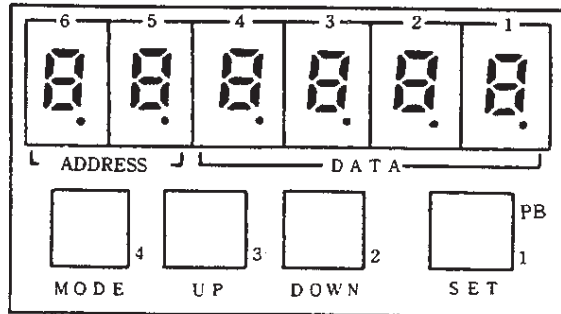


3.3.2 Display and setting switches (on SGJ-CA, CB card)



"Status display", "diagnosis", "alarm", "parameter setting (1) to (8)" and "debug" can be displayed.

Display

MODE : Display mode can be changed.

UP : Value displayed in ADDRESS and DATA can be incremented.

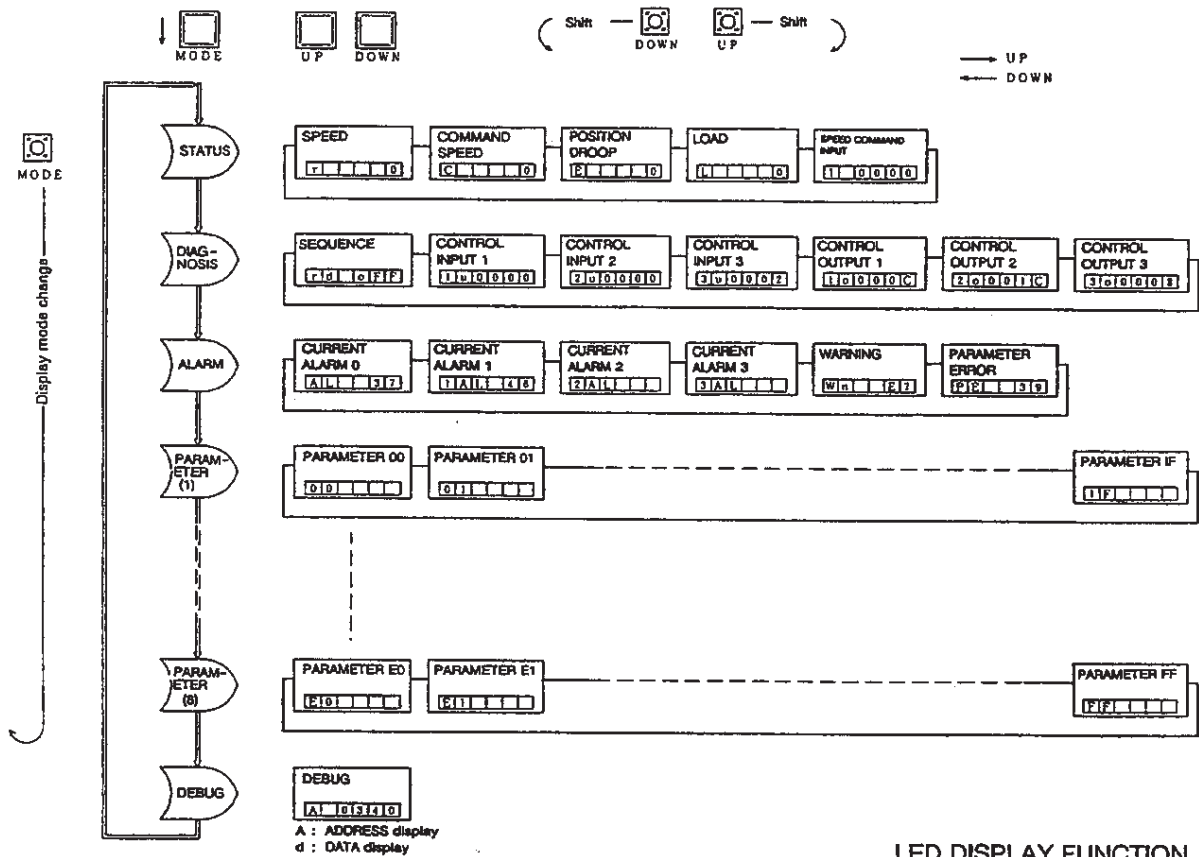
DOWN : Value displayed in ADDRESS and DATA can be decremented.

SET : Data set for parameter is stored when this switch is pressed.

Setting

- There are 12 display modes, namely, "status display", "diagnosis", "alarm", "parameter setting (1) to (8)" and "debug".
- After turning on the power, "Speed" is displayed in status mode unless alarm occurs.
- In case of alarm, the alarm code is displayed in error alarm mode.
- Display mode can be changed by pressing **MODE** switch.
- For display mode sequence and display content, refer to "LED display mode" on the next page.

