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You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON VARISPEED E7. You'll find the answers to all your questions on the OMRON VARISPEED E7 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual OMRON VARISPEED E7**  
**User guide OMRON VARISPEED E7**  
**Operating instructions OMRON VARISPEED E7**  
**Instructions for use OMRON VARISPEED E7**  
**Instruction manual OMRON VARISPEED E7**

Manual No.  
TEC548-5A-1H3-07



## **VARISPEED E7**

Variable Torque Frequency Inverter

## **USER'S MANUAL**



[You're reading an excerpt. Click here to read official OMRON VARISPEED E7 user guide](http://yourpdfguides.com/dref/2890331)  
<http://yourpdfguides.com/dref/2890331>

**Manual abstract:**

@@@@@XII Registered Trademarks.....

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*The Varispeed E7 DC bus capacitor remains charged even after the power has been switched off. To avoid an electric shock hazard, disconnect the frequency inverter from the mains before carrying out maintenance. Then wait for at least 5 minutes after all LEDs have gone out. Do not perform a withstand voltage test on any part of the Varispeed.*

*The frequency inverter contains semiconductors, which are not designed for such high voltages. Do not remove the digital operator while the mains supply is switched on. The printed circuit board must also not be touched while the inverter is connected to the power. Never connect general LC/RC interference suppression filters, capacitors or overvoltage protection devices to the inverter input or output. To avoid unnecessary overcurrent faults, etc. being displayed, the signaling contacts of any contactor or switch fitted between inverter and motor must be integrated into the inverter control logic (e.g. baseblock). This is absolutely imperative! This manual must be read thoroughly before connecting and operating the inverter. All safety precautions and instructions for use must be followed.*

*The inverter may must be operated with the appropriate line filters, following the installation instructions in this manual and with all covers closed and terminals covered. Only then will adequate protection be provided. Please do not connect or operate any equipment with visible damage or missing parts. The operating company is responsible for any injuries or equipment damage resulting from failure to heed the warnings in this manual. VII Safety Precautions and Instructions for Use General Please read these safety precautions and instructions for use thoroughly before installing and operating this inverter. Also read all of the warning signs on the inverter and ensure they are never damaged or removed. Live and hot inverter components may be accessible during operation. Removal of housing components, the digital operator or terminal covers runs the risk of serious injuries or damage in the event of incorrect installation or operation. The fact that frequency inverters control rotating mechanical machine components can give rise to other dangers. The instructions in this manual must be followed.*

*Installation, operation and maintenance may only be carried out by qualified personnel. For the purposes of the safety precautions, qualified personnel are defined as individuals who are familiar with the installation, starting, operation and maintenance of frequency inverters and have the proper qualifications for this work. Safe operation of these units is only possible if they are used properly for their intended purpose. The DC bus capacitors can remain live for about 5 minutes after the inverter is disconnected from the power. It is therefore necessary to wait for this time before opening its covers. All of the main circuit terminals may still carry dangerous voltages. Children and other unauthorized persons must not be allowed access to these inverters. Keep these Safety Precautions and Instructions for Use readily accessible and supply them to all persons with any form of access to the inverters. Intended Use Frequency inverters are intended for installation in electrical systems or machinery. Their installation in machinery and systems must conform to the following product standards of the Low Voltage Directive: EN 50178, 1997-10, Equipping of Power Systems with Electronic Devices EN 60204-1, 1997-12 Machine Safety and Equipping with Electrical Devices Part 1: General Requirements (IEC 60204-1:1997)/ Please note: Includes Corrigendum of September 1998 EN 61010-1, A2, 1995 Safety Requirements for Information Technology Equipment (IEC 950, 1991 + A1, 1992 + A2, 1993 + A3, 1995 + A4, 1996, modified) CE marking is carried out to EN 50178, using the line filters specified in this manual and following the appropriate installation instructions.*

*Transportation and storage The instructions for transportation, storage and proper handling must be followed in accordance with the technical data. Installation Install and cool the inverters as specified in the documentation. The cooling air must flow in the specified direction. The inverter may therefore only be operated in the specified position (e.g. upright). Maintain the specified clearances. Protect the inverters against impermissible loads. Components must not be bent nor insulation clearances changed. To avoid damage being caused by static electricity, do not touch any electronic components or contacts.*

*VIII Electrical Connection Carry out any work on live equipment in compliance with the national safety and accident prevention regulations. Carry out electrical installation in compliance with the relevant regulations. In particular, follow the installation instructions ensuring electromagnetic compatibility (EMC), e.g. shielding, grounding, filter arrangement and laying of cables.*

*This also applies to equipment with the CE mark. It is the responsibility of the manufacturer of the system or machine to ensure conformity with EMC limits. Your supplier or Omron Yaskawa Motion Control representative must be contacted when using leakage current circuit breaker in conjunction with frequency inverters. In certain systems it may be necessary to use additional monitoring and safety devices in compliance with the relevant safety and accident prevention regulations. The frequency inverter hardware must not be modified.*

*Notes The Varispeed E7 frequency inverters are certified to CE, UL, and cUL except the IP54 version which is certified to CE only. IX EMC Compatibility Introduction This manual was compiled to help system manufacturers using OMRON YASKAWA Motion Control (OYMC) frequency inverters design and install electrical switch gear. It also describes the measures necessary to comply with the EMC Directive. The manual's installation and wiring instructions must therefore be followed. Our products are tested by authorized bodies using the standards listed below. Product standard: EN 61800-3:1996 EN 61800-3: A11:2000 Measures to Ensure Conformity of OYMC Frequency inverters to the EMC Directive OYMC frequency inverters do not necessarily have to be installed in a switch cabinet. It is not possible to give detailed instructions for all of the possible types of installation. This manual therefore has to be limited to general guidelines. All electrical equipment produces radio and line-borne interference at various frequencies. The cables pass this on to the environment like an aerial.*

*Connecting an item of electrical equipment (e.g. drive) to a supply without a line filter can therefore allow HF or LF interference to get into the mains. The basic countermeasures are isolation of the wiring of control and power components, proper grounding and shielding of cables. A large contact area is necessary for low-impedance grounding of HF interference. The use of grounding straps instead of cables is therefore definitely advisable. Moreover, cable shields must be connected with purpose-made ground clips.*



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.....1-16 Removing/Attaching the Digital Operator and Front Cover1-18 Varispeed E7 Introduction Varispeed E7 Applications The Varispeed E7 is ideal for the following applications. · Fan, blower and pump applications with variable torque characteristics. Settings must be adjusted to the application for optimum operation.

Refer to page 4-1, Trial Operation. Varispeed E7 Models The Varispeed E7 Series includes Inverters in two voltage classes: 200 V and 400 V. The maximum motor capacities vary from 0.55 to 300 kW. The inverter is available in protection classes IP00, IP20 and IP54 according to the following table: Table 1.

