TOSVERT VF-MB1

Hit and stop control

Toshiba Schneider Inverter Corporation

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1. Introduction

TOSVERT VF-MB1 has hit and stop control for material handling and car transfer horizontal or vertical. The control enables smooth deceleration and stopping by limit switches. And it can keep the stop condition on contact state. This instruction manual explains the hit and stop control of VF-MB1.

<Notice>
Instruction manual of VF-MB1 explains the hit and stop control. This manual explains the control more and more include the detail of the factory specific coefficient parameters.
2. Hit and stop control

Hit and stop control enables smooth deceleration and stopping for material handling and car transfer horizontal or vertical. The inverter decelerates to setting frequency by limit switch signal and stops at hit and sop torque setting or less. And it can continue the stop condition on contact state at hit and stop continuation torque setting or less.

2.1 Hit and stop \(<F382=1>\)

The inverter decelerates to the setting frequency (F383) and stops smoothly by limit switches.

<table>
<thead>
<tr>
<th>Title</th>
<th>Function</th>
<th>Adjustment range</th>
<th>Default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>F382</td>
<td>Hit and stop control</td>
<td>0: Disabled, 1: Enabled, 2: -</td>
<td>0</td>
</tr>
<tr>
<td>F383</td>
<td>Hit and stop control frequency</td>
<td>0.1-30.0 (Hz)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

1) Set the parameter \(F382=1\).

2) Assign the following functions to the input terminals. You can operate the hit and stop control by ON/OFF of the terminals.

<table>
<thead>
<tr>
<th>Input terminal function</th>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>140 (141)</td>
<td>Forward deceleration (Inversion)</td>
<td>Forward operation toward F383 setting</td>
</tr>
<tr>
<td>142 (143)</td>
<td>Forward stop (Inversion)</td>
<td>Forward stop</td>
</tr>
<tr>
<td>144 (145)</td>
<td>Reverse deceleration (Inversion)</td>
<td>Reverse operation toward F383 setting</td>
</tr>
<tr>
<td>146 (147)</td>
<td>Reverse stop (Inversion)</td>
<td>Reverse stop</td>
</tr>
</tbody>
</table>

'Sample of sequence diagram'

<Sample of sequence diagram>
2.2 Hit and stop continuation $<F 382=2>$

The inverter decelerates to the setting frequency and stops smoothly by the input signal. After hit and stop time, it continues the stop conditions on contact state at hit and stop continuation torque setting or less.

<Notice>
This paragraph explains the parameters include the factory specific coefficient parameters.

2.2.1 Parameter setting

<table>
<thead>
<tr>
<th>Title</th>
<th>Function</th>
<th>Adjustment range</th>
<th>Default setting</th>
</tr>
</thead>
</table>
| $F 382$ | Hit and stop control            | 0: Disabled  
1: Enabled  
2: Enabled (Hit and stop continuation) | 0               |
| $F 383$ | Hit and stop control frequency  | 0.1-30.0 (Hz)               | 5.0             |
| $F 384$ *1 | Hit and stop torque        | 0-100 (%)                   | 100             |
| $F 385$ *1 | Hit and stop time            | 0.0-25.0 (s)                | 0.3             |
| $F 386$ *1 | Hit and stop continuation torque | 0-100 (%)                  | 50              |

*1: The factory specific coefficient parameters in the instruction manual of VF-MB1

(1) Description
The inverter decelerates to the hit and stop control frequency ($F 383$) smoothly by the input signal. Hit and stop torque ($F 384$) is the torque limit at the time. Then the machinery hit the stop target. After hit and stop time ($F 385$), it continues the stop conditions on contact state at hit and stop continuation torque setting ($F 386$) or less. The inverter outputs the signal of the stop contact state. The output signal turns off when the operation command turns off.

(2) Parameter setting

1) Set the parameter $F 382=2$.
   Note) The setting value 2 is out of adjustment range in the instruction manual of VF-MB1.

2) The inverter decelerates the hit and stop control frequency ($F 383$) after input the inverse slow operation signal. Set the $F 384$ for the motor.
   Note) If you set the large value to $F 384$ for gear motor, it is possible to break the gear.

3) Set the $F 384$ to $F 386$ for the motor.
   If you set the small value to $F 386$, it is possible that the control instability occurs.
   Note) The parameters are factory specific coefficient parameters in the instruction manual of VF-MB1.

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

<table>
<thead>
<tr>
<th>Input terminal function</th>
<th>150 (151)</th>
<th>Inverse slow operation (Inversion)</th>
</tr>
</thead>
</table>

Note) The input terminal function: 140(141) and 144(145) are valid for $F 382=2$. The inverter operates toward the $F 383$ setting frequency when the terminals turn on. Set to the 150(151) for the hit and stop continuation control.
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 $F_{384}$ and $F_{385}$ setting.
The signal is output in case that the load torque is $F_{384}$ or more with $F_{385}$ setting time even though the motor does not hit the stop target.

### 2.2.2 Sequence diagram

Sequence diagram of the hit and stop control is following.
Note1) If you input the inverse operation signal after the output signal of stop on contact state turned on, the output signal becomes OFF. The inverter operates the following though the output signal is OFF.

*The inverter starts the inverse operation at the frequency of $F_{383}$ and the torque of $F_{384}$. And it continues the operation until it has passed through the receiving point of the inverse slow operation signal.

*The inverter accelerates to the frequency reference after passing the receiving point. The torque limit levels change to $F_{441}$ (Power running torque limit 1 level) and $F_{443}$ (Regenerative braking torque limit level 1).

Note2) If you input the inverse operation signal between the receiving point of the inverse slow operation signal and the stop target, the inverter operates the following.

*The inverter decelerates to 0Hz. And it starts to the inverse operation at the frequency of $F_{383}$ and the torque of $F_{384}$.

*After starting of the inverse operation, the operation is same as Note1).