NIKKI AC SERVO CONTROLLER
N E X S R T

N C S － FI1／2　TYPE
N C S － FS1／2 TYPE
＜ VOLUME:DEDICATED FUNCTION＞

INSTRUCTION MANUAL
Ver. 1. 1

NIKKI DENSO CO.,LTD.

Manual No. TIE-12410A

Preface

Thank you for adopting Nikki Dedicated Function Control NC Servo Controller
＜ＮＥＸＳＲＴ　ＮＣＳ－ＦＩ／ＦＳ series＞.

【Notice of this manual】

This instruction manual explains about dedicated functions of Dedicated Function Control NC Servo Controller NCS-FI/FS 1 and NCS-FI/FS 2 types.

As for items of installation, wiring, operation, maintenance, trouble diagnosis, trouble shooting, etc. not described in this manual can be referred to the separate instruction manual『Volume: Basic function』.

As for description of sequence control section (Hereafter, 'SQB' is used) of NCS-FI/FS 2 types can be referred to the separate instruction manual『Volume: SQB』.

In order for you to use this unit properly, please deeply understand the contents of this manual.

If a unit with specific specification is used, please refer to this manual and specification sheet of the unit, altogether.
(The description of the specification sheet is prior to the same item in this manual.)

This manual is for the types which LCD display in Self-diagnostic display mode is as follows.
TYPE display : 「FI 1m STD」, 「FS 1m STD」,
「FI 2m STD」, 「FS 2m STD」,
SOFT display:「1.02」

【Warranty period】

Warranty period of our product is 1 year after shipping from our factory.
However please note that any failure or abnormality resulting from the following causes is not covered by our warranty.

① Modification by parties other than NIKKI DENSO
② None standard operation different from the description in our manual.
③ Natural disasters
④ Connection with an other maker's unit not approved by us.

When you find a failure or an abnormality during the warranty period, please contact our sales man.

When you receive the ordered units, please immediately check outlook of them and presence of accessories.
At unpacking if outlook of units is abnormal, non-specified accessories are found, or quantity is wrong, please do not use them and inform the results to our sales man.

※ NIKKI DENSO retains the right to revise this publication no matter how it is altered. Although the information from NIKKI DENSO is reliable, NIKKI DENSO will not assume responsibility whatever results may arise from the use of this information unless specially guaranteed by NIKKI DENSO.

Cautions for Safety

Before conducting installation, running, maintenance, and inspection, please deeply understand this manual, and all associated manuals / materials as well as the knowledge of all the applied equipment and information for safety and then use this unit properly.

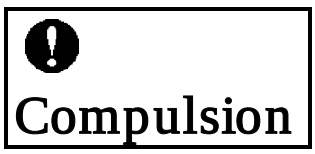
In this manual, cautions for safety are ranked as『Danger』and『Caution』.
And cautions for handling are divided into 『Prohibition』and 『Compulsion』which are defined (Action not to be done) and (Action to be done.), respectively.

Danger : If mis-handling is made, dangerous situation as death or serious injury could occur.

Caution : If mis-handling is made, dangerous situation as medium or light injury and mechanical damage could occur.

However, (Caution) marked item could cause serious results depending on the actual situation. Since both of the above description include important contents, please be sure to follow them.

: **Prohibited action**
If this caution is ignored, this unit does not perform properly.



: **Compulsory action**
If this is ignored, this unit does not perform properly.

【Cautions when using unit】

Danger

☆ Since electric shock and injury may occur, please comply with the following suggestions.

① Never touch inside of this unit (NC servo controller) and terminal blocks.
『Electric shock may occur.』

② Be sure to make grounding of an earth terminal or lead wire of this unit (NC servo controller).
Use larger earth cables for JIS Class 3 or better grounding.
『Electric shock may occur.』

③ Transportation, wiring, maintenance, and inspection shall be conducted stipulated time after confirming complete lit off condition of front panel display, by power off.
『Electric shock may occur.』

④ Do not damage, force excessively, put on heavy thing, or nip cables.
『Electric shock may occur.』

⑤ Never touch rotating section of a running motor.
『Injury may occur.』

Caution

① Use specified motor and this unit (NC servo controller).
『Fire or failure may occur.』

② Never use in the atmosphere such as water splash, corrosive or low flashing point gas and near flammable things.
『Fire or failure may occur.』

③ Since temperature of a motor, this unit (NC servo controller), and peripherals raises quite high, do not touch them.
『Burn of a worker may occur.』

④ In supplying power, or for a while after shutting power off, since a radiator, a regenerative unit, a motor etc. could be very hot, do not touch them.
『Burn of a worker may occur.』

【Receiving and checking of packages】

Caution

① When you receive ordered units, please check contents. if wrong thing is found or quantity is wrong, please do not use them and inform the status to our sales man.
『Electric shock, injury, damage or failure may occur.』

② If packages of our products are broken, do not un-pack them and inform the fact to our sales man.
『Electric shock, injury, damage or failure may occur.』

【Storage】

Prohibition

① Do not store units in a place of raining, water dripping, and harmful gas /liquid.

Compulsion

① Store units in a place of no sun-shine but controlled temperature / humidity within specified range.
② If storage term became quite long, please consult purchased or nearest sales office before using them.

【Transportation】

⚠Caution

① Do not hold a cable and a motor shaft during transporting units.
『Injury or failure may occur.』

Compulsion

① Comply with proper suggestion and avoid excess amount transportation which may break the whole package.

【Installation】

⚠Caution

① Do not climb or put any heavy thing on this unit.
『Injury or failure may occur.』
② Do not disturb or choke intake / outlet air holes with foreign thing.
『Fire may occur.』
③ Use specified direction for installation.
『Fire or failure may occur.』
④ Keep specified distance between this unit and control panel inside or other equipment.
『Fire or failure may occur.』
⑤ Never apply heavy shock to this unit.
『This unit may be damaged.』
⑥ Conduct proper attachment suitable for the output or weight of this unit.
『This unit may be damaged.』
⑦ Attach this unit to non-flammable thing as metal.
『Fire may occur.』

【Wiring】

⚠Caution

① Be sure to conduct correct wiring.
『Running away, burning of a motor, injury or fire may occur.』

② To prevent this unit from noise influence, use specified length treated (shielded / twisted, etc.) cables.
『Running away of a motor, injury or machine damage may occur.』

③ To prevent this unit (NC servo controller) from noise influence, use separate control I/O cables of the unit from other power cables.
『Running away of a motor, injury or machine damage may occur.』

④ To avoid electric shock and noise influence, be sure to make proper grounding (earthing).
『Running away of a motor, electric shock, injury or machine damage may occur.』

