VARISPEED-616G5
DESCRIPTIVE MANUAL FOR CONSTANTS

MULTI-FUNCTION ALL-DIGITAL TYPE (VS-616G5)

MODEL: CIMR-G5E□□□□, CIMR-G5V□□□□

200V CLASS 0.55 to 75kW (1.2 to 110kVA)
400V CLASS 0.55 to 300kW (1.4 to 460kVA)

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

REFERENCE

VARISPEED-616G5 INSTRUCTION MANUAL (TOE-S616-10.10)

YASKAWA

MANUAL NO. TOEZ-S616-10.11B

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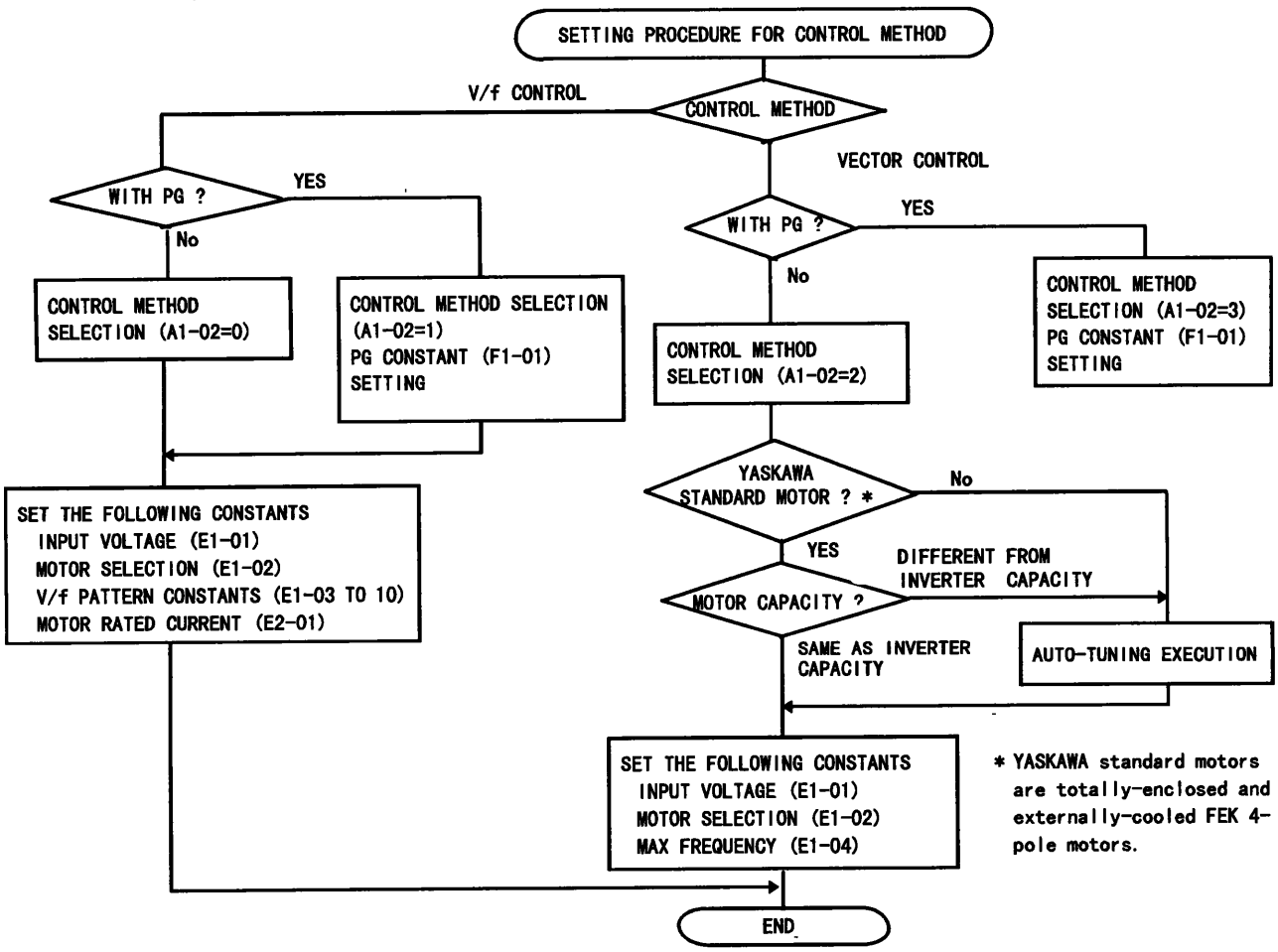
1. CONTROL METHOD SELECTION

1.1 INTRODUCTION

The VS-616G5 is provided with four control modes : open loop vector, flux vector, V/f control with PG feedback, and V/f control.
The control method can be selected easily by using the operator according to the users' applications.
The method is set to open loop vector prior to shipment. Set the control method and motor-related constants according to the following procedures before using the VS-616G5



1.2 FEATURES OF FOUR CONTROL METHODS

Control Method	V/f Control	V/f with PG feedback	Open Loop Vector	Flux Vector
Basic control	Voltage/frequency control (open loop)	Voltage/frequency control with speed compensation	Current vector control without PG	Current vector control
Speed detector	Not needed	Needed (pulse generator)	Not needed	Needed (pulse generator)
Speed detection option	Not needed	PG-A2, PG-D2	Not needed	PG-B2, PG-X2
Speed control range	1·40	1:40	1·100	1·1000
Starting torque	150%/3Hz	150%/3Hz	150%/1Hz	150%/0r/min
Speed control accuracy	±2~±3%	±0.03%	±0 2%	±0 02%
Torque limit	Not possible	Not possible	Possible	Possible
Torque control	Not possible	Not possible	Not possible	Possible
Noise reduction	Standard *	Standard *	Standard *	Standard *
Application	Multiple motor drives Replacement of existing motors whose motor constants are not known When auto-tuning is disabled	Application where pulse generator is provided to machine side	All range of variable speed applications	Simplified servo drives High-accuracy speed control Torque control

* Some capacity models cannot be applied for noise reduction.

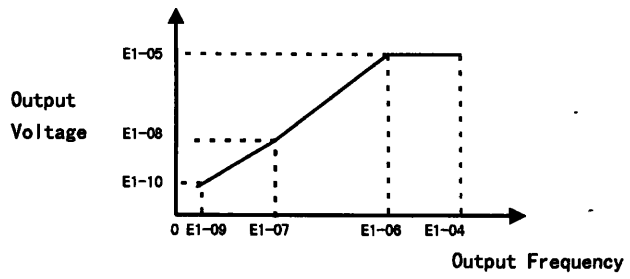
1.3 CHANGING CONTROL METHOD

(Example) The control method is changed from open loop vector to V/f control.

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00Hz	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Initialize.	↓ ↑	**Main Menu** Initialize	
• Select Initialize.	DATA/ENTER	Select Language English	When selecting Initialize, Select Language is displayed.
• Change the constant name. (Displays Control Method.)	↓ ↑	Control Method Open Loop Vector	
• By depressing DATA/ENTER key, Constant No. and set value are displayed.	DATA/ENTER	A1-02=02 Open Loop Vector	
• Change the control method. (Displays V/f Control.)	↓ ↑	A1-02=00 V/F Control	
• Select V/f Control.	DATA/ENTER	Entry Accepted	After displaying Entry Accepted for 0.5 second, returns to the control method display.
• Return to Operation.	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference.	DATA/ENTER	Frequency Ref U1-01=60.00Hz	

1.4 SETTING PROCEDURE AT V/f CONTROL (A1-02=0, 1)

Set the motor related constants in the following procedure.

Order	Contents	Description
1	Input voltage setting	Set the inverter input voltage in constant E1-01 in units of 0.1V
2	Motor selection	Set 00 (standard motor) or 01 (inverter motor) in constant E2-01.
3	V/f pattern selection	Select V/f pattern • At E1-03=0 to 0E, 15 preset V/f patterns can be selected. For each V/f pattern, refer to Par. 2.7, "V/f PATTERN" • At E1-03=0F, custom V/f patterns can be set in constants E1-04 to E1-10. The following shows the relation of E1-04 to E1-10 
4	Motor rated current setting	Set motor rated current in constant E2-01 Motor rated current setting unit is 0.01A for models of 7.5kW or below and 0.1A for models of 11kW or above

1.5 AUTO-TUNING PROCEDURE

Perform auto-tuning, referring to the following description

PRECAUTIONS

① Since the motor rotates automatically during auto-tuning, disconnect the motor from the machine system for safe operation.

② All control circuit terminal input signals are disregarded in the auto-tuning mode.

③ Since carrier frequency is changed to 2kHz during auto-tuning, motor noise may be increased.

④ Verify that the motor is stopped before starting tuning.

[Operation Procedure]

<table>
<tr><th colspan="2">Procedure</th><th>Description</th></tr>
<tr><td>1</td><td>Verify safety</td><td>▪ Is the motor disconnected from the machine system ?
▪ Is the motor shaft key removed ?
▪ Is there any person or object around the motor shaft ?
▪ Is the brake released ? (In case of motor with brake)
▪ Are inspections or settings described in Pars. 4.2 and 4.3 of the instruction manual performed ?</td></tr>
<tr><td>2</td><td>Turn ON inverter power supply</td><td>▪ Verify that no fault has occurred.
▪ Verify the PG rotating direction (when PG is provided).</td></tr>
<tr><td>3</td><td>Select tuning mode</td><td>▪ Depress MENU key and select „Main Menu“ / Operation. Then depress ▽ or △ key to display „Main Menu“ / Auto-Tuning</td></tr>
<tr><td>4</td><td>Input tuning data</td><td>▪ After depressing DATA / ENTER key, input the motor nameplate data.
<table>
<tr><th>Data Name</th><th>Input Value</th></tr>
<tr><td>Rated Voltage</td><td>Set motor rated voltage [VAC]</td></tr>
<tr><td>Rated Current</td><td>Set motor rated current [A]</td></tr>
<tr><td>Rated Frequency</td><td>Set motor rated frequency [Hz]</td></tr>
<tr><td>Rated Speed</td><td>Set rated rotating speed [r/min] (with constant torque motor).
Set base rotating speed [r/min] (with constant output motor)</td></tr>
<tr><td>Number of Poles</td><td>Set the number of motor poles.</td></tr>
<tr><td>Select Motor 1/2</td><td>1 . For driving the connected motor as the 1st motor
2 . For driving the connected motor as the 2nd motor.</td></tr>
<tr><td>PG Pulses/Rev (Displayed only when control with PG is selected.)</td><td>Set the number of pulse generator pulses [PPR].
Set 0 when tuning without PG.</td></tr>
</table>
① Depress DATA/ENTER key to display Rated Voltage
② Change the set value by depressing ▽, △ or > /Reset keys, and then depress DATA/ENTER key
③ Depress △ key to display Rated Current
④ To change the data, perform the same procedure as step ②
⑤ Input the data in Rated Frequency, Rated Speed, Number of Poles, Select Motor 1/2, PG Pulses/Rev, respectively.
Note : PG pulse/Rev is not displayed when control without PG is selected
⑥ Depress △ key to display Tuning Ready ? / Press RUN Key. (“Press RUN Key” is blinking.)</td></tr>
</table>

5	Execute tuning	• Verify the motor rotating direction by LED and change it by FWD/REV key when necessary Depress RUN key to execute tuning. During tuning, "Tune Proceeding" (blinking) is displayed After completing tuning, "Tune Successful" (blinking) is displayed. After the motor stops, "Tune Successful" is displayed Note : By depressing STOP key during tuning, auto-tuning is interrupted and the motor coasts to stop. The data under tuning are returned to the data obtained before tuning
6	After Completion of Tuning	• After completion or interruption of tuning, depress MENU key to return to the drive mode. • To perform tuning again, start from step 1

【 FAULT DISPLAYS AND CORRECTIVE ACTIONS AT AUTO-TUNING 】

The following are fault displays and corrective actions at auto-tuning If any of the following faults are found, the digital operator displays the fault contents ; the motor coasts to stop if it is under operation Fault contact output or minor fault contact output does not operate

Fault Display	Contents	Description	Corrective Action
Data Invalid	Motor data fault	Motor data input tuning was not proper	• Check the input data • Check the inverter and motor capacities
Resistance	Line-to-line resistance fault	Tuning was not completed within the specified time	• Check the input data • Check the motor wiring
No-load Current	No-load current fault		
Saturation - 1	Iron core saturation coefficient 1 fault		
Saturation - 2	Iron core saturation coefficient 2 fault		
Rated Slip	Rated slip fault		
Accelerate	Acceleration fault	Motor did not accelerate in the specified time	• Increase acceleration time (C1-01) • Increase torque limit values (L7-01, 02) if they are small values • When the motor is connected to the machine, separate them from each other
PG Direction	Motor rotating direction fault	Inverter, PG (phases A and B) and motor (phases U, V and W) were not connected properly	• Check the PG wiring • Check the motor wiring
Motor speed	Motor speed fault	Torque reference became excessive (100%) at tuning	• If the motor is connected to the machine, separate them from each other • Increase acceleration time (C1-01) • Check the input data, especially the number of PG pulses
ALARM Over Load (Displayed after completion of tuning)	Excessive tuning load	Torque reference exceeded 20% at tuning	(For display at tuning with motor single-unit) • Check the input data, especially the number of PG pulses

1.6 INITIALIZE MODE

As described below, the language displayed on the digital operator, the access level to set/read constants or constants or control method (V/f control, vector control) can be selected. Make sure to set this mode before using the VS-616G5. The following table shows the main constants for initialize mode.

Constant No.	Digital Operator Display	Name	Description
A1-00	Select Language	Language selection (can be changed during run)	0 : English 1 : Japanese
A1-01	Access Level	Access level (can be changed during run)	0 : Exclusive for monitoring 1 : Constants for user selection (Constants to be set/read can be programmed by digital operator.) 2 : QUICK-START (Constants required for test run are set/read.) 3 : BASIC (Normally-used constants are set/read) 4 : ADVANCED (All constants are set/read.)
A1-02	Control Method	Control method selection	0 : V/f control 1 : V/f control with PG feedback 2 : Open loop vector 3 : Flux vector
A1-03	Init Parameters	Reset to factory defaults	1110 : Initialization of user setting 2220 : 2-wire initialization 3330 : 3-wire initialization
A1-04	Enter Password	Password 1	Input password 1
A1-05	Select Password	Password 2	Input password 2
A2-01 ~32	User Param 1 to 32	User select constants	Up to 32 constants required for the user can be selected. When A1-01=01 (user program) is selected, only constants specified by A2-01 to 32 can be selected Set the constant Nos. you select.

Note : When password 1 differs from password 2, A1-01 to A1-03 and A2-01 to 32 cannot be set (can be read only) and all constants belonging to the VS-616G5 are locked in the status initialized by the user.

If you depress both > /RESET key and MENU key simultaneously, password 2 is displayed and it can be set/read.

1.6.1 Constant Access Level

Constants to be set/read by digital operator can be selected by setting constant A1-01 as shown below. A1-01=2 (QUICK-START) is preset at the factory.

A1-01	Name	Description
0	Exclusive for monitoring	Operation mode and initialize mode are enabled. Constants cannot be set/read by digital operator in programming mode or modified constants mode.
1	User selected constants	Up to 32 constants to be set/read by digital operator can be selected When A1-01=01 is selected, constants specified by A2-01 to 32 can be set/read by digital operator. Set the constant Nos. in A2-01 to 32. When constant Nos. are not set in A2-01 to 32, user selected constants by A1-01 cannot be set/read.
2	QUICK-START	Constants required for quick-start operation are set/read. For details, refer to the access level list in Table 1.
3	BASIC	Basic constants are set/read For details, refer to the access level list in Table 1.
4	Advanced	Advanced constants are set/read For details, refer to the access level list in Table 1.

Table 1 Access Level List

Group No.	Group	Function No.	Function Name	Digital Operator Display	Access Level		
					Q	B	A
B	Application	B1	Operation mode selection	Sequence	O	O	O
		B2	DC injection braking	DC Braking		O	O
		B3	Speed search	Speed Search			O
		B4	Timer function	Delay Timers			O
		B5	PID control	PID Control			O
		B6	DWELL function	Reference Hold			O
		B7	DROOP function	Droop Control			O
		B8	Energy-saving control	Energy Saving			O
		B9	Zero servo	Zero Servo			O
C	Tuning	C1	Accel/decel time	Accel / Decel	O	O	O
		C2	S-curve characteristics	S-Curve Acc/Dec		O	O
		C3	Slip compensation	Motor-Slip Comp		O	O
		C4	Torque compensation	Torque Comp		O	O
		C5	ASR	ASR Tuning		O	O
		C6	Carrier frequency	Carrier Freq		O	O
		C7	Hunting prevention	Hunting Prev			O
		C8	Factory adjusted constant	Factory Tuning			O
D	Reference	D1	Frequency reference value	Preset Reference	O	O	O
		D2	Upper/lower limits	Reference Limits		O	O
		D3	Setting prohibiting frequency	Jump Frequencies		O	O
		D4	Sequence	Sequence			O
		D5	Torque reference	Torque Control			O
E	Motor	E1	V/f characteristics	V/F Pattern	O	O	O
		E2	Motor constants	Motor Setup	O	O	O
		E3	Motor 2 control method	Motor 2 Ctl Meth			O
		E4	V/f characteristics 2	V/F Pattern 2			O
		E5	Motor 2 constants	Motor 2 Setup			O
F	Options	F1	PG speed control card	PG Option Setup	O	O	O
		F2	Analog reference card	AI-14 Setup		O	O
		F3	Digital input card	DI-08, 16 Setup		O	O
		F4	Analog monitor card	AO-08, 12 Setup		O	O
		F5	Digital output card	DO-02 Setup		O	O
		F6	Digital output card	DO-08 Setup		O	O
		F7	Pulse monitor card	PO-36F Setup		O	O
H	Terminal	H1	Sequence input	Digital Inputs		O	O
		H2	Sequence output	Digital Outputs		O	O
		H3	Analog input	Analog Inputs		O	O
		H4	Analog output	Analog Outputs		O	O
		H5	MODBUS communication (RS-485)	Serial Com Setup			O
L	Protection	L1	Motor electronic overload thermal	Motor Overload		O	O
		L2	Momentary power loss ride-through	PwrLoss Ridethru		O	O
		L3	Stall prevention	Stall Prevention		O	O
		L4	Frequency detection	Ref Detection		O	O
		L5	Fault retry	Fault Restart		O	O
		L6	Overtorque detection	Torque Detection		O	O
		L7	Torque limit	Torque Limit		O	O
		L8	Hardware protection	Hdwe Protection		O	O
O	Operator	O1	Selection of display	Monitor Select		O	O
		O2	Operation (key functions)	Key Selections		O	O

1.6.2 Constant Initialization

To return the inverter constants to the factory settings or to replace the control circuit boards, initialize the constants after setting language selection (A1-00), control method selection (A1-02), or kVA selection (02-04).
The contents of initialization differ as shown below, depending on the set values.

A1-03	Name	Description
1110	User Initialize	• Returns to the initial value of user setting. • By setting 02-03=1 , constants stored in the inverter are stored as user setting initial values. • Up to 50 constants can be stored in the inverter as user setting initial values. When the constants are not stored as user setting initial values, this initialization is not possible.
2220	2-Wire Initialize	Terminal 1 becomes FWD run command and terminal 2 becomes REV run command.
3330	3-Wire Initialize	Terminal 1 becomes run command, terminal 2 becomes stop command and terminal 3 becomes FWD/REV run selection.

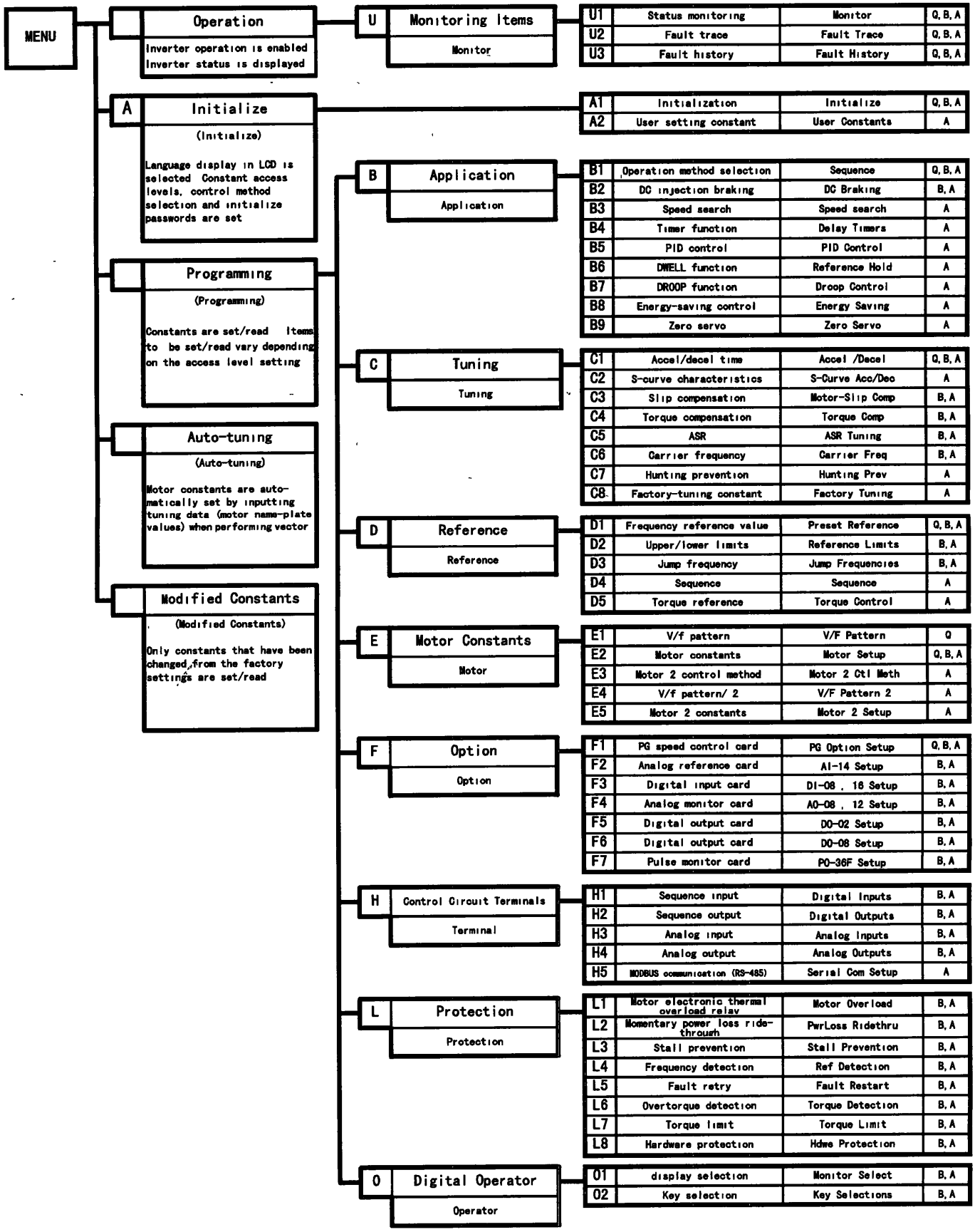
Term 5

○ The following shows typical operation to initialize to English display and open loop vector control.

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference		Frequency Ref U1-01=60.00Hz	
• Displays Main Menu	MENU	**Main Menu** Operation	
• Displays Initialize	↓ ↑	**Main Menu** Initialize	
• Select Initialize	DATA/ENTER	Select Language English	• When selecting Initialize, Select Language is displayed.
• Displays Control Method	↓ ↑	Control Method Open Loop Vector	• To change control method, depress ENTER key and then ↑ key to select control method.
• Displays Initialize Selection	↓ ↑	Initialize No Initialize	
• Depress DATA/ENTER key	DATA/ENTER	A1-03=0 * No Initialize	
• Displays 2-Wire Initialize	↓ ↑	A1-03=2220 * 2-Wire Initial	
• Perform initialization	DATA/ENTER	Entry Accepted	After displaying Entry Accepted for 1 5 seconds, returns to display of Initialize Selection.
• Return to Operation	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference	DATA/ENTER	Frequency Ref U1-01=60 00Hz	

2. CONSTANT LIST

2.1 CONSTANTS ARRAY OF DIGITAL OPERATOR DISPLAY FUNCTIONS



Group	Function	Display	Access Level
U1	Status monitoring	Monitor	Q, B, A
U2	Fault trace	Fault Trace	Q, B, A
U3	Fault history	Fault History	Q, B, A
A1	Initialization	Initialize	Q, B, A
A2	User setting constant	User Constants	A
B1	Operation method selection	Sequence	Q, B, A
B2	DC injection braking	DC Braking	B, A
B3	Speed search	Speed search	A
B4	Timer function	Delay Timers	A
B5	PID control	PID Control	A
B6	DWELL function	Reference Hold	A
B7	DROOP function	Droop Control	A
B8	Energy-saving control	Energy Saving	A
B9	Zero servo	Zero Servo	A
C1	Accel/decel time	Accel /Decel	Q, B, A
C2	S-curve characteristics	S-Curve Acc/Dec	A
C3	Slip compensation	Motor-Slip Comp	B, A
C4	Torque compensation	Torque Comp	B, A
C5	ASR	ASR Tuning	B, A
C6	Carrier frequency	Carrier Freq	B, A
C7	Hunting prevention	Hunting Prev	A
C8	Factory-tuning constant	Factory Tuning	A
D1	Frequency reference value	Preset Reference	Q, B, A
D2	Upper/lower limits	Reference Limits	B, A
D3	Jump frequency	Jump Frequencies	B, A
D4	Sequence	Sequence	A
D5	Torque reference	Torque Control	A
E1	V/f pattern	V/F Pattern	Q
E2	Motor constants	Motor Setup	Q, B, A
E3	Motor 2 control method	Motor 2 Ctl Meth	A
E4	V/f pattern/ 2	V/F Pattern 2	A
E5	Motor 2 constants	Motor 2 Setup	A
F1	PG speed control card	PG Option Setup	Q, B, A
F2	Analog reference card	AI-14 Setup	B, A
F3	Digital input card	DI-08 , 16 Setup	B, A
F4	Analog monitor card	AO-08 , 12 Setup	B, A
F5	Digital output card	DO-02 Setup	B, A
F6	Digital output card	DO-08 Setup	B, A
F7	Pulse monitor card	PO-36F Setup	B, A
H1	Sequence input	Digital Inputs	B, A
H2	Sequence output	Digital Outputs	B, A
H3	Analog input	Analog Inputs	B, A
H4	Analog output	Analog Outputs	B, A
H5	MODBUS communication (RS-485)	Serial Com Setup	A
L1	Motor electronic thermal overload relay	Motor Overload	B, A
L2	Momentary power loss ride-through	PwrLoss Ridethru	B, A
L3	Stall prevention	Stall Prevention	B, A
L4	Frequency detection	Ref Detection	B, A
L5	Fault retry	Fault Restart	B, A
L6	Overtorque detection	Torque Detection	B, A
L7	Torque limit	Torque Limit	B, A
L8	Hardware protection	Hdwe Protection	B, A
O1	display selection	Monitor Select	B, A
O2	Key selection	Key Selections	B, A

2.2 VS-616G5 CONSTANT LIST (1)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Initialize	Initialize	A1-00	Language selection for digital operator display (Select Language)	0, 1	1	1 *1	0 English 1 Japanese	O	Q	Q	Q	Q
		A1-01	Constant access level (Access Level)	0~4	1	2	0 Exclusive for monitor 1 User program 2 Quick-start (Q) 3 Basic (B) 4 Advanced (A)	O	Q	Q	Q	Q
		A1-02	Control method selection (Control Method)	0~3	1	2 *1	0 V/f Control 1 V/f with PG feedback 2 Open loop vector 3 Flux vector	×	Q	Q	Q	Q
		A1-03	Initialize (Init Parameters)	0000~ 9999	1	0000	1110 User Initialize 2220 2-Wire Initialize 3330 3-Wire Initialize	×	Q	Q	Q	Q
		A1-04	Password 1 (Enter Password)	0000~ 9999	1	0000		×	Q	Q	Q	Q
		A1-05	Password 2 (Select Password)	0000~ 9999	1	0000		×	Q	Q	Q	Q
	User Constants	A2-01 | A2-32	User setting constant (User Param 1 to 32)	-	-	-		×	A	A	A	A
Application	Sequence	B1-01	Reference selection (Reference Source)	0~3	1	1	0 Digital operator 1 Terminal 2 Serial communication 3 Option PCB	×	Q	Q	Q	Q
		B1-02	Operation method selection (Run Source)	0~3	1	1	0 Digital operator 1 Terminal 2 Serial communication 3 Option PCB	×	Q	Q	Q	Q
		B1-03	Stopping method selection (Stopping Method)	0~3 *3	1	0	0 Ramp to stop 1 Coast to stop 2 DC injection to stop 3 Coast with timer	×	Q	Q	Q	Q
		B1-04	Prohibition of reverse operation (Reverse Oper)	0 , 1	1	0	0 Reverse enabled 1 Reverse disabled	×	B	B	B	B
		B1-05	Operation selection for setting of E1-09 or less (Zero-Speed Oper)	0~3	1	0	0 Run at frequency reference 1 STOP 2 Run at min frequency 3 Run at zero speed	×	×	×	×	A
		B1-06	Read sequence input twice (Cntl Input Scan)	0 , 1	1	1	0 2ms - 2 Scans 1 5ms - 2 Scans	×	A	A	A	A
	DC Braking	B2-01	Zero speed level (DC injection braking starting frequency) (DCInj Start Freq)	0 0~ 10 0	0 1Hz	0 5		×	B	B	B	B
		B2-02	DC injection braking current (DCInj Current)	0~100	1%	50		×	B	B	B	×
		B2-03	DC injection braking time at start (DCInj Time @Start)	0 00~ 10 00	0 01sec	0 00		×	B	B	B	B
		B2-04	DC injection braking time at stop (DCInj Time @Stop)	0 00~ 10 00	0 01sec	0 50		×	B	B	B	B

