TOSHIBA

Toshiba HV6AS Instruction Manual

Vacuum circuit breakers – fixed type 4.8 & 7.2kv voltage classes

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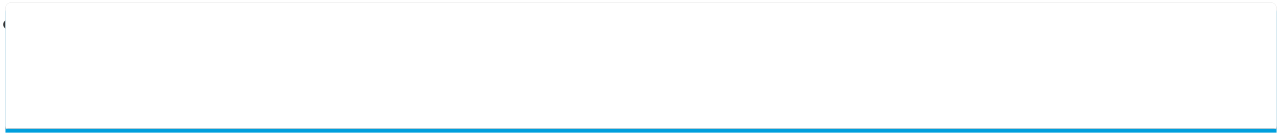

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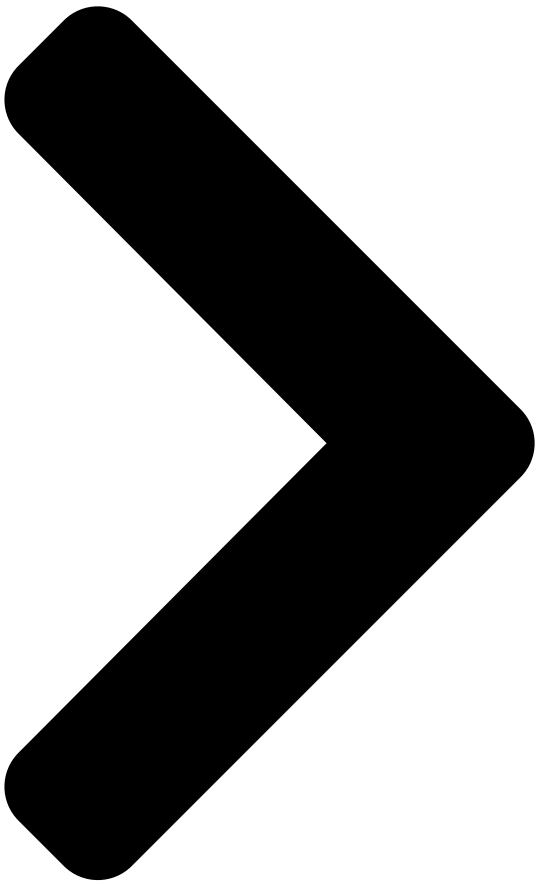

INSTRUCTION MANUAL

INSTALLATION - OPERATION - MAINTENANCE

HV6AS Vacuum Circuit Breakers – Fixed Type
4.8 & 7.2kV Voltage Classes

APPLICABLE MODEL NUMBERS:
(Manual Operation Types)
HV6AS-U
HV6AS-L
(Motor Operation Types)
HV6AS-MU

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Related Manuals for Toshiba HV6AS

Power Tool Toshiba KK-1600 Service Manual

(24 pages)

Summary of Contents for Toshiba HV6AS

Page 1: Instruction Manual

INSTRUCTION MANUAL INSTALLATION - OPERATION - MAINTENANCE HV6AS Vacuum Circuit Breakers – Fixed Type 4.8 & 7.2kV Voltage Classes APPLICABLE MODEL NUMBERS: (Manual Operation Types) HV6AS-U HV6AS-L (Motor Operation Types) HV6AS-MU HV6AS-ML Issued: 2/2000 Supercedes First Issue Dated 2/99. Document:...

Page 3 INSTRUCTION MANUAL For the Installation, Operation and Maintenance of HV6AS Vacuum Circuit Breakers – Fixed Type 4.8 & 7.2kV Voltage Classes Never attempt to install, operate, maintain or dispose of this equipment until you have first read and understood all of the relevent product warnings and WARNING user directions that are contained in this Instruction Manual.

Page 5 SAFETY IMPORTANT MESSAGES Read this manual and follow its instructions. Signal words such as DANGER, WARNING and CAUTION will be followed by important safety information that must be carefully reviewed. Indicates a situation which will result in death, serious injury, and severe DANGER property damage if you do not follow instructions.

Page 6 Be trained in rendering first aid. SAFETY CODES Toshiba HV6AS vacuum circuit breakers are designed and built in accordance with C 4603-1990 and JEC-2300-1985. Installations must comply with all applicable state and local codes, adhere to all applicable National Electric Code (NFPA 70) standards and instructions provided in this manual.

Page 7 SAFETY HAZARDOUS VOLTAGE will cause severe injury, death, fire, explosion and DANGER property damage. • Turn off and lock out Primary and Control Circuit Power before servicing. • Keep all panels and covers securely in place. • Never Defeat, Modify, or Bypass any Safety Interlocks •...

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TABLE OF CONTENTS Inspection During Storage...32 SPECIFICATIONS...33 Table 3. Ratings – Manual Operation HV6AS-U and HV6AS-L Types ...33 Table 4. Ratings – Motor Operation HV6AS-MU and HV6AS-MU Types ...33 WARRANTY AND LIMITATION OF LIABILITY...34 Page 5...

