



Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON V1000. You'll find the answers to all your questions on the OMRON V1000 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual OMRON V1000
User guide OMRON V1000
Operating instructions OMRON V1000
Instructions for use OMRON V1000
Instruction manual OMRON V1000

Manual No.
SECH004010-01

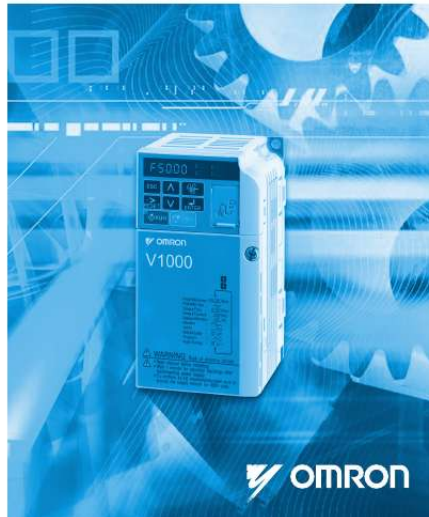


V1000

Compact Vector Control Drive
Model: V2A

200 V Class Three-Phase Input 0.1 to 15 kW
200 V Class Single-Phase Input 0.1 to 4.0 kW
400 V Class Three-Phase Input 0.2 to 15 kW

USER'S MANUAL



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Manual abstract:

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.....397 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 9 Table of Contents This Page Intentionally Blank 10 SIEP C710606 20 OYMC AC Drive - V1000 User Manual i Preface & General Safety This section provides safety messages pertinent to this product, that, if not heeded, may result in fatality, personal injury, or equipment damage. OYMC is not responsible for the consequences of ignoring these instructions.

1.1 1.2 PREFACE.....

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...13 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 11 i.1 Preface i.

1 Preface OYMC distributes products used as components in a wide variety of industrial systems and equipment. The selection and application of OYMC products remain the responsibility of the equipment manufacturer or end user. OYMC accepts no responsibility for the way its products are incorporated into the final system design. Under no circumstances should any OYMC product be incorporated into any product or design as the exclusive or sole safety control. Without exception, all controls should be designed to detect faults dynamically and fail safely under all circumstances. All systems or equipment designed to incorporate a product distributed by OYMC must be supplied to the end user with appropriate warnings and instructions as to the safe use and operation of that part. Any warnings provided by OYMC must be promptly provided to the end user. OYMC offers an express warranty only as to the quality of its products in conforming to standards and specifications published in the OYMC manual. NO OTHER WARRANTY, EXPRESSED OR IMPLIED, IS OFFERED. OYMC assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

u Applicable Documentation The following manuals are available for V1000 series drives: V1000 Series AC Drive Quick Start Guide Read this manual first. This guide is packaged together with the product. It contains basic information required to install and wire the drive. This guide provides basic programming and simple setup and adjustment. V1000 Series AC Drive User Manual This manual describes installation, wiring, operation procedures, functions, troubleshooting, maintenance, and inspections to perform before operation. u Symbols Note: Indicates a supplement or precaution that does not cause drive damage. TERMS Indicates a term or definition used in this manual. u Terms and Abbreviations TERMS Drive: OYMC V1000 Series Drive PM motor: Synchronous motor (an abbreviation for IPM motor or SPM motor) IPM motor: SSR1 Series OYMC: Omron Yaskawa Motion Control B.V. 12 SIEP C710606 20 OYMC AC Drive - V1000 User Manual i.

2 General Safety i.2 General Safety u Supplemental Safety Information General Precautions · The diagrams in this manual may be indicated without covers or safety shields to show details. Restore covers or shields before operating the drive and run the drive according to the instructions described in this manual. · Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable. · The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual.



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· When ordering a new copy of the manual due to damage or loss, contact your OYMC representative or the nearest OYMC sales office and provide the manual number shown on the front cover. · If nameplate becomes worn or damaged, order a replacement from your OYMC representative or the nearest OYMC sales office. **WARNING** Read and understand this manual before installing, operating or servicing this drive. The drive must be installed according to this manual and local codes. The following conventions are used to indicate safety messages in this manual.

DANGER Indicates a hazardous situation, which, if not avoided, will result in death or serious injury. **WARNING** Indicates a hazardous situation, which, if not avoided, could result in death or serious injury. **WARNING!** will also be indicated by a bold key word embedded in the text followed by an italicized safety message. **CAUTION** Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury. **CAUTION!** will also be indicated by a bold key word embedded in the text followed by an italicized safety message. **NOTICE** Indicates a property damage message. **NOTICE:** will also be indicated by a bold key word embedded in the text followed by an italicized safety message. u Safety Messages **DANGER** Heed the safety messages in this manual. Failure to comply will result in death or serious injury.

The operating company is responsible for any injuries or equipment damage resulting from failure to heed the warnings in this manual. SIEP C710606 20 OYMC AC Drive - V1000 User Manual 13 i.2 General Safety **DANGER** Electrical Shock Hazard Do not connect or disconnect wiring while the power is on. Failure to comply will result in death or serious injury. Before servicing, disconnect all power to the equipment. The internal capacitor remains charged even after the power supply is turned off. The charge indicator LED will extinguish when the DC bus voltage is below 50 Vdc. To prevent electric shock, wait at least five minutes after all indicators are OFF and measure the DC bus voltage level to confirm safe level. **WARNING** Sudden Movement Hazard System may start unexpectedly upon application of power, resulting in death or serious injury. Clear all personnel from the drive, motor and machine area before applying power.

Secure covers, couplings, shaft keys and machine loads before applying power to the drive. When using FBDs to create custom programming, the drive I/O terminal functions change from factory settings and the drive will not perform as outlined in this manual. Unpredictable equipment operation may result in death or serious injury. Take special note of custom I/O programming in the drive before attempting to operate equipment. Electrical Shock Hazard Do not attempt to modify or alter the drive in any way not explained in this manual.

Failure to comply could result in death or serious injury. OYMC is not responsible for any modification of the product made by the user. This product must not be modified. Do not allow unqualified personnel to use equipment. Failure to comply could result in death or serious injury.