1 Varispeed E7 Models Voltage Class Maximum Motor Capacity kW 0.55 0.75 1.5 2.2 3.

7 5.5 7.5 11 200 V class 15 18.5 22 30 37 45 55 75 90 110 Specifications (Always specify through the protective structure when ordering.) Output IEC IP00 NEMA 1 (IEC IP20) IEC IP54 Basic Model Number Capacity kVA CIMR-E7Z CIMR-E7Z CIMR-E7Z 1.2 CIMR-E7Z20P4 20P4I Varispeed E7 1.6 2.7 3.7 5.7 8.

8 12 17 22 27 32 44 55 69 82 110 130 160 CIMR-E7Z20P7 CIMR-E7Z21P5 CIMR-E7Z22P2 CIMR-E7Z23P7 CIMR-E7Z25P5 CIMR-E7Z27P5 CIMR-E7Z2011 CIMR-E7Z2015 CIMR-E7Z2018 CIMR-E7Z2022 CIMR-E7Z2030 CIMR-E7Z2037 CIMR-E7Z2045 CIMR-E7Z2055 CIMR-E7Z2075 CIMR-E7Z2090 CIMR-E7Z2110 20220 20300 20370 20450 20550 20750 20900 21100 Remove the top and bottom covers from the IP20 model. 20P7I 21P5I 22P2I 23P7I 25P5I 27P5I 2011I 2015I 2018I 2022I 2030I 2037I 2045I 2055I 2075I - 1-2 Varispeed E7 Introduction Voltage Class Maximum Motor Capacity kW 0.55 0.75 1.5 2.2 3.7 4.0 5.5 7.5 11 15 18.

5 22 30 37 45 55 75 90 110 132 160 185 220 300 Specifications (Always specify through the protective structure when ordering.) Output IEC IP00 NEMA 1 (IEC IP20) IEC IP54 Basic Model Number Capacity kVA CIMR-E7Z CIMR-E7Z CIMR-E7Z 1.4 CIMR-E7Z40P4 40P4I Varispeed E7 1.6 2.8 4.0 5.8 6.6 9.5 13 18 24 30 34 46 57 69 85 110 140 160 200 230 280 390 510 CIMR-E7Z40P7 CIMR-E7Z41P5 CIMR-E7Z42P2 CIMR-E7Z43P7 CIMR-E7Z44P0 CIMR-E7Z45P5 CIMR-E7Z47P5 CIMR-E7Z4011 CIMR-E7Z4015 CIMR-E7Z4018 CIMR-E7Z4022 CIMR-E7Z4030 CIMR-E7Z4037 CIMR-E7Z4045 CIMR-E7Z4055 CIMR-E7Z4075 CIMR-E7Z4090 CIMR-E7Z4110 CIMR-E7Z4132 CIMR-E7Z4160 CIMR-E7Z4185 CIMR-E7Z4220 CIMR-E7Z4300 40220 40300 40370 40450 40550 40750 40900 41100 41320 41600 41850 42200 43000 Remove the top and bottom covers from the IP20 model.



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40P71 41P51 42P21 43P71 44P01 45P51 47P51 40111 40151 40181 40221 40301 40371 40451 40551 40751 40901 41101 41321 41601 47P52 40112 40152 40182 40222 40302 40372 40452 40552 - 400 V class 1-3 Confirmations upon Delivery Checks Check the following items as soon as the Inverter is delivered.

Table 1.2 Checks upon delivery Item Has the correct Inverter model been delivered? Is the Inverter damaged in any way? Are any screws or other components loose? Method Check the model number on the nameplate on the side of the Inverter. Inspect the entire exterior of the Inverter to see if there are any scratches or other damage resulting from shipping. Use a screwdriver or other tools to check for tightness. Additionally check that following parts are delivered in the package with the IP54 inverter: Table 1.3 Additional Deliveries with IP54 Inverters Part Name Cable Gland (for Input) Cable Gland (for Motor Output) Cable Gland (for Control) Cable Gland (for Fieldbus) Door Key Blind Plug (Control Cable Entry) Blind Plug (Fieldbus Cable Entry) Qty. 1 1 1 1 1 1 If any irregularities in the above items are found, contact the agency from which the Inverter was purchased or your Omron Yaskawa Motion Control representative immediately. Nameplate Information There is a nameplate attached to the side of each Inverter. The nameplate shows the model number, specifications, lot number, serial number, and other information on the Inverter. Example Nameplate The following nameplate is an example for a standard European Inverter: 3-phase, 400 VAC, 0.

55 kW, NEMA 1 / IP20 standards Inverter model Input specifications Output specifications Lot number Serial number MODEL: CIMR-E7Z40P4 SPEC: 40P41A Inverter specifications OUTPUT: AC3PH 0-480V 0-200Hz 1.8A 1.4kVA Mass Software Number Fig 1.1 Nameplate Example 1-4 Confirmations upon Delivery Inverter Model Numbers The model number of the Inverter on the nameplate indicates the specification, voltage class, and maximum motor capacity of the Inverter in alphanumeric codes. CIMR E7Z40P4 Inverter Varispeed E7 European Spec. Max. Motor Power 0P4 0.55 kW 0P7 0.75 kW to to 300 300 kW Voltage Class 2 200 V 4 400 V Fig 1.2 Inverter Model Numbers Inverter Specifications The Inverter specifications ("SPEC") on the nameplate indicate the voltage class, maximum motor capacity, the protective structure, and the revision of the Inverter in alphanumeric codes.

40P41A Voltage Class 2 200 V 4 400 V Max. Motor Power 0P4 0.55 kW 0P7 0.75 kW to to 300 300 kW Revision Protection 0 1 2 IP00 IP20 IP54 Fig 1.3 Inverter Specifications Inverter Software Version The Inverter software version can be read out from the monitor parameter U1-14. The parameter shows the last four digits of the software number (e.g. display is "3021" for the software version VSE103021). IMPORTANT This manual describes the functionality of the inverter software version VSE103021. Older software versions do not support all described functions.

Check the software versions before starting to work with this manual. 1-5 Component Names Inverters of 18.5 kW or Less The external appearance and component names of the Inverter are shown in Fig 1.4, the terminal arrangement in Fig 1.5 Top cover Front cover Mounting hole Digital Operator Diecast case Terminal cover Nameplate Bottom protective cover Fig 1.4 NEMA 1 Inverter Appearance (18.5 kW or Less) IMPORTANT The top cover is a protection against foreign bodies (screws, metal scrap from drilling etc.), which could fall into the inverter during the installation in the cabinet. Remove the top cover when the installation is finished! SN SC SP A1 A2 +V AC -V MP AC RP R+ RE(G) S1 S2 S3 S4 S5 S6 S7 FM AC AM IG S+ S- M5 M6 MA MB MC M3 M4 M1 M2 E(G) Control Circuit Terminals Main Circuit Terminals NOT USED Charge Indicator Ground Terminal Fig 1.5 Terminal Arrangement (18.

