VARISPEED-686SS5
DESCRIPTIVE MANUAL FOR CONSTANTS

SUPER-ENERGY SAVING VARIABLE SPEED DRIVE (VS-686SS5)

MODEL: CIMR-SSA□□□□

200V CLASS 0.4 to 75kW (1.2 to 110kVA)
400V CLASS 0.4 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-686SS5 INSTRUCTION MANUAL (TOE-S686-15)

YASKAWA

MANUAL NO. TOE-S686-15.2

CONTENTS

1 OPERATION MODE SELECTION

1.1 CONTROL METHOD SETTING

When setting up the VS-686SS5, make sure to follow the procedures below. Mistakes in setup order may cause values to be written over resulting in poor operation.

STEP 1 Control method selection (Page 40 of the INSTRUCTION MANUAL)

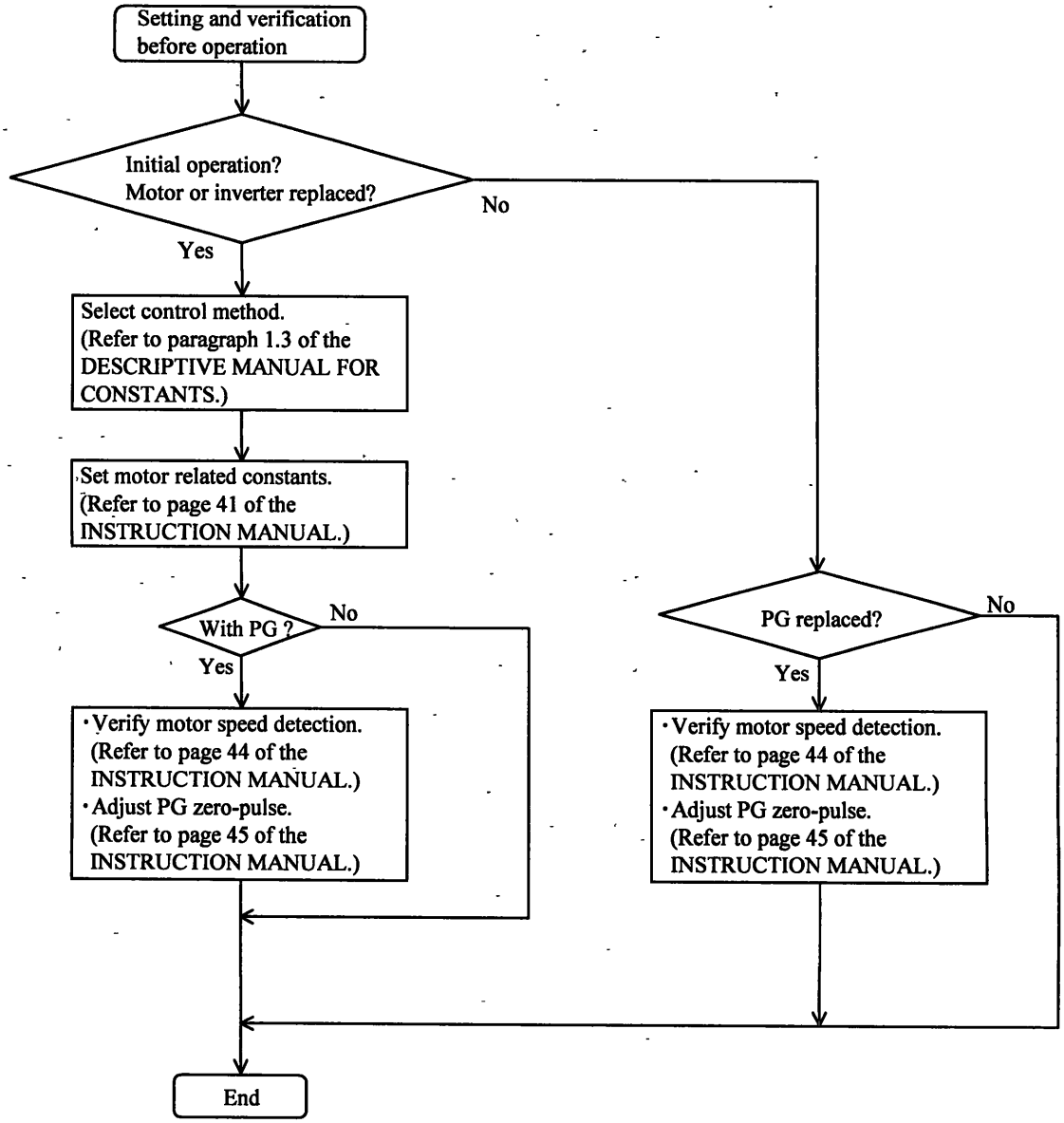
STEP 2 Constant torque/variable torque motor setting (Pages 41 to 43 of the INSTRUCTION MANUAL)

STEP 3 Motor capacity selection (Pages 41 to 43 of the INSTRUCTION MANUAL)

STEP 4 Nameplate value setting (Pages 41 to 43 of the INSTRUCTION MANUAL)

The VS-686SS5 is equipped with two current vector control methods (with or without PG). Either method can be easily selected by using the digital operator to meet user application needs. Open loop vector control is set at the factory prior to shipment. In the following cases, observe the following procedures to set and verify the control method and motor related constants.

- When conducting initial operation of the VS-686SS5.
- When replacing either motor or inverter
- When replacing PG


Setting and verification before operation
Initial operation? Motor or inverter replaced?
No
Yes
Select control method. (Refer to paragraph 1.3 of the DESCRIPTIVE MANUAL FOR CONSTANTS.)
Set motor related constants. (Refer to page 41 of the INSTRUCTION MANUAL.)
With PG ?
No
Yes
• Verify motor speed detection. (Refer to page 44 of the INSTRUCTION MANUAL.)
• Adjust PG zero-pulse. (Refer to page 45 of the INSTRUCTION MANUAL.)
PG replaced?
No
Yes
• Verify motor speed detection. (Refer to page 44 of the INSTRUCTION MANUAL.)
• Adjust PG zero-pulse. (Refer to page 45 of the INSTRUCTION MANUAL.)
End

1.2 FEATURES OF TWO CONTROL METHODS

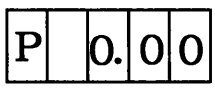
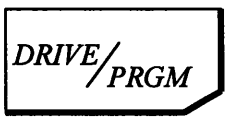
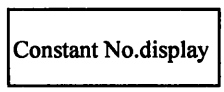
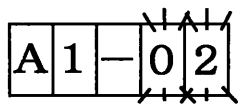
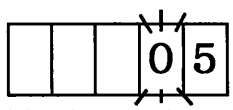
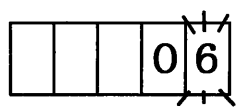
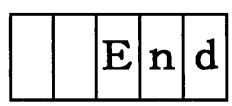
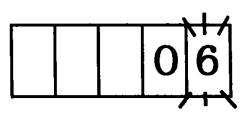
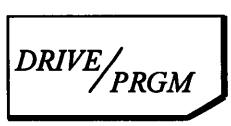
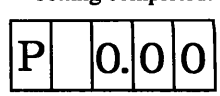
Table 1 shows the features of open loop vector control and flux vector control.

Table 1 Features of Two Control Methods

Control Method	Open Loop Vector	Flux Vector
Basic control	Current vector control without PG	Current vector control with PG
Speed detector	Not needed	Needed (pulse generator)
Speed detection option	Not needed	PG-X2
Speed control range	1 10	1 500
Starting torque	50%/0 Hz	150%/0Hz
Speed control accuracy	±0 2%	±0 02%
Torque accuracy	±10%	±5%
Torque limit	Possible	Possible
Torque control	Not possible	Possible
Momentary overcurrent	Higher than approx 200% of inverter rated output current	Higher than approx 200% of inverter rated output current
Motor protection	Protection by electronics overload thermal relay	Protection by electronics overload thermal relay
Momentary power loss ride-through	Possible	Possible
Stall prevention	Overvoltage prevention	Overvoltage prevention
Application	Fans, blowers (Root variable torque characteristics)	General variable speed (constant torque characteristics)

1.3 CONTROL METHOD CHANGING PROCEDURE

The following procedure shows how to select or change the control method.

Step	Description	Key Sequence	Digital Operator Display
①	Power ON ·Displays speed reference value		 REMOTE LEDs (SEQ,REF) ON
②	Control method selection ·Move to program mode		
③	·Move to control method selection (A1-02)		
④	·Verify the set value		 (Initial setting: open loop vector)
⑤	·Change to flux vector		
⑥	·Write-in the value		 Displays for 0.5 seconds.  Setting completed.
⑦	Return to drive mode		

1.4 INITIALIZE MODE

As described below, the access level to set/read constants and control method can be selected. Set initialize mode constants before use of the VS-686SS5.

The following table shows the constants for initialize mode.

Constant No	Name	Description
A1-01	Access level (change enable during run)	0 Exclusive for monitoring A1-01 can be set/read and U constants in QUICK-START level can be read 2 QUICK-START Constants required for quick-start operation can be set/read 3 BASIC Constants required for basic operation can be set/read 4 ADVANCED Constants required for advanced operation can be set/read
A1-02	Control method	5 Open loop vector 6 Flux vector
A1-03	Initialize	Constant initialization 2220 2-wire sequence (Returns to the value set at the factory prior to shipment) 3330 3-wire sequence
A1-04	Password (for input)	For future use (Do not set because of special function)

1.4.1 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
2	QUICK-START	Constants required for quick-start operation are set/read For details, refer to the VS-686SS5 access level list in Table 2
3	BASIC	Basic constants are set/read For details, refer to the VS-686SS5 access level list in Table 2
4	ADVANCED	Advanced constants are set/read For details, refer to the VS-686SS5 access level list in Table 2

Table 2 VS-686SS5 Access Level List

Group No	Group	Function No.	Function Name	Access Level		
				Q	B	A
b	Application	b1	Operation mode selection	O	O	O
		b2	Zero-speed level	O	O	
		b3	Initial magnetic pole pull-in			O
		b4	Timer function			O
		b5	PID control			O
		b6	DWELL function			O
		b7	DROOP function			O
C	Tuning	C1	Accel/decel time	O	O	O
		C2	Phase compensation			O
		C3	Energy-saving control selection			O
		C5	ASR		O	O
		C6	Carrier frequency			O
d	Reference	d1	Speed reference value	O	O	O
		d2	Limits		O	O
		d3	Jump speed		O	O
		d4	Sequence			O
		d5	Torque reference			O
E	Motor	E1	Motor constants	O	O	O
F	Options	F1	PG speed control card	O	O	O
		F2	Analog reference card		O	O
		F3	Digital input card		O	O
		F4	Analog output card		O	O
		F5	Digital output card		O	O
		F6	Digital output card		O	O
H	Control circuit terminal function	H1	Sequence input		O	O
		H2	Sequence output		O	O
		H3	Analog input		O	O
		H4	Analog output		O	O
L	Protection	L1	Motor protection		O	O
		L2	Momentary power loss ride-through			O
		L3	Overvoltage prevention		O	O
		L4	Speed detection			O
		L5	Fault retry		O	O
		L6	Overtorque detection		O	O
		L7	Torque limit		O	O
		L8	Hardware protection			O
		L9	Step-out protection			O
o	Operator	o1	Selection of display		O	O
		o2	Operation (key function)			O
T	Auto-tuning	T1	Auto-tuning	O	O	O

Following letters indicate each access level

Q: QUICK-START (A1-01=2) B: BASIC (A1-01=3) A: ADVANCED (A1-01=4)

1.4.2 CONSTANT INITIALIZATION

To return the inverter constants to the factory setting or to replace the control circuit boards, initialize the constants after control method selection (A1-02) and kVA selection (o2-04).

All the constants are returned to initial setting by initialization. Several constants such as motor constants cannot be initialized. For details, refer to 2.2 CONSTANT LIST.

The contents of initialization differ as shown below, depending on the set values.

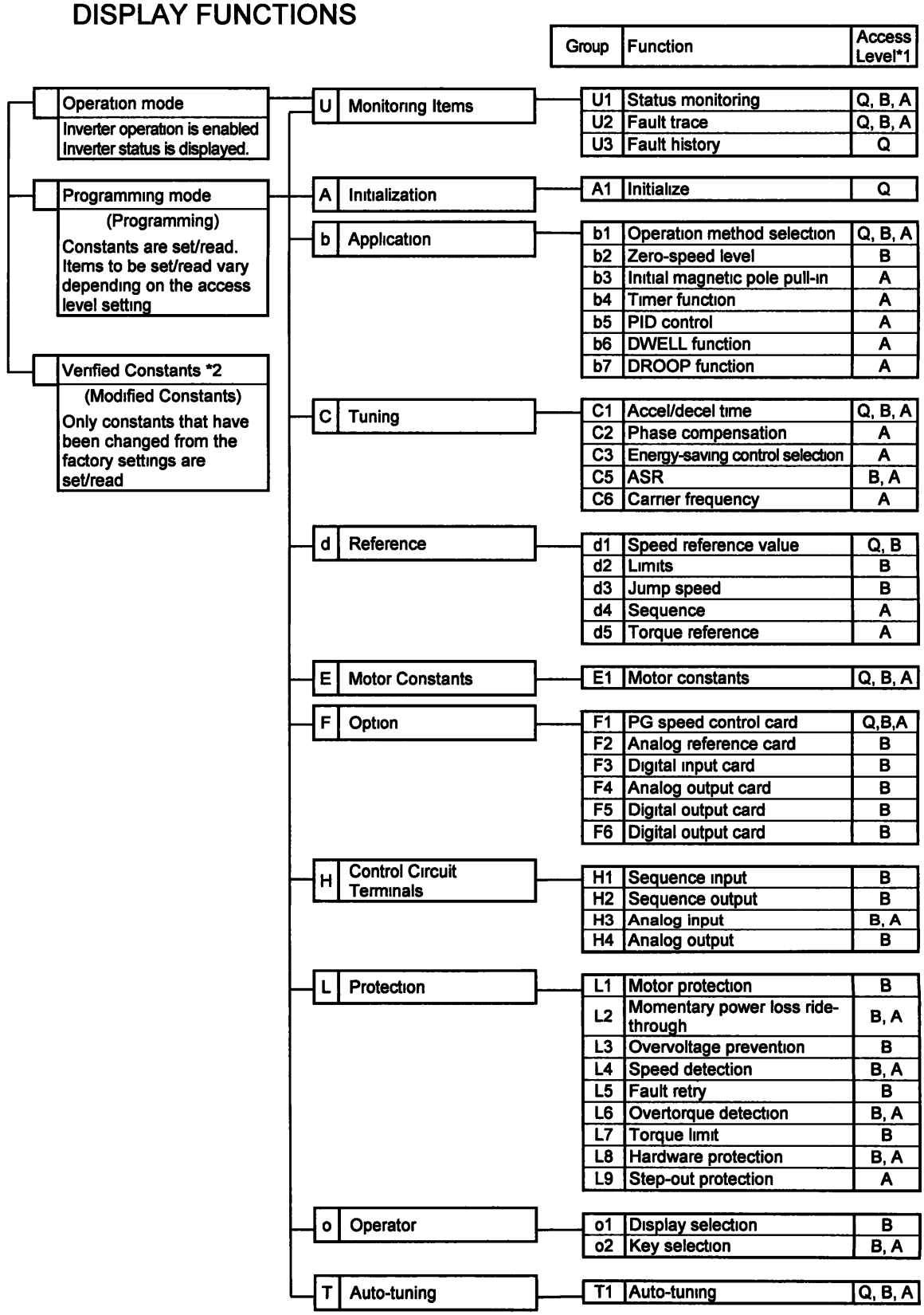
A1-01	Name	Description
2220	2-wire initialize	Terminal 1 becomes FWD run command and terminal 2 becomes REV run command.
3330	3-wire initialize	Terminal 1 becomes run command, terminal 2 becomes stop command and terminal 3 becomes FWD/REV run selection

The following shows an example of constant initialization.

Step	Description	Key Sequence	Digital Operator Display	Remarks
	Displaying speed reference		P100.0	
①	Move to program mode	DRIVE/PRGM	Constant No. diplay	Displays the constant No selected formely
②	Select A1-03	RESET, ∧, ∨	A1-03	
③	Display the set value	DATA/ENTER	0000	
④	Input 2220	RESET, ∧, ∨	2220	
⑤	Write-in the value	DATA/ENTER	End	Displays for 0 5 seconds
			0000	Displays return to 0
⑥	Return to constant No display	DSPL	A1-03	
⑦	Return to drive mode	DRIVE/PRGM	P000.0	Speed reference return to 0

2 CONSTANT LIST

2.1 CONSTANTS ARRAY OF DIGITAL OPERATOR (JVOP-132) DISPLAY FUNCTIONS



*1: Constant Access Level
Setting or reading possible when Q: QUICK-START (A1-01=2), B BASIC (A1-01=3) or A· ADVANCED (A1-01=4).

*2. Verified Constants
Verified Constants can be read in the operation mode.
The mode can be changed by pressing the RESET key and DRIVE/PRGM key of operator JVOP-132 at the same time.

2.2 VS-686SS5 CONSTANT LIST (1)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled ×. Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Initialize	Initialize	A1-01	Constant access level	0 to 4	1	2	0 Exclusive for monitor 2 Quick-start(Q) 3 Basic (B) 4· Advanced (A) (Refer to page 6)	O	Q	Q
		A1-02	Control method selection	5 , 6	1	5	5 Open loop vector 6. Flux vector (Refer to page 4)	×	Q	Q
		A1-03	Initialize	0000 to 9999	1	0000	2220· 2-wire Initialize 3330 3-wire Initialize (Refer to page 8)	×	Q	Q
		A1-04	Password 1 (for input)	0000 to 9999	1	0000	(Refer to page 6)	×	Q	Q
Application	Sequence	b1-01	Speed reference selection	0 to 3	1	1	0 Digital operator 1. Control circuit terminal 2· — 3. Option card (CP-916B/G, 216I/F) 4· Personal computer (CP-717) (Refer to page 38)	×	Q	Q
		b1-02	Operation method selection	0 to 3	1	1	0· Digital operator 1. Control circuit terminal 2· — 3· Option card (CP-916B/G, 216I/F) 4 Personal computer (CP-717) (Refer to page 38)	×	Q	Q
		b1-03	Stopping method selection	0 to 3	1	0	0 Ramp to stop 1: Coast to a stop 2· — 3 Coast to a stop with timer (Refer to page 38)	×	Q	Q
		b1-04	Prohibition of reverse operation	0 , 1	1	0	0. Reverse enabled 1: Reverse disabled (Refer to page 39)	×	B	B
		b1-05	Operation selection for setting of E1-08 or less	0 to 3 *1	1	1	* Factory setting differs depending on the control method (A1-02) (Refer to pages 28 and 39.)	×	A	A
		b1-06	Operation selection after switching to remote mode	0 , 1	1	0	0 Does not operate even if run command is ON when switching LOCAL to REMOTE 1: Operates if run command is ON when switching LOCAL to REMOTE	×	A	A
	Zero-speed Level	b2-01	Zero speed level	0 00 to 10 00	0 01%	1.00*	* Changing the control method (A1-02) changes the set value automatically (Refer to pages 28 and 40)	×	B	B

*1 Setting range is only 1 and 2 when the control method is set to flux vector control

CONSTANT LIST (2)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O: Enabled ×: Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Application	Initial Magnetic Pole Lead-in	b3-02	Magnetic-pole lead-in current	0 to 150	1%	80	(Refer to page 40.)	×	A	A
		b3-04	Current rising time start	0.0 to 5 0	0.1sec	0.2	(Refer to page 40.)	×	A	A
		b3-05	Magnetic-pole lead-in time	0 0 to 5 0	0.1sec	0 0	(Refer to page 40.)	×	A	A
	Delay Timers	b4-01	Timer function ON-delay time (Delay-ON Timer)	0 0 to 300.0	0.1sec	0 0	(Refer to page 41.)	×	A	A
		b4-02	Timer function OFF-delay time (Delay-OFF Timer)	0 0 to 300 0	0.1sec	0 0	(Refer to page 41.)	×	A	A
	PID Control	b5-01	PID control mode selection	0 ,1 , 2	1	0	0: Disabled 1: Enabled 2: Enabled (D=Feed-Forward) (Refer to page 41.)	×	A	A
		b5-02	Proportional gain (P)	0 00 to 25 00	0 01	1.00	(Refer to page 42)	O	A	A
		b5-03	Integral time (I)	0.0 to 360 0	0.1sec	1 0	(Refer to page 42)	O	A	A
		b5-04	Integral limit	0 0 to 100.0	0 1%	100 0	(Refer to page 42)	O	A	A
		b5-05	Differential time (D)	0 00 to 10 00	0 01sec	0 00	(Refer to page 42)	O	A	A
		b5-06	PID limit	0 0 to 100 0	0.1%	100 0	(Refer to page 42.)	O	A	A
		b5-07	PID offset adjustment	-100.0 to 100 0	0 1%	0.0	(Refer to page 42.)	O	A	A
		b5-08	PID primary delay time constant	0.00 to 10 00	0.01sec	0.00	(Refer to page 42.)	O	A	A
	DWELL Function	b6-01	Dwell speed at start	0.00 to 100 00	0.01%	0 00	Setting unit differs depending on o1-03 setting	×	A	A
		b6-02	Dwell time at start	0.0 to 10 0	0.1sec	0 0	(Refer to page 43.)	×	A	A
		b6-03	Dwell speed at stop	0.00 to 100.00	0.01%	0 00	Setting unit differs depending on o1-03 setting.	×	A	A
		b6-04	Dwell time at stop	0 0 to 10 0	0.1sec	0.0	(Refer to page 43)	×	A	A
	Droop Function	b7-01	Droop value	0 0 to 100 0	0 01%	0 0	(Refer to page 43)	O	—	A
		b7-02	Droop delay time	0 00 to 1.00	0 01sec	0 10	(Refer to page 43)	O	—	A