Maintenance, inspection, and replacement of parts must be performed only by authorized personnel familiar with installation, adjustment and maintenance of AC drives. Do not remove covers or touch circuit boards while the power is on. Failure to comply could result in death or serious injury. Fire Hazard Do not use an improper voltage source. Failure to comply could result in death or serious injury by fire. Verify that the rated voltage of the drive matches the voltage of the incoming power supply before applying power. Crush Hazard Do not use this drive in lifting applications without installing external safety circuitry to prevent accidental dropping of the load. The drive does not possess built-in load drop protection for lifting applications. Failure to comply could result in death or serious injury from falling loads. Install electrical and/or mechanical safety circuit mechanisms independent of drive circuitry.

CAUTION Crush Hazard Do not carry the drive by the front cover. Failure to comply may result in minor or moderate injury from the main body of the drive falling. 14 SIEP C710606 20 OYMC AC Drive - V1000 User Manual i.2 General Safety **NOTICE** Observe proper electrostatic discharge procedures (ESD) when handling the drive and circuit boards. Failure to comply may result in ESD damage to the drive circuitry. Never connect or disconnect the motor from the drive while the drive is outputting voltage. Improper equipment sequencing could result in damage to the drive. Do not perform a withstand voltage test on any part of the drive. Failure to comply could result in damage to the sensitive devices within the drive. Do not operate damaged equipment.

Failure to comply could result in further damage to the equipment. Do not connect or operate any equipment with visible damage or missing parts. Install adequate branch circuit short circuit protection per applicable codes. Failure to comply could result in damage to the drive. The drive is suitable for circuits capable of delivering not more than 30,000 RMS symmetrical Amperes, 240 Vac maximum (200 V Class) and 480 Vac maximum (400 V Class).

Do not expose the drive to halogen group disinfectants. Failure to comply may cause damage to the electrical components in the drive. Do not pack the drive in wooden materials that have been fumigated or sterilized. Do not sterilize the entire package after the product is packed. u Drive Label Warnings Always heed the warning information listed in Figure i.

1 in the position shown in Figure i.2 . **WARNING** Risk of electric shock. Read manual before installing. Wait 5 minutes for capacitor discharge after disconnecting power supply. To conform to requirements, make sure to ground the supply neutral for 400V class. Figure i.1 Warning Information Figure i.2 Warning Information Position u Warranty Information n Restrictions The V1000 was not designed or manufactured for use in devices or systems that may directly affect or threaten human lives or health. SIEP C710606 20 OYMC AC Drive - V1000 User Manual 15 i.

2 General Safety Customers who intend to use the product described in this manual for devices or systems relating to transportation, health care, space aviation, atomic power, electric power, or in underwater applications must first contact their OYMC representatives or the nearest OYMC sales office. This product has been manufactured under strict quality-control guidelines. However, if this product is to be installed in any location where failure of this product could involve or result in a life-and-death situation or loss of human life or in a facility where failure may cause a serious accident or physical injury, safety devices must be installed to minimize the likelihood of any accident.



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u Quick Reference Easily Set Application-Specific Parameters Preset parameter defaults are available for many applications. Refer to Application Selection on page 82. Run a Motor of One-Frame Larger Capacity When using this drive for variable torque loads such as fans and pumps, a motor one frame size larger can be used. Refer to C6-01: Drive Duty Mode Selection on page 131 Know the Details of Safety Measures The functions listed below affect the safe operation of the drive. Ensure that the settings fit the application requirements prior to operation. Operation of digital outputs during Auto-tuning. Rotational Auto-tuning allows for normal digital output operation, while non-rotational Autotuning does not allow for normal digital output operation.

Safe operations. Run by power on. Parameter setting b1-17. LOCAL/REMOTE key effective during stop in drive mode. Parameter o2-01. LED operator stop key priority selection. Parameter o2-02. Enter press required after changing the keypad frequency reference. Parameter o2-05. Operation interlock when program mode is selected.

Parameter b1-08. Replace the Drive The removable terminal block with parameter backup function allows the transfer of parameter settings after drive replacement. Refer to Replacing the Drive on page 269. Drive a Synchronous PM Motor The V1000 drive can operate synchronous PM motors. Refer to Subchart A3: Operation with Permanent Magnet Motors on page 80. Perform Auto-Tuning Automatic tuning sets motor parameters. Refer to Auto-Tuning on page 87. Check the Maintenance Period Using Drive Monitors The maintenance period of fans and capacitors can be checked with drive monitors. Refer to Performance Life Monitors on page 266 Drive or Motor Faults are Displayed on a Digital Operator Refer to Fault Displays, Causes, and Possible Solutions on page 230 and Refer to Alarm Codes, Causes, and Possible Solutions on page 241. Standards Compliance Refer to European Standards on page 382 and Refer to UL Standards on page 388.

C UL R US LISTED 16 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 1 Receiving This chapter describes the proper inspections to perform after receiving the drive and illustrates the different enclosure types and components. 1.1 1.2 1.3 1.4 SECTION SAFETY.....

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22 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 17 1.1 Section Safety 1.1 Section Safety CAUTION Do not carry the drive by the front cover. Failure to comply may cause the main body of the drive to fall, resulting in minor or moderate injury. NOTICE Observe proper electrostatic discharge procedures (ESD) when handling the drive and circuit boards.

Failure to comply may result in ESD damage to the drive circuitry. A motor connected to a PWM drive may operate at a higher temperature than a utility-fed

motor and the operating speed range may reduce motor cooling capacity. Ensure that the motor is suitable for drive duty and/or the motor service factor is adequate to accommodate the additional heating with the intended operating conditions. 18 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 1.2 Model Number and Nameplate Check 1.

2 Model Number and Nameplate Check Please perform the following tasks after receiving the drive: · Inspect the drive for damage. If the drive appears damaged upon receipt, contact the shipper immediately. · Verify receipt of the correct model by checking the information on the nameplate. · If you have received the wrong model or the drive does not function properly, contact your supplier. u Nameplate Heavy Duty Amps / Normal Duty Amps AC drive model Input specifications Output specifications Lot number Serial number Yaskawa Ref. number Software version Enclosure type Figure 1.1 Nameplate Information VZ V1000 Series No. Z Type European Standard No. A No. B 2 4 A B 0P1 No.