【Operation・Run】

⚠Caution

① There is no applicable protection to motors. For the protection, over-current protector, earth leakage breaker, over-heat protector, and emergency stop device shall be provided.
『Injury or fire may occur.』

② Confirm that power source specification is correct.
『Injury, fire or machine damage may occur.』

③ At test run, fix a motor to a place separating from its machine system and confirm the motion, then connect the motor to the machine.
『Injury or machine damage may occur.』

④ Since the brake is only for holding machine position, do not use it for safety system of your machine.
『Injury or machine damage may occur.』

⑤ Since excess adjustment change may cause this unit unstable, avoid this situation.
『Injury or machine damage may occur.』

⑥ When an alarm occurs, eliminate the cause, reset the alarm and then resume this unit.
『Injury or machine damage may occur.』

⑦ When power recovers from black out status, since sudden restart may occur, do not approach the machine.
（Machine system design shall be considered to maintain safety of workers against the restart.）
『Injury may occur.』

⃠ Prohibition

① Do not apply power in the motor turning or vibrating status.
『Running away of a motor, injury or machine damage may occur.』

② Since the brake installed on a motor is only for holding, do not use it for actual braking.

Compulsion

① Provide external shut down circuit in order to stop running and shut the power off, immediately.

【Maintenance・Inspection】

⚠Caution

① Capacity of condensers in the power line will be deteriorated.
To prevent secondary damage caused by condenser failure, we recommend to replace them for about every 5 years.
『Failure may occur.』

② Cooling efficiency of a cooling motor will be deteriorated as time going.
To prevent secondary damage caused by condenser failure, we recommend to replace them for about every 5 years.
『Failure may occur.』

Prohibition

① Overhaul / repair shall be conducted only by us or suggested shop.

Contents

Chapter 1 Outline

1－1 Feature

NCS-FI/FS of NCS-FI/FS 1 and NCS-FI/FS 2 (Hereafter, this unit or controller is used.) is corresponding to the following 2 types which function and operation are identical.
NCS-FI 1 and 2 type：AC servo controller for induction AC servo motor
NCS-FS 1 and 2 type：AC servo controller for synchronous AC servo motor

1－1－1 NCS-FI/FS type

＜NEXSRT NCS-FI/FS1 type＞ is an integrated『NC servo controller』consists of AC servo driver and 1 axis positioning unit for general purpose and multiple functions.
This unit has several following features suitable for positioning control of various industrial machines.

【NCS-FI/FS type features】

① By combining 1 axis positioning unit with AC servo driver, less wiring system and compact size were realized.

② Full digital control achieved less temperature drift, fine adjustment, strengthened Man-machine interface, etc., seeking for better reliability and easier operation.

③ The custom made LCD module supports each Monitoring, Alarm history record, Self-diagnostic function, etc.. And reliability and maintenance method are improved.

④ Many custom made LSIs and less wiring structure improved reliability and realized compact size of this unit.

⑤ Adoption of IPM (IGBT) in the power switching section, improved servo performance and lowered noise.

⑥ Either Positioning run, or Pulse train run mode can be selected for wide range of application requirements.

⑦ Program run by internally stored data (280 points) can be conducted.

⑧ External trigger positioning can be conducted.

⑨ Position data and speed data can be set by Index data.

⑩ Control such as Linear / S shape curve Accel./ Decel., Feed-forward, Torque command filter, gain change at stop status or Decel., R2 compensation, Non-coherence control, etc. can be conducted by advanced software servo suitable for machine rigidity.

⑪ By setting a parameter, one unit can be available for various AC servo motor types.

⑫ By setting a parameter, "full closed loop control" by feedback pulses using measuring encoder output can be conducted.

⑬ Through Serial communication, peripheral as a touch panel, main computer, MDI, servo display, etc. can be interfaced.

⑭ Zero return is not necessary by using an optional absolute encoder.

⑮ Auto. tuning function

⑯ Torque control and Speed control can be conducted by commands.

⑰ Pulse train run of max. 10 axes synchronized to a command value can be conducted.

⑱ Either induction servo motor or synchronous servo motor can be controlled by same operation.

【NCS-FI/FS１ types】

NCS-FI/FS 10： It controls with internally stored data by commands from a main controller.
I/O points「Input：28 points output：8 points」
NCS-FI/FS 12： It controls with internally stored data by commands from a main controller.
I/O points「Input：37 points output：18 points」
NCS-FI/FS 13： It controls with internally stored data controlled by remote sequence.

Remote sequence control is the control of NCS-FI/FS 23, NCS-FI/FS 13, and Remote I/O unit connected by high speed communication as the control of Input / Output directly connected by sequence control of NCS-FI/FS 23.

1－1－2　ＮＣＳ－ＦＩ／ＦＳ２ type

＜NEXSRT NCS-FI/FS２ type＞ is a version of NCS-FI/FS 1 types combined with sequence function and an 『Integrated controller』 consists of 3 major functions, Power control, NC, and Sequence control.
In addition to the features of FI/FS 1 type, below advantages are added which realizes **integrated control** of various industrial machines.

【NCS-FI/FS２ type features】

① Exclusive management of System control is possible.

② More compact size, less wiring, and simpler operation of the unit are realized.

③ Exclusive management of data related both to NC control section and Sequence control section can be conducted.

④ By mutual monitoring function of NC control section and Sequence control section, reliability is improved.

⑤ Cost performance to a function is raised.

⑥ Creation, edition, and transmission of Sequence program are conducted by a main personal computer with a dedicated software and those data are stored in the unit. The program language supports mnemonic method and ladder method.

⑦ Data (position, speed , etc.) for Auto. run of NC control section can be stored as sequence data.

⑧ Machine status monitoring can be conducted by LCD of NC control section and next display units.
- Touch panel
- LED of Sequence control (I/O status display)
- Main computer

⑨ By parameter setting, Read / Write of NC control section data can be freely conducted in Sequence program.

⑩ Sequence control of max. 16 axes can be conducted by one controller with sequence control function.