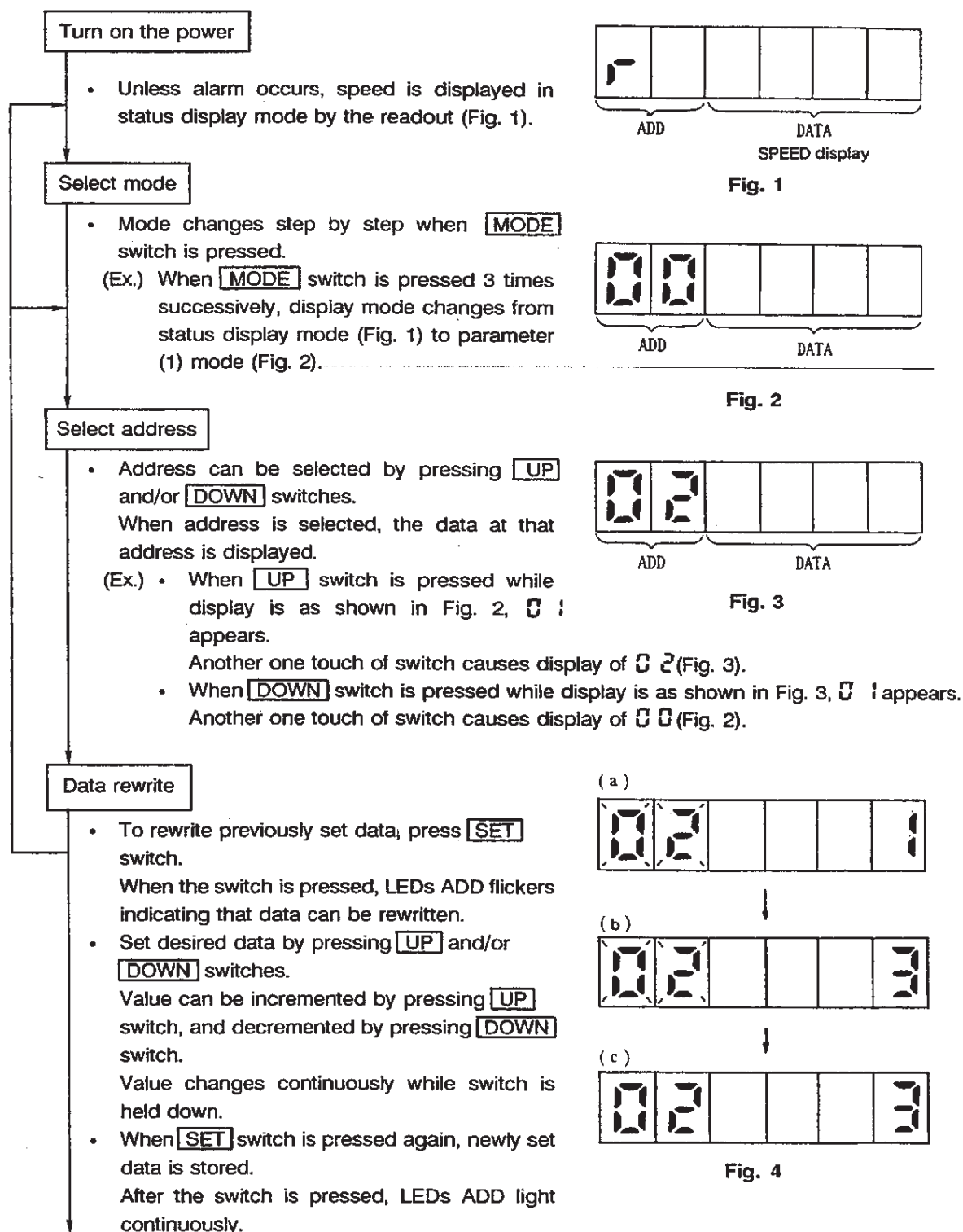
3.3.3 LED display mode



- Display mode change, "status display", "status display", "diagnosis", "alarm", "parameter setting (1)" can be selected by pressing **MODE** switch.
- Display content can be changed in the same display mode by pressing **UP** or **DOWN** switch.

3.3.7 Parameter settings

To specify parameter, set "SET" (machine ready for operation) to "OFF".



↓
Data set completed

- Press **RESET** switch and reset the FR-SGJ (or turn off and then on the power).

Now data setting has been completed.

(Note) When the parameter data is not within the setting range, the LED display will be as shown in Fig. 5 (a). Reset after checking the parameter data value to be set.

- * To confirm the presently set parameter, turn on dip switch (SW1) 4, and it will display. (Fig. 5(a) - (b).)

(Example)

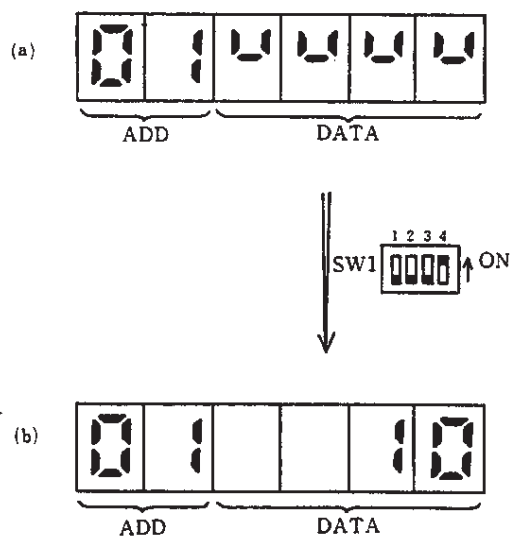


Fig. 5

3.3.8 Parameter list

#	Parameter		Description	Setting range (unit)
01	NOX	Motor type	bit0=0 Standard =1 Set range constant output valid bit1=0 Standard =1 Special motor constant (E ₂ ROM) bit2=0 Standard =1 Base slide valid (When the motor constant is standard, select with MSL.)	Hexadecimal notation
02	MSL	Motor selection	<256PLG> 1 = SJ-N0.75A (10000 rpm) 2 = SJ-N1.5A (10000 rpm) 3 = SJ-N2.2X (10000 rpm) 4 = SJ-N2.2A (10000 rpm) 5 = SJ-N3.7A (10000 rpm) 6 = SJ-N5.5AP (10000 rpm) 7 = SJ-N5.5A (8000 rpm) 8 = SJ-N7.5A (8000 rpm) <128PLG> 17 = (Spare) 18 = (Spare) 19 = SJ-J2.2X (10000 rpm) 20 = SJ-J2.2A (10000 rpm) 21 = SJ-J3.7A (10000 rpm) 22 = (Spare) 23 = SJ-J5.5A (8000 rpm) 24 = SJ-J7.5A (8000 rpm) * The SJ-J motor can be selected also.	Decimal notation
03	PLG	Position loop encoder type	Setting is made for number of encoder pulses. 0: 1024 pulses (encoder orientation, sync. TAP)	Decimal notation
04	MOD	External interface mode selection	Setting depends on interface with NC. 0: Digital I/O (CON1 signal is used for operation) 2: Bus-line connection to M300	Decimal notation
05	DSR	Digital speed command type	Type of digital speed command input is selected. This parameter is valid when MOD (#04) is set "0". 0: 12-bit binary 1: Signed 12-bit binary 2: BCD (2-digit) 3: BCD (3-digit)	Decimal notation
06	MON	Output monitor selection	The details of the load meter output (CON1 M02 output) are set. 0: Load meter 2: Load meter (with primary delay filter)	Decimal notation
07			Not used. Set "0".	
08			Not used. Set "0".	
09			Not used. Set "0".	
0A			Not used. Set "0".	

Continued on the next page.