B F E B Enclosure Type IP20 NEMA 1 IP20 with built-in EMC filter A A Design Revision Order Customized Specifications Standard model Voltage Class 1-phase, 200-240 Vac 3-phase, 200-240 Vac 3-phase, 380-480 Vac No. A M N S Environmental Specification <1> Standard Humidity- and dust-resistant Oil-resistant Vibration-resistant n Single-Phase 200 V No. B0P1 B0P2 B0P4 B0P7 B1P5 B2P2 B4P0 Heavy Duty Max. Motor Capacity kW 0.1 0.2 0.4 0.75 1.5 2.2 4. 0 Rated Output Current A 0.8 1.6 3.0 5.0 8. 0 11.0 17.5 No. B0P1 B0P2 B0P4 B0P7 B1P5 B2P2 -- Normal Duty Max. Motor Capacity kW 0. 2 0.4 0.75 1.1 2.2 3.0 -- Rated Output Current A 1.2 1.9 3.3 6.0 9.

6 12.0 -- SIEP C710606 20 OYMC AC Drive - V1000 User Manual 19 Receiving 1 1.2 Model Number and Nameplate Check n Three-Phase 200 V No. 20P1 20P2 20P4 20P7 21P5 22P2 24P0 25P5 27P5 2011 2015 Heavy Duty Max Motor Capacity kW 0.1 0.2 0.4 0.75 1.5 2.2 4. 0 5.5 7.5 11 15 Rated Output Current A 0.8 1.6 3. 0 5.0 8.0 11.0 17.5 25.

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8 5.5 7.2 9.2 14.8 18.0 24.0 31.0 No. 40P2 40P4 40P7 41P5 42P2 43P0 44P0 45P5 47P5 4011 4015 Normal Duty Max. Motor Capacity kW 0. 4 0.75 1.5 2.2 3.0 4.

0 5.5 7.5 11 15 18.5 Rated Output Current A 1 2 2.

1 4.1 5.4 6.9 8.8 11.1 17.5 23.0 31.0 38.0 <1> Drives with these specifications do not guarantee complete protection for the specified environmental condition.

Note: Refer to Component Names on page 22 for differences regarding enclosure protection types and component descriptions. 20 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 1.3 Drive Models and Enclosure Types 1.3 Drive Models and Enclosure Types Table 1.1 Drive Models and Enclosure Types Enclosure Type IP20/Open-Chassis VZA B0P1B B0P2B B0P4B B0P7B B1P1B B2P2B B4P0B 20P1B 20P2B 20P4B 20P7B 21P5B 22P2B 24P0B - - - - - 40P2B 40P4B 40P7B 41P5B 42P2B 43P0B 44P0B - - - - - The following table describes drive enclosures and models. Voltage Class Single-Phase 200 V Class Three-Phase 200 V Class Three-Phase 400 V Class Two types of enclosures are offered for V1000 drives. · IP20/Open-Chassis models are often placed inside a large enclosure panel where the front of the drive is covered to prevent someone from accidentally touching charged components. · IP20/NEMA Type 1 models mount to an indoor wall and not inside a large enclosure panel. SIEP C710606 20 OYMC AC Drive - V1000 User Manual 21 Receiving IP20/NEMA Type 1 VZA - - - - - 25P5F 27P5F 2011F 2015F - - - - - 45P5B 47P5B 4011B 4015B 1 1.4 Component Names 1.

4 Component Names This section illustrates the drive components as they are mentioned in this manual. u IP20/Open-Chassis n Single-Phase AC200 V VZAB0P1B ~ VZAB0P4B Three-Phase AC200 V VZA20P1B ~ VZA20P7B A L K J C H I D E G A B C D E B F Front cover screw Front cover Comm port LED operator Refer to Using the Digital LED Operator on page 66 K Case L Cooling fan <1> G H I J Fan cover <1> Mounting hole Heatsink Optional 24 V DC power supply connector cover Terminal board Refer to Control Circuit Terminal Block Functions on page 50 F Terminal cover Figure 1.



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2 Exploded View of IP20/Open-Chassis Type Components Three-Phase AC200 V VZA20P7B <1> The drives VZAB0P1B ~ VZAB0P4B and VZA20P1B ~ VZA20P4B do not have a cooling fan or a cooling fan cover. 22 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 1.4 Component Names n Single-Phase AC200 V VZAB0P7B ~ VZAB4P0B Three-Phase AC200 V VZA21P5B ~ VZA24P0B Three-Phase AC400 V VZA40P2B ~ VZA44P0B A M L K C I H E F G Fan cover <1> Mounting hole Heatsink Optional 24 V DC power supply connector cover Comm port Terminal board Refer to Control Circuit Terminal Block Functions on page 50 G Front cover screw A B C D E F Front cover Terminal cover Bottom cover LED operator Refer to Using the Digital LED Operator on page 66 L Case M Cooling fan <1> H I J K B J D Figure 1.

3 Exploded view of IP20/Open-Chassis Type Components Three-Phase AC200 V VZA22P2B <1> The drives VZAB0P7B and VZA40P2B ~ VZA40P7B do not have a cooling fan or a cooling fan cover. The drive VZAB4P0B has two cooling fans. SIEP C710606 20 OYMC AC Drive - V1000 User Manual 23 Receiving 1 1.4 Component Names u IP20/NEMA Type 1 Enclosure n Three-Phase AC200 V VZA25P5F ~ VZA2015F Three-Phase AC400 V VZA45P5F ~ VZA4015F A O N M L K J F B C D E I A Fan cover B Cooling fan Refer to Drive Cooling Fans on page 267 C Mounting Hole D Heatsink E Cable cover F Front cover screws G H G Front cover H Terminal board Refer to Control Circuit Terminal Block Functions on page 50 I Terminal cover J Comm port K LED operator Refer to Using the Digital LED Operator on page 66 L Case Figure 1.4 Exploded view of IP20/NEMA Type 1 Components Three-Phase AC400 V VZA45P5F 24 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 1.

