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TOSHIBA

T300MVi/MTX

MEDIUM VOLTAGE

ADJUSTABLE SPEED MOTOR DRIVE

VOLT/HERTZ PARAMETER SETTING MANUAL

June, 2011

TOSHIBA INTERNATIONAL CORPORATION

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Software 09E17

Important Notice

The instructions contained in this manual are not intended to cover all details or variations in equipment types, nor may it provide for every possible contingency concerning the installation, operation, or maintenance of this equipment. Should additional information be required contact your Toshiba representative.

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Manual's Purpose and Scope

This manual provides information on the parameter settings available for your TIC power electronics product. Read the manual completely before adjusting any of the parameters for this equipment.

This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review.

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Contacting Toshiba's Customer Support Center

Toshiba's Customer Support Center can be contacted to obtain help in resolving any **Adjustable Speed Drive** system problem that you may experience or to provide application information.

The center is open from 8 a.m. to 5 p.m. (CST), Monday through Friday. The Support Center's toll free number is US (800) 231-1412/Fax (713) 466-8773 — Canada (800) 527-1204.

You may also contact Toshiba by writing to:

Toshiba International Corporation
13131 West Little York Road
Houston, Texas 77041-9990
Attn: ASD Product Manager.

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1 Contents

2 Outline

2.1 Introduction

Improper setting can cause damage to the product quality or cause breakage of the unit.
Read this manual and the instruction manual thoroughly before changing the setting values of the unit.
If you have any questions, please contact the department concerned of Toshiba.

- DeviceNet$_{TM}$ is a registered trademark of ODVA (Open DeviceNet Vendor Association).
- PROFIBUS is a standard of DIN19245 (German Industrial Standard) and EN50170 (European Standard).

2.2 How to Read this Manual

Standard value:
This is the setting that is normally used for most applications. These settings generally disable any special or optional functions. Which functions are enabled must be determined by the application. It is not recommended that any special functions are enabled unless they are needed. These settings may need adjustment for the specific application.

Initial value: These are recommended initial settings when a function is used. They will generally need to be adjusted for the application.

Limit:
This is the settable range.

Note:

Initialize	Parameters that become effective with a power supply initialize.
Automatic setting	Parameters that have an automatic setting function with other parameters.
Not used	Parameters not used at present.

[Related parameters]
These are the parameters needed to be set at the same time or required for an automatic setting, etc.

The following prefixes of symbols are used in this manual.

ACR_	Automatic Current Regulator	Current regulation
CAP_	CAPture buffer	Capture buffer
CP_	Constant Protection	Protection setting
CPT_	CaPTure	Utility synchronization capture
CR_	Constant Reference	Control reference
CS_	Constant System	System rating
DNET_	DeviceNET	Parameter for DeviceNet
FLG_	FLaG	Control mode flag
FLT_	FiLTer	Filter constant
INF_	INFormation	Tool information
IPLL_	Inverter PLL	Motor induction voltage PLL
LMT_	LiMiT	Control limit
LVL_	LeVeL	Detection level
MA_	Motor Adjustment	Motor adjustment parameter
MI_	Motor adjustment of Induction motor	Motor adjustment parameter (IM)
MSK_	MaSK	Sequence mask
OP_	OPtion	Option control
SIM_	SIMulation mode	Simulation mode
SL_	Sensor-Less control	Speed sensor-less control
TIME_	TIME	Sequence delay time
TL_	TOSLINE-S20	Parameter for transmission
TOOL_	TOOL	Parameter for tool Ethernet communication
TRB_	TRace Back	Trace back
XFR_	transFeR	Utility synchronization transfer

3 Parameter Explanation

3.1 Parameter A~

ACR_P

ACR proportional gain
Standard value: (0)
Initial value: (300)
Limit: 0 ~ 32767
Sets the ACR (Automatic Current Regulator) proportional gain. This parameter is used for factory testing and power ride thru only.

ACR_W1

ACR response gain
Standard value: (0 rad/s)
Initial value: (50 rad/s)
Limit: 0 ~ 1023 rad/s
Sets the ACR (Automatic Current Regulator) response gain. This parameter is used for factory testing and power ride thru only.

$$ACR\_I\_T = \frac{ACR\_P \times ACR\_W1}{F\_ACR}$$

ACR_I_T	integral gain
ACR_P	proportional gain
ACR_W1	response gain [rad/s]
F_ACR	current control frequency [Hz]

AD_GS0 ~ AD_GS5, AD_GS10 ~ AD_GS13, AD_GS16, AD_GS17, AD_GS20 ~ AD_GS23

Analog feedback gain

Standard value: (See table under AD_OSn)
Limit: AD_GS0 ~ AD_GS3 : 0 ~ 32767
AD_GS5 : -32767 ~ 0
Others : 0 ~ 32767

AD_OS0 ~ AD_OS5, AD_OS10 ~ AD_OS13, AD_OS16, AD_OS17, AD_OS20 ~ AD_OS23

Analog feedback offset

Standard value: (See table below)
Limit: -32767 ~ 32767
Sets the gain and offset of analog feedback.

#	Symbol	Content	Gain	Offset
0	IU_F	U-phase current feedback	1000	0
1	IW_F	W-phase current feedback	1000	0
2	IU_F_B	U-phase current feedback, B bank	1000	0
3	IW_F_B	W-phase current feedback, B bank	1000	0
4	VR_F	R-phase voltage feedback	6500	0
5	VT_F	T-phase voltage feedback	-6500	0
10	VDC_UP	U-phase P-bus DC voltage feedback	1000	0
11	VDC_UN	U-phase N-bus DC voltage feedback	1000	0
12	VDC_VP	V-phase P-bus DC voltage feedback	1000	0
13	VDC_VN	V-phase N-bus DC voltage feedback	1000	0
16	VDC_WP	W-phase P-bus DC voltage feedback	1000	0
17	VDC_WN	W-phase N-bus DC voltage feedback	1000	0
20	CPS	Control power supply	1800	0
21	CPS_FAULT	Control power supply to measure power failure time	1000	0
22	M_TMP_F	Motor temperature detection feedback	1000	0
23	IGR	Grounding current	8000	0

AIN1_AS, AIN2_AS

General analog input data storing address
Standard value: (DUST)
Limit:
Normally these inputs are used for speed reference input and are programmed to SP_REF_AIN1 or SP_REF_AIN2

AIN1_GS, AIN2_GS

General analog input gain
Standard value: (25000)
Limit:

AIN1_OS, AIN2_OS

General analog input offset
Standard value: (0)
Limit:
Specify the data storing address, gain, and offset of general analog input (2 channels).
Symbol is input for the data storing address. If a symbol which cannot be designated as a data storing destination is input, DUST (invalid data setting address) will automatically be the data storing destination.
Set DUST if general analog input is not used.
(Example)
When inputting an analog signal (0 ~ 8 V / 0 ~ 100%) from AIN1 as the speed reference
(SP_REF_AIN1: 0 ~ 100% / 0 ~ 25000 counts).

$$AIN1\_AS = SP\_REF\_AIN1$$

$$AIN1\_GS = \frac{25000}{100\%} \times \frac{100\%}{8} \times 10 = 31250$$

$$AIN1\_OS = 0$$

AIN1_TYPE, AIN2_TYPE

General analog input typeStandard value: (1)
Limit: 0 ~ 2
Sets input form of the signal to general analog input. In case of using differential type, set 0. In case of using single-end type, set 1 or 2. `.

AOUT1_CODE, AOUT2_CODE, AOUT3_CODE

General analog output code 1 to 3
Standard value: 2 (AOUT1_CODE), 8 (AOUT2_CODE), 0 (AOUT3_CODE)
Limit: 0 ~ 9
Select general analog output (3 channels) data by code.
The correspondence between data and codes is shown below.

Code	Symbol	Content	100% count	D/A output voltage at 100%
1	SP_R	Speed reference (after rate)	25000	8 V
2	SP_F	Speed feedback	25000	8 V
3	T_R	Torque reference	4000	3 V
4	IQ_R	Torque current reference	4000	3 V
5	IQ_F	Torque current feedback	4000	3 V
6	FL_R	Flux reference	10000	8 V
7	I1_R	Primary current reference	4000	3 V
8	I1_F	Primary current feedback	4000	3 V
9	FREQ	Frequency	1000	8 V
0	Option	Set by AOUTn_AS, AOUTn_GS, AOUTn_OS (n = 1, 2,3)		

AOUT1_OP_AS, AOUT2_OP_AS, AOUT3_OP_AS

General analog output option address
Standard value: DUST (AOUT1_OP_AS, AOUT2_OP_AS), MAIN_VAC_F (AOUT3_OP_AS)
Limit:

AOUT1_OP_GS, AOUT2_OP_GS, AOUT3_OP_GS

General analog output option gain
Standard value: 0 (AOUT1_OP_GS, AOUT2_OP_GS), 12500 (AOUT3_OP_GS)
Limit:

AOUT1_OP_OS, AOUT2_OP_OS, AOUT3_OP_OS

General analog output option offset
Standard value: (0)
Limit: -32767 ~ 32767
Specify the address, gain, and offset of general analog output (2 channels).
[Related parameters] Valid when OUT1_CODE = 0, AOUT2_CODE = 0, AOUT3_CODE = 0, respectively.

ASPR_G_SEL

ASPR gain selection
Standard value: (0)
Limit: 0 ~ 3 (0 ~ 2, when the setting value changeover control is selected)
Selects a group of ASPR (Automatic SPeed Regulator) gain, Multi-motor rating, and speed filter time constant.

ASPR_G_SEL	Content
0	Fixed to ASPR_GAIN_GROUP0
1	Selects from ASPR_GAIN_GROUP 0 – 3 in accordance with ASPR_G_NO. Specifies ASPR_G_NO directly through transmission.
2	Speed control gain continuously changeable. See the Item of LMT_ASPRG.
3	Selects from ASPR_GAIN_GROUP 0 – 3 in accordance with ASPR_G_NO. Specifies ASPR_G_NO with 3S, 2S.

Group No. of ASPR_GAIN_GROUP is shown below.

GROUP0	GROUP1	GROUP2	GROUP3
ACR_P	OP_ACR_P_1	OP_ACR_P_2	OP_ACR_P_3
ACR_W1	OP_ACR_W1_1	OP_ACR_W1_2	OP_ACR_W1_3
FLT_SP	OP_FLT_SP_1	OP_FLT_SP_2	OP_FLT_SP_3
MI_ID_BASE	OP_ID_BASE_1	OP_ID_BASE_2	OP_ID_BASE_3
MI_L_CMP	OP_MI_L_CMP_1	OP_MI_L_CMP_2	OP_MI_L_CMP_3
MI_R1_SET	OP_MI_R1_SET_1	OP_MI_R1_SET_2	OP_MI_R1_SET_3
MI_R1_SET_LF	OP_MI_R1_SET_LF_1	OP_MI_R1_SET_LF_2	OP_MI_R1_SET_LF_3
SL_I_DB	OP_SL_I_DB_1	OP_SL_I_DB_2	OP_SL_I_DB_3
CS_MOTOR_FREQ	OP_MOT_FREQ_1	OP_MOT_FREQ_2	OP_MOT_FREQ_3
CS_MOTOR_VOLT	OP_MOT_VOLT_1	OP_MOT_VOLT_2	OP_MOT_VOLT_3
MA_MOTOR_KW	OP_MOT_KW_1	OP_MOT_KW_2	OP_MOT_KW_3
CS_MOTOR_POLE	OP_MOTOR_POLE_1	OP_MOTOR_POLE_2	OP_MOTOR_POLE_3
CS_MOTOR_CURR	OP_MOTOR_CURR_1	OP_MOTOR_CURR_2	OP_MOTOR_CURR_3
CS_MOTOR_RPM	OP_MOTOR_RPM_1	OP_MOTOR_RPM_2	OP_MOTOR_RPM_3

[Related parameters] When the setting value changeover control (FLG_CHGSYS) is selected, 2S signal is used as the setting value and thus 3 cannot be selected for ASPR_G_SEL.

3.2 Parameter C~

CAP_1_AS ~ CAP_8_AS

Capture buffer channel addressStandard value: (DUST)
Limit:
This is used in the capture buffer function of the tool.
Sets the address for channels 1 to 8.

CAP_CHAN_CFG

Capture buffer channel configurationStandard value: (2)
Limit: 1 ~ 3
This is used in the capture buffer function of the tool.
Sets the channel configuration.
1 = 2 channels
2 = 4 channels
3 = 8 channels

CAP_ENB_DLY

Capture buffer auto enable delay timeStandard value: (-1)
Limit: -1 ~ 32767
This is used in the capture buffer function of the tool.
Sets the delay time in increments of 1 minute before the automatic sampling restarts.
If -1 is set, the automatic enable does not work.

CAP_P_MULT

Capture buffer sampling period multiplierStandard value: (1)
Limit: 1 ~ 32767
This is used in the capture buffer function of the tool.
Sets the multiplier for the sampling period selected by CAP_TSK_EXEC.
Sampling period = Period selected by CAP_TSK_EXEC x CAP_P_MULT

CAP_PRE_SAMP

Capture buffer pre-trigger sampling ratioStandard value: (20.0%)
Limit: 0.0 ~ 100.0%
This is used in the capture buffer function of the tool.
Sets the pre-trigger sampling ratio to the total sampling period.

CAP_TRIG_AS

Capture buffer trigger addressStandard value: (DUST)
Limit:
This is used in the capture buffer function of the tool.
Sets the trigger signal address.

CAP_TRIG_BIT

Capture buffer trigger bitStandard value: (0)
Limit: 0 ~ 15
This is used in the capture buffer function of the tool.
Sets the bit number of the trigger signal.
[Related parameters] This is valid when CAP_TRIG_MOD = 0 or 1.

CAP_TRIG_LVL

Capture buffer trigger levelStandard value: (0)
Limit:
This is used in the capture buffer function of the tool.
Sets the trigger level. This is used with CAP_TRIG_MOD = 2 to 5.

CAP_TRIG_MOD

Capture buffer trigger mode

Standard value: (0)
Limit: 0 ~ 5
This is used in the capture buffer function of the tool.
Sets the trigger mode.

CAP_TRIG_MOD	Content
0	Bit on
1	Bit off
2	= level
3	≠ level
4	> level
5	< level

CAP_TRIG_TYP

Capture buffer trigger type

Standard value: (0)
Limit: 0, 1
This is used in the capture buffer function of the tool.
Sets the trigger type.
0 = Level trigger
1 = Edge trigger

CAP_TSK_EXEC

Capture buffer sampling period

Standard value: (1)
Limit: 0 ~ 3
This is used in the capture buffer function of the tool.
Selects the sampling period.
0 = No sampling
1 = 1 ms period
2 = 10 ms period
3 = Current control period
Sampling period = Period selected by CAP_TSK_EXEC x CAP_P_MULT

CNT_GS_IUF

V/F counter type U-phase output current feedback gain

Standard value: (0)
Limit: 0 ~ 32767
Note: Not used

Sets the feedback gain of the V/F counter type U-phase output current. This feedback cannot be used for current control.

CNT_GS_VVU, CNT_GS_VWU, CNT_GS_VVW

U phase output voltage feedback gain,

V phase output voltage feedback gain,

W phase output voltage feedback gainStandard value: (1000)
Limit: 0 ~ 32767

Sets the output voltage feedback gain for U phase, V phase and W phase, respectively.

CNT_OS_IUF

V/F counter type U-phase output current feedback offsetStandard value: (0)
Limit: -32767 ~ 32767
Note: Not used

Sets the feedback offset of the V/F counter type U-phase output current. This feedback cannot be used for current control.

CNT_OS_VVU, CNT_OS_VWU, CNT_OS_VVW

U phase output voltage feedback offset,

V phase output voltage feedback offset,

W phase output voltage feedback offset

Standard value: (0)
Limit: -32767 ~ 32767
Note: Not used

Sets the output voltage feedback offset for U phase, V phase and W phase, respectively.

COMB1_AS ~ COMB4_AS

Bit combination output address

Standard value: (DUST)
Limit:

COMB1_MSK1 ~ COMB1_MSK4, COMB2_MSK1 ~ COMB2_MSK4, COMB3_MSK1 ~ COMB3_MSK4, COMB4_MSK1 ~ COMB4_MSK4,

Bit combination output mask

Standard value: (0000 H)

Limit:

When observing bit signals with D/A converter, set as follows and set COMB1_OUT – COMB4_OUT to the measuring analog output address (DAn_AS, where n = 1 to 5).

Set the symbol including the desired bit to observe to COMBn_AS (n = 1 to 4).

Set 1 to the bit of COMBn_MSKm (m = 1 to 4) corresponding to the desired bit to observe.

When the bit corresponding to the mask 1 to 4 (COMBn_MSK1 ~ COMBn_MSK4) is 1, COMBn_OUT becomes 16384, 8192, 4096 and 2048 count respectively. When more than 1 mask is set and their corresponding bit is 1, COMBn_OUT becomes the value all of the counts above are added.

(Example) When observing the bit F of BLR1_OUT in 16384 count, bit E in 8192 count using one D/A channel,

Analog output	Channel 1, 5.0 V/(bit F = 1, bit E = 0)
COMB1_AS = BLR1_OUT	Observing data address
COMB1_MSK1 = 8000 H	Observing data bit F mask
COMB1_MSK2 = 4000 H	Observing data bit E mask
DA1_AS = COMB1_OUT	Bit output address
DA1_GS = 32767	Analog output gain
DA1_OS = 0	Analog output offset

In the above settings, the output becomes 5.0 if only bit F is 1, 2.5 V if only bit E is 1, and 7.5 V if bits E and F are both 1.

COMM_TYPE

Transmission selection

Standard value: (0000 H)

Limit:

Note: Initialize

Selects the type of transmission.

COMM_TYPE	Content
0400 H	S-NET board (ARND-8110) (Standard version), Modbus board (PC61910P079)
2400 H	S-NET board (ARND-8110) (High-speed version), Profibus board (ARND-8130)
2200 H	DeviceNet board (ARND-8127)
0040 H	ISBus board (ARND-8204)
0020 H	S-NET board (ARND-8217) (Standard version)
2020 H	S-NET board (ARND-8217) (High-speed version)
0000 H	Transmission not used

CP_CURCHK

Abnormal current detection applied voltage level

Standard value: (8192)

Limit:

Sets the applied voltage level to detect abnormal current feedback. 16384 count corresponds to 100% (percent modulation is 1) of PWM carrier amplitude. Set to 3000 for drives with sinewave filters.

[Related parameters] MSK_BLR1, 2

CP_GDI

Ground fault detection level

Standard value: (6.00 mA)
Limit: 0.00 ~ 327.67 mA
Sets the ground fault detection (GR) level.
[Related parameters] MSK_UVA3, TIME_GR, CP_GDI_A

CP_GDI_A

Ground fault detection alarm level

Standard value: (4.00 mA)
Limit: 0.00 ~ 327.67 mA
Sets the ground fault detection alarm (GR_A) level.
[Related parameters] MSK_STPRQ1, MSK_LFD1, MSK_ACIL1, TIME_GR, CP_GDI

CP_MOT_V_IL

Motor start interlock voltage level

Standard value: (2.0%)
Limit: 0.0 ~ 125.0%
Sets the start interlock voltage level. If motor has residual voltage over this setting, drive cannot start.
[Related parameters] MSK_READY1

CP_MOTOR_OH

Motor overheat detection level

Standard value: (155.00°C)
Limit: 20.00 ~ 200.00°C
Sets the motor overheat (M_OH) detection level.
[Related parameters] MSK_UV2, MSK_HFD2, MSK_STPRQ1, MSK_LFD1

CP_N_IM_LL

Lower limit setting for motor number

Standard value: (0.00%)
Limit: 0.00 ~ 327.67%
Sets the lower limit of motor number when sensor-less control.
Set to 1 MSK_UVA4(8)N_IM_, when the motor number becomes lower than this setting, the equipment will be stoped with the number of induction motors failure (N_IM).
(Example)
In case that the number of induction motors is 8, the equipment operates at 3 or more and stops with the number of induction motors failure (N_IM) at less 3. The setting value is 25.01% <= CP_N_IM_LL <= 37.49% according to the followings. Select the middle value for keeping away from the detection error. In this case, CP_N_IM_LL = 31.25%.

$$\frac{3}{8} \times 100\% = 37.50\%$$

$$\frac{2}{8} \times 100\% = 25.00\%$$

[Related parameters] MSK_UVA4

CP_OC_UTL

Utility side current detection level
Standard value: (100)
Limit: 0 ~ 1000
Note: Initialize
Set the level for detection of the utility current.
1000 count setting corresponds to 10V detection.
Set the detection level so that it is about 10% of the utility current. The hardware detection circuit will not work below 1.0 V.

CP_OCA

AC overcurrent detection level
Standard value: (165%)
Limit: 0.0 ~ 400.0%
Note: Initialize
Sets the AC overcurrent (OCA) detection level using the rating of the equipment.
[Related parameters] MSK_BLR1, MSK_BLR2

CP_OSP

Overspeed detection level
Standard value: (115.0%)
Limit: 0.0 ~ 130.0%
Sets the overspeed (OSS) detection level.
This setting should take into consideration the overspeed capability of the motor.
[Related parameters] MSK_BLR3

CP_OSS_FO

Output frequency over level
Standard value: (69 Hz)
Limit: 0 ~ 500 Hz
Sets the output frequency over level. This setting should take into consideration the overspeed capability of the motor.

The following value is set as standard:

$$CP\_OSS\_FO = \frac{CS\_MOTOR\_FREQ}{10} \times \frac{CS\_OSP}{100}$$

CP_OSS_FO [Hz]
CS_MOTOR_FREQ [x 0.1 Hz]
CP_OSP [%]
[Related parameters] MSK_BLR3

CP_OV

DC overvoltage detection level
Standard value: (125%)
Limit: 0.0 ~ 150.0%
Note: Initialize
Sets the DC overvoltage (OVD) detection level.
[Related parameters] CS_DC_VOLT, MSK_BLR6

CP_PSF

Control power supply failure detection level

Standard value: (84.0 V)
Limit: 0.0 ~ 1000.0 V

Sets the control power supply failure (PSF) detection level. As the setting level is higher, the time to detect the control power supply failure becomes shorter.
[Related parameters] MSK_BLR6, FLG_PSFRCV, TIME_CEMFOFF

CP_PSFRCV_TIME

Main Power supply failure recovery time

Standard value: (0.00 s)
Limit: 0.00 ~ 10.00 s

Sets the allowable power loss time for automatic restart after a main power loss. If the power loss is longer than this time, the drive will not automatically restart when power is returned.

CP_REV_ROT

Reverse rotation detection level

Standard value: (0.0%)
Initial Value: (10.0%)
Limit: 0.0 ~ 125.0%

Sets the motor reverse rotation detection level.
Sets the detection signal B_REV_ROT_F_(BLR3:bit4) to 0 after a 2s delay when the difference between the speed reference and speed feedback exceeds the reverse rotation detection level while their signs are different.
Set the BLR3 mask disabled if reverse rotation detection is not used.

CP_RMS_20

20-minute RMS overload detection

Standard value: (100.8%)
Limit: 0.0 ~ 181.0%

Sets the RMS value for 20 minutes.

$$20\,\text{min RMS} = \sqrt{\frac{1.0^2(20\times 60 - T) + \left(\frac{OL}{100}\right)^2 \times T}{20\times 60}}$$

OL: Overload [%]
T: Time [s]

In the case of overload 125% - 60 s, 20 min RMS=1.014, then CP_RMS_20 = 101.4% See the chart below
[Related parameters] MSK_UVA1

CP_RMS_5

5-minute RMS overload response

Standard value: (103.2%)
Limit: 0.0 ~ 181.0%
Sets the RMS value for 5 minutes.

$$5\,\text{min RMS} = \sqrt{\frac{1.0^2\left(5\times 60 - T\right) + \left(\frac{OL}{100}\right)^2 \times T}{5\times 60}}$$

OL: Overload [%]
T: Time [s]
In the case of overload 125% - 60 s, 5 min RMS=1.05.5, then CP_RMS_5 = 105.5% See the chart below
[Related parameters] MSK_UVA1

CP_RMS_A

5-minute overload alarm setting

Standard value: (101.1%)
Limit: 0.0 ~ 181.0%
Sets the 5-minute RMS alarm setting.
Logical sum of 5-minute RMS alarm and 20-minute RMS alarm becomes the overload alarm (OL_A) .See the chart below
[Related parameters] MSK_STPRQ1

CP_RMS_A20

20-minute overload alarm detection

Standard value: (100.3%)
Limit: 0.0 ~ 181.0%
Sets the 20-minute RMS alarm setting.
The logical sum of this setting and the 5-minute RMS alarm is the overload alarm (OL_A). See the chart below
[Related parameters] MSK_STPRQ1

TIME_CL	60 sec							
OL(%)	**110**	**115**	**125**	**150**	**175**	**200**	**225**	**250**
CP_RMS_5(%)	102.08	103.17	105.48	111.80	118.85	126.49	134.63	143.18
CP_RMS_20(%)	100.52	100.80	101.40	103.08	105.03	107.24	109.69	112.36
CP_RMS_A(%)	100.04	101.11	103.37	109.57	116.47	123.96	131.94	140.31
CP_RMS_A20(%)	100.02	100.30	100.89	102.56	104.50	106.70	109.14	111.80

CP_ROT_F_DIFF

Motor stall detection level

Standard value: (20.0%)
Limit: 0.0 ~ 125.0%

Sets the difference (absolute value) between the speed reference and speed feedback.
Used for motor stall detection.
Motor stall detection sets the B_ROTATE_FAIL_(FLGSTS_MV1:bit10) bit to 0 after the delay TIME_ROTATE_FAIL when both of the following conditions are met:
(1) The difference above exceeds the motor stall detection difference level.
(2) The absolute value of the speed feedback is below CP_SP_LOW, which is set separately.
The motor stall detection signal B_ROTATE_FAIL_ is also outputted to BLR3:bit5.
Set the BLR3 mask disabled if motor stall detection is not used.
[Related parameters] CP_SP_LOW, TIME_ROTATE_FAIL

CP_ROT_F_EN

Motor stall detection speed detection level

Standard value: (10.0%)
Limit: 0.0 ~ 125.0%

Sets the absolute value of speed feedback regarded as motor stall.
Motor stall detection sets the B_ROTATE_FAIL_(FLGSTS_MV1:bit10) bit to 0 after the delay TIME_ROTATE_FAIL when both of the following conditions are met:
(1) The difference above exceeds the motor stall detection difference level.
(2) The absolute value of the speed feedback is below CP_SP_LOW, which is set separately.
The motor stall detection signal B_ROTATE_FAIL_ is also outputted to BLR3:bit5.
Set the BLR3 mask disabled if motor stall detection is not used.
[Related parameters] CP_SP_DIFF, TIME_ROTATE_FAIL

CP_SP_LOST

External speed reference loss detection level

Standard value: (0.0%)
Limit: -25.0 ~ 125.0%

Sets the loss detection level for the external speed reference.
Detects the loss of the speed reference input (SP_REF_AIN1, SP_REF_AIN2) from analog.
Set 0% to detect the speed reference loss from analog.
When any loss is detected, B_SP_LST_A_ and B_SP_LOST_ are set to 0.
Because B_SP_LOST_ is latched, fault reset is required for recovery.
Set FLG_SP_LOST_EN to 1 to maintain the speed at the time of speed loss detection.
Each bit is outputted to the following sequence.
[Related parameters] FLG_SP_LOST_EN

Signal name	Output	Application
B_SP_LST_A_	STPRQ1 :BIT3	Outputs stop request signal at detection using the mask.
	LFD1 :BIT15	Outputs minor failure signal at detection using the mask.
B_SP_LOST_	READY1 :BIT11	Stops speed reduction at detection using the mask.
	UV1 :BIT12	Stops free run at detection using the mask.

