



Toshiba TOSVERT VF-AS3 Manual

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TOSHIBA

Positioning Control Function Manual

Attention

1. Read this manual carefully before using the product. Keep this manual in a safe place for future maintenance and inspection.
2. The information in this manual is subject to change without prior notice. For the latest contents, refer to the Toshiba inverter website "<http://www.inverter.co.jp/>."

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Summary of Contents for Toshiba TOSVERT VF-AS3

Page 1 1. Read this manual carefully before using the product. Keep this manual in a safe place for future maintenance and inspection. 2. The information in this manual is subject to change without prior notice. For the latest contents, refer to the Toshiba inverter website "http://www.inverter.co.jp/."...

Page 3 E6582187 Safety precautions The items described in the instruction manual and on the inverter itself are very important so that you can use safely and correctly the inverter,

prevent injury to yourself and other people around you as well as to prevent damage to property in the area. Thoroughly familiarize yourself with the following (display/symbols) and then continue to read the manual.

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[Page 5: Introduction](#)

E6582187 1. Introduction Positioning control is control to calculate the speed command to make the motor stop at the command position. During positioning control, the motor is rotated by calculating the speed command to keep the difference between the number of command pulses and the number of feedback pulses zero.

[Page 6: Operation Method Of Positioning Control](#)

E6582187 2. Operation method of positioning control This chapter describes the parameter setting necessary for positioning control and the operation procedure of the inverter. 2.1 Parameters to be set before positioning control Set necessary parameters for positioning control. For how to set, see the following table. For the parameter settings to use - PG feedback option (VEC008Z), refer to E6582148.

[Page 7: Positioning Control By Multi-Step Point Setting](#)

E6582187 Parameter Function Setting Remarks 0: Digital input • Set F146 and F147=2 to input the Terminal S4 input F146 1: Pulse train input speed feedback signal to the S4 and select 2: PG input S5 terminals. • Set the relevant parameter to 1 to 0: Digital input Terminal S5 input input the position command signal...

[Page 8](#) E6582187 Target position Speed at Preset speed input signal Acceler- Decel- Multi-step Function the time of ation eration Higher 4 Lower 4 point setting position 1 (SS1) 2 (SS2) 3 (SS3) time time digits digits control A592 A593 A594 A595 A596 x: ON -: OFF...

[Page 9](#) E6582187 2.2.1.2 About functions Here, description is given by using the parameter for multi-step point 1. The same applies also to multi-step points 2 to 7. The function parameter (A546) is a parameter that allows you to select the method to specify the target position as shown in the table below.

[Page 10](#) E6582187 Frequency command value (Hz) Time POS signal (digital input: 178/179) Run signal (digital input: 2/3 or 4/5) Preset speed 1 (digital input: 10/11) Preset speed 2 (digital input: 12/13) Positioning completion signal (digital output: 118/119) 2.2.3 Caution • Change the setting of A510 after turning OFF the positioning preparation signal (input terminal function 178/179) and run signal (input terminal functions 2/3, 4/5).

[Page 11: Positioning Control By Pulse Train Input](#)

E6582187 2.2.4 Contact example of positioning control by multi-step point Run signal Positioning preparation signal Preset point signal Positioning completion signal PG option (VEC008Z) 2.3 Positioning control by pulse train input 2.3.1 Settings of main parameters When A510=2 or 3, input of the target position by pulse train is enabled. The target position can be specified by the number of all pulses input and the frequency at the time of positioning control by the frequency of pulse input.

[Page 12](#) E6582187 2.3.1.2 How to input pulse train when A510=3 The following are how to input a pulse train and parameter setting. • Input a pulse train from the S4 and S5 terminal. Set F146=1 and F147=1. The number of command pulses is "number of pulses input from the S4 terminal - number of pulses input from the S5 terminal."...

[Page 13: Current Position Clearing](#)

E6582187 2.3.4 Contact example of positioning control by pulse train input Run signal IN V Positioning preparation signal (Use a twisted cable) Command pulse Positioning completion signal PG option (VEC008Z) 2.4 Current position clearing Clear the current position before

performing positioning control. Perform the following current position clearing by setting A527.

[Page 14](#) E6582187 2.4.1 0 point ignore method (A527=0, 10) • Set A527=0 or 10. • When A527=0, the position when the positioning preparation signal (input terminal function 178/179) is turned ON is (A528, A529). • When A527=10, the position when the positioning preparation signal (input terminal function 178/179) is turned ON is (A528, A529).