【NCS-FI/FS２ types】

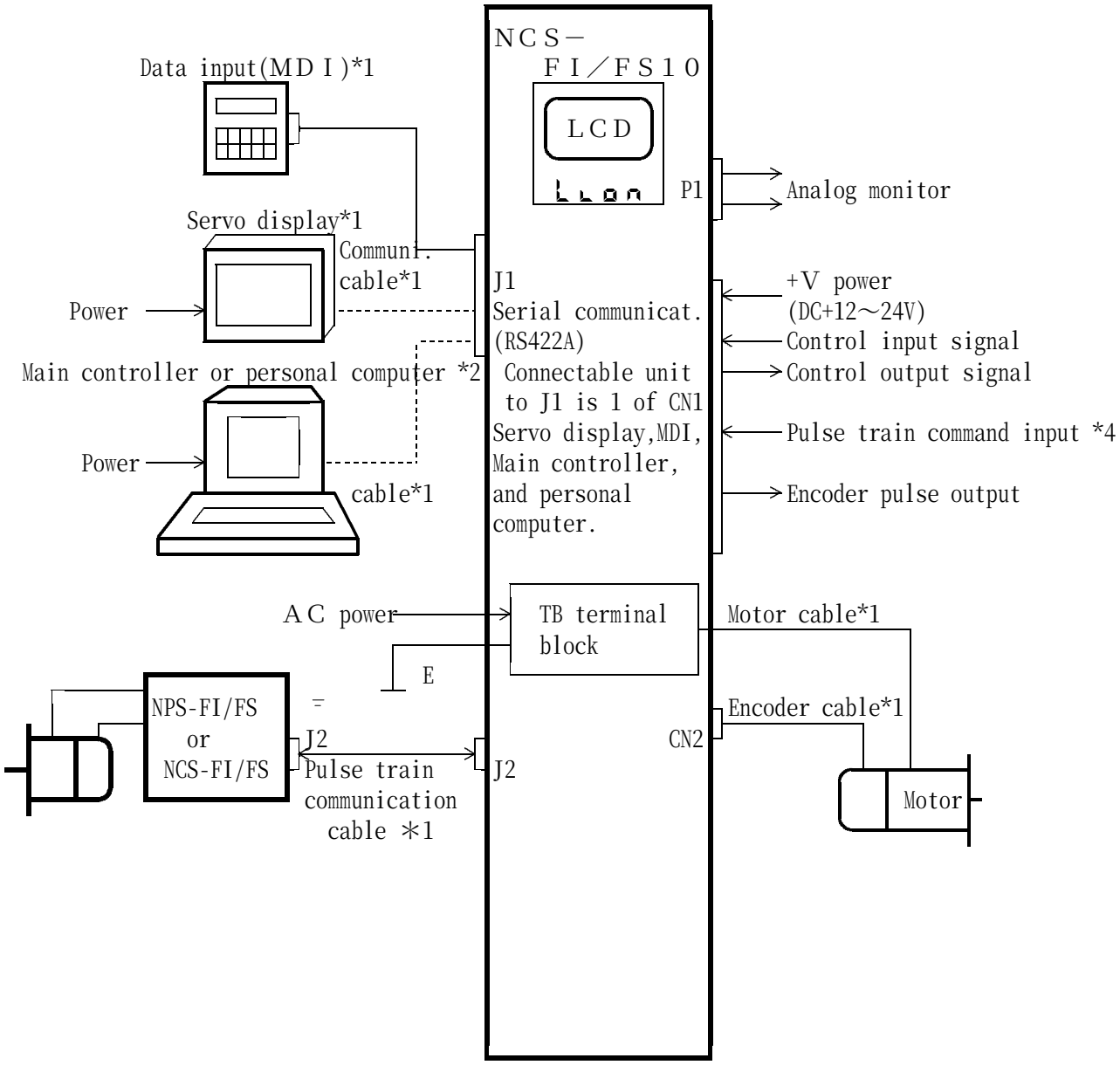
Number of external I/O for Sequence control of NCS-FI/FS 2 are as follows.

NCS-FI/FS 22 :「Input：64 points　output：32 points」
NCS-FI/FS 23 :「Input：64 points　output：32 points,
By combination of NCS-FI/FS13 and a remote I/O unit, max. 15 units can be connected.」

1－2　System configuration

1－2－1　NCS-FI/FS10 type

Peripheral system configuration of NCS-FI/FS 10 unit is as ［Fig.1－1］.



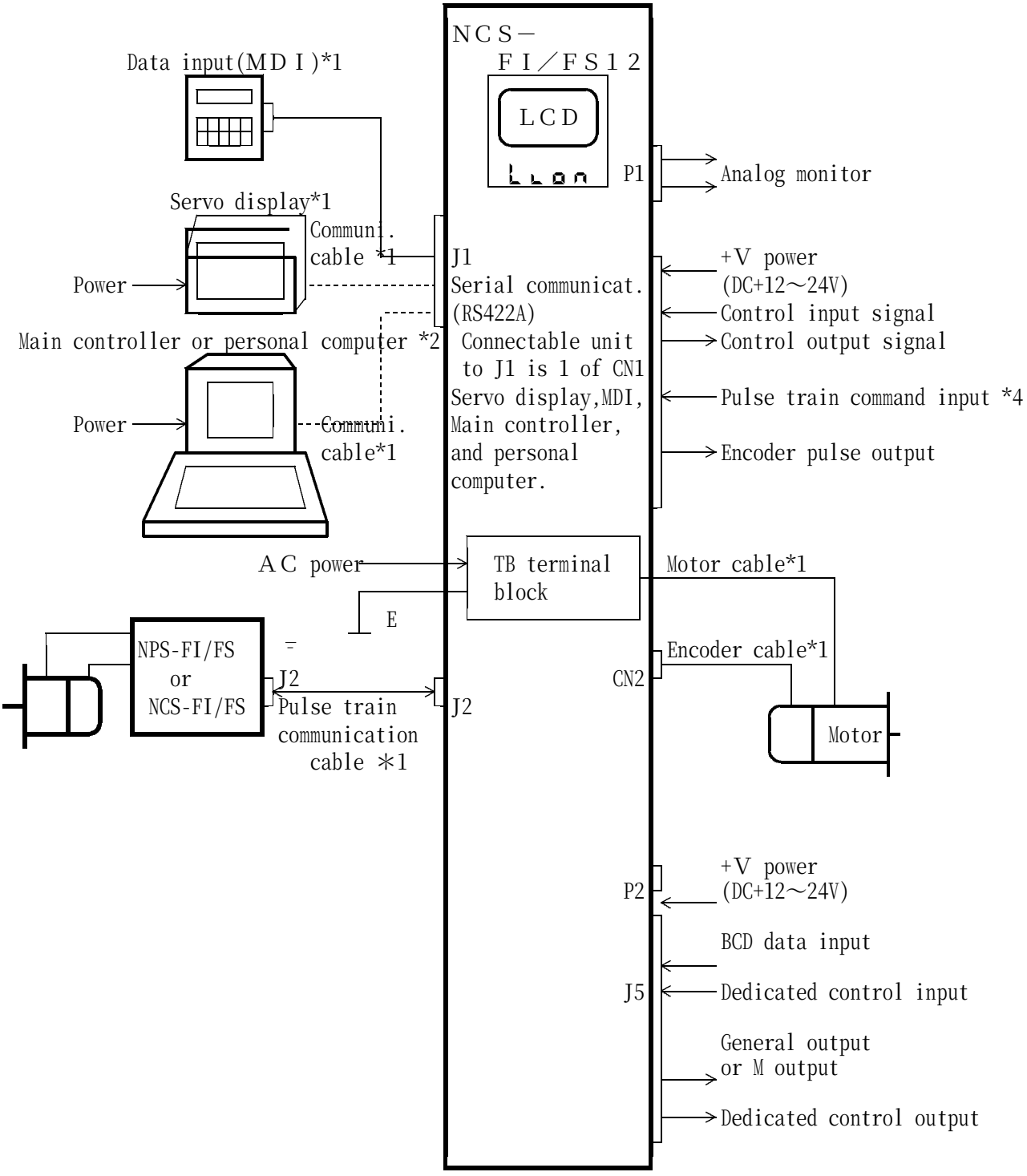
［Fig.1－1］　NCS-FI/FS10 type system configuration

