FUJITEC

New Brushless Driver User Manial

Driver Model No. MB-1330H, 1330M, 1350L, 1350S, 1350Z

With Sensor Driver Model No. MB-1330HS, 1330MS, 1350LS

Controller Model No. DO-1390D

For automatic screw fastening machines

Ver.114

211112

1. Overview

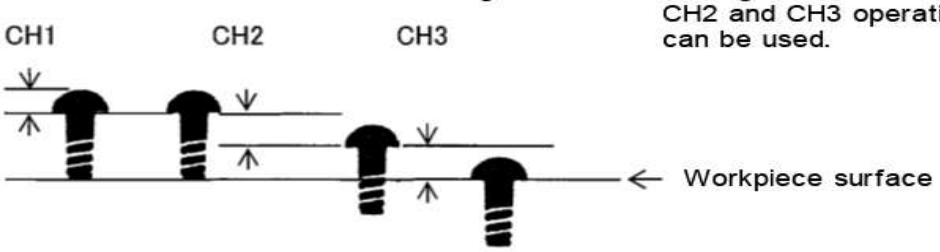
This user manual describes FUJITEC brushless drivers 5 model (MB-1330H, 1330M, 1350L, 1350S, 1350Z) With sensor (MB-1330HS, MB-1330MS, MB-1350LS) and controller DO-1390D.
The DO-1390D controller is designed to control up to 32 channels (CH1 to CH32) of operation by setting the torque and speed separately for each channel.
The controller allows operation in 3 modes: OUT mode, IN mode, and PROGRAM mode.
OUT mode allows selecting the channels from CH1 to CH32 to perform operations by start input.
IN mode performs constant operation using CH1 only.
PROGRAM mode allows operation using up to 32 programs. Each program from PROG1 to PROG32 can be set by specifying the order of CH1 to CH32. When a program is started, it performs sequential operation according to the specified order. When finished, a "completion signal" is output.
For optimum screw fastening, the torque and speed can be varied, and the number of revolutions, torque control (rotates until the specified torque is reached), and angle control (angle setting) can be specified.
Each mode outputs a "completion signal" when the operation is finished.

The basics of tightening screws include a slow-start during bite-in and the speed & torque during intermediate screw-in. Also specifying a slow speed & torque during screw seating is essential. See below for examples of tightening screws.

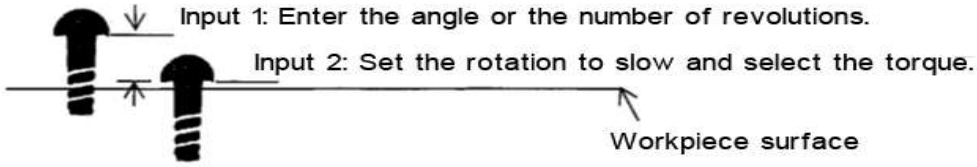
What it can do !

Example 1

Slow rotation during screw bite-in	User can set a torque value at maximum speed during intermediate screw-in.	User can set torque control for slow rotation during final screw seating.	CH1, 2, 3 User can make individual settings for the number of revolutions and torque. Settings entered for CH2 and CH3 operation can be used.



Example 2



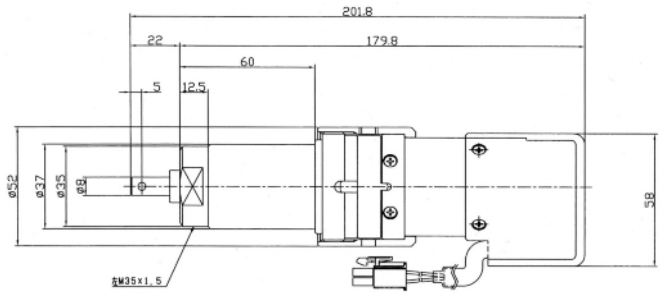
Example 3

After Input 2 in Example 2, operation stops at any desired angle (angles can be set in 10 degree units).

2. Basic specifications

Driver section (MB-1330H, 1330M, 1350L, 1350S, 1350Z)

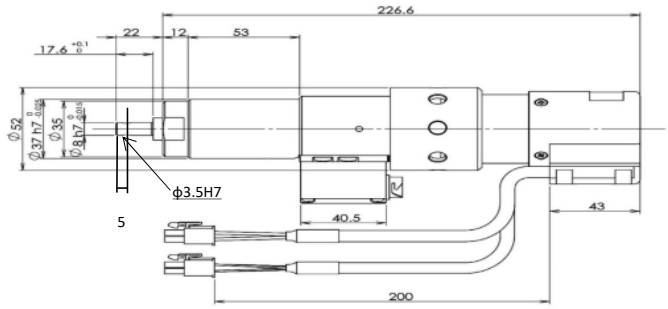
<Dimensional outline (mm)>



Specifications					
Model No.	MB-1330H	MB-1330M	MB-1350L	MB-1350S	MB-1350Z
Calculated output torque (N·m)	0.4 to 1.5	0.3 to 2.3	1.0 to 5	0.2 to 1.0	1.28 to 6.4
Rotational speed with no load (rpm)	20～1060	170～640	10～450	50～2,160	7～330
Weight (g)	Approx. 750				
Output axis diameter (mm)	8 (standard), 6 (option)				
Gripper outer diameter (mm)	37±0.1				

With sensor driver section (MB-1330HS, 1330MS, 1350LS)

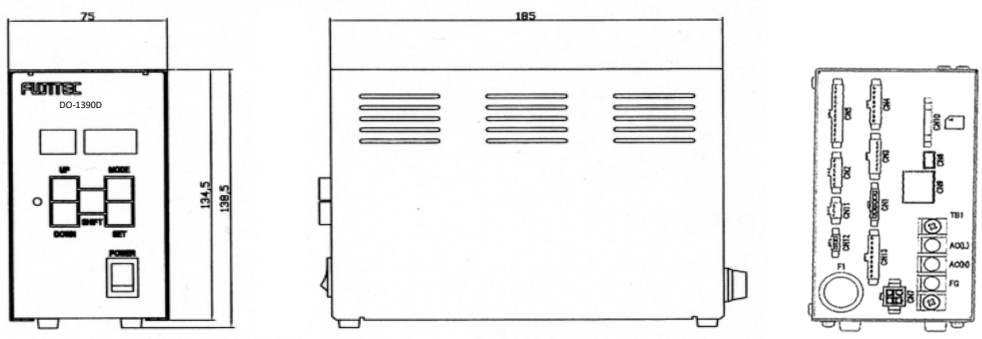
<Dimensional outline (mm)>



Specifications			
品番	MB-1330HS	MB-1330MS	MB-1350LS
Calculated output torque (N·m)	0.4 to1.5	0.3 to 2.3	1.0 to 5
Rotational speed with no load (rpm)	20～1060	170～640	10～450
Weight (g)	Approx. 750		
Output axis diameter (mm)	8 (standard), 6 (option)		
Gripper outer diameter (mm)	37±0.1		

Controller section (DO-1390D) for Brushless Driver, With sensor Driver

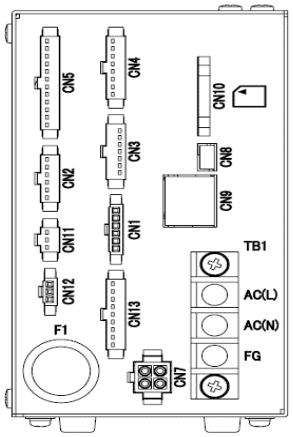
<Dimensional outline (mm)>



Input voltage	100 to 240 V AC
Rated current	6 A
Display	7-segment display
External I/O	Start input
	Stop input: 2 points
	Completion signal output
Weight	Approx. 1500 g

The following functions are included:
Constant voltage, high voltage, and overcurrent detection functions.
Error display function such as for rotational speed error, angle not reached, open-circuit fault, and no program setting

3. Connectors



部品番号	名称
CN1	Hall element (input) connector
CN2	Torque sensor (input) connector
CN3	Start / Completion signal (input/output) connector
CN4	Stop signal (input) connector
CN5	Channel switching / Start input connector
CN7	Motor signal (output) connector
CN8	Communication connector
CN9	LAN communication
CN10	SD card
CN11	24V power output
CN12	Communication
CN13	External input/output
TB1	AC Power
F1	Fuse

(1) Hall element (input) connector

CN1	Type No.	DF1B-6ES-2.5RC	
	Maker	Hirose Electric	
No.	Signal name	Input/output area	Remarks
1	+5V	DC4.75V～DC5.25V	Hall C power
2	GND	DC0V	Hall C GND
3	H1	DC0V～DC5.25V	Hall C U
4	H2	DC0V～DC5.25V	Hall C V
5	H3	DC0V～DC5.25V	Hall C W
6	E	—	Ground

Mating housing
DF1B-6EP-2.5RC

Mating contact
DF1B-2428PC

(2) Torque sensor (input) connector

CN2	Type No.	SMP-06V-B	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	+12V	DC10.8V～DC13.2V	Torque sensor power
2	0V	DC0V	Torque sensor GND
3	NC	—	
4	Zero reset	DC0V or OPEN	(Output)
5	Torque input	DC-0.5V～DC4.5V	
6	0V	DC0V	Torque input GND