#	Parameter		Description	Setting range (unit)
0B	VOP	Speed command offset adjustment	When analog speed command is used, offset value is set. Standard setting: 0	Signed decimal notation -999 ~ +999
0C	VON	Speed command clamp value	Set "0".	-999 ≤ ≤ +999
0D	VGP	Speed command gain adjustment	Gain for speed command is set. Actual speed command is product obtained by multiplying speed command from external signal source by this setting (1 multiplier = 1000). Standard setting: 1000	Decimal notation 0 ~ 1150
0E			Not used. Set "0".	
0F	CSN2	2nd cushion (slow-start) time constant	Set "0".	Decimal notation
10	DTYP	Data type	Whether data of parameters #11 ~ #20 are valid or invalid depends on this setting. 0: Invalid 1: Valid When "1" is selected, data set for parameters #11 ~ #20 become valid for input signal to connector CONC of SGJ-OR card.	Decimal notation
11 12 13 14 15 16 17 18 19 1A 1B 1C	DT01 DT02 DT03 DT04 DT05 DT06 DT07 DT08 DT09 DT10 DT11 DT12	Data 1 Data 2 Data 3 Data 4 Data 5 Data 6 Data 7 Data 8 Data 9 Data 10 Data 11 Data 12	These data are valid when "1" is set for #10 DTYP . Speed command selected by speed select signal is set for each data. Data is set in terms of motor speed within the range up to the motor maximum speed set by #31 TSP .	Decimal notation
1D	DT13		Not used. Set "0".	
1E	DT14		Not used. Set "0".	
1F	DT15		Not used. Set "0".	
20			Not used. Set "0".	

Continued on the next page.

#	Parameter		Description	Setting range (unit)	
* 21	PG1	Magnesen- sor, Motor built- in encoder, Oriented position loop gain	The larger the setting, shorter time taken for orientation, and the higher is the servo stiffness. Larger setting, however, may cause more intense vibration overshoot. Standard setting: See Appendix table 1.	0 ~ 360 (1/10 rad/s)	
* 22	PG2	Encoder oriented position loop gain	Same as above Standard setting: See Appendix table 1.	0 ~ 360 (1/10 rad/s)	
* 23	PGC	Sync. TAP position loop gain	Spindle position loop gain in sync. TAP is set. Standard setting: 40 (NC display standard setting: 10.00)	1 ~ 512 (1/4 rad/s) For NC display parameter, 0.25 ~ 128.00 (rad/s)	
* 24	ZRZ	Oriented in- position range	Positioning range within which "orientation complete" signal is output is set. Standard setting: 16 (NC display standard setting: 1.00)	Encoder 1 ~ 5760 (1/16 deg.) For parameter on NC display 0 ~ 359 deg.	Magne- sensor 1 ~ 512 (1/16 deg.) 0 ~ 39 deg.
* 25	OSP		Not used. Set "0".		
* 26	CSP	Creep speed	Time taken for orientation is reduced by increasing this setting. Standard setting: See Appendix table 1.	1 ~ 1000	
* 27	PST	Position shift	Oriented stop position is set. Encoder: Stop position is set within 360 deg. with increment of 360/4096. Magne-sensor: Stop position is set within range from -5 deg. to +5 deg. with increment 10/1024 (2048 for 0 deg.). Standard setting: 2048	Encoder 0 ~ 4095 (pulses)	Magne- sensor 1536~2560 (about 1/100 deg.)
* 28	BRC		Not used. Set "0".		
* 29	PGT	Position loop gain during synchro- nous tap	When combining the synchronous spindle function and synchronous tap function set the position loop gain for during synchronous tapping. Here the PGC will become invalid. Standard setting: 40 (NC display standard setting: 10.00)	1 ~ 512 (1/4 rad/s) The NC display parameters will be 0.25 ~ 128.00 (rad/s)	
* 2A	PGS	Position loop gain during synchronous spindle	Set the position loop gain for the spindle during synchronous spindle. When the setting value is "0", the parameter #23 PGC setting value will be used. Standard setting: 40 (NC display standard setting: 10.00)	1 ~ 512 (1/4 rad/s) The NC display parameters will be 0.25 ~ 128.00 (rad/s)	

Continued on the next page.

Parameters marked with * are set on the NC side when the controller is connected to M300, M3/L3 series with bus line.

#	Parameter	Description	Setting range (unit)																																																																
2B	ORTS	<p>Synchronous tap, synchronous spindle control selection</p> <p>During synchronous spindle or when the synchronous spindle function and synchronous tap function are used together, set the control method for the synchronous tap. Here the ORS2 position loop related parameters will become invalid.</p> <table><tr><td>F</td><td>E</td><td>D</td><td>C</td><td>B</td><td>A</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="7">For synchronous spindle</td><td colspan="9">For synchronous tap</td></tr><tr><td colspan="2">Detector direction</td><td colspan="2">Strong excitation</td><td colspan="2">Semi-close</td><td colspan="2">Motor command direction</td><td colspan="2">Zero point return direction</td><td colspan="2">Strong excitation</td><td colspan="4">ORTS valid</td></tr><tr><td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2">0: Movable excitation 1: Strong excitation</td><td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2">0: Close 1: Semi-close</td><td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2">0: Movable excitation 1: Strong excitation</td><td colspan="4">0: ORTS invalid 1: ORTS valid (The setting for ORS2 setting is used.)</td></tr></table> <p>* Bits 0, 9, A, E are used for both the synchronous tap and synchronous spindle.</p>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	For synchronous spindle							For synchronous tap									Detector direction		Strong excitation		Semi-close		Motor command direction		Zero point return direction		Strong excitation		ORTS valid				0: (+) direction 1: (-) direction		0: Movable excitation 1: Strong excitation		0: (+) direction 1: (-) direction		0: Close 1: Semi-close		0: (+) direction 1: (-) direction		0: Movable excitation 1: Strong excitation		0: ORTS invalid 1: ORTS valid (The setting for ORS2 setting is used.)				Hexadecimal notation
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																																																				
For synchronous spindle							For synchronous tap																																																												
Detector direction		Strong excitation		Semi-close		Motor command direction		Zero point return direction		Strong excitation		ORTS valid																																																							
0: (+) direction 1: (-) direction		0: Movable excitation 1: Strong excitation		0: (+) direction 1: (-) direction		0: Close 1: Semi-close		0: (+) direction 1: (-) direction		0: Movable excitation 1: Strong excitation		0: ORTS invalid 1: ORTS valid (The setting for ORS2 setting is used.)																																																							
2C		Not used. Set "0".																																																																	
2D		Not used. Set "0".																																																																	
2E		Not used. Set "0".																																																																	

Continued on the next page.

Parameters marked with * are set on the NC side when the controller is connected to M300, M3/L3 series with bus line.

