

TOSHIBA

Toshiba Adjustable Speed Drive H3 Operation Manual

Variable torque adjustable speed drive

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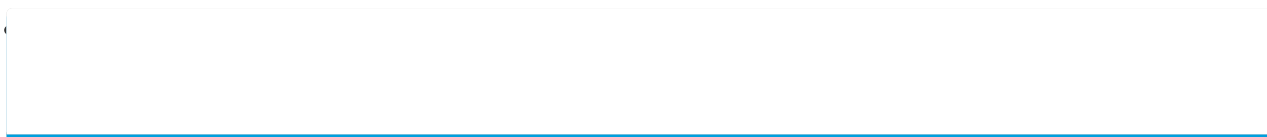
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March, 2008
Part #46687-004

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Related Manuals for Toshiba Adjustable Speed Drive H3

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[HCV-1KAU Vacuum Contactor, 1.5kV - 720A Instruction Manual](#)

Vacuum contactor, 1.5kv - 600a & 720a (30 pages)

[Accessories Toshiba E6580772 Instruction Manual](#)

Optional add-on cassette (26 pages)

[Accessories Toshiba TWBM001C-NB User Manual](#)

Environment sensing logger (11 pages)

[Accessories Toshiba RS-485 Operation Manual](#)

Option unit for tosvert vf-s7 (10 pages)

[Accessories Toshiba CANVIO User Manual](#)

For smartphone (960 pages)

[Accessories Toshiba TPS856 Owner's Manual](#)

Ultra-compact surface-mount photo-ic for illuminance sensors (14 pages)

[Accessories Toshiba TCB-SIR41UM-E Installation Manual](#)

Occupancy sensor (2 pages)

[Accessories Toshiba TCB-SIR41UM-E Operation Manual](#)

Occupancy sensor (4 pages)

[Accessories Toshiba TCB-SIR41UYP-E Installation Manual](#)

Occupancy sensor kit (2 pages)

Summary of Contents for Toshiba Adjustable Speed Drive H3

[Page 1](#) March, 2008 Part #46687-004...

[Page 3](#) AC ADJUSTABLE SPEED DRIVE Please complete the Extended Warranty Card supplied with this inverter and return it by prepaid mail to Toshiba. This activates the extended warranty. If additional information or technical assistance is required, call Toshiba's marketing department toll free at (800) 231-1412 or write to: Toshiba International Corporation, 13131 W.

[Page 4: Introduction](#)

Toshiba's complete line of motors, adjustable speed drives, switchgear, instrumentation, uninterruptable power supplies, PLCs, and motor control products, please call toll free (800) 231-1412 or write to our plant at: Toshiba International Corporation, 13131 W. Little York Road, Houston, TX 77041-9990.

[Page 5: General Safety Instructions](#)

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. TOSHIBA...

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Selection of Main Circuit Wiring Equipment and Standard Cable Sizes ...4-3 Grounding ... 4-5
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Pattern Run Control Parameters ...8-16 Feedback Parameters ... 8-22 Communication Setting Parameters ...8-24 Industrial Application Parameters (Pump) ...8-26 Industrial Application Parameters (Fan) ...8-26 Industrial Application Parameters (Conveyor) ... 8-26 Industrial Application Parameters (Hoist) ...8-26 Industrial Application Parameters (Textiles) ... 8-26 TOSHIBA CONTENTS (cont'd) PAGE...

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[Page 9: Inspection/Storage/Disposal](#)

Avoid storage in locations with extreme temperatures, high humidity, dust, or metal particles. Disposal Please contact your state environmental agency for details on disposal of electrical components and packaging in your particular area. Never dispose of electrical components via incineration. TOSHIBA 1 - 1...

[Page 10: Installation And Operation](#)

If the factory provided enclosure is removed from the drive, then it must be provided with an alternate enclosure before operating. The alternate enclosure should be a minimum of NEMA 1. TOSHIBA CAUTION 2 - 1...

[Page 11: Operating Safety Precautions](#)

Do not apply commercial power to the output terminals T1 (U), T2 (V), or T3 (W) even if the inverter source power is off. Disconnect the inverter from the motor before megging or applying bypass voltage to the motor. TOSHIBA CAUTION CAUTION not touch any internal part with DO NOT OPERATE THIS UNIT WITH ITS CABINET DOOR OPEN.

[Page 12: Confirmation Of Wiring](#)

Interface problems can occur when this drive is used in conjunction with some types of process controllers. Signal isolation may be required to prevent controller and/or drive malfunction (contact Toshiba or the process controller manufacturer for additional information about compatibility and signal isolation).

[Page 13: Start-Up And Test](#)

Periodically check the operating drive for cleanliness. Do not use liquid cleaning agents. Keep the heatsink free of dust and debris. Periodically check electrical connections for tightness (with power off, locked out, and with charge LED out (see page 5-1 for location)). TOSHIBA 2 - 4...

