

TOSHIBA

Toshiba 4400 Series Installation And Operation Manual

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INSTALLATION AND OPERATION MANUAL

Part # 64527-006

January 2016

Manufactured in the USA

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TOSHIBA
Leading Innovation >>>

UNINTERRUPTIBLE POWER SYSTEM (UPS)

4400 SERIES

THREE PHASE - 15/20/25/30/50/80 KVA

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Related Manuals for Toshiba 4400 Series

[UPS Toshiba 4400 Series Installation And Operation Manual](#)

Three phase - 15/20/25/30/50/80/100 kva (138 pages)

[UPS Toshiba 4400 Series Installation And Operation Manual](#)

Battery cabinets (46 pages)

[UPS Toshiba 4400 Series Installation Instructions Manual](#)

Seismic adapter kit (14 pages)

[Adapter Toshiba 4400 Series Installation Instructions Manual](#)

Ups seismic adapter kit (12 pages)

[UPS Toshiba 4200FA User Manual](#)

Uninterruptible power system three-phase 15/ 25/ 30/ 33/ 50 kva ups (66 pages)

[UPS Toshiba 4200FA User Manual](#)

Uninterruptible power system three-phase 80 kva ups (66 pages)

[UPS Toshiba 4200FA Installation And Operation Manual](#)

Three-phase 15/25/30/50 kva ups (138 pages)

[UPS Toshiba 4200FA Installation And Operation Manual](#)

Three-phase 15/25/30/50 kva ups (98 pages)

[UPS TOSHIBA 4200FA User Manual](#)

Uninterruptible power system three-phase 75 / 80 kva ups (65 pages)

[UPS Toshiba 4200FA Series Operation Manual](#)

Battery cabinet system for 4200fa series 15 & 25kva ups (20 pages)

[UPS Toshiba 4200FA CT/XT User Manual](#)

Toshiba 4200fa ct/xt uninterruptible power system three-phase 15/25/30/50 kva ups user's manual (68 pages)

[UPS Toshiba 4200FA XT Installation And Operation Manual](#)

Three-phase 80 kva ups (68 pages)

[UPS Toshiba 4200 FA CT User Manual](#)

Three-phase 15/25/30/50 kva ups (70 pages)

[UPS Toshiba 431A Installation And Operation Manual](#)

4300 series ancillary cabinets (78 pages)

[UPS Toshiba 4300 series Installation And Operation Manual](#)

4300 series three phase 30/50 kva ups (86 pages)

[UPS Toshiba 4200 series Operation Manual](#)

Uninterruptible power system three phase- 75/100kva ups (45 pages)

Summary of Contents for Toshiba 4400 Series

[Page 1](#) UNINTERRUPTIBLE POWER SYSTEM (UPS) 4400 SERIES INSTALLATION AND OPERATION MANUAL THREE PHASE - 15/20/25/30/50/80 KVA Part # 64527-006 January 2016 Manufactured in the USA © Copyright 2016 TOSHIBA International Corporation All rights reserved.

[Page 2](#) 4400 Series Installation and Operation Manual - 64527-006...

[Page 3](#) UNINTERRUPTIBLE POWER SYSTEM (UPS) 4400 SERIES INSTALLATION AND OPERATION MANUAL THREE PHASE - 15/20/25/30/50/80 KVA Part # 64527-006 January 2016 4400 Series

[Page 4: Qualified Personnel Only](#)

Usage includes atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, life-support equipment, all types of safety devices, etc. Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk.

[Page 5](#) Unless otherwise specified, the warranty period for the UPS or UPS part is 36 months from the shipment date (see Toshiba International Corporation bill of lading). Unless otherwise specified, the warranty period for a UPS battery or battery cabinet is 36 months from the shipment date (see Toshiba International Corporation bill of lading). JOB NUMBER MODEL NUMBER...

[Page 6](#)) Toshiba is a registered trademark of the Toshiba Corporation. All other product or trade references appearing in this manual are registered trademarks of their respective owners. Toshiba International Corporation shall not be liable for direct, indirect, special, or consequential damages resulting from the use of the information contained within this manual.

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[Page 11: Introduction](#)

• Safety Precautions • Installation Precautions Read this 4400 Series Operation Manual for important instructions on operating the UPS. This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review.

[Page 12: General Safety Instructions](#)

Ground Symbol indicates the location of the equipment grounding conductor. Electrical – Voltage & Shock Hazard Symbol indicates parts inside may cause electric shock. Explosion Hazard Symbol indicates parts may explode. 4400 Series Installation and Operation Manual – 64527-006...

[Page 13: Signal Words](#)

Be trained in the proper care and use of protective equipment such as safety shoes, rubber gloves, hard hats, safety glasses, face shields, flash clothing, etc., in accordance with established safety practices. • Be trained in rendering first aid. For further information on workplace safety visit www.osha.gov. 4400 Series Installation and Operation Manual – 64527-006...

