TOSHIBA

TOSVERT VF-S15

Hit and stop control Instruction Manual

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1. Introduction

TOSVERT VF-S15 has hit and stop control for material handling including automatic warehouse and multi-story car park.
The inverter decelerates to the set frequency and execute hit and stop operation.
Also, it is possible to proceed to hit and stop continuation after hit and stop time elapsed.
This instruction manual explains the hit and stop control of VF-S15.

<Notice>
   This manual explains hit and stop continuation in addition to hit and stop control.
   Therefore, here explains the parameters mentioned as factory specific coefficient and settings not described in the instruction manual.

2. Hit and stop control

Hit and stop control enables smooth deceleration and stop for material handling including automatic warehouse and multi-story car park.
The inverter decelerates to the set frequency and execute hit and stop operation. Also, it is possible to proceed to hit and stop continuation after hit and stop time elapsed
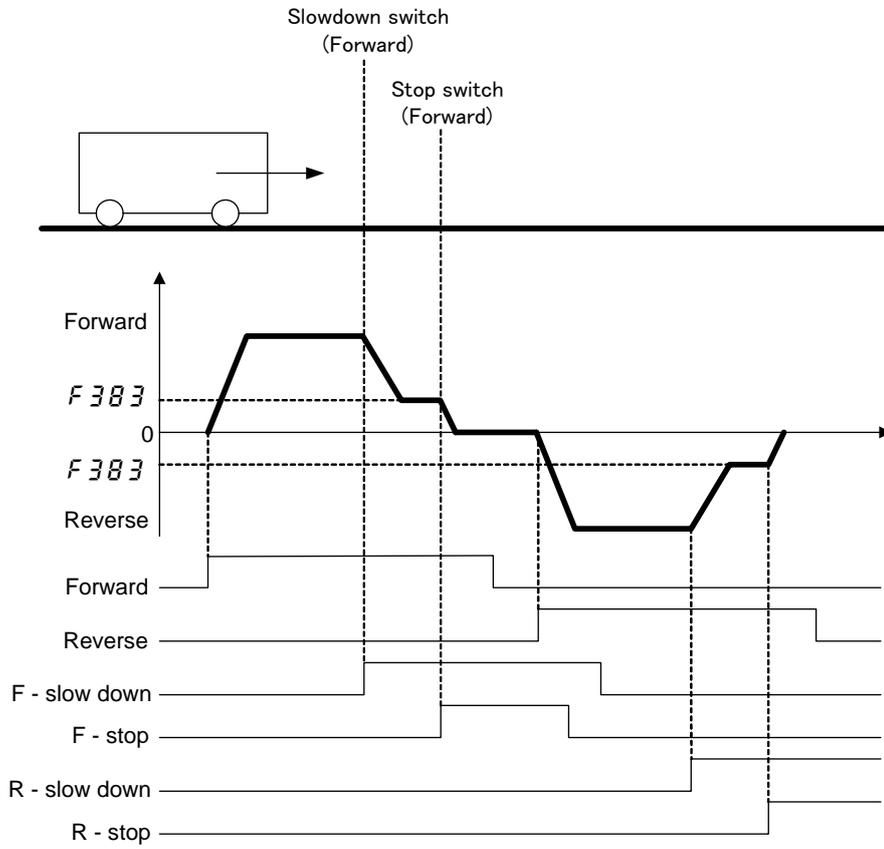
2.1 Hit and stop <$F382 = 1$>

The inverter decelerates smoothly to the set frequency ($F383$) and stops by using the maximum of four limit switches.

Title	Function	Adjustment range	Default setting
$F382$	Hit and stop control	0: Disabled, 1: Enabled, 2: -	0
$F383$	Hit and stop control frequency	0.1-30.0 (Hz)	5.0

1) Set the parameter $F382 = 1$.

2) The inverter controls deceleration and stop by inputting signals from limit switches to the input terminals. Assign the following functions to each input terminal.