[Page 15](#) E6582187 The following diagram shows the operation of the dog method. Frequency command value (Hz) The position at this time corresponds to (A528, A529) Update the current position at this time A530 Time Z phase signal Settled in origin POS signal (digital input: 178/179) Dog signal (digital input: 186/187) Run signal (digital input: 2/3(F), or 4/5(R)) Origin signal (digital input: 180/181)

[Page 16: Other Functions](#)

E6582187 2.5 Other functions 2.5.1 How to set gains and limits of positioning control • There are two types of gains of positioning control. The first gains (P gain: F362, I gain: F363, D gain: F366) and the second gains (P gain: A314, I gain: A315, D gain: A318) can be switched with input terminal function 116/ 117.

[Page 17: List Of Positioning Control Parameters](#)

E6582187 3. List of positioning control parameters ■ List of parameters Default setting Title Function Adjustment range value Common to positioning control 0: disabled 1: point to point A510 Position control select 2: pulse train input (single phase) 3: pulse train input (2 phases) Position control Dec.

[Page 18](#) E6582187 Default setting Title Function Adjustment range value Current position clearing 0: 0 point ignore (+) 1: 0 point signal (+) 2: 0 point dog system (+) A527 0 point recovery select 10: 0 point ignore (-) 11: 0 point signal (-) 12: 0 point dog system (-) A528 0 point offset upper 3-digit...

[Page 19](#) E6582187 Default setting Title Function Adjustment range value Position reference decrease A556 0.00 - 600.00 (s) 1.00 time 2 Position reference upper A560 0 - 9999 4-digits 3 Position reference lower A561 0 - 9999 4-digits 3 0: Absolute position command, positive direction Position control function set 1: Absolute position command, negative direction A562...

[Page 20](#) E6582187 Default setting Title Function Adjustment range value 0: Absolute position command, positive direction Position control function set 1: Absolute position command, negative direction A586 2: Relative position command, positive direction 3: Relative position command, negative direction Position reference increase A587 0.00 - 600.00 (s) 1.00...

[Page 21](#) E6582187 ■ List of input/output terminals, monitors, and trips Number Function Remarks Input terminal 178/179 Position control ready 180/181 0 point set Position F/R command for PTI 182/183 input Position command clear for PTI 184/185 input 186/187 0 point dog start 188/189 Phase initialization 10/11...

[Page 22: Setting Example Of Positioning Control](#)

E6582187 4. Setting example of positioning control 4.1 Carrying goods to specified three points by carrier machine according to command <System example> Motor: The induction machine and the PG are directly connected to the motor axis. PG pulses number: 2000 pulses PG feedback detector: VEC008Z Point 1:...

[Page 23: Moving Motor For Specified Amount By Carrier Machine According To Command](#)

E6582187 <Operation example> Frequency command value (Hz) Time -Sr2 POS signal (digital input: 178/179) Run signal (digital input: 2/3 or 4/5) Point command signal (digital input: 10/11) Point command signal (digital input: 12/13) Positioning completion signal (digital output: 118/119) 4.2 Moving motor for specified amount by carrier machine according to command <System example>...

[Page 24](#) E6582187 • Set the limits of the target position. This parameter should be also set by 0.01 mm. For example, with a range of -10.00 mm to 210.00 mm, the setting is as follows. A512=2, A513=1000, A514=0, A515=1000 • It is necessary to turn the origin position setting signal OFF -> ON -> OFF each time positioning control is performed to set the current position

to the origin.

[Page 25: Orientation Control](#)

E6582187 5. Orientation control Orientation control is a function to stop a rotating machine at the specified phase. The following is a block diagram of orientation control. Switched by digital input: 116/117 P - gain: F362 I - gain: F363 D - gain: F366 P - gain: A314 I - gain: A315...

[Page 26: Orientation Control](#)

E6582187 5.2 Orientation control 5.2.1 Settings of main parameters Make the following settings to enable orientation control. • Set F359=3. • Set the number of pulses for one rotation of the motor in F375. - When the encoder is connected to the motor: Set the number of pulses of the encoder in F375. - When the encoder is connected to the load machine: Set "number of pulses of the encoder/reduction gear ratio"...

[Page 27: Orientation Control](#)

E6582187 6. Orientation control ■ List of parameters Default Title Function Adjustment range setting value Phase setting, orientation 0: Initialize with the input terminal function 188/189 A670 Position initialization select 1: Initialize with the Z phase of the encoder A671 Initial position 0.0 -...

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