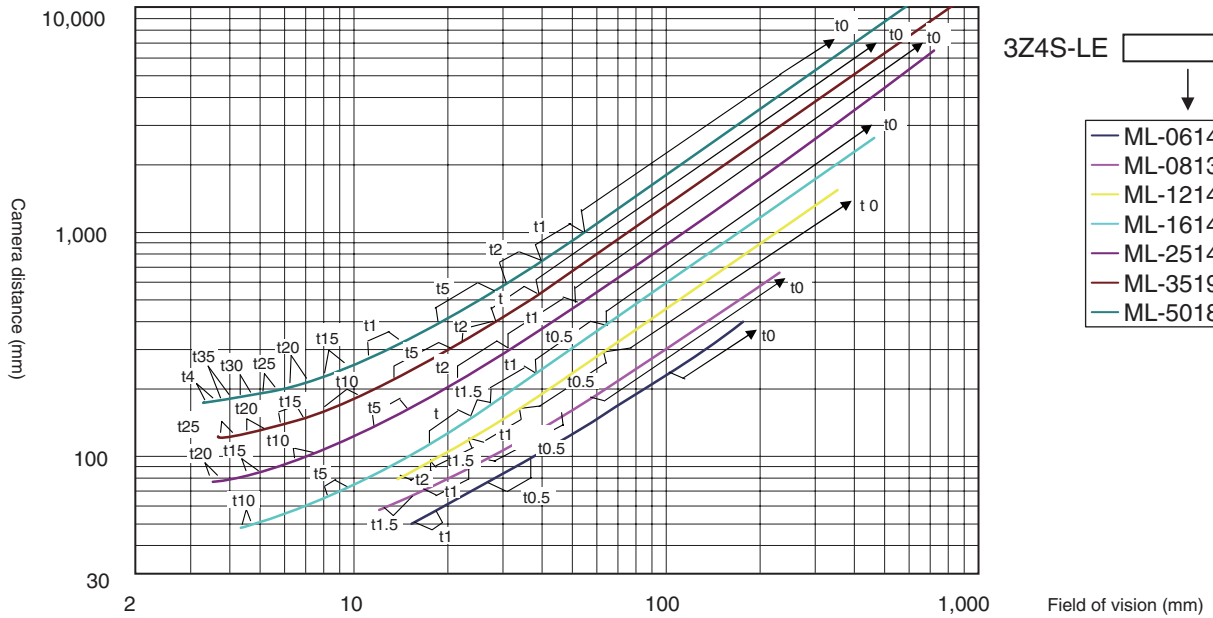
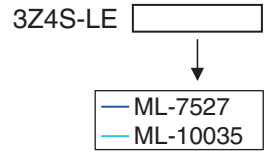
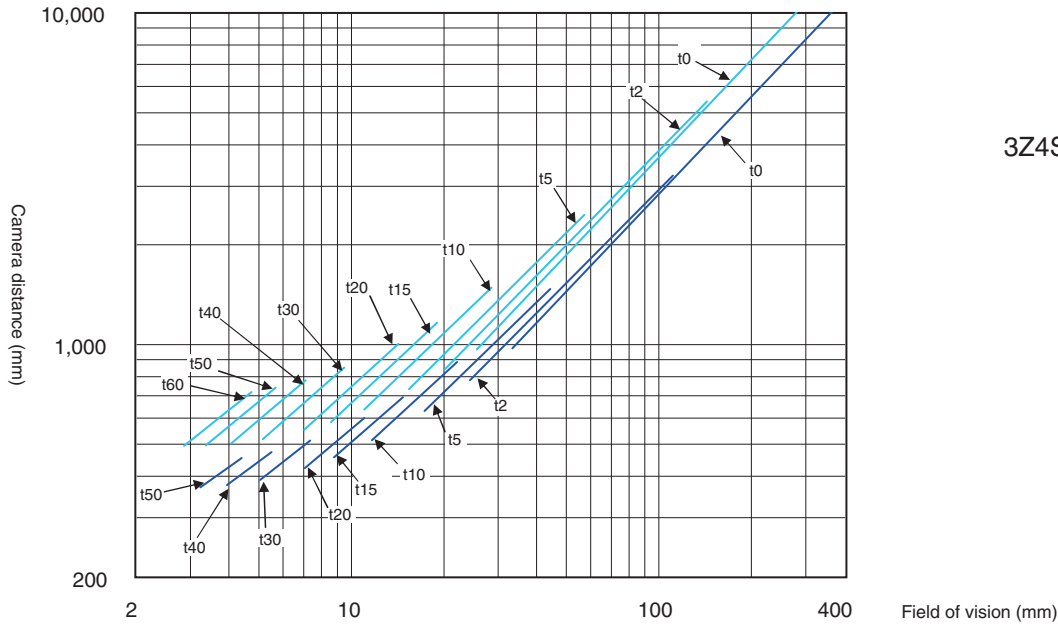
* Cable is available in 5 m/10 m.

- Straight type
FQ-MWD005/010



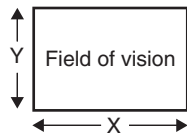
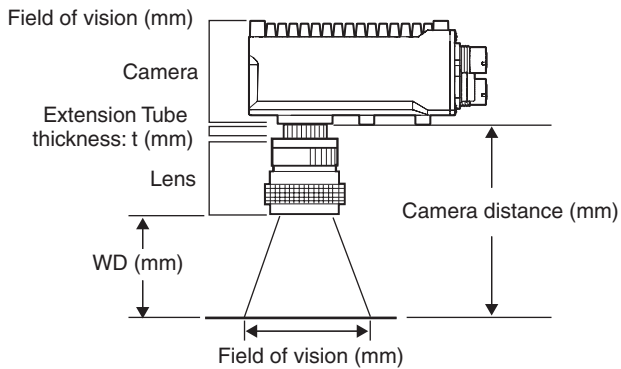
* Cable is available in 5 m/10 m.

Optical Chart



Meaning of Optical Chart

The X axis of the optical chart shows the field of vision (mm) *1,
and the Y axis of the optical chart shows the camera installation distance (mm).*2



*1. The lengths of the fields of vision given in the optical charts are the lengths of the Y axis.
*2. The vertical axis represents WD for small cameras.

Fiber Sensor E3X-HD0

High Functionality Fiber Amplifier Long-term Stable Detection with Your Finger Tip

- High functionality, but easy operation through ultimate usability.
- Detect dirt, vibration and LED aged deterioration, and automatically compensate incident level and light intensity. Long-term stable detection.
- Support for high-speed network EtherCAT by mounting a Communications Unit.
- Connection of up to 30 Fiber Sensors with a Communications Unit is available.
- You can read incident levels, change settings, and perform various tunings of Fiber Sensors from the host device by using a Communication Unit.



General Specifications

Fiber Sensor E3X-HD0

| Item | Specifications | |
|--------------------------------------|---|---|
| Model | E3X-HD0 | |
| Connection method | Communications Unit Connector | |
| Light source (wavelength) | Red, 4-element LED (625 nm) | |
| Power supply voltage | 12 to 24 VDC \pm 10%, ripple (P-P) 10% max. | |
| Power consumption | Normal Mode: 720 mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC) Power Saving Eco Mode: 530 mW max. (Current consumption: 22 mA max. at 24 VDC, 44 mA max. at 12 VDC) | |
| Protection circuits | Power supply reverse polarity protection, output short-circuit protection and output reverse polarity protection | |
| Protection circuits | Super-high-speed Mode (SHS) * | Operate or reset: 50 μ s |
| | High-speed Mode (HS) | Operate or reset: 250 μ s (default setting) |
| | Standard Mode (Std) | Operate or reset: 1 ms |
| | Giga-power Mode (GI GA) | Operate or reset: 16 ms |
| Mutual interference prevention | Possible for up to 10 units (optical communications sync) * | |
| Auto power control (APC) | Always ON | |
| Other functions | Power tuning, differential detection, DPC, timer (OFF-delay, ON-delay, or one-shot), zero reset, resetting settings, and Eco Mode | |
| Ambient Illumination (Receiver side) | Incandescent lamp: 20,000 lux max., Sunlight: 30,000 lux max. | |
| Maximum connectable Units | with E3X-ECT: 30 units | |
| Ambient temperature range | Operating: Groups of 1 to 2 Amplifiers: 0 to 55 °C Groups of 3 to 10 Amplifiers: 0 to 50 °C Groups of 11 to 16 Amplifiers: 0 to 45 °C Groups of 17 to 30 Amplifiers: 0 to 40 °C Storage: -30 to 70 °C (with no icing or condensation) | |
| Ambient humidity range | Operating and storage: 35% to 85% (with no condensation) | |
| Insulation resistance | 20 M Ω min. (at 500 VDC) | |
| Dielectric strength | 1,000 VAC at 50/60 Hz for 1 minute | |
| Vibration resistance | Destruction: 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | |
| Shock resistance | Destruction: 500 m/s ² , for 3 times each in X, Y, and Z directions | |
| Degree of protection | IEC 60529 IP50 (with Protective Cover attached) | |
| Weight (packed state/Amplifier only) | Approx. 65 g/Approx. 25 g | |
| Materials | Case | Heat-resistant ABS |
| | Cover | Polycarbonate (PC) |
| Accessories | Instruction Manual | |

* The communications function and mutual interference prevention function are disabled when the detection mode is set to Super-high-speed mode (SHS). So SHS mode can't be used this product.

EtherCAT Communication Unit E3X-ECT

This is the communication unit to connect the Fiber Sensor E3X-ED0 to EtherCAT network.
This communication unit passed the conformance test of EtherCAT.

Common Specifications

| Item | Specifications |
|-------------------------------|---|
| Power Supply Voltage | 20.4 to 26.4 VDC |
| Power Consumption | 2.4 W max. (Not include sensors current) 100 mA max. at 24 VDC (Not include sensors current) |
| Indicators | L/A IN (yellow), L/A OUT (yellow), PWR (green) RUN (green), ERROR (red), SS (Sensor Status) (green/red) |
| Vibration Resistance | 10 to 150 Hz with double-amplitude of 0.7 mm or 50 m/s ² |
| Shock Resistance | 150 m/s ² , for 3 times each in 3 directions |
| Dielectric Strength | 500 VAC at 50/60 Hz for 1 minute |
| Insulation Resistance | 20MΩ min. |
| Ambient Operating Temperature | 0 to +55°C |
| Ambient Operating Temperature | 25 to 85 % (with no condensation) |
| Storage Temperature | -30 to +70°C (with no icing or condensation) |
| Storage Humidity | 25 to 85 % (with no condensation) |
| Installation | Mounted on 35-mm DIN Track |
| Accessories | Power Supply Connector, Connector Caver, Brackets for DIN |
| Weight | 95g max. |

EtherCAT Communications Specifications

| Item | Specification |
|------------------------------------|---|
| Communication Protocol | Dedicated protocol for EtherCAT |
| Modulation | Base band |
| Baud Rate | 100 Mbps |
| Physical Layer | 100BASE-TX (IEEE802.3) |
| Connectors | RJ45 shielded connector × 2 CN IN: EtherCAT input CN OUT: EtherCAT output |
| Communications Media | Category 5 or higher (cable with double, aluminum tape and braided shielding is recommended.) |
| Communications Distance | Distance between nodes (slaves): 100 m max. |
| Noise Resistance | Conforms to IEC 61000-4-4, 1 kV or higher |
| Node Address Setting Method | Set with decimal rotary switch or Sysmac Studio |
| Node Address Range | 1 to 999: Set with rotary switch 1 to 65535: Set with Sysmac Studio |
| LED Display | PWR × 1 L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1 |
| Process Data | Variable PDO Mapping |
| PDO Size/node | 36 byte max. |
| Mailbox | Emergency messages, SDO requests, SDO responses, and SDO information |
| SYNCHRONIZATION Mode | Free Run mode or DC mode 1 |

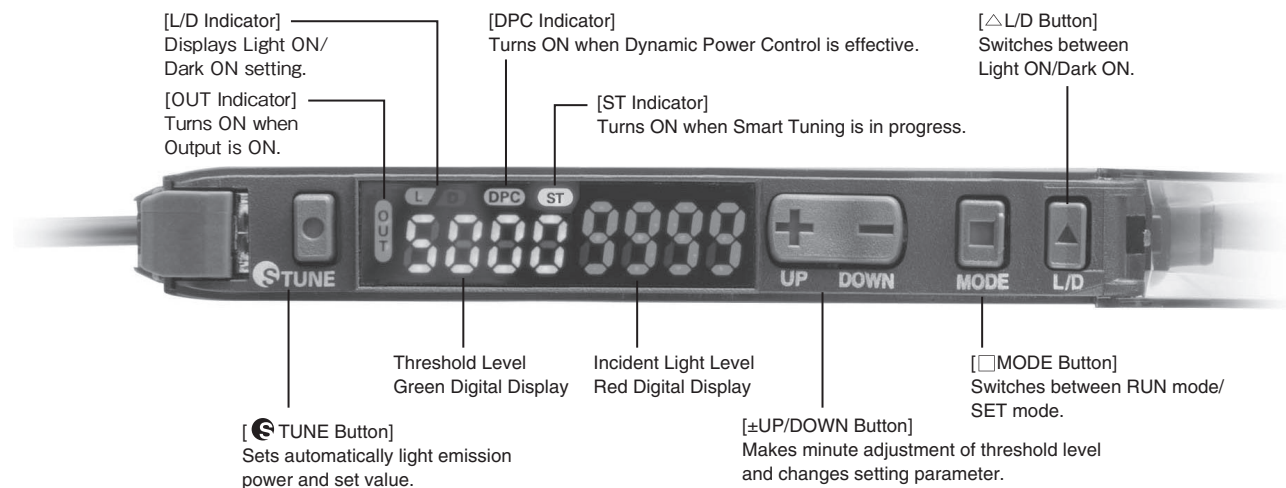
Version Information

E3X-HD0 and Sysmac Studio

| Communication Unit | Sysmac Studio | |
|--------------------|-------------------|--------------------|
| | Ver.1.01 or lower | Ver.1.02 or higher |
| E3X-ECT | Not available | O |

Components and Functions

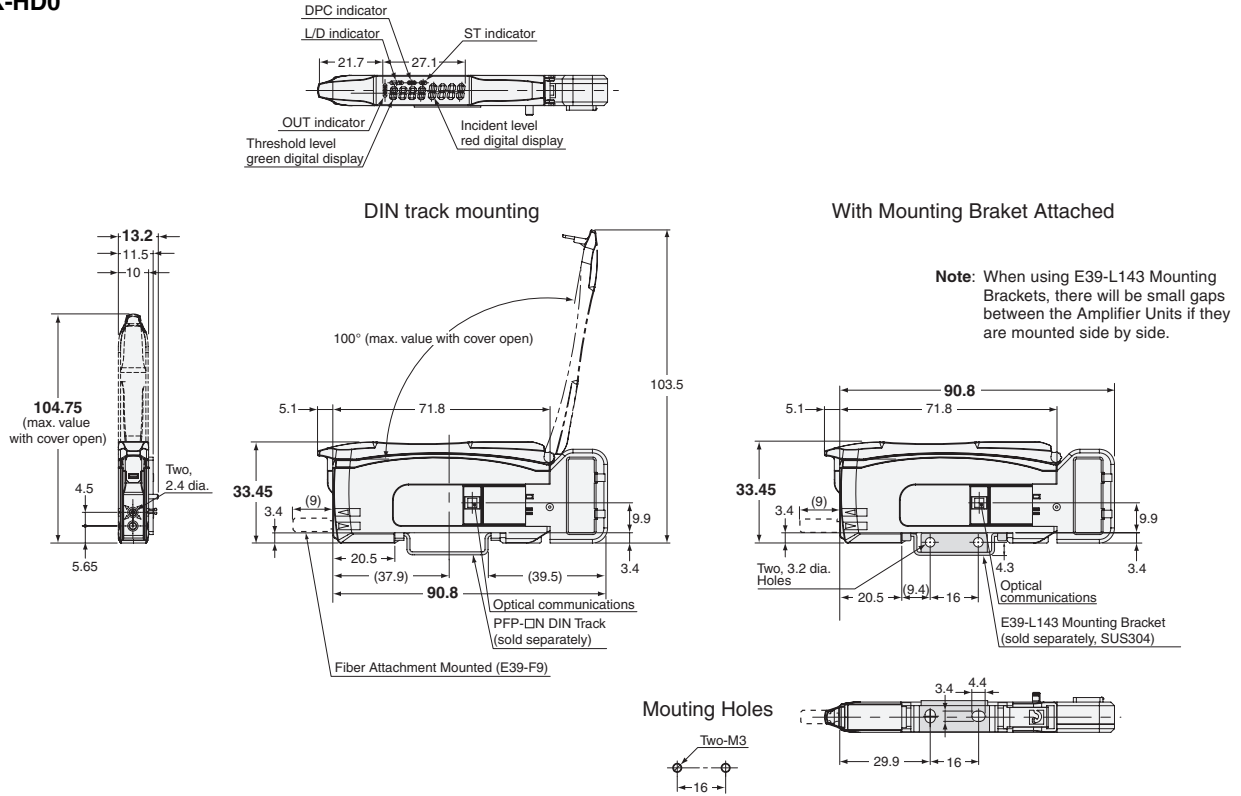
Fiber Sensor E3X-HD0



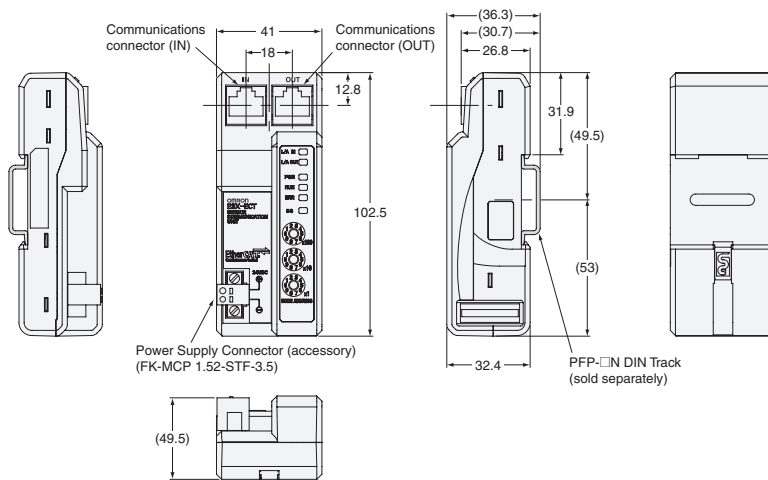
Dimensions

(Unit: mm)

E3X-HD0



E3X-ECT



GX-Series

Realizes high-speed communication to match a variety of applications

- **Digital I/O Terminals**

Inputs/Outputs the digital ON/OFF signals.

- **Analog I/O Terminals**

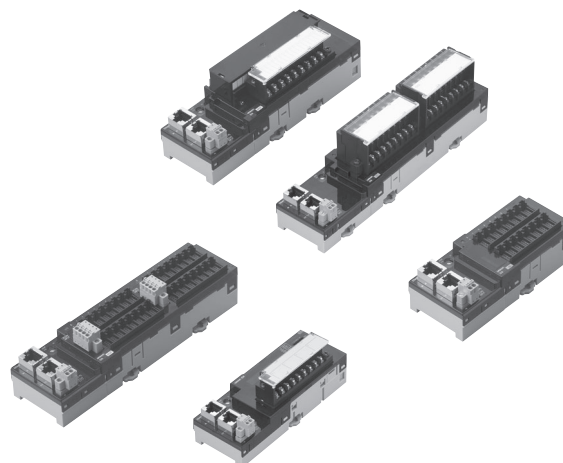
Inputs/Outputs the analog signal of 0-5V or 4-20mA, etc., and executes A/D or D/A conversion.

- **Encoder Input Terminal**

Performs conversion for pulse input signals from an encoder.

- **Expansion Units**

Attached to the Digital I/O Unit to expands the I/O points.
Can be attached to a two-tier terminal block type with 16 inputs, 16 outputs, and 16 relay outputs.



General Specifications

It is common specifications of EtherCAT Remote I/O Terminal GX-Series. Refer to the pages of specifications for individual I/O terminals for details.

| Item | Specification |
|---|---|
| Unit power supply voltage | 20.4 to 26.4 VDC (24 VDC -15% to +10%) |
| I/O power supply voltage | 20.4 to 26.4 VDC (24 VDC -15% to +10%) |
| Noise resistance | Conforms to IEC 61000-4-4, 2 kV (power line) |
| Vibration resistance | Malfunction 10 to 60 Hz with amplitude of 0.7 mm, 60 to 150Hz and 50 m/s ² in X, Y, and Z directions for 80 minutes <Relay Output Unit GX-OC1601 only> 10 to 55 Hz with double-amplitude of 0.7 mm |
| Impact resistance | 150 m/s ² with amplitude of 0.7 mm <Relay Output Unit GX-OC1601 only> 100 m/s ² (3 times each in 6 directions on 3 axes) |
| Dielectric strength | 600 VAC (between isolated circuits) |
| Isolation resistance | 20 MΩ or more (between isolated circuits) |
| Ambient operating temperature | -10 to 55 °C |
| Operating humidity | 25% to 85% (with no condensation) |
| Operating atmosphere | No corrosive gases |
| Storage temperature | -25 to 65 °C |
| Storage humidity | 25% to 85% (with no condensation) |
| Terminal block screws tightening torque * | M3 wiring screws: 0.5 N•m M3 terminal block mounting screws: 0.5 N•m |
| Mounting method | 35-mm DIN track mounting |

* Applicable only to 2-tier terminal block and 3-tier terminal block type slaves.

EtherCAT Communications Specifications

Communications Specifications of GX-Series EtherCAT Remote I/O Terminal

| Item | Specification |
|------------------------------------|---|
| Communication protocol | Dedicated protocol for EtherCAT |
| Modulation | Base band |
| Baud rate | 100 Mbps |
| Physical layer | 100BASE-TX (IEEE802.3) |
| Connectors | RJ45 shielded connector × 2 CN IN: EtherCAT input CN OUT: EtherCAT output |
| Communications media | Category 5 or higher (cable with double, aluminum tape and braided shielding is recommended.) |
| Communications distance | Distance between nodes (slaves): 100 m max. |
| Noise resistance | Conforms to IEC 61000-4-4, 1 kV or higher |
| Node address setting method | Set with decimal rotary switch or Sysmac Studio |
| Node address range | 1 to 99: Set with rotary switch 1 to 65535: Set with Sysmac Studio |
| LED display | PWR × 1 L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1 |
| Process data | Fixed PDO mapping |
| PDO size/node | 2 bit to 256 byte |
| Mailbox | Emergency messages, SDO requests, SDO responses, and SDO information |
| SYNCHRONIZATION mode | Digital I/O Slave Unit and Analog I/O Slave Unit: Free Run mode (asynchronous) Encoder Input Slave Unit: DC mode 1 |

Version Information

Unit Versions

| Units | Models | Unit Version | |
|----------------------------------|-----------|------------------------|-----------------------|
| | | Unit version 1.0 | Unit version 1.1 |
| GX-Series EtherCAT Slave Units | GX-□□□□□□ | Supported | Supported |
| Compatible Sysmac Studio version | | Version1.00 or higher* | Version1.00 or higher |

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

Function Support by Unit Version

The following tables show the relationship between unit versions and CX-Programmer versions.

Unit Versions and Programming Devices

| Unit Model | GX-Series EtherCAT Slave Units GX-□□□□□□ | |
|-------------------------------|---|------------------|
| | Unit version | Unit version |
| Item | Unit version 1.0 | Unit version 1.1 |
| Sysmac error status | No Supported | Supported |
| Save the node address setting | No Supported | Supported |
| Serial Number Display | No Supported | Supported |
| ESI standard (1.0) | Supported | Supported |
| SII data check | No Supported | Supported |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multi-Function Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

General Specifications

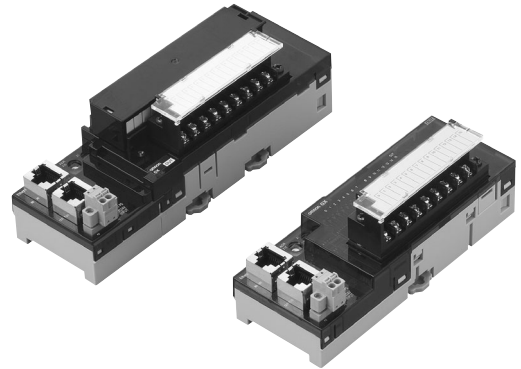
EtherCAT Communications Specifications

Version Information

GX-□D16□1/OC1601

High-speed digital I/O terminal with the screw type terminal block for EtherCAT communications

- Detachable screw terminal block facilitates the maintenance.
- The expansion unit can be connected.
(One expansion unit per one I/O terminal unit.)
Input/output point can be flexibly increased depending on the system.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.



Expansion Units

One Expansion Unit can be combined with one Digital I/O Terminal (GX-ID16□1/OD16□1/OC1601). The following Expansion Units are available. They can be combined in various ways for flexible I/O capacity expansion.

| Model | I/O points | Input capacity | Output capacity |
|------------|-----------------------------|----------------|-----------------|
| XWT-ID08 | 8 DC inputs (NPN) | 8 | 0 |
| XWT-ID08-1 | 8 DC inputs (PNP) | 8 | 0 |
| XWT-OD08 | 8 transistor outputs (NPN) | 0 | 8 |
| XWT-OD08-1 | 8 transistor outputs (PNP) | 0 | 8 |
| XWT-ID16 | 16 DC inputs (NPN) | 16 | 0 |
| XWT-ID16-1 | 16 DC inputs (PNP) | 16 | 0 |
| XWT-OD16 | 16 transistor outputs (NPN) | 0 | 16 |
| XWT-OD16-1 | 16 transistor outputs (PNP) | 0 | 16 |

General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Input Section Specifications

16-point Input Terminals

| Item | Specification | |
|---------------------------------------|--|--|
| | GX-ID1611 | GX-ID1621 |
| Input capacity | 16 points | |
| Internal I/O common | NPN | PNP |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 16 inputs/common | |
| Input indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Unit power supply current consumption | 90 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 180 g max. | |
| Expansion functions | Enabled | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

| Item | Specification | |
|---|--|--|
| | GX-OD1611 | GX-OD1621 |
| Output capacity | 16 points | |
| Rated current (ON current) | 0.5 A/output, 4.0 A/common | |
| Internal I/O common | NPN | PNP |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 points/common | |
| Output indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Unit power supply current consumption | 90 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 180 g max. | |
| Expansion functions | Enabled | |
| Output handling for communications errors | Select either hold or clear | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Precautions for Correct Use

- With a current of between 2 and 3 A (8 to 10 A per common), either ensure that the number of points per common that simultaneously turn ON does not exceed 4 or ensure that the ambient temperature does not exceed 45 °C. Also, there are no restrictions if the current does not exceed 2 A (8 A per common).
- The rated current is the value for assuring normal operation, and not for assuring durability of the relays. The relay service life depends greatly on factors such as the operating temperature, the type of load, and switching conditions. The actual equipment must be checked under actual operating conditions.

Relay 16-point Output Terminals

| Item | Specification |
|---|--|
| | GX-OC1601 |
| Output capacity | 16 points |
| Mounted relays | NY-5W-K-IE (Fujitsu Component) * |
| Rated load | Resistance load 250 VAC 2 A/output, common 8 A 30 VDC 2 A/output, common 8 A |
| Rated ON current | 3 A/output |
| Maximum contact voltage | 250 VAC, 125 VDC |
| Maximum contact current | 3 A/output |
| Maximum switching capacity | 750 VAAC, 90 WDC |
| Minimum applicable load (reference value) | 5 VDC 1mA |
| Mechanical service life | 20,000,000 operations min. |
| Electrical service life | 100,000 operations min. |
| Number of circuits per common | 16 points/common |
| Output indicators | LED display (yellow) |
| Isolation method | Relay isolation |
| I/O power supply method | The relay drive power is supplied from the unit power supply. |
| Unit power supply current consumption | 210 mA max. (for 20.4 to 26.4-VDC power supply voltage) |
| Weight | 290 g max. |
| Expansion functions | Enabled |
| Output handling for communications errors | Select either hold or clear |
| Short-circuit protection function | No |

* For the specification of individual relay, refer to the data sheet of published by manufacturers.