Input terminal function		ON	OFF
140 (141)	Forward deceleration (Inversion)	Forward operation toward $F383$ setting	Clear
142 (143)	Forward stop (Inversion)	Forward stop	Clear
144 (145)	Reverse deceleration (Inversion)	Reverse operation toward $F383$ setting	Clear
146 (147)	Reverse stop (Inversion)	Reverse stop	Clear

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<Sample of sequence diagram>

Slowdown switch
(Forward)

Stop switch
(Forward)

Forward

$F\ 383$

0

$F\ 383$

Reverse

Forward

Reverse

F - slow down

F - stop

R - slow down

R - stop

2.2 Hit and stop continuation < $F\ 382=2$ >

The inverter decelerates to the setting frequency and executes hit and stop operation, then, proceeds to hit and stop continuation after the elapse of hit and stop time by the input signal.

<Notice>
   This section explains the parameters mentioned as factory specific coefficient and settings not described in the instruction manual.

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2.2.1 Parameter setting

Title	Function	Adjustment range	Default setting
$F382$	Hit and stop control	0: Disabled 1: Enabled 2: Enabled (Hit and stop continuation)	0
$F383$	Hit and stop control frequency	0.1-30.0 (Hz)	5.0
$F384$ *1	Hit and stop torque	0-100 (%)	100
$F385$ *1	Hit and stop time	0.0-25.0 (s)	0.3
$F386$ *1	Hit and stop continuation torque	0-100 (%)	50

*1:   The factory specific coefficient parameters in the instruction manual of VF-S15

(1) Description

The inverter decelerates to the hit and stop control frequency ($F383$) smoothly by the input signal.
Hit and stop torque ($F384$) is the torque upper limit.
The target of hit and stop prevents the motor from rotating. After hit and stop time ($F385$), output torque proceeds to hit and stop continuation torque setting ($F386$) and maintains stop on contact state.
Hit and stop status signal output turns off when operation command turns off or inverse operation command (reverse run command during forward run, and forward run command during reverse run) turns on.

(2) Parameter setting

1) Set the parameter $F382=2$.
   Note) The setting value 2 is out of adjustment range in the instruction manual of VF-S15.

2) The inverter decelerates to the hit and stop control frequency ($F383$) after inputting the inverse slow operation signal.
   Set the $F383$ according to the motor.
   In case of gear motor, it is recommended to regard default setting as standard value. Be careful that the large value to $F383$ may break the gear.

3) Set the $F384$ to $F386$ according to the motor.
   Too small value to $F385$ may lead to the control instability.
   Note) These parameters are factory specific coefficient parameters in the instruction manual of VF-S15.

4) Assign the following function to the input terminal.
   You can operate the hit and stop control by ON/OFF of the terminal.

Input terminal function	
140 (141)	Forward deceleration (Inversion)
144 (145)	Reverse deceleration (Inversion)
150 (151)	Inverse slow operation (Inversion)

5) Assign the following function to the output terminal if necessary.

Input terminal function	
174 (175)	Stop on contact state (Inversion)

Note) The output conditions depend on $F384$ and $F385$ setting.

   Please note that the inverter determines the stop on contact state when the load torque larger than $F384$ continues for $F385$ set time before contacting to the target and the signal is output.