* 1 Not initialized (Domestic standard specifications A1-01=1, A1-02=2)

* 2 Setting range is only 0 and 1 when the control method is set to flux vector control (A1-03=3)

* 3 Constant access levels

Setting / reading enabled at Q Quick-start(A1-01=2), B Basic(A1-01=3), A Advanced(A1-01=4)

X Setting / reading disabled

VS-616G5 CONSTANT LIST (2)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Application	Speed Search	b3-01	Speed search selection at start (SpdSrch at Start)	0, 1	1	0 *	0 Disabled 1 Enabled * Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	A
		b3-02	Speed search operating current (SpdSrch Current)	0~200	1%	150		×	A	×	A	×
		b3-03	Speed search deceleration time (SpdSrch Dec Time)	0 1~ 10 0	0 1sec	2 0		×	A	×	A	×
	Delay Timers	b4-01	Timer function ON-delay time (Delay-ON Timer)	0 0~ 300 0	0 1sec	0 0		×	A	A	A	A
		b4-02	Timer function OFF-delay time (Delay-OFF Timer)	0 0~ 300 0	0 1sec	0 0		×	A	A	A	A
	PID Control	b5-01	PID control mode selection (PID Mode)	0, 1, 2	1	0	0 Disabled 1 Enabled (D=Feedback) 2 Enabled (D=Feed-Forward)	×	A	A	A	A
		b5-02	Proportional gain (P) (PID Gain)	0 00~ 10 00	0 01	1 00		×	A	A	A	A
		b5-03	Integral (I) time (PID I Time)	0 0~ 360 0	0 1sec	1 0		×	A	A	A	A
		b5-04	Integral (I) limit (PID I Limit)	0 0~ 100 0	0 1%	100 0		×	A	A	A	A
		b5-05	Differential (D) time (PID D Time)	0 00~ 10 00	0 01sec	0 00		×	A	A	A	A
		b5-06	PID limit (PID Limit)	0 0~ 100 0	0 1%	100 0		×	A	A	A	A
		b5-07	PID offset adjustment (PID Offset)	-100 0 ~ 100 0	0 1%	0 0		×	A	A	A	A
		b5-08	PID primary delay time constant (PID Delay Time)	0 00~ 10 00	0 01sec	0 00		×	A	A	A	A
	Reference Hold	b6-01	Dwell frequency at start (Dwell Ref @ Start)	0 0~ 400 0	0 1Hz	0 0		×	A	A	A	A
		b6-02	Dwell time at start (Dwell Time @ Start)	0 0~ 10 0	0 1sec	0 0		×	A	A	A	A
		b6-03	Dwell frequency at stop (Dwell Ref @ Stop)	0 0~ 400 0	0 1Hz	0 0		×	A	A	A	A
		b6-04	Dwell time at stop (Dwell Time @ Stop)	0 0~ 10 0	0 1sec	0 0		×	A	A	A	A
	Droop Control	b7-01	Droop control gain (Droop gain)	0 00~ 1 00	0 01	0 00		×	×	×	×	A
		b7-02	Droop control delay time (Droop Delay Time)	0 00~ 1 00	0 01sec	0 00		×	×	×	×	A
	Energy Saving	b8-01	Energy-saving gain (Energy Save Gain)	0~100	1%	80		×	A	A	×	×
		b8-02	Energy-saving frequency (Energy Save Freq)	0 0~ 400 0	0 1Hz	0 0		×	A	A	×	×
	Zero Servo	b9-01	Zero-servo gain (Zero Servo Gain)	0~100	1	5		×	×	×	×	A
		b9-02	Zero-servo completion width (Zero Servo Count)	0~ 16383	1	10		×	×	×	×	A

VS-616G5 CONSTANT LIST (3)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Tuning	Accel / Decel	C1-01	Acceleration time 1 (Accel Time 1)	Depending on C1-10	Depending on C1-10	10 0		O	Q	Q	Q	Q
		C1-02	Deceleration time 1 (Decel Time 1)			10 0		O	Q	Q	Q	Q
		C1-03	Acceleration time 2 (Accel Time 2)			10 0		O	B	B	B	B
		C1-04	Deceleration time 2 (Decel Time 2)			10 0		O	B	B	B	B
		C1-05	Acceleration time 3 (Accel Time 3)			10 0		×	A	A	A	A
		C1-06	Deceleration time 3 (Decel Time 3)	0 00-600 00 or 0 0-6000 0	0 01 sec or 0 1 sec	10 0		×	A	A	A	A
		C1-07	Acceleration time 4 (Accel Time 4)			10 0		×	A	A	A	A
		C1-08	Deceleration time 4 (Decel Time 4)			10 0		×	A	A	A	A
		C1-09	Emergency stop time (Fast Stop Time)			10 0		O	B	B	B	B
		C1-10	Accel / decel time setting unit (Acc / Dec Units)	0, 1	1	1	0 0 01 Seconds 1 0 1 Seconds	×	A	A	A	A
		C1-11	Accel / decel time switching frequency (Acc / Dec SW Freq)	0 0～400 0	0 1Hz	0 00		×	A	A	A	A
	S-Curve ACC / Dec	C2-01	S-curve characteristic time at acceleration start (SCrv Acc@ Start)	0 00～2 50	0 01sec	0 20		×	A	A	A	A
		C2-02	S-curve characteristic time at acceleration end (SCrv Acc@ End)	0 00～2 50	0 01sec	0 20		×	A	A	A	A
		C2-03	S-curve characteristic time at deceleration start (SCrv Dec@ Start)	0 00～2 50	0 01sec	0 20		×	A	A	A	A
		C2-04	S-curve characteristic time at deceleration end (SCrv Dec@ End)	0 00～2 50	0 01sec	0 00		×	A	A	A	A
	Motor-Slip Compensation	C3-01	Slip compensation gain (Slip Comp Gain)	0 0～2 5	0 1	1 0 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	O	B	×	B	B
		C3-02	Slip compensation primary delay time (Slip Comp Time)	0～10000	1ms	200 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	×	A	×
		C3-03	Slip compensation limit (Slip comp Limit)	0～250	1%	200		×	A	×	A	×
		C3-04	Slip compensation selection during regeneration (Slip Comp Regen)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	×
	Torque Compensation	C4-01	Torque compensation gain (Torq comp Gain)	0 00～2 50	0 01	1 00		O	B	B	B	×
		C4-02	Torque compensation time constant (Torq Comp Time)	0～10000	1ms	20 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	×
	Constant No.	C5-01	ASR proportional (P) gain 1 (ASR P Gain 1)	0 00～300 00	0 01	20 00 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	O	×	B	×	B
		C5-02	ASR integral (I) time 1 (ASR I Time 1)	0 000 ～ 10 000	0 001 sec	0 500 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	O	×	B	×	B
		C5-03	ASR proportional (P) gain 2 (ASR P Gain 2)	0 00～300 00	0 01	20 00 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	O	×	B	×	B
		C5-04	ASR integral (I) time 2 (AR I Time 2)	0 000 ～ 10 000	0 001 sec	0 500 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	O	×	B	×	B

VS-616G5 CONSTANT LIST (4)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (○ Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Tuning	ASR	C5-05	ASR limit (ASR Limit)	0 0~20 0	0 1%	5 0		×	×	A	×	×
		C5-06	ASR primary delay time (ASR Delay Time)	0 000~0 500	0 001sec	0 004		×	×	×	×	A
		C5-07	ASR switching frequency (ASR Gain SW Freq)	0 0~400 0	0 1Hz	0 0		×	×	×	×	A
	Carrier Frequency	C6-01	Carrier frequency upper limit (Carrier Freq Max)	0 4~15 0**	0 1KHz	15 0 **	When vector control (A1-02=2 or 3) is selected, the setting range of C6-01 and 02 is 2 0 to 15 0	×	B	B	B	B
		C6-02	Carrier frequency lower limit (Carrier Freq Min)	0 4~15 0**	0 1KHz	15 0 **	** Setting range and factory setting differ depending on the inverter capacity (Refer to page 26 or 27)	×	A	A	×	×
		C6-03	Carrier frequency proportional gain (Carrier Freq Gain)	00~99 **	1	00 **		×	A	A	×	×
	Hunting Prevention	C7-01	Hunting prevention selection (Hunt Prev Select)	0 1	1	1	0 Disabled 1 Enabled	×	A	A	×	×
		C7-02	Hunting prevention gain (Hunt Prev Gain)	0 00~2 50	0 01	1 00		×	A	A	×	×
	Factory Tuning	C8-08	AFR gain (AFR Gain)	0 00~10 00	0 01	1 00		×	×	×	A	×
Reference	Preset Reference	D1-01	Frequency reference 1 (Reference 1)	0 0~400 0	0 1Hz	0 0		○	Q	Q	Q	Q
		D1-02	Frequency reference 2 (Reference 2)	0 0~400 0	0 1Hz	0 0		○	Q	Q	Q	Q
		D1-03	Frequency reference 3 (Reference 3)	0 0~400 0	0 1Hz	0 0		○	Q	Q	Q	Q
		D1-04	Frequency reference 4 (Reference 4)	0 0~400 0	0 1Hz	0 0		○	Q	Q	Q	Q
		D1-05	Frequency reference 5 (Reference 5)	0 0~400 0	0 1Hz	0 0		○	B	B	B	B
		D1-06	Frequency reference 6 (Reference 6)	0 0~400 0	0 1Hz	0 0		○	B	B	B	B
		D1-07	Frequency reference 7 (Reference 7)	0 0~400 0	0 1Hz	0 0		○	B	B	B	B
		D1-08	Frequency reference 8 (Reference 8)	0 0~400 0	0 1Hz	0 0		○	B	B	B	B
		D1-09	Jog frequency reference (Jog Reference)	0 0~400 0	0 1Hz	6 0		○	Q	Q	Q	Q
	Reference Limit	D2-01	Frequency reference upper limit (Ref Upper Limit)	0 0~110 0	0 1%	100 0		×	B	B	B	B
		D2-02	Frequency reference lower limit (Ref Lower Limit)	0 0~100 0	0 1%	0 0		×	B	B	B	B

VS-616G5 CONSTANT LIST (5)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (○ Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Reference	Jump frequencies	D3-01	Jump frequency 1 (Jump freq 1)	0.0～400.0	0.1Hz	0.0		×	B	B	B	B
		D3-02	Jump frequency 2 (Jump freq 2)	0.0～400.0	0.1Hz	0.0		×	B	B	B	B
		D3-03	Jump frequency 3 (Jump freq 3)	0.0～400.0	0.1Hz	0.0		×	B	B	B	B
		D3-04	Jump frequency width (Jump Bandwidth)	0.0～20.0	0.1Hz	1.0		×	B	B	B	B
	Sequence	D4-01	Frequency reference hold function selection (MOP Ref Memory)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	A
		D4-02	+− Speed limits (Trim Control Lvl)	0～100	1%	25		×	A	A	A	A
	Torque Control	D5-01	Torque control selection (Torq Control Sel)	0, 1	1	0	0 Speed control 1 Torque control	×	×	×	×	A
		D5-02	Torque reference delay time (Torque Ref Filter)	0～1000	1msec	0		×	×	×	×	A
		D5-03	Speed limit selection (Speed Limit Sel)	1, 2	1	1	1 Analog input (terminals 13, 14) 2 Program setting	×	×	×	×	A
		D5-04	Speed limit (Speed Lmt Value)	−120～+120	1%	0		×	×	×	×	A
		D5-05	Speed limit bias (Speed Lmt Bias)	0～120	1%	10		×	×	×	×	A
		D5-06	Speed/torque control switching timer (Ref Hold Time)	0～1000	1msec	0		×	×	×	×	A
Motor	V / f Pattern	E1-01	Input voltage setting (Input Voltage)	155～255 *1	1V	200 *1		×	Q	Q	Q	Q
		E1-02	Motor selection (Motor Selection)	0, 1	1	0	0 Standard motor 1 Inverter motor	×	Q	Q	Q	Q
		E1-03	V / f pattern selection (V/F Selection)	00～0F	1	0F	00 to 0E 15 preset V/f patterns 0F Custom V/f patterns	×	Q	Q	×	×
		E1-04	Max output frequency (Max frequency)	50.0～400.0	0.1Hz	60.0		×	Q	Q	Q	Q
		E1-05	Max voltage (Max Voltage)	0.0～255.0 *1	0.1V	200.0 *1		×	Q	Q	Q	Q
		E1-06	Max voltage frequency (Base Frequency)	0.0～400.0	0.1Hz	60.0		×	Q	Q	Q	Q
		E1-07	Mid output frequency (Mid Frequency A)	0.0～400.0	0.1Hz	3.0 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	Q	Q	A	
		E1-08	Mid output frequency voltage (Mid voltage A)	0.0～255.0 *1	0.1V	11.0 *1 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	Q	Q	A	
		E1-09	Min output frequency (Min Frequency)	0.0～400.0	0.1Hz	0.5 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	Q	Q	Q	A
		E1-10	Min output frequency voltage (Min Voltage)	0.0～255.0 *1	0.1V	2.0 *1 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	Q	Q	A	

*1 Set value for 200V class For 400V class, the value is twice as that of 200V class

VS-616G5 CONSTANT LIST (6)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (○ Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Motor	Motor setup	E2-01	Motor rated current (Motor Rated FLA)	0 01～1500 0	0 1A *1	1 90 **	*1 Setting unit is 0 01A for models of 7 5kW or below	×	Q	Q	Q	Q
		E2-02	Motor rated slip (Motor Rated slip)	0 00～20 00	0 01Hz	2 90 **	** Factory setting differs depending on inverter capacity (Refer to page 26 or 27)	×	A	A	Q	Q
		E2-03	Motor no-load current (No-Load Current)	0 00～1500 0	0 01A	1 20 **		×	A	A	Q	Q
		E2-04	Number of motor poles (Number of Poles)	2～48	1pole	4		×	×	Q	×	Q
		E2-05	Motor line-to-line resistance (Term Resistance)	0 000 ～ 65 000	0 001Ω	9 842 **		×	A	A	A	A
		E2-06	Motor leak inductance (Leak Inductance)	0 0～30 0	0 1%	18 2 **		×	×	×	A	A
		E2-07	Motor iron-core saturation coefficient 1 (Saturation comp 1)	0 00～0 50	0 01	0 50		×	×	×	A	A
		E2-08	Motor iron-core saturation coefficient 2 (Saturation comp 2)	0 00～0 75	0 01	0 75		×	×	×	A	A
		E2-09	Motor mechanical loss (Mechanical Loss)	0 0～10 0	0 1%	0 0		×	×	×	×	A
	Motor 2 Control Method	E3-01	Motor 2 control method selection (Control Method)	0～3	1	2	0 V/f control 1 V/f with PG feedback 2 Open loop vector 3 Flux vector	×	A	A	A	A
	V / f Pattern 2	E4-01	Motor 2 max output frequency (V/F2 Max Freq)	50 0～400 0	0 1Hz	60 0		×	A	A	A	A
		E4-02	Motor 2 max voltage (V/F2 Max Voltage)	0 0～255 0 *2	0 1V	200 0 *2		×	A	A	A	A
		E4-03	Motor 2 max voltage frequency (V/F2 Base Freq)	0 0～400 0	0 1Hz	60 0		×	A	A	A	A
		E4-04	Motor 2 mid output frequency 1 (V/F2 Mid Freq)	0 0～400 0	0 1Hz	3 0 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	
		E4-05	Motor 2 mid output frequency voltage 1 (V/F2 Mid Voltage)	0 0～255 0 *2	0 1V	10 0 *2 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	
		E4-06	Motor 2 min output frequency (V/F2 Min Freq)	0 0～400 0	0 1Hz	0 5 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	
		E4-07	Motor 2 min output frequency voltage (V/F2 Min Voltage)	0 0～255 0 *2	0 1V	1 7 *2 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	
	Motor 2 Setup	E5-01	Motor 2 rated current (Motor 2 rated FLA)	0 00～1500 0	0 1A *1	1 90 **	*1 Setting unit is 0 01A for models of 7 5kW or below	×	A	A	A	A
		E5-02	Motor 2 rated slip (Motor 2 Slip Freq)	0 00～20 00	0 01Hz	2 90 **	** Factory setting differs depending on inverter capacity	×	A	A	A	A
		E5-03	Motor 2 no-load current (Motor 2 No-load I)	0 00～1500 0	0 01A	1 20 **		×	A	A	A	A
		E5-04	Motor 2 number of poles (Motor 2 # Poles)	2～48	1pole	4		×	×	A	×	A
		E5-05	Motor 2 line-to-line resistor (Motor 2 term Ohms)	0 000 ～ 65 000	0 001Ω	9 842 **		×	A	A	A	A
		E5-06	Motor 2 leak inductance (Motor 2 Leak)	0 0～30 0	0 1%	18 2 **		×	×	×	A	A

*2 : Set value for 200V class For 400V class, the value is twice as that of 200V class

VS-616G5 CONSTANT LIST (7)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Options	PG Option Setup	F1-01	PG constant (PG Pulses/Rev)	0~60000	1	600		×	×	Q	×	Q
		F1-02	Operation selection at PG open circuit (PG Fdbk Loss Sel)	0~3	1	1	0 : Ramp to stop 2 Fast-stop 1 Coast to stop 3 Alarm only	×	×	B	×	B
		F1-03	Operation selection at overspeed (PG Overspeed Sel)	0~3	1	1	0 Ramp to stop 2 Fast-stop 1 Coast to stop 3 Alarm only	×	×	B	×	B
		F1-04	Operation selection at deviation (PG Deviation Sel)	0~3	1	3	0 Ramp to stop 2 Fast-stop 1 Coast to stop 3 Alarm only	×	×	B	×	B
		F1-05	PG rotation (PG Rotation Sel)	0, 1	1	0	0 Counter-clockwise 1 Clockwise	×	×	B	×	B
		F1-06	PG division rate (PG pulse monitor) (PG Output Ratio)	1~132	1	1	Effective only with control circuit board PG-B2	×	×	B	×	B
		F1-07	Integral value during accel/decel enable/disable (PG Ramp PI/I Sel)	0, 1	1	0	0 Disabled 1 Enabled	×	×	B	×	×
		F1-08	Overspeed detection level (PG Overspd Level)	0~120	1%	115		×	×	A	×	A
		F1-09	Overspeed detection delay time (PG Overspd Time)	0.0~2.0	0.1sec	0.0 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	×	A	×	A
		F1-10	Excessive speed deviation detection level (PG Deviate Level)	0~50	1%	10		×	×	A	×	A
		F1-11	Excessive speed deviation detection delay time (PG Deviate Time)	0.0~10.0	0.1sec	0.5		×	×	A	×	A
		F1-12	Number of PG gear teeth 1 (PG# Gear Teeth 1)	0~1000	1	0		×	×	A	×	×
		F1-13	Number of PG gear teeth 2 (PG# Gear Teeth 2)	0~1000	1	0		×	×	A	×	×
	AI	F2-01	Bi-polar or uni-polar input selection (AI-14 Input Sel)	0, 1	1	0	0 3-channel individual 1 3-channel addition	×	B	B	B	×
	DI	F3-01	Digital input option (DI Input)	0~7	1	0	0 BCD 1% 1 BCD 0.1% 2 BCD 0.01% 3 BCD 1Hz 4 BCD 0.1Hz 5 BCD 0.01Hz 6 BCD (5DG) 0.01Hz 7 BN 0.01Hz 8 Binary	×	B	B	B	B
	AO-08 · 12	F4-01	Channel 1 monitor selection (AO Ch1 Select)	1~31	1	2		×	B	B	B	B
		F4-02	Channel 1 gain (AO Ch1 Gain)	0.00~2.50	0.01	1.00		O	B	B	B	B
		F4-03	Channel 2 monitor selection (AO Ch2 Select)	1~31	1	3		×	B	B	B	B
		F4-04	Channel 2 gain (AO Ch2 Gain)	0.00~2.50	0.01	0.50		O	B	B	B	B
	DO-02	F5-01	Channel 1 output selection (DO-02 Ch1 Select)	00~FF	1	0		×	B	B	B	B
		F5-02	Channel 2 output selection (DO-02 Ch2 Select)	00~FF	1	1		×	B	B	B	B
	DO-08	F6-01	Output mode selection (DO-08 Selection)	0, 1	1	0	0 8-channel individual 1 Binary output	×	B	B	B	B
	PO-36	F7-01	Frequency multiple selection (PO-36F Selection)	0~4	1	1	0 1×Output frequency 1 6×Output frequency 2 10×Output frequency 3 12×Output frequency 4 36×Output frequency	×	B	B	B	B

VS-616G5 CONSTANT LIST (8)

Function		Con-stant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Terminal	Digital Inputs	H1-01	Multi-function input (terminal 3) (Terminal 3 Sel)	00~FF	1	24		×	B	B	B	B
		H1-02	Multi-function input (terminal 4) (Terminal 4 Sel)	00~FF	1	14		×	B	B	B	B
		H1-03	Multi-function input (terminal 5) (Terminal 5 Sel)	00~FF	1	3 (0) *1		×	B	B	B	B
		H1-04	Multi-function input (terminal 6) (Terminal 6 Sel)	00~FF	1	4 (3) *1		×	B	B	B	B
		H1-05	Multi-function input (terminal 7) (Terminal 7 Sel)	00~FF	1	6 (4) *1		×	B	B	B	B
		H1-06	Multi-function input (terminal 8) (Terminal 8 Sel)	00~FF	1	8 (6) *1		×	B	B	B	B
	Digital Outputs	H2-01	Multi-function input (terminal 9-10) (Terminal 9 Sel)	00~FF	1	0		×	B	B	B	B
		H2-02	Multi-function input (terminal 25-27) (Terminal 25 Sel)	00~FF	1	1		×	B	B	B	B
		H2-03	Multi-function input (terminal 26-27) (Terminal 26 Sel)	00~FF	1	2		×	B	B	B	B
	Analog Inputs	H3-01	Signal level selection (terminal 13) (Term 13 Signal)	0, 1	1	0	0 0 to 10 VDC 1 −10 to +10VDC	×	B	B	B	B
		H3-02	Gain (terminal 13) (Terminal 13 Gain)	0 0~ 1000 0	0 1%	100 0		O	B	B	B	B
		H3-03	Bias (terminal 13) (Terminal 13 Bias)	−100 0 ~ +100 0	0 1%	0 0		O	B	B	B	B
		H3-04	Signal level selection (terminal 16) (Term 16 Signal)	0, 1	1	0	0 0 to 10 VDC 1 −10 to +10VDC	×	B	B	B	B
		H3-05	Multi-function analog input (terminal 16) (Terminal 16 Sel)	0~1F	1	0		×	B	B	B	B
		H3-06	Gain (terminal 16) (Terminal 16 Gain)	0 0~ 1000 0	0 1%	100 0		O	B	B	B	B
		H3-07	Bias (terminal 16) (Terminal 16 Bias)	−100 0 ~ +100 0	0 1%	0 0		O	B	B	B	B
		H3-08	Signal level selection (terminal 14) (Term 14 Signal)	0, 1, 2	1	2	0 0 to 10 VDC 1 −10 to +10VDC 2 4 to 20mA	×	A	A	A	A
		H3-09	Multi-function analog input (terminal 14) (Terminal 14 Sel)	0~1F	1	1F		×	A	A	A	A
		H3-10	Gain (terminal 14) (Terminal 14 Gain)	0 0~ 1000 0	0 1%	100 0		O	A	A	A	A
		H3-11	Bias (terminal 14) (Terminal 14 Bias)	−100 0 ~ +100 0	0 1%	0 0		O	A	A	A	A
		H3-12	Analog input filter time constant (Filter Avg Time)	0 00~ 2 00	0 01sec	0 00		×	A	A	A	A
	Analog Outputs	H4-01	Monitor selection (terminal 21) (Terminal 21 Sel)	1~31	1	2		×	B	B	B	B
		H4-02	Gain (terminal 21) (Terminal 21 Gain)	0 00~ 2 50	0 01	1 00		O	B	B	B	B
		H4-03	Bias (terminal 21) (Terminal 21 Bias)	−10 0 ~ +10 0	0 0%	0 0		O	B	B	B	B

*1 Factory settings in the parentheses are values obtained at 3-wire initialization

VS-616G5 CONSTANT LIST (9)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (○ Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Terminal	Analog Outputs	H4-04	Monitor selection (terminal 23) (Terminal 23 Sel)	1~31	1	3		×	B	B	B	B
		H4-05	Gain (terminal 23) (Terminal 23 Gain)	0.00~2.50	0.01	0.50		○	B	B	B	B
		H4-06	Bias (terminal 23) (Terminal 23 Bias)	−10.0~+10.0	0.1%	0.0		○	B	B	B	B
		H4-07	Analog output signal level selection (AO Level Select)	0, 1	1	0	0 0 to 10VDC 1 −10 to +10VDC	×	B	B	B	B
	Serial Communication Setup	H5-01	Station address (Serial Comm Adr)	0~1F	1	1F		×	A	A	A	A
		H5-02	Communication speed selection (Serial Baud Rate)	0~3	1	3	0 1200 baud 2 4800 baud 1 2400 baud 3 9600 baud	×	A	A	A	A
		H5-03	Communication parity selection (Serial Com Sel)	0, 1, 2	1	0	0 No parity 2 Odd parity 1 Even parity	×	A	A	A	A
		H5-04	Stopping method after communication error (Serial Fault Sel)	0~3	1	3	0 Ramp to stop 2 Fast-stop 1 Coast to stop 3 Alarm only	×	A	A	A	A
Protection	Motor Overload	L1-01	Motor protection selection (MOL Fault select)	0, 1	1	1	0 Disabled 1 Enabled	×	B	B	B	B
		L1-02	Motor protection time constant (MOL Time Const)	0.1~5.0	0.1min	1.0		×	B	B	B	B
	Power Loss Ridethru	L2-01	Momentary power loss detection (PwrL Selection)	0, 1, 2	1	0	0 Disabled 1 Power loss ridethru 2 CPU power active	×	B	B	B	B
		L2-02	Momentary power loss ridethru time (PwrL Ridethru t)	0.0~2.0	0.1sec	0.7 **	** Factory setting differs depending on inverter capacity (Refer to page 26 or 27)	×	B	B	B	B
		L2-03	Min baseblock time (PwrL Baseblock t)	0.0~5.0	0.1sec	0.5 **	** Factory setting differs depending on inverter capacity (Refer to page 26 or 27)	×	B	B	B	B
		L2-04	Voltage recovery time (PwrL V/F Ramp t)	0.0~2.0	0.1sec	0.3		×	A	A	A	A
		L2-05	Undervoltage detection level (PUV Det Level)	150~210	1V	190 *1	*1 Set value for 200V class For 400V class, the value is twice as that of 200V class	×	A	A	A	A
	Stall Prevention	L3-01	Stall prevention selection during accel (StallP Accel Sel)	0, 1, 2	1	1	0 Disabled 2 Intelligent 1 General-purpose	×	B	B	B	×
		L3-02	Stall prevention level during accel (StallP Accel Lvl)	0~200	1%	150		×	B	B	B	×
		L3-03	Stall prevention limit during accel (StallP CHP Lvl)	0~100	1%	100 *	* Changing the control method (A1-02) changes the set value automatically (Refer to page 25)	×	A	A	A	×
		L3-04	Stall prevention selection during decel (StallP Decel Sel)	0, 1, 2	1	1	0 Disabled 2 Intelligent 1 General-purpose *2	×	B	B	B	B
		L3-05	Stall prevention selection during running (StallP Run Sel)	0, 1, 2	1	1	0 Disabled 1 Decel time 1 2 Decel time 2	×	B	B	×	×
		L3-06	Stall prevention level during running (StallP Run Level)	30~200	1%	160		×	B	B	×	×