4 Component Names u Front Views VZAB0P1B I I H A B C D G E F A Terminal board connector B DIP switch S1 Refer to DIP Switch S1 Analog Input Signal Selection on page 57 C DIP switch S3 Refer to Sinking/Sourcing Mode Switch on page 55 D Control circuit terminal Refer to Control Circuit Wiring on page 50 E Main circuit terminal Refer to Wiring the Main Circuit Terminal on page 49 VZA42P2B A B C D E F F Ground terminal G Terminal cover H - Option card connector Refer to Connecting the Option Card on page 284 I DIP switch S2 Refer to MEMOBUS/Modbus Termination on page 58 H G Figure 1.5 Front Views of Drives SIEP C710606 20 OYMC AC Drive - V1000 User Manual 25 Receiving 1 1.4 Component Names This Page Intentionally Blank 26 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 2 Mechanical Installation This chapter explains how to properly mount and install the drive. 2.1

2.2 SECTION SAFETY.....

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.....28 MECHANICAL INSTALLATION...

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.....30 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 27 2.1 Section Safety 2.

1 Section Safety WARNING Fire Hazard Provide sufficient cooling when installing the drive inside an enclosed panel or cabinet. Failure to comply could result in overheating and fire. When multiple drives are placed inside the same enclosure panel, install proper cooling to ensure air entering the enclosure does not exceed 40 °C. CAUTION Crush Hazard Do not carry the drive by the front cover. Failure to comply may result in minor or moderate injury from the main body of the drive falling.

NOTICE Observe proper electrostatic discharge (ESD) procedures when handling the drive. Failure to comply could result in ESD damage to the drive circuitry. It may be difficult to perform maintenance on the cooling fans of drives installed in a vertical row inside an enclosure. Ensure adequate spacing at the top of the drive to perform cooling fan replacement when required. Operating the motor in the low-speed range diminishes the cooling effects, increases motor temperature, and may lead to motor damage by overheating.

Reduce the motor torque in the low-speed range whenever using a standard blower cooled motor. If 100% torque is required continuously at low speed, consider using a special drive or vector motor. Select a motor that is compatible with the required load torque and operating speed range. Do not operate motors above the maximum rated RPM. Failure to comply may lead to bearing or other mechanical motor failures. The speed range for continuous operation differs according to the lubrication method and motor manufacturer. If the motor is to be operated at a speed higher than the rated speed, consult with the manufacturer. Continuously operating an oil-lubricated motor in the low-speed range may result in burning. 28 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 2.1 Section Safety NOTICE When the input voltage is 480 V or higher or the wiring distance is greater than 100 meters, pay special attention to the motor insulation voltage or use a drive-rated motor.

Failure to comply could lead to motor winding failure. Motor vibration may increase when operating a machine in variable-speed mode, if that machine previously operated at a constant speed. Install vibration-proof rubber on the motor base or use the frequency jump function to skip a frequency resonating the machine. The motor may require more acceleration torque with drive operation than with a commercial power supply. Set a proper V/f pattern by checking the load torque characteristics of the machine to be used with the motor. The rated input current of submersible motors is higher than the rated input

current of standard motors. Select an appropriate drive according to its rated output current. When the distance between the motor and drive is long, use a cable thick enough to connect the motor to the drive to prevent motor torque reduction. When using an explosion-proof motor, it must be subject to an explosion-proof test in conjunction with the drive. This is also applicable when an existing explosion-proof motor is to be operated with the drive. Since the drive itself is not explosion-proof, always install it in a safe place. Do not use a drive for a single-phase motor. Replace the motor with a three-phase motor. If an oil-lubricated gearbox or speed reducer is used in the power transmission mechanism, oil lubrication will be affected when the motor operates only in the low speed range. The power transmission mechanism will make noise and experience problems with service life and durability if the motor is operated at a speed higher than the rated speed.

SIEP C710606 20 OYMC AC Drive - V1000 User Manual 29 Mechanical Installation 2.2 Mechanical Installation 2.2 Mechanical Installation This section outlines specifications, procedures, and environment for proper mechanical installation of the drive. u Installation Environment To help prolong the optimum performance life of the drive, install the drive in the proper environment. The table below provides a description of the appropriate environment for the drive.



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Environment Installation Area Table 2.1 Installation Environment Conditions Indoors -10 °C to +40 °C (IP20/NEMA 1) -10 °C to +50 °C (IP20/Open-Chassis) Drive reliability improves in environments without wide temperature fluctuations. When using an enclosure panel, install a cooling fan or air conditioner in the area to ensure that the air temperature inside the enclosure does not exceed the specified levels. Do not allow ice to develop on the drive. 95% RH or less and free of condensation -20 °C to +60 °C Install the drive in an area free from: · oil mist and dust · metal shavings, oil, water or other foreign materials · radioactive materials · combustible materials (e.g., wood) · harmful gases and liquids · excessive vibration · chlorides · direct sunlight 1000 m or lower 10 to 20 Hz at 9.8 m/s² 20 to 55 Hz at 5.9 m/s² Install the drive vertically to maintain maximum cooling effects. Ambient Temperature Humidity Storage Temperature Surrounding Area Altitude Vibration Orientation NOTICE: Prevent foreign matter such as metal shavings or wire clippings from falling into the drive during installation and project construction.

