Door System(S-type)

◆ **Revision History**

Rev. No.	Date	Revision Contents	Prepared by	Checked by	Approved by
0	Aug. 2004	Release (V S 0.5)	YS Kim	S Jeong	Harold Lee
1	Jun 2006	OS Program Change to V S1.5	YS Kim	S Jeong	Harold Lee
2	Sep 2006	Program Change to V S1.6	YS Kim	S Jeong	Harold Lee
3	Oct 2008	Program Change to V S1.9 (SED1 door is controlled by V S1.9)	YS Kim	DH Kim	Harold Lee

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1. DCD-231 PCB

1.1. Application

SAV1, SBD1 and **SED1 door system**

1.2. Feature

a. Power: Single phase - AC110V

b. Size: 220×165×1.6T - 2 layers

c. Door SPEC and inverter adjustment through SVC tool kit or DOA-100 PCB

d. OS program download through PDA instead of ROM change.

1.3. I/O display

It requires an adjustment tool to change or adjust some data that is related to door type and speed.

a. SVC Tool kit

a) SVC tool kit is mainly used for DCD-23X PCB adjustment

b) It has a strong quality against electric noise.

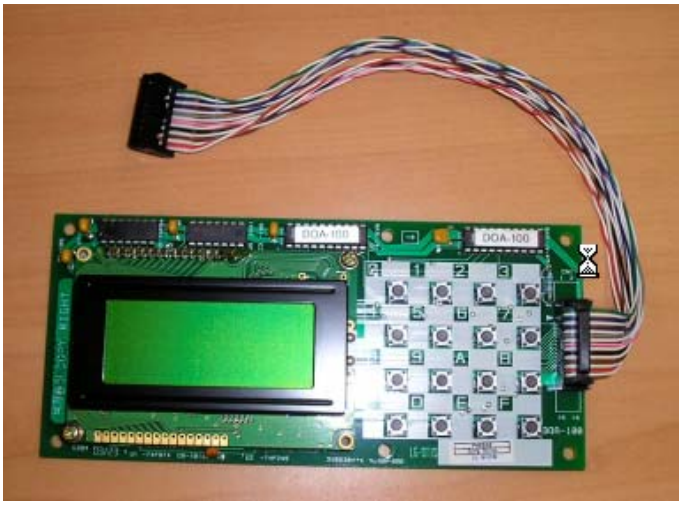
b. DOA-100 PCB

a) It can be also used to DCD-23X PCB for adjustment.

b) In case of old type DOA-100 PCB, display error will occur. Then, cut the13th cable.