5 kW or less) 1-6 Confirmations upon Delivery Inverters of 22 kW or More The external appearance and component names of the Inverter are shown in Fig 1.6, the terminal arrangement in Fig 1.7 Mounting holes Inverter cover Cooling fan Front cover Digital Operator Terminal cover Nameplate Fig 1.6 Inverter Appearance (22 kW or More) SN SC SP A1 A2 +V AC -V MP AC RP R+ RE(G) S1 S2 S3 S4 S5 S6 S7 FM AC AM IG S+ S- M5 M6 MA MB MC M3 M4 M1 M2 E(G) Control Circuit Terminals Charge Indicator Main Circuit Terminals Ground Terminals Fig 1.7 Terminal Arrangement (22kW or More) 1-7 Protection Class IP54 The external appearance and component names of the Inverter are shown in Fig 1.8. Inverter enclosure Digital Operator Door Locks Nameplate Mounting Holes Door Cable Entry Plate Fig 1.8 IP54 Inverter Appearance 1-8 Exterior and Mounting Dimensions Exterior and Mounting Dimensions IP00 Inverters W1 4-d W1 4-d H1 H H1 t1 H W H2 D1 3 D H2 t1 D1 5 D Max.10 W Max.10 200 V/400 V Class Inverters of 0.

55 to 18.5 kW W1 W2 200 V Class Inverters of 22 or 110 kW 400 V Class Inverters of 22 to 160 kW Ø H1 H H2 W3 W1 15 W t1 D1 5 D 400 V Class Inverters of 185 to 300 kW Fig 1.9 Exterior Diagrams of IP00 Inverters 1-9 NEMA 1 / IP20 Inverters W1 4-d W1 4-d H1 t1 H0 H1 H0 H H2 H H3 t1 Max.10 D1 5 D H2 H3 W 4 D1 3 D Max.10 W Max.

10 Grommet 200 V/400 V Class Inverters of 0.55 to 18.5 kW 200 V Class Inverters of 22 to 75 kW 400 V Class Inverters of 22 to 160 kW Fig 1.10 Exterior Diagrams of NEMA 1 / IP20 Inverters IP54 Inverters W D 2 - lifting holes W1 4-d H t1 Fig 1.11 Exterior Diagrams of IP54 Inverters 1-10 H2 H1 Exterior and Mounting Dimensions Table 1.

4 Inverter Dimensions (mm) and Masses (kg) from 0.4 to 160 kW, IP00 and NEMA 1 / IP20 Max. AppliVoltage cable Class Motor Output [kW] Dimensions (mm) Protection Class IP00 W H D W1 H1 H2 D1 t1 Appr ox. Mass W H D Protection Class NEMA 1 / IP20 W1 H0 H1 H2 H3 D1 t1 Caloric Value (W) CoolTotal ing Heat Metho Moun Exter InterAppr ting nal nal Gend ox. eraHoles Mass tion d\* 0.55 0.75 1.5 2.2 3.7 5.

5 7.5 11 200 V (3phase) 15 18.5 22 30 37 45 55 75 90 110 0.55 0.75 1.5 2.2 3.7 4.0 5.5 7.

5 11 400 V (3phase) 15 18.5 22 30 37 45 55 75 90 110 132 160 450 725 348 325 700 12.5 130 500 850 358 370 820 15 3.2 88 89 102 4.5 120 325 550 283 260 535 105 36 329 200 300 197 186 285 240 350 207 216 335 279 450 258 220 435 8 65.

5 78 100 2.3 6 10 21 200 300 197 186 300 285 240 350 207 216 350 335 279 535 258 220 450 435 635 715 283 260 550 535 165 105 40 96 97 122 170 8 65.5 78 100 2.3 6 10 24 140 280 177 126 266 7 59 5 4 140 280 177 126 266 266 7 0 59 5 4 M5 157 39 3 157 39 3 140 280 177 157 126 266 7 59 39 5 4 6 7 2.3 11 21 24 57 3.

2 130 15 4.5 63 86 87 150 200 240 300 310 350 380 3 140 280 177 197 186 300 285 207 216 350 335 258 298 328 195 400 385 220 450 435 250 600 575 12.



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5 302 130 15 390 7.5 8 157 126 280 266 7 0 59 65.5 78 100 100 3.2 2.3 39 5 4 6 7 11 24 27 62 68 94 95 4.5 114 M12 M10 M6 3 M5 20 27 50 70 112 164 39 42 50 59 74 84 59 100 129 186 248 69 Natural 200 300 197 186 285 7.5 65.5 240 350 207 216 335 250 400 275 450 375 600 258 298 328 195 385 220 435 250 575 12.

5 8 7.5 78 100 100 219 113 332 374 170 544 429 183 612 501 211 712 586 274 860 865 352 1217 1015 411 1426 1266 505 1771 1588 619 2207 2019 838 2857 2437 997 3434 2733 1242 3975 14 17 36 59 80 91 127 39 41 48 56 68 70 82 53 58 84 115 148 161 209 Natural Fan 10 0 30 135 165 209 254 535 279 615 380 809 450 725 348 325 700 500 850 358 370 820 575 885 378 445 855 453 1027 348 325 725 700 108 504 1243 358 370 850 820 --- 140 193 114 307 252 158 410 326 172 498 426 208 634 M6 466 259 725 678 317 995 784 360 1144 901 415 1316 1203 495 1698 1399 575 1974 1614 671 2285 2097 853 2950 2791 1147 3938 Fan 7.5 7.5 85 453 1027 348 325 725 700 12.5 302 130 504 1243 358 370 850 820 15 46 393 408 140 3.2 M10 4.5 130 M12 2388 1002 3390 575 916 378 445 855 45.8 140 160 579 1324 378 445 916 855 Table 1.5 Inverter Dimensions (mm) and Masses (kg) of 400V Class Inverters of 185 kW to 300 kW, IP00 Max. ApplicaVoltage ble Motor Class Output [kW] 185 400V (3-phase) 220 300 Dimensions (mm) Protection Class IP00 W 710 916 H 1305 1475 D 413 413 W1 540 730 W2 240 365 W3 270 365 H1 1270 1440 H2 15 15 D1 125.

5 125.5 t1 4.5 4.5 Caloric Value (W) Total MountHeat Extering Internal Approx. Generanal Mass Holes d tion 260 3237 1372 4609 280 405 M12 3740 5838 1537 2320 5277 8158 Cooling Method Fan 1-11 Table 1.

6 Inverter Dimensions (mm) and Masses (kg) of 400V class inverters 7.5 to 55 kW, IP54 Max. ApplicaVoltage ble Motor Class Output [kW] 7.5 11 15 18.5 400V (3-phase) 22 30 37 45 55 580 750 330 410 714 11 2.