※ Caution 1: Our optional unit is available for the item with *1 mark.
Please use an unit on the general market for the item with *2 mark.
NPS-FI/FS with *3 mark is a controller for Speed control, Torque control, and Pulse train control.
The item with mark *4 can be changed to feedback pulse input from a measuring encoder by parameter setting which enables full closed loop control.

※ Caution 2: Our optional "Data edit software for a personal computer" can be available.

1－2－2 NCS-FI/FS12 type

Peripheral system configuration of NCS-FI/FS 12 unit is as [Fig. 1－2] .



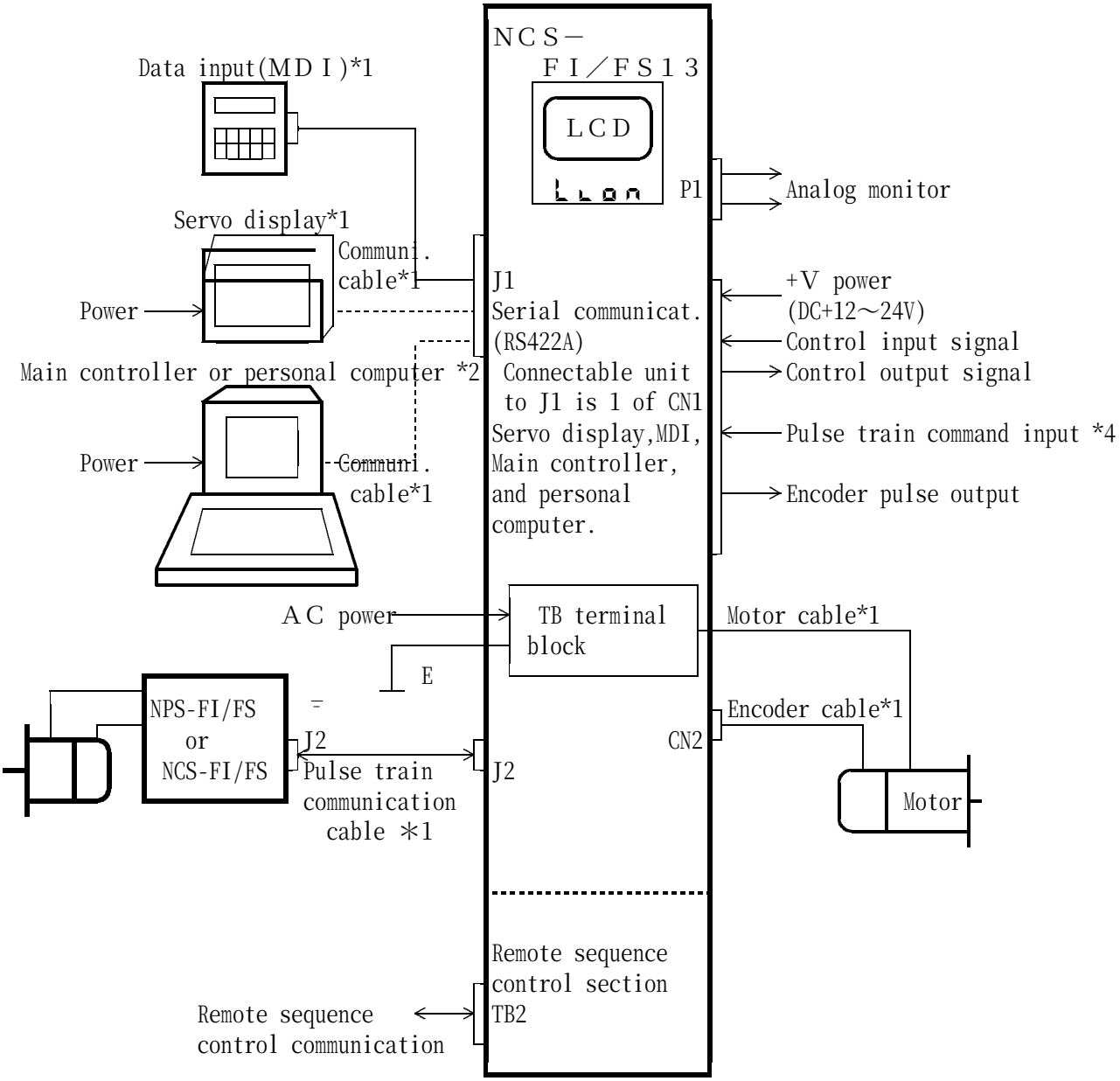
[Fig. 1－2] NCS-FI/FS12 type system configuration

※ Caution 1: Our optional unit is available for the item with *1 mark.
Please use an unit on the general market for the item with *2 mark.
NPS-FI/FS with *3 mark is a controller for Speed control, Torque control, and Pulse train control.
The item with mark *4 can be changed to feedback pulse input from a measuring encoder by parameter setting which enables full closed loop control.

※ Caution 2 : Our optional "Data edit software for a personal computer" can be available.

1－2－3　NCS-FI/FS13 type

Peripheral system configuration of NCS-FI/FS 13 unit is as ［Fig.1－3］.