CONSTANT LIST (3)

Function		Con-stant No	Name	Setting Range	Setting Unit	Facto-ry Setting	Remarks	Change Dunng Operation (O Enabled ×. Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Tuning	Accel / Decel	C1-01	Acceleration time 1	0 00 to 600 00 (at C1-10=1) 0 0 to 6000 (at C1-10=0)	0 1 sec or 0 01 sec	10 0	(Refer to page 44.)	O	Q	Q
		C1-02	Deceleration time 1			10 0	(Refer to page 44.)	O	Q	Q
		C1-03	Acceleration time 2			10 0	(Refer to page 44)	O	B	B
		C1-04	Deceleration time 2			10 0	(Refer to page 44.)	O	B	B
		C1-05	Acceleration time 3			10 0	(Refer to page 44)	×	A	A
		C1-06	Deceleration time 3			10.0	(Refer to page 44.)	×	A	A
		C1-07	Acceleration time 4			10.0	(Refer to page 44.)	×	A	A
		C1-08	Deceleration time 4			10 0	(Refer to page 44)	×	A	A
		C1-09	Emergency stop time			10 0	(Refer to page 44.)	×	B	B
		C1-10	Accel / decel time setting unit	0, 1	1	1	0 0 01 seconds 1. 0.1 seconds (Refer to page 44.)	×	A	A
		C1-11	Accel / decel time switching speed	0 00 to 100 00	0 01%	0 00	(Refer to page 44)	×	A	A
	Phase Compensation	C2-12	Leading phase compensation amount	-180 to +180.0	0 1 deg	-5 6	Not initialized by Initialize. (Refer to page 45)	×	Q	—
		C2-13	PG zero-pulse compensation amount	-180 to +180 0	0 1 deg	0.0	Not initialized by Initialize. (Refer to page 45)	×	—	A
	Energy-saving Control Selection	C3-01	Energy-saving control selection	0, 1	1	1	0 Disabled 1 Enabled (Refer to page 45.)	×	A	A
		C3-05	Voltage limit control selection	0, 1	1	1	0 Disabled 1. Enabled (Refer to page 45.)	×	A	A
	ASR	C5-01	ASR proportional (P) gain 1	0 00 to 300 00	0 01	15 00*	* Changing the control method (A1-02) changes the set value automatically. (Refer to pages 28, 45 and 46)	O	B	B
		C5-02	ASR integral (I) time 1	0 000 to 10.000	0.001 sec	0.500	(Refer to pages 45 and 46)	O	B	B
		C5-03	ASR proportional (P) gain 2	0 00 to 300 00	0 01	15 00*	* Changing the control method (A1-02) changes the set value automatically (Refer to pages 28, 45 and 46)	O	B	B
		C5-04	ASR integral (I) time 2	0 000 to 10.000	0 001 sec	0.500	(Refer to pages 45 and 46.)	O	B	B
		C5-05	ASR primary delay time	0.000 to 0 500	0.001 sec	0.004	(Refer to pages 45 and 46.)	O	A	A
		C5-06	ASR switching speed	0 00 to 100 00	0.01%	0.00	(Refer to pages 45 and 46.)	×	A	A
		C5-07	ASR Proportional (P) gain at start	0 00 to 300 00	0 01	20.00	(Refer to pages 45 and 46)	×	A	A

CONSTANT LIST (4)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O. Enabled ×. Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Tuning	Carrier Frequency	C6-02	Carrier frequency selection	2, 4, 8, 12	2 kHz	2 **	Input effective value (Refer to page 47)	×	A	A
		C6-07	γ -axis voltage offset	-100 0 to +100 0	0 1%	-1.0	Not initialized (Refer to page 47.)	×	A	A
		C6-11	Adaptive control selection	0, 1	1	0	0: Disabled 1. Enabled (Refer to page 47)	×	A	A
		C6-12	Adaptive control compensation gain	0 70 to 1.30	0 01	0.95 **	** Factory setting differs depending on kVA capacity (o2-04) (Refer to pages 29 and 47)	×	A	A
Reference	Preset Reference	d1-01	Speed reference 1	0.00 to 100.00	0.01%	0 00	Changing o1-03 setting changes the setting unit automatically. (Refer to page 48)	O	Q	Q
		d1-02	Speed reference 2	0 00 to 100 00	0 01%	0 00	Changing o1-03 setting changes the setting unit automatically (Refer to page 48)	O	Q	Q
		d1-03	Speed reference 3	0 00 to 100 00	0 01%	0.00	Changing o1-03 setting changes the setting unit automatically. (Refer to page 48)	O	Q	Q
		d1-04	Speed reference 4	0 00 to 100.00	0 01%	0.00	Changing o1-03 setting changes the setting unit automatically (Refer to page 48)	O	Q	Q
		d1-05	Speed reference 5	0 00 to 100 00	0 01%	0 00	Changing o1-03 setting changes the setting unit automatically, (Refer to page 48)	O	B	B
		d1-06	Speed reference 6	0.00 to 100.00	0 01%	0 00	Changing o1-03 setting changes the setting unit automatically. (Refer to page 48.)	O	B	B
		d1-07	Speed reference 7	0 00 to 100.00	0 01%	0 00	Changing o1-03 setting changes the setting unit automatically (Refer to page 48)	O	B	B
		d1-08	Speed reference 8	0.00 to 100 00	0.01%	0 00	Changing o1-03 setting changes the setting unit automatically. (Refer to page 48)	O	B	B
		d1-09	Jog speed reference	0 00 to 100.00	0.01%	10 00	Changing o1-03 setting changes the setting unit automatically (Refer to page 48)	O	Q	Q
	Reference Limit	d2-01	Speed reference upper limit	0.0 to 110.0	0 1%	100.0	(Refer to page 49)	×	B	B
		d2-02	Speed reference lower limit	0 0 to 100 0	0.1%	0 0	(Refer to page 49)	×	B	B

CONSTANT LIST (5)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Reference	Jump Speed	d3-01	Jump speed 1	0 0 to 100 0	0 1%	0.0	(Refer to page 49)	×	B	B
		d3-02	Jump speed 2	0.0 to 100.0	0 1%	0 0	(Refer to page 49.)	×	B	B
		d3-03	Jump speed 3	0.0 to 100 0	0 1%	0 0	(Refer to page 49)	×	B	B
		d3-04	Jump speed width	0 0 to 100.0	0 1%	1 0	(Refer to page 49)	×	B	B
	Sequence	d4-01	Speed reference hold function selection	0, 1	1	0	0 Disabled 1. Enabled (Refer to pages 49, 51 and 52)	×	A	A
	Torque Control	d5-01	Torque control selection	0, 1	1	0	0 Speed control 1 Torque control (Refer to pages 49, 51 and 52)	—	—	A
		d5-02	Torque reference delay time	0 to 1000	1 msec	0	(Refer to pages 49, 51 and 52)	—	—	A
		d5-03	Speed limit selection	1, 2	1	1	1. Speed reference value set by b1-01 2 d5-04 set value (Refer to pages 50, 51 and 52)	—	—	A
		d5-04	Speed limit	-120 to +120	1%	0	(Refer to pages 50, 51 and 52)	—	—	A
		d5-05	Speed limit bias	0 to 120	1%	10	(Refer to pages 50, 51 and 52)	—	—	A
		d5-06	Speed/torque control switching timer	0 to 1000	1 msec	0	(Refer to pages 50, 51 and 52)	—	—	A
Motor		E1-01	Input voltage setting	18 to 230	1 V	200	For 400V class, the value is twice as that of 200V class. Not initialized by initialize (Refer to page 53)	×	Q	Q
		E1-02	Motor capacity selection	000 to 2FF	—	****	0xx Rated 1750 (r/min) 1xx Rated 1450 (r/min) 2xx Not initialized at rated 1150 (r/min) **** Factory setting differs depending on inverter capacity selection (o2-04) and the value of rated 1750 (r/min)	×	Q	Q
		E1-03	Motor rated voltage	0.0 to 255 0	0 1 V	***	For 400 V class, the value is twice that of 200 V class. *** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53) Not initialized by initialize	×	A	A
		E1-04	Motor rated current	0 0 to 200.0*	0 1 A	***	Least setting unit 0 01 for 7 5 kW or less. *** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53) Not initialized by initialize	×	Q	Q
		E1-05	Number of motor poles	2, 4, 6, 8 poles	2 poles	6	Four types 2, 4, 6 and 8 Not initialized by initialize. (Refer to pages 30 to 37 and 53)	×	A	A

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

CONSTANT LIST (6)

Function	Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O: Enabled × Disabled)	Constant Access Level	
								Open Loop Vector	Flux Vector
Motor	E1-06	Motor max r/min	0 to 1.5 ×(E1-07)	1 r/min	***	*** Factory setting differs depending on motor selection (E1-02). (Refer to pages 30 to 37 and 53.) Not initialized by initialize	×	A	A
	E1-07	Motor base r/min	1000 to 3600	1 r/min	***	*** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53) Not initialized by initialize	×	A	A
	E1-08	Motor min. r/min	0 to 3600	1 r/min	*	Initial value without PG: 175 r/min Initial value with PG 30 r/min * Factory setting differs depending on control method selection (A1-02). (Refer to pages 28 and 53) Not initialized by initialize	×	A	A
	E1-09	Motor armature resistance	0 000 to 65 000	0 001 Ω	***	Resistance value for armature winding one phase *** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53) Not initialized initialize	×	Q	Q
	E1-10	Motor d-axis inductance	0.00 to 300 00	0 01 mH	***	*** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53) Not initialized by initialize	×	Q	Q
	E1-11	Motor q-axis inductance	0 00 to 600 00	0 01 mH	***	*** Factory setting differs depending on motor selection (E1-02). (Refer to pages 30 to 37 and 53.) Not initialized by initialize	×	Q	Q
	E1-13	Induced voltage	100 0 to 2000 0	0 1 mV/sec/rad	***	Phase voltage wave height value (electrical angle). *** Factory setting differs depending on motor selection (E1-02) (Refer to pages 30 to 37 and 53.) Not initialized by initialize	×	Q	Q
	E1-14	Variable torque/constant torque selection	0, 1	1	0	0: Motor for variable torque 1. Motor for constant torque Not initialized by initialize (Refer to page 53.)	×	A	A
	E1-15	Motor mechanical loss	0 0 to 10.0	0 1%	0.0	Not initialized (Refer to page 53)	×	A	A
	E1-16	Motor wiring resistance	0.0 to 10.0	0.1%	1.0	Not initialized by initialize (Refer to page 53)	×	A	A

CONSTANT LIST (7)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O: Enabled ×: Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Options	PG Option Setup	F1-01	PG constants	0 to 10000	1	1024	(Refer to page 54.)	×	—	Q
		F1-02	Operation selection at PG open-circuit (PGO) detection	0 to 3	1	1	0 Ramp to stop 1 Coast to stop 2: Fast-stop 3: Continues operation (Refer to pages 54 and 55)	×	—	B
		F1-03	Operation selection at overspeed (OS) detection	0 to 3	1	1	0 Ramp to stop 1 Coast to stop 2 Fast-stop 3 Continues operation (Refer to page 54.)	×	B	B
		F1-04	Operation selection at deviation (DEV) detection	0 to 3	1	3	0 Ramp to stop 1. Coast to stop 2: Fast-stop 3: Continues operation (Refer to pages 54 and 55.)	×	B	B
		F1-05	PG rotation detection	0, 1	1	1*	0 Motor forward run with phase A leading 1. Motor reverse run with phase A leading (Refer to page 54.)	×	—	B
		F1-08	Overspeed (OS) detection level	0 to 120	1%	115	(Refer to page 55.)	×	A	A
		F1-09	Overspeed (OS) detection delay time	0 0 to 2 0	0.1 sec	0 0	(Refer to page 55.)	×	A	A
		F1-10	Speed deviation (DEV) detection level	0 to 50	1%	10	(Refer to page 55.)	×	A	A
		F1-11	Speed deviation (DEV) delay time	0 0 to 10 0	0 1 sec	0 5	(Refer to page 55)	×	A	A
		F1-13	PG open-circuit (PGO) detection delay time	0 0 to 10.0	0 1 sec	3 0	(Refer to page 55)	×	—	A
	Analog Reference Card	F2-01	AI-14B input function selection	0, 1	1	0	0. 3-channel individual 1: 3-channel addition (Refer to page 56)	×	B	B
	Digital Input Card	F3-01	DI-08, DI-16H2 speed reference setting selection	0 to 7	1	0	0: BCD 1% 1. BCD 0 1% 2 BCD 0 01% 7: Binary (Displays set value in decimal) (Refer to page 56)	×	B	B
	Analog Output Card	F4-01	AO-08, 12CH1 output item selection	0 to 60	1	5	(Refer to page 56)	O	B	B
		F4-02	AO-08, 12CH1 output gain	-300 0 to +300 0	0 1	1 0	(Refer to page 56)	O	B	B
		F4-03	AO-08, 12CH1 output bias	-109 2 to +109 2	0 1%	0 0	(Refer to page 56)	O	B	B
		F4-04	AO-08, 12CH2 output item selection	0 to 60	1	3	(Refer to page 56)	O	B	B
		F4-05	AO-08, 12CH2 output gain	-300 0 to +300 0	0 1	1.0	(Refer to page 56)	O	B	B
		F4-06	AO-08, 12CH2 output bias	-109 2 to +109 2	0 1%	0 0	(Refer to page 56)	O	B	B

* The initial value is "0" with the software numbers (at flash side) (U1-14) up to 1031: it is "1" with those after 1031.

CONSTANT LIST (8)

Function		Constant No.	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled ×· Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Options	Digital Output Card	F5-01	DO-02 CH1 output selection	00 to FFH	—	0	Refer to H2-xx for setting. (Refer to page 55.)	×	B	B
		F5-02	DO-02 CH2 output selection	00 to FFH	—	1	Refer to H2-xx for setting (Refer to page 55.)	×	B	B
		F6-01	DO-08 output mode selection	0 to 2	1	0	0· 8-channel individual output 1: Code output 2· General-purpose individual output (Refer to page 57)	×	B	B
	Trans-mission Option Card	F9-01	Input level of external fault from transmission option	0, 1	1	0	(Refer to page 58)	×	B	B
		F9-02	External fault from transmission option	0, 1	1	0	(Refer to page 58.)	×	B	B
		F9-03	Operation at external fault input from transmission option	0 to 3	1	1	(Refer to page 58.)	×	B	B
		F9-04	Trace sampling cycle of transmission option	0 to 6000	1	0	(Refer to page 58.)	×	B	B
		F9-05	Torque reference selection of transmission option	0, 1	1	1	(Refer to page 58)	×	B	B
		F9-06	Operation selection at BUS error detection	0 to 3	1	1	(Refer to page 58.)	×	B	B

CONSTANT LIST (9)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O: Enabled × Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Terminal	Sequence Inputs	H1-01	Multi-function input (terminal 3-11)	00 to FFH		24	(Refer to pages 59 to 64)	×	B	B
		H1-02	Multi-function input (terminal 4-11)	00 to FFH		14	(Refer to pages 59 to 64.)	×	B	B
		H1-03	Multi-function input (terminal 5-11)	00 to FFH		3 (0) *1	(Refer to pages 59 to 64)	×	B	B
		H1-04	Multi-function input (terminal 6-11)	00 to FFH		4 (3) *1	(Refer to pages 59 to 64.)	×	B	B
		H1-05	Multi-function input (terminal 7-11)	00 to FFH		6 (4) *1	(Refer to pages 59 to 64.)	×	B	B
		H1-06	Multi-function input (terminal 8-11)	00 to FFH		8 (6) *1	(Refer to pages 59 to 64.)	×	B	B
	Sequence Outputs	H2-01	Multi-function output (terminal 9-10)	00 to FFH		0	(Refer to pages 65 to 68)	×	B	B
		H2-02	Multi-function output (terminal 25-27)	00 to FFH		1	(Refer to pages 65 to 68)	×	B	B
		H2-03	Multi-function output (terminal 26-27)	00 to FFH		2	(Refer to pages 65 to 68)	×	B	B
	Analog Inputs	H3-01	Signal level selection (terminal 13)	0, 1	1	0	0: 0 to 10 VDC 1 -10 to +10 VDC (Refer to page 69)	×	B	B
		H3-02	Gain (terminal 13)	0 0 to 1000 0	0 1%	100 0	(Refer to page 69)	O	B	B
		H3-03	Bias (terminal 13)	-100 0 to +100 0	0 1%	0 0	(Refer to page 69)	O	B	B
		H3-04	Signal level selection (terminal 16)	0,1	1	0	0 0 to 10 VDC 1 -10 to +10 VDC (Refer to pages 69 to 71)	×	B	B
		H3-05	Multi-function analog input (terminal 16)	0 to 1F	—	00	(Refer to pages 70 to 71)	×	B	B
		H3-06	Gain (terminal 16)	0 0 to 1000.0	0 1%	100.0	(Refer to pages 70 to 71)	O	B	B
		H3-07	Bias (terminal 16)	-100 0 to +100 0	0 1%	0 0	(Refer to pages 70 to 71)	O	B	B
		H3-08	Signal level selection (terminal 14)	0, 1, 2	1	2	0 0 to 10 VDC 1: -10 to +10 VDC 2 4 to 20 mA (Refer to pages 69 to 71)	×	A	A
		H3-09	Multi-function analog input (terminal 14)	00 to 1F	—	1F	(Refer to pages 69 to 71)	×	A	A
		H3-10	Gain (terminal 14)	0 0 to 1000 0	0 1%	100 0	(Refer to pages 69 to 71.)	O	A	A
		H3-11	Bias (terminal 14)	-100 0 to +100 0	0 1%	0 0	(Refer to pages 69 to 71)	O	A	A
		H3-12	Analog input filter time constant	0 00 to 2 00	0 01 sec	0 00	(Refer to pages 69 to 71)	×	A	A
	Analog Outputs	H4-01	Monitor selection (Multi-function AO) (terminal 21-22)	0 to 60	1	5	(Refer to page 71)	O	B	B
		H4-02	Gain (terminal 21-22)	-300 0 to +300 0	0 1	1.0	(Refer to page 71.)	O	B	B
		H4-03	Bias (terminal 21-22)	-109.2 to +109.2	0 1%	0.0	(Refer to page 71.)	O	B	B

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

CONSTANT LIST (10)

Function		Con-stant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled ×: Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Terminal	Analog Outputs	H4-04	Monitor selection (terminal 23-22)	0 to 60	1	3	(Refer to page 71.)	O	B	B
		H4-05	Gain (terminal 23-22)	-300 0 to +300 0	0.1	1.0	(Refer to page 71.)	O	B	B
		H4-06	Bias (terminal 23-22)	-109 2 to +109 2	0 1 %	0 0	(Refer to page 71.)	O	B	B
		H4-07	Analog output signal level selection (Multifunction AO)	0, 1	1	1	AO-12 signal characteristics used in common. 0 without sign 1 with sign (Refer to page 71)	O	B	B
Protection	Motor Protection	L1-01	Motor protection selection	0, 1	1	1	0 Disabled 1: Enabled (Refer to page 72)	×	B	B
		L1-02	Motor protection time	0 1 to 300 0	0.1 sec	60 0	(Refer to page 72)	×	B	B
	Power Loss Rid	L2-01	Momentary power loss detection	0, 1	1	0	0 Disabled 1 Power loss ride (Refer to page 72)	×	B	B
		L2-02	Momentary power loss ridethru time	0 0 to 2 0	0 1 sec	**	** Factory setting differs depending on inverter capacity. (Refer to pages 23, 24 and 72)	×	B	B
		L2-03	Deceleration time at momentary power loss	0 1 to 100 0	0.1 sec	30 0	(Refer to page 73.)	×	B	B
		L2-05	Undervoltage detection level	150 to 210	1 V	190	Set value for 200V class For 400V class, the value is twice as that of 200V class (Refer to page 73)	O	A	A
	Over Voltage Prevention	L3-01	Overvoltage prevention selection	0, 1	1	1	0 Disabled 1 Enabled (Refer to page 73)	×	B	B

CONSTANT LIST (11)

Function		Con-stant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled ×. Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Protection	Speed Detection	L4-01	Speed detection level	0 0 to 100 0	0 1%	0.0	(Refer to pages 73 and 74.)	×	B	B
		L4-02	Speed detection width	0 0 to 100 0	0 1%	2.0	(Refer to pages 73 and 74)	×	B	B
		L4-03	Speed detection level (+/-)	0 0 to ±100 0	0 1%	0.0	(Refer to pages 73 and 74.)	×	A	A
		L4-04	Speed detection width(+/-)	0.0 to 100 0	0 1%	2 0	(Refer to pages 73 and 74)	×	A	A
		L4-05	Operation when speed reference is missing	0, 1	1	0	0 Disabled 1: Enabled (Refer to page 75.)	×	A	A
	Fault Restart	L5-01	Number of auto restart attempts	0 to 10	1 time	0	(Refer to page 76)	×	—	B
		L5-02	Auto restart operation selection	0, 1	-1	0	0: Disabled 1: Enabled (Refer to page 76)	×	—	B
	Torque Detection	L6-01	Torque detection selection 1	0 to 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 (Refer to page 76)	×	B	B
		L6-02	Torque detection level 1	0 to 300	1%	150	(Refer to page 76)	×	B	B
		L6-03	Torque detection time 1	0 0 to 10 0	0 1 sec	0 1	(Refer to page 76.)	×	B	B
		L6-04	Torque detection selection 2	0 to 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 (Refer to page 76.)	×	A	A
		L6-05	Torque detection level 2	0 to 300	1%	150	(Refer to page 76)	×	A	A
		L6-06	Torque detection time 2	0.0 to 10 0	0 1 sec	0 1	(Refer to page 76)	×	A	A

CONSTANT LIST (12)