Mating housing
SMR-06V-B

Mating contact
SYM-001T-P0.6

(3) Start / Completion signal (input/output) connector

CN3	Type No.	SMP-07V-B	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	Start input	DC0V～DC24V 8mA	Contact input
2	24G	DC0V	24G
3	Error output	DC24V 1A OPEN or 7pin SHORT	a Contact output(3-7pin)
4	Completion output a	DC30V 2A OPEN or 6pin SHORT	a Contact output(4-6pin)
5	Completion output b	DC30V 2A OPEN or 6pin SHORT	b Contact output(5-6pin)
6	Completion output COM	DC30V 2A 4pin SHORT or 5pin SHORT	Contact output(COM)
7	Error output	DC24V 1A OPEN or 7pin SHORT	a Contact output(3-7pin)

Mating housing
SMR－07V－B

Mating contact
SYM-001T-P0.6

(4) Stop signal (input) connector

CN4	Type No.	SMP-08V-B	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	Stop 1	DC0V～DC24V 8mA	Stop input(1)
2	24G	DC0V	24G
3	Stop 2	DC0V～DC24V 8mA	Stop input(2)
4	24G	DC0V	24G
5	Alam reset	DC0V～DC24V 8mA	Alarm release imput
6	24G	DC0V	24G
7	停止3	DC0V～DC24V 8mA	Compulsion stop
8	24G	DC0V	24G

a Contact

a Contact

Turn on and release with off

Rreset when forced to stop at the B contact

Mating housing
SMR-08V-B

Mating contact
SYM-001T-P0.6

(5) Channel switching / Start input connector

CN5	Type No.	SMP-07V-B	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	+24V	DC21.6V～DC26.4V 100mA	External power input 24V
2	+24V	DC21.6V～DC26.4V 100mA	External power input 24V
3	1	DC0V～DC24V 8mA	
4	2	DC0V～DC24V 8mA	
5	4	DC0V～DC24V 8mA	
6	8	DC0V～DC24V 8mA	
7	16	DC0V～DC24V 8mA	
8	NC	―	
9	Start in put	DC0V～DC24V 8mA	Contact input
10	COM	DC0V	24G
11	COM	DC0V	24G
12	COM	DC0V	24G

Mating housing
SMR－12V－B

Mating contact
SYM-001T-P0.6

(7) Motor signal (output) connector

CN7	Type No.	172159-1	
	Maker	TE Technology	
No.	Signal name	Input/output area	Remarks
1	U-phase	AC0V～AC240V	Out put
2	V-phase	AC0V～AC240V	Out put
3	W-phase	AC0V～AC240V	Out put
4	E	―	Ground

Mating housing
172167-1

Mating contact
170366-1

(8) Communication connector

CN8	Type No.	54819-0519	
	Maker	MOLEX	
No.	Signal name	Input/output area	Remarks
1	+5V	DC4.75V～DC5.25V	Communication Power
2	DATA(-)	DC0V～DC5.25V	
3	DATA(+)	DC0V～DC5.25V	
4	MODE	DC0V～DC5V 2.5mA	
5	GND	DC0V	Communication GND

(9) LAN communication

CN9	Type No.	RJLDC-308TA	
	Maker	TAIMAG	
No.	Signal name	Input/output area	Remarks
1	TXP		Send date(+)
2	TXN		Send date(−)
3	RXP		Received date(+)
4	NC	−	
5	NC	−	
6	RXN		Received date(−)
7	NC	−	
8	NC	−	

(10) SD card

CN10	Type No.	AXA2R73361P-M	
	Maker	Honda Tsushin kogyo Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	DAT3/CS	DC0V～DC3.3V	Communication date
2	CMD/DI	DC0V～DC3.3V	Communication date
3	Vss1	DC0V	GND
4	Vdd	DC3.0V～DC3.45V	Power
5	CLK	DC0V～DC3.3V	Communication date
6	Vss2	DC0V	GND
7	DAT0/DO	DC0V～DC3.3V	Communication date
8	DAT1	DC0V～DC3.3V	Communication date
9	DAT2	DC0V～DC3.3V	Communication date

(11) 24V power output

CN11	Type No.	SMP-03V-B	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	24V	DC21.6V～DC26..4V	24V
2	24G	DC0V	24G
3	NC	—	

(12) Communication

CN12	Type No.	DF1B-3ES-2.5RC	
	Maker	Hirose Electric	
No.	Signal name	Input/output area	Remarks
1	TXD		Send date
2	RXD		Received date
3	GND	DC0V	FG

(13) External input/output

CN13	Type No.	SMP-09V-BC	
	Maker	J.S.T.Mfg.Co.,Ltd	
No.	Signal name	Input/output area	Remarks
1	DIS ZERO_ADJ	DC0V～DC24V	
2	DIS START	DC0V～DC24V	
3	DIS_END	DC0V～DC24V	
4	OK_OUT	DC0V～DC24V	
5	NG_OUT	DC0V～DC24V	
6	24G	DC0V	
7	24G	DC0V	
8	DIS_RESULT	DC0V～DC24V 8mA	
9	DIS_COMP	DC0V～DC24V 8mA	

Mating housing
SMR-9V-B

Mating contact
SYM-001T-P0.6

(TB1) AC power input

TB1	Type No.	W507D-3PC	
	Maker	WORLD	
No.	Signal name	Input/output area	Remarks
1	FG	—	Frame ground
2	AC(N)	AC100V～AC240V	AC power(input)
3	AC(L)	AC100V～AC240V	AC power(input)

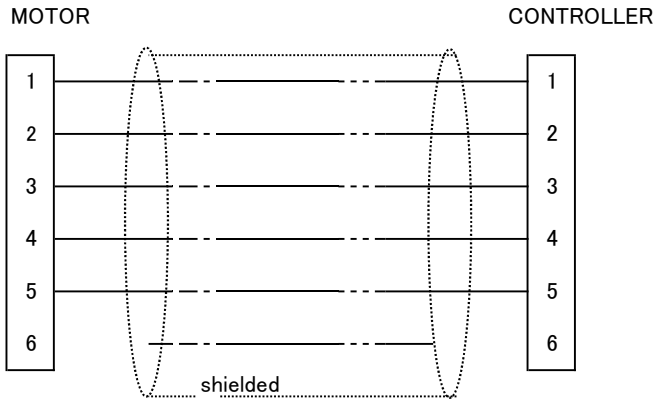
(F1)ヒューズ

F1	Type No.	FGBO 250V 5A
	Maker	Fuji Terminal Industry

WIRING DIAGRAM

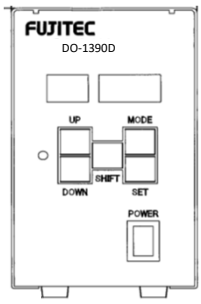
POWER CORD(4P) 910040035

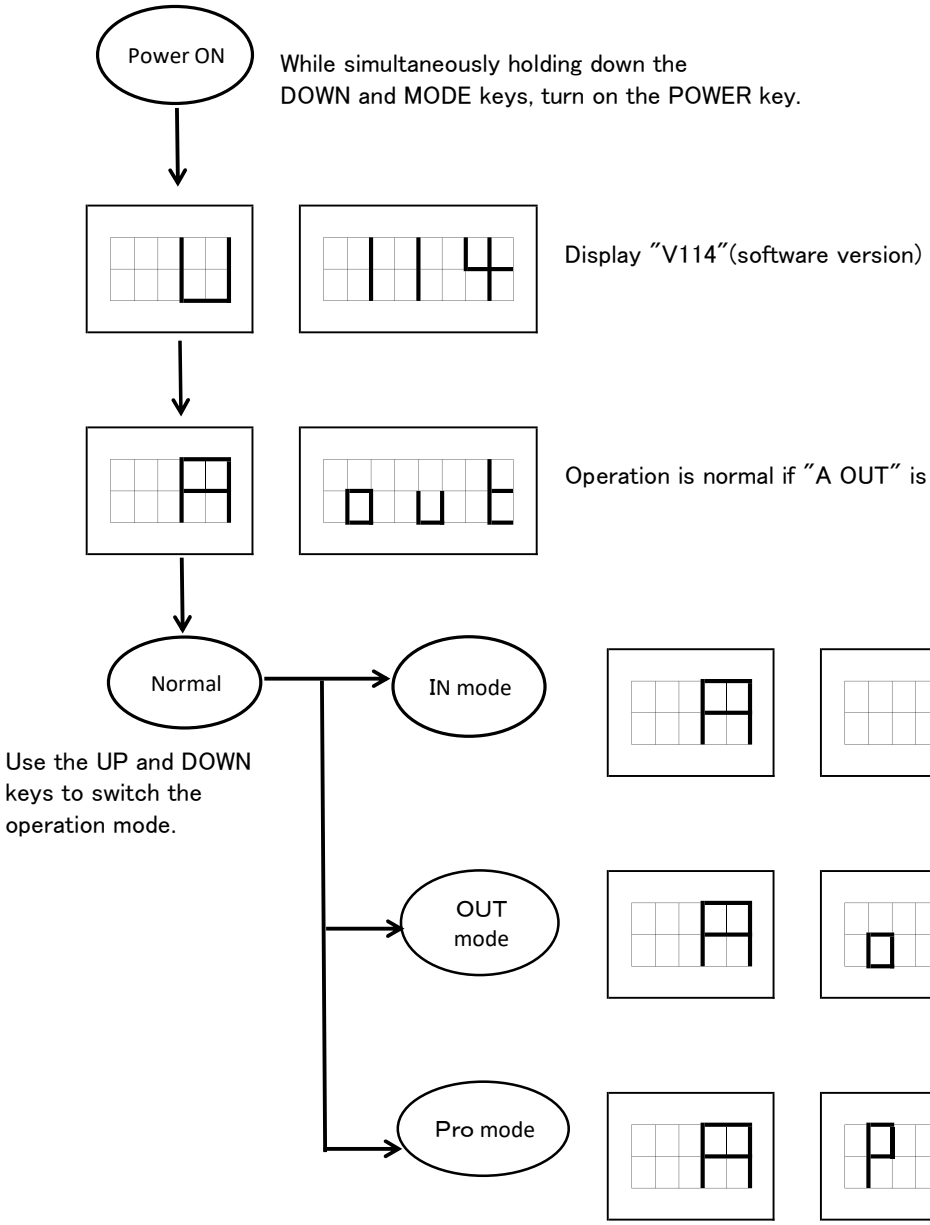
SIGNAL CABLE(6P) 910060035



4. Switching the operation mode: IN mode, OUT mode, or Program mode

While simultaneously holding down the DOWN and MODE keys, turn on the POWER key to switch the operation mode.
(See the figure on the right.)