5 71 410 650 350 600 260 300 270 620 12 2.5 Dimensions (mm) Approx. Mass 25 260 576 9 2.5 30 43 12 M10 14 M10 W H D W1 H1 H2 t1 240 Total MountHeat ing GeneraHoles d tion 302 10 M8 423 531 655 754 989 1145 1317 1701 Cooling Method Fan 1-12 Checking and Controlling the Installation Site Checking and Controlling the Installation Site Install the Inverter in the installation site described below and maintain optimum conditions. Installation Site Install the Inverter under the following conditions in a pollution degree 2 environment. Type Protection Class IP20 and IP54 Protection Class IP00 Ambient Operating Temperature -10 to + 40 °C -10 to + 45 °C Humidity 95% RH or less (no condensation) 95% RH or less (no condensation) Protection covers are attached to the top and bottom of the NEMA 1 and IP00 Inverters. Be sure to remove the top cover before operating a 200 or 400 V Class Inverter with an output of 18.5 kW or less inside a panel. · Observe the following precautions when mounting the Inverter. · Install the Inverter in a clean location which is free from oil mist and dust.

It can be installed in a totally enclosed panel that is completely shielded from floating dust. · When installing or operating the Inverter, always take special care so that metal powder, oil, water, or other foreign matter does enter the Inverter. · Do not install the Inverter on combustible material, such as wood. · Install the Inverter in a location free from radioactive materials and combustible materials. · Install the Inverter in a location free from harmful gasses and liquids. · Install the Inverter in a location without excessive oscillation. · Install the Inverter in a location free from chlorides. · Install the Inverter in a location without in direct sunlight. · The IP54 Inverters provide protection from non-conductive dust and splashing water from all directions. Install the Inverter indoors in a heated and controlled environment to avoid condensation inside the Inverter.

· Keep any water or dust outside of the IP54 Inverter when wiring. Controlling the Ambient Temperature To enhance the reliability of operation, the Inverter should be installed in an environment free from extreme temperature increases. If the IP00 or NEMA 1 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 45°C. When the IP54 Inverter is installed in a environment with low temperatures or when the Inverter remains switched off for a long time, condensation may occur inside the Inverter. In that case additional heaters may effectively prevent condensation inside the inverter.

Protecting the IP00 or NEMA 1 Inverter from Foreign Matter Place a cover over the Inverter during installation to shield it from metal power produced by drilling. Always remove the cover from the Inverter after completing installation. Otherwise, ventilation will be reduced, causing the Inverter to overheat.

1-13 Additional Installation Precautions for the IP54 Inverters · Ensure that the door locks are closed before carrying the Inverter. Always hold the case when carrying the Inverter, do not carry it holding the door or the cable glands.

If the door locks are open or the Inverter is held by the door (or cable glands) when carrying the main body of the Inverter may fall, possibly resulting injury.

· Pay attention not to damage the cable glands when lifting. Otherwise the equipment may be damaged by ingress of water or dust. Keeping the IP54 protection · Mount the blind plugs attached for option and control entry if these terminals are not connected · Pay attention not to damage the cable glands during the installation 1-14 Installation Orientation and Space Installation Orientation and Space Install the Inverter vertically so as not to reduce the cooling effect. When installing the Inverter, always provide the following installation space to allow normal heat dissipation. A B Air 50mm min. 30mm min. 30mm min. 120mm min. Air Horizontal Space Vertical Space A 200V class inverter, 0.

55 to 90 kW 400V class inverter, 0.55 to 132 kW 200V class inverter, 110 kW 400V class inverter, 160 to 220 kW 400V class inverter, 300 kW 50 mm 120 mm 300 mm B 120 mm 120 mm 300 mm Fig 1.12 Inverter Installation Orientation and Space IMPORTANT 1. The same space is required horizontally and vertically for Inverters of all protection classes, either IP00, NEMA 1 / IP20 and IP54 Inverters. 2. Always remove the top cover after installing a 200 or 400 V Class Inverter with an output of 18.5 kW or less in a panel. 3. Always provide enough space for suspension eye bolts and the main circuit lines when installing a 200 or 400 V Class Inverter with an output of 22 kW or more in a panel. 4.

When IP54 Inverters are installed side by side provide a distance of 60mm or more between the Inverters 1-15 Accessing the Inverter Terminals Removing the Terminal Cover (IP00 and NEMA 1 / IP20 Inverters) Inverters of 18.



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.....2-27 Wiring Check.

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..2-37 Installing and Wiring Option Cards ...

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.2-38 Connection Diagrams The connection diagrams of the Inverters are shown in Fig 2.1 and Fig 2.2 When using the Digital Operator, the motor can be operated by wiring only the main circuits. DC reactor to improve input power factor (optional) U Short-circuit bar 1 Main contactor Fuse X 1 2 Varispeed E7 R/L1 U/T1 Motor V/T2 W/T3 3-phase power L2 supply 380 to 480 V L3 50/60 Hz L1 Line Filter S/L2 T/L3 CIMRE7Z47P51 M PE 2 Forward Run/Stop Reverse Run/Stop External fault Fault reset Multi-function digital inputs [Factory settings] Multi-step speed setting 1 Multi-step speed setting 2 Jog frequency selection S1 S2 S3 S4 S5 S6 S7 SN SC SP E(G) 24V Shield terminal Shield terminal E(G) 3 M1 M2 M3 M4 Contact output 1 [Default: During run] Contact output 2 [Default: Zero speed] Multi-function digital output 250 VAC, 1 A max. 30 VDC, 1 A max. MA MB MC Fault contact output 250 VAC, 1 A max. 30 VDC, 1 A max. Adjustment 3 2k 1 4 to 20mA P P 0 to 10V 2 2k +V Analog input power supply +15 V, 20 mA AI Analog input 1: Master frequency reference 0 to 10 V (20 k ) A2 Multi-function analog input 1: [Default: Frequency Bias 4 to 20 mA (250 )] AC -V 0V Analog input power supply -15 V, 20 mA FM Adjustment, 20 k + FM - Multi-function analog output 1 (0 to 10 V, 2 mA) [Default: Output frequency, 0 to 10 V] Adjustment, 20 k AM + AM - Multi-function analog output 2 (0 to 10 V, 2 mA) [Default: Output power, 0 to 10 V] AC Input Option Cards Terminating resistance R+ P MEMOBUS communication RS-485/422 P RS+ SIG 2CN Shielded wires P Twisted-pair shielded wires Fig 2.



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1 Connection Diagram of IP20 Inverters (Model CIMR-E7Z47P51 Shown Above) 2-2 Connection Diagrams DC reactor to improve input power factor (optional) U Short-circuit bar 1 Main contactor Fuse X 1 2 3-phase power supply 380 to 480 V 50/60 Hz L1 L2 L3 PE R/L1 S/L2 T/L3 Varispeed E7 CIMR-E7Z47P52 Motor U/T1 V/T2 W/T3 M 2 Forward Run/Stop Reverse Run/Stop External fault Fault reset Multi-function digital inputs [Factory settings] Multi-step speed setting 1 Multi-step speed setting 2 Jog frequency selection S1 S2 S3 S4 S5 S6 S7 SN SC SP E(G) 24V Shield terminal Shield terminal E(G) 3 M1 M2 M3 M4 Contact output 1 [Default: During run] Contact output 2 [Default: Zero speed] Multi-function digital output 250 VAC, 1 A max.