[Page 14: Factory Authorized Personnel](#)

Factory Authorized Personnel Factory authorized personnel have been factory trained and certified to install, service, and repair the UPS. Contact the Toshiba Customer Support Center for assistance in locating the factory 4400-authorized personnel nearest you. Important Safety Instructions The following contains important instructions that should be followed during the

installation, operation, and maintenance of the 4400 Series UPS.

[Page 15: Unintended Usage](#)

(computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Toshiba products are neither intended nor warranted for use in equipment that, if a malfunction or failure occurs, may result in loss of human life or bodily injury (collectively referred to as "Unintended Usage").

[Page 16: Transporting](#)

UPS to move it. Always use a crane, forklift, or pallet jack for transporting and positioning the UPS. Pushing/pulling on the sides of the unit to move it may result in damage to the UPS. 4400 Series Installation and Operation Manual – 64527-006...

[Page 17: Unpacking](#)

Packing materials should be disposed by the appropriate means. • Immediately report any abnormalities to Toshiba Customer Support Center or an authorized representative. • Retain the packing rails for offloading the UPS from the shipping pallet, and for final UPS installation.

[Page 18](#) SLOWLY roll the unit down the ramp. 8. Save the loading rails for anchoring of the UPS. See Section 8.3. FIGURE 4.1 – UNSHIPPING 15-30KVA UPS 4400 Series Installation and Operation Manual – 64527-006...

[Page 19: Unpack The 50Kva Model Ups \(With Casters\)](#)

6. SLOWLY roll the unit down the ramp. 7. Save the loading rails for anchoring the UPS. See Section 8.3. FIGURE 4.2 – UNSHIPPING 50KVA UPS 4400 Series Installation and Operation Manual – 64527-006...

[Page 20: Unpack The 80Kva Model Ups](#)

4. Put down the UPS and remove the pallet. 5. Use a forklift or pallet jack to transport the UPS to its installation location. See Section 8.3. FIGURE 4.3 – UNSHIPPING 80KVA UPS 4400 Series Installation and Operation Manual – 64527-006...

[Page 21: Inspection/Storage](#)

During periods of non-use, the following guidelines are recommended for storage. These instructions apply to installations that have already been through initial Start-up with Toshiba Service. For installations that have not been through initial startup, arrange the power up with Toshiba Service. Storage Preparation 1) If the UPS has a battery backup, power up the UPS and allow it to operate with no load for 24 hours to fully charge the batteries.

[Page 22: Warning Labels](#)

Make sure all the warning labels are installed in the appropriate locations. Allow equipment to cool before TEXT AREA BACKGROUND COLOR: ANSI WHITE If a label is missing or illegible, contact Toshiba Customer Support Center or an TEXT AREA TEXT COLOR: ANSI BLACK servicing.

[Page 23](#) WLM 11-13 FULL D A N G E R D A N G E R THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL DC VOLTAGE THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL DC VOLTAGE-FR CORPORATION AND SHALL NOT BE REPRODUCED, USED, OR DISCLOSED...

[Page 24](#) JEE 10-14-13 WLM 11-13 WLM 11-13 OIL SOLVENTS and rating of fuse. THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL PLP-FRENCH ALL MATERIALS USED MUST ALL MATERIALS USED MUST PN 40830...

[Page 25](#) Their location in the 15-30kVA UPS cabinet is shown in Figures 5.2 – 5.3, for the 50kVA cabinet in Figures 5.4 – 5.5, and for the 80kVA cabinet in Figures 5.6 – 5.7. FIGURE 5.2 – 15-30KVA CABINET EXTERNAL FIGURE 5.3 – 15-30KVA CABINET INTERNAL WARNING LABEL LOCATIONS WARNING LABEL LOCATIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 26](#) FIGURE 5.4 – 50KVA CABINET FIGURE 5.5 – 50KVA CABINET INTERNAL WARNING

EXTERNAL WARNING LABEL LABEL LOCATIONS LOCATIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 27](#) FIGURE 5.6 – 80KVA CABINET FIGURE 5.7 – 80KVA CABINET INTERNAL EXTERNAL WARNING LABEL WARNING LABEL LOCATIONS LOCATIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 28: Storage/Operating Environment](#)

Less than or equal to 0.002 PPM Hydrochloric acid mist (HCl) Less than or equal to 0.1 mg/m
Operating Precautions Initial startup/commissioning of the UPS should be performed by factory authorized personnel. 4400 Series Installation and Operation Manual – 64527-006...

[Page 29](#) UPS. 4. If using the UPS to provide power to motors that require high starting current or with motors that require a long starting time, call Toshiba support for guidance in over sizing the UPS for lock rotor current.

[Page 30: Maintenance Precautions](#)

3. The maximum ambient operating temperature at 1.0 PF is 86 °F (30 °C) , and at 0.9 PF 104 °F (40 °C). 4. Only factory authorized personnel should service the UPS. Contact Toshiba for the nearest authorized service center.

