



Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON VS MINI J7. You'll find the answers to all your questions on the OMRON VS MINI J7 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual OMRON VS MINI J7
User guide OMRON VS MINI J7
Operating instructions OMRON VS MINI J7
Instructions for use OMRON VS MINI J7
Instruction manual OMRON VS MINI J7

Manual No.
M2E001



VS mini J7
Compact General Purpose Inverter

USER'S MANUAL



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Manual abstract:

@@@1. @No. I63-EN-01) to gain sufficient knowledge of the devices, safety information, and precautions before actual use. 2. The products are illustrated without covers and shieldings for closer look in this USER'S MANUAL. For actual use of the products, make sure to use the covers and shieldings as specified. 3. This USER'S MANUAL and other related user's manuals are to be delivered to the actual end users of the products. 4. Please keep this manual close at hand for future reference.

5. If the product has been left unused for a long time, please inquire at our sales representative. NOTICE 1. This manual describes the functions of the product and relations with other products. You should assume that anything not described in this manual is not possible.

2. Although care has been given in documenting the product, please contact your OMRON representative if you have any suggestions on improving this manual. 3. The product contains potentially dangerous parts under the cover. Do not attempt to open the cover under any circumstances.

Doing so may result in injury or death and may damage the product. Never attempt to repair or disassemble the product. 4. We recommend that you add the following precautions to any instruction manuals you prepare for the system into which the product is being installed. · Precautions on the dangers of high-voltage equipment. · Precautions on touching the terminals of the product even after power has been turned OFF. (These terminals are live even with the power turned OFF.) 5. Specifications and functions may be changed without notice in order to improve product performance. Items to Check Before Unpacking Check the following items before removing the product from the package: · Has the correct product been delivered (i.

e., the correct model number and specifications)? · Has the product been damaged in shipping? · Are any screws or bolts loose? II Notice OMRON-YASKAWA products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property. ! DANGER ! WARNING ! Caution Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Additionally, there may be severe property damage. Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage. Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

OMRON-YASKAWA Product References All OMRON-YASKAWA products are capitalized in this manual. The word "Unit" is also capitalized when it refers to an OMRON-YASKAWA product, regardless of whether or not it appears in the proper name of the product. The abbreviation "Ch," which appears in some displays and on some OMRON-YASKAWA products, often means "word" and is abbreviated "Wd" in documentation in this sense. The abbreviation "PC" means Programmable Controller and is not used as an abbreviation for anything else. Visual Aids The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product. III General Precautions Observe the following precautions when using the VARISPEED Inverters and peripheral devices. This manual may include illustrations of the product with protective covers removed in order to describe the components of the product in detail. Make sure that these protective covers are on the product before use. Consult your OMRON-YASKAWA representative when using the product after a long period of storage.

! WARNING ! WARNING Do not touch the inside of the Inverter. Doing so may result in electrical shock. Operation, maintenance, or inspection must be performed after turning OFF the power supply, confirming that the CHARGE indicator (or status indicators) are OFF, and after waiting for the time specified on the front cover. Not doing so may result in electrical shock. Do not damage, pull on, apply stress to, place heavy objects on, or pinch the cables. Doing so may result in electrical shock. Do not touch the rotating parts of the motor under operation. Doing so may result in injury. Do not modify the product. Doing so may result in injury or damage to the product.

Do not store, install, or operate the product in the following places. Doing so may result in electrical shock, fire or damage to the product. · Locations subject to direct sunlight. · Locations subject to temperatures or humidity outside the range specified in the specifications. · Locations subject to condensation as the result of severe changes in temperature. · Locations subject to corrosive or flammable gases. · Locations subject to exposure to combustibles. · Locations subject to dust (especially iron dust) or salts. · Locations subject to exposure to water, oil, or chemicals. · Locations subject to shock or vibration.

Do not touch the Inverter radiator, regenerative resistor, or Servomotor while the power is being supplied or soon after the power is turned OFF. Doing so may result in a skin burn due to the hot surface. Do not conduct a dielectric strength test on any part of the Inverter. Doing so may result in damage to the product or malfunction. Take appropriate and sufficient countermeasures when installing systems in the following locations.

Not doing so may result in equipment damage. · Locations subject to static electricity or other forms of noise. · Locations subject to strong electromagnetic fields and magnetic fields. · Locations subject to possible exposure to radioactivity. · Locations close to power supplies.

! WARNING ! WARNING ! Caution ! Caution ! Caution ! Caution ! Caution IV Transportation Precautions ! Caution ! Caution ! Caution Do not hold by front cover or panel, instead, hold by the radiation fin (heat sink) while transporting the product. Doing so may result in injury. Do not pull on the cables. Doing so may result in damage to the product or malfunction. Use the eye-bolts only for transporting the Inverter. Using them for transporting the machinery may result in injury or malfunction. Installation Precautions ! WARNING Provide an appropriate stopping device on the machine side to secure safety. (A holding brake is not a stopping device for securing safety.) Not doing so may result in injury. Provide an external emergency stopping device that allows an instantaneous stop of operation and power interruption.

Not doing so may result in injury. Be sure to install the product in the correct direction and provide specified clearances between the Inverter and control panel or with other devices.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Not doing so may result in fire or malfunction. Do not allow foreign objects to enter inside the product. Doing so may result in fire or malfunction. Do not apply any strong impact. Doing so may result in damage to the product or malfunction. ! WARNING ! Caution ! Caution ! Caution Wiring Precautions ! WARNING ! WARNING ! WARNING ! WARNING Wiring must be performed only after confirming that the power supply has been turned OFF. Not doing so may result in electrical shock. Wiring must be performed by authorized personnel.

Not doing so may result in electrical shock or fire. Be sure to confirm operation only after wiring the emergency stop circuit. Not doing so may result in injury. Always connect the ground terminals to a ground of 100 W or less for the 200V AC class, or 10 W or less for the 400-V AC class. Not connecting to a proper ground may result in electrical shock.

Install external breakers and take other safety measures against shortcircuiting in external wiring. Not doing so may result in fire. Confirm that the rated input voltage of the Inverter is the same as the AC power supply voltage. An incorrect power supply may result in fire, injury, or malfunction. Connect the Braking Resistor and Braking Resistor Unit as specified in the manual.

Not doing so may result in fire. Be sure to wire correctly and securely. Not doing so may result in injury or damage to the product. Be sure to firmly tighten the screws on the terminal block. Not doing so may result in fire, injury, or damage to the product. Do not connect an AC power to the U, V, or W output.

Doing so may result in damage to the product or malfunction. ! Caution ! Caution ! Caution ! Caution ! Caution ! Caution V Operation and Adjustment Precautions ! WARNING Turn ON the input power supply only after mounting the front cover, terminal covers, bottom cover, Operator, and optional items.

Not doing so may result in electrical shock. Do not remove the front cover, terminal covers, bottom cover, Operator, or optional items while the power is being supplied.