CP_UL_H

Low current detection level at 100% speed

Standard value: (20.0%)

Limit: 0.0 ~ 100.0%

CP_UL_L

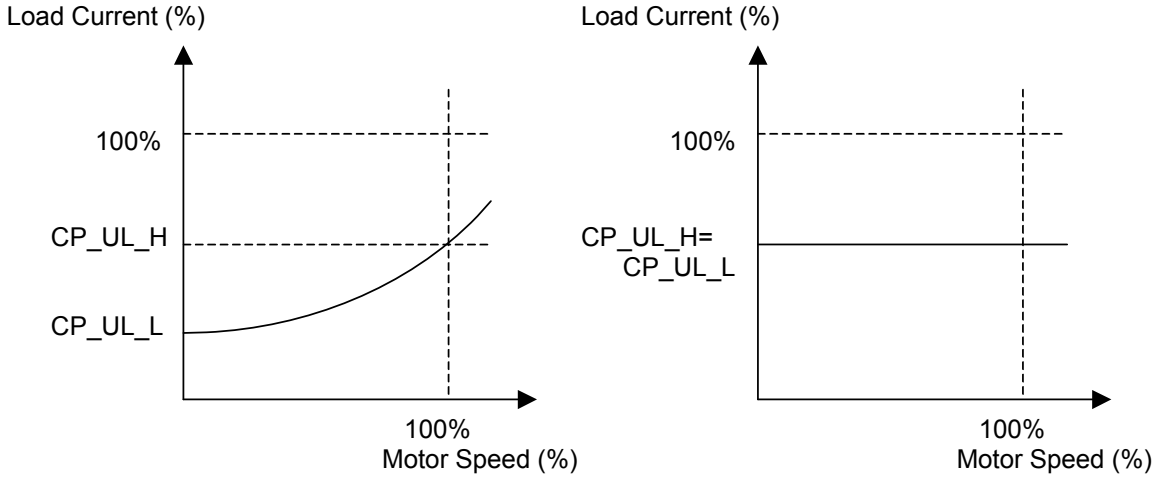
Low current detection level at 0% speed

Standard value: (0.0%)

Limit: -100.0 ~ 100.0%

Sets the low current detection level each 0% and 100% speed condition. The detection level of each speed is calculated by second order approximation. If CP_UL_H=CP_UL_H, this level is constant value in all speed condition. When load current is below this level and after timer setting (TIME_UL), drive detects UL_T for fault and UL_A for alarm.

[Related parameters] TIME_UL, MSK_UVA1, MSK_LFD2



CP_UV_SIL

DC voltage drop detection level for startup interlock

Standard value: (80.0%)

Limit: 0.0 ~ 100.0%

Sets the DC voltage drop (UV_SIL) detection level for startup interlock.

The startup interlock will be released 1.5 seconds after this setting level is reached.

[Related parameters] MSK_SIL1

CP_UVA

Input voltage loss fault level

Standard value: (75.0%)

Limit: 0.0 ~ 100.0%

Sets the detection level forthe input voltage loss fault (MPSF_MV)

CP_UVD

DC under voltage detection

Standard value: (75.0%)
Limit: 0.0 ~ 100.0%
Sets the DC voltage drop (under voltage drop: UVD) detection level.
[Related parameters] MSK_UVA1, MSK_UVA2

CP_VAC_PH_LOSS

Input open phase detection unbalance level

Standard value: (0.0%)
Limit: 0.0 ~ 100.0%
Sets the unbalance level for open phase detection of input voltage.
The average value of the three phases of the input voltage is taken as 100% and multiplied by CP_VAC_PH_LOSS, and a phase that is lower than the value is regarded as an open phase.
(Example: If the average of three phase input is 90% and the set value is 80%, any phase below 72% is regarded as an open phase.)
The open phase detection signal B_VAC_PH_LOSS_ is outputted to UVA2:bit0.
Set the appropriate mask of UVA2 disabled if input open phase detection is not used.

CP_VDC_FUS

Input rectifier fuse blown detection level

Standard value: (25.0%) 4160V and 3300V drive
(15.0%) 2400V drive

Limit: 0.0 ~ 100.0%
Sets the unbalance level of DC voltage for input fuse blown detection after pre-charge..

CP_VDC_FUS_CHG

Input rectifier fuse blown detection level in case of pre-charge

Standard value: (15.0%)
Limit: 0.0 ~ 100.0%
Sets the unbalance level of DC voltage for input fuse blown detection during pre-charge.

CP_VINV_PH_LOSS

Output open phase detection unbalance level

Standard value: (0.0%)
Limit: 0.0 ~ 100.0%
Sets the unbalance level for open phase detection of output current.
The average value of the three phases of the output current is taken as 100% and multiplied by CP_VINV_PH_LOSS, and a phase that is lower than the value is regarded as an open phase.
(Example: If the average of three phase output is 90% and the set value is 80%, any phase below 72% is regarded as an open phase.)
The open phase detection signal B_VINV_PH_LOSS_ is outputted to UVA2:bit1.
Set the appropriate mask of UVA2 disabled if output open phase detection is not used.

CPS_TIME_TAU

Power failure time detection CR filter time constantStandard value: (2.35 s)
Limit: 0.00 ~ 327.67 s
Sets the CR filter time constant to detect the power failure time.

CPT_CYCLE

Counter electro-motive voltage phase following synchronization determination cycle count
Standard value: (30 cycle)
Limit: 0 ~ 1500 cycle
Set the phase synchronization determination cycle count upon utility synchronization capture.
It is determined as synchronization if the phase difference is within LVL_IPLL_DLTQ during this cycle period.
Also, the timeout time for utility synchronization capture is set as "CPT_CYCLE + 2s".
[Related parameters] LVL_IPLL_DLTQ, TIME_CPT_SPHLD

CPT_IQ_F

Utility synchronization capture IQ_F preset value
Standard value: (0.0%)
Limit: 0.0 ~ 130.0%
Set the IQ_F preset value upon utility synchronization capture.
Set 0% if utility side current detection is present.
[Related parameters] CPT_IUTL_GAIN, FLG_BP_CUR_USE

CPT_IUTL_GAIN

Utility synchronization capture IQ_F preset gain
Standard value: (100.0%)
Limit: 0.0 ~ 110.0%
Set the gain for the value detected from the utility current in the IQ_F preset value upon utility synchronization capture.
Set 0% if utility side current detection is present and IQ_F preset is not used.

CPT_QSHIFT

Utility synchronization capture side phase shift
Standard value: (0 deg)
Limit: -10 ~ 10 deg
Set the phase offset upon utility synchronization capture.
If this is set to a positive value, the inverter phase is behind the utility phase; if set to negative, it is ahead.

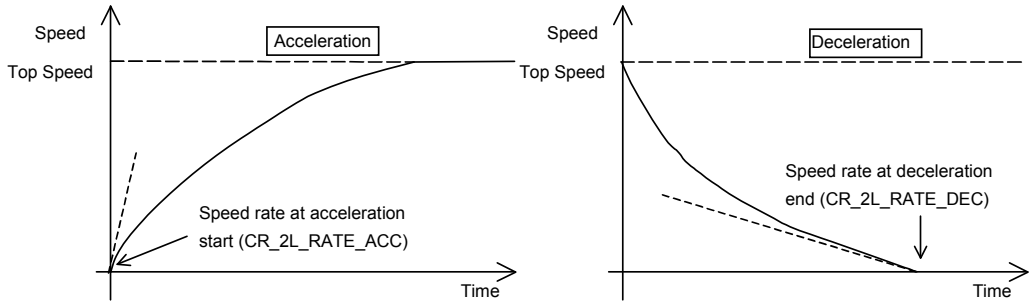
CPT_V_GAIN

Utility synchronization capture output voltage adjustment gain
Standard value: (100.0%)
Limit: 0.0 ~ 130.0%
Set the output voltage adjustment gain upon utility synchronization
[Related parameters] FLT_SYNC_V_G, XFR_V_GAIN

CR_2L_RATE_ACC

Square load acceleration rate
Standard value: (00.0s)
Initial value: (60.0s)
Limit: 0.0 ~ 3276.7s

This parameter along with CR_2L_RATE_DEC, CR_2L_TOPLD_A and CR_2L_TOPLD_D configure the pump/fan optimum speed reference ramp function. Loads which have the characteristic that their load torque increases according to the square of the speed can use this function to obtain the minimum possible times to accelerate and decelerate. Applications which are using the V/Hz control can benefit from this function. Applications which use vector control can achieve the same results using the CR_RATE_ACC and CR_RATE_DEC and the speed regulator/current management inherent in that control. This function is disabled by setting all four parameters to zero.

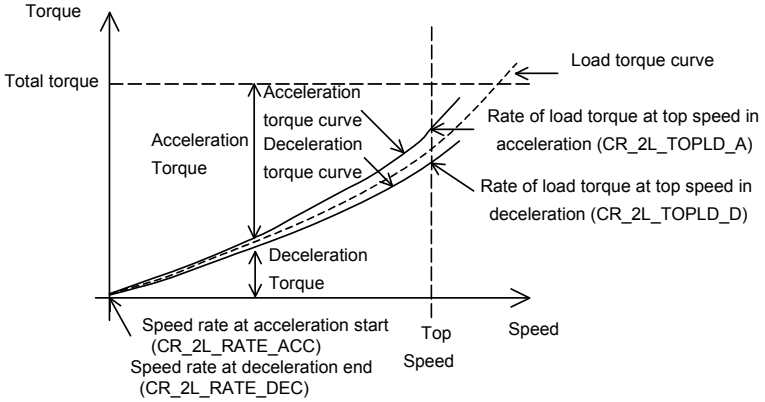


The initial accelerating speed reference ramp rate is set by this parameter. As the speed increases the ramp rate is automatically reduced from this value as required to prevent the speed regulator from being clamped by the torque limit. Set this parameter the same as ASR_J0 to achieve the maximum acceleration rate.
[Related parameters] CR_2L_RATE_DEC, CR_2L_TOPLD_A, CR_2L_TOPLD_D

CR_2L_RATE_DEC

Square load deceleration rate
Standard value: (0.0s)
initial value: (300.0s)
Limit: 0.0 ~ 3276.7s

The final decelerating reference ramp is set by this value. The maximum rate is limited by the drives ability to regenerate power. Setting this value to 3% * ASR_J0 (secs) /MA_ZERO_SP (%) should give a satisfactory result in most situations.
[Related parameters] CR_2L_RATE_ACC, CR_2L_TOPLD_A, CR_2L_TOPLD_D



CR_2L_TOPLD_A

Rate of load torque at top speed in acceleration
Standard value: (0.0%)
Initial value: (80.0%)
Limit: 0.0 ~ 100.0%
The above figure illustrates that the torque available to accelerate/decelerate the load depends on speed. At low speeds the motor can be accelerated rapidly while at high speeds less acceleration is possible. The drive predicts the load curve during acceleration using this parameter. Set this parameter equal to maximum expected load torque at top speed considering all material or temperature variations expected. Setting a number which is too high will mean your acceleration time is longer than necessary. Setting a number which is too low will mean that an overcurrent situation could develop.
[Related parameters] CR_2L_RATE_ACC, CR_2L_RATE_DEC, CR_2L_TOPLD_D

CR_2L_TOPLD_D

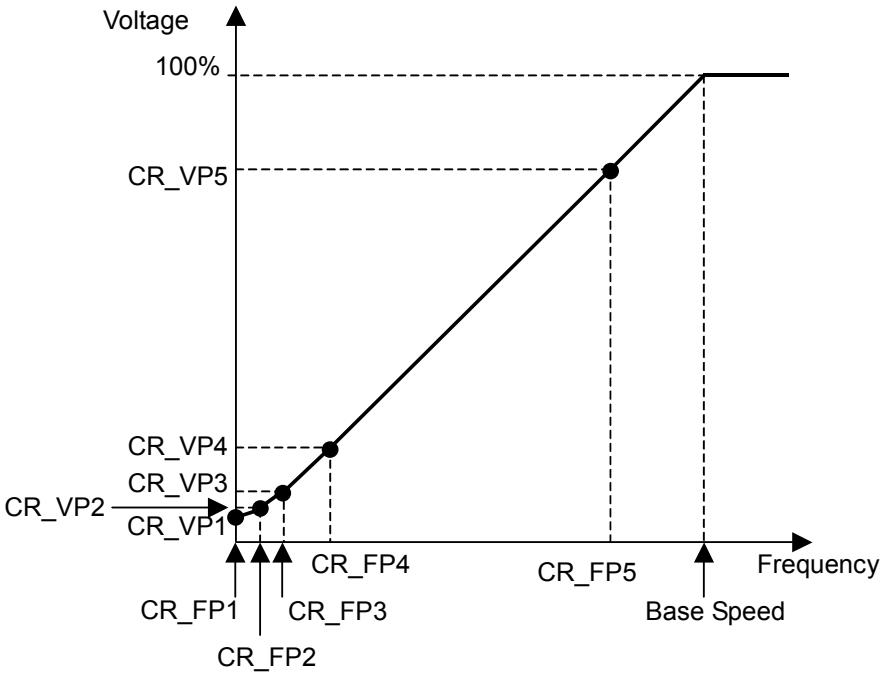
Rate of load torque at top speed in deceleration
StanStandard value: (0.0%)
Initial value: (70.0%)
Limit: 0.0 ~ 100.0%
The drive predicts the load curve during deceleration using this parameter. Set this parameter equal to the minimum expected load torque at top speed minus 2%. If this parameter is set too high then a DC bus over-voltage trip during deceleration could occur. If the parameter is set too low your deceleration time will take longer than is necessary.
[Related parameters] CR_2L_RATE_ACC, CR_2L_RATE_DEC, CR_2L_TOPLD_A

CR_FP1 ~ CR_FP5

V/f 5 points frequency 1 ~ V/f 5 points frequency 5
Standard value: CR_FP1 ~ CR_FP5 = (0.0%), (5.0%), (10.0%), (20.0%), (80.0%)
Limit: 0.0 ~ 125.0%

CR_VP1 ~ CR_VP5

V/f 5 points voltage 1 ~ V/f 5 points voltage 5
Standard value: CR_VP1 ~ CR_VP5 = (5.0%), (7.0%), (11.0%), (20.0%), (80.0%)
Limit: 0.0 ~ 125.0%
Use these parameters to create a custom V/f curve. The drive will follow a strait line between the points. The chart below shows the result of the standard settings listed above.
This is available when CS_VF_MODE = 2.
[Related parameters] CS_VF_MODE



CR_JOG_FJ1S
Forward jog 1 speed reference
Standard value: (10.0%)
Limit: 0.0 ~ 130.0%
Sets the forward inching speed 1 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_JOG_FJ2S
Forward jog 2 speed reference
Standard value: (50.0%)
Limit: 0.0 ~ 130.0%
Sets the forward inching speed 2 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_JOG_FJ3S
Forward jog 3 speed reference
Standard value: (100.0%)
Limit: 0.0 ~ 130.0%
Sets the forward inching speed 3 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_JOG_RJ1S
Reverse jog 1 speed reference
Standard value: (-10.0%)
Limit: -130.0 ~ 0.0%
Sets the reverse inching speed 1 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_JOG_RJ2S
Reverse jog 2 speed reference
Standard value: (-50.0%)
Limit: -130.0 ~ 0.0%
Sets the reverse inching speed 2 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_JOG_RJ3S
Reverse jog 3 speed reference
Standard value: (-100.0%)
Limit: -130.0 ~ 0.0%
Sets the reverse inching speed 3 reference.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DIn_IX, DIn_BN, SGN_DI

CR_RATE_ACC

Acceleration rate

Standard value: (120.0 s)
Limit: 0.0 ~ 3276.7 s
Sets the internal rate corresponding to the speed reference signal for 0 ~ 100% acceleration time.
Sets 60.0 s to accelerate 0 ~ 100% in 60 seconds.
[Related parameters] FLG_TIME_RATE

CR_RATE_ACC2 ~ CR_RATE_ACC4

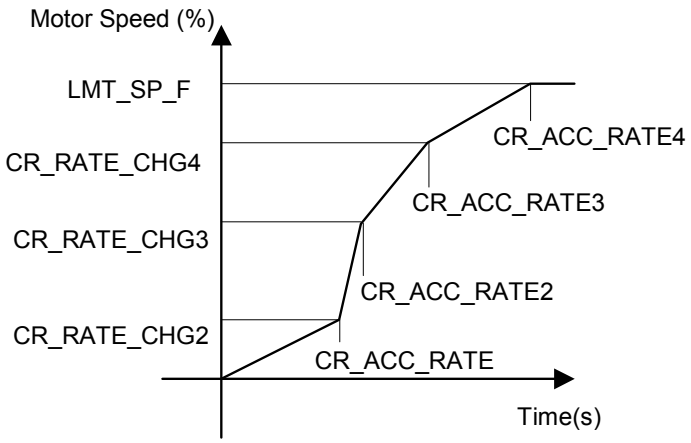
Acceleration rate for polygonal line acceleration/deceleration

Standard value: (0.0 s)
Limit: 0.0 ~ 3276.7 s
Sets the acceleration rate used for polygonal line acceleration/deceleration.
[Related parameters] CR_RATE_CHG2 ~ CR_RATE_CHG4

CR_RATE_CHG2 ~ CR_RATE_CHG4

Polygonal line acceleration/deceleration switch frequency

Standard value: (0.0 %)
Limit: 0.0 ~ 125.0 %
Sets the frequency of rate switch point for polygonal line acceleration/deceleration.
Set all parameters to 0 if polygonal line acceleration/deceleration is not used.
Set a lower frequency to a set value with smaller number.
To set one or two switch point, set them in the ascending order of number and set the remaining parameters to 0.
[Related parameters] CR_RATE_ACC2 ~ CR_RATE_ACC4, CR_RATE_DEC2 ~ CR_RATE_DEC4



CR_RATE_DEC

Deceleration rate

Standard value: (120.0 s)
Limit: 0.0 ~ 3276.7 s
Sets the internal rate corresponding to the speed reference signal for 100 ~ 0% deceleration time.
Sets 60.0 s to decelerate 100 ~ 0% in 60 seconds.
[Related parameters] FLG_TIME_RATE

CR_RATE_DEC2 ~ CR_RATE_DEC4

Deceleration rate for polygonal line acceleration/deceleration

Standard value: (0.0 s)
Limit: 0.0 ~ 3276.7 s
Sets the deceleration rate used for polygonal line acceleration/deceleration.
[Related parameters] CR_RATE_CHG2 ~ CR_RATE_CHG4

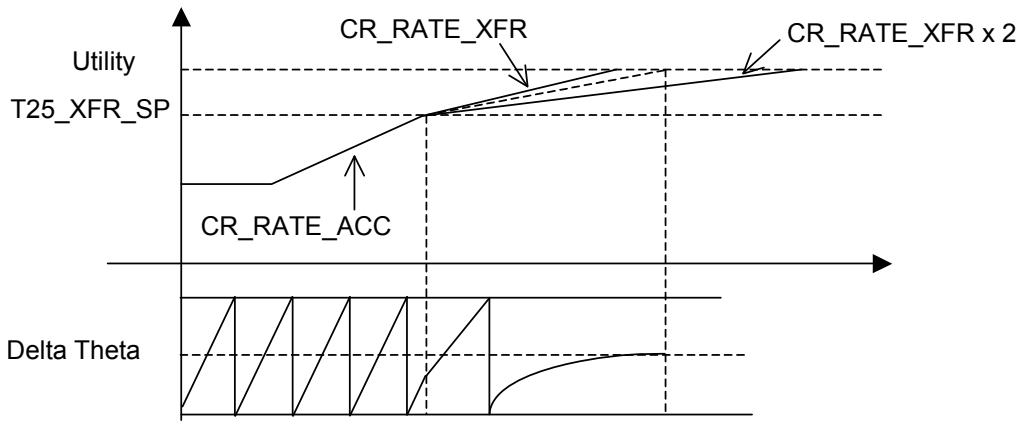
CR_RATE_MRH

MRH function (include Enhanced Keypad) acceleration / deceleration rate

Standard value: (120.0 s)
Limit: 0.0 ~ 3276.7 s
Sets increase-and-decrease rate (time which it takes to increase 100%) of speed reference when operating motor using UP/DOWN digital input . When 0.00 sec is set as increase-and-decrease rate, 10 sec is applied automatically.
[Related parameters] KPAD_PRIVILEGE

CR_RATE_XFR

Acceleration rate for Xfr.
Standard value: (0.0 s)
Limit: 0.0 ~ 3276.7 s
Set the acceleration time for utility synchronization.
First, the inverter accelerates to T25_XFR_SP according to CR_RATE_ACC, later, accelerates to the rate above CR_RATE_XFR below CR_RATE_XFR x 2.



CR_SOFT_STALL

Overload speed reduction level

Standard value: (80.0 %)
Limit: 0.0 ~ 100.0 %

Sets the rate of speed reduction at the time of overload.
(Example: If the speed reference is 90% and CR_SOFT_STALL=80%, the speed reference is reduced to 72% at the time of overload.)
The setting is valid when FLG_SOFT_STALL is 1.
[Related parameters] FLG_SOFT_STALL, CP_RMS_5, CP_RMS_20

CR_SP_JP1 ~ CR_SP_JP3

Frequency jump center frequency

Standard value: (0.0 %)
Limit: 0.0 ~ 125.0 %

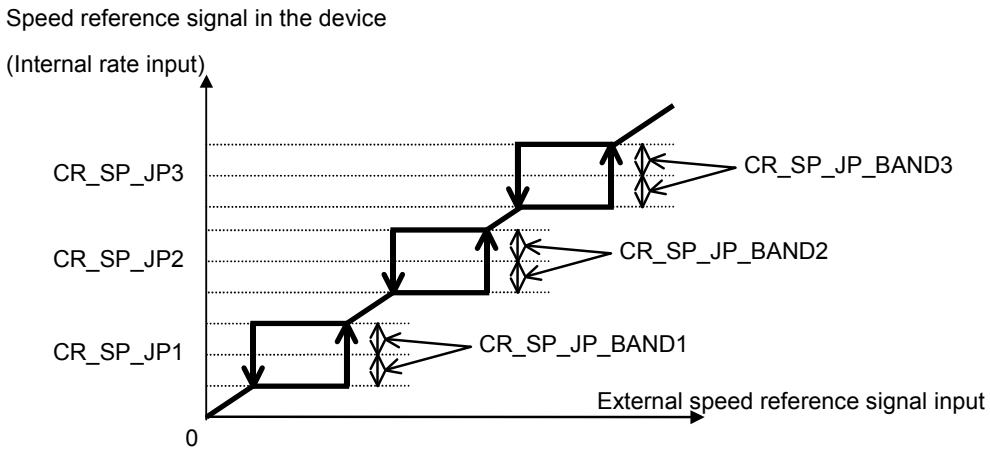
Set three points of center frequency for jump to avoid mechanic resonance frequencies during operation.
Set them along with the frequency jump width.
Set a center frequency in absolute value. The jump region is set to the same region for both forward and reverse rotation.
Set all parameters to 0 if frequency jump is not used.
If only one or two points among the three points are used, use a set value with smaller number first, and set the set values not used to 0.

CR_SP_JP_BAND1 ~ CR_SP_JP_BAND3

Frequency jump width

Standard value: (0.0 %)
Limit: 0.0 ~ 30.0 %

If the frequency jump region contains 0, it is limited to a region that does not contain 0.
Set three points of jump width to avoid mechanic resonance frequencies during operation.
Set them along with the frequency jump center frequency.
Set all parameters to 0 if frequency jump is not used.
If only one or two points among the three points are used, use a set value with smaller number first, and set the set values not used to 0.
If jump regions overlap, the region between the lower limit to upper limit becomes a new jump region.



The operation of the internal speed reference (internal rate input) can be switched with flag setting.
(1) FLG_SP_R_JP = 0
The internal speed reference is according to the internal rate and follows the speed reference signal.
(2) FLG_SP_R_JP = 1
The internal speed reference changes in steps to avoid the jump region described above.

CR_SP_LOW

Speed low detection level

Standard value: (0.0 %)
Limit: 0.0 ~ 125.0 %

Set the speed at which speed low is detected.
Set it to 0 if speed low detection is not used.
When the absolute value of speed feedback is below the speed low detection level, the speed low detection signal B_SP_LOW(FLGSTS_MV1:14bit) is set to 1.
After that, when the absolute value of speed feedback exceeds the value (speed low detection level + CR_SP_LOW_BAND), the speed low detection signal is cleared to 0.
[Related parameters] CR_SP_LOW_BAND

CR_SP_LOW_BAND

Speed low detection recovery width

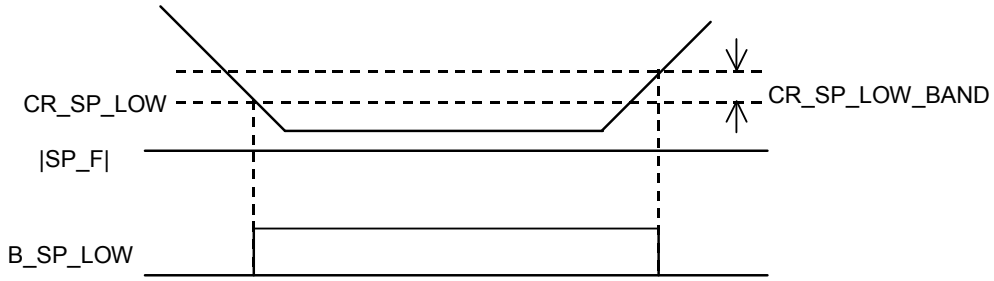
Standard value: (0.0 %)

Limit: 0.0 ~ 125.0 %

Sets the recovery width (hysteresis width) for speed low detection.

Set it to 0 if speed low detection is not used.

[Related parameters] CR_SP_LOW



CR_SP_RCH

Speed reach detection level

Standard value: (10.0 %)

Limit: 0.0 ~ 125.0 %

Sets the speed reach detection level.