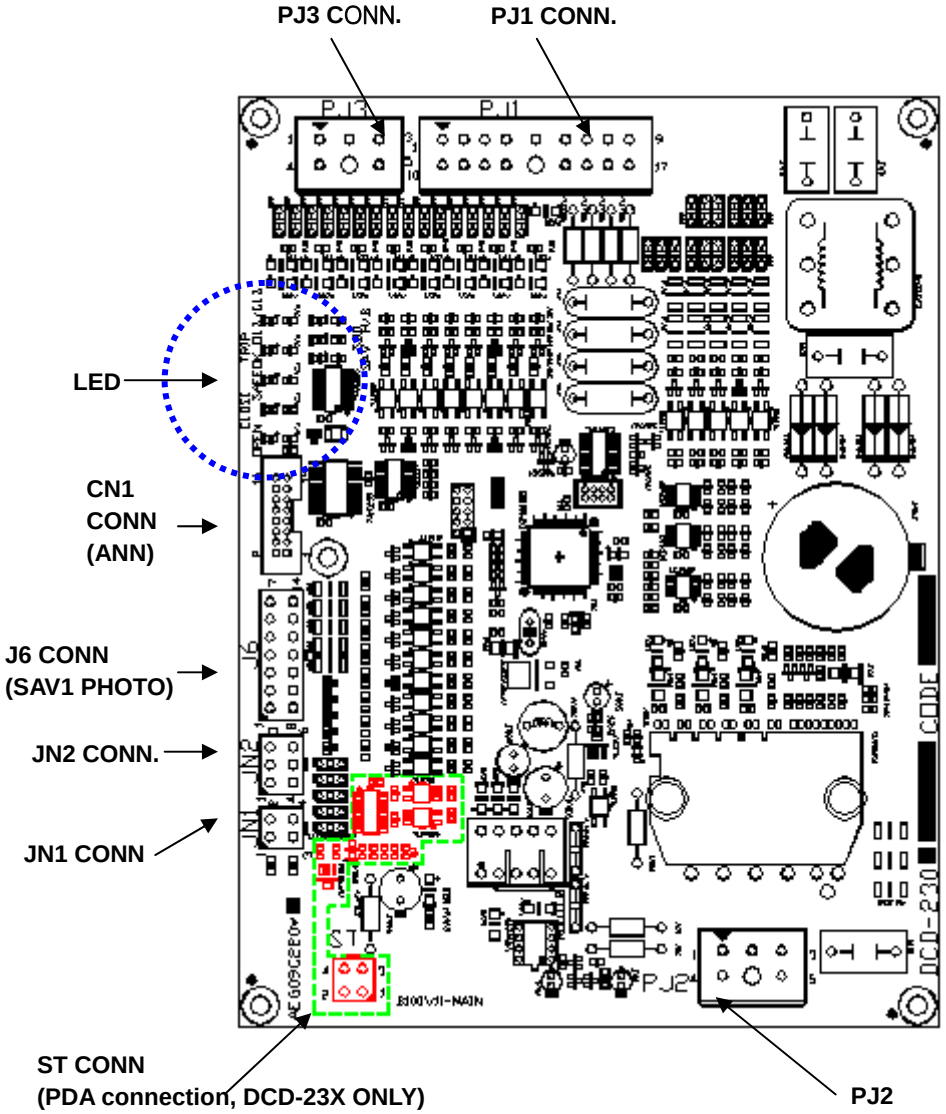
SVC Tool Kit

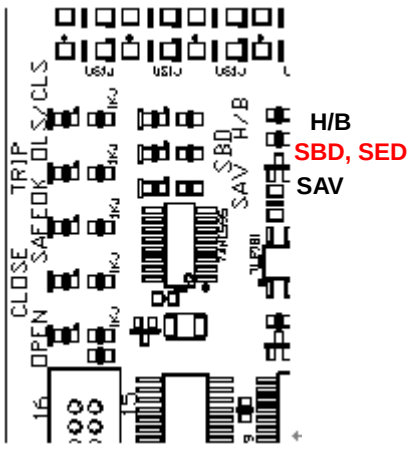


DOA-100 PCB

1.4. DCD-231 PCB detail

a. Outlook





< Detail of LED >

b. Connector comparison

Connector Of DCD231	Description	DCD-221	DCD-212	Remark
PJ1/PJ3	Power, I/O	PJ1/PJ3	PJ1/PJ3	No, 8, 17 is used for power line only in SAV1
PJ2	DOOR MOTOR	PJ2	PJ2	
JN1	CLS/OLS SWITCH	N/A	JN1	
JN2	Rotary Encoder	N/A	JN2	SBD1
PJ6	PHOTO SENSOR	PJ6	N/A	SAV1
CN1	SVC TOOL	N/A	N/A	
ST	PDA	N/A	N/A	DCD-231 ONLY

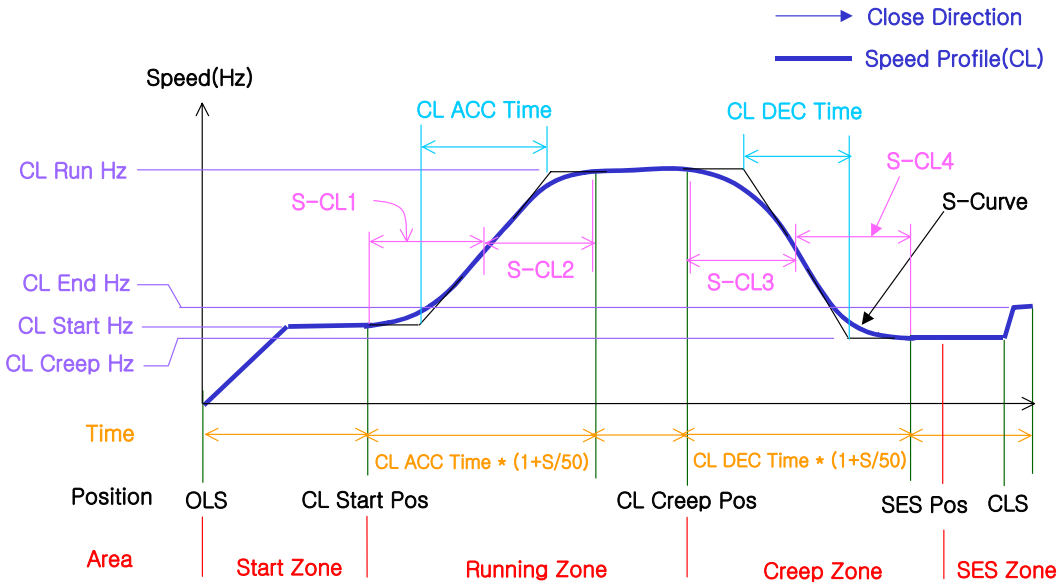
Note PJ1) **In case PJ6 cable is connected, system works as SAV1 mode. Else if it is not connected. Door system works as SBD1 or SED mode.**

c. LED comparison

LED	DCD-221	DCD-212	DCD-23X
OPEN	LD2	LD2	ON : OPEN command signal triggered OFF : OPEN command signal unable
CLOSE	LD3	LD3	ON : CLOSE command signal triggered OFF : CLOSE command signal unable
OLS/CLS	LD7	LD5	ON : OLS / CLS signal is detected OFF : OLS / CLS signal is not detected
SAFE-OK	LD4	LD4	ON : Normal working is possible OFF : An error has occurred
WDT	LD1	LD6	N/A
DC-OK	LD6	LD7	LED9 ON : DC-LINK Power input
OC	N/A	LD1	N/A
TRIP	N/A	N/A	ON : An error has occurred
SAV	N/A	N/A	ON : SAV1 DOOR TYPE
SBD	**N/A**	**N/A**	**ON : SBD1 or SED1 DOOR TYPE**
H/B	N/A	N/A	Blinking : CPU working normally

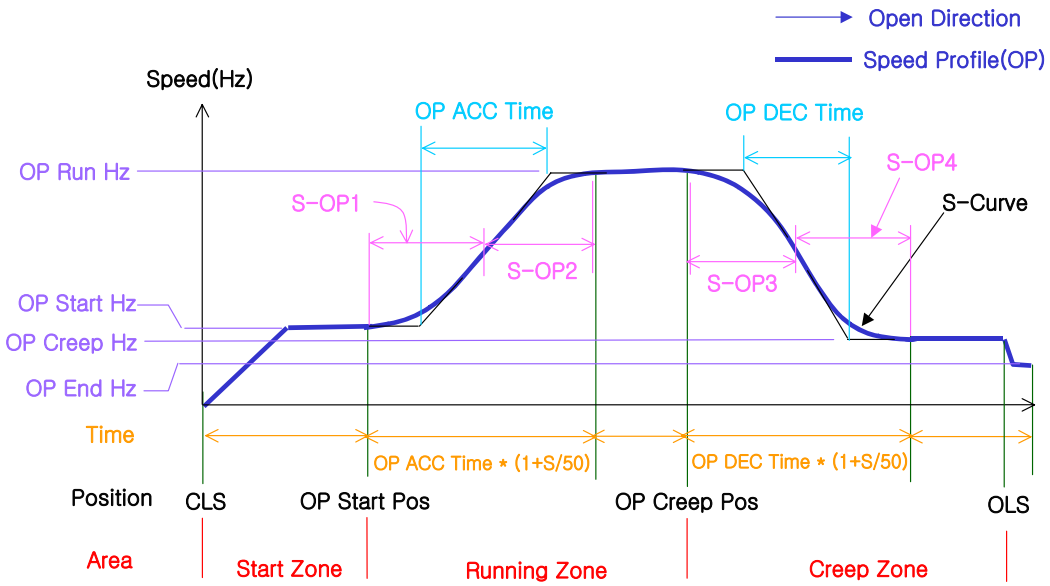
d. Speed adjustment

a) Speed pattern according to each fluent data (Close)