Function		Constant No	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O. Enabled ×: Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Protection	Torque Limit	L7-01	Forward torque limit	0 to 300	1%	160	(Refer to pages 76 and 77)	×	B	B
		L7-02	Reverse torque limit	0 to 300	1%	160	(Refer to pages 76 and 77)	×	B	B
		L7-03	Forward regenerative torque limit	0 to 300	1%	160	(Refer to pages 76 and 77.)	×	B	B
		L7-04	Reverse regenerative torque limit	0 to 300	1%	160	(Refer to pages 76 and 77.)	×	B	B
	Hardware Protection	L8-01	Protect selection for internal DB resistor	0, 1	1	0	0 Disabled 1 . Enabled (Refer to page 77.)	×	B	B
		L8-02	Inverter pre-alarm level	50 to 110	1 deg	95		×	A	A
Protection	Hardware Protection	L8-03	Operation selection after OH pre-alarm	0 to 3	1	3	0: Ramp to stop 1: Coast to stop 2 Fast-stop 3: Alarm only (Refer to page 77.)	×	A	A
		L8-05	Input open-phase protection selection	0, 1	1	0	0· Disabled 1 Enabled (Refer to page 78.)	×	A	A
		L8-07	Output open-phase protection selection	0, 1	1	0	0. Disabled 1. Enabled (Refer to page 78.)	×	A	A
		L8-10	Ground fault protection selection	0, 1	1	1	0· Disabled 1. Enabled (Refer to page 78)	×	A	A
	Step-Out Protection	L9-01	Step-out Protection selection	0, 1	1	1	0 Disabled 1: Enabled (Refer to page 78)	×	A	—

CONSTANT LIST (13)

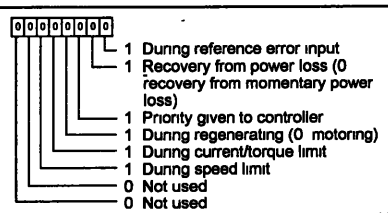
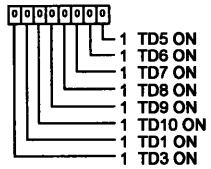
Function		Constant No.	Name	Setting Range	Setting Unit	Factory Setting	Remarks	Change During Operation (O Enabled × Disabled)	Constant Access Level	
									Open Loop Vector	Flux Vector
Operator	Monitor Select	o1-01	Monitor selection	4 to 54	1	6	(Refer to page 79)	×	B	B
		o1-02	Monitor selection after power up	1 to 4	1	1	1: Speed reference 2: Motor speed (U1-05 or equivalent) 3 Output current 4 Monitor selected by o1-01 (Refer to page 79)	×	B	B
		o1-03	Speed units of reference setting and monitor	0 to 39999	1	0	(Refer to page 79.)	×	B	B
	Key Select	o2-01	LOCAL/ REMOTE key enable/disable	0, 1	1	1	0 Disabled 1: Enabled	×	B	B
		o2-02	STOP key during control circuit terminal operation	0, 1	1	0	0 Disabled 1 Enabled	×	B	B
		o2-04	kVA selection	0 to FF	1	*	* Not initialized Factory setting differs depending on the inverter capacity (Refer to pages 29 and 80.)	×	B	B
		o2-05	Speed reference setting method selection	0, 1	1	0	0 Disabled 1 Enabled (Refer to page 80)	×	A	A
		o2-06	Operation selection when digital operator is disconnected	0, 1	1	0	0. Disabled 1 Enabled (Refer to page 81)	×	A	A
		o2-07	Cumulative operation time setting	0 to 65535	1 hour	—	(Refer to page 81)	×	A	A
		o2-08	Cumulative operation time selection	0, 1	1	0	0. Power-on time 1: Running time (Refer to page 81.)	×	A	A
	Auto-tuning	T1-02	Auto-tuning mode	0, 2 only	1	0	0 Normal mode 2 Tuning mode (Refer to page 82)	×	Q	Q
		T1-03	Auto-tuning item selection	0, 1	1	1	0: All auto-tuning executed 1. Auto-tuning executed only for PG origin pulse compensated value (Refer to page 82)	×	—	Q

2.3 MONITOR CONSTANT LIST (1)

* Analog monitor output selection is disabled.

Function	Constant No	Name	Setting Unit	Remarks	Analog Monitor Output Level	Constant Access Level	
						Open Loop Vector	Flux Vector
Monitor	U1-01	Speed reference (Frequency Ref)	0 01%	Setting unit differs depending on setting of o1-03.	10 V/max. r/min	Q	Q
	U1-02	Output frequency	0 01 H_z	Refer to u1-05 for motor rotation	10 V/max output frequency	Q	Q
	U1-03	Output current	0 1 A	Setting unit is 0 01 A for 7 5 kW or less	10 V/inverter rated current	Q	Q
	U1-04	Control method *	—	5. Open loop vector 6· Flux vector	—	Q	Q
	U1-05	Motor speed	0 01%	Setting unit differs depending on setting of o1-03	10 V/max r/min	Q	Q
	U1-06	Output voltage	0 1 V		10 V/200 V or 400 V	Q	Q
	U1-07	DC bus voltage	1 V		10 V/400 V or 800 V	Q	Q
	U1-08	Output power	0 1 kW		10 V/inverter capacity (kW)	Q	Q
	U1-09	Torque reference (internal)	0 1%		10 V/motor rated torque	Q	Q
	U1-10	Input terminal status *	—	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
	U1-11	Output terminal status *	—	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
	U1-12	Operation status *	—	During run During zero-speed During reverse run During reset signal inputting During speed agree Inverter operation ready Minor fault Major fault	—	Q	Q
	U1-13	Cumulative operation time *	1 hour		—	Q	Q
	U1-14	Software No. (at flash side) *	—		—	Q	Q
	U1-15	Control circuit terminal 13 input voltage	0 1%		10 V/100 %	B	B
	U1-16	Control circuit terminal 14 input current/voltage	0 1%		10 (V), 4 (mA) to 20 (mA) /100 %	B	B
	U1-17	Control circuit terminal 16 input (Term 16 Level)	0.1%		10 V/100 %	B	B
	U1-18	Motor q-axis current (Iq)	0 1%		10 V/motor rated current	A	B
	U1-19	Motor d-axis current (Id)	0.1%		10 V/motor rated current	A	B
	U1-20	Output frequency after soft-start	0 01%	Setting unit differs depending on seting of o1-03.	10 V/max. r/min	A	A
	U1-21	ASR input	0.01%		10 V/max r/min	A	A

MONITOR CONSTANT LIST (2)

Function	Constant No.	Name	Setting Unit	Remarks	Analog Monitor Output Level	Constant Access Level	
						Open Loop Vector	Flux Vector
Monitor	U1-22	ASR output	0 01%	Analog monitor output level becomes 10 V/max output frequency with V/f control	10 V/motor rated primary current	A	A
	U1-27	q-axis current reference	0.1%		10 V/motor rated current	A	A
	U1-28	d-axis current reference	0 1%		10 V/motor rated current	A	A
	U1-29	Voltage limit control output	0 1%		10 V/motor rated current	A	A
	U1-30	q-axis current control output	0.1%	200 for 200 V class, 400 for 400 V class	10 V/200 V or 400 V	A	A
	U1-31	d-axis current control output	0 1%	200 for 200 V class, 400 for 400 V class	10 V/200 V or 400 V	A	A
	U1-32	Output voltage reference Vq	0 1 V	V δ without PG 200 for 200 V class, 400 for 400 V class.	10 V/200 V or 400 V	A	A
	U1-33	Output voltage reference Vd	0 1 V	V γ without PG 200 for 200 V class, 400 for 400 V class	10 V/200 V or 400 V	A	A
	U1-36	Output voltage phase	0 1 deg		10 V/360 deg	A	A
	U1-37	Magnetic pole position detection value (with PG)	0 1 deg		10 V/360 deg	—	A
	U1-38	Magnetic pole position detection estimated value (without PG)	0 1 deg		10 V/360 deg	A	—
	U1-41	LED check (diagnosis)	—		Analog output disabled	A	A
	U1-42	Operation status 2	—		Analog output disabled	A	A
	U1-43	Command 1 from transmission option	—	Cleared by initialization	—	Q	Q
	U1-44	Command 2 from transmission option	—	Cleared by initialization.	—	Q	Q
	U1-45	External torque reference	0 01%		10 V/motor rated torque	A	A
	U1-46	Torque compensation	0 01%		10 V/motor rated torque	—	A
	U1-47	DO-08/H output status	—		Analog output disabled	A	A
	U1-48	Momentary power loss drop amount	0 01%	Setting unit differs depending on o1-03 setting	10 V/max. r/min	A	A
	U1-49	Software No. (at CPU side)	—		Analog output disabled	A	A
	U1-50	Speed detection PG counter value	Pulse		10 V/65536	—	A
	U1-51	Output current phase	0 1 deg		10 V/360 deg	A	A
	U1-53	PID feedback amount	0.01%	Setting unit differs depending on o1-03 setting	10 V/max r/min	A	A
	U1-54	DI-16H input status	—	Displays input value according to F3-01 setting. (Example) When lower 8 bits are ON: Binary selection: 256 BCD selection: 99	Analog output disabled	A	A

MONITOR CONSTANT LIST (3)

Function	Constant No	Name	Setting Unit	Remarks	Analog Monitor Output Level	Constant Access Level	
						Open Loop Vector	Flux Vector
Fault Trace	U2-01	Current fault	-	Cleared by fault reset	—	Q	Q
	U2-02	Last fault	-	Cleared by intialization	—	Q	Q
	U2-03	Speed reference at fault (U1-01)	0 01%	Cleared by intialization.	—	Q	Q
	U2-04	Output frequency at fault (U1-02)	0 01Hz	Cleared by intialization.	—	Q	Q
	U2-05	Output current at fault (U1-03)	0.1 A	Cleared by intialization	—	Q	Q
	U2-06	Motor speed at fault (U1-05)	0.01%	Cleared by intialization.	—	Q	Q
	U2-07	Output voltage reference at fault (U1-06)	0.1 V	Cleared by intialization	—	Q	Q
	U2-08	DC bus voltage at fault (U1-07)	1 V	Cleared by intialization	—	Q	Q
	U2-09	Output power at fault (U1-08)	0 1 kW	Cleared by intialization.	—	Q	Q
	U2-10	Torque reference at fault (U1-09)	0 1%	Cleared by intialization	—	Q	Q
	U2-11	Input terminal status at fault (U1-10)	—	Displays the same status at that of U1-10. Cleared by intialization.	—	Q	Q
	U2-12	Output terminal status at fault (U1-11)	—	Displays the same status at that of U1-11 Cleared by intialization.	—	Q	Q
	U2-13	Operation status at fault (U1-12)	—	Displays the same status at that of U1-12. Cleared by intialization	—	Q	Q
	U2-14	Cumulative operation time at fault (U1-13)	1 hour	Cleared by intialization.	—	Q	Q
	U2-15	Motor q-axis current at fault (U1-18)	0 1%	Cleared by initialization.	—	A	B
	U2-16	Motor d-axis current at fault (U1-19)	0.1%	Cleared by initialization	—	A	B
	U2-17	Operation status 2 at fault (U1-42)	—	Displayed in the same format as U1-42 Cleared by initialization.	—	A	A
	U2-18	Command 1 from transmission option at fault (U1-43)	—	Cleared by initialization	—	Q	Q
	U2-19	Command 2 from transmission option at fault (U1-44)	—	Cleared by initialization.	—	Q	Q
	U2-20	External torque reference at fault (U1-45)	0 01%	Cleared by initialization	—	A	A
	U2-21	Torque compensation at fault (U1-46)	0 01%	Cleared by initialization	—	—	A
	U2-22	ASR output at fault (U1-22)	0.01%	Cleared by initialization.	—	A	A
	U2-23	Output voltage phase at fault (U1-36)	0.1 deg	Cleared by initialization	—	A	A
	U2-24	Magnetic-pole position detection value at fault (U1-37)	0 1 deg	Cleared by initialization	—	—	A
	U2-25	Magnetic-pole position detection estimated value at fault (U1-38)	0.1 deg	Cleared by initialization	—	A	—

MONITOR CONSTANT LIST (4)

Function	Constant No	Name	Setting Unit	Remarks	Analog Monitor Output Level	Constant Access Level	
						Open Loop Vector	Flux Vector
Fault History	U3-01	Most recent fault	—	Cleared by initialization	—	Q	Q
	U3-02	Second most recent fault	—	Cleared by initialization	—	Q	Q
	U3-03	Third most recent fault	—	Cleared by initialization.	—	Q	Q
	U3-04	Fourth/oldest fault	—	Cleared by initialization.	—	Q	Q
	U3-05	Cumulative operation time at fault	1 hour	Cleared by initialization	—	Q	Q
	U3-06	Accumulated time of second fault	1 hour	Cleared by initialization	—	Q	Q
	U3-07	Accumulated time of third fault	1 hour	Cleared by initialization.	—	Q	Q
	U3-08	Accumulated time of fourth/oldest fault	1 hour	Cleared by initialization	—	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 speed reference
01	Local/remote selection	Zero-speed	FGAIN
02	Option/inverter selection	Frequency agree 1	FBIAS
03	Multi-step speed reference 1	Desired speed agree 1	Not used
04	Multi-step speed reference 2	Speed detection 1	
05	Multi-step speed reference 3	Speed detection 2	
06	Jog reference selection	Inverter operation ready	
07	Accel/decel time selection 1	During undervoltage detection	Overtorque detection level
08	External baseblock (NO contact)	During baseblock (No contact)	Not used
09	External baseblock (NC contact)	Operation reference mode	Speed reference lower limit level
0A	Accel/decel prohibit (hold)	Speed reference mode	Setting prohibit speed
0B	Inverter overheat alarm (OH2)	During overtorque detection 1 (NO contact output)	PID feedback
0C	Multi-function analog input enable/disable	Speed reference missing	Not used
0D	Not used	Braking resistor fault	
0E	Speed control integral reset	Fault	
0F	Not used	For transmission option	
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	Speed agree 2	Torque reference (at torque control), limit (at speed control)
14	Fault reset	Desired speed agree 2	Torque compensation
15	Emergency stop	Speed detection 3	FWD/REV torque limits
16	Not used	Speed detection 4	Not used
17		During overtorque detection 1 (NC contact)	
18	ON-/OFF-delay 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 2 (NC contact)	
1C	Not used	Not used	
1D		Motoring/regenerating mode	
1E	Analog speed reference sample/hold	During retry	
1F	Analog input terminal (13/14) selection	OL1 pre-alarm	
20	External fault	OH pre-alarm	
21-2F		Not used	
30	PID control integral reset	During current/torque limiting	
31	Not used	During speed limit	
32		Not used	
33			
37		During run 2	
34-5F		Not used	
60			
61			
62			
63			
64, 65, 66			
67-70			
71	Speed/torque control selection		
72	Not used		
73-76			
77	Speed control proportional gain selection		
78-FF	Not used		

Note: Values which can be set depends on the control method (A1-02).

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

Constant No	Name	Setting Range	Setting Unit	Factory Setting	
				Open Loop Vector A1-02 = 05	Flux Vector A1-02 = 06
b1-05	Operation selection for setting of E1-08 or less	0 to 3	1	1	0
b2-01	Zero-speed level	0.00 to 10 00	0 01%	1.00*	0 50*
C5-01	ASR proportional gain 1	0 00 to 300.00	0 01	15 00	20 00
C5-03	ASR proportional gain 2	0 00 to 300.00	0 01	15.00	20 00
E1-08	Motor minimum r/min	0 to 3600	1 r/min	10% of base r/min (E1-07)*	30*

* Setting unit depens on the o1-03 setting

2.6 CONSTANTS THAT CAN BE CHANGED BY SETTING INVERTER CAPACITY (o2-04)

200 V Class

Constant	Name	Unit	Factory Setting								
—	Inverter capacity	kW	0 4	0.75	1.5	2.2	3.7	5 5	7 5	11	15
o2-04	Inverter capacity selection	—	0	1	2	3	4	5	6	7	8
C6-12	Adaptive control compensation gain	—	0.95	0.95	0.95	0 95	0 95	0 95	0 95	0.95	0 95
L2-02	Momentary power loss ride time	sec	0.7	1.0	1 0	1.0	2 0	2 0	2 0	2.0	2 0

Constant	Name	Unit	Factory Setting						
—	Inverter capacity	kW	18.5	22	30	37	45	55	75
o2-04	Inverter capacity selection	—	9	A	B	C	D	E	F
C6-12	Adaptive control compensation gain	—	0 95	0.95	0 95	0 95	0 95	0 95	0 95
L2-02	Momentary power loss ride time	sec	2 0	2 0	2 0	2 0	2.0	2 0	2 0

*: Not initialized by Initialize (A1-03).

400 V Class

Constant	Name	Unit	Factory Setting								
—	Inverter capacity	kW	0 4	0 75	1 5	2 2	3 7	4 0	5 5	7 5	11
o2-04	Inverter capacity selection	—	20	21	22	23	24	25	26	27	28
C6-12	Adaptive control compensation gain	—	0 95	0 95	0 95	0.95	0 95	0 95	0 95	0 95	0 95
L2-02	Momentary power loss ride time	sec	1.0	1.0	1.0	1.0	2.0	2 0	2.0	2 0	2 0

Constant	Name	Unit	Factory Setting								
—	Inverter capacity	kW	15	18 5	22	30	37	45	55	75	110
o2-04	Inverter capacity selection	—	29	2A	2B	2C	2D	2E	2F	30	32
C6-12	Adaptive control compensation gain	—	0.95	0.95	0 95	0.95	100	0 95	0 95	0 95	0.95
L2-02	Momentary power loss ride time	sec	2 0	2.0	2 0	2 0	2.0	2 0	2 0	2 0	2 0

Constant	Name	Unit	Factory Setting			
—	Inverter capacity	kW	160	185	220	300
o2-04	Inverter capacity selection	—	34	35	36	37
C6-12	Adaptive control compensation gain	—	0 95	0 95	0.95	0 95
L2-02	Momentary power loss ride time	sec	2 0	2 0	2 0	2.0

* Not initialized by Initialize (A1-03)

2.7 CONSTANTS THAT CAN BE CHANGED BY SETTING MOTOR CAPACITY SELECTION (VARIABLE TORQUE)

(1) 200V Class, 1750 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0.75	1.5	2.2	3 7	5 5	7 5	11	15
E1-02	Motor capacity selection	—	000	001	002	003	004	005	006	007	008
E1-03	Motor rated voltage	V	200	200	200	200	200	200	200	200	200
E1-04	Motor rated current	A	1 72	3 19	5.66	8 55	14	20 5	26.2	39 4	53 2
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	10 58	3.006	1.996	1 07	0 645	0.332	0.266	0.112	0.0862
E1-10	Motor d-axis inductance	mH	41 66	19 06	15 12	9 803	7 839	5 034	4.431	3 014	2 403
E1-11	Motor q-axis inductance	mH	65 26	29 85	23.69	13 48	10 77	7 187	6 326	4 404	3 652
E1-13	Induced voltage mV·sec/rad		223 7	222 21	245 57	239 04	243 63	247 73	265 77	254.12	253 85

Constant No	Name	Unit	Factory Settin						
—	Motor capacity	kW	18 5	22	30	37	45	55	75
E1-02	Motor capacity selection	—	009	00A	00B	00C	00D	00E	00F
E1-03	Motor rated voltage	V	200	200	200	200	200	200	200
E1-04	Motor rated current	A	64.4	77.3	99 7	126 6	152 8	176 3	242 5
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	0 0664	0.0493	0 0412	0 0272	0.0188	0 0169	0 0096
E1-10	Motor d-axis inductance	mH	1 994	1.602	1 383	0 973	0 788	0.778	0 515
E1-11	Motor q-axis inductance	mH	3 031	2 435	2 188	1 538	1 229	1.214	0 804
E1-13	Induced voltage mV·sec/rad		259 92	256 05	277 07	265 59	264.33	294 84	285 08

(2) 200V Class, 1450 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0.75	1.5	2.2	3 7	5 5	7 5	11	15
E1-02	Motor capacity selection	—	100	101	102	103	104	105	106	107	108
E1-03	Motor rated voltage	V	200 0	200 0	200 0	200 0	200.0	200 0	200 0	200.0	200 0
E1-04	Motor rated current	A	1.78	3.12	5 88	8.55	14 1	20	25 7	38 6	51.6
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	4.405	2 425	1.647	0 936	0 462	0 341	0 247	0.13	0 0986
E1-10	Motor d-axis inductance	mH	26 62	19 14	14 53	11 29	7 098	5 899	6 414	3.589	3 004
E1-11	Motor q-axis inductance	mH	41 7	29 98	19.98	15 5	10 14	8.423	9 026	5.456	4.565
E1-13	Induced voltage mV·sec/rad		262 62	276.26	291.02	292 37	294 26	306.63	333	310 28	318 96

Constant No	Name	Unit	Factory Setting					
—	Motor capacity	kW	18 5	22	30	37	45	55
E1-02	Motor capacity selection	—	109	10A	10B	10C	10D	10E
E1-03	Motor rated voltage	V	200 0	200 0	200 0	200 0	200.0	200 0
E1-04	Motor rated current	A	64.3	74	101.7	124 4	148.6	172 7
E1-05	Number of motor poles	Pole	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	0 0747	0 0567	0 0407	0 0284	0 0214	0 0164
E1-10	Motor d-axis inductance	mH	2 393	1.883	1 453	1.177	0 985	0 834
E1-11	Motor q-axis inductance	mH	3.637	2 978	2 298	1.837	1.537	1.302
E1-13	Induced voltage mV·sec/rad		312 98	323.33	318.78	323.1	331.74	362.84