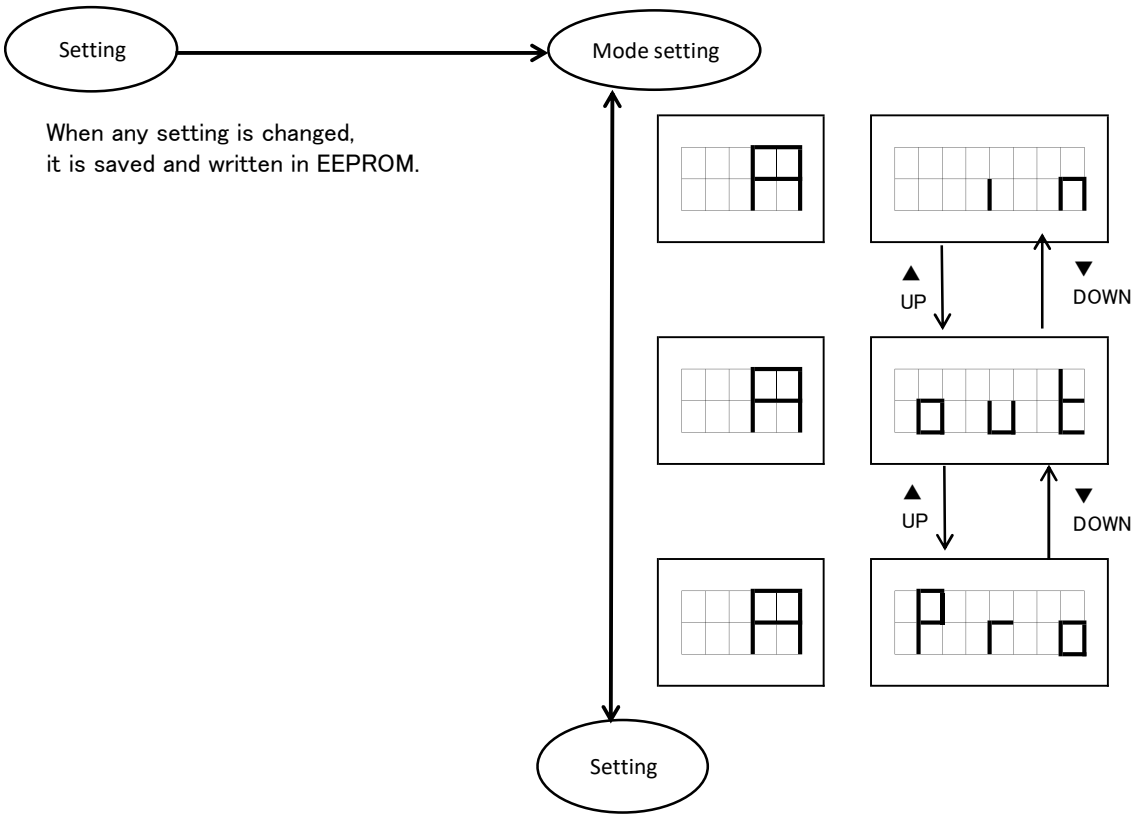


After the operation mode is switched to IN or OUT or PROG mode, turn the power off and then back on.

IN Can be used for channel 1 only.

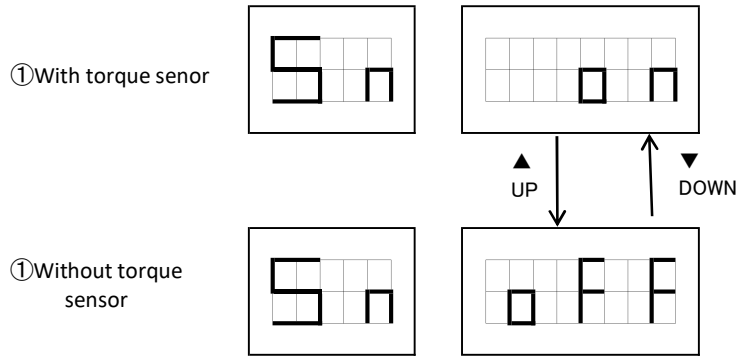
OUT Can be used from channel 1 to channel 32.
Specify the channel from an external unit and start the screwdriver by "start input" and turn off the start input by "completion" signal.

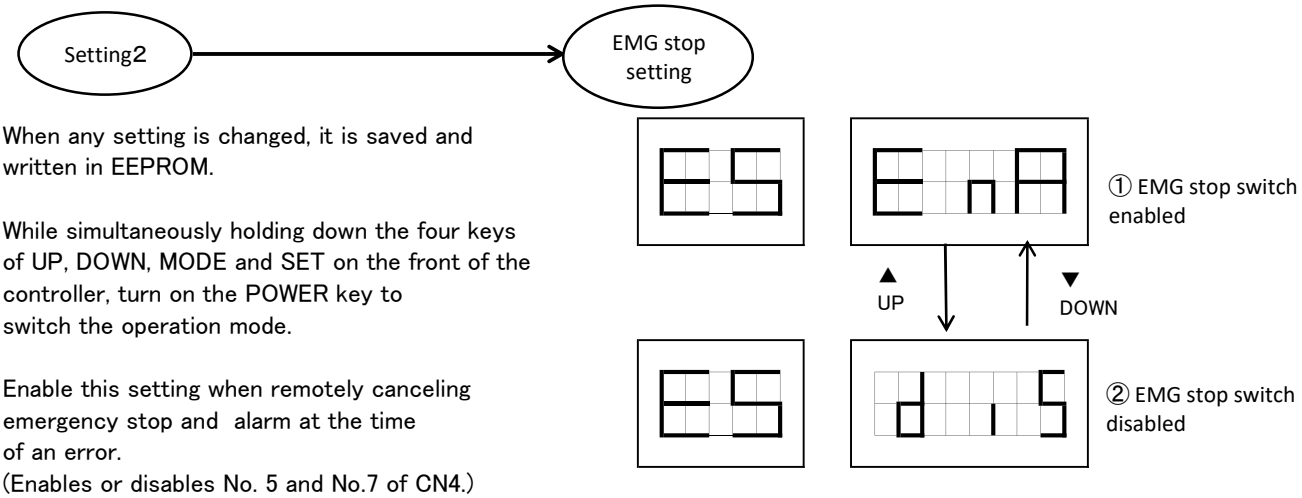
PRO When PRO (Program) mode is set, the CH switching for CN1 to 32changes to programs 1 to 32.



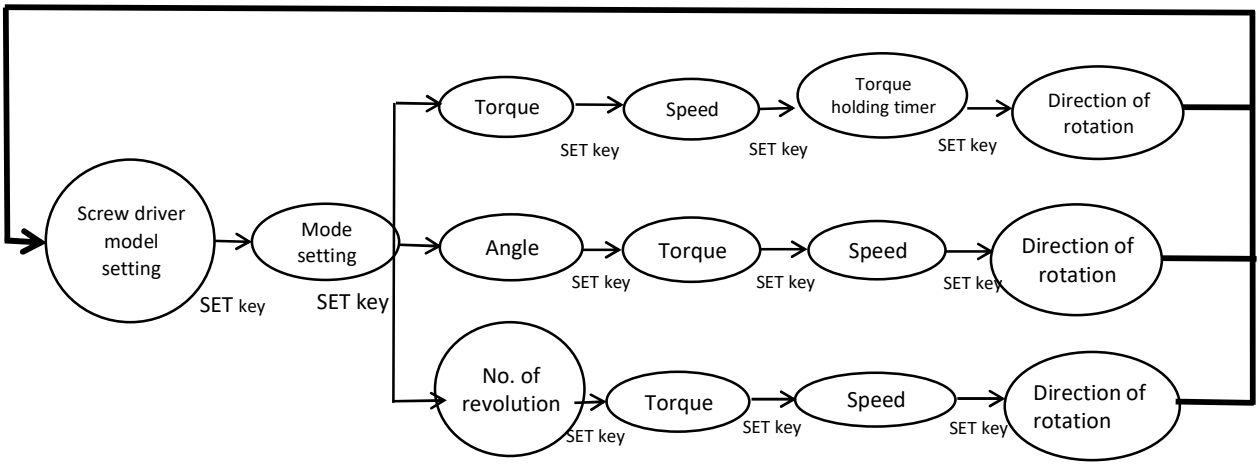
If you SHIFT press it as it is,
the Sn OFF display will appear.

On when using a torque sensor
set to Sn OFF when not
in use.





1) IN mode　When operation indicated by bold arrow is done, the settings are saved and written in EEPROM.