Page 10: Introduction

Page 6 INTRODUCTION It is the intent of this manual to provide a guide for safely installing, operating and maintaining Toshiba vacuum circuit breakers. This manual consists of a section of general safety instructions and is marked throughout with warning symbols. Read this manual thoroughly before installation, operation and maintenance of this equipment.

Page 11: General Description

GENERAL DESCRIPTION The Toshiba HV6AS vacuum circuit breakers described in this manual are suitable for use on systems of 4.8kV and 7.2kV voltage classes which require interrupting

ratings of 16kA and 14kA respectively and a continuous current rating of 630A. The circuit breakers are intended for use in limited applications requiring small physical size and low maintenance.

Page 12: Indicators And Controls

Page 8 SAFETY DEVICES Safety interlocks and guards are provided as an integral part of the equipment design. devices are provided for safety to the operator. Never defeat, modify or DANGER bypass any safety devices, interlocks or operating mechanism. This would make the equipment unsafe.

Page 13: Receiving, Inspection And Handling

CAUTION upside down. This may cause damage. 4) File a claim with the carrier for any damaged or missing items and immediately notify the nearest Toshiba representative. Do not install or energize equipment that has been WARNING damaged. Damaged equipment can fail during operation, resulting in fire and explosion.

Page 14: Handling And Moving

Page 10 HANDLING AND MOVING When handling and moving the circuit breaker, the techniques shown in this section may be used. Care and caution should be used when handling the circuit breaker units to avoid damage to the equipment and personal injury. Always keep the circuit breaker in a generally upright position.

Page 15: Installation

Using this equipment in other than usual service conditions can result in equipment failure. Toshiba HV6AS circuit breakers are intended for use in usual service conditions as defined in IEEE C37.20.2. The temperature of the cooling air (ambient air temperature) surrounding the breaker should be between the limits of -5°C...

Page 16: Mounting The Circuit Breaker To Apanel

11 ga. (.12 in.) thick steel. If the breaker must be mounted to a panel of different thickness, contact Toshiba. Panel cutout dimensions for the circuit breakers are given in Fig. 12. One cutout size is used for all breaker types.

Page 17 INSTALLATION 8.03 0.25 Dimensions in Inches Fig. 12 Panel Cutout Dimensions 0.343 DIA 4 PLACES 10.71 Page 13 0.25 0.38 RADIUS 4 PLACES 0.25 0.25...

Page 18: Mounting Directly To A Shelf

Page 14 MOUNTING DIRECTLY TO A SHELF The shelf should be flat and level within ± 0.5 mm (± 0.02 in.). If there are any noticeable gaps between the breaker and the shelf, fill them in using flat washers as spacers. Check to make sure the breaker On-Off indicator shows OFF (green), then mount it by following the steps below:...

Page 19: Main Circuit Cable Connections

INSTALLATION MAIN CIRCUIT CABLE CONNECTIONS Cables which connect to the circuit breaker should be routed to avoid interference with sharp edges and moving parts. Minimum bending radius for the type of cable used should be observed. Power cables should be braced and/or laced to withstand short-circuit forces wherever such cables are unsupported.

Page 20: Ground Connections

Page 16 GROUND CONNECTIONS The circuit breaker must be grounded in accordance with the requirements of the National Electrical Code, Article 250 or applicable local standards. Proper grounding WARNING connections must be made to the circuit breaker before incoming power is applied. It is very important that the circuit breaker and its enclosure be adequately grounded to protect the operator from injury in the event of short circuits...

Page 21: Control Circuit Connections

INSTALLATION CONTROL CIRCUIT CONNECTIONS Control circuit wiring is connected to the terminal block on the top of the operating mechanism (Fig. 20). Connect control wires in accordance with the appropriate wiring diagram shown in Fig. 28 through Fig. 31 in the OPERATION section of this manual.

Page 22: Pre-Energization Check

Page 18 GENERAL BEFORE ENERGIZING BREAKER for the first time, follow the procedure below to verify that the equipment is properly installed and functional. Hazardous Voltage. Turn off DANGER and lock out all primary and control circuit power sources prior to performing this pre-energization check.

Page 23: Operation

OPERATION MANUAL OPERATION Powerful springs. Do not WARNING place your hands or any part of your body inside the circuit breaker while the indicators show CHARGED (yellow) or ON (red). To avoid damaging the CAUTION mechanism, do not close the circuit breaker when the On-Off Indicator shows ON (red).

Page 24: Electrical Operation

Page 20 MANUAL CLOSING (Manual Spring-Operated U and L Types): 1. Check to make sure that the On-Off indicator shows OFF (green). 2. Turn the closing handle clockwise. The breaker will close (On-Off indicator changes after handle approximately 75°. NOTE If the handle is turned in small increments, the closing spring will store the energy from the handle...