(3) 200V Class, 1150 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2 2	3 7	5 5	7 5	11	15
E1-02	Motor capacity selection	—	200	201	202	203	204	205	206	207	208
E1-03	Motor rated voltage	V	200.0	200.0	200 0	200.0	200 0	200.0	200.0	200 0	200.0
E1-04	Motor rated current	A	1.74	3 17	5 9	8.84	14 2	18.6	25.8	38 6	53 1
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	6 763	3.66	1 48	0 696	0 502	0 414	0 262	0 149	0.111
E1-10	Motor d-axis inductance	mH	42.88	28 59	17 64	10 4	8 495	10 6	7.529	4 487	3 604
E1-11	Motor q-axis inductance	mH	67 17	44 78	24.23	14.85	12 13	14.92	10 97	6.82	5 479
E1-13	Induced voltage mV·sec/rad		333 32	337 68	365 45	356.18	368.01	428.18	410	389 84	384.12

Constant No	Name	Unit	Factory Setting				
—	Motor capacity	kW	18 5	22	30	37	45
E1-02	Motor capacity selection	—	209	20A	20B	20C	20D
E1-03	Motor rated voltage	V	200 0	200.0	200 0	200 0	200 0
E1-04	Motor rated current	A	63 8	74.1	100.6	124.7	148 9
E1-05	Number of motor poles	Pole	6	6	6	6	6
E1-06	Motor max r/min	r/min	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	0 083	0 0653	0.0461	0 0324	0.0214
E1-10	Motor d-axis inductance	mH	2 776	2 354	1.907	1.472	1.09
E1-11	Motor q-axis inductance	mH	4.391	3 722	2 975	2.296	1 7
E1-13	Induced voltage mV·sec/rad		392.58	405 72	411.21	405 5	414.72

(4) 200V Class, 1750 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2.2	3 7	5.5	7 5	11	15
E1-02	Motor capacity selection	—	020	021	022	023	024	026	027	028	029
E1-03	Motor rated voltage	V	400	400	400	400	400	400	400	400	400
E1-04	Motor rated current	A	0 86	1.6	2 83	4.28	6 99	10.3	13 1	19 7	26 6
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	42 32	12 02	7.984	4 28	2 578	1 328	1.065	0.4995	0.345
E1-10	Motor d-axis inductance	mH	166.6	76.24	60.48	39.21	31.36	20 14	17.72	12 06	9.611
E1-11	Motor q-axis inductance	mH	261	119.4	94.76	53 92	43 07	28 75	25 3	17.62	14 61
E1-13	Induced voltage mV·sec/rad		447 44	444 47	491.18	478 04	487 35	495 5	531.41	508.41	507 92

Constant No	Name	Unit	Factory Setting						
—	Motor capacity	kW	18 5	22	30	37	45	55	75
E1-02	Motor capacity selection	—	02A	02B	02C	02D	02E	02F	030
E1-03	Motor rated voltage	V	400	400	400	400	400	400	400
E1-04	Motor rated current	A	32 2	38.6	49.9	63 3	76.4	88 2	121.2
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	0.266	0 197	0.165	0.1088	0 0751	0.0674	0 0385
E1-10	Motor d-axis inductance	mH	7 976	6.407	5.533	3 89	3 153	3.114	2.06
E1-11	Motor q-axis inductance	mH	12 12	9 739	8 751	6.153	4.917	4.856	3.214
E1-13	Induced voltage mV·sec/rad		519 89	512 24	554.36	521.82	528.53	589 77	570.15

(5) 400V Class, 1450 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1 5	2 2	3.7	5 5	7 5	11	15
E1-02	Motor capacity selection	—	120	121	122	123	124	126	127	128	129
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400 0	400 0	400 0	400.0	400.0	400 0
E1-04	Motor rated current	A	0 89	1.56	2 94	4 28	7 07	10	12 9	19 3	25 8
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	17 62	9.7	6 588	3.743	1.848	1.366	0 987	0 52	0 394
E1-10	Motor d-axis inductance	mH	106.5	76 56	58 12	45 16	28.39	23.6	25.66	14.36	12 01
E1-11	Motor q-axis inductance	mH	166 8	119 9	79 91	62 02	40 54	33 69	36 1	21 82	18 26
E1-13	Induced voltage	mV·sec/rad	525 15	552 47	582.12	584 51	588 33	613 26	665 91	620 42	638 15

Constant No	Name	Unit	Factory Setting					
—	Motor capacity	kW	18 5	22	30	37	45	55
E1-02	Motor capacity selection	—	12A	12B	12C	12D	12E	12F
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400 0	400 0	400 0
E1-04	Motor rated current	A	32 2	37	50 9	62.2	74.3	86.4
E1-05	Number of motor poles	Pole	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	0 299	0 227	0 163	0.113	0 0856	0.0654
E1-10	Motor d-axis inductance	mH	9 572	7 53	5 812	4 709	3 941	3 338
E1-11	Motor q-axis inductance	mH	14.55	11.91	9 192	7 346	6 147	5 206
E1-13	Induced voltage	mV·sec/rad	626 18	646 74	637 65	646 29	663 53	725 76

(6) 400V Class, 1150 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2.2	3 7	5 5	7.5	11	15
E1-02	Motor capacity selection	—	220	221	222	223	224	226	227	228	229
E1-03	Motor rated voltage	V	400 0	400 0	400.0	400.0	400 0	400 0	400 0	400 0	400 0
E1-04	Motor rated current	A	0 87	1.59	2 95	4 42	7 1	9 31	12 9	19 3	26 6
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	27 05	14 64	5 921	2 783	2 006	1.657	1.049	0 595	0 444
E1-10	Motor d-axis inductance	mH	171.5	114.4	70 56	41 61	33.98	42 41	30 12	17 95	14 42
E1-11	Motor q-axis inductance	mH	268 7	179 1	96.9	59 41	48 52	59.68	43 88	27 28	21.91
E1-13	Induced voltage	mV·sec/rad	666 86	675 5	731 03	712 35	735 8	856 44	820 04	779 85	768 33

Constant No	Name	Unit	Factory Setting				
—	Motor capacity	kW	18 5	22	30	37	45
E1-02	Motor capacity selection	—	22A	22B	22C	22D	22E
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400.0	400 0
E1-04	Motor rated current	A	31.9	37	50.3	62.3	74 4
E1-05	Number of motor poles	Pole	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	0.332	0 261	0 185	0.129	0 0857
E1-10	Motor d-axis inductance	mH	11 1	9 414	7 629	5 887	4.359
E1-11	Motor q-axis inductance	mH	17 56	14.89	11 9	9 182	6 799
E1-13	Induced voltage	mV·sec/rad	785.12	811.44	822 47	810 95	829 62

2.8 CONSTANTS THAT CAN BE CHANGED BY SETTING MOTOR CAPACITY SELECTION (CONSTANT TORQUE)

(1) 200V Class, 1750 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2 2	3 7	5.5	7.5	11	15
E1-02	Motor capacity selection	—	000	001	002	003	004	005	006	007	008
E1-03	Motor rated voltage	V	200.0	200.0	200 0	200.0	200.0	200.0	200 0	200.0	200 0
E1-04	Motor rated current	A	1 8	3.5	6.5	8 9	14.6	20.0	29.3	37 9	53 2
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	3.006	1.474	1.048	0.645	0.331	0 370	0.223	0.153	0 095
E1-10	Motor d-axis inductance	mH	18.16	11.03	6 96	7.03	4.78	5 39	3 58	3 46	2 46
E1-11	Motor q-axis inductance	mH	27 10	16.46	10 58	9 71	6 52	7 36	4.89	4.96	3 70
E1-13	Induced voltage	mV·sec/rad	214.61	207 54	220.82	235.31	239 31	254 25	236.97	269 96	254.25

Constant No	Name	Unit	Factory Setting						
—	Motor capacity	kW	18.5	22	30	37	45	55	75
E1-02	Motor capacity selection	—	009	00A	00B	00C	00D	00E	00F
E1-03	Motor rated voltage	V	200 0	200.0	200 0	200 0	200 0	200 0	200 0
E1-04	Motor rated current	A	65.0	76.4	103 5	133.1	149 4	181.6	241.0
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/min	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	0.069	0 054	0 041	0 027	0.022	0 016	0 011
E1-10	Motor d-axis inductance	mH	1.99	1.70	1.29	0 91	0.90	0 72	0.57
E1-11	Motor q-axis inductance	mH	2 99	2 55	2 00	1.41	1.39	1.11	0 88
E1-13	Induced voltage	mV·sec/rad	256 73	261.05	260 37	245 07	275 99	277 07	292 23

(2) 200V Class, 1450 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0.75	1 5	2.2	3 7	5.5	7 5	11	15
E1-02	Motor capacity selection	—	100	101	102	103	104	105	106	107	108
E1-03	Motor rated voltage	V	200.0	200 0	200.0	200.0	200 0	200.0	200.0	200 0	200 0
E1-04	Motor rated current	A	1.8	3 2	6.1	9.4	13 9	19.5	26 0	39 2	52.9
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	4.669	2.425	0.966	0.429	0.514	0.338	0.247	0.155	0.099
E1-10	Motor d-axis inductance	mH	27.36	18 24	10 60	6.05	7.47	6 37	6 04	4 34	2 86
E1-11	Motor q-axis inductance	mH	40.82	27.21	13 99	8 25	10.19	8.69	8 86	6.31	4 30
E1-13	Induced voltage	mV·sec/rad	263 39	266 81	282.33	269 24	299.12	315 95	321 66	309.92	308 12

Constant No	Name	Unit	Factory Setting						
—	Motor capacity	kW	18 5	22	30	37	45	55	75
E1-02	Motor capacity selection	—	109	10A	10B	10C	10D	10E	10F
E1-03	Motor rated voltage	V	200 0	200.0	200 0	200.0	200.0	200 0	200.0
E1-04	Motor rated current	A	65.0	74 0	101.1	123.3	146 3	178.2	246.8
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	0.078	0 065	0.048	0 033	0.025	0 016	0 009
E1-10	Motor d-axis inductance	mH	2 39	2.01	1.61	1.29	1.12	0 77	0 55
E1-11	Motor q-axis inductance	mH	3.58	3 13	2.50	2.00	1.74	1.19	0.91
E1-13	Induced voltage	mV·sec/rad	309.15	325 49	326.75	331.2	346.37	340 97	325.67

(3) 200V Class, 1150 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2 2	3 7	5 5	7.5	11	15
E1-02	Motor capacity selection	—	200	201	202	203	204	205	206	207	208
E1-03	Motor rated voltage	V	200 0	200 0	200 0	200.0	200 0	200.0	200 0	200 0	200 0
E1-04	Motor rated current	A	1 8	3 4	6 1	8 8	14.8	18 8	27.8	39 3	54 6
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	3 660	2 100	1 480	0 747	0 502	0 414	0 262	0.177	0 111
E1-10	Motor d-axis inductance	mH	27.25	14 72	15.82	10.75	8.06	9.98	7 09	5 43	3 43
E1-11	Motor q-axis inductance	mH	40.66	22 38	21.85	14.67	11.00	14.64	10 29	7 88	5 16
E1-13	Induced voltage	mV·sec/rad	326 16	321 21	352 98	358 97	355 46	413 55	369 86	389 39	371.03

Constant No	Name	Unit	Factory Setting						
—	Motor capacity	kW	18 5	22	30	37	45	55	75
E1-02	Motor capacity selection	—	209	20A	20B	20C	20D	20E	20F
E1-03	Motor rated voltage	V	200 0	200 0	200 0	200 0	200.0	200 0	200 0
E1-04	Motor rated current	A	64 3	74 3	100 7	123 5	144.7	175 1	248.4
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	0 093	0 075	0 049	0 036	0 025	0.017	0 011
E1-10	Motor d-axis inductance	mH	2 89	2 51	2 02	1.62	1 27	0.97	0.72
E1-11	Motor q-axis inductance	mH	4.50	3.91	3.12	2.50	1.97	1.62	1.11
E1-13	Induced voltage	mV·sec/rad	390.6	408 47	413 96	415 58	438 35	434.21	412 7

(4) 400V Class, 1750 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0.75	1.5	2.2	3 7	4.0	5.5	7.5	11
E1-02	Motor capacity selection	—	020	021	022	023	024	025	026	027	028
E1-03	Motor rated voltage	V	400 0	400.0	400 0	400 0	400 0	400 0	400 0	400 0	400.0
E1-04	Motor rated current	A	0.9	1.8	3 3	4.5	7 3	8.6	10.0	14.6	19 0
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max. r/mın	r/mın	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/mın	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	12 020	5.894	4.192	2 658	1.329	1.819	1.479	0 892	0.613
E1-10	Motor d-axis inductance	mH	72 66	44.12	27 83	28.12	19 11	19 18	21.58	14 33	13 84
E1-11	Motor q-axis inductance	mH	108 4	65.84	42 32	38.85	26.08	32 35	29 44	19 56	19 83
E1-13	Induced voltage	mV·sec/rad	429 21	415.04	441.68	470 57	478.62	556 8	508.41	473 85	540

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	15	18 5	22	30	37	45	55	75	90
E1-02	Motor capacity selection	—	029	02A	02B	02C	02D	02E	02F	030	031
E1-03	Motor rated voltage	V	400 0	400 0	400.0	400 0	400 0	400 0	400 0	400 0	400.0
E1-04	Motor rated current	A	26 6	32 5	38 2	51.8	66.6	74.7	90 8	120 5	147 7
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/mın	1750	1750	1750	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	0.378	0 276	0 217	0 165	0 107	0 087	0 064	0 045	0 025
E1-10	Motor d-axis inductance	mH	9.85	7.95	6.80	5 15	3 62	3 59	2 87	2 26	1.52
E1-11	Motor q-axis inductance	mH	14.79	11.94	10.22	8.00	5 63	5.55	4.44	3 50	2.53
E1-13	Induced voltage	mV·sec/rad	508 41	513 68	522 27	520.83	490 23	551.97	554.36	584.51	542 88

Constant No	Name	Unit	Factory Setting					
—	Motor capacity	kW	110	132	160	200	250	300
E1-02	Motor capacity selection	—	032	033	034	035	036	037
E1-03	Motor rated voltage	V	400.0	400 0	400 0	400.0	400 0	400 0
E1-04	Motor rated current	A	174.2	212.8	242 9	311.5	382 8	453.2
E1-05	Number of motor poles	Pole	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1750	1750	1750	1750	1750	1750
E1-07	Motor base r/min	r/mın	1750	1750	1750	1750	1750	1750
E1-09	Motor armature resistance	Ω	0 022	0 016	0 011	0 009	0 006	0.005
E1-10	Motor d-axis inductance	mH	1.46	1.12	0.95	0 67	0.57	0 49
E1-11	Motor q-axis inductance	mH	2 27	1 74	1.48	1 04	0.98	0 84
E1-13	Induced voltage	mV·sec/rad	589 77	567 27	627 62	590.27	596 97	617.54

(5) 400V Class, 1450 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0 75	1.5	2.2	3 7	4 0	5.5	7.5	11
E1-02	Motor capacity selection	—	120	121	122	123	124	125	126	127	128
E1-03	Motor rated voltage	V	400.0	400 0	400 0	400.0	400 0	400.0	400 0	400.0	400 0
E1-04	Motor rated current	A	0 9	1 7	3 1	4.4	7.4	6 2	9.4	13.9	19 7
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	14.640	8 400	5.921	2.987	2 006	2.546	1.657	1.049	0 708
E1-10	Motor d-axis inductance	mH	109 00	58 88	63 28	43.00	32 24	29.22	39 94	28.35	21.70
E1-11	Motor q-axis inductance	mH	162 60	89 52	87 40	58.68	44 00	52.83	58 56	41.18	31.52
E1-13	Induced voltage	mV·sec/rad	652 5	642 47	706 1	718 07	710 91	612 7	827.24	739 62	778.91

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	15	18.5	22	30	37	45	55	75	90
E1-02	Motor capacity selection	—	129	12A	12B	12C	12D	12E	12F	130	131
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400 0	400 0	400 0	400.0	400.0	400 0
E1-04	Motor rated current	A	27 3	32.2	37 1	50.3	61.8	72 3	87.6	124.2	146 3
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max. r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	0 444	0 371	0 300	0.196	0 144	0 102	0 067	0 045	0 036
E1-10	Motor d-axis inductance	mH	13 74	11 58	10.05	8.08	6 47	5 09	3 89	2 87	2 53
E1-11	Motor q-axis inductance	mH	20 63	18.00	15 63	12 49	9 99	7 87	6 46	4 45	3.92
E1-13	Induced voltage	mV·sec/rad	742 01	781 29	816 71	827 73	831 06	876 56	868 41	825.3	850 68

Constant No	Name	Unit	Factory Setting				
—	Motor capacity	kW	110	132	160	200	250
E1-02	Motor capacity selection	—	132	133	134	135	136
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400 0	400 0
E1-04	Motor rated current	A	175 9	207 6	247 0	314.4	400 0
E1-05	Number of motor poles	Pole	6	6	6	6	6
E1-06	Motor max r/min	r/min	1450	1450	1450	1450	1450
E1-07	Motor base r/min	r/min	1450	1450	1450	1450	1450
E1-09	Motor armature resistance	Ω	0 020	0.016	0 013	0 009	0.004
E1-10	Motor d-axis inductance	mH	1.79	1.50	1 27	0 95	0 50
E1-11	Motor q-axis inductance	mH	2 80	2.35	2 20	1.65	0 80
E1-13	Induced voltage	mV·sec/rad	863 15	885 65	895 68	864.59	652.7

(6) 400V Class, 1150 r/min Rating

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	0 4	0.75	1.5	2.2	3.7	4.0	5 5	7 5	11
E1-02	Motor capacity selection	—	220	221	222	223	224	225	226	227	228
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400.0	400 0	400.0	400.0	400.0	400.0
E1-04	Motor rated current	A	0.9	1.6	3 1	4.7	7.0	6 2	9 7	13 0	19.6
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/mın	r/min	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/mın	r/mın	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	18 680	9 700	3 862	1 715	2 057	2 753	1.554	0.987	0.619
E1-10	Motor d-axis inductance	mH	109 40	72 96	42 40	24.19	29 86	35.49	25 48	24.16	17.36
E1-11	Motor q-axis inductance	mH	163 30	108 80	55.96	33.00	40 76	64.19	34 77	35 42	25 22
E1-13	Induced voltage	mV·sec/rad	526.59	533.79	564.89	538.56	598 41	779 7	631 94	643.41	619 97

Constant No	Name	Unit	Factory Setting								
—	Motor capacity	kW	15	18 5	22	30	37	45	55	75	90
E1-02	Motor capacity selection	—	229	22A	22B	22C	22D	22E	22F	230	231
E1-03	Motor rated voltage	V	400 0	400 0	400 0	400 0	400 0	400 0	400 0	400.0	400 0
E1-04	Motor rated current	A	26.4	32.5	37 0	50 6	61.6	73 1	89.1	123.4	142 7
E1-05	Number of motor poles	Pole	6	6	6	6	6	6	6	6	6
E1-06	Motor max r/min	r/mın	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-07	Motor base r/mın	r/mın	1150	1150	1150	1150	1150	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	0 394	0 311	0 260	0 190	0 131	0 099	0 065	0 037	0 032
E1-10	Motor d-axis inductance	mH	11.45	9.54	8 04	6.43	5.17	4.49	3.08	2.19	2.10
E1-11	Motor q-axis inductance	mH	17.19	14.33	12.50	10 00	8 00	6 94	4.76	3 64	3 28
E1-13	Induced voltage	mV·sec/rad	616.1	618.53	651.06	653.45	662.54	692.73	681.71	651 56	707 54

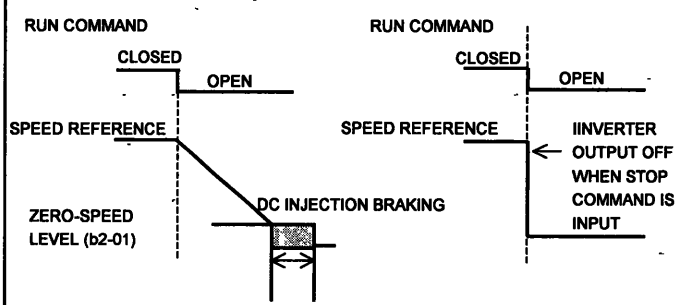
Constant No	Name	Unit	Factory Setting			
—	Motor capacity	kW	110	132	160	200
E1-02	Motor capacity selection	—	232	233	234	235
E1-03	Motor rated voltage	V	400.0	400 0	400 0	400 0
E1-04	Motor rated current	A	174.4	207 3	254.6	311.4
E1-05	Number of motor poles	Pole	6	6	6	6
E1-06	Motor max r/min	r/min	1150	1150	1150	1150
E1-07	Motor base r/min	r/min	1150	1150	1150	1150
E1-09	Motor armature resistance	Ω	0 025	0 014	0 009	0 008
E1-10	Motor d-axis inductance	mH	1.76	1.20	0 91	0 77
E1-11	Motor q-axis inductance	mH	2 72	1.88	1 42	1 33
E1-13	Induced voltage	mV·sec/rad	708 98	706 1	688 91	696 56