[Page 14: Volt Nema Type 1 Chassis Ratings](#)

75/55 410K 100/75 412K 125/90 415K 150/110 420K 200/150 425K 250/185 430K 300/220
NOTES: 1) NEMA Type 1 UL/CUL listing. TOSHIBA STANDARD RATINGS OUTPUT OVERLOAD VOLTAGE CURRENT (AMPS) 10.6 200-230V 120% FOR 3-PHASE 60 SEC. 24.3 110% MAX VOLTAGE CONTINUOUS...

[Page 15: Standard Specifications](#)

Easy access user group containing all changed parameters Select to display needed parameter groups and parameters User's parameter values can be saved into a default library. User can then default drive to Toshiba's values or to the user's own. 3 - 2 =67k...

[Page 16](#) Relative humidity Vibration Climatic class Pollution degree IP rating TOSHIBA STANDARD SPECIFICATIONS 2-line backlit display LCD 20 characters per line Overcurrent, overvoltage, heatsink overheat, load-side short-circuit, load-side ground fault, inverter overload, stator overcurrent during start-up, load-side overcurrent during start-up, EEPROM error, RAM...

[Page 17: Standard Connection Diagrams](#)

400-460VAC, 60Hz. As an example, the "S4" terminal is shown above as an EMERGENCY OFF input. See Section 8 for information on how to program the drive for this and other functions. TOSHIBA TOSVERT-130H3 STANDARD CONNECTION MODEL 2035 TO 2330...

[Page 18](#) ANALOG INPUT NOTE: As an example, the "S4" terminal is shown above as an EMERGENCY OFF input. See Section 8 for information on how to program the drive for this and other functions. TOSHIBA TOSVERT-130H3 STANDARD CONNECTION MODEL 4400 TO 430K...

[Page 19: Selection Of Main Circuit Wiring Equipment And Standard Cable Sizes](#)

H3-4750 130.0 H3-410K H3-412K H3-415K H3-420K H3-425K H3-430K See page 4-4 for notes. TOSHIBA ** Typical cable size (AWG) Main power Input and Output Frequency command input, frequency meter, ammeter motor load Wire Capacity 24-12 / 24-12 24-12 / 24-12...

[Page 20](#) Applications featuring multiple motors on one drive require overload protection for each motor. CAUTION CAUTION TOSHIBA Turn off power to the drive before making any wiring changes to the analog output circuits. Use separate conduits for routing incoming power, power to motor, and control conductors.

[Page 21: Grounding](#)

> 5 kHz For lead lengths that exceed suggested maximum contact Toshiba for application assistance. Toshiba EQP III, III-XS & EQP III-841 motors incorporate an insulation system that is in compliance with NEMA MG-1-1998 Section IV Part 31. Bearing Considerations: A.

[Page 22: Connection Examples: Potentiometer Operation](#)

TOSHIBA Connection Examples: Potentiometer Operation RES RR FLC FLB FLA Terminal Block 4 - 6...

[Page 23: Ma Reference Operation](#)

TOSHIBA Connection Examples: 4 - 20mA Reference Operation RES RR FLC FLB FLA Terminal Block 4 - 7...

[Page 24: Rs232 Port](#)

TOSHIBA Connection Examples: Keypad Frequency Reference and Remote Stop/Start RES RR FLC FLB FLA Terminal Block FREQUENCY MODE SELECTION Connection Examples: RS232 Port 4 - 8...

[Page 25: Volt Reference Operation](#)

TOSHIBA Connection Examples: 0-10 volt Reference Operation RES RR FLC FLB FLA Terminal Block 4 - 9...

[Page 26: Terminal Strip Board](#)

Functions starting on page 5-3. This board is used in all drive sizes. 0-1mA Jumper JP3 is used to set AM terminal and Jumper JP4 is used to set FM terminal. CAUTION TOSHIBA RES RR 4-20 mA 0-1mA 4-20 mA Turn off power to the drive before connecting or disconnecting any wiring to the terminal block.

[Page 27: Control Board](#)

Option Communication socket Ribbon cable connector TOSHIBA Dip Switch SW1 (Detail) When a 4(0)-20mA reference signal is input to terminal "IV", set switch SW1 to I When a 0-10 volt reference signal is input to terminal "IV", set SW1 to V When a +/- 0-5 volt reference signal is input to terminal "RX", set SW1 to 5...

[Page 28: Terminal Connections And Functions](#)

Connect to either 3 \emptyset , 50HZ, 400VAC or 3 \emptyset , 60Hz, 400 to 460VAC. Drives can be operated on single phase power with when appropriately derated; contact Toshiba distributor for information. T1, T2, T3 Motor output terminals. Connect these terminals to a 3-phase (U, V, W) induction motor of the proper voltage, current, and horsepower.

[Page 29](#) Programmable digital input. With default setting, shorting "S4" to "CC" gives drive preset speed frequency reference. Programmable digital input. With default setting, shorting "RES" to "CC" resets a tripped drive. TOSHIBA Terminal functions Do not connect to GND(E). 5 - 4...