*2 When vector control (A1-02 = 2 or 3) is selected, set value 2 (intelligent) cannot be set

VS-616G5 CONSTANT LIST (10)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Protection	Reference Detection	L4-01	Speed agree detection level (Spd Agree Level)	0.0~400.0	0.1Hz	0.0		×	B	B	B	B
		L4-02	Speed agree detection width (Spd Agree Width)	0.0~20.0	0.1Hz	2.0		×	B	B	B	B
		L4-03	Speed agree detection level (+/−) (Spd Agree Lvl +−)	0.0~±400.0	0.1Hz	0.0		×	A	A	A	A
		L4-04	Speed agree detection width(+/−) (Spd Agree Wdth +−)	0.0~20.0	0.1Hz	2.0		×	A	A	A	A
		L4-05	Operation when frequency reference is missing (Ref Loss Sel)	0, 1	1	0	0 Stop 1 Run at 80% of frequency reference	×	A	A	A	A
	Fault Restart	L5-01	Number of auto restart attempts (Num of Restarts)	0~10	1time	0		×	B	B	B	B
		L5-02	Auto restart operation selection (Restart Sel)	0, 1	1	0	0 No fault retry 1 Fault retry active	×	B	B	B	B
	Torque Detection	L6-01	Torque detection selection 1 (Torq Det 1 Sel)	0~4	1	0	0 Disabled 1 Detected during speed agree, and operation continues after detection 2 Detected during running, and operation continues after detection 3 Detected during speed agree, and inverter output is shut OFF 4 Detected during running, and inverter output is shut OFF	×	B	B	B	B
		L6-02	Torque detection level 1 (Torq Det 1 Lvl)	0~300	1%	150		×	B	B	B	B
		L6-03	Torque detection time 1 (Torq Det 1 Time)	0.0~10.0	0.1sec	0.1		×	B	B	B	B
		L6-04	Torque detection selection 2 (Torq Det 2 Sel)	0~4	1	0	0 Disabled 1 Detected during speed agree, and operation continues after detection 2 Detected during running, and operation continues after detection 3 Detected during speed agree, and inverter output is shut OFF 4 Detected during running, and inverter output is shut OFF	×	A	A	A	A
		L6-05	Torque detection level 2 (Torq Det 2 Lvl)	0~300	1%	150		×	A	A	A	A
		L6-06	Torque detection selection 2 (Torq Det 2 Time)	0.0~10.0	0.1sec	0.1		×	A	A	A	A
	Torque Limit	L7-01	Forward torque limit (Torq Limit Fwd)	0~300	1%	200		×	×	×	B	B
		L7-02	Reverse torque limit (Torq Limit Rev)	0~300	1%	200		×	×	×	B	B
		L7-03	Forward regenerative torque limit (Torq Lmt Fwd Rgn)	0~300	1%	200		×	×	×	B	B
		L7-04	Reverse regenerative torque limit (Torq Lmt Rev Rgn)	0~300	1%	200		×	×	×	B	B
	Hardware Protection	L8-01	Protect selection for internal DB resistor (DB Resistor Prot)	0, 1	1	0	0 Not Provided 1 Provided	×	B	B	B	B
		L8-02	Over Heat pre-alarm level (OH Pre-Alarm Lvl)	50~110	1deg	95		×	A	A	A	A

VS-616G5 CONSTANT LIST (11)

Function		Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	*3 Constant Access Level			
									V / f	V / f with PG	Open Loop Vector	Flux Vector
Protection	Hardware Protection	L8-03	Operation selection after OH : pre-alarm (OH Pre-Alarm Sel)	0~3	1	3	0 Ramp to stop 2 Fast-stop 1 Coast to stop 3 Alarm only	×	A	A	A	A
		L8-05	Input open-phase protection selection (Ph Loss In Sel)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	A
		L8-07	Output open-phase protection selection (Ph Loss Out Sel)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	A
Operator	Monitor Select	01-01	Monitor selection (Monitor Select)	4~29	1	6		O	B	B	B	B
		01-02	Monitor selection after power up (Power-On Monitor)	1~4	1	1	1 Frequency reference 2 Output frequency 3 Output current 4 Selected monitor	O	B	B	B	B
		01-03	Frequency units of reference setting and monitor (Display Scaling)	0~39999	1	0		×	B	B	B	B
		01-04	Frequency units of constant setting (Display Units)	0, 1	1	0	0 H_z 1 r/min	×	×	×	×	B
		01-05	Constant No display selection (Address Display)	0, 1	1	0	0 Constant number 1 MODBUS address	×	A	A	A	A
	Key Select	02-01	LOCAL/REMOTE key enable/disable (Local/Remote Key)	0, 1	1	1	0 Disabled 1 Enabled	×	B	B	B	B
		02-02	STOP key during control circuit terminal operation (Oper STOP Key)	0, 1	1	1	0 Disabled 1 Enabled	×	B	B	B	B
		02-03	User constant initial value (User Defaults)	0, 1, 2	1	0	1 Set default 2 Clear all	×	B	B	B	B
		02-04	kVA selection (Inverter Model #)	0~FF	1	- *	* Not initialized Factory setting differs depending on the inverter capacity	×	B	B	B	B
		02-05	Frequency reference setting method selection (Operator M O P)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	A
		02-06	Operation selection when digital operator is disconnected (Oper Detection)	0, 1	1	0	0 Disabled 1 Enabled	×	A	A	A	A
		02-07	Cumulative operation time setting (Elapsed Time Set)	0~65535	1hour	-		×	A	A	A	A
		02-08	Cumulative operation time selection (Elapsed Time Run)	0, 1	1	0	0 Power-on time 1 Running time	×	A	A	A	A
		02-09	Initialize mode selection (Init mode sel)	0, 1, 2	1	2*	0 Japanese specification 1 US specification 2 European specification * Factory setting differs depending on the area	×	A	A	A	A

2.3 VS-616G5 MONITOR CONSTANT LIST (1)

* Analog monitor output selection is disabled

Function	Constant No	Name (Digital Operator Display)	Setting Unit	Remarks	Analog Monitor Output Level	*3 Constant Access Level			
						V / f	V / f with PG	Open Loop Vector	Flux Vector
Monitor	U1-01	Frequency reference (Frequency Ref)	0 01Hz	Setting unit differs depending on setting of 01-03	10V/max output frequency	Q	Q	Q	Q
	U1-02	Output frequency (Output Freq)	0 01Hz	Setting unit differs depending on setting of 01-03	10V/max output frequency	Q	Q	Q	Q
	U1-03	Output current (Output Current)	0 1A	Setting unit is 0 01A for 7 5kW or less	10V/inverter rated current	Q	Q	Q	Q
	U1-04	Control method * (Control Method)	-	0 V/f control 1 V/f with PG feedback 2 Open loop vector 3 Flux vector	-	Q	Q	Q	Q
	U1-05	Motor speed (Motor Speed)	0 01Hz		10V/max output frequency	×	Q	Q	Q
	U1-06	Output voltage (Output Voltage)	0 1V		10V/200V or 400V	Q	Q	Q	Q
	U1-07	DC bus voltage (DC Bus Voltage)	1V		10V/400V or 800V	Q	Q	Q	Q
	U1-08	Output power (Output kWatts)	0 1kW		10V/inverter capacity (kW)	Q	Q	Q	Q
	U1-09	Torque reference (internal) (Torque Reference)	0 1%		10V/motor rated torque	×	×	Q	Q
	U1-10	Input terminal status * (Input Term Sts)	-	0 0 0 0 0 0 0 0 Control circuit terminal 1 "Closed" Control circuit terminal 2 "Closed" Control circuit terminal 3 "Closed" Control circuit terminal 4 "Closed" Control circuit terminal 5 "Closed" Control circuit terminal 6 "Closed" Control circuit terminal 7 "Closed" Control circuit terminal 8 "Closed"	-	Q	Q	Q	Q
	U1-11	Output terminal status * (Output Term Sts)	-	0 0 0 0 0 0 0 0 Control circuit terminal 9-10 "Closed" Control circuit terminal 25 "Closed" Control circuit terminal 26 "Closed" Not used Not used Not used Not used Fault contact output operates	-	Q	Q	Q	Q
	U1-12	Operation status * (Int Ctl Sts 1)	-	0 0 0 0 0 0 0 0 During run During zero-speed During reverse run During reset signal inputting During speed agree Inverter operation ready Minor fault Major fault	-	Q	Q	Q	Q
	U1-13	Cumulative operation time * (Elapsed Time)	1hour		-	Q	Q	Q	Q
	U1-14	Software No (at FLASH side) * (FLASH ID)	-		-	Q	Q	Q	Q
	U1-15	Control circuit terminal 13 input voltage (Term 13 Level)	0 1%		10V/10V	B	B	B	B
	U1-16	Control circuit terminal 14 input voltage (Term 14 Level)	0 1%		10V/10V or 20mA	B	B	B	B
	U1-17	Control circuit terminal 16 input voltage (Term 16 Level)	0 1%		10V/10V	B	B	B	B
	U1-18	Motor secondary current (Iq) (Mot SEC Current)	0 1%		10V/motor rated primary current	B	B	B	B
	U1-19	Motor exciting current (Id) (Mot EXC Current)	0 1%		10V/motor rated primary current	×	×	B	B
	U1-20	Output frequency after soft-start (SFS Output)	0 01Hz		10V/max output frequency	A	A	A	A
	U1-21	ASR input (ASR Input)	0 01%		10V/max output frequency	×	A	×	A

VS-616G5 MONITOR CONSTANT LIST (2)

* Analog monitor output selection is disabled

Function	Constant No	Name (Digital Operator Display)	Setting Unit	Remarks	Analog Monitor Output Level	*3 Constant Access Level			
						V / f	V / f with PG	Open Loop Vector	Flux Vector
Monitor	U1-22	ASR output (ASR Output)	0.01%	Analog monitor output level becomes 10V/max output frequency with V/f control	10V/motor rated primary current	×	A	×	A
	U1-23	Speed deviation (Speed Deviation)	0.01%		10V/max output frequency	×	A	×	A
	U1-24	PID feedback amount (PID Feedback)	0.01%		10V/max output frequency	A	A	A	A
	U1-25	DI-16H input status * (DI-16 Reference)	-	Displays an input value according to the setting of F3-01 (ex) At lower digit 8-bit ON Binary selection 256, BCD selection 99	-	A	A	A	A
	U1-26	Output voltage reference Vq (Voltage Ref (Vq))	0.1V		10V/200V or 400V	×	×	A	A
	U1-27	Output voltage reference Vd (Voltage Ref (Vd))	0.1V		10V/200V or 400V	×	×	A	A
	U1-28	Software No (at CPU side) * (CPU ID)	-		-	A	A	A	A
Fault Trace	U2-01	Current fault (Current Fault)	-		-	Q	Q	Q	Q
	U2-02	Last fault (Last Fault)	-		-	Q	Q	Q	Q
	U2-03	Frequency reference at fault (Frequency Ref)	0.01Hz		-	Q	Q	Q	Q
	U2-04	Output frequency at fault (Output Freq)	0.01Hz		-	Q	Q	Q	Q
	U2-05	Output current at fault (Output Current)	0.1A		-	Q	Q	Q	Q
	U2-06	Motor speed at fault (Motor Speed)	0.01Hz		-	×	Q	Q	Q
	U2-07	Output voltage reference at fault (Output Voltage)	0.1V		-	Q	Q	Q	Q
	U2-08	DC bus voltage at fault (DC Bus Voltage)	1V		-	Q	Q	Q	Q
	U2-09	Output power at fault (Output kWatts)	0.1kW		-	Q	Q	Q	Q
	U2-10	Torque reference at fault (Torque Reference)	0.1%		-	×	×	Q	Q
	U2-11	Input terminal status at fault (Input Term Sts)	-	Displays the same status at that of U1-10	-	Q	Q	Q	Q
	U2-12	Output terminal status at fault (Output Term Sts)	-	Displays the same status at that of U1-11	-	Q	Q	Q	Q
	U2-13	Operation status at fault (Inverter Status)	-	Displays the same status at that of U1-12	-	Q	Q	Q	Q
	U2-14	Cumulative operation time at fault (Elapsed Time)	1hour		-	Q	Q	Q	Q
Fault History	U3-01	Most recent fault (Last Fault)	-		-	Q	Q	Q	Q
	U3-02	Second most recent fault (Fault Message 2)	-		-	Q	Q	Q	Q
	U3-03	Third most recent fault (Fault Message 3)	-		-	Q	Q	Q	Q
	U3-04	Fourth/oldest fault (Fault Message 4)	-		-	Q	Q	Q	Q
	U3-05	Cumulative operation time at fault (Elapsed Time 1)	1hour		-	Q	Q	Q	Q
	U3-06	Accumulated time of second fault (Elapsed Time 2)	1hour		-	Q	Q	Q	Q
	U3-07	Accumulated time of third fault (Elapsed Time 3)	1hour		-	Q	Q	Q	Q
	U3-08	Accumulated time of fourth/ oldest fault (Elapsed Time 4)	1hour		-	Q	Q	Q	Q

2.4 MULTI-FUNCTION I/O TERMINAL SETTING LIST

Set Value	Multi-function Input Terminal Function (H1-01, 02, 03, 04, 05, 06)	Multi-function Output Terminal Function (H2-01, 02, 03)	Multi-function Analog Input Terminal Function (H3-05)
00	3-Wire sequence (FWD/REV run selection)	During run	Auxiliary frequency reference
01	Local/remote selection	Zero-speed	FGAIN
02	Option/inverter selection	Frequency agree 1	FBIAS
03	Multi-step speed reference 1	Desired frequency agree 1	Not used
04	Multi-step speed reference 2	Frequency detection 1	VBIAS
05	Multi-step speed reference 3	Frequency detection 2	Accel/decel time reduction coefficient
06	Jog reference selection	Inverter operation ready	DC injection braking current
07	Accel/decel time selection 1	During undervoltage detection	Overtorque detection level
08	External baseblock (NO contact)	During baseblock	Stall prevention level during run
09	External baseblock (NC contact)	Frequency reference mode	Frequency reference lower limit level
0A	Accel/decel prohibit (hold)	Operation reference mode	Jump frequency
0B	Inverter overheat alarm	During overtorque detection 1 (NO contact output)	PID feedback
0C	Multi-function analog input enable/disable	Frequency reference missing	Not used
0D	Speed control cancel	Braking resistor fault	
0E	Speed control integral reset	Fault	
0F	Not used	Not used	
10	UP command	Alarm	FWD torque limit
11	DOWN command	During fault reset	REV torque limit
12	FJOG command	Timer output	Regeneration side torque limit
13	RJOG command	Frequency agree 2	Torque reference (at torque control), limit (at speed control)
14	Fault reset	Desired frequency agree 2	Torque compensation
15	Emergency stop	Frequency detection 3	FWD/REV torque limits
16	Not used	Frequency detection 4	
17	Not used	During overtorque detection 1 (NC contact)	
18	Timer input	During overtorque detection 2 (NO contact)	
19	PID control cancel	During overtorque detection 2 (NC contact)	
1A	Accel/decel time selection 2	During reverse run	
1B	Constant write-in prohibit	During baseblock	
1C	Not used	Motor selection	
1D	Not used	Motoring/regenerating mode	
1E	Analog frequency reference S/H	During retry	
1F	Analog input terminal (13/14) selection	OL1 pre-alarm	
20	External fault	OH pre-alarm	
21-2F		Not used	
30	Not used	During current/torque limiting	Not used
31		During speed limit	
32		Not used	
33		Zero-servo completed	
37		During run	
34-5F		Not used	
60	DC injection braking command		
61	External search command 1		
62	External search command 2		
63	Energy-saving operation		
67-70	Not used		
71	Speed/torque control selection		
72	Zero-servo command		
73-76	Not used		
77	Speed control proportional gain selection		
78-FF	Not used		

2.5 CONSTANTS THAT CAN BE CHANGED BY SETTING CONTROL METHOD (A1-02)

Constant No	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting			
				V / f A1-02=0	V / f with PG A1-02=1	Open Loop Vector A1-02=2	Flux Vector A1-02=3
B3-01	Speed search at start (SpdSrch at Start)	0, 1	1	0	1	0	1
C3-01	Slip compensation gain (Slip Comp Gain)	0 0~2 5	0 1	0 0	-	1 0	1 0
C3-02	Slip compensation primary delay time (Slip Comp Time)	0~10000	1msec	2000	-	200	-
C4-02	Torque compensation time constant (Torq Comp Time)	0~10000	1msec	200	200	20	-
C5-01	ASR proportional gain 1 (ASR P Gain 1)	0 00~300 00	0 01	-	0 20	-	20 00
C5-02	ASR integral time 1 (ASR I Time 1)	0 000~10 000	0 001sec	-	1 000	-	0 500
C5-03	ASR proportional gain 2 (ASR P Gain 2)	0 00~300 00	0 01	-	0 02	-	20 00
C5-04	ASR integral time 2 (ASR I Time 2)	0 000~10 000	0 001sec	-	1 000	-	0 500
E1-07 E4-04	Mid output frequency (Mid frequency A, V/F2 Mid Freq)	0 0~400 0	0 1Hz	3 0	3 0	3 0	0 0
E1-08 E4-05	Mid output frequency voltage (Mid Voltage A, V/F2 Min Voltage)	0 0~255 0 (0 0~510 0)	0 1V	*	*	11 0 (22 0)	0 0
E1-09 E4-06	Min output frequency (Min Frequency, V/F2 Min Freq)	0 0~400 0	0 1Hz	1 5	1 5	0 5	0 0
E1-10 E4-07	Min output frequency voltage (Min Voltage, V/F2 Min Voltage)	0 0~255 0 (0 0~510 0)	0 1V	*	*	2 0 (4 0)	0 0
F1-09	Overspeed detection delay time (PG Overspd Time)	0 0~2 0	0 1sec	-	1 0	-	0 0
L3-03	Stall prevention level during acceleration (StallP CHP Lvl)	0~100	1%	50	50	100	-

Note Values in the parentheses are for 400V class

* Factory setting differs depending on the inverter capacity as follows

200V class

INVERTER CAPACITY (kW)	0 4~1 5	2 2~45	55, 75
E1-08 E4-05	15 0	14 0	12 0
E1-10 E4-06	9 0	7 0	6 0

400V class

INVERTER CAPACITY (kW)	0 4~1 5	2 2~45	55~300
E1-08 E4-05	30 0	28 0	24 0
E1-10 E4-06	18 0	14 0	12 0

2.6 CONSTANTS THAT CAN BE CHANGED BY SETTING INVERTER CAPACITY (02-04) (1)

200V Class

Constant No	Name	Unit	Factory Setting										
-	Inverter Capacity	kW	0 4	0 75	1 5	2 2	3 7	5 5	7 5	11	15	18 5	22
02-04	kVA selection	1	0	1	2	3	4	5	6	7	8	9	A
C6-01	Carrier frequency upper limit	kHz	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	10 0
-	Carrier frequency upper limit range	kHz	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	12 5
C6-02	Carrier frequency lower limit	kHz	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	10 0
C6-03	Carrier frequency proportional gain	1	0	0	0	0	0	0	0	0	0	0	0
E2-01	Motor rated current	A	1 90	3 30	6 20	8 50	14 00	19 60	26 60	39 7	53 0	65 8	77 2
E2-02	Motor rated slip	Hz	2 90	2 50	2 60	2 90	2 73	1 50	1 30	1 70	1 60	1 67	1 70
E2-03	Motor no-load current	A	1 20	1 80	2 80	3 00	4 50	5 10	8 00	11 2	15 2	15 7	18 5
E2-05	Motor-line-to-line resistance	Ω	9 842	5 156	1 997	1 601	0 771	0 399	0 288	0 230	0 138	0 101	0 079
E2-06	Motor leak inductance	%	18 2	13 8	18 5	18 4	19 6	18 2	15 5	19 5	17 2	20 1	19 5
L2-02	Momentary power loss ride-through	sec	0 7	1 0	1 0	1 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0
L2-03	Min baseblock time	sec	0 5	0 5	0 5	0 5	0 5	0 7	0 7	0 7	0 7	1 0	1 0

200V Class

Constant No	Name	Unit	Factory Setting				
-	Inverter Capacity	kW	30	37	45	55	75
02-04	kVA selection	1	B	C	D	E	F
C6-01	Carrier frequency upper limit	kHz	10 0	10 0	10 0	10 0	10 0
-	Carrier frequency upper limit range	kHz	10 0	10 0	10 0	10 0	10 0
C6-02	Carrier frequency lower limit	kHz	10 0	10 0	10 0	10 0	10 0
C6-03	Carrier frequency proportional gain	1	0	0	0	0	0
E2-01	Motor rated current	A	105 0	131 0	160 0	190 0	260 0
E2-02	Motor rated slip	Hz	1 80	1 33	1 60	1 43	1 39
E2-03	Motor no-load current	A	21 9	38 2	44 0	45 6	72 0
E2-05	Motor-line-to-line resistance	Ω	0 064	0 039	0 030	0 022	0 023
E2-06	Motor leak inductance	%	20 8	18 8	20 2	20 5	20 0
L2-02	Momentary power loss ride-through	sec	2 0	2 0	2 0	2 0	2 0
L2-03	Min baseblock time	sec	1 0	1 0	1 0	1 0	1 0

CONSTANTS THAT CAN BE CHANGED BY SETTING INVERTER CAPACITY (02-04) (2)

400V Class

Constant No	Name	Unit	Factory Setting										
-	Inverter Capacity	kW	0 4	0 75	1 5	2 2	3 7	4 0	5 5	7 5	11	15	18 5
02-04	kVA selection	1	20	21	22	23	24	25	26	27	28	29	2A
C6-01	Carrier frequency upper limit	kH_z	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0
-	Carrier frequency upper limit range	kH_z	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0
C6-02	Carrier frequency lower limit	kH_z	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0	15 0
C6-03	Carrier frequency proportional gain	1	0	0	0	0	0	0	0	0	0	0	0
E2-01	Motor rated current	A	1 00	1 60	3 10	4 20	7 00	7 00	9 80	13 30	19 9	26 5	32 9
E2-02	Motor rated slip	H_z	2 90	2 60	2 50	3 00	2 70	2 70	1 50	1 30	1 70	1 60	1 67
E2-03	Motor no-load current	A	0 60	0 80	1 40	1 50	2 30	2 30	2 60	4 00	5 6	7 6	7 8
E2-05	Motor-line-to-line resistance	Ω	38 198	22 459	10 100	6 495	3 333	3 333	1 595	1 152	0 922	0 550	0 403
E2-06	Motor leak inductance	%	18 2	14 3	18 3	18 7	19 3	19 3	18 2	15 5	19 8	17 2	20 1
L2-02	Momentary power loss ride-through	sec	1 0	1 0	1 0	1 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0
L2-03	Min baseblock time	sec	0 5	0 5	0 5	0 5	0 5	0 7	0 7	0 7	0 7	0 7	1 0

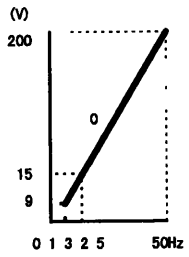
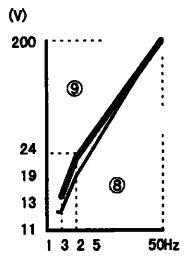
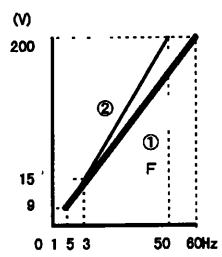
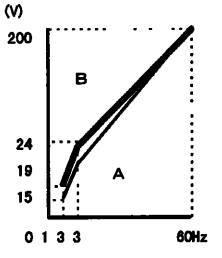
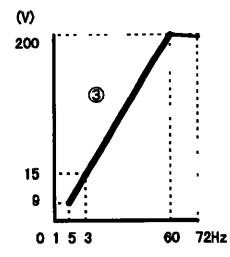
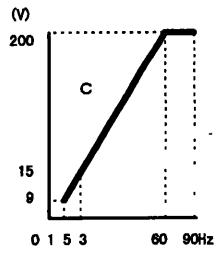
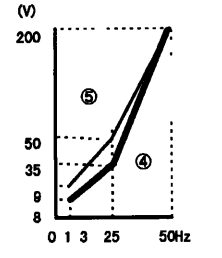
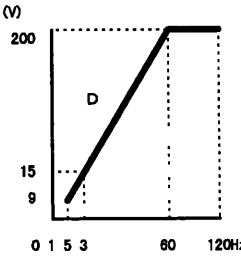
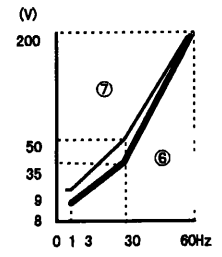
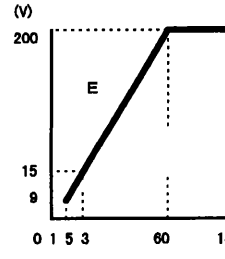
400V Class

Constant No	Name	Unit	Factory Setting										
-	Inverter Capacity	kW	22	30	37	45	55	75	110	160	185	220	300
02-04	kVA selection	1	2B	2C	2D	2E	2F	30	32	34	35	36	37
C6-01	Carrier frequency upper limit	kH_z	15 0	15 0	10 0	10 0	10 0	10 0	10 0	10 0	2 0	2 0	2 0
-	Carrier frequency upper limit range	kH_z	15 0	15 0	10 0	10 0	10 0	10 0	10 0	10 0	2 5	2 5	2 5
C6-02	Carrier frequency lower limit	kH_z	15 0	15 0	10 0	10 0	10 0	10 0	10 0	10 0	1 0	1 0	1 0
C6-03	Carrier frequency proportional gain	1	0	0	0	0	0	0	0	0	36	36	36
E2-01	Motor rated current	A	38 6	52 3	65 6	79 7	95 0	130 0	190 0	270 0	310 0	370 0	500 0
E2-02	Motor rated slip	H_z	1 70	1 80	1 33	1 60	1 46	1 39	1 40	1 35	1 30	1 30	1 25
E2-03	Motor no-load current	A	9 2	10 9	19 1	22 0	24 0	36 0	49 0	70 0	81 0	96 0	130 0
E2-05	Motor-line-to-line resistance	Ω	0 316	0 269	0 155	0 122	0 088	0 092	0 046	0 029	0 025	0 020	0 014
E2-06	Motor leak inductance	%	23 5	20 7	18 8	19 9	20 0	20 0	20 0	20 0	20 0	20 0	20 0
L2-02	Momentary power loss ride-through	sec	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0	2 0
L2-03	Min baseblock time	sec	1 0	1 0	1 0	1 0	1 0	1 0	4 0	4 0	4 0	4 0	4 0

2.7 CONSTANTS THAT CAN BE CHANGED BY SETTING V/f PATTERN (E1-03) (ENABLED ONLY IN V/f CONTROL)

200V Class (0.4 to 1.5kW)

(For 400V class, the voltage is doubled.)