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

| Item | Specification | |
|---------------------------------------|--|-----------|
| | GX-MD1611 | GX-MD1621 |
| Internal I/O common | NPN | PNP |
| I/O indicators | LED display (yellow) | |
| Unit power supply current consumption | 80 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 190 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | No | |

Input Section

| Item | Specification | |
|--------------------------------------|---|---|
| | GX-MD1611 | GX-MD1621 |
| Input capacity | 8 points | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 8 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |

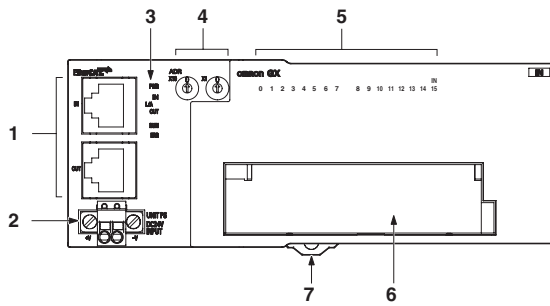
Output Section

| Item | Specification | |
|---|---|---|
| | GX-MD1611 | GX-MD1621 |
| Output capacity | 8 points | |
| Rated output current | 0.5 A/output, 2.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Output handling for communications errors | Select either hold or clear | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

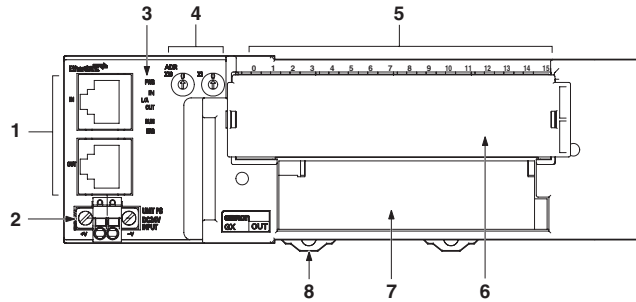
Components and Functions

16 Inputs Terminal **GX-ID1611/ID1621**
16 Outputs Terminal **GX-OD1611/OD1621**



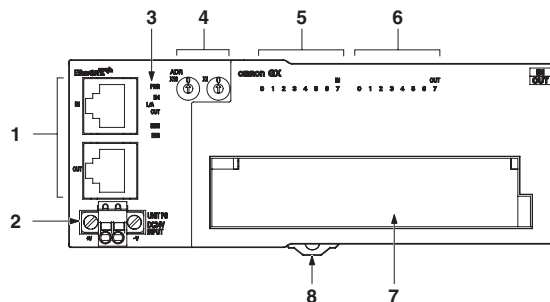
| No. | Name | Function |
|-----|--|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input terminal: Input indicator (0 to 15) Output terminal: Output indicator (0 to 15) | Indicates the state of input/output contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) Output terminal: Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 6 | Terminal Block | Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Input terminals |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

Relay 16-point Output Terminals **GX-OC1601**



| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Output indicator (0 to 15) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | Output Relay | Turn ON/OFF the contacts. |
| 7 | Terminal Block | Connects external devices and the I/O power supply. COM0, COM1: Common terminals 0 to 15: Output terminals |
| 8 | DIN track mounting hook | Fixes a slave to a DIN track. |

8 Inputs Terminal / 8 Outputs Terminal **GX-MD1611/MD1621**



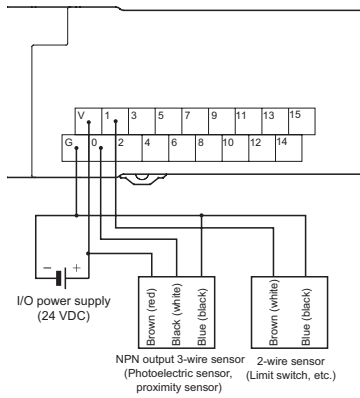
| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (0 to 7) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | Output indicator (0 to 7) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 7 | Terminal Block | Connects external devices and the I/O power supply. <Left side> V1, G1: Input I/O terminals 0 to 7: Input terminals <Right side> V2, G2: Output I/O terminals 0 to 7: Output terminals |
| 8 | DIN track mounting hook | Fixes a slave to a DIN track. |

EtherCAT Remote I/O Terminals GX-Series

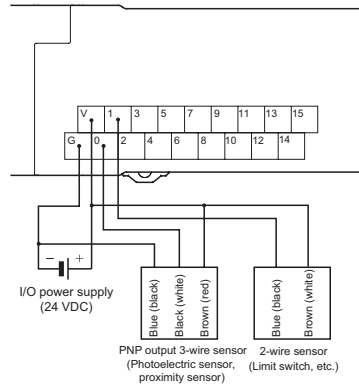
Digital I/O Terminal 2-tier Terminal Block Type

Wiring

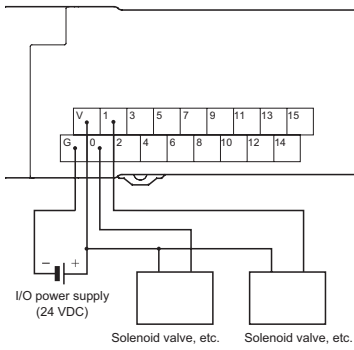
GX-ID1611 (NPN)



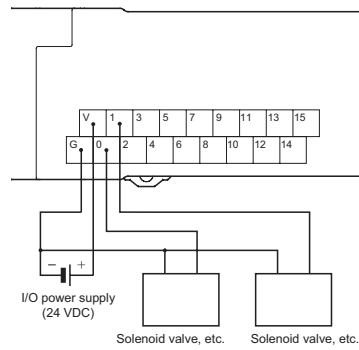
GX-ID1621 (PNP)



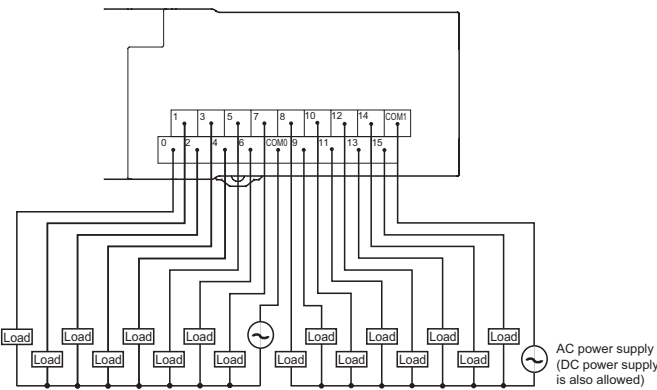
GX-OD1611 (NPN)



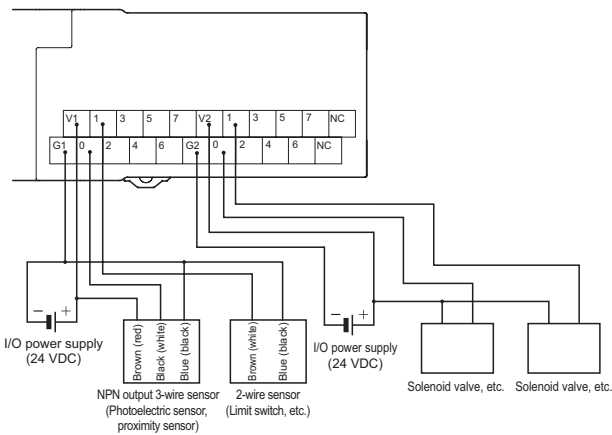
GX-OD1621 (PNP)



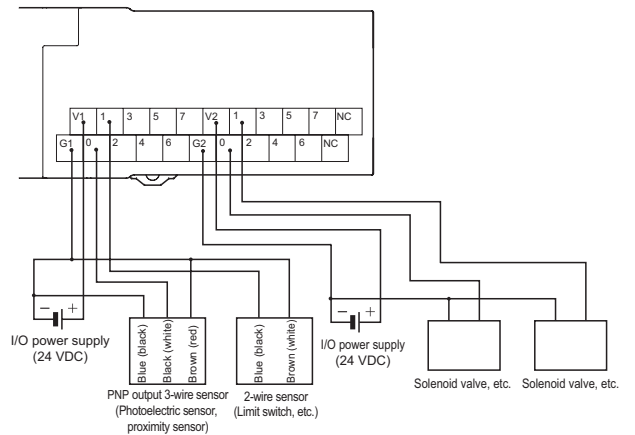
GX-OC1601



GX-MD1611 (NPN)



GX-MD1621 (PNP)

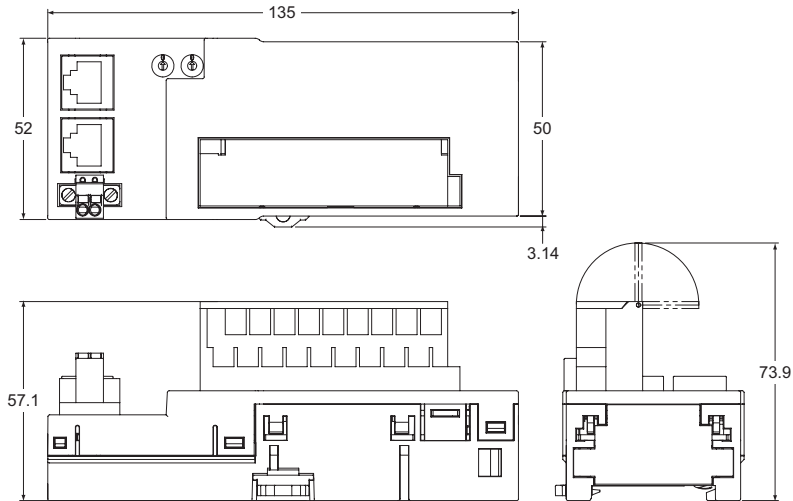


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

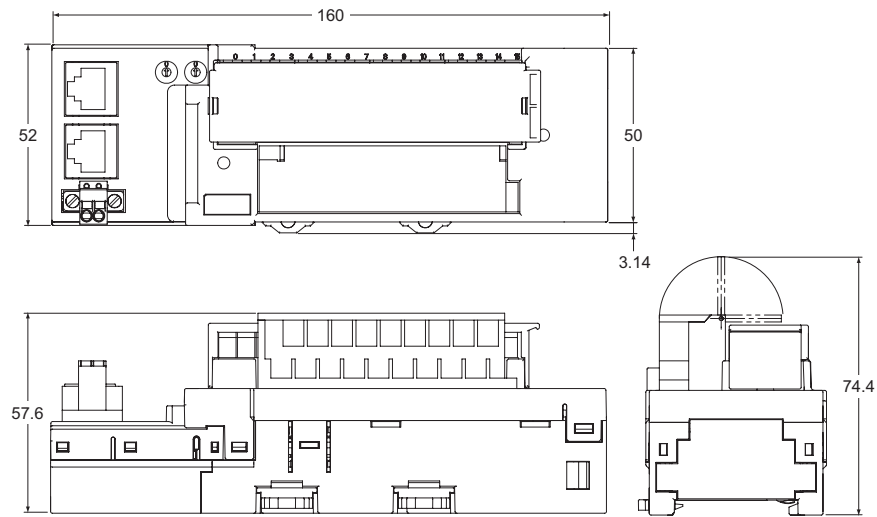
Dimensions

(Unit: mm)

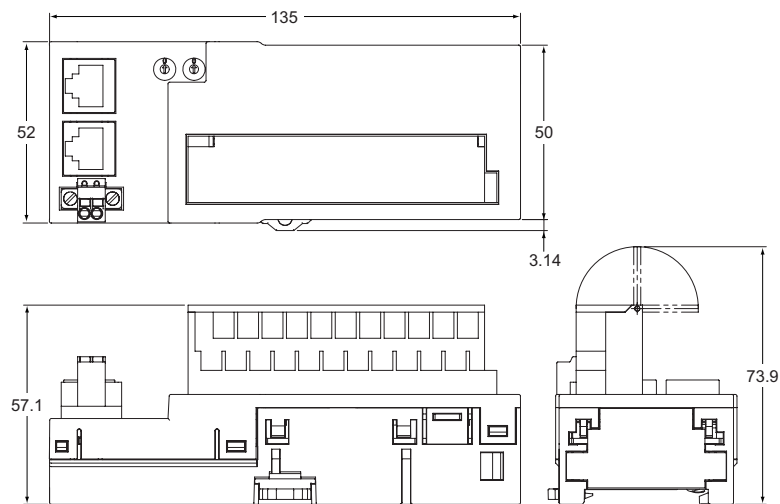
GX-ID1611/ID1621
GX-OD1611/OD1621



GX-OC1601



GX-MD1611/MD1621



System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Expansion Units
 General Specifications

Multi-Function Compact Inverter

Components and Functions

Wiring

Vision Sensor

Dimensions

Fiber Sensor

Remote I/O Terminals

Ordering Information

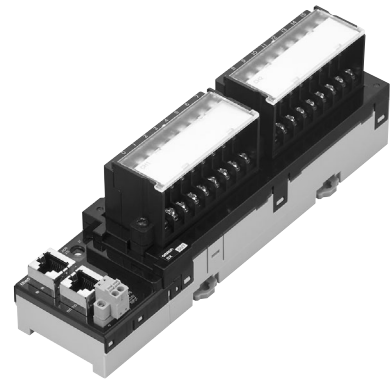
Digital I/O Terminal 3-tier Terminal Block Type

GX-ID16□2/OD16□2/MD16□2

A common terminal is provided for each contact.

It eliminates the need for relay terminal blocks

- It is unnecessary to share the common terminal among multiple contacts.
Easy-to-find wiring locations.
- Detachable screw terminal block facilitates the maintenance.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.



General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Input Section Specifications

16-point Input Terminals

| Item | Specification | |
|---------------------------------------|--|---|
| | GX-ID1612 | GX-ID1622 |
| Input capacity | 16 points | |
| Internal I/O common | NPN | PNP |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 8 points/common | |
| Input indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Input device supply current | 100 mA/point | |
| Unit power supply current consumption | 90 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 370 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

| Item | Specification | |
|---|--|--|
| | GX-OD1612 | GX-OD1622 |
| Output capacity | 16 points | |
| Rated current (ON current) | 0.5 A/output, 4.0 A/common | |
| Internal I/O common | NPN | PNP |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 points/common | |
| Output indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| Unit power supply current consumption | 90 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 370 g max. | |
| Expansion functions | No | |
| Output handling for communications errors | Select either hold or clear | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

| Item | Specification | |
|---------------------------------------|--|-----------|
| | GX-MD1612 | GX-MD1622 |
| Internal I/O common | NPN | PNP |
| I/O indicators | LED display (yellow) | |
| Unit power supply current consumption | 90 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 370 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | No | |

Input Section

| Item | Specification | |
|--------------------------------------|--|--|
| | GX-MD1612 | GX-MD1622 |
| Input capacity | 8 points | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max./input | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 8 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Input device supply current | 100 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |

Output Section

| Item | Specification | |
|---|---|---|
| | GX-MD1612 | GX-MD1622 |
| Output capacity | 8 points | |
| Rated output current | 0.5 A/output, 2.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Output handling for communications errors | Select either hold or clear | |

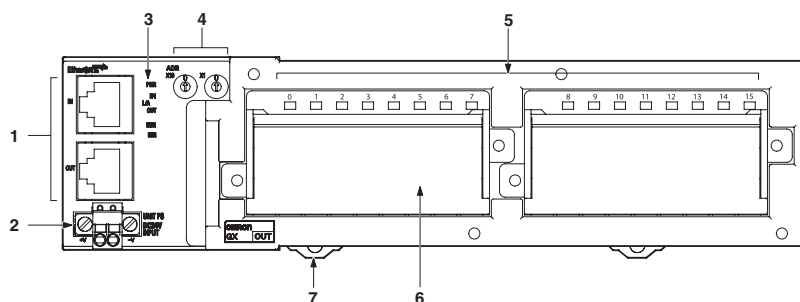
Note: For the I/O power supply current value to V and G terminals, refer to GX-Series Operation Manual (Cat. No. W488).

EtherCAT Remote I/O Terminals **GX-Series**

Digital I/O Terminal 3-tier Terminal Block Type

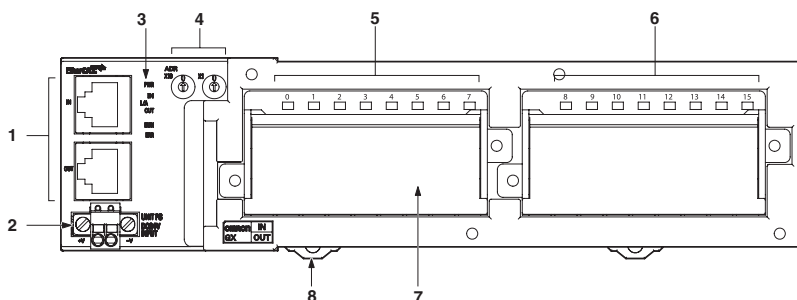
Components and Functions

16 Inputs Terminal **GX-ID1612/ID1622**
 16 Outputs Terminal **GX-OD1612/OD1622**



| No. | Name | Function |
|-----|--|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input terminal: Input indicator (0 to 15) Output terminal: Output indicator (0 to 15) | Indicates the state of input/output contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) Output terminal: Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 6 | Terminal Block | Connects external devices and the I/O power supply. <Left side> V1, G1: I/O power supply terminals 0 to 7: Output terminals <Right side> V2, G2: I/O power supply terminals 8 to 15: Input terminals (Output terminals) |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

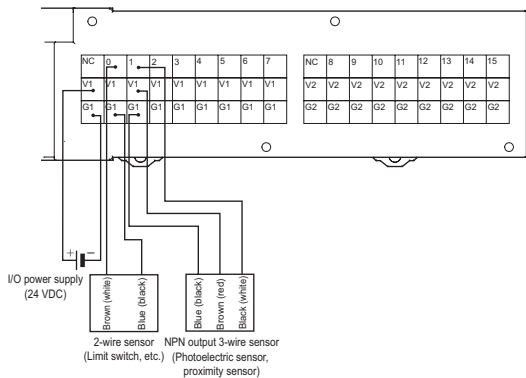
8 Inputs Terminal / 8 Outputs Terminal **GX-MD1612/MD1622**



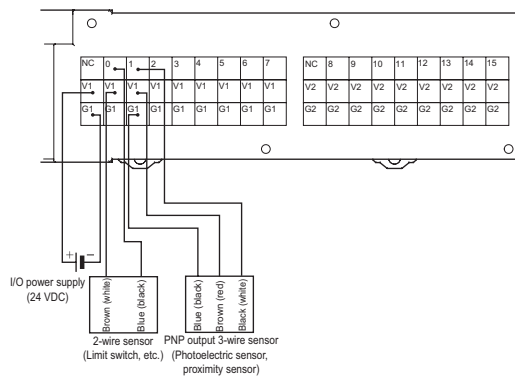
| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (0 to 7) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | Output indicator (0 to 7) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 7 | Terminal Block | Connects external devices and the I/O power supply. <Left side> V1, G1: Input I/O power supply terminals 0 to 7: Input terminals <Right side> V2, G2: Output I/O power supply terminals 0 to 7: Output terminals |
| 8 | DIN track mounting hook | Fixes a slave to a DIN track. |

Wiring

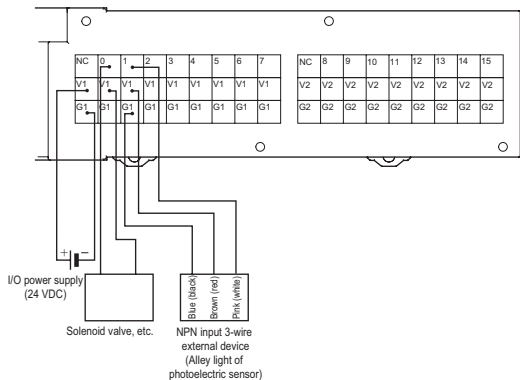
GX-ID1612 (NPN)



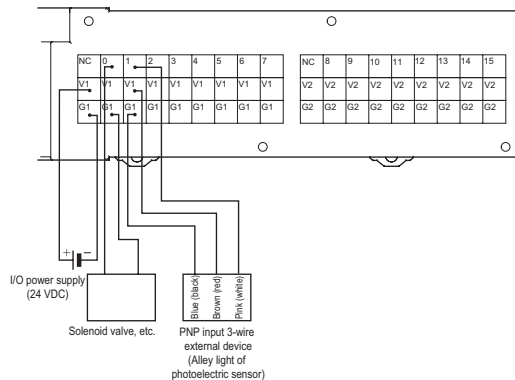
GX-ID1622 (PNP)



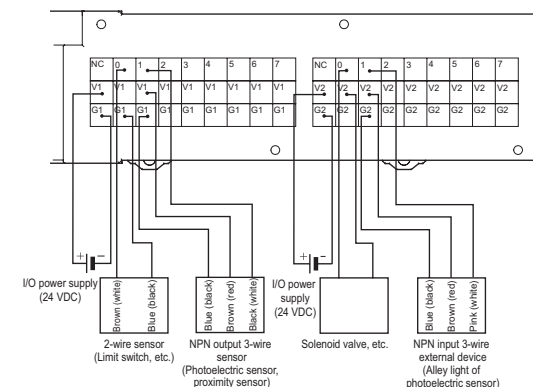
GX-OD1612 (NPN)



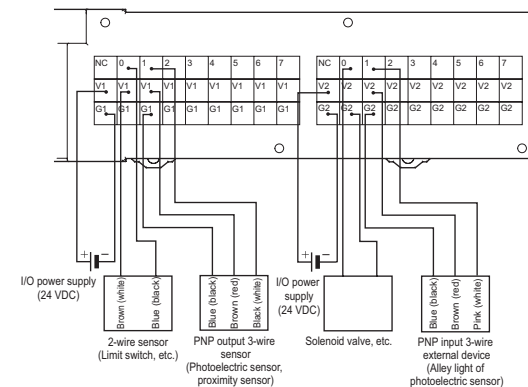
GX-OD1622 (PNP)



GX-MD1612 (NPN)



GX-MD1622 (PNP)

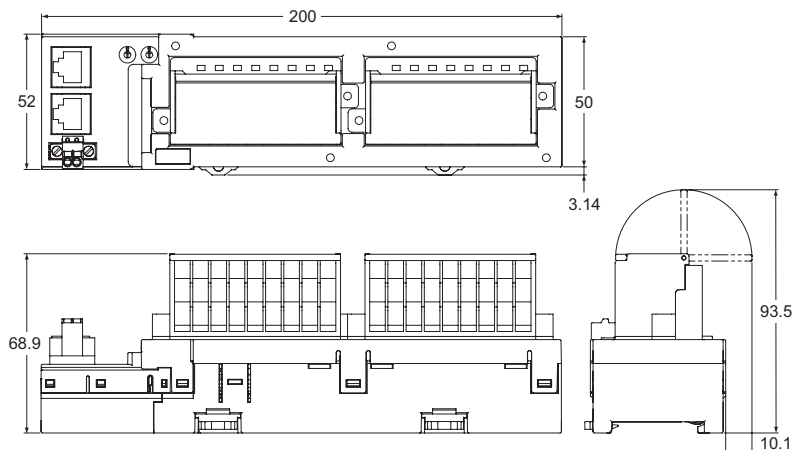


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

Dimensions

(Unit: mm)

GX-ID1612/ID1622
GX-OD1612/OD1622
GX-MD1612/MD1622

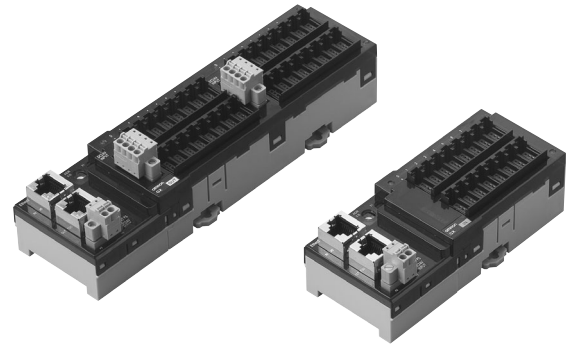


Digital I/O Terminal e-CON Connector Type

GX-□D16□8/□D32□8

**Easy wiring using industry standard e-CON connectors.
Special wiring tool is not necessary**

- Digital I/O terminal with industry standard e-CON connectors.
- A common terminal is provided for each connector.
The I/O terminal and the sensors can be connected directly.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.



General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Input Section Specifications 16-point Input Terminals

| Item | Specification | |
|---------------------------------------|--|---|
| | GX-ID1618 | GX-ID1628 |
| Input capacity | 16 points | |
| Internal I/O common | NPN | PNP |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 16 points/common | |
| Input indicators | LED display (yellow) | |
| Isolation method | No isolation | |
| I/O power supply method | Supplied from unit power supply | |
| Input device supply current | 50 mA/point | |
| Unit power supply current consumption | 150 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 140 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | Available (Operates at 50 mA/point min.) | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

32-point Input Terminals

| Item | Specification | |
|---------------------------------------|--|---|
| | GX-ID3218 | GX-ID3228 |
| Input capacity | 32 points | |
| Internal I/O common | NPN | PNP |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 32 points/common | |
| Input indicators | LED display (yellow) | |
| Isolation method | No isolation | |
| I/O power supply method | Supplied from unit power supply | |
| Input device supply current | 50 mA/point | |
| Unit power supply current consumption | 230 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 220 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | Available (Operates at 50 mA/point min.) | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

| Item | Specification | |
|---|---|---|
| | GX-OD1618 | GX-OD1628 |
| Output capacity | 16 points | |
| Rated current (ON current) | 0.5 A/output, 4.0 A/common | |
| Internal I/O common | NPN | PNP |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 points/common | |
| Output indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| Unit power supply current consumption | 80 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 130 g max. | |
| Expansion functions | No | |
| Output handling for communications errors | Select either hold or clear | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

| Item | Specification | |
|---------------------------------------|--|-----------|
| | GX-MD1618 | GX-MD1628 |
| Internal I/O common | NPN | PNP |
| I/O indicators | LED display (yellow) | |
| Unit power supply current consumption | 120 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 140 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | Available at input section only (Operates at 50 mA/point min.) | |

32-point Output Terminals

| Item | Specification | |
|---|---|---|
| | GX-OD3218 | GX-OD3228 |
| Output capacity | 32 points | |
| Rated current (ON current) | 0.5 A/output, 4.0 A/common | |
| Internal I/O common | NPN | PNP |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 points/common | |
| Output indicators | LED display (yellow) | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| Unit power supply current consumption | 100 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 210 g max. | |
| Expansion functions | No | |
| Output handling for communications errors | Select either hold or clear | |
| Short-circuit protection function | No | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

EtherCAT Remote I/O Terminals GX-Series

Digital I/O Terminal e-CON Connector Type

Input Section

| Item | Specification | |
|--------------------------------------|--|---|
| | GX-MD1618 | GX-MD1628 |
| Input capacity | 8 points | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 8 points/common | |
| Isolation method | No-isolation | |
| I/O power supply method | Supplied from unit power supply | |
| Input device supply current | 50 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |

16-point Input and 16-point output Terminals

General Specifications

| Item | Specification | |
|---------------------------------------|--|-----------|
| | GX-MD3218 | GX-MD3228 |
| Internal I/O common | NPN | PNP |
| I/O indicators | LED display (yellow) | |
| Unit power supply current consumption | 140 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 220 g max. | |
| Expansion functions | No | |
| Short-circuit protection function | Available at input section only (Operates at 50 mA/point min.) | |

Input Section

| Item | Specification | |
|--------------------------------------|--|---|
| | GX-MD3218 | GX-MD3228 |
| Input capacity | 16 points | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | 6.0 mA max./input (at 24-VDC) 3.0 mA max./input (at 17-VDC) | |
| ON delay | 0.1 ms max. | |
| OFF delay | 0.2 ms max. | |
| Input filter value | Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms) | |
| Number of circuits per common | 16 points/common | |
| Isolation method | No-isolation | |
| I/O power supply method | Supplied from unit power supply | |
| Input device supply current | 50 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |

Output Section

| Item | Specification | |
|---|---|---|
| | GX-MD1618 | GX-MD1628 |
| Output capacity | 8 points | |
| Rated output current | 0.5 A/output, 2.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Output handling for communications errors | Select either hold or clear | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

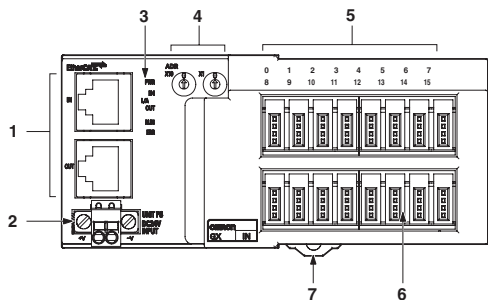
Output Section

| Item | Specification | |
|---|---|---|
| | GX-MD3218 | GX-MD3228 |
| Output capacity | 16 points | |
| Rated output current | 0.5 A/output, 2.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 ADC, between each output terminal and the G terminal) | 1.2 V max. (0.5 ADC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 points/common | |
| Isolation method | Photocoupler isolation | |
| I/O power supply method | Supply by I/O power supply | |
| Output device supply current | 100 mA/point | |
| I/O power supply current consumption | 5 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Output handling for communications errors | Select either hold or clear | |

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

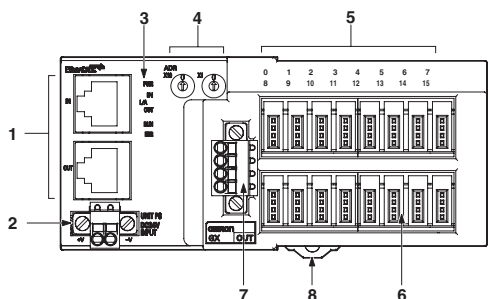
Components and Functions

16 Inputs Terminal GX-ID1618/ID1628



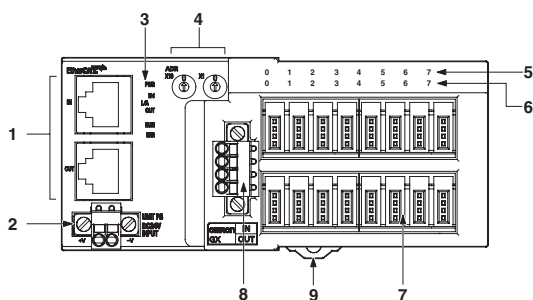
| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (0 to 15) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | I/O connector (0 to 15) | Connects an external device. |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

16 Outputs Terminal GX-OD1618/OD1628



| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Output indicator (0 to 15) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 6 | I/O connector (0 to 15) | Connects an external device. |
| 7 | I/O power supply connector | Supplies the I/O power. |
| 8 | DIN track mounting hook | Fixes a slave to a DIN track. |