[Page 30: Operating Panel](#)

20 character x 2-line LCD and a LED in the LOCAL/REMOTE button of the keypad. The illustration below shows the operating panel keypad layout and the locations of the keys and display. Local / remote TOSHIBA Liquid crystal display 6 - 1...

[Page 31: Keys And Functions](#)

This key is used to select or enter a parameter name, a parameter value, a READ frequency command, or a group name. WRITE This key is used to enter the programming mode. TOSHIBA Keys and Functions Function 6 - 2...

[Page 32: Local Mode](#)

METHOD as desired (see page 8-9). In LOCAL mode and with display of OUTPUT FREQUENCY FORWARD JOG MODE (PRESS RUN) TOSHIBA Avoid frequent starting and stopping of the H3 by turning the (MCCB) power on and off. This will shorten the life of the drive.

[Page 33: Remote Mode](#)

If drive displays "79", the keypad ROM is version 121; if the drive displays "6E", the keypad ROM version is 110. If the drive does nothing, keypad ROM is version 100. TOSHIBA 60.0 HZ 0.0 HZ...

[Page 34: Monitor Mode](#)

"1". Monitor voltages can be shown in percent by adjusting Item 297, VOLTAGE UNITS SELECTION to "0". The monitor's past four faults can be cleared by setting Item 280, STANDARD SETTING MODE SELECTION to "4". TOSHIBA Display Standard output frequency display 0.0HZ Pressing the MON key places drive in monitor mode.

[Page 35: Monitoring "Rr" Input Special Function](#)

LCD Message OUTPUT FREQUENCY PATTERN GROUP #1 SPEED #3 NUMBER OF CYCLES REMAINING 145 PRESET SPEED # 12 REMAINING PATTERN TIME MOTOR RUN DIRECTION: TOSHIBA Monitor display OUTPUT FREQUENCY FREQUENCY CURRENT UNITS SELECTION 30.0HZ 2365 MIN FORWARD 7 - 4 MAXIMUM...

[Page 36](#) ACC/DEC PATTERN #1 SELECTION ACCEL/DECEL PATTERN ADJUST LOW ACCEL/DECEL PATTERN ADJUST HIGH *Item 9 is available only when Item 8 Adjustment Range option 1 or 2 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION Maximum frequency 30 - 400 Hz Base frequency #1...

[Page 37](#) FREQUENCY *Item 17 is available only when Item 8, VOLTS PER HERTZ PATTERN Adjustment Range option 1 or 2 is selected. **Item 20 is available only when Item 19 Adjustment Range option 0 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION RANGE...

[Page 38: Fundamental Parameters #1](#)

(FORWARD/REV) STOP PATTERN SELECTION FUNDAMENTAL PARAM SWITCHING ACCEL/DECEL #1/#2 SELECTION PANEL RESET SELECTION PANEL FEEDBACK CONTROL TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION Forward/reverse 0: Reverse 1: Forward Stop pattern selection 0: Decelerated stop 1: Coast stop Fundamental parameter #1 or #2 1: Fundamental...

[Page 39](#) PWM carrier frequency for 230V PWM CARRIER FREQUENCY PWM carrier frequency for 460V PWM carrier frequency for 460V *Items 36 - 41 are available only when Item 35 Adjustment Range option 1 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION RANGE Start-up frequency 0.0 - 10...

[Page 40](#) "RCH" CONTACTS FUNCTION "RCH" CONTACTS DELAY TIME "RCH" CONTACTS HOLD TIME *Items 44 - 55 are available only when Item 43 Adjustment Range option 1 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION Input terminal selection 0: Standard terminal functions 1: custom terminal functions * assign function to "R"...

[Page 41](#) SPEED REACH MINIMUM FREQUENCY COMMERCIAL POWER/INV SWITCHING OUTPUT COMMERCIAL POWER/INV SWITCH FREQ *Item 77 is available only when Item 76 Adjustment Range option 2 or 3 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION RANGE assign

function to "LOW" 0 - 63 contact "LOW"...

[Page 42](#) GROUP:TERMINAL SELECTION PARAMETERS LIQUID CRYSTAL DISPLAY ITEM "FP" OUTPUT TERMINAL PULSE FREQUENCY RR input special function selection 0: Standard RR INPUT SPECIAL FUNCTION SELECT TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE Output terminal pulse 0: 48 times output frequency frequency selection...

[Page 43](#) *Items 84 - 87 are available only when Item 83 Adjustment Range option 1 is selected. **Items 89 - 92 are available only when Item 88 Adjustment Range option 1 is selected. ***Items 94 - 97 are available only when Item 93 Adjustment Range option 1 is selected. TOSHIBA PARAMETER ADJUSTMENT...