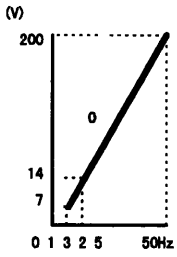
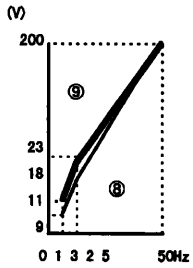
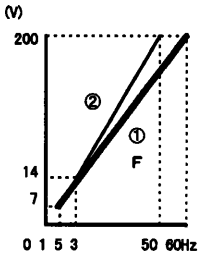
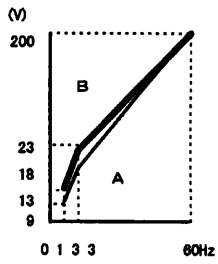
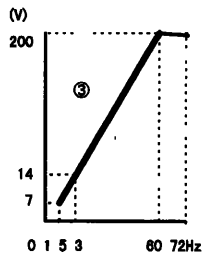
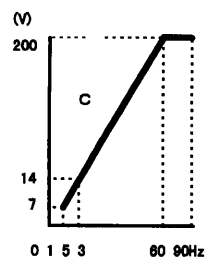
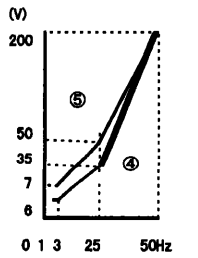
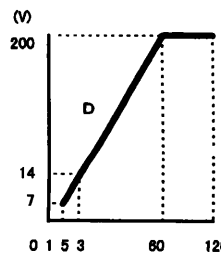
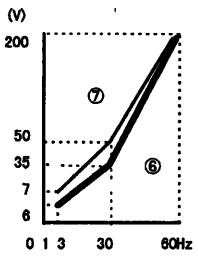
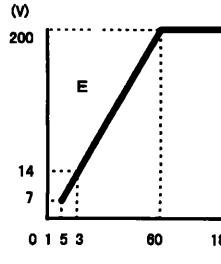
Application	Specifications		E1-03	V/f Pattern *1	Application	Specifications		E1-03	V/f Pattern *1
General-purpose	50Hz		0		High Starting Torque	50Hz	Low starting torque	⑧	
							High starting torque	⑨	
	60Hz	60Hz Saturation	① F			60Hz	Low starting torque	A	
		50Hz Saturation	②				High starting torque	B	
	72Hz		③		High Speed Operation (Machine Tools)	90Hz		C	
Variable Torque Character-istics	50Hz	Variable torque 3	④			120Hz		D	
		Variable torque 2	⑤						
	60Hz	Variable torque 3	⑥			180Hz		E	
		Variable torque 2	⑦						

*1 Consider the following items as the conditions for selecting a V/f pattern. They must be suitable for
(1) The voltage and frequency characteristics of motor
(2) The maximum rotation speed of motor

*2 Select high starting torque only in the following conditions. Normally, this selection is not required
(1) The wiring distance is long (150m and above)
(2) Voltage drop at startup is large
(3) AC reactor is inserted in the input or output of the inverter
(4) A motor smaller than the nominal output of the inverter is used

200V Class (2 2 to 45kW)

(For 400V class, the voltage is twice)

Application	Specifications		E1-03	V/f Pattern *1	Application	Specifications		E1-03	V/f Pattern *1
General-purpose	50Hz		0		High Starting Torque	50Hz	Low starting torque	⑧	
							High starting torque	⑨	
	60Hz	60Hz Saturation	① F			60Hz	Low starting torque	A	
		50Hz Saturation	②				High starting torque	B	
	72Hz		③			90Hz		C	
Variable Torque Characteristics	50Hz	Variable torque 3	④		High Speed Operation (Machine Tools)	120Hz		D	
		Variable torque 2	⑤						
	60Hz	Variable torque 3	⑥			180Hz		E	
		Variable torque 2	⑦						

*1 Consider the following items as the conditions for selecting a V/f pattern They must be suitable for

(1) The voltage and frequency characteristics of motor

(2) The maximum rotation speed of motor

*2 Select high starting torque only in the following conditions Normally, this selection is not required

(1) The wiring distance is long (150m and above)

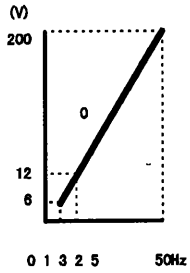
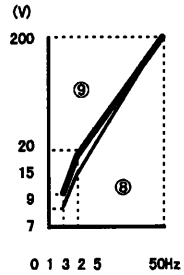
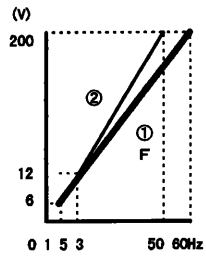
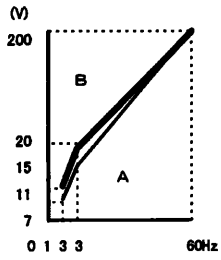
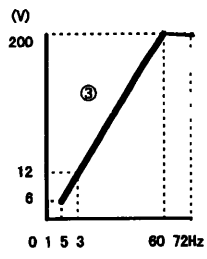
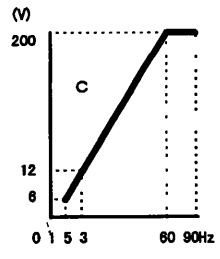
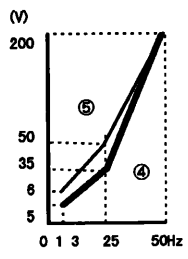
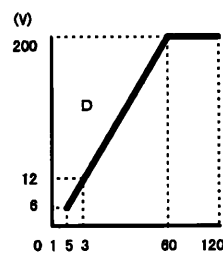
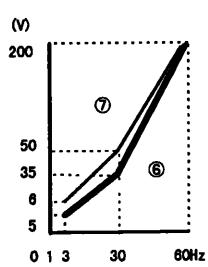
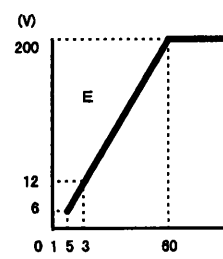
(2) Voltage drop at startup is large

(3) AC reactor is inserted in the input or output of the inverter

(4) A motor smaller than the nominal output of the inverter is used

200V Class (55kW and above)

(For 400V class, the voltage is twice)

Application	Specifications		E1-03	V/f Pattern *1	Application	Specifications		E1-03	V/f Pattern *1
General-purpose	50Hz		0		High Starting Torque	50Hz	Low starting torque	⑧	
							High starting torque	⑨	
	60Hz	60Hz Saturation	① F			60Hz	Low starting torque	A	
		50Hz Saturation	②				High starting torque	B	
	72Hz		③		High Speed Operation (Machine Tools)	90Hz		C	
Variable Torque Characteristics	50Hz	Variable torque 3	④			120Hz		D	
		Variable torque 2	⑤						
	60Hz	Variable torque 3	⑥			180Hz		E	
		Variable torque 2	⑦						

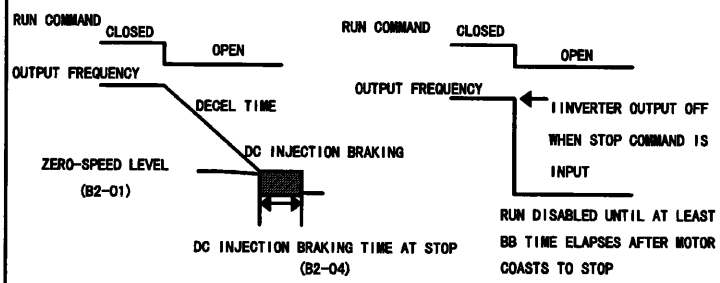
*1 Consider the following items as the conditions for selecting a V/f pattern They must be suitable for
(1) The voltage and frequency characteristics of motor
(2) The maximum rotation speed of motor

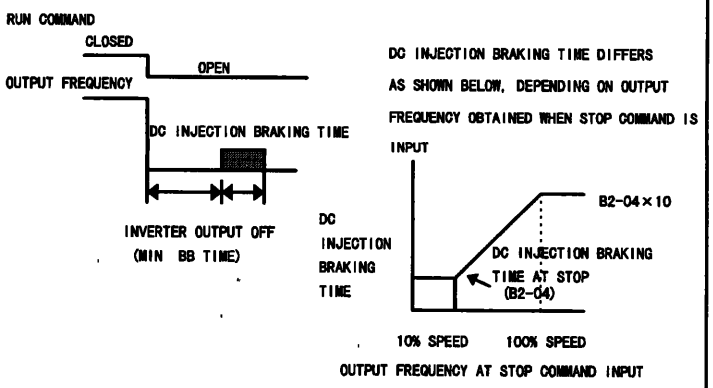
*2 Select high starting torque only in the following conditions Normally, this selection is not required
(1) The wiring distance is long (150m and above)
(2) Voltage drop at startup is large
(3) AC reactor is inserted in the input or output of the inverter
(4) A motor smaller than the nominal output of the inverter is used

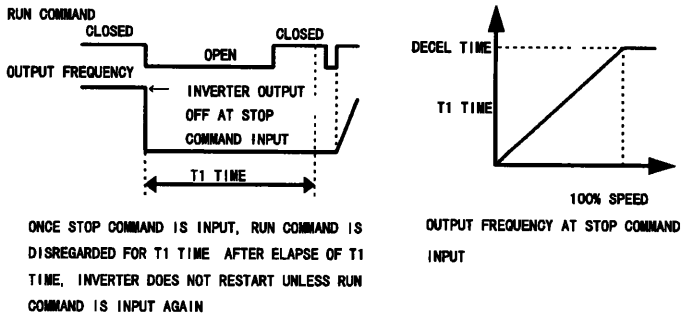
B APPLICATION-RELATED CONSTANTS

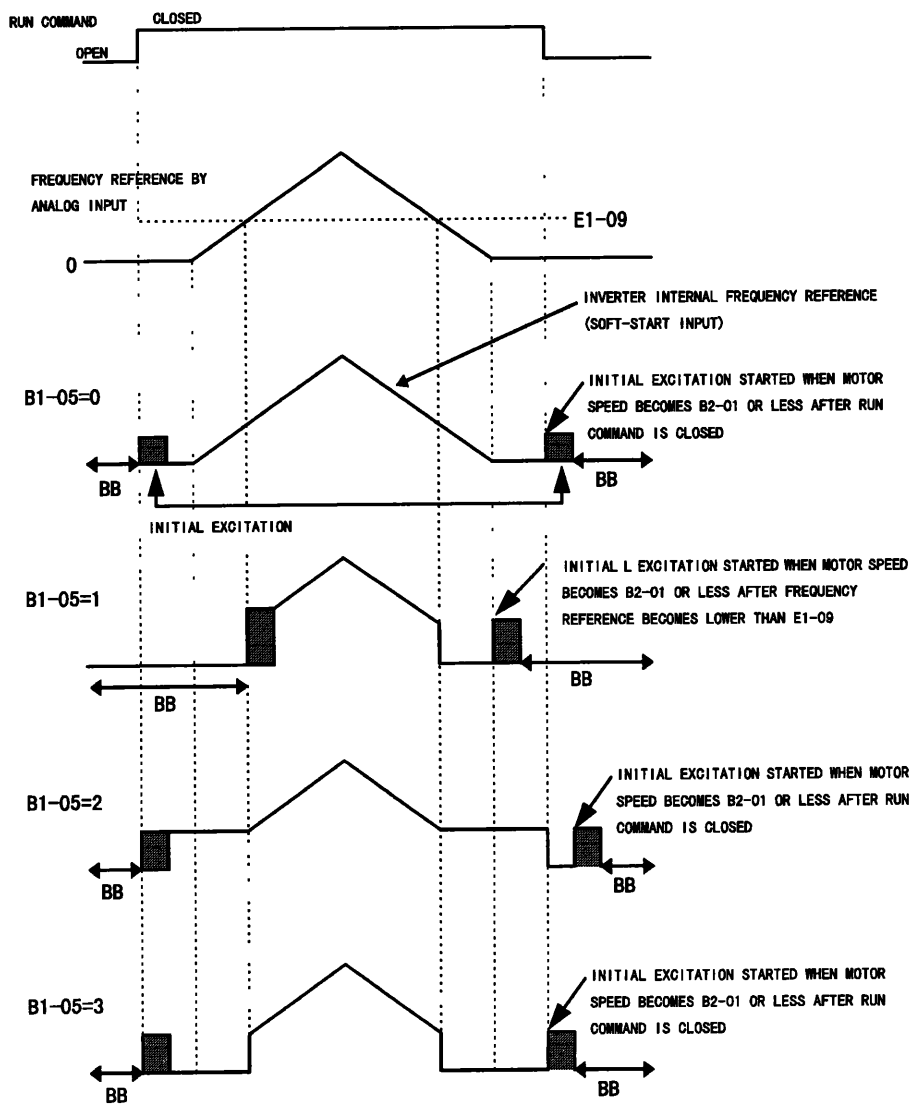
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>B1-01

B1-02</td><td>Reference selection

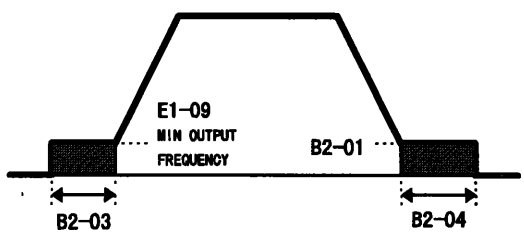
Opertion method selection</td><td>Frequency reference and run command can be set independently as shown below.
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>Run by digital operator reference</td></tr>
<tr><td>1</td><td>Run by control circuit terminal reference</td></tr>
<tr><td>2</td><td>Run by serial communication reference</td></tr>
<tr><td>3</td><td>Run by option reference</td></tr>
</table>
• By using the digital operator LOCAL/REMOTE key, operation mode can be selected during stop as shown below.
LOCAL: Run by frequency reference and run command from digital operator
REMOTE: Run by frequency reference and run command set by B1-01 and B1-02, respectively.
Note: REMOTE is set when the power supply is turned ON.</td><td>When B1-01 is selected, frequency reference is a sum of terminals 13 and 14. (When terminal 14 is selected as a multi-function input, only terminal 13 is input.)</td></tr>
<tr><td>B1-03</td><td>Stopping method selection</td><td>The stopping method can be set as shown below
① B1-03=00 Deceleration to stop ② B1-03=01 Coast to stop


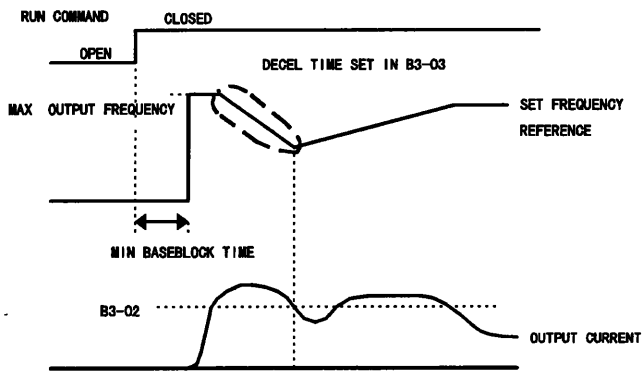
③ B1-03=02 Full-range DC injection braking stop


④ B1-03=03 Coasting to a stop (with timer function)

</td><td>Only 00 and 01 can be selected when A1-02=3 (flux vector control). Deceleration time is selected among C1-02, C1-04, C1-06 and C1-08.</td></tr>
</table>

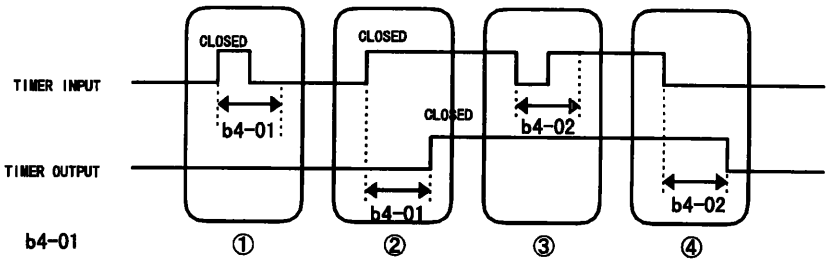
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>B1-04</td><td>Prohibition of reverse operation</td><td>
<table>
<tr><th>Selection</th><th>Description</th></tr>
<tr><td>0</td><td>REV run enabled</td></tr>
<tr><td>1</td><td>REV run prohibited (REV run command and minus frequency reference are not accepted.)</td></tr>
</table>
</td><td></td></tr>
<tr><td>B1-05</td><td>Operation selection for setting of E1-09 (min. frequency reference) or less</td><td>
When flux vector control is set, select operation mode for frequency reference less than E1-09.
<table>
<tr><th>Selection</th><th>Description</th></tr>
<tr><td>0</td><td>Run according to frequency reference (E1-09 invalid)</td></tr>
<tr><td>1</td><td>Baseblock</td></tr>
<tr><td>2</td><td>Run with min frequency reference (E1-09)</td></tr>
<tr><td>3</td><td>Zero-speed operation (Internal speed reference is set to zero.)</td></tr>
</table>
Time Chart of Inverter internal frequency reference and initial excitation when initial excitation time is set at start and stop


</td><td>
• This setting is disabled when E1-09=0 (INITIAL VALUE).
• When frequency reference is less than the min, frequency reference at A1-02=0, 1 or 2, baseblock is applied
</td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>B1-06</td><td>Read sequence input twice</td><td><table><tr><th>Selection</th><th>Description</th></tr><tr><td>0</td><td>Twice reading of control circuit terminal input signal for 2 msec</td></tr><tr><td>1</td><td>Twice reading of control circuit terminal input signal for 5 msec</td></tr></table></td><td>Set "0" when control circuit terminal response is needed.</td></tr>
<tr><td>B2-01</td><td>Zero-speed level (DB starting frequency)</td><td>Set frequency which starts DC injection braking (initial excitation for flux vector control) in units of 0. 1Hz when deceleration to stop is selected. When B2-01 <E1-09, DC injection braking is started from E1-09.</td><td></td></tr>
<tr><td>B2-02</td><td>DC injection braking current</td><td>Sets DC injection braking current in units of 1%. Inverter rated current becomes 100%.</td><td>※Note : Initial excitation is performed with current value set in E2-03 when A1-02=3 (flux vector control)</td></tr>
<tr><td>B2-03</td><td>DC injection braking time at start</td><td>When the motor rotating direction is not defined, DC injection braking at start is used in order to stop the coasting motor temporarily and start it again without tripping
Set the time to preform DC injection braking (initial excitation for flux vector control) at start in units of 0 1 second</td><td>When the set value is 0, DC injection braking at start is not performed.</td></tr>
<tr><td>B2-04</td><td>DC injection braking time at stop</td><td>Used to prevent coasting after stop command is input.
Set the time to perform DC injection braking (zero speed control for flux vector control) at stop in units of 0 1 second
 
DC Injection Braking Time Chart (Initial Excitation)</td><td>When the set value is 0, DC injection braking at stop is not performed.</td></tr>
<tr><td>B3-01</td><td>Speed search selection at start</td><td><table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>When run command is input, the motor accelerates to the set frequency from the min. output frequency</td></tr><tr><td>1</td><td>When run command is input, speed search is performed from the max. output frequency. For a control method with PG, the motor accelerates/decelerates to the set frequency from the motor speed.</td></tr></table></td><td>• Factory setting of B3-01 is 01 for control with PG.</td></tr>
</table>

Constant No.	Name	Description	Remarks
B3-02	Speed search operating current	Set speed search operating level in the ratio (%) for the inverter rated current.	
B3-03	Speed search deceleration time	Set deceleration time during speed search in units of 0.1 second ○ Speed search time chart at start with V/f control When inverter output current is larger than B3-02, the motor decelerates to the set frequency in the set accel/decel time  	

Constant No.	Name	Description	Remarks
		By combining multi-function input terminal input (set value=18) and multi-function output terminal timer output (set value=12), a timer to be mounted on the outside of the inverter can be enclosed in the inverter.	For selection of multi-function input terminal function, refer to H3-04 to H3-12
B4-01	Timer function ON-delay time	Sets ON-delay time in units of 0.1 second.	
B4-02	Timer function OFF-delay time	Sets OFF-delay time in units of 0.1 second.	



Sequence

① When timer input "CLOSED" time is shorter than b4-01, timer output remains OPEN.

② When timer input is "CLOSED" time output becomes "CLOSED" after the time set to b4-01 elapses

③ When timer input "OPEN" time is shorter than b4-02, timer output remains "CLOSED".

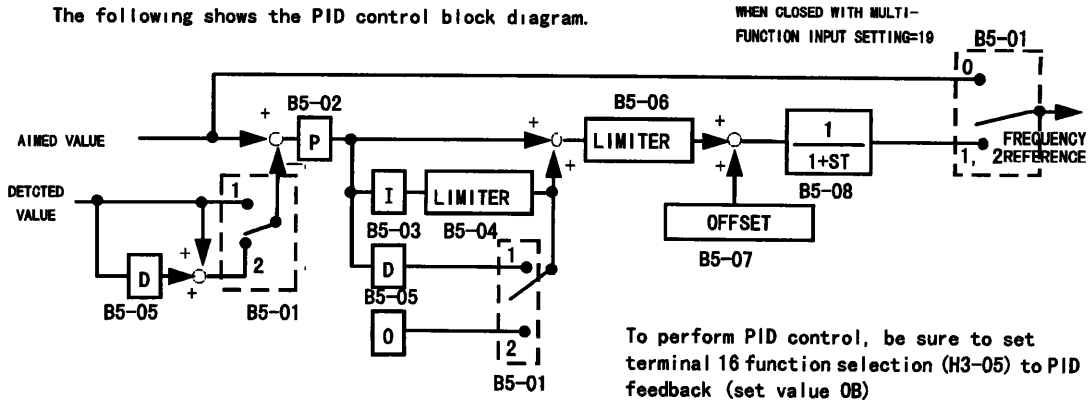
④ When timer input is "OPEN" time output becomes "OPEN" after the time set to b4-02 elapses

B5-01 PID control mode selection

• PID process control is enabled in the inverter

B5-01	PID Control Function
0	PID control disabled
1	PID control enabled (Deviation is D-controlled.)
2	PID control enabled (Feedback value is D-controlled.)

The following shows the PID control block diagram.



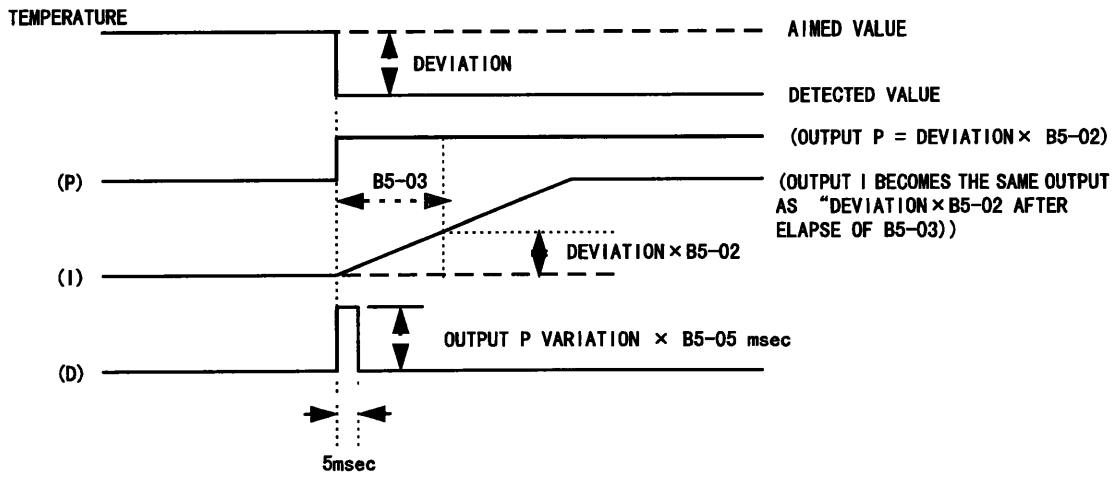
To perform PID control, be sure to set terminal 16 function selection (H3-05) to PID feedback (set value 0B)

• Setting of aimed value

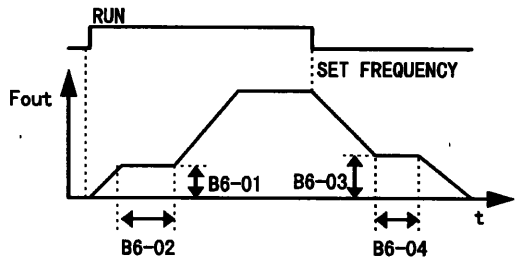
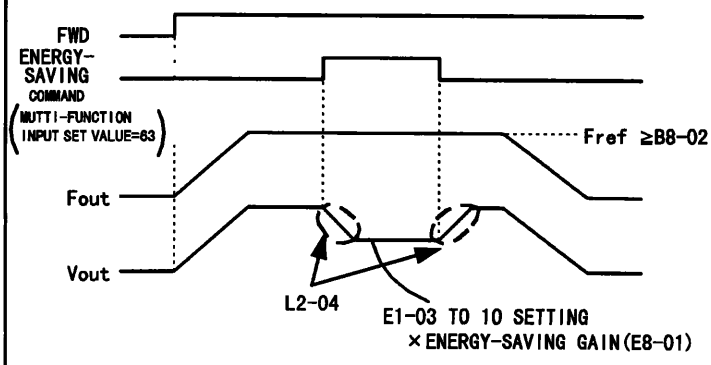
Frequency reference selection (B1-01), multi-function input multi-step speed references 1 to 3 and frequency reference selected by jog reference become aimed values.

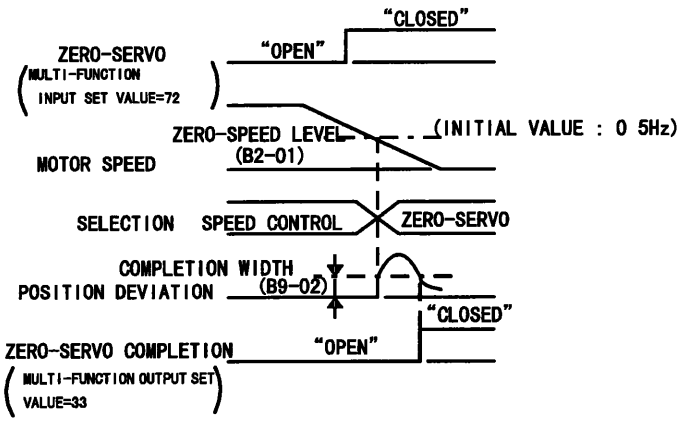
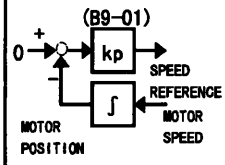
Constant No.	Name	Description	Remarks
B5-02	Proportional gain (P)	Sets P-control proportional gain. Setting to 0.0 does not perform P-control.	For multi-function analog input terminal function, refer to H3-04 to H3-12.
B5-03	Integral (I) time	Sets I-control integral time. Setting to 0.0 does not perform I-control.	
B5-04	Integral (I) limit	Sets integral limit in the ratio for max. frequency (E1-04).	
B5-05	Differential (D) time	Sets D-control differential time. Setting to 0.0 does not perform D-control.	
B5-06	PID limit	Sets PID limit control limiter in the ratio for max. frequency (E1-04).	
B5-07	PID offset adjustment	Sets offset for output after PID control in the ratio for max. frequency.	
B5-08	PID primary delay time constant	Sets primary delay time constant for frequency reference after PID control.	

(When variation is of step form)



- Value I is reset to 0 in the following cases; Stop command is input or operation held
  For selection of multi-function input PID control, terminal is set to CLOSED and PID control is set to DISABLED.
- The upper limit of value I can be set by B5-04.
  To increase control capability by integration, increase the value of B5-04. If the control system vibrates and it cannot be resolved by adjusting integral time or primary time constant, decrease the value of B5-04.
- By selecting multi-function input PID DISABLED/ENABLED and closing the contact during run, PID control is canceled and the aimed value signal is used as frequency reference without being changed.

Constant No.	Name	Description	Remaks
		Dwell (temporary stop) function is used to stop output frequency temporarily and start it again when driving a motor with a heavy starting load.	
B6-01	Dwell frequency at start	Sets frequency to stop output frequency during acceleration in units of 0.1Hz.	
B6-02	Dwell time at start	Sets time to stop output frequency during acceleration in units of 0.1Hz.	
B6-03	Dwell frequency at stop	Sets frequency to stop output frequency during deceleration in units of 0.1Hz	
B6-04	Dwell time at stop	Sets time to stop output frequency during deceleration in units of 0.1Hz 	
B7-01	Droop control gain	Drooping is a function to provide speed drooping characteristics in proportion to load torque. Sets B7-01 to speed reduction amount in the rated (100%) load status in the ratio (%) for max. frequency (E1-04)	Function only for A1-02 =3 (flux vector control) (Not available at present time)
B7-02	Droop control delay time	By decreasing B7-02, drooping response quicker, however, the motor would hunt more easily.	
B8-01	Energy-saving gain	When output does not have to be large after completion of acceleration, by decreasing output voltage, energy-saving operation is enabled.	This function is validated only at A1-02 = 1 or 2 (V/f control).
B8-02	Energy-saving frequency	When multi-function input energy-saving command is input, output voltage is decreased during speed agree at energy-saving starting frequency (B8-02) higher	
		Output voltage during energy-saving, normal V/f (E1-03 to 10) setting× energy-saving gain (E8-01. Output voltage declines and recovers in V-recovery time (L2-04). 	

Constant No.	Name	Description	Remarks
		Zero servo function is to perform position control at a position where the motor speed becomes less than the zero-speed level.	
B9-01	Zero-servo gain	Sets zero-servo gain.	
B9-02	Zero-servo completion width	Sets zero-servo completion width in units of one pulse. 	 • For multi-function input terminal function selection, refer to H1-01 to H2-06. • For multi-function output terminal function selection, refer to H2-01 to H2-03. • This function is enabled only at A1-02 = 1 or (V/f control).

C CONSTANTS FOR ADJUSTMENT

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>C1-01
C1-02
C1-03
C1-04
C1-05
C1-06
C1-07
C1-08</td><td>Acceleration time 1
Deceleration time 1
Acceleration time 2
Deceleration time 2
Acceleration time 3
Deceleration time 3
Acceleration time 4
Deceleration time 4</td><td>Sets acceleration time to accelerate from 0Hz to the max. frequency (E1-04), and deceleration time to decelerate from the max. frequency to 0Hz.