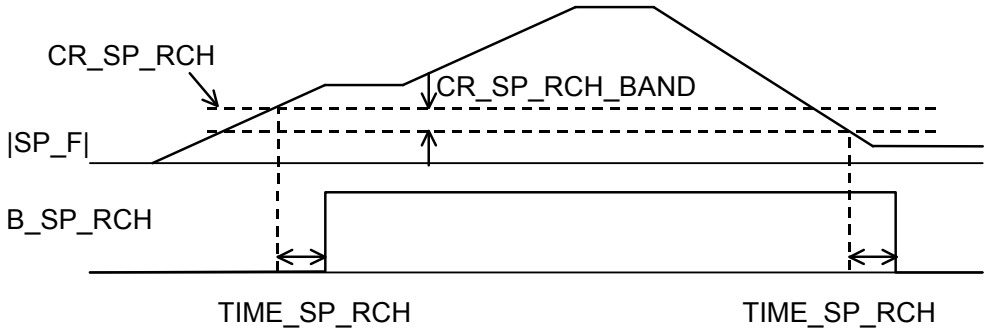
When the absolute value of speed feedback reaches this speed reach detection level, the reach detection signal B_SP_RCH(FLGSTS_MV1:15bit) is set to 1 after the time delay TIME_SP_RCH.

After that, when the absolute value of speed feedback decreases below the value (speed reach detection level - CR_SP_RCH_BAND), the reach detection signal B_SP_RCH(FLGSTS_MV1:15bit) is cleared to 0.

This set value is valid only if FLG_SP_RCH=1.

Set it to 0 if speed reach detection is not used.

[Related parameters] CR_SP_RCH_BAND, FLG_SP_RCH, TIME_SP_RCH



CR_SP_RCH_BAND

Speed follow complete detection width

Standard value: (2.0 %)

Limit: 0.0 ~ 125.0 %

Functions differently according to the FLG_SP_RCH setting:

FLG_SP_RCH=0 (Speed follow detection width)

Sets the difference width for which speed is regarded as following the target.

When the absolute value of the difference between the external speed reference and speed feedback is below CR_SP_RCH_BAND, the reach detection signal B_SP_RCH(FLGSTS_MV1:15bit) is set to 1 after the time delay TIME_SP_RCH.

After that, when absolute value of the difference between the external speed reference and speed feedback exceeds CR_SP_RCH_BAND, the reach detection signal B_SP_RCH(FLGSTS_MV1:15bit) is cleared to 0.

Set it to 0 if speed follow detection is not used.

FLG_SP_RCH=1 (Speed reach detection hysteresis width)

Sets the detection hysteresis width for speed reach detection.

[Related parameters] CR_SP_RCH, FLG_SP_RCH, TIME_SP_RCH

CR_SP00 ~ CR_SP15

Speed reference 16-point preset value

Standard value: (0.0 %)

Limit: 0.0 ~ 130.0 %

Sets the speed reference for the speed reference 16-point preset function.

Jog speed references to be used can be selected with the bits (MV_JOG_B0 ~ MV_JOG_B3) DI_EX4.

Bit condition of DI_EX4				Selected Speed reference
MV_JOG_B3	MV_JOG_B2	MV_JOG_B1	MV_JOG_B0	
0	0	0	0	CR_SP00
0	0	0	1	CR_SP01
0	0	1	0	CR_SP02
0	0	1	1	CR_SP03
0	1	0	0	CR_SP04
0	1	0	1	CR_SP05
0	1	1	0	CR_SP06
0	1	1	1	CR_SP07
1	0	0	0	CR_SP08
1	0	0	1	CR_SP09
1	0	1	0	CR_SP10
1	0	1	1	CR_SP11
1	1	0	0	CR_SP12
1	1	0	1	CR_SP13
1	1	1	0	CR_SP14
1	1	1	1	CR_SP15

CR_STYP_EN

S-rate end adjustment

Standard value: (0.0 s)

Limit: 0.0 ~ (STYP_EN_UL) s (Limited to 3.0s in the lower boundary when CR_STYP_ST≠0)

Sets the S-rate adjustment for the acceleration/deceleration end side.

Set it to 0 if S-acceleration/deceleration is not used.

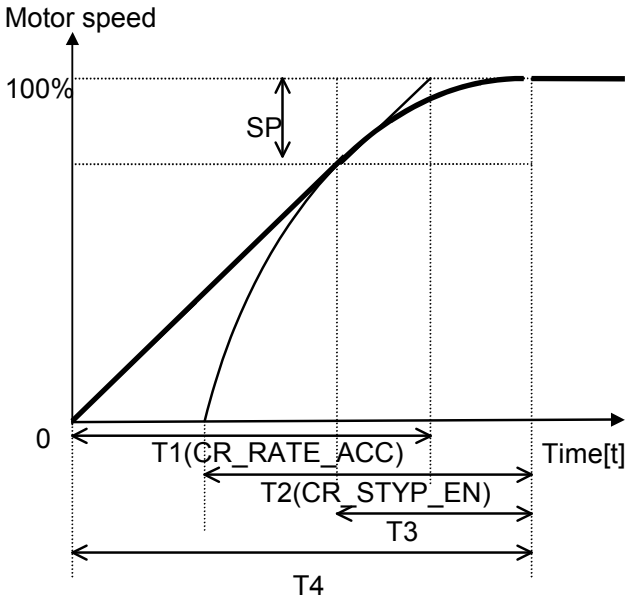
The value indicates the time to accelerate from 0% to 100% in uniform acceleration. The S-time is determined based on the relation to the acceleration/deceleration rate.

This set value is limited in the upper limit (STYP_EN_UL).

$STYP\_EN\_UL = 2 \times \sqrt{0.1} \times \min(CR\_RATE\_ACC, CR\_RATE\_DEC)$

If the speed reference changes in steps to the reverse direction during S-end operation (interval T3 in the figure below), an overshoot up to 10% toward acceleration may occur.

(Operation) When acceleration from 0 to 100% is done with the acceleration rate (CR_RATE_ACC)=T1(s) and the S-rate adjustment (CR_STYP_EN)=T2(s), the operation is as follows



$$\text{S-part acceleration time (T3)} = \frac{T2 \times T2}{2 \times T1}$$

$$\text{S-part acceleration (SP)} = \frac{T2 \times T2}{4 \times T1 \times T1} \times 100$$

$$\text{Acceleration time (T4)} = T1 + \frac{T2 \times T2}{4 \times T1}$$

(Operation example)

・CR_STYP_EN=CR_RATE_ACC×2

S-start speed: 0%, Acceleration time: 2 times CR_RATE_ACC

・CR_STYP_EN=CR_RATE_ACC

S-start speed: 75%, Acceleration time: 3/2 times CR_RATE_ACC

（Setting example）

To set SP (%) of S-acceleration for CR_RATE_ACC=T1(s), set CR_STYP_EN=2×T1×√SP

[Related parameters] CR_RATE_ACC, CR_RATE_DEC, CR_STYP_ST

CR_STYP_ST

S-rate start adjustment

Standard value: (0.0 s)

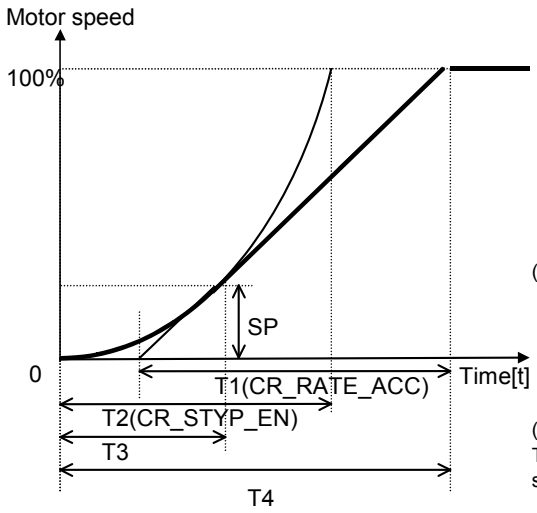
Limit: 0.0 ~ 3276.7 s

Sets the S-rate adjustment for the acceleration/deceleration start side.

Set it to 0 if S-acceleration/deceleration is not used.

The value indicates the time to accelerate from 0% to 100% in uniform acceleration. The S-time is determined based on the relation to the acceleration/deceleration rate.

(Operation) When acceleration from 0 to 100% is done with the acceleration rate (CR_RATE_ACC)=T1(s) and the S-rate adjustment (CR_STYP_EN)=T2(s), the operation is as follows



$$\text{S-part acceleration time (T3)} = \frac{T2 \times T2}{2 \times T1}$$

$$\text{S-part acceleration (SP)} = \frac{T2 \times T2}{4 \times T1 \times T1} \times 100$$

$$\text{Acceleration time (T4)} = T1 + \frac{T2 \times T2}{4 \times T1}$$

(Operation example)

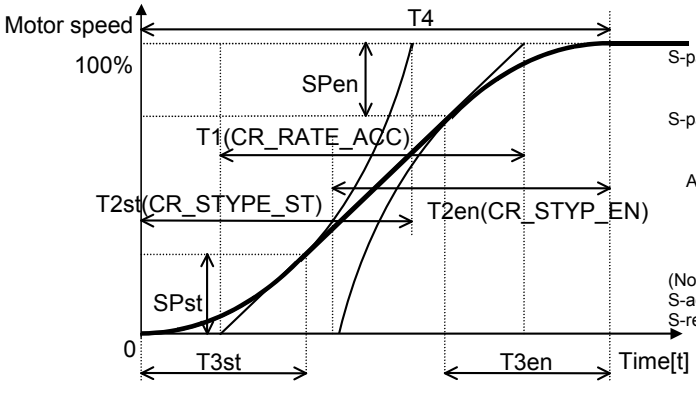
・CR_STYP_ST=CR_RATE_ACC×2
S-start speed: 0%, Acceleration time: 2 times CR_RATE_ACC

・CR_STYP_ST=CR_RATE_ACC
S-start speed: 75%, Acceleration time: 3/2 times CR_RATE_ACC

(Setting example)

To set SP (%) of S-acceleration for CR_RATE_ACC=T1(s), set CR_STYP_ST=2×T1×√SP

(Remark) If the S-rate adjustment (CR_STYP_ST) in the end side is also set, the acceleration time is as follows.



$$\text{S-part acceleration time (T3xx)} = \frac{T2xx \times T2xx}{2 \times T1}$$

$$\text{S-part acceleration (SPxx)} = \frac{T2xx \times T2xx}{4 \times T1 \times T1} \times 100$$

$$\text{Acceleration time (T4)} = T1 + \frac{T2st \times T2st}{4 \times T1} + \frac{T2en \times T2en}{4 \times T1}$$

(Note) If the step amount is small, or the S-adjustment is large and S-regions overlap, the S-regions become smaller according to the rate.

[Related parameters] CR_RATE_ACC, CR_RATE_DEC, CR_STYP_ENCS_AC_VOLT

Input rated voltage

Standard value: (2400, 4160, 4800, 6600, 13800 V) Set to rated transformer input voltage.

Limit: 0 ~ 15000 V

Sets the rated value for input voltage.

CS_AC_VOLT

Input rated voltage

Standard value: (2400, 4160, 4800, 6600, 13800 V) Set to rated transformer input voltage.
Limit: 0 ~ 15000 V
Sets the rated value for input voltage.

CS_CURR_SCALE

DeviceNet Transmission current scale

Standard value: (0)
Limit: 0 ~ 32767
Note: Initialize
Sets the DeviceNet transmission current scale.

$$\text{Scale} = 2^{\text{CS\_CURR\_SCALE}}$$

(Standard value)
In case of 1600 kVA – 4160V

$$\textit{Rated current peak value} = 222 \times \sqrt{2} = 314 < 2^9$$

Because this setting is the rated current peak value [A], set 9.
[Related parameters] COMM_TYPE

CS_DC_VOLT

Rated DC voltage

Standard value: (1650 V)
Limit: 0 ~ 6000 V
Sets the DC voltage.

CS_DEAD_TIME

Dead time

Standard value: (20.0 µs)
Limit: 0.0 ~ 122.0 µs
Note: Initialize
Sets the dead time. **Do not adjust this time.**

CS_DERATE

Temperature-high capacity reduction rate

Standard value: (100.0 %)
Limit: 0.0 ~ 100.0 %
Sets the reduction rate of load current for reducing speed when the device ambient temperature is high.
Set the reduction rate when the temperature increases 10°C taking 40°C as the standard.
(Example: When using 75% of the device rated capacity at 50°C, set CS_DERATE = 75%.)
To enable this set value, set FLG_SOFT_STALL to 1.
If the temperature-high capacity reduction function is working, B_SOFT_STL_(FLGSTS_MV1:bit11) is set to 0.
Set it to 100% if the temperature-high capacity reduction function is not used.
[Related parameters] FLG_SOFT_STALL

CS_EQUIP_CURR

Equipment rated current

Standard value: (Drive rating)
Limit: 0.0 ~ 3276.7 A
Note: Initialize
Sets the rated AC current [Arms] of the equipment.
[Related parameters] CS_MOTOR_CURR

CS_EQUIP_KVA

Equipment rated capacity

Standard value: (Drive rating)
Limit: 0.0 ~ 10000.0 kVA
Sets the rated capacity of the equipment
[Related parameters] CS_EQUIP_VOLT, CS_EQUIP_CURR

CS_EQUIP_VOLT

Equipment rated voltage

Standard value: (4160, 2400 V) Set to drive rating.
Limit: 0 ~ 32767 V
Sets the rated voltage of the equipment.

[Related parameters] CS_DC_VOLT

CS_F_PWM

PWM carrier frequency

Standard value: (2048Hz)
Limit: 1024 ~ 4096 Hz
Note: Initialize
Sets the PWM carrier frequency. **Do not adjust this frequency**.
[Related parameters] DEAD_T_CMP, CS_DEAD_TIME

CS_FRAME_SIZE

Equipment frame size

Standard value: (Drive frame size)
Limit: 0 ~ 4000 frame
Note: Initialize
Sets the equipment frame size in the unit of frame.

CS_HCT_CURR

HCT rated current

Standard value: (Hardware dependant)
Limit: 0 ~ 32767 A
Note: Initialize

Sets the HCT rated current (current when HCT outputs 10 V). CS_HCT_CURR = [(10V)/($R_{Fbk\ resistor}$)] x (1/HCT Ratio)] (AD_GS0 and AD_GS1 are to set to 1000counts)

Example: 112A drive (CS_EQUIP_CURR = 112A), 50Ω resistor, 100mA/200A HCT

[(10)/(50)] x (200/0.1) = 400A

[Related parameters] CS_FRAME_SIZE, CS_HCT_TURN

CS_HCT_TURN

HCT turn count

Standard value: (1)
Limit: 0 ~ 32767 turns
Note: Initialize

Sets the number of HCT wiring turns. **This parameter should always be set to 1**.
[Related parameters] CS_FRAME_SIZE, CS_HCT_CURR

CS_KS_FAI

Rated flux value

Standard value: (100.0%)
Limit: 20.0 ~ 100.0%
Note: Initialize

Sets the rated flux value

CS_MIN_PULSE

Minimum pulse width

Standard value: (0.0 µs)
Limit: 0.0 ~ 122.0 µs
Note: Initialize

Sets the minimum pulse width. Not currently used. This should always be set to 0.0.

CS_MOTOR_CURR

Motor rated current

Standard value: (Set to the motor full load current)
Limit: 0.0 ~ 3276.7 A
Note: Initialize

Sets the motor rated current.
If field weakening is used, the motor current at the base speed should be set.
[Related parameters] CS_EQUIP_CURR

CS_MOTOR_FREQ

Motor rated frequency

Standard value: (Set to the motor rated frequency)
Limit: 0.0 ~ 200.0 Hz

Sets the motor rated frequency that is equivalent to the motor top frequency.

CS_MOTOR_POLE

Number of motor poles

Standard value: (Set to the number of motor poles)
Limit: 0 ~ 18 poles
Note: Initialize
Sets the number of motor poles.
When the motor has 4 poles, set 4.

CS_MOTOR_RPM

Motor rated speed

Standard value: (Set to the motor rated synchronous RPM)
Limit: -25000.0 ~ 25000.0 min^{-1}
Note: Initialize
Sets the motor rated speed (revolutions per minute). Set to the motor rated full load RPM if slip compensation is used.

CS_MOTOR_VOLT

Motor rated voltage

Standard value: (Set to the motor rated voltage)
Limit: 0 ~ 32767 V
Sets the rated voltage at the motor top speed.

CS_PGCNT

PG input pulse count

Standard value: (1024 P/rev)
Limit: 64 ~ 32767 P/rev
Sets the input pulse count per revolution of PG pulse input.
When the PG pulse input is to be speed feedback, set CS_PGOUT = 0.
Select a pulse count so that the maximum frequency will be 10 kHz or less.
Setting of CS_PGCNT is ignored in using no PG.
[Related parameters] CS_PGOUT

CS_PGOUT

PG output pulse count

Standard value: (0 P/rev)

Limit:

Sets the output pulse count per revolution of PG pulse output.

To use the PG, set zero.

When the resolver for speed measurement is not used, set zero, too.

When $CS\_PG\_OUT \neq 0$, the speed feedback from the resolver is converted to the PG pulse before being externally output.

When $CS\_PG\_OUT = 0$, the PG input pulse is output externally as it is (the resolver is unusable).

CS_PGOUT	Output Pulse [P/rev]	
	CS_RES_TYPE (The number of resolver poles)	
	4	1
4096	4096	64
2048	2048	64
1024	1024	1024
512	512	512
256	256	256
128	256	128
64	256	64
0	PG	
Other than above	256	64

[Related parameters] CS_PGCNT

CS_PT_VOLT

PT input voltage setting

Standard value: (2400, 4200, 4800, 7200, 14400 V) Set to PT primary rating

Limit: 0 ~ 15000 V

Sets the PT primary rated voltage for input voltage feedback.

CS_RES_DGFLT

R/D conversion position detection signal filter time constant

Standard value: (1000 µs)
Limit: 125 ~ 16000 µs
Note: Initialize

Sets the digital filter time constant of the position detection signal by R/D conversion.

CS_RES_DGFLT	Filter time constant [µs]
16000	16000
8000	8000
4000	4000
250	250
125	125
Other than above	125

CS_RES_TYPE

Number of resolver poles

Standard value: (1)
Limit: 1 ~ 4
Note: Initialize

Sets the number of poles of the resolver.
1 = 1x resolver
4 = 4x resolver
Others = 4x resolver
When the PG is used as a speed sensor, set 1.
When using the (4x) resolver, please do not use resolver off-center clear P1 and P2 phase adjust gains.
When CS_RES_TYPE = 4, Set OP_RDCMP_G1 = 0
OP_RDCMP_G2 = 0

CS_SP_BASE

Base speed

Standard value: (125.0%)
Limit: 8.0 ~ 125.0%

Sets the base speed
When field weakening is not used, set to 125.0%. When field weakening is used, set to the percent of top speed that represents base speed.

CS_SRC_FRQ

Power source (Utility) frequency setting
Standard value: (60 Hz)
Limit: -80 ~ 80 Hz
Sets the power source (Utility) frequency.

CS_VAC_MIN

Input voltage low detection level

Standard value: (90.0 %)
Limit: 0.0 ~ 100.0 %
Sets the input voltage low detection level.
When the input voltage decreases below the input voltage low detection level, the output voltage is reduced.
[Related parameters] FLT_FLX_LMT

CS_VF_MODE

V/f control mode selection

Standard value: (0)
Limit: 0 ~ 2
Set V/f control mode as shown in below table.
[Related parameters] VF_CURVE_GAIN, CR_FP1 ~ CR_FP5, CR_VP1 ~ CR_VP5

CS_VF_MODE	Control Mode	Explanation
0	V/f constant mode	This mode is that ratio of voltage and frequency is constant.
1	V/f square function mode	This mode is that ratio of voltage and frequency is expressed with square function. VF_CURVE GAIN sets gain of square function.
2	V/f 5 points mode	This mode is that ratio of voltage and frequency is expressed polygonal lines defined by 5 points. 5 points are set by CR_FP1 ~ CR_FP5 and CR_VP1 ~ CR_VP5.

*

Starting Voltage boost (VF_LSP_VBST) and auto torque boost function (MI_R1_SET, MI_L_CMP, MI_ID_BASE, VF_TQQBST_GAIN) is available in every mode.

CS_VOLT_RANK

Equipment rated output voltage rank setting

Standard value: (4000V for five level drive, 2000V for three level drive)
Limit: 0,2000,4000 V
Sets the voltage rank of the equipment rated output.

CS_VOLT_SCALE

DeviceNet transmission voltage scale

Standard value: (0)
Limit: 0 ~ 32767
Note: Initialize
Sets the transmission voltage scale.

$\text{Scale} = 2^{\text{CS\_VOLT\_SCALE}}$

When the rated voltage is 4160 V, set 13 because $4160 < 2^{13}$.
[Related parameters] COMM_TYPE

3.3 Parameter D~

DA_AS_PRT_OFF

D/A output address protection disabling flag

Standard value: (0000 H)
Limit: 0000 ~ 00FF H
Note: Not used. D/A address protection always disable at any values of this parameter.

Disables the output address protection for the measuring D/A 5 channels and general D/A 3 channels. Lower 8 bits correspond to address symbols as shown below. The corresponding address protection can be disabled by setting 1 to each bit.

Bit	Corresponding address symbol
0	DA1_AS
1	DA2_AS
2	DA3_AS
3	DA4_AS
4	DA5_AS
5	AOUT1_OP_AS
6	AOUT2_OP_AS
7	AOUT3_OP_AS

[Related parameters] DA1_AS ~ DA5_AS, AOUT1_OP_AS ~ AOUT3_OP_AS

DA_LMT_OFF

D/A output limit disabling flag

Standard value: (0000 H)
Limit: 0000 ~ 00FF H

Disables the output limit of the measuring D/A 5 channels and general D/A 3 channels. Lower 8 bits correspond to channels symbols as shown below. The corresponding output limit of channels can be disabled by setting 1 to each bit.

Bit	Corresponding D/A channels
0	Measuring D/A 1 ch
1	Measuring D/A 2 ch
2	Measuring D/A 3 ch
3	Measuring D/A 4 ch
4	Measuring D/A 5 ch
5	General D/A 1 ch
6	General D/A 2 ch
7	General D/A 3 ch

DA1_AS ~ DA5_AS

D/A1~5 analog output address

Standard value: (DUST)

Limit:

DA1_GS ~ DA5_GS

D/A1~5 analog output gain

Standard value: (0)

Limit:

DA1_OS ~ DA5_OS

D/A1~5 analog output offset

Standard value: (0)

Limit:

Sets the address, gain and offset of the Measuring analog output (5 channels).

$$\text{DA output} = \frac{\text{DA\_ASn value} + \text{DA\_OSn}}{\text{DA\_GSn}} \times 10$$

n = 1 ~ 5

DA output [V]

Normally, DA1_AS – DA5_AS are protected from erroneous settings. To disable protection, set 1 to the corresponding bit of DA_ASA_PRT_OFF. See the Item DA_AS_PRT_OFF for details.

[Related parameters] DA_AS_PRT_OFF

DATA_STS

Parameter bank information

Standard value: (0)

Limit:

Used in order to discriminate whether it is which setting parameter for A or B bank in shared motion. Set 0 in the case of the setting parameter for A bank, and set 1 in the case of the setting parameter for B bank.

DEAD_T_CMP

Dead time compensation value

Standard value: (1342)

Limit: 0 ~ 16383

Sets the dead time compensation value. **Do not adjust this setting.**

16384 count corresponds to 100% (PWM carrier width).

Sets as follows:

$$DEAD\_T\_CMP = CS\_DEAD\_TIME \times CS\_F\_PWM \times 10^{-6} \times 2^{15}$$

In case CS_DEAD_TIME=20us and CS_F_PWM=2048Hz, DEAD_T_CMP = 1342.

[Related parameters] CS_F_PWM, CS_DEAD_TIME

DI_G

Digital input group selection

Standard value: (0)
Limit: 0 ~ 3

Sets the application group for DI auto-setting. Each DI auto-setting is enable only when the individual DI index setting (Dix_IX) is “0”.

DI channel	DI_G			
	0	1	2	3
DI7	2S	SPA1	SPA2	2S
DI6	EXRST	EXRST	EXRST	EXRST
DI5	SPA1	IM_NUM_B1	SPA1	SPA1
DI4	IM_NUM_B0	IM_NUM_B0	IM_NUM_B0	IM_NUM_B0
DI3	M_FN_	SEL_DI	M_FN_	CPT
DI2	SPA2	EXT1	STOP0_DI	XFR
DI1	EXT0	EXT0	START0_DI	ASD
DI0 (Fixed)	UVS	UVS	UVS	UVS

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nerally, it can be used as follows;

DI_G ; Applications
0 ; Normal one or two motor drive application
1 ; Multi-Motor (4 motor) selection, Local/Remote control
2 ; Start/Stop two command
3 ; Synchronous transfer/capture

It can be modify for variable application. In case 4 motor synchronous transfer application, set DI_G=3, and set only DI5 as “3S” (Refer the table in “Dix_IX”).

DI1_BN ~ DI7_BN

Digital input data storing bit

Standard value: (0)
Limit: 0 ~ 15

DI1_IX ~ DI7_IX

Digital input data storing code

Standard value: (0)
Limit: 0 ~ 5

Sets the 7 channel data storing bits excluding a general-purpose 0 ch digital input (UVS only) among 8 channel general-purpose digital input signals.
DIn_IX specifies each digital input assignment bit in the symbol DI_EX1 ~ DI_EX5. When 0 is specified, DI signal of that channel cannot be assigned in any of DI_EX1 ~ DI_EX5. DIn_BN specifies the assignment bit of each digital input corresponds to which bit of DI_EXm counted from LSB.
(Example) When assigning the general digital input 1 ch to “EXT” in the 14th bit of DI_EX1.
Set 1 to DI1_IX and set 14 to DI1_BN.