30 VDC, 1 A max. MA MB MC Fault contact output 250 VAC, 1 A max. 30 VDC, 1 A max. Adjustment 3 2k 1 4 to 20mA P P 0 to 10V 2 2k +V Analog input power supply +15 V, 20 mA A1 Analog input 1: Master frequency reference 0 to 10 V (20 k ) A2 Multi-function analog input 1: [Default: Frequency Bias 4 to 20 mA (250 )] AC -V 0V Analog input power supply -15 V, 20 mA FM Adjustment, 20 k + FM - Multi-function analog output 1 (0 to 10 V, 2 mA) [Default: Output frequency, 0 to 10 V] Adjustment, 20 k AM + AM - Multi-function analog output 2 (0 to 10 V, 2 mA) [Default: Output power, 0 to 10 V] AC Input Option Cards Terminating resistance R+ P MEMOBUS communication RS-485/422 P RS+ SIG 2CN Shielded wires P Twisted-pair shielded wires Fig 2.2 Connection Diagram of IP54 Inverters (Model CIMR-E7Z47P52 Shown Above) 2-3 Circuit Descriptions Refer to the numbers indicated in Fig 2.1 and Fig 2.2. 1 2 These circuits are hazardous and are separated from accessible surfaces by protective separation. These circuits are separated from all other circuits by protective separation consisting of double and reinforced insulation. These circuits may be interconnected with SELV (or equivalent) or nonSELV\* circuits, but not both.

Inverter supplied by four-wire-system source (neutral grounded) These circuits are SELV\* circuits and are separated from all other circuits by protective separation consisting of double and reinforced insulation. These circuits may only be interconnected with other SELV\* (or equivalent) circuits. Inverter supplied by three-wire-system source (ungrounded or corner grounded) These circuits are not separated from hazardous circuits by protective separation, but only with basic insulation. These circuits must not be interconnected with any circuits which are accessible, unless they are isolated from accessible circuits by supplemental insulation. 3 \* SELV (Safety Extra Low Voltage) circuits have no direct connection to the primary power and are supplied by a transformer or equivalent isolating device.

The circuits are designed and protected, so that, under normal and fault condition, its voltage does not exceed a safe value. (See IEC 61010) 1. Control circuit terminals are arranged as shown below. IMPORTANT 2. The output current capability of the +V terminal is 20 mA.

3. Main circuit terminals are indicated with double circles and control circuit terminals are indicated with single circles. 4. The wiring of the digital inputs S1 to S7 is shown for the connection of relay contacts or NPN transistors (0V common and sinking mode). This is the default setting. For the connection of PNP transistors or for using a 24V external power supply, refer to page 2-33, Sinking/Sourcing Mode. 5. The master speed frequency reference can be input either at terminal A1 or at terminal A2 by changing the setting of parameter H3-13. The default setting is terminal A2. 6.

DC reactors to improve the input power factor are built into 200 V Class Inverters from 22 up to 110 kW and 400 V Class Inverters from 22 up to 300 kW. A DC reactor is an option only for Inverters of 18.5 kW or less. Remove the short circuit bar when connecting a DC reactor. 2-4 Terminal Block Configuration Terminal Block Configuration The terminal arrangements are shown in Fig 2.3 and Fig 2.4. E(G) M SN SC SP A1 A2 +V AC -VF P AC RP R+ RA S1 S2 S3 S4 S5 S6 S7 M AC M IG S+ S- M M5 M6 MA MB C M3 M4 M1 M2 E(G) Control Circuit Terminals Main Circuit Terminals NOT USE D Charge Indicator Ground Terminal Fig 2.3 Terminal Arrangement (200V / 400V Class Inverter of 0.4 kW) SN SC SP A1 A2 +V AC -V MP AC RP R+ RE(G) S1 S2 S3 S4 S5 S6 S7 FM AC AM IG S+ S- M5 M6 MA MB MC M3 M4 M1 M2 E(G) Control Circuit Terminals Charge Indicator Main Circuit Terminals Ground Terminals Fig 2.

4 Terminal Arrangement (200V / 400V Class Inverter of 22 kW or more) 2-5 Control Terminals Output Terminals - N OT U SED +1 +2 U/T1 MOTOR V/T2 W/T3 R/L1 S/L2 T/L3 CAUTION Terminal tightening torque; M5:2.5N.m Refer to manual for connections. M6:4.0-5.

0N.m Use 75°C Cu wires or equivalent. NPJU 30012 -1-1 Input Terminals Ground Terminals Fig 2.5 Terminal Arrangement (IP54 Inverter of 18.5kW) Control Terminals Shielding Clamp for Control Cables R/L1 S/L2 S/L3 Input Terminals Output Terminals Shielding Clamp for Motor Cables Ground Terminals Fig 2.

6 Terminal Arrangement (IP54 Inverter of 37kW) 2-6 Wiring Main Circuit Terminals Wiring Main Circuit Terminals Applicable Wire Sizes and Crimp Terminals Select the appropriate wires and crimp terminals from the following tables. Table 2.1 200 V Class Wire Sizes Inverter Model CIMR Terminal Screws 2, B1, B2, M4 1.2 to 1.5 Tightening Torque (N·m) Possible Wire Sizes mm<sup>2</sup>(AWG) 1.5 to 4 (14 to 10) Recommended Wire Size mm<sup>2</sup> (AWG) 2.5 (14) Terminal Symbol Wire Type E7Z20P4 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, E7Z20P7 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2.

5 (14) E7Z21P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2.5 (14) E7Z22P2 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2 (14) E7Z23P7 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 4 (12 to 10) 4 (12) E7Z25P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.

2 to 1.5 6 (10) 6 (10) E7Z27P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M5 2.5 10 (8 to 6) 10 (8) Power cables, e.g., 600 V vinyl power cables E7Z2011 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M5 2.

5 16 (6 to 4) 25 (4 to 2) 10 (8 to 6) 25 (4) 25 to 35 (3 to 2) 10 (8 to 6) 25 (4) 25 to 35 (3 to 1) 10 to 16 (8 to 4) 25 to 35 (4 to 2) 50 (1 to 1/0) 10 to 16 (8 to 4) 25 to 35 (4 to 2) 16 (6) 25 (4) 25 (4) 25 (3) 25 (4) 25 (3) 25 (4) 50 (1) 25 (4) R/L1, S/L2, T/L3, T2, W/T3 E7Z2015 B1, B2, 1, 2, U/T1, V/M6 M5 M6 4.0 to 5.0 2.5 4.0 to 5.

0 9.0 to 10.0 2.5 4.0 to 5.0 9.0 to 10.0 4.0 to 5.0 9.

0 to 10.0 9.0 to 10.0 4.0 to 5.0 9.0 to 10.