Zone	Explanation & Adjustment	Remark
Start Zone	1. Beginning section of close zone 2. [S02] close frequency. It effects on OLS to [S01] close section.	[S01] SBD1,SED1: Pulse quantity of encoder SAV1: Detector quantity
Running Zone	1. Acceleration section and standard speed section 2. [S01] close to [S05] close creep section 3. For the speed up or down adjustment, change this [S02] frequency every 0.1 unit a try. 4. To reduce the close speed, decrease the [S03] about 0.1unit a try.	
Creep Zone	1. Close Creep section(deceleration) 2. [S04]close creep to [S31] SES position section 3. In case the creep section is too long, minimize the [S04] close creep position. 4. Else if a door is closed with slam, increase the [S04] close creep position. 5. In case of 2 SES type, if a door repeats open and close, increase the [S31] SES position.	[S31] SES position: It is related to door reopen at the end of close section.
SES Zone	1. Door close holding section 2. [S31] SES position to CLS section. Hold the close status	

b) Speed pattern according to each fluent data (Open)



Zone	Explanation & Adjustment	Remark
Start Zone	1. Beginning section of open zone 2. [S08] open frequency. It effects on CLS to [S07] open section.	[S07] SBD1, SED1: Pulse quantity of encoder SAV1: Detector quantity
Running Zone	1. Acceleration section and standard speed section 2. [S07] open to [S10] close creep section 3. For the speed up or down adjustment, change this [S08] frequency every 0.1 unit a try. 4. To reduce the open speed, decrease the [S09] about 0.1unit a try.	
Creep Zone	1. Open Creep section(deceleration) 2. [S10] open creep to OLS position section 3. In case the creep section is too long, minimize the [S10] open creep position. 4. Else if a door is opened with slam, increase the [S10] open creep position.	[S31] SES position: It is related to door reopen at the end of close section.
OLS Zone	1. Door open holding section	

e. Examples (V S1.3~V S1.9)

a) In case it requires faster close in deceleration term. (Creep)

(a) Connect the SVC-TOOL, and check that there is any error.

(b) Check the new data again what you are going to modify. And key in 'A22E' on the [S00] menu

(c) Key in '0' repeatedly to go 'S[04]'.

(d) Check current data and key in 'AAE'.

(e) Input new data what you want to.(For example, 'key in '01E')

(f) For a decimal point, you can push 'A'. (2.5E = 2A5E)

(g) Key in 'FFFF' to exit to initial display.

(h) Key in 'BBB' and '39E' to go [S39] menu to save new data.

(i) Key in 'AAE' and '1E' in sequence. Then, the new data is saved.

b) Adjustment sample.

No.	Occasion	Adjustment fluent	Action	Remark
1	Repeats open and close (Safety Shoe is not ignored)	S[31]SES Position	1 ↑ (SAV) 50 ↑ (SBD, SED)	
2	Slam at full of door close	S[04]CL Creep Pos	1 ↑ (SAV) 50 ↑ (SBD, SED)	
		S[06]CL Creep hold Hz	0.2 ↓	
3	Fast door close	S[04]CL Creep Pos	1 ↑ (SAV) 50 ↑ (SBD,SED)	
		S[05]CL Creep Hz	0.2 ↓	
		S[03]CL Run Hz	0.2 ↓	
4	Slam at full of door open	S[09]OP Run Hz	0.2 ↓	
		S[16]OP Dec Time	0.1 ↑	
		S[11]OP Creep Hz	0.1 ↓	

Door	CMD	Move	Menu	Description	Modified value	Default
SED	A22E	0/8/BBB	S36	Door Type	0	3
			S03	Close Run Hz	14.6	15.0
			S04	Close Creep Pos	450	400
			S06	Close End Hz	4.8	5.0
			S09	Open Run Hz	26.4	27.0
			S14	Close Dec Time	0.8	0.6
			S26	Reopen Dec Time	0.2	0.3
			S31	SES Pos	250	250

1.5. FAQ

a. How to select door type? SAV1 and SBD1

- In case the data of [S36] system type menu is “1”

If “J6” SAV1 position line is connected, it is automatically set to SAV1 door type.

Else If “J6” SAV1 position line is not connected, it is automatically set to SBD1 door type.

It is automatically set according to photo line connection to “J6”

- In case the data of [S36] system type menu is “0”

It always set to SAV1 door type. There is no relation to “J6” connection.

► The data of [S36] must be accord to SPEC data of 07B8 in DOC PCB.

b. What is the difference between DCD230, DCD231 and DCD232 PCB?

- DCD230X: ST port is configured. ST port is for PDA connection (RS232 Communication)
- DCD231: ST port is not configured.
- DCD232: ADS door type control PCB (Program can not be compatible with DCD230 and DCD231)

c. How to adjust the door noise when it is closed?

- Increase the starting position of [S04] close creep.
- After modification, key in ‘AAE’ and ‘’1E’ on [S39] to save new data.

d. A door closes slowly, How to make it faster?

- Increase the [S03] Close Run Hz rather than present data.
- Decrease the [S04] Close creep position rather than present data
- After modification, key in ‘AAE’ and ‘’1E’ on [S39] to save new data.

e. How to erase all errors?

- Key in ‘AAE’ and ‘2E’ on the [S39] menu.

f. How to check the ROM version?

- Key in ‘D’ on the initial screen.
- Then, it displays the position data, Version and date of program compile in sequence.

g. How to read the indication of door position?

- Read the ‘POS’ data on the initial display while a door is operating.

SAV1: 0(Opened) ~ 16(Closed). If there is no data, check the disk and PCB

SBD1, SED1:0(Opened) ~ 500(Closed, It can be little different according to door size and site). Formula; Closed data = Encoder value / 10

2. Annunciator

2.1. Annunciator mode

Classification	MAIN MODE		SUB MODE		Resetting KEY Input
	MAIN MODE	KEY Input	SUB MODE	KEY Input	
Status display	Inverter operation	A23E	Address INC	0	FFFF
			Address DEC	8	
			Address Input	BBB	
Set Group (D,S)	Door type set group	A22E	Address INC	0	FFFF
			Address DEC	8	
			Address Input	BBB	
			PROTECTION release	AAE	
			Data Input	xxE	
Set Group (F)	Inverter display group	A32E	Address INC	0	FFFF
			Address DEC	8	
			Address Input	BBB	
			PROTECTION release	AAE	
			Data Input	xxE	
Error scan	Error display	A41E	Address INC	0	FFFF
			Address DEC	8	
			Address Input	BBB	

This mode is applicable for V S1.3 ~ S1.9

2.2. Annunciator instruction

a. Initial screen of annunciator

a) Preparation

Connect SVC-tool kit or DOA-100 PCB to CN1 of DCD-23X PCB.

b) Screen check

(a) Key in '0000'. And wait 3 seconds for normal displaying.