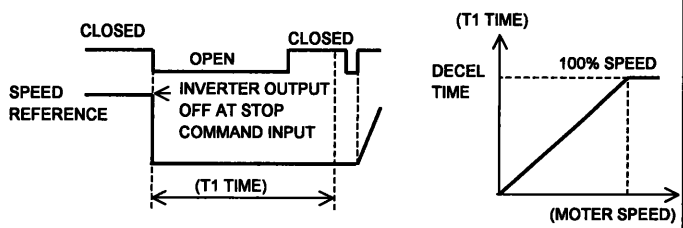
3. CONSTANT DESCRIPTION

b APPLICATION-RELATED CONSTANTS

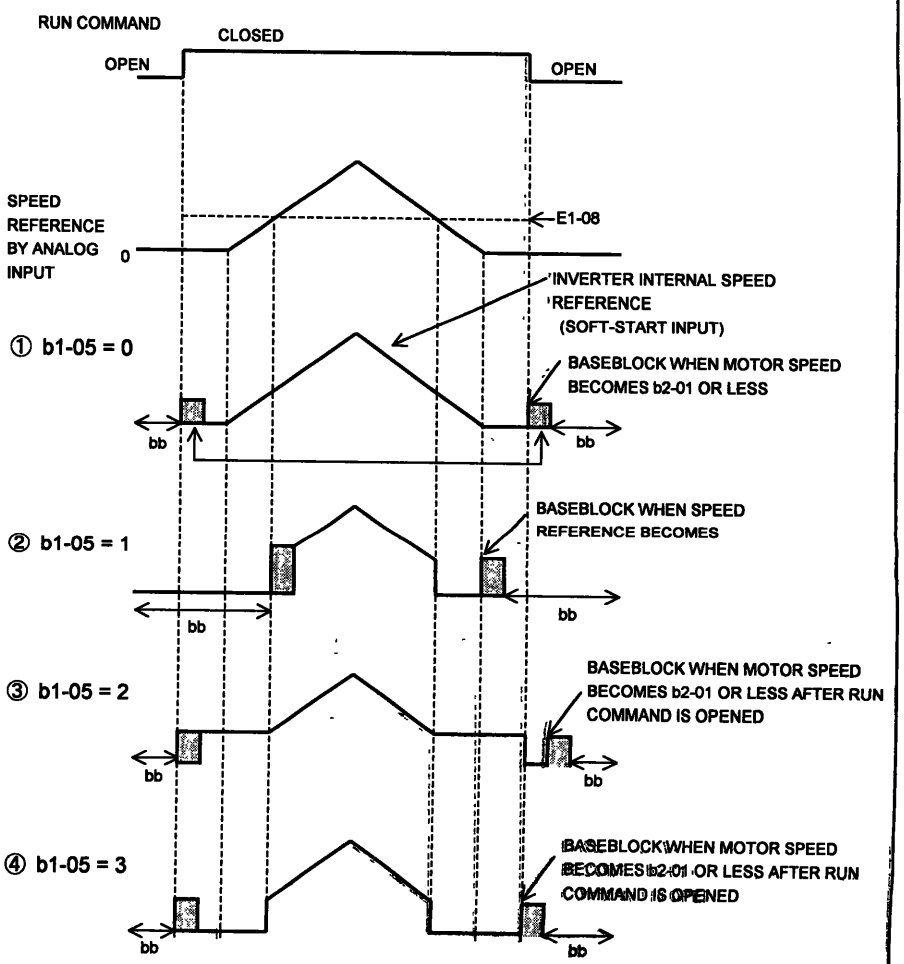
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>b1-01

b1-02</td><td>Speed reference selection

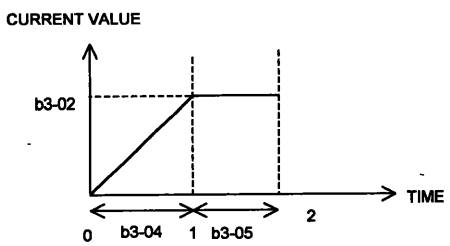
Operation method selection</td><td>Frequency reference and run command can be set independently in the REMOTE mode as shown below
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>Run by digital operator reference</td></tr>
<tr><td>1</td><td>Run by control circuit terminal reference</td></tr>
<tr><td>2</td><td>—</td></tr>
<tr><td>3</td><td>Run by option card (CP-916 B/G or 216 I/F reference)</td></tr>
<tr><td>4</td><td>Run by personal computer (CP-717)</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 = 0 Deceleration to stop ② b1-03 = 1 Coast to stop


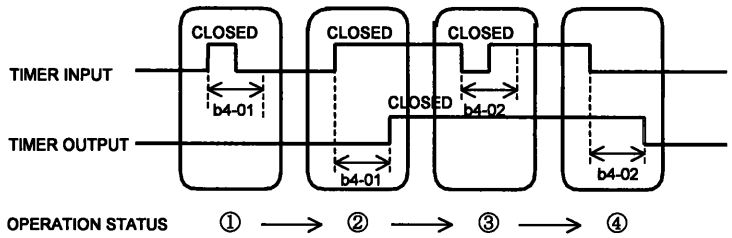
③ B1-03 = 3 Coasting to a stop (with timer function)


ONCE STOP COMMAND IS INPUT, RUN COMMAND IS DISREGARDED FOR T1 TIME AFTER ELAPSE OF T1 TIME, INVERTER DOES NOT RESTART UNLESS RUN COMMAND IS INPUT AGAIN
T1 TIME IS SPECIFIED ACCORDING TO MOTOR SPEED AT STOP COMMAND INPUT</td><td>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>Remaks</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 speed reference are not accepted)</td></tr>
</table>
</td><td></td></tr>
<tr><td>b1-05</td><td>Operation selection for setting of E1-08 or less</td><td>When flux vector control is set select operation mode for speed reference less than E1-08.
<table>
<tr><th>Selection</th><th>Description</th></tr>
<tr><td>0</td><td>Run according to speed reference (E1-08 invalid)</td></tr>
<tr><td>1</td><td>Baseblock</td></tr>
<tr><td>2</td><td>Run with min speed reference (E1-08)</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 speed reference


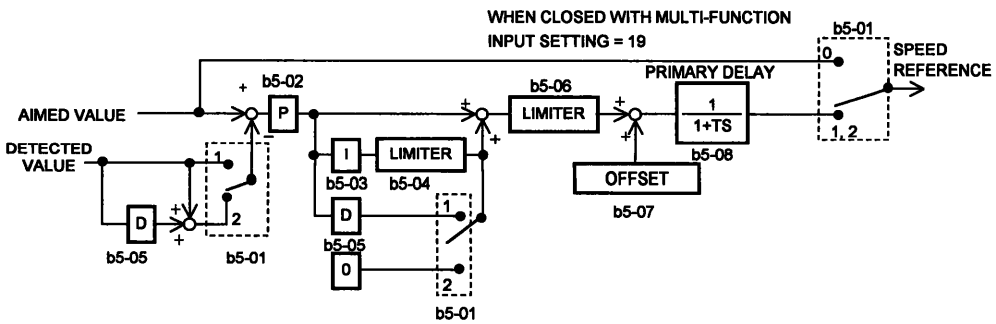
</td><td>• This setting is disabled when E1-08=0 (INITIAL VALUE)
• When A1-02 = 05 (open loop vector control), only 1 and 2 can be selected at less than the minimum r/min (E1-08) since the rotor position is not defined</td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>b1-06</td><td>Operation selection after switching to remote mode</td><td><table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Does not operate even if REMOTE run command is ON when switching LOCAL to REMOTE</td></tr><tr><td>1</td><td>Operates if REMOTE run command is ON when switching LOCAL to REMOTE</td></tr></table></td><td>When the set value is 0, turn OFF the run command once and then turn it ON to start the operation</td></tr>
<tr><td>b2-01</td><td>Zero-speed level (BB starting speed)</td><td>Set speed which starts baseblock in units of 0. 01%, when deceleration to stop is selected</td><td>The initial values are 1.00% at A1-02=5 (open loop vector control) and 0.50% at A1-02=6 (flux vector control). The setting unit can be changed by o1-03.</td></tr>
<tr><td>b3-02</td><td>Magnetic-pole lead-in current</td><td>Sets current at initial magnetic-pole lead-in (Unit 1%)
Motor rated current (E1-04) becomes 100%
To increase starting torque, increase this value</td><td></td></tr>
<tr><td>b3-04</td><td>Current rising time</td><td>Sets current rising time at initial magnetic-pole lead-in (Unit· 0 1 sec).</td><td></td></tr>
<tr><td>b3-05</td><td>Magnetic-pole lead-in time</td><td>Sets the waiting time for lead-in after current positive start at initial magnetic-pole lead-in (Unit 0 1 sec).
Current variation at initial·magnetic-pole lead-in is as shown below.
 
The following outlines the adjustment for reduction of starting time or increase of starting torque at startup in open loop vector control method
<table><tr><th>Operation Status</th><th>b3-02 Adjustment</th><th>b3-04 Adjustment</th><th>b3-05 Adjustment</th></tr><tr><td>Startup is slow.</td><td>—</td><td>Decrease set value</td><td>Decrease set value.</td></tr><tr><td>Starting torque is short and “STO” is output</td><td>Increase set value.</td><td>—</td><td>—</td></tr></table></td><td>Control operation by b3-02 to b3-05 differs depending on the control method (A1-02)
Flux vector control (A1-02=06)· Operates only at origin pulse tuning Does not operate under normal operation
Open loop vector control (A1-02=05) Performs magnetic-pole lead-in operation at every startup</td></tr>
</table>

Constant No	Name	Description	Remaks
		By combining multi-function input terminal timer 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 H1-01 to H1-06
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 method 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.)

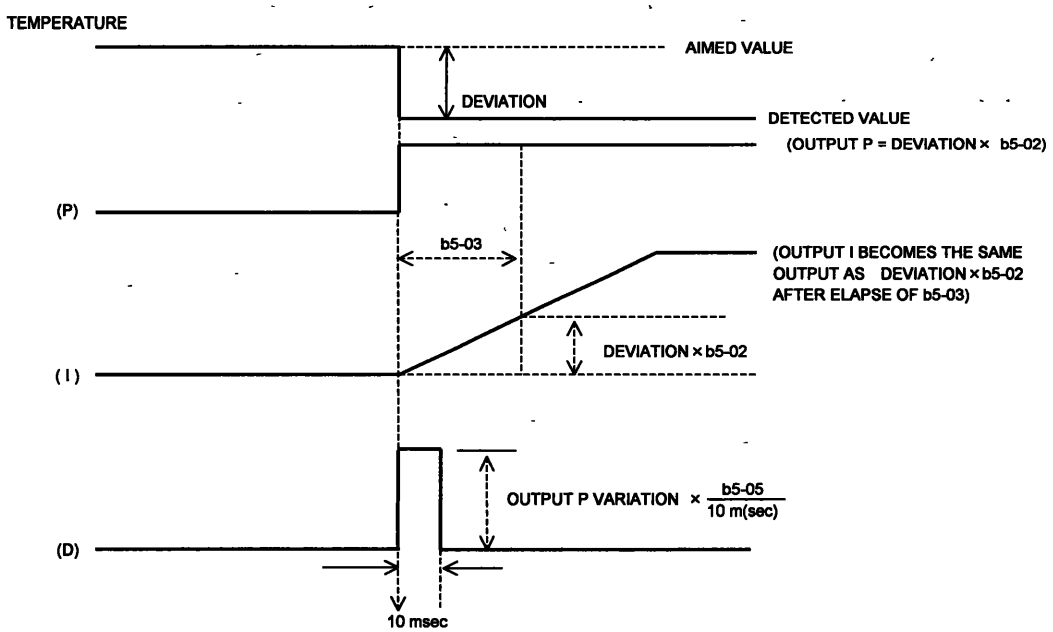
The following shows the PID control block diagram.



- Set this constant to 1 or 2 for PID control. Normally, use measured value differential type PID control of set value 2
- When "PID control enabled" is selected, the aimed value input is determined by b1-01 (speed reference selection)
- Input the feedback value from multi-function analog input terminal or speed reference (current) terminal Set PID feedback (set value B) either to multi-function analog input terminal 16 function selection (H3-05) or speed reference (current) terminal 14 function selection (H3-09) Set gain and bias of the analog input to be used for adjustment of feedback amount. Proportional gain (P), integral time (I), differential time (D)· b5-02, b5-03, b5-05
- Adjust the response of PID control using proportional gain (P), integral time (I) and differential time (D).

Constant No	Name	Description	Remaks
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 motor r/min max (E1-06).	
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 motor max. r/min (E1-06).	
b5-07	PID offset adjustment	Sets offset for output after PID control in the ratio for motor max. r/min(E1-06)	
b5-08	PID primary delay time	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

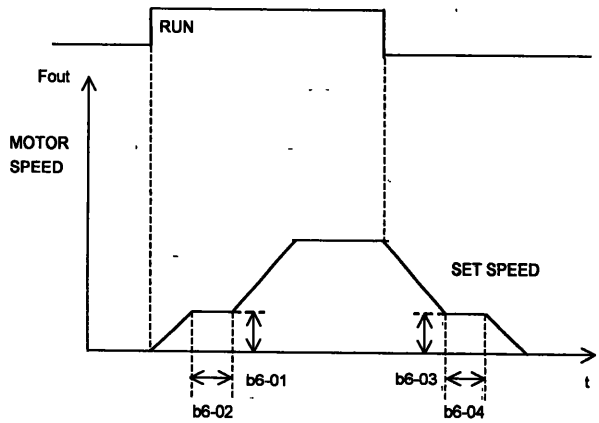
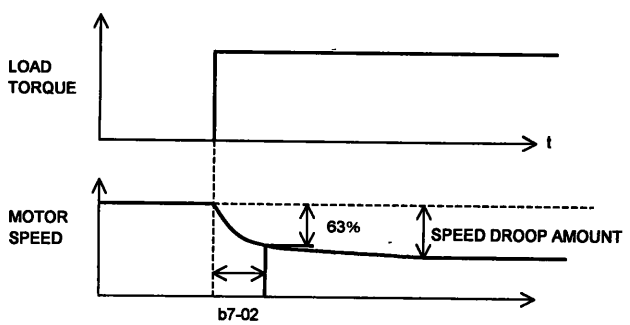
  ① Stop command is input or operation held

  ② For selection of multi-function input PID control, terminal is set to CLOSED and PID control is set to DISABLED

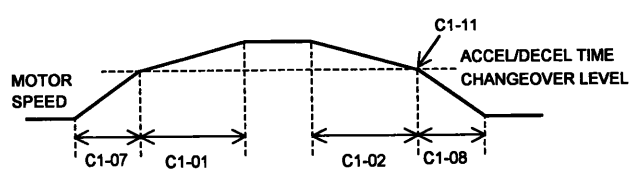
  ③ For selection of multi-function input PID control integral reset, terminal is set to CLOSED and integration is reset.

- 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.

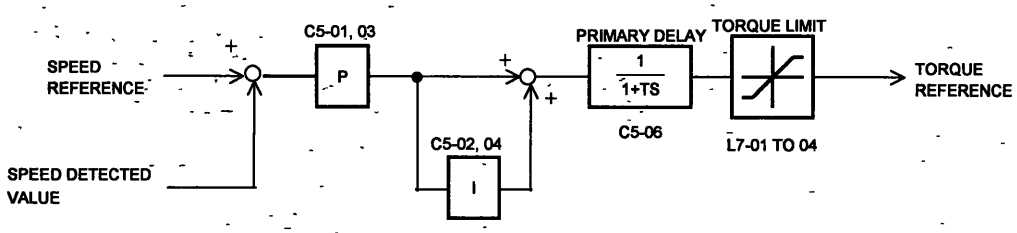
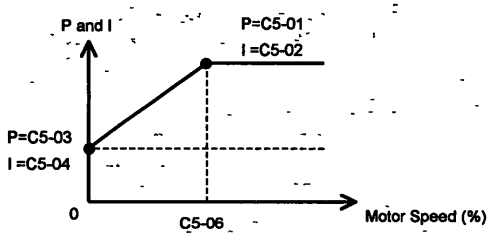
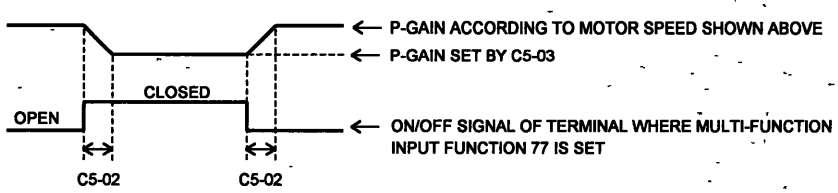
Constant No.	Name	Description	Remaks
		Dwell (temporary stop) function is used to stop motor speed or speed reference temporarily and hold it when driving a motor with a heavy starting load.	The unit of b6-01 and b6-03 can be changed by o1-03 setting.
b6-01	Dwell speed at start	Sets speed reference to hold motor speed during acceleration in units of 0.01% with motor max r/min (E1-06) as 100%.	Dwell function at startup becomes invalid when b6-01 ≦E1-08 (motor min r/min).
b6-02	Dwell time at start	Sets time to hold motor speed during acceleration in units of 0.1sec	
b6-03	Dwell speed at stop	Sets speed reference to hold motor speed during deceleration in units of 0 01% with motor max r/min (E1-06) as 100%	
b6-04	Dwell time at stop	Sets time to hold motor speed during deceleration in units of 0 1sec	Dwell function at stopping becomes invalid when b6-03 ≦E1-08
			
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 motor max r/min (E1-06) Speed droop amount (%) = $\frac{(b7\text{-}01)}{100}$ ×100% (rated torque)	Function only for A1-02 = 6 (flux vector control)
b7-02	Droop control delay time	Sets the drooping response time to b7-02 By decreasing b7-02, drooping response quicker, however, the motor would hunt more easily The following shows the speed drooping characteristics when a step load is applied	
			

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 0(r/min) to the max r/min (E1-06), and deceleration time to decelerate from the max. r/min to 0(r/min).
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 = 15) is closed
• Selection at fault detection is set to emergency stop</td><td>Turn OFF operation signal and emergency stop signal at reactivation after emergency stop</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 0.01 second
Setting range 0.00 to 600 00 seconds</td></tr>
<tr><td>1</td><td>Accel/decel time (C1-01 to 09) setting range is in units of 0 1 second
Setting range 0 0 to 6000.0 seconds</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 1 to 0 at C1-01 = 12.4 seconds, 12 40 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 1 to 0</td><td></td></tr>
<tr><td>C1-11</td><td>Accel/decel time switching speed</td><td>By using C1-11, accel/decel time can be changed automatically.
Run at C1-01 and 02 accel/decel time at motor speed ≧ C1-11.
Run at C1-07 and 08 accel/decel time at motor speed < 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>Remaks</th></tr>
<tr><td>C2-12</td><td>Leading phase compensation amount</td><td>Compensates for difference between estimated magnetic-pole position (control axis) and actual magnetic-pole position in units of 0.1 degree (electrical angle).
Set automatically by auto-tuning of open loop vector control. Do not change it unnecessarily after setting.</td><td>Not initialized</td></tr>
<tr><td>C2-13</td><td>PG zero-pulse compensation amount</td><td>Sets the gap between magnetic pole and Z-phase pulse (Zero-pulse) in units of 0.1 degree (electrical angle) Set automatically by auto-tuning of flux vector control Do not change it unnecessarily after setting</td><td>Not initialized</td></tr>
<tr><td>C3-01</td><td>Energy saving control selection</td><td>Sets energy-saving control selection.<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Controls d-axis current as 0 in a constant torque area.
Applies d-axis current required to limit output voltage by C3-05 setting in a constant output area</td></tr><tr><td>1</td><td>Controls d-axis current and q-axis current so that motor efficiency will be the maximum according to torque reference
Energy-saving operation is not enabled since output voltage limit has a priority in a constant output area</td></tr></table></td><td>Normally, set the value to "1".</td></tr>
<tr><td>C3-05</td><td>Voltage limit control selection</td><td>Sets voltage limit control selection.<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Disabled</td></tr><tr><td>1</td><td>Enabled
Applies d-axis current to control voltage so that the voltage limit control set value (peculiar to motor) will not be exceeded when output voltage is increased.</td></tr></table></td><td>Normally, set the value to "1"</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>Refer to the block diagram on page 46</td></tr>
<tr><td>C5-02</td><td>ASR integral time 1</td><td>Sets ASR integral time 1 in units of 1 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 1 msec</td><td></td></tr>
<tr><td>C5-05</td><td>ASR primary delay time</td><td>Sets the primary delay time (Unit 1 msec).</td><td></td></tr>
<tr><td>C5-06</td><td>ASR switching speed</td><td>Sets the speed to switch ASR proportional gain and integral time in units of 0 01%.</td><td>·Refer to the block diagram on page 46
·The setting unit can be changed by o1-03</td></tr>
<tr><td>C5-07</td><td>ASR proportional gain at start</td><td>ASR proportional gain used at magnetic-pole lead-in or startup (Setting unit· 0 01).</td><td></td></tr>
</table>

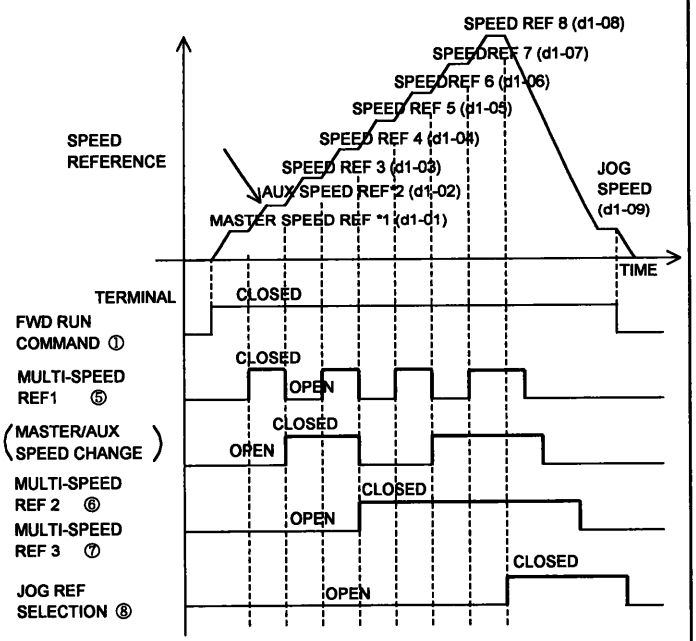
Constant No	Description
	ASR of vector control The following shows the block diagram  Note: ASR P-gain in flux vector control is based on motor max r/min (E1-06). Proportional gain and integral time are approximated in a straight line by motor speed as shown below  • When C5-06 0, Fixed to P = C5-01, 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

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>C6-02</td><td>Carrier frequency selection</td><td>Sets carrier frequency.
Set value must be either 2, 4, 8 or 12 kHz To reduce carrier noise, set to 12 kHz To reduce noise, set to 2 kHz</td><td>2 kHz is set prior to shipment.</td></tr>
<tr><td>C6-07</td><td>γ -axis voltage offset</td><td>Compensates for offset between voltage reference and actual voltage.
Set in unit of 0.1% with voltage class as 100%.
Set automatically by auto-tuning
Do not change it unnecessarily after setting</td><td>Not initialized</td></tr>
<tr><td>C6-11</td><td>Adaptive control selection</td><td>A function to compensate for torque accuracy according to motor parameter variation caused by heat generation at operation.
<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>C6-12</td><td>Adaptive control compensation gain</td><td>Sets the gain for power estimated value
The smaller the set value is, the greater the torque compensation that can be obtained</td><td></td></tr>
</table>

d SPEED REFERENCE-RELATED CONSTANTS

Constant No.	Name	Description	Remaks
d1-01 d1-02 d1-03 d1-04 d1-05 d1-06 d1-07 d1-08 d1-09	Speed reference 1 Speed reference 2 Speed reference 3 Speed reference 4 Speed reference 5 Speed reference 6 Speed reference 7 Speed reference 8 Jog speed reference	Sets speed reference [Example of multi-step speed operation] By combining multi-function input multi-step speed references 1 to 3 and jog speed reference selections, up to 9 steps can be selected	Setting unit of speed can be changed according to speed reference/monitor display unit (o1-03).