Doing so may result in electrical shock or damage to the product. Do not operate the Operator or switches with wet hands. Doing so may result in electrical shock. Do not touch the inside of the Inverter. Doing so may result in electrical shock. ! WARNING ! WARNING ! WARNING ! WARNING Do not come close to the machine when using the error retry function because the machine may abruptly start when stopped by an alarm. Doing so may result in injury. Do not come close to the machine immediately after resetting momentary power interruption to avoid an unexpected restart (if operation is set to be continued in the processing selection function after momentary power interruption is reset). Doing so may result in injury. Provide a separate emergency stop switch because the STOP Key on the Operator is valid only when function settings are performed.

Not doing so may result in injury. Be sure to confirm that the RUN signal is turned OFF before turning ON the power supply, resetting the alarm, or switching the LOCAL/REMOTE selector. Doing so while the RUN signal is turned ON may result in injury. Be sure to confirm permissible ranges of motors and machines before operation because the Inverter speed can be easily changed from low to high. Not doing so may result in damage to the product. Provide a separate holding brake when necessary. Not doing so may result in injury. Do not perform a signal check during operation. Doing so may result in injury or damage to the product. Do not carelessly change settings.

Doing so may result in injury or damage to the product. ! WARNING ! WARNING ! WARNING ! Caution ! Caution ! Caution ! Caution VI Maintenance and Inspection Precautions ! WARNING ! WARNING Do not touch the Inverter terminals while the power is being supplied. Maintenance or inspection must be performed only after turning OFF the power supply, confirming that the CHARGE indicator (or status indicators) is turned OFF, and after waiting for the time specified on the front cover. Not doing so may result in electrical shock. Maintenance, inspection, or parts replacement must be performed by authorized personnel. Not doing so may result in electrical shock or injury. Do not attempt to take the Unit apart or repair. Doing either of these may result in electrical shock or injury. Carefully handle the Inverter because it uses semiconductor elements. Careless handling may result in malfunction.

Do not change wiring, disconnect connectors, the Operator, or optional items, or replace fans while power is being supplied. Doing so may result in injury, damage to the product, or malfunction. ! WARNING ! WARNING ! Caution ! Caution Warning Labels Warning labels are pasted on the product as shown in the following illustration. Be sure to follow the instructions given there. Warning Labels VII Contents of Warning · For CIMR-J7AZ20P1 to 20P7 (0.1 to 0.75 kW) and CIMR-J7AZB0P1 to B0P4 (0.1 to 0.4 kW): · For CIMR-J7AZ21P5 to A4P0 (1.5 to 4.

0 kW), CIMR-J7AZB0P7 to B1P5 (0.75 to 1.5 kW), and CIMR-J7AZ40P2 to 44P0 (0.2 to 3.7 kW): Checking Before Unpacking Checking the Product On delivery, always check that the delivered productAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. In no event shall the responsibility of OMRON-YASKAWA for any act exceed the individual price of the product on which liability is asserted. IN NO EVENT SHALL OMRON-YASKAWA BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON-YASKAWA'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR. Application Considerations SUITABILITY FOR USE OMRON-YASKAWA shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products. At the customer's request, OMRON-YASKAWA will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products: · Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual. · Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.



[You're reading an excerpt. Click here to read official OMRON VS](http://yourpdfguides.com/dref/2890388)

[MINI J7 user guide](http://yourpdfguides.com/dref/2890388)

<http://yourpdfguides.com/dref/2890388>

· Systems, machines, and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to the products. NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON-YASKAWA PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. PROGRAMMABLE PRODUCTS OMRON-YASKAWA shall not be responsible for the user's programming of a programmable product, or any consequence thereof. X Disclaimers CHANGE IN SPECIFICATIONS Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice.

When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON-YASKAWA representative at any time to confirm actual specifications of purchased products. DIMENSIONS AND WEIGHTS Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown. PERFORMANCE DATA Performance data given in this manual is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON-YASKAWA's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON-YASKAWA Warranty and Limitations of Liability. ERRORS AND OMISSIONS The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions. XI XII Table of Contents CHAPTER 1 Overview. . .

.....
.....
.....

.....
.....
1 1-1 1-2 Function

.....
.....
.....
.....

.....
.....
. 2 Nomenclature.

.....
.....
.....
.....

. . . 3 CHAPTER 2 Design

.....
.....
.....
.....

. . . 5 2-1 2-2 Installation

.....
.....
.....
.....

. 6 Wiring

.....
.....
.....
.....
.....
.....

. . . 10 CHAPTER 3 Preparing for Operation and Monitoring
. . . 33 3-1 3-2 Nomenclature.

.....	
.....	
.....	54 Setting the Frequency Reference .
.....	
.....	
.....	
.....	55 Setting the Acceleration/Deceleration Time
.....	
.....	
.....	60 Selecting the Reverse Rotation-prohibit
.....	
.....	
.....	62 Selecting the Interruption Mode
.....	
.....	
.....	62 Multi-function I/O ..
.....	
.....	
.....	
.....	63 5-10 Analog Monitor Output
.....	
.....	
.....	
.....	68 CHAPTER 6 Advanced Operation ..
.....	
.....	
.....	69 6-1 6-2 6-3 6-4 6-5 6-6 6-7 Setting the Carrier Frequency
.....	
.....	
.....	
.....	70 DC Injection Braking Function
.....	
.....	
.....	
.....	72 Stall Prevention Function
.....	
.....	
.....	
.....	73 Overtorque Detection Function
.....	

.....
.....
.....
..... 76 Torque Compensation Function ..

.....
.....
.....
.....
..... 77 Slip Compensation Function

.....
.....
..... 78 Other Functions ..
.....
.....
.....

.....
..... 79 XIII Table of Contents CHAPTER 7 Communications

.....
..... 89 7-1 7-2 7-3 7-4 7-5 7-6 7-7 7-8 7-9 RS-422/485 Communications Unit

..... 90 Inverter Settings.
.....

..... 93 Message Communications Basic Format.

..... 98 DSR Message and Response

..... 101 Enter Command

..... 108 Setting the Communications Data

.....
.....
.....

..... 109 Register Number Allocations in Detail

.....
.....
.....

..... 111 Communications Error Codes

.....
.....
.....
.....

.. 115 Self-diagnostic Test

.....
.....
.....

.....
.....

.. 116 CHAPTER 8 Communications ...

.....

.....
.....

. 117 8-1 8-2 8-3 Protective and Diagnostic Functions

.....

.....
.....

... 118 Troubleshooting ..

.....

.....
.....

.....

..... 123 Maintenance and Inspection

.....
.....
.....

..... 128 CHAPTER 9 Specifications .

.....
.....

.....
.....

. 131 9-1 9-2 9-3 Inverter Specifications

.....

.....
.....

.....

..... 132 Specifications of Accessories .

.....
.....

.....

..... 135 Option Specifications.

.....
.....
.....

142 CHAPTER 10 List of Parameters

... 145 CHAPTER 11 Using the Inverter for a Motor..

..... 159 XIV CHAPTER 1 Overview 1-1 1-2 Function

Nomenclature.....