Failure to comply could result in damage to the drive. Place a temporary cover over the top of the drive during installation. Remove the temporary cover before startup, as the cover will reduce ventilation and cause the drive to overheat. 30 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 2.2 Mechanical Installation u Installation Orientation and Spacing Install the drive upright as illustrated in Figure 2.1 to maintain proper cooling. A B B A Correct B Incorrect Figure 2.1 Correct Installation Orientation n Single Drive Installation Figure 2.2 explains the required installation spacing to maintain sufficient space for airflow and wiring. Install the heatsink against a closed surface to avoid diverting cooling air around the heatsink. Side Clearance A A C Top/Bottom Clearance B C Figure 2.2 Correct Installation Spacing Note: IP20/NEMA Type 1 and IP20/Open-Chassis models require the same amount of space above and below the drive for installation. n Multiple Drive Installation When installing multiple drives into the same enclosure panel, mount the drives according to Figure 2.2. When mounting drives with a minimum side-by-side clearance of 2 mm according to Figure 2.3, derating must be considered and parameter L8-35 must be set. Refer to Parameter List on page 297. A B 2 mm B C D C A Line up the tops of the drives. B - 30 mm minimum C 100 mm minimum D Airflow direction Figure 2.3 Space Between Drives (Side-by-Side Mounting) Note: When installing drives of different heights in the same enclosure panel, the tops of the drives should line up.

Leave space between the top and bottom of stacked drives for cooling fan replacement if required. Using this method, it is possible to replace the cooling fans later. SIEP C710606 20 OYMC AC Drive - V1000 User Manual 31 Mechanical Installation A 30 mm minimum B Airflow direction C 100 mm minimum 2.2 Mechanical Installation NOTICE: When drives with IP20/NEMA Type 1 enclosures are mounted side by side, the top covers of all drives must be removed as shown in Figure 2.4. Figure 2.4 IP20/NEMA 1 Side-by-Side Mounting in Enclosure u Removing and Attaching the Protective Covers Refer to Electrical Installation on page 37, for information regarding the removal and reattachment of protective covers. u Exterior and Mounting Dimensions Protective Design Table 2.2 Drive Models and Types Drive Model VZA Single-Phase Three-Phase 200 V Class 200 V Class 20P1B B0P1B 20P2B B0P2B 20P4B B0P4B 20P7B B0P7B B1P5B B2P2B B4P0B B0P1E B0P2E B0P4E IP20/Open-Chassis With an EMC Filter B0P7E B1P5E B2P2E 21P5B 22P2B 24P0B Three-Phase 400 V Class 40P2B 40P4B 40P7B 41P5B 42P2B 43P0B 44P0B 40P2E 40P4E 40P7E 41P5E 42P2E 43P0E 44P0E 45P5F 47P5F 4011F 4015F Page 33 IP20/Open-Chassis Without an EMC Filter 33 34 34 IP20/NEMA Type 1 Without an EMC Filter 25P5F 27P5F 2011F 2015F 35 Note: Refer to Specifications on page 287 for information on the amount of heat generated by the drive and appropriate cooling methods. 32 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 2.

2 Mechanical Installation n IP20/Open-Chassis Drives Table 2.3 IP20/Open-Chassis (without an EMC filter) W1 2-M4 t1 H1 H W H2 D1 D Voltage Class Single-Phase 200 V Class Three-Phase 200 V Class Drive Model VZA B0P1B B0P2B B0P4B 20P1B 20P2B 20P4B 20P7B W1 W1 56 56 56 56 56 56 56 H1 118 118 118 118 118 118 118 4-M4 W 68 68 68 68 68 68 68 Dimensions (mm) H D t1 128 76 3 128 76 3 128 118 5 128 76 3 128 76 3 128 108 5 128 128 5 H2 5 5 5 5 5 5 5 D1 6.5 6.5 38.5 6.5 6.5 38.5 58.5 Weight (kg) 0.6 0.6 1.0 0.6 0.6 0.9 1.

1 Table 2.4 IP20/Open-Chassis (without an EMC filter) H1 H W H2 D D1 t1 Voltage Class Single-Phase 200 V Class Three-Phase 200 V Class Three-Phase 400 V Class Drive Model VZA B0P7B B1P5B B2P2B B4P0B 21P5B 22P2B 24P0B 40P2B 40P4B 40P7B 41P5B 42P2B 43P0B 44P0B W1 96 96 128 158 96 96 128 96 96 96 96 96 128 H1 118 118 118 118 118 118 118 118 118 118 118 118 118 118 W 108 108 140 170 108 108 140 108 108 108 108 108 108 140 H 128 128 128 128 128 128 128 128 128 128 128 128 128 128 Dimensions (mm) D t1 137.5 5 154 5 163 5 180 5 129 5 137.5 5 143 5 81 5 99 5 137.5 5 154 5 154 5 154 5 143 5 H2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 D1 58 58 65 65 58 58 65 10 28 58 58 58 58 65 Weight (kg) 1. 7 1.8 2.4 3.0 1.7 1.7 2.4 1.0 1.2 1.7 1.

7 1.7 1.7 2.4 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 33 Mechanical Installation 2.2 Mechanical Installation Table 2.5 IP20/Open-Chassis (with EMC filter) W1 2-M4 t1 H2 H3 H1 H W H4 D1 D Voltage Class Single-Phase 200 V Class Drive Model VZA B0P1E B0P2E B0P4E W1 W 68 68 68 W1 56 56 56 4-M4 H 178 178 178 H1 128 128 128 Dimensions (mm) H2 H3 H4 D 118 5 2 76 118 5 2 76 118 5 2 118 D1 6.5 6.5 38.5 t1 3 3 3 Weight (kg) 0.8 0.

8 1.2 Table 2.6 IP20/Open-Chassis (with EMC filter) t1 H2 H3 H1 H4 H W D1 D Voltage Class Single-Phase 200 V Class Three-Phase 400 V Class Drive Model VZA B0P7E B1P5E B2P2E 40P2E 40P4E 40P7E 41P5E 42P2E 43P0E 44P0E W 108 108 140 108 108 108 108 108 108 140 W1 96 96 128 96 96 96 96 128 H 178 178 183 178 178 178 178 178 183 H1 128 128 128 128 128 128 128 128 128 128 128 128 128 Dimensions (mm) H2 H3 H4 D 118 5 2 137.5 118 5 2 137.5 118 5 2 163 118 5 2 81 118 5 2 99 118 5 2 137.5 118 5 2 137. 5 118 5 2 137.5 118 5 2 143 D1 59.6 64.6 66. 6 11.6 29.6 59.6 59.6 59.6 59.6 66.6 t1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 Weight (kg) 2.0 2.1 2.