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2.2.2 Sequence diagram

Sequence diagram of the hit and stop control is as follows;
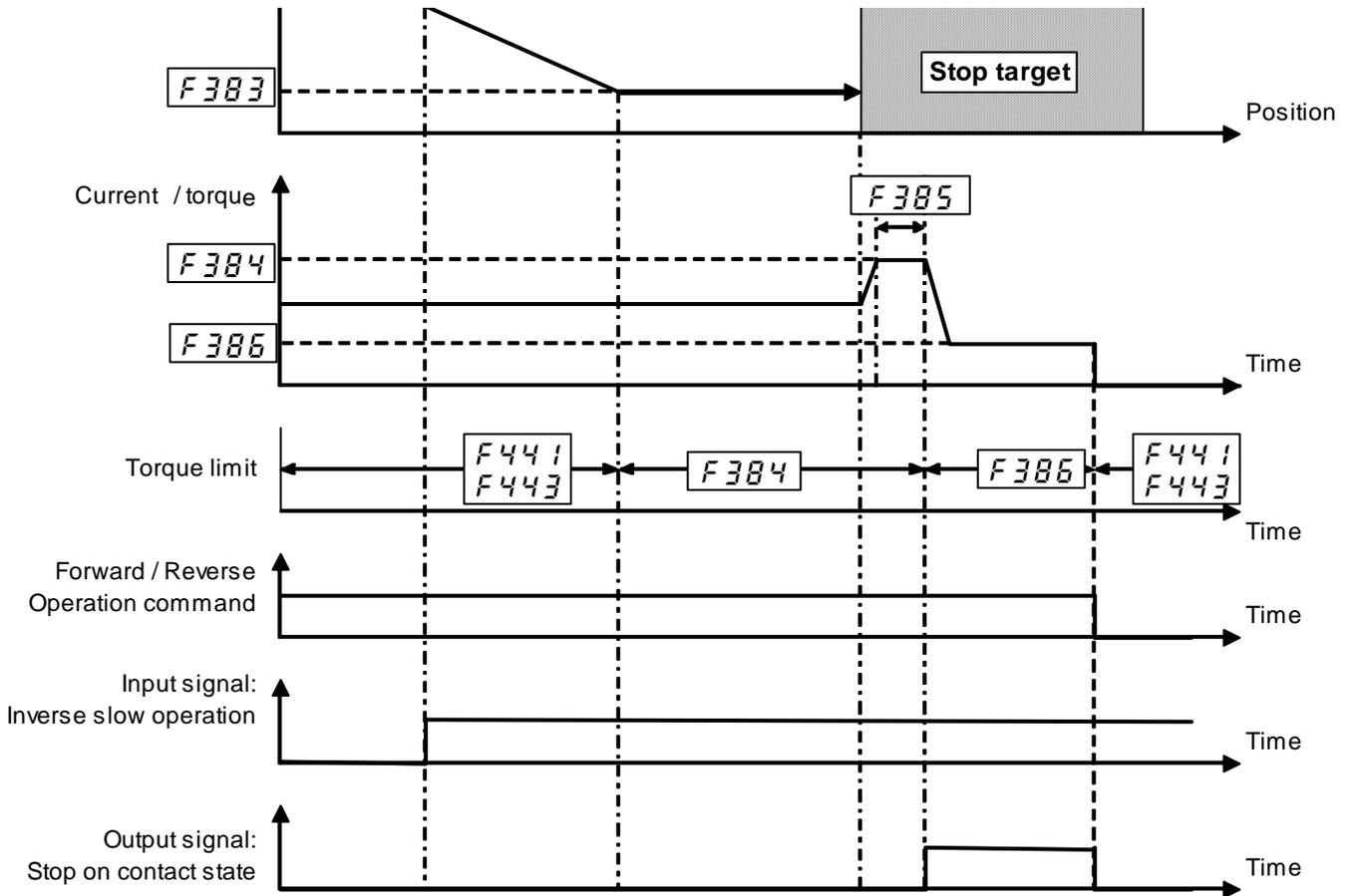
Title	Function	Adjustment range	Default setting
F383	Hit and stop control frequency	0.1-30.0 (Hz)	5.0
F384	Hit and stop torque	0-100 (%)	100
F385	Hit and stop time	0.0-25.0 (s)	0.3
F386	Hit and stop continuation torque	0-100 (%)	50
F441	Power running torque limit 1 level	0-249(%), 250:Disabled	250
F443	Regenerative braking torque limit level 1	0-249(%), 250:Disabled	250