[Page 44](#) *Items 99 - 102 are available only when Item 98 Adjustment Range option 1 is selected. **Items 104 - 107 are available only when Item 103 Adjustment Range option 1 is selected. ***Item 109 is available only when Item 108 Adjustment Range is set to other than "0". TOSHIBA (cont'd) PARAMETER...

[Page 45](#) 116* PRESET SPEED #3 FREQUENCY 117* PRESET SPEED #3 OPERATING MODE *Items 111 - 117 are available only when Item 110 Adjustment Range options 1 - 15 are selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE 0: Disabled to be unblinded...

[Page 46](#) 132* PRESET SPEED #11 FREQUENCY 133* PRESET SPEED #11 OPERATING MODE *Items 118 - 133 are available only when Item 110 Adjustment Range options 1 - 15 are selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE 4th speed Lower limit frequency 0.1/0.01 Hz...

[Page 47](#) 140* PRESET SPEED #15 FREQUENCY 141* PRESET SPEED #15 OPERATING MODE *Items 134 - 141 are available only when Item 110 Adjustment Range options 1 - 15 are selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE 12th speed Lower limit frequency 0.1/0.01 Hz...

[Page 48](#) *** Item 152 is available only when Item 151 Adjustment Range option 2 is selected. **** Item 154 is available only when Item 153 Adjustment Range options 1 - 10 are selected. ***** Default wattage and ohm values depend on the inverter size. TOSHIBA PARAMETER ADJUSTMENT...

[Page 49](#) Output short-circuit detection OUTPUT SHORT-CIRCUIT DETECTION SELECT *Item 156 is available only when Item 155 Adjustment Range option 1 is selected. **Item 163 is available only when Item 162 Adjustment Range option 0 is selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION...

[Page 50](#) LEVEL FAULT TRIP EEPROM SAVE ENABLE COOLING FAN CONTROL SELECTION Cumulative run timer alarm setting CUMULATIVE RUN TIMER ALARM SETTING TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION Overtorque detection can cause 0: Trip disabled a warning or a trip 1: Trip enabled...

[Page 51](#) 183* PATTERN GROUP #1 SPEED #6 184* PATTERN GROUP #1 SPEED #7 *Items 176 - 184 are available only when Item 175 Adjustment Range option 1 is selected. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION RANGE Pattern run on/off 0: Off 1: On *...

[Page 52](#) 197* PATTERN GROUP #3 SPEED #2 198* PATTERN GROUP #3 SPEED #3 *Items 185 - 198 are available only when Item 175 Adjustment Range option 1 is selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE number of repeats for 1 - 254, 255=infinity...

[Page 53](#) 211* PATTERN GROUP #4 SPEED #7 212* PATTERN GROUP #4 NUMBER OF CYCLES *Items 199 - 212 are available only when Item 175 Adjustment Range option 1 is selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE 3rd Pattern Group Same options as...

[Page 54](#) ***Item 218 is available only when Item 217 Adjustment Range option 0 - 3 is selected. ****Item 220 is available only when Item 219 Adjustment Range option 0 - 3 is selected. *****Item 222 is available only when Item 221 Adjustment Range option 0 - 3 is

selected. TOSHIBA (cont'd) PARAMETER...

[Page 55](#) TOSHIBA GROUP:PATTERN RUN CONTROL PARAMETERS SPEED #6 CONTINUE MODE SPEED #6 DRIVE TIME SPEED #7 CONTINUE MODE SPEED #7 DRIVE TIME SPEED #8 CONTINUE MODE SPEED #8 DRIVE TIME SPEED #9 CONTINUE MODE SPEED #9 DRIVE TIME SPEED #10 CONTINUE...

[Page 56](#) ***Item 238 is available only when Item 237 Adjustment Range option 0 - 3 is selected. ***Item 240 is available only when Item 239 Adjustment Range option 0 - 3 is selected. ****Item 242 is available only when Item 241 Adjustment Range option 0 - 3 is selected. TOSHIBA (cont'd) PARAMETER...

[Page 57](#) **Item 249 is available only when Item 243 Adjustment Range option 1 is selected. ***Items 251 - 252 are available only when Item 250 Adjustment Range option 1 is selected. ****Item 256 is available only when Item 255 Adjustment Range option 1 is selected. TOSHIBA PARAMETER ADJUSTMENT...

[Page 58](#) OVERRIDE CONTROL SELECTION 258* OVERRIDE MULTIPLIER INPUT SELECTION 259* OVERRIDE CHANGE MULTIPLIER *Items 258 - 259 are available only when Item 257 Adjustment Range option 7 is selected. TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE trim source 0: Off 1: "RR" terminal 2: "IV"...

[Page 59](#) *Items 265 - 266 are available only when Item 264 Adjustment Range option 1 is selected. **Item 267 is available only when Item 264 Adjustment Range option 2 or 3 is selected. Cycle power after changing any parameter in GROUP: COMMUNICATION SETTING PARAMETERS. TOSHIBA PARAMETER ADJUSTMENT...