Appendix table 1 Parameter standard setting value for orientation

Parameter	Application	For small load GD ² (Machining center, etc.)	For large load GD ² (Lathe, etc.)
PG1		100	50
PG2		100	50
CSP		20	8
ORS1		4400	4400

#	Parameter	Description	Setting range (unit)																																																	
2F	ORS1	<p>Orient stop control 1</p> <table border="1"> <thead> <tr> <th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr> </thead> <tbody> <tr> <td colspan="4">Orient K_i magnification</td><td colspan="4">Orient K_p magnification</td><td colspan="4"></td><td>Servo lock control method</td><td colspan="4">ω T selection [rad/s]</td></tr> <tr> <td colspan="4">4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2</td><td colspan="4">4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2</td><td colspan="4">0: Delay/advance 1: PI</td><td colspan="4">4-bit combination 0: 0.55 [rad/s] 1: 1.1 2: 1.65 3: 2.2 4: 2.75 5: 3.3 6: 3.85 7: 4.4 8: 4.95 9: 5.5 A: 6.05 B: 6.6 C: 7.15 D: 7.7 E: 8.25 F: 8.8</td></tr> </tbody> </table> <p>Standard setting: Refer to Appendix table 1.</p>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	Orient K_i magnification				Orient K_p magnification								Servo lock control method	ω T selection [rad/s]				4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2				4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2				0: Delay/advance 1: PI				4-bit combination 0: 0.55 [rad/s] 1: 1.1 2: 1.65 3: 2.2 4: 2.75 5: 3.3 6: 3.85 7: 4.4 8: 4.95 9: 5.5 A: 6.05 B: 6.6 C: 7.15 D: 7.7 E: 8.25 F: 8.8				Hexadecimal notation
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																																					
Orient K_i magnification				Orient K_p magnification								Servo lock control method	ω T selection [rad/s]																																							
4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2				4-bit combination 0: 0.6 [magnification] 1: 0.7 2: 0.8 3: 0.9 4: 1 5: 1.2 6: 1.4 7: 1.6 8: 1.8 9: 2 A: 2.2 B: 2.4 C: 2.6 D: 2.8 E: 3 F: 3.2				0: Delay/advance 1: PI				4-bit combination 0: 0.55 [rad/s] 1: 1.1 2: 1.65 3: 2.2 4: 2.75 5: 3.3 6: 3.85 7: 4.4 8: 4.95 9: 5.5 A: 6.05 B: 6.6 C: 7.15 D: 7.7 E: 8.25 F: 8.8																																								
30	ORS2	<p>Orient stop control 2</p> <table border="1"> <thead> <tr> <th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr> </thead> <tbody> <tr> <td colspan="2">Position loop detector direction</td><td colspan="2"></td><td colspan="2">Position loop strong excitation</td><td colspan="2">Position loop close/semi-close</td><td colspan="2">Position loop motor command direction</td><td colspan="2">Detector direction for orient</td><td colspan="2"></td><td colspan="2">Orient rotation direction</td></tr> <tr> <td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2"></td><td colspan="2">0: Weak excitation 1: Strong excitation</td><td colspan="2">0: Close 1: Semi-close</td><td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2">0: (+) direction 1: (-) direction</td><td colspan="2">2-bit combination 0: PRE 1: Forward 2: Reverse 3: Prohibit</td><td colspan="2">PRE is the forward/reverse command and same direction until the last time. Normal PRE</td></tr> </tbody> </table>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	Position loop detector direction				Position loop strong excitation		Position loop close/semi-close		Position loop motor command direction		Detector direction for orient				Orient rotation direction		0: (+) direction 1: (-) direction				0: Weak excitation 1: Strong excitation		0: Close 1: Semi-close		0: (+) direction 1: (-) direction		0: (+) direction 1: (-) direction		2-bit combination 0: PRE 1: Forward 2: Reverse 3: Prohibit		PRE is the forward/reverse command and same direction until the last time. Normal PRE		Hexadecimal notation	
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																																					
Position loop detector direction				Position loop strong excitation		Position loop close/semi-close		Position loop motor command direction		Detector direction for orient				Orient rotation direction																																						
0: (+) direction 1: (-) direction				0: Weak excitation 1: Strong excitation		0: Close 1: Semi-close		0: (+) direction 1: (-) direction		0: (+) direction 1: (-) direction		2-bit combination 0: PRE 1: Forward 2: Reverse 3: Prohibit		PRE is the forward/reverse command and same direction until the last time. Normal PRE																																						

Continued on the next page.

Parameters marked with * are set on the NC side when the controller is connected to M300, M3/L3 series with bus line.

#	Parameter		Description	Setting range (unit)
* 31	TSP	Motor maximum speed	The maximum speed of motor depends on this setting.	1 ~ 3276 (10 rpm) 10 ~ 32760 (rpm) for parameter setting on NC display
* 32	ZSP	Zero speed	Speed at which "zero speed" is output is set. Standard setting: 50	1 ~ 1000 (rpm)
* 33	CSN	Acceleration time constant	Time for acceleration to maximum speed from zero speed is set (invalid for position loop control). Standard setting: 30 (300 for parameter setting on NC display)	2 ~ 3276 (10 msec) 20 ~ 32760 (msec) for parameter setting on NC display
* 34	SDT	Speed detection ratio	Speed at which "speed detect" signal is output is set in terms of percentage to motor maximum speed. Standard setting: 10	1 ~ 100 (%)
* 35	TLM	Torque limit	Torque limit is set in terms of percentage for torque limit. Standard setting: 10	1 ~ 120 (%)
* 36	VKP	Speed loop proportional gain	Proportional gain is set for speed loop. The larger the setting (100 ~ 150), the faster is the response, but the larger is the noise and vibration. Standard setting: 63	1 ~ 100 (rad/s)
* 37	VKI	Speed loop integral gain	Integral gain is set for speed loop. It should be set so that its ratio to proportional gain VKP is almost constant. Standard setting: 60	0 ~ 1000 (1/10 rad/s)
* 38	TYP	Position loop "IN" type	Setting is made for transition from "speed loop" to "position loop". 0: Position loop "IN" after orientation 1: Position loop "IN" after the stop with creep speed. Set "0" when initialization (zero return) is required, otherwise set "1". Standard setting: 0	Decimal notation

Continued on the next page.

Parameters marked with * are set on the NC side when the controller is connected to M300, M3/L3 series with bus line.