Follow the steps below to enter the settings.

tY & A Blinking tY Screwdriver model display and A IN mode display

Use Up and DOWN to select the screwdriver model.
Press SET key to set the model.

▲UP ▼DOWN　33H or 33M or 35L or 35S or 35Z SET

CO & A Blinking trq Ang rot Select the mode

Use UP and DOWN to select the mode

▲UP ▼DOWN　SET Press SET key to store the mode

tr & A Blinking　Use UP and DOWN to set the torque from 1 to 100 %.

▲UP ▼DOWN　SET Press SET key to store the setting

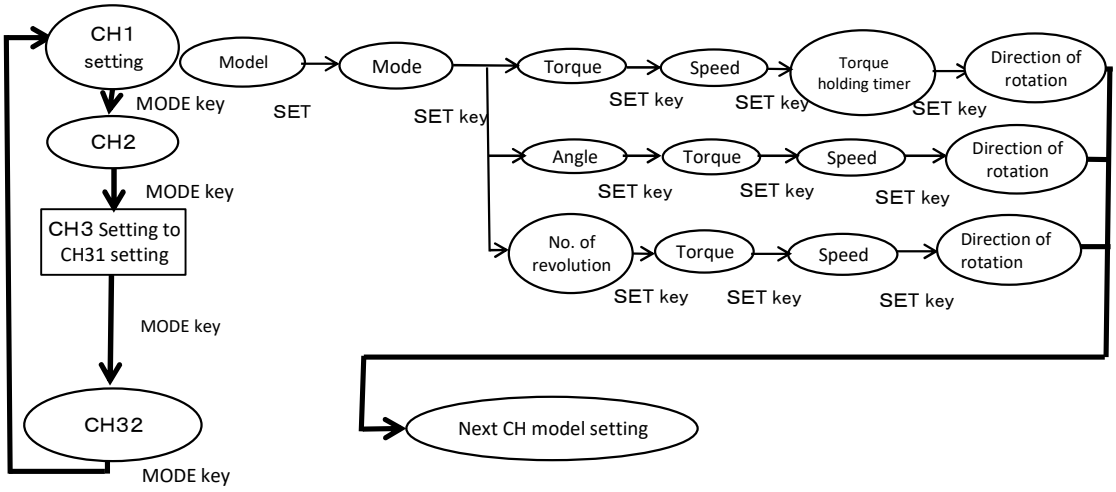
SP & A Blinking　Set the speed (rpm).　SET Press SET key to store the setting

1330H : 20 to 1060rpm
1330M : 170 to 640rpm
1350L : 10 to 450rpm
1350S : 50 to 2160rpm
1350Z : 7 to 330rpm

tt & A Blinking　Set the torque holding time during screw tightening, from 0 to 1.0 seconds in 0.1 steps.　SET Press SET key to store the setting

dr & A Blinking　Set normal or reverse rotation.　nor rev SET Press SET key to store the setting

2) OUT mode　When operation indicated by bold arrow is done, the settings are saved and written in EEPROM.



Follow the steps below to enter the settings.

tY & 01 Blinking　tY Screwdriver model display and　01 Channel display

Use UP and DOWN to select the screwdriver model.

▲UP　▼DOWN　SET Press SET key to set the model.

C0 & 01 Blinking　tr9　Ang　rot Select the mode.

Use UP and DOWN to select the mode.

▲UP　▼DOWN　SET Press SET key to set the mode.

tr & 01 Blinking　Use UP and DOWN to set the torque from 1 to 100 %.

▲UP　▼DOWN　SET Press SET key to store the setting.

SP & 01 Blinking　Set the speed(rpm).　SET Press SET key to store the setting.

1330H :　20 to 1060rpm
1330M :　170 to 640rpm
1350L :　10 to 450rpm
1350S :　50 to 2160rpm
1350Z :　7 to 330rpm

tt & 01 Blinking　Set the torque holding time during screw tightening,from 0 to 1.0 seconds in 0.1 steps.　SET Press SET key to store the setting.

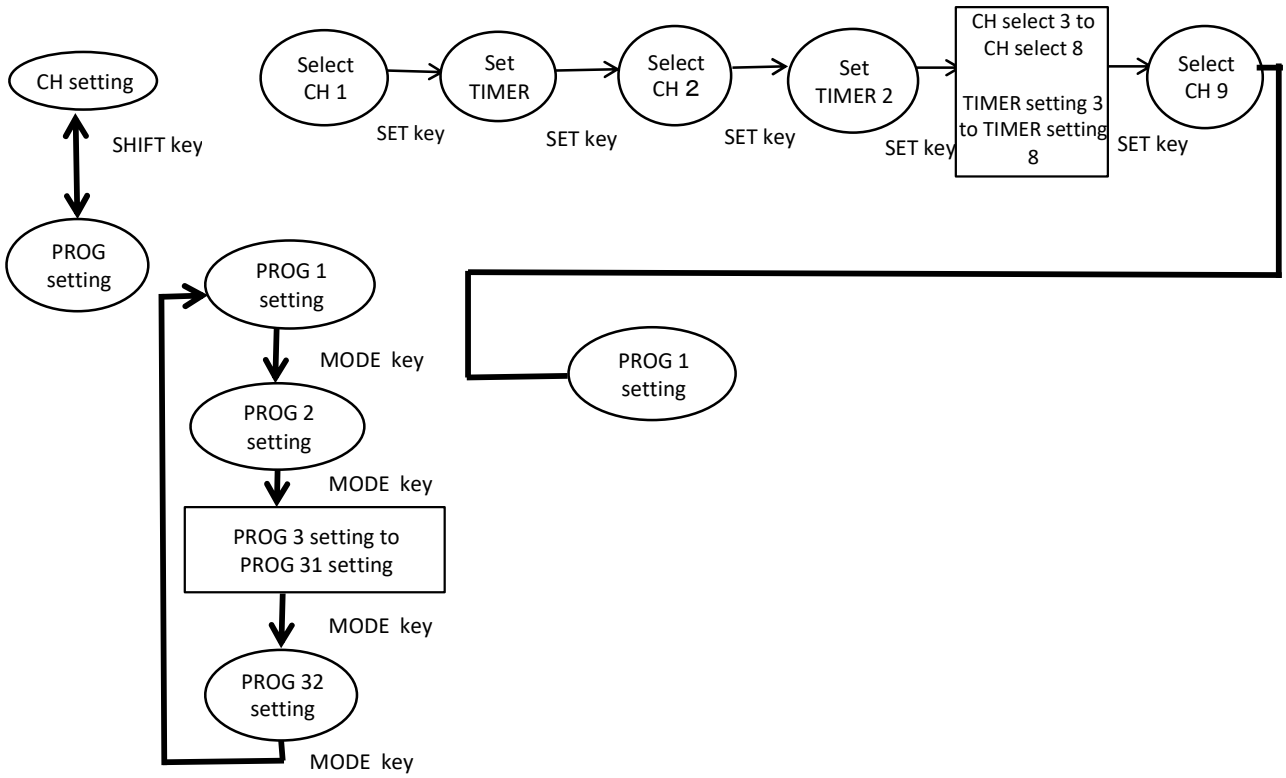
dr & 01 Blinking　Set the torque holding time during screw tightening , from 0 to 1.0 seconds in 0.1 steps.　nor　rev　SET Press SET key to store the setting.

tY & 02

CH-2
↓
CH-32

tY 03

3）PROG mode　When operation indicated by hold arrow is done, the settings are saved and written in EEPROM.



The setting procedure is the same for OUT mode. See the preceding page.

※To make the setting for continuous channel operation.

Prss [SHIFT] key.

[C1] and [O1] blink. [C1] shows the step in program [O1]

The 2-digit number at the right is the CH number from 01 to 32.

When [C1] and [O1] blink, entering [O1] at the right sets CH1 as the first step of program 01.

Use [UP] and [DOWN] to set the CH at the right "- - - " indicates no setting.

After making the setting. Press [SET] to store the setting.

Next, [t1] and [O1] blinks, and the timer number is displayed at the right.

The timer can be set form 0 to 99.9 seconds.

Set the timer to switch between each channel, in 0.1 second steps.

After making the setting , press [SET] to store the a setting.

The display changes to [C2] [O1], indicating that the next CH can be set as the second step of program 01.

Set the next CH number.

To increase the program number , press [MODE] key.

After pressing [MODE] key, press [SET] to determine the program number.

To return to the screen showing [C1] [O1] ,press [SHIFT] key.

5. IN mode setting

①Setting screen

After power ON, the setting screen is displayend until start signal 1 or 2 is turned ON. When the start signal is turned ON , operation starts in the operation mode of the CH-A setting.

7-segment display (Switches every one second)

	A	t	r	q
t	y	3	5	L

Setting date

CH A settings

CH settings

Model
Operation mode
Torque
Rotational speed
Angle
Number of revolutions
Direction of rotation
Torque holding time

②－1 Torque mode operation

This mode operates at the constant torque, and the output stops when the torque holding time is up. Operation is then complete.

7-segment display (Switches every one second)

	A	t	r	q
	A	x	x	x

(xxx is the torque setting.)

Setting date used

CH A settings

Model
Operation mode
Torque
Rotational speed
Direction of rotaion
Torque holding time

②－2 Angle mode operation

This mode allows rotation to a specified angle, and the output stops when the angle is reached. Operation is then complete.

7-segment display (Switches every one second)

	A	A	n	q
	A	x	x	x

(xxx is the angle setting.)