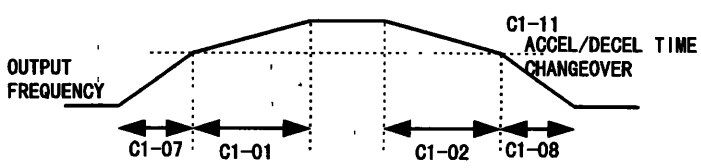
By accel/decel time selection commands 1 and 2 of multi-function inputs, accel/decel time can be changed up to 4 steps. (Changeable even during run.)

<table><tr><th>Accel/decel Time Selection 2 Multi-function Input Set Value =1A</th><th>Accel/decel Time Selection 1 Multi-function Input Set Value =07</th><th>Accel Time</th><th>Decel Time</th></tr><tr><td>Open or not set</td><td>Open or not set</td><td>C1-01</td><td>C1-02</td></tr><tr><td>Open or not set</td><td>Closed</td><td>C1-03</td><td>C1-04</td></tr><tr><td>Closed</td><td>Open or not set</td><td>C1-05</td><td>C1-06</td></tr><tr><td>Closed</td><td>Closed</td><td>C1-07</td><td>C1-08</td></tr></table></td><td>For multi-function input terminal function selection refer to H1-01 to H1-06</td></tr>
<tr><td>C1-09</td><td>Emergency stop time</td><td>Emergency stop time becomes valid in the following cases.
○ Multi-function input emergency stop command (set value = 1) is closed.
○ Selection at fault detection is set to emergency stop.</td><td></td></tr>
<tr><td>C1-10</td><td>Accel/decel time setting unit</td><td>Accel/decel Time Setting Unit

<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Accel/decel time (C1-01 to 09) setting range is in units of 0.1 second.
Setting range : 0 to 6000.0seconds</td></tr><tr><td>1</td><td>Accel/decel time (C1-01 to 09) setting range is in units of 0.01 second.
Setting range : 0 to 600.00seconds</td></tr></table>
When C1-10 is changed, the setting unit of accel/decel time (C1-01 to 09) stored in the inverter is changed automatically as follows.

When C1-10 is changed from 0 to 1 at C1-01 = 12.4 seconds, 12.4 seconds is automatically set to C1-01.

If either of C1-01 to 09 is set to 600.1 seconds or more, C1-10 cannot be changed from 0 to 1.</td><td></td></tr>
<tr><td>C1-11</td><td>Accel/decel time switching frequency</td><td>By using C1-11, accel/decel time can be changed automatically.
Run at C1-01 and 02 accel/decel time at output frequency ≧ C1-11
Run at C1-07 and 08 accel/decel time at output frequency < C1-11

Multi-function input accel/decel time selection has priority over automatic change of accel/decel.</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>C2-01

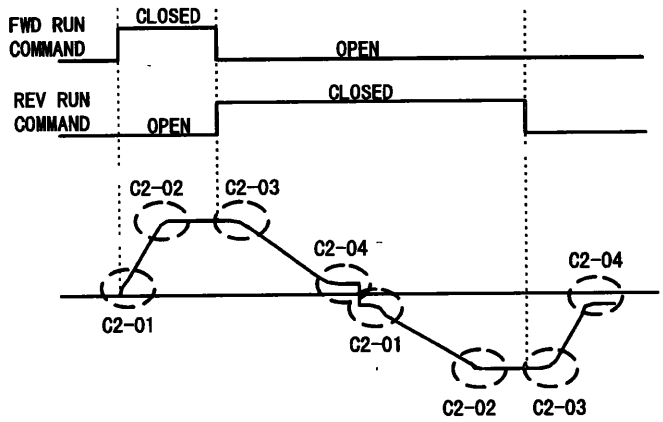
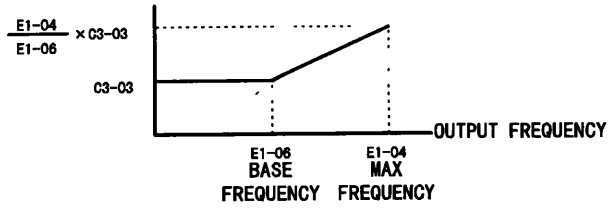
C2-02

C2-03

C2-04</td><td>S-curve characteristic time at acceleration start

S-curve characteristic time at acceleration end

S-curve characteristic time at deceleration start

S-curve characteristic time at deceleration end</td><td>S-curve characteristic is used to prevent the machine from shock at transfer or stop. As shown below, S-curve characteristic time can be set independently at 4 points · at acceleration start/stop and deceleration start/stop.
 
</td><td>Time to accelerate from 0 to the maximum frequency can be calculated as follows .
Accelerate time
+ $\frac{C2\text{-}01 + C2\text{-}02}{2}$</td></tr>
<tr><td>C3-01</td><td>Slip compensation gain</td><td>Meaning of slip compensation gain differs depending on the control method.
○PG-less control. PG-less vector control (open loop vector)
○Calculates motor torque according to output current and sets gain to compensate for output frequency in units of 0.1.
Adjusts when speed accuracy is reduced when operating with a load
<table><tr><th>Run Status</th><th>C3-01 Adjustment *</th></tr><tr><td>When actual speed is low</td><td>Increase the set value.</td></tr><tr><td>When actual speed is high</td><td>Decrease the set value.</td></tr></table>* · Adjust the value by 0.1
○Vector control with PG (flux vector control)
Gain to compensate for slip caused by temperature variation.
Normally, this setting does not have to be modified.</td><td></td></tr>
<tr><td>C3-02</td><td>Slip compensation primary delay time</td><td>Adjusted value when speed is not stabilized or speed response is slow when operating with a load in PG-less V/f control or PG-less vector control.
<table><tr><th>Run Status</th><th>C3-02 Adjustment *</th></tr><tr><td>When actual speed is low</td><td>Increase the set value.</td></tr><tr><td>When actual speed is high</td><td>Decrease the set value</td></tr></table>* : Adjust the value by 10 msec.</td><td></td></tr>
<tr><td>C3-03</td><td>Slip compensation limit</td><td>Sets slip compensation limit in the ratio (%) for motor rated slip (E2-02).
The limit is as shown below in the constant torque and constant output area.
 
</td><td></td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>C3-04</td><td>Slip compensation during regeneration</td><td>
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>Slip compensation disabled during regeneration</td></tr>
<tr><td>1</td><td>Slip compensation enabled during regeneration</td></tr>
</table>
</td><td></td></tr>
<tr><td>C4-01</td><td>Torque compensation gain</td><td>Torque compensation is a function to calculate load torque according to output current and to compensate for output voltage required to obtain torque characteristics

In open loop vector, torque compensation gain does not have to be adjusted

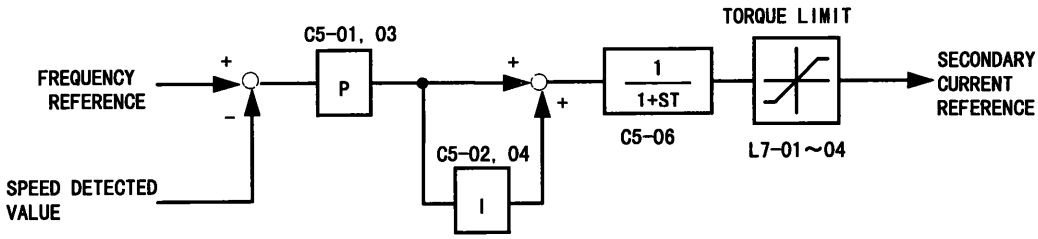
The following outlines the adjusting method in V/f control
<table>
<tr><th>Run Status</th><th>C4-01 Adjustment *</th></tr>
<tr><td>When sufficient torque is not obtained at low-speed operation</td><td>Increase the set value.</td></tr>
<tr><td>When motor current value is not stable, or motor current value is excessively large at light loads operation</td><td>Decrease the set value.</td></tr>
</table>
* . If torque compensation is increased excessively, the following faults may occur;
• Excessive motor current is applied to cause the inverter to malfunction
• Motor generates excessive heat or vibration.
Therefore, adjust this value little by little, checking the motor current</td><td></td></tr>
<tr><td>C4-02</td><td>Torque compensation time constant</td><td>Adjusted when motor output current is not stabilized or speed response is slow.

In open loop vector, torque compensation time constant does not have to be adjusted.
<table>
<tr><th>Run Status</th><th>C4-02 Adjustment *</th></tr>
<tr><td>When motor current value is not stable</td><td>Increase the set value.</td></tr>
<tr><td>When speed respone is slow</td><td>Decrease the set value</td></tr>
</table>
* Adjust the value by 10 msec</td><td></td></tr>
<tr><td>C5-01</td><td>ASR proportional gain 1</td><td>Sets ASR proportional gain in units of 0.01.</td><td></td></tr>
<tr><td>C5-02</td><td>ASR integral time 1</td><td>Sets ASR integral time 1 in units of msec.</td><td></td></tr>
<tr><td>C5-03</td><td>ASR proportional gain 2</td><td>Sets ASR proportional gain in 2 in units of 0.01.</td><td></td></tr>
<tr><td>C5-04</td><td>ASR integral time 2</td><td>Sets ASR integral time 2 in units of msec.</td><td></td></tr>
<tr><td>C5-05</td><td>ASR limit</td><td>Sets ASR limit of frequency to be compensated for by ASR in units of 1% when V/f control with PG feedback is selected . MAX. output frequency (E1-04) is regarded as 100%.</td><td></td></tr>
<tr><td>C5-06</td><td>ASR primary delay time</td><td>Sets primary delay time constant to control secondary current reference variation in units of 1 msec when flux vector control is selected.</td><td></td></tr>
<tr><td>C5-07</td><td>ASR switching frequency</td><td>Sets frequency to change ASR P-gain and integral time constant in units of 0.1Hz when flux vector control is selected.</td><td></td></tr>
</table>

Constant No.	Description

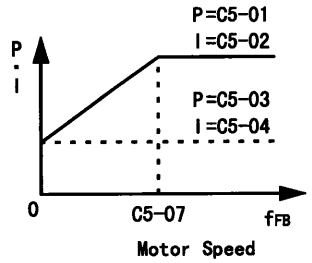
ASR of flux vector

○ The following shows the block diagram



Note . ASR P-gain in flux vector control is based on the max frequency

Proportional gain and integral time are approximated in a straight line by motor speed as shown below

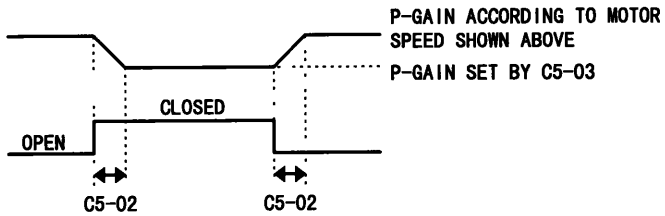


$$f_{FB} = \frac{P \cdot N}{120}$$

P = Number of poles
N = r/min

- When C5-07 0,
  Fixed to P = C5-01, I = C5-02

If 77 is selected to multi-function input terminal, proportional gain can be changed

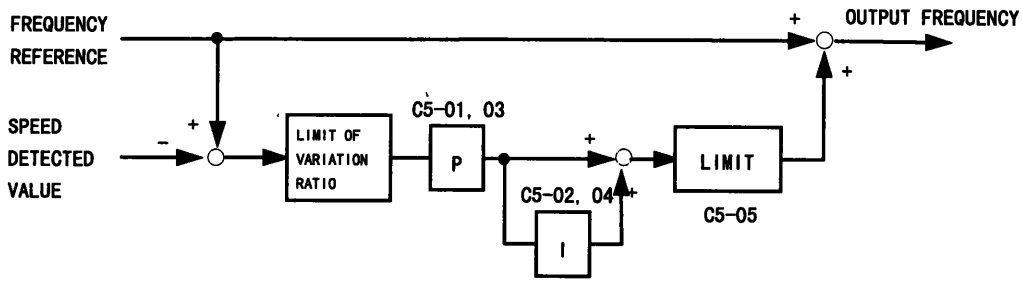


- Changed at time set by C5-02
- Integral time is not changed

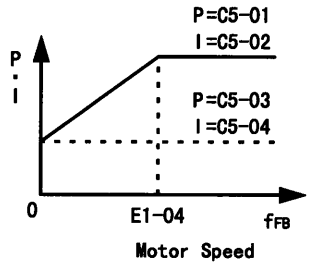
Constant No	Description

ASR of V/f control with PG

○ The following shows the block diagram.



Proportional gain and integral time are approximated in a straight line by motor speed as shown below.



$$f_{FB}=\frac{P \cdot N}{120}$$

P=Number of motor poles

N=r/min

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>C6-01

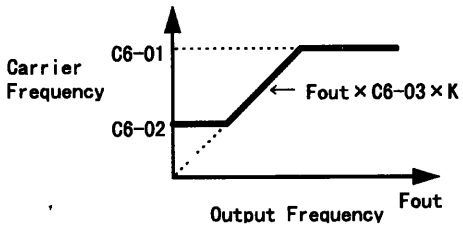
C6-02

C6-03</td><td>Carrier frequency upper limit

Carrier frequency lower limit

Carrier frequency proportional gain</td><td>The following shows the relation between carrier frequency and output frequency according to the set values of C6-01 to 03. Only C6-01 is effective in vector control.

For constant carrier frequency (C6-01 set value);
Set C6-03 to 0 and C6-01 and C6-02 to the same value.

Note · Value K varies depending on the upper limit of carrier frequency as described below.

<table><tr><td>C6-01 ≧ 10.0kHz</td><td>K=3</td></tr><tr><td>10.0kHz > C6-01 ≧ 5.0kHz</td><td>K=2</td></tr><tr><td>C6-01 < 5.0kHz</td><td>K=1</td></tr></table>
In the following cases, a setting error (OPE11) occurs :
① C6-03>6 and C6-02>C6-01
② C6-01>5kHz and C6-02 ≦ 5kHz</td><td></td></tr>
<tr><td>C7-01</td><td>Hunting prevention selection</td><td>Current amplitude is varied or the machine vibrates because of frequency of 10 to 30Hz under a light load, which is called hunting Selects the hunting prevention function in V/f control mode.

<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Disabled</td></tr><tr><td>1</td><td>Enabled</td></tr></table></td><td></td></tr>
<tr><td>C7-02</td><td>Hunting prevention gain</td><td>Sets hunting prevention in units of 0.1.
The following shows how to adjust hunting prevention gain.

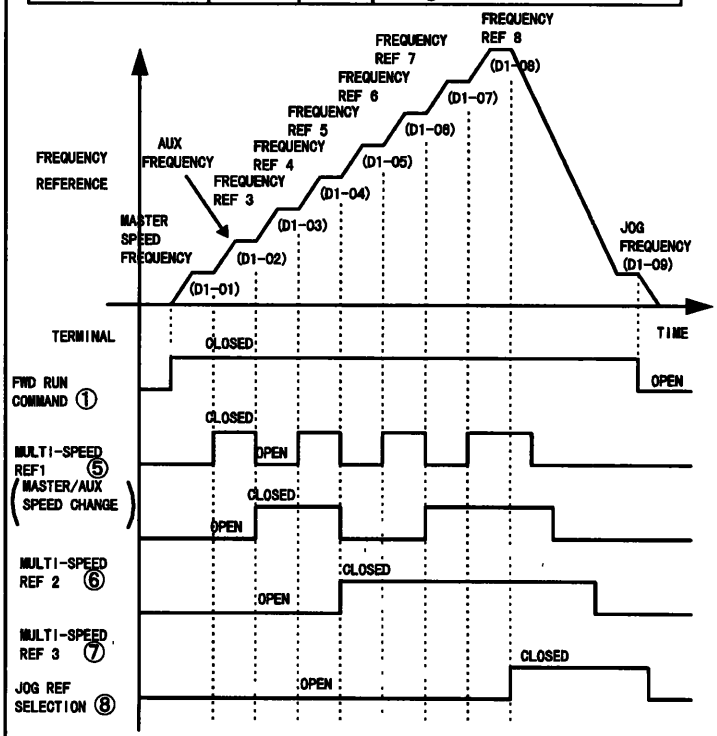
<table><tr><th>Run Status</th><th>C7-02 Adjustment *</th></tr><tr><td>Hunting under light load</td><td>Increase the set value</td></tr><tr><td>Machine vibration or stepout under heavy load</td><td>Decrease the set value.</td></tr></table>
* · Adjust the value by 0 1</td><td></td></tr>
<tr><td>C8-08</td><td>AFR gain</td><td>In open loop vector, adjust the value as shown below when the motor is hunting or in order to increase responsibility.

<table><tr><th>Run Status</th><th>C8-08 Adjustment *</th></tr><tr><td>Torque or speed response is slow</td><td>Increase the set value.</td></tr><tr><td>Hunting</td><td>Decrease the set value</td></tr></table>
* . Adjust the value by 0 1</td><td></td></tr>
</table>

D FREQUENCY REFERENCE-RELATED CONSTANTS

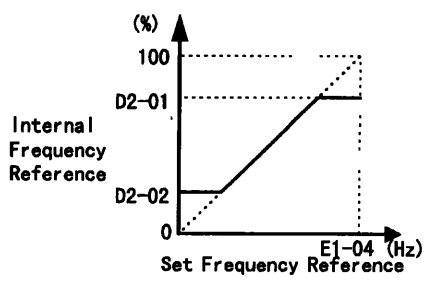
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>D1-01
D1-02
D1-03
D1-04
D1-05
D1-06
D1-07
D1-08
D1-09</td><td>Frequency reference 1
Frequency reference 2
Frequency reference 3
Frequency reference 4
Frequency reference 5
Frequency reference 6
Frequency reference 7
Frequency reference 8
Jog frequency reference</td><td>Sets frequency reference.
Setting unit of frequency can be changed according to frequency reference/monitor display unit (01-03)

[Example of multi-step speed operation]
By combining multi-function input multi-step speed references 1 to 3 and jog frequency reference selections, up to 9 steps can be selected.

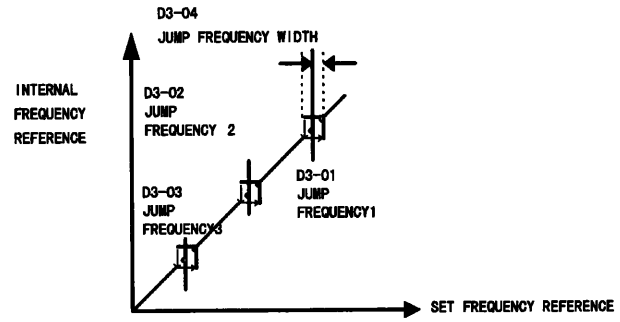
<table>
<tr><th colspan="2">Terminal Constant No.</th><th>Factory Setting</th><th>Set Value</th><th>Name</th></tr>
<tr><td>5</td><td>HI-03</td><td>3</td><td>3</td><td>Multi-step speed reference 1</td></tr>
<tr><td>6</td><td>HI-04</td><td>4</td><td>4</td><td>Multi-step speed reference 2</td></tr>
<tr><td>7</td><td>HI-05</td><td>6</td><td>5</td><td>Multi-step speed reference 3</td></tr>
<tr><td>8</td><td>HI-06</td><td>8</td><td>6</td><td>Jog reference selection</td></tr>
</table>


*1. Master speed frequency reference becomes constant set value (D1-01) when B1-01 = 0, and analog reference set by control terminal 13 or 14 when B1-01 = 1.
*2: Auxiliary frequency reference becomes analog frequency reference input from terminal 16 when H3-05 = 00 and the constant set value (D1-02) at any setting other then H3-05 = 00. Set H3-03 to 1F when multi-function analog input (terminal 16) is not used.</td><td></td></tr>
<tr><td>D2-01

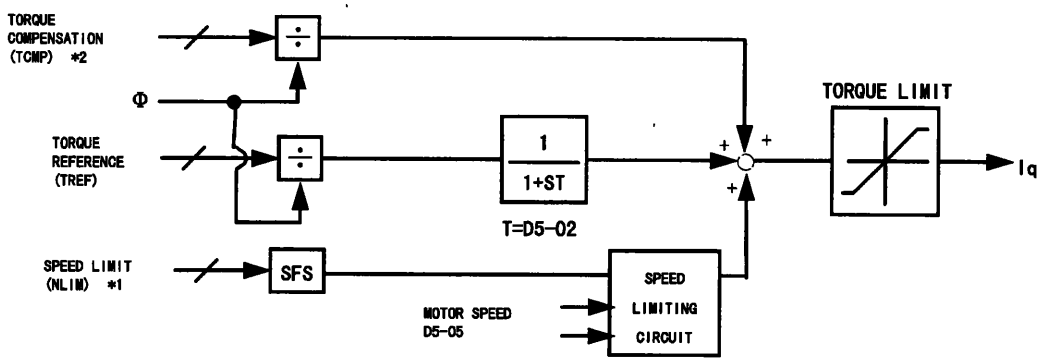
D2-02</td><td>Frequency reference upper limit

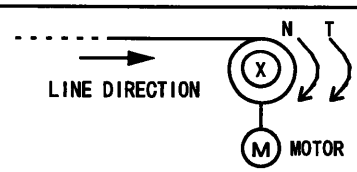
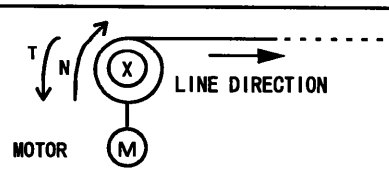
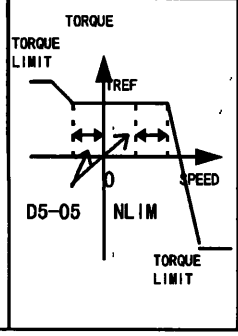
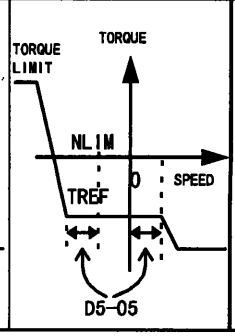
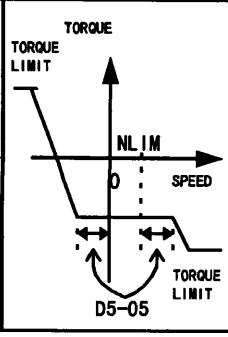
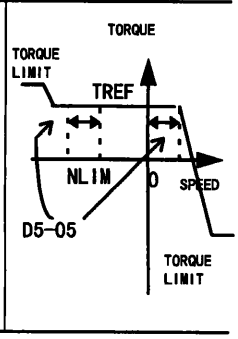
Frequency reference lower limit</td><td>• Sets the upper/lower limit values of output frequency in the ratio (%) for max. frequency (E1-04).
• When frequency reference is zero and a run command is input, the motor accelerates from the min. frequency to the frequency reference lower limit and maintains operation at the frequency reference lower limit.

</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>D3-01
D3-02
D3-03
D3-04</td><td>Jump frequency 1
Jump frequency 2
Jump frequency 3
Jump frequency width</td><td>Sets the jump frequency width by combining D3-01 to 04 By setting jump frequency to 0.0Hz, this function is disabled

D3-01～03—D3-04 ≦Sets the jump frequency width ≦D3-01～03+D3-04
 

Note . Constant speed operation is prohibited in jump frequency However, output frequency does not jump during accel/decel and smooth accel/decel is available.</td><td>● When some jump frequency width set by D3-01 to 04 are overlapped, be sure to set D3-03≦ D3-02≦D3-01</td></tr>
<tr><td>D4-01</td><td>Reference frequency hold function selection</td><td>Sets whether frequency at HOLD is stored when the power supply is turned OFF or a stop command is input during HOLD by multi-function input terminal UP/DOWN commands or accel/decel stop command.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>Does not store frequency during HOLD (but it becomes 0).</td></tr><tr><td>2</td><td>Stores frequency during HOLD and runs at stored frequency at restart of operation.</td></tr></table></td><td></td></tr>
<tr><td>D5-01</td><td>Torque control selection</td><td>Selects speed/torque control
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Speed control</td></tr><tr><td>1</td><td>Torque control mode</td></tr></table></td><td>Torque control is enabled only when A1-01 = 3 (flux vector control).</td></tr>
<tr><td>D5-02</td><td>Torque reference delay time</td><td>Sets primary delay time constant for torque reference input in torque control mode in units of 1ms.</td><td></td></tr>
<tr><td>D5-03</td><td>Speed limit selection</td><td>Selects speed limit value in the torque control mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>Speed limit becomes analog master speed frequency reference set by control terminal 13 or 14, disregarding the setting of frequency reference selection (B1-01).</td></tr><tr><td>2</td><td>Speed limit value becomes the set value of the constant.</td></tr></table></td><td></td></tr>
<tr><td>D5-04</td><td>Speed limit</td><td>Sets speed limit value in the torque control mode in the ratio (%) for the max frequency when D5-03 = 2</td><td></td></tr>
<tr><td>D5-05</td><td>Speed limit bias</td><td>Sets bias value for speed limit input in the torque control mode in the ratio (%) for max. frequency.</td><td></td></tr>
<tr><td>D5-06</td><td>Speed/torque control switching timer</td><td>Sets time when speed/torque control select command is input until the control mode is actually changed in the units of 1ms</td><td>Speed/torque control select is executed by multi-function input function (set value . 71)</td></tr>
</table>

Function	Description
Torque Control Operation	• When A1-01 = 03 (flux control), torque control is enabled. • To select torque control, set torque selection (D5-01) to 1 or close multi-function input terminal speed/torque control selection and set terminal 16 function selection to "torque reference" (H3-05 = 13). 〔Block Diagram〕  *1 . When speed limit selection (D5-03) = 1, master frequency reference input from terminal 13 or 14 becomes the speed limit , when D5-03 =2, the constant set value (D5-04) becomes the speed limit. *2 · When terminal 14 function selection is set to torque compensation (H3-09 = 14), terminal 14 input value can be used as torque compensated value. 〔Sequence〕 When torque reference> 0 and speed limit> 0 (winder sequence), the following sequence is performed. • When -1× speed limit bias (D5-05) <motor speed < "speed limit +D5-05" torque control is performed with the set torque reference. • When motor speed > "speed limit +D5-05" , torque control is performed with the set torque reference. • When motor speed < "-1 × D5-05" , the speed limiting circuit outputs plus torque reference to prevent motor speed from increasing to the reverse run side. Therefore, when torque reference > 0 and speed limit > 0, the possible torque control range is; "-1×D5-05" < motor speed "speed limit +D5-05" For the detailed relation of torque reference, speed limit and motor speed, refer to the table shown below.

		Winding		Rewinding	
Configuration					
Rotating Direction		FWD run	REV run	FWD run	REV run
Reference Polarity	Torque Reference (TREF)	+	−	−	+
	Speed Limit (SLIM)	+	−	+	−
Generated Torque					

Function	Description

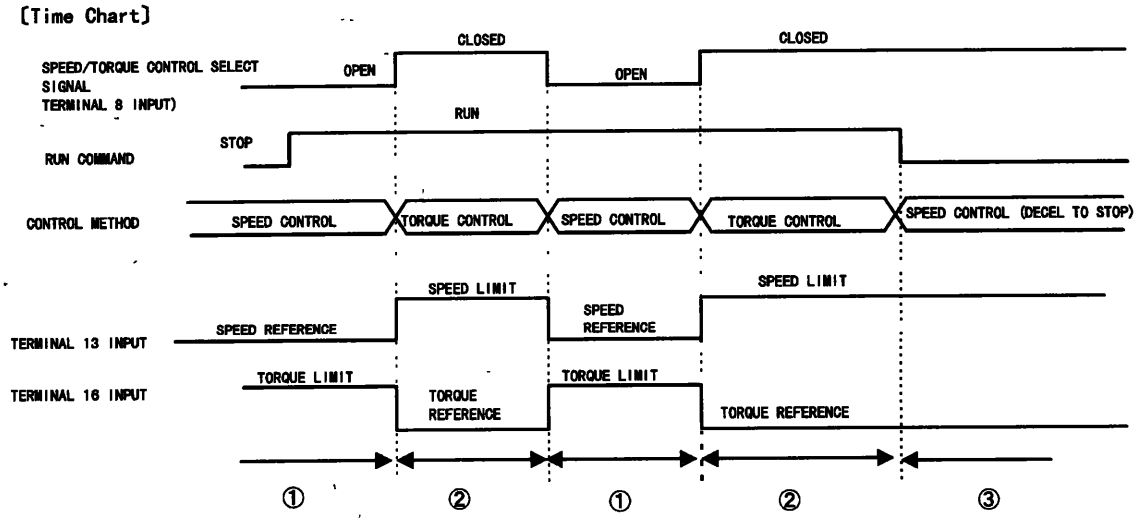
Speed/Torque Control Switching

When A1-03 = 3 (flux control), speed control or torque control can be selected during run by using the multi-function input speed/torque control select command (set value = 71). The following shows an example of selection.