8 1.3 1.5 2.0 2.0 2.0 2.0 2.8 34 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 2.2 Mechanical Installation n IP20/NEMA Type 1 Drives Table 2.



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7 IP20/NEMA Type 1 (without an EMC filter) W1 4-d H6 H2 H1 H H3 W t1 D1 D H5 H4 Voltage Class Drive Model VZA 25P5F 27P5F 2011F 2015F
45P5F 47P5F 4011F 4015F Dimensions (mm) W1 122 122 160 192 122 122 160 160 H2 248 248 284 336 248 248 284 284 W 140 140 180 220 140 140 180
180 H1 234 234 270 320 234 234 270 270 D 140 140 163 187 140 140 143 163 t1 5 5 5 5 5 5 5 H5 13 13 13 22 13 13 13 13 D1 55 55 75 78 55 55 55 75 H
254 254 290 350 254 254 290 290 H4 13 13 15 15 13 13 15 13 H3 6 6 6 7 6 6 6 6 H6 1.

5 1.5 1.5 1.5 1.5 1.

5 1.5 1.5 d M5 M5 M5 M6 M5 M5 M5 M5 Weight (kg) 3.8 3.8 5.

5 9.2 3.8 3.8 5.2 5.5 Three-Phase 200 V Class Three-Phase 400 V Class SIEP C710606 20 OYMC AC Drive - V1000 User Manual 35 Mechanical Installation
2.2.2 Mechanical Installation This Page Intentionally Blank 36 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 3 Electrical Installation This
chapter explains proper procedures for wiring the control circuit terminals, motor and power supply. 3.1 3.2 3.

3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 SECTION SAFETY.

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..38 STANDARD CONNECTION DIAGRAM....

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40 MAIN CIRCUIT CONNECTION DIAGRAM.....

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....42 TERMINAL BLOCK CONFIGURATION.....

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....43 PROTECTIVE COVERS.....

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.....44 MAIN CIRCUIT WIRING..

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.....46 CONTROL CIRCUIT WIRING.....

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.....50 I/O CONNECTIONS...

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.....55 MAIN FREQUENCY REFERENCE..

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57 MEMOBUS/MODBUS TERMINATION....

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.....58 BRAKING RESISTOR....

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2 MCCB For single phase 200 V r1 power supply, use s1 R/L1 and S/L2. t1 MC 1 MCCB Three phase R/L1 power supply S/L2 200 to 240 V T/L3 Forward run/stop DC reactor (option) Jumper +2 +1 <3> <1> - Thermal relay Braking resistor (option) (option) <2> Motor FU FV FW U V W M Cooling fan M r1 B1 B2 s1 t1 U/T1 V/T2 W/T3 R/L1 V1000 Control circuit S/L2 Main circuit T/L3 <4> THRX OFF ON MC 2 MCCB SA MC THRX Thermal relay for motor cooling fan MC MC MA S1 S2 S3 S4 S5 S6 +24 V 8 mA 24 V Sink Source P1 0V P2 RP Pulse train input (max.



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32 kHz) Setting power supply +10.5 max. 20 mA PC MP AM AC Termination resistor 120 , 1/2 W R+ RH1 During Run (photocoupler 1) Frequency agree (photocoupler 2) Photocoupler output common Pulse train output 0 to 32 kHz Analog monitor + output AM 0 to +10 Vdc - (2 mA) Reverse run/stop External fault Fault reset Multi-step speed 1 main/aux switch Multi-step speed 2 Option card connector DIP switch S1 V I Ground 10 or less (400 V class) 100 or less (200 V class) Digital output 250 Vac, 10 mA to 1 A 30 Vdc, 10 mA to 1 A (default setting) SA TRX SA TRX Fault relay MA Fault MB MC Digital output 5 ~ 48 Vdc 2 to 50 mA (default setting) Digital inputs (default setting) <5> SC DIP switch S3 Shield ground terminal 2k Main speed frequency reference. Multi-function programmable +V A1 0 to +10 V (20 k) A2 0 to +10 V (20 k) 0/4 to 20 mA (250) AC <6> Safety switch Safe Disable Input Jumper <7> H2 DIP switch S2 Comm. connector Monitor output S+ SIG Cable shield ground HC shielded line main circuit terminal twisted-pair shielded line control terminal MEMOBUS/ Modbus comm. RS-485/422 Figure 3.1 Drive Standard Connection Diagram 40 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 3.2 Standard Connection Diagram Remove the jumper when installing an optional DC reactor. The MC on the input side of the main circuit should open when the thermal relay is triggered. Self-cooled motors do not require separate cooling fan motor wiring. Connected using sequence input signal (S1 to S6) from NPN transistor; Default: sink mode (0 V com). Use only a +24 V internal power supply in sinking mode; the source mode requires an external power supply Refer to I/O Connections on page 55. <6> Monitor outputs work with devices such as analog frequency meters, ammeters, voltmeters and wattmeters; they are not intended for use as a feedback-type of signal.

<7> Disconnect the wire jumper between HC, H1, and H2 when utilizing the safety input. Refer to Wiring Procedure on page 52 for details on removing the jumper. The wire length for the Safe Disable input should not exceed 30 m. WARNING! Sudden Movement Hazard. Do not close the wiring for the control circuit unless the multifunction input terminal parameter is properly set (S5 for 3-Wire; H1-05 = "0"). Improper sequencing of run/stop circuitry could result in death or serious injury from moving equipment. WARNING! Sudden Movement Hazard. Ensure start/stop and safety circuits are wired properly and in the correct state before energizing the drive. Failure to comply could result in death or serious injury from moving equipment. When programmed for 3-Wire control, a momentary closure on terminal S1 may cause the drive to start.

WARNING! When 3-Wire sequence is used, set the drive to 3-Wire sequence before wiring the control terminals and ensure parameter b1-17 is set to 0 (drive does not accept a run command at power up (default). If the drive is wired for 3-Wire sequence but set up for 2Wire sequence (default) and if parameter b1-17 is set to 1 (drive accepts a Run command at power up), the motor will rotate in reverse direction at power up of the drive and may cause injury. WARNING!