Setting date used

CH A settings

Model
Operation mode
Torque
Rotational speed
Angle
Direction of rotaion

②－3 Rotation mode operation

This mode allows rotation up to a specified number of revolutions , and the output stops when the number of revolutions is reached or stop signal is turned ON. Operation is then complete.

7-segment display (Switches every one second)

	A	r	o	t
	A	x	x	x

(xxx is the specified number of revolutions.)

Setting date used

CH A

Model
Operation mode
Torque
Rotational speed
Number of revolutions
Direction of rotaion

③ Operation complete

The completion signal remains ON until the starts signal is turned OFF. The "Operation complete"display appears and the LED indicator blinks.
When the start signal is turned OFF , the completion signal also turns OFF and the display returns to the nomal screen.

7-segment display

		F	i	n

6. OUT mode setting

①Setting screen

After power ON,the setting screen is display until start signal 1 or 2 is turned ON.
When the start signal is turned ON, operation starts by CH input in the operation mode detemined by the CH setting

Setting date

CH-nn setting

CH input

CH nn

Model
Operation mode
Torque
Rotational speed
Angle
Number of revolutions
Direction of rotation
Torque holding time

7-segment display (Switches every one second)

x	x
t	y

3	5	L
3	5	L

(xxx is the channnel No. being set.)

CH input determines the channel to use.

CH setting

CH 01 setting	CH 02 setting	CH 03 setting	CH 04 setting
CH 05 setting	CH 06 setting	CH 07 setting	CH 08 setting
CH 09 setting	CH 010 setting	CH 011 setting	CH 12 setting
CH 13 setting	CH 14 setting	CH 15 setting	CH 16 setting
CH 17 setting	CH 18 setting	CH 19 setting	CH 20 setting
CH 21 setting	CH 22 setting	CH 23 setting	CH 24 setting
CH 25 setting	CH 26 setting	CH 27 setting	CH 28 setting
CH 29 setting	CH 30 setting	CH 31 setting	CH 32 setting

②－1 Torque mode operation

The mode operates at a constant torque, and the output stops when the torque holding time is up. Operation is then complete.

Setting date used

CH nn

Model
Operation mode
Torque
Rotational speed
Direction of rotation
Torque holding time

7-segment display (Switches every one second)

n	n
n	n

t	r	q
x	x	x

(xxx is the channel No. in operation)
(xxx is the torque setting.)

②－2 Angle mode operation

This mode allows rotation to a specified angle, and the output stops when the angle is reached. Operation si then complete.

Setting date used

CH nn

Model
Operation mode
Torque
Rotational speed
Angle
Direction of rotation

7-segment display (Switches every one second)

n	n
n	n

A	n	g
x	x	x

(nn is the channel No. operation.)
(xxx is the angle setting.)

②－3 Rotation mode operation

This mode allows rotation up to a specified number of revolutions, and the output stops when the number of revolutions is reached or stop signal is turned ON . Operation is then complete.

Setting date used

CH nn

Model
Operation mode
Torque
Rotational speed
Number of revolutions
Direction of rotation

7-segment display (Switches every one second)

n	n
n	n

r	o	t
x	x	x

(nn is the channnel No. in operation.)
(xxx is the specified number of revolutions.)

③ Operation complere

The completion signal remains ON until the start signal is turned OFF.The ″Operation complete″display appears and the LED indicator blinks.
When the start signal is turned OFF , the completion signal also turns OFF and the display returns to the normal screen.

7-segment display

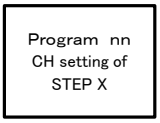
F	i	n

7. PROGRAM mode setting

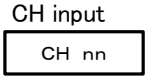
①Setting screen

After power ON ,the setting screen is display until start signal 1 or 2 is turned ON.
When the start signal is turned ON, operation starts by CH input in the operation mode determined by the selected CH in STEP 1 of the selected program.

Stetting date



CH input



CH Setting

Model
Operation mode
Torque
Rotational speed
Angle
Number of revolutions
Direction of rotation
Torque holding time

CH input determines the program to use.

7-segment display (Switches every one second)

x	x		3	5	L
t	y		3	5	L

(xx the channel No. being set.)

Program Setting

STEP1	Select CH
STEP1	TIMER
STEP2	Select CH
STEP2	TIMER
STEP3	Select CH
STEP3	TIMER
STEP4	Select CH
STEP4	TIMER
STEP5	Select CH
STEP5	TIMER
STEP6	Select CH
STEP6	TIMER
STEP7	Select CH
STEP7	TIMER
STEP8	Select CH
STEP8	TIMER
STEP9	Select CH

CH Setting

CH 01 Setting	CH 02 Setting	CH 03 Setting	CH 04 Setting
CH 05 Setting	CH 06 Setting	CH 07 Setting	CH 08 Setting
CH 09 Setting	CH 10 Setting	CH 11 Setting	CH 12 Setting
CH 13 Setting	CH 14 Setting	CH 15 Setting	CH 16 Setting
CH 17 Setting	CH 18 Setting	CH 19 Setting	CH 20 Setting
CH 21 Setting	CH 22 Setting	CH 23 Setting	CH 24 Setting
CH 25 Setting	CH 26 Setting	CH 27 Setting	CH 28 Setting
CH 29 Setting	CH 30 Setting	CH 31 Setting	CH 32 Setting

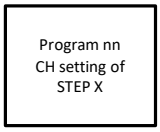
Program Setting

Program 01 Setting	Program 02 Setting	Program 03 Setting	Program 04 Setting
Program 05 Setting	Program 06 Setting	Program 07 Setting	Program 08 Setting
Program 09 Setting	Program 10 Setting	Program 11 Setting	Program 12 Setting
Program 13 Setting	Program 14 Setting	Program 15 Setting	Program 16 Setting
Program 17 Setting	Program 18 Setting	Program 19 Setting	Program 20 Setting
Program 21 Setting	Program 22 Setting	Program 23 Setting	Program 24 Setting
Program 25 Setting	Program 26 Setting	Program 27 Setting	Program 28 Setting
Program 29 Setting	Program 30 Setting	Program 31 Setting	Program 32 Setting

②－1 Torque mode operation

This mode operates at a constant torque, and the output stops when the torque holding time is up. Operation is then complete.

Setting date used



Model
Operation mode
Torque
Direction of rotation
Torque holding time

7-segment display (Switches every one second)

n	n		t	r	q
n	n		x	x	x

(nn is the channnel No. in operation.)
(xxx is the torque setting.)

②－2 Angle mode operation

This mode allows rotation to a specified angle, and the output stops when the angle is reached. Operation is then complete.

7-segment display (Switches every one second)

n	n	A	n	g
n	n	x	x	x

(nn is the channnel No. in operation.)
(xxx is the angle setting.)

Setting date used

Program nn CH setting of STEP X

Model
Operation mode
Torque
Rotational speed
Angle
Direction of rotation

②－3 Rotation mode operation

This mode allows rotation up to a specified number of revolutions,and the output stops when the number of revolutions is reached or stop signal is turned ON. Operation is then complete.

7-segment display (Switches every one second)

n	n	r	o	g
n	n	x	x	x

(nn is the channnel No. in operation.)
(xxx is the specified number of revolutions.)

Setting date used

Program nn STEP Xの CH設定

Model
Operation mode
Torque
Rotational speed
Number of revolutions
Direction of rotation

③ Wait for next step

Except for the last step, STEP X waits until the TIMER setting is reached before proceeding to the next step. After the wait time has elapsed, the next step begins in the operation mode selected by the CH setting.(Moves to ②)
When in the last step, the operation is finished and the completion signal turn ON.

7-segment display
Operation display for next step

④ Operation complete

The completion sinal remains ON until the start signal is turned OFF. The "Operation complete"display appears and the LED indicator blinks.
When the start signal is turned OFF, the completion signal also turns OFF and the display returns to the normal screen.

7-segment display

		F	i	n

8. Setting items

CH setting(IN mode)

Setting item	Setting range	Unit	Display (Left2 digits) ※	Display (Right3 digits)	Remarks
Model	1330H／1330M／1350L	—	Ty / A	30H/30M/35L	Select the screwdriber model.
					Displays(. . .)When a backup error occurs.
Operation mode	Torque/Angle/Rotation	—	Co / A	trq/Ang/rot	Select from among 3 modes.
Torque	1 to 100	—	trq / A	XXX	Set the torque in percentage(%)
Rotation speed	1330H 20 to 1060	rpm	Sp / A	XXX	Use a dot"."to set a value of 1000 or larger.
	1330M 170 to 640	rpm	Sp / A	XXX	—
	1350L 10 to 450	rpm	Sp / A	XXX	—
Angle	10 to 1800(in 10 steps)	°	An / A	XXX	Use a dot "."to set a value of 1000 or larger. After setting the angle, press SET key to select the "completion" signal output by entering 0,1 or 2.See [Note]below.
Number of revolutions	1to 100 /Stop signal 1 / Stop signal 2	rot	rot / A	XXX/ Sn1／Sn2	When set to 1 to 100, operation will be complete when the set number of revolutions is reached. When set to sn 1 or sn 2,operation will stp when the input signal is turned ON. An error is displayed if the set torque is reached before the set number of revolutions is reched. In that case, recheck the torque setting for rolled tap or tapping.
Direction of rotation	Nomal / Reverse	—	dr / A	nor/reV	Select normal or reverse rotation.
Torque holding	0.1～1.0	sec.	tt / A	X.X	In torque mode, operation will be complete when the set time is reached.