2 3 1 Function Chapter 1-1 1-1 Function The compact simple VARISPEED J7-Series Inverter ensures greater ease of use than any conventional model. The VARISPEED J7 Inverter meets EC Directives and UL/cUL standard requirements for worldwide use. VARISPEED J7 Inverter Models The following 3-phase and single-phase 200-V AC-class, and 3-phase 400-V AC-class J7AZ models are available. Rated voltage 3-phase 200 V AC Protective structure Panel-mounting models (conforming to IP20) 0.1 0.25 0.55 1.1 1.5 2.2 4.

0 0.1 0.25 0.55 1.1 1.5 0.37 0.55 1.1 1.5 2.

2 4.0 Maximum applied motor capacity kW Model CIMR-J7AZ20P1 CIMR-J7AZ20P2 CIMR-J7AZ20P4 CIMR-J7AZ20P7 CIMR-J7AZ21P5 CIMR-J7AZ22P2 CIMR-J7AZ24P0 CIMR-J7AZB0P1 CIMR-J7AZB0P2 CIMR-J7AZB0P4 CIMR-J7AZB0P7 CIMR-J7AZB1P5 CIMR-J7AZ40P2 CIMR-J7AZ40P4 CIMR-J7AZ40P7 CIMR-J7AZ41P5 CIMR-J7AZ42P2 CIMR-J7AZ44P0 Single-phase 200 V AC Panel-mounting models (conforming to IP20) 3-phase 400 V AC Panel-mounting models (conforming to IP20) Note It is not possible to connect a Braking Resistor or Braking Unit to a J7-series Inverter. Select an Inverter from another series if the application requires braking control. International Standards (EC Directives and UL/cUL Standards) The J7 Inverter meets the EC Directives and UL/cUL standard requirements for worldwide use.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Classification EC Directives EMC Directive Low-Voltage Directive UL/cUL Applicable standard EN50081-2 and EN5008-2 prEN50178 UL508C Versatile Easy-to-use Functions · Incorporates the functions and operability ensured by the conventional J7AZ Series.

· Easy to initialize and operate with the FREQ adjuster on the Digital Operator. · Ease of maintenance. The cooling fan is easily replaceable. The life of the cooling fan can be prolonged by turning on the cooling fan only when the Inverter is in operation. Suppression of Harmonics Connects to DC reactors, thus suppressing harmonics more effectively than conventional AC reactors.

Further improvement in the suppression of harmonics is possible with the combined use of the DC and AC reactors. 2 Nomenclature Chapter 1-2 1-2 Panel Nomenclature Digital operator Function display LEDs Data display Selected function is lit (see the functions below). Its data is displayed on data display. Display selection key Switch functions among function display LEDs. Operation key Press to run the motor. The RUN light is ON while running. Enter key Enter data when setting constants. After selecting constant no. at PRGM mode, data are displayed. Alarm LED Run LED Increment key Increase constant no.

or data. Frequency setting volume Set operational frequency with volume. Decrement key Decrease constant no. or data. Stop/Reset key Press to stop the motor. If fault occurs, reset the inverter. Note 1. The front cover functions as a terminal cover. The Digital Operator Unit cannot be removed. 2. Instead of mounting holes, each of the following models has two U-shaped cutouts located diagonally. CIMR-J7AZ20P1 (0.1 kW), CIMR-J7AZ20P2 (0.25 kW), CIMR-J7AZ20P4 (0.55 kW), and CIMR-J7AZ20P7 (1.

1 kW) CIMR-J7AZB0P1 (0.1 kW), CIMR-J7AZB0P2 (0.25 kW), and CIMR-J7AZB0P4 (0.55 kW) 3 Nomenclature Digital Operator Indicators (Setting/Monitor item indicators) Chapter 1-2 Data display Keys FREQ adjuster Appearance Name Data display Function Displays relevant data items, such as frequency reference, output frequency, and parameter set values. Sets the frequency reference within a range between 0 Hz and the maximum frequency. FREQ adjuster FREF indicator FOUT indicator IOUT indicator MNTR indicator F/R indicator LO/RE indicator The frequency reference can be monitored or set while this indicator is lit. The output frequency of the Inverter can be monitored while this indicator is lit. The output current of the Inverter can be monitored while this indicator is lit. The values set in U01 through U10 are monitored while this indicator is lit. The direction of rotation can be selected while this indicator is lit when operating the Inverter with the RUN Key. The operation of the Inverter through the Digital Operator or according to the set parameters is selectable while this indicator is lit. Note This status of this indicator can be only monitored while the Inverter is in operation. Any RUN command input is ignored while this indicator is lit. The parameters in n01 through n79 can be set or monitored while this indicator is lit. Note While the Inverter is in operation, the parameters can be only monitored and only some parameters can be changed.

Any RUN command input is ignored while this indicator is lit. Switches the setting and monitor item indicators in sequence. Parameter being set will be canceled if this key is pressed before entering the setting. Increases multi-function monitor numbers, parameter numbers, and parameter set values. Decreases multi-function monitor numbers, parameter numbers, and parameter set values. Enters multi-function monitor numbers, parameter numbers, and internal data values after they are set or changed. Starts the Inverter running when the J7AZ is in operation with the Digital Operator. Stops the Inverter unless parameter n06 is set to disable the STOP Key. Functions as a Reset Key when an Inverter error occurs. (See note.

) PRGM indicator Mode Key Increment Key Decrement Key Enter Key RUN Key STOP/RESET Key Note For safety reasons, the reset will not work while a RUN command (forward or reverse) is in effect. Wait until the RUN command is OFF before resetting the Inverter. 4 CHAPTER 2 Design 2-1 Installation . . .

.....
.....
.....
.....
.....

... 2-1-1 2-1-2 2-2 2-2-1 2-2-2 2-2-3 2-2-4 2-2-5 2-2-6 Dimensions

.....
.....
.....

... Installations Conditions . .

.....
.....
.....

... Removing and Mounting the Covers

.....
.....

.. Terminal Block . . .

.....
.....
.....

..... Standard Connections . .

.....
.....

.....
.....

.... Wiring around the Main Circuit

.....
.....
.....

.. Wiring Control Circuit Terminals

.....
.....

..... Conforming to EC Directive .

.....
.....
.....

6 6 8 10 11 12 16 17 27 29 Wiring

.....
.....

.....
.....
.....

..... 5 Installation Chapter 2-1 2-1 2-1-1 Installation Dimensions CIMR-J7AZ20P1 to CIMR-J7AZ20P7 (0.1 to 0.75 kW) 3-phase 200-V AC Input CIMR-J7AZB0P1 to CIMR-J7AZB0P4 (0.1 to 0.4 kW) Single-phase 200-V AC Input 118 128 5 6 56 68 8.