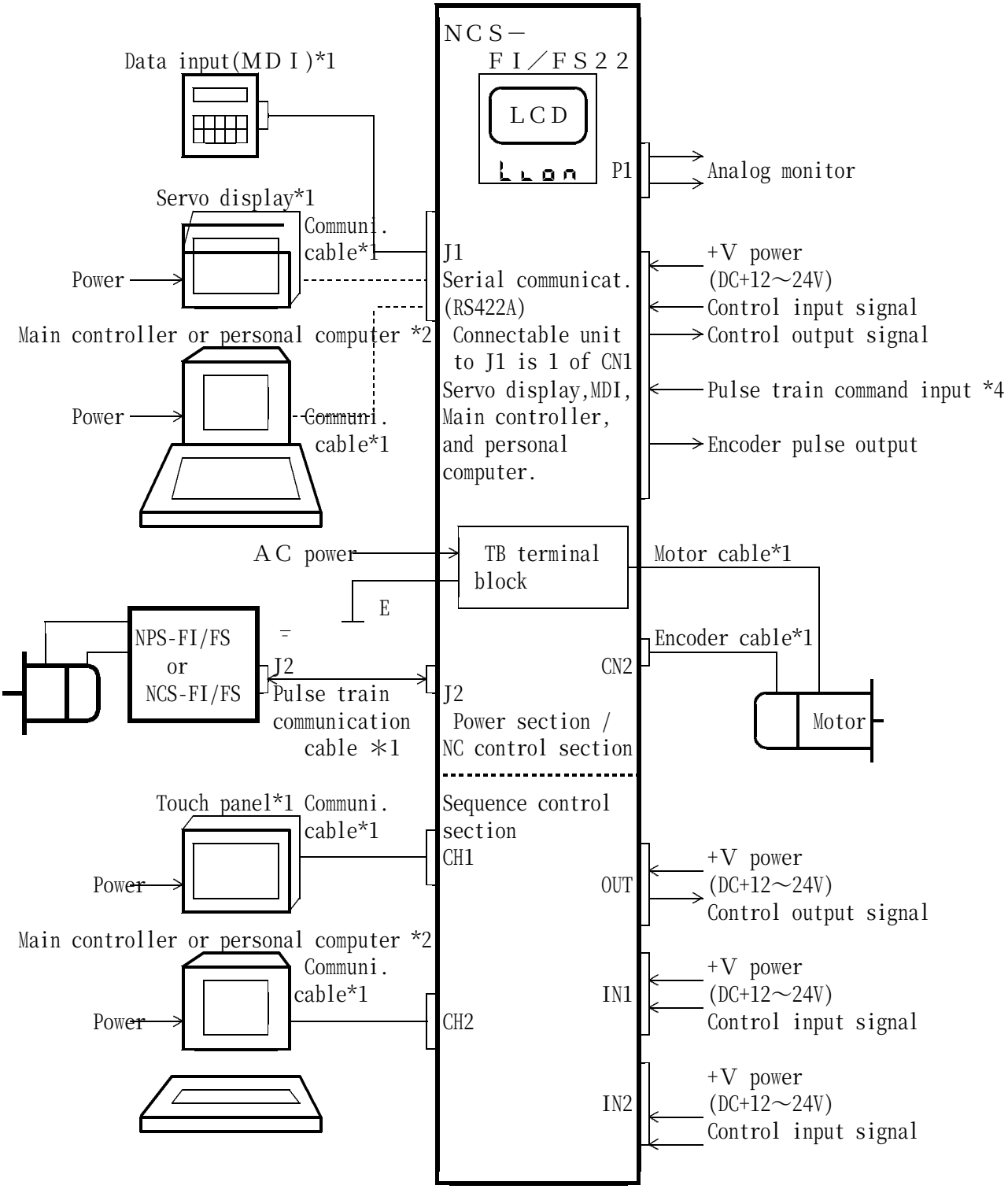
［Fig.1－3］　NCS-FI/FS13 type system configuration

※ Caution 1: Our optional unit is available for the item with *1 mark.
Please use an unit on the general market for the item with *2 mark.
NPS-FI/FS with *3 mark is a controller for Speed control, Torque control, and Pulse train control.
The item with mark *4 can be changed to feedback pulse input from a measuring encoder by parameter setting which enables full closed loop control.

※ Caution 2: Our optional "Data edit software for a personal computer" can be available.

1－2－4 NCS-FI/FS22 type

Peripheral system configuration of NCS-FI/FS 22 unit is as [Fig.1－4] .



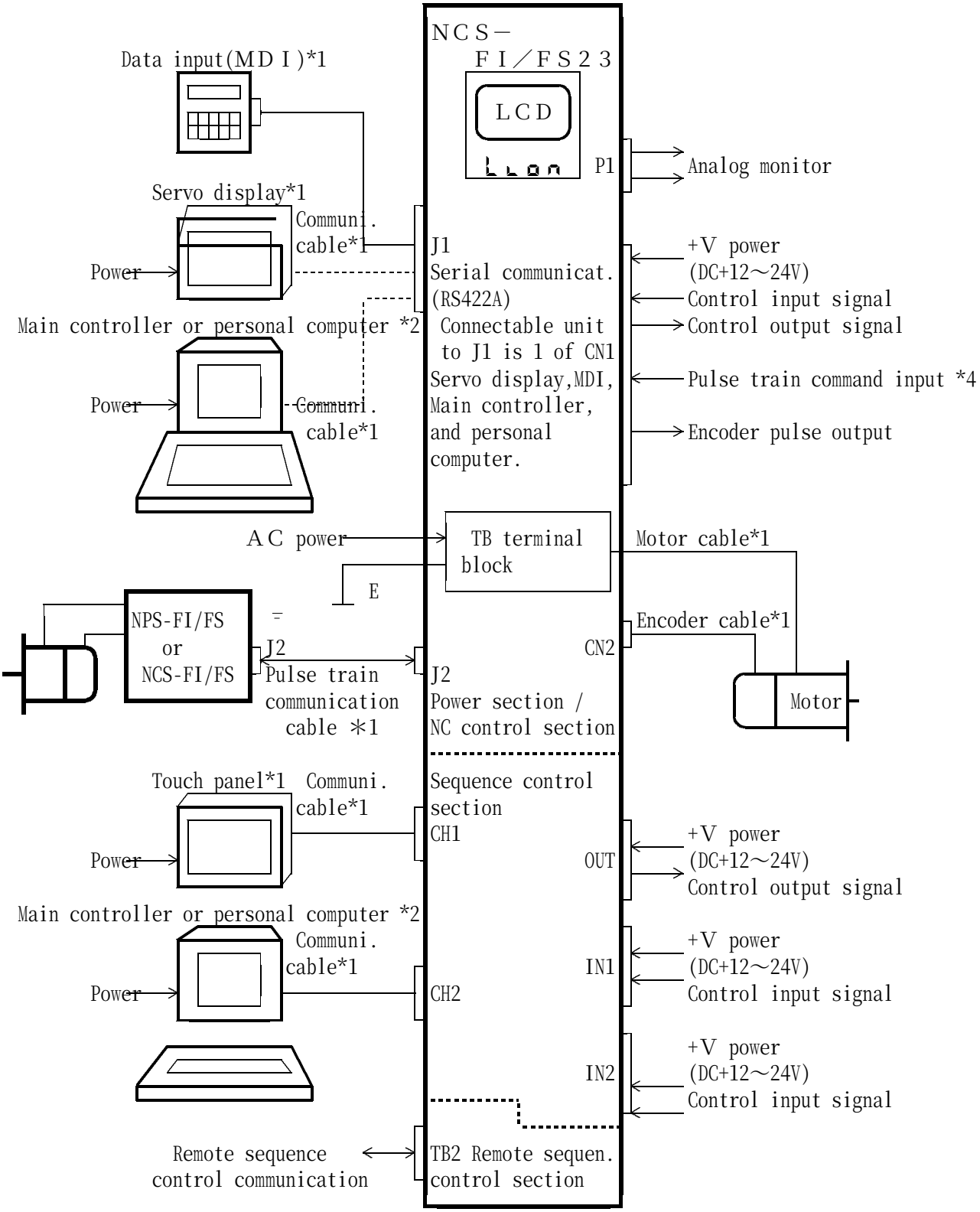
[Fig.1－4] NCS-FI/FS22 type system configuration