8 Inputs/8 Outputs Terminal GX-MD1618/MD1628

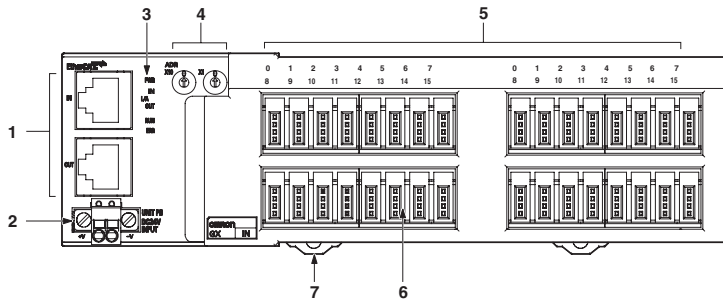


| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (0 to 7) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | Output indicator (0 to 7) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 7 | I/O connector (0 to 15) | Connects an external device. <Top side> For input device <Bottom side> For output device |
| 8 | I/O power supply connector | Supplies the I/O power. (For output device) |
| 9 | DIN track mounting hook | Fixes a slave to a DIN track. |

EtherCAT Remote I/O Terminals **GX-Series**

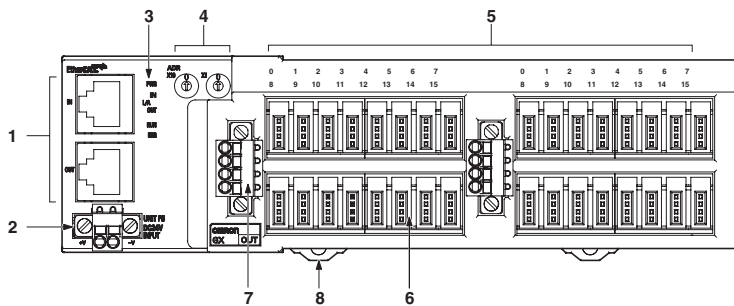
Digital I/O Terminal e-CON Connector Type

32 Inputs Terminal GX-ID3218/ID3228



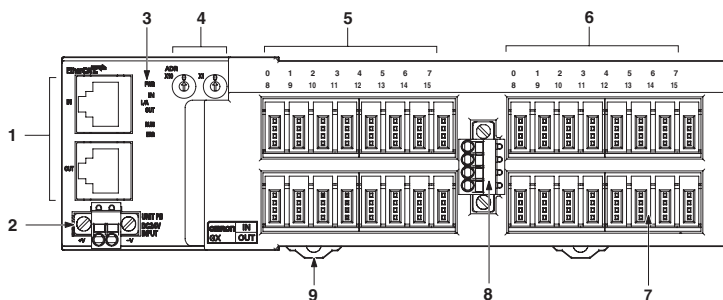
| No. | Name | Function |
|-----|--|---|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (IN1 0 to 15, IN2 0 to 15) | Indicates the state of input contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | I/O connector (0 to 15 × 2) | Connects an external device. |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

32 Outputs Terminal GX-OD3218/OD3228



| No. | Name | Function |
|-----|---|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Output indicator (OUT1 0 to 15, OUT2 0 to 15) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 6 | I/O connector (0 to 15 × 2) | Connects an external device. |
| 7 | I/O power supply connector | Supplies the I/O power. |
| 8 | DIN track mounting hook | Fixes a slave to a DIN track. |

16 Inputs/16 Outputs Terminal GX-MD3218/MD3228

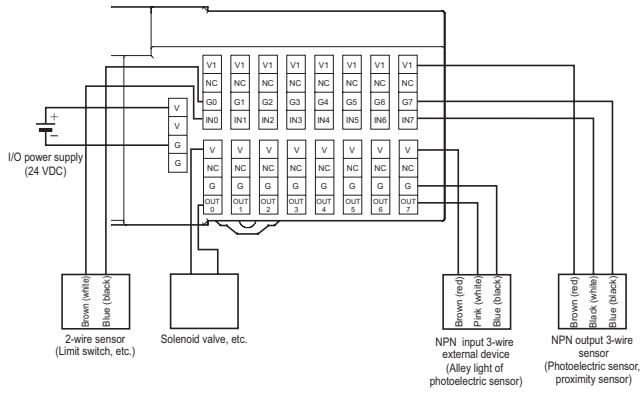


| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input indicator (0 to 15) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 6 | Output indicator (0 to 15) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 7 | I/O connector (0 to 15 × 2) | Connects an external device. <Top side> For input device <Bottom side> For output device |
| 8 | I/O power supply connector | Supplies the I/O power. (For output device) |
| 9 | DIN track mounting hook | Fixes a slave to a DIN track. |

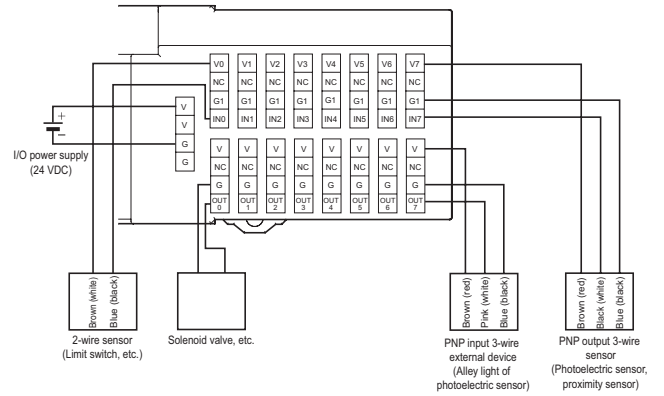
EtherCAT Remote I/O Terminals GX-Series

Digital I/O Terminal e-CON Connector Type

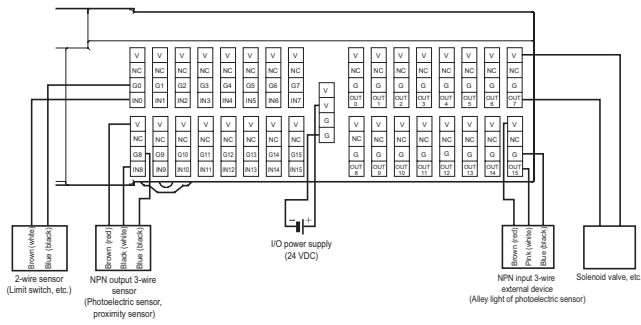
GX-MD1618 (NPN)



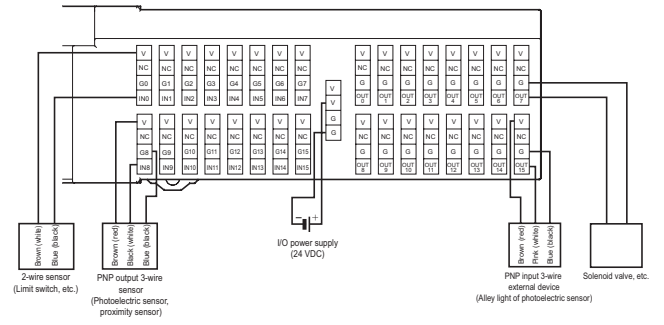
GX-MD1628 (PNP)



GX-MD3218 (NPN)



GX-MD3228 (PNP)

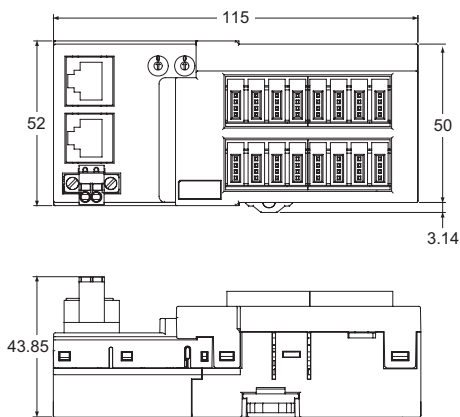


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

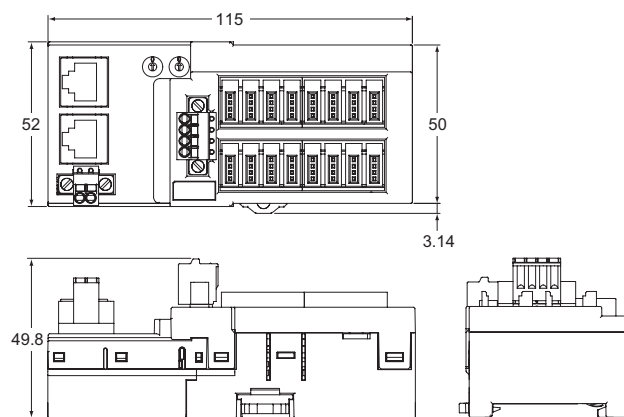
Dimensions

(Unit: mm)

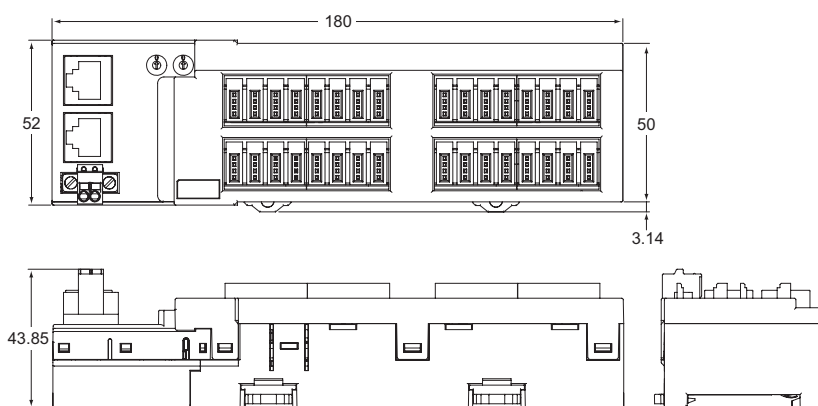
GX-ID1618/ID1628



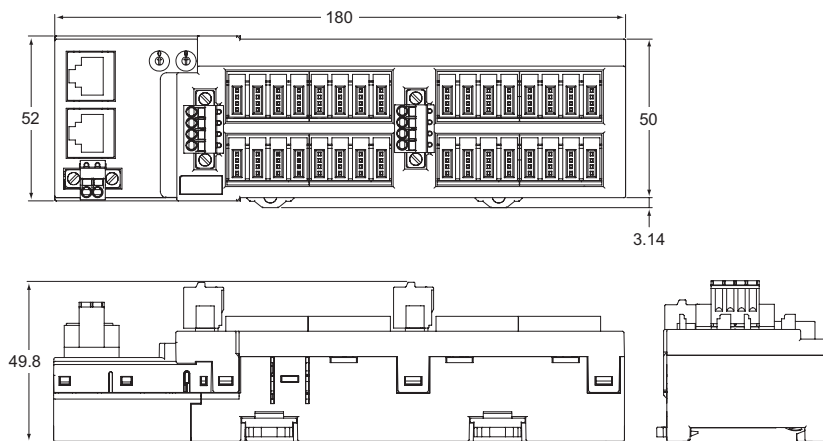
GX-OD1618/OD1628
GX-MD1618/MD1628



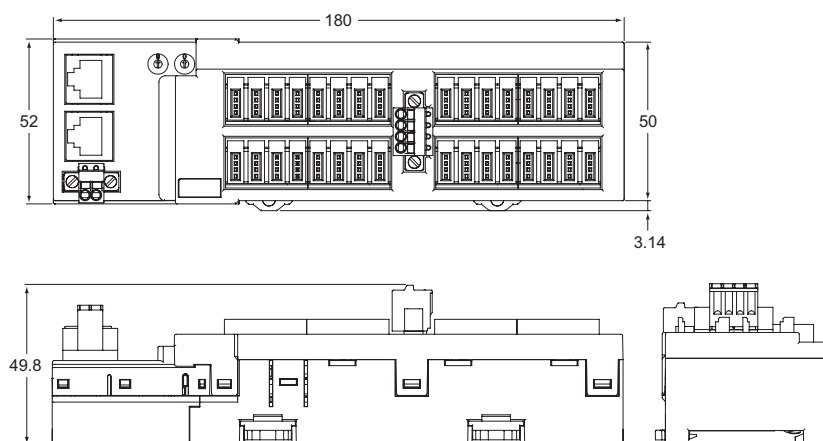
GX-ID3218/ID3228



GX-OD3218/OD3228



GX-MD3218/MD3228

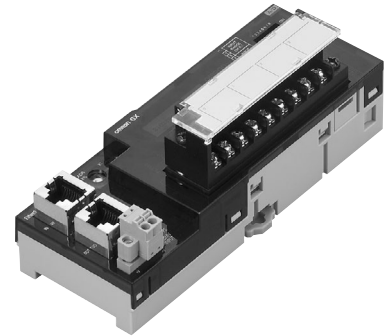


Analog I/O Terminal 2-tier Terminal Block Type

GX-AD0471/DA0271

Analog I/O terminal with screw terminal block for EtherCAT communications

- The input/output range can be easily changed by the setting with the switch.
- Detachable screw terminal block facilitates the maintenance.
- Moving average calculation function.
Settings within the range of 100 μ s-64ms. (For input only.)
- Disconnection detection function.
(For input only and for usage with 1-5V or 4-20mA ranges.)
- Selectable node address setting methods: setting with rotary switch and with tool software.
When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.



General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Input Section Specifications

4-point Input Terminals

| Item | Specification | |
|---------------------------------------|--|----------------------|
| | Voltage input | Current input |
| Input capacity | 4 points (possible to set number of enabled channels) | |
| Input range | 0 to 5V 1 to 5V 0 to 10V -10 to +10V | 4 to 20mA |
| Input range setting method | Input range switch: Common to input CH1/CH2, common to input CH3/CH4 SDO communication: Possible to set input CH1 to CH4 individually | |
| Maximum signal input | ± 15 V | ± 30 mA |
| Input impedance | 1 M Ω min. | Approx. 250 Ω |
| Resolution | 1/8000 (full scale) | |
| Overall accuracy | 25 $^{\circ}$ C | $\pm 0.3\%$ FS |
| | -10 to +55 $^{\circ}$ C | $\pm 0.6\%$ FS |
| Analog conversion cycle | 500 μ s/input When 4 points are used: 2 ms max. | |
| A/D converted data | Other than ± 10 V: 0000 to 1F40 Hex full scale (0 to 8000) ± 10 V: F060 to 0FA0 Hex full scale (-4000 to +4000) A/D conversion range: $\pm 5\%$ FS of the above data ranges. | |
| Isolation method | Photocoupler isolation (between input and communications lines) No isolation between input signals | |
| Unit power supply current consumption | 120 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 180 g max. | |
| Accessories | Four short-circuit metal fixtures (for current input) * | |

* Short-circuit metal fixtures are used for current input only, but store in a safe place when using for voltage inputs as well.

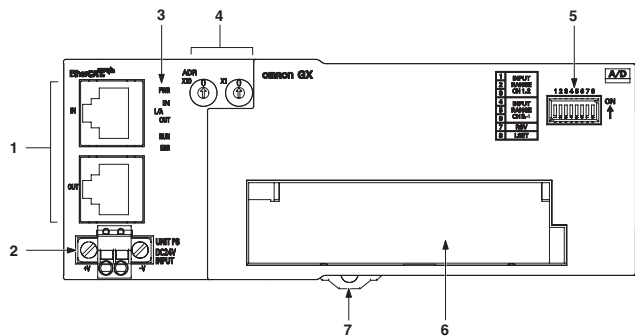
Output Section Specifications

2-point Output Terminals

| Item | Specification | |
|---|---|-------------------|
| | Voltage output | Current output |
| Output capacity | 2 points (possible to set number of enabled channels) | |
| Output range | 0 to 5V 1 to 5V 0 to 10V -10 to +10V | 4 to 20mA |
| Output range setting method | Output range switch, SDO communications: Possible to set outputs CH1 and CH2 separately. | |
| External output allowable load resistance | 5 k Ω min. | 600 Ω max. |
| Resolution | 1/8000 (full scale) | |
| Overall accuracy | 25 $^{\circ}$ C | $\pm 0.4\%$ FS |
| | -10 to +55 $^{\circ}$ C | $\pm 0.8\%$ FS |
| Analog conversion cycle | 500 μ s/input When 2 points are used: 1 ms max. | |
| D/A converted data | Other than ± 10 V: 0000 to 1F40 Hex full scale (0 to 8000) ± 10 V: F060 to 0FA0 Hex full scale (-4000 to +4000) D/A conversion range: $\pm 5\%$ FS of the above data ranges | |
| Isolation method | Photocoupler isolation (between output and communications lines) No isolation between output signals | |
| Unit power supply current consumption | 150 mA max. (for 20.4 to 26.4-VDC power supply voltage) | |
| Weight | 190 g max. | |

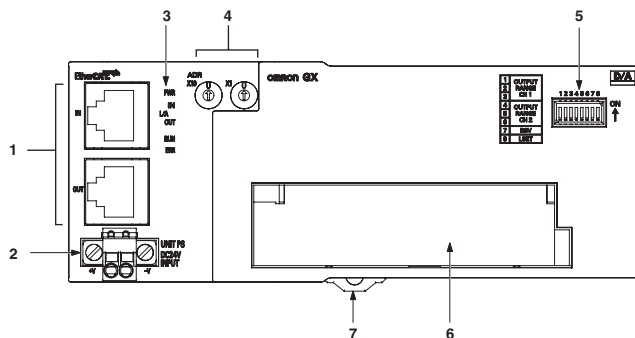
Components and functions

4-points Analog Inputs Terminal GX-AD0471



| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Input range switch | DIP switch for setting input range. |
| 6 | Terminal Block | Terminal block for analog input signals V1 to V4: Voltage input terminals I1 to I4: Current input terminals AG: Analog GND NC: Not used |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

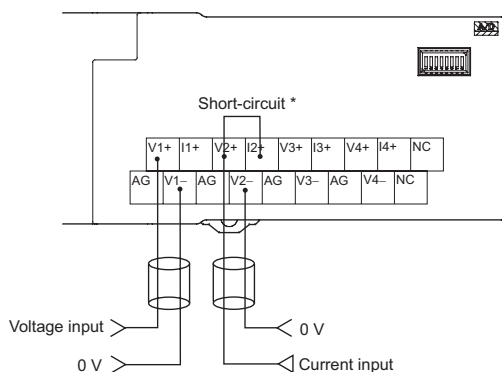
2-points Analog Inputs Terminal GX-DA0271



| No. | Name | Function |
|-----|-----------------------------|---|
| 1 | Communications connector | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status indicator | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switch | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Output range switch | DIP switch for setting output range. |
| 6 | Terminal Block | Terminal block for analog output signals V1+, V2+: Voltage output positive terminals I1+, I2+: Current output positive terminals 1-, 2-: Voltage/current output negative terminals NC: Not used |
| 7 | DIN track mounting hook | Fixes a slave to a DIN track. |

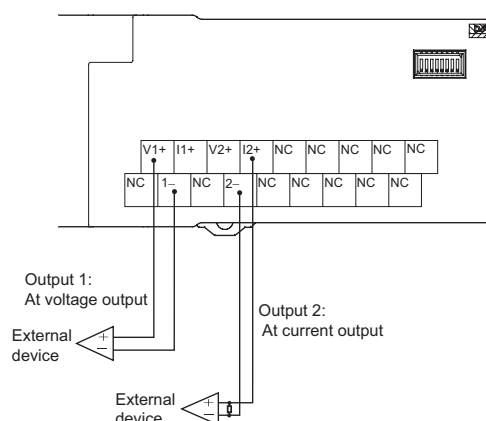
Wiring

GX-AD0471



* Short-circuit the "V positive" terminal and "I positive" terminal at current input.
Use the attached short-circuit metal fixture to short-circuit terminals.

GX-DA0271

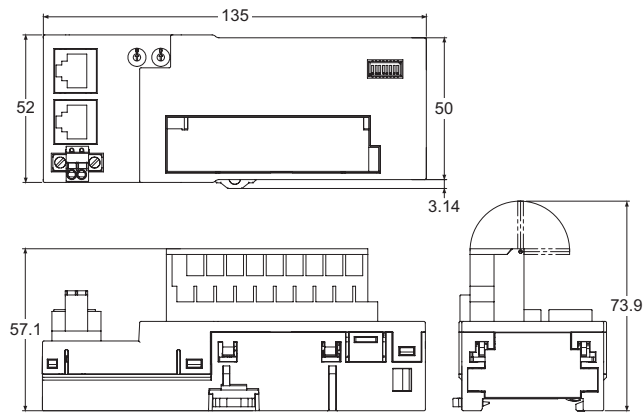


EtherCAT Remote I/O Terminals **GX-Series**
Analog I/O Terminal 2-tier Terminal Block Type

Dimensions

(Unit: mm)

GX-AD0471
GX-DA0271

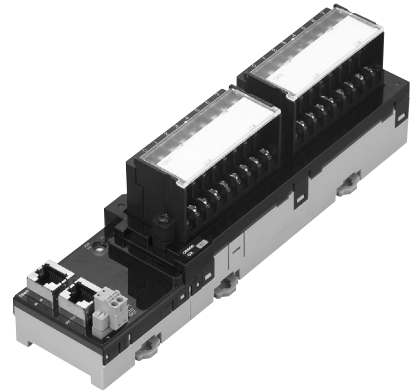


Encoder Input Terminal 3-tier Terminal Block Type

GX-EC0211/EC0241

EtherCAT-compatible encoder input terminal which enables high-speed and accurate control

- Two counter function available. Pulse count within 32 bit range.
- Maximum input pulse frequency of 4MHz (Line driver input after quadrature). High-speed network EtherCAT enables high-speed and accurate control.
- Selectable two input types: Open collector input and line driver input.
- Built-in two external latch inputs and one reset input .
- Selectable node address settings: setting with rotary switches and setting on tool software.
- Detouchable screw terminal will facilitate the maintenance work.



General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Open collector inputs Type

Terminal specifications

| Item | Specification |
|---------------------------------------|---|
| Counter point | 2 points |
| Input signal | Counter phase A Counter phase B Counter phase Z Latch input (A/B) Counter reset input |
| Counter enabled status display | LED display (green) |
| Input indicators | LED display (yellow) |
| Unit power supply current consumption | 130 mA max. (for 20.4 to 26.4 VDC power supply voltage) |
| Weight | 390 g max. |

Pulse input specifications

| Item | Specification | | | |
|------------------------------|--|-------------------------------|--|-------------------------------|
| | Counter phase A/B | | Counter phase Z | |
| Input voltage | 20.4 to 26.4 VDC (24 VDC -15 to +10%) | 4.5 to 5.5 VDC (5 VDC ±5%) | 20.4 to 26.4 VDC (24 VDC -15 to +10%) | 4.5 to 5.5 VDC (5 VDC ±5%) |
| Input current | 8.4 mA (at 24 VDC) | 8.6 mA (at 5 VDC) | 8.4 mA (at 24 VDC) | 8.6 mA (at 5 VDC) |
| ON voltage | 19.6 V min. | 4.5 V min. | 18.6 V min. | 4.5 V min. |
| OFF voltage | 4 V max. | 1.5 V max. | 4 V max. | 1.5 V max. |
| Input restriction resistance | 2.7 kΩ | 430 Ω | 2.7 kΩ | 430 Ω |
| Maximum response frequency | Single phase 500 kHz (phase difference Multiplication × 4, 125 kHz) | | 125 kHz | |
| Filter switching | NA | | NA | |

Latch/reset input specifications

| Item | Specification | |
|-------------------------|---------------------------------------|---------------------------------------|
| | Latch input (A/B) | Reset input |
| Internal I/O common | NPN | |
| Input voltage | 20.4 to 26.4 VDC (24 VDC -15 to +10%) | 20.4 to 26.4 VDC (24 VDC -15 to +10%) |
| Input impedance | 4.0 kΩ | 3.3 kΩ |
| Input current | 5.5 mA (at 24 VDC) | 7 mA (at 24 VDC) |
| ON voltage/ON current | 17.4 VDC min./3 mA min. | 14.4 VDC min./3 mA min. |
| OFF voltage/OFF current | 5 VDC max./1 mA max. | 5 VDC max./1 mA max. |
| ON response time | 3 μs max. | 15 μs max. |
| OFF response time | 3 μs max. | 90 μs max. |

Note: For the pulse input timing specifications, refer to USER'S MANUAL (Cat. No. W488).

EtherCAT Remote I/O Terminals **GX-Series**

Encoder Input Terminal 3-tier Terminal Block Type

Line Driver inputs Type

Terminal specifications

| Item | Specification |
|---------------------------------------|---|
| Counter point | 2 points |
| Input signal | Counter phase A Counter phase B Counter phase Z Latch input (A/B) Counter reset input |
| Counter enabled status display | LED display (green) |
| Input indicators | LED display (yellow) |
| Unit power supply current consumption | 100 mA max. (for 20.4 to 26.4 VDC power supply voltage) |
| Weight | 390 g max. |

Pulse input specifications

| Item | Specification | |
|----------------------------|---|-----------------|
| | Counter phase A/B | Counter phase Z |
| Input voltage | EIA standard RS-422-A line driver level | |
| Input impedance | 120 Ω ±5% | |
| gH level input voltage | 0.1 V | |
| gL level input voltage | -0.1 V | |
| Hysteresis voltage | 60 mV | |
| Maximum response frequency | Single phase 4 MHz (phase difference Multiplication ×4, 1 MHz) | 1 MHz |
| Filter switching | NA | |

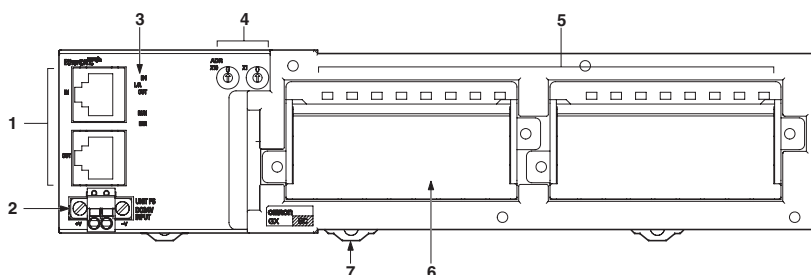
Latch/reset input specifications

| Item | Specification | |
|-------------------------|---------------------------------------|---------------------------------------|
| | Latch input (A/B) | Reset input |
| Internal I/O common | PNP | |
| Input voltage | 20.4 to 26.4 VDC (24 VDC -15 to +10%) | 20.4 to 26.4 VDC (24 VDC -15 to +10%) |
| Input impedance | 4.0 kΩ | 3.3 kΩ |
| Input current | 5.5 mA (at 24 VDC) | 7 mA (at 24 VDC) |
| ON voltage/ON current | 17.4 VDC min./3 mA min. | 14.4 VDC min./3 mA min. |
| OFF voltage/OFF current | 5 VDC max./1 mA max. | 5 VDC max./1 mA max. |
| ON response time | 3 μs max. | 15 μs max. |
| OFF response time | 3 μs max. | 90 μs max. |

Note: For the pulse input timing specifications, refer to USER'S MANUAL (Cat. No. W488).