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0 R/L1, S/L2, T/L3, T2, W/T3 E7Z2018 B1, B2, 1, 2, U/T1, V/M8 M5 M6 R/L1, S/L2, T/L3, , 1, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2022 3 M8 M6 M8 R/L1, S/L2, T/L3, , 1 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2030 3 M8 M6 M8 2-7 Table 2.1 200 V Class Wire Sizes Inverter Model CIMRTerminal Screws M10 M8 M10 r/11, /12 R/L1, S/L2, T/L3, , 1 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2045 3 M4 M10 M8 M10 r/11, /12 R/L1, S/L2, T/L3, , 1 M4 M12 M10 M8 M10 r/11, /12 R/L1, S/L2, T/L3, , 1 M12 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2090 3 M8 M12 r/11, /12 M4 8.8 to 10.  
8 31.4 to 39.2 1.3 to 1.4 31.  
4 to 39.2 M4 Tightening Torque (N·m) 17.6 to 22.5 8.8 to 10.  
8 17.6 to 22.5 1.3 to 1.4 17.6 to 22.5 8.8 to 10.8 17.6 to 22.  
  
5 1.3 to 1.4 31.4 to 39.2 17.6 to 22.5 8.8 to 10.8 17.6 to 22.  
5 1.3 to 1.4 31.4 to 39.2 17.  
6 to 22.5 8.8 to 10.8 17.6 to 22.  
5 1.3 to 1.4 Possible Wire Sizes mm2(AWG) 70 to 95 (2/0 to 4/0) 6 to 16 (10 to 4) 35 to 70 (2 to 2/0) 0.5 to 4 (20 to 10) 95 (3/0 to 4/0) 6 to 16 (10 to 4) 50 to 70 (1 to 2/0) 0.5 to 4 (20 to 10) 50 to 95 (1/0 to 4/0) 90 (4/0) 6 to 70 (10 to 2/0) 35 to 95 (3 to 4/0) 0.5 to 4 (20 to 10) 95 to 122 (3/0 to 250) 95 (3/0 to 4/0) 6 to 70 (10 to 2/0) 95 to 185 (3/0 to 400) 0.5 to 4 (20 to 10) 150 to 185 (250 to 400) 95 to 150 (4/0 to 300) 6 to 70 (10 to 2/0) 70 to 150 (2/0 to 300) 0.5 to 4 (20 to 10) 240 to 300 (350 to 600) M12 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2110 3 M8 M12 r/11, /12 M4 8.8 to 10.8 31.

4 to 39.2 1.3 to 1.4 31.4 to 39.2 150 to 300 (300 to 600) 6 to 70 (10 to 2/0) 150 (300) 0.5 to 4 (20 to 10) Recommended Wire Size mm2 (AWG) 70 (2/0) 35 (2) 1.5 (16) 95 (3/0) 50 (1) 1.5 (16) 50 × 2P (1/0 × 2P) 90 (4/0) 50 (1/0) 1.5 (16) 95 × 2P (3/0 × 2P) 95 × 2P (3/0 × 2P) 95 (3/0) 1.  
5 (16) 150 × 2P (250 × 2P) 95 × 2P (4/0 × 2P) 70 × 2P (2/0 × 2P) 1.5 (16) 240 × 2P, or 50 × 4P (350 × 2P, or 1/0 × 2P) 150 × 2P, or 50 × 4P (300 × 2P, or 1/0 × 4P) 150 × 2P (300 × 2P) 1.5 (16) Terminal Symbol Wire Type R/L1, S/L2, T/L3, , 1 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2037 3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2055 3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z2075 3 Power cables, e.g., 600 V vinyl power cables R/L1, S/L2, T/L3, , 1 The wire thickness is set for copper wires at 75°C.  
The wire thickness is set for copper wires at 75° 2-8 Wiring Main Circuit Terminals Table 2.2 400 V Class Wire Sizes, NEMA 1/ IP20 and IP00 Inverters Inverter Model CIMRTerminal Screws 2, B1, B2, M4 1.2 to 1.5 Tightening Torque (N·m) Possible Wire Sizes mm2 (AWG) 1.5 to 4 (14 to 10) Recommended Wire Size mm2 (AWG) Terminal Symbol Wire Type E7Z40P4 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2.  
5 (14) E7Z40P7 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2.5 (14) E7Z41P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2.5 (14) E7Z42P2 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 1.5 to 4 (14 to 10) 2.5 (14) 4 (12) 2.5 (14) 4 (12) 2.5 (14) 4 (12) 2.5 (14) 6 (10) 4 (12) 10 (8) 6 (10) 10 (8) 6 (10) 10 (8) 10 (8) 10 (8) 16 (6) 16 (6) 25 (4) 25 (4) Power cables, e.g., 600 V vinyl power cables E7Z43P7 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 2.  
5 to 4 (14 to 10) E7Z44P0 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 2.5 to 4 (14 to 10) 4 (12 to 10) 2.5 to 4 (14 to 10) E7Z45P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.  
2 to 1.5 E7Z47P5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M4 1.2 to 1.5 6 (10) 4 (12 to 10) E7Z4011 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M5 2.5 6 to 10 (10 to 6) 10 (8 to 6) 6 to 10 (10 to 6) 10 to 35 (8 to 2) 10 (8) 10 to 16 (8 to 4) 16 (6 to 4) 16 to 25 (6 to 2) 25 (4) 25 to 35 (4 to 2) E7Z4015 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, 1, 2, B1, B2, M5 M5 (M6) 2.  
5 2.5 (4.0 to 5.0) 4.0 to 5.0 2.5 4.0 to 5.0 4.0 to 5.

0 9.0 to 10.0 4.0 to 5.0 9.0 to 10.0 R/L1, S/L2, T/L3, T2, W/T3 E7Z4018 B1, B2, 1, 2, U/T1, V/M6 M5 M6 E7Z4022 R/L1, S/L2, T/L3, , 1, 3, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 M6 M8 E7Z4030 R/L1, S/L2, T/L3, , 1, 3, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 M6 M8 2-9 Table 2.2 400 V Class Wire Sizes, NEMA 1/ IP20 and IP00 Inverters Inverter Model CIMRTerminal Screws M8 M6 M8 R/L1, S/L2, T/L3, , 1, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4045 3 M8 M6 M8 R/L1, S/L2, T/L3, , 1, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4055 3 M8 M6 M8 R/L1, S/L2, T/L3, , 1 M10 M10 M8 M10 r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3, , 1 M4 M10 M10 M8 M10 r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3, , 1 M4 M10 M8 M12 r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3, , 1 M10 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4132 3 M8 M12 r/11, 200/12200, 400/12400 M4 8.8 to 10.8 31.  
4 to 39.2 1.3 to 1.4 31.4 to 39.  
2 M4 Tightening Torque (N·m) 9.0 to 10.0 4.0 to 5.0 9.  
0 to 10.0 9.0 to 10.0 4.0 to 5.0 9.0 to 10.0 9.0 to 10.0 4.  
  