[Constant Setting]

Terminal No.	Constant No.	Factory Setting	Set Value	Description
8	H1-06	8	71	Speed/torque control select
13	B1-01	1	1	Frequency reference selection (terminals 13, 14)
	D5-03	1	1	Speed limit selection (terminals 13, 14)
16	H3-05	1	13	Torque reference/speed limit

[Time Chart]



[Sequence]

① When torque/speed control select command is "OPEN", speed control is performed.

- Speed reference at speed control depends on frequency reference selection (B1-01) setting. To change terminal 13 or 14 master frequency reference to frequency reference, set B1-01 to 1.
- Torque limit at speed control is the smaller absolute value of terminal 16 torque limit or constant set values (L7-01 to 04).
- When a stop command is input during sped control, speed control is maintained and the smaller absolute value of terminal 16 torque limit or constant set values (L7-01 to 04), is used as torque limit. Then the motor decelerates to a stop.

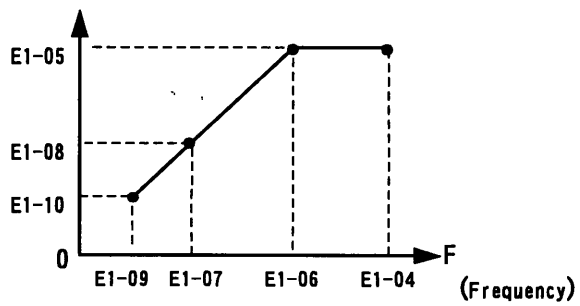
② When torque/speed control select command is "CLOSED", torque control is performed.

- Speed limit under torque control uses terminal 13 or 14 master frequency reference as frequency reference when speed limit selection (D5-03) = 1 and as constant set value (D5-04) when D5-03 = 2, disregarding frequency reference selection (B1-01) setting
- During torque control, terminal 16 analog input value becomes torque reference.

③ By inputting a stop command during torque control, it is changed to speed control automatically, and the motor decelerates to a stop. Torque limit during deceleration to a stop becomes constant set value (L7-01 to 04).

Note Actual control mode is changed after the torque /speed control select command is changed and the speed/torque select timer (D5-06) elapses. Terminal 13 speed reference/speed limit and terminal 16 torque limit/torque reference are held in the inverter until the time set to D5-06 elapses.

E MOTOR-RELATED CONSTANTS

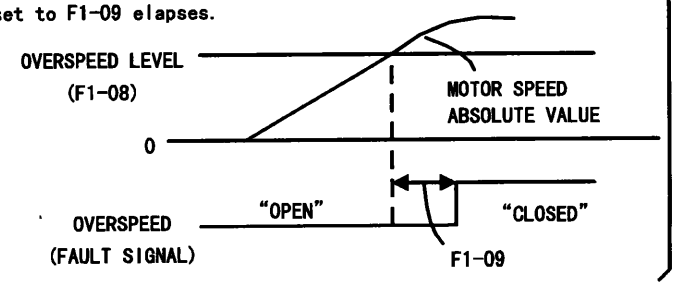
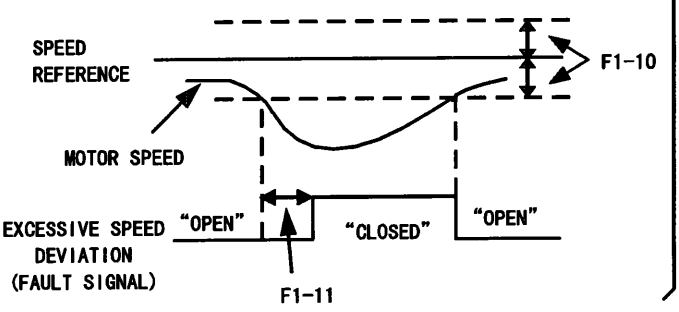
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>E1-01</td><td>Input voltage setting</td><td>Sets inverter input voltage in units of 1V.</td><td></td></tr>
<tr><td>E1-02</td><td>Motor selection</td><td>Motor protective characteristics are changed by this setting.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Standard motor protective characteristics</td></tr><tr><td>1</td><td>Inverter motor protective characteristics</td></tr></table></td><td></td></tr>
<tr><td>E1-03</td><td>V/f pattern selection</td><td>Selects a V/f pattern in the V/f control mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0~E</td><td>Preset V/f pattern can be selected.
(For details, refer to Par. 2.7.)</td></tr><tr><td>F</td><td>Custom V/f pattern can be set.</td></tr></table>This setting is fixed to F in the vector control mode.</td><td></td></tr>
<tr><td>E1-04</td><td>Max. output frequency</td><td rowspan="6">When E1-03=1, V/f pattern setting can be adjusted by E1-04 to 10.
 

Set frequency so that E1-09 ≦ E1-07 < E1-06 ≦ E1-04 will be obtained.
Note .If V of the V/f pattern is increased excessively, motor torque can be obtained but the following faults may occur.
• Excessive motor current may cause the inverter malfunction.
• Motor generates heat and vibrates.
Therefore, increase the value of V little by little, checking motor current each time.</td><td rowspan="6"></td></tr>
<tr><td>E1-05</td><td>Max. voltage</td></tr>
<tr><td>E1-06</td><td>Max. voltage frequency</td></tr>
<tr><td>E1-07</td><td>Mid. output frequency</td></tr>
<tr><td>E1-08</td><td>Mid. output frequency voltage</td></tr>
<tr><td>E1-09</td><td>Min. output frequency</td></tr>
<tr><td>E1-10</td><td>Min. output frequency voltage</td><td></td></tr>
</table>

Constant No.	Name	Description	Remarks
E2-01	Motor rated current	Sets motor rated current in units of 0.01A for 7.5kW or less, 0.1A for 11kW or more.	
E2-02	Motor rated slip	Sets motor rated slip in units of 0.01Hz. To convert (r/min) to (Hz), use the following equation ; fs (Rated slip [Hz]) $fs\ (\text{Rated slip}_{(Hz)}) = (\text{Rated frequency}_{(Hz)}) - \frac{(\text{Rated revolutions}_{(r/min)})(\text{No. of poles})}{120}$	
E2-03	Motor no-load current	Sets motor no-load current in units of 0.01A for 7.5kW or less 0.1A for 11kW or more.	
E2-04	Number of motor poles	Sets the number of motor poles.	
E2-05	Motor line-to-line resistance	Sets motor phase-to-phase resistance value in units of 0.01Ω. $\text{Motor line-to-line resistance} = \left(\begin{array}{l}\text{Phase-to-phase}\\ \text{resistance at}\\ \text{insulation}\\ \text{class}\\ \text{temperature}\end{array}\right) \times \frac{273+(25°C+\text{insulation class temperature}) / 2}{273+\text{insulation class temperature}}$	
E2-06	Motor leakage inductance	Sets motor leakage inductance in units of 0.1%.	
E2-07	Motor iron-core saturation coefficient 1	Sets motor iron-core saturation coefficient at 50% of magnetic flux. This constant does not have to be set since it is set automatically by auto-tuning.	
E2-08	Motor iron-core saturation coefficient 2	Sets motor iron-core saturation coefficient at 75% of magnetic flux. This constant does not have to be set since it is set automatically by auto-tuning.	
E2-09	Motor mechanical loss	Sets motor mechanical loss in units of 0.1%. 100% of this value is motor rated output.	

F OPTION-RELATED CONSTANTS

Constant No.	Name	Description	Remarks
F1-01	PG constant	Sets the number of pulses of PG (pulse generator) to be used. The set value is the number of pulses per motor revolution (pulses/rev).	
F1-02	Operation selection at PG open circuit	Sets the stopping method at PG disconnected detection. 0 : Deceleration to stop (deceleration time : C1-02) 1 : Coasting to stop 2 : Emergency stop (deceleration time : C1-09) 3 : Continuous operation (displayed only) (Setting disabled when A1-01=3 : flux vector control)	
F1-03	Operation selection at overspeed	Sets the stopping method at Overspeed detected. 0 : Deceleration to stop (deceleration time : C1-02) 1 : Coasting to stop 2 : Emergency stop (deceleration time : C1-09) 3 : Continuous operation (displayed only) (Setting disabled when A1-01=3 : flux vector control.)	
F1-04	Operation selection at deviation	Sets the stopping method at excessive speed deviation detected. 0 : Deceleration to stop (deceleration time : C1-02) 1 : Coasting to stop 2 : Emergency stop (deceleration time : C1-09) 3 : Continuous operation (displayed only)	
F1-05	PG rotation	Sets the relation between the motor rotating direction and PG polarity. 0 : Phase A advanced in motor FWD rotation 1 : Phase A advanced in motor REV rotation When PG-A or-D option is connected, this constant is disabled.	• Motor FWD rotation is in the counterclockwise (CCW) direction viewed from the load side.
F1-06	PG division rate (Effective only when PG-B2 card is mounted)	Sets the division ratio when pulse signals from PG are monitored. [Setting of division ratio] Division ratio = $\frac{n+1}{m}$ (Setting range $\frac{1}{1} \sim \frac{1}{32}$) Data □ □ m, 1~32 n, 0, 1	• Division is only for pulse monitoring and has nothing to do with control.
F1-07	Integral value during accel/decel enable/disable	Sets whether speed control section (ASR) integral operation is performed during accel/decel 0 : Enabled 1 : Disabled	

Constant No.	Name	Description	Remarks
F1-08	Overspeed detection level	Sets the motor overspeed detection level in the ratio (%) for E1-04 (max frequency)	• Stopping method at overspeed detection depends on the setting of F1-03.
F1-09	Overspeed detection delay time	Sets the time from when overspeed is detected to when it is regarded as a fault. A fault signal is output to stop operation after the absolute value of motor speed exceeds the set value of F1-08 and the time set to F1-09 elapses. 	
F1-10	Excessive speed deviation detection level	Sets the excessive speed deviation detection level in the ratio (%) for E1-04 (max. frequency).	• Stopping method at excessive speed deviation detection depends on the setting of F1-04
F1-11	Detection delay time	Sets the time from when excessive speed deviation is detected to when it is regarded as a fault. A fault signal is output to stop operation after deviation between speed reference and motor speed exceeds the set value of F1-10 and the time set to F1-11 elapses. 	• This is not detected during accel/decel or torque control.
F1-12 F1-13	Number of PG gear teeth 1 Number of PG gear teeth 2	Sets the number of gear teeth when there are gears between the motor and the PG. When the number of gear teeth is set, the motor r/min is calculated in the inverter as shown below. Motor revolutions [r/min] $= \frac{\text{No. of PG output pulses} \times 60}{\text{PG constant (F1-01)}} \times \frac{\text{No. of gear teeth 2 (F1-13)}}{\text{No of gear teeth 1 (F1-12)}}$	• This function is disabled when F1-12=0 or F1-13=0.

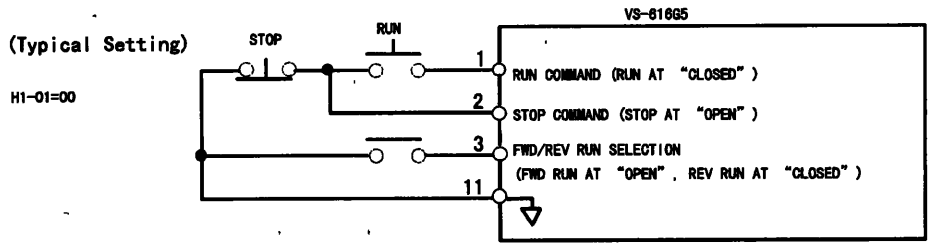
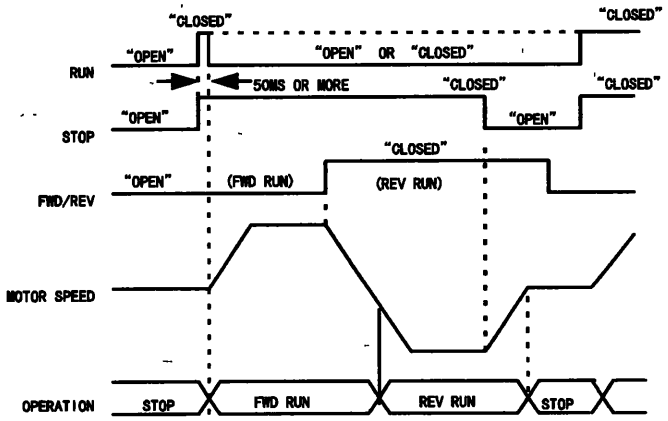
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>F2-01</td><td>Bi-polar or uni-polar input selection</td><td>Selects CH1 to 3 input functions when AI-14B (optional) is connected
<table><tr><th>Set Value</th><th>Function</th><th>CH1 (TC1-TC4)</th><th>CH2 (TC2-TC4)</th><th>CH3 (TC3-TC4)</th></tr><tr><td>0</td><td>3CH Individual Input</td><td>Substitute for terminals ⑬-⑰</td><td>Substitute for terminals ⑭-⑰</td><td>Substitute for terminals ⑯-⑰</td></tr><tr><td>1</td><td>3CH Addition Input</td><td colspan="3">Sum of CH1 to 3 input values is regarded as a frequency reference value</td></tr></table>Sets B1-01 to 01 (frequency reference from control circuit terminal) when 3CH individual input is used.</td><td>The function of multi-function input (option/inverter reference select) (set value : 02) is disabled</td></tr>
<tr><td>F3-01</td><td>Digital input option</td><td>Selects the setting mode of frequency reference input from DI-08 (optional) or DI-16H (optional).
<table><tr><th>Set Value</th><th>Frequency Reference Setting Mode</th></tr><tr><td>0</td><td>BCD 1% unit</td></tr><tr><td>1</td><td>BCD 0.1% unit</td></tr><tr><td>2</td><td>BCD 0.01% unit</td></tr><tr><td>3</td><td>BCD 1Hz unit</td></tr><tr><td>4</td><td>BCD 0.1Hz unit</td></tr><tr><td>5</td><td>BCD 0.01Hz unit</td></tr><tr><td>6</td><td>Binary
DI-08 : 255/100%
DI-16H, 12-bit selection : 4096/100%
DI-16H, 16-bit selection : 30000/100%</td></tr><tr><td>7</td><td>Binary-Set value is displayed in decimal notation</td></tr></table></td><td></td></tr>
<tr><td>F4-01
F4-02
F4-03
F4-04</td><td>AO-08, AO-12
Channel 1 monitor selection
Channel 1 gain
Channel 2 monitor selection
Channel 2 gain</td><td>Selects items to be output to AO-08 (optional) or AO-12 (optional), and sets output gain.
For output items, set the monitor No. (U1-XX) to be output.
To obtain the output level, multiply the monitor item output level by F4-02 or F4-04 set value.</td><td></td></tr>
<tr><td>F5-01
F5-02</td><td>DO-02C
Channel 1 output selection
Channel 2 output selection</td><td>Sets multi-function output items to be output to DO-02C (optional).
For the selecting method of output items, refer to H2-01 to 03.</td><td></td></tr>
</table>

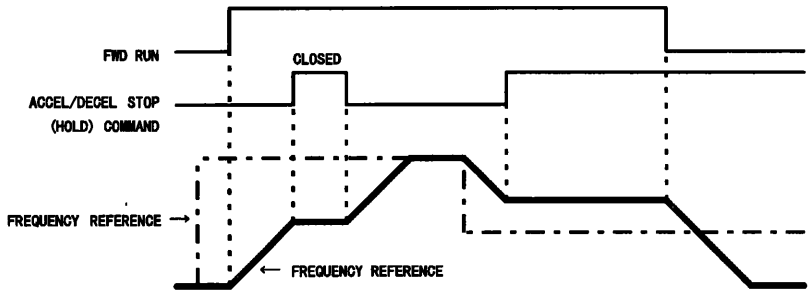
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>F6-01</td><td>DO-08
Output mode selection</td><td>The following table outlines items to be output from DO-08 (optional) according to F6-01 setting.
<table>
<tr><th>Set Value</th><th>Output Contents</th></tr>
<tr><td>0</td><td>
<table>
<tr><th>Terminal No.</th><th>Output Contents</th></tr>
<tr><td>TD5-TD11</td><td>Overcurrent (SC, OC, GF)</td></tr>
<tr><td>TD6-TD11</td><td>Overvoltage (OV)</td></tr>
<tr><td>TD7-TD11</td><td>Inverter overload (OL2)</td></tr>
<tr><td>TD8-TD11</td><td>Fuse blown (FU)</td></tr>
<tr><td>TD9-TD11</td><td>Not used</td></tr>
<tr><td>TD10-TD11</td><td>Inverter overheat (OH)</td></tr>
<tr><td>TD1-TD2</td><td>During zero-speed detection</td></tr>
<tr><td>TD3-TD4</td><td>During speed agree</td></tr>
</table>
</td></tr>
<tr><td>1</td><td>
<table>
<tr><th>Terminal No.</th><th>Output Contents</th></tr>
<tr><td>TD5-TD11</td><td rowspan="4">Sign output (See the table below)</td></tr>
<tr><td>TD6-TD11</td></tr>
<tr><td>TD7-TD11</td></tr>
<tr><td>TD8-TD11</td></tr>
<tr><td>TD9-TD11</td><td>During zero-speed detection</td></tr>
<tr><td>TD10-TD11</td><td>During speed agree</td></tr>
<tr><td>TD1-TD2</td><td>During run</td></tr>
<tr><td>TD3-TD4</td><td>Minor fault</td></tr>
</table>
<table>
<tr><th>bit 3210</th><th>Output Contents</th><th>bit 3210</th><th>Output Contents</th></tr>
<tr><td>0000</td><td>No fault</td><td>1000</td><td>External fault</td></tr>
<tr><td>0001</td><td>Overcurrent</td><td>1001</td><td>Controller fault</td></tr>
<tr><td>0010</td><td>Overvoltage</td><td>1010</td><td>Motor overload</td></tr>
<tr><td>0011</td><td>Inverter overload</td><td>1011</td><td>Not used</td></tr>
<tr><td>0100</td><td>Inverter overheat</td><td>1100</td><td>Power loss</td></tr>
<tr><td>0101</td><td>Not used</td><td>1101</td><td>Not used</td></tr>
<tr><td>0110</td><td>Fuse blown</td><td>1110</td><td>Not used</td></tr>
<tr><td>0111</td><td>Not used</td><td>1111</td><td>Not used</td></tr>
</table>
</td></tr>
</table>
</td><td></td></tr>
<tr><td>F7-01</td><td>PO-3F
Frequency multiple selection</td><td>The following table shows the number of pulses to be output from PO-3F (optional) according to the setting of F7-01.
<table>
<tr><th>F7-01</th><th>Number of Output Pulses</th></tr>
<tr><td>0</td><td>Inverter output frequency ×1</td></tr>
<tr><td>1</td><td>Inverter output frequency ×6</td></tr>
<tr><td>2</td><td>Inverter output frequency ×10</td></tr>
<tr><td>3</td><td>Inverter output frequency ×12</td></tr>
<tr><td>4</td><td>Inverter output frequency ×36</td></tr>
</table>
</td><td></td></tr>
</table>

H CONTROL CIRCUIT TERMINAL-RELATED CONSTANTS

Constant No.	Name	Description
	Multi-function input terminal function selection	Selects the function of a signalinput form control circuit termanals 3 to 8.
H1-01	Multi-function input (terminal 3)	
H1-02	Multi-function input (terminal 4)	
H1-03	Multi-function input (terminal 5)	
H1-04	Multi-function input (terminal 6)	
H1-05	Multi-function input (terminal 7)	
H1-06	Multi-function input (terminal 8)	

Set Value	Function	V/f	V/f with PG	Open Loop Vector	Flux Vector	Reference Page
00	3-wire sequence FWD/REV run selection	O	O	O	O	56
01	Local/remote selection	O	O	O	O	56
02	Option/inverter selection	O	O	O	O	56
03	Multi-step speed reference 1	O	O	O	O	45
04	Multi-step speed reference 2	O	O	O	O	45
05	Multi-step speed reference 3	O	O	O	O	45
06	Jog frequency reference	O	O	O	O	45
07	Accel/decel time selection 1	O	O	O	O	39
08	External baseblock/NO contact	O	O	O	O	56
09	External baseblock/NC contact	O	O	O	O	57
0A	Accel/decel stop	O	O	O	O	57
0B	Inverter overheat prediction	O	O	O	O	57
0C	Multi-function analog input enable/disable	O	O	O	O	57
0D	Speed control disabled	×	O	×	×	57
0E	Speed control integral reset	×	O	×	O	57
0F	Not used	—	—	—	—	—
10	UP command	O	O	O	O	58
11	DOWN command	O	O	O	O	58
12	FJOG command (FWD jog run)	O	O	O	O	59
13	RJOG command (REV jog run)	O	O	O	O	59
14	Fault reset	O	O	O	O	—
15	Emergency stop	O	O	O	O	39
16	Not used	—	—	—	—	—
17	Not used	—	—	—	—	—
18	ON-delay, OFF-delay timer input	O	O	O	O	35
19	PID control cancel	O	O	O	O	35
1A	Accel/decel time selection 2	O	O	O	O	39
1B	Constant write-in prohibition	O	O	O	O	59
1C	Not used	—	—	—	—	59
1D	Not used	—	—	—	—	59
1E	Not used	—	—	—	—	59
1F	Terminal 13/14 selection	O	O	O	O	59
20 to 2F	External fault	O	O	O	O	59
60	DC injection braking command	O	O	O	O	60
61	External search command 1	O	×	O	×	60
62	External search command 2	O	×	O	×	60
63	Energy-saving operation	O	O	×	×	37
71	Speed/torque control selection	×	×	×	O	48
72	Zero-servo command	×	×	×	O	38
77	Speed control proportional gain selection	×	×	×	O	42

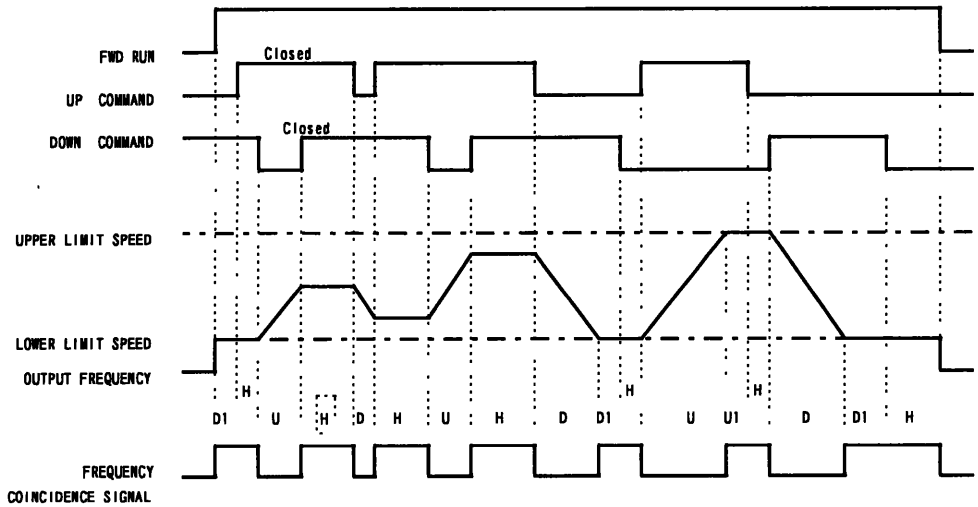
Set Value	Description
00	• 3-wire sequence When 00 is set to H1-01 to 06, 3-wire sequence is entered. The terminal having set value of 00 becomes a FWD/REV run command.  The following shows the time chart. 
01	• Local/remote selection Operation signal selection is effective only during stop. Open : Runs according to the setting of B1-01 or B1-02 in the remotemode. Closed : Runs by digital operator frequency reference or run command in the local mode Note : When local/remote selection is set by multi-function input terminal, digital operator local/remote selection becomes invalid.
02	• Option/inverter selection Selects whether operation is performed with option card reference or inverter reference. Option/inverter selection is effective only during stop. Open : Runs by frequency reference and run command from inverter control circuit terminal or digital operator. Closed : Runs by frequency reference and run command from option card.
08	• External baseblock Baseblock operation is performed at "closed". External baseblock operation differs as described below, depending on the run command input status. - When an external baseblock signal is input during run, BB blinks on the digital operator to shut OFF inverter output. When the external baseblock signal is removed, operation restarts with the frequency reference obtained before baseblock. At this time, voltage recovers up to the set value in the voltage recovery time (L2-04). - When a stop signal is input and an external baseblock signal is input while the inverter is decelerating, BB blinks on the digital operator to shut OFF inverter output and stop the operation.

Set Value	Description
09	• External baseblock Baseblock is performed at "open". The other sequence is the same as that of set value =08.
0A	• Accel/decel stop (HOLD) command Accel/decel is stopped while an accel/decel stop command is input, and the current output frequency is held. When a stop command is input, the accel/decel stopped status is released to stop operation. The following shows the time chart.  Note · When D4-01 is set to 1 and accel/decel stop command is input, by inputting a run command again after a stop command is input, the held output frequency is stored unless the accel/decel stop command is released. Therefore, operation is performed at the stored frequency. When the power supply is turned OFF in the status where the accel/decel stop command is input, the held output frequency is also stored When D4-01 is set to 0, the held output frequency is not stored.
0B	• Inverter overheat alarm While the inverter overheat alarm signal is input, only OH2 is displayed, blinking, on the digital operator. Used for monitoring inverter ambient temperature.
0C	• Multi-function analog input enable/disable When this function is selected for multi-function terminal, the functions set to multi-function analog input have the following limitation. Open · Multi-function analog input is not accepted. Closed · Multi-function analog input is accepted.
0D	• Speed control disabled Speed control disabled/enabled selection is possible even during running. However, speed control integral value is held until stop. Open · Speed control enabled (closed loop) Closed · Speed control disabled (open loop)
0E	• Speed control integral value reset This function is effective only when F1-07 (integral control selection during accel/decel)=0. Speed control integral value reset is enabled even during running. Open · PI-control (Speed control integral values are added.) Closed · P-control (Speed control integral values are reset by integral time constant.)

Set Value	Description
10, 11	● UP/DOWN commands By inputting UP and DOWN signals, accel/decel can be performed for operation at an aimed speed without changing frequency reference while a FWD(REV) run command is input. Set value = 10: UP signal Set value = 11 DOWN signal

UP Command	Closed	Open	Open	Closed
DOWN Command	Open	Closed	Open	Closed
Status	Accel	Decel	HOLD	HOLD

The following shows the time chart where UP/DOWN commands are used.



U = UP (acceleration) status
D = DOWN (deceleration) status
H = HOLD (constant speed) status
U1 = During clamping at upper limit speed in UP status
D1 = During clamping at lower limit speed in DOWN status

Notes

1 To use UP/DOWN commands, be sure to set 1 to B1-01 setting (frequency reference selection).
Set value = 1. UP/DOWN commands enabled.
Set value ≠ 1 UP/DOWN commands disabled.

2 Upper limit speed
= Max. output frequency (E1-04) × Frequency upper limit (D2-01)

3 Lower limit value is either frequency reference limit (D2-01) or master frequency reference from control circuit terminal 13 or 14.

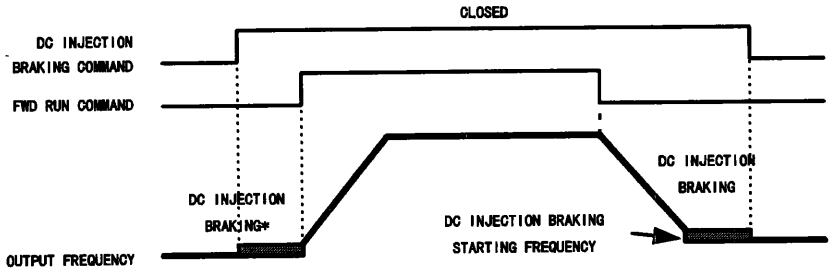
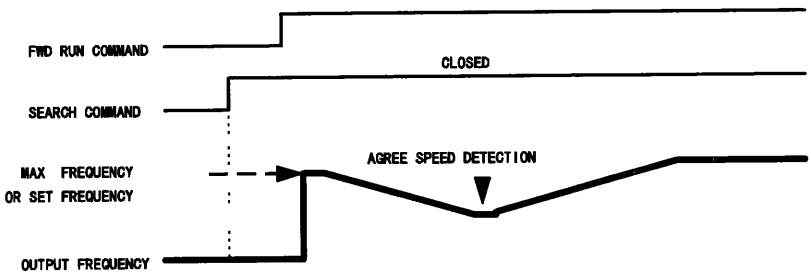
4 When D4-01=1, even if the power supply is turned OFF in the status where accel/decel stop (HOLD) command is input, the held output frequency is stored.
When D4-01=0, the held output frequency is stored.

5 If a jog frequency reference is input during run by UP/DOWN commands, the jog reference has priority.

6 When UP and DOWN commands are set together, a setting error (OPE03) occurs.

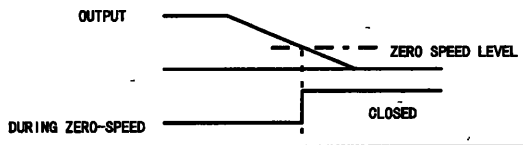
7 When multi-function input accel/decel stop (HOLD) command is set simultaneously, a setting error (OPE03) occurs.