[Page 31: Installation Safety](#)

UPS to move it. Always use a crane, forklift, or pallet jack for transporting and positioning the UPS. Pushing/pulling on the sides of the unit to move it may result in damage to the UPS. See Figure 4.1 Exterior Handling label. 4400 Series Installation and Operation Manual – 64527-006...

[Page 32](#) Electrical shock, injury or UPS failure may occur if non-authorized technicians attempt to modify or relocate the UPS. Please contact Toshiba Customer Support Center if you plan to move or make modifications to the UPS 4400 Series Installation and Operation Manual – 64527-006...

[Page 33](#) 3. Always ground the unit to reduce the potential for electrical shock and to help reduce electrical noise. 4. A separate ground cable should be run inside the conduit with the input power, output power, and control circuits. 4400 Series Installation and Operation Manual – 64527-006...

[Page 34: Installation](#)

Do not remove the fan covers until UPS start up. The fan covers should be removed by factory authorized personnel. Packing materials should be disposed by the appropriate means. • Immediately report any abnormalities to Toshiba Customer Support Center or an authorized representative. UPS Clearance Maintain the indicated clearance during installation.

[Page 35](#) Top 16 in (406 mm) Front 36 in (900 mm) Side Clearance Back Clearance 15-80kVA: 0 in (0 mm) 15-80kVA: 0 in (0 mm) FIGURE 8.2 CLEARANCE FOR SEISMIC INSTALLATIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 36: Ups Anchorage](#)

UPS Anchorage All 4400 Series models, except the 80 kVA, come with casters and leveling feet. The 80kVA model comes with Angle Bracket skids. The leveling feet allow the 15-50kVA models to be rolled into place, then the leveling feet extended to remove weight from the casters to ensure the UPS remains stationary.

[Page 37: 15-50Kva Anchorage - Standard](#)

Feet Leveling Feet 20.12 in (511 mm) 32.1 in (816 mm) FIGURE 8.4 – FOOTPRINT FOR 15-30 FIGURE 8.5 FOOTPRINT FOR 50 KVA USING KVA USING LOAD LEVELING FEET LOAD LEVELING FEET 4400 Series Installation and Operation Manual – 64527-006...

[Page 38: 80Kva Anchorage - Standard](#)

2.0 in (51 mm) Angle Bracket Skids FRONT 80kVA ANCHORAGE SPACING Back 4 x 0.703 in Dia. (17.9 mm) Front 27.1 in (689 mm) FIGURE 8.6 ANCHORAGE HOLE LOCATIONS – 80kVA UNITS

[Page 39: Power Cable Access](#)

*NOTE: Although the entire width of the top and bottom main conduit landing plates can be used for cable access, using the far right and left sides of the plates will make it easier to remove the UPS deadfront panel(s) for servicing and battery replacement. 4400 Series Installation and Operation Manual – 64527-006...

[Page 40](#) Left and Right Side Conduit Landing Plate Cable Access Conduit Cable Access Conduit Landing Plate Landing Plate NOTE: See Appendix A – Dimensional Drawings for Conduit Landing Plate dimensions FIGURE 8.7 – CONDUIT LANDING LOCATIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 41: Ups Parts Identification - 15-30Kva](#)

MCCB1 – Primary Input Circuit Breaker MCCB2 Secondary Input Circuit Breaker (on Dual Input) (Optional) Air filter PCB 9 – Display Control Board RemotEye Control Board – PCB-9B RS-232C Plug Dry Contact Plug 4400 Series Installation and Operation Manual – 64527-006...

[Page 42](#) Input Power Lugs TB3 – Terminals for Battery Cabinet Breaker Shunt Trip and Aux. Ground Bus Shunt Trip DC Power Supply Bottom Cable Access Port Side Cable Access Ports Top Cable Access Port 4400 Series Installation and Operation Manual – 64527-006...

[Page 43: Ups Parts Identification - 50Kva](#)

MCCB1 – Primary Input Circuit Breaker MCCB2 Secondary Input Circuit Breaker (Dual Input) (Optional) Air filter PCB 9 – Display Control Board RemotEye Control Board – PCB-9B RS-232 Plug Dry Contact Connector Plug 4400 Series Installation and Operation Manual – 64527-006...

[Page 44](#) TB3 – Terminals for Battery Cabinet Breaker Shunt Trip and Aux. Ground Bus Shunt Trip DC Power Supply 28 29 Bottom Cable Access Port Side Cable Access Ports Top Cable Access Port 4400 Series Installation and Operation Manual – 64527-006...

[Page 45: Ups Parts Identification - 80Kva](#)

MCCB1 – Primary Input Circuit Breaker MCCB2 Secondary Input Circuit Breaker (Dual Input) (Optional) Air filter PCB 9 – Display Control Board RemotEye Control Board – PCB-9B RS-232 Plug Dry Contact Plug 4400 Series Installation and Operation Manual – 64527-006...