Components and functions

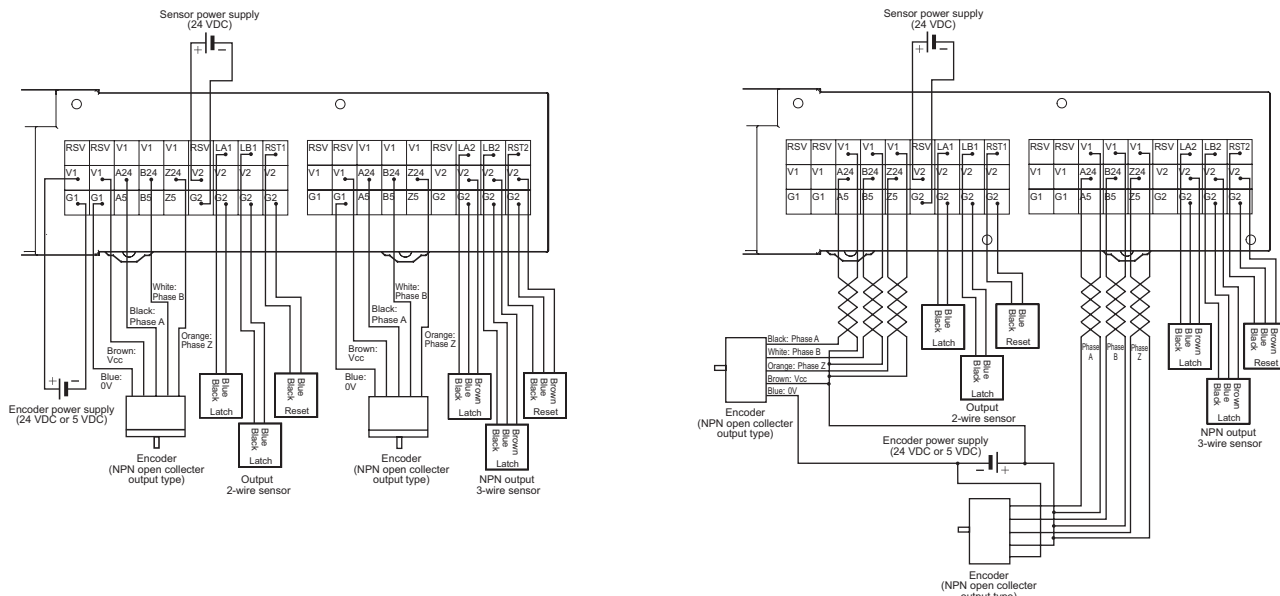
Open collector inputs Type **GX-EC0211**
Line driver inputs Type **GX-EC0241**



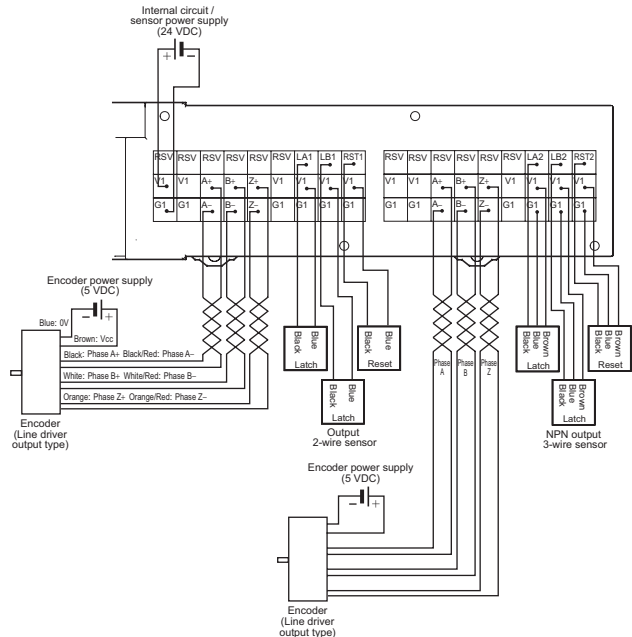
| No. | Name | Function |
|-----|-----------------------------|--|
| 1 | Communications Connectors | (CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal. |
| 2 | Unit Power Supply Connector | Connect the unit power supply (24 VDC). |
| 3 | Status Indicators | It indicates the communication state and the operation state of I/O terminals. |
| 4 | Node address Switches | It sets node addresses of terminals (decimal). Setting range is 00 to 99. |
| 5 | Inputs Indicators | The indicators show the status of the inputs of each channel. For details, refer to GX Series Operation Manual (Cat.No.W488). |
| 6 | Terminal Block | Connects external devices and the I/O power supply. For details, refer to GX Series Operation Manual (Cat.No.W488). |
| 7 | DIN track mounting hook | Fixes Slave Unit to a DIN track. |

Wiring

Open collector inputs Type GX-EC0211



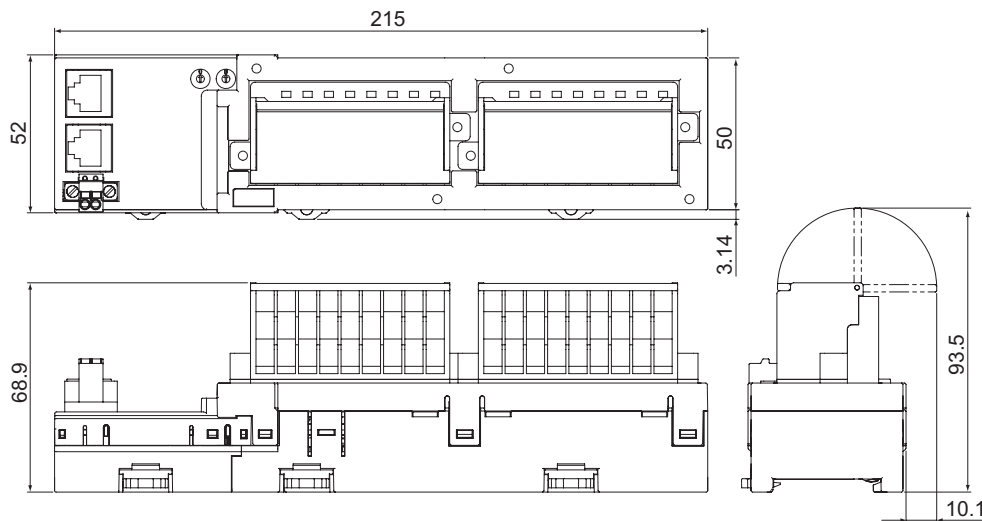
Line driver inputs Type GX-EC0241



Dimensions

(Unit: mm)

GX-EC0211/EC0241

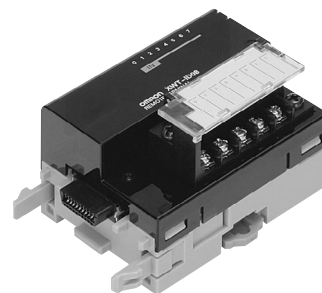


Expansion Units

XWT-□D08(-1)/□D16(-16)

Expansion I/O Units make expansion easy!

- Flexible expansion with many different combinations.
- Removable I/O terminal block enables faster startup time and improved maintainability.
- Common expansion unit with DeviceNet (DRT2-Series) and CompoNet (CRT1-Series).



General Specifications

For Common Specifications of I/O terminals, refer to page 103.

Input Section Specifications

8-point Input Expansion Units

| Item | Specification | |
|---|--|--|
| | XWT-ID08 | XWT-ID08-1 |
| Internal I/O common | NPN | PNP |
| I/O capacity | 8 inputs | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA max./input | |
| ON delay | 1.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 inputs/common | |
| Communications power supply current consumption | 5 mA | |
| Weight | 80 g max. | |

16-point Input Expansion Units

| Item | Specification | |
|---|--|--|
| | XWT-ID16 | XWT-ID16-1 |
| Internal I/O common | NPN | PNP |
| I/O capacity | 16 inputs | |
| ON voltage | 15 VDC min. (between each input terminal and the V terminal) | 15 VDC min. (between each input terminal and the G terminal) |
| OFF voltage | 5 VDC max. (between each input terminal and the V terminal) | 5 VDC max. (between each input terminal and the G terminal) |
| OFF current | 1.0 mA max. | |
| Input current | At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA max./input | |
| ON delay | 1.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 inputs/common | |
| Communications power supply current consumption | 10 mA | |
| Weight | 120 g max. | |

Output Section Specifications

8-point Input Expansion Units

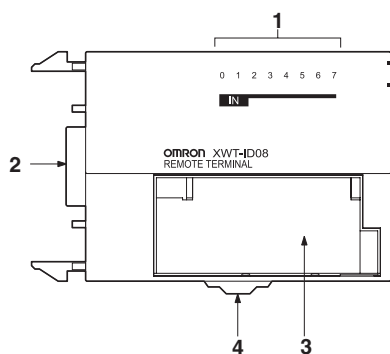
| Item | Specification | |
|---|--|--|
| | XWT-OD08 | XWT-OD08-1 |
| Internal I/O common | NPN | PNP |
| I/O capacity | 8 outputs | |
| Rated output current | 0.5 A/output, 2.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 8 outputs/common | |
| Communications power supply current consumption | 5 mA | |
| Weight | 80 g max. | |

16-point Input Expansion Units

| Item | Specification | |
|---|--|--|
| | XWT-OD16 | XWT-OD16-1 |
| Internal I/O common | NPN | PNP |
| I/O capacity | 16 outputs | |
| Rated output current | 0.5 A/output, 4.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | |
| ON delay | 0.5 ms max. | |
| OFF delay | 1.5 ms max. | |
| Number of circuits per common | 16 outputs/common | |
| Communications power supply current consumption | 10 mA | |
| Weight | 120 g max. | |

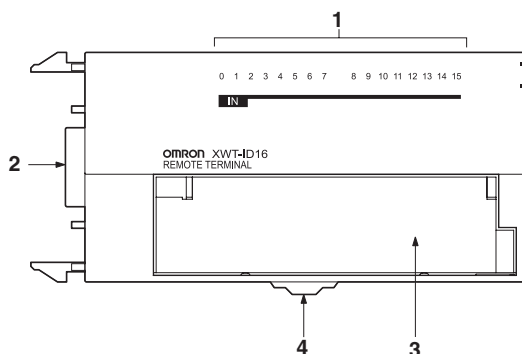
Components and functions

XWT-ID08/ID08-1



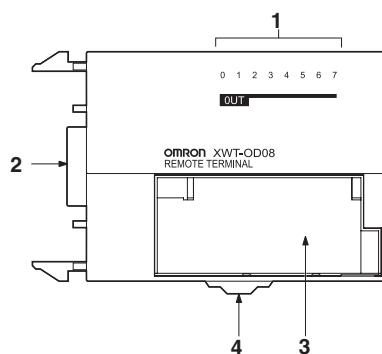
| No. | Name | Function |
|-----|--------------------------|--|
| 1 | Input indicator (0 to 7) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 2 | Terminal connector | Connects the connector on the right side of the slave. |
| 3 | Terminal block | Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 7: Input terminals |
| 4 | DIN track mounting hook | Fixes a slave to a DIN track. |

XWT-ID16/ID16-1



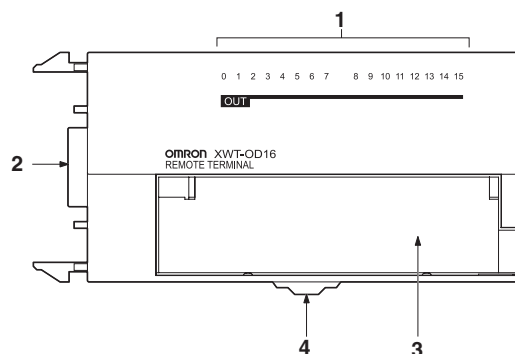
| No. | Name | Function |
|-----|---------------------------|--|
| 1 | Input indicator (0 to 15) | Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) |
| 2 | Terminal connector | Connects the connector on the right side of the slave. |
| 3 | Terminal block | Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Input terminals |
| 4 | DIN track mounting hook | Fixes a slave to a DIN track. |

XWT-OD08/OD08-1



| No. | Name | Function |
|-----|---------------------------|---|
| 1 | Output indicator (0 to 7) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 2 | Terminal connector | Connects the connector on the right side of the slave. |
| 3 | Terminal block | Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 7: Output terminals |
| 4 | DIN track mounting hook | Fixes a slave to a DIN track. |

XWT-OD16/OD16-1



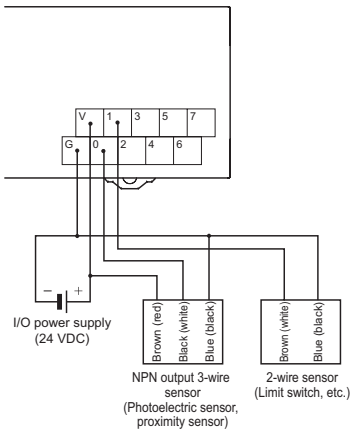
| No. | Name | Function |
|-----|----------------------------|---|
| 1 | Output indicator (0 to 15) | Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state) |
| 2 | Terminal connector | Connects the connector on the right side of the slave. |
| 3 | Terminal block | Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Output terminals |
| 4 | DIN track mounting hook | Fixes a slave to a DIN track. |

EtherCAT Remote I/O Terminals GX-Series

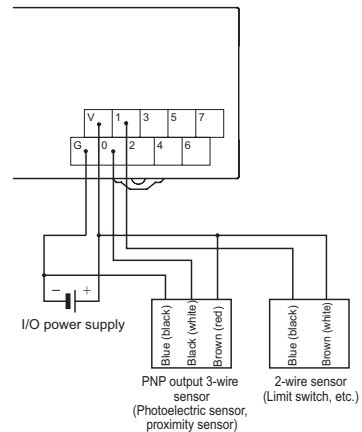
Expansion Unit

Wiring

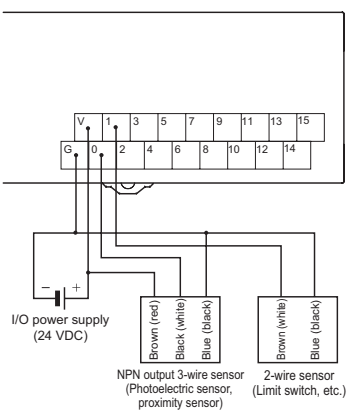
XWT-ID08 (NPN)



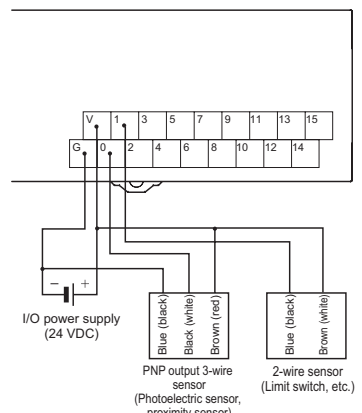
XWT-ID08-1 (PNP)



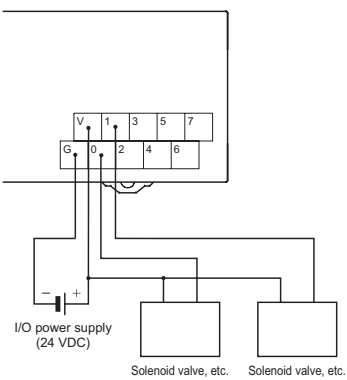
XWT-ID16 (NPN)



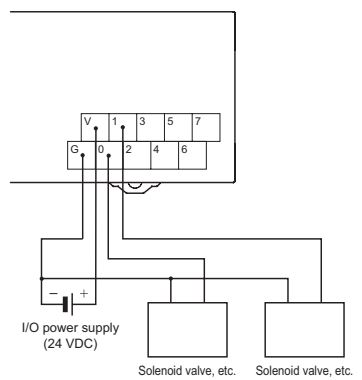
XWT-ID16-1 (PNP)



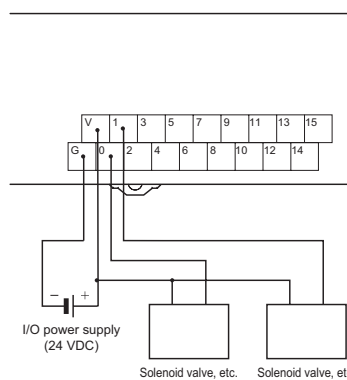
XWT-OD08 (NPN)



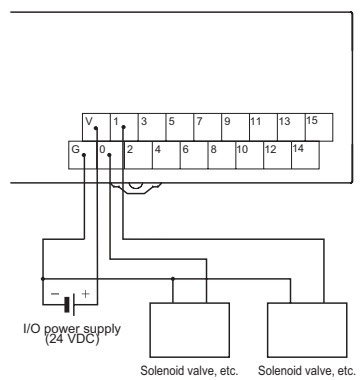
XWT-OD08-1 (PNP)



XWT-OD16 (NPN)



XWT-OD016-1 (PNP)

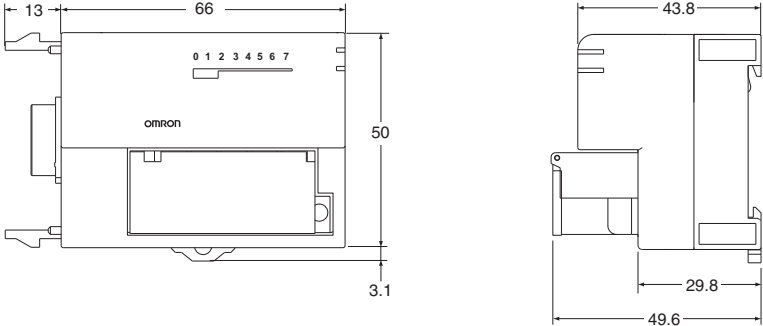


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

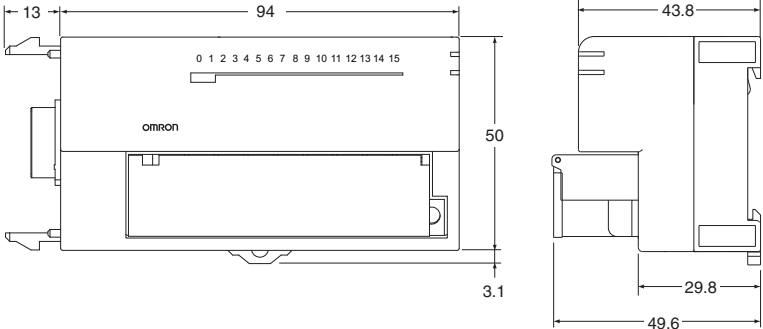
Dimensions

(Unit: mm)

XWT-ID08/ID08-1
XWT-OD08/OD08-1



XWT-ID16/ID16-1
XWT-OD16/OD16-1



- System Configuration
- Machine Automation Controller
- Automation Software
- AC Servomotors / Servo Drives
 - General Specifications
 - Components and Functions
- Multi-Function Compact Inverter
 - Wiring
 - Dimensions
- Vision Sensor
- Fiber Sensor
- Remote I/O Terminals
- Ordering Information

Ordering Information

Ordering Information

| | |
|---|-----|
| Machine Automation Controller NJ-Series | 136 |
| Automation Software Sysmac Studio | 150 |
| FA Communications Software CX-Compolet / SYSMAC Gateway | 152 |
| AC Servomotor/Drives G5-Series | 154 |
| Multi-function Compact Inverter MX-Series | 172 |
| Vision Sensor FQ-M-Series | 177 |
| Fiber Sensor E3X-HD0 | 179 |
| EtherCAT Remote I/O Terminal GX-Series | 180 |
| Programmable Terminals NS-Series | 182 |

Related Manuals

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Contact your OMRON representative for further details and applicable conditions for these standards.

● EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

● EMC Directives

Applicable Standards

EMI: EN61000-6-4, EN61131-2

EMS: EN61000-6-2, EN61131-2

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

● Low Voltage Directive

Applicable Standard: EN61131-2

VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.

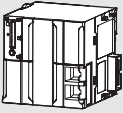
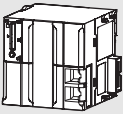
These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.

Ordering Information

Basic Configuration Units

CPU Rack

CPU Units

| Product name | Specifications | | | | Current consumption (A) | | Model | Standards | | | | |
|--|--|------------------|--|-----------------------|-------------------------|--------|------------|---------------|------|-----|------------|---------------|
| | I/O capacity / maximum number of configuration Units (Expansion Racks) | Program capacity | Memory capacity for variables | Number of motion axes | 5 VDC | 24 VDC | | | | | | |
| NJ501 CPU Units  | 2,560 points / 40 Units (3 Expansion Racks) | 20 MB | 2 MB: Retained during power interruption 4 MB: Not retained during power interruption | 64 | 1.90 | --- | NJ501-1500 | UC1, N, L, CE | | | | |
| | | | | 32 | | | | | | | | |
| | | | | 16 | | | | | | | | |
| NJ301 CPU Units  | | 5 MB | 0.5 MB: Retained during power interruption 2 MB: Not retained during power interruption | 8 | | | | | 1.90 | --- | NJ301-1200 | UC1, N, L, CE |
| | | | | 4 | | | | | | | | |
| | | | | | | | | | | | | |

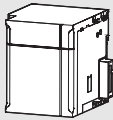
Accessories

The following accessories come with the CPU Unit.

| Item | Specification |
|-----------|--|
| Battery | CJ1W-BAT01 |
| End Cover | CJ1W-TER01 (necessary to be connected to the right end of the CPU Rack.) |
| End Plate | PFP-M (2 pcs) |

■ Power Supply Units

One Power Supply Unit is required for each Rack.


| Product name | Power supply voltage | Output current | | Output capacity | Options | | | Model | Standards |
|---|----------------------|-----------------------|------------------------|-------------------------|-----------------------------|------------|------------------------------|-----------|---------------|
| | | 5-VDC output capacity | 24-VDC output capacity | Total power consumption | 24-VDC service power supply | RUN output | Maintenance forecast monitor | | |
| AC Power Supply Unit  | 100 to 240 VAC | 6.0 A | 1.0 A | 30 W | No | Yes | No | NJ-PA3001 | UC1, N, L, CE |
| DC Power Supply Unit | 24 VDC | | | | | | | | |

Note: Power supply units for the CJ-Series cannot be used as a power supply for a CPU rack of the NJ system or as a power supply for an expansion rack.

Expansion Racks


Select the I/O Control Unit, I/O Interface Unit, Expansion Connecting Cable, and CJ-Series Power Supply Unit.

■ CJ-Series I/O Control Unit (Mounted on CPU Rack when Connecting Expansion Racks)

| Product name | Specifications | Current consumption (A) | | Model | Standards |
|--|---|-------------------------|------|------------|---------------|
| | | 5 V | 24 V | | |
| CJ-Series I/O Control Unit  | Mount one I/O Control Unit on the CJ-Series CPU Rack when connecting one NJ-Series Expansion Racks. Connecting Cable: CS1W-CN□□□3 Expansion Connecting Cable Connected Unit: CJ1W-II101 I/O Interface Unit Mount to the right of the CPU Unit. | 0.02 | --- | CJ1W-IC101 | UC1, N, L, CE |


Note: Mounting the I/O Control Unit in any other location may cause faulty operation.

■ CJ-Series I/O Interface Unit (Mounted on Expansion Rack)


| Product Name | Specifications | Current consumption (A) | | Model | Standards |
|--|--|-------------------------|------|------------|---------------|
| | | 5 V | 24 V | | |
| CJ-Series I/O Interface Unit  | One I/O Interface Unit is required on each Expansion Rack. Connecting Cable: CS1W-CN□□□3 Expansion Connecting Cable Mount to the right of the Power Supply Unit. | 0.13 | --- | CJ1W-II101 | UC1, N, L, CE |

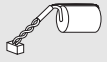

Note: Mounting the I/O Interface Unit in any other location may cause faulty operation.

■ I/O Connecting Cables

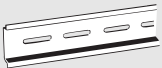

| Product name | Specifications | Model | Standards | |
|--|--|---------------------|-----------|------------|
| I/O Connecting Cable  | <ul style="list-style-type: none"> Connects an I/O Control Unit on NJ-Series CPU Rack to an I/O Interface Unit on a NJ-Series Expansion Rack. or Connects an I/O Interface Unit on NJ-Series Expansion Rack to an I/O Interface Unit on another NJ-Series Expansion Rack. | Cable length: 0.3 m | N, L, CE | |
| | | Cable length: 0.7 m | | CS1W-CN313 |
| | | Cable length: 2 m | | CS1W-CN713 |
| | | Cable length: 3 m | | CS1W-CN223 |
| | | Cable length: 5 m | | CS1W-CN323 |
| | | Cable length: 10 m | | CS1W-CN523 |
| | | Cable length: 12 m | | CS1W-CN133 |
| | CS1W-CN133-B2 | | | |

Optional Products and Maintenance Products

| Product name | Specifications | Model | Standards |
|--|---------------------|-----------|-----------|
| Memory Cards  | SD memory card, 2GB | HMC-SD291 | --- |

| Product name | Specifications | Model | Standards |
|---|---|--|-----------------------------|
| Battery Set  | Battery for NJ501-□□□□/NJ301-□□□□ NJ-Series CPU Unit maintenance | Note: 1. The battery is included as a standard accessory with the CPU Unit. 2. The battery service life is 5 years at 25°C. (The service life depends on the ambient operating temperature and the power conditions.) 3. Use batteries within two years of manufacture. | CJ1W-BAT01 --- |
| End Cover  | Mounted to the right-hand side of NJ-Series CPU Racks or Expansion Racks. | One End Cover is provided as a standard accessory with each CPU Unit and I/O Interface Unit. | CJ1W-TER01 UC1, N, L, CE |

DIN Track Accessories

| Product name | Specifications | Model | Standards |
|---|--|-----------|-----------|
| DIN Track  | Length: 0.5 m; Height: 7.3 mm | PFP-50N | --- |
| | Length: 1 m; Height: 7.3 mm | PFP-100N | |
| | Length: 1 m; Height: 16 mm | PFP-100N2 | |
| End Plate  | There are 2 stoppers provided with CPU Units and I/O Interface Units as standard accessories to secure the Units on the DIN Track. | PFP-M | |

Connecting Cable

■ Peripheral (USB) Port



Use commercially available USB cable.

Specifications: USB 1.1 or 2.0 cable (A connector - B connector), 5.0 m max.

■ Recommended EtherCAT and EtherNet/IP Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

Use Straight or cross STP (shielded twisted-pair) cable of category 5 or higher for EtherNet/IP.

| Item | | Recommended manufacturer | Cable length (m) *1 | Model |
|------------------------------|--|---|------------------------------|-----------------------------|
| For EtherCAT | Wire Gauge and Number of Pairs: AWG22, 2-pair Cable | Cable with Connectors on Both Ends (RJ45/RJ45)  | 0.3 | XS5W-T421-AMD-K |
| | | | 0.5 | XS5W-T421-BMD-K |
| | | | 1 | XS5W-T421-CMD-K |
| | | | 2 | XS5W-T421-DMD-K |
| | | | 5 | XS5W-T421-GMD-K |
| | | Cable with Connectors on Both Ends (M12/RJ45)  | 0.3 | XS5W-T421-AMC-K |
| | | | 0.5 | XS5W-T421-BMC-K |
| | | | 1 | XS5W-T421-CMC-K |
| | | | 2 | XS5W-T421-DMC-K |
| | | | 5 | XS5W-T421-GMC-K |
| For EtherCAT and EtherNet/IP | Wire Gauge and Number of Pairs: AWG24, 4-pair Cable | Cables | Tonichi Kyosan Cable, Ltd. | NETSTAR-C5E SAB 0.5 × 4P *2 |
| | | | Kuramo Electric Co. | KETH-SB *2 |
| | | | SWCC Showa Cable Systems Co. | FAE-5004 *2 |
| | Wire Gauge and Number of Pairs: AWG22, 2-pair Cable | RJ45 Connectors | Panduit Corporation | MPS588 *2 |
| | | Cables | Kuramo Electric Co. | KETH-PSB-OMR *3 |
| | | RJ45 Assembly Connector | OMRON | XS6G-T421-1 *3 |
| For EtherNet/IP | Wire Gauge and Number of Pairs: 0.5 mm, 4-pair Cable | Cables | Fujikura Ltd. | F-LINK-E 0.5mm × 4P *4 |
| | | RJ45 Connectors | Panduit Corporation | MPS588 *4 |

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

*2 We recommend you to use above cable for EtherCAT and EtherNet/IP, and RJ45 Connector together.





*3 We recommend you to use above cable for EtherCAT and EtherNet/IP, and RJ45 Assembly Connector together.

*4 We recommend you to use above cable For EtherNet/IP and RJ45 Connectors together.

Note: Please be careful while cable processing, for EtherCAT, connectors on both ends should be shield connected and for EtherNet/IP, connectors on only one end should be shield connected.

Basic I/O Units






■ **Input Units**

| Unit classification | Product name | Specifications | | | | Number of bits allocated | Response time ^{*1} | | Current consumption (A) | | Model | Standards |
|---------------------|--|-------------------------------------|-------------------------------------|----------------------|--------------------------|--------------------------|-----------------------------|-------------|-------------------------|---------------|---------------|---------------|
| | | I/O points | Input voltage and current | Commons | External connection | | ON | OFF | 5 V | 24 V | | |
| CJ1 Basic I/O Units | DC Input Units    | 8 inputs | 12 to 24 VDC, 10 mA | Independent contacts | Removable terminal block | 16 | 20 μs max. | 400 μs max. | 0.08 | --- | CJ1W-ID201 | UC1, N, L, CE |
| | | 16 inputs | 24 VDC, 7 mA | 16 points, 1 common | Removable terminal block | 16 | 20 μs max. | 400 μs max. | 0.08 | --- | CJ1W-ID211 | |
| | | 16 inputs <i>High-speed type</i> | 24 VDC, 7 mA | 16 points, 1 common | Removable terminal block | 16 | 15 μs max. | 90 μs max. | 0.13 | --- | CJ1W-ID212 | |
| | | 32 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | Fujitsu connector | 32 | 20 μs max. | 400 μs max. | 0.09 | --- | CJ1W-ID231 *2 | |
| | | 32 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | MIL connector | 32 | 20 μs max. | 400 μs max. | 0.09 | --- | CJ1W-ID232 *2 | |
| | | 32 inputs <i>High-speed type</i> | 24 VDC, 4.1 mA | 16 points, 1 common | MIL connector | 32 | 15 μs max. | 90 μs max. | 0.20 | --- | CJ1W-ID233 *2 | |
| | | 64 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | Fujitsu connector | 64 | 120 μs max. | 400 μs max. | 0.09 | --- | CJ1W-ID261 *2 | |
| | 64 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | MIL connector | 64 | 120 μs max. | 400 μs max. | 0.09 | --- | CJ1W-ID262 *2 | | |
| | AC Input Units  | 8 inputs | 200 to 24 VAC, 10 mA (200 V, 50 Hz) | 8 points, 1 common | Removable Terminal Block | 16 | 10 μs max. | 40 μs max. | 0.08 | --- | CJ1W-IA201 | |
| 16 inputs | 100 to 120 VAC, 7 mA (100 V, 50 Hz) | 16 points, 1 common | Removable Terminal Block | 16 | 10 μs max. | 40 μs max. | 0.09 | --- | CJ1W-IA111 | | | |

*1 This is the input response time when no filter (i.e., 0 ms) is set.

*2 The cable-side connector is not provided with Units equipped with cables. Purchase the 40-pin connector separately (Refer to page 142), or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal .

■ Output Units

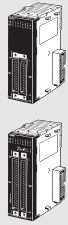
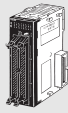
| Unit classification | Product name | Specifications | | | | | Number of bits allocated | Current consumption (A) | | Model | Standards |
|---------------------|---|---|--|---|----------------------|--------------------------|--------------------------|-------------------------|------------|-------------------|---------------|
| | | Output type | I/O points | Maximum switching capacity | Commons | External connection | | 5 V | 24 V | | |
| CJ1 Basic I/O Units | Relay Contact Output Units  | – | 8 outputs | 250 VAC/24 VDC, 2 A | Independent contacts | Removable terminal block | 16 | 0.09 | 0.048 max. | CJ1W-OC201 | UC1, N, L, CE |
| | | – | 16 outputs | 250 VAC/24 VDC, 2 A | 16 points, 1 common | Removable terminal block | 16 | 0.11 | 0.096 max. | CJ1W-OC211 | |
| | Triac Output Unit  | – | 8 outputs | 250 VAC, 0.6 A | 8 points, 1 common | Removable terminal block | 16 | 0.22 | – | CJ1W-OA201 | |
| | Transistor Output Units    | Sinking | 8 outputs | 12 to 24 VDC, 2 A | 4 points, 1 common | Removable terminal block | 16 | 0.09 | – | CJ1W-OD201 | |
| | | Sinking | 8 outputs | 12 to 24 VDC, 0.5 A | 8 points, 1 common | Removable terminal block | 16 | 0.10 | – | CJ1W-OD203 | |
| | | Sinking | 16 outputs | 12 to 24 VDC, 0.5 A | 16 points, 1 common | Removable terminal block | 16 | 0.10 | – | CJ1W-OD211 *1 | |
| | | Sinking | 16 outputs <small>High-speed type</small> | 24 VDC, 0.5 A | 16 points, 1 common | Removable terminal block | 16 | 0.15 | – | CJ1W-OD213 *1 | |
| | | Sinking | 32 outputs | 12 to 24 VDC, 0.5 A | 16 points, 1 common | Fujitsu connector | 32 | 0.14 | – | CJ1W-OD231 *2 | |
| | | Sinking | 32 outputs | 12 to 24 VDC, 0.5 A | 16 points, 1 common | MIL connector | 32 | 0.14 | – | CJ1W-OD233 *1, *2 | |
| | | Sinking | 32 outputs <small>High-speed type</small> | 24 VDC, 0.5 A | 16 points, 1 common | MIL connector | 32 | 0.22 | – | CJ1W-OD234 *1, *2 | |
| | | Sinking | 64 outputs | 12 to 24 VDC, 0.3 A | 16 points, 1 common | Fujitsu connector | 64 | 0.17 | – | CJ1W-OD261 *2 | |
| | | Sinking | 64 outputs | 12 to 24 VDC, 0.3 A | 16 points, 1 common | MIL connector | 64 | 0.17 | – | CJ1W-OD263 *2 | |
| | | Sourcing | 8 outputs | 24 VDC, 2 A Short-circuit protection | 4 points, 1 common | Removable terminal block | 16 *1 | 0.11 | – | CJ1W-OD202 | |
| | | Sourcing | 8 outputs | 24 VDC, 0.5 A Short-circuit protection | 8 points, 1 common | Removable terminal block | 16 *1 | 0.10 | – | CJ1W-OD204 | |
| | | Sourcing | 16 outputs | 24 VDC, 0.5 A Short-circuit protection | 16 points, 1 common | Removable terminal block | 16 | 0.10 | – | CJ1W-OD212 | |
| Sourcing | 32 outputs | 24 VDC, 0.5 A Short-circuit protection | 16 points, 1 common | MIL connector | 32 | 0.15 | – | CJ1W-OD232 *2 | | | |
| Sourcing | 64 outputs | 12 to 24 VDC, 0.3 A | 16 points, 1 common | MIL connector | 64 | 0.17 | – | CJ1W-OD262 *2 | | | |

*1 The ON/OFF response time for the CJ1W-OD213/CJ1W-OD234 is shorter than for the CJ1W-OD211/CJ1W-OD233, as shown below.

- ON response time: 0.1 ms improved to 0.015 ms
- OFF response time: 0.8 ms improved to 0.08 ms

*2 Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

■ I/O Units

| Unit classification | Product name | Specifications | | | | | Number of bits allocated | Current consumption (A) | | Model | Standards | |
|---|--|----------------|---|------------------------------|---------------------|---------------------|--------------------------|-------------------------|--------------|---------------|------------|------------|
| | | Output type | I/O points | Input voltage, Input current | Commons | External connection | | 5 V | 24 V | | | |
| | | | | Maximum switching capacity | | | | | | | | |
| CJ1 Basic I/O Units | DC Input/Transistor Output Units  | Sinking | 16 inputs | 24 VDC, 7 mA | 16 points, 1 common | Fujitsu connector | 32 | 0.13 | --- | CJ1W-MD231*2 | UC1, N, CE | |
| | | | 16 outputs | 250 VAC/24 VDC, 0.5 A | 16 points, 1 common | | | | | | | |
| | | Sinking | 16 inputs | 24 VDC, 7 mA | 16 points, 1 common | MIL connector | 64 | 0.13 | --- | CJ1W-MD233*2 | | |
| | | | 16 outputs | 12 to 24 VDC, 0.5 A | 16 points, 1 common | | | | | | | |
| | | Sinking | 32 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | Fujitsu connector | 32 | 0.14 | --- | CJ1W-MD261*1 | | UC1, N, CE |
| | | | 32 outputs | 12 to 24 VDC, 0.3 A | 16 points, 1 common | | | | | | | |
| | Sinking | 32 inputs | 24 VDC, 4.1 mA | 16 points, 1 common | MIL connector | 64 | 0.14 | --- | CJ1W-MD263*1 | | | |
| | | 32 outputs | 12 to 24 VDC, 0.3 A | 16 points, 1 common | | | | | | | | |
| | Sourcing | 16 inputs | 24 VDC, 7 mA | 16 points, 1 common | MIL connector | 32 | 0.13 | --- | CJ1W-MD232*2 | UC1, N, L, CE | | |
| | | 16 outputs | 24 VDC, 0.5 A Short-circuit protection | 16 points, 1 common | | | | | | | | |
| TTL I/O Units  | --- | 32 inputs | 5 VDC, 35 mA | 16 points, 1 common | MIL connector | 64 | 0.19 | --- | CJ1W-MD563*1 | UC1, N, CE | | |
| | | 32 outputs | 5 VDC, 35 mA | 16 points, 1 common | | | | | | | | |

*1 Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

*2 Connectors are not provided with these connector models. Either purchase one of the following 20-pin or 24-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

● Applicable Connectors


Fujitsu Connectors for 32-input, 32-output, 64-input, 64-output, 32-input/32-output, and 16-input/16-output Units

| Name | Connection | Remarks | Applicable Units | Model | Standards |
|-------------------|-----------------|---|--|------------|-----------|
| 40-pin Connectors | Soldered | FCN-361J040-AU Connector FCN-360C040-J2 Connector Cover | Fujitsu Connectors: CJ1W-ID231(32 inputs): 1 per Unit CJ1W-ID261 (64 inputs) 2 per Unit CJ1W-OD231 (32 outputs):1 per Unit CJ1W-OD261 (64 outputs): 2 per Unit CJ1W-MD261 (32 inputs, 32 outputs): 2 per Unit | C500-CE404 | --- |
| | Crimped | FCN-363J040 Housing FCN-363J-AU Contactor FCN-360C040-J2 Connector Cover | | C500-CE405 | |
| | Pressure welded | FCN-367J040-AU/F | | C500-CE403 | |
| 24-pin Connectors | Soldered | FCN-361J024-AU Connector FCN-360C024-J2 Connector Cover | Fujitsu Connectors: CJ1W-MD231 (16 inputs, 16 outputs): 2 per Unit | C500-CE241 | --- |
| | Crimped | FCN-363J024 Housing FCN-363J-AU Contactor FCN-360C024-J2 Connector Cover | | C500-CE242 | |
| | Pressure welded | FCN-367J024-AU/F | | C500-CE243 | |


MIL Connectors for 32-input, 32-output, 64-input, 64-output, 32-input/32-output, and 16-input/16-output Units

| Name | Connection | Remarks | Applicable Units | Model | Standards |
|-------------------|-----------------|----------------|---|-------------|-----------|
| 40-pin Connectors | Pressure welded | FRC5-AO40-3TOS | MIL Connectors: CJ1W-ID232/233 (32 inputs): 1 per Unit CJ1W-OD232/233/234 (32 outputs): 1 per Unit CJ1W-ID262 (64 inputs): 2 per Unit CJ1W-OD262/263 (64 outputs): 2 per Unit CJ1W-MD263/563 (32 inputs, 32 outputs): 2 per Unit | XG4M-4030-T | --- |
| 20-pin Connectors | Pressure welded | FRC5-AO20-3TOS | MIL Connectors: CJ1W-MD232/233 (16 inputs, 16 outputs): 2 per Unit | XG4M-2030-T | --- |

■ Quick-response Input Units

| Unit classification | Product name | Specifications | | | | Number of bits allocated | Response time | | Current consumption (A) | | Model | Standards |
|---------------------|--|----------------|------------------------------|---------------------|--------------------------|--------------------------|---------------|-------------|-------------------------|------|------------|---------------|
| | | I/O points | Input voltage, Input current | Commons | External connection | | ON | OFF | 5 V | 24 V | | |
| CJ1 Basic I/O Units | Quick-response Input Unit  | 16 inputs | 24 VDC, 7 mA | 16 points, 1 common | Removable terminal block | 16 | 0.05 ms max. | 0.5 ms max. | 0.08 | --- | CJ1W-IDP01 | UC1, N, L, CE |


■ B7A Interface Units

| Unit classification | Product name | Specifications | | Number of bits allocated | Current consumption (A) | | Model | Standards |
|---------------------|--|-------------------|--------------------------|--------------------------|-------------------------|------|------------|-----------|
| | | I/O points | External connection | | 5 V | 24 V | | |
| CJ1 Basic I/O Units | B7A Interface Units  | 64 inputs | Removable terminal block | 64 | 0.07 | --- | CJ1W-B7A14 | UC1, CE |
| | | 64 outputs | | | 0.07 | --- | CJ1W-B7A04 | |
| | | 32 inputs/outputs | | | 0.07 | --- | CJ1W-B7A22 | |

Special I/O Units and CPU Bus Units

■ **Process I/O Units**


● **Isolated-type Units with Universal Inputs**

| Unit classification | Product name | Input points | Signal range selection | Signal range | Conversion speed (resolution) | Accuracy (at ambient temperature of 25°C) | External connection | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|---|--------------|-------------------------------|---|---|--|--------------------------|-------------------------------|-------------------------|------|--------------|------------|
| | | | | | | | | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Process Input Units (Isolated-type Units with Universal Inputs)  | 4 inputs | Set separately for each input | Universal inputs: Pt100 (3-wire), JPt100 (3-wire), Pt1000 (3-wire), Pt100 (4-wire), K, J, T, E, L, U, N, R, S, B, WRe5-26, PL II, 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 1.25 V, 0 to 5 V, 0 to 10 V, ±100 mV selectable range -1.25 to 1.25 V, -5 to 5 V, -10 to 10 V, ±10 V selectable range, potentiometer | Resolution (conversion speed): 1/256,000 (conversion cycle: 60 ms/4 inputs) 1/64,000 (conversion cycle: 10 ms/4 inputs) 1/16,000 (conversion cycle: 5 ms/4 inputs) | Standard accuracy: ±0.05% of F.S. | Removable terminal block | 1 | 0.30 | --- | CJ1W-PH41U*1 | UC1, CE |
| | | 4 inputs | Set separately for each input | Universal inputs: Pt100, JPt100, Pt1000, K, J, T, L, R, S, B, 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, 0 to 10 V | Conversion speed: 250 ms/4 inputs | Accuracy: Platinum resistance thermometer input: (±0.3% of PV or ±0.8°C, whichever is larger) ±1 digit max. Thermocouple input: (±0.3% of PV or ±1.5°C, whichever is larger) ±1 digit max. *2 Voltage or current input: ±0.3% of F.S. ±1 digit max. | | | 0.32 | --- | CJ1W-AD04U | UC1, L, CE |

*1 Do not connect a Relay Output Unit to the same CPU Rack or to the same Expansion Rack as the CJ1W-PH41U.

*2 L and -100°C or less for K and T are ±2°C±1 digit max., and 200°C or less for R and S is ±3°C±1 digit max. No accuracy is specified for 400°C or less for B.


● **Isolated-type DC Input Units**

| Unit classification | Product name | Input points | Signal range selection | Conversion speed (resolution) | Accuracy (at ambient temperature of 25°C) | External connection | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|---|--------------|---|--|---|--------------------------|-------------------------------|-------------------------|--------|------------|-----------|
| | | | | | | | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Isolated-type DC Input Units  | 2 inputs | DC voltage: 0 to 1.25 V, -1.25 to 1.25 V, 0 to 5 V, 1 to 5 V, -5 to 5 V, 0 to 10 V, -10 to 10 V, ±10 V selectable range DC current: 0 to 20 mA, 4 to 20 mA | Conversion speed: 10 ms/2 inputs Resolution: 1/64,000 | Standard accuracy: ±0.05% of F.S. | Removable terminal block | 1 | 0.18 | 0.09 * | CJ1W-PDC15 | UC1, CE |

* This is for an external power supply, and not for internal current consumption.

■ Analog I/O Units

● Analog Input Units


| Unit classification | Product name | Input points | Signal range selection | Signal range | Resolution | Conversion speed | Accuracy (at ambient temperature of 25°C) | External connection | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|---|--------------|-------------------------------|---|------------|--|--|--------------------------|-------------------------------|---|---------------------------------------|---|-----------|
| | | | | | | | | | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Analog Input Units  | 4 inputs | Set separately for each input | 1 to 5 V (1/10,000), 0 to 10 V (1/20,000), -5 to 5 V (1/20,000), -10 to 10 V (1/40,000), and 4 to 20 mA (1/10,000) | | 20 μs/1 point, 25 μs/2 points, 30 μs/3 points, 35 μs/4 points | Voltage: ±0.2% of F.S. Current: ±0.4% of F.S. | Removable terminal block | 1 | 0.52 | --- | CJ1W-AD042 *1 | UC1, CE |
| | | 8 inputs | | | | | | | | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/4000, (Settable to 1/8000) *2 | 1 ms/point max. (Settable to 250 μs/point) *2 | |
| | 4 inputs | | | | | | 0.42 | --- | | CJ1W-AD041-V1 | | | |

*1 The direct conversion function using the AIDC instruction cannot be used.

*2 The resolution and conversion speed cannot be set independently. If the resolution is set to 1/4,000, then the conversion speed will be 1 ms/point.

*3 At 23 ±2°C


● Analog Output Units

| Unit classification | Product name | Output points | Signal range selection | Signal range | Resolution | Conversion speed | Accuracy (at ambient temperature of 25°C) | External connection | External power supply | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|--|--|-------------------------------|--|---|--|---|--------------------------|-----------------------|-------------------------------|---|----------------------------------|---|-----------|
| | | | | | | | | | | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Analog Output Units  | 4 outputs | Set separately for each input | 1 to 5 V (1/10,000), 0 to 10 V (1/20,000), and -10 to 10 V (1/40,000) | | 20 μs/ 1 point, 25 μs/ 2 points, 30 μs/ 3 points, 35 μs/ 4 points | ±0.3% of F.S. | Removable terminal block | --- | 1 | 0.40 | --- | CJ1W-DA042V *1 | UC1, CE |
| | | 8 outputs | | | | | | | | | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V | 1/4,000 (Settable to 1/8,000) | 1 ms/point max. (Settable to 250 μs/point) | |
| | 8 outputs | 4 to 20 mA | | | 24 VDC +10% -15% , 170 mA max. | 0.14 | 0.17 *2 | CJ1W-DA08C | UC1, N, CE | | | | | |
| | 4 outputs | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | | 1/4000 | 1 ms/point max. | Voltage output: ±0.3% of F.S. Current output: ±0.5% of F.S. | 24 VDC +10% -15% , 200 mA max. | 0.12 | 0.2 *2 | | CJ1W-DA041 | UC1, N, L, CE | | |
| | 2 outputs | | | | | 24 VDC +10% -15% , 140 mA max. | 0.12 | 0.14 *2 | CJ1W-DA021 | | | | | |

*1 The direct conversion function using the AODC instruction cannot be used.


*2 This is for an external power supply, and not for internal current consumption

● Analog I/O Units


| Unit classification | Product name | No. of points | Signal range selection | Signal range | Resolution (See note.) | Conversion speed (See note.) | Accuracy (at ambient temperature of 25°C) | External connection | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|---|---------------|-------------------------------|--|-------------------------------|--|---|--------------------------|-------------------------------|-------------------------|------|------------|---------------|
| | | | | | | | | | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Analog I/O Units  | 4 inputs | Set separately for each input | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/4,000 (Settable to 1/8,000) | 1 ms/point (Settable to 500 μs/point max.) | Voltage input: ±0.2% of F.S. | Removable terminal block | 1 | 0.58 | --- | CJ1W-MAD42 | UC1, N, L, CE |
| | | 2 outputs | | | | | Current input: ±0.2% of F.S. | | | | | | |

Note: The resolution and conversion speed cannot be set independently. If the resolution is set to 1/4,000, then the conversion speed will be 1 ms/point.

■ Temperature Control Units

| Unit classification | Product name | Specifications | | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|---|--|---|-------------------------------------|-------------------------------|-------------------------|------|------------|---------------|
| | | No. of loops | Temperature sensor inputs | Control outputs | | 5 V | 24 V | | |
| CJ1 Special I/O Units | Temperature Control Units  | 2 loops, heater burnout detection function | Thermocouple input (R, S, K, J, T, B, L) | Open collector NPN outputs (pulses) | 2 | 0.25 | --- | CJ1W-TC003 | UC1, N, L, CE |
| | | | | Open collector PNP outputs (pulses) | | 0.25 | --- | CJ1W-TC004 | |
| | | | Platinum resistance thermometer input (JPt100, Pt100) | Open collector NPN outputs (pulses) | | 0.25 | --- | CJ1W-TC103 | |
| | | | | Open collector PNP outputs (pulses) | | 0.25 | --- | CJ1W-TC104 | |

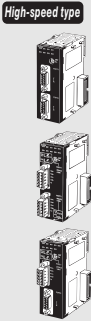

■ High-speed Counter Unit

| Unit classification | Product name | Specifications | | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|--|--------------------|--|--------------------|-------------------------------|-------------------------|------|------------|---------------|
| | | Countable channels | Encoder A and B inputs, pulse input Z signals | Max. counting rate | | 5 V | 24 V | | |
| CJ1 Special I/O Units | High-speed Counter Unit  | 2 | Open collector Input voltage: 5 VDC, 12 V, or 24 V (5 V and 12 V are each for one axis only.) | 50 kHz | 4 | 0.28 | --- | CJ1W-CT021 | UC1, N, L, CE |
| | | | RS-422 line driver | 500 kHz | | | | | |

Note: The following functions become unavailable when it is used with the NJ-Series CPU unit.

- Counter value capture using allocation area(CIO)
- The capture, Stop/capture/continue, Stop/capture/reset/continue, and Capture/reset functions using External Control Input Function
- Pulse rate range control using Output Control Mode
- The pulse rate measurement function
- Because the NJ-Series has no power OFF interrupt task, operation cannot be restarted from the position at which the power was interrupted.
- Read or write the data using IORD/IOWR instruction
- Starting of External Interrupt Task by Output and External Control Input

Serial Communications Units


| Unit classification | Product name | Specifications | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|--|--|---------------------------------------|--|-------------------------------|-------------------------|------|------------|---------------|
| | | Communications Interface | Communications functions | | 5 V | 24 V | | |
| CJ1 CPU Bus Units | Serial Communications Units  | 2 RS-232C ports | The following functions can be selected for each port: Protocol macro *1 Host Link NT Links (1:N mode) Serial Gateway No-protocol Modbus-RTU Slave | 1 | 0.29 *2 | --- | CJ1W-SCU22 | UC1, N, L, CE |
| | | 2 RS-422A/485 ports | | | 0.46 | --- | CJ1W-SCU32 | |
| | | 1 RS-232C port and 1 RS-422A/485 port | | | 0.38 *2 | --- | CJ1W-SCU42 | |
| RS-422A Converter  | | Converts RS-232C to RS-422A/RS-485. | | | | | CJ1W-CIF11 | |

Note: Simple Backup Function and Interrupt notification function cannot be used.

*1 You can activate protocol macro trace function when the CPU Unit is set to the RUN Mode. (MONITOR Mode is not available with the NJ-Series CPU Units.)

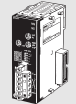
*2 When an NT-AL001 RS-232C/RS-422A Conversion Unit is used, this value increases by 0.15 A/Unit. Add 0.20A/Unit when using NV3W-M□20L Programmable Terminals. Add 0.04A/Unit when using CJ1W-CIF11 RS-422A Adapters.

EtherNet/IP Unit

| Unit classification | Product name | Specifications | | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|---------------------|---|--|-------------------------------|-----------------------------------|-------------------------------|-------------------------|------|--------------|---------------|
| | | Communications cable | Communications functions | Max. Units mountable per CPU Unit | | 5 V | 24 V | | |
| CJ1 CPU Bus Unit | EtherNet/IP Unit  | STP (shielded twisted-pair) cable of category 5, 5e, or higher | Tag data link message service | 4 | 1 | 0.41 | --- | CJ1W-EIP21 * | UC1, N, L, CE |

* Supported only by the EtherNet/IP Units with unit version 2.1 or later, CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.


DeviceNet Unit

| Unit classification | Product name | Specifications | Communications type | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|---------------------|---|--|---|-------------------------------|-------------------------|------|------------|---------------|
| | | | | | 5 V | 24 V | | |
| CJ1 CPU Bus Units | DeviceNet Unit  | Functions as master and/or slave; allows control of 32,000 points max. per master. | <ul style="list-style-type: none"> Remote I/O communications master (fixed or user-set allocations) Remote I/O communications slave (fixed or user-set allocations) Message communications | 1 | 0.29 | --- | CJ1W-DRM21 | UC1, N, L, CE |

Note: 1. Simple backup function cannot be used.

2. DeviceNet configurator cannot be used. Use CX-Integrator.


■ CompoNet Master Unit

| Unit classification | Product name | Specifications | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|-----------------------|--|---|--|-------------------------------|-------------------------|------|--------------|-----------------|
| | | Communications functions | No. of I/O points per Master Unit | | 5 V | 24 V | | |
| CJ1 Special I/O Units | CompoNet Master Unit  | Remote I/O communications Message communications | Word Slaves: 2,048 max. (1,024 inputs and 1,024 outputs) Bit Slaves: 512 max. (256 inputs and 256 outputs) | 1, 2, 4, or 8 | 0.4 | --- | CJ1W-CRM21 * | U, U1, N, L, CE |

Note: Simple backup function cannot be used.

* Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

■ ID Sensor Units



| Unit classification | Product name | Specifications | | | No. of unit numbers allocated | Current consumption (A) | | Model | Standards |
|---------------------|---|-------------------------|----------------------------|-----------------------|-------------------------------|-------------------------|--------|--------------|-----------|
| | | Connected ID Systems | No. of connected R/W heads | External power supply | | 5 V | 24 V | | |
| CJ1 CPU Bus Units | ID Sensor Units  | V680-Series RFID System | 1 | Not required. | 1 | 0.26 | 0.13 * | CJ1W-V680C11 | UC, CE |
| | | | 2 | | 2 | 0.32 | 0.26 | CJ1W-V680C12 | |

Note: The data transfer function using intelligent I/O commands can not be used.

* To use a V680-H01 Antenna, refer to the V680 Series RFID System Catalog (Cat. No. Q151).


Peripheral Devices

■ EtherCAT junction slaves

| Product name | | No. of ports | Power supply voltage | Current consumption (A) | Model | Standards |
|--------------------------|---|--------------|--|-------------------------|---------|-----------|
| EtherCAT junction slaves |  | 3 | 20.4 to 28.8 VDC (24 VDC -15 to +20%) | 0.08 | GX-JC03 | CE, UC1 |
| |  | 6 | | 0.17 | GX-JC06 | |

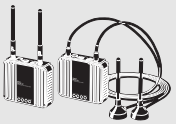
Note: 1. Please do not connect EtherCAT junction slaves with OMRON position control unit, Model CJ1W-NC□81/□82.
2. EtherCAT junction slaves cannot be used for EtherNet/IP and Ethernet.

■ Industrial Switching Hubs for EtherNet/IP and Ethernet

| Product name | Specifications | | | Accessories | Current consumption (A) | Model | Standards | |
|---------------------------|---|--|-------------------|-------------|---|-------|-----------|--------|
| | Functions | No. of ports | Failure detection | | | | | |
| Industrial Switching Hubs |  | Quality of Service (QoS): EtherNet/IP control data priority Failure detection: Broadcast storm and LSI error detection 10/100BASE-TX, Auto-Negotiation | 3 | No | • Power supply connector | 0.22 | W4S1-03B | UC, CE |
| | | | 5 | No | | 0.22 | W4S1-05B | |
| | | | 5 | Yes | • Power supply connector • Connector for informing error | 0.22 | W4S1-05C | CE |

Note: Industrial switching hubs cannot be used for EtherCAT.

■ WE70 FA WIRELESS LAN UNITS

| Product name | Applicable region | Type | Model | Standards |
|---|-------------------|-----------------------|------------|-----------|
| WE70 FA WIRELESS LAN UNITS  | Japan | Access Point (Master) | WE70-AP | --- |
| | | Client (Slave) | WE70-CL | |
| | Europe | Access Point (Master) | WE70-AP-EU | CE |
| | | Client (Slave) | WE70-CL-EU | |
| | U.S | Access Point (Master) | WE70-AP-US | UC |
| | | Client (Slave) | WE70-CL-US | |
| | Canada | Access Point (Master) | WE70-AP-CA | --- |
| | | Client (Slave) | WE70-CL-CA | |
| | China | Access Point (Master) | WE70-AP-CN | --- |
| | | Client (Slave) | WE70-CL-CN | |

Note: 1. A Pencil Antenna, mounting magnet, and screw mounting bracket are included as accessories.
2. Always use a model that is applicable in your region. For example, using the WE70-AP-US outside of the United States is illegal in terms of the usage of electromagnetic waves. Refer to the WE70 Catalog (Cat. No. N154).

Ordering Information

Automation Software

Please purchase a DVD and licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. The license does not include the DVD.

| Product | Specifications | Number of licenses | Media | Model | Standards |
|---|---|--------------------|--------|----------------------|-----------|
| | | | | | |
| Sysmac Studio Standard Edition Ver.1.□□ | 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 *1 | SYSMAC-SE200D | – |
| | | 1 license | – | SYSMAC-SE201L | – |
| | | 3 licenses | – | SYSMAC-SE203L | – |
| | | 10 licenses | – | SYSMAC-SE210L | – |
| | | 30 licenses | – | SYSMAC-SE230L | – |
| | | 50 licenses | – | SYSMAC-SE250L | – |
| Sysmac Studio Vision Edition Ver.1.□□ *2 | Sysmac Studio Vision Edition is limited license that provides selected functions required for FQ-M-series Vision Sensor settings. | 1 license | – | SYSMAC-VE001L | – |

Note: Site licenses are available for users who will run Sysmac Studio on multiple computers. Ask your OMRON sales representative for details.

*1 The same media is used for both the Standard Edition and the Vision Edition.

*2 With the Vision Edition, you can use only the setup functions for FQ-M-series Vision Sensors.

Components

DVD (SYSMAC-SE200D)

| Components | Description |
|-----------------------------|--|
| Introduction | An introduction about components, installation/uninstallation, user registration and auto update of the Sysmac Studio is provided. |
| Setup disk (DVD-ROM) | 1 |

License (SYSMAC-SE2□□L)

| Components | Description |
|-------------------------------|---|
| License Agreement | The license agreement gives the usage conditions and warranty for the Sysmac Studio. |
| License Card | A model number, version, license number, and number of licenses are described. |
| User Registration Card | Two cards are contained. One is for users in Japan and the other is for users in other countries. |

Included Support Software

DVD media of Sysmac Studio includes the following software.

| Included Support Software | Outline |
|-------------------------------------|---|
| CX-Designer Ver.3.□ | The CX-Designer is used to create screens for NS-Series PTs. |
| CX-Integrator Ver.2.□ | The CX-Integrator is used to set up FA networks. |
| CX-Protocol Ver.1.□ | The CX-Protocol is used for protocol macros for Serial Communications Units. |
| Network Configurator Ver.3.□ | The Network Configurator is used for tag data links on the built-in EtherNet/IP port. |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multi-Function Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

NLS Series

Sysmac Studio

G5 Series

MX2 Series

FQM Series

E3X-HD0

GX Series

NS Series

Related Manuals

Ordering Information

CX-Compolet

| Product name | Specification | Model | Standards |
|---------------|---|----------------|-----------|
| CX-Compolet*1 | Software components that can make it easy to create programs for communications between a computer and controllers. This packaged product bundles CX-Compolet and SYSMAC Gateway with 1 license each. Supported execution environment: .NET Framework (1.1, 2.0, 3.0, 3.5 or 4.0) Development environment: Visual Studio .NET*2 / .NET2003/.NET2005/.NET2008/.NET2010 Development languages: Visual Basic .NET, Visual C#.NET, Visual Basic Ver. 5/6*3 Supported communications: Equal to SYSMAC Gateway. | WS02-CPLC1 | - |
| | 3 additional licenses (This product provides only additional licenses. The software must be purchased in advance.) | WS02-CPLC1-L3 | |
| | 5 additional licenses (This product provides only additional licenses. The software must be purchased in advance.) | WS02-CPLC1-L5 | |
| | 10 additional licenses (This product provides only additional licenses. The software must be purchased in advance.) | WS02-CPLC1-L10 | |
| | Software components only. This package includes CX-Compolet with 1 license. SYSMAC Gateway is not included. | WS02-CPLC2 | |

Note: Supported only by the CPU Units with unit version 1.01 or later and the CX-Compolet version 1.30 or higher.

*1 One license is required per computer.

*2 Only the components compatible with CX-Compolet version 2003 are supported.

A development environment of .NET 2003 or higher is required for CIP communications.

*3 Only functions provided by Compolet V2 as ActiveX controls are supported for Visual Basic version 5 or 6.

SYSMAC Gateway (Communications Middleware)

| Product name | Specification | Model | Standards |
|-----------------|---|--------------|-----------|
| SYSMAC Gateway* | Communications middleware for personal computers running Windows. Supports CIP communications and tag data links (EtherNet/IP) in addition to FinsGateway functions. This package includes SYSMAC Gateway with 1 license. (Fins Gateway is also included.) Supported communications: RS-232C, USB, Controller Link, SYSMAC LINK, Ethernet, EtherNet/IP | WS02-SGWC1 | - |
| | 10 additional licenses (This product provides only additional licenses.) | WS02-SGWC1-L | |

Note: Supported only by the CPU Units with unit version 1.01 or later and the SYSMAC Gateway version 1.30 or higher.