5 D t D1 Rated voltage 3-phase 200 V AC Model CIMR-J7AZ20P1 20P2 20P4 20P7 B0P1 B0P2 B0P4 Single-phase 200 V AC Dimensions (mm) D D1 t 70 10 3 70 10 3 102 42 5 122 62 5 70 10 3 70 10 3 112 42 5 Weight (kg) Approx. 0.5 Approx. 0.5 Approx. 0.8 Approx. 0.9 Approx. 0.5 Approx. 0.5 Approx. 0.9 6 Installation CIMR-J7AZ21P5 to CIMR-J7AZ22P2 (1.

5 to 2.2 kW) 3-phase 200-V AC Input CIMR-J7AZB0P7 to CIMR-J7AZB1P5 (0.75 to 1.5 kW) Single-phase 200-V AC Input CIMR-J7AZ40P2 to CIMR-J7AZ42P2 (0.2 to 2.

2 kW) 3-phase 400-V AC Input Two, 5-dia. holes Chapter 2-1 118 128 5 6 96 108 8.5 D 5 D1 Rated voltage 3-phase 200 V AC Single-phase 200 V AC 3-phase 400 V AC Model CIMR-J7AZ21P5 22P5 B0P7 B1P5 40P2 40P4 40P7 41P5 42P2 129 154 129 154 81 99 129 154 154 Dimensions (mm) D D1 64 64 64 64 16 34 64 64 64 Weight (kg) Approx. 1.3 Approx. 1.5 Approx. 1.5 Approx. 1.

5 Approx. 1.0 Approx. 1.1 Approx. 1.5 Approx. 1.5 Approx. 1.

5 7 Installation CIMR-J7AZ24P0 (4.0 kW) 3-phase 200-V AC Input CIMR-J7AZ44P0 (4.0 kW) 3-phase 400-V AC Input Two, 5-dia. holes Chapter 2-1 118 128 5 6 128 140 8.5 D D1 5 Rated voltage 3-phase 200 V AC 3-phase 400 V AC Model CIMR-J7AZ24P0 44P0 Dimensions (mm) D D1 161 71 161 71 Weight (kg) Approx.

2.1 Approx. 2.1 2-1-2 Installations Conditions Provide an appropriate stopping device on the machine side to secure safety. (A holding brake is not a stopping device for securing safety.

) Not doing so may result in injury. Provide an external emergency stopping device that allows an instantaneous stop of operation and power interruption. Not doing so may result in injury. Be sure to install the product in the correct direction and provide specified clearances between the Inverter and control panel or with other devices.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Not doing so may result in fire or malfunction. Do not allow foreign objects to enter inside the product. Doing so may result in fire or malfunction. Do not apply any strong impact. Doing so may result in damage to the product or malfunction. ! WARNING ! WARNING ! Caution ! Caution ! Caution 8 Installation Installation Direction and Dimensions Install the Inverter under the following conditions.

Chapter 2-1 · Ambient temperature for operation (panel-mounting): -10°C to 50°C · Humidity: 95% or less (no condensation) Install the Inverter in a clean location free from oil mist and dust. Alternatively, install it in a totally enclosed panel that is completely protected from floating dust. When installing or operating the Inverter, always take special care so that metal powder, oil, water, or other foreign matter does not get into the Inverter. Do not install the Inverter on inflammable material such as wood. Direction Dimensions Install the Inverter on a vertical surface so that the characters on the nameplate are oriented upward. When installing the Inverter, always provide the following clearances to allow normal heat dissipation from the Inverter. W = 30 mm min. 100 mm min. Air Inverter Inverter Inverter Side W W W 100 mm min. Air Ambient Temperature Control To enhance operation reliability, the Inverter should be installed in an environment free from extreme temperature changes.

If the Inverter is installed in an enclosed environment such as a box, use a cooling fan or air conditioner to maintain the internal air temperature below 50°C. The life of the built-in electrolytic capacitors of the Inverter is prolonged by maintaining the internal air temperature as low as possible. The surface temperature of the Inverter may rise approximately 30°C higher than the ambient temperature. Be sure to keep away equipment and wires from the Inverter as far as possible if the equipment and wires are easily influenced by heat. Protecting Inverter from Foreign Matter during Installation Place a cover over the Inverter during installation to shield it from metal power produced by drilling.

Upon completion of installation, always remove the cover from the Inverter. Otherwise, ventilation will be affected, causing the Inverter to overheat. 9 Wiring Chapter 2-2 2-2 Wiring Wiring must be performed only after confirming that the power supply has been turned OFF. Not doing so may result in electrical shock. Wiring must be performed by authorized personnel.

Not doing so may result in electrical shock or fire. Be sure to confirm operation only after wiring the emergency stop circuit. Not doing so may result in injury. Always connect the ground terminals to a ground of 100 or less for the 200V AC class, or 10 or less for the 400V AC class. Not connecting to a proper ground may result in electrical shock. Install external breakers and take other safety measures against shortcircuiting in external wiring. Not doing so may result in fire. Confirm that the rated input voltage of the Inverter is the same as the AC power supply voltage. An incorrect power supply may result in fire, injury, or malfunction. Connect the Braking Resistor and Braking Resistor Unit as specified in the manual.

Not doing so may result in fire. Be sure to wire correctly and securely. Not doing so may result in injury or damage to the product. Be sure to firmly tighten the screws on the terminal block. Not doing so may result in fire, injury, or damage to the product. Do not connect an AC power to the U, V, or W output. Doing so may result in damage to the product or malfunction. ! WARNING ! WARNING ! WARNING ! WARNING ! Caution ! Caution ! Caution ! Caution ! Caution 10 Wiring Chapter 2-2 2-2-1 Removing and Mounting the Covers It is necessary to remove the front cover, optional cover, top protection cover, and the bottom protection cover from the Inverter to wire the terminal block. Follow the instructions below to remove the covers from the Inverter. To mount the covers, take the opposite steps.

Removing the Front Cover · Loosen the front cover mounting screws with a screwdriver. · Press the left and right sides of the front cover in the arrow 1 directions and lift the bottom of the cover in the arrow 2 direction to remove the front cover as shown in the following illustration. 1 2 Removing the Top and Bottom Protection Covers and Optional Cover Removing the Top and Bottom Protection Covers · After removing the front cover, pull the top and bottom protection covers in the arrow 1 directions. Removing the Optional Cover · After removing the front cover, lift the optional cover in the arrow 2 direction based on position A as a fulcrum. 1 Position A 1 2 11 Wiring Chapter 2-2 2-2-2 Terminal Block Before wiring the terminal block, be sure to remove the front cover, top protection cover, and the bottom protection cover.