[Page 46](#) Power Box Lugs TB3 – Terminals for Battery Cabinet Breaker Shunt Trip and Aux. Ground Bus Shunt Trip DC Power Supply Bottom Cable Access Port Side Cable Access Ports Top Cable Access Port 4400 Series Installation and Operation Manual – 64527-006...

[Page 47: Ups Wiring](#)

NOTICE Follow the torque criteria for tightening screws. Loose connections may cause fire due to heating. See Chapter 9 – UPS Wiring 4400 Series Installation and Operation Manual – 64527-006...

[Page 48: One-Line Diagram](#)

AC Input 3 Φ 3W 3 Φ 3W MCCB or 3 Φ 4W or 3 Φ 4W Input Output AC/DC DC/AC Contactor Contactor Converter Inverter DC/DC Converter Ground Wire FIGURE 9.2 – 4400 DUAL INPUT ONE-LINE DIAGRAM 4400 Series Installation and Operation Manual – 64527-006...

[Page 49](#) 4400 Series Installation and Operation Manual – 64527-006...

[Page 50](#) 3 Φ /4W DC/DC Converter 3 Φ /3W or 4W 208/120V 6. 4400 WITH DUAL INPUT TRANSFORMERS (15-50KVA) FIGURE 9.4 – ONE LINE DIAGRAMS OF POSSIBLE 4400 CONFIGURATIONS (NOT INCLUDING MATCHING EXTERNAL BATTERY OR AUXILIARY CABINETS) 4400 Series Installation and Operation Manual – 64527-006...

[Page 51: Multiple Battery Cabinets](#)

One battery string. (Consult factory if using more than one battery string.) Size neutral cable appropriate to actual load type: balanced, unbalanced, non-linear. The terminal blocks for the 15-30 kVA UPS are shown in Figure 9.4. 4400 Series Installation and Operation Manual –

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[Page 52](#) Use these values to determine the correct power cable size per the National Electrical Code (Ref. Table 310.16.) Lug tightening torque is the same as given in Tables 9.1 thru 9.3. 4400 Series Installation and Operation Manual – 64527-006...

[Page 53](#) TB 3 See Section 9.7 for Control Wiring Details. TB 1 – GROUND LUG EARTH GROUND BUS TB 4 FIGURE 9.5 – 15–30KVA POWER CABLING LUGS 4400 Series Installation and Operation Manual – 64527-006...

[Page 54](#) GROUND F - GROUND LUGS TB 3 TB 4 See Section 9.7 for Control Wiring Details. SECONDARY INPUT/ BYPASS TB 1 – BATTERY INPUT OUTPUT FIGURE 9.6 – 50KVA POWER CABLING LUGS 4400 Series Installation and Operation Manual – 64527-006...

[Page 55](#) TB 3 See Section 9.7 for Control Wiring Details. GROUND & EARTH GROUND BUS TB 1 – INPUT SECONDARY BATTERY OUTPUT INPUT/ BYPASS FIGURE 9.7 – 80KVA POWER CABLING LUGS 4400 Series Installation and Operation Manual – 64527-006...

[Page 56: External Breakers](#)

1/2 in bolts. Ground wire must have a crimp terminal with a corresponding diameter bolt hole. Connect the crimp terminal and ground bus together using the appropriate diameter bolt. 4400 Series Installation and Operation Manual – 64527-006...

[Page 57: Control Wiring](#)

LBABNL (Local Button Abnormal) TABLE 9.7 TB3 TERMINAL FASTENING TORQUE TB3 Terminals Wire Size Fastener Torque 1 thru 20 14 – 16 AWG 8 in-lb (0.9 N•m) 4400 Series Installation and Operation Manual – 64527-006...

[Page 58: Communication Interfaces](#)

If the computer is started/restarted within 10 minutes after the recovery from a power failure, the power supply may be reset while the computer is restarting. FIGURE 10.2 – R 4400 Series Installation and Operation Manual – 64527-006...

[Page 59: Rs-232C](#)

DB9 female connector located to on the inside of the UPS door just to the right of the Display PCB. For reference, the pinout of the connector is illustrated below. NOTE: Use the cross cable provided by Toshiba to avoid potential communications problems. RS-232C CONNECTOR PIN ASSIGNMENT...

[Page 60: Specifications](#)

Output Voltage Adjustment (%) $\pm 5\%$ via Touchscreen Voltage Transient Response $\pm 3\%$ @ 100% Step Load Change (%) @ 100% Step Load Change 1 - Requires adjustment of factory/service adjustable parameters. 4400 Series Installation and Operation Manual – 64527-006...

[Page 61](#) 5 x 250 cfm (Max) Operating Temperature (°F/°C) 32°F – 104°F (0 °C – 40 °C) Storage Temperature (°F/°C) 14°F – 122°F (-10 °C – 50 °C) Operating Humidity (%) 5 – 95% RH 4400 Series Installation and Operation Manual – 64527-006...