(b) If it does not display normal, input 'FFFF'. And input '0000' again.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
R1	**S**	**A**	**V**		**o**	**c**	**n**	**h**		**o**	**c**	**e**	**[**	**0**	**0**	**]**
R2	**V**	**:**			**1**	**1**	**V**			**I**	**:**		**0**	**.**	**0**	**A**
R3	**F**	**:**		**0**	**.**	**0**	**H**	**z**								
R4	**P**	**O**	**S**	**:**			**0**			**K**	**:**					

b. Initial screen:

a) Screen check

It displays current door type:

(a) SBD: SBD1 door mode

(b) SED: SED1 door mode

(c) SAV: SAV1 door mode

b) 'ocnh' : door signal input check.(Capital letter : The signal has occurred)

(a) 'O'/'o' : OPEN

(b) 'C'/'c' : CLOSE

(c) 'N'/'n/ : NUDGE

(d) 'H'/'h' : HCL

c) 'oce' : Output check (Capital letter : The output is activated)

(a) 'O'/'o' : OLS

(b) 'C'/'c' : CLS

(c) 'E'/'e' : Door error

d) 'V: 11V'

Voltage that is supplied to motor from inverter (110Vac)

e) 'I: 0.0A'

Electric current that is supplied to motor from inverter

f) 'F: 0.0Hz'

Frequency of voltage and current that supply to motor from inverter

c. Displays of inverter operation status (A23E- D display) and error (A41E- T display)

a) Key in A23E

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
R1	S	A	V		o	c	n	h		o	c	e	[	0	0	]
R2	V	:			1	1	V			I	:		0	.	0	A
R3	F	:		0	.	0	H	z								
R4	P	O	S	:			0			K	:	A	2	3	E	

b) Inverter status is displayed (D[01] screen, But if “A41E’ is inputted, T[01] screen is displayed)

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
R1	S	A	V		o	c	n	h		o	c	e	[	0	0	]
R2	D	[	0	1	]	O	u	t		V		D	i	s	p	
R3	D	A	T	A	:							I	I		V	
R4										K	:				9	

* The displayed data is decimal value.

c) Address increment/ decrement

‘0’ : to go higher address rather than present address

‘8’ : to go lower address rather than present address

d) Address change

‘BBB’ : Skip to other address

Input ‘BBB’ and input address to go.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
R1	S	A	V		o	c	n	h		o	c	e	[	0	0	]
R2	D	[	0	1	]	O	u	t		V		D	i	s	p	
R3	D	A	T	A	:							I	I		V	
R4										K	:	B	B	B		

e) Mode cancellation: ‘FFFF’

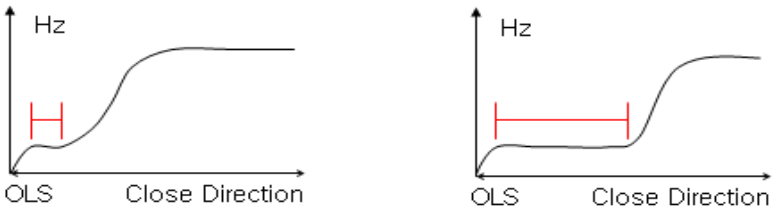
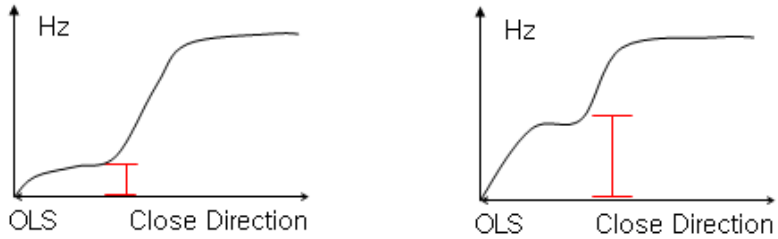
f) Menu access of ‘A41E’ is same as ‘A23E’.

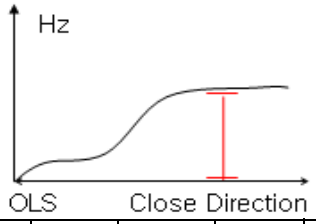
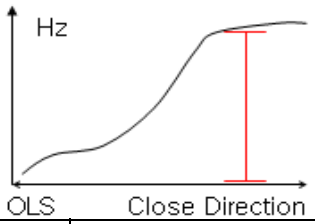
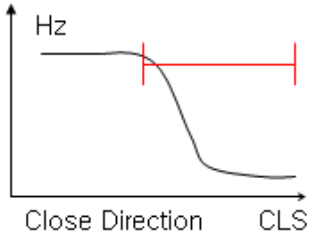
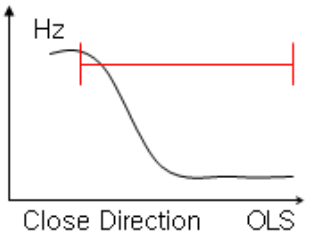
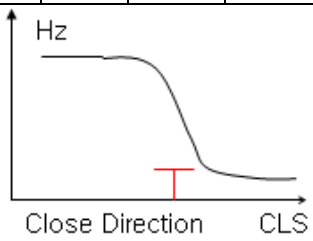
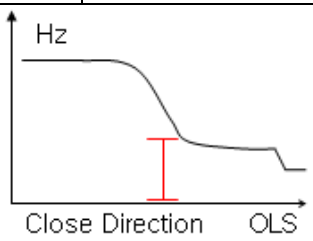
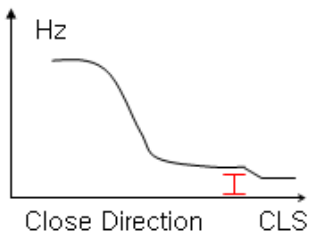
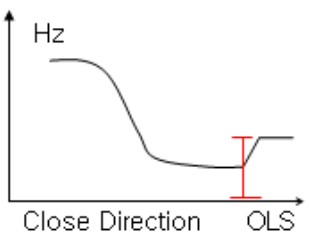
3. Parameter

The parameter for speed adjustment is consists of 3 groups. The version of following parameter is S1.9 version.