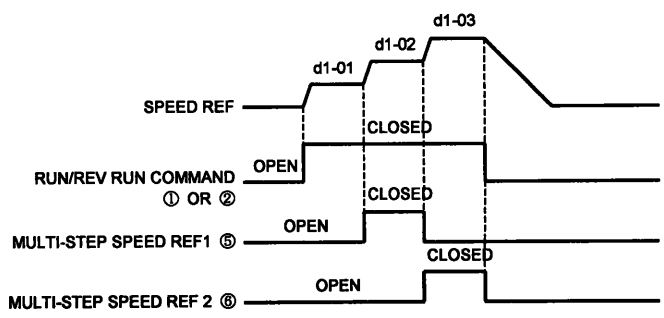
Terminal Constant No	Factory Setting	Set Value	Name
⑤ H1-03	3 (Multi-step speed reference 1)	3	Multi-step speed reference 1
⑥ H1-04	4 (Multi-step speed reference 2)	4	Multi-step speed reference 2
⑦ H1-05	6 (Jog speed reference selection)	5	Multi-step speed reference 3
⑧ H1-06	8 (External baseblock NO)	6	Jog reference selection



*1 Master speed reference becomes constant set value (d1-01) when B1-01 = 0, and analog reference set by control terminal 13 or 14 when b1-01 = 01

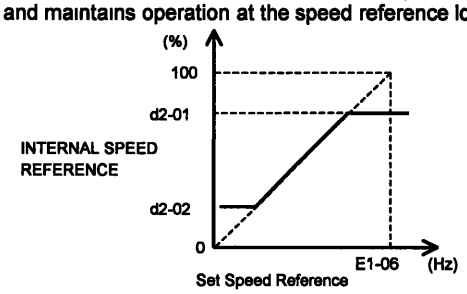
*2 Auxiliary speed reference becomes analog frequency reference input from terminal 16 when H3-05 = 00 and the constant set value (d1-02) at any setting other then H3-05 = 00 Set H3-05 to 1F when multi-function analog input (terminal 16) is not used [H3-05 constant access level A1-01 is "3" (BASIC) or "4" (ADVANCED)]

[Example of 3-step speed operation]
The following shows an example of 3-step speed operation at the speed set by a constant in the inverter



<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>d2-01

d2-02</td><td>Speed reference upper limit

Speed reference lower limit</td><td>• Sets the upper/lower limit values of motor speed in the ratio (%) for motor max r/min (E1-06).
• When speed reference is zero and a run command is input, the motor accelerates from the min speed to the speed reference lower limit and maintains operation at the speed reference lower limit
 
</td><td></td></tr>
<tr><td>d3-01

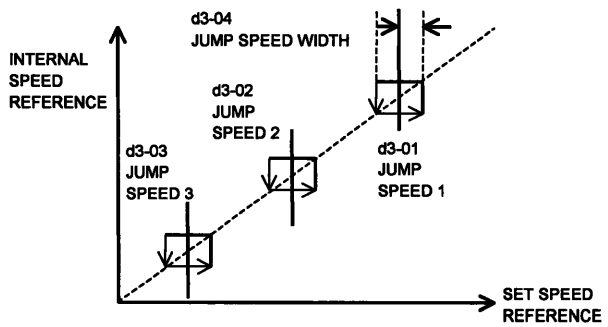
d3-02

d3-03

d3-04</td><td>Jump speed 1

Jump speed 2

Jump speed 3

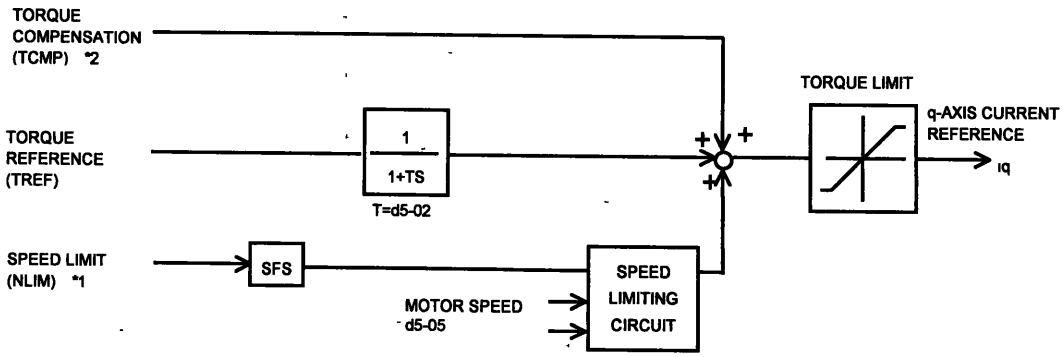
Jump speed width</td><td>Sets the jump speed width by combining d3-01 to 04. By setting jump speed to 0 (%), this function is disabled.
d3-01 to 03−d3-04≦Sets the jump speed width≦d3-01 to 03+d3-04
 

Note Constant speed operation is prohibited in jump speed
However, output speed does not jump during accel/decel and smooth accel/decel is available</td><td>·When some jump speed 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 speed hold function selection</td><td>Sets whether speed 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>0</td><td>Does not store speed during HOLD (but it becomes 0)</td></tr><tr><td>1</td><td>Stores speed during HOLD and runs at stored speed 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 method</td></tr><tr><td>1</td><td>Torque control method</td></tr></table></td><td>Torque control is enabled only when A1-02 = 06 (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 method in units of 1 ms</td><td></td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>d5-03</td><td>Speed limit selection</td><td>Selects speed limit value in the torque control method<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>Speed limit becomes speed reference set by the setting of speed reference selection (b1-01).</td></tr><tr><td>2</td><td>Speed limit value becomes the set value of d5-04</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 method in the ratio (%) for motor max r/min (E1-06) when d5-03 = 02</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 motor max r/min (E1-06)</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 method is actually changed in the units of 1 ms</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 A1-02 = 06 (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 At speed limit selection (d5-03) = 01, constant set value (d5-04) becomes the speed limit when the speed reference selected by speed reference selection (b1-01) is d5-03 = 02 To input the speed limit to terminal 14, set H3-09 to "IF" (Refer to the description of H3-08 to 11)

*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 (Refer to the description of H3-08 to 11)

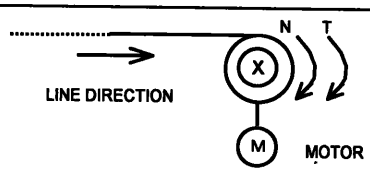
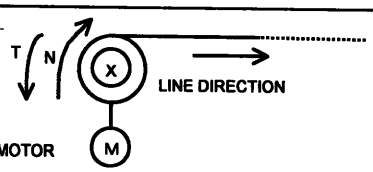
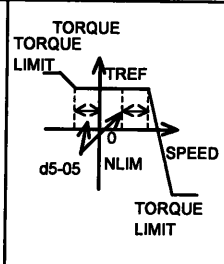
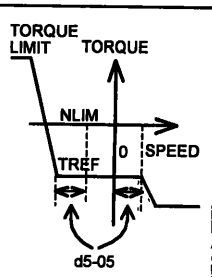
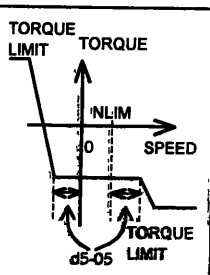
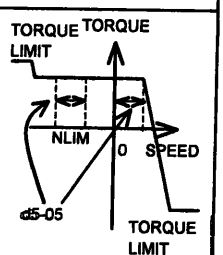
[Sequence]

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" , the speed limiting circuit outputs minus toque reference to prevent motor speed from increasing.
- 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 (NLIM)	+	−	+	−
Generated Torque*					

Function	Description
	Note: The speed limit (NLIM) polarity of generating torque is specified according to the speed limit input polarity selected by d5-03 (speed limit selection and run command (FWD/REV).

Run Command \ Speed Limit Input Polarity	+	−
Forward run	+	−
Reverse run	−	+

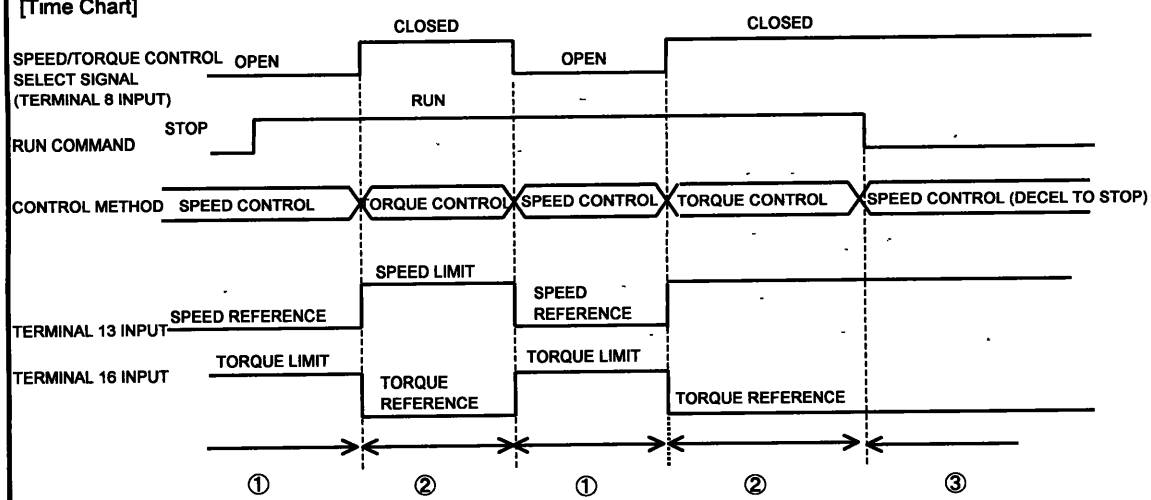
Speed / Torque Control Switching

When A1-02 = 06 (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 d5-03	1 1	1 1	Speed reference selection (terminals 13, 14) 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 speed reference selection (b1-01) setting. To change terminal 13 or 14 master speed reference to speed reference, set b1-01 to 01
- 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 speed 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 speed reference as frequency reference when speed limit selection (d5-03) = 01 and as constant set value (d5-04) when d5-03 = 02, disregarding speed 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

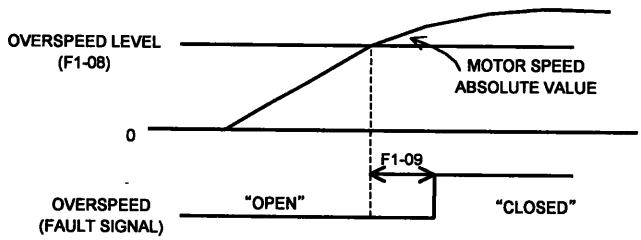
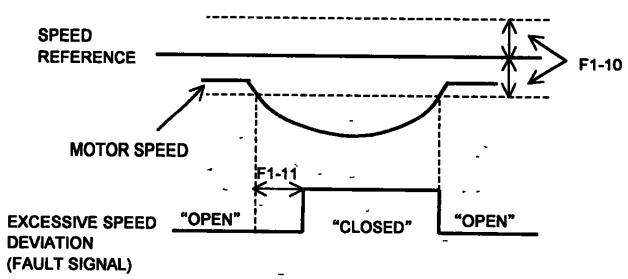
E MOTOR-RELATED CONSTANTS

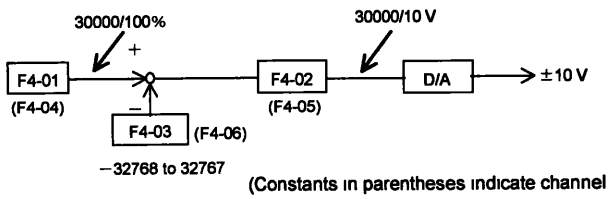
Constant No	Name	Description	Remaks
E1-01	Input voltage setting	Sets inverter input voltage in units of 1V	The value for 400 V class will be twice as large as that for 200 V class
E1-02	Motor capacity selection	Sets motor capacity. Motor constants are set automatically by this constant setting Do not change it unnecessarily after setting Motor constants will be initialized.	Refer to Par 2 7.
E1-03	Motor rated voltage	Sets motor rated voltage in units of 0 1 V	
E1-04	Motor rated current	Sets motor rated current in units of 0.01A for motor capacity of 7 5 kW or less or in units of 0 1 A for 11 kW or more	
E1-05	Number of motor poles	Sets the number of motor poles	2, 4, 6 or 8 poles can be selected
E1-06	Motor max r/min	Sets the motor maximum r/min in units of 1 (r/min)	100% reference of speed
E1-07	Motor base r/min	Sets the motor base r/min in units of 1 (r/min)	
E1-08	Motor min. r/min	Sets operable motor minimum r/min in units of 1 (r/min)	
E1-09	Motor armature resistance	Sets resistance per motor phase in units of 0 001 Ω Set automatically by auto-tuning Do not change unnecessarily after setting	
E1-10	Motor d-axis inductance	Sets motor d-axis inductance in units of 0 01 mH Set automatically by auto-tuning Do not change unnecessarily after setting	
E1-11	Motor q-axis inductance	Sets q-axis inductance at motor rated load in units of 0.01 mH	
E1-13	Induced voltage	Sets wave height value of induced voltage per motor phase in units of 0 1 mV/(rad/s) [electrical angle] Set automatically by auto-tuning Do not change unnecessarily after setting	
E1-14	Variable torque/constant torque selection	Selects whether variable torque motor or constant torque motor is to be used This constant matches the motor overload protective characteristics to the motor overload resistance	
E1-15	Motor mechanical loss	Sets motor mechanical loss in units of 0 1% Motor rated output is 100%	
E1-16	Motor wiring resistance	Sets wiring resistance between the inverter and the motor according to percent of inverter rated voltage. $\text{Rfeed\%} = \frac{\frac{Rf \times Im}{Vb}}{\sqrt{3}} \times 100$ Rf: feeder resistance (Ω) Im Rated current (E1-04) (A) Vd· Rated voltage (E1-03) (V)	

Note. E constants cannot be initialized.

F OPTION-RELATED CONSTANTS

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>F1-01</td><td>PG constants</td><td>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)</td><td></td></tr>
<tr><td>F1-02</td><td>Operation selection at PG open-circuit (PGO) detection</td><td>Sets the stopping method at PG disconnected detection.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Deceleration to stop (deceleration time C1-02)</td></tr><tr><td>1</td><td>Coasting to stop</td></tr><tr><td>2</td><td>Emergency stop (deceleration time. C1-09)</td></tr><tr><td>3</td><td>Continuous operation (displayed only)</td></tr></table></td><td></td></tr>
<tr><td>F1-03</td><td>Operation selection at overspeed (OS) detection</td><td>Sets the stopping method at overspeed detection
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Deceleration to stop (deceleration time C1-02)</td></tr><tr><td>1</td><td>Coasting to stop</td></tr><tr><td>2</td><td>Emergency stop (deceleration time C1-09)</td></tr><tr><td>3</td><td>Continuous operation (displayed only)</td></tr></table></td><td></td></tr>
<tr><td>F1-04</td><td>Operation selection at deviation (DEV) detection</td><td>Sets the stopping method at excessive speed deviation detected
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Deceleration to stop (deceleration time C1-02)</td></tr><tr><td>1</td><td>Coasting to stop</td></tr><tr><td>2</td><td>Emergency stop (deceleration time C1-09)</td></tr><tr><td>3</td><td>Continuous operation (displayed only)</td></tr></table></td><td></td></tr>
<tr><td>F1-05</td><td>PG rotation detection</td><td>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</td><td>• Motor FWD rotation is in the counterclockwise (CCW) direction viewed from the load side</td></tr>
</table>

Constant No	Name	Description	Remaks
F1-08	Overspeed (OS) detection level	Sets the motor overspeed detection level in the ratio (%) for E1-06 (motor max r/min).	• Stopping method at overspeed detection depends on the setting of F1-03.
F1-09	Overspeed (OS) 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	Speed deviation (DEV) detection level	Sets the excessive speed deviation detection level in the ratio (%) for E1-06 (motor max. r/min)	• Stopping method at excessive speed deviation detection depends on the setting of F1-04
F1-11	Speed deviation (DEV) 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
F1-13	PG open-circuit (PGO) detection delay time	Sets the time from when PG open-circuit is detected to when it is regarded as a fault.	• Stopping method at detection of PG open-circuit depends on F1-03 setting.

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>F2-01</td><td>AI-14B input function 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 speed reference value</td></tr></table>Sets b1-01 to 01 (speed reference from control circuit terminal) when 3CH individual input is used</td><td>The function of multi-function input (option/inverter reference selection) (set value 02) is disabled</td></tr>
<tr><td>F3-01</td><td>DI-08, DI-16H2 speed reference setting selection</td><td>Selects the setting mode of frequency reference input from DI-08 (optional) or DI-16H2 (optional).
<table><tr><th>Set Value</th><th>Speed 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 to 6</td><td>Not used</td></tr><tr><td>7</td><td>Binary
DI-08 255/100%
DI-16H2, 12-bit selection 4096/100%
DI-16H2, 16-bit selection. 30000/100%</td></tr></table></td><td>*: When o1-03 is set to 2 or more, the BCD setting unit becomes the o1-03 setting unit</td></tr>
<tr><td>F4-01
F4-02
F4-03
F4-04
F4-05
F4-06</td><td>AO-08, 12
CH1 output item selection
CH1 output gain
CH1 output bias
CH2 output item selection
CH2 output gain
CH2 output bias</td><td>Selects item to be output to AO-08 (optional) and AO-12 (optional) and sets output gain and output bias
Set the monitor number (U1-XX) to be output
For calculation of output level and output bias, convert the monitor item output level into 30000/100%, and subtract the output bias set value from the converted value and multiply it with output gain This calculated value is output to AO-08 or AO-12 channel as 10 V/30000
The following diagram shows this calculation
 
(Constants in parentheses indicate channel 2)</td><td></td></tr>
<tr><td>F5-01
F5-02</td><td>DO-02C
CH1 output selection
CH2 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 H2-03</td><td></td></tr>
</table>

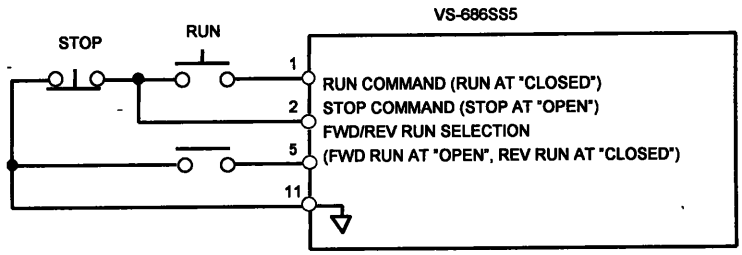
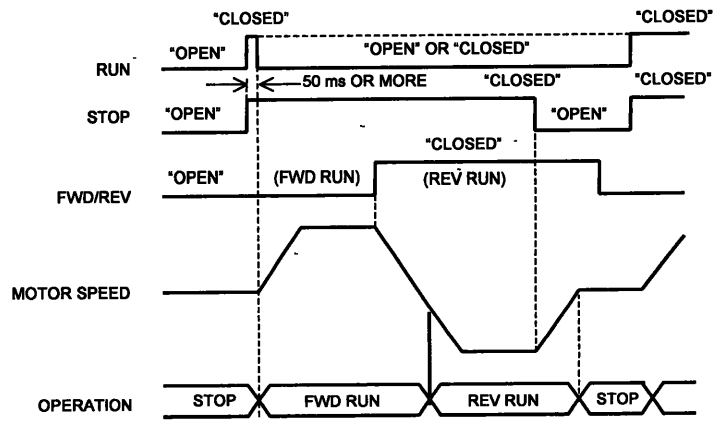
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>F6-01</td><td>DO-08
Output mode selection</td><td>
The following table outlines items to be output from DO-08 (optional) according to F6-01 setting
<table>
<tr><th>Set Value</th><th>Output Contents</th></tr>
<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 (PUF)</td></tr>
<tr><td>TD9-TD11</td><td>Overspeed (OS)</td></tr>
<tr><td>TD10-TD11</td><td>Inverter overheat (OH1) or motor overlord (OL1)</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 colspan="2">Output Contents</th></tr>
<tr><td>TD5-TD11</td><td>bit0</td><td rowspan="4">Sign output (See the table below)</td></tr>
<tr><td>TD6-TD11</td><td>bit1</td></tr>
<tr><td>TD7-TD11</td><td>bit2</td></tr>
<tr><td>TD8-TD11</td><td>bit3</td></tr>
<tr><td>TD9-TD11</td><td colspan="2">During zero-speed detection</td></tr>
<tr><td>TD10-TD11</td><td colspan="2">During speed agree</td></tr>
<tr><td>TD1-TD2</td><td colspan="2">During run</td></tr>
<tr><td>TD3-TD4</td><td colspan="2">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 (EFxx)</td></tr>
<tr><td>0001</td><td>Overcurrent (SC, OC, GF)</td><td>1001</td><td>Controller fault (CPUxx)</td></tr>
<tr><td>0010</td><td>Overvoltage (OV)</td><td>1010</td><td>Motor overload (OL1)</td></tr>
<tr><td>0011</td><td>Inverter overlord (OL2)</td><td>1011</td><td>Hunting (STO)</td></tr>
<tr><td>0100</td><td>Inverter overheat (OH, OH1)</td><td>1100</td><td>Power loss (UV1, UV2, UV3)</td></tr>
<tr><td>0101</td><td>Overspeed (OS)</td><td>1101</td><td>Speed deviation (DEV), Z-phase pulse error (ZDEV)</td></tr>
<tr><td>0110</td><td>Fuse blown (PUF)</td><td>1110</td><td>PG open-circuit (PGO)</td></tr>
<tr><td>0111</td><td>Braking resistor unit overheat (RH), braking transistor error (RR)</td><td>1111</td><td>Not used</td></tr>
</table>
</td></tr>
</table>
</td><td></td></tr>
</table>