BIT	DI_EX1	DI_EX2	DI_EX3	DI_EX4	DI_EX5
F	IL_	N.U.	QSTOP	MV_JOG_B3	RATE_CHG
E	UVS	N.U.	UVS	MV_JOG_B2	N.U.
D	EXT0	N.U.	EXT0	MV_JOG_B1	N.U.
C	SPA1	SPA4	CM_BUF1	MV_JOG_B0	N.U.
B	BRTST	SPA3	CM_BUF2	EX_LMT_I1	N.U.
A	ST	SPA2	ST	EX_LMT_TR	N.U.
9	F	BLA_	F	SP_UP_DI	N.U.
8	R	M_FN_	R	SP_DN_DI	N.U.
7	3S	OH_ACL_	3S	SEL_DI	N.U.
6	2S	E_DRIVE	2S	DIR0_DI	N.U.
5	B	HOLD	N.U.	DIR1_DI	ASD
4	FLD	QSTOP	FLD	START0_DI	IM_NUM_B1
3	BC_	F_LMT_	LATCH_PG_POS	START1_DI	IM_NUM_B0
2	SPA0	R_LMT_	SPA0	STOP0_DI	XFR_CHK
1	EXRST	B_HLTY	EXRST	STOP1_DI	CPT
0	R_TEN	BA	R_TEN	EXT1	XFR

DNET_BAUD

DeviceNet transmission baud rate

Standard value: (0)
Limit: 0 ~ 2
Note: Initialize
Set as follows:

DNET_BAUD	Transmission baud rate [kbps]
0	125
1	250
2	500

[Related parameters] COMM_TYPE

DNET_CODE

DeviceNet transmission code setting

Standard value: (0)
Limit: 0 ~ 2
Note: Initialize, Not used
[Related parameters] COMM_TYPE

DNET_M_MACID

DeviceNet Transmission master MAC ID

Standard value: (0)
Limit: 0 ~ 63
Note: Initialize
Sets DeviceNet Transmission master MAC ID
[Related parameters] COMM_TYPE

DNET_MACID

DeviceNet Transmission MAC ID

Standard value: (0)
Limit: 0 ~ 63
Note: Initialize
Sets the DeviceNet transmission MAC ID.
[Related parameters] COMM_TYPE

DNET_OPTION

DeviceNet Transmission option setting

Standard value: (1)
Limit: 0, 1
Note: Initialize
Set 0 to disable the operation until the reset signal is received after a transmission fault has occurred in DeviceNet and even if the transmission fault has been corrected.
[Related parameters] COMM_TYPE

DNET_PRC_GAIN

Transmission process input gain

Standard value: (1)
Limit:
Note: Initialize
Sets the transmission process input gain.
The transmission receiving data is converted by the equation below, and to be the process reference

$$\text{PROSESS\_REF} = \frac{\text{DNET\_PRC\_GAIN}}{2^{\text{DNET\_PRC\_GAIN}} \times 1} \times \text{transmission receiving data}$$

N = DNET_PRC_SCALE
[Related parameters] COMM_TYPE

DNET_PRC_GAIN2

DeviceNet Transmission process output gain

Standard value: (1)
Limit:
Note: Initialize
Sets the transmission process output gain.
The transmission sending data is converted by the equation below, and to be the process output

$$\text{PROSESS\_OUT} = \frac{2^{\text{DNET\_PRC\_SCALE}} \times 1}{\text{DNET\_PRC\_GAIN2}} \times \text{transmission sending data}$$

N = DNET_PRC_SCALE
[Related parameters] COMM_TYPE

DNET_PRC_SCALE

DeviceNet Transmission process scale

Standard value: (0)
Limit:
Note: Initialize
Sets the transmission process scale.

$$\text{Scale} = 2^{\text{DNET\_PRC\_SCALE}}$$

This scale should be set so that the process output and input data are in the range of -32768 ~ 32767.
[Related parameters] COMM_TYPE

DNET_RD_AS

DeviceNet Transmission monitor address setting

Standard value: (0)
Limit:
Note: Initialize, Not used
[Related parameters] COMM_TYPE

DNET_SERIAL_NO

DeviceNet Transmission serial number

Standard value: (0)
Limit: 0 ~ 32767
Note: Initialize
Sets the transmission serial number of the DeviceNet PWB.
[Related parameters] COMM_TYPE

DNET_SP_SCALE

DeviceNet Transmission speed scale

Standard value: (4)
Limit: -128 ~ 127
Note: Initialize
Sets the transmission speed scale.

$$\text{Scale} = 2^{\text{DNET\_SP\_SCALE}}$$

This setting (N) scales SP_F (converted [min^{-1}]) for the transmission output data by (× Scale).
The transmission data are as follows. Set those data to be in the range of -32768 ~ 32767.

$$\text{Transmission gain} = 25000 \times \frac{10}{\text{CS\_MOTOR\_RPM}}$$

$$\text{Transmission output data} = \frac{\text{SP\_F}}{\text{Transmission gain}} \times 2^{\text{DNET\_SP\_SCALE}}$$

$$\text{SP\_REF1} = \text{Transmission input gain} \times \text{transmission gain} \times \frac{1}{2^{\text{DNET\_SP\_SCALE}}}$$

CS_MOTOR_RPM: Motor revolution [x 0.1 min^{-1}]
SP_F: Speed feedback [25000/100%]
SP_REF_AIN1: Speed reference [25000/100%]
[Related parameters] COMM_TYPE

DNET_TR_SCALE

DeviceNet Transmission torque scale

Standard value: (2)
Limit: -128 ~ 127
Note: Initialize

Sets the transmission torque scale.

$$\text{Scale} = 2^{\text{DNET\_TR\_SCALE}}$$

This setting (N) scales (x scale) T_R (converted [N•m]) for the transmission output data.
The transmission data are as follows. Set the transmission input data to be in the range of -32768 ~ 32767.

$$\text{Transmission gain} = \frac{4 \times \text{CS\_MOTOR\_RPM} \times \text{CS\_SP\_BASE}}{974 \times \frac{\text{MA\_MOTOR\_KW}}{10} \times 98}$$

$$\text{Transmission output data} = \frac{\text{T\_R}}{\text{Transmission gain}} \times 2^{\text{DNET\_TR\_SCALE}}$$

$$\text{TENS\_R1} = \text{Transmission input data} \times \text{Transmission gain} \times \frac{1}{2^{\text{DNET\_TR\_SCALE}}}$$

CS_MOTOR_RPM: Motor revolution [x 0.1 min^{-1}]
MA_MOTOR_KW: Motor rated output [x 0.1 kW]
T_R: Torque reference [4000/100%]
TENS_R1: Tension control torque reference [4000/100%]
[Related parameters] COMM_TYPE

DO_G

Digital output group selection

Standard value: (0)
Limit: 0 ~ 3

Sets the application group for DOI auto-setting. Each DO auto-setting is enable only when the individual DO index address setting (DOx_AS) is “DO_AUTO_SET”.

DO channel	DO_G			
	0	1	2	3
DO_TR1 (Fixed)	READY_DO			
DO_TR2 (Fixed)	FAULT			
DO_RY1 (Fixed)	ASD_EN			
DO_RY2 (Fixed)	PRE_CTT_CMD			
DO5	BLR_DO	BLR_DO	BLR_DO	BLR_DO
DO4	SP_LOST	SP_LOST	SYNC	SYNC
DO3	SP_RCH	SP_RCH	CPT_READY	CPT_READY
DO2	SOFT_STL	REMOTE	ACSW_CMD_DO	ACSW_CMD_DO
DO1	ALARM	ALARM	ALARM	SP_RCH
DO0	UV_DO	UV_DO	UV_DO	SP_LOST

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nerally, it can be used as follows;

DO_G ; Applications
0 ; Common application with soft stall
1 ; Common application with Local/Remote identification
2 ; Common Synchronous transfer/capture
3 ; Synchronous transfer/capture with speed reach, speed reference lost detection

DO0_AS ~ DO5_AS

General digital output address

Standard value: (As required by the application)
Limit:

DO0_BN ~ DO5_BN

General digital output bit

Standard value: (As required by the application)
Limit: 0 ~ 15

Sets the output bits of general digital output (6 channels).
Specifies which bit outputted by DOn_BS corresponds to the symbol including bit outputted in each DO channel by DOn_AS.

3.4 Parameter F~

FLGSET01

Integrated flag setting 1
Standard value: (2000)
Limit:
Sets the parameters. See the table below for details.

BIT	Abbreviation	Content
F	FLG_PSF_CLR	PSF failure will be cleared in case STCMD is down
E	FLG_SPA_T_G10	TIME_SPAx 10 times gain is available
D	FLG_LOWV_WPI_	Low voltage frequency PI control hold is enable. **Keep set to "0". Do not use.**
C	N.U.	Not used
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	N.U.	Not used
6	N.U.	Not used
5	N.U.	Not used
4	N.U.	Not used
3	N.U.	Not used
2	N.U.	Not used
1	N.U.	Not used
0	VEC_VF_CHG	Control mode switch. **Keep set to "0". Do not use!**

FLGSET31

Integrated flag setting 31
Standard value: (4000)
Limit:
Sets the parameters. See the table below for derails.

BIT	Abbreviation	Content
F	FLG_PCTT_UVS	PRE_CTT_CMD will be independent from UVS condition
E	FLG_LOWV_OS	Rectangle voltage offset in low voltage control
D	N.U.	Not used
C	N.U.	Not used
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	N.U.	Not used
6	N.U.	Not used
5	N.U.	Not used
4	N.U.	Not used
3	N.U.	Not used
2	N.U.	Not used
1	N.U.	Not used
0	N.U.	Not used

FLG_BP_CUR_USE

Utility side current detection usage flag
Standard value: (1)
Limit: 0, 1
Set 1 if utility current detection is used upon utility synchronization control.
[Related parameters] CP_OC_UTL

FLG_CHGSYS

Setting value changeover control selection flag
Standard value: (0)
Limit:
Sets whether the setting value changeover control is used or not. To input the setting value changeover signal with DI, set 12345 to FLG_CHGSYS. To input the setting value changeover signal through serial transmission, set 6789 to FLG_CHGSYS. When any other values are set, the setting value changeover control does not work.
[Related parameters] ASPR_G_SEL

FLG_CURSET_OFF

Current feedback-related auto setting disabling flag

Standard value: (12345)
Limit:
Sets whether the current feedback-related automatic setting for CP_OCA etc. by CS_FRAME_SIZE is enabled or disabled. When 12345 is set to FLG_CURSET_OFF, automatic setting is disabled and CP_OCA etc. can be set manually. **This function must never be enabled for the T300MVi/MTX.**
[Related parameters] CS_FRAME_SIZE, CS_VOLT_RANK, CP_OCA, CS_HCT_CURR, CS_HCT_TURN, LMT_I1_LOWF

FLG_DI_DATA1_SEL

DI_DATA1 input data selection flag

Standard value: (0)
Limit: 0, 1
Note: Initialize
Changes the data as follows to enter data to DI_DATA1:
0 = A logical AND operation is applied between DI_EX1 and SERSEQDATA1 but a logical OR operation is applied to BIT(1)EXRST.
1 = A logical AND operation is applied between DI_EX3 and SERSEQDATA2 but a logical OR operation is applied to BIT(1)EXRST.
[Related parameters] DI1_IX ~ DI7_IX, DI1_BN ~ DI7_BN, MSK_DI1, MSK_SERSEQDATA1

FLG_DSCAN

Drive-to-drive transmission

Standard value: (0)
Limit: 0, 1
Note: Initialize
To transmit data between drives, set 1.
[Related parameters] COMM_TYPE, TL_OP1_DT ~ TL_OP4_DT, TL_OP1_ST ~ TL_OP4_ST, SCAN_RCV7_AS ~ SCAN_RCV10_AS

FLG_EXRST

Remote reset request change flag

Standard value: (0)
Limit: 0, 1
Sets the reset range when the remote reset signal (EXRST) is entered.
0 = Resets all fault signals (same as the reset operation on the panel).
1 = Resets the overload, master station transmission errors, current limits etc.

FLG_FAULT

Transmission fault automatic reset disabled

Standard value: (1)
Limit: 0, 1
Set 1 to disable the operation until the reset signal is received after a transmission fault has occurred in TL_S20 and even if the transmission fault has been corrected.
When FLG_FAULT = 0, TL_F3 (failure of PLC station) and TL_F4 (failure of transmission between drives) are, at the only case of not operating, automatically reset after the transmission fault has been corrected.
[Related parameters] MSK_UV2, MSK_READY1, MSK_HFD2

FLG_HB_DOWN

Heartbeat down selection

Standard value: (0)
Limit: 0, 1
Set 1 when heartbeat is used for detecting transmission fault 3 (PLC station failure)
[Related parameters] MSK_UV2, MSK_READY1, MSK_HFD2, TIME_HB_DOWN

FLG_IPLL_RESTART

Inverter output voltage PLL restart enable flag
Standard value: (0)
Limit: 0, 1
Set 1 when inverter output voltage PLL is used for flying restart. IPLL restart will be enabled when the motor residual voltage is over LVL_VF_LOW.
[Related parameters] LVL_VF_LOW, IPLL_P, IPLL_W1, FLT_IPLL

FLG_MRH_CLR

EOI Reference Clear When Stopped Flag

Standard value: (0)
Limit: 0, 1
Set 1 toset speed reference to zero after the motor is stopped with "STOP" key when running from the MVi-EOI..

FLG_MV_JOG

Jog function selection

Standard value: 0
Limit: 0, 1
Sets selection of the jog function.
If this is set to 0, jog operation is done with the jog speed reference set in CR_JOG_FJ1S ~ FJ3S, CR_JOG_RJ1S ~ RJ3S.
If this is set to 1, jog operation is done with the jog speed reference set in CR_SP00 ~ CR_SP15.
(In this case, the signals 2S, 3S are invalid. FJ is used for forward rotation, and RJ for reverse rotation.)

FLG_MV_NET_DI

Digital input transmission selection for the single function

Standard value: (0)
Limit: 0, 1
When writing data to the digital input signal (DI_EX4) via transmission, set 1.
For bit allocation of the digital input signal (DI_EX4), refer to MSK_DI_EX4.

FLG_OS_ADJ_OFF

Current analog feedback offset auto-adjust off flag

Standard value: (1)
Limit: 0, 1
Set 1 to turn off the function that adjust offset of current analog feedback automatically.

FLG_PSFRCV

Power supply failure recovery flag

Standard value: (0)
Limit: 0, 1
When using the power failure recovery function, set 1.

FLG_RATE_READY

Speed rate calculation flag

Standard value: (0)
Limit: 0, 1

Set 1 when the condition for executing speed rate calculation should be (READY on) or (RNFLG on).
Set 0 when the condition should be (RNFLG on).
In this case, for example, when BA = 0 (brake close).

FLG_SL_DB

DC brake control enable flag

Standard value: (0)
Limit: 0, 1

When using DB, set 1.
Set 1 to use DC brake control.
[Related parameters] MI_R1_SET, SL_I_DB, TIME_FOFF

FLG_SL_IM_N_DET

Parallel motor detection enable flag

Standard value: (0)
Limit: 0, 1

When multiple motor operation is used and detection of the number of motors is required, set 1.
[Related parameters] OP_IM_NUM_1, OP_IM_NUM_2, OP_IM_NUM_3, SL_FLT_N

FLG_SL_MON_SP_N

Monitor speed reversing

Standard value: (0)
Limit: 0, 1

When reversing the sign of measuring speed, set 1.

FLG_SOFT_STALL

Overload auto speed reduction selection

Standard value: (0)
Limit: 0, 1

Set to 1 when Soft Stall is to be used.
[Related parameters] CR_SOFT_STALL

FLG_SP_BASE2

2-step field weakening selection flag

Standard value: (0)
Limit: 0, 1

When weakening the magnetic field in two steps, set 1. A changeover instruction is entered by SPA1.

FLG_SP_LOST_EN

Speed maintenance at external speed reference loss detection selection

Standard value: (0)
Limit: 0, 1

When maintaining the current speed reference if external speed reference loss is detected, set 1.
[Related parameters] CP_SP_LOST

FLG_SP_R_JP

Rate jump selection

Standard value: (0)
Limit: 0, 1

When the speed reference passes the frequency jump region, it changes in steps so that the internal speed reference does not enter the jump region.
[Related parameters] CR_SP_JP1 ~ 3

FLG_SP_RCH

Speed follow/speed reach changeover flag

Standard value: (0)
Limit: 0, 1

When the speed follow function is selected, set to 0, and when the speed reach function is selected, set to 1.
[Related parameters] CR_SP_RCH, CR_SP_RCH_BAND, TIME_SP_RCH

FLG_STOP_MODE

Stop key effective mode flag

Standard value: (0)
Limit: 0, 1

Set to 1 when the stop command for the current operation mode only is to be used. Set to 0 to allow any stop command, regardless of the operation mode, to stop the drive. This function only works for 3-wire control.

FLG_SYNC_TRB

Utility synchronization trace back save flag
Standard value: (0)
Limit: 0, 1

Set 1 when trace back is to be collected upon utility synchronization transfer.

FLG_WVU

Inverter phase order reverse flag

Standard value: (0)
Limit: 0, 1
Note: Initialize

When this flag is set to 0, the drive will output U-V-W phase rotation when operating in the forward direction. When set to 1, the drive output phase rotation will be reversed.
[Related parameters] CS_MOTOR_RPM

FLG_XFR_RETRY

Utility synchronization transfer retry permission flag
Standard value: (0)
Limit: 0, 1

Set 1 to permit only one retry operation when transfer fails in utility synchronization transfer.
If the retry fails, a trip or alarm output with continued operation occurs depending on the mask setting of the sequence.
[Related parameters] MSK_BLR3, MSK_LFD1

FLT_CNV_FO
Utility frequency detection filter
Standard value: (1.0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Set the filter for θ used for frequency detection in the utility side.

FLT_FLX
Flux filter
Standard value: (10.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Set 0 when the filter is not used.

FLT_FLX_LMT
Flux limit value filter
Standard value: (100.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets the filter time constant to control reduction of output voltage upon input voltage low.
Set it to 0 if no filter is used.
[Related parameters] CS_VAC_MIN

FLT_FO
Inverter frequency detection filter
Standard value: (50.0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Set the filter for speed detection for utility synchronization transfer.

FLT_IGR
Ground current filter
Standard value: (3.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets the time constant of the grounding current feedback filter. When filter is not used, set 0.

FLT_IPLL
Inverter output voltage PLL filter
Standard value: (300.0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Set the filter for phase difference upon utility synchronization capture and for IPLL Restart.
[Related parameters] LVL_VF_LOW, IPLL_P, IPLL_W1, FLG_IPLL_RESTART

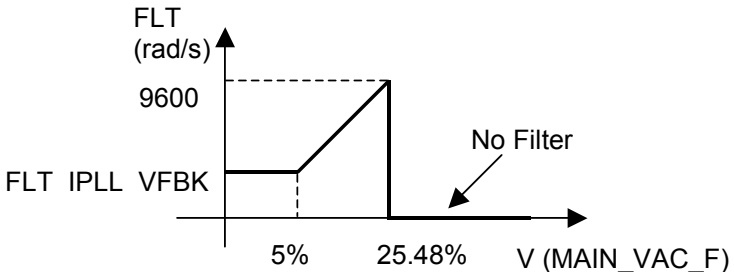
FLT_IPLL_FLX
Motor flux feedback filter for FSEEK restart
Standard value: 20.0 rad/s
Limit: 0.0 ~ 1023.9rad/s
Set the filter time constant for inverter flux feedback filter for FSEEK restart.
The filter becomes invalid while driving the inverter.
[Related parameters] FLT_IPLL_VFBK, FSEEK_LOW_FREQ, FSEEK_ID_RATE, FLG_IPLL_RESTART

FLT_IPLL_HIGAIN

Inverter voltage PLL gain switch determination filter
Standard value: (0.0 rad/s)
Initial value: (300.0 rad/s)
Limit: 0.0 ~ 1023.9rad/s
Set the filter time constant for inverter voltage PLL upon gain magnification switch determination.
If filter is not used, sets 0.
[Related parameters] IPLL_PI_MUL, LVL_IPLL_HIGAIN

FLT_IPLL_VFBK

Inverter voltage feedback low voltage filter for PLL restart
Standard value: 100 rad/s
Limit: 0 ~ 10239rad/s
Set the filter time constant for inverter voltage feedback filter for PLL restart.
The filter time constant changes according to output voltage (MAIN_VAC_F).
The filter becomes invalid above 25.48% feeback.



FLT_PG_SP_ERR

PG speed compensation filter
Standard value: (0.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets the time constant of PG speed compensation filter. When filter is not used, set 0.

FLT_PLL

Utility voltage phase-locked loop angle filter
Standard value: (50.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Note: Not used
Sets the time constant of the utility voltage phase PLL filter. When filter is not used, set 0.

FLT_SP

Speed feedback filter
Standard value: (150.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Set 0 when the filter is not used.

FLT_SYNC_V_G

Utility synchronization motor voltage adjustment filter
Standard value: (20.0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Set the filter for gain to adjust inverter output voltage upon utility synchronization transfer and capture.

FLT_VAC_PRO

Filter time constant for input voltage low protection
Standard value: (154.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets the filter time constant of input voltage detection for power failure detection.

FLT_VDC_F

DC voltage feedback filter
Standard value: (10.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Set 0 when the filter is not used.

FLT_VFBK

Output voltage feedback filter
Standard value: (500.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Set the filter time constant of output voltage feedback.

FLT_XFR

Utility synchronization motor voltage adjustment filter
Standard value: (1000.0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Set the filter for phase difference upon utility synchronization transfer.

FSEEK_LOW_FREQ

Freerun motor speed detection lower limit frequency
Standard value: 2.0 % (For flying restart), 0.0% (Others)
Limit: 0.0 ~ 100.0 %
Note: Available in firmware version 09 series or later, and in FLG_IPLL_RESTART=1.
Sets lower limit frequency of coast motor speed detection in FSEEK flying restart. Coast motor speed is considered to zero if actual speed of coast motor is lower than this setting.
[Related parameters] FLT_IPLL_FLX, FLT_IPLL_VFBK, FLG_IPLL_RESTART

3.5 Parameter G~

G_IBC_I

Output current balance control integral gain
Standard value: (500)
Limit: -32768 ~ 32767
Set the integral gain to adjust inverter output current to be balanced each three phases.

G_IBC_P

Output current balance control proportional gain
Standard value: (600)
Limit: -32768 ~ 32767
Set the proportional gain to adjust inverter output current to be balanced each three phases.

G_XFR_I

Utility synchronization motor voltage adjustment integral gain
Standard value: (5.00 rad/s)
Limit: 0 ~ 327.67 rad/s
Set the integral gain to adjust inverter output voltage to utility one upon utility synchronization transfer.

GAIN_QCMP_I

Current detection delay compensation gain
Standard value: (500)
Limit: -31999 ~ 31999
Sets the current detection delay compensation gain.

GAIN_QCMP_V

Operation time delay compensation gain
Standard value: (900)
Limit: -31999 ~ 31999
Sets the operation time delay compensation gain.

3.6 Parameter I~

INF_DBREV

Database revision

Standard value: (0)
Limit: 0 ~ 9
Sets the revision number of database. Do not adjust.

INF_JOBNO

Job number, item number

Standard value:
Limit:
Toshiba's job number and items number constituting the order number are set. Do not use.

INF_M_TYPE

Type code

Standard value: (Automatic setting)
Limit:
Note: Automatic setting
The type code of database is automatically set.
Please do not change this setting.

INF_MEMO

Memo

Standard value: (Generally the project number and serial number of the drive is stored here.)
Limit:
Writes memo.
This setting is used by the tool.

INF_PANEL

Panel name

Standard value:
Limit:
Sets the panel name. Do not use.

INF_SOFTVER

Software version

Standard value: (Automatic setting)
Limit:
Note: Automatic setting
Software version is automatically recorded.
Please do not change this setting.

INF_TAG

Tag

Standard value:
Limit:
Please do not change this setting. Do not use.

INF_TEMPLATE_NO

Setting value template number

Standard value: (0)
Limit: 0 ~ 41
Sets the template of setting value.

INF_TIME_DAY, INF_TIME_HOUR, INF_TIME_MIN, INF_TIME_MONTH, INF_TIME_SEC, INF_TIME_YEAR

Parameter setting storage time

Standard value: (Automatic setting)
Limit:
Note: Automatic setting
The time when parameter setting value was stored in EEPROM is automatically recorded.
Please do not change these setting.

INF_TITLE

Parameter setting storage title

Standard value:
Limit:
The title used when the parameter setting was stored in EEPROM is recorded.

IPLL_P

Inverter output voltage PLL proportional gain
Standard value: (10)
Limit: 0 ~ 32767
Set the proportional gain of Inverter output voltage PLL used for utility synchronization capture and IPLL restart.
[Related parameters] FLT_IPLL, IPLL_W1, FLG_IPLL_RESTART

IPLL_PI_MUL

Induction voltage PLL gain mutiplier
Standard value: (100.0%)
Initial value: (300.0%)
Limit: 0.0 ~ 3276.7%
Set the gain magnification of inverter voltage PLL.
When phase difference of induction voltage PLL (IPLL_DLTQ) exceeds LVL_IPLL_HIGAIN, proportion gain (IPLL_P) and integral gain (IPLL_W1) of inverter voltage PLL are multiplied by IPLL_PI_MUL.
If gain switch is not used, sets LVL_IPLL_HIGAIN=90deg.
[Related parameters] FLT_IPLL_HIGAIN, IPLL_P, IPLL_W1, LVL_IPLL_HIGAIN

IPLL_W1

Inverter output voltage PLL response gain
Standard value: (3,00 rad/s)
Limit: 0 ~ 327.67 rad/s
Set the response gain of Inverter output voltage PLL used for utility synchronization capture and IPLL restart.
[Related parameters] FLT_IPLL, IPLL_P, FLG_IPLL_RESTART

3.7 Parameter K~

KPAD_PRIVILEGE

EOI access privilege level.

Standard value: 2
Limit: 0 ~ 2

Sets the access privilege level for the MVi-EOI .

Setting	Explanation
0	Disables all function except monitoring.
1	Allows monitoring and drive operation.
2	Monitoring, operation, and programming of the drive is allowed.

3.8 Parameter L~

LMT_E

Output Voltage limit

Standard value: (135.0%)
Limit: 0.0 ~ 140.0%
Sets the limit value of the voltage reference that can be output.
100% assumes 100% of the PWM carrier amplitude (modulation rate 1).

LMT_I1

Total Current LimitStandard value: (115.0%)
Limit: 0.1 ~ 400.0%
Sets the limit value of the motor total average primary current. If the total average current is at or above this level, the drive will trip after the time defined by TIME_CL.

LMT_I1_EX

Total Current Limit Via External ControlStandard value: (115.0%)
Limit: 0.1 ~ 400.0%
When bit11 of the digital input (DI_EX4) is 1, this setting is enabled as the motor primary current limit.
When it is 0, LMT_I1 is enabled as the motor primary current limit.
[Related parameters] MSK_DI_EX4

LMT_SP_F

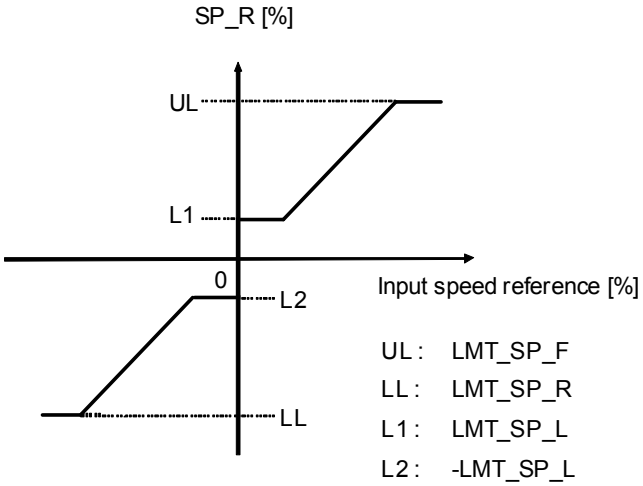
Forward speed limit

Standard value: (100.0%)
Limit: 0.0 ~ 125.0%
Sets the limit of the forward speed of the motor.
Set 0.0% when the motor is used in the reverse rotation only and the forward rotation is disabled.

LMT_SP_L

Minimum operation speed

Standard value : (1.0%)
Limit: 0.0 ~ 20.0%
Sets the lower limit of speed reference in operation. This is used for sensor-less motor operation mainly.