* One license is required per computer.

System Requirements (CX-Compolet / SYSMAC Gateway)

| Item | Requirement | | | | |
|---|--|---------------------------------------|---------------------------------|--|---|
| Operating system (OS) Japanese or English system | Microsoft Windows XP SP3 (32bit) | Microsoft Windows Server 2003 (32bit) | Microsoft Windows Vista (32bit) | Microsoft Windows 7 (32bit/64bit) | Microsoft Windows Server 2008 (32bit/64bit) or Microsoft Windows Server 2008 R2 (64bit) |
| Personal compute | Windows computers with Intel x86 processor | | | Windows computers with Intel 32bit (x86) processor or 64bit (x64) -based processor | |
| CPU | Processor recommended by Microsoft. (1 GHz or faster recommended.) | | | Processor recommended by Microsoft. (2 GHz or faster recommended.) | |
| Memory | 512 MB minimum (1 GB min. recommended.) | | | 1 GB minimum (2 GB min. recommended.) | |
| Hard disk | At least 400 MB of available space | | | | |

Note: USB Port on the PC can not be shared between SYSMAC Gateway and CX-One in Windows Vista.

Correspondence between Controller Models and Connected Networks

| Personal Computer Side Controller Model | RS-232C | | | | USB | Ethernet (LAN) | | Controller Link |
|--|---------------------------------|----------------------------------|---|-------------------|------|--------------------|-------------|-----------------|
| | SYSWAY (Host Link C Mode) | SYSWAY-CV (Host Link FINS) | CompoWay/F (master at personal computer) | Peripheral Bus | FINS | Ethernet (FINS) | EtherNet/IP | FINS |
| NJ5 (unit version 1.01 or later)*1 | No | No | No | No | No | No | Yes*2 | No |
| NJ3 (unit version 1.01 or later)*1 | No | No | No | No | No | No | Yes*2 | No |

*1. To connect the NJ Controller, CX-Compolet / SYSMAC Gateway version 1.30 or higher is required.

*2. Tag data links between SYSMAC Gateway and the NJ-series CPU Unit can be created within the CJ-series specifications for variable with basic data type, array variable, and structure variable. SYSMAC Gateway memory allocation of structure variable is the same as the CJ-series.

AC Servomotor/Drives **G5-Series**

Interpreting Model Numbers

Servo Drive Model Numbers

R88D-K N 01 H -ECT

(1) (2) (3) (4) (5)

| No | Item | Symbol | Specifications |
|-----|--|--------|-------------------------|
| (1) | G5-Series Servo Drive | | |
| (2) | Drive Type | N | Communication type |
| (3) | Maximum Applicable Servomotor Capacity | A5 | 50 W |
| | | 01 | 100 W |
| | | 02 | 200 W |
| | | 04 | 400 W |
| | | 06 | 600 W |
| | | 08 | 750 W |
| | | 10 | 1 W |
| | | 15 | 1.5 kW |
| | | 20 | 2 kW |
| | | 30 | 3 kW |
| | | 40 | 4 kW |
| | | 50 | 5 kW |
| | | 75 | 7.5 kW |
| 150 | 15 kW | | |
| (4) | Power Supply Voltage | L | 100 VAC |
| | | H | 200 VAC |
| | | F | 400 VAC |
| (5) | Network type | -ECT | EtherCAT Communications |

Servomotor Model Numbers

R88M-K □ 750 30 H -BO S2

(1) (2) (3) (4) (5) (6)

| No | Item | Symbol | Specifications |
|------|----------------------|--------|---|
| (1) | G5-Series Servomotor | | |
| (2) | Motor Type | Blank | Cylinder type |
| (3) | Servomotor Capacity | – | – |
| | | 050 | 50 W |
| | | 100 | 100 W |
| | | 200 | 200 W |
| | | 400 | 400 W |
| | | 600 | 600 W |
| | | 750 | 750 W |
| | | 900 | 900 W |
| | | 1K0 | 1 kW |
| | | 1K5 | 1.5 kW |
| | | 2K0 | 2 kW |
| | | 3K0 | 3 kW |
| | | 4K0 | 4 kW |
| | | 4K5 | 4.5 kW |
| | | 5K0 | 5 kW |
| | | 6K0 | 6 kW |
| | | 7K5 | 7.5 kW |
| 11K0 | 11 kW | | |
| 15K0 | 15 kW | | |
| (4) | Rated Rotation Speed | 10 | 1,000 r/min |
| | | 15 | 1,500 r/min |
| | | 20 | 2,000 r/min |
| | | 30 | 3,000 r/min |
| (5) | Applied Voltage | F | 400 VAC (with incremental encoder specifications) INC |
| | | H | 200 VAC (with incremental encoder specifications) INC |
| | | L | 100 VAC (with incremental encoder specifications) INC |
| | | C | 400 VAC (with absolute encoder specifications) ABS/INC |
| | | T | 200VAC (with absolute encoder specifications) ABS/INC |
| | | S | 100 VAC (with absolute encoder specifications) ABS/INC |
| (6) | Option | Blank | Straight shaft |
| | | B | With brake |
| | | O | With oil seal |
| | | S2 | With key and tap |

Note: **INC** incremental encoder: 20bit
ABS/INC incremental encoder: 17bit, absolute encoder: 17bit

Understanding Decelerator Model Numbers (Backlash = 3' Max./Backlash = 15' Max.)

Backlash = 3' Max.

R88G-HPG 14A 05 100 S B J
 (1) (2) (3) (4) (5) (6) (7)

Backlash = 15' Max.

R88G-VRSF 09 B 100 C J
 (1) (2) (3) (4) (5) (6) (7)

| No | Item | Symbol | Specifications |
|-----|--|--------|-------------------------------------|
| (1) | Decelerator for G□-Series Servomotors Backlash = 3' Max. | | |
| (2) | Flange Size Number | 11B | □40 |
| | | 14A | □60 |
| | | 20A | □90 |
| | | 32A | □120 |
| | | 50A | □170 |
| | | 65A | □230 |
| (3) | Gear Ratio | 05 | 1/5 |
| | | 09 | 1/9 (only frame number 11B) |
| | | 11 | 1/11 (except frame number 65A) |
| | | 12 | 1/12 (only frame number 65A) |
| | | 20 | 1/20 (only frame number 65A) |
| | | 21 | 1/21 (except frame number 65A) |
| | | 25 | 1/25 (only frame number 65A) |
| | | 33 | 1/33 |
| (4) | Applicable Servomotor Capacity | 050 | 50 W |
| | | 100 | 100 W |
| | | 200 | 200 W |
| | | 400 | 400 W |
| | | 750 | 750 W |
| | | 900 | 900 W |
| | | 1K0 | 1 kW |
| | | 1K5 | 1.5 kW |
| | | 2K0 | 2 kW |
| | | 3K0 | 3 kW |
| | | 4K0 | 4 kW |
| | | 4K5 | 4.5 kW |
| | | 5K0 | 5 kW |
| (5) | Motor Type | Blank | 3,000-r/min cylindrical servomotors |
| | | - | - |
| | | S | 2,000-r/min cylindrical servomotors |
| | | T | 1,000-r/min cylindrical servomotors |
| (6) | Backlash | B | Backlash = 3' Max |
| (7) | Option | Blank | Straight shaft |
| | | J | With key and tap |

| No | Item | Symbol | Specifications |
|-----|---|--------|-------------------------------------|
| (1) | Decelerator for G□-Series Servomotors Backlash = 15' Max. | | |
| (2) | Gear Ratio | 05 | 1/5 |
| | | 09 | 1/9 |
| | | 15 | 1/15 |
| | | 25 | 1/25 |
| (3) | Flange Size Number | B | □52 |
| | | C | □78 |
| (4) | Applicable Servomotor Capacity | D | □98 |
| | | 050 | 50 W |
| | | 100 | 100 W |
| | | 200 | 200 W |
| | | 400 | 400 W |
| (5) | Motor Type | 750 | 750 W |
| | | Blank | 3,000-r/min cylindrical servomotors |
| (6) | Backlash | C | Backlash = 15' Max |
| (7) | Option | J | With key (without tap) |

Table of Servomotor Variations

R88M-K -

(3) (4) (5) (6) (7) (8) (9)

| (3) Type | (4) Applicable Servomotor Capacity | (5) Rotation speed | Model | (6) Applied Voltage | | | | | | (7) With brake / Without brake | | (8) Models with oil seals | | (9) Shaft type | | |
|-------------|---------------------------------------|---|---|------------------------|---|-----|-----|-----|-----|-----------------------------------|---|------------------------------|--|-------------------|---|--|
| | | | | INC | INC | INC | ABS | ABS | ABS | - | B | Blank | O | Blank | S2 | |
| | | | | 400 | 200 | 100 | 400 | 200 | 100 | | | | | | | |
| | | | | F | H | L | C | T | S | Blank | With brake | | | | | |
| Cylinder | 50 W | 3,000 r/min | R88M-K05030 *1 | | √ | | | √ | | | √ | √ | √ | √ | | |
| | 100 W | | R88M-K10030 | | √ | √ | | √ | √ | | √ | √ | √ | √ | | |
| | 200 W | | R88M-K20030 | | √ | √ | | √ | √ | | √ | √ | √ | √ | | |
| | 400 W | | R88M-K40030 | | √ | √ | | √ | √ | | √ | √ | √ | √ | | |
| | 750 W | | R88M-K75030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 1 kW | | R88M-K1K030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 1.5 kW | | R88M-K1K530 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 2 kW | | R88M-K2K030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 3 kW | | R88M-K3K030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 4 kW | | R88M-K4K030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 5 kW | | R88M-K5K030 | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 400 W | | R88M-K40020 | 2,000 r/min | R88M-K40020 | √ | | | √ | | | √ | √ | √ | √ | |
| | 600 W | R88M-K60020 | √ | | | | √ | | | √ | √ | √ | √ | √ | | |
| | 1 kW | R88M-K1K020 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 1.5 kW | R88M-K1K520 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 2 kW | R88M-K2K020 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 3 kW | R88M-K3K020 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 4 kW | R88M-K4K020 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 5 kW | R88M-K5K020 | √ | | √ | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 7.5 kW | R88M-K7K515 *2 | | | | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 11 kW | R88M-K11K015 *2 | | | | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 15 kW | R88M-K15K015 *2 | | | | | √ | √ | | √ | √ | √ | √ | √ | | |
| | 900 W | R88M-K90010 | 1,000 r/min | | R88M-K90010 | √ | √ | | √ | √ | | √ | √ | √ | √ | |
| | 2 kW | R88M-K2K010 | | √ | √ | | √ | √ | | √ | √ | √ | √ | | | |
| | 3 kW | R88M-K3K010 | | √ | √ | | √ | √ | | √ | √ | √ | √ | | | |
| | 4.5 kW | R88M-K4K510 | | | | | √ | √ | | √ | √ | √ | √ | | | |
| | 6 kW | R88M-K6K010 | | | | | √ | √ | | √ | √ | √ | √ | | | |
| | Blank: Cylinder type | example 030: 30 W 100: 100 W 1K0: 1 kW | 10: 1,000 r/min 20: 2,000 r/min 30: 3,000 r/min | | F: 400 VAC (with incremental encoder) INC H: 200 VAC (with incremental encoder) INC L: 100 VAC (with incremental encoder) INC C: 400 VAC (with absolute encoder) ABS/INC T: 200 VAC (with absolute encoder) ABS/INC S: 100 VAC (with absolute encoder) ABS/INC | | | | | | Blank: Without brake B: 24 VDC With brake | | Blank: Without oil seals O: With oil seals | | Blank: Straight shaft S2: With key and tap | |

*1 R88M-K05030H-□, R88M-K05030T-□, can be used for Power Supply Voltage of 100/200VAC.

*2 The rated speed is 1,500 r/min.

Ordering Information

AC Servo Drives EtherCAT Communications

| Specifications | | Model |
|-------------------------------------|--------------------------------|-----------------|
| Power Model Supply Voltage | Applicable Servomotor Capacity | |
| Single-phase 100 VAC | 50 W | R88D-KNA5L-ECT |
| | 100 W | R88D-KN01L-ECT |
| | 200 W | R88D-KN02L-ECT |
| | 400 W | R88D-KN04L-ECT |
| Single-phase/three-phase 200 VAC | 100 W | R88D-KN01H-ECT |
| | 200 W | R88D-KN02H-ECT |
| | 400 W | R88D-KN04H-ECT |
| | 750 W | R88D-KN08H-ECT |
| | 1 kW | R88D-KN10H-ECT |
| Three-phase 200 VAC | 1.5 kW | R88D-KN15H-ECT |
| | 2 kW | R88D-KN20H-ECT |
| | 3 kW | R88D-KN30H-ECT |
| | 5 kW | R88D-KN50H-ECT |
| | 7.5 kW | R88D-KN75H-ECT |
| Three-phase 400 VAC | 15 kW | R88D-KN150H-ECT |
| | 600 W | R88D-KN06F-ECT |
| | 1 kW | R88D-KN10F-ECT |
| | 1.5 kW | R88D-KN15F-ECT |
| | 2 kW | R88D-KN20F-ECT |
| | 3 kW | R88D-KN30F-ECT |
| | 5 kW | R88D-KN50F-ECT |
| | 7.5 kW | R88D-KN75F-ECT |
| 15 kW | R88D-KN150F-ECT | |

Note: When connecting a Servo Drive to the NJ-Series Machine Automation Controller, it is recommended that you use the Servo Drive with Built-in EtherCAT Communications, R88D-KN□□□-ECT, with unit version 2.1 or later.

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

NJ5 Series

Sysmac Studio

Multi-Function Compact Inverter

G5 Series

MX2 Series

Vision Sensor

FQM Series

Fiber Sensor

EX-HD0

GX Series

Remote I/O Terminals

NS Series

Related Manuals

Ordering Information

Servomotors

<Cylinder Type>
3,000-r/min servomotors

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 3,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|-----------------|-------------------|---------------------------------|--|
| | | | With incremental encoder | |
| | | | Straight shaft with key and tap | |
| Voltage | Rated output | Without oil seals | | |
| Without brake | 100 V | 50 W | R88M-K05030H-S2 | |
| | | 100 W | R88M-K10030L-S2 | |
| | | 200 W | R88M-K20030L-S2 | |
| | | 400 W | R88M-K40030L-S2 | |
| | 200 V | 50 W | R88M-K05030H-S2 | |
| | | 100 W | R88M-K10030H-S2 | |
| | | 200 W | R88M-K20030H-S2 | |
| | | 400 W | R88M-K40030H-S2 | |
| | | 750 W | R88M-K75030H-S2 | |
| | | 1 kW | R88M-K1K030H-S2 | |
| | | 1.5 kW | R88M-K1K530H-S2 | |
| | | 2 kW | R88M-K2K030H-S2 | |
| 3 kW | | R88M-K3K030H-S2 | | |
| 4 kW | | R88M-K4K030H-S2 | | |
| 5 kW | R88M-K5K030H-S2 | | | |
| 400 V | 750 W | R88M-K75030F-S2 | | |
| | 1 kW | R88M-K1K030F-S2 | | |
| | 1.5 kW | R88M-K1K530F-S2 | | |
| | 2 kW | R88M-K2K030F-S2 | | |
| | 3 kW | R88M-K3K030F-S2 | | |
| | 4 kW | R88M-K4K030F-S2 | | |
| With brake | 100 V | 50 W | R88M-K05030H-BS2 | |
| | | 100 W | R88M-K10030L-BS2 | |
| | | 200 W | R88M-K20030L-BS2 | |
| | | 400 W | R88M-K40030L-BS2 | |
| | 200 V | 50 W | R88M-K05030H-BS2 | |
| | | 100 W | R88M-K10030H-BS2 | |
| | | 200 W | R88M-K20030H-BS2 | |
| | | 400 W | R88M-K40030H-BS2 | |
| | | 750 W | R88M-K75030H-BS2 | |
| | | 1 kW | R88M-K1K030H-BS2 | |
| | | 1.5 kW | R88M-K1K530H-BS2 | |
| | | 2 kW | R88M-K2K030H-BS2 | |
| | | 3 kW | R88M-K3K030H-BS2 | |
| | | 4 kW | R88M-K4K030H-BS2 | |
| | 5 kW | R88M-K5K030H-BS2 | | |
| | 400 V | 750 W | R88M-K75030F-BS2 | |
| | | 1 kW | R88M-K1K030F-BS2 | |
| | | 1.5 kW | R88M-K1K530F-BS2 | |
| | | 2 kW | R88M-K2K030F-BS2 | |
| | | 3 kW | R88M-K3K030F-BS2 | |
| | | 4 kW | R88M-K4K030F-BS2 | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 3,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|--------------|-------------------|----------------------------|--|
| | | | With incremental encoder | |
| | | | Straight shaft without key | |
| Voltage | Rated output | Without oil seals | | |
| Without brake | 100 V | 50 W | R88M-K05030H | |
| | | 100 W | R88M-K10030L | |
| | | 200 W | R88M-K20030L | |
| | | 400 W | R88M-K40030L | |
| | 200 V | 50 W | R88M-K05030H | |
| | | 100 W | R88M-K10030H | |
| | | 200 W | R88M-K20030H | |
| | | 400 W | R88M-K40030H | |
| | | 750 W | R88M-K75030H | |
| | | 1 kW | R88M-K1K030H | |
| | | 1.5 kW | R88M-K1K530H | |
| | | 2 kW | R88M-K2K030H | |
| 3 kW | | R88M-K3K030H | | |
| 4 kW | | R88M-K4K030H | | |
| 5 kW | R88M-K5K030H | | | |
| 400 V | 750 W | R88M-K75030F | | |
| | 1 kW | R88M-K1K030F | | |
| | 1.5 kW | R88M-K1K530F | | |
| | 2 kW | R88M-K2K030F | | |
| | 3 kW | R88M-K3K030F | | |
| | 4 kW | R88M-K4K030F | | |
| With brake | 100 V | 50 W | R88M-K05030H-B | |
| | | 100 W | R88M-K10030L-B | |
| | | 200 W | R88M-K20030L-B | |
| | | 400 W | R88M-K40030L-B | |
| | 200 V | 50 W | R88M-K05030H-B | |
| | | 100 W | R88M-K10030H-B | |
| | | 200 W | R88M-K20030H-B | |
| | | 400 W | R88M-K40030H-B | |
| | | 750 W | R88M-K75030H-B | |
| | | 1 kW | R88M-K1K030H-B | |
| | | 1.5 kW | R88M-K1K530H-B | |
| | | 2 kW | R88M-K2K030H-B | |
| | | 3 kW | R88M-K3K030H-B | |
| | | 4 kW | R88M-K4K030H-B | |
| | 5 kW | R88M-K5K030H-B | | |
| | 400 V | 750 W | R88M-K75030F-B | |
| | | 1 kW | R88M-K1K030F-B | |
| | | 1.5 kW | R88M-K1K530F-B | |
| | | 2 kW | R88M-K2K030F-B | |
| | | 3 kW | R88M-K3K030F-B | |
| | | 4 kW | R88M-K4K030F-B | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 3,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 3,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|--------------|-------------------|--------------------------------|--|
| | | | With absolute encoder | |
| | | | Straight shaft withkey and tap | |
| Voltage | Rated output | Without oil seals | | |
| Without brake | 100 V | 50 W | R88M-K05030T-S2 | |
| | | 100 W | R88M-K10030S-S2 | |
| | | 200 W | R88M-K20030S-S2 | |
| | | 400 W | R88M-K40030S-S2 | |
| | 200 V | 50 W | R88M-K05030T-S2 | |
| | | 100 W | R88M-K10030T-S2 | |
| | | 200 W | R88M-K20030T-S2 | |
| | | 400 W | R88M-K40030T-S2 | |
| | | 750 W | R88M-K75030T-S2 | |
| | | 1 kW | R88M-K1K030T-S2 | |
| | | 1.5 kW | R88M-K1K530T-S2 | |
| | | 2 kW | R88M-K2K030T-S2 | |
| 400 V | 3 kW | R88M-K3K030T-S2 | | |
| | 4 kW | R88M-K4K030T-S2 | | |
| | 5 kW | R88M-K5K030T-S2 | | |
| | 750 W | R88M-K75030C-S2 | | |
| | 1 kW | R88M-K1K030C-S2 | | |
| | 1.5 kW | R88M-K1K530C-S2 | | |
| With brake | 100 V | 50 W | R88M-K05030T-BS2 | |
| | | 100 W | R88M-K10030S-BS2 | |
| | | 200 W | R88M-K20030S-BS2 | |
| | | 400 W | R88M-K40030S-BS2 | |
| | 200 V | 50 W | R88M-K05030T-BS2 | |
| | | 100 W | R88M-K10030T-BS2 | |
| | | 200 W | R88M-K20030T-BS2 | |
| | | 400 W | R88M-K40030T-BS2 | |
| | | 750 W | R88M-K75030T-BS2 | |
| | | 1 kW | R88M-K1K030T-BS2 | |
| | | 1.5 kW | R88M-K1K530T-BS2 | |
| | | 2 kW | R88M-K2K030T-BS2 | |
| 400 V | 3 kW | R88M-K3K030T-BS2 | | |
| | 4 kW | R88M-K4K030T-BS2 | | |
| | 5 kW | R88M-K5K030T-BS2 | | |
| | 750 W | R88M-K75030C-BS2 | | |
| | 1 kW | R88M-K1K030C-BS2 | | |
| | 1.5 kW | R88M-K1K530C-BS2 | | |

| Specifications | | | Model | |
|----------------|--------------|-------------------|----------------------------|--|
| | | | With absolute encoder | |
| | | | Straight shaft without key | |
| Voltage | Rated output | Without oil seals | | |
| Without brake | 100 V | 50 W | R88M-K05030T | |
| | | 100 W | R88M-K10030S | |
| | | 200 W | R88M-K20030S | |
| | | 400 W | R88M-K40030S | |
| | 200 V | 50 W | R88M-K05030T | |
| | | 100 W | R88M-K10030T | |
| | | 200 W | R88M-K20030T | |
| | | 400 W | R88M-K40030T | |
| | | 750 W | R88M-K75030T | |
| | | 1 kW | R88M-K1K030T | |
| | | 1.5 kW | R88M-K1K530T | |
| | | 2 kW | R88M-K2K030T | |
| 400 V | 3 kW | R88M-K3K030T | | |
| | 4 kW | R88M-K4K030T | | |
| | 5 kW | R88M-K5K030T | | |
| | 750 W | R88M-K75030C | | |
| | 1 kW | R88M-K1K030C | | |
| | 1.5 kW | R88M-K1K530C | | |
| With brake | 100 V | 50 W | R88M-K05030T-B | |
| | | 100 W | R88M-K10030S-B | |
| | | 200 W | R88M-K20030S-B | |
| | | 400 W | R88M-K40030S-B | |
| | 200 V | 50 W | R88M-K05030T-B | |
| | | 100 W | R88M-K10030T-B | |
| | | 200 W | R88M-K20030T-B | |
| | | 400 W | R88M-K40030T-B | |
| | | 750 W | R88M-K75030T-B | |
| | | 1 kW | R88M-K1K030T-B | |
| | | 1.5 kW | R88M-K1K530T-B | |
| | | 2 kW | R88M-K2K030T-B | |
| 400 V | 3 kW | R88M-K3K030T-B | | |
| | 4 kW | R88M-K4K030T-B | | |
| | 5 kW | R88M-K5K030T-B | | |
| | 750 W | R88M-K75030C-B | | |
| | 1 kW | R88M-K1K030C-B | | |
| | 1.5 kW | R88M-K1K530C-B | | |

Note: Models with oil seals are also available.

Note: Models with oil seals are also available.

2,000-r/min servomotors

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 2,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | | |
|----------------|------------------|-------------------|---------------------------------|------------------|------------------|
| | | | With incremental encoder | | |
| | | | Straight shaft with key and tap | | |
| Voltage | Rated output | Without oil seals | | | |
| Without brake | 200 V | 1 kW | R88M-K1K020H-S2 | | |
| | | 1.5 kW | R88M-K1K520H-S2 | | |
| | | 2 kW | R88M-K2K020H-S2 | | |
| | | 3 kW | R88M-K3K020H-S2 | | |
| | | 4 kW | R88M-K4K020H-S2 | | |
| | | 5 kW | R88M-K5K020H-S2 | | |
| Without brake | 400 V | 400 W | R88M-K40020F-S2 | | |
| | | 600 W | R88M-K60020F-S2 | | |
| | | 1 kW | R88M-K1K020F-S2 | | |
| | | 1.5 kW | R88M-K1K520F-S2 | | |
| | | 2 kW | R88M-K2K020F-S2 | | |
| | | 3 kW | R88M-K3K020F-S2 | | |
| | | 4 kW | R88M-K4K020F-S2 | | |
| | | 5 kW | R88M-K5K020F-S2 | | |
| | | With brake | 200 V | 1 kW | R88M-K1K020H-BS2 |
| | | | | 1.5 kW | R88M-K1K520H-BS2 |
| 2 kW | R88M-K2K020H-BS2 | | | | |
| 3 kW | R88M-K3K020H-BS2 | | | | |
| 4 kW | R88M-K4K020H-BS2 | | | | |
| 5 kW | R88M-K5K020H-BS2 | | | | |
| With brake | 400 V | | 400 W | R88M-K40020F-BS2 | |
| | | | 600 W | R88M-K60020F-BS2 | |
| | | | 1 kW | R88M-K1K020F-BS2 | |
| | | | 1.5 kW | R88M-K1K520F-BS2 | |
| | | | 2 kW | R88M-K2K020F-BS2 | |
| | | | 3 kW | R88M-K3K020F-BS2 | |
| | | | 4 kW | R88M-K4K020F-BS2 | |
| | | | 5 kW | R88M-K5K020F-BS2 | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 2,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | | |
|----------------|----------------|-------------------|----------------------------|----------------|----------------|
| | | | With incremental encoder | | |
| | | | Straight shaft without key | | |
| Voltage | Rated output | Without oil seals | | | |
| Without brake | 200 V | 1 kW | R88M-K1K020H | | |
| | | 1.5 kW | R88M-K1K520H | | |
| | | 2 kW | R88M-K2K020H | | |
| | | 3 kW | R88M-K3K020H | | |
| | | 4 kW | R88M-K4K020H | | |
| | | 5 kW | R88M-K5K020H | | |
| Without brake | 400 V | 400 W | R88M-K40020F | | |
| | | 600 W | R88M-K60020F | | |
| | | 1 kW | R88M-K1K020F | | |
| | | 1.5 kW | R88M-K1K520F | | |
| | | 2 kW | R88M-K2K020F | | |
| | | 3 kW | R88M-K3K020F | | |
| | | 4 kW | R88M-K4K020F | | |
| | | 5 kW | R88M-K5K020F | | |
| | | With brake | 200 V | 1 kW | R88M-K1K020H-B |
| | | | | 1.5 kW | R88M-K1K520H-B |
| 2 kW | R88M-K2K020H-B | | | | |
| 3 kW | R88M-K3K020H-B | | | | |
| 4 kW | R88M-K4K020H-B | | | | |
| 5 kW | R88M-K5K020H-B | | | | |
| With brake | 400 V | | 400 W | R88M-K40020F-B | |
| | | | 600 W | R88M-K60020F-B | |
| | | | 1 kW | R88M-K1K020F-B | |
| | | | 1.5 kW | R88M-K1K520F-B | |
| | | | 2 kW | R88M-K2K020F-B | |
| | | | 3 kW | R88M-K3K020F-B | |
| | | | 4 kW | R88M-K4K020F-B | |
| | | | 5 kW | R88M-K5K020F-B | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 2,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|---------------------|---------------------|-----------------------|---------------------------------|
| | | | With absolute encoder | Straight shaft with key and tap |
| Voltage | Rated output | Without oil seals | | |
| | | 200 V | 1 kW | R88M-K1K020T-S2 |
| 1.5 kW | R88M-K1K520T-S2 | | | |
| 2 kW | R88M-K2K020T-S2 | | | |
| 3 kW | R88M-K3K020T-S2 | | | |
| 4 kW | R88M-K4K020T-S2 | | | |
| 5 kW | R88M-K5K020T-S2 | | | |
| 7.5 kW | R88M-K7K515T-S2 * | | | |
| 11 kW | R88M-K11K015T-S2 * | | | |
| 15 kW | R88M-K15K015T-S2 * | | | |
| 400 V | 400 W | | R88M-K40020C-S2 | |
| | 600 W | | R88M-K60020C-S2 | |
| | 1 kW | | R88M-K1K020C-S2 | |
| | 1.5 kW | | R88M-K1K520C-S2 | |
| | 2 kW | | R88M-K2K020C-S2 | |
| | 3 kW | R88M-K3K020C-S2 | | |
| | 4 kW | R88M-K4K020C-S2 | | |
| | 5 kW | R88M-K5K020C-S2 | | |
| | 7.5 kW | R88M-K7K515C-S2 * | | |
| | 11 kW | R88M-K11K015C-S2 * | | |
| 15 kW | R88M-K15K015C-S2 * | | | |
| 200 V | 1 kW | R88M-K1K020T-BS2 | | |
| | 1.5 kW | R88M-K1K520T-BS2 | | |
| | 2 kW | R88M-K2K020T-BS2 | | |
| | 3 kW | R88M-K3K020T-BS2 | | |
| | 4 kW | R88M-K4K020T-BS2 | | |
| | 5 kW | R88M-K5K020T-BS2 | | |
| | 7.5 kW | R88M-K7K515T-BS2 * | | |
| | 11 kW | R88M-K11K015T-BS2 * | | |
| | 15 kW | R88M-K15K015T-BS2 * | | |
| | 400 V | 400 W | R88M-K40020C-BS2 | |
| | | 600 W | R88M-K60020C-BS2 | |
| | | 1 kW | R88M-K1K020C-BS2 | |
| | | 1.5 kW | R88M-K1K520C-BS2 | |
| | | 2 kW | R88M-K2K020C-BS2 | |
| 3 kW | | R88M-K3K020C-BS2 | | |
| 4 kW | | R88M-K4K020C-BS2 | | |
| 5 kW | | R88M-K5K020C-BS2 | | |
| 7.5 kW | | R88M-K7K515C-BS2 * | | |
| 11 kW | | R88M-K11K015C-BS2 * | | |
| 15 kW | R88M-K15K015C-BS2 * | | | |

Note: Models with oil seals are also available.
 * The rated speed is 1,500 r/min.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 2,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|-------------------|-------------------|-----------------------|----------------------------|
| | | | With absolute encoder | Straight shaft without key |
| Voltage | Rated output | Without oil seals | | |
| | | 200 V | 1 kW | R88M-K1K020T |
| 1.5 kW | R88M-K1K520T | | | |
| 2 kW | R88M-K2K020T | | | |
| 3 kW | R88M-K3K020T | | | |
| 4 kW | R88M-K4K020T | | | |
| 5 kW | R88M-K5K020T | | | |
| 7.5 kW | R88M-K7K515T * | | | |
| 11 kW | R88M-K11K015T * | | | |
| 15 kW | R88M-K15K015T * | | | |
| 400 V | 400 W | | R88M-K40020C | |
| | 600 W | R88M-K60020C | | |
| | 1 kW | R88M-K1K020C | | |
| | 1.5 kW | R88M-K1K520C | | |
| | 2 kW | R88M-K2K020C | | |
| | 3 kW | R88M-K3K020C | | |
| | 4 kW | R88M-K4K020C | | |
| | 5 kW | R88M-K5K020C | | |
| | 7.5 kW | R88M-K7K515C * | | |
| | 11 kW | R88M-K11K015C * | | |
| 15 kW | R88M-K15K015C * | | | |
| 200 V | 1 kW | R88M-K1K020T-B | | |
| | 1.5 kW | R88M-K1K520T-B | | |
| | 2 kW | R88M-K2K020T-B | | |
| | 3 kW | R88M-K3K020T-B | | |
| | 4 kW | R88M-K4K020T-B | | |
| | 5 kW | R88M-K5K020T-B | | |
| | 7.5 kW | R88M-K7K515T-B * | | |
| | 11 kW | R88M-K11K015T-B * | | |
| | 15 kW | R88M-K15K015T-B * | | |
| | 400 V | 400 W | R88M-K40020C-B | |
| 600 W | | R88M-K60020C-B | | |
| 1 kW | | R88M-K1K020C-B | | |
| 1.5 kW | | R88M-K1K520C-B | | |
| 2 kW | | R88M-K2K020C-B | | |
| 3 kW | | R88M-K3K020C-B | | |
| 4 kW | | R88M-K4K020C-B | | |
| 5 kW | | R88M-K5K020C-B | | |
| 7.5 kW | | R88M-K7K515C-B * | | |
| 11 kW | | R88M-K11K015C-B * | | |
| 15 kW | R88M-K15K015C-B * | | | |

Note: Models with oil seals are also available.
 * The rated speed is 1,500 r/min.