Page 25 OPERATION Circuit Breaker Open Control Power Applied Motor Begins Operating Closing Springs Begin Charging Closing Springs Charged Motor Stops Closing Signal Given Motor Begins Operating Circuit Breaker Closes Auxiliary Relay Closes Anti-Pumping Circuit Completed Opening Signal Given Trip Coil Energized Circuit Breaker Opens Fig.

Page 26 Page 22 125 VDC 120 VAC SUPPLY SUPPLY Terminal Layout (As Viewed From Front of Circuit Breaker) Fig. 28 125 VDC Control Circuit Schematic for U Type Circuit Breaker Fig. 29 125 VDC Control Circuit Schematic for L Type Circuit Breaker 125 VDC 120 VAC SUPPLY...

Page 27 OPERATION Fig. 30 125 VDC Control Circuit Schematic for MU Type Circuit Breaker Fig. 31 125 VDC Control Circuit Schematic for ML Type Circuit Breaker 125 VDC 120 VAC SUPPLY SUPPLY LS3 LS3 Components Inside Dashed Box Located On Control Circuit Board PR3 NT3 Terminal Layout (As Viewed From Front of Circuit Breaker)

Page 28: Undervoltage Trip

Page 24 OPERATION UNDERVOLTAGE TRIP All HV6AS fixed mounted circuit breakers are furnished with an undervoltage trip device. The undervoltage trip device operates to trip the circuit breaker OFF unless 120VAC control power is present at the terminals of relay UV.

Page 29: Maintenance

MAINTENANCE MAINTENANCE PROGRAM In order to ensure continued reliable and safe operation of the equipment, a program of periodic maintenance must be established. Operating and environmental conditions will usually dictate the frequency of inspection required. NFPA Publication 70B Equipment Maintenance" may be used as a guide for setting up the maintenance program.

Page 30: Inspection And Maintenance Types

Page 26 RECOMMENDED INSPECTION AND MAINTENANCE TYPES NOTE: Refer to the SAFETY section of this manual for important information. A. Acceptance Inspection This inspection confirms that the circuit breaker unit is complete, correct as specified, undamaged from procedure for this inspection is outlined in the RECEIVING, INSPECTION AND HANDLING section of this manual.

Page 31: Table 2. Check Points For Periodic Inspection

Check the cause and repair. Tighten connections to circuit breaker. See Table 1 for tightening torques. See Table 1 for tightening torques. Wipe with a clean, dry cloth. Wipe with a clean, dry cloth. If damaged, contact Toshiba.

Page 32 Page 28 Table 2. Check Points for Inspection (cont’d) Check Point Check Item Auxiliary Terminals loose Switch or disconnected Case/contacts Control Smooth Circuits movement of motor charging mechanism Terminals loose or disconnected Insulation Meaure main Resistance circuit to ground Measure- ment Meaure between main...

Page 33: Vacuum Check

Therefore, interrupter integrity is checked by performing a high potential test across the open gap of the interrupter. TEST EQUIPMENT: Toshiba offers a compact vacuum checker (Type CI35-1D) which enables a quick and easy check vacuum interrupter internal Alternatively, any commercially available AC high...

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Page 30 CRITERIA: 1. If a current flow above 5 milliamperes is observed or if breakdown occurs, one or more of the interrupters has insufficient vacuum and must be replaced. Exception: If the current exceeds 5 milliamperes the first time the voltage is brought up, reduce the voltage to zero and increase it again.

Page 35: Disposal

DISPOSAL Page 31 DISPOSAL Contact your state environmental agency for details on disposal of electrical components and packaging in your particular area.

Page 36: Storage

STORAGE STORAGE If the circuit breaker is to be stored for any length of time prior to installation, the following precautions should be taken: 1) The original packing should be restored, if possible. 2) Do not subject the equipment to moisture or sun rays.

Page 37: Specifications

Rated Control Voltage (Opening) Rated Control Voltage (Undervoltage Trip) Operating Duty Auxiliary Contacts Weight Table 4 Circuit Breaker Ratings – Motor Stored Energy Operation HV6AS-MU and HV6AS-ML Types Rated Voltage Rated Low Frequency Withstand Voltage Impulse Withstand Voltage Rated Continuous Current...

Page 38: Warranty And Limitation Of Liability

EQUIPMENT AND PARTS FURNISHED PURSUANT TO THE FOREGOING WARRANTY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY. The total liability of the Company, Toshiba Corporation and their suppliers and subcontractors for any loss, damage or claim, whether in contact, tort (including negligence and liability without fault), or otherwise, arising out of,...

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TOSHIBA TOSHIBA INTERNATIONAL CORPORATION 13131 W. Little York Road, Houston, TX 77041, U.S.A. Tel: (713) 466-0277 Fax: (713) 466-8773...

This manual is also suitable for:

Hv6as-uHv6as-lHv6as-muHv6as-ml