※ Caution 1: Our optional unit is available for the item with *1 mark.
Please use an unit on the general market for the item with *2 mark.
NPS-FI/FS with *3 mark is a controller for Speed control, Torque control, and Pulse train control.
The item with mark *4 can be changed to feedback pulse input from a measuring encoder by parameter setting which enables full closed loop control.

※ Caution 2: Our optional "Data edit software for a personal computer" can be available.

1－2－5　NCS-FI/FS23 type

Peripheral system configuration of NCS-FI/FS 23 unit is as ［Fig.1－5］.



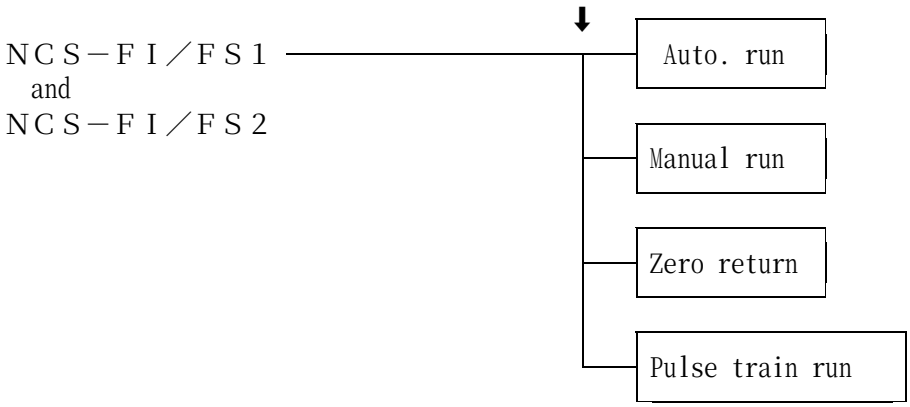
［Fig.1－5］　NCS-FI/FS23 type system configuration

※ Caution 1: Our optional unit is available for the item with *1 mark.
Please use an unit on the general market for the item with *2 mark.
NPS-FI/FS with *3 mark is a controller for Speed control, Torque control, and Pulse train control.
The item with mark *4 can be changed to feedback pulse input from a measuring encoder by parameter setting which enables full closed loop control.

※ Caution 2: Our optional "Data edit software for a personal computer" can be available.

1－3 Mode configuration

［1］ Run mode



And there are modes which change the condition to enable External input signal or Remote input signal by Control input signal as follows. (Change by Control input signal「PC」.)

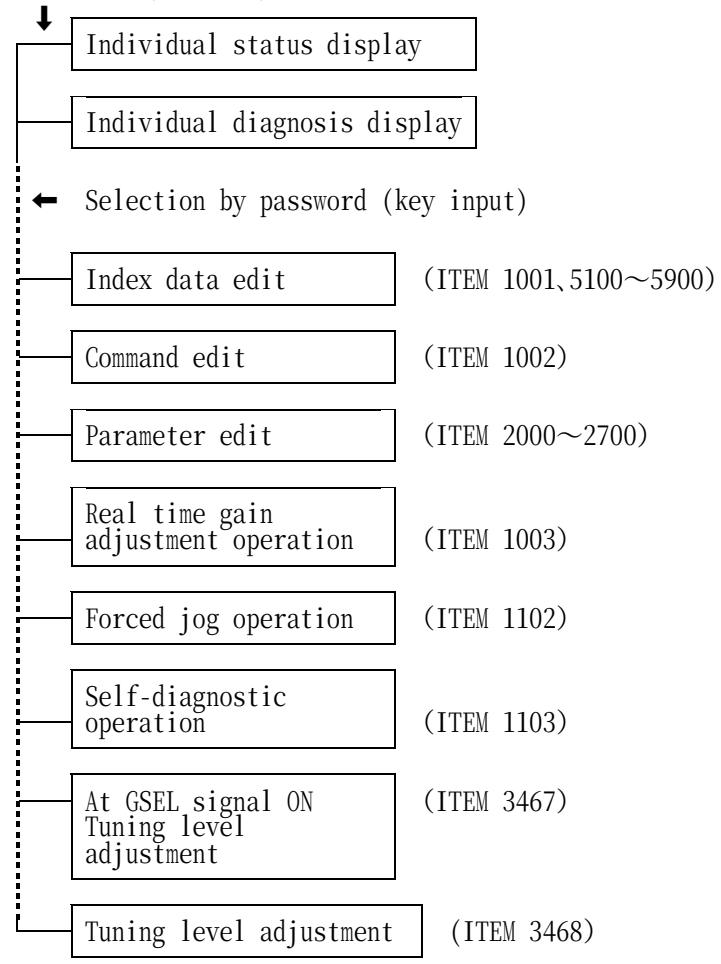
＊ Local mode ：Control as individual Run mode selection, Motion start / stop, etc. is conducted in Local run by an effective Control input signal in accordance with External input disable selection parameters (P516,P518).

＊ Remote mode：Control as individual Run mode selection, Motion start / stop, etc. is conducted in Remote run by an effective Control input signal in accordance with External input disable selection parameters (P517,P519).

And Remote input signal is the interface to conduct control as External input signal of a controller by using Serial communication or Sequence control section.