[Page 60](#) *Item 268 is available only when Item 264 Adjustment Range option 2 or 3 is selected. **Items 271 - 274 are available only when Item 270 Adjustment Range option 1 is selected. Cycle power after changing any parameter in GROUP:COMMUNICATION SETTING PARAMETERS. TOSHIBA PARAMETER ADJUSTMENT...

[Page 61: Industrial Application Parameters \(Machine Tools\)](#)

GROUP:INDUSTRIAL APPLICATION PARAMETERS (TEXTILES) GROUP:INDUSTRIAL APPLICATION PARAMETERS (MACHINE TOOLS) These groups contain the parameters likely to be used for certain applications. See the H3 Industrial Application Manual (available from your Toshiba distributor) for programming charts and macro values. 8 - 26...

[Page 62: Am/Fm Terminal Adjustment Parameters](#)

GROUP:AM/FM TERMINAL ADJUSTMENT PARAMETERS LIQUID CRYSTAL DISPLAY ITEM FM TERMINAL FUNCTION SELECTION FREQUENCY METER ADJUSTMENT AM TERMINAL FUNCTION SELECTION CURRENT METER ADJUSTMENT TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION RANGE "FM" terminal signal selection 0: Pre-compensation ref frequency 1: Post-compensation output frequency 2: Frequency...

[Page 63: Utility Parameters](#)

SELECTION * 283 PANEL OPERATION MODE SELECTION * NOTE: Recycle power after changing ITEM 283, PANEL OPERATION MODE SELECTION. ESTOP from keypad while in remote mode cannot be disabled. TOSHIBA PARAMETER ADJUSTMENT DESCRIPTION selects application-specific 0: Does nothing programming (macros)

[Page 64](#) GROUP:UTILITY PARAMETERS LIQUID CRYSTAL DISPLAY ITEM * 283 PANEL OPERATION MODE SELECTION * NOTE: Recycle power after changing ITEM 283, PANEL OPERATION MODE SELECTION. TOSHIBA (cont'd) PARAMETER DESCRIPTION Panel operation mode selection 15:Perform run/stop operations, perform emergency stop, perform monitor operations,...

[Page 65](#) Frequency display resolution FREQUENCY DISPLAY RESOLUTION ACC/DEC time units selection ACC/DEC TIME UNITS SELECTION CURRENT UNITS SELECTION VOLTAGE UNITS SELECTION TOSHIBA (cont'd) PARAMETER ADJUSTMENT DESCRIPTION RANGE 0 - 99 CPU version Can be monitored only ROM version Can be monitored only...

[Page 66: Special Control Parameters](#)

This group must be unblinded to 0: Blind MOTOR PARAMETERS BLIND *Items 299 - 315 are available only when Item 298 Adjustment Range option 1 is selected. **Contact Toshiba for details on Traverse Parameter Item 313A TOSHIBA (cont'd) PARAMETER ADJUSTMENT...

[Page 67: Motor Parameters](#)

*Item 317 factory setting depends on inverter rating (1 HP = .746kW) **Items 319 - 322 are available only when Item 318 Adjustment Range option 2 is selected. ***Inverters sized 150 HP and larger cannot be auto-tuned. TOSHIBA PARAMETER ADJUSTMENT...

[Page 68: Parameter Tree](#)

LEGEND FOR PARAMETER TREE Unblinded Group Blinded Group Item # Item # Unblinded Parameter Blinded Parameter 600 V G3s HAVE ANOTHER GROUP NOT COVERED IN THIS MANUAL TOSHIBA Special Control Terminal Selection Terminal Parameters Parameters Parameters (continued) Start up Frequency Input Terminal "RCH"...

[Page 69](#) Index Dimensions Service Programming Parameters Keypad Panel Jumpers Specifications Precautions Inspection...

[Page 70: Feedback Parameters](#)

Step 5: Adjust displayed value with up/down arrow keys. Press READ/WRITE when finished. Drive flashes WRT to confirm entry. Step 6: Use up/down arrows to select another parameter in this group, or press PRG to exit. TOSHIBA 9 - 1 PARAMETERS #1,...

[Page 71: Groups](#)

WRITE is pressed, the drive will display SEARCHING. Any displayed parameters have been changed to a value different from Toshiba's default. Press READ/WRITE to see the value of the parameter. The parameter can be modified with the up/down arrows. Pressing READ/WRITE again resumes the drive's search.

[Page 72](#) Item 6, UPPER LIMIT FREQUENCY - This parameter sets the maximum frequency the drive will output, regardless of reference. LOWER LIMIT FREQUENCY - LOWER LIMIT FREQUENCY VOLTS PER HERTZ PATTERN BLIND FUNCTION SELECTION BLIND TOSHIBA GROUP: FUNDAMENTAL PARAMETERS #2 UPPER LIMIT FREQUENCY MAXIMUM OUTPUT VOLTAGE #1. LOWER LIMIT FREQUENCY MOTOR PARAMETERS GROUP:MOTOR PARAMETERS...