LMT_SP_MIN

Minimum forward speed reference limit

Standard value: (5.0%)
Limit: -125.0 ~ 125.0%
Sets the minimum forward speed limit for the speed reference. Do not run this drive at zero speed. .
Set an absolute value. If a negative value is set, the limit becomes invalid. Set -125% if not used.

LMT_SP_R

Reverse speed limit

Standard value: (0.0%)
Limit: -125.0 ~ 0.0%
Sets the limit of the reverse speed of the motor.
Set 0.0% when the motor is used in the forward rotation only and the reverse rotation is disabled.

LVL_IPLL_DLTQ

Inverter output voltage PLL allowable phase difference
Standard value: (1.0 deg)
Limit: 0 ~ 90 deg
Set the allowable phase error of IPLL for capture and IPLL restart.
The phase difference is evaluated in terms of absolute value. If 1.0deg is set, a value ±1.0deg is regarded as synchronization.
[Related parameters] LVL_IPLL_UNLCK, LVL_VF_LOW, IPLL_P, IPLL_W1, FLT_IPLL, FLG_IPLL_RESTART

LVL_IPLL_HIGAIN

Inverter voltage PLL gain change start angle
Standard value: (90.0 deg)
Initial value: (45.0 deg)
Limit: 0.0 ~ 90.0deg
Set the angle difference level of gain change for inverter voltage PLL.
If the angle difference of inverter voltage PLL is more than this set value, proportional gain and integral gain are changed according to the magnification of IPLL_PI_MUL. And in this case, FLT_IPLL is changed to 0.
It has the hysteresis characteristic, and the switch is maintained until there is a angle difference in "LVL_IPLL_HIGAIN - 10deg" or less if the gain changes once.
If gain switch is not used, set LVL_IPLL_HIGAIN=90deg.
[Related parameters] FLT_IPLL, FLT_IPLL_HIGAIN, IPLL_P, IPLL_W1, IPLL_PI_MUL

LVL_IPLL_UNLCK

Out-of-phase level upon capture
Standard value: (4.0 deg)
Limit: 0 ~ 90 deg
Set the phase difference at which utility contactor is determined to be open upon utility synchronization capture.
The phase difference setting to be determined is LVL_IPLL_UNLCK + LVL_IPLL_DLTQ.
[Related parameters] LVL_IPLL_DLTQ

LVL_VF_LOW

Inverter output voltage low detection level for capture and IPLL restart
Standard value: (3.0 %)
Limit: 0.0 ~ 125.0 %
Set the minimum level for detection of inverter output voltage used with capture and IPLL restart.
[Related parameters] LVL_IPLL_DLTQ, IPLL_P, IPLL_W1, FLT_IPLL,FLG_IPLL_RESTART

LVL_XFR_DLTQ

Utility synchronization transfer allowable phase difference
Standard value: (1.5 deg)
Limit: 0 ~ 180 deg
Set the phase allowance of phase adjusting PLL upon utility synchronization transfer.
The phase difference is evaluated in terms of absolute value. If 1.0deg is set, a value ±1.0deg is regarded as synchronization.

3.9 Parameter M~

MA_BR_CURR

Brake release current

Standard value: (0.0%)
Limit: 0.0 ~ 400.0%
Sets the brake release current
The brake control signal (BR_DATA(1)B01) operates when $|IQ\_F| > MA\_BR\_CURR$

MA_BR_SPEED

Full brake close start speed

Standard value: (0.0%)
Limit: 0.0 ~ 130.0%
Sets the full brake close start speed
BR2 is closed when the full brake close command is issued and the motor speed is less than MA_BR_SPEED.

MA_FLUXFUNC00 ~ MA_FLUXFUNC20

Flux saturation function

Standard value: (0.00% ~ 100.00%, incremented by 5.00%)
Limit: 0.00 ~ 100.00%
Sets the flux saturation (21 points) carves.
Sets the value in 5.00% between 0.00% and 100.00% when there is no saturation.
When field weakening is performed, adjust by MA_FLUXFUNC so that the motor voltage (E1_R_V) will be uniform for the entire speed range above the base speed.
The speed for the flux saturation function n is as the following equation.

$$\text{Speed} = \frac{CS\_SP\_BASE \times 100}{n \times 5}$$

Speed [%]
CS_SP_BASE [%]
n = 0 ~ 20
[Related parameters] MA_V_RATE, CS_SP_BASE

MA_MOTOR_KW

Motor rated output

Standard value: (Set to motor kW)
Limit: 0.0 ~ 13107.2 kW
Sets the motor rated output.

MA_V_RATE

Field weakening area voltage taper

Standard value: (0.0%)
Limit: -125.0 ~ 125.0%
Set 20.0% when the difference in voltage between at the base speed and rated speed is 20%.
[Related parameters] MA_FLUX_FUNC00 ~ 20, CS_SP_BASE

MA_ZERO_SP

Zero speed detection level

Standard value: (5.0%)
Limit: 0.0 ~ 125.0%

Zero speed is detected when $|\text{speed feedback}[\%]| \leq \text{MA\_ZERO\_SP}[\%]$ (SP = 0).

MI_ID_BASE

Motor exciting current

Standard value: (0.0%)
Initial value: (15%)
Limit: 0.0 ~ 100.0%

Sets the exciting current for the motor. Used for advanced control only

MI_L_CMP

Reactance compensation gain

Standard value: (0)
Initial value: (1000)
Limit: 0 ~ 32767

Sets the reactance compensation gain.
In case of advanced control, operate the motor under the condition of 16% of speed reference, and adjust to make E2D = 0.

MI_R1_SET

Primary resistance compensation gain

Standard value: (0)
Initial value: (100)
Limit: 0 ~ 32767

MI_R1_SET_FREQ

Primary resistance compensation changeover frequency Used for advanced control only

Standard value: (0)
Initial value: (64)
Limit: 0 ~ 32767

128 count corresponds to 1 Hz.

MI_R1_SET_LF

Resistance compensation low-speed area gain

Standard value: (0)
Initial value: (100)
Limit: 0 ~ 32767

Sets the primary resistance compensation. Used for advanced control only
Compensates the voltage drop caused by the motor's primary resistance and cable's resistance.
When MI_R1_SET becomes larger, it may not be started due to the over-differential values of speed estimate value at startup.
Therefore, at low-speed area (MI_R1_SET_FREQ or less), the setting will be changed to MI_R1_SET_LF.
Operate the motor in the DC operation mode, and adjust to make E2D = 0.

MSK_ACIL1

AC power receiving control interlock mask 1

Standard value: (0000h)

Limit:

Power receiving interlock mask setting.

Signals are assigned to each bit and to use each signal, set 1 to its corresponding bit and otherwise set 0.

BIT	Abbreviation	Content
F	GR_	Grounding fault detection
E	N.U.	Not used
D	N.U.	Not used
C	N.U.	Not used
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	ACSW_C_	AC contactor close
6	N.U.	Not used
5	N.U.	Not used
4	N.U.	Not used
3	ACSW_C_B_	AC contactor closed, B bank
2	N.U.	Not used
1	N.U.	Not used
0	UV	Electrical condition satisfied

MSK_ACT1

AC circuit breaker trip mask 1

Standard value: (0000 H)

Limit:

Note: Not Used

Sets the AC circuit breaker trip mask.

Signals are assigned to each bit and to use each signal, set 1 to its corresponding bit and otherwise set 0.

BIT	Abbreviation	Content
F	SPA4_T	Spare 4 timer
E	SPA4	Spare 4
D	N.U.	Not used
C	DS_	Door open
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	N.U.	Not used
6	AC_MCCB_	Converter AC input circuit breaker open
5	N.U.	Not used
4	N.U.	Not used
3	N.U.	Not used
2	AC_MCCB_B_	Converter AC input circuit breaker open, B bank
1	BLR_	Electrical critical fault
0	BLR_CPSF_	Electrical critical fault except power fault

MSK_BLR1

Electric critical fault mask 1

Standard value: (41FC H)

Limit:

This is the mask setting for electric critical fault 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	OCA_	AC overcurrent	**On**
D	N.U.	Not used	
C	N.U.	Not used	
B	N.U.	Not used	
A	N.U.	Not used	
9	N.U.	Not used	
8	OH_T_U_	U-phase stack overheat timer	**On**
7	OH_T_V_	V-phase stack overheat timer	**On**
6	OH_T_W_	W-phase stack overheat timer	**On**
5	CURU_	U-phase abnormal current	**On unless open circuit running is required**
4	CURW_	W-phase abnormal current	**On unless open circuit running is required**
3	CPU_A_	Slave CPU error	**On**
2	CPU_M_	Master CPU error	**On**
1	N.U.	Not used	
0	N.U.	Not used	

MSK_BLR2

Electric critical fault mask 2

Standard value: (8FC0 H)

Limit:

This is the mask setting for electric critical fault 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	OH_TR_	Transformer overheat	**On**
E	OCA_B_	AC overcurrent, B bank	**On for twin drives only**
D	N.U.	Not used	
C	N.U.	Not used	
B	FUSE_UP_	U-phase P-bus REC fuse blown	**On**
A	FUSE_UN_	U-phase N-bus REC fuse blown	**On**
9	FUSE_VP_	V-phase P-bus REC fuse blown	**On**
8	FUSE_VN_	V-phase N-bus REC fuse blown	**On**
7	FUSE_WP_	W-phase P-bus REC fuse blown	**On**
6	FUSE_WN_	W-phase N-bus REC fuse blown	**On**
5	CURU_B_	U-phase abnormal current, B bank	**On for twin drives only**
4	CURW_B_	W-phase abnormal current, B bank	**On for twin drives only**
3	N.U.	Not used	
2	N.U.	Not used	
1	N.U.	Not used	
0	N.U.	Not used	

MSK_BLR3

Electric critical fault mask 3

Standard value: (3020 H)

Limit:

This is the mask setting for electric critical fault 3.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	N.U.	Not used	
D	OSS_	Overspeed	**On**
C	OSS_FO_	Over frequency output	**On**
B	N.U.	Not used	
A	N.U.	Not used	
9	SP_ERR_	Speed detection error	
8	SP_ERR2_	Speed detection error 2	
7	N.U.	Not used	
6	N.U.	Not used	
5	ROT_F_	Rotation failure	On – Can turn off if not needed
4	REV_ROT_F_	Reverse rotation	As required by application
3	ENCODER_F_	Encoder failure	As required by application
2	N.U.	Not used	
1	N.U.	Not used	
0	XFR_FAIL	Transfer failure	On – For synch transfer drives

MSK_BLR4

Electric critical fault mask 4

Standard value: (8FFF H)

Limit:

This is the mask setting for electric critical fault 4.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	REC_F_	Rectifier failure	**On**
E	N.U.	Not used	
D	N.U.	Not used	
C	N.U.	Not used	
B	OCD_UA1_	U-phase A-leg Q1 IGBT over current	**On**
A	OCD_UA4_	U-phase A-leg Q4 IGBT over current	**On**
9	OCD_UB1_	U-phase B-leg Q1 IGBT over current	**On**
8	OCD_UB4_	U-phase B-leg Q4 IGBT over current	**On**
7	OCD_VA1_	V-phase A-leg Q1 IGBT over current	**On**
6	OCD_VA4_	V-phase A-leg Q4 IGBT over current	**On**
5	OCD_VB1_	V-phase B-leg Q1 IGBT over current	**On**
4	OCD_VB4_	V-phase B-leg Q4 IGBT over current	**On**
3	OCD_WA1_	W-phase A-leg Q1 IGBT over current	**On**
2	OCD_WA4_	W-phase A-leg Q4 IGBT over current	**On**
1	OCD_WB1_	W-phase B-leg Q1 IGBT over current	**On**
0	OCD_WB4_	W-phase B-leg Q4 IGBT over current	**On**

MSK_BLR5

Electric critical fault mask 5

Standard value: (9000 H)

Limit:

This is the mask setting for electric critical fault 5.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	PLD_ERR_	PLD error	**On**
E	N.U.	Not used	
D	N.U.	Not used	
C	DS_T_	Door open timer	**On**
B	N.U.	Not used (A3TFV07A , A3TV07A, and older firmware. All A3DA firmware.)	
	RUN_CMD_F_	Run command failure (A3TF08A, A3TV08A and newer firmware)	As required by application
A	N.U.	Not used	
9	N.U.	Not used	
8	N.U.	Not used	
7	SPA4_T	Spare 4 timer	As required by application
6	SPA3_T	Spare 3 timer	As required by application
5	SPA2_T	Spare 2 timer	As required by application
4	SPA1_T	Spare 1 timer	As required by application
3	SPA4	Spare 4	As required by application
2	SPA3	Spare 3	As required by application
1	SPA2	Spare 2	As required by application
0	SPA1	Spare 1	As required by application

MSK_BLR6

Electric critical fault mask 6

Standard value: (DFC0 H)

Limit:

This is the mask setting for electric critical fault 6.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	MPSF_MV_	Main power supply failure (by input voltage)	**On**
E	CPSF_	Control power supply failure	**On**
D	PLLPSF_	PLL power supply failure (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	N.U.	Not used (A3TF06A , A3TV06A, A3DA56A and newer software)	
C	MPSF_	Main power supply failure (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	GR_T_	Grounding detection timer (A3TF06A , A3TV06A, A3DA56A and newer software)	**On**
B	OV_UP_	U-phase P-bus DC overvoltage	**On**
A	OV_UN_	U-phase N-bus DC overvoltage	**On**
9	OV_VP_	V-phase P-bus DC overvoltage	**On**
8	OV_VN_	V-phase N-bus DC overvoltage	**On**
7	OV_WP_	W-phase P-bus DC overvoltage	**On**
6	OV_WN_	W-phase N-bus DC overvoltage	**On**
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	N.U.	Not used	
1	N.U.	Not used	
0	PLL_	Power supply synchronous PLL error	As required by application

MSK_BR

Brake command mask

Standard value: (0000H)

See the table below if brake is used. Generally, 00E1h used.

Limit:

This is the mask setting for brake command.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content
F	N.U.	Not used
E	N.U.	Not used
D	N.U.	Not used
C	N.U.	Not used
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	BA	Brake answerback
6	BR_T	Brake open instruction timer
5	BR	Brake
4	SPBR_	Full brake close starting speed detection
3	UV	Electrical condition satisfied
2	BC_	Brake close instruction
1	BR01	Brake control signal 1
0	BR02	Brake control signal 2

Standard value table

Brake Type		Standard Setting of MSK_BR
Open Condition	Close Condition	
EXTR=1	SP=0	00E1h
B=1	SP=0 B=0	00E1h
IQ_F>MA_BR_CURR	SP=0	00E3h
UV=1	ABSSF>MA_BR_SPEED	00F8h
IQ_F >MA_BR_CURR	UV=0 & ABSSF >MA_BR_SPEED	00FBh
EXTR=1	UV=0	00F9h
BC_=1	BC_=0	00E4h

• Mask condition of SPBR_ and UV should be corresponding.
• Set MA_BR_SPEED to 125% when SPBR_ condition is not used and UV condition is used.

MSK_DI_EMG

Emergency DI relay input mask

Standard value: (FFFF H)

Limit:

This is the mask setting for emergency DI relay input.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

This is valid when DI_DATE2(6)E_DRIVE = 1.

BIT	Abbreviation	Content	
F	IL_	External interlock	1: Operation permitted
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	SPA1	Spare 1	
B	BRTST	Brake test	1: Brake open
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	B	Brake command	1: Brake open command
4	FLD	Field excitation command	1: Field excitation command
3	BC_	Brake close command	0: Break close
2	SPA0	Spare 0	
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

MSK_DI_EX4

Digital input mask for the single function

Standard value: (FFFF H)

Limit:

This is the mask setting for digital input for the single function.

Signals are assigned to each bit and to use each signal, set 1 to its corresponding bit and otherwise set 0.

BIT	Abbreviation	Content	
F	MV_JOG_B3	16-point speed reference selection bit 3	
E	MV_JOG_B2	16-point speed reference selection bit 2	
D	MV_JOG_B1	16-point speed reference selection bit 1	
C	MV_JOG_B0	16-point speed reference selection bit 0	
B	EX_LMT_I1	Motor primary current limit selection	0: Internal; 1: External
A	EX_LMT_TR	Torque limit selection	0: Internal; 1: External
9	SP_UP	Speed up	
8	SP_DN	Speed down	
7	SEL	Local/Remote switch	0: Local; 1: Remote
6	DIR0	Motor rotation direction command (Local)	0: Forward; 1: Reverse
5	DIR1	Motor rotation direction command (Remote)	0: Forward; 1: Reverse
4	START0	Start button (Local)	One shot to start (SEL=0)
3	START1	Start button (Remote)	One shot to start (SEL=1)
2	STOP0	Stop button (Local)	One shot to stop
1	STOP1	Stop button (Remote)	One shot to stop
0	EXT1	Startup command (Remote)	1: Startup command (SEL=1)

MSK_DI_EX5

Digital input mask for utility synchronization
Standard value: Standard when utility synchronization is not used: (FFDF H)

Limit:
Mask setting of digital input for utility synchronization.
Signals are assigned to each bit and to use each signal, set 1 to its corresponding bit and otherwise set 0.

BIT	Abbreviation	Content	
F	N.U.	Not used	
E	N.U.	Not used	
D	N.U.	Not used	
C	N.U.	Not used	
B	N.U.	Not used	
A	N.U.	Not used	
9	N.U.	Not used	
8	N.U.	Not used	
7	N.U.	Not used	
6	N.U.	Not used	
5	ASD	Variable speed drive operation command	1 for synchronous xfr drive
4	IM_NUM_B1	Motor unit count switch bit 1	
3	IM_NUM_B0	Motor unit count switch bit 0	
2	XFR_CHK	Synchronization tester input	For synchronous transfer: 1 if synch check relay input is used 0 if synch check relay input is not used
1	CPT	Capture command	
0	XFR	Transfer command	

MSK_DI1

DI relay input mask 1

Standard value: (FFFF H)

Limit:

This is the mask setting for DI 1 relay input.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

In principle, a logical AND operation is applied between DI_EX1 and SERSEQDATA1, but a logical OR operation is applied to EXRST. Thus, MSK_DI1(1)EXRST is always limited to 1.

BIT	Abbreviation	Content	
F	IL_	External interlock	1: Operation permitted
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	SPA1	Spare 1	
B	BRTST	Brake test	1: Brake open
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	B	Brake command	1: Brake open command
4	FLD	Field excitation command	1: Field excitation command
3	BC_	Brake close command	0: Break close
2	SPA0	Spare 0	
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

[Related parameters] FLG_DI_DATA1_SEL, MSK_SERSEQDATA1

MSK_DI3

DI relay input mask 3

Standard value: (FFFFH)

Limit:

This is the mask setting for DI_EX3 relay input.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

In principle, a logical AND operation is applied between DI_EX3 and SERSEQDATA2, but a logical OR operation is applied to EXRST. Thus, MSK_DI3(1)EXRST is always limited to 1.

BIT	Abbreviation	Content	
F	QSTOP	Emergency stop command	1: Emergency stop command
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	CM_BUF1	Command buffer bit 1	
B	CM_BUF2	Command buffer bit 2	
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	N.U.	Not used	
4	FLD	Field excitation command	1: Field excitation command
3	LATCH_PG_POS	PG counter latch command	Latch at rising and falling edges of this signal.
2	SPA0	Spare 0	
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

[Related parameters] FLG_DI_DATA1_SEL, MSK_SERSEQDATA2

MSK_DI3_EMG

Emergency DI_EX3 relay input mask

Standard value: (FFFF H)

Limit:

This is the mask setting for emergency DI_EX3 relay input.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

This is valid when DI_DATE2(6)E_DRIVE = 1.

BIT	Abbreviation	Content	
F	QSTOP	Emergency stop command	1: Emergency stop command
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	CM_BUF1	Command buffer bit 1	
B	CM_BUF2	Command buffer bit 2	
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	N.U.	Not used	
4	FLD	Field excitation command	1: Field excitation command
3	LATCH_PG_POS	PG counter latch command	Latch at rising and falling edges of this signal.
2	SPA0	Spare 0	
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

[Related parameters] FLG_DI_DATA1_SEL, MSK_DI3

MSK_HFD1

Critical fault processing mask 1

Standard value: (0002 H)

Limit:

This is the mask setting for critical fault processing 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	N.U.	Not used	
D	P_SW_	Panel interlock switch on	As required by application
C	SP_LOST_	Extrnal speed reference lost	As required by application
B	QSTOP_FAULT_	QSTOP fault	As required by application
A	N.U.	Not used	
9	N.U.	Not used	
8	ACSW_F_	AC contact fault	
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	UVA_EX	External unit electrical ready condition	As required by application
1	UVA	Electrical ready condition	**On**
0	N.U.	Not used	

MSK_HFD2

Critical fault processing mask 2

Standard value: (8200 H)

Limit:

This is the mask setting for critical fault processing 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	PRE_CTT	Initial charging contactor open	**On**
E	AIN_FAULT_	General analog input error	As required by application
D	TL_F3_	Transmission error 3 - Trunk line error	As required by application
C	TL_F4_	Transmission error 4 - Drive-to-drive transmission error	As required by application
B	M_FN_T_	Motor cooling fan stop timer	As required by application
A	BR_F_	Electromagnetic brake excitation circuit fault	As required by application
9	M_OH_	Motor overheat	On – Can turn off if not needed
8	B_HLTY	Brake healthy normal	As required by application
7	N.U.	Not used	
	TL_F1_	Transmission error 1 – Comm board CPU error (A3TF07A, A3TV07A, A3DA57A and newer firmware.)	As required by application
6	N.U.	Not used	
	TL_F2_	Transmission error 2 – Comm board transmission error (A3TF07A, A3TV07A, A3DA57A and newer firmware.)	As required by application
5	N.U.	Not used (A3DF08A, A3DV08A, and A3DA58A and earlier software only)	
	PP7_CODE_ ERR_	SRAM check-sum error (A3TF09A , A3TV09A, A3DA59A and newer software)	As required for application
4	TUNE_IL_	Auto-tuning interlock	As required by application
3	N.U.	Not used	
2	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA1	Spare 1 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
1	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA2	Spare 2 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
0	GR_T_	Grounding detection timer	As required by application

MSK_LFD1

Minor fault processing mask 1

Standard value: (4031 H) For drives with Standard fans
(5031 H) For drives with Redundant fans

Limit:
This is the mask setting for minor fault processing 1.
Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	SP_LST_A_	Extrnal speed reference lost alarm	As required by application
E	C_FN_	Equipment ventilation fan stop	**On**
D	SOFT_STL_	Motor Soft Stall Alarm	As required by application
C	C_FN_B_	Equipment ventilation fan stop, B bank	**On for redundant fans**
B	OH_ACL_	ACL overheat	
A	MTMP_S_	Motor temperature sensor error	As required by application
9	M_OH_	Motor overheat	As required by application
8	M_OH_A_	Motor overheat alarm	As required by application
7	AIN_FAULT_	General analog input error	As required by application
6	XFR_FAIL_	Failure to synchronize during transfer	As required by application
5	GR_A_	Grounding detection alarm	**On**
4	PRE_CTT_F_	Initial charging contactor fault	**On**
3	CUR_DIFF_	Differential current detection	As required by application
2	M_FN_	Motor cooling fan stop	As required by application
1	GR_T_	Grounding detection timer	As required by application
0	STPRQ_	Intermediate fault (stop request)	**On**

MSK_LFD2

Minor fault processing mask 2

Standard value: (8100 H)

Limit:

This is the mask setting for minor fault processing 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	RTRY_	Auto retry is working alarm	On – Can turn off if not needed
E	UL_A	Undercurrent Alarm	As required by application
D	N.U.	Not used (A3TF06B, A3TV06B, and A3DA56B and older firmware)	
	CPT_FAIL_	Capture failure (A3TF07A, A3TV07A, A3DA57A and newer firmware)	On – Can turn off if not needed
C	N.U.	Not used	
B	N.U.	Not used (A3TF08A, A3TV08A, and A3DA58A and older firmware)	
	TL_F1_	Transmission error 1 – Own station error (A3TF09A, A3TV09A, A3DA59A and newer firmware)	As required by application
A	N.U.	Not used (A3TF08A, A3TV08A, and A3DA58A and older firmware)	
	TL_F2_	Transmission error 2 – Initialization error, Online error (A3TF09A, A3TV09A, A3DA59A and newer firmware)	As required by application
9	N.U.	Not used (A3TF08A, A3TV08A, and A3DA58A and older firmware)	
	TL_F3_	Transmission error 3 – Trunk line error (A3TF09A, A3TV09A, A3DA59A and newer firmware)	As required by application
8	N.U.	Not used (A3TF08A, A3TV08A, and A3DA58A and older firmware)	
	PP7_CODE_ ERR_	SRAM check-sum error (A3TF09A, A3TV09A, A3DA59A and newer firmware)	**On**
7	SPA4_T	Spare 4 timer	As required by application
6	SPA3_T	Spare 3 timer	As required by application
5	SPA2_T	Spare 2 timer	As required by application
4	SPA1_T	Spare 1 timer	As required by application
3	SPA4	Spare 4	As required by application
2	SPA3	Spare 3	As required by application
1	SPA2	Spare 2	As required by application
0	SPA1	Spare 1	As required by application

MSK_READY1

Operation ready complete mask 1

Standard value: (0423 H)

Limit:

This is the mask setting for operation ready 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	TL_F1_	Transmission error 1 – Own station error	As required by application
E	TL_F2_	Transmission error 2 – Initialization error, Online error	As required by application
D	TL_F3_	Transmission error 3 – Trunk line error	As required by application
C	TL_F4_	Transmission error 4 – Drive-to-drive transmission error	As required by application
B	SP_LOST_	Extrnal speed reference lost	As required by application
A	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	MOT_V_IL_	Motor voltage flying restart interlock (A3TF06A , A3TV06A, A3DA56A and newer software)	**On**
9	N.U.	Not used	
8	N.U.	Not used	
7	N.U.	Not used	
6	N.U.	Not used	
5	ACSW_T_	AC contactor open timer	***On**
4	N.U.	Not used	
3	N.U.	Not used	
2	N.U.	Not used	
1	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	HFD_READY	Heavy fault ready interlock(A3TF06A , A3TV06A, A3DA56A and newer software)	**On**
0	UV_READY	Electrical condition satisfied	**On**

*** If an output contactor is not installed, SGN_DI3 bit # 15 must be set to “1” If one is installed, you must set this bit to “0”**

MSK_READY2

Operation ready mask 2

Standard value: (0100 H)

Limit:

This is the mask setting for operation ready 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	N.U.	Not used	
D	N.U.	Not used	
C	N.U.	Not used	
B	M_FN_T_	Motor cooling fan stop timer	As required by application
A	BR_F_	Electromagnetic brake excitation circuit error	As required by application
9	N.U.	Not used	
8	CHG_START_	System is being changed	**On**
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA1	Spare 1 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
1	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA2	Spare 2 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
0	N.U.	Not used	

MSK_SERSEQ1

Transmission serial sequence input mask 1

Standard value: (0002 H)

Limit:

This is the mask setting for transmission serial sequence input 1.
Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.
In principle, a logical AND operation is applied between DI_EX1 and SERSEQDATA1, but a logical OR operation is applied to EXRST. MSK_SERSEQ1(1)EXRST must always be set to 1 or the drive will not reset. The standard set is 0002H when the transmission is not used.