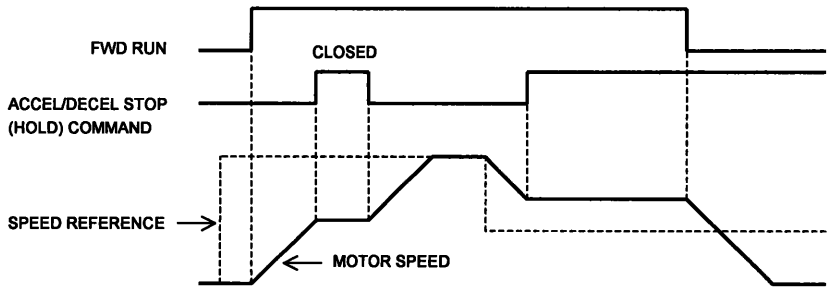
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>F9-01</td><td>Input level of external fault from transmission option</td><td>Sets the level to detect an external fault from a transmission option
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Detected by NO contact</td></tr><tr><td>1</td><td>Detected by NC contact</td></tr></table></td><td></td></tr>
<tr><td>F9-02</td><td>External fault from transmission option</td><td>Specifies the detection timing of an external fault from a transmission option.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Always detected</td></tr><tr><td>1</td><td>Detected during running</td></tr></table></td><td></td></tr>
<tr><td>F9-03</td><td>Operation at external fault input from transmission option</td><td>Sets the stopping method at external fault input from a transmission option
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Ramp to stop</td></tr><tr><td>1</td><td>Coast to a stop</td></tr><tr><td>2</td><td>Emergency stop</td></tr><tr><td>3</td><td>Continue operation</td></tr></table></td><td></td></tr>
<tr><td>F9-04</td><td>Trace sampling time of transmission option</td><td>Sets the sampling cycle of the inverter trace function - Setting it to 0 executes trace at every scan (processing basic cycle of transmission option) Setting it to N executes trace once at N scan.</td><td></td></tr>
<tr><td>F9-05</td><td>Torque reference selection of transmission option</td><td>Selects whether torque reference (torque limit at speed control) from a transmission option is to be enabled or disabled
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Torque reference (limit) from transmission option disabled Inverter torque reference (limit) enabled.</td></tr><tr><td>1</td><td>Torque reference (limit) from transmission option enabled Set control reference item No. 3 to the reference value.</td></tr></table></td><td></td></tr>
<tr><td>F9-06</td><td>Operation selection at BUS error detection</td><td>Sets the stopping method at BUS error detection from a transmission option
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Ramp to stop</td></tr><tr><td>1</td><td>Coast to a stop</td></tr><tr><td>2</td><td>Emergency stop</td></tr><tr><td>3</td><td>Continue operation</td></tr></table></td><td></td></tr>
</table>

H CONTROL CIRCUIT TERMINAL-RELANTED CONSTANTS

Constant No	Name	Description
	Multi-function input terminal function selection	Selects the function of a signal input form control circuit termanals 3 to 8
H1-01	Multi-function input (terminal 3-11)	
H1-02	Multi-function input (terminal 4-11)	
H1-03	Multi-function input (terminal 5-11)	
H1-04	Multi-function input (terminal 6-11)	
H1-05	Multi-function input (terminal 7-11)	
H1-06	Multi-function input (terminal 8-11)	

Set Value	Function	Open Loop Vector	Flux Vector	Reference Page
00	3-wire sequence FWD/REV run selection	O	O	60
01	LOCAL/REMOTE selection	O	O	60
02	Option/Inverter selection	O	O	60
03	Multi-step speed reference 1	O	O	48
04	Multi-step speed reference 2	O	O	48
05	Multi-step speed reference 3	O	O	48
06	Jog speed reference	O	O	48
07	Accel/decel time selection 1	O	O	44
08	External baseblock/NO contact	O	O	60
09	External baseblock/NC contact	O	O	61
0A	Accel/decel stop	O	O	61
0B	Inverter overheat prediction (OH2)	O	O	61
0C	Multi-function analog input enable/disable	O	O	61
0D	Not used	–	–	–
0E	Speed control integral reset	O	O	61
0F	Not used	–	–	–
10	UP command	O	O	62
11	DOWN command	O	O	62
12	FJOG command (FWD jog run)	O	O	63
13	RJOG command (REV jog run)	O	O	63
14	Fault reset	O	O	63
15	Emergency stop	O	O	44
16	Not used	–	–	–
17	Not used	–	–	–
18	ON-delay, OFF-delay timer input	O	O	41
19	PID control cancel	O	O	41
1A	Accel/decel time selection 2	O	O	44
1B	Constant write-in prohibition	O	O	63
1C	Not used	–	–	–
1D	Not used	–	–	–
1E	Analog speed reference sample/hold	O	O	–
1F	Terminal 13/14 selection	O	O	63
20 to 2F	External fault	O	O	64
30	PID control integral reset	O	O	64
60	Not used	–	–	–
61	Not used	–	–	–
62	Not used	–	–	–
63	Not used	–	–	–
64	Not used	–	–	–
65	Not used	–	–	–
66	Not used	–	–	–
71	Speed/torque control selection	×	O	52
72	Not used	–	–	–
77	Speed control proportional gain selection	O	O	47

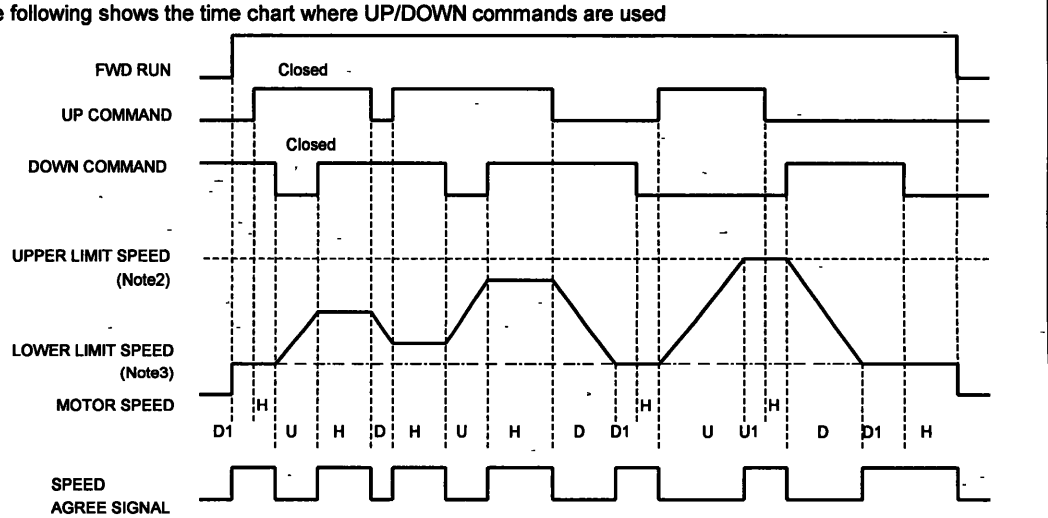
Set Value	Description
00	• 3-wire sequence When 00 is set to HI-01 to 06, 3-wire sequence is entered The terminal having set value of 00 becomes a FWD/REV run command (Typical Setting) H1-03=00  The following shows the time chart 
01	• LOCAL/REMOTE selection Operation signal selection is effective only during stop Open Runs according to the setting of b1-01 or b1-02 in the remote mode Closed Runs by digital operator speed 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 speed reference and run command from inverter control circuit terminal or digital operator. Closed. Runs by speed 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 speed reference obtained before baseblock When a stop signal is input and an external baseblock signal is input while the inverter is decelerating, bb blinks on the digital operator and the inverter output is shut OFF to stop the operation At open loop vector control, releasing bb during coasting drives may cause OC (overcurrent) or OV (overvoltage). In this case, do not release bb until the motor stops

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 motor speed is held. When a stop command is input, the accel/decel stop 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 motor speed is stored unless the accel/decel stop command is released. Therefore, operation is performed at the stored motor speed When the power supply is turned OFF in the status where the accel/decel stop command is input, the held motor speed is still stored When d4-01 is set to 0, the held motor speed is not stored
0B	• Inverter overheat prediction (OH2) While the inverter overheat predicion 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
0E	• Speed control integral value reset 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 speed 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 (speed reference selection)

Set value = 1 UP/DOWN commands enabled

Set value ≠ 1 UP/DOWN commands disabled

2 Upper limit speed

= motor max r/min (E1-06)× speed reference upper limit (d2-01)

3 Lower limit value is either speed reference over limit (d2-01) or master speed reference from control circuit terminal 13 or 14

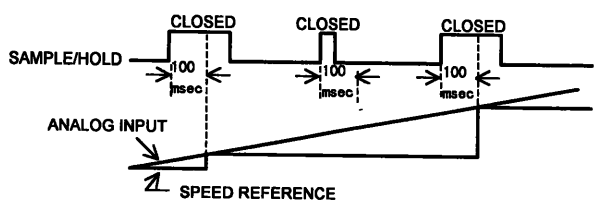
4 When d4-01=01, even if the power supply is turned OFF in the status where accel/decel stop (HOLD) command is input, the held motor speed is stored

When d4-01=0, the held output frequency is stored

5 If a jog speed 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

Set Value	Description
12,13	• FJOG command, RJOG command FWD and REV run jog speed operations are enabled Set value = 12 FJOG command closed. FWD run at jog speed reference (d1-09) Set value = 13 RJOG command closed. REV run at jog speed 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 500 ms, inverter stops according to the stopping method selection (b1-03) 3 FJOG command or RJOG command can be set independently.
14	• Fault reset Closed: Resets a fault
1B	• Constant write-in prohibition Open: To write in constants is prohibited Closed. To write in constants is permitted.
1E	• Analog speed reference sample/hold Analog input value 100 msec after setting to "closed" is to be the speed reference.  Notes 1 Analog speed reference sample/hold is enabled only for analog inputs from terminals 13, 14, 16 or AI-14U, B-option 2 An error (OPE03) will occur if more than one of accel/decel stop (0A), UP/DOWN commands (10, 11) and analog speed reference sample/hold (1E) are set simultaneously
1F	• Terminal 13/14 selection Open Terminal 13 is regarded as the master speed reference Closed Terminal 14 is regarded as the master speed reference When "1F" (terminal 13/14 selection) is not set to multi-function input terminal function selection (H1-01 to H1-06) and when of terminal 14 (H3-09) is "1F" (master speed reference), the master speed 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

Set Value	Description
20 to 2F	• External fault Used to stop the inverter or send an alarm to external devices at fault of peripheral devices, etc

Set Value (HEX input) (Same date cannot be set)		Selection Mode							
		Contact Mode		Detection Mode		Stopping Method			
2nd Digit	3rd Digit	NO contact input	NC contact input	Always detected	Detected during run	Decel to stop (major fault)	Coasting to stop (major fault)	Emergency stop (major fault)	Continuous operation (major fault)
2	0	O		O		O			
	1		O	O		O			
	2	O		△	O	O			
	3		O	△	O	O			
	4	O		O			O		
	5		O	O			O		
	6	O		△	O		O		
	7		O	△	O		O		
	8	O		O				O	
	9		O	O				O	
	A	O		△	O			O	
	B		O	△	O			O	
	C	O		O					O
	D		O	O					O
	E	O			O				O
	F		O		O				O

(Example) When "24" is set to HI-06 (terminals 8-11 function selection)

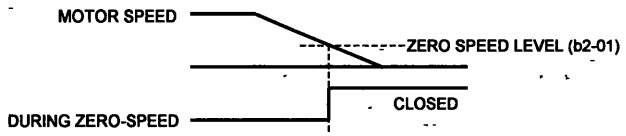
- An external fault occurs when it is closed between terminals 8 and 11 (NO contact)
- An external fault is always detected
- An external fault is regarded as a major fault and the motor coasts to stop

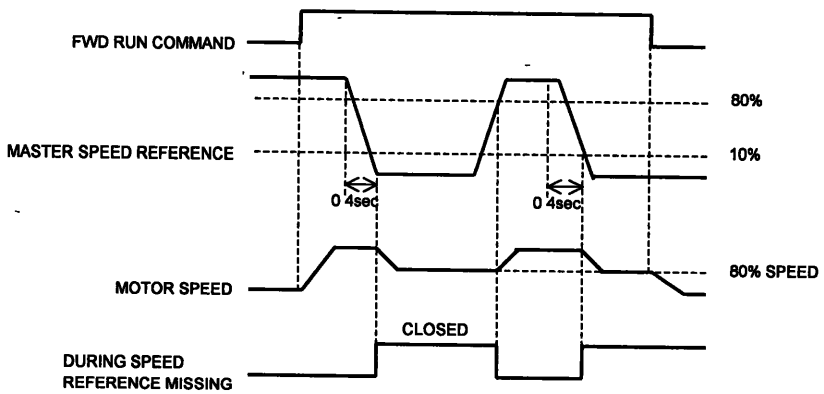
Note: Setting "closed" during stop causes a minor fault when the detection mode is set to "Detected during run" and the stopping method is set to major fault (set value = 22, 23, 26, 27, 2A, 2B) (in the sections marked with △).

Set Value	Description
30	• Integral reset Reset at stop command input or during stop at PID control.

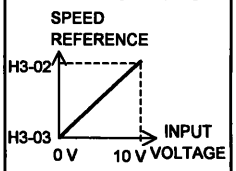
Constant No	Name	Description
	Multi-function output terminal function selection	Selects the function of signals output from control circuit terminals 9, 25 and 26.
H2-01	Multi-function output (terminal 9-10)	
H2-02	Multi-function output (terminal 25-27)	
H2-03	Multi-function output (terminal 26-27)	

Set Value	Function	Open Loop Vector	Flux Vector	Reference
00	During run	O	O	66
01	Zero-speed	O	O	66
02	Speed agree 1	O	O	66
03	Desired speed agree 1	O	O	66
04	Speed detection 1	O	O	66
05	Speed detection 2	O	O	66
06	Inverter operation ready	O	O	66
07	During undervoltage detection	O	O	66
08	During baseblock (NO contact output)	O	O	66
09	Speed reference mode	O	O	66
0A	Run command mode	O	O	66
0B	Overtorque detection 1 (NO contact output)	O	O	66
0C	Speed reference missing	O	O	67
0D	Braking resistor fault	O	O	67
0E	Fault	O	O	67
0F	For transmission option	–	–	67
10	Minor fault	O	O	67
11	During fault reset	O	O	67
12	Timer output	O	O	67
13	Speed agree 2	O	O	67
14	Desired speed agree 2	O	O	67
15	Speed detection 3	O	O	67
16	Speed detection 4	O	O	67
17	Overtorque detection 1 (NC contact output)	O	O	68
18	Overtorque detection 2 (NO contact output)	O	O	68
19	Overtorque detection 2 (NC contact output)	O	O	68
1A	During REV run	O	O	68
1B	During baseblock 2 (NC contact output)	O	O	68
1C	Not used	–	–	–
1D	Motoring retry	×	O	68
1E	During retry	O	O	68
1F	OL1 pre-alarm	O	O	68
20	OH pre-alarm	O	O	68
21 to 2F	Not used	–	–	–
30	During torque limit	O	O	68
31	During speed limit	×	O	68
32	Not used	–	–	–
33	Not used	–	–	–
37	During run 2	O	O	68
34 to 3F	Not used	–	–	–

Set Value	Description
00	• During run Closed when the inverter outputs voltage or when run command is input
01	• During zero-speed Closed when the motor speed is less than the zero-speed level (b2-01) in flux vector control 
02	• Speed agree 1 Closed when output speed is Speed reference − L4-02 ≦ SFS output ≦ Speed reference + L4-02
03	• Desired speed agree 1 Closed when the set value = 02 (speed agree status) and motor speed is within the detection range shown below L4-01 − L4-02 ≦ SFS output (without a sign) ≦ L4-01 + L4-02
04	• Speed detection 1 Closed when output frequency is less than the detection level shown below. SFS output (without a sign) ≦ L4-01 + L4-02
05	• Speed detection 2 Closed when motor speed 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	• Speed reference mode Open during run with speed reference given by control circuit terminal or option. Closed during run with speed 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
0B	• Overtorque detection 1 Closed while overtorque detection 1 is being detected (Refer to L6-01 to 03)

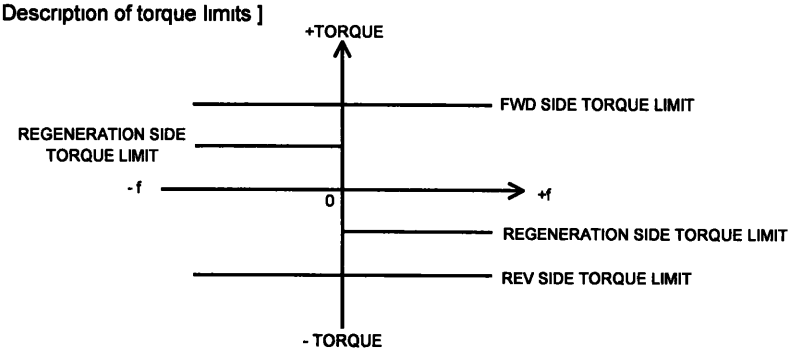
Set Value	Description
0C	• During speed reference is missing Closed when speed reference is missing. (Example) By setting this constant to ENABLED (L4-05), operation is continued at 80% of the frequency reference as shown below By setting L4-05 = 1, master frequency reference obtained 0.4 second before 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 speed reference obtained 0 4 second before. At this time, during speed 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.
0F	• For transmission option Reserved for transmission option. Do not use unnecessarily
10	• Minor fault Closed while an alarm is displayed
11	• During fault reset Closed while fault is being reset
12	• Timer output Closed while a timer input is being output
13	• Speed agree 2 Closed when motor speed is within the detection range shown below. Speed reference−L4-04 ≦ SFS output ≦ speed reference + L4-04 Same as speed agree 1 (set value = 02) except that the detection width is L4-04.
14	• Desired speed 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
15	• Speed detection 3 Closed when motor speed is less than the detection level shown below. SFS output (with a sign) ≦ L4-03
16	• Speed detection 4 Closed when motor speed is less than the detection level shown below. SFS output (with a sign) ≧ L4-03

Set Value	Description
17	• Overtorque detection 1 Open while overtorque detection 1 is being detected (NC contact output) (Refer to L6-01 to 03)
18	• Overtorque detection 2 Closed while overtorque detection 2 is being detected (NO contact output). (Refer to L6-04 to 06)
19	• Overtorque detection 2 Open while overtorque detection 2 is being detected (NC contact output). (Refer to L6-04 to 06)
1A	• During REV run Closed during REV run
1B	• During baseblock Open during inverter output baseblock (NC contact output)
1D	• Motoring retry Closed in the regenerating mode in flux vector control.
1E	• During retry Closed during retry operation at fault retry Valid only at A1-02 = 06 (flux vector control).
1F	• OL1 pre-alarm Closed when electronic thermal overload relay integrated value becomes 90% of the fault detection level (Refer to 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 either of the following constants limits the speed reference (1) Speed reference upper limit (d2-01) (2) Speed reference lower limit [d2-02, multi-function analog input (set value = 09)] (3) Motor min, r/min (E1-08)
37	• During run 2 Closed, except during baseblock (bb), or initial magnetic-pole lead-in, or during initial status estimation

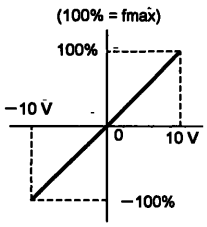
Constant No.	Name	Description	Remaks
H3-01	Signal level selection (terminal 13)	Set Value: 0 — 0 to 10 V input; 1 — −10 to +10 V input	• Resolution [11-bit + sign input] 
H3-02	Gain (terminal 13)	Sets the speed reference when speed reference voltage is 10 V.	
H3-03	Bias (terminal 13)	Sets the speed reference when speed reference voltage is 0 V	
H3-04	Signal level selection (terminal 16)	Set Value: 0 — 0 to 10 V input; 1 — −10 to +10 V 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	