[Page 62](#) UPS must be at least the width of the front door of the UPS, or per NEC 110.34(A)(36 in./900 mm) and local requirements, whichever is greater. 2 - Approximate weights for dual-input units. Actual weights may vary depending on exact UPS configuration. 4400 Series Installation and Operation Manual – 64527-006...

[Page 63: Estimated Runtime On Internal Batteries - 15-30Kva](#)

11.2 Estimated Runtime on Internal Batteries – 15-30kVA Following are charts of the estimated runtime for the 4400 Series 15, 20, 25, and 30kVA on internal batteries at various loads at a 0.8 and 0.9 Power Factor. These runtimes are estimates based on new batteries operating at 76 °F. Actual runtimes may vary due to manufacturing variations, previous discharge profiles, battery age, and operating temperature.

[Page 64](#) Voltage Total Harmonic Distortion (Full Linear Load) (%) Output Voltage Adjustment (%) $\pm 5\%$ via Touchscreen Voltage Transient Response $\pm 3\%$ @ 100% Step Load Change (%) @ 100% Step Load Change 4400 Series Installation and Operation Manual – 64527-006...

[Page 65](#) 65 Adc 87 Adc 109 Adc 130 Adc Battery Capacity Required at 15 kW 20 kW 25 kW 30 kW Full Load (kW) Battery Test (Interval per hr) Pre-alarm Level (Vdc) 259 Vdc 4400 Series Installation and Operation Manual – 64527-006...

[Page 66](#) Touchscreen and LED Monitoring Operator Interface (Front Panel) Touchscreen and LED Dry Contacts Included RS-232 Interface Optional – Intelligent Monitoring Yes – RemoteEye 4 Optional – Remote Status Alarm Panel (RSAP) Additional Features 4400 Series Installation and Operation Manual – 64527-006...

[Page 67: 15-30Kva Efficiency Vs. Load \(Typical, No Transformer\)](#)

25kVA + 2 Xfmr. 82.8% 84.9% 85.0% 85.0% 30kVA 88.8% 90.9% 91.0% 91.0% 30kVA + 1 Xfmr. 85.8% 87.9% 88.0% 88.0% 30kVA + 2 Xfmr. 82.8% 84.9% 85.0% 85.0% * Subject to change without notice. 4400 Series Installation and Operation Manual – 64527-006...

[Page 68: 15-30Kva Thermal Loss Vs. Load \(Typical\)](#)

Cold Start (0-100% load) (sec) 25 sec. from cold start BYPASS 208/120 V, 3P/4W +GND Voltage (V) Frequency (Hz) 50/60 Hz $\pm 5\%$ Bypass Overload @ 125% Load 10 min. @ 125% Load 4400 Series Installation and Operation Manual – 64527-006...

[Page 69](#) See: Section 11.7 - Estimated Runtime on Internal Batteries Type / Rating (Ah) Yuasa NPX-150RFR, 12 V, 40 Ah Number of Batteries Replaceable Batteries Yes – Field Replaceable 1 - Requires adjustment of factory/service adjustable parameters. 4400 Series Installation and Operation Manual – 64527-006...

[Page 70](#) UPS must be at least the width of the front door of the UPS, or per NEC 110.34(A) (36 in./900 mm) and local requirements, whichever is greater. 3 - Approximate weights for dual-input units. Actual weights may vary depending on exact UPS configuration. 4400 Series Installation and Operation Manual – 64527-006...

[Page 71: Estimated Runtime On Internal Batteries - 50Kva](#)

11.7 Estimated Runtime on Internal Batteries – 50kVA Below are charts of the estimated runtime for the 4400 Series 50kVA on internal batteries at various loads at a 0.9 and 0.8 Power Factor. The 80kVA UPS is not available with internal batteries. An external battery cabinet (or equivalent) is required to provide backup power.

[Page 72: 50-80Kva Specifications - W/ External Battery Backup](#)

Bypass Overload @ 150% Load 2 min. @ 150% Load Bypass Overload @ 1000% Load 1 cycle @ 1000% Load Automatic Retransfer (Max load % for Retransfer) OUTPUT 1 - Requires adjustment of factory/service adjustable parameters. 4400 Series Installation and Operation Manual – 64527-006...

[Page 73](#) Surge Protection Auto transfer to bypass, retransfer to inverter BATTERY GENERAL, EXTERNAL Type VRLA Batteries Voltage – Nominal (Vdc) 288 Vdc Voltage – Minimum (Vdc) 230.4 Vdc Voltage -Float (Vdc) 324 Vdc 4400 Series Installation and Operation Manual – 64527-006...

[Page 74](#) NEMA 1 Construction Welded Steel Chassis Color Powder Coat, Dupont O'Brien Black Emergency Power Off (EPO) Control Panel Touchscreen and LED MONITORING Operator Interface (Front Panel) Touchscreen and LED Dry Contacts Included 4400 Series Installation and Operation Manual – 64527-006...