※ The display (left 2 digits)switch every one second,such as between Ty and A.

CH setting (OUT mode, PROGRAM mode)1330H/1330M/1350L

Setting item	Setting range	Unit	Display (Left2 digits) ※	Display (Right3 digits)	Remarks
Model	1330H／1330M／1350L	—	Ty / XX	30H/30M/35L	Select the screwdriver model.
					Displays (. . .)when a backup error occurs.
Operation mode	Torque/Angle/Rotation	—	Co / XX	trq/Ang/rot	Select form among 3 modes.
Torque	1 to 100	—	tr / XX	XXX	Set the torque in percentage (%).
Rotation speed	1330H 20 to 1060	rpm	Sp / XX	XXX	Use a dot"."to set a value of 1000 or larger.
	1330M 170 to 640	rpm	Sp / XX	XXX	—
	1350L 10 to 450	rpm	Sp / XX	XXX	—
Angle	10 to 1800(in 10 steps)	°	An / XX	XXX	Use a dot"."to set a value of 1000 or larger. After settin the angle,press SET key to select the "completion signal output by entering 0, 1 or 2. See [Note] below.
Number of revolutions	1 to 100／Stop signal 1 ／ Stop signal 2	rot	ro / XX	XXX/ Sn1/Sn2	When set to 1 to 100,operation will be complete when the set number of revolutions is reached.When set to sn 1 or sn 2 , operation will stop when the input signal is turned ON. An error is display if the set torque is reached before the set number of revolutions is reached. In that case,recheck the torque setting for rolled tap or tapping.
Direction of rotation	Norma / Reverse	—	dr / XX	nor/reV	Select normal or reverse rotation.
Torque holding	0.1 to 1.0	sec.	tt / XX	X.X	In torque mode, operation will be complete when the set time is reached.

※:XX on the display (left 2 digits) shows the channnel No.
The display (left2 digits) switches every one second, such as between Ty and XX.

[Note]"Completion"signal output for angle setting

0:"Completion" signal is output when either the set torque or angle is reached.

1:"Completion" signal is output when the set angle is reached before the set torque is reached.
and an error is display if the set angle is not reached before the set torque is reached.

2:"Completion"signal is output when the set torque is reached before the set angle is reached
and an error is displayed if the se angle is reached before the set torque is reached.

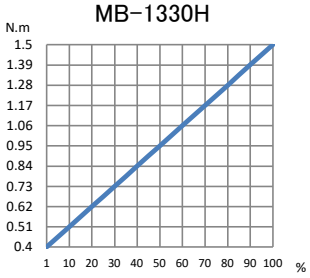
PROGRAM settin (PROGRAM mode)

Setting item	Setting range	Unit	Display (left2 digits)	Display (Right3 digits	Remarks
Select CH	1 to 32/---(Not selected	—	CX / XX	XXX/---	When not set, the preceding step will be the last step. Displays (. . .)when a backup error occurs.
TIMER setting	0.0 to 99.9 (Wait until next step)	sec.	tx / XX	XXX	—

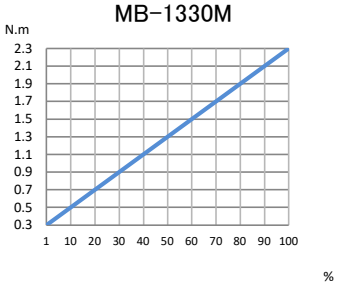
※:When selecting a channel, CX on the display (left 2 digits) shows "C + setp No."and XX shows the program No.
When selecting a channnel, tX on the display (left 2 digits) shows "t + setp No."and Xxshows the program No.
The display (left 2 digits)switches every one second.

Torque conversion table

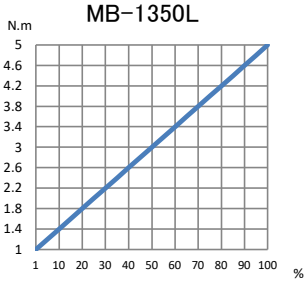
MB-1330H



MB-1330M

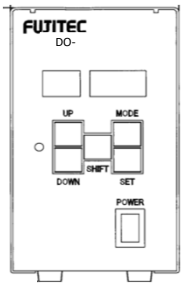


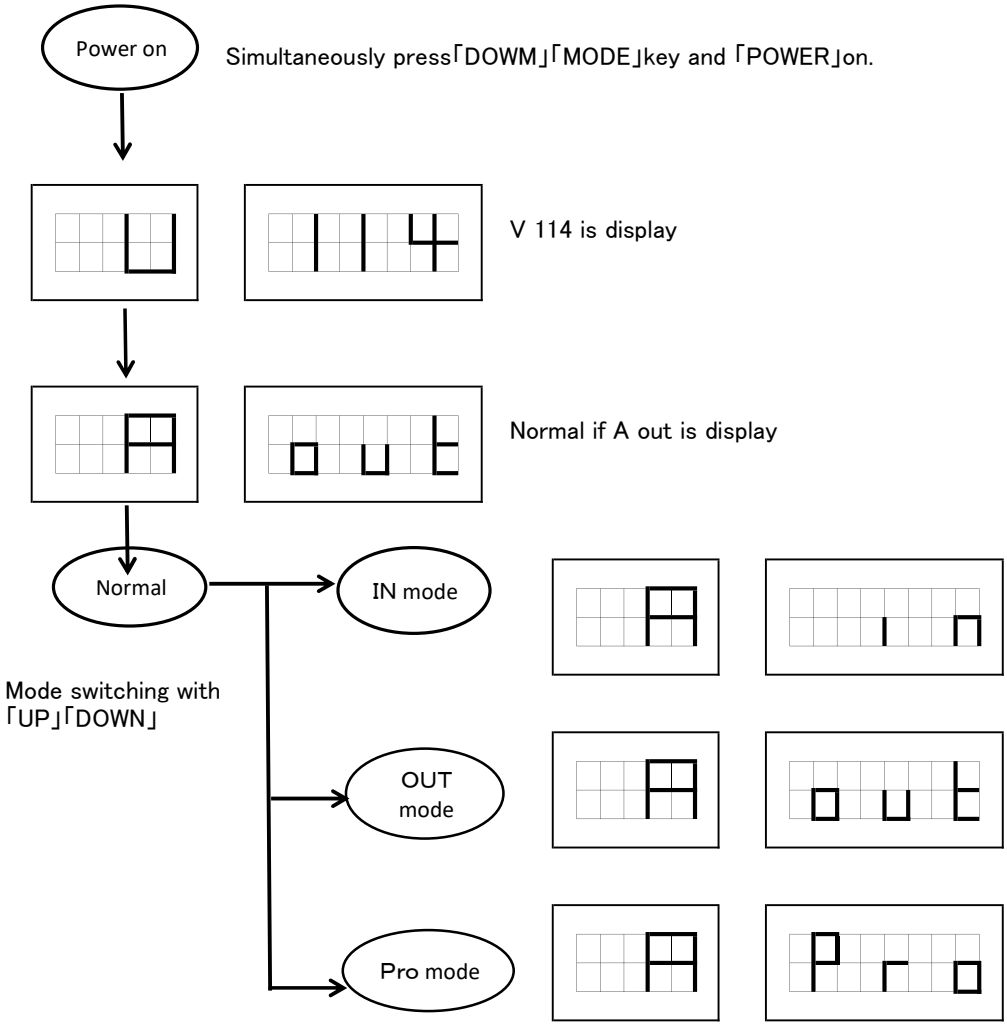
MB-1350L



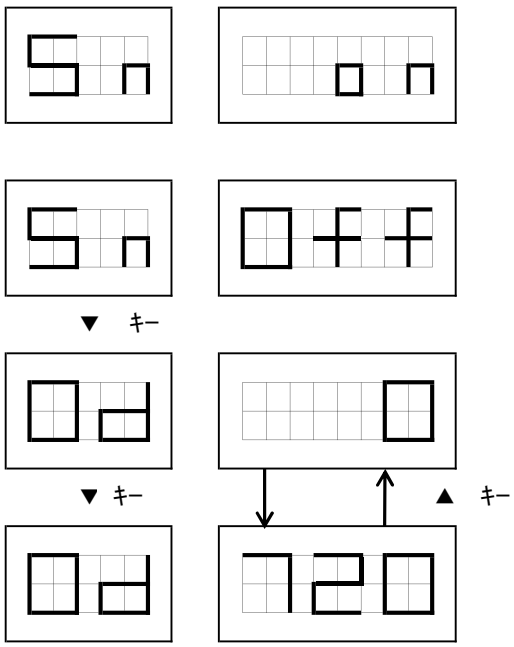
8-1. Monitor setting of screw rotation within torque holding time(Valid after Ver.108)

Switch to IN made ・OUT mode・PRO mode switching setting screen.
Simultaneously hold down the lower left 「DOWN」 key and the upper right 「MODE」key.
turn on the 「POWER」key and switch with 「UP」or 「DOWN」key.
(Right figure referring)





Pree the 「SHIFT」 key on this screen.