Position of Terminal Block Ground terminal Main circuit input terminals Control circuit terminals Main circuit output terminals Ground terminal Arrangement of Control Circuit Terminals Arrangement of Main Circuit Terminals · CIMR-J7AZ20P1 to CIMR-J7AZ20P7 CIMR-J7AZB0P1 to CIMR-J7AZB0P4 · CIMR-J7AZ21P5 to CIMR-J7AZ24P0 CIMR-J7AZB0P7 to CIMR-J7AZB4P0 CIMR-J7AZ40P2 to CIMR-J7AZ44P0 Main Circuit Input Terminals (Upper Side) Main Circuit Input Terminals (Upper Side) Main Circuit Output Terminals (Lower Side) Main Circuit Output Terminals (Lower Side) 12 Wiring Main Circuit Terminals Symbol R/L1 S/L2 T/L3 U/T1 V/T2 W/T3 +1 +2 Connection terminals +1 and +2: DC reactor connection terminals +1 and +2: DC power supply input terminals Ground terminal Motor output terminals Name Power Supply input terminals Chapter 2-2 Description CIMR-J7AZ2_ : 3-phase 200 to 230 V AC CIMR-J7AZB_ : Single-phase 200 to 240 V AC CIMR-J7AZ4_ : 3-phase 380 to 460 V AC Note Connect single-phase input to terminals R/L1 and S/L2. 3-phase power supply output for driving motors. CIMR-J7AZ2_ : 3-phase 200 to 230 V AC CIMR-J7AZB_ : 3-phase 200 to 240 V AC CIMR-J7AZ4_ : 3-phase 380 to 460 V AC Connect the DC reactor for suppressing harmonics to terminals +1 and +2. When driving the Inverter with DC power, input the DC power to terminals +1 and . (Terminal +1 is a positive terminal.

) Be sure to ground the terminal under the following conditions. CIMR-J7AZ2_ : Ground at a resistance of 100 or less. CIMR-J7AZB_ : Ground at a resistance of 100 or less. CIMR-J7AZ4_ : Ground at a resistance of 10 or less, and connect to the power supply's neutral phase to conform to EC Directives. Note Be sure to connect the ground terminal directly to the motor frame ground. Note The maximum output voltage corresponds to the power supply input voltage of the Inverter. 13 Wiring Control Circuit Terminals Symbol Input S1 S2 S3 S4 S5 SC FS FR FC Output MA MB MC AM AC Name Forward/Stop Multi-function input 1 (S2) Multi-function input 2 (S3) Multi-function input 3 (S4) Multi-function input 4 (S5) Sequence input common Frequency reference power supply Frequency reference input Function Forward at ON.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Stops at OFF. Set by parameter n36 (Reverse/Stop) Set by parameter n37 (Fault reset) Set by parameter n38 (External fault:Normally open) Set by parameter n39 (Multi-step reference 1) Common for S1 through S5 DC power supply for frequency reference use Input terminal for frequency reference use Chapter 2-2 Signal level Photocoupler 8 mA at 24 V DC Note NPN is the default setting for these terminals. Wire them by providing a common ground.

No external power supply is required. To provide an external power supply and wire the terminals through a common positive line, however, set the SW7 to PNP and make sure that the power supply is at 24 V DC $\pm 10\%$. 20 mA at 12 V DC 0 to 10 V DC (input impedance: 20 k) Frequency reference common Common for frequency reference use Multi-function contact output (Normally open) Multi-function contact output (Normally closed) Multi-function contact output common Analog monitor output Analog monitor output common Common for MA and MB use Set by parameter n44 (Output frequency) Common for AM use 2 mA max. at 0 to 10 V DC Set by parameter n40 (during running) Relay output 1 A max. at 30 V DC 1 A max. at 250 V AC Note 1. Depending on the parameter settings, various functions can be selected for multi-function inputs and multi-function contacts outputs. 2. Functions in parentheses are default settings. Selecting Input Method Switches SW7 and SW8, both of which are located above the control circuit terminals, are used for input method selection. Remove the front cover and optional cover to use these switches. SW7 SW8 SW7 SW8 Selector Control circuit terminal block 14 Wiring Selecting Frequency Reference Input Method Chapter 2-2 By using SW7, NPN or PNP input can be selected as shown below. NPN 24V SW7 GND S1 to 5 S1 to 5 0.1 μ 360 SC GND 3.3k PNP 24V SW7 GND S1 to 5 S1 to 5 24V DC 24 VDC (+10%) (+10%) SC 3.

3k 0.1 μ 360 GND Selecting Frequency Reference Input Method By using SW8, frequency reference voltage or current input can be selected. Parameter settings are required together with the selection of the frequency reference input method. Frequency reference input method Voltage input Current input SW8 setting Frequency reference selection (parameter n03) Set value 2 Set value 3 or 4 V (OFF) I (ON) 15 Wiring Chapter 2-2 2-2-3 Standard Connections DC reactor (optional) Noise Filter 3-phase 200 V AC Single-phase 200 V AC (see note 1) 3-phase 400 V AC Forward/Stop Multi-function input 1 (S2) Multi-function input 2 (S3) Multi-function input 3 (S4) Multi-function input 4 (S5) Sequence input common Frequency reference power supply 20 mA at +12 V FREQ adjuster Frequency reference input Frequency reference common Multi-function contact output NO NC Common Analog monitor output Analog monitor output common (2k, 1/4 W min.) Note 1.

Connect single-phase 200 V AC to terminals R/L1 and S/L2 of the CIMR-J7AZB_. 2. The braking resistor cannot be connected because no braking transistor is incorporated. Example of 3-wire Sequence Connections Stop switch (NC) RUN switch (NO) RUN input (Operates with the stop switch and RUN switch closed.) Direction switch Stop input (Stops with the stop switch opened.) Forward/Stop reference (Forward with the direction switch opened and reverse with the direction switch closed.) Sequence input common Note Set parameter n37 for 3-wire sequence input. 16 Wiring Chapter 2-2 2-2-4 Wiring around the Main Circuit Wire Size, Terminal Screw, Screw Tightening Torque, and Molded-case Circuit Breaker Capacities For the main circuit and ground, always use 600-V polyvinyl chloride (PVC) cables. If any cable is long and may cause voltage drops, increase the wire size according to the cable length. 3-phase 200-V AC Model Model CIMR-J7AZTerminal symbol Terminal screw Screw tightening torque (N·m) 0.

8 to 1.0 Wire size (mm²) ReMoldedcommended case circuit wire size breaker capacity (A) (mm²) 2 5 20P1 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.75 to 2 20P2 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 0.75 to 2 2 5 20P4 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.

0 0.75 to 2 2 5 20P7 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 0.

75 to 2 2 10 21P5 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 2 20 22P2 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 3.5 20 24P0 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M4 1.2 to 1.5 2 to 5.5 5.5 30 17 Wiring Single-phase 200-V AC Model Model CIMR-J7AZTerminal symbol Terminal screw Terminal torque (N·m) 0.8 to 1.

0 Wire size (mm²) Chapter 2-2 B0P1 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.75 to 2 ReCircuit commended breaker wire size capacity (A) (mm²) 2 5 B0P2 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 0.75 to 2 2 5 B0P4 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 0.

75 to 2 2 10 B0P7 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 3.

5 2 20 B1P5 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 5.

5 2 20 3-phase 400-V AC Model Model CIMR-J7AZTerminal symbol Terminal screw Terminal torque (N·m) 0.8 to 1.0 Wire size (mm²) ReCircuit commended breaker wire size capacity (A) (mm²) 2 5 40P2 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 2 to 5.5 40P4 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 2 5 40P7 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.