[Page 75: 50-80Kva Efficiency Vs. Load \(Typical, No Transformer\)](#)

15,703 20,938 50kVA + 2 Xfmr. 4095 7991 13,665 20,322 27,096 80kVA 5459 7770 12,312 18,223 24,297 80kVA + 1 Xfmr 6824 10,190 16,925 25,125 33,501 * Subject to change without notice. 4400 Series Installation and Operation Manual – 64527-006...

[Page 76: Operator Interface](#)

The display may not respond if the button press is too short. Touch Screen Display and Control Panel Touch Screen Display Indicators Display Reset On-Line/Fault Button Warning AC Input EPO - Emergency Power Off Switch FIGURE 12.1 - UPS DISPLAY PANEL 4400 Series Installation and Operation Manual - 64527-006...

[Page 77: Operator Controls - Light Emitting Diodes \(Led\)](#)

Green - Flashing Input or Bypass voltage is over specified range. Green - OFF Input or Bypass voltage is under specified range. NOTE: On-Line/Fault LEDs - Appear Amber if Green and Red flash concurrently. 4400 Series Installation and Operation Manual - 64527-006...

[Page 78: Operator Controls](#)

SYNC Fuse Fuse AC Input AC Output 3Φ 4W 3Φ 4W MCCB Input Output AC/DC DC/AC Contactor Contactor TRIPPED Converter Inverter DC/DC Converter Ground Wire FIGURE 12-2 - EFFECT OF EPO ACTIVATION 4400 Series Installation and Operation Manual - 64527-006...

[Page 79: Touch Screen Display](#)

12.13) Press Run: UPS switches to On-Line mode, label changes to STOP. Press STOP: UPS switches to Bypass mode, label changes to RUN. FIGURE 12.3 - TOUCHSCREEN DISPLAY COMPONENTS (INITIAL MAIN DISPLAY) 4400 Series Installation and Operation Manual - 64527-006...

[Page 80: Header Bar](#)

Warning - Displays last warning sensed by UPS. Multiple frequent warnings of the same type may induce a fault condition. UPS Mode - Current state of UPS. FIGURE 12.5 - FOOTER BAR DISPLAY COMPONENTS 4400 Series Installation and Operation Manual - 64527-006...

[Page 81: Touchscreen Data And Controls](#)

Security Level (USR, ADM) Warning Buzzer Switch/Status (press for ON, press again for OFF) Touchscreen Enable/Disable Quick View Selector (press for Quick View, press again for Normal View) FIGURE 12.6 - TOUCHSCREEN CONTROLS 4400 Series Installation and Operation Manual - 64527-006...

[Page 82: Quick Access Toolbar](#)

OFF disables all touchscreen areas except the TOUCH button. Quick View On/Off Selector - Press to toggle between Normal view and Quick view. Quick view displays a simultaneous summary of the Input/Output/Bypass/DC Voltages and Currents See Section 12.12. 4400 Series Installation and Operation Manual - 64527-006...

[Page 83: 4400 Menu Tree](#)

(Tab Buttons) (TAB Selection Buttons) MAIN STOP MONITOR INPUT CTL&CFG HIST OUTPUT DSP&EX BATT SETUP INPUT OUTPUT BATT CTL&CFG HIST DSP&EX RECORD FAULT/WARNING OPERATION FAULT HELP WARNING STATUS FIGURE 12.7 - MENU TREE 4400 Series Installation and Operation Manual - 64527-006...

[Page 84: Toolbar: Security](#)

The touchscreen can be turned OFF (locked) by pressing the TOUCH ON/OFF button. With TOUCH OFF, only the TOUCH button is active, the rest of the display will not respond to touch. 4400 Series Installation and Operation Manual - 64527-006...

[Page 85: Toolbar: Quick View On/Off](#)

Amps (A), or as a % of rated current (%). The highlighted icon indicates the current display mode. Displays DC Bus voltage, Battery voltage, and Battery discharge current. FIGURE 12-9 QUICK VIEW DISPLAY 4400 Series Installation and Operation Manual - 64527-006...

[Page 86: Tab: Main - Run/Stop](#)

Press Run: UPS switches to On-Line mode, label changes to STOP. Press STOP: UPS switches to Bypass mode, label changes to RUN. Information Bar - Randomly displays status, helpful hints, acronym definitions every two seconds. FIGURE 12.10 - MAIN TAB COMPONENTS 4400 Series

[Page 87](#) 4. To put the UPS back into Bypass mode, press the STOP button. The hourglass will display as in step 2, then the 2013012345 button will display the RUN icon. 4400F3F300FAB 30KVA FIGURE 12.11 – RUN/STOP BUTTON OPERATION 4400 Series Installation and Operation Manual – 64527-006...

[Page 88: Tab: Monitor](#)

Flow Indicator illustration on the following page. The figure below illustrates the data displayed when the corresponding button is pressed. MONITOR TAB 4400F Series UPS 4400F3F050 FIGURE 12-12 MONITOR TAB DISPLAY OPTIONS 4400 Series Installation and Operation Manual – 64527-006...