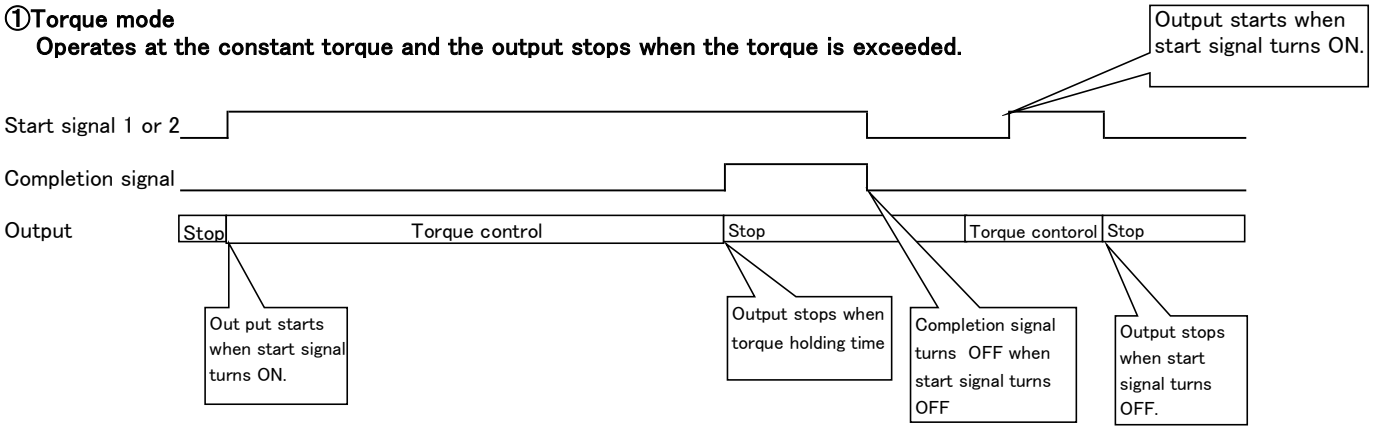
Flashing when chenging numeric value.
Press the SET key to confirm change Set from
0 to 720° in increments of 90°
At least the specified angle within the torque holding time.
An error will be displayed if the bit is rotated.
(Completion signal does not come out)

9. Timing diagrams

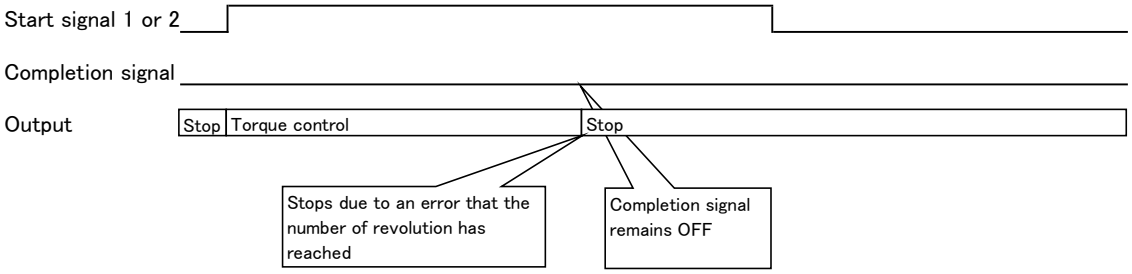
1) IN mode

①Torque mode

Operates at the constant torque and the output stops when the torque is exceeded.

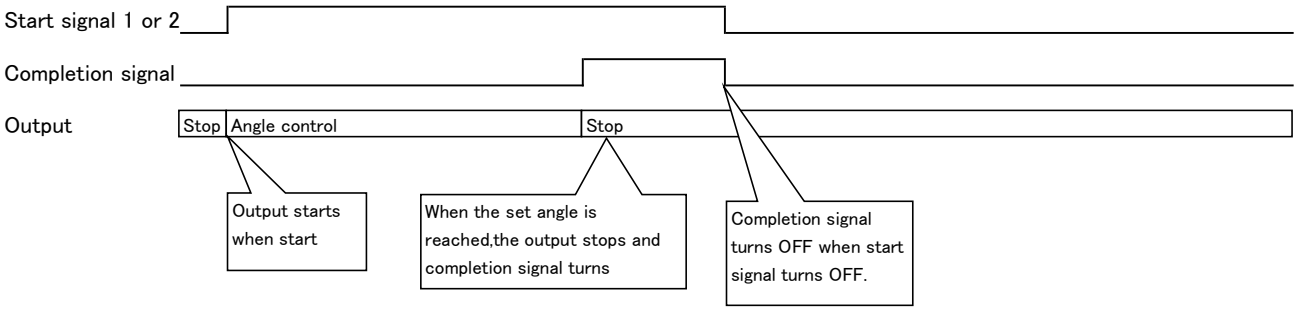


A "100 revolutions error" occurs when the number of revolution has reached 100.

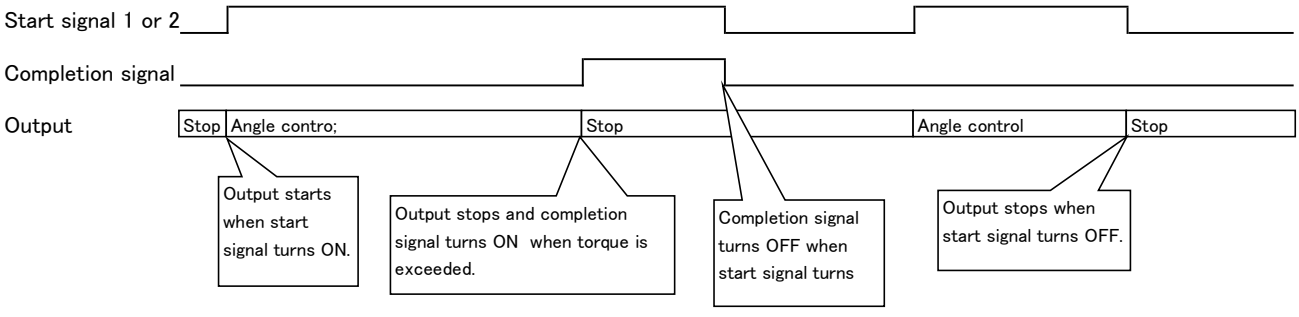


② Angle control

Rotates up to the specified angle under torque control.



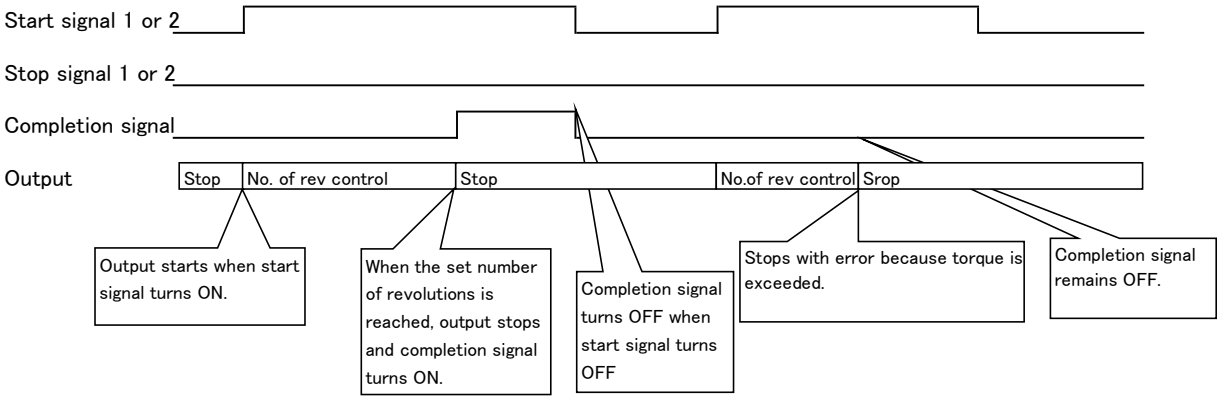
Stop the output when the torque is exceeded.



③ Number-of revolutions control

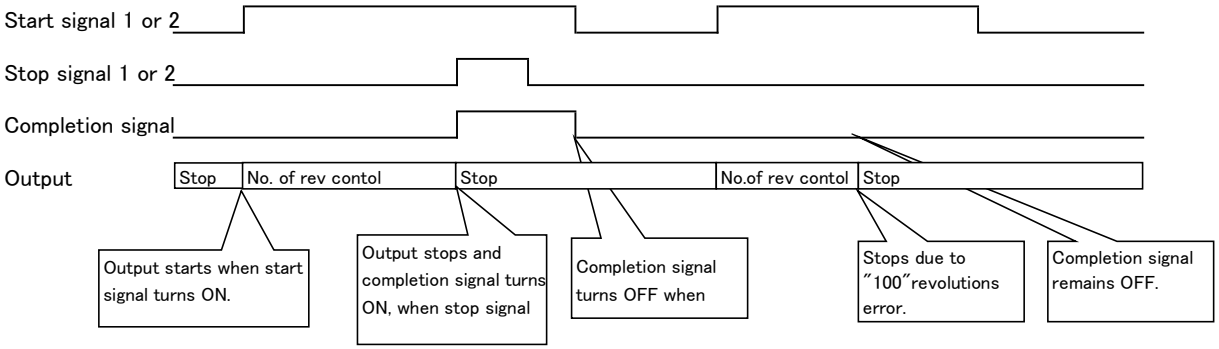
Stop condition : Number of revolutions

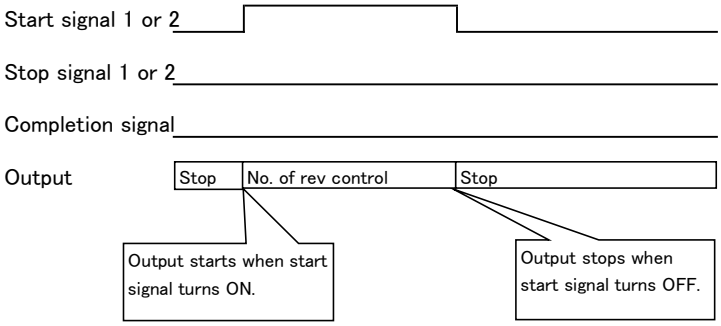
Rotates at a specified speed until the set number of revolutions is reached.
Stops with an error if the torque is exceeded before reaching the set number of revolutions.