8 to 1.0 2 to 5.5 2 5 41P5 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M3.5 0.8 to 1.0 2 to 5.5 2 10 42P2 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M4 1.2 to 5.5 2 to 5.5 2 10 44P0 R/L1, S/L2, T/L3, , +1, +2, U/T1, V/T2, W/T3 M4 1.

2 to 1.5 2 to 5.5 2 3.5 20 18 Wiring Wiring on the Input Side of the Main Circuit Installing a Molded-case Circuit Breaker Chapter 2-2 Always connect the power input terminals (R/L1, S/L2, and T/L3) and power supply via a molded case circuit breaker (MCCB) suitable to the Inverter. · Install one MCCB for every Inverter used.

· Choose an appropriate MCCB capacity according to the Circuit breaker capacity column in the table on the previous page. · For the MCCB's time characteristics, be sure to consider the Inverter's overload protection (one minute at 150% of the rated output current). · If the MCCB is to be used in common among multiple Inverters, or other devices, set up a sequence such that the power supply will be turned off by a fault output, as shown in the following diagram.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)

<http://yourpdfguides.com/dref/2890388>

Inverter 3-phase/Single-phase 200 V AC 3-phase 400 V AC Power supply MCCB R/L1 S/L2 T/L3 MB OFF ON MC Fault output (NC) Installing a Ground Fault Interrupter Inverter outputs use high-speed switching, so high-frequency leakage current is generated. In general, a leakage current of approximately 100 mA will occur for each Inverter (when the power cable is 1 m) and approximately 5 mA for each additional meter of power cable. Therefore, at the power supply input area, use a special-purpose breaker for Inverters, which detects only the leakage current in the frequency range that is hazardous to humans and excludes high-frequency leakage current. For the special-purpose breaker for Inverters, choose a ground fault interrupter with a sensitivity amperage of at least 10 mA per Inverter. When using a general leakage breaker, choose a ground fault interrupter with a sensitivity amperage of 200 mA or more per Inverter and with an operating time of 0.1 s or more. Installing a Magnetic Contactor If the power supply of the main circuit is to be shut off because of the sequence, a magnetic contactor can be used instead of a molded-case circuit breaker. When a magnetic contactor is installed on the primary side of the main circuit to stop a load forcibly, however, the regenerative braking does not work and the load coasts to a stop. A load can be started and stopped by opening and closing the magnetic contactor on the primary side. Frequently opening and closing the magnetic contactor, however, may cause the Inverter to break down. In order not to shorten the service life of the Inverter's internal relays and electrolytic capacitors, it is recommended that the magnetic contactor is used in this way no more than once every 30 minutes. When the Inverter is operated with the Digital Operator, automatic operation cannot be performed after recovery from a power interruption.

19 Wiring Connecting Input Power Supply to the Terminal Block Installing an AC Reactor Chapter 2-2 Input power supply can be connected to any terminal on the terminal block because the phase sequence of input power supply is irrelevant to the phase sequence (R/L1, S/L2, and R/L3). If the Inverter is connected to a large-capacity power transformer (660 kW or more) or the phase advance capacitor is switched, an excessive peak current may flow through the input power circuit, causing the converter unit to break down. To prevent this, install an optional AC reactor on the input side of the Inverter. This also improves the power factor on the power supply side. Installing a Surge Absorber Installing a Noise Filter on the Power Supply Side Always use a surge absorber or diode for the inductive loads near the Inverter. These inductive loads include magnetic contactors, electromagnetic relays, solenoid valves, solenoid, and magnetic brakes. The Inverter's outputs use high-speed switching, so noise may be transmitted from the Inverter to the power line and adversely affect other devices in the vicinity. It is recommended that a Noise Filter be installed at the Power Supply to minimize noise transmission. Noise will also be reduced from the power line to the Inverter. Wiring Example 1 Input Noise Filters EMC-conforming Input Noise Filter: 3G3JV-PFI_ Power supply MCCB Noise Filter MCCB Programmable Controller CIMR-J7AZ VARISPEED Note Use a Noise Filter designed for the Inverter.

A general-purpose Noise Filter will be less effective and may not reduce noise. 20 Wiring Wiring on the Output Side of the Main Circuit Connecting the Terminal Block to the Load Chapter 2-2 Connect output terminals U/T1, V/T2, and W/T3 to motor lead wires U, V, and W. Check that the motor rotates forward with the forward command. Switch over any two of the output terminals to each other and reconnect if the motor rotates in reverse with the forward command. Never Connect a Power Supply to Output Terminals Never Short or Ground Output Terminals Never connect a power supply to output terminals U/T1, V/T2, or W/T3.

If voltage is applied to the output terminals, the internal circuit of the Inverter will be damaged. If the output terminals are touched with bare hands or the output wires come into contact with the Inverter casing, an electric shock or grounding will occur. This is extremely hazardous. Also, be careful not to short the output wires. Never connect a phase advance capacitor or LC/RC Noise Filter to the output circuit.

Doing so will result in damage to the Inverter or cause other parts to burn. Do not connect an electromagnetic switch of magnetic contactor to the output circuit. If a load is connected to the Inverter during running, an inrush current will actuate the overcurrent protective circuit in the Inverter. The Inverter has an electronic thermal protection function to protect the motor from overheating. If, however, more than one motor is operated with one inverter or a multi-polar motor is used, always install a thermal relay (THR) between the Inverter and the motor and set n33 to 2 (no thermal protection). In this case, program the sequence so that the magnetic contactor on the input side of the main circuit is turned off by the contact of the thermal relay. Do not Use a Phase Advancing Capacitor or Noise Filter Do not Use an Electromagnetic Switch of Magnetic Contactor Installing a Thermal Relay Installing a Noise Filter on the Output Side Connect a Noise Filter to the output side of the Inverter to reduce radio noise and induction noise. Power supply MCCB CIMR-J7AZ VARISPEED Noise Filter Signal line Induction noise Radio noise Controllor AM radio Induction Noise: Electromagnetic induction generates noise on the signal line, causing the controller to malfunction. Radio Noise: Electromagnetic waves from the Inverter and cables cause the broadcasting radio receiver to make noise. 21 Wiring Countermeasures against Induction Noise Chapter 2-2 As described previously, a Noise Filter can be used to prevent induction noise from being generated on the output side.

Alternatively, cables can be routed through a grounded metal pipe to prevent induction noise. Keeping the metal pipe at least 30 cm away from the signal line considerably reduces induction noise. MCCB CIMR-J7AZ VARISPEED Metal pipe Power supply 30 cm min. Signal line Controllor Countermeasures against Radio Interference Radio noise is generated from the Inverter as well as the input and output lines. To reduce radio noise, install Noise Filters on both input and output sides, and also install the Inverter in a totally enclosed steel box. The cable between the Inverter and the motor should be as short as possible. Steel box Power supply MCCB Noise Filter CIMR-J7AZ Noise Filter Metal pipe VARISPEED Cable Length between Inverter and Motor As the cable length between the Inverter and the motor is increased, the floating capacity between the Inverter outputs and the ground is increased proportionally.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

The increase in floating capacity at the Inverter outputs causes the high-frequency leakage current to increase, and this may adversely affect peripheral devices and the current detector in the Inverter's output section. To prevent this from occurring, use a cable of no more than 100 meters between the Inverter and the motor. If the cable must be longer than 100 meters, take measures to reduce the floating capacity by not wiring in metallic ducts, by using separate cables for each phase, etc.