[Page 89](#) The mimic display indicates the power flow through, or around, the UPS. There are four possible modes the UPS operates in: Off, Bypass, On-Line, and Backup. The figure below illustrates the display for each of these modes. FIGURE 12-13 MIMIC DISPLAY CURRENT FLOW INDICATOR 4400 Series Installation and Operation Manual – 64527-006...

[Page 90: Tab: Setup](#)

UPS Operation time, Number of Faults, Backup, Operations. Display and Ext Comm. – Disp. S/W version, buzzer status, display calibration values. RemotEye I/P address, data and network status. FIGURE 12.14 – PARAMETER CATEGORIES 4400 Series Installation and Operation Manual – 64527-006...

[Page 91](#) Write information (Enter) (Pressing Quit without first pressing Write will cause the newly entered data to be lost.) Quit Exit keypad. Example 3 – Binary choice (On/Off, Enable/Disable, Contact A/Contact B) 4400 Series Installation and Operation Manual – 64527-006...

[Page 92: Setup: Calibrating The Touchscreen](#)

After the touchscreen has been recalibrated the display will indicate that the calibration routine has passed. Press Quit to return to the main display. See Fig. 12-15 C. FIGURE 12-15 TOUCHSCREEN DISPLAY CALIBRATION 4400 Series Installation and Operation Manual – 64527-006...

[Page 93: Tab: Record](#)

Pressing will cause the records to auto-page every 2 seconds. The button will alternately blink in black-on-white/white-on-black while in Auto-Page mode. Press the button again to stop Auto-Page. FIGURE 12.16 – RECORDS 4400 Series Installation and Operation Manual – 64527-006...

[Page 94: Tab: Help](#)

Auto-Page mode. Press the button again to exit Auto-Page mode. FIGURE 12.17 – HELP CATEGORIES 12.19 4400 Parameter Definitions See Appendix A for the Command Parameter definitions and functions. 4400 Series Installation and Operation Manual – 64527-006...

[Page 95: System Fault Messages](#)

Toshiba Authorized service representative. INVCER OUTPUT CIRCUIT ABNORMAL Contact nearest Toshiba Authorized service representative. INVERR UPS CONTROL CIRCUIT Inverter voltage is out of spec. Contact nearest ERROR Toshiba Authorized service representative. 4400 Series Installation and Operation Manual – 64527-006...

[Page 96: System Warning Messages](#)

When a Warning condition exists, the amber LED on the UPS display panel will flash for the duration of the Warning condition. TABLE 12.6 – SYSTEM WARNING MESSAGES System Warning Messages Display Meaning Action ASYN Output and Input do not match Contact nearest Toshiba Authorized service representative 4400 Series Installation and Operation Manual – 64527-006...

[Page 97](#) BATTERY VOLTAGE Supplied battery voltage is incorrect or is not connected. Check if battery cabinet circuit breaker is open, the battery polarity is correct, or the battery Voltage is correct.. 4400 Series Installation and Operation Manual – 64527-006...

[Page 98: System Mode Messages](#)

No action needed. BTDIS Battery Test Disabled No action needed. BTING Battery Test in Progress Bypass mode - Power is sup- No action needed. plied by UPS input. BYPEN Bypass Enable No action needed. 4400 Series Installation and Operation Manual - 64527-006...

[Page 99](#) Input and output are synchronized. TIMEDSD UPS is counting down prior to Immediately shut down the load equipment in an shutdown. orderly fashion and then press the STOP key. A warning has occurred. See Warning record. 4400 Series Installation and Operation Manual - 64527-006...

[Page 100: Ups Operation](#)

HH is the two digit hour followed by a colon (:) MM is the two digit month. AM/PM is before or after noon. Press Write to set the time. Press Quit to exit System Time setup. 4400 Series Installation and Operation Manual - 64527-006...

[Page 101: Start The Ups](#)

After shutting down the UPS by pressing the EPO switch, restore system power as follows: Ensure the cause of the EPO action has been resolved. Reset the UPS main circuit breaker MCCB, located behind the UPS front door, by first switching the breaker OFF, then ON. 4400 Series Installation and Operation Manual - 64527-006...

[Page 102: Battery Backup Time And Discharge Process](#)

288 Vdc 288 Vdc Alarm voltage (V 246 Vdc 246 Vdc Shutdown voltage (V 230 Vdc 230 Vdc CURRENT VOLTAGE Shutdown Voltage TIME 100% Battery Capacity FIGURE 13.1 - TYPICAL BATTERY DISCHARGE CURVE 4400 Series Installation and Operation Manual - 64527-006...