Group	No	Name	Default			Min.	Max.	Unit	Description Change under operation
			SBD	SAV (CO)	SED				
Inverter operation status. Display group(A23E or A21E)									
D	01	Output voltage	-		-	1	-	V	
D	02	Output current	-		-	0.01	-	A	
D	03	Output Hz	-		-	0.1	-	Hz	
D	04	S/W Version	-		-	0	-	-	Software Version
D	05	S/W Version(date)	-		-			-	Date of S/W 05/09/28 (28 Sep, 2005)
D	06	Input port status	- -		- -			-	b5 (0) b4(0) b3(0) b2(0) b1(0) b0(0) CL OP Nudge HCL CLS OLS It displays'1', if 'ON'
D	07	Output port status	- - -		- - -			-	B6 (0) b5(0) b4(0) b3(0) b2(0) b1(0) b0(0) CLS OLS MON SES-CUT DERR1 DERR2 DERR3 It displays'1', if 'ON'
D	08	Door Operation Status	-		-	0	7		Displays current door status 0: CLS, Closed fully 1:Open-acceleration, 2:Open-standard speed, 3:Open-deceleration, 4:Open, 5:Close acceleration, 6:Close-standard speed, 7:Close-decleration
D	09	Door Position	-			0	100 %	%	Displays current door position 0: Fully open, 1000: Fully close
D	10	Main Loop Time	-			0	-	-	Main loop of software repetition task time 1= 100msec.
D	11	1msec Loop Time	-			0	-	-	Interrupt routine task 1= 1msec
D	12	Open Time	-			0.1	-	sec	Door Open time
D	13	Close Time	-			0.1	-	sec	Door Close time
D	14	Frequency order	-			0.1	-	Hz	Frequency order before acceleration or deceleration
D	15	DC Link volts.	-			1	-	V	DC Link voltage
D	16	Encode value	-			-	-	-	SBD only Encoder input value * 10000
D	17	Encoder value(10000)	-			-	-	-	SBD only Encoder input value
D	18	Photo sensor input value				0	31		Displays position of disk 0: open, 31: close
D	19	Door operation time(10000)	0	0	0	0	10000		* 10000 times
D	20	Door operation time	0	0	0	0	9999		0~9999 times

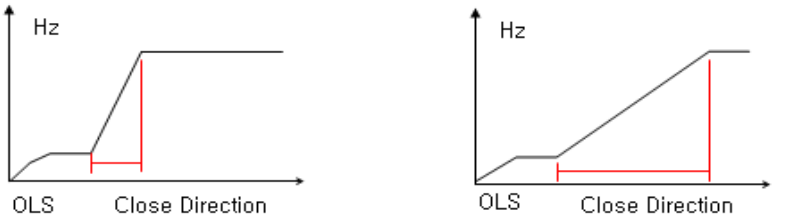
D	21	Door reopen times(10000)	0	0	0	0	10000		* 10000 times
D	22	Door reopen times	0	0	0	0	9999		0~9999 times
D	23	Door operation mode	0	0	0	0	2		0: Normal operation, 1: OP measurement operation, 2: test mode operation
D	24	'Close lock' detection times	0	0	0	0	65536		0~65535 times. Value'1' is increased whenever door position is not reached to 'OLS' during open lock waiting time of F40 after door open command. As soon as it detects 'CLS', it counts again
D	25	'Open lock' detection times	0	0	0	0	65535		0~65535 times. Value'1' is increased whenever door position is not reached to 'CLS' during open lock waiting time of F40 after door open command As soon as it detects 'CLS', it counts again
D	26	ROM check result	0	0	0	0	1		
D	27	ROM check result	0	0	0	0	1		

Group	No	Name	Default			Min.	Max.	Unit	Description Change under operation
			SBD	SAV (CO)	SED				
Door setting group - Parameters that define door operation pattern.(A22E or A31E)									
S	01	Close start position	0	3	0	0	3000	-	A section that initial frequency is applied to close operation Ex1) SBD, SED 0: it is operated with initial frequency until the encoder pulse input value is 100. Ex2) SAV 3: it is operated with initial frequency until the photo sensor input value is 3.
		As S01 is increased, the point of close acceleration is changed. 							
S	02	Close initial Hz	5.0	5.0	5.0	0.0	Max. Freq	Hz	Output frequency for the beginning of close operation
									

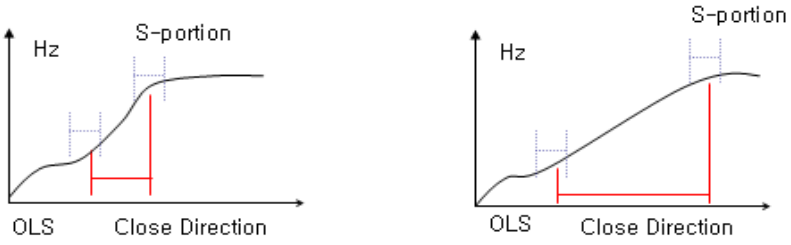
S	03	Close run Hz	20.0	20.0	15.0	0.0	Max. Freq	Hz	Normal running frequency of close operation
		Do not set a high value for close speed. It effects on the door close speed strongly  							
S	04	Close Creep start position	650	14	400	0	3000	-	A starting point that the door speed is decelerated. Ex) SBD 650: It begin to decelerate that encoder input value is Max 500. * The Max value is set under the initial entrance width is measured.
		 							
S	05	Close Creep Hz	2.0	2.0	2.0	0.0	Max. Freq	Hz	Frequency from end of close deceleration to CLS position.
		 							
S	06	Close End Hz	5.0	2.0	5.0	0.0	Max. Freq	Hz	Frequency to hold the close condition after 1.0 second of CLS detection Ex)SBD,SED 5.0: It is operated by 5.0 Hz after 1.0 second of CLS detection.
		This is close holing frequency. If it is set a high value, the holding current will be increased. It must be set according to motor SPEC. It has no relation to total close speed profile  							
S	07	Open start position	250	3	100	0	3000	-	Refer to S01 for main concept.
S	08	Open initial Hz	5.0	5.0	5.0	0.0	Max Freq.	Hz	Refer to S02 for main concept.