[Page 73](#) Drive follows similar curve during decel. 3: Overspeed pattern - When outputting a frequency greater than the motor's base frequency, drive extends accel/decel time to reduce possibility of overload trip due to reduction in torque. TOSHIBA MAXIMUM OUTPUT FREQUENCY MAXIMUM OUTPUT FREQUENCY...

[Page 74](#) ACC/DEC PATTERN #2 SELECTION ACC/DEC #1/#2 SWITCHING FREQUENCY DIRECTION SELECTION (FORWARD/REVERSE STOP PATTERN SELECTION FUNDAMENTAL PARAM SWITCHING FUNDAMENTAL PARAMETERS #1 TOSHIBA GROUP: FUNDAMENTAL PARAMETERS #1 GROUP: FUNDAMENTAL PARAMETERS #1 ACCELERATION TIME #1/DECELERA- BASE FREQUENCY #1 MAXIMUM OUTPUT VOLTAGE #1 VOLTAGE BOOST #1...

[Page 75](#) The drive allows the user to program up to three separate frequencies along with a bandwidth for each. Item 36 JUMP FREQUENCY #1 - Enter the jump frequency. TOSHIBA END FREQUENCY. 100%...

[Page 76](#) TOSHIBA Item 37 JUMP FREQUENCY BAND #1 - Enter the bandwidth for JUMP FREQUENCY #1. The value entered here will be added to and subtracted from JUMP FREQUENCY #1 to determine the upper and lower frequencies of the deadband. Item 38 JUMP FREQUENCY #2 - see item 36.

[Page 77](#) 1. If the same function is assigned to more than one input terminal, 'OR' logic is in effect. 2. If none of the input terminals' function is set to "7" (enable), the drive will assume the drive enabled (just like ST-CC is made). TOSHIBA 9 - 8...

[Page 78](#) "42", the drive responds to binary reference only when terminal is closed to "CC". Binary reference is lost when power is cycled. emulate LOCAL/REMOTE key Drive/bypass

switching signal give "RR" priority over "IV" and "RX" give "IV" priority over "RR" and "RX"
TOSHIBA 9 - 9...

[Page 79](#) TOSHIBA Item 56, R,S1-S7 RESPONSE TIME - Use this function to adjust the time between an input terminal's connection to "CC" and its function's realization. A setting of "100" results in a delay of about 200 milliseconds. Item 57, "F" INPUT TERMINAL RESPONSE TIME - Use this function to adjust the time between an input terminal's connection to "CC"...

[Page 80](#) LOW CURRENT DETECTION LEVEL CURRENT DETECTION TIME CURRENT DETECTION LEVEL DETECTION TIME OVERTORQUE TRIP LEVEL OVERTORQUE TRIP LEVEL TOSHIBA LOWER LIMIT FREQUENCY LOWER LIMIT FREQUENCY UPPER LIMIT FREQUENCY UPPER LIMIT FREQUENCY LOW SPEED SIGNAL OUTPUT FREQUENCY SPEED REACH MAXIMUM FREQUENCY...

[Page 81](#) CUMULATIVE RUN TIMER ALARM SETTING OVERCURRENT(ACCEL) OVERCURRENT(DECCEL) OVERCURRENT(RUN) DC OVERCURRENT(ACC) DC OVERCURRENT (DEC) DC OVERCURRENT(RUN) OVERVOLTAGE(ACCEL) OVERVOLTAGE(DECCEL) OVERVOLTAGE(RUN) OVERHEAT MOTOR OVERLOAD INVERTER OVERLOAD DBR OVERLOAD TRIP TOSHIBA BRAKING RESISTOR VALUE BRAKING RESISTOR VALUE PID DEVIATION UPPER LIMIT PID DEVIATION LOWER LIMIT...

[Page 82](#) 2: Motor runs on bypass when a signal is given 3: Both of the above Contact your Toshiba distributor for information on how to program and wire a H3 for this function. Item 77, COMMERCIAL POWER/INVERTER SWITCHING FREQUENCY - On appropriately equipped drives, use this parameter to determine the drive output frequency reached before the H3's bypass circuitry is activated.

[Page 83](#) Item 86 above. IV TERMINAL STANDARD OR ADJUSTABLE RX TERMINAL STANDARD OR ADJUSTABLE PG TERMINAL STANDARD OR ADJUSTABLE BINARY INPUT STANDARD OR ADJUSTABLE TOSHIBA With default programming, drive outputs 40 Hz 9 - 14...

[Page 84](#) Item 143, BRAKING RESISTOR VALUE - Item 144, BRAKING RESISTOR POWER RATING - Enter kilowatt value of resistor. Note: Items 142, 143, 144 are not applicable to H3 drives above 30 horsepower. TOSHIBA OPERATING MODE FREQUENCY - OPERATING MODE - .