#	Parameter		Description	Setting range (unit)
* 39	GRA1	Number of gear teeth on spindle side (Driven side)	Number of gear teeth for gear 00 is converted into hexadecimal value, and set.	Parameters necessary for oriented stop 64 ~ 7FFF (HEX) The NC display is a 100 ~ 32767 (decimal), and does not need to be changed to a hexadecimal. When the following equation is used, set (GRA1 ~ GRA4) and (GRB1 ~ GRB4) to the smallest integer within the setting range. Spindle speed × number of gear teeth on spindle side (GRA1~4) number of gear teeth on motor side (GRB1~4) = motor speed. (Note 1)
* 3A	GRA2		Number of gear teeth for gear 01 is converted into hexadecimal value, and set.	
* 3B	GRA3		Number of gear teeth for gear 10 is converted into hexadecimal value, and set.	
* 3C	GRA4		Number of gear teeth for gear 11 is converted into hexadecimal value, and set.	
* 3D	GRB1	Number of gear teeth on motor side (Drive side)	Number of gear teeth for gear 00 is converted into hexadecimal value, and set.	
* 3E	GRB2		Number of gear teeth for gear 01 is converted into hexadecimal value, and set.	
* 3F	GRB3		Number of gear teeth for gear 10 is converted into hexadecimal value, and set.	
* 40	GRB4		Number of gear teeth for gear 11 is converted into hexadecimal value, and set.	

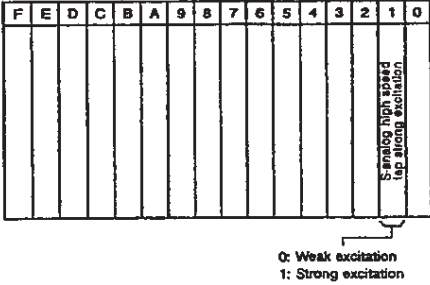
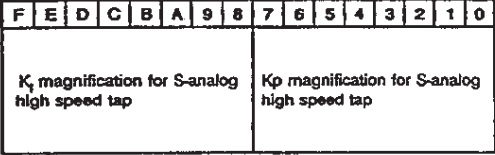
Continued on the next page.

Parameters marked with * are set on the NC side when the controller is connected to M300, M3/L3 series with bus line.

Note 1) When the GRA and GRB value is smaller than 64_H (100_D with a decimal), multiply GRA and GRB with the same constant and change it so that it will be a value larger than 100_D.
(Ex. When GRA1=31, GRB1=29, multiply both by 4, and set GRA1-124_D=7C_H and GRB1=116_D=74_H.)

#	Parameter		Description	Setting range (unit)																																
41	OSL	Orientation type	Type of orientation is set. 0: Motor built-in encoder 1: Encoder 2: Magnesensor	Hexadecimal notation																																
42	BSL	Bit assignment	<table border="1"><tr><td>F</td><td>E</td><td>D</td><td>C</td><td>B</td><td>A</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="11"></td><td>Load meter output</td><td></td><td>MRDY (NC mode) input</td><td>EMG (NC mode) input</td><td>Alarm LED (EMG)</td></tr></table> <div><div>Emergency stop "Alarm code" output 0: Not output 1: Output</div><div>NC mode external emergency stop 0: Invalid 1: Valid</div><div>NC mode machine "ready" signal 0: Invalid 1: Valid</div><div>0: Load meter output 10V 1: Load meter output 3V</div></div>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0												Load meter output		MRDY (NC mode) input	EMG (NC mode) input	Alarm LED (EMG)	Hexadecimal notation
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																					
											Load meter output		MRDY (NC mode) input	EMG (NC mode) input	Alarm LED (EMG)																					
43	SPC	For general-purpose motor, meter output is valid/invalid	This parameter is set when using 1 amp 2 motor function. For details refer to option specifications BNP-A2956-23.	Hexadecimal notation																																
44			Not used. Set "0".																																	
45			Not used. Set "0".																																	

Continued on the next page.

#	Parameter		Description	Setting range (unit)
46	HSP	S-analog high speed tap selection	 <p>0: Weak excitation 1: Strong excitation</p>	Hexadecimal notation
47	HSPI	K_p , K_i magnification for S-analog high speed tap	<p>The K_p, K_i magnification is set in addition to orient for the S-analog high speed tap.</p>  <p>K_i magnification for S-analog high speed tap K_p magnification for S-analog high speed tap</p> <p>The K_i and K_p magnifications can be set between 1/16 ~ 15 times with 10_H (16_D) as 1 time. When the magnification is raised, the response to the impact load is increased, and the noise of the gears will increase. Set at 1 ~ 2 times ($1010_H \sim 2020_H$). Normally the K_i and K_p magnifications are set to the same value.</p>	<p>Hexadecimal notation</p> <hr/> <p>Setting example When setting both K_i and K_p to 1.5 times: $CPI = \frac{18}{K_i} \frac{18_H}{K_p}$</p>
48	DAM	PLG magnification	<p>When optional SGJ-OR or SGJ-DA cards are added-on, the pulse number magnification of the PLG (motor built-in encoder) output from CONAA is set.</p> <p>0H: $\times 1$ (256PPR) 100H: $\times 2$ (512PPR)</p>	Hexadecimal notation
49			Not used. Set "0".	
4A			Not used. Set "0".	
4B			Not used. Set "0".	
4C			Not used. Set "0".	
4D			Not used. Set "0".	
4E			Not used. Set "0".	
4F			Not used. Set "0".	
50			Not used. Set "0".	
51			Not used. Set "0".	

Continued on the next page.

#	Parameter		Description	Setting range (unit)
52	SETM		This is a fixed parameter set by Mitsubishi. Please take care not to change it.	Decimal notation
53	ZSTM			Decimal notation
54			Not used. Set "0".	
55	STOD		This is a fixed parameter set by Mitsubishi. Please take care not to change it.	Decimal notation
56			Not used. Set "0".	
57			Not used. Set "0".	
58	CVHS		This is a fixed parameter set by Mitsubishi. Please take care not to change it.	Decimal notation
59			Not used. Set "0".	
5A			Not used. Set "0".	
5B			Not used. Set "0".	
5C			Not used. Set "0".	
5D			Not used. Set "0".	
5E			Not used. Set "0".	
5F	PXY	Variable excitation	<p>The variable excitation ratio is set. When the gear noise is loud, select a small value. A large value is effective in responding to the impact load. (When setting value = 0, the excitation ratio is 50%.)</p> <p>Standard setting: 0</p>	0 ~ 100 (%)

Continued on the next page.