Stop condetion : Stop signal

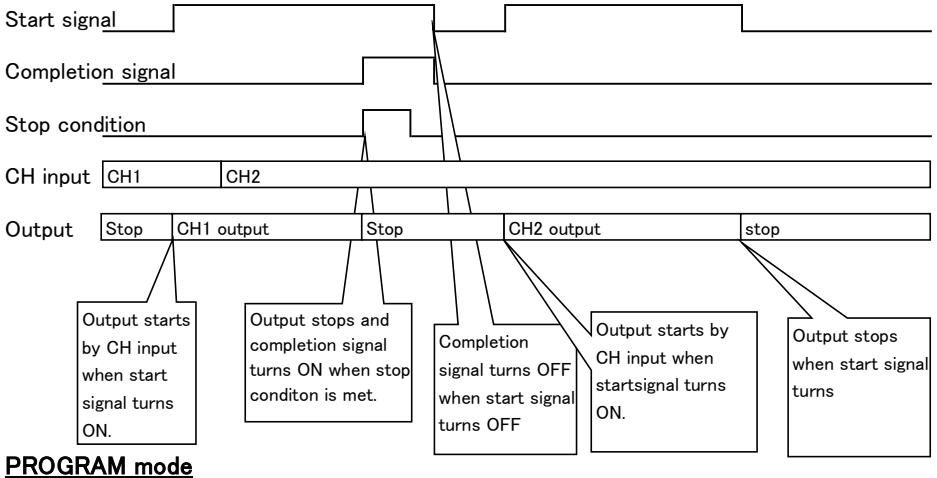
Rotates atu a specified speed until a stpp signal is input.
A"100 revolutions error"occurs when the number of revolutions has reached 100.





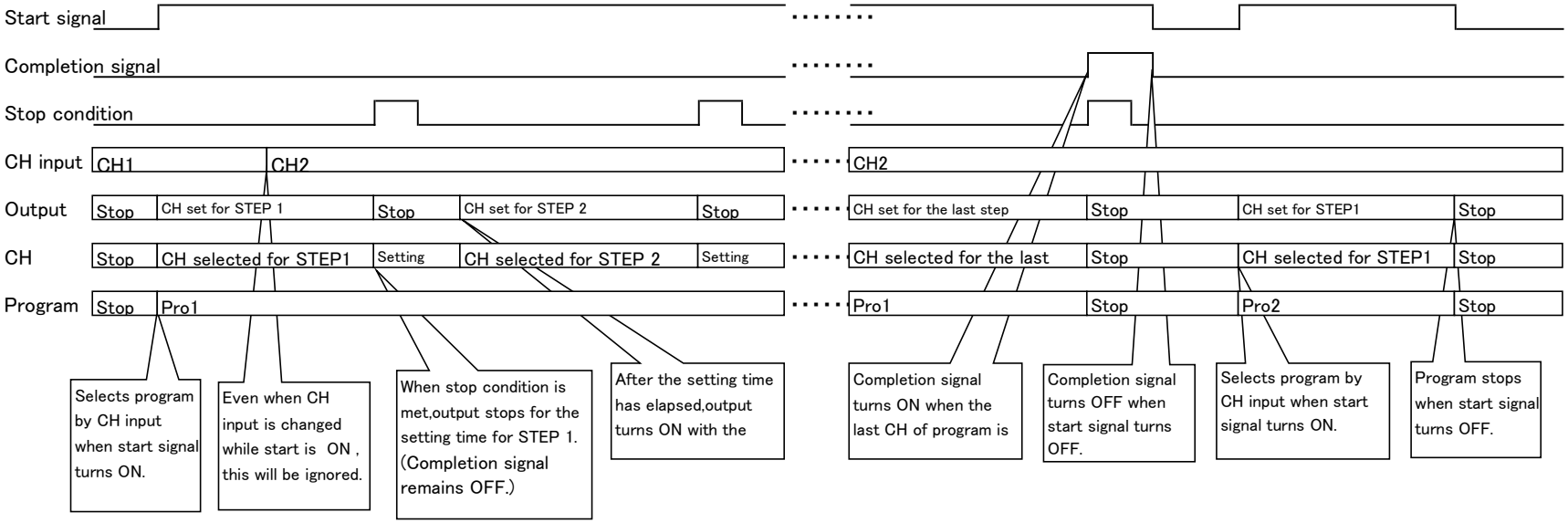
OUT mode

Output starts with the settings of the channel that is input when start signal turns ON.
Even when the channnel is changed during output , this does not affect the operation.
The cannel will change when the next start signal turns ON.



PROGRAM mode

Output starts with the program by CH input when start sign：turns ON.
Even when the channel is changed during output, the does not affect the operation .The program will change when the next start signal turns ON.



10. Stop and error display

1) Stop

Stop cause No.	Meaning	Description	To erase displayed No.
St-001	Operation completed successfully (without further tightening)	Operation was successfully completed in torque mode (without further tightening)	Power off
St-002	Operation completed successfully (with further tightening)	Operation was successfully completed in torque mode (with further tightening)	Power off
St-003	Operation stopped because torque was reached	Operation was stopped by torque setting in angle mode. (Same action as Err-010)	Power off
St-004	Operation stopped because angle was reached	Operation was stopped by angle setting in angle mode. (Same action as Err-011)	Power off
St-005	Operation stopped by stop SW10N	Operation stopped by the stop SW10N when the SW10N setting was enabled in rotation mode.	Power off
St-006	Operation stopped by stop SW20N	Operation stopped by the stop SW20N whenthe SW20N setting was enabled in rotation mode.	Power off
St-007	Operation completed successfully	Operation was completed successfully in rotation mode.	Power off
St-008	PROG not specified	When an error "Err-12"has occurred,this stop occurs if power is not turned off or error is cleared. (No program and channels are set.)	Power off

2）Error list

Error list	Meaning	Description	Error reset
Err-001	Constant voltage error	Input voltage is lower than 75 V AC.	Power off or alarm reset input
Err-002	Overvoltage error	Input voltage is higher than 250 V AC.	Power off
Err-003	Overcurrent error	Output current of U-phase or W-phase exceeded 7 A.	Power off
Err-004	IPM error	IPM error input occurred.	Power off
Err-005	Number-of revolutions error	Number of revolutions reached 100 when stop condition was other angle number of revolutions.	Power off or alarm reset input
Err-006	Error stop	Operation stopped before reaching the specified number of revolutions when stop condition was set to the number of revolutions.	Power off or alarm reset input
Err-007	Undefined CH (program) selected	Undefined channel or program was selected by CH input to start operation	Power off or alarm reset input
Err-008	Backup date error	Setting date used at startup was invalid.	Power off or alarm reset input
Err-009	System date error	Setting date used at startup for selecting the mode (IN/OUT/PROGRAM)selection sensor (yes/no)was invalid.	Power off or alarm reset input
Err-010	Operation stoppeda because torque was reached	When in enable setting 1 in angle mode, operation stopped before reaching the specified angle as the torque was reached.	Power off or alarm reset input
Err-011	Operation stopped because angle was reached	When in enable setting 2 in angle mode,operation stopped before reaching the specified torque because the angle was reached.	Power off or alarm reset input
Err-012	PROG not specified	Operation was attempted with an undefined program	Power off or alarm reset input
Err-013	Motor sensor error short-circuit error	Position did not change at startup even after 500 [ms] have elapsed,or the hall element input information was not input. ※This error also occurs when the motor won't rotate due to short-circuit.	Power off
Err-014	Motor won't rotate	Speed did not change ato startup even after 500 [ms] have elapsed,or the motor cable is disconnected.	Power off
Err-015	Emergency stop	Falling edge of emergency stop signal is detected.	Detection of rising edge of emergency stop input
Err-016	Screw break error	When the judgment angle is set in the setting for screw break judgment. When rotating more than the judgment angle within the holding time of the torque timer.	Power off or alarm reset input
Err-017	Date and time setting error	By erasing backup due to dead battery Battery life is about 2 weeks when the power is turned off from the maximum charge state.	Power off or alarm reset input
Err-018	Touque-up judgment error (number of rotations)	The setting is valid in the torque-up judgment,and the set number of rotations. When out of range.	Power off or alarm reset input
Er-19	Torque-up judgment error (torque)	The setting is valid in the torque-up judgment,and the set torque When out of range	Power off or alarm reset input
Er-20	SD card remaining capacity alarm	When light access to the SD card , the remaining capacity of the SD card is 50%. At the following times.	Power off or alarm reset input

Backup data error

At standup , SUM check and data range check are performed on the settings of each program and channel (32 settings each) stored in the EEPROM. If an error is found, it will be displayed. After the error is restored, the first item (Model setting in CH setting, or CH setting of STEP 1 in PRGRAM setting) of the setting again for the item showing ″. . . ″.

Error release

At the lower right of the segment display on the right when on error occurs 「. 」is displayed and error number is displayed. To release the error,enter the alarm release in put from the outside,or turn off the power and turn it on again,and the press hold the 「SHIFT」 key and press the 「MODE」 key to release the error.

Item No.	
Dated purchased	年　　月　　日
Dealer	TEL(　　)　　—

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