S	09	Open Run Hz	27.0	20.0	20.0	0.5	Max. Freq	Hz	Refer to S03 for main concept.
S	10	Open Creep start position	50	14	20	0	3000	-	Refer to S04 for main concept.
S	11	Open Creep Hz	2.0	2.0	2.0	0.0	Max. Freq.	Hz	Refer to S05 for main concept.
S	12	Open End Hz	2.0	2.0	2.0	0.0	Max. Freq	Hz	Refer to S06 for main concept.
S	13	Close acceleration time	0.5	0.7	0.5	0.1	30.0	sec	Acceleration time in acceleration section under close operation

S-curve is defined according to this data.
As the value is increased, running section is decreased. So, Total close time will be increased.

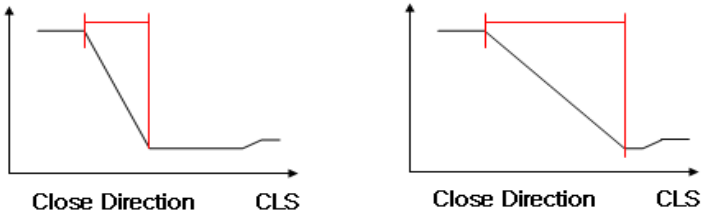


0% of S-portion

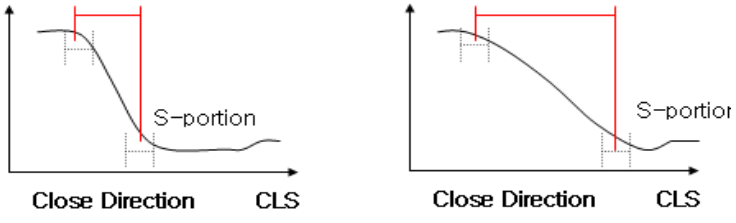


n% of S-portion

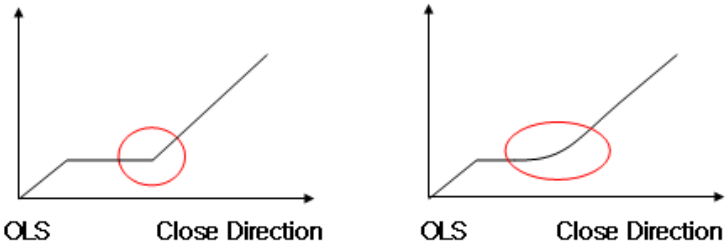
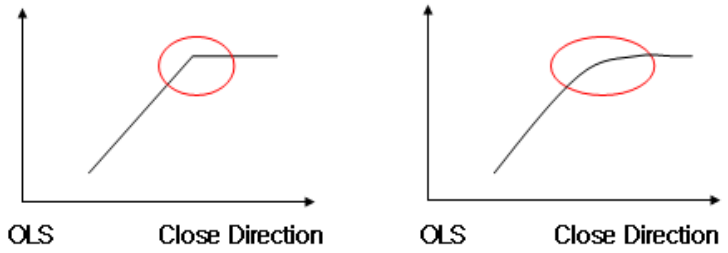
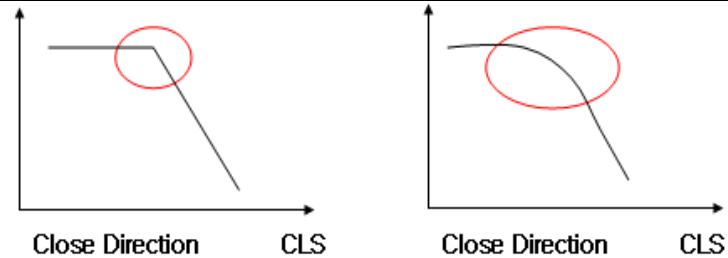
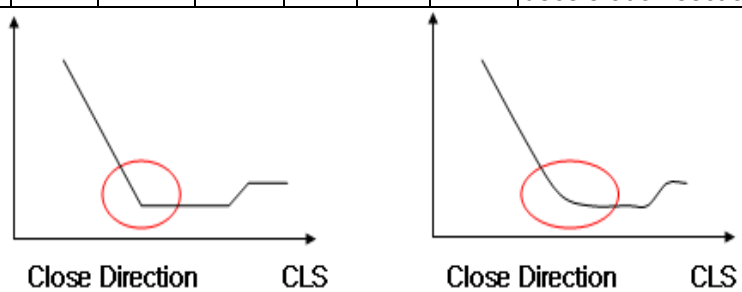
S	14	Close deceleration time	0.6	0.6	0.6	0.1	30.0	sec	Deceleration time in deceleration section under close operation

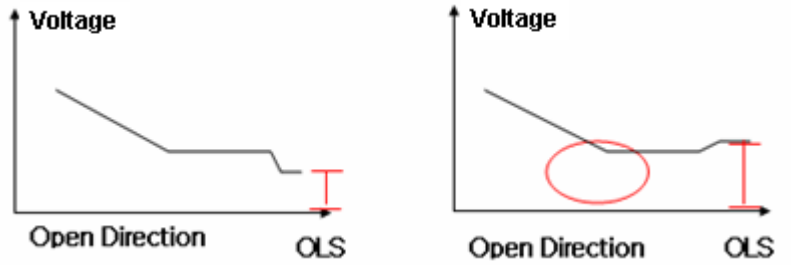
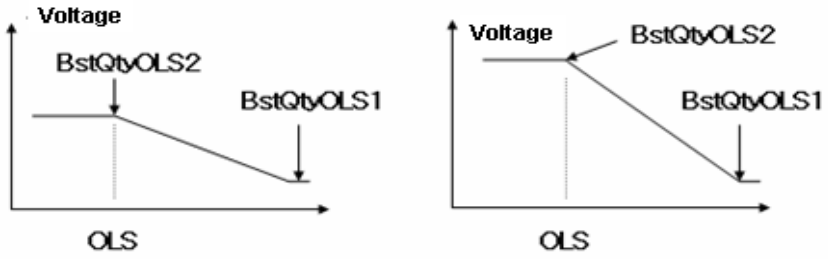