BIT	Abbreviation	Content	
F	IL_	External interlock	1: Interlock disabled
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	SPA1	Spare 1	
B	BRTST	Brake test	1: Brake open
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	B	Brake command	1: Brake open command
4	FLD	Field excitation command	1: Field excitation command
3	BC_	Brake close command	0: Break close
2	HB	Heartbeat	Heartbeat reception
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

[Related parameters] FLG_DI_DATA1_SEL, MSK_DI1

MSK_SERSEQ2

Transmission serial sequence input mask 2

Standard value: (0002 H)

Limit:

This is the mask setting for transmission serial sequence input 2.
Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.
In principle, a logical AND operation is applied between DI_EX3 and SERSEQDATA2, but a logical OR operation is applied to EXRST. MSK_SERSEQ1(1)EXRST must always be set to 1 or the drive will not reset. The standard set is 0002H when the transmission is not used.

BIT	Abbreviation	Content	
F	QSTOP	Emergency stop command	1: Emergency stop command
E	UVS	External safety switch	1: Operation permitted
D	EXT0	Startup command (Local)	1: Startup command (SEL=0)
C	CM_BUF1	Command buffer bit 1	
B	CM_BUF2	Command buffer bit 2	
A	ST	Torque control selection	1: Tension control, 0: speed control
9	F	Forward inching operation command	1: Forward inching command
8	R	Reverse inching operation command	1: Reverse inching command
7	3S	3-speed reference command	1: 3-speed reference command
6	2S	2-speed reference command	1: 2-speed reference command
5	N.U.	Not used	
4	FLD	Field excitation command	1: Field excitation command
3	LATCH_PG_POS	PG counter latch command	Latch at rising and falling edges of this signal.
2	SPA0	Spare 0	
1	EXRST	External reset	1: Reset request
0	R_TEN	Reverse rotation command	1: Reverse winding, 0: Forward winding

[Related parameters] FLG_DI_DATA1_SEL, MSK_DI3

MSK_SIL1

Start interlock mask 1

Standard value: (0A01 H)

Limit:

This is the mask setting for startup interlock 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA1	Spare1 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
E	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA2	Spare 2 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required by application
D	N.U.	Not used	
C	N.U.	Not used	
B	UVA_SIL_	AC voltage drop startup interlock	**On**
A	N.U.	Not used	
9	UV_SIL_	DC voltage drop startup interlock	**On**
8	ACSW_C_	AC contactor close	As required by application
7	N.U.	Not used	
	SIL_R_CMD_	Run command start interlock (A3TF08A, A3TV08A and newer firmware)	As required by application
6	N.U.	Not used	
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	M_FN_	Motor fan stop	As required by application
1	SP_SIL_	Zero speed startup interlock	As required by application
0	STCMD_	Operation instruction startup interlock	**On**

MSK_STPRQ1

Intermediate fault (stop request) mask 1

Standard value: (80C0 H)

Limit:

This is the mask setting for intermediate fault (stop request) 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	OH_	Equipment overheat	**On**
E	C_FN_	Equipment ventilation fan stop	As required for application
D	OH_B_	Equipment overheat, B bank	**On for twin drives**
C	C_FN_B_	Equipment ventilation fan stop, B bank	As required for application
B	OH_ACL_	ACL overheat	
A	MTMP_S_	Motor temperature sensor error	As required for application
9	M_OH_	Motor overheat	As required for application
8	M_OH_A_	Motor overheat alarm	As required for application
7	OL_A_	Overload alarm	**On**
6	CL_TA_	Current limiting alarm	**On**
5	GR_A_	Grounding detection alarm	As required for application
4	PRE_CTT_F_	Initial charging contactor fault	As required for application
3	SP_LST_A_	Speed reference lost alarm	As required for application
2	M_FN_	Motor cooling fan stop	As required for application
1	N.U.	Not used	
0	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA1	Spare 1 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required for application

MSK_UV1

Electrical condition mask 1

Standard value: (A003 H)

Limit:

This is the mask setting for electrical condition 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	UVS	External safety switch	**On**
E	IL_	External interlock	As required for application
D	P_SW_	Panel interlock switch on	**On**
C	SP_LOST	Extrnal speed reference lost	As required for application
B	QSTOP_FAULT_	QSTOP fault	As required for application
A	UV_MPSF_	Main Power Lost	
9	N.U.	Not used	
8	ACSW_F_	AC contact fault	
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	UVA_EX	External unit electrical ready condition	As required for application
1	UVA	Electrical ready condition	**On**
0	C_IL	Closing interlock	**On**

MSK_UV2

Electrical condition mask 2

Standard value: (8001 H)

Limit:

This is the mask setting for electrical condition 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	PRE_CTT	Initial charging contactor open	**On**
E	AIN_FAULT_	General analog input error	As required for application
D	TL_F3_	Transmission error 3 – Trunk line error	As required for application
C	TL_F4_	Transmission error 4 – Drive-to-drive transmission error	As required for application
B	N.U.	Not used	
A	N.U.	Not used	
9	M_OH_	Motor overheat	As required for application
8	B_HLTY	Brake healthy normal	As required for application
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used (A3DF08A, A3DV08A, and A3DA58A and earlier software only)	
	PP7_CODE_ ERR_	SRAM check-sum error (A3TF09A , A3TV09A, A3DA59A and newer software)	As required for application
4	TUNE_IL_	Auto-tuning interlock	As required for application
3	N.U.	Not used	
2	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA1	Spare 1 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required for application
1	N.U.	Not used (A3DF04B, A3DV04B, and A3DA55A and earlier software only)	
	SPA2	Spare 2 (A3TF06A , A3TV06A, A3DA56A and newer software)	As required for application
0	DSP_ESTP	Display E-stop	**On**

MSK_UVA1

Electrical ready condition mask 1

Standard value: (7311 H) Standard Fans
(7211 H) Redundant Fans

Limit:

This is the mask setting for electrical ready condition 1.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	UVD_	DC voltage drop	**On**
D	OL5_	Overload 5-minute RMS	**On**
C	OL20_	Overload 20-minute RMS	**On**
B	N.U.	Not used (A3DF04B, A3DV04B, A3DA54B and older firmware)	
	UL_T	Undercurrent timer (A3TF06B, A3TV06B, A3DA56B and newer firmware.)	As required by application
A	N.U.	Not used	
9	CL_T_	Current limiting timer	**On**
8	C_FN_T_	Equipment ventilation fan stop timer	**On for drives without redundant fans**
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used	
4	AC_MCCB_	AC input circuit breaker open	**On**
3	N.U.	Not used	
2	N.U.	Not used	
1	N.U.	Not used	
0	BLR_	Electrical critical fault	**On**

MSK_UVA2

Electrical ready condition mask 2

Standard value: (0001 H) Standard Fans
(0101 H) Redundant Fans

Limit:

This is the mask setting for electrical ready condition 2.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	UVD_B_	DC voltage drop, B bank	
D	N.U.	Not used	
C	N.U.	Not used	
B	N.U.	Not used	
A	N.U.	Not used	
9	N.U.	Not used	
8	C_FN_T_B_	Equipment ventilation fan stop timer, B bank	**On for drives with redundant fans**
7	N.U.	Not used	
6	N.U.	Not used	
5	N.U.	Not used	
4	N.U.	Not used	
3	N.U.	Not used	
2	N.U.	Not used	
1	VINV_PH_LOSS_	Inverter output phase lost detection	As required for application
0	VAC_PH_LOSS_	AC input phase lost detection	**On**

MSK_UVA3

Electrical ready condition mask 3

Standard value: (0340 H) non synchronous transfer drives
(0341 H) synchronous transfer drives)

Limit:

This is the mask setting for electrical ready condition 3.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	UVP_B_	Positive side DC voltage drop, B bank	
E	UVN_B_	Negative side DC voltage drop, B bank	
D	UVP_	Positive side DC voltage drop	
C	UVN_	Negative side DC voltage drop	
B	OH_ACL_T_	Converter ACL overheat timer	
A	N.U.	Not used	
9	SYS_ERR_	System configuration error	**On**
8	PARA_ERR_	Set parameter check error	**On**
7	N.U.	Not used	
6	AC_NL_	Output open (A3VF06B, A3TV06B, A3DA56B and older firmware)	**On unless open circuit running is required**
	NO_LOAD_	Output open (A3TF07A, A3TV07A, A3DA57A and newer firmware)	**On unless open circuit running is required**
5	GR_T_	Grounding detection timer	As required for application
4	PHASE_ERR_	Phase rotation error	As required for application
3	BLA_	Converter AC circuit breaker trip	
2	STALL_	Low frequency overload	As required for application
1	N.U.	Not used	
0	CPT_FAIL_	Capture failure	**On for synchronous transfer**

MSK_UVA4

Electrical ready condition mask 4

Standard value: (0000 H)

Limit:

This is the mask setting for electrical ready condition 4.

Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content	Comment
F	N.U.	Not used	
E	N.U.	Not used	
D	TL_F1_	Transmission error 1 – Own station error	As required for application
C	TL_F2_	Transmission error 2 – Initialization error, Online error	As required for application
B	N.U.	Not used	
A	N.U.	Not used	
9	N.U.	Not used	
8	N_IM_	Number of motors error	As required for application
7	SPA4_T	Spare 4 timer	As required for application
6	SPA3_T	Spare 3 timer	As required for application
5	SPA2_T	Spare 2 timer	As required for application
4	SPA1_T	Spare 1 timer	As required for application
3	SPA4	Spare 4	As required for application
2	SPA3	Spare 3	As required for application
1	SPA2	Spare 2	As required for application
0	SPA1	Spare 1	As required for application

MTMP_OS

Motor temperature offset

Standard value: (0.00°C)
Limit: -327.67 ~ 327.67°C
Sets the motor temperature offset.

MTMP_PT_RMAX

200°C PT resistance

Standard value: (1688 Ω)
Limit: 0 ~ 10000 Ω

MTMP_PT_RMIN

0°C PT resistance

Standard value: (1000 Ω)
Limit: 0 ~ MTMP_PT_RMAX Ω
Sets the PT resistance value for temperature detection at 200°C and 0°C, respectively. This is valid when FLG_MTMP_SEL is 0 (PT mode).
[Related parameters] FLG_MTMP_SEL, MTMP_RTD_MAX, MTMP_RTD_MIN

MTMP_RTD_MAX

RTD unit 5V output temperature

Standard value: (200.00°C)
Limit: -10.00 ~ 327.67°C

MTMP_RTD_MIN

RTD unit 0V output temperature

Standard value: (0.00°C)
Limit: -10.00 ~ MTMP_RTD_MAX°C
Sets the motor temperature when the RTD unit outputs 5 V and 0 V, respectively.
Valid when FLG_MTMP_SEL = 1 (RTD mode).
[Related parameters] FLG_MTMP_SEL, MTMP_PT_RMAX, MTMP_PT_RMIN

3.10 Parameter O~

OP_ACR_P_1 ~ OP_ACR_P_3

Current control proportional gain
Standard value: (0)
Limit: 0 ~ 32767

OP_ACR_W1_1 ~ OP_ACR_W1_3

Current control response gain
Standard value: (0rad/s)
Limit: 0 ~ 1023rad/s
Set the current control gain (3 channels).
ACR_P and ACR_W1 are selected respectively except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_DEC_CHG2 ~ OP_DEC_CHG4

Polygonal line deceleration switch frequency

Standard value: 0.0 %

Limit: 0.0 ~ 125.0 %

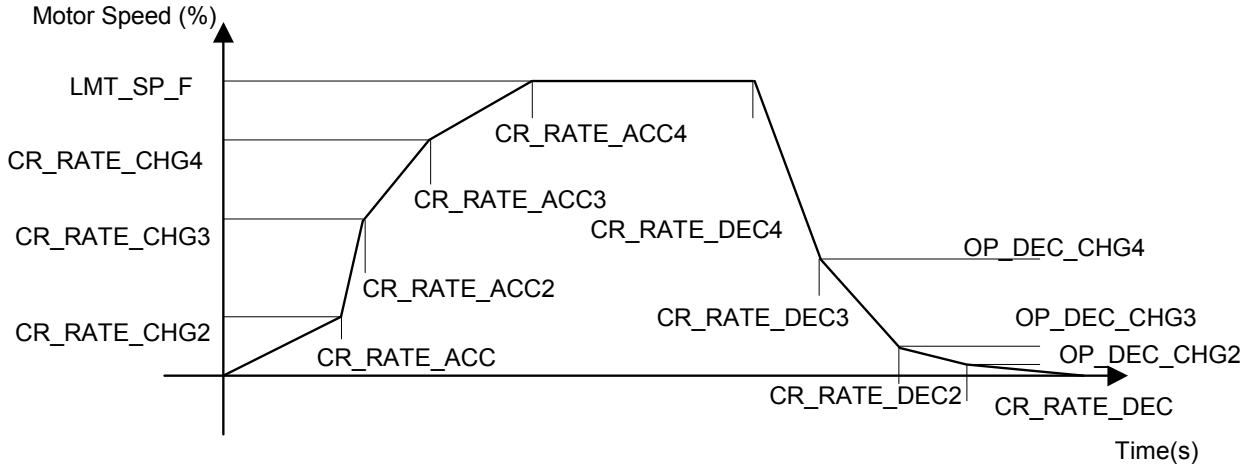
Sets the frequency of rate switch point for polygonal line deceleration.

Set all parameters to 0 if polygonal line acceleration point (CR_RATE_CHG2~4) is used.

Set a lower frequency to a set value with smaller number.

To set one or two switch point, set them in the ascending order of number and set the remaining parameters to 0.

[Related parameters] CR_RATE_ACC2 ~ CR_RATE_ACC4, CR_RATE_DEC2 ~ CR_RATE_DEC4



OP_ID_BASE_1 ~ OP_ID_BASE_3

Motor excitation current

Standard value: (0.0%)

Limit: 0.0 ~ 100.0%

Set the motor excitation current (3 channels).

MI_ID_BASE is selected except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_IM_NUM_1 ~ OP_IM_NUM_3

Multiple unit drive operation gain
Standard value: (100.0 %)
Limit: 30.0 ~ 100.0 %
Set the unit count reduction ratio when multiple number of motors with the same rating are switched in the speed sensor-less mode.
Set the unit count reduction ratio by entering the selection signal via DI_EX5 bit (IM_NUM_B1,0).
Decreasing unit count of motors during operation is possible; however, increasing unit count of motors is prohibited.
Set the unit count reduction ratio to 30% or above for resolution of motor current feedback.

Motor size	Selection condition
100%	IM_NUM_B0 = 0 and IM_NUM_B1 = 0
OP_IM_NUM_1	IM_NUM_B0 = 1 and IM_NUM_B1 = 0
OP_IM_NUM_2	IM_NUM_B0 = 0 and IM_NUM_B1 = 1
OP_IM_NUM_3	IM_NUM_B0 = 1 and IM_NUM_B1 = 1

The initial value of the variable IM_NUMBER is 10000(100%).
[Related parameters] Effective at FLG_SL_IM_N_DET = 1. MSK_DI_EX5, SGN_DI_EX5

OP_LF_FAI_HF

Low frequency field weakening start frequency H
Standard value: (0)
Limit: 0 ~ 16384

OP_LF_FAI_LF

Low frequency field weakening reset frequency L
Standard value: (0)
Limit: 0 ~ 16384
Where the exciting current is large, used for torque control by torque current by weakening the flux current when at low frequency.
In the frequency area under $OP\_LF\_FAI\_LF \leq ABS\_FO \leq OP\_LF\_FAI\_HF$, low frequency field becomes weak.
256 counts correspond to 1 Hz.

OP_LF_KS_FAI

Low frequency field weakening flux reference
Standard value: (0.0%)
Limit: 0.0 ~ 100.0%
Where the exciting current is large, used for torque control by torque current by weakening the flux current when at low frequency.

OP_MI_L_CMP_1 ~ OP_MI_L_CMP_3

Reactance compensation gain
Standard value: (0)

Limit: 0 ~ 32767
Set the reactance compensation gain (3 channels).
MI_L_CMP is selected except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_MI_R1_LF_1 ~ OP_MI_R1_LF_3

Primary resistance compensation low speed range gain
Standard value: (0)
Limit: 0 ~ 32767

OP_MI_R1_SET_1 ~ OP_MI_R1_SET_3

Primary resistance compensation gain
Standard value: (0)
Limit: 0 ~ 32767
Set the primary resistance compensation gain (3 channels).
MI_R1_SET_LF and MI_R1_SET are selected respectively except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_MOT_FREQ_1 ~ OP_MOT_FREQ_3

Motor rated frequency
Standard value: 0.0 Hz)
Limit: 0.0 ~ 200.0 Hz

OP_MOT_KW_1 ~ OP_MOT_KW_3

Motor rated output
Standard value: (0.0 kW)
Limit: 0 ~ 13107.2 kW

OP_MOT_VOLT_1 ~ OP_MOT_VOLT_3

Motor rated voltage
Standard value: (0 V)
Limit: 0 ~ 32767 V

OP_MOTOR_CURR_1 ~ OP_MOTOR_CURR_3

Motor rated current
Standard value: (0.0 A)
Limit: 1.0 ~ 3276.7 A

OP_MOTOR_POLE_1 ~ OP_MOTOR_POLE_3

Motor pole count
Standard value: (0 poles)
Limit: 0 ~ 18 poles

OP_MOTOR_RPM_1 ~ OP_MOTOR_RPM_3

Motor rated speed
Standard value: (0.0 min^{-1})
Limit: -25000.0 ~ 25000.0 min^{-1}

Set the motor rating (3 channels).
CS_MOTOR_FREQ, MA_MOTOR_KW, CS_MOTOR_VOLT, CS_MOTOR_POLE and CS_MOTOR_RPM are selected respectively except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_RATE_ACC, OP_RATE_DEC

Optional Acceleration/Deceleration rate

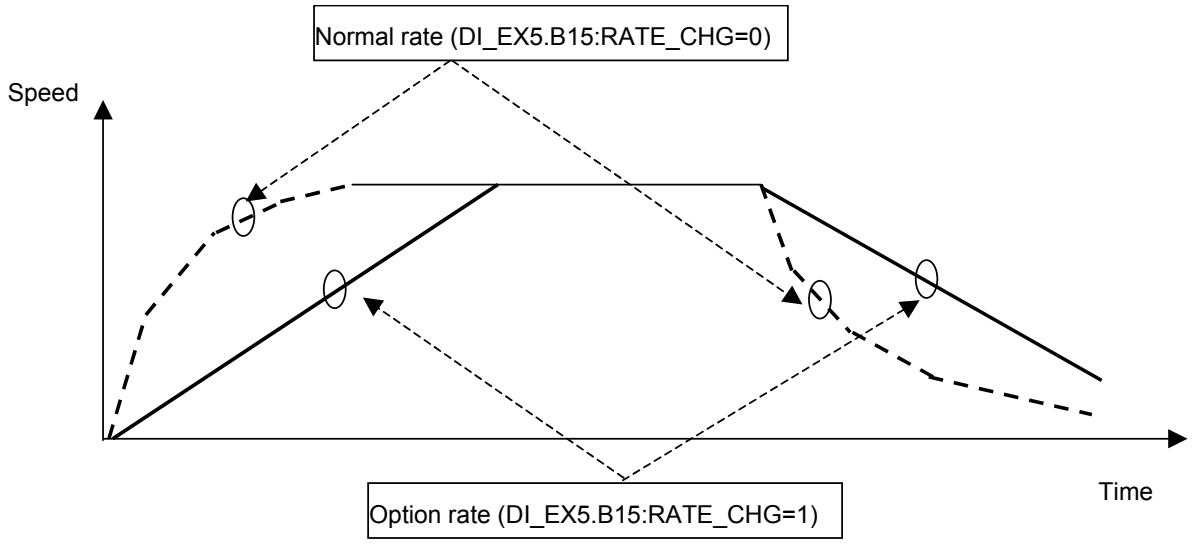
Standard value: 120.0 s

Limit: 0.0 ~ 3276.7 s

Sets the optional internal rate corresponding to the speed reference signal for 0 ~ 100% acceleration/deceleration time.

Sets 60.0 s to accelerate/decelerate 0 ~ 100% in 60 seconds.

This optional rate is available in case digital input DI_EX5.Bit15:RATE_CHG = 1.



OP_SL_I_DB_1 ~ OP_SL_I_DB_3

DB mode excitation current setting

Standard value: (0.0%)

Limit: 0.0 ~ 100.0%

Set the DC brake (DB) current during stop (3 channels).

SL_I_DB is selected except the following cases:

Channel	Selection condition
1	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 1
2	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 2
3	ASPR_G_SEL = 1, 3 and ASPR_G_NO = 3

[Related parameters] ASPR_G_SEL

OP_SP_BASE2

Field weakening by 2 steps base speed

Standard value: (0.0%)

Limit: 0.0 ~ 125.0%

Sets the field weakening base speed to use changing with CS_SP_BASE setting in 0.1% units.

Field weakening by 2 steps is valid, when FLG_SP_BASE2 = 1.

When field weakening is not used, sets FLG_SP_BASE2 = 0.

OP_SP_DBAND

Speed standard input dead zone
Standard value: (0.00%)
Limit: 0.00 ~ 1.00%
Set the input dead zone for input of analog speed standard. If the amount of change of analog speed standard input is below the dead zone, the input is ignored.

OP_VAC_A

VAC input power dip detection anti-overshoot gain
Standard value: (0)
Limit: 0 ~ 32767
Sets the anti-overshoot gain of the VAC input power dip detection.
[Related parameters] OP_VAC_AT

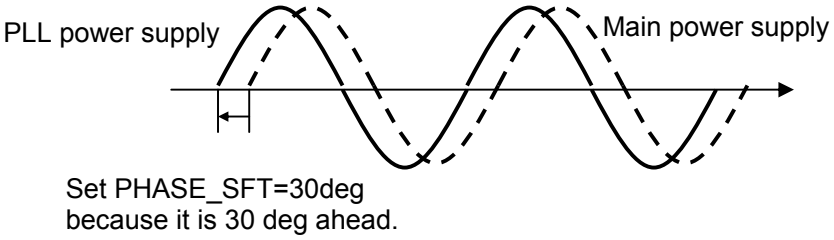
OP_VAC_AT

VAC input power dip detection anti-overshoot W AT gain
Standard value: (0 rad/s)
Limit: 0 ~ 1023.9 rad/s
Sets the anti-overshoot W AT gain of the VAC input power dip detection.
[Related parameters] OP_VAC_A

3.11 Parameter P~

PHASE_SFT

Power supply phase shift setting
Standard value: (0.0 deg)
Limit: -180.0 ~ 180.0 deg
Set the phase shift of the main power supply with respect to the PLL power supply phase.
For example, set 30.0 deg if the PLL power supply phase is 30 deg ahead of the main power supply phase.



Set PHASE_SFT=30deg
because it is 30 deg ahead.

PLL_P

Power phase PLL proportional gain
Standard value: (40)
Limit: 0 ~ 32767
Sets the power phase PLL proportional gain.
[Related parameters] PLL_W1

PLL_W1

Power phase PLL response gain
Standard value: (0.40 rad/s)
Limit: 0 ~ 10.23 rad/s
Sets the power phase PLL response gain.
[Related parameters] PLL_P

PP7_READ_AS0 ~ PP7_READ_AS3

Symbol value read function symbol setting 0 to 3
Standard value: (DUST)
Limit:
Sets the symbol to read data using the symbol value read function. The symbol value, maximum value and minimum value set by PP7_READ_ASn (n = 0 to 3) goes into PP7_READ_DATn, PP7_READ_MAXN and PP7_READ_MINn, respectively. Maximum value and minimum value can be cleared by the fault reset function.

3.12 Parameter R~

RTRY_F_EN

Automatic retry fault output enable

Standard value: (0)
Limit: 0 ~ 1
Set the FAULT output enable in case of automatic retry. If it is 1, drive output FAULT in case of automatic retry.

RTRY_INTVL

Automatic retry interval time

Standard value: (0.0s)
Initial value: (10.0s)
Limit: 0.0 ~ 300.0s
Sets the interval time for automatic retry from selected fault.

RTRY_MSK

Automatic retry enable mask

Standard value: (0000 H)
Limit:
This is the mask setting for Automatic retry function.
Signals are assigned to each bit. Set 1 to bits whose signals are used and set 0 to bits not used.

BIT	Abbreviation	Content
F	BLR_HFD	Other fault except PSF
E	N.U.	Not used
D	N.U.	Not used
C	N.U.	Not used
B	N.U.	Not used
A	N.U.	Not used
9	N.U.	Not used
8	N.U.	Not used
7	N.U.	Not used
6	N.U.	Not used
5	N.U.	Not used
4	OH_	Power module overheat
3	OL_	Overload
2	FUSE_	Fuse blown
1	OV_	DC overvoltage
0	OCA_	AC overcurrent

RTRY_MAX

Automatic retry trial max time

Standard value: (0)
Limit: 0 ~ 10
Sets the maximum attempt times for automatic retry.

3.13 Parameter S~

SCAN_R_ADRS

Scan transmission receive data top address

Standard value: (0)
Limit: 0 ~ 1023
Note: Initialize

Specifies by word the top address of the dual port RAM in which scan transmission receive data is stored.
Word 0 to 127 can be specified in the high speed version, and word 0 to 1023 in the standard version.
The adjustment value is determined for each station according to the transmission memory map.
[Related parameters] COMM_TYPE

SCAN_R_SIZE

Scan transmission receive data size

Standard value: (10)
Limit: 0 ~ 10
Note: Initialize

Sets the size to read the number of words following the scan transmission receive top address.
1 to 6 can be specified. Set 0 when transmission is not used.
The adjustment value is determined for each station according to the transmission memory map.
[Related parameters] COMM_TYPE

SCAN_RCV01_AS ~ SCAN_RCV10_AS

Scan transmission receive data transfer destination

Standard value: (See table below)
Limit:

Sets the destination in symbol to transfer data received through scan transmission.
Data of channels 1 to 6 is received from main trunk line and data of channel 7 to 10 is received from other drive units.
(Setting example)
[Related parameters] COMM_TYPE

SCAN_W_ADRS

Scan transmission send data top address

Standard value: (10)
Limit: 0 ~ 1023
Note: Initialize

Specifies by word the top address of the dual port RAM in which scan transmission send data is stored.
Word 0 to 127 can be specified in the high speed version, and word 0 to 1023 in the standard version.
The adjustment value is determined for each station according to the transmission memory map.
[Related parameters] COMM_TYPE

SCAN_W_SIZE

Scan transmission sending data size

Standard value: (10)
Limit: 0 ~ 25
Note: Initialize

Sets the size to write the number of words following the scan transmission send top address.
1 to 10 can be specified. Set 0 when transmission is not used.
The adjustment value is determined for each station according to the transmission memory map.
[Related parameters] COMM_TYPE

SCAN_WR01_AS ~ SCAN_WR10_AS

Scan transmission sending data

Standard value: (See example table below)

Limit:

Sets the symbol of data to be sent by scan transmission.