#	Parameter		Description	Setting range (unit)																																								
60	HI1	Auxiliary input 1 selection	<p>Meaning of each input For details refer to the auxiliary input signal section of Standard Specification.</p> <p>0 = Invalid 1 = Orient start 2 = Gear selection L 3 = Gear selection M 4 = Emergency stop 5 = Torque limit H 6 = Torque limit L 7 = Forward index 8 = Reverse index 9 = External reset 10 = Motor selection 1 11 = Motor selection 2 12 = Speed selection 1 13 = Speed selection 2 14 = Speed selection 3 15 = Digital speed selection 16 = S-analog high speed tap</p>	Decimal notation 0 ~ 16																																								
61	HI2	Auxiliary input 2 selection																																										
62	HI3	Auxiliary input 3 selection																																										
63	HI4	Auxiliary input 4 selection																																										
64	HI5	Auxiliary input 5 selection																																										
65	HO1	Auxiliary out-put 1 selection	<p>Meaning of each output For details refer to the auxiliary output signal section of Standard Specification.</p> <p>0 = Invalid 1 = Orient completed 2 = Speed detect 3 = Current detect 4 = Emergency stop 5 = Torque limit 6 = Ready-ON 7 = Motor forward run 8 = Motor reverse run 9 = Alarm 10 = Motor selection output 1 11 = Motor selection output 2</p>	Decimal notation 0 ~ 11																																								
66	HO2	Auxiliary out-put 2 selection																																										
67	HO3	Auxiliary out-put 3 selection																																										
68	SS0	Speed setting 0	<p>Speed selection with a combination of auxiliary input signal section 1, 2, 3</p> <table><tr><th colspan="3">Speed selection</th><th></th></tr><tr><th>3</th><th>2</th><th>1</th><th>Selection</th></tr><tr><td>0</td><td>0</td><td>0</td><td>SS0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>SS1</td></tr><tr><td>0</td><td>1</td><td>0</td><td>SS2</td></tr><tr><td>0</td><td>1</td><td>1</td><td>SS3</td></tr><tr><td>1</td><td>0</td><td>0</td><td>SS4</td></tr><tr><td>1</td><td>0</td><td>1</td><td>SS5</td></tr><tr><td>1</td><td>1</td><td>0</td><td>SS6</td></tr><tr><td>1</td><td>1</td><td>1</td><td>SS7</td></tr></table> <p>0: Contact open 1: Contact closed</p>	Speed selection				3	2	1	Selection	0	0	0	SS0	0	0	1	SS1	0	1	0	SS2	0	1	1	SS3	1	0	0	SS4	1	0	1	SS5	1	1	0	SS6	1	1	1	SS7	Decimal notation 0 ~ 9999 (rpm)
Speed selection																																												
3	2	1		Selection																																								
0	0	0		SS0																																								
0	0	1		SS1																																								
0	1	0		SS2																																								
0	1	1		SS3																																								
1	0	0		SS4																																								
1	0	1		SS5																																								
1	1	0	SS6																																									
1	1	1	SS7																																									
69	SS1	Speed setting 1																																										
6A	SS2	Speed setting 2																																										
6B	SS3	Speed setting 3																																										
6C	SS4	Speed setting 4																																										
6D	SS5	Speed setting 5																																										
6E	SS6	Speed setting 6																																										
6F	SS7	Speed setting 7																																										

Continued on the next page.

#	Parameter		Description	Setting range (unit)
70	HI6	Auxiliary input 6 selection	Selection is possible by adding on the optional SGJ-DA card. The meaning of each input is the same as HI1 ~ HI5.	Decimal notation 0 ~ 16
71	HI7	Auxiliary input 7 selection		
72	HI8	Auxiliary input 8 selection		
73	HO4	Auxiliary output 4 selection	Selection is possible by adding on the optional SGJ-DA card. The meaning of the output is the same as HO1 ~ HO3.	Decimal notation 0 ~ 11
74			Not used. Set "0".	
75			Not used. Set "0".	
76			Not used. Set "0".	
77			Not used. Set "0".	
78			Not used. Set "0".	
79			Not used. Set "0".	
7A			Not used. Set "0".	
7B			Not used. Set "0".	
7C			Not used. Set "0".	
7D	HSPT	Maximum speed during S-analog high speed tap	When carrying out S-analog high speed tap, the maximum motor speed is set for when S-analog $\pm 10V$ is input. When the set value is 0, it will be the same value as TSP.	Decimal notation 0 ~ 3276 (10 rpm)
7E	DIQN		This is a fixed parameter set by Mitsubishi. Please take care not to change it.	Decimal notation
7F	SMO	Maximum speed for speed meter	The speed to output 10V to the speed meter is set. When the set value is 0, it will be the same value as TSP.	Decimal notation
80 ~ AF	TOUT ~ BSD		This is a fixed parameter set by Mitsubishi. Please take care not to change it.	Hexadecimal notation
B0			Not used. Set "0".	
B1			Not used. Set "0".	
B2			Not used. Set "0".	

Continued on the next page.

#	Parameter		Description	Setting range (unit)
B3			Not used. Set "0".	
B4			Not used. Set "0".	
B5			Not used. Set "0".	
B6			Not used. Set "0".	
B7			Not used. Set "0".	
B8			Not used. Set "0".	
B9			Not used. Set "0".	
BA			Not used. Set "0".	
BB			Not used. Set "0".	
BC			Not used. Set "0".	
BD			Not used. Set "0".	
BE			Not used. Set "0".	
BF			Not used. Set "0".	
C0 { C9	MT20 { MT29	General-purpose sub-motor 1 constant	This parameter is set when the 1 amp 2 motor function is used. For details refer to option specifications (BNP-A2956-23).	Decimal notation
CA			Not used. Set "0".	
CB			Not used. Set "0".	
CC			Not used. Set "0".	
CD			Not used. Set "0".	
CE			Not used. Set "0".	
CF			Not used. Set "0".	

Continued on the next page.