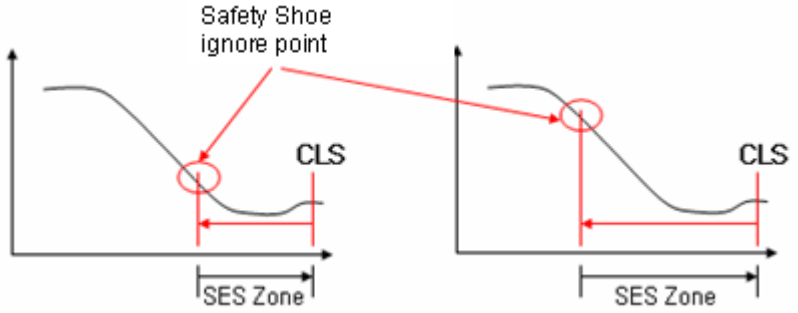
0% of S-portion



n% of S-portion

S	15	Open acceleration time	0.5	0.7	0.7	0.1	30.0	sec	Acceleration time in acceleration section under open operation S-curve is defined according to this data. As the value is increased, running section is decreased. So, Total open time will be increased Refer to S13 for graph
S	16	Open deceleration time	0.6	1.0	0.6	0.1	30.0	sec	Deceleration time in deceleration section under open operation. As the value is increased, running section is decreased. So, Total open time will be increased Refer to S14 for graph
S	17	S-CL1	35.0	35.0	35.0	0.0	50.0	%	S-curve point setting at 1st acceleration section
									
S	18	S-CL2	30.0	35.0	30.0	0.0	50.0	%	S-curve point setting at 2nd acceleration section
									
S	19	S-CL3	30.0	40.0	30.0	0.0	50.0	%	S-curve point setting at 1st deceleration section
									
S	20	S-CL4	50.0	50.0	50.0	0.0	50.0	%	S-curve point setting at 2nd deceleration section
									

S	21	S-OP1	35.0	35.0	35.0	0.0	50.0	%	S-curve point setting at 1st acceleration section. refer to S17
S	22	S-OP2	30.0	35.0	30.0	0.0	50.0	%	S-curve point setting at 2nd acceleration section. Refer to S18
S	23	S-OP3	30.0	40.0	30.0	0.0	50.0	%	S-curve point setting at 1st deceleration section. Refer to S19
S	24	S-OP4	50.0	50.0	50.0	0.0	50.0	%	S-curve point setting at 2nd deceleration section Refer to S20
S	25	Reopen acceleration time	1.0	1.0	1.0	0.1	30.0	sec	Reopen acceleration time Refer to S15
S	26	Reopen deceleration time	0.3	0.3	0.3	0.1	30.0	sec	Reopen deceleration time Refer to S16
S	27	BstQtyOLS 1	10.0	10.0	10.0	0.0	50.0	%	Adjustable output voltage at OLS position.(Door open holding voltage) As OLS is detected, it will enable
									
S	28	BstQtyOLS 2	15.0	25.0	15.0	0.0	50.0	%	There is no close command at OLS but in case a door is slightly moved to close direction, the open holding voltage is compensated linear type according to door position. Always set : S28>S27
									
S	29	BstQtyCLS 1	5.0	0.0	5.0	0.0	50.0	%	Adjustable output voltage at CLS position.(Door open holding voltage) As CLS is detected, it will enable
S	30	BstQtyCLS 2	10	0.0	10.0	0.0	50.0	%	There is no open command at CLS but in case a door is slightly moved to move direction, the close holding voltage is compensated linear type according to door position. Always set : S30>S29
S	31	SES position	250	14	250	0	10000	-	Door position that SES activation is ignored Because the SES Pos is related safety, do not set it to be too high or low. Modify it around default value. SBD: R.E Pulse data SAV: Photo disk sensing data



S	32	Off Pos	500	16	500	0	10000	-	
		A section that close command is steadily maintained by DCD PCB, if a door is moved without close command signal of CP after fully close , In case door position is over this section, the voltage is not supplied to motor anymore Close command voltage is set by BstQtyCLS2 until CLS section, And it over CLS position, voltage is set by S29 and S30 relation. It is valid that S42 and set with 1. If S42 is set with 0, The function of S32 is not operational.							
S	33	OP measurement mode	0	N/A	0	0	1	-	0: When power is applied to door, it measures OP. (Entrance width). As it completes OP measurement, the data is changed '1' automatically. 1: The OP measurement is completed. If there is no OLS and CLS position data, it is operated with slow speed.
S	34	Door operation mode	0	0	0	0	99	-	0: Normal operation(Default) 99: Auto Run mode When a close or open order is inputted, the test operation mode is cancelled.
S	35	Auto operation mode RUN	0	0	0	0	9999		0: Normal operation(Default) 9999: Auto Run mode When a close or open order is inputted, it is set by'0' automatically and the test operation mode is cancelled.
S	36	System type	1	0	3	0	1		0:SAV 1:SBD(In case a photo sensor is detected, it works as SAV) 2: ADS (ADS software is separate) **3 : SED**
S	37	OPW Type	0	0	0	0	xx		Door open type
S	38	Entrance width search Frequency	5.0	N/A	5.0	0.0	Max. Freq	Hz	Frequency for the entrance width measurement of SBD/SED door.
S	39	Init Mode	0	0	0	0	2		0 : None of change. (Default) 1 : Modified parameter saving 2: Initialize the saved information to be '0' 3. Initialize the RUN COUNT 99 : Initialize all parameters to their origin data
S	40	F Modify							Approval data for accessing 'F' Menu If the value is "55", F group can be accessed by "A32E" command on initial mode

S	41	SAV side open	0.0	0.0	0.0	0	0		SAV side open setting 0: Center open, 1: SAV side open SBD/SED door have no side open type. So, even it is set '1' under SBD/SED door, it does not effect on the system
S	42	CloseEnd ON	0	0	0	0	1		Door Holding current after CLS
S	43	OpenEnd ON	0	0	0	0	1		Door Holding current after OLS

The following F group is rarely handled at field. Most of filed adjustment is done through S and D group. So, F group must be handled by electric designer's recommendation.

F group can be viewed when [S40 = 55] only.