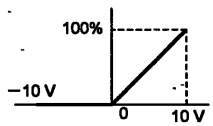
Set Value	Function	Open Loop Vector	Flux Vector	Input Level	Remarks
00	Auxiliary speed reference	O	O	±100% / ±10 V	100% Motor max r/min (E1-06)
01	FGAIN	O	O	100% / 10 V	
02	FBIAS	O	O	±100% / ±10 V	100%. Motor max r/min (E1-06)
04	Not used	–	–	100% / 10 V	
05	Not used	–	–	100% / 1 V	
06	Not used	–	–	100% / 10 V	
07	Overtorque detection level	O	O	100% / 10 V	100% Motor rated torque
08	Not used	–	–	100% / 10 V	
09	Speed reference lower limit level	O	O	100% / 10 V	100% Motor max r/min (E1-06)
0A	Jump speed	O	O	100% / 10 V	100% Motor max r/min (E1-06)
0B	PID feedback	O	O	±100% / ±10 V	100%: Motor max. r/min (E1-06)
0C to 0F	Not used	–	–	——	
10	FWD side torque limit	O	O	100% / ±10 V	100% Motor rated torque
11	REV side torque limit	O	O	100% / ±10 V	100% Motor rated torque
12	Regeneration side torque limit	O	O	100% / ±10 V	100% Motor rated torque
13	Torque reference (at torque control) Torque limit (at speed control)	×	O	±100% / ±10 V	100% Motor rated torque
14	Torque compensation (bias)	×	O	±100% / ±10 V	100%: Motor rated torque
15	FWD/REV side torque limit	O	O	±100% / 10 V	100% Motor rated torque
16 to 1F	Not used	–	–	——	Set H3-05 to 1F when speed reference 2 (d1-02) is used

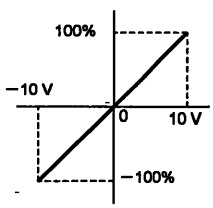
[Description of torque limits]

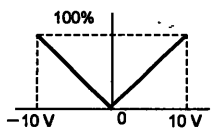


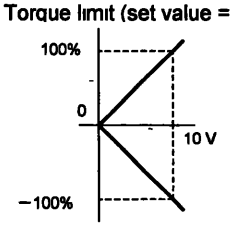
Note For torque limit, smaller value between constants (L7-01 to 04) and analog reference has the priority

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td></td><td></td><td>
• Auxiliary speed reference (set value = 00)
• FBIAS (set value = 02)
• PID feedback (set value = 0B)


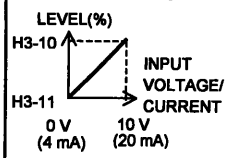
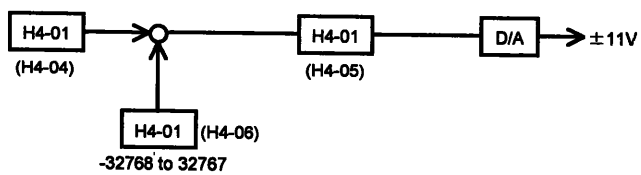
• A product of FGAIN (set value = 01) and F-gain setting (H3-01)
• Overtorque detection level (set value = 07)
• Speed reference lower limit (set value = 09)
• Jump speed (set value = 0A)


• Torque reference (set value = 13)
• Torque compensation (set value = 14)


• Torque limit (set value = 10, 11, 12)


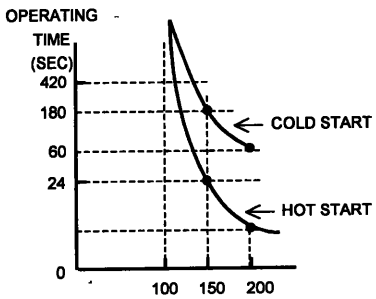
• Torque limit (set value = 15)


</td><td></td></tr>
<tr><td>H3-06</td><td>Gain (terminal 16)</td><td>Sets the input gain (level) when terminal 16 is 10 V</td><td></td></tr>
<tr><td>H3-07</td><td>Bias (terminal 16)</td><td>Sets the input bias (level) when terminal 16 is 0 V</td><td></td></tr>
<tr><td>H3-08</td><td>Signal level selection (terminal 14)</td><td>
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>0 to 10 V input</td></tr>
<tr><td>1</td><td>−10 to +10 V inputt</td></tr>
<tr><td>2</td><td>4 to 20 mA input</td></tr>
</table>
Note. To change the analog reference level from current input (4 to 20 mA) to voltage input (0 to 10 V,etc), it is necessary to cut a Jumper-wire (J1) on the control board
</td><td>• Resolution
[10-bit input]</td></tr>
<tr><td>H3-09</td><td>Multi-function analog input (terminal 14)</td><td>
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 speed 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 speed reference), master speed reference is the sum of terminals 13 and 14
When any value other than "1F" (master speed reference) 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 (OPE 03) occurs
</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>H3-10
H3-11</td><td>Gain (terminal 14)
Bias (terminal 14)</td><td>Sets the input gain (level) when terminal 14 is 20 mA (10 V).
Sets the input bias (level) when terminal 14 is 4 mA (0 V).
Note: When master speed reference is the sum of terminals 13 and 14 (when H3-09 is set to "IF" and H1-01 to 06 is not set to "IF"),H3-10[Gain (terminal 14)] and H3-11 [Bias (terminal 14)] become invalid In this case,H3-02 and H3-03 set gain and bias for the master speed referense that is the sum of terminals 13 and 14</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
H4-02
H4-03</td><td>Monitor selection (terminal 21-22)
Gain (terminal 21-22)
Bias (terminal 21-22)</td><td rowspan="2">Selects item to be output to terminals 21-22 and 23-22 (multi-function analog monitor) function selection and sets output gain and output bias.
For output item, set the monitor number (U1-XX) to be output
For calculation of output level and output bias, convert the monitor item output level into 30000/100%, and subtract the output bias set value from the converted value and multiply it by output gain. This calculated value is output to multi-function analog monitor channel as 10 V/30000.
The following diagram shows this calculation
 

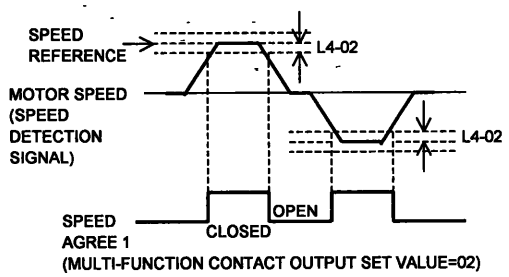
(Constants in parentheses indicate terminals 23-22)</td><td>• Resolution
[9-bit + sign output]
Set value 0 is a special function for transmission option Do not set to 0</td></tr>
<tr><td>H4-04
H4-05
H4-06</td><td>Monitor selection (terminal 23-22)
Gain (terminal 23-22)
Bias (terminal 23-22)</td><td>• Resolution
[9-bit + sign output]
Set value 0 is a special function for transmission option. Do not set to 0.</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 10 V input</td></tr><tr><td>1</td><td>−10 to +10 V inputt</td></tr></table></td><td></td></tr>
</table>

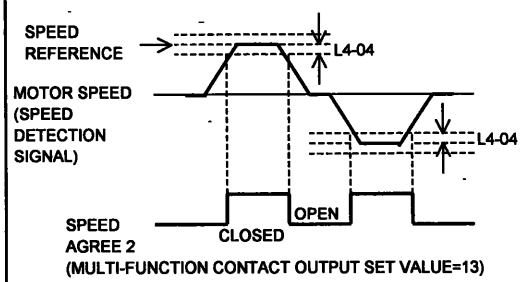
L PROTECTION-RELATED CONSTANTS

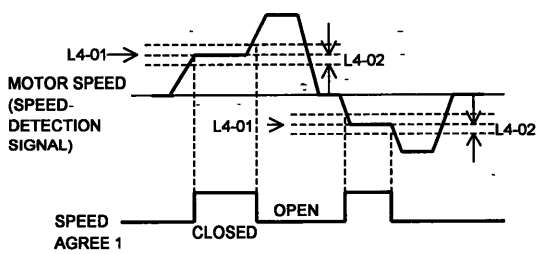
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>L1-01</td><td>Motor protection selection</td><td>Selects whether motor overload protection is provided at electronic thermal overload relay
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Disabled</td></tr><tr><td>1</td><td>Enabled</td></tr></table>
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
 
MOTOR CURRENT (%) E2-04 BECOMES 100%</td><td></td></tr>
<tr><td>L2-01</td><td>Momentary power loss detection</td><td>Selects whether the inverter stops 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
When PN voltage reaches the undervoltage detection level (L2-05), a fault occurs immediately resulting in basebloock</td></tr><tr><td>1</td><td>Operation restarts after recovery.
① Operation restarts it PN voltage is held by regenerative energy using L2-03 and the power supply is recovered within the L2-05 set time.
② Operation restarts if the power supply is recovered within the L2-02 set time even after clapse of the C2-05 set time.</td></tr></table></td><td></td></tr>
<tr><td>L2-02</td><td>Momentary power loss ride 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
Setting unit 0 1sec</td><td>Valid only at L2-01=1</td></tr>
</table>

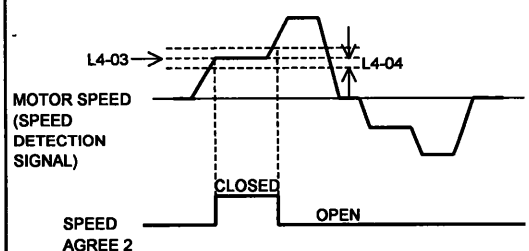
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>L2-03</td><td>Deceleration time at momentary power loss</td><td>Sets deceleration time at momentary power loss occurrence
Deceleration time is set in order that motor regenerative energy followed by deceleration is returned to the DC bus bar to maintain the controller power supply and control Reduction of deceleration time can maintain the controller power supply longer.
<table><tr><th>Contents</th><th>C2-03 Adjustment</th></tr><tr><td>Overvoltage (OV) display</td><td>Increase by 5 seconds</td></tr><tr><td>Momentary power loss (UV) display</td><td>Decrease by 5 seconds</td></tr></table></td><td>Valid only at L2-01=01.</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 190 VDC, 400 V classs 380 VDC), it may be necessary to insert at the input side</td><td></td></tr>
<tr><td>L3-01</td><td>Overvoltage prevention function selection</td><td>Sets a function to prevent the inverter DC bus bar from overvoltage.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Disabled
Inverter does not maintain DC bus bar voltage When overvoltage (OV) is detected, the inverter outputs a fault contact and stops</td></tr><tr><td>1</td><td>Enabled.
Regenerative side torque limit is decreased automatically to prevent overvoltage (OV), monitoring DC bus bar voltage status For automatic adjustment of deceleration rate, the deceleration time may be longer than the set value</td></tr></table>Set the value to 0 when decelerating using braking unit/braking resistor unit.</td><td></td></tr>
<tr><td>L4-01</td><td>Speed detection level</td><td>This constant is used to detect speed agree, etc Motor speed to be detected is set.
This detection is performed both for FWD and REV run.</td><td>Refer to page 74</td></tr>
<tr><td>L4-02</td><td>Speed detection width</td><td>Set detection width at L4-01 frequency detection</td><td>Refer to page 74.</td></tr>
<tr><td>L4-03</td><td>Speed detection level (+/—)</td><td>This constant is used to detect speed agree, etc. Motor speed to be detected is set.
This detection is enabled either for FWD or REV run (Motor speed polarity is provided at detection)</td><td>Refer to page 74.</td></tr>
<tr><td>L4-04</td><td>Speed detection width (+/—)</td><td>Sets detection width at L4-03 speed agree detection</td><td>Refer to page 74</td></tr>
</table>

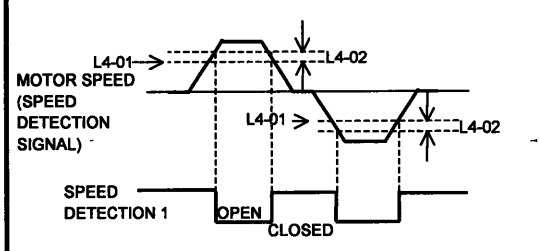
DESCRIPTION OF SPREED DETECTION ON OPERATION

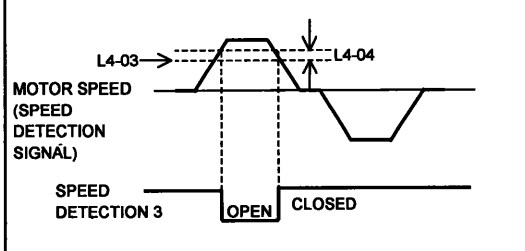
<table>
<tr><th>Related Constants</th><th>L4-01 (Speed Detection Level)
L4-02 (Speed Detection Width)</th><th>L4-03 (Speed Detection Level)
L4-04 (Speed Detection Width)</th></tr>
<tr><td rowspan="2">Speed Agree</td><td>Speed Agree 1</td><td>Speed Agree 2</td></tr>
<tr><td> 

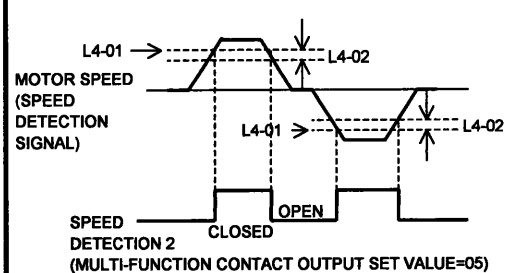
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=02)</td><td> 

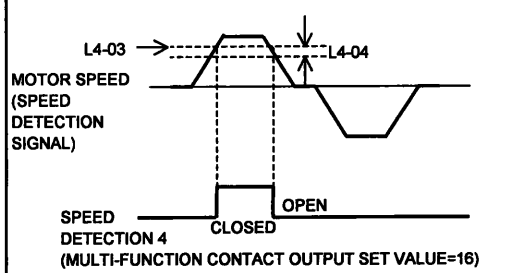
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=13)</td></tr>
<tr><td rowspan="2">Desired Speed Agree</td><td>Desired Speed Agree 1</td><td>Desired Speed Agree 2</td></tr>
<tr><td> 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=03)</td><td> 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=14)</td></tr>
<tr><td rowspan="4">Speed Detection</td><td>Speed Detection 1</td><td>Speed Detection 3</td></tr>
<tr><td> 

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

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=15)</td></tr>
<tr><td>Speed Detection 2</td><td>Speed Detection 4</td></tr>
<tr><td> 

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

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

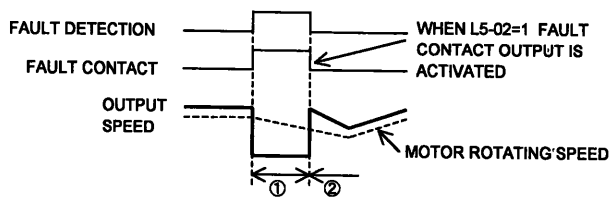
<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>L4-05</td><td>Operation when speed reference is missing</td><td>Selects when speed reference from the control circuit terminal is quickly reduced.
<table><tr><th>Set Value</th><th>Contents</th></tr><tr><td>0</td><td>Normal operation (Following variation of reference)</td></tr><tr><td>1</td><td>When speed reference from control circuit terminal is reduced by 90% within 400 ms, operation continues at 80% of speed 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 resulting in baseblock The digital operator displays the fault while the inverter output is shut OFF

② The fault is reset automatically to continue opration

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

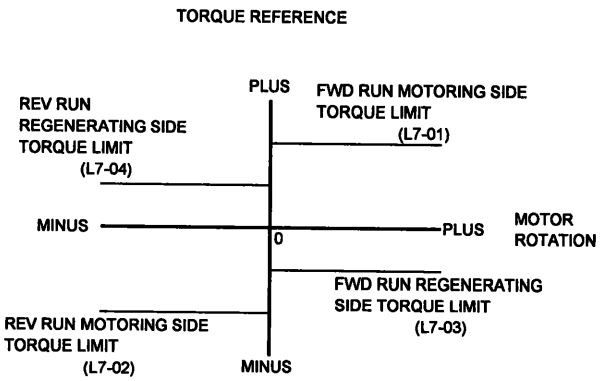
② A fault reset signal is input from the control circuit terminal or digital operator.

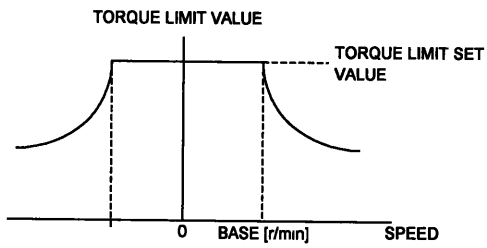
③ The power supply is shut OFF and the control power supply has dissipated, and then the power supply is turned ON again.

Fault retry is disabled for the following faults.

UV3 (MC answer fault)
SC (Load short-circuit)
OH (Heatsink overheat)
EF (Run command fault)
OS (Over speed)
DEV (Excessive speed deviation)
ZDEV (Z-phase error)
PGO (PG disconnection)
OPR (Constant setting error)
CE (Transmission error)
EF3 to 8 (External fault)
STO (Hunting prevention)
ERR (EEPROM write-in error)
UV1 (Main circuit under voltage) · Only when L2-01=00</td><td></td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</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 using the inverter internal torque reference
<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. 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
Torque limit value decreases automatically in reverse proportion to speed in a constant output area [base r/min (E1-07) or more].</td><td></td></tr>
<tr><td>L7-02</td><td>Reverse torque limit</td><td>Sets motoring side torque limit value during REV run
Torque limit value decreases automatically in reverse proportion to speed in a constant output area [base r/min (E1-07) or more]</td><td></td></tr>
<tr><td>L7-03</td><td>Forward regenerative torque limit</td><td>Sets regenerating side torque limit value during FWD run
Torque limit value decreases automatically in reverse proportion to speed in a constant output area [base r/min (E1-07) or more]</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>L7-04</td><td>Reverse regenerative torque limit</td><td>Sets regenerating side torque limit value during REV run.
Torque limit value decreases automatically in reverse prorortion to speed in a constant output area [base r/min (E1-07) or more].
 


</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 either C1-02, 04, 06, or 08, set value whichever is selected at detection of overheat prediction</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 (Displayed only)</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></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>
<tr><td>L8-10</td><td>Ground fault protection selection</td><td>A function to detect grounding fault
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Ground fault protection disabled</td></tr><tr><td>1</td><td>Ground fault protection enabled</td></tr></table></td><td></td></tr>
<tr><td>L9-01</td><td>Step-out protection selection</td><td>A function to select operation when step-out is detected at open loop vector control
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Step-out protection disabled</td></tr><tr><td>1</td><td>Step-out protection enabled</td></tr></table></td><td></td></tr>
</table>

o DIGITAL OPREATOR-RELATED CONSTANTS

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>o1-01</td><td>Monitor selection</td><td>Four items can be monitored in drive mode This constant can select an item to be monitored instead of output voltage. Set o1-01 to □□ in monitor constant U1-□□</td><td></td></tr>
<tr><td>o1-02</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 speed reference</td></tr>
<tr><td>2</td><td>Displays motor speed</td></tr>
<tr><td>3</td><td>Displays output current</td></tr>
<tr><td>4</td><td>Displays a monitor item selected by o1-01</td></tr>
</table></td><td></td></tr>
<tr><td>o1-03</td><td>Speed units of reference setting and monitor</td><td>Units for speed related reference or monitor can be selected as shown below.
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>1</td><td>Unit 0 01%
Speed reference indicated as P□□ □□</td></tr>
<tr><td>2 to 39</td><td>• Unit r/min
• r/min = 120 × speed reference (Hz)/ (E1-05)
• Speed reference indicated as n□□□□.</td></tr>
<tr><td>40 to 3999</td><td>Decimal point position set with 5th digit value of o1-03.
5th digit value = 0. Displayed as v□□□□
5th digit value = 1 Displayed as v□□□ □
5th digit value = 2: Displayed as v□□ □□
5th digit value = 3 Displayed as v□ □□□
o1-03 1st to 4th digits determine the set value of 100% speed.
(Example 1)
Assuming that 100% speed set value is 200 0 set o1-03 = 12000
When o1-03 = 12000 is set, 100% frequency is displayed as 200 0 and 60% speed is displayed as 120 0
(Example 2)
Assuming that 100% speed set value is 65 00, set o1-03 = 26500
When o1-03 = 26500 is set, 60% speed is displayed as 39 00</td></tr>
</table></td><td></td></tr>
<tr><td>o2-01</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 speed reference and run command is alternated with priority set by digital operator and b1-01/02.</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>o2-02</td><td>STOP key during control circuit terminal operation</td><td>Sets digital operator STOP key enabled/disabled in operation 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>o2-03</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>0</td><td>User constant initial value setting
Each constant obtained when o2-03 = 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>1</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>o2-04</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>• Refer to Par 2 6 of this manual.
• Do not change it unnecessarily
Not initialized (A1-03 setting)</td></tr>
<tr><td>o2-05</td><td>Speed reference setting method selection</td><td>Whether ENTER key operation is needed can be set when speed 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 speed reference by digital operator, the inverter accepts speed 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 speed reference displayed on the digital operator speed 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>Remaks</th></tr>
<tr><td>o2-06</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 continues</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>o2-07</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
The operator display returns to "0" for o2-07 set value after setting.</td><td></td></tr>
<tr><td>o2-08</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>

T AUTO-TUNING CONSTANTS

<table>
<tr><th>Constant No</th><th>Name</th><th>Description</th><th>Remaks</th></tr>
<tr><td>T1-02</td><td>Auto-tuning mode</td><td>Sets the auto-tuning mode Pressing the [RUN] key of the digital operator in the drive mode after setting "2" executes auto-tuning.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Normal operation mode</td></tr><tr><td>2</td><td>Auto-tuning mode</td></tr></table>Returns to "0" automatically after completion of auto-tuning</td><td>For auto-tuning, refer to APPENDIX 5 of the instruction manual</td></tr>
<tr><td>T1-03</td><td>Auto-tuning item selection</td><td>Selects auto-tuning items in the flux vector control mode
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Executes all auto-tuning items.</td></tr><tr><td>1</td><td>Executes only PG origin pulse adjustment</td></tr></table></td><td></td></tr>
</table>

VARISPEED-686SS5
DESCRIPTIVE MANUAL FOR CONSTANTS

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YASKAWA ELECTRIC CORPORATION

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MANUAL NO TOE-S686-15 2

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