(Setting example)

Channel	Sending data symbol
1	SSEQ_OUT1
2	SP_F
3	I1_F
4	MOT_VOLT
5	MOT_FREQ
6	VI_POWER
7 ~ 10	DUST

[Related parameters] COMM_TYPE

SCAN_WR011_AS ~ SCAN_WR25_AS

Scan transmission sending data

Standard value: (See table below)

Limit:

Sets the symbol of data to be sent by scan transmission. Currently only available for Modbus.

(Setting example)

Channel	Sending data symbol
11 ~ 25	DUST

[Related parameters] COMM_TYPE

SCAN_WR_YSS_EN

Serial transmission snapshot data enable flag.

Standard value: (0)
Limit: 0, 1

When this flag is set to 1, the drive will capture one sample of the data from SCAN_WR01_AS ~ SCAN_WR25_AS and store it in SCAN_WR26_AS ~ SCAN_WR50_AS when a fault occurs. The time and date of the fault will also be stored in SCAN_WR51_AS ~ SCAN_WR56_AS. This is currently only available for Modbus communication.
[Related parameters] SCAN_WR01_AS ~ SCAN_WR025_AS

SETEND

Setting parameters area end

Standard value: (00000000 H)
Limit:

This is a symbol to indicate start and end addresses of setting parameters area.
Please do not change this setting.

SETSTART

Setting parameters area start

Standard value: (00000000 H)
Limit:

This is a symbol to indicate start and end addresses of setting parameters area.
Please do not change this setting.

SETSUM

Setting parameters area check sum

Standard value: (Automatic setting H)
Limit:
Note: Automatic setting

When parameter settings are changed, the software calculates check sum of the setting parameters area, and set the value to SETSUM.
Please do not change this setting.

SGN_DI_EX3

Digital input DI_EX3 data sign inversion

Standard value: (0000 H)
Limit:

Specifies the sign inversion of digital input DI_EX3 data.
When you set 1 to the corresponding bit, its signal will be inverted.
[Related parameters] MSK_DI3

SGN_DI_EX4

Digital input data sign inversion for the single function

Standard value: (0000 H)
Limit:

Sets the sign inversion of the DI_EX4 digital input data.
When you set 1 to the corresponding bit, its signal will be inverted.
[Related parameters] MSK_DI_EX4, DI1_IX ~ DI7_IX, DI1_BN ~ DI7_BN

SGN_DI_EX5

Digital input data sign inversion for the utility sync.
Standard value: (0000 H)
Limit:
Sets the sign inversion of the DI_EX5 digital input data.
When you set 1 to the corresponding bit, its signal will be inverted.
[Related parameters] MSK_DI_EX5

SGN_DI1 ~ SGN_DI8

Digital input data sign inversion

Standard value: (000C H) SGN_DI2, (8000 H) SGN_DI3, (0000 H) Others,
Limit:
Specifies the sign inversion of digital input data (8 channels).
When you set 1 to the corresponding bit, its signal will be inverted.
[Related parameters] MSK_SERSEQDATA1, MSK_DI1, DI1_IX ~ DI7_IX, DI1_BN ~ DI7_BN

SGN_DOEX

Digital output data sign inversion

Standard value: (0020 H)
Limit:
Specifies the sign inversion of digital output data.
When you set 1 to the corresponding bit, its signal will be inverted.
[Related parameters] DO0_AS ~ DO5_AS, DO0_BN ~ DO5_AS

SH_READ_AS0 ~ SH_READ_AS3

SH read address

Standard value: (00000000 H)
Limit:
Sets an absolute address of SH (the master CPU) to read. Read-out data goes into the following variables.
When you reset maximum and the minimum value, please input a larger value than the present value and a small value, respectively.

SH_READ_DAT0 ~ SH_READ_DAT3:	Read-out data
SH_READ_MAX0 ~ SH_READ_MAX3:	The maximum value of read-out data
SH_READ_MIN0 ~ SH_READ_MIN3:	The minimum value of read-out data

SIM_MODE

Simulation mode selection

Standard value: (0)
Limit: 0, 1
Note: Initialize
Do not use.
Set 1 to select the simulation mode with power on.
Even if SIM_MODE = 0 is set, it becomes simulation mode when the variable, SIM_MODE_T = 1 is inputted.
In this case, mode is changeable when being stopped or under 20% of main DC voltage.
While the simulation mode (SIM_MODE_T = 1), the gate block operates automatically.

SL_FLT_EDQFBK

IPLL capture and Restart voltage feedback filter

Standard value: (0.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Filter setting for voltage signal used in IPLL capture and Restart .

SL_FLT_MON_SP

Sensor-less monitor speed filter

Standard value: (0.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets the filter time constant of sensor-less monitor speed.

SL_I_DB

Sensor-less DB mode exciting current setting

Standard value: (0.0%)
Initial value: (15.0%)
Limit: 0.0 ~ 100.0%
Sets the DC brake (DB) current while not operating.
When standard case, set the same value of MI_ID_BASE.

SL_SP_RESTART

V/F Flying Restart Top Search Speed

Standard value: (100.0%)
Limit: 0.0 ~ 125.0%
Sets the initial speed reference used in speed search of VF Flying restart. Set to the maximum expected speed for restart.
[Related parameters] VF_SRCH_SP_G, VF_SRCH_RATE, VF_SRCH_MODE, VF_SRCH_I1_CMP, VF_SRCH_IQ_LVL

SSEQ_OUT_B0_AS ~ SSEQ_OUT_B3_AS

Sequence output option bit input data address

Standard value: (DUST)
Limit:

SSEQ_OUT_B0_BN ~ SSEQ_OUT_B3_BN

Sequence output option bit input data bit number

Standard value: (0)
Limit: 0 ~ 15
Sets the bit signals inputting the bit 0 ~ 3 of a sequence output SSEQ_OUT2.
Sets the symbol of the inputting signal to SSEQ_OUT_Bn_AS, and sets the bit number of the inputting signal to SSEQ_OUT_Bn_BN (n = 0 ~ 3).
(Example) When inputting the bit 14 "EXT" of DI_DATA1 to the bit 1 of SSEQ_OUT2.
SSEQ_OUT_B1_AS = DI_DATA1
SSEQ_OUT_B1_BN = 14

SYSTEM

Drive unit system configuration

Standard value: (0000 H) 4000V class drives
(8000 H) 2000V class drives

Limit:

Note: Initialize

Sets the system configuration of the drive unit. Regarding each mode of speed sensor-less control and voltage series configuration, you can select each one by setting 1 to its corresponding bit shown below:

BIT	Abbreviation	Content
F	3LVL	Set 0 to use 4000 V series. Set 1 to use 2000 V series.
E	CNV	Not used, and it should be set 0.
D	SL	Not used, and it should be set 0.
C	A_BANK_	Not used, and it should be set 0.
B	B_BANK	Not used, and it should be set 0.
A	L_JOINT	Not used, and it should be set 0.
9	N.U.	Not used
8	N.U.	Not used
7	N.U.	Not used
6	N.U.	Not used
5	N.U.	Not used
4	N.U.	Not used
3	N.U.	Not used
2	N.U.	Not used
1	N.U.	Not used
0	N.U.	Not used

The 2000V series / 4000V series control setting is also set with a DIP switch on the main control board. Both SYSTEM and DIP switch must be set correctly.

SYSTEM_OP

Drive unit system configuration option

Standard value: (0000 H)

Limit:

Note: Not used

3.14 Parameter T~

TIME_AC_P

Input breaker delay time timer

Standard value: (1.00 s)
Limit: 0.00 ~ 32.76 s
Sets the delay time from the auxiliary contact operation to main contact operation of the input breaker.

TIME_AIN_FAULT

General analog input fault timer

Standard value: (1.00 s)
Limit: 0.00 ~ 319.99 s
Sets the delay time to detect the fault (AIN_FAULT) when using current type general analog input.
[Related parameters] MSK_UV2, MSK_HFD2, MSK_LFD1, AIN1_TYPE, AIN2_TYPE

TIME_BR

Brake timer

Standard value: (0.00 s)
Limit: 0.00 ~ 31.99 s
Sets the delay time to detect the brake open instruction timer (BR_T).
[Related parameters] MSK_BR

TIME_CEMFOFF

Timer for restart after power failure

Standard value: (5.00 s)
Limit: 0.00 ~ 31.99 s
Sets the delay time taken from the moment of establishing UV to the moment of restart after power failure.
In the case of control with speed sensor, set the time obtained by adding the contactor answer-back delay time to the sum of TIME_CTT and TIME_FON.
In the case of sensor-less control, set the time obtained by adding the contactor answer-back delay time to TIME_CTT.
When restart after power failure is not used, set zero.
[Related parameters] TIME_CTT, TIME_FON

TIME_CFAN

Cooling fan timer

Standard value: (30.00 s)
Limit: 0.00 ~ 319.99 s
Sets the delay time to detect the Equipment ventilation fan stop timer (C_FN_T).
[Related parameters] MSK_UVA1, MSK_UVA2

TIME_CL

Current limiting timer

Standard value: (60.00 s)
Limit: 0.00 ~ 319.99 s
Sets the delay time to detect the current limit (CL_T).
Current limiting alarm (CL_TA) is detected at a time calculated by TIME_CL × 80%.
[Related parameters] MSK_UVA1, MSK_STPRQ1

TIME_CODE_ERR

CPU code SRAM check-sum error

Standard value: 3.0 s
Limit: 0.0 ~ 3276.7 s

Sets the detection delay of SRAM check-sum error. Scan time for check-sum calculation is 2 seconds. In case this delay time is 3 seconds it will detect PP7_CODE_ERR in UV2, HFD and LFD2 sequence when there is more than twice sum error.
[Related parameters] MSK_UV2, MSK_HFD2, MSK_LFD2

TIME_CPT_FHLD_D

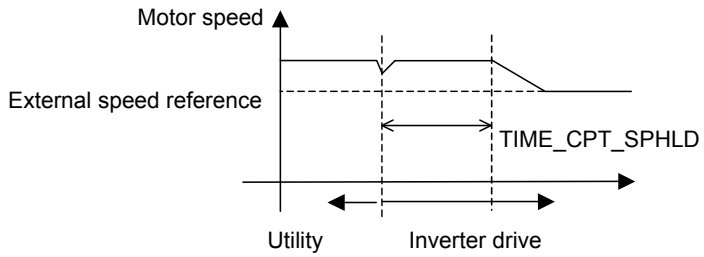
Frequency hold delay time upon capture
Standard value: (0.01 s)
Limit: 0.00 ~ 31.999 s

Set the time interval during which the frequency hold delay when the drive detect the motor phase angel and output the utility CTT open command.
After the drive hold the frequency, it may have angle error by held frequency ripple, this timer delay may help to avoid this angle error while utility CTT open delay from frequency hold. This parameter should be set the value shorter than actual utility CTT open time from the command.

TIME_CPT_SPHLD

Speed maintenance time upon capture
Standard value: (1.00 s)
Limit: 0.00 ~ 31.999 s

Set the time interval during which the speed is maintained when the motor starts to drive in the inverter upon utility synchronization capture.
After the inverter captures the motor, it maintains the utility speed for the time interval, and then follows the external speed reference.
This parameter should be set the value longer than utility contactor answer (BP_CTT) delay time.
[Related parameters] CPT_CYCLE



TIME_CTT

Contactor timer

Standard value: (1.00 s)
Limit: 0.00 ~ 319.99 s

Sets the on delay time for ACSW and ACSW_B.
It is also used for setting of delay time from the moment of establishing UV to the moment of establishing READY at restart after power failure. When restart after power failure is issued, it is need to set the same value to the all equipments.
[Related parameters] TIME_FON, TIME_CEMFOFF, MSK_READY

TIME_DS

Door switch timer

Standard value: (0.20 s)
Limit: 0.00 ~ 319.99 s

Sets the delay time to detect the door open (DS) condition.
[Related parameters] MSK_BLR5

TIME_FOFF

Exciting off delay timer

Standard value: (0.00 s)
Limit: 0.00 ~ 31.99 s

Sets the delay time to detect the field excitation off condition.

TIME_FON

Field current on delay timer

Standard value: (0.00 s)
Limit: 0.00 ~ 31.99 s

Sets the time the drive output voltage will remain at the voltage boost level at 0 Hertz output, before going to the starting frequency. This timer should be set long enough for the motor's magnetic field to be established
[Related parameters] VF_LSP_VBST

TIME_GR

Grounding detection timer

Standard value: (0.02 s)
Limit: 0.00 ~ 319.99 s

Sets the delay time to detect the grounding detection timer (GR_T).
[Related parameters] MSK_UVA3, MSK_HFD2, MSK_LFD1

TIME_HB_DOWN

Heartbeat down timer

Standard value: (1.00 s)
Limit: 0.00 ~ 31.99 s

Sets the delay time to detect the transmission fault 3, PLC station failure, when the heartbeat input by transmission would not change.
[Related parameters] Valid when FLG_HB_DOWN = 1. MSK_UV2, MSK_READY1, MSK_HFD2

TIME_MFAN

Motor cooling fan timer

Standard value: (0.00 s)
Limit: 0.00 ~ 319.99 s
Sets the delay time to detect the motor cooling fan stop timer (M_FN_T).
[Related parameters] MSK_READY2, MSK_HFD2

TIME_MVD

Main input voltage and control power voltage fault delay timer.

Standard value: (0.0 s)
Limit: 0.0 ~ 0.6 s
Sets the time delay for MPSF_MV and CPSF faults when the main power or the control power supply feedback is lost.[Related parameters] FLT_VAC_PRO

TIME_OH

Overheat timer

Standard value: (5.00 s)
Limit: 0.00 ~ 319.99 s
Sets the delay time to detect the equipment overheat timer (OH_T).
[Related parameters] MSK_BLR1, MSK_BLR2

TIME_RATE

Automatic speed rate adjusting time

Standard value: (0.000 s)
Limit: 0.000 ~ 32.767 s

Sets the renewal time interval of speed reference (SP_REF1 or SP_REF2) from the data transmission. When a change of SP_REF1 or SP_REF2 is detected, the speed reference changing rate is calculated by the following calculation (ΔSP_REF12) / TIME_RATE. According to use this function, the step changing of speed reference from the PLC is automatically corrected as liner.
[Related parameters] Valid when FLG_TIME_RATE = 1.

TIME_RNTD

RNTD timer

Standard value: (0.00 s)
Limit: 0.00 ~ 32.76 s

Sets the delay time to detect the motor run (RNTD) off condition.

TIME_ROT_F

Motor stall detection delay time

Standard value: (2.00 s)
Limit: 0.000 ~ 32.767 s

Sets the detection delay time for the motor stall detection signal.
[Related parameters] CP_SP_DIFF, CP_SP_LOW

TIME_SP_ERR2

SP_ERR2 detection delay time

Standard value: (0.20 s)
Limit: 0.00 ~ 319.99 s

Sets the delay time to detect the speed detection error 2 (SP_ERR2) when PG is used as speed sensor.
[Related parameters] MSK_BLR3

TIME_SP_RCH

Speed reach detection timer setting

Standard value: (1.00 s)
Limit: 0.00 ~ 32.76 s

Sets the detection delay time for speed reach detection or speed follow detection.
[Related parameters] CR_SP_RCH, CR_SP_RCH_BAND, FLG_SP_RCH

TIME_SPA1 ~ TIME_SPA4

Spare input signal delay time 1 to 4

Standard value: (0.00 s)
Limit: 0.00 ~ 319.99 s

Sets the delay time for DI input spare signal 1 to 4. When FLGSET01.B14:FLG_SPA_T_G10=1, then these timer will be 10 times.
[Related parameters] MSK_BLR5, MSK_UVA4, FLGSET01

TIME_ST

Starting frequency hold timer
Standard value: (1.000s)
Limit: 0.000 ~ 32.767s
Sets the time the drive will remain at the starting frequency during startup. If the starting torque of the load is large, set the time until the motor speed rises to the minimum startup frequency. If the drive output frequency rises before the motor speed follows, an excessive amount of current may flow.
[Related parameters] LMT_SP_L

TIME_TL_F

Transmission failure detection timer
Standard value: (0.00 s)
Limit: 0.00 ~ 319.99 s
Sets waiting time for detection of transmission initialization failure (TL_F2), transmission failure (TL_F3), and drive-to-drive transmission failure (TL_F4). 500ms as standard time is applied when TIME_TL_F = 0. If TIME_TL_F is not 0, the waiting time is equal to TIME_TL_F value.

TIME_UL

Low current detection time
Standard value: (60.00 s)
Limit: 0.00 ~ 31.999 s
Set the timeout time for low current detection. When load current is below the level (CP_UL_H, CP_UL_L) and after this timer setting, drive detects UL_T for fault and UL_A for alarm.
[Related parameters] CP_UL_H, CP_UL_L, MSK_UVA1, MSK_LFD2

TIME_XFR_END

Utility contactor answer timeout time
Standard value: (0.3 s)
Limit: 0.00 ~ 31.999 s
Set the timeout time for answer-wait for the utility contactor upon utility synchronization transfer.
Set a value greater than the contact operation delay time of the utility contactor.

TIME_XFR_F

Transfer operation timeout time
Standard value: (5.0 s)
Limit: 0.00 ~ 327.67 s
Set the timeout time for phase synchronization test upon utility synchronization transfer.
If the phase does not synchronize after this time interval after the motor rises to the utility speed, a trip or alarm output with continued operation occurs depending on the mask setting of the sequence.
Set a value greater than the time required for phase synchronization test (TIME_XFR_IL + XFR_CYCLE × (1/utility frequency)).
If the synchronization tester is used, set a value greater than the synchronization detection time of the synchronization tester.
[Related parameters] TIME_XFR_IL, XFR_CYCLE

TIME_XFR_IL

Transfer operation synchronization test interlock time
Standard value: (1.0 s)
Limit: 0.00 ~ 31.999 s
Set the interlock time until synchronization test starts after the motor rises to utility speed upon utility synchronization transfer.

TIME_XFR_SPHLD

Transfer operation speed hold time
Standard value: (1.0 s)
Limit: 0.00 ~ 31.999 s
Set the speed hold time from deceleration to re-acceleration for transfer retry upon utility synchronization transfer operation.
[Related parameters] FLG_XFR_RETRY

TL_CYC_TIME

Transmission cycle target time
Standard value: (21)
Limit: 3 ~ 31
Note: Initialize
Standard version: Select the desired value from the table below.
The time is the actually set target cycle time.

Setting	Time [ms]	Setting	Time [ms]	Setting	Time [ms]	Setting	Time [ms]
3	3.07	9	9.22	15	15.4	26	41.0
4	4.10	10	10.2	21	20.5	27	45.1
5	5.12	11	11.3	22	24.6	28	49.2
6	6.14	12	12.3	23	28.7	29	49.2
7	7.17	13	13.3	24	32.8	30	57.3
8	8.19	14	14.3	25	36.9	31	61.4

High-speed version: 21 (20.5 ms) fixed
[Related parameters] COMM_TYPE

TL_OP1_DT ~ TL_OP4_DT

Drive-to-drive transmission memory map address
Standard value: (0)
Limit: 0 ~ 1023
`Note: Initialize
Sets the address (4 channels) of the transmission memory map to obtain data when using the drive-to-drive transmission mode.
Unless this setting and the transmitting station (TL_OP1_ST ~ TL_OP4_ST) are set, drive-to-drive transmission function does not work. In addition, the transfer destination setting is made with SCAN_RCV07_AS ~ SCAN_RCV10_AS.
[Related parameters] COMM_TYPE, TL_OP1_DT ~ TL_OP4_DT, SCAN_RCV07_AS ~ SCAN_RCV10_AS, FLG_DSCAN

TL_OP1_ST ~ TL_OP4_ST

Drive-to-drive transmission sending station

Standard value: (0)
Limit: 0 ~ 64
Note: Initialize

Sets the station number (4 channels) to obtain data when using the drive-to-drive transmission mode.
Unless this setting and the memory map address (TL_OP1_DT – TL_OP4_DT) are set, inter-drive transmission function does not work. In addition, the transfer destination setting is made with SCAN_RCV07_AS – SCAN_RCV10_AS.
[Related parameters] COMM_TYPE, TL_OP1_DT ~ TL_OP4_DT, SCAN_RCV07_AS ~ SCAN_RCV10_AS, FLG_DSCAN

TL_PC_NO

Transmission line master station number

Standard value: (1)
Limit: 0 ~ 64
Note: Initialize

Sets the station number of the master transmission station.
[Related parameters] COMM_TYPE

TL_SELF_NO

Transmission line own station number.

Standard value: (64)
Limit: 0 ~ 64
Note: Initialize

Sets the station number of its own transmission station
[Related parameters] COMM_TYPE

TOOL_GATEWAY1 ~ TOOL_GATEWAY4

Tool gateway

Standard value: (192, 168, 87, 1)
Limit: 0 ~ 255
Note: Initialize

Sets the gateway number for Ethernet transmission.

TOOL_IP1 ~ TOOL_IP4

IP address

Standard value: (192, 168, 87, 87)
Limit: 0 ~ 255
Note: Initialize

Sets the IP address of its own station for Ethernet transmission.
The IP address must be unique (the same IP address is not used elsewhere) in that network.

TOOL_SUBNET_MSK1 ~ TOOL_SUBNET_MSK4

Subnet mask

Standard value: (255, 255, 255, 0)
Limit: 0 ~ 255
Note: Initialize
Sets the subnet mask for tool Ethernet transmission.

TOOL_TEST

Tool test

Standard value: (0)
Limit: 0, 1
Note: Not used
When password ID is not used in the tool Ethernet transmission, set 1.

TRB_L1_OP_AS ~ TRB_L8_OP_AS

Long trace-back option address

Standard value: (See table below)
Limit:
Sets the symbol of the data (8 channels) obtained by long trace-back
(Standard value)

#	Symbols	
	Standard	Synchronous transfer function
1	SP_R	SP_R
2	SP_F	DI_DATA3
3	VI_POWER	XFR_DLTQ
4	IQ_F	IQ_F
5	VAC_FBK	VAC_FBK
6	ID_F	IPLL_DLTQ
7	MAIN_VAC_F	SSEQ_OUT3
8	I1_F	I1_F

TRB_TIME_LONG

Log trace-back time

Standard value: (100 ms)
Limit: 10 ~ 10000 ms
Sets the sampling period of long trace-back.
The setting can be made in the unit of 10ms. Fractional figures will be discarded.

TRB01_OP_AS ~ TRB28_OP_AS

Standard trace-back option address
Standard value: (See table below)
Limit:

Sets the symbol of the data (28 channels) to be obtained by the standard trace-back.
(Standard value)

#	Symbols	
	Standard	Synchronous transfer function
1	SP_R	<-
2	SP_F	<-
3	MAIN_VAC_F	<-
4	E1_R	XFR_DLTQ
5	VI_POWER	<-
6	IQ_F	<-
7	IU_F	IPLL_DLTQ
8	ID_F	<-
9	EQ_R	<-
10	ED_R	<-
11	VDC_F	<-
12	IGR_FLT	<-
13	I1_F	<-
14	VAC_PRO	<-
15	VDC_UP	<-
16	VDC_UN	<-
17	VDC_VP	<-
18	VDC_VN	<-
19	VDC_WP	<-
20	VDC_WN	<-
21	DI_DATA1	DI_DATA3
22	SSEQ_OUT1	SSEQ_OUT3
23	VR_F	<-
24	VT_F	<-
25	CPS_FLT	<-
26	VF_FCMP	<-
27	VF_STLCMP	<-
28	IW_F	T25_SRC_FRQ

TRB_TRIG_MOD

Trace-back trigger mode
Standard value: (0)
Limit: 0, 1

Determines if traceback data is saved when the drive is stopped with the UVS input signal. Setting this to 0 will cause the drive to collect traceback when it is stopped via the UVS input. When the UVS is frequently used to stop operation, set 1 to inhibit traceback collection.

3.15 Parameter V~

VF_ASPR_EN

V/f simple ASPR controls enable flag

Standard value: (0)
Limit: 0 ~ 32767
Sets enable flag for using ASPR. Speed sensor is required for this function.
[Related parameters] VF_ASPR_P, VF_ASPR_W1

VF_ASPR_P

V/f simple ASPR proportional gain

Standard value: (0)Limit: 0 ~ 32767
Sets proportional gain of V/f simple ASPR. It is available only when VF_ASPR_EN=1. Speed sensor is required for this function.
[Related parameters] VF_ASPR_EN, VF_ASPR_W1

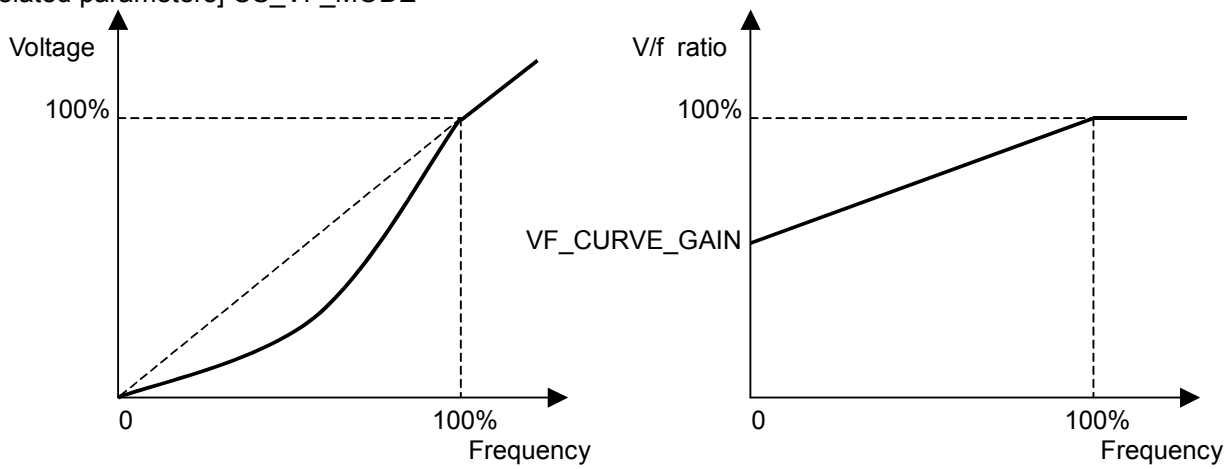
VF_ASPR_W1

V/f simple ASPR response gain

Standard value: (0.00 rad/s)Limit: 0 ~ 327.67 rad/s
Sets response gain of V/f simple ASPR. It is available only when VF_ASPR_EN=1. Speed sensor is required for this function.
[Related parameters] VF_ASPR_EN, VF_ASPR_P

VF_CURVE_GAIN

V/f control square function curve gain
Standard value: (30.0 %)
Limit: 0.0 ~ 125.0 %
Sets square function gain when square function mode is selected from V/f control mode. Ratio of voltage and frequency is shown as below graph about setting of square function gain. This is available when CS_VF_MODE = 1.
[Related parameters] CS_VF_MODE



Voltage corresponding to frequency is given by following formula:

$$Volt[\%] = Freq[\%] \times \left(\frac{100\% - VF\_CURVE\_GAIN}{100\%} \times Freq[\%] + VF\_CURVE\_GAIN\right)$$

VF_DV_GAIN

Steady State Field Current Stability Gain
Standard value: (0)
Initial value: (2000)
Limit: 0 ~ 32767
Note: Not used
Sets voltage compensation gain for stabilization. Do not use if VF_DVCMP_A and VF_DVCMP_A are used.
[Related parameters] VF_STBST_GAIN, VF_SP_STBST

VF_DVCMP_A

Field Current Stability Anti-overshoot Gain
Standard value: (1000)
Limit: 0 ~ 32767
Sets anti-overshoot gain for voltage stabilization compensation. Do not use if VF_DV_GAIN, VF_STBST_GAIN, and VF_SP_STBST are used.
[Related parameters] VF_DVCMP_AT

VF_DVCMP_AT

Field Current Stability Anti-overshoot Response Gain
Standard value: (5.00 rad/s)
Limit: 0.00 ~ 255.96 rad/s
Sets anti-overshoot time constant for voltage stabilization compensation. Do not use if VF_DV_GAIN, VF_STBST_GAIN, and VF_SP_STBST are used.