[2] Operation mode

Operation block figure by LCD section or MDI



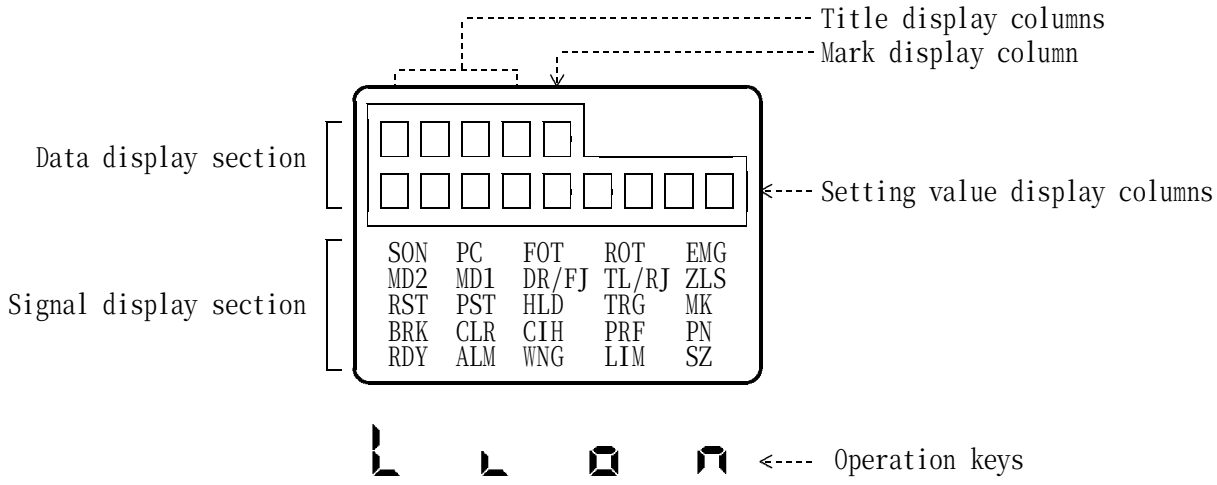
Chapter 2 Setting and display

2－1　LCD module operation

2－1－1　LCD module each component function

Various parameters and data are set by key input of LCD module in the controller front panel.
Since parameters deeply influence motion of machine system and whole system, pay special attention to set.

［1］ LCD module outlook



［Fig. 2－1］　LCD module outlook

［2］ Display contents of each display section

Display section		Display contents
Data display section	Title display columns	Subject item title (name, No.), message (Alarm, /WNG, /Error), etc. when Protective function works, are displayed.
	Mark display column	Contents as mark, etc, of subject item data are displayed.「P」indicates positive direct data. 「－」indicates negative direct data. 「＊」indicates Index data set. 「／」indicates setting data are invalid.
	Setting value display column	Subject item data (setting value / status / Diagnosis results / Alarm name, etc.) are displayed.
Signal display section		I/O signal status is displayed. When a signal is inputted or outputted, corresponding letter is lit. Details can be referred to the separate manual『Volume: Basic function』.

［Tab. 2－1］　Display contents of each display section

［3］Each operation key function

Key	Function	
↓	Item select.	Displays next item.
	Data setting	Increases number (0～9),change of (P, －, ＊, ／) mark and displays next data value of menu data.
↑	Item select.	Displays back item.
	Data setting	Decreases number (0～9),change of (P, －, ＊, ／) mark and displays back data value of menu data.
○	Item select.	Displays top item of next subject mode.
	Data setting	Selects data setting columns.
∩	Item select.	Moves to data setting status of subject item.
	Data setting	Enters display data (all columns) as new data.
↓ ↑	At Power ON	Initializes all the stored data. ※ Refer to the following caution.
	Data setting	Finishes data setting, forcibly. (Data are not changed, and back data are retained.)
↓ ○ ∩	Full time	Resets CPU by simultaneously pushing them for 3 sec.. 【Caution】 ① In case of NCS-FS type, since「Encoder fault」occurs by CPU fault, it can not be used. ② It is not accepted in Self-diagnostic or HALT.

［Tab. 2－2］ Each operation key function

【Caution】

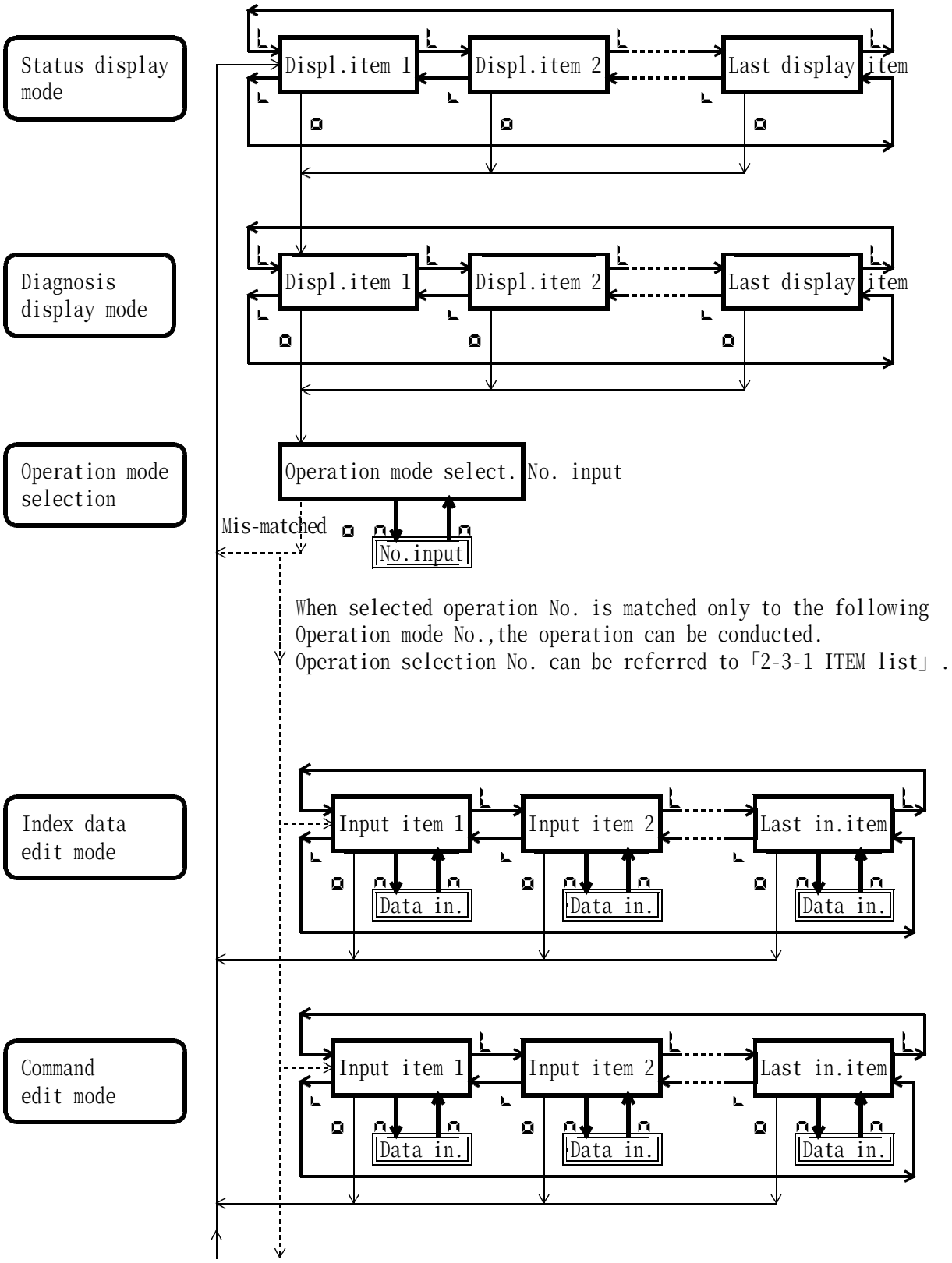
When unit power is ON by pushing↓and↑keys, simultaneously, all the stored data (parameter , etc.) are initialized.
And then, following figure is displayed in LCD data display section.