#	Parameter		Description	Setting range (unit)																																
D0 └ D9	MT30 └ MT39	General-purpose sub-motor 2 constant	This parameter is set when the 1 amp 3 motor function is used. For details refer to option specifications (BNP-A2956-23).	Decimal notation																																
DA			Not used. Set "0".																																	
DB			Not used. Set "0".																																	
DC			Not used. Set "0".																																	
DD			Not used. Set "0".																																	
DE			Not used. Set "0".																																	
DF			Not used. Set "0".																																	
E0			Not used. Set "0".																																	
E1	SYNV	Matched synchronized speeds	This parameter is set when the synchronized spindle function is used. This sets the judged speed difference that occurs when speed control is switched to position control.	Decimal notation																																
E2	SPI	K _p , K _i magnification for synchronized spindles	<div>This is valid when #E3 SWT bit 8 is set to 1. The K_p, K_i magnifications are set in addition to orient for synchronized spindles.</div> <table border="1"><tr><td>F</td><td>E</td><td>D</td><td>C</td><td>B</td><td>A</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">K_i magnification for synchronized spindles</td><td colspan="8">K_p magnification for synchronized spindles</td></tr></table> <div>The K_i and K_p magnifications can be set between 1/16 ~ 15 times with 10_H (16_p) as 1 time. When the magnification is raised, the response to the impact load is increased, and the noise of the gears will increase. Set at 1 ~ 2 times (1010_H ~ 2020_H). Normally the K_i and K_p magnifications are set to the same value.</div>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	K _i magnification for synchronized spindles								K _p magnification for synchronized spindles								<div>Hexadecimal notation</div> <div>Setting example When setting both K_i and K_p to 1.5 times: $CPI = \frac{18}{K_i} \frac{18_H}{K_p}$</div>
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																					
K _i magnification for synchronized spindles								K _p magnification for synchronized spindles																												

Continued on the next page.

#	Parameter	Description	Setting range (unit)																																
E3	SWT	<div><div>Setting of K_p, K_i, ω_T control methods for synchronized spindles. Valid/invalid selection.</div><div><table><tr><th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="11"></td><td colspan="5">ω_T selection for synchronized spindles. (rad/s)</td></tr></table><div><div>Control method during synchronized spindle</div><div>0: Delay/advance 1: PI</div><div>5-bit combination 0: 0.55 10: 9.4 1: 1.1 11: 10.0 2: 1.65 12: 10.55 3: 2.2 13: 11.10 4: 2.75 14: 11.65 5: 3.3 15: 12.2 6: 3.85 16: 12.8 7: 4.4 17: 13.35 8: 4.95 18: 13.9 9: 5.5 19: 14.45 A: 6.05 1A: 15.05 B: 6.6 1B: 15.6 C: 7.15 1C: 16.15 D: 7.7 1D: 16.75 E: 8.25 1E: 17.3 F: 8.85 1F: 17.85</div></div><div><div>Valid/invalid selection of #E2 and #E3 parameters. 0: Invalid The K_p, K_i and ω_T control method will be the value set in #2F ORS1. 1: Valid The K_p, K_i and ω_T control method during position loop will be the value set in #E2 and E3.</div></div></div></div>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0												ω_T selection for synchronized spindles. (rad/s)					Hexadecimal notation
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																				
											ω_T selection for synchronized spindles. (rad/s)																								
E4	TPI	<div><div>K_p, K_i magnification during synchronous tap</div><div><div>This is valid when #ESTWT bit 8 is set to 1. The K_p, K_i magnification is set in addition to the orient for synchronous tap.</div><div><table><tr><th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="8">K_i magnification for synchronous tap</td><td colspan="8">K_p magnification for synchronous tap</td></tr></table></div></div><div><div>The K_i and K_p magnifications can be set between 1/16 ~ 15 times with 10_H (16_D) as 1 time. When the magnification is raised, the response to the impact load is increased, and the noise of the gears will increase. Set at 1 ~ 2 times ($1010_H \sim 2020_H$). Normally the K_i and K_p magnifications are set to the same value.</div></div></div> <td><div>Hexadecimal notation</div><div>Setting example When setting both K_i and K_p to 1.5 times: $CPI = \frac{18}{K_i} \frac{18_H}{K_p}$</div></td>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	K_i magnification for synchronous tap								K_p magnification for synchronous tap								<div>Hexadecimal notation</div> <div>Setting example When setting both K_i and K_p to 1.5 times: $CPI = \frac{18}{K_i} \frac{18_H}{K_p}$</div>
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																				
K_i magnification for synchronous tap								K_p magnification for synchronous tap																											

Continued on the next page.