[Page 103: Battery Low Voltage Tolerances](#)

CHARGING BATTERY CURRENT CHARGE CHARGE VOLTAGE (11.5A) = 324 V = 230 V DISCHARGE SHUT-OFF POINT FULLY CHARGED TIME PERIOD 1 PERIOD 2 PERIOD 3 FIGURE 13.2 - TYPICAL BATTERY CHARGING CURVE 4400 Series Installation and Operation Manual - 64527-006...

[Page 104: Audible Alarm Functions](#)

The buzzer can be disabled permanently by selecting the Settings tab then setting the parameter Buzzer Disable to Disable. This will disable the alarm so that no alarm sounds for any Fault or Warning condition. 4400 Series Installation and Operation Manual - 64527-006...

[Page 105: Options](#)

BACnet IP/MSTP (Internet Protocol /Master Slave Token Passing) 14.3 Remote System Monitoring - Remote Radar A network of Toshiba UPS's equipped with the RemotEye network cards can be viewed and monitored using the optional RemotRadar application software on any MS-Windows machine. •...

[Page 106: External Layouts/Dimensions/Shipping Weights](#)

25 kVA 25 kVA w/ Int. Batt. 1000 1155 25 kVA w/ 2 Xfmrs 1120 1275 30 kVA 30 kVA w/ Int. Batt. 1000 1155 30 kVA w/ 2 Xfmrs 1115 1270 4400 Series Installation and Operation Manual - 64527-006...

[Page 107](#) 80 kVA 1500 1655 80 kVA w/ 1 Xfmr Subject to change without notice. Shipping weights include 120 lb. (54.4 kg) for shipping pallet, and 35 lb. (15.9 kg) for shipping rails. 4400 Series Installation and Operation Manual - 64527-006...

[Page 108](#) 4400 Series Installation and Operation Manual - 64527-006...

[Page 109: Appendix A - Dimensional Drawings](#)

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[Page 112](#) 4400 Series Installation and Operation Manual – 64527-006...

[Page 113: Appendix B - Command Parameter Definitions Table](#)

Appendix B – Command Parameter Definitions Table 4400 Series Installation and Operation Manual – 64527-006...

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[Page 120](#) This Page Intentionally Left Blank 4400 Series Installation and Operation Manual – 64527-006...

[Page 121: Appendix C - Installation Planning Guide](#)

Maximum battery discharge current based on lowest permissible discharge voltage of 1.6 VPC. 9. DC Circuit Breaker size based on breakers external to Toshiba-supplied Battery Cabinet(s) or UPS(s). (NOTE: Toshiba-supplied Battery Cabinets come equipped with internal circuit breakers sized to meet specific operating conditions) 10.

[Page 122](#) (1) x 2 AWG / (1) x 2 AWG 200 A (1) x 4/0 / (1) 250 kcmil 300 A (1) x 500 kcmil / (2) 500 kcmil 4400 Series Installation and Operation Manual – 64527-006 Rev. 1.4 Page 1 of 2 4400-IPG-208/120v-208/120V...

[Page 123: Appendix D - Input/Output Cabling Guide](#)

Appendix D – Input/Output Cabling Guide The 4400 Series UPS can be configured with a variety of Input and Output voltage transformers to accommodate different Input/Output voltage combinations. Table D.1 – UPS Power Lug Cable Capacity and Torque Specifications Table D.2 –...

[Page 124: Output/Bypass Cable Size For 3-Phase/4-Wire + G](#)

TABLE D4 – RECOMMENDED MINIMUM INPUT CABLE SIZE FOR 3-PHASE/3-WIRE + G Vin, Vout 15kVA 20kVA 25kVA 30kVA 50kVA 80kVA 3P/3W+G (AWG) (AWG) (AWG) (AWG) (AWG) (AWG) 208V Phase 350 kcmil 220V Phase 250 kcmil 4400 Series Installation and Operation Manual – 64527-006...

[Page 125: Cable Size For 3-Phase/3-Wire + G](#)

30 kVA 50 kVA 80 kVA 208/120V 42 (46) 55 (60) 69 (74) 83 (88) 139 (148) 222 (238) 220/127V 41 (45) 54 (59) 68 (72) 81 (86) 136 (144) 217 (232) 4400 Series Installation and Operation Manual – 64527-006...

[Page 126: Output Transformer Current For Given Output Voltage](#)

TABLE D.8 – OUTPUT TRANSFORMER CURRENT AT GIVEN OUTPUT VOLTAGE Output Output Current at Full Load (A) Voltage 15 kVA 20 kVA 25 kVA 30 kVA 50 kVA 80 kVA 208/120V 220/127V 230/133V 240/139V 380/220V 400/227V 415/240V 480/277V 600/347V 4400 Series Installation and Operation Manual – 64527-006...

[Page 128](#) SOCIAL INFRASTRUCTURE SYSTEMS GROUP POWER ELECTRONICS DIVISION - UPS 13131 West Little York Road, Houston, Texas 77041 US (855) 803-7087 Fax. (713) 896-5212 Canada (800) 872-2192 www.toshiba.com/tic/industrial/uninterruptible-power-systems Printed

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