0 to 5.0 9.0 to 10.0 31.4 to 39.2 17.6 to 22.5 8.8 to 10.8 31.  
4 to 39.2 1.3 to 1.4 31.4 to 39.  
2 17.6 to 22.5 8.8 to 10.8 31.  
4 to 39.2 1.3 to 1.4 31.4 to 39.2 8.8 to 10.8 31.4 to 39.2 1.

3 to 1.4 Possible Wire Sizes mm2 (AWG) 25 to 50 (4 to 1/0) 10 to 16 (8 to 4) 25 to 35 (4 to 2) 35 to 50 (2 to 1/0) 10 to 16 (8 to 4) 25 to 35 (4 to 2) 50 (1 to 1/0) 10 to 16 (8 to 4) 25 to 35 (4 to 2) 70 to 95 (2/0 to 4/0) 50 to 100 (1/0 to 4/0) 6 to 16 (10 to 4) 35 to 70 (2 to 2/0) 0.5 to 4 (20 to 10) 95 (3/0 to 4/0) 95 (3/0 to 4/0) 10 to 16 (8 to 4) 50 to 95 (1 to 4/0) 0.5 to 4 (20 to 10) 50 to 95 (1/0 to 4/0) 10 to 70 (8 to 2/0) 70 to 150 (2/0 to 300) 0.5 to 4 (20 to 10) 95 (3/0 to 4/0) 75 to 95 (2/0 to 4/0) 10 to 70 (8 to 2/0) 95 to 150 (4/0 to 300) 0.5 to 4 (20 to 10) Recommended Wire Size mm2 (AWG) 35 (2) 25 (4) 35 (2) 25 (4) 50 (1) 25 (4) 70 (2/0) 50 (1/0) 35 (2) 1.5 (16) 95 (4/0) 95 (4/0) 50 (1) 1.5 (16) 50 × 2P (1/0 × 2P) 70 (2/0) 1.5 (16) 95 × 2P (3/0 × 2P) 75 × 2P (2/0 × 2P) 95 (4/0) 1.5 (16) Terminal Symbol Wire Type R/L1, S/L2, T/L3, , 1, U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4037 3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4075 3 Power cables, e.g., 600 V vinyl power cables U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4090 3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31 E7Z4110 3 2-10 Wiring Main Circuit Terminals Table 2.2 400 V Class Wire Sizes, NEMA 1/ IP20 and IP00 Inverters Inverter Model CIMRTerminal Screws Tightening Torque (N·m) Possible Wire Sizes mm2 (AWG) 95 to 185 (4/0 to 400) 95 to 185 (3/0 to 400) 10 to 70 (8 to 2/0) 50 to 150 (1/0 to 300) 0.5 to 4 (20 to 10) Recommended Wire Size mm2 (AWG) 95 × 2P (4/0 × 2P) 95 × 2P (3/0 × 2P) 50 × 2P (1/0 × 2P) 1.

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5 (16) 150 × 2P (300 × 2P) 120 × 2P (250 × 2P) 300 × 2P (600 × 2P) 95 × 2P (3/0 × 2P) 1.  
5 (16) 240 × 2P (500 × 2P) 240 × 2P (400 × 2P) 120 × 4P (250 × 4P) 120 × 2P (250 × 2P) 1.5 (16) 120 × 4P (250 × 4P) 120 × 4P (4/0 × 4P) 240 × 4P  
(400 × 4P) 120 × 2P (250 × 2P) 1.5 (16) Terminal Symbol Wire Type R/L1, S/L2, T/L3, , 1 M12 31.4 to 39.2 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L31  
E7Z4160 3 M8 M12 r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L33 E7Z4185, 3 1 M16 78.  
4 to 98 M4 8.8 to 10.8 31.4 to 39.2 1.3 to 1.4 95 to 300 (4/0 to 600) r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3 U/T1, V/T2, W/T3, R1/L11, S1/L21, T1/L33  
E7Z4220, 3 1 M4 1.3 to 1.4 0.5 to 4 (20 to 10) Power cables, e.

g., 600 V vinyl power cables M16 78.4 to 98 95 to 300 (4/0 to 600) r/11, 200/12200, 400/12400 R/L1, S/L2, T/L3 R1/L11, S1/L21, T1/L31 U/T1, V/T2, W/T3  
E7Z4300, 3 1 M4 1.3 to 1.4 0.5 to 4 (20 to 10) M16 78.4 to 98 95 to 300 (4/0 to 600) r/11, 200/12200, 400/12400 M4 1.3 to 1.4 0.5 to 4 (20 to 10) 2-11 Table 2.  
3 400 V Class Wire Sizes, IP54 Inverters Inverter Model CIMR Terminal Screws Tightening Torque (N·m) Recommended Wire Size mm<sup>2</sup> (AWG) Possible  
Minimum Clamp Cable Gland Diam Over ing Cable size Braid Shield Diam. (mm) (mm) Terminal Symbol INPUT (R/L1, S/L2, T/L3, E7Z47P52 OUTPUT  
(U/T1, V/T2, W/T3, , 1 ) ) M5 M4 M4 2.5 1.8 1.8 2.

5 2.5 2.5 2.5 2.5 4.  
0 to 5.0 2.5 2.5 4.0 to 5.0 4.0 to 5.0 4.0 to 5.0 4.  
0 to 5.0 9.0 to 10.0 4.0 to 5.0 4.0 to 5.0 4.0 to 5.0 9.  
0 to 10.0 4.0 to 5.0 9.0 to 10.  
0 9.0 to 10.0 9.0 to 10.0 9.  
0 to 10.0 9.0 to 10.0 9.0 to 10.0 9.0 to 10.0 9.0 to 10.0 9.