System Configuration
 Machine Automation Controller
 Automation Software
 AC Servomotors / Servo Drives
 Multi-Function Compact Inverter
 Vision Sensor
 Fiber Sensor
 Remote I/O Terminals
 Ordering Information

NLS Series
 Synrac Studio
 G5 Series
 MX2 Series
 FOM Series
 EX-HD0
 GX Series
 NS Series
 Related Manuals

1,000-r/min servomotors

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 1,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|-----------------|-------------------|---------------------------------|-------|
| | | | Straight shaft with key and tap | |
| Voltage | Rated output | Without oil seals | | |
| | | Without brake | 200 V | 900 W |
| 2 kW | R88M-K2K010H-S2 | | | |
| 3 kW | R88M-K3K010H-S2 | | | |
| 400 V | 900 W | 900 W | R88M-K90010F-S2 | |
| | | 2 kW | R88M-K2K010F-S2 | |
| | | 3 kW | R88M-K3K010F-S2 | |
| With brake | 200 V | 900 W | R88M-K90010H-BS2 | |
| | | 2 kW | R88M-K2K010H-BS2 | |
| | | 3 kW | R88M-K3K010H-BS2 | |
| | 400 V | 900 W | R88M-K90010F-BS2 | |
| | | 2 kW | R88M-K2K010F-BS2 | |
| | | 3 kW | R88M-K3K010F-BS2 | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 1,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|--------------|-------------------|----------------------------|-------|
| | | | Straight shaft without key | |
| Voltage | Rated output | Without oil seals | | |
| | | Without brake | 200 V | 900 W |
| 2 kW | R88M-K2K010H | | | |
| 3 kW | R88M-K3K010H | | | |
| 400 V | 900 W | 900 W | R88M-K90010F | |
| | | 2 kW | R88M-K2K010F | |
| | | 3 kW | R88M-K3K010F | |
| With brake | 200 V | 900 W | R88M-K90010H-B | |
| | | 2 kW | R88M-K2K010H-B | |
| | | 3 kW | R88M-K3K010H-B | |
| | 400 V | 900 W | R88M-K90010F-B | |
| | | 2 kW | R88M-K2K010F-B | |
| | | 3 kW | R88M-K3K010F-B | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 1,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|-----------------|-------------------|---------------------------------|-------|
| | | | Straight shaft with key and tap | |
| Voltage | Rated output | Without oil seals | | |
| | | Without brake | 200 V | 900 W |
| 2 kW | R88M-K2K010T-S2 | | | |
| 3 kW | R88M-K3K010T-S2 | | | |
| 4.5 kW | R88M-K4K510T-S2 | | | |
| 6 kW | R88M-K6K010T-S2 | | | |
| 400 V | 900 W | 900 W | R88M-K90010C-S2 | |
| | | 2 kW | R88M-K2K010C-S2 | |
| | | 3 kW | R88M-K3K010C-S2 | |
| | | 4.5 kW | R88M-K4K510C-S2 | |
| | | 6 kW | R88M-K6K010C-S2 | |
| With brake | 200 V | 900 W | R88M-K90010T-BS2 | |
| | | 2 kW | R88M-K2K010T-BS2 | |
| | | 3 kW | R88M-K3K010T-BS2 | |
| | | 4.5 kW | R88M-K4K510T-BS2 | |
| | | 6 kW | R88M-K6K010T-BS2 | |
| | 400 V | 900 W | R88M-K90010C-BS2 | |
| | | 2 kW | R88M-K2K010C-BS2 | |
| | | 3 kW | R88M-K3K010C-BS2 | |
| | | 4.5 kW | R88M-K4K510C-BS2 | |
| | | 6 kW | R88M-K6K010C-BS2 | |

Note: Models with oil seals are also available.

| Rotation speed | Encoder | Option |
|----------------|---------|-------------|
| 1,000 r/min | INC | Without key |
| | ABS/INC | With key |

| Specifications | | | Model | |
|----------------|--------------|-------------------|----------------------------|-------|
| | | | Straight shaft without key | |
| Voltage | Rated output | Without oil seals | | |
| | | Without brake | 200 V | 900 W |
| 2 kW | R88M-K2K010T | | | |
| 3 kW | R88M-K3K010T | | | |
| 4.5 kW | R88M-K4K510T | | | |
| 6 kW | R88M-K6K010T | | | |
| 400 V | 900 W | 900 W | R88M-K90010C | |
| | | 2 kW | R88M-K2K010C | |
| | | 3 kW | R88M-K3K010C | |
| | | 4.5 kW | R88M-K4K510C | |
| | | 6 kW | R88M-K6K010C | |
| With brake | 200 V | 900 W | R88M-K90010T-B | |
| | | 2 kW | R88M-K2K010T-B | |
| | | 3 kW | R88M-K3K010T-B | |
| | | 4.5 kW | R88M-K4K510T-B | |
| | | 6 kW | R88M-K6K010T-B | |
| | 400 V | 900 W | R88M-K90010C-B | |
| | | 2 kW | R88M-K2K010C-B | |
| | | 3 kW | R88M-K3K010C-B | |
| | | 4.5 kW | R88M-K4K510C-B | |
| | | 6 kW | R88M-K6K010C-B | |

Note: Models with oil seals are also available.

Decelerators (Backlash = 3' Max./Backlash = 15' Max.)

Backlash = 3' Max
<Cylinder Type>

3,000-r/min servomotors

Straight shaft without key

| Motor capacity | Gear Ratio | Model (Straight shaft) |
|----------------|------------|------------------------|
| 50 W | 1/5 | R88G-HPG11B05100B |
| | 1/9 | R88G-HPG11B09050B |
| | 1/21 | R88G-HPG14A211100B |
| | 1/33 | R88G-HPG14A33050B |
| | 1/45 | R88G-HPG14A45050B |
| 100 W | 1/5 | R88G-HPG11B05100B |
| | 1/11 | R88G-HPG14A111100B |
| | 1/21 | R88G-HPG14A211100B |
| | 1/33 | R88G-HPG20A33100B |
| | 1/45 | R88G-HPG20A45100B |
| 200 W | 1/5 | R88G-HPG14A05200B |
| | 1/11 | R88G-HPG14A11200B |
| | 1/21 | R88G-HPG20A21200B |
| | 1/33 | R88G-HPG20A33200B |
| | 1/45 | R88G-HPG20A45200B |
| 400 W | 1/5 | R88G-HPG14A05400B |
| | 1/11 | R88G-HPG20A11400B |
| | 1/21 | R88G-HPG20A21400B |
| | 1/33 | R88G-HPG32A33400B |
| | 1/45 | R88G-HPG32A45400B |
| 750 W (200 V) | 1/5 | R88G-HPG20A05750B |
| | 1/11 | R88G-HPG20A11750B |
| | 1/21 | R88G-HPG32A21750B |
| | 1/33 | R88G-HPG32A33750B |
| | 1/45 | R88G-HPG32A45750B |
| 750W (400 V) | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG32A211K5B |
| | 1/33 | R88G-HPG32A33600SB |
| | 1/45 | R88G-HPG50A451K5B |
| 1kW | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG32A211K5B |
| | 1/33 | R88G-HPG50A332K0B |
| | 1/45 | R88G-HPG50A451K5B |
| 1.5kW | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG32A211K5B |
| | 1/33 | R88G-HPG50A332K0B |
| | 1/45 | R88G-HPG50A451K5B |
| 2kW | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG50A212K0B |
| | 1/33 | R88G-HPG50A332K0B |
| | 1/45 | R88G-HPG50A451K5B |
| 3kW | 1/5 | R88G-HPG32A053K0B |
| | 1/11 | R88G-HPG50A113K0B |
| | 1/21 | R88G-HPG50A213K0B |
| 4kW | 1/5 | R88G-HPG32A054K0B |
| | 1/11 | R88G-HPG50A115K0B |
| 5kW | 1/5 | R88G-HPG50A055K0B |
| | 1/11 | R88G-HPG50A115K0B |

Note: 1. The standard models have a straight shaft.
2. To order a Servomotor with a straight shaft with key, add "J" to the end of the model number, in the place indicated by the box.

2,000-r/min servomotors

Straight shaft without key

| Motor capacity | Gear Ratio | Model (Straight shaft) |
|----------------|------------|------------------------|
| 400 W | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG32A211K5B |
| | 1/33 | R88G-HPG32A33600SB |
| | 1/45 | R88G-HPG32A45400SB |
| 600 W | 1/5 | R88G-HPG32A052K0B |
| | 1/11 | R88G-HPG32A112K0B |
| | 1/21 | R88G-HPG32A211K5B |
| | 1/33 | R88G-HPG32A33600SB |
| | 1/45 | R88G-HPG50A451K5B |
| 1 kW | 1/5 | R88G-HPG32A053K0B |
| | 1/11 | R88G-HPG32A112K0SB |
| | 1/21 | R88G-HPG32A211K0SB |
| | 1/33 | R88G-HPG50A332K0SB |
| | 1/45 | R88G-HPG50A451K0SB |
| 1.5 kW | 1/5 | R88G-HPG32A053K0B |
| | 1/11 | R88G-HPG32A112K0SB |
| | 1/21 | R88G-HPG50A213K0B |
| | 1/33 | R88G-HPG50A332K0SB |
| | 1/45 | R88G-HPG32A053K0B |
| 2 kW | 1/11 | R88G-HPG32A112K0SB |
| | 1/21 | R88G-HPG50A213K0B |
| | 1/33 | R88G-HPG50A332K0SB |
| 3 kW | 1/5 | R88G-HPG32A054K0B |
| | 1/11 | R88G-HPG50A115K0B |
| | 1/21 | R88G-HPG50A213K0SB |
| 4 kW | 1/25 | R88G-HPG65A253K0SB |
| | 1/5 | R88G-HPG50A055K0SB |
| | 1/11 | R88G-HPG50A115K0SB |
| 5 kW | 1/20 | R88G-HPG65A205K0SB |
| | 1/25 | R88G-HPG65A255K0SB |
| | 1/5 | R88G-HPG50A055K0SB |
| | 1/11 | R88G-HPG50A115K0SB |
| 5 kW | 1/20 | R88G-HPG65A205K0SB |
| | 1/25 | R88G-HPG65A255K0SB |

Note: 1. The standard models have a straight shaft.
2. To order a Servomotor with a straight shaft with key, add "J" to the end of the model number, in the place indicated by the box.

1,000-r/min servomotors

Straight shaft without key

| Motor capacity | Gear Ratio | Model (Straight shaft) |
|----------------|------------|------------------------|
| 900 W | 1/5 | R88G-HPG32A05900TB |
| | 1/11 | R88G-HPG32A11900TB |
| | 1/21 | R88G-HPG50A21900TB |
| | 1/33 | R88G-HPG50A33900TB |
| 2 kW | 1/5 | R88G-HPG32A052K0TB |
| | 1/11 | R88G-HPG50A112K0TB |
| | 1/21 | R88G-HPG50A212K0TB |
| | 1/25 | R88G-HPG65A255K0SB |
| 3 kW | 1/5 | R88G-HPG50A055K0SB |
| | 1/11 | R88G-HPG50A115K0SB |
| | 1/20 | R88G-HPG65A205K0SB |
| | 1/25 | R88G-HPG65A255K0SB |

- Note:** 1. The standard models have a straight shaft.
 2. To order a Servomotor with a straight shaft with key, add "J" to the end of the model number, in the place indicated by the box.

**Backlash = 15' Max
 <Cylinder Type>
 3,000-r/min servomotors**

Straight shaft with key

| Motor capacity | Gear Ratio | Model (Straight shaft) |
|----------------|------------|------------------------|
| 50 W | 1/5 | R88G-VRSF05B100CJ |
| | 1/9 | R88G-VRSF09B100CJ |
| | 1/15 | R88G-VRSF15B100CJ |
| | 1/25 | R88G-VRSF25B100CJ |
| 100 W | 1/5 | R88G-VRSF05B100CJ |
| | 1/9 | R88G-VRSF09B100CJ |
| | 1/15 | R88G-VRSF15B100CJ |
| | 1/25 | R88G-VRSF25B100CJ |
| 200 W | 1/5 | R88G-VRSF05B200CJ |
| | 1/9 | R88G-VRSF09C200CJ |
| | 1/15 | R88G-VRSF15C200CJ |
| | 1/25 | R88G-VRSF25C200CJ |
| 400 W | 1/5 | R88G-VRSF05C400CJ |
| | 1/9 | R88G-VRSF09C400CJ |
| | 1/15 | R88G-VRSF15C400CJ |
| | 1/25 | R88G-VRSF25C400CJ |
| 750 W | 1/5 | R88G-VRSF05C750CJ |
| | 1/9 | R88G-VRSF09D750CJ |
| | 1/15 | R88G-VRSF15D750CJ |
| | 1/25 | R88G-VRSF25D750CJ |

Accessories and Cables

■ Connection Cables (Motor Power Cables, Brake Cables, Encoder Cables)

<Non-flexible Cable>

Motor Power Cables

| Specifications | | Without brake | With brake |
|---|------|---------------|---------------|
| | | Model | Model |
| [100 V/200 V] 3,000-r/min Servomotors of 50 to 750 W | 3 m | R88A-CAKA003S | (See note1.) |
| | 5 m | R88A-CAKA005S | |
| | 10 m | R88A-CAKA010S | |
| | 15m | R88A-CAKA015S | |
| | 20 m | R88A-CAKA020S | |
| | 30 m | R88A-CAKA030S | |
| | 40 m | R88A-CAKA040S | |
| | 50 m | R88A-CAKA050S | |
| [200 V] 3,000-r/min Servomotors of 1 to 2 kW 2,000-r/min Servomotors of 1 to 2 kW 1,000-r/min Servomotors of 900 W | 3 m | R88A-CAGB003S | R88A-CAGB003B |
| | 5 m | R88A-CAGB005S | R88A-CAGB005B |
| | 10 m | R88A-CAGB010S | R88A-CAGB010B |
| | 15 m | R88A-CAGB015S | R88A-CAGB015B |
| | 20 m | R88A-CAGB020S | R88A-CAGB020B |
| | 30 m | R88A-CAGB030S | R88A-CAGB030B |
| | 40 m | R88A-CAGB040S | R88A-CAGB040B |
| | 50 m | R88A-CAGB050S | R88A-CAGB050B |
| [400 V] 3,000-r/min Servomotors of 750 W to 2 kW 2,000-r/min Servomotors of 400 W to 2 kW 1,000-r/min Servomotors of 900 W | 3 m | R88A-CAGB003S | R88A-CAKF003B |
| | 5 m | R88A-CAGB005S | R88A-CAKF005B |
| | 10 m | R88A-CAGB010S | R88A-CAKF010B |
| | 15 m | R88A-CAGB015S | R88A-CAKF015B |
| | 20 m | R88A-CAGB020S | R88A-CAKF020B |
| | 30 m | R88A-CAGB030S | R88A-CAKF030B |
| | 40 m | R88A-CAGB040S | R88A-CAKF040B |
| | 50 m | R88A-CAGB050S | R88A-CAKF050B |
| [200 V] [400 V] 3,000-r/min Servomotors of 3 to 5 kW 2,000-r/min Servomotors of 3 to 5 kW 1,000-r/min Servomotors of 2 to 4.5 kW | 3 m | R88A-CAGD003S | R88A-CAGD003B |
| | 5 m | R88A-CAGD005S | R88A-CAGD005B |
| | 10 m | R88A-CAGD010S | R88A-CAGD010B |
| | 15 m | R88A-CAGD015S | R88A-CAGD015B |
| | 20 m | R88A-CAGD020S | R88A-CAGD020B |
| | 30 m | R88A-CAGD030S | R88A-CAGD030B |
| | 40 m | R88A-CAGD040S | R88A-CAGD040B |
| | 50 m | R88A-CAGD050S | R88A-CAGD050B |
| [200 V] [400 V] 1,500-r/min Servomotors of 7.5 kW 1,000-r/min Servomotors of 6 kW | 3 m | R88A-CAGE003S | |
| | 5 m | R88A-CAGE005S | |
| | 10 m | R88A-CAGE010S | |
| | 15 m | R88A-CAGE015S | |
| | 20 m | R88A-CAGE020S | |
| | 30 m | R88A-CAGE030S | |
| | 40 m | R88A-CAGE040S | |
| | 50 m | R88A-CAGE050S | |

Note: 1. Different connectors are used for the motor power and the brake on 100-V and 200-V, 3,000-r/min Servomotors of 50 to 750 W and Servomotors of 6 to 15 kW. When using a Servomotor with a brake, two cables are required: a Power Cable without Brake and a Brake Cable.

2. For non-flexible power cables for Servomotors of 11 or 15 kW, refer to G5 series USER'S MANUAL (Cat.No. I576) and make your own cable.

Brake Cable

| Specifications | Standard Cables | |
|---|-----------------|---------------|
| | Model | |
| [100 V][200 V] 3,000-r/min Servomotors of 50 to 750 W | 3 m | R88A-CAKA003B |
| | 5 m | R88A-CAKA005B |
| | 10 m | R88A-CAKA010B |
| | 15 m | R88A-CAKA015B |
| | 20 m | R88A-CAKA020B |
| | 30 m | R88A-CAKA030B |
| | 40 m | R88A-CAKA040B |
| | 50 m | R88A-CAKA050B |
| [200 V][400 V] 1,500-r/min and 2,000-r/min Servomotors of 7.5 to 15 kW 1,000-r/min Servomotors of 6 kW | 3 m | R88A-CAGE003B |
| | 5 m | R88A-CAGE005B |
| | 10 m | R88A-CAGE010B |
| | 15 m | R88A-CAGE015B |
| | 20 m | R88A-CAGE020B |
| | 30 m | R88A-CAGE030B |
| | 40 m | R88A-CAGE040B |
| 50 m | R88A-CAGE050B | |

Encoder Cable

| Specifications | Standard Cables | |
|---|-----------------|---------------|
| | Model | |
| [100 V/200 V] 3,000-r/min Servomotors of 50 to 750 W (for both absolute encoders and incremental encoders) | 3 m | R88A-CRKA003C |
| | 5 m | R88A-CRKA005C |
| | 10 m | R88A-CRKA010C |
| | 15 m | R88A-CRKA015C |
| | 20 m | R88A-CRKA020C |
| | 30 m | R88A-CRKA030C |
| | 40 m | R88A-CRKA040C |
| | 50 m | R88A-CRKA050C |
| [100 V and 200 V] 3,000-r/min Servomotors of 1.0 kW or more 2,000-r/min Servomotors 1,500-r/min Servomotors 1,000-r/min Servomotors [400 V] 3,000-r/min Servomotors 2,000-r/min Servomotors 1,500-r/min Servomotors 1,000-r/min Servomotors | 3 m | R88A-CRKC003N |
| | 5 m | R88A-CRKC005N |
| | 10 m | R88A-CRKC010N |
| | 15 m | R88A-CRKC015N |
| | 20 m | R88A-CRKC020N |
| | 30 m | R88A-CRKC030N |
| | 40 m | R88A-CRKC040N |
| | 50 m | R88A-CRKC050N |

<Flexible Cables>

Motor Power Cables

| Specifications | | Without brake | With brake |
|---|------|----------------|----------------|
| | | Model | Model |
| [100 V/200 V] 3,000-r/min Servomotors of 50 to 750 W | 3 m | R88A-CAKA003SR | (See note1.) |
| | 5 m | R88A-CAKA005SR | |
| | 10 m | R88A-CAKA010SR | |
| | 15 m | R88A-CAKA015SR | |
| | 20 m | R88A-CAKA020SR | |
| | 30 m | R88A-CAKA030SR | |
| | 40 m | R88A-CAKA040SR | |
| | 50 m | R88A-CAKA050SR | |
| [200 V] 3,000-r/min Servomotors of 1 to 2 kW 2,000-r/min Servomotors of 1 to 2 kW 1,000-r/min Servomotors of 900 W | 3 m | R88A-CAGB003SR | R88A-CAGB003BR |
| | 5 m | R88A-CAGB005SR | R88A-CAGB005BR |
| | 10 m | R88A-CAGB010SR | R88A-CAGB010BR |
| | 15 m | R88A-CAGB015SR | R88A-CAGB015BR |
| | 20 m | R88A-CAGB020SR | R88A-CAGB020BR |
| | 30 m | R88A-CAGB030SR | R88A-CAGB030BR |
| | 40 m | R88A-CAGB040SR | R88A-CAGB040BR |
| | 50 m | R88A-CAGB050SR | R88A-CAGB050BR |
| [400 V] 3,000-r/min Servomotors of 750 W to 2 kW 2,000-r/min Servomotors of 400 W to 2 kW 1,000-r/min Servomotors of 900 W | 3 m | R88A-CAGB003SR | R88A-CAKF003BR |
| | 5 m | R88A-CAGB005SR | R88A-CAKF005BR |
| | 10 m | R88A-CAGB010SR | R88A-CAKF010BR |
| | 15 m | R88A-CAGB015SR | R88A-CAKF015BR |
| | 20 m | R88A-CAGB020SR | R88A-CAKF020BR |
| | 30 m | R88A-CAGB030SR | R88A-CAKF030BR |
| | 40 m | R88A-CAGB040SR | R88A-CAKF040BR |
| | 50 m | R88A-CAGB050SR | R88A-CAKF050BR |
| [200 V] [400 V] 3,000-r/min Servomotors of 3 to 5 kW 2,000-r/min Servomotors of 3 to 5 kW 1,000-r/min Servomotors of 2 to 4.5 kW | 3 m | R88A-CAGD003SR | R88A-CAGD003BR |
| | 5 m | R88A-CAGD005SR | R88A-CAGD005BR |
| | 10 m | R88A-CAGD010SR | R88A-CAGD010BR |
| | 15 m | R88A-CAGD015SR | R88A-CAGD015BR |
| | 20 m | R88A-CAGD020SR | R88A-CAGD020BR |
| | 30 m | R88A-CAGD030SR | R88A-CAGD030BR |
| | 40 m | R88A-CAGD040SR | R88A-CAGD040BR |
| | 50 m | R88A-CAGD050SR | R88A-CAGD050BR |

- Note:**
1. Different connectors are used for the motor power and the brake on 100-V and 200-V, 3,000-r/min Servomotors of 50 to 750 W and Servomotors of 6 to 15 kW. When using a Servomotor with a brake, two cables are required: a Power Cable without Brake and a Brake Cable.
 2. For flexible power cables for Servomotors of 11 or 15 kW, refer to G5 series USER'S MANUAL (Cat.No. I576) and make your own cable. For flexible motor power cables for Servomotors of 6 to 7.5kW, make your own cable by referring to the wirings of non-flexible motor power cables in the G5 series USER'S MANUAL (Cat.No.I576).

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
Multi-Function Compact Inverter
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

NJS Series

Synrac Studio

G5 Series

MX2 Series

FOM Series

EX-HD0

GX Series

NS Series

Related Manuals

Brake Cable

| Specifications | Robot Cables | |
|---|--------------|----------------|
| | Model | |
| [100 V] [200 V] 3,000-r/min Servomotors of 50 to 750 W | 3 m | R88A-CAKA003BR |
| | 5 m | R88A-CAKA005BR |
| | 10 m | R88A-CAKA010BR |
| | 15 m | R88A-CAKA015BR |
| | 20 m | R88A-CAKA020BR |
| | 30 m | R88A-CAKA030BR |
| | 40 m | R88A-CAKA040BR |
| | 50 m | R88A-CAKA050BR |

Note: For flexible brake cables for Servomotors of 6 to 15 kW, refer to G5 series USER'S MANUAL (Cat.No. I576) and make your own brake cable.

Encoder Cable

| Specifications | Robot Cables | |
|---|--------------|----------------|
| | Model | |
| [100 V/200 V] 3,000-r/min Servomotors of 50 to 750 W (for both absolute encoders and incremental encoders) | 3 m | R88A-CRKA003CR |
| | 5 m | R88A-CRKA005CR |
| | 10 m | R88A-CRKA010CR |
| | 15 m | R88A-CRKA015CR |
| | 20 m | R88A-CRKA020CR |
| | 30 m | R88A-CRKA030CR |
| | 40 m | R88A-CRKA040CR |
| | 50 m | R88A-CRKA050CR |
| [100 V and 200 V] 3,000-r/min Servomotors of 1.0 kW or more 2,000-r/min Servomotors 1,500-r/min Servomotors 1,000-r/min Servomotors [400 V] 3,000-r/min Servomotors 2,000-r/min Servomotors 1,500-r/min Servomotors 1,000-r/min Servomotors | 3 m | R88A-CRKC003NR |
| | 5 m | R88A-CRKC005NR |
| | 10 m | R88A-CRKC010NR |
| | 15 m | R88A-CRKC015NR |
| | 20 m | R88A-CRKC020NR |
| | 30 m | R88A-CRKC030NR |
| | 40 m | R88A-CRKC040NR |
| | 50 m | R88A-CRKC050NR |

Cable/Connector

Absolute Encoder Battery Cable

| Name | Length | Model |
|--|--------|-------------------------|
| Absolute Encoder Battery Cable (Battery not included) | 0.3 m | R88A-CRGD0R3C |
| Absolute Encoder Battery Cable (One R88A-BAT01G Battery included) | 0.3 m | R88A-CRGD0R3C-BS |

Absolute Encoder Backup Battery

| Specifications | Model |
|--------------------|--------------------|
| 2,000 mA • h 3.6 V | R88A-BAT01G |

Servo Drive Connectors (General-purpose Input)

| Name | Connects to | Model |
|-----------------------|-------------|--------------------|
| Control I/O Connector | CN1 | R88A-CNU11C |

Servomotor Connector

| Name | Applicable Servomotor Capacity | Model |
|-----------------------|--|--------------------|
| | Servomotor Connector for Encoder Cable | |
| | [100 V/200 V] 3,000 r/min (1 to 5 kW) 2,000r/min, 1,000r/min [400 V] 3,000 r/min, 2,000 r/min, 1,000 r/min | R88A-CNK04R |
| Power Cable Connector | (750 W max.) | R88A-CNK11A |
| Brake Cable Connector | (750 W max.) | R88A-CNK11B |

Analog Monitor Cable

| Name | Length | Model |
|----------------------|--------|---------------------|
| Analog Monitor Cable | 1 m | R88A-CMK001S |

Servo Drive Connectors (common)

| Name | Connects to | Model |
|--------------------------|-------------|--------------------|
| Encoder Connector | CN2 | R88A-CNW01R |
| External Scale Connector | CN4 | R88A-CNK41L |
| Safety Connector | CN8 | R88A-CNK81S |

Servo Drive Connectors (EtherCAT Communications)

| Name | Connects to | Model |
|-----------------------|-------------|--------------------|
| Control I/O Connector | CN1 | R88A-CNW01C |

Control Cables**Control Cables (for Connector Terminal Block/CN1)**

| Name | Specifications | | Model |
|--|-------------------------|---|----------------------------------|
| | | | |
| Connector Terminal Block Cables | EtherCAT Communications | Length 1.0 m | XW2Z-100J-B34 |
| | | Length 2.0 m | XW2Z-200J-B34 |
| Connector Terminal Block Conversion Unit | EtherCAT Communications | Conversion Unit for General-purpose Controllers (M3 screws) | Through type XW2B-20G4 |
| | | Conversion Unit for General-purpose Controllers (M3.5 screws) | Through type XW2B-20G5 |
| | | Conversion Unit for General-purpose Controllers (M3 screws) | Slim type XW2D-20G6 |

EtherCAT Communications Cables

Refer to Connecting cable with NJ-series Controller for the recommended cables.