Also, adjust the carrier frequency (set in n46) according to the cable length between the Inverter and the motor, as shown in the following table. Cable length 50 m or less Carrier frequency 10 kHz max. 100 m or less 5 kHz max. More than 100 m 2.5 kHz Note Single-phase motors cannot be used.

The Inverter is not suited for the variable speed control of single-phase motors. The rotation direction of a single-phase motor is determined by the capacitor starting method or phase-splitting starting method to be applied when starting the motor. In the capacitor starting method, however, the capacitor may be damaged by a sudden electric discharge of the capacitor caused by the output of the Inverter. On the other hand, the starting coil may burn in the phase-splitting starting method because the centrifugal switch does not operate. 22 Wiring Ground Wiring Chapter 2-2 · Always use the ground terminal with the following ground resistance: 200-V Inverter: 100 W or less 400-V Inverter: separate ground, 10 W or less · Do not share the ground wire with other devices such as welding machines or power tools.

· Always use a ground wire that complies with technical standards on electrical equipment and minimize the length of the ground wire. Leakage current flows through the Inverter. Therefore, if the distance between the ground electrode and the ground terminal is too long, the potential on the ground terminal of the Inverter will become unstable. · When using more than one Inverter, be careful not to loop the ground wire. 23 Wiring Harmonics Definition Chapter 2-2 Harmonics consist of electric power produced from AC power and alternating at frequencies that are integral multiples of the frequency of the AC power. The following frequencies are harmonics of a 60- or 50-Hz commercial power supply. Second harmonic: 120 (100) Hz Third harmonic: 180 (150) Hz Second harmonic (120 Hz) Basic frequency (60 Hz) Third harmonic (180 Hz) Problems Caused by Harmonics Generation The waveform of the commercial power supply will be distorted if the commercial power supply contains excessive harmonics. Machines with such a commercial power supply will malfunction or generate excessive heat. Basic frequency (60 Hz) Third harmonic (180 Hz) Distorted current wave form 24 Wiring Causes of Harmonics Generation Chapter 2-2 Usually, electric machines have built-in circuitry that converts commercial AC power supply into DC power. Such AC power, however, contains harmonics due to the difference in current flow between DC and AC.

Obtaining DC from AC Using Rectifiers and Capacitors DC voltage is obtained by converting AC voltage into a pulsating one-side voltage with rectifiers and smoothing the pulsating one-side voltage with capacitors. Such AC current, however, contains harmonics. Inverter The Inverter as well as normal electric machines has an input current containing harmonics because the Inverter converts AC into DC. The output current of the Inverter is comparatively high. Therefore, the ratio of harmonics in the output current of the Inverter is higher than that of any other electric machine. Voltage Time Rectified Voltage Time Smoothed Voltage Time Current A current flows into the capacitors. The current is different from the voltage in waveform. Time 25 Wiring Countermeasures with Reactors against Harmonics Generation DC/AC Reactors Chapter 2-2 The DC reactor and AC reactor suppress harmonics and currents that change suddenly and greatly. The DC reactor suppresses harmonics better than the AC reactor. The DC reactor used with the AC reactor suppresses harmonics more effectively.

The input power factor of the Inverter is improved by suppressing the harmonics of the input current of the Inverter. Connection Connect the DC reactor to the internal DC power supply of the Inverter after shutting off the power supply to the Inverter and making sure that the charge indicator of the Inverter turns off. Do not touch the internal circuitry of the Inverter in operation, otherwise an electric shock or burn injury may occur. Wiring Method With DC Reactor DC reactor (optional) MCCB Power supply 3-phase 200 V AC Single-phase 200 V AC 3-phase 400 V AC VARISPEED CIMR-J7AZ With DC and AC Reactors DC reactor (optional) MCCB Power supply 3-phase 200 V AC Single-phase 200 V AC 3-phase 400 V AC AC reactor (optional) VARISPEED CIMR-J7AZ Reactor Effects Harmonics suppression method No reactor AC reactor DC reactor DC and AC reactors Harmonics are effectively suppressed when the DC reactor is used with the AC reactor as shown in the following table. Harmonic generation rate (%) 5th 7th 11th 13th 17th 19th harmonic harmonic harmonic harmonic 65 41 8. 5 7.7 4.3 3.1 38 14.5 7. 4 3.4 3.2 1.9 30 13 8.4 5 4.7 3.2 28 9.1 7.2 4.1 3.

2 2.4 23rd harmonic 2.6 1.7 3.0 1.6 25th harmonic 1.8 1.3 2.2 1.4 26 Wiring Chapter 2-2 2-2-5 Wiring Control Circuit Terminals A control signal line must be 50 m maximum and separated from power lines.

The frequency reference must be input into the Inverter through shielded, twisted-pair wires. Wiring of Control I/O Terminals Wire each control I/O terminal under the following conditions. Wires and Tightening Torque Multi-function Contact Output (MA, MB, and MC) Terminal Tightening Wire Wire size screw size torque N-m M3 0.5 to 0.6 Single wire 0.

5 to 1.25 (20 to 16) Standard 0.5 to 1.25 wire (20 to 16) Recommended wire size 0.75 (18) Cable Cable with polyethylene sheath Sequential Input (S1 through S5 and SC) and Analog Monitor Output (AM or AC) Terminal Tightening Wire Wire size screw size torque N-m M2 0.

22 to 0.25 Single wire 0.5 to 1.25 (20 to 16) Standard 0.5 to 0.75 wire (20 to 18) Recommended Cable wire size 0.75 (18) Cable with polyethylene sheath Frequency Reference Input (FR, FS, and FC) Terminal Tightening Wire Wire size screw size torque N-m M2 0.22 to 0.25 Single wire 0.5 to 1.

25 (20 to 16) Standard 0.5 to 0.75 wire (20 to 18) Recommended Cable wire size 0.75 (18) Special cable with polyethylene sheath and shield for measurement use Solderless Terminal Size The use of solderless terminals for the control circuit terminals is recommended for the reliability and ease of connection. Note Make sure that the wire size is 0.5 mm² when using the following solderless terminal. 1.0 dia. 8 Model: Phoenix Contact's A1 0.5-8 WH 14 (Size: mm) 2. 6 dia. 27 Wiring Wiring Method 1.



[You're reading an excerpt. Click here to read official OMRON VS MINI J7 user guide](http://yourpdfguides.com/dref/2890388)
<http://yourpdfguides.com/dref/2890388>

Loosen the terminal screws with a thin-slotted screwdriver. 2. Insert the wires from underneath the terminal block.