When the application preset function is executed (or A1-06 is set to any value other than 0) the drive I/O terminal functions change. This may cause unexpected operation and potential damage to equipment or injury. <1> <2> <3> <4> <5> Figure 3.

2 illustrates an example of a 3-Wire sequence. Stop relay (N.C.) Run relay (N.O.)

) Drive S1 S2 S5 SC Run command (run on momentary close) Stop command (stop on momentary open) Forward/reverse command (multi-function input: H1-05 = 0) Sequence input common Figure 3.2 3-Wire Sequence SIEP C710606 20 OYMC AC Drive - V1000 User Manual 41 Electrical Installation 3 3.3 Main Circuit Connection Diagram 3.3 Main Circuit Connection Diagram Refer to diagrams in this section for the Main Circuit wiring connections.

Connections may vary based on drive capacity. The main circuit DC power supply powers the control circuit. NOTICE: Do not use the negative DC bus terminal "-" as a ground terminal. This terminal is at high voltage DC potential. Improper wiring connections could result in damage to the drive. u Single-Phase 200 V Class (VZAB0P1 ~ B4P0) DC reactor (option) Jumper +2 R/L1 S/L2 +1 Braking Resistor Unit (option) B1 B2 Drive U/T1 V/T2 W/T3 Motor Single-phase 200 Vac Figure 3.

3 Connecting Single-Phase Main Circuit Terminals NOTICE: Do not connect T/L3 terminal when using single-phase power supply input. Incorrect wiring may damage the drive. u Three-Phase 200 V Class (VZA20P1 ~ 2015); Three-Phase 400 V Class (VZA40P2 ~ 4015) DC reactor (option) Jumper +2 +1 R/L1 S/L2 T/L3 Three phase 200 Vac (400 Vac) -- Braking Resistor Unit (option) B1 B2 Drive U/T1 V/T2 W/T3 Motor Figure 3.4 Connecting Three-Phase Main Circuit Terminals 42 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 3.4 Terminal Block Configuration 3.4 Terminal Block Configuration The figures in this section provide illustrations of the main circuit terminal block configurations of the different drive sizes. Models: VZAB0P1, B0P2, B0P4 VZA20P1, 20P2, 20P4, 20P7 Models: VZAB0P7, B1P5, B2P2 VZA21P5, 22P2, 24P0 VZA40P2, 40P4, 40P7, 41P5 42P2, 43P0, 44P0 Model: VZAB4P0 Models: VZA25P5, 27P5 VZA45P5, 47P5 Figure 3.5 Main Circuit Terminal Block Configurations SIEP C710606 20 OYMC AC Drive - V1000 User Manual 43 Electrical Installation Models: VZA2011 VZA4011, 4015 Model: VZA2015 3 3.5 Protective Covers 3.5 Protective Covers Follow the procedure below to remove the protective covers before wiring the drive and to reattach the covers after wiring is complete.

u IP20/Open-Chassis Cover Removal and Installation n Removing the Protective Covers 1. Loosen the screw that locks the front cover in place to remove. Figure 3.6 Remove the Front Cover on an IP20/Open-Chassis Drive 2. Apply pressure to the tabs on each side of the terminal cover.

Pull the terminal cover away from the drive while pushing in on the tabs to pull the cover free. Figure 3.7 Remove the Terminal Cover on an IP20/Open-Chassis Drive n Reattaching the Protective Covers Properly connect all wiring and route power wiring away from control signal wiring. Reattach all protective covers when wiring is complete. Apply only a small amount of pressure to lock the cover back into place.

Figure 3.8 Reattach the Protective Covers on an IP20/Open-Chassis Drive u IP20/NEMA Type 1 Cover Removal and Installation n Removing the Protective Covers on an IP20/NEMA Type 1 Design 1. Loosen the screw on the front cover to remove the front cover. Figure 3.9 Remove the Front Cover on an IP20/NEMA Type 1 Drive 2. Loosen the screw on the terminal cover (Figure 3.10, B) to remove the terminal cover and expose the conduit bracket (Figure 3.



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10 Remove the Terminal Cover on an IP20/NEMA Type 1 Drive 3. Loosen two screws attaching the conduit bracket (Figure 3.11, A) to remove. A Figure 3.11 Remove the Conduit Bracket on an IP20/NEMA Type 1 Drive n Reattaching the Protective Covers Pass power wiring and control signal wiring through the exit holes on the bottom of the conduit bracket of the drive. Place power wiring and control signal wiring in separate conduits. Properly connect all wiring after installing the drive and connecting other devices. Reattach all protective covers when wiring is complete. A A Pass power wiring and control signal wiring through different exit holes at the bottom of the drive. Figure 3.

12 Reattach the Protective Covers and Conduit Bracket on an IP20/NEMA Type 1 Drive SIEP C710606 20 OYMC AC Drive - V1000 User Manual 45 Electrical Installation 3 3.6 Main Circuit Wiring 3.6 Main Circuit Wiring This section describes the functions, specifications, and procedures required to safely and properly wire the main circuit of the drive. NOTICE: Do not solder the ends of wire connections to the drive. Soldered wiring connections can loosen over time.

Improper wiring practices could result in drive malfunction due to loose terminal connections. u Main Circuit Terminal Functions Terminal R/L1 S/L2 T/L3 U/T1 V/T2 W/T3 B1 B2 +1 +2 +1 (2 terminals) Type Main circuit power supply input Drive output Braking resistor DC reactor connection DC power supply input Ground Table 3.1 Main Circuit Terminal Functions Function Connects line power to the drive. Drives with single-phase 200 V input power use terminals R/L1 and S/L2 only (T/L3 must not be used). Connects to the motor.

Available for connecting a braking resistor or the braking resistor unit option. These terminals are shorted at shipment. Remove the shorting bar between +1 and +2 when connecting a DC reactor to this terminal. For connecting a DC power supply. Grounding Terminal For 200 V class: 100 or less For 400 V class: 10 or less Reference 42 48 59 279 48 u Wire Gauges and Tightening Torque Select the appropriate wires and crimp terminals from Table 3.2 through Table 3.4. Note: 1. Wire gauge recommendations based on drive continuous current ratings using 75 °C 600 Vac vinyl-sheathed wire assuming ambient temperature within 30 °C and wiring distance less than 100 m. 2.