0 to 10.0 9.0 to 10.0 9.0 to 10.0 9.0 to 10.0 6 6 6 10 10 10 10 10 10 10 16 16 16 25 25 25 35 35 35 35 35 50 50 50 M32 (Plastic) 11 to 21 M32  
(Metal) 11 to 21 - 9.0 9.0 9.  
0 9.0 15.0 15.0 - INPUT (R/L1, S/L2, T/L3, E7Z40112 OUTPUT (U/T1, V/T2, W/T3, , 1 ) ) M5 M5 M5 M5 M5 M6 M5 M32 (Plastic) 11 to 21 M32 (Metal) 11 to 21  
to 21 - E7Z40152 INPUT (R/L1, S/L2, T/L3, ) U/T1, V/T2, W/T3 OUTPUT ( , 1 ) ) M32 (Plastic) 11 to 21 M32 (Metal) 11 to 21 - INPUT (R/L1, S/L2, T/L3,  
E7Z40182 OUTPUT (U/T1, V/T2, W/T3, , 1 M5 M6 M6 M6 M6 M8 M6 M6 M6 M8 M6 M8 M8 M8 M8 M8 M8 M8 M8 M8 M8 M8 M32 (Plastic) 11 to 21  
M32 (Metal) 11 to 21 - E7Z40222 INPUT (R/L1, S/L2, T/L3, ) (U/T1, V/T2, W/T3) OUTPUT ( , 1 M40 (Plastic) 19 to 28 M40 (Metal) 19 to 28 - E7Z40302  
INPUT (R/L1, S/L2, T/L3, ) (U/T1, V/T2, W/T3) OUTPUT ( , 1 M40 (Plastic) 19 to 28 M40 (Metal) 19 to 28 - E7Z40372 INPUT (R/L1, S/L2, T/L3, ) (U/T1,  
V/T2, W/T3) OUTPUT ( , 1 M50 (Plastic) 19 to 28 M50 (Metal) 19 to 28 - E7Z40452 INPUT (R/L1, S/L2, T/L3, ) (U/T1, V/T2, W/T3) OUTPUT ( , 1 M50 (Plastic) 19 to 28 M50 (Metal) 19 to  
(Plastic) 19 to 28 M50 (Metal) 19 to 28 - E7Z40552 INPUT (R/L1, S/L2, T/L3, ) (U/T1, V/T2, W/T3) OUTPUT ( , 1 M50 (Plastic) 19 to 28 M50 (Metal) 19 to  
28 - Table 2.4 Recommended Wire Types for IP54 Inverters INPUT OUTPUT (-), (+) 4-core Power Cable\*1 4-core shielded Power Cable\*1 e.  
g. 600V Vinyl Power Cable \*1. 4-core power cables or 4-core shielded power cables are available e.g. Lappkabel (Ölflex) or Pirelli 2-12 Wiring Main Circuit  
Terminals Table 2.

5 Tightening Torques for Cable Gland Tightening Torque (Nm) Cable Gland Size Plastic M16 M20 M25 M32 M40 M50 3.0 6.0 8.0 10.0 13.0 15.0 Metal 10.0  
12.0 12.0 18.

0 18.0 20.0 Determine the wire size for the main circuit so that line voltage drop is within 2% of the rated voltage. Line voltage drop is calculated as follows:  
IMPORTANT Line voltage drop (V) = 3 x wire resistance (W/km) x wire length (m) x current (A) x 10<sup>-3</sup> 2-13 Recommended Crimp Terminals Table 2.6  
Recommended Crimp Terminals Recommended Crimp Terminals Wire Cross Section (mm<sup>2</sup>) Terminal Screws Klaukey a b 1620/4 1620/4 1630/4 1650/4  
1650/4 1650/5 1650/6 1650/8 1652/5 1652/6 1652/8 1653/5 1653/6 1653/8 1654/6 1654/8 1655/6 1655/8 1655/10 1656/8 1656/10 1656/12 1657/8 1657/10  
1657/12 1658/10 1658/12 1658/16 1659/12 1659/16 1660/12 1660/16 1662/12 1662/16 620/4 630/4 630/4 650/4 650/4 101 R/5 101 R/6 101 R/8 102 R/5 102  
R/6 102 R/8 103 R/5 \*1 JST GS4-1 GS4-1 GS4-2.5 GS4-6 GS4-6 GS5-6 GS6-6 GS8-6 GS5-10 GS6-10 GS8-10 GS5-16 GS6-16 GS8-16 GS6-25 GS8-25  
GS6-35 GS8-35 GS10-35 GS8-50 GS10-50 GS12-50 GS8-70 GS10-70 GS12-70 GS10-95 GS12-95 GS16-95 GS12-120 GS16-120 GS12-150 GS16-150  
GS12-240 GS16-240 - 0.5-1.0 1.5 2.5 4 M4 M4 M4 M4 M4 M5 6 M6 M8 M5 10 M6 M8 M5 16 M6 M8 M6 25 M8 M6 35 M8 M10 M8 50 M10 M12 M8 70  
M10 M12 M10 95 M12 M16 M12 120 M16 M12 150 M16 M12 240 M16 300 \*1.

not applicable for E7Z2011 103 R/6 103 R/8 104 R/6 104 R/8 105 R/6 105 R/8 106 R/8 106 R/10 106 R/8 106 R/12 107 R/8 107 R/10 107 R/12 108 R/10 108  
R/12 108 R/16 109 R/12 109 R/16 110 R/12 110 R/16 112 R/12 112 R/16 113 R/16 M16 2-14 Wiring Main Circuit Terminals Main Circuit Terminal Functions  
Main circuit terminal functions are summarized according to terminal symbols in Table 2.7. Wire the terminals correctly for the desired purposes. Table 2.7  
Main Circuit Terminal Functions Purpose Main circuit power input Inverter outputs DC bus terminals DC reactor connection Braking Unit connection  
Ground Terminal Symbol R/L1, S/L2, T/L3 R1/L11, S1/L21, T1/L31 U/T1, V/T2, W/T3 1, 1, 3, 2 Model: CIMR-E7Z 200 V Class 20P4 to 2110 2022 to 2110  
20P4 to 2110 20P4 to 2110 20P4 to 2018 2022 to 2110 20P4 to 2110 400 V Class 40P4 to 4300 4022 to 4300 40P4 to 4300 40P4 to 4300 40P4 to 4018 4022  
to 4300 40P4 to 4300 2-15 Main Circuit Configurations The main circuit configurations of the Inverter are shown in Table 2.

8 Table 2.8 Inverter Main Circuit Configurations (IP00, NEMA 1/IP20 Inverters) 200 V Class CIMR-E7Z20P4 to 2018 B1 B2 400 V Class CIMR-E7Z40P4 to  
4018 B1 B2 + + 1 2 U V W + + 1 2 U V W R S T - R S T - Power Supply Control Circuit Power Supply Control Circuit CIMR-E7Z2022 to 2030 + CIMR-  
E7Z4022 to 4055 +3 3 + 1 +1 R R S T R1 S1 T1 U V W S T R1 S1 T1 - U V W Power Supply Control Circuit Power Supply Control Circuit CIMR-E7Z2037 to  
2110 +3 CIMR-E7Z4075 to 4300 +3 +1 R/L1 S/L2 T/L3 R1/L11 S1/L21 T1/L31 r/11 s 200/12200 Power Supply Control Circuit U/T1 V/T2 W/T3 +1 R/L1  
S/L2 T/L3 R1/L11 S1/L21 T1/L31 r/11 s 200/12200 s 400/12400 Power Supply Control Circuit U/T1 V/T2 W/T3 400/200 Note: Consult your Omron Yaskawa  
Motion Control representative before using 12-phase rectification. 2-16 Wiring Main Circuit Terminals Table 2.9 Main Circuit Configurations (IP54  
Inverters) 400 V class CIMR-E7Z47P52 to 40182 1 2 R/L1 S/L2 T/L3 EMC filter U/T1 V/T2 W/T3 Power supply Control circuits CIMR-E7Z40222 to 40552 3  
1 R/L1 S/L2 T/L3 EMC Filter U/T1 V/T2 W/T3 Power Supply Control Circuits 2-17 Standard Connection Diagrams Standard Inverter (NEMA 1 / IP20)  
connection diagrams are shown in Fig 2.



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