Chapter 2-2 3. Tighten each terminal screw firmly to a torque specified in the previous tables. Note 1. Always separate the control signal line from the main circuit cables and other power cables. 2.

Do not solder the wires to the control circuit terminals. The wires may not contact well with the control circuit terminals if the wires are soldered. 3. The end of each wire connected to the control circuit terminals must be stripped for approximately 5.5 mm. 4. Connect the shield wire to the ground terminal of the CIMR-J7AZ. Do not connect the shield wire to the device side being controlled. 5. Be sure to insulate the shield wire with tape so that the shield wire will not come into contact with other signal wires or equipment.

Thin-slotted screwdriver Terminal block Strip the end for approximately 5.5 mm if no solderless terminal is used. Wire Solderless terminal or wire without soldering. Note Applying excessive torque may damage the terminal block. If the tightening torque is insufficient, however, wires may disconnect. 28 Wiring Chapter 2-2 2-2-6 Conforming to EC Directive The following description provides the wiring method of the Inverter to meet DC Directive requirements. If the following requirements are not satisfied, the whole equipment incorporating the Inverter will need further confirmation. Standard Connection Main Circuit Terminals MCCBs Noise Filter Clamp core 3-phase 200 V AC Single-phase 200 V AC 3-phase 400 V AC Control Circuit Terminals Multi-function contact output Forward/Stop Multi-function input 1 (S2) Multi-function input 2 (S3) Multi-function input 3 (S4) Multi-function input 4 (S5) NO NC Common Sequence input common Analog-monitor output Analog-monitor output common Frequency reference power supply at +12 V FREQ adjuster Frequency reference input Frequency reference common (2k, 1/4 W min.) Note I/O signals can be connected to a single shielded cable. 29 Wiring Wiring the Power Supply Chapter 2-2 Make sure that the Inverter and Noise Filter are grounded together.

· Always connect the power input terminals (R/L1, S/L2, and T/L3) and power supply via a dedicated Noise Filter. · Reduce the length of the ground wire as much as possible. · Locate the Noise Filter as close as possible to the Inverter. Make sure that the cable length between the Noise Filter and the Inverter does not exceed 40 cm. · The following Noise Filters are available.

3-phase 200-V AC Noise Filter Inverter Model CIMR-J7AZ20P1/20P2/20P4/20P7 21P5/22P2 24P0 Schaffner model 3G3JV-PFI2010-SE 3G3JV-PFI2020-SE --3-phase 200-V AC Noise Filter Rasmi model Rated current (A) 3G3JV-PFI2010-E 10 3G3JV-PFI2020-E 16 3G3JV-PFI2030-E 26 Single-phase 200-V AC Noise Filter Inverter Model 3G3JVB0P1/B0P2/B0P4 B0P7/B1P5 Schaffner model 3G3JV-PFI1010-SE 3G3JV-PFI1020-SE Single-phase 200-V Noise Filter Rasmi model Rated current (A) 3G3JV-PFI1010-E 10 3G3JV-PFI1020-E 20 3-phase 400-V AC Noise Filter Inverter Model CIMR-J7AZ40P2/40P4 40P7/41P5/44P0 A44P0 Schaffner model 3G3JV-PFI3005-SE 3G3JV-PFI3010-SE 3G3JV-PFI3020-SE Single-phase 200-V Noise Filter Rasmi model Rated current (A) Schaffner model Rasmi model 3G3JV-PFI3005-E 5 3G3JV-PFI3010-E 10 3G3JV-PFI3020-E 20 15 Connecting a Motor to the Inverter · When connecting a motor to the Inverter, be sure to use a cable with a braided shield. · Reduce the length of the cable as short as possible and ground the shield on the Inverter side as well as the motor side. Make sure that the cable length between the Inverter and the motor does not exceed 20 cm. Furthermore, connect a clamp core (Clamp Filter) close to the output terminals of the Inverter. Product Clamp Filter Model 2CAT3035-1330 Manufacturer

TDK Wiring a Control Cable · Be sure to connect a cable with a braided shield to the control circuit terminals.

· Ground the shield on the Inverter side only. 30 Wiring Grounding the Shield Chapter 2-2 In order to ground the shield securely, it is recommended that a cable clamp be directly connected to the ground plate as shown below. Ground plate Cable clamp Cable Shield LVD Conformance · Always connect the Inverter and power supply via a molded case circuit breaker (MCCB) suitable to the Inverter for protecting the Inverter from damage that may result from short-circuiting. · Use one MCCB per Inverter. · Select a suitable MCCB from the following table. · With 400-V Inverters, it is necessary to ground to the power supply's neutral phase. 300V Models Inverter Model CIMR-J7AZ20P1 20P2 20P4 20P7 21P5 22P2 24P0 B0P1 B0P2 B0P4 B0P7 B1P5 MCCB (Mitsubishi Electric) Type Rated current (A) 5 5 5 10 20 20 30 5 5 10 20 20 NF30 NF30 31 Wiring 400-V Models Inverter Model CIMR-J7AZ40P2 40P4 40P7 41P5 42P2 44P0 Chapter 2-2 NF30 MCCB (Mitsubishi Electric) Type Rated current (A) 5 5 5 10 10 20 To satisfy LVD (Low-voltage Directive) requirements, the system must be protected by a molded case circuit breaker (MCCB) when a short-circuit occurs. A single MCCB may be shared with more than one Inverter or with other machines. In that case, however, take some appropriate measures so that the MCCB will protect all the Inverters from the occurrence of any single short-circuit. The frequency reference power supply (FS) of the Inverter is of basic insulation construction.

When connecting the Inverter to peripheral devices, be sure to increase the degree of insulation. 32 CHAPTER 3 Preparing for Operation and Monitoring 3-1 3-2 Nomenclature

.
.
.
.
.
.
.
.
.
.

. Outline of Operation

. . . . 34 35 33 Nomenclature Chapter 3-1 3-1 Nomenclature Indicators Setting/Monitor item indicators Data display Keys FREQ adjuster Appearance Name Data display Function Displays relevant data items, such as frequency reference, output frequency, and parameter set values. Sets the frequency reference within a range between 0 Hz and the maximum frequency. FREQ adjuster FREF indicator FOUT indicator IOUT indicator MNTR indicator F/R indicator LO/RE indicator The frequency reference can be monitored or set while this indicator is lit. The output frequency of the Inverter can be monitored while this indicator is lit. The output current of the Inverter can be monitored while this indicator is lit.

The values set in U01 through U10 are monitored while this indicator is lit. The direction of rotation can be selected while this indicator is lit, when operating the Inverter with the RUN Key. The operation of the Inverter through the Digital Operator or according to the parameters set is selectable while this indicator is lit. Note Note This status of this indicator can be only monitored while the Inverter is in operation.

[You're reading an excerpt. Click here to read official OMRON VS](#)



[MINI J7 user guide](#)

<http://yourpdfguides.com/dref/2890388>