Terminals +1, +2, , B1 and B2 are for connecting optional devices such as a DC reactor or braking resistor. Do not connect other non-specified devices to these terminals. · Consider the amount of voltage drop when selecting wire gauges. Increase the wire gauge when the voltage drop is greater than 2% of motor rated voltage. Ensure the wire gauge is suitable for the terminal block. Use the following formula to calculate the amount of voltage drop: · Line drop voltage (V) = 3 x wire resistance (/km) x wire length (m) x current (A) x 10⁻³ · Refer to instruction manual TOBPC72060000 for braking unit or braking resistor unit wire gauges. · Refer to UL Standards Compliance on page 388 for information on UL compliance. n Single-Phase 200 V Class Model VZA B0P1 B0P2 B0P4 B0P7 B1P5 , +1, +2, B1, B2 B2P2 B4P0 R/L1, S/L2, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, U/T1, V/T2, W/T3, , +1, +2, B1, B2, M4 M4 M5 Table 3.2 Wire Gauge and Torque Specifications Applicable Tightening Gauge Terminal Screw Size Torque N·m (lb.in.)

) mm2 (AWG) R/L1, S/L2, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, U/T1, V/T2, W/T3, M3.5 M4 M4 0.8 to 1.0 (7.1 to 8.

9) 1.2 to 1.5 (10.6 to 13.3) 1.

2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.

6 to 13.3) 2 to 2.5 (17.7 to 22.1) 0.75 to 2.5 (18 to 14) 2.5 to 6 (14 to 10) 2.5 to 6.0 (14 to 10) 2.

5 to 6.0 (14 to 10) 2.5 to 6 (14 to 10) 4 to 10 (12 to 8) Recommended Gauge mm2 (AWG) 2.5 (14) 2.5 (14) 4 (12) 6 (10) 6 (10) 10 (8) 46 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 3.

6 Main Circuit Wiring n Three-Phase 200 V Class Table 3.3 Wire Gauge and Torque Specifications Model VZA 20P1 20P2 20P4 20P7 21P5 22P2 24P0 Terminal R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2 B1, B2 Screw Size M3.5 M4 M4 M4 M4 M4 M4 M5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2 27P5 B1, B2 M4 M4 M5 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2 2011 B1, B2 M6 M5 M6 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2 2015 B1, B2 M8 M5 M6 Tightening Torque N·m (lb.in.) 0.

8 to 1.0 (7.1 to 8.9) 1.2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.

6 to 13.3) 1.2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.6 to 13.3) 1.

2 to 1.5 (10.6 to 13.3) 1.2 to 1.

5 (10.6 to 13.3) 2 to 2.5 (17.7 to 22.

1) 1.2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.6 to 13.3) 2 to 2.5 (17.

7 to 22.1) 4 to 6 (35.4 to 53.1) 2 to 2.5 (17.7 to 22.1) 4 to 6 (35.4 to 53.1) 9 to 11 (79.7 to 11.

0) 2 to 2.5 (17.7 to 22.1) 4 to 6 (35.4 to 53.

1) Applicable Gauge mm2 (AWG) 0.75 to 2.5 (18 to 14) 2.5 to 6 (14 to 10) 2.5 to 6 (14 to 10) 2.

5 to 6 (14 to 10) 2.5 to 6 (14 to 10) 6 to 16 (10 to 6) 2.5 to 6 (14 to 10) 6 to 16 (10 to 6) 6 to 16 (10 to 6) 2.5 to 6 (14 to 10) 6 to 16 (10 to 6) 16 to 25 (6 to 4) 6 to 10 (10 to 8) 16 to 25 (6 to 4) 10 to 35 (8 to 2) 10 to 16 (8 to 6) 10 to 25 (8 to 4) Recommended Gauge mm2 (AWG) 2.5 (14) 2.5 (14) 4 (12) 4 (12) 6 (10) 10 (8) 6 (10) 10 (8) 16 (6) 6 (10) 10 (8) 25 (4) 10 (8) 25 (4) 35 (2) 16 (6) 25 (4) 25P5 n Three-Phase 400 V Class Table 3.4 Wire Gauge and Torque Specifications Model VZA 40P2 40P4 40P7 41P5 42P2 43P0 Terminal Screw Size Tightening Torque Applicable Gauge N·m (lb.in.) mm2 (AWG) 1.2 to 1.

5 (10.6 to 13.3) 1.2 to 1.5 (10.6 to 13.3) 1.2 to 1.5 (10.6 to 13.

3) 1.2 to 1.5 (10.6 to 13.3) 1.

2 to 1.5 (10.6 to 13.3) 1.2 to 1.

5 (10.6 to 13.3) 2 to 2.5 (17.7 to 22.1) 1.2 to 1.5 (10.6 to 13.3) 1.

2 to 1.5 (10.6 to 13.3) 2 to 2.5 (17.7 to 22.1) 2.5 to 6.0 (14 to 10) 2.5 to 6 (14 to 10) 2.

5 to 6 (14 to 10) 2.5 to 6 (14 to 10) 2.5 to 6 (14 to 10) 2.5 to 6 (14 to 10) 6 to 16 (10 to 6) 6 to 16 (10 to 6) 2.5 to 6 (14 to 10) 6 to 16 (10 to 6) Recommended Gauge mm2 (AWG) 2.

5 (14) 2.5 (14) 4 (12) 2.5 (14) 4 (12) 6 (10) 6 (10) 10 (8) 6 (10) 6 (10) R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2, R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, , +1, +2, B1, B2 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2, B1, B2 R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, -, +1, +2 M4 M4 M4 M4 M4 M4 M5 M4 M4 M5 44P0 45P5 47P5 B1, B2 SIEP C710606 20 OYMC AC Drive - V1000 User Manual 47 Electrical



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