[Related parameters] VF_DVCMP_A

VF_FCMP_A

Frequency stabilization compensation anti-overshoot gain
Standard value: (2000)
Limit: 0 ~ 32767
Sets anti-overshoot gain for frequency stabilization compensation for Torque Current Stability.
[Related parameters] VF_FCMP_AT, VF_TIME_FCMP

VF_FCMP_AT

Frequency stabilization compensation anti-overshoot time constant
Standard value: (5.00 rad/s)
Limit: 0.00 ~ 255.96 rad/s
Sets anti-overshoot time constant for frequency stabilization compensation for Torque Current Stability.
[Related parameters] VF_FCMP_A, VF_TIME_FCMP

VF_FLT_SP_R

Filter of speed reference for start torque boost
Standard value: (0.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets filter time constant for speed reference used in start torque boost.

VF_FLT_STL

Stall prevention input current filter
Standard value: (100.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets filter time constant for current feedback used in stall prevention compensation.
[Related parameters] VF_STL_P, VF_STL_W1, VF_LMT_STL, VF_STLPOINT, VF_STLONSP

VF_FLT_TQZ

Regeneration Control Power Feedback Filter
Standard value: (200.0 rad/s)
Limit: 0.0 ~ 1023.9 rad/s
Sets filter time constant for output power used in DC voltage rise prevention compensation.
[Related parameters] VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_G_VBST

Voltage start torque boost
Standard value: (0.00 %)
Initial value: (1.00%)
Limit: 0.00 ~ 5.00 %
Sets voltage boost gain at motor start up.

VF_LMT_STL

Stall prevention compensation limit
Standard value: (30.0 %)
Limit: 0.00 ~ 125.0 %
Sets output limit for compensation gain used in stall prevention compensation.
[Related parameters] VF_STL_P, VF_STL_W1

VF_LMT_VCMP

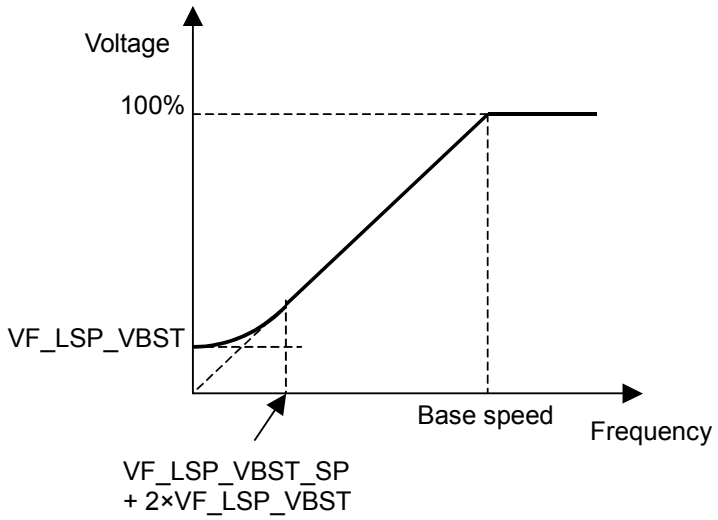
Output voltage control compensation limit
Standard value: (0.0 %)
Initial value: (10.0%)
Limit: 0.0 ~ 200.0%
Sets output limit for compensation gain used in output voltage control.
[Related parameters] VF_VCMP_P, VF_VCMP_W1

VF_LSP_VBST

Low speed voltage boost
Standard value: (0.5 %)
Limit: 0.0 ~ 10.0 %
Sets voltage reference boost value used at low speed. The relation between voltage and speed is shown as below graph by setting VF_LSP_VBST. In case using auto torque boost (MI_R1_SET, MI_L_CMP, MI_ID_BASE, VF_TRQBST_GAIN), set VF_LSP_VBST=0%.

VF_LSP_VBST_SP

Low speed voltage boost enable frequency
Standard value: (10.0 %)
Limit: 0.0 ~ 20.0 %
Sets voltage reference boost enabled frequency, it is used at low speed. The relation between voltage and speed is shown as below graph by setting VF_LSP_VBST. In case using auto torque boost (MI_R1_SET, MI_L_CMP, MI_ID_BASE, VF_TRQBST_GAIN), set VF_LSP_VBST=0%.



VF_MVD_EN

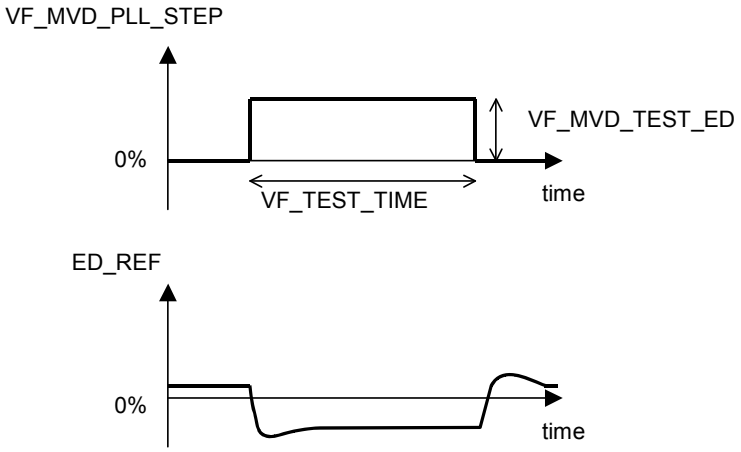
Power ride through enable flag
Standard value: (0)
Limit: 0 ~ 1
Sets 1 in case using power ride through function.
[Related parameters] ACR_P, ACR_W1, TIME_MVD, VF_MVD_PLL_P, VF_MVD_PLL_W1

VF_MVD_PLL_P

Power ride through speed PLL proportional gain
Standard value: (100)
Limit: 0 ~ 32767

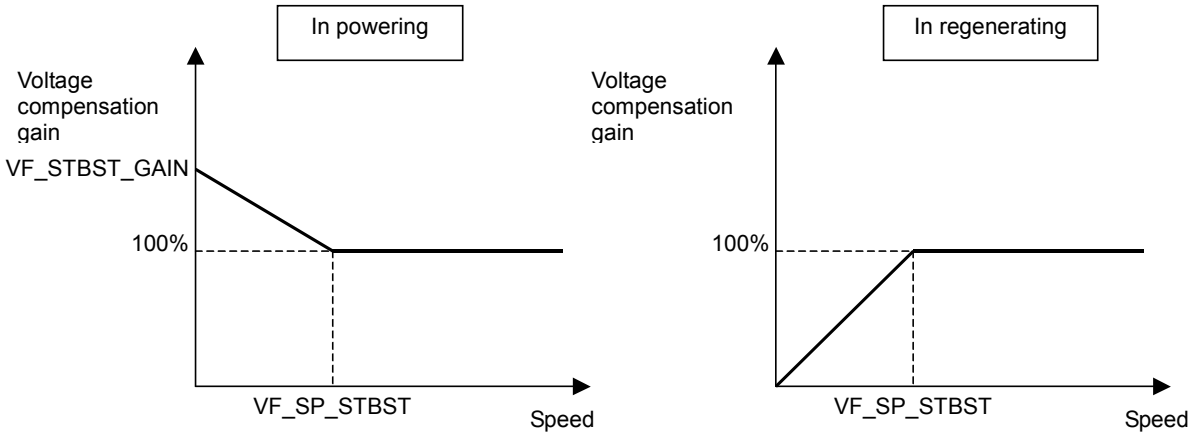
VF_MVD_PLL_W1

Power ride through speed PLL response gain
Standard value: (20.00 rad/s)
Limit: 0.00 ~ 327.67 rad/s
In case of power ride-through control enable, set speed PLL gain. Drive will be in the adjustment test mode when step time (VF_TEST_TIME) and voltage step (VF_MVD_TEST_ED) have some value. Adjust these parameters not to have much over-shoot with d-axis voltage reference (ED_REF)
(note) It also needs current response adjustment (ACR_P, ACR_W1). It can be in current response test mode (TEST 26). Current response adjustment should be done before adjustment of VF_MVD_PLLP and VF_MVD_PLL_W1.
[Related parameters] ACR_P, ACR_W1, TIME_MVD, VF_MVD_EN



VF_SP_STBST

Low Speed Field Current Compensation End Speed
Standard value: (0.0 %)
Initial value: (10.0%)
Limit: 0.0 ~ 125.0 %
Sets speed that changes voltage compensation gain in stabilization compensation of V/f control. Voltage compensation gain in the area where speed is lower than speed set, is shown as below graph. Do not use if VF_DVCMP_A and VF_DVCMP_A are used.
[Related parameters] VF_DV_GAIN, VF_STBST_GAIN



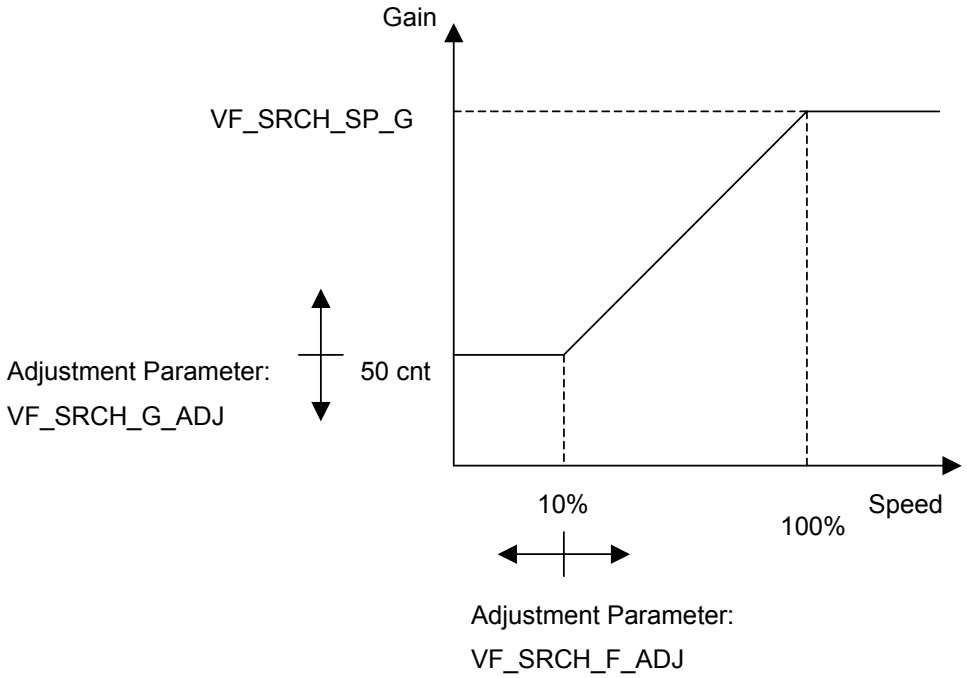
VF_SP_TRQBST

Base speed of auto torque boost gain
Standard value: (0.0%)
Initial value: (5.0 %)
Limit: 0.0 ~ 125.0 %
Sets base speed that changes auto torque boost gain.
[Related parameters] VF_TRQBST_GAIN

VF_SRCH_F_ADJ, VF_SRCH_G_ADJ

VF Flying Restart Low Speed Search Gain Change Adjustment
Standard value: (0)
Limit:
VF_SRCH_F_ADJ -100 ~ 900 cnt
VF_SRCH_G_ADJ -50 ~ (VF_SRCH_SP_G - 50) cnt

Sets low speed searching gain change adjustment gain. With 0 value, searching gain will be 50 count in 10% searching speed.
[Related parameters] VF_SRCH_SP_G



VF_SRCH_I1_CMP

Flying restart current limit adjustment
Standard value: (0.0 %)
Limit: -50.0 ~ 50.0 %
Sets adjustment current level from 50% (default). Current level is used to help limit the excessive flux current caused by fast voltage increase rate after speed search.
[Related parameters] VF_SRCH_SP_G, VF_SRCH_RATE, VF_SRCH_MODE, SL_SP_RESTART, VF_SRCH_IQ_LVL

VF_SRCH_IQ_LV

VF Flying Restart Speed Search Torque Reference
Standard value: (1.0 %)
Limit: 0.0 ~ 20.0 %
Sets torque current reference for speed search in flying restart. While in speed search mode, the frequency is adjusted to try to keep the torque current at this level.
[Related parameters] VF_SRCH_SP_G, VF_SRCH_RATE, VF_SRCH_MODE, VF_SRCH_I1_CMP, SL_SP_RESTART

VF_SRCH_IQ_RATE

VF Flying Restart Speed Search Torque Current Recovery Ramp Rate
Standard value: (2.0 S)
Limit: 0.00 ~ 327.67 S
Sets torque current increase rate while speed search. The torque current increase will start when searching frequency is below VF_SRCH_SP_END. Usually, this rate is enabled in low speed.
[Related parameters] VF_SRCH_SP_END

VF_SRCH_MODE

VF Flying Restart Speed Search Mode
Standard value: (0)
Limit: -2 ~ 2
Sets flag for search attempt time and search direction. When drive cannot find flying speed, it will start from 0% speed at the normal acceleration rate.
[Related parameters] VF_SRCH_SP_G, VF_SRCH_RATE, SL_SP_RESTART, VF_SRCH_I1_CMP, VF_SRCH_IQ_LVL

VF_SRCHMODE	Attempt times	Search direction
2	2	Search forward, and next, reverse
1	1	Search forward
0	0	No speed search
-1	1	Search reverse
-2	2	Search reverse, and next, forward

VF_SRCH_RATE

VF Flying Restart Speed Search Voltage Ramp Rate
Standard value: (1.0 S)
Limit: 0.00 ~ 327.67 S
Sets voltage increase rate after speed search. Usually, it should be motor time constant. If this rate is fast, flux current may become too large during this time.
[Related parameters] VF_SRCH_SP_G, SL_SP_RESTART, VF_SRCH_MODE, VF_SRCH_I1_CMP, VF_SRCH_IQ_LVL

VF_SRCH_SP_END

VF Flying Restart Speed Search Torque Current Recovery Starting Frequency
Standard value: (125.0 %)
Limit: 0.0 ~ 125.0 %
Sets torque current increase rate while speed search. The torque current increase will start when searching frequency is below VF_SRCH_SP_END.
[Related parameters] VF_SRCH_IQ_RATE

VF_SRCH_SP_G

VF Flying Restart Speed Search Frequency Ramp Gain
Standard value: (250)
Limit: 0 ~ 32767
Sets speed search integral gain. When this setting is small, it takes long time to search motor speed. When this setting is big, it may fail to catch the speed.
[Related parameters] SL_SP_RESTART, VF_SRCH_RATE, VF_SRCH_MODE, VF_SRCH_I1_CMP, VF_SRCH_IQ_LVL

VF_STBST_GAIN

Low Speed Field Current Stability Gain
Standard value: (0.0 %)
Initial value: (80.0%)
Limit: 0.0 ~ 3000.0 %
Sets enhancement value of voltage compensation gain that used in powering in stabilization compensation of V/f control. Do not use if VF_DVCMP_A and VF_DVCMP_A are used.

[Related parameters] VF_DV_GAIN, VF_SP_STBST

VF_STL_IQ_NL

Powering/regenerating change point current
Standard value: (0.0 %)
Limit: -10.0 ~ 10.0 %
Sets no load current whether powering or regenerating.

VF_STL_P

Stall prevention proportional gain
Standard value: (1000)
Limit: 0 ~ 32767
Sets proportional gain for stall prevention compensation.
[Related parameters] VF_STL_W1, VF_LMT_STL, VF_STLPOINT, VF_STLONSP

VF_STL_W1

Stall prevention response time constant
Standard value: (3.00 rad/s)
Limit: 0.00 ~ 327.67 rad/s
Sets response time constant for stall prevention compensation.
[Related parameters] VF_STL_P, VF_LMT_STL, VF_STLPOINT, VF_STLONSP

VF_STLONSP

Sall prevention compensation valid speed
Standard value: (10.0 %)
Limit: 0.0 ~ 125.0 %
Sets the minimum speed that compensation becomes valid in stall prevention compensation.
[Related parameters] VF_STL2POINT, VF_STLPOINT

VF_STLPOINT
V/f control stall prevention compensation start current
Standard value: (115.0 %)
Limit: 0.0 ~ 400.0 %
Sets compensation start current in stall prevention compensation.
[Related parameters] VF_STL_P, VF_STL_W1, VF_LMT_STL, VF_STLONSP

VF_TIME_FCMP
Frequency stabilization compensation start time
Standard value: (0.000 sec)
Limit: 0.000 ~ 32.767 sec
Sets delay time from drive start to compensation start in stabilization compensation.
[Related parameters] VF_FCMP_A, VF_FCMP_AT

VF_TQZ_A
Regeneration Control Anti-overshoot Gain
Standard value: (1000)
Limit: 0 ~ 32767
Sets anti-overshoot gain for DC voltage rise prevention control.
[Related parameters] VF_FLT_TQZ, VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_TQZ_AT
Regeneration Control Anti-overshoot Response Gain
Standard value: (5.00 rad/s)
Limit: 0.00 ~ 255.96 rad/s
Sets anti-overshoot time constant for DC voltage rise prevention control.
[Related parameters] VF_FLT_TQZ, VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_TQZ_LV
Regeneration Control Power Level
Standard value: (-0.5 %)
Limit: -10.0 ~ 10.0 %
Sets power level for power used in DC voltage rise prevention control.
[Related parameters] VF_FLT_TQZ, VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_TQZ_P
Regeneration Control Compensation Proportional Gain
Standard value: (2000)
Limit: 0 ~ 32767
Set proportional gain for power control used in DC voltage rise prevention control.
[Related parameters] VF_FLT_TQZ, VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_TQZ_W1
Regeneration Control Compensation Response Gain
Standard value: (5.00 rad/s)
Limit: 0.00 ~ 327.67 rad/s
Set response gain for power control used in DC voltage rise prevention control.
[Related parameters] VF_FLT_TQZ, VF_TQZ_A, VF_TQZ_AT, VF_TQZ_LV, VF_TQZ_P, VF_TQZ_W1

VF_TRQBST_GAIN
V/f control automatic torque boost gain
Standard value: (0.0%)
Initial value: (100.0 %)
Limit: 0.0 ~ 125.0 %
Sets compensation output gain in automatic torque boost compensation of V/f control.

VF_VCMP_A
Voltage stabilization compensation anti-overshoot gain
Standard value: (0)
Limit: 0 ~ 32767
Sets anti-overshoot gain for output voltage stabilization.
[Related parameters] VF_VCMP_AT

VF_VCMP_AT
Voltage stabilization compensation anti-overshoot time constant
Standard value: (0.00 rad/s)
Limit: 0.00 ~ 255.96 rad/s
Sets anti-overshoot time constant for output voltage stabilization.
[Related parameters] VF_VCMP_A

VF_VCMP_P
Output voltage control proportional gain
Standard value: (0)
Initial value: (50)
Limit: 0 ~ 32767
Sets proportional gain for voltage control.
[Related parameters] VF_LMT_VCMP, VF_VCMP_W1

VF_VCMP_W1
Output voltage control response time constant
Standard value: (0.00 rad/s)
Initial value: (3.00 rad/s)
Limit: 0.00 ~ 327.67 rad/s
Sets response time constant for output voltage control.
[Related parameters] VF_LMT_VCMP, VF_VCMP_P

VF_VDCR_A
VDC OV prevention Control Anti-overshoot Gain
Standard value: (10923)
Limit: 0 ~ 32767
Sets anti-overshoot gain for DC over-voltage control.
[Related parameters] VF_FLT_VDCR, VF_VDCR_AT, VF_VDCR_LV, VF_VDCR_P, VF_VDCR_W1

VF_VDCR_AT

VDC OV prevention Control Anti-overshoot Response Gain
Standard value: (1.00 rad/s)
Limit: 0.00 ~ 255.96 rad/s
Sets anti-overshoot time constant for DC over-voltage control.
[Related parameters] VF_FLT_VDCR, VF_VDCR_A, VF_VDCR_LV, VF_VDCR_P, VF_VDCR_W1

VF_VDCR_LV

VDC OV prevention Control Voltage Level
Standard value: (115.0%)
Limit: 0.0 ~ 150.0 %
Sets power level for power used in DC over-voltage control.
[Related parameters] VF_FLT_VDCR, VF_VDCR_A, VF_VDCR_AT, VF_VDCR_P, VF_VDCR_W1

VF_VDCR_P

VDC OV prevention Control Compensation Proportional Gain
Standard value: (20)
Limit: 0 ~ 32767
Set proportional gain for power control used in DC over- voltage control.
[Related parameters] VF_FLT_VDCR, VF_VDCR_A, VF_VDCR_AT, VF_VDCR_LV, VF_VDCR_W1

VF_VDCR_W1

VDC OV prevention Control Compensation Response Gain
Standard value: (1.00 rad/s)
Limit: 0.00 ~ 327.67 rad/s
Set response gain for power control used in DC over-voltage control.
[Related parameters] VF_FLT_VDCR, VF_VDCR_A, VF_VDCR_AT, VF_VDCR_LV, VF_VDCR_P

VF_WSCMP_EN

Slip frequency compensation enable flag
Standard value: (0)
Limit: 0 ~ 1
Sets enable flag for slip frequency compensation. Compensation gain is calculated from motor RPM, pole and frequency rating setting. So it needs motor RPM setting (CS_MOTOR_PRM).
[Related parameters] CS_MOTOR_RPM, CS_MOTOR_POLE

3.16 Parameter X~

XFR_A

Transfer phase difference PLL anti-overshoot gain
Standard value: (5000)
Limit: 0 ~ 32767
Set the anti-overshoot gain of the phase synchronization PLL upon utility synchronization transfer.
[Related parameters] XFR_AT

XFR_AT

Transfer phase difference PLL anti-overshoot W AT gain
Standard value: (10.00 rad/s)
Limit: 0 ~ 255.96
Set the anti-overshoot W AT gain of the phase synchronization PLL upon utility synchronization transfer.
[Related parameters] XFR_A

XFR_CYCLE

Utility synchronization transfer synchronization determination cycle count
Standard value: (30)
Limit: 0 ~ 1500
Set the phase synchronization determination cycle count upon utility synchronization transfer.
It is determined as synchronization if the phase difference is within the determination value LVL_XFR_DLTQ during this cycle.
[Related parameters] LVL_XFR_DLTQ

XFR_DIF_G

Transfer input gain of incomplete difference
Standard value: (10)
Limit: 1 ~ 32767
Set the input gain of incomplete difference upon utility synchronization transfer.
[Related parameters] XFR_A, XFR_AT

XFR_PLL_P

Transfer phase difference PLL proportional gain
Standard value: (10)
Limit: 0 ~ 32767
Set the proportional gain of the phase synchronization PLL upon utility synchronization transfer.
[Related parameters] XFR_PLL_W1

XFR_PLL_W1

Transfer phase difference PLL response gain
Standard value: (3.00 rad/s)
Limit: 0 ~ 327.67 rad/s
Set the response gain of the phase synchronization PLL upon utility synchronization transfer.
[Related parameters] XFR_PLL_P

XFR_QSHIFT

Utility synchronization transfer side phase shift
Standard value: (0 deg)
Limit: -10 ~ 10 deg
Set the phase offset upon utility synchronization transfer.
If this is set to a positive value, the inverter phase is behind the utility phase; if set to negative, it is ahead.

XFR_V_GAIN

Utility synchronization transfer output voltage adjustment gain
Standard value: (100.0 %)
Limit: 0.0 ~ 130.0 %
Set the output voltage adjustment gain upon utility synchronization transfer.
[Related parameters] FLT_SYNC_V_G, CPT_V_GAIN

XIO_TYPE

External terminal block board type
Standard value: (2)
Limit: 0 ~ 3
Sets the board type of ARND-3120 series external terminal block as follows. This setting will be reflected on the general analog input gain.

Board type	XIO_TYPE
TYPE A	0
TYPE B	1
TYPE C	2
TYPE D	3

[Related parameters] AIN1_GS, AIN2_GS, AIN1_TYPE, AIN2_TYPE

4 Appendix

4.1 Representative Variables

Representative Variables are shown below.

No.	Symbol	Explanation
1.	F_P	Frequency pattern 250cnt/%
2.	E1_R	Output voltage reference 16384cnt/100%
3.	I1_F	Motor average total current feedback 40cnt/%
4.	VI_POWER	Inverter output power 1cnt/kW
5.	VDC_F	Average DC voltage feedback 100cnt/%
6.	SP_R	Total speed reference 250cnt/%
7.	IQ_F	q-Axis (Torque) motor current feedback 40cnt/%
8.	ID_F	d-Axis (Field) motor current feedback 40cnt/%
9.	FL_R	Flux reference 10cnt/%
10.	QO	Output Electrical Angle 180cnt/degree
11.	SSEQ_OUT1	Serial sequence output word 1 Bit format
12.	CPS_FLT	Filtered control power supply voltage 1cnt/volt
13.	VDC_F_FLT	Filtered average DC voltage feedback 100cnt/%
14.	SERSEQDATA1	Serial Sequence input word 1 Bit format
15.	SP_REF_MRH	Speed Reference from EOI 250cnt/%
16.	SP_REF_AIN1	Speed Reference from Analog input 250cnt/%
17.	SP_REF_AIN2	Speed Reference from Analog input 250cnt/%
18.	VDC_xP_FLT	P-bus DC Voltage Feedback of x phase (x : U, V, W) 100cnt/%
19.	VDC_xN_FLT	N-bus DC Voltage Feedback of x phase (x : U, V, W) 100cnt/%
20.	MOT_FREQ	Output frequency 10cnt/Hz
21.	MOT_VOLT	Output voltage 1count/V
22.	INV_U_CURR	U-phase RMS output current 10cnt/A
23.	INV_V_CURR	V-phase RMS output current 10cnt/A
24.	INV_W_CURR	W-phase RMS output current 10cnt/A
25.	LINE_VOLT	Input voltage 1cnt/V
26.	MOT_FREQ_PCT	Output frequency converted into % 100cnt/%
27.	DUST	Memory location that will not effect software operation