Peripheral Devices (External Regeneration Resistors, Reactors, Mounting Brackets)

External Regeneration Resistors

| Specifications | Model |
|----------------|----------------|
| 80 W 50 Ω | R88A-RR08050S |
| 80 W 100 Ω | R88A-RR080100S |
| 220 W 47 Ω | R88A-RR22047S1 |
| 500 W 20 Ω | R88A-RR50020S |

Reactors

| Specifications | Model |
|--|--------------|
| EtherCAT Communications | |
| R88D-KNA5L-ECT/-KN01H-ECT(Single-phase) | 3G3AX-DL2002 |
| R88D-KN01L-ECT/-KN02H-ECT(Single-phase) | 3G3AX-DL2004 |
| R88D-KN02L-ECT/-KN04H-ECT(Single-phase) | 3G3AX-DL2007 |
| R88D-KN04L-ECT/-KN08H-ECT/-KN10H-ECT (Single-phase) | 3G3AX-DL2015 |
| R88D-KN15H-ECT (Single-phase) | 3G3AX-DL2022 |
| R88D-KN01H-ECT/-KN02H-ECT/-KN04H-ECT/ -KN08H-ECT/-KN10H-ECT/-KN15H-ECT (Three-phase) | 3G3AX-AL2025 |
| R88D-KN20H-ECT/-KN30H-ECT | 3G3AX-AL2055 |
| R88D-KN50H-ECT | 3G3AX-AL2110 |
| R88D-KN06F-ECT/-KN10F-ECT/-KN15F-ECT | 3G3AX-AL4025 |
| R88D-KN20F-ECT/-KN30F-ECT | 3G3AX-AL4055 |
| R88D-KN50F-ECT | 3G3AX-AL4110 |
| R88D-KT75H-ECT/-KT150F-ECT | 3G3AX-AL4220 |

Mounting Brackets (L Brackets for Rack Mounting)

| Specifications | Model |
|--|------------|
| EtherCAT Communications | |
| R88D-KNA5L-ECT/-KN01L-ECT/-KN01H-ECT/ -KN02H-ECT | R88A-TK01K |
| R88D-KN02L-ECT/-KN04H-ECT | R88A-TK02K |
| R88D-KN04L-ECT/-KN08H-ECT | R88A-TK03K |
| R88D-KN10H-ECT/-KN15H-ECT/-KN06F-ECT/ -KN10F-ECT/-KN15F-ECT | R88A-TK04K |

System Configuration

Machine Automation Controller

Automation Software

AC Servomotors / Servo Drives

Multi-Function Compact Inverter

Vision Sensor

Fiber Sensor

Remote I/O Terminals

Ordering Information

NJS Series

Synmac Studio

G5 Series

MX2 Series

FQM Series

E3X-HD0

GX Series

NS Series

Related Manuals

Multi-function Compact Inverter **MX-Series**

Interpreting Model Numbers

3G3MX2-A

1 2

3G3MX2

1) Voltage class

| | |
|---|-------------------------------|
| B | 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. applicable 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

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

EtherCAT Communication Unit

| Name | Model |
|-----------------------------|----------------------|
| EtherCAT Communication Unit | 3G3AX-MX2-ECT |

Related Options

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

| Name | Specifications of Inverter | | | Model |
|------------|----------------------------|----------------|----------------|----------------|
| | Voltage class | CT: Heavy load | VT: Light load | |
| DC Reactor | 3-phase 200 VAC | 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 |
| | | 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 | |
| | 1-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-DL2002 |
| | | 0.2 kW | 0.4 kW | 3G3AX-DL2004 |
| | | 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 |
| | 3-phase 400 VAC | 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 |
| | | 3.0 kW | 4.0 kW | 3G3AX-DL4055 |
| | | 4.0 kW | 5.5 kW | 3G3AX-DL4075 * |
| | | 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 | | |

* Only the CT rating is supported.

| Name | Specifications of Inverter | | | Model |
|--------------------|----------------------------|----------------|----------------|-------------------------|
| | Voltage class | CT: Heavy load | VT: Light load | |
| Radio Noise Filter | 3-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-ZCL2 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.75 kW | |
| | | 0.75 kW | 1.1 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | 3G3AX-ZCL1 (3G3AX-ZCL2) |
| | | 3.7 kW | 5.5 kW | |
| | | 5.5 kW | 7.5 kW | |
| | | 7.5 kW | 11 kW | 3G3AX-ZCL1 |
| | 11 kW | 15 kW | | |
| | 15 kW | 18.5 kW | | |
| | 1-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-ZCL2 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.55 kW | |
| | | 0.75 kW | 1.1 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | |
| | 3-phase 400 VAC | 0.4 kW | 0.75 kW | 3G3AX-ZCL2 (3G3AX-ZCL1) |
| | | 0.75 kW | 1.5 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | |
| | | 3.0 kW | 4.0 kW | |
| | | 4.0 kW | 5.5 kW | |
| | | 5.5 kW | 7.5 kW | |
| | | 7.5 kW | 11 kW | 3G3AX-ZCL1 |
| | | 11 kW | 15 kW | |
| | 15 kW | 18.5 kW | | |
| Input Noise Filter | 3-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-NFI21 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.75 kW | |
| | | 0.75 kW | 1.1 kW | 3G3AX-NFI22 |
| | | 1.5 kW | 2.2 kW | 3G3AX-NFI23 |
| | | 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 | |
| | 1-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-NFI21 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.55 kW | 3G3AX-NFI22 |
| | | 0.75 kW | 1.1 kW | 3G3AX-NFI23 |
| | | 1.5 kW | 2.2 kW | 3G3AX-NFI23 * |
| | | 2.2 kW | 3.0 kW | 3G3AX-NFI24 |
| | 3-phase 400 VAC | 0.4 kW | 0.75 kW | 3G3AX-NFI41 |
| | | 0.75 kW | 1.5 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | 3G3AX-NFI42 |
| | | 3.0 kW | 4.0 kW | |
| | | 4.0 kW | 5.5 kW | 3G3AX-NFI43 |
| | | 5.5 kW | 7.5 kW | |
| | | 7.5 kW | 11 kW | |
| | | 11 kW | 15 kW | 3G3AX-NFI45 |
| | 15 kW | 18.5 kW | 3G3AX-NFI46 | |

* Only the CT rating is supported.

| Name | Specifications of Inverter | | | Model |
|-----------------------------|----------------------------|----------------|----------------|--|
| | Voltage class | CT: Heavy load | VT: Light load | |
| EMC-compatible Noise Filter | 3-phase 200 VAC | 0.1 kW | 0.2 kW | Schaffner product will be supported in future. |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.75 kW | |
| | | 0.75 kW | 1.1 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 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 | | |
| | 1-phase 200 VAC | 0.1 kW | 0.2 kW | |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.55 kW | |
| | | 0.75 kW | 1.1 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | |
| | 3-phase 400 VAC | 0.4 kW | 0.75 kW | |
| | | 0.75 kW | 1.5 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | |
| | | 3.0 kW | 4.0 kW | |
| | | 4.0 kW | 5.5 kW | |
| | | 5.5 kW | 7.5 kW | |
| 7.5 kW | | 11 kW | | |
| Output Noise Filter | 3-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-NFO01 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.75 kW | |
| | | 0.75 kW | 1.1 kW | 3G3AX-NFO02 |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | 3G3AX-NFO03 |
| | | 3.7 kW | 5.5 kW | |
| | | 5.5 kW | 7.5 kW | 3G3AX-NFO04 |
| | | 7.5 kW | 11 kW | |
| | 11 kW | 15 kW | 3G3AX-NFO05 | |
| | 15 kW | 18.5 kW | 3G3AX-NFO06 | |
| | 1-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-NFO01 |
| | | 0.2 kW | 0.4 kW | |
| | | 0.4 kW | 0.55 kW | 3G3AX-NFO02 |
| | | 0.75 kW | 1.1 kW | |
| | | 1.5 kW | 2.2 kW | 3G3AX-NFO03 |
| | | 2.2 kW | 3.0 kW | |
| | 3-phase 400 VAC | 0.4 kW | 0.75 kW | 3G3AX-NFO01 |
| | | 0.75 kW | 1.5 kW | |
| | | 1.5 kW | 2.2 kW | |
| | | 2.2 kW | 3.0 kW | 3G3AX-NFO02 |
| | | 3.0 kW | 4.0 kW | |
| | | 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 | | |

System Configuration
Machine Automation Controller
Automation Software
AC Servomotors / Servo Drives
Multi-Function Compact Inverter
Vision Sensor
Fiber Sensor
Remote I/O Terminals
Ordering Information

NJS Series
Synrac Studio
G5 Series
MX2 Series
FOM Series
E3X-HD0
GX Series
NS Series
Related Manuals

| Name | Specifications of Inverter | | | Model | | |
|------------|----------------------------|-----------------|-----------------|----------------|----------------|----------------|
| | Voltage class | CT: Heavy load | VT: Light load | | | |
| AC Reactor | 3-phase 200 VAC | 0.1 kW | 0.2 kW | 3G3AX-AL2025 | | |
| | | 0.2 kW | 0.4 kW | | | |
| | | 0.4 kW | 0.75 kW | | | |
| | | 3-phase 200 VAC | 0.75 kW | 1.1 kW | 3G3AX-AL2055 | |
| | | | 1.5 kW | 2.2 kW | | |
| | | | 2.2 kW | 3.0 kW | | |
| | | | 3-phase 200 VAC | 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 | |
| | 1-phase 200 VAC | | | 0.1 kW | 0.2 kW | 3G3AX-AL2025 |
| | | 0.2 kW | | 0.4 kW | | |
| | | 0.4 kW | | 0.55 kW | | |
| | | 0.75 kW | | 1.1 kW | 3G3AX-AL2055 * | |
| | | 1.5 kW | 2.2 kW | | | |
| | | 2.2 kW | 3.0 kW | | | |
| | 3-phase 400 VAC | 0.4 kW | 0.75 kW | 3G3AX-AL4025 | | |
| | | 0.75 kW | 1.5 kW | 3G3AX-AL4055 | | |
| | | 1.5 kW | 2.2 kW | | | |
| | | 2.2 kW | 3.0 kW | | | |
| | | 3.0 kW | 4.0 kW | 3G3AX-AL4110 | | |
| | | 4.0 kW | 5.5 kW | | | |
| | | 5.5 kW | 7.5 kW | | | |
| | | 7.5 kW | 11 kW | 3G3AX-AL4220 | | |
| | | 11 kW | 15 kW | 3G3AX-AL4220 * | | |
| | 15 kW | 18.5 kW | 3G3AX-AL4330 | | | |

Note: When using the Inverter for light load rating, select the model with one size larger capacity (rated current).

* Only the CT rating is supported.

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


EtherCAT Communications Cables

Refer to Connecting cable with NJ-series Controller for the recommended cables.

Vision Sensor **FQ-M-Series**


Ordering Information

Sensors

| Appearance | Type | | Model |
|---|------------|-----|----------------|
|  | Color | NPN | FQ-MS120-ECT |
| | | PNP | FQ-MS125-ECT |
| | Monochrome | NPN | FQ-MS120-M-ECT |
| | | PNP | FQ-MS125-M-ECT |






EtherCAT communication function provided

Touch Finder







| Appearance | Type | Model |
|---|-----------------|---------|
|  | DC power supply | FQ-MD30 |
| | AC/DC/battery * | FQ-MD31 |

* AC Adapter and Battery are sold separately.

Bend resistant Cables for FQ-M Series

| Appearance | Type | Model | | |
|---|---|--------------------|--------------------|------------|
|  | For EtherCAT and Ethernet cable Angle: M12/ Straight: RJ45 | Cable length: 5 m | FQ-MWNL005 | |
| | | Cable length: 10 m | FQ-MWNL010 | |
|  | For EtherCAT and Ethernet cable Straight type (M12/RJ45) | Cable length: 5m | FQ-WN005 | |
| | | Cable length: 10 m | FQ-WN010 | |
|  | For EtherCAT cable Angle type (M12/M12) | Cable length: 5 m | FQ-MWNEL005 | |
| | | Cable length: 10 m | FQ-MWNEL010 | |
|  | For EtherCAT cable Straight type (M12/M12) | Cable length: 5m | FQ-MWNE005 | |
| | | Cable length: 10 m | FQ-MWNE010 | |
|  | I/O Cables | Angle type | Cable length: 5 m | FQ-MWDL005 |
| | | | Cable length: 10 m | FQ-MWDL010 |
| | Straight type | Cable length: 5 m | FQ-MWD005 | |
| | | Cable length: 10 m | FQ-MWD010 | |

Accessories

| Appearance | Type | Model |
|---|--|-----------|
|  | Panel Mounting Adapter | FQ-XPM |
|  | AC Adapter (for models for DC/AC/Battery) | FQ-AC□ * |
|  | Battery (for models for DC/AC/Battery) | FQ-BAT1 |
|  | Touch Pen (enclosed with Touch Finder) | FQ-XT |
|  | Strap | FQ-XH |
|  | SD Card (2 GB) | HMC-SD291 |

* AC Adapters for Touch Finder with DC/AC/Battery Power Supply. Select the model for the country in which the Touch Finder will be used.

| Plug type | Voltage | Certified standards | Model |
|-----------|------------|---------------------|---------------|
| A | 125 V max. | PSE | FQ-AC1 |
| | | UL/CSA | FQ-AC2 |
| | 250 V max. | CCC mark | FQ-AC3 |
| C | 250 V max. | --- | FQ-AC4 |
| BF | 250 V max. | --- | FQ-AC5 |
| O | 250 V max. | --- | FQ-AC6 |

Cameras peripheral devices

| Type | | Model |
|----------------------------|---------------|-----------------------|
| Cameras peripheral devices | CCTV Lenses | 3Z4S-LE Series |
| External Lightings | | FL Series |
| Lighting Controllers | For FL Series | FL-TCC1 |

Fiber Sensor E3X-HD0

Ordering Information

Fiber Sensor

| Product name | Connection Method | Power supply | Model |
|--|---|-----------------------------|---------|
| Standard fiber amplifier for Communications Unit | Connect to a communication unit Only by connector | Supplied from the connector | E3X-HD0 |

Note: Please read and understand the important precautions and reminders described on the instruction sheet bundled to the product, before attempting to start operation.

EtherCAT Communications Unit

| Product name | Power Supply Voltage | Power Supply | Model |
|------------------------------|----------------------|-----------------------------|---------|
| EtherCAT Communications Unit | DC24V | Supplied from the connector | E3X-ECT |

Note: Please read and understand the important precautions and reminders described on the manuals (E413) of E3X-ECT, before attempting to start operation.

EtherCAT Communications Cables

Refer to Connecting cable with NJ-series Controller for the recommended cables.

Interpreting Model Numbers

GX-

1 2 3 4 5

1) Type

| Code | Specifications |
|------|-----------------|
| ID | DC Input |
| OD | DC Output |
| MD | DC Input/Output |
| OC | Relay Output |
| AD | Analog Input |
| DA | Analog Output |
| EC | Encoder Input |

2) Number of I/O point

| Code | Specifications |
|------|----------------|
| 02 | 2 points (2CH) |
| 04 | 4 points (4CH) |
| 16 | 16 points |
| 32 | 32 points |

3) Input/Output type

| Code | Digital Input/ Digital Output type | Analog Input/ Analog Output type | Encoder Input Type |
|------|---------------------------------------|-------------------------------------|---------------------------|
| 1 | NPN/Sinking | – | Open collector input, NPN |
| 2 | PNP/Sourcing | – | – |
| 4 | – | – | Line driver input, PNP |
| 7 | – | Multi 1 (Current/Voltage) | – |

4) Connecting

| Code | Specifications |
|------|--|
| 1 | Screw (Common) (2-tier Terminal Block) |
| 2 | Screw (Divided common) (3-tier Terminal Block) |
| 8 | e-CON |

5) Figure/Function

| Code | Digital Input/ Digital Output type | Analog Input/ Analog Output type | Encoder Input Type |
|------|---------------------------------------|-------------------------------------|--------------------|
| None | Horizontal type | Standard type | – |

Ordering Information

Digital I/O Terminal Terminal Block Type

| Name | Specifications | | | Model | Standards |
|---------------------------|----------------|--------------------|-----------|-----------|---------------|
| 2-tier terminal blocks | Inputs | 16 inputs | NPN | GX-ID1611 | UC1, N, L, CE |
| | | | PNP | GX-ID1621 | |
| | Outputs | 16 outputs | NPN | GX-OD1611 | |
| | | | PNP | GX-OD1621 | |
| | Outputs | 16 outputs | Relay | GX-OC1601 | |
| | Inputs/Outputs | 8 inputs/8 outputs | NPN | GX-MD1611 | |
| PNP | | | GX-MD1621 | | |
| 3-tier terminal blocks | Inputs | 16 inputs | NPN | GX-ID1612 | UC1, N, L, CE |
| | | | PNP | GX-ID1622 | |
| | Outputs | 16 outputs | NPN | GX-OD1612 | |
| | | | PNP | GX-OD1622 | |
| | Inputs/Outputs | 8 inputs/8 outputs | NPN | GX-MD1612 | |
| | | | PNP | GX-MD1622 | |

e-CON Connector Type

| Name | Specifications | | | Model | Standards |
|----------------------|----------------|----------------------|-----|-----------|---------------|
| e-CON Connector Type | Inputs | 16 inputs | NPN | GX-ID1618 | UC1, N, L, CE |
| | | | PNP | GX-ID1628 | |
| | Outputs | 16 outputs | NPN | GX-OD1618 | |
| | | | PNP | GX-OD1628 | |
| | Inputs/Outputs | 8 inputs/8 outputs | NPN | GX-MD1618 | |
| | | | PNP | GX-MD1628 | |
| | Inputs | 32 inputs | NPN | GX-ID3218 | |
| | | | PNP | GX-ID3228 | |
| | Outputs | 32 outputs | NPN | GX-OD3218 | |
| | | | PNP | GX-OD3228 | |
| | Inputs/Outputs | 16 inputs/16 outputs | NPN | GX-MD3218 | |
| | | | PNP | GX-MD3228 | |

Analog I/O Terminal

2-tier Terminal Block Type

| Name | Specifications | | Model | Standards |
|----------------------------|----------------|-----------|------------------|---------------|
| 2-tier terminal block type | Analog inputs | 4 inputs | GX-AD0471 | UC1, N, L, CE |
| | Analog outputs | 2 outputs | GX-DA0271 | |

Encoder Input Terminal

3-tier Terminal Block Type

| Name | Specifications | | Model | Standards |
|----------------------------|-----------------------|----------|------------------|---------------|
| 3-tier Terminal Block Type | Open collector inputs | 2 inputs | GX-EC0211 | UC1, N, L, CE |
| | Line driver inputs | 2 inputs | GX-EC0241 | |

Expansion Units

| Name | Specifications | | | Model | Standards |
|-----------------|----------------|------------|-----|-------------------|------------|
| Expansion Units | Inputs | 8 inputs | NPN | XWT-ID08 | UC1, N, CE |
| | | | PNP | XWT-ID08-1 | |
| | Outputs | 8 outputs | NPN | XWT-OD08 | |
| | | | PNP | XWT-OD08-1 | |
| | Inputs | 16 inputs | NPN | XWT-ID16 | |
| | | | PNP | XWT-ID16-1 | |
| | Outputs | 16 outputs | NPN | XWT-OD16 | |
| | | | PNP | XWT-OD16-1 | |

One Expansion Unit can be mounted to one GX-ID16□1/OD16□1/OC1601 Digital I/O Terminal.

EtherCAT Communications Cables

Refer to Connecting cable with NJ-series Controller for the recommended cables.

Programmable Terminals NS-Series



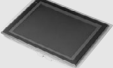

Ordering Information

Programmable Terminals

| Product name | Specifications | | | | Model | Standards |
|--------------|--|-------------------|----------|------------|---------------|----------------------------|
| | Effective display area | Number of dots | Ethernet | Case color | | |
| NS5-V2 | 5.7-inch STN monochrome | 320 × 240 dots | Yes | Ivory | NS5-MQ11-V2 | UC1, CE, N, L, UL Type4 |
| | | | | Black | NS5-MQ11B-V2 | |
| | 5.7-inch TFT color LED backlight | | Yes | Ivory | NS5-SQ11-V2 | |
| | | | | Black | NS5-SQ11B-V2 | |
| | 5.7-inch High-luminance TFT color * LED backlight | | Yes | Ivory | NS5-TQ11-V2 | |
| | | | | Black | NS5-TQ11B-V2 | |
| NS8-V2 | 8.4-inch TFT | 640 × 480 dots | Yes | Ivory | NS8-TV01-V2 | UC1, CE, N, L |
| | | | | Black | NS8-TV01B-V2 | |
| NS10-V2 | 10.4-inch TFT | 640 × 480 dots | Yes | Ivory | NS10-TV01-V2 | UC1, CE, N, L, UL Type4 |
| | | | | Black | NS10-TV01B-V2 | |
| NS12-V2 | 12.1-inch TFT | 800 × 600 dots | Yes | Ivory | NS12-TS01-V2 | |
| | | | | Black | NS12-TS01B-V2 | |
| NS15-V2 | 15-inch TFT | 1,024 × 768 dots, | Yes | Silver | NS15-TX01S-V2 | |
| | | | | Black | NS15-TX01B-V2 | |

Note: To connect the NJ-Series Controller, NS system version 8.5 or higher is required. CX-Designer version 3.3 or higher is also required.
 * NS5-TQ-Series (high luminance TFT) luminance is better than that of NS5-SQ-Series by about 110cd/m².

Options

| Product name | Specifications | Model | Standards |
|--|--|----------------|-------------|
| Cable *1 | USB relay cable Length: 1 m | NS-USBEXT-1M | --- |
| Video Input Unit   | Inputs: 4 channels Signal type: NTSC/PAL | NS-CA001 | UC1, CE |
| | Input channels: 2 video channels and 1 RGB channel *2 Signal type: NTSC/PAL | NS-CA002 | |
| Special Cable for the Console | Cable length: 2 m | F150-VKP (2 m) | --- |
| | Cable length: 5 m | F150-VKP (5 m) | |
| Sheet/Cover *3  | Anti-reflection Sheets (5 surface sheets) | NS15 | NS15-KBA04 |
| | | NS12/10 | NS12-KBA04 |
| | | NS8 | NS7-KBA04 |
| | | NS5 | NT30-KBA04 |
| | Protective Covers (5 pack) (anti-reflection coating) | NS12/10 | NS12-KBA05 |
| | | NS8 | NS7-KBA05 |
| | | NS5 | NT31C-KBA05 |
| | Protective Covers (1 cover included) (Transparent) | NS15 | NS15-KBA05N |
| Protective Covers (5 covers included) (Transparent) | NS12/10 | NS12-KBA05N | |
| | NS8 | NS7-KBA05N | |
| | NS5 | NT31C-KBA05N | |
| Attachment | NT625C/631/631C-Series to NS12/10-Series | NS12-ATT01 | --- |
| | NT625C/631/631C-Series to NS12/NS10-Series (Black) | NS12-ATT01B | |
| | NT610C-Series to NS12/10-Series | NS12-ATT02 | |
| | NT620S/620C/600S-Series to NS8-Series | NS8-ATT01 | |
| | NT600M/600G/610G/612G-Series to NS8-Series | NS8-ATT02 | |
| Memory Card  | 128MB | HMC-EF183 | --- |
| | 256 MB | HMC-EF283 | |
| | 512 MB | HMC-EF583 | |
| Memory Card Adapter | --- | HMC-AP001 | CE |
| Replacement Battery | Battery life: 5 years (at 25°C) | CJ1W-BAT01 | --- |

*1 To connect the NS-Series PT to NJ-Series Controller, using a commercially available 10/100-BASE-TX twisted-pair cable. For detail, refer to the NS series SETUP MANUAL (Cat. No.V083).

Use a standard USB Type A male to Type B type male Cable to connect the NS-Series PT to a personal computer (CX-Designer).

Use a standard USB cable to connect the NS-Series PT to a PictBridge-compatible printer. USB cable type depends on the printer.

*2 One screen cannot display two video inputs simultaneously.

*3 A Chemical-resistant Cover (NT30-KBA01) is available only for the NS5.

Related Manuals

NJ-Series

| Cat. No. | Model number | Manual |
|----------|---------------------------------|--|
| W500 | NJ501/NJ301-□□□□ | NJ-series CPU Unit Hardware User's Manual |
| W501 | NJ501/NJ301-□□□□ | NJ-series CPU Unit Software User's Manual |
| W507 | NJ501/NJ301-□□□□ | NJ-series CPU Unit Motion Control User's Manual |
| W502 | NJ501/NJ301-□□□□ | NJ-series Instructions Reference Manual |
| W508 | NJ501/NJ301-□□□□ | NJ-series Motion Control Instructions Reference Manual |
| W505 | NJ501/NJ301-□□□□ | NJ-series CPU Unit Built-in EtherCAT Port User's Manual |
| W506 | NJ501/NJ301-□□□□ | NJ-series CPU Unit Built-in EtherNet/IP Port User's Manual |
| W503 | NJ501/NJ301-□□□□ | NJ-series Troubleshooting Manual |
| W490 | CJ1W-AD0□□-□□/DA0□□□/MA42 | CJ-series Analog I/O Units Operation Manual for NJ-series CPU Unit |
| W498 | CJ1W-PDC15/-AD04U/-PH41U | CJ-series Analog I/O Units Operation Manual for NJ-series CPU Unit |
| W491 | CJ1W-TC003/-TC004/-TC103/-TC104 | CJ-series Temperature Control Units Operation Manual for NJ-series CPU Unit |
| Z317 | CJ1W-V680C11/-V680C12 | CJ-series ID Sensor Units Operation Manual for NJ-series CPU Unit |
| W492 | CJ1W-CT021 | CJ-series High-speed Counter Units Operation Manual for NJ-series CPU Unit |
| W494 | CJ1W-SCU□ | CJ-series Serial Communication Units Operation Manual for NJ-series CPU Unit |
| W495 | CJ1W-EIP21 | CJ-series EtherNet/IP Units Operation Manual for NJ-series CPU Unit |
| W497 | CJ1W-DRM21 | CJ-series DeviceNet Units Operation Manual for NJ-series CPU Unit |
| W493 | CJ1W-CRM21 | CJ-series CompoNet Master Units Operation Manual for NJ-series CPU Unit |

Sysmac Studio

| Cat. No. | Model number | Manual |
|----------|---------------|---|
| W504 | SYSMAC-SE2□□□ | Sysmac Studio version 1 OPERATION MANUAL |
| V099 | --- | CX-Designer Ver.3.□ User's Manual |
| W464 | | CS/CJ/CP/NSJ Series CXIntegrator Ver.2.□ OPERATION MANUAL |
| W344 | | CX-Protocol OPERATION MANUAL |

G5-Series

| Cat. No. | Model number | Manual |
|----------|---------------------|---|
| I576 | R88D-KN□-ECT/R88M-K | G5-SERIES EtherCAT Communications AC SERVOMOTOR AND SERVO DRIVE USER'S MANUAL |

MX2-Series

| Cat. No. | Model number | Manual |
|----------|---------------|--|
| I570 | 3G3MX2 | Multi-function Compact Inverter MX2-series USER'S MANUAL |
| I574 | 3G3AX-MX2-ECT | EtherCAT Communication Unit USER'S MANUAL |

FQ-M-Series

| Cat. No. | Model number | Manual |
|----------|----------------------------------|---|
| Z314 | FQ-MS□□□(-M) FQ-MS□□□(-M)-ECT | Specialized Vision Sensor for Positioning FQ-M-Series User's Manual |

E3X-HD0

| Cat. No. | Model number | Manual |
|----------|--------------|--------------------------|
| E413 | E3X-ECT | E3X-ECT Operation Manual |

GX-Series

| Cat. No. | Model number | Manual |
|----------|--------------|--|
| W488 | GX-□□□□□□□ | GX-Series EtherCAT Slave USER'S MANUAL |

NS-Series

| Cat. No. | Model number | Manual |
|----------|------------------------|---|
| V083 | NS15/NS12/NS10/NS8/NS5 | NS Series Programmable Terminals SETUP MANUAL |
| V073 | NS15/NS12/NS10/NS8/NS5 | NS-Series Programmable Terminals PROGRAMMING MANUAL |

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