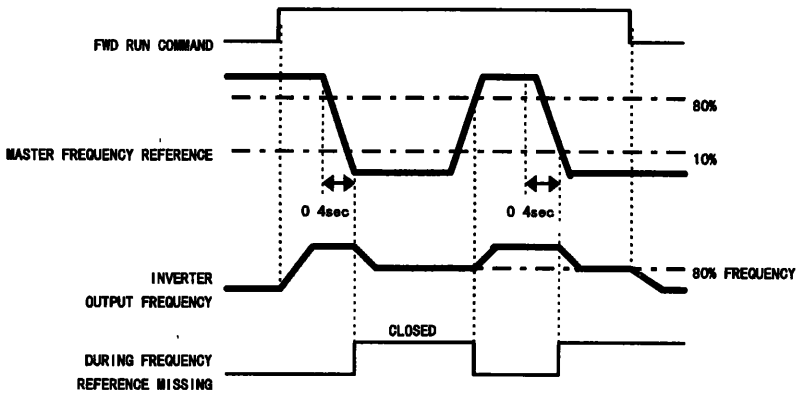
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>12, 13</td><td>
● FJOG command, RJOG command
FWD and REV run jog frequency operations are enabled.
Set value = 12 FJOG command closed : FWD run at jog frequency reference (D1-09).
Set value = 13 RJOG command closed . REV run at jog frequency reference (D1-09).
Notes.
1 When FJOG command is input during run, FJOG command and RJOG command have priority.
2 When both FJOG command and RJOG command are closed more than 500ms, the inverter stops according to the stopping method selection (B1-03).
3 FJOG command or RJOG command can be set independently.
</td></tr>
<tr><td>14</td><td>
● Fault reset
Closed Resets a fault.
</td></tr>
<tr><td>1B</td><td>
● Constant write-in prohibition
Open . To write in constants is prohibited.
Closed : To write in constants is permitted.
</td></tr>
<tr><td>1F</td><td>
● Terminal 13/14 selection
Open . Terminal 13 is regarded as the master frequency reference.
Closed . Terminal 14 is regarded as the master frequency reference.
When "1F" (terminal 13/14 selection) is not set to multi-function input terminal function selection (H1-01 to H1-06) and when terminal 14 (H3-09) is set to "1F" (master frequency reference), the master frequency reference becomes the sum of terminals 13 and 14.
When the set value of H3-09 is other than 1F and multi-function input terminal 13/14 selection (set value 1F) is set, a setting error (OPE03) occurs.
</td></tr>
<tr><td>20
to
2F</td><td>
● External fault
Used to stop the inverter or send an alarm to external devices at fault of peripheral devices, etc.
<table>
<tr><th colspan="2" rowspan="2">Set Value (HEX input)
(Same date cannot be set)</th><th colspan="8">Sslection Mode</th></tr>
<tr><th colspan="2">Contact Mode</th><th colspan="2">Detection Mode</th><th colspan="4">Stopping Method</th></tr>
<tr><th>2nd Digit</th><th>3rd Digit</th><th>NO contact input</th><th>NC contact input</th><th>Always detected</th><th>Detected during run</th><th>Decel to stop (major fault)</th><th>Coasting to stop (major fault)</th><th>Emergency stop (major fault)</th><th>Continuous operation (major fault)</th></tr>
<tr><td rowspan="16">2</td><td>0</td><td>○</td><td></td><td>○</td><td></td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>1</td><td></td><td>○</td><td>○</td><td></td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>○</td><td></td><td></td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td>○</td><td></td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>○</td><td></td><td>○</td><td></td><td></td><td>○</td><td></td><td></td></tr>
<tr><td>5</td><td></td><td>○</td><td>○</td><td></td><td></td><td>○</td><td></td><td></td></tr>
<tr><td>6</td><td>○</td><td></td><td></td><td>○</td><td></td><td>○</td><td></td><td></td></tr>
<tr><td>7</td><td></td><td>○</td><td></td><td>○</td><td></td><td>○</td><td></td><td></td></tr>
<tr><td>8</td><td>○</td><td></td><td>○</td><td></td><td></td><td></td><td>○</td><td></td></tr>
<tr><td>9</td><td></td><td>○</td><td>○</td><td></td><td></td><td></td><td>○</td><td></td></tr>
<tr><td>A</td><td>○</td><td></td><td></td><td>○</td><td></td><td></td><td>○</td><td></td></tr>
<tr><td>B</td><td></td><td>○</td><td></td><td>○</td><td></td><td></td><td>○</td><td></td></tr>
<tr><td>C</td><td>○</td><td></td><td>○</td><td></td><td></td><td></td><td></td><td>○</td></tr>
<tr><td>D</td><td></td><td>○</td><td>○</td><td></td><td></td><td></td><td></td><td>○</td></tr>
<tr><td>E</td><td>○</td><td></td><td></td><td>○</td><td></td><td></td><td></td><td>○</td></tr>
<tr><td>F</td><td></td><td>○</td><td></td><td>○</td><td></td><td></td><td></td><td>○</td></tr>
</table>
(Example) When "24" is set to HI-06 (terminals 8-11 function selection)
• An external fault occurs when it is closed between terminals 8 and 11 (NO contact).
• An external fault is always detected.
• An external fault is regarded as a major fault and the motor coasts to stop.
</td></tr>
</table>

Set Value	Description
60	• DC injection braking command When a DC injection braking command is input during inverter stop, DC injection braking operation is performed When a run command or a jog command is input, DC injection braking is released to start operation. (Operation has a priority.) The following shows the time chart  * : When A1-01=3 (flux vector control), initial excitation (exciting current) is executed.
61, 62	• Search command To start a coasting motor for commercial power supply and inverter changing operation etc , operation is enabled without tripping the motor by using the speed search function. Set value = 61: Starts speed search from the max. frequency. Set value = 62: Starts speed search from the frequency reference value set at search command input Note : For V/f control with PG feedback and flux vector control (A1-02=01 or 03), acceleration starts from set motor speed. The following shows the time chart when a speed search command is input.  When the search command is closed and run command is input during baseblock, speed search starts after the min. baseblock time (L2-03). Note : 1. In the continuous operation mode at a power loss, speed search starts from the current output frequency disregarding whether any run command or search command is provided After completion of speed search, operation is performed according to the run command. 2 Search commands with set values 61 or 62 cannot be set simultaneously

Constant No	Name	Description
	Multi-function output terminal function selection	Selects the function of signals output from control circuit terminals 9, 25 and 26.
H2-01	Multi-function output (terminal 9-10)	
H2-02	Multi-function output (terminal 25-27)	
H2-03	Multi-function output (terminal 26-27)	

Set Value	Function	V/f	V/f with PG	Open Loop Vector	Flux Vector	Reference
00	During run	O	O	O	O	62
01	Zero-speed	O	O	O	O	62
02	Frequency agree 1	O	O	O	O	62
03	Desired frequency agree	O	O	O	O	62
04	Frequency detection 1	O	O	O	O	62
05	Frequency detection 2	O	O	O	O	62
06	Inverter operation ready	O	O	O	O	62
07	During undervoltage detection	O	O	O	O	62
08	During baseblock	O	O	O	O	62
09	Frequency reference mode	O	O	O	O	62
0A	Run command mode	O	O	O	O	62
0B	Overtorque detection 1 (NO contact output)	O	O	O	O	63
0C	Frequency reference missing	O	O	O	O	63
0D	Braking resistor fault	O	O	O	O	63
0E	Fault	O	O	O	O	63
0F	Not used	—	—	—	—	—
10	Alarm	O	O	O	O	63
11	During fault reset	O	O	O	O	63
12	Timer output	O	O	O	O	63
13	Frequency agree 2	O	O	O	O	63
14	Desired frequency agree 2	O	O	O	O	63
15	Frequency detection 3	O	O	O	O	64
16	Frequency detection 4	O	O	O	O	64
17	Overtorque detection 1 (NC contact output)	O	O	O	O	64
18	Overtorque detection 2 (NC contact output)	O	O	O	O	64
19	Overtorque detection 2 (NC contact output)	O	O	O	O	64
1A	During REV run	O	O	O	O	64
1B	During baseblock	O	O	O	O	64
1C	Not used	—	—	—	—	—
1D	Motoring retry	×	×	×	O	64
1E	During retry	O	O	O	O	64
1F	OL1 pre-alarm	O	O	O	O	64
20	OH1 pre-alarm	O	O	O	O	64
21～2F	Not used	—	—	—	—	—
30	During torque limit	×	×	O	O	64
31	During speed limit	×	×	×	O	64
32	Not used	—	—	—	—	—
33	Zero servo completion	×	×	×	O	65
37	During run 2	O	O	O	O	65
34～3F	Not used	—	—	—	—	—

Set Value	Description
00	● During run Closed when the inverter is outputting voltage or a run command is input.
01	● During zero-speed Closed when the inverter output frequency is less than the min. output frequency (E1-09) in V/f control with PG feedback Closed when the motor speed is less than the zero-speed level (B2-01) in flux vector control 
02	● Frequency agree 1 Closed when output frequency is Frequency reference − L4-02 ≦ SFS output ≦ frequency reference + L4-02
03	● Desired frequency agree 1 Closed when the set value = 02 (frequency agree status) and output frequency is within the detection range shown below L4-01 − L4-02 ≦ SFS output (without a sign) ≦ L4-01 + L4-02
04	● Frequency detection 1 Closed when output frequency is less than the detection shown below SFS output (without a sign) ≦ L4-01 + L4-02
05	● Frequency detection 2 Closed when output frequency is less than the detection level shown below. SFS output (without a sign) ≧ L4-01
06	● Inverter operation ready Closed when inverter operation is ready
07	● During undervoltage detection Closed when the main circuit or control circuit power supply is reduced or main circuit MC is turned OFF
08	● During baseblock Closed during inverter output baseblock. (NO contact output)
09	● Frequency reference mode Open during run with frequency reference given by control circuit terminal or option Closed during run with frequency reference from the digital operator.
0A	● Run command mode Open during run by run command given by control circuit terminal or option. Closed during run by run command from the digital operator

Set value	Description
0B	• Overtorque detection 1 Closed while overtorque detection 1 is being detected. (Refer to L6-01 to 03.)
0C	• During frequency reference is missing. Closed when frequency reference is missing. (Example) By setting this constant to ENABLED (L4-05), operation is continued at 80% of the frequency reference as shown below. By setting L4-05 = 1, master frequency reference obtained 0.4 second before is always compared with the current reference; when the current reference is reduced to 10% or less of the reference obtained 0.4 second before, operation continues at 80% of the master frequency reference obtained 0.4 second before. At this time, during frequency reference missing signal is closed. 
0D	• Braking resistor fault Closed during braking resistor overheating or a braking transistor fault.
0E	• Fault Closed during a fault excluding CPF00 and CPF01.
10	• Alarm Closed while an alarm is displayed.
11	• During fault reset Closed while fault is being reset.
12	• Time output Closed while a time input is being output
13	• Frequency agree 2 Closed when output frequency is within the detection range shown below. Frequency reference -L4-04 ≦ SFS output ≦ frequency reference + L4-04 Same as frequency agree 1 (set value = 02) except that the detection width is L4-04.
14	• Desired frequency agree 2 Closed when the set value is 13 (speed agree status) and it is within detection range shown below. L4-03 —L4-04 ≦ SFS output (with a sign) ≦ L4-03 + L4-04

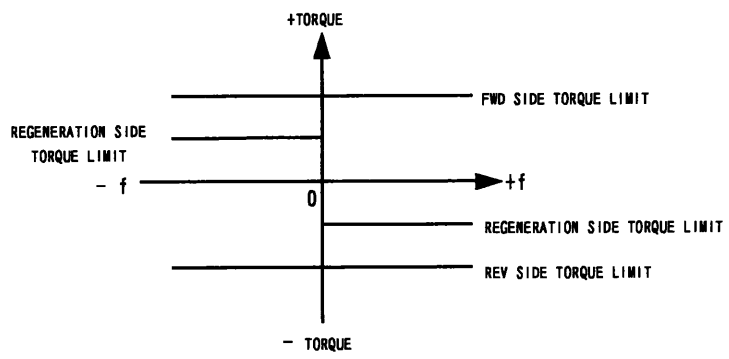
Set	Description
15	• Frequency detection 3 Closed when output frequency is less than the detection level shown below SFS output (with a sign) ≦ L4-03
16	• Frequeny detection 4 Closed when output frequency is less than the detection level shown below. SFS output (with a sign) ≦ L4-03
17	• Overtorque detection 1 Open while overtorque detection 1 is being detected (NC contact output). (Refer to L6-01~03.)
18	• Overtorque detection 2 Closed while overtorque detection 2 is being detected (NO contact output). (Refer to L6-04, 05, 07.)
19	• Overtorque detection 2 Open while overtorque detection 2 is being detected (NO contact output). (Refer to L6-04, 05, 07.)
1A	• During REV run Closed during REV run.
1B	• During baseblock Open during inverter output baseblock (NC contact output).
1D	• Motoring/regenerating mode Closed in the regenerating mode in flux vector control.
1E	• During retry Closed during retry operation at fault retry.
1F	• OL1 pre-alarm Closed when electronic thermal overload relay integrated value becomes 90% of the fault detection level. (L8-02, 03.)
20	• OH pre-alarm Closed when the cooling fin temperature exceeds the cooling fin overheat temperature (Refer to L8-02, 03)
30	• During torque limit Closed during torque limit.
31	• During speed limit Closed when the speed limit level is reached at torque control in flux vector control.

Set Value	Description
33	● Zero-servo completion Closed when zero-servo is completed
37	● During run 2 Closed, Except during baseblock (BB), or injection braking (OB), or during initial excitation

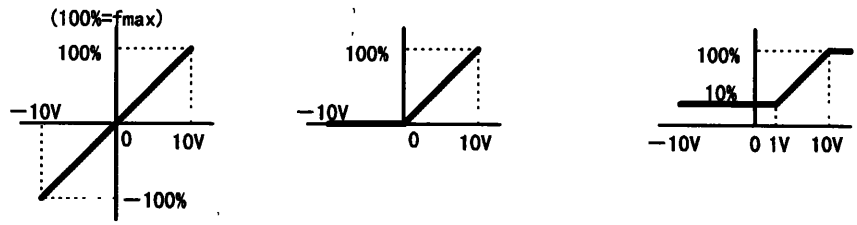
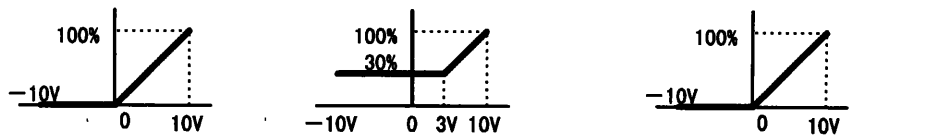
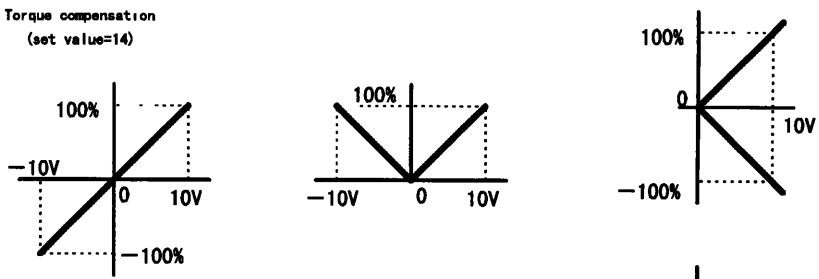
Constant No.	Name	Description	Remarks
H3-01	Signal level selection (terminal 13)	Set Value: 0 — Description: 0 to 10V input; 1 — −10 to 10V + input	● Resolution [11 bit + sign input]
H3-02	Gain (terminal 13)	Sets the input gain (level) when frequency reference voltage is 10V.	
H3-03	Gain (terminal 13)	Sets the input bias (level) when frequency reference voltage is 0V.	
H3-04	Signal level selection (terminal 16)	Set Value: 0 — Description: 0 to 10V input; 1 — −10 to 10V + input	● Resolution [11 bit + sign input]
H3-05	Multi-function analog input (terminal 16)	Set terminal 16 to multi-function analog reference. The following table shows the set values.	

Set Value	Function	V/f	V/f with PG	Open Loop Vector	Flux Vector	Input Level
00	Auxiliary frequency reference	○	○	○	○	±100% / ±10V
01	FGAIN	○	○	○	○	100% / 10V
02	FBIAS	○	○	○	○	±100% / ±10V
04	VBIAS	○	○	×	×	100% / 10V
05	Accel/decel time reduction coefficient	○	○	○	○	100% / 1V
06	DC injection braking current	○	○	○	×	100% / 10V
07	Overtorque detection level	○	○	○	○	100% / 10V
08	Stall prevention level during run	○	○	×	×	100% / 10V
09	Frequency reference lower limit level	○	○	○	○	100% / 10V
0A	Jump frequency	○	○	○	○	100% / 10V
0B	PID feedback	○	○	○	○	±100% / ±10V
0C～0F	Not used	−	−	−	−	——
10	FWD side torque limit	×	×	○	○	100% / ±10V
11	REV side torque limit	×	×	○	○	100% / ±10V
12	Regeneration side torque limit	×	×	○	○	100% / ±10V
13	Torque reference (at torque control) Torque limit (at speed control)	×	×	×	○	±100% / ±10V
14	Torque compensation (bias)	×	×	×	○	±100% / ±10V
15	FWD/REV side torque limit	×	×	○	○	±100% / 10V
16～1F	Not used	−	−	−	−	——

[Description of torque limits]



Note For torque limit, one of the smallest, (L7-01 to 04) or analog reference

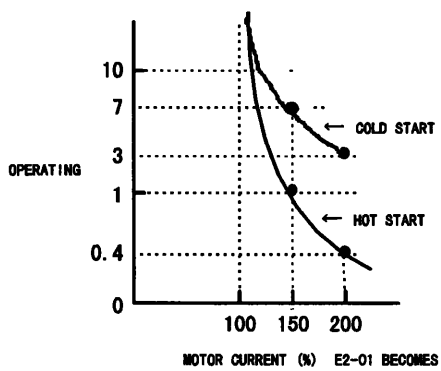
Constant No	Name	Description	Remarks
		• Auxiliary frequency reference (set value=00) • FBIAS (set value=02) • PID feedback (set value=08) • FGAIN (set value=01) • VBIAS (set value=04) • DC injection braking current (set value=06) • Overtorque detection level (set value=07) • Frequency reference lower limit (set value=09) • Jump frequency (set value=0A) • Accel/decel time reduction coefficient (set value=05)  • Dc injection braking current (set value=06) • Overtorque detection level (set value=07) • Stall prevention level during run (set value=08) • Frequency reference lower limit (set value=09) • Jump frequency (set value=0) (100%=fmax)  • Torque reference (set value=13) • Torque compensation (set value=14) • Torque limit (set value=10, 11, 12) • Torque limit (set value=15) 	
H3-06	Gain (terminal 16)	Sets the input gain (level) when terminal 16 is 10V.	
H3-07	Bias (terminal 16)	Sets the input bias (level) when terminal 16 is 0V.	
H3-08	Signal level selection (terminal 14)	<table><tr><th>Set value</th><th>Description</th></tr><tr><td>0</td><td>0 to 10V input</td></tr><tr><td>1</td><td>−10 to +10V inputt</td></tr><tr><td>2</td><td>4 to 20mA input</td></tr></table> Note : To activate the setting value "0" or "1", it is necessary to cut a Jumper-wire (J1) on the control board. Located in the bottom left hand corner directly behind terminal 13.	• Resolution [10-bit input]
H3-09	Multi-function analog input (terminal 14)	Inputs the set value of multi-function analog reference. (Refer to H3-05.) However, set values "00" and "1F" have functions different from those of H3-05 as described below. 00 : not used 1F : master frequency reference When "1F" (terminal 13/14 selection) is not set to multi-function input terminal function selection (H1-01 to H1-06) and when terminal 14 (H3-09) is set to "1F" (master frequency reference), master frequency reference is the sum of terminals 13 and 14. When any value other than "1F" (master frequency ref) is set to terminal 14 (H3-09) and when "1F" (terminal 13/14 selection) is set to multi-function input terminal function selection (H1-01 to H1-06), setting error (OPE03) occurs.	

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>H3-10</td><td>Gain (terminal 14)</td><td>Sets the input gain (level) when terminal 16 is 10V.</td><td></td></tr>
<tr><td>H3-11</td><td>Bias (terminal 14)</td><td>Sets the input bias (level) when terminal 16 is 0V</td><td></td></tr>
<tr><td>H3-12</td><td>Analog input filter time constant</td><td>Sets terminals 13, 14 and 16 to primary delay filter time constant.</td><td></td></tr>
<tr><td>H4-01</td><td>Monitor selection (terminal 21)</td><td>Selects control circuit terminals 21-22 (multi-function analog monitor) items to be output.
Sets a monitor No. (U1-XX) to be output.</td><td>• Resolution [9 bits + sign]</td></tr>
<tr><td>H4-02</td><td>Gain (terminal 21)</td><td>Multiplies the monitor constant output level by H4-02 set value.</td><td></td></tr>
<tr><td>H4-03</td><td>Bias (terminal 21)</td><td>Adds the H4-03 set value to the value obtained by multiplying the monitor constant output level by H4-02 set value.</td><td></td></tr>
<tr><td>H4-04</td><td>Monitor selection (terminal 23)</td><td>Selects control circuit terminals 23-22 (multi-function and analog monitor) to items to be output.
Sets a monitor No. (U1-XX) to be output.</td><td>• Resolution [9 bits + sign]</td></tr>
<tr><td>H4-05</td><td>Gain (terminal 23)</td><td>Miltiplies the monitor constant output level by H4-05 set value.</td><td></td></tr>
<tr><td>H4-06</td><td>Bias (terminal 23)</td><td>Adds the H4-06 set value to the value obtained by multiplying the monitor constant output level by H4-05 set value.</td><td></td></tr>
<tr><td>H4-07</td><td>Analog output signal level selection</td><td><table><tr><th>Set value</th><th>Description</th></tr><tr><td>0</td><td>0 to 10V input</td></tr><tr><td>1</td><td>-10 to +10V inputt</td></tr></table></td><td></td></tr>
<tr><td>H5-01</td><td>Station address</td><td>Sets an inverter station address.</td><td></td></tr>
<tr><td>H5-02</td><td>Communication speed selection</td><td>Selects 6CN MEMOBUS transmission speed.<table><tr><th>Set value</th><th>Description</th></tr><tr><td>0</td><td>1200BPS</td></tr><tr><td>1</td><td>2400BPS</td></tr><tr><td>2</td><td>4800BPS</td></tr><tr><td>3</td><td>9600BPS</td></tr></table></td><td></td></tr>
<tr><td>H5-03</td><td>Communication parity selection</td><td>Selects 6CN MEMOBUS transmission parity.<table><tr><th>Set value</th><th>Description</th></tr><tr><td>0</td><td>No parity</td></tr><tr><td>1</td><td>Even parity</td></tr><tr><td>2</td><td>Odd parity</td></tr></table></td><td></td></tr>
<tr><td>H5-04</td><td>Stopping method after communication error</td><td>Selects the stopping method at transmission error detected.<table><tr><th>Set value</th><th>Description</th></tr><tr><td>0</td><td>Decel to stop (decel time C1-02)</td></tr><tr><td>1</td><td>Emergency stop (decel time C1-09)</td></tr><tr><td>2</td><td>Coasting to stop</td></tr><tr><td>3</td><td>Continuous operation (displayed only)</td></tr></table></td><td></td></tr>
</table>

L PROTECTION-RELATED CONSTANTS

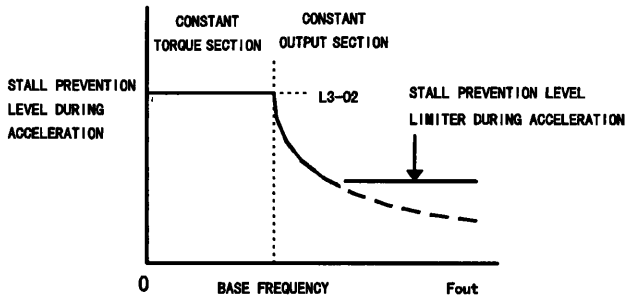
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L1-01</td><td>Motor protection selection</td><td>Selects whether motor overload protection is provided at electronic thermal overload relay.

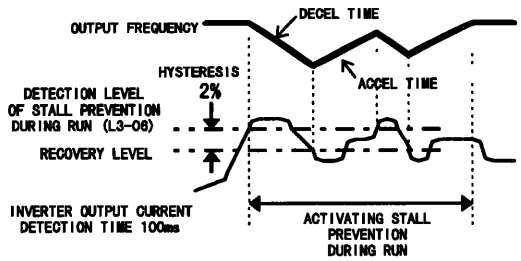
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Disabled</td></tr><tr><td>1</td><td>Enabled</td></tr></table>
• To drive several motors by one inverter simultaneously, this electronic thermal overload relay cannot protect the motors from overloading. A thermal overload relay must be inserted in each motor cable.
• If the inverter power supply is turned OFF, the assumed value of the motor temperature is cleared to 0. Therefore, in some applications where the inverter power supply is turned OFF, protection may not be effective.</td><td></td></tr>
<tr><td>L1-02</td><td>Motor protection time constant</td><td>Sets the electronic thermal overload relay protection time when 150% of overload is applied (hot-start) after the motor is operated continuously at rated current. The factory setting is one minute.
Set the value according to the overload resistance of motors to be used

 
Typical Electronic Thermal Overload Relay Protection Time Charactertics
(L1-02=1.0, run at 60Hz, general-purpose motor characteristics)</td><td></td></tr>
<tr><td>L2-01</td><td>Momentary</td><td>Selects whether the inverter is stopped at momentary power loss detection or operation restarts after recovery if momentary power loss occurs

<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Operation does not restart after recovery.
A fault contact is output to stop the inverter when a momentary power loss is detected.</td></tr><tr><td>1</td><td>Operation restart after recovery.
Operation restarts at recovery within the time set to L2-02.
In this case, a fault contact output is not activated.
If it does not restart within the L2-02 set time, a fault contact output is activated to stop the inverter after elapse of the L2-02 set time.</td></tr><tr><td>2</td><td>Operation restarts after recovery.
Disregarding the L2-02 set time, when the power supply can be recovered while the inverter control power supply can be held, a mode to restart operation is entered. A fault contact output is not activated. The control power supply holding time differs depending on the inverter capacity.</td></tr></table></td><td></td></tr>
</table>

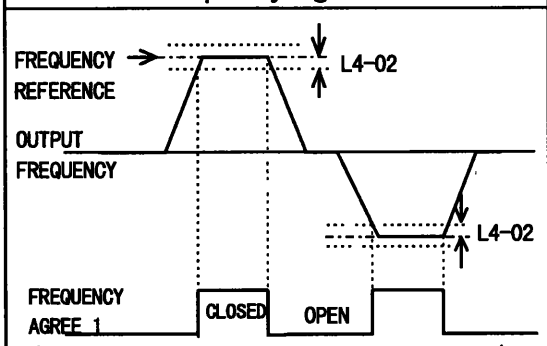
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L2-02</td><td>Momentary power loss ridethru time</td><td>Sets the allowable value of power supply recovery time when restart of operation after recovery of the power supply (L2-01=1) is selected for a process at momentary power loss occurrence If the power supply recovers within this time, operation restarts. If not, a fault contact is not activated to stop the inverter after this set value from detection of a power loss.</td><td></td></tr>
<tr><td>L2-03</td><td>Min baseblock time</td><td>To restart operation after detecting a momentary power loss. (If the motor has residual voltage) excessive current is applied to the motor at the moment of startup and the inverter may detect a fault The baseblock time is the wait time for restart until the motor residual voltage is almost dissipated. Effective when L2-02=1 or 2 is selected.
• When "min. baseblock time ≧ recovery time"
Operation restarts after elapse of the min. baseblock time from a momentary power loss.
• When "min. baseblock time < recovery time"
Operation restarts after recovery.</td><td></td></tr>
<tr><td>L2-04</td><td>Voltage restarts time</td><td>At restart after recovery from a momentary power loss. the inverter performs speed search operation in order to detect the motor speed After completion of speed search, the time to start up output voltage to normal V/f pattern is set It is defined as follows.
200V class : 0→time to increase output voltage from 0 to 200V.
400V class : 0→time to increase output voltage from 0 to 400V</td><td></td></tr>
<tr><td>L2-05</td><td>Undervoltage detection level</td><td>Sets inverter main circuit DC bus bar voltage value to detect undervoltage.
To set this value less than the standard set value (200V class 190VDC, 400V classs. 380VDC), it may be necessary to insert at the input side.</td><td></td></tr>
<tr><td>L3-01</td><td>Stall prevention selection during accel</td><td>Sets a function to prevent the motor from stalling at acceleration.
<table><tr><th>Set Value</th><th>Contents</th></tr><tr><td>0</td><td>Motor stall prevention during acceleration disabled. Disregarding the motor status, the inverter increases output frequency at the set acceleration rate. With a large load, the motor may stall.</td></tr><tr><td>1</td><td>Motor stall prevention during acceleration enabled. Acceleration rate is automatically reduced according to motor current to prevent the motor from stalling during acceleration. Acceleration time may be longer than the set value according to the load</td></tr><tr><td>2</td><td>Optimum acceleration mode.
By monitoring motor current, acceleration rate is automatically adjusted so that acceleration can be accomplished in the shortest time disregarding the setting of acceleration time.</td></tr></table></td><td></td></tr>
</table>

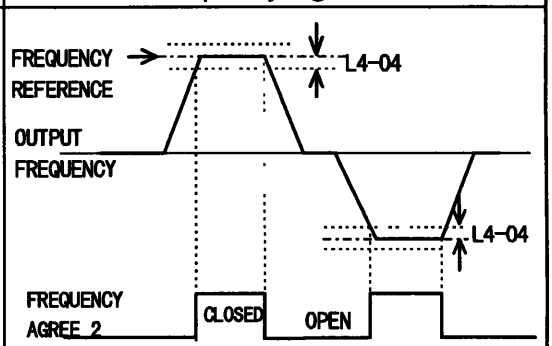
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L3-02</td><td>Stall prevention level during accel</td><td>When motor stall prevention during acceleration (L3-01=1) or optimum acceleration function (L3-01=2) is selected, the inverter adjusts the acceleration rate automatically so that motor current at acceleration will not exceed the set value</td><td></td></tr>
<tr><td>L3-03</td><td>Stall prevention limit during accel</td><td>When a motor is used in a constant output area, the stall prevention level during acceleration is automatically reduced for smoother acceleration.
This constant is a limiting value to control the stall prevention level during acceleration in the constant output section so that it will not be reduced unnecessarily.
 