[Page 85](#) (watts). Insufficient resistance may lead to IGBT7 damage; too low of a wattage may result in braking resistor damage from overheating. Contact your Toshiba distributor for dynamic braking resistor part numbers and information. Item 145, OVERVOLTAGE STALL PROTECTION - This function is turned on as a default setting.

[Page 86](#) Item 155, REGENERATION POWER RIDE THROUGH CONTROL - Item 156, REGENERATION POWER RIDE THROUGH TIME - Item 157, AUTO-RESTART (MOTOR SPEED SEARCH) - TOSHIBA DC INJECTION CURRENT Speed search is automatically on during retry. Retry will Make sure that workers are not exposed to danger from equipment suddenly re-starting when a fault occurs and a retry selection option other than "0"...

[Page 87](#) Item 168. Enter a "1" here to enable the low current detection. A low current alarm is available in the form of a drive output contact change; see Items 60,63, or 66 and setting values 26/27 on page 9-11. TOSHIBA 9 - 18...

[Page 88](#) Item 176, PATTERN RUN CONTINUE MODE - This parameter determines if a pattern group is continued after a pattern run is stopped and restarted: 0: Pattern group starts over with its first speed 1: Pattern resumes at the time of and with the speed at interruption TOSHIBA 9 - 19...

[Page 89](#) 4: Non-stop (stop by breaking ST-CC or F-CC or R-CC). 5: Drive waits for step command to change speeds. See Items 45-54 and setting value 19 on page 9-9. TOSHIBA CONTINUE MODE. This parameter affects the timing 15 DRIVE TIME...

[Page 90](#) See the Extended Terminal Block Option Manual for more information. TOSHIBA DRIVE TIME - This parameter determines the 9 - 21...

[Page 91](#) Item 262, PARITY SETTING - sets the parity. Cycle power after changing this parameter. Item 263, INVERTER ID NUMBER - assigns unique ID to drive for use on RS485 net.

Cycle power after changing this parameter. TOSHIBA 9 - 22 Torque Ratio...

[Page 92](#) 0: None 1: RS485 port on option boards INV3-COM-A, INV3-COM-C, or INV3-COM-B 2: Toshiba TOSLINE F10 (twisted pair). Contact your Toshiba distributor for more information 3: Toshiba TOSLINE S20 (fiber optic). Contact your Toshiba distributor for more information. 4: 12 bit binary reference using option card G3-VF5X-4526A 5: Three digit BCD input on card G3-VF5X-4526A (0.1 Hz resolution)

[Page 93](#) For peak output current, adjust arrows until meter/system reads drive rated amps (or 100%). For peak input voltage, adjust arrows until meter/system reads 200 VAC for a 230 V drive or 400 VAC for a 460 V drive. TOSHIBA =(torque amps) +(excitation amps)

[Page 94](#) With this parameter set to "2", preset speeds from terminal strip will not function. Item 282, FREQUENCY MODE SELECTION 4: Local or remote as determined by setting of LOCAL/REMOTE button on keypad Terminal strip enable, reset, and ESTOP commands are always valid, regardless of Item 282's setting. TOSHIBA 9 - 25...

[Page 95](#) PASS NUMBER ENTERED CORRECTLY ENTER PASS NUMBER Item 284, PASS NUMBER Item 285, CPU VERSION Item 286, ROM VERSION Item 287, EEPROM VERSION Item 288, INVERTER TYPEFORM TOSHIBA 4: ESTOP only 16: Read parameters only PASS NUMBER H3U420K H3U425K H3U430K...

[Page 96: Section 9 Programming Groups](#)

Item 299, FUNDAMENTAL PARAMS #2 BLIND This parameter must be set to "1" before any of the parameters on page 8-2 can be read or changed. Putting a "1" here adds GROUP: FUNDAMENTAL PARAMETERS #1 to the group list (accessed via the PRG button). TOSHIBA SELECT =(torque amps)

[Page 97](#) The settings of these parameters are still set at factory default. Contact your Toshiba distributor for the Industrial Application Manual for more information on the pump group.

[Page 98](#) The settings of these parameters are still set at factory default. Contact your Toshiba distributor for the Industrial Application Manual for more information on the textile application group.

[Page 99](#) TERMINAL SELECTION PARAMETERS INPUT TERMINAL SELECTION TERMINAL SELECTION PARAMETERS "S1" INPUT TERMINAL FUNCTION TERMINAL SELECTION PARAMETERS "S2" INPUT TERMINAL FUNCTION TERMINAL SELECTION PARAMETERS "S3" INPUT TERMINAL FUNCTION FREQUENCY SETTING PARAMETERS TOSHIBA Parameter BLIND FUNCTION SELECTION FREQUENCY SETTING PARAMETERS BLIND Parameter...