Group	No	Name	Default		Min.	Max	Unit	Description Change under operation
			SBD/SED	SAV				
Inverter display group **(A32E)**								
F	01	Compensation of CL section 1 volts	100	100	50	200	%	Adjustable voltage at the close start section Ex) 100% : standard Voltage 80% : 80% of standard Voltage 150%: 150% of standard Voltage. The voltage can be down according to DC link voltage.
F	02	Compensation of CL section 2 volts	80	100	50	200	%	Adjustable voltage at the close acceleration section
F	03	Compensation of CL section 3 volts	70	100	50	200	%	Adjustable voltage at the close running section
F	04	Compensation of CL section 4 volts	70	100	50	200	%	Adjustable voltage at the close deceleration section
F	05	Compensation of CL section 5 volts	100	100	50	200	%	Adjustable voltage at the close creep section
F	06	Compensation of CL section 6 volts	100	100	50	200	%	Adjustable voltage after CDS detection (Only ADS type)
F	07	Compensation of CL section 7 volts	45	100	50	200	%	Adjustable voltage in CLS
F	08	Compensation of OP section 1 volts	100	100	50	200	%	Adjustable voltage at the open start section
F	9	Compensation of OP section 2 volts	80	100	50	200	%	Adjustable voltage at the open acceleration section
F	10	Compensation of OP section 3 volts	80	100	50	200	%	Adjustable voltage at the open running section
F	11	Compensation of OP section 4 volts	80	100	50	200	%	Adjustable voltage at the open deceleration section
F	12	Compensation of OP section 5 volts	100	100	50	200	%	Adjustable voltage at the open creep section
F	13	Compensation of OP section 6 volts	100	100	50	200	%	Adjustable voltage in OLS

Group	No	Name	Default.			Min.	Max.	Unit	Description Change under operation
			SBD	SAV (CO)	SBD				
Error status display group **(A41E)**									
T	01	Error Info 0							Present Error: Error detection time/Error code
T	02	Error Info 1							Former time Error: Error detection time/Error code
T	03	Error Info 2							
T	04	Error Info 3							
T	05	Error Info 4							
T	06	Error Info 5							
T	07	Error Info 6							
T	08	Error Info 7							
T	09	Error Info 8							
T	10	Error Info 9							
T	11	Error Info 10							
T	12	Error Info 11							
T	13	Error Info 12							
T	14	Error Info 13							
T	15	Error Info 14							
T	16	Error Info 15							
T	17	Error Info 16							
T	18	Error Info 17							
T	19	Error Info 18							
T	20	Error Info 19							
T	21	Error count							
									Total errors after last initialize

4. TCD code

Code	Error Name	Operation after error detection	Detection condition
1	Arm Short	Save the Error Information and door operation is stopped.	Arm short LV of Gate power of IPM
3	OV trip	Save the Error Information and door operation is stopped.	DC Link voltage ＞200V
4	UV trip	Save the Error Information and door operation is stopped.	1) DC Link voltage＜ 90V 2) In case the condition1) is maintained over 500msec
5	ETH	Save the Error Information and door operation is stopped.	Standard : 2A, The electrical thermal will detect an error in case the current is over 50% (3A) rather than standard and this condition is over 60sec continuously.
8	MTH	Save the Error Information and door operation is stopped.	Motor thermal is activated
9	Position signal error	Save the Error Information and door operation is stopped.	1) INV run speed feedback=0 2) 0.7A＜ Output current ＜ 2A output 3) Frequency: 1.5Hz 4) In case the condition1),2) and 3) are maintained over 1sec

Code	Error Name	Operation after error detection	Detection condition
21	OC U	Save the Error Information	U Phase output current ＞OC level
22	OC V	Save the Error Information	V Phase output current ＞OC level
23	OC W	Save the Error Information	W Phase output current ＞OC level
24	Output unbalance	Save the Error Information	1) Output frequency of inverter run＞Frequency of OP measurement 2) Ia+Ib+Ic ＞0.5A 3) In case the condition1) and 2) are maintained over 100msec
25	Ia offset	Save the Error Information	Ia offset ＞10% of standard
26	Ib offset	Save the Error Information	Ib offset ＞10% of standard
27	Ic offset	Save the Error Information	Ic offset ＞10% of standard
28	Over load	Save the Error Information	1) Output current ＞2A 2) In case the condition1) is maintained over 5sec
29	Over speed	Save the Error Information	1) None of OLS and CLS 2) Output frequency ＞10Hz 3) Feedback speed ＞110% of Output frequency 4) In case the condition1), 2) and 3) are maintained over 1sec
30	Velocity tracking error	Save the Error Information	1) None of OLS and CLS 2) Output frequency ＞OPW measurement frequency 3) Output frequency-Feedback speed ＞5 Hz 4) Output current ＞0.7A 4) In case the condition1), 2), 3) and 4) are maintained over 1sec
31	CDS ON error	Save the Error Information	1) While it is operated normally after OPW measurement, Door position ＞95% 2) CDS input is ‘off’ while it is under close operation 3) In case the condition1) and 2) are happened same time. It is reset again to detect this error at OLS position.
32	CDS off error	Save the Error Information	1) While it is operated normally after OPW measurement, Door position＜ 50% 2) CDS input is ‘on’ while it is under open operation 3) In case the condition1) and 2) are happened same time. It is reset again to detect this error at CLS position.
33	OLS on error	Save the Error Information	1) While it is operated normally after OPW measurement, Door position＜ 5% 2) OLS input is ‘off’ while it is under open operation 3) In case the condition1) and 2) are happened same time. It is reset again to detect this error at CLS position.
34	OLS off error	Save the Error Information	1) While it is operated normally after OPW measurement, Door position ＞50% 2) OLS input is ‘on’ when it is not close operation and CLS is not detected 3) In case the condition1) and 2) are happened same time. It is reset again to detect this error at CLS position.

Code	Error Name	Operation after error detection	Detection condition
35	OPW CDS error	Save the Error Information	1) Close order output current ＞0.7A 2) Close output frequency ＞1.5Hz 3) Motor stop condition is maintained over 1sec. In case the encoder feed back condition is nothing and this condition is maintained over 1sec, it processes as an encoder error
36	OPW OLS error	Save the Error Information	1) Open order output current ＞0.7A 2) Open output frequency ＞1.5Hz 3) Motor stop condition is maintained over 1sec. In case the encoder feed back condition is nothing and this condition is maintained over 1sec, it processes as an encoder error
38	Reversed encoder	Save the Error Information and door operation is stopped.	The reversed pulses are inputted over 100.