</td><td></td></tr>
<tr><td>L3-04</td><td>Stall prevention selection during decel</td><td>Sets a function to prevent inverter DC bus bar overvoltage during deceleration.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Stall prevention during deceleration disabled.
Inverter deceleration time. Excessively short deceleration time detects overvoltage fault (OV) to stop the inverter.</td></tr><tr><td>1</td><td>Stall prevention during deceleration enabled
By monitoring DC bus bar voltage status, the deceleration rate is automatically reduced to prevent overvoltage Deceleration time may be longer than the set value</td></tr><tr><td>2</td><td>Optimum deceleration mode.
Deceleration rate is automatically adjusted so that the inverter can be decelerated in shortest time.</td></tr></table>• For deceleration using a braking unit or braking resistor, set the value to 0 (stall prevention during deceleration disabled). The motor may hunt.
• Optimum deceleration function (L3-04=2) cannot be set in the vector control mode</td><td></td></tr>
</table>

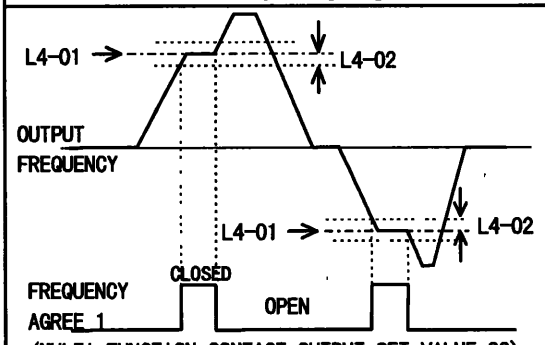
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L3-05</td><td>Stall prevention selection during running</td><td>Sets a function to prevent motor stalling status at a overload during constant speed operation.
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>Stall prevention during run disabled
A load exceeding the inverter overload capacity is applied during speed agree The motor may continue stalling even if load is reduced</td></tr>
<tr><td>1</td><td>Stall prevention during run enabled.
When inverter output current exceeds the value set to L3-06 and it continues more than 100ms during speed agree, output frequency is decreased (deceleration time: C1-02) to control the motor stalling. When the load returns to the normal state, acceleration restarts to continue operation at the former frequency.</td></tr>
<tr><td>2</td><td>Stall prevention during run enabled
The basic operation is the same as that of set value 1 except that the deceleration time to decrease frequency is the value set to C1-04</td></tr>
</table></td><td></td></tr>
<tr><td>L3-06</td><td>Stall prevention level during running</td><td>Sets the inverter output current level to start stall prevention during run (preventing the continuous stalling status by decreasing frequency).
 
</td><td></td></tr>
<tr><td>L4-01</td><td>Speed agree detection level</td><td>This constant is used to detect speed agree, etc Output frequency to be detected is set.
This detection is performed both for FWD and REV run.</td><td>Refer to page 73</td></tr>
<tr><td>L4-02</td><td>Speed agree detection width</td><td>Set detection width at L4-01 frequency detection.</td><td>Refer to page 73.</td></tr>
<tr><td>L4-03</td><td>Speed agree detection level (+/-)</td><td>This constant is used to detect speed agree, etc Output frequency to be detected is set.
This detection is enabled either for FWD or REV run. (Output frequency polarity is provided at detection.)</td><td>Refer to page 73.</td></tr>
<tr><td>L4-04</td><td>Speed agree detection width (+/-)</td><td>Sets detection width at L4-03 frequency detection.</td><td>Refer to page 73</td></tr>
</table>

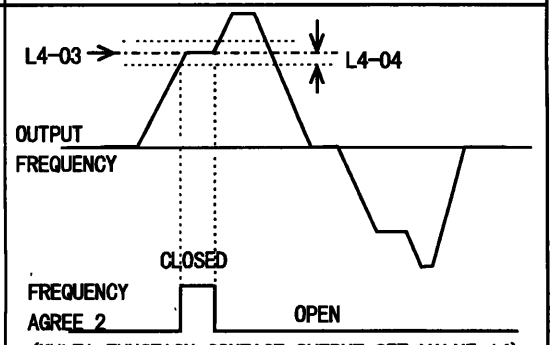
DESCRIPTION OF FREQUENCY DETECTION OPERATION

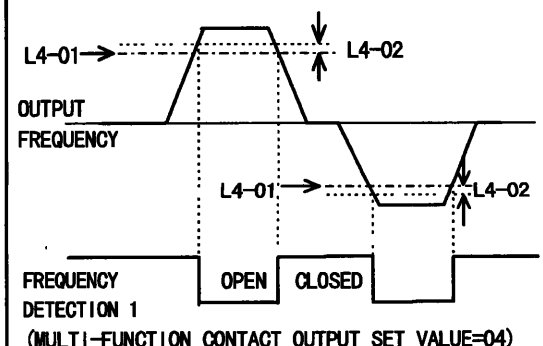
(1) When A1-02 set value is 0, 1 or 2 (control method selection is set to V/f, V/f with PG or open loop vector)

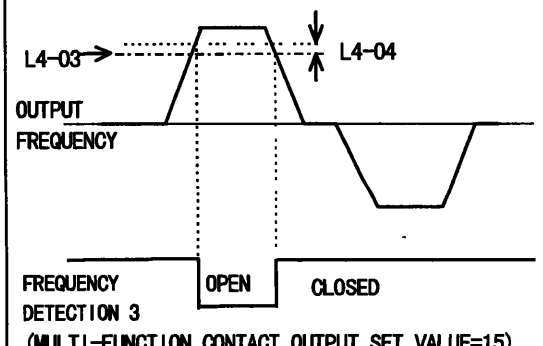
<table>
<tr><th>Related constants</th><th>L4-01 (Frequency Detection Level)
L4-02 (Frequency Detection Width)</th><th>L4-03 (Frequency Detection Level)
L4-04 (Frequency Detection Width)</th></tr>
<tr><td rowspan="2">Frequency Agree</td><td>Frequency Agree 1
 

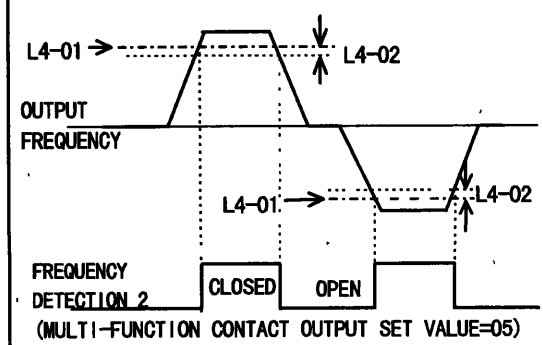
(MULTI-FUNCTION COTACT OUTPUT SET VALUE=02)</td><td>Frequency Agree 2
 

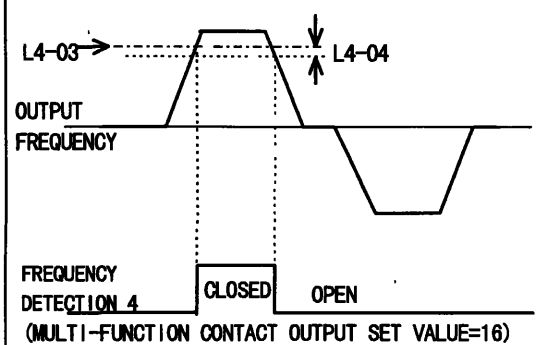
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=13)</td></tr>
<tr><td rowspan="2">Desired Frequency Agree</td><td>Desired Frequency Agree 1
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=03)</td><td>Desired Frequency Agree 2
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=14)</td></tr>
<tr><td rowspan="2">Frequency Detection</td><td>Frequency Detection 1
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=04)</td><td>Frequency Detection 3
 

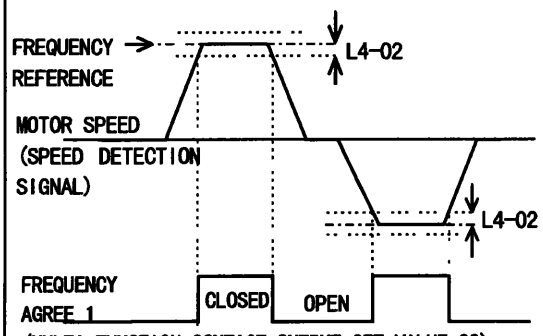
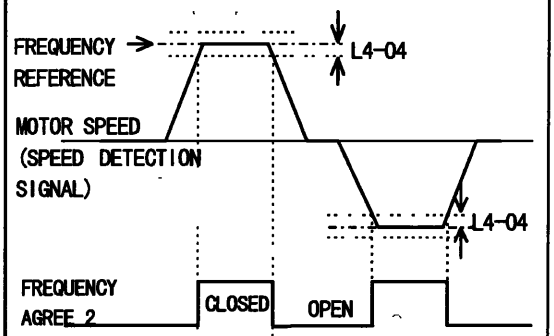
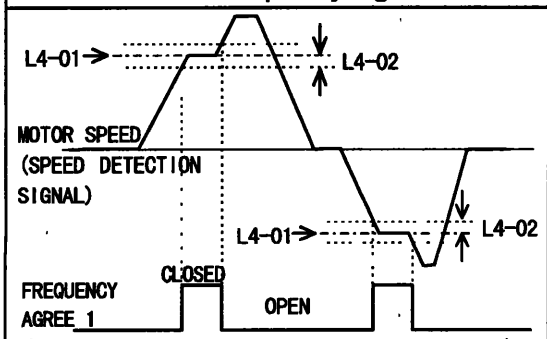
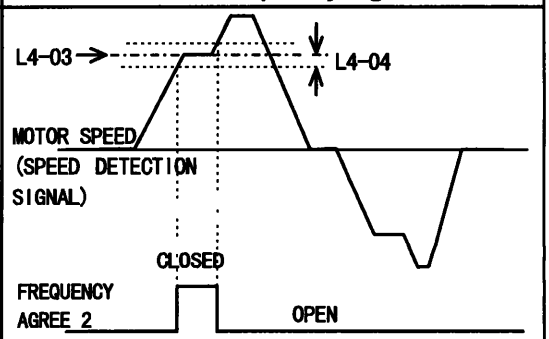
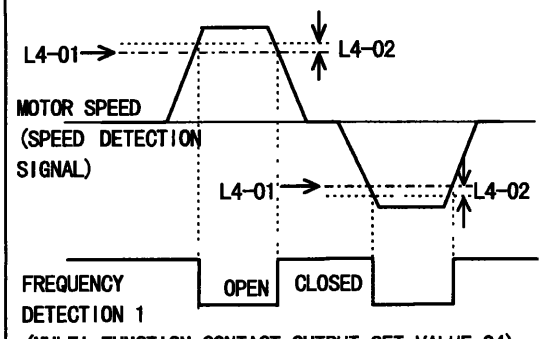
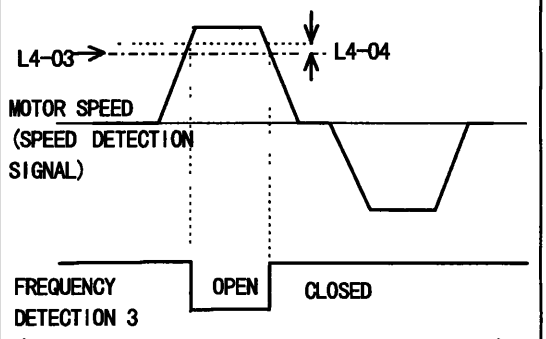
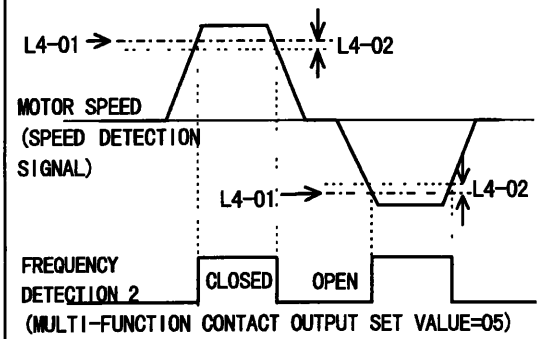
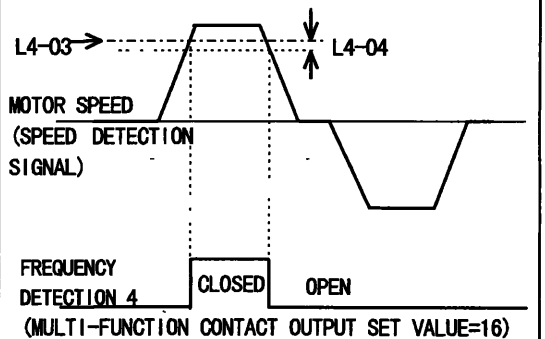
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=15)</td></tr>
<tr><td>Frequency Detection 2
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=05)</td><td>Frequency Detection 4
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=16)</td></tr>
</table>

DESCRIPTION OF FREQUENCY DETECTION OPERATION

(2) When A1-02 set value is 3 (control method selection is set to flux vector)

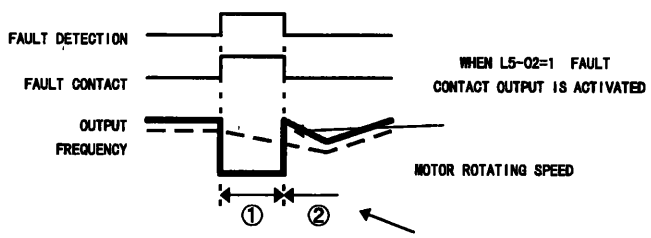
<table>
<tr><th>Related constants</th><th>L4-01 (Frequency Detection Level)
L4-02 (Frequency Detection Width)</th><th>L4-03 (Frequency Detection Level)
L4-04 (Frequency Detection Width)</th></tr>
<tr><td rowspan="2">Frequency Agree</td><td>Frequency Agree 1
 
</td><td>Frequency Agree 2
 
</td></tr>
<tr><td>Desired Frequency Agree 1
 
</td><td>Desired Frequency Agree 2
 
</td></tr>
<tr><td rowspan="3">Frequency Detection</td><td>Frequency Detection 1
 
</td><td>Frequency Detection 3
 
</td></tr>
<tr><td>Frequency Detection 2
 
</td><td>Frequency Detection 4
 
</td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L4-05</td><td>Operation when frequency reference is missing</td><td>Selects when frequency reference from the control circuit terminal is quickly reduced.

<table><tr><th>Set Value</th><th>Contents</th></tr><tr><td>0</td><td>Normal operation (Following variation of reference)</td></tr><tr><td>1</td><td>When frequency reference from control circuit terminal is reduced by 90% within 400ms, operation continues at 80% of frequency reference obtained before reduction.</td></tr></table></td><td></td></tr>
<tr><td>L5-01</td><td>Number of auto restart attempts</td><td>Fault retry is function to reset the fault in the inverter and restart automatically to continue operation if a fault occurs.
This constant sets the number of fault retry times
By setting 0, fault retry operation is not performed

Fault retry operation

① When a fault is detected, the inverter output is shut OFF for the min. baseblock time (L2-03). The digital operator displays the fault while the inverter output is shut OFF.
② When the min. baseblock time (L2-03) elapses, a fault is reset automatically and speed search operation is performed from the output frequency obtained fault occurrence.
③ When the total number of faults exceeds the number of fault retry times (L5-01), the faults are not reset automatically and the inverter output remains OFF. At this time, a fault contact output is activated.

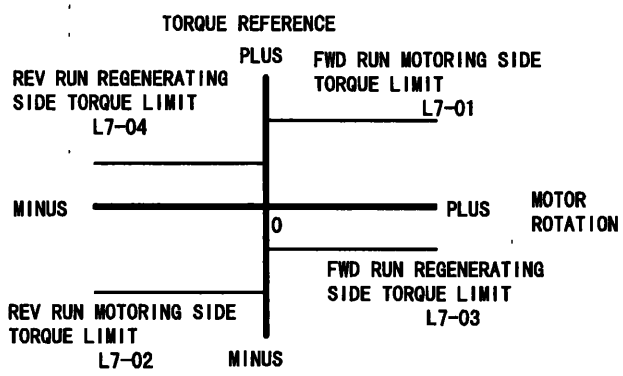
 

Clearing the number of retry times

The number of retry times is cleared to 0 in the following cases:
① A fault does not occur for more than 10 minutes.
② A fault reset signal is input from the control circuit terminal or digital operator.
③ The power supply is shut OFF and the control power supply has dissipated; and then the power supply is turned ON again.

However, fault retry is disabled for the following faults.
UV2 (Control circuit undervoltage)
UV3 (MC answer fault)
SC (Load short-circuit)
OH (Heatsink overheat)
EF (Run command fault)
OS (Over speed)
DEV (Excessive speed deviation)
PGO (PG disconnection)
OPR (Constant setting error)
CE (Transmission error)
EF3 to 8 (External fault)</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L5-02</td><td>Auto restart operation selection</td><td>Sets whether a fault contact output is activated during fault retry
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>A fault contact output is not activated during fault retry</td></tr><tr><td>1</td><td>A fault contact output is activated during fault retry.</td></tr></table></td><td></td></tr>
<tr><td>L6-01</td><td>Torque detection selection 1</td><td>Sets a function to detect overtorque.
Overtorque is detected according to output current value in the V/f control mode and using the inverter internal torque reference in the vector control mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Overtorque detection disabled (factory setting)</td></tr><tr><td>1</td><td>Overtorque detection enabled.
Overtorque detection is performed only during speed agree and “OL3” is displayed, blinking, to continue operation after detection</td></tr><tr><td>2</td><td>Overtorque detection enabled
Overtorque detection is performed during run and “OL3” is displayed, blinking, to continue operation after detection.</td></tr><tr><td>3</td><td>Overtorque detection enabled.
Overtorque detection is performed only during speed agree. “OL3” is displayed, lighting at overtorque detection, and a fault contact is output to shut OFF inverter output.</td></tr><tr><td>4</td><td>Overtorque detection enabled.
Overtorque detection is performed during run. “OL3” is displayed, lighting at overtorque detection, and a fault contact output is activated to shut OFF inverter output.</td></tr></table></td><td></td></tr>
<tr><td>L6-02</td><td>Torque detection level 1</td><td>Sets the overtorque detection level.
V/f control mode. Inverter rated current becomes 100%.
Vector control mode. Motor rated torque becomes 100%.</td><td></td></tr>
<tr><td>L6-03</td><td>Torque detection time 1</td><td>Overtorque is detected if the time when motor current or torque exceeds the value set to L6-02 is longer than the time set by this constant Digital operator displays “OL3”</td><td></td></tr>
<tr><td>L6-04
L6-05
L6-06</td><td>Torque detection selection 2
Torque detection level 2
Torque detection time 2</td><td>The functions are the same as those described for constants L6-01 to L6-03. Used when two types of overtorque detection are output to multi-function outputs. Digital operator displays “OL4”.</td><td></td></tr>
<tr><td>L7-01</td><td>Forward torque limit</td><td>Sets motoring side torque limit value during FWD run.</td><td>Refer to page 77.</td></tr>
<tr><td>L7-02</td><td>Reverse torque limit</td><td>Sets motoring side torque limit value during REV run.</td><td>Refer to page 77</td></tr>
<tr><td>L7-03</td><td>Forward regenerative torque limit</td><td>Sets regenerating side torque limit value during FWD run.</td><td>Refer to page 77</td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L7-04</td><td>Reverse regenerative torque limit</td><td>Sets regenerating side torque limit value during REV run.
 
</td><td></td></tr>
<tr><td>L8-01</td><td>Protect selection for internal DB resistor</td><td>When a braking resistor that can be built in the inverter is used, overheat protection is enabled by using this function. (Overheat is detected at operating duty 3% of braking resistor.)
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Braking resistor overheat protection disabled</td></tr><tr><td>1</td><td>Braking resistor overheat protection enabled</td></tr></table></td><td></td></tr>
<tr><td>L8-02</td><td>OH pre-alarm level</td><td>Sets the heatsink temperature to predict heatsink overheat.</td><td></td></tr>
<tr><td>L8-03</td><td>Operation selection after OH pre-alarm</td><td>Selects the operation mode when the inverter detects heatsink overheat prediction.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Deceleration to stop at value set to C1-02</td></tr><tr><td>1</td><td>Inverter output OFF (Coasting to stop)</td></tr><tr><td>2</td><td>Deceleration to stop at value set to C1-09
(Quick deceleration to stop)</td></tr><tr><td>3</td><td>Continuous operation</td></tr></table></td><td></td></tr>
<tr><td>L8-05</td><td>Input open-phase protection selection</td><td>IF power supply open-phase, excessive power supply voltage imbalance or main circuit electrolytic capacitor deterioration occurs, excessive inverter DC bus bar ripple voltage is detected to stop the inverter
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Excessive ripple detection disabled</td></tr><tr><td>1</td><td>Excessive ripple detection enabled</td></tr></table></td><td></td></tr>
<tr><td>L8-07</td><td>Output open-phase protection selection</td><td>A function to detect inverter output open-phase.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Inverter output open-phase detection disabled</td></tr><tr><td>1</td><td>Inverter output open-phase detection enabled</td></tr></table>Output open-phase may be detected inadvertently when applied motor capacity is small for inverter capacity, etc.</td><td></td></tr>
</table>

0 DIGITAL OPERATOR-RELATED CONSTANTS

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>01-01</td><td>Monitor selection</td><td>4 items can be monitored in operation. This constant can select an item to be monitored instead of output voltage Set 01-01 to □ □ in monitor constant U1-□□.</td><td></td></tr>
<tr><td>01-02</td><td>Monitor selection after power up</td><td>Set an item to be monitored immediately after the power supply is turned ON. Digital operator displays the item set by this constant after the power supply is turned ON.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>Displays frequency reference.</td></tr><tr><td>2</td><td>Displays output frequency.</td></tr><tr><td>3</td><td>Displays output current</td></tr><tr><td>4</td><td>Displays a monitor item selected by 01-01.</td></tr></table></td><td></td></tr>
<tr><td>01-03</td><td>Frequency units of reference setting and monitor</td><td>Units for frequency related reference or monitor can be selected as shown below.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Unit: 0.01Hz</td></tr><tr><td>1</td><td>Unit 0.01%</td></tr><tr><td>2 to 39</td><td>Unit: r/min (0 to 3999)
r/min=120 × frequency reference(Hz)/ 01-03 (01-03: Number of motor poles)
Effective except when in flux vector control</td></tr><tr><td>40 to 3999</td><td>Decimal point position set with 5th digit value of 01-03.
5th digit value=0: Displayed as □□□□
5th digit value=1: Displayed as □□□.□
5th digit value=2: Displayed as □□.□□
5th digit value=3. Displayed as □.□□□
01-03 1st to 4th digits determine the set value of 100% frequency.
(Example 1)
Assuming that 100% frequency set value is 200.0 set 01-03=12000.
When 01-03=12000 is set, 100% frequency is displayed as 200.0 and 60% speed is displayed as 120.0.
(Example 2)
Assuming that 100% frequency set value is 65 00, set 01-03=26500.
When 01-03=26500 is set, 60% frequency is displayed as 39.00.</td></tr></table></td><td></td></tr>
<tr><td>01-04</td><td>Frequency units of constant setting</td><td>V/f related constant (E1-04, 06, 07 and 09) setting unit can be changed to r/min.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Setting monitor unit: Hz</td></tr><tr><td>1</td><td>Setting monitor unit: rpm</td></tr></table></td><td></td></tr>
<tr><td>01-05</td><td>Constant No. display selection</td><td>How to display operator constant No. can be selected
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Normal display (A1-00, etc.)</td></tr><tr><td>1</td><td>Displays constant No. specified by MODBUS communication (address)</td></tr></table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>02-01</td><td>LOCAL / REMOTE key enable/disable</td><td>Sets digital operator LOCAL / REMOTE key enabled/disabled
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator REMOTE/LOCAL key disabled.</td></tr><tr><td>1</td><td>Digital operator REMOTE/LOCAL key enabled.
Priority of frequency reference and run command is alternated with priority set by digital operator and B1-01/02.</td></tr></table></td><td></td></tr>
<tr><td>02-02</td><td>STOP key during control circuit terminal operation</td><td>Sets digital operator STOP key enabled/disabled in the run mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator STOP key disabled.
Digital operator STOP key is disabled during run by run command other than that given from the digital operator.</td></tr><tr><td>1</td><td>Digital operator STOP key enabled.
Digital operator STOP key is enabled even during run by run command other than that given from the digital operator.</td></tr></table>When the set value is “1 (factory setting)” and operation is stopped by a STOP command other than that given from the digital operator, it is necessary to turn OFF the RUN command once.</td><td></td></tr>
<tr><td>02-03</td><td>User constant initial value</td><td>Constants set by user can be stored in the inverter as user initial values
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>User constant initial value setting.
Each constant obtained when 02-03=1 is set, is stored as a constant initial value. Even if each constant setting is changed after setting this constant, it can be returned to the user constant initial value by setting A1-03=1110 (initialization to user initial value).</td></tr><tr><td>2</td><td>Clearing user constant initial value.
Clears the user constant initial values that are set as above.</td></tr></table>After setting the value, the indication on the digital operator shows “Entry accepted” then resets to “0”.</td><td></td></tr>
<tr><td>02-04</td><td>kVA selection</td><td>Sets inverter capacity By this constant setting, control constants peculiar to the inverter can be set automatically</td><td></td></tr>
<tr><td>02-05</td><td>Frequency reference setting method selection</td><td>Whether ENTER key operation is needed can be set when frequency reference is set by digital operator.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator ENTER key needed.
To set frequency reference by digital operator, the inverter accepts frequency reference at the time when the digital operator ENTER key is depressed.</td></tr><tr><td>1</td><td>Digital operator ENTER key not needed.
Inverter accepts frequency reference displayed on the digital operator frequency reference without ENTER key operation.</td></tr></table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>02-06</td><td>Operation selection when digital operator is disconnected</td><td>When running by digital operator, inverter operation selection at communication fault occurrence between the digital operator and the inverter (cable disconnection, removal of digital operator, etc) is set.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Operation is continued</td></tr><tr><td>1</td><td>Coasting to a stop and an error message "OPR" is indicated on a digital operator</td></tr></table></td><td></td></tr>
<tr><td>02-07</td><td>Cumulative operation time setting</td><td>Sets an initial value of cumulative operation time. Accumulation of operation time starts from this set value.</td><td></td></tr>
<tr><td>02-08</td><td>Cumulative operation time selection</td><td>Defines the operation time.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>All time while the inverter power supply is turned ON is accumulated as operation time</td></tr><tr><td>1</td><td>Only the time while the inverter is running is accumulated as operation time.</td></tr></table></td><td></td></tr>
</table>

VARISPEED-616G5
DESCRIPTIVE MANUAL FOR CONSTANTS

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