#	Parameter	Description	Setting range (unit)																																																																																																								
E5	TWT	<div><div>Setting of K_p, K_i, ω_T control methods for synchronous tap. Valid, invalid selection.</div><div><table><tr><td>F</td><td>E</td><td>D</td><td>C</td><td>B</td><td>A</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="16"><div><div><div>Control method during synchronous tap 0: Delay/advance 1: PI</div><div><div>Valid/invalid selection of #E4 and #E5 parameters. 0: Invalid The K_p, K_i and ω_T control method will be the value set in #2F ORS1. 1: Valid The K_p, K_i and ω_T control method during position loop will be the value set in #E4 and E5.</div></div><div><div>5-bit combination</div><table><tr><td>0: 0.55</td><td>10: 9.4</td></tr><tr><td>1: 1.1</td><td>11: 10.0</td></tr><tr><td>2: 1.65</td><td>12: 10.55</td></tr><tr><td>3: 2.2</td><td>13: 11.10</td></tr><tr><td>4: 2.75</td><td>14: 11.65</td></tr><tr><td>5: 3.3</td><td>15: 12.2</td></tr><tr><td>6: 3.85</td><td>16: 12.8</td></tr><tr><td>7: 4.4</td><td>17: 13.35</td></tr><tr><td>8: 4.95</td><td>18: 13.9</td></tr><tr><td>9: 5.5</td><td>19: 14.45</td></tr><tr><td>A: 6.05</td><td>1A: 15.05</td></tr><tr><td>B: 6.6</td><td>1B: 15.6</td></tr><tr><td>C: 7.15</td><td>1C: 16.15</td></tr><tr><td>D: 7.7</td><td>1D: 16.75</td></tr><tr><td>E: 8.25</td><td>1E: 17.3</td></tr><tr><td>F: 8.85</td><td>1F: 17.85</td></tr></table></div></div></div></td><td>Hexadecimal notation</td></tr><tr><td>E6</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>E7</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>E8</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>E9</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>EA</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>EB</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>EC</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>ED</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>EE</td><td></td><td>Not used. Set "0".</td><td></td></tr><tr><td>EF</td><td></td><td>Not used. Set "0".</td><td></td></tr></table></div></div>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	<div><div><div>Control method during synchronous tap 0: Delay/advance 1: PI</div><div><div>Valid/invalid selection of #E4 and #E5 parameters. 0: Invalid The K_p, K_i and ω_T control method will be the value set in #2F ORS1. 1: Valid The K_p, K_i and ω_T control method during position loop will be the value set in #E4 and E5.</div></div><div><div>5-bit combination</div><table><tr><td>0: 0.55</td><td>10: 9.4</td></tr><tr><td>1: 1.1</td><td>11: 10.0</td></tr><tr><td>2: 1.65</td><td>12: 10.55</td></tr><tr><td>3: 2.2</td><td>13: 11.10</td></tr><tr><td>4: 2.75</td><td>14: 11.65</td></tr><tr><td>5: 3.3</td><td>15: 12.2</td></tr><tr><td>6: 3.85</td><td>16: 12.8</td></tr><tr><td>7: 4.4</td><td>17: 13.35</td></tr><tr><td>8: 4.95</td><td>18: 13.9</td></tr><tr><td>9: 5.5</td><td>19: 14.45</td></tr><tr><td>A: 6.05</td><td>1A: 15.05</td></tr><tr><td>B: 6.6</td><td>1B: 15.6</td></tr><tr><td>C: 7.15</td><td>1C: 16.15</td></tr><tr><td>D: 7.7</td><td>1D: 16.75</td></tr><tr><td>E: 8.25</td><td>1E: 17.3</td></tr><tr><td>F: 8.85</td><td>1F: 17.85</td></tr></table></div></div></div>																0: 0.55	10: 9.4	1: 1.1	11: 10.0	2: 1.65	12: 10.55	3: 2.2	13: 11.10	4: 2.75	14: 11.65	5: 3.3	15: 12.2	6: 3.85	16: 12.8	7: 4.4	17: 13.35	8: 4.95	18: 13.9	9: 5.5	19: 14.45	A: 6.05	1A: 15.05	B: 6.6	1B: 15.6	C: 7.15	1C: 16.15	D: 7.7	1D: 16.75	E: 8.25	1E: 17.3	F: 8.85	1F: 17.85	Hexadecimal notation	E6		Not used. Set "0".		E7		Not used. Set "0".		E8		Not used. Set "0".		E9		Not used. Set "0".		EA		Not used. Set "0".		EB		Not used. Set "0".		EC		Not used. Set "0".		ED		Not used. Set "0".		EE		Not used. Set "0".		EF		Not used. Set "0".	
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																																																																																												
<div><div><div>Control method during synchronous tap 0: Delay/advance 1: PI</div><div><div>Valid/invalid selection of #E4 and #E5 parameters. 0: Invalid The K_p, K_i and ω_T control method will be the value set in #2F ORS1. 1: Valid The K_p, K_i and ω_T control method during position loop will be the value set in #E4 and E5.</div></div><div><div>5-bit combination</div><table><tr><td>0: 0.55</td><td>10: 9.4</td></tr><tr><td>1: 1.1</td><td>11: 10.0</td></tr><tr><td>2: 1.65</td><td>12: 10.55</td></tr><tr><td>3: 2.2</td><td>13: 11.10</td></tr><tr><td>4: 2.75</td><td>14: 11.65</td></tr><tr><td>5: 3.3</td><td>15: 12.2</td></tr><tr><td>6: 3.85</td><td>16: 12.8</td></tr><tr><td>7: 4.4</td><td>17: 13.35</td></tr><tr><td>8: 4.95</td><td>18: 13.9</td></tr><tr><td>9: 5.5</td><td>19: 14.45</td></tr><tr><td>A: 6.05</td><td>1A: 15.05</td></tr><tr><td>B: 6.6</td><td>1B: 15.6</td></tr><tr><td>C: 7.15</td><td>1C: 16.15</td></tr><tr><td>D: 7.7</td><td>1D: 16.75</td></tr><tr><td>E: 8.25</td><td>1E: 17.3</td></tr><tr><td>F: 8.85</td><td>1F: 17.85</td></tr></table></div></div></div>																0: 0.55	10: 9.4	1: 1.1	11: 10.0	2: 1.65	12: 10.55	3: 2.2	13: 11.10	4: 2.75	14: 11.65	5: 3.3	15: 12.2	6: 3.85	16: 12.8	7: 4.4	17: 13.35	8: 4.95	18: 13.9	9: 5.5	19: 14.45	A: 6.05	1A: 15.05	B: 6.6	1B: 15.6	C: 7.15	1C: 16.15	D: 7.7	1D: 16.75	E: 8.25	1E: 17.3	F: 8.85	1F: 17.85	Hexadecimal notation																																																											
0: 0.55	10: 9.4																																																																																																										
1: 1.1	11: 10.0																																																																																																										
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6: 3.85	16: 12.8																																																																																																										
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F: 8.85	1F: 17.85																																																																																																										
E6		Not used. Set "0".																																																																																																									
E7		Not used. Set "0".																																																																																																									
E8		Not used. Set "0".																																																																																																									
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EE		Not used. Set "0".																																																																																																									
EF		Not used. Set "0".																																																																																																									

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#	Parameter		Description	Setting range (unit)																																
F0	FNK	Option function selection	<table><tr><td>F</td><td>E</td><td>D</td><td>C</td><td>B</td><td>A</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>S-analog high speed tap</td><td>1 amp 2 motor</td><td>Synchronous tap/ synchronous spindles</td><td>Index</td></tr></table> <p>{ 0: Function valid 1: Function invalid</p> <p>* When the corresponding option function bit is not set to 1, the function will not run and the option error will show "AL 57" when command is input. This parameter can be set only when shipped from the factory, and cannot be changed by the user.</p>	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0													S-analog high speed tap	1 amp 2 motor	Synchronous tap/ synchronous spindles	Index	Hexadecimal notation
F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																					
												S-analog high speed tap	1 amp 2 motor	Synchronous tap/ synchronous spindles	Index																					
F1			Not used. Set "0".																																	
F2			Not used. Set "0".																																	
F3			Not used. Set "0".																																	
F4			Not used. Set "0".																																	
F5			Not used. Set "0".																																	
F6			Not used. Set "0".																																	
F7			Not used. Set "0".																																	
F8 ~ FF	OLL ~ ENCP		This is a fixed parameter set by Mitsubishi. Please take care not to change the settings.	Decimal notation																																