[Page 100](#) MOTOR PARAMETERS MOTOR PARAMETERS MOTOR PARAMETERS MOTOR PARAMETERS MOTOR PARAMETERS MOTOR PARAMETERS MOTOR PARAMETERS AUTO TUNE ERROR TOSHIBA Parameter BLIND FUNCTION SELECTION MOTOR PARAMETERS BLIND VOLTS PER HERTZ PATTERN NUMBER OF MOTOR POLES MOTOR RATED CAPACITY MOTOR TYPE LOAD MOMENT OF INERTIA...

[Page 101: Section 10 Service](#)

Drive Model No. spec. Serial No. Test No. Delivery date Time in service Date when problem arose Motor rating Made by Toshiba? New? Alternate? Status of Indoor? Ambient Humidity: condition Dust composition and size: Presence of salt and extent of corrosion from it:...

[Page 102](#) TOSHIBA In order to obtain the best performance and to get the maximum service life from the drive it is necessary to perform timely maintenance repairs on some parts of the system even though the equipment may still be functioning with no apparent problems.

[Page 103: How To Clear A Fault](#)

"PB" terminals may solve problem (see page 9-16). If there are severe load fluctuations, adding mechanical dampening or an output line reactor may help to electrically dampen. TOSHIBA Some trips are the result of ACCELERATION TIME may be too small. VOLTAGE DECELERATION TIME may be too small.

[Page 104](#) "16"); a line reactor or a lower tap on transformer may help. Motor may be

mechanically forced to run faster than drive is commanding; install appropriate dynamic braking resistor (see page 9-16). On eccentric cyclic loads like presses or pump jacks, contact your Toshiba distributor for special programming instructions that may make a DBR unnecessary.

[Page 105](#) If using multiple resistors, make sure parallel-series combination is wired correctly. Check IGBT7. Check DC bus fuse for continuity; if open, check output transistors. Consult your Toshiba distributor for authorized service. DBR OVERLOAD Cause: Dynamic braking resistor is in danger of overheating (as determined by drive).

[Page 106](#) Cause: AUTO-TUNING ERROR Cause: GATE ARRAY FAULT CURRENT DETECT ERROR Comments: INV TYPEFORM ERROR Cause: TOSHIBA FREQUENCY PRIORITY SELECTION #1 COMMUNICATION SELECTION REGENERATION RIDE-THROUGH TIME LOAD MOMENT OF INERTIA STANDARD SETTING MODE SELECTION 10 - 6 FREQUENCY UNDERVOLTAGE DETECT TIME...

[Page 107: Drive Warning Displays And Explanations](#)

Display disappears when heatsink temperature reaches 80 COMM A flashing comm display means that the drive has momentarily lost communications. Display will clear when follower receives valid reference. Cycling power or reinitializing drive will clear warning. TOSHIBA UNDERVOLTAGE DETECT 10 - 7...

[Page 108: Section 11 Dimensions/Weights](#)

VT130H3U4330 18.75(476) 14.25(362) VT130H3U4400 23.63(600) 17.25(438) 11.50(292) 21.63(549) 22.75(578) 14.25(362) VT130H3U4500 23.63(600) 17.25(438) 11.50(292) 21.63(549) 22.75(578) 14.25(362) VT130H3U4600 23.63(600) 17.25(438) 11.50(292) 21.63(549) 22.75(578) 14.25(362) TOSHIBA DIMENSIONS in inches(millimeters) 8.66(220) 7.44(189) 11.38(289) 11.63(295) 7.69(195) 8.66(220) 7.44(189) 11.38(289) 11.63(295) 7.69(195) 8.66(220) 7.44(189) 17.13(435) 17.38(441) 7.69(195) 9.81(249) 17.09(434) 18.09(459) 11.25(286)

[Page 109](#) 57.00(1448) 19.25(489) 13.16(334) 54.16(1376) 55.81(1418) 12.63(321) VT130H3U420K 57.00(1448) 19.25(489) 13.16(334) 54.16(1376) 55.81(1418) 12.63(321) VT130H3U425K 57.00(1448) 19.25(489) 13.16(334) 54.16(1376) 55.81(1418) 12.63(321) VT130H3U430K 59.94(1522) 25.88(657) 14.47(368) 57.00(1448) 58.75(1492) 11.81(300) TOSHIBA in inches(millimeters) 35.34(898) 35.34(898) 11 - 2 2-"H" DIA. 2-SLOT "G" DIA.

[Page 110: Shipping Weights](#)

Shipping Weights Model 2035 2055 2080 2110 2160 2220 2270 2330 TOSHIBA Shipping Weight Shipping Weigh Pounds Model Pounds 4055 4080 14.1 4110 23.2 4160 24.1 4220 24.5 4270 24.5 4330 44.5 4400 4500 4600 4750 410K 412K 415K 420K...

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[Page 112](#) TOSHIBA Product 11 - 5...

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[Page 122](#) TOSHIBA INTERNATIONAL CORPORATION INDUSTRIAL DIVISION 13131 West Little York Rd., Houston Texas 77041 Tel: [800] 231-1412 Fax: [713] 937-9349 Telex: 762078 www.toshiba.com/ind Printed in U.S.A.

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