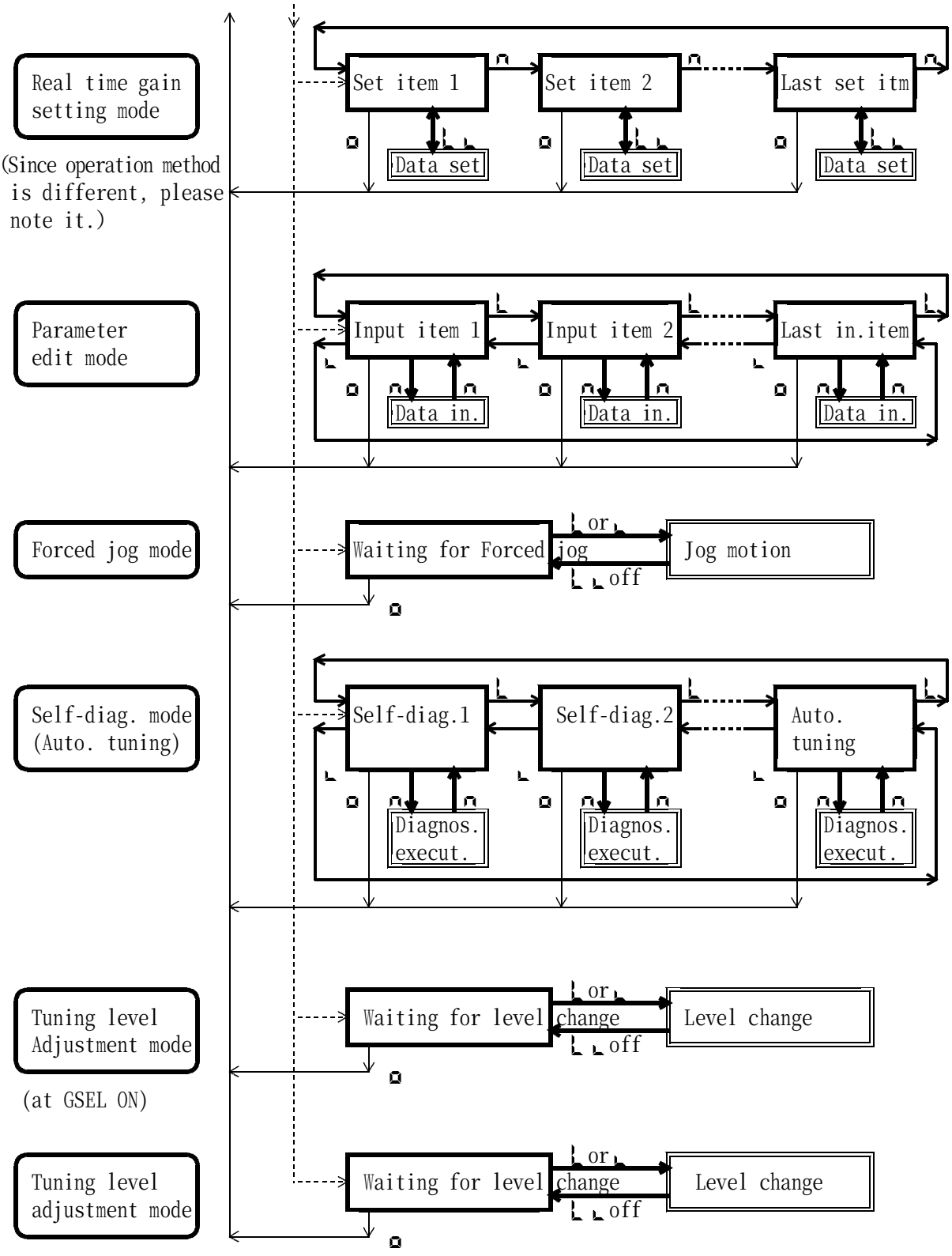
INIT DATA

We recommend you to save data before initializing the unit.
Backup of data by a personal computer can be conducted by our optional Data edit software.

2－1－2　LCD module operation procedure

Display & key operation and data setting flow chart is shown as below.





[Fig. 2－2]　Display & key operation flow chart

2－2　Display mode

2－2－1　Initial status Display

⚠During an unit is initialized when power source is turned ON, 『Power ON！』 is displayed.
⚠At the unit shipment, initial values are set to various parameters and data.
⚠Since a motor not selected by the parameter P000 can not run, at first 〔P000：Motor type selection〕 and other parameter shall be set to meet the applied conditions.
⚠In order to confirm parameters and request resetting, soon after power source is turned ON for the first time, Motor not selected alarm 『ALM MOTOR TYPE1』 is displayed.
⚠Simultaneously, Alarm signal is outputted.
⚠Initial status display can be cleared by any of ／／／ key input.
⚠After display is cleared, contents can be confirmed by Alarm history.

[Fig. 2－3]　Initial status display

Display sample

《Motor torque is displayed.》

Actual torque is displayed in Status display（ＳＴ１０）.

1) By , display mode changes in turns as Status display（ＳＴ００）→ Diagnosis display（ＴＹＰＥ）→ Operation selection（ＩＴＥＭ）→ Status display（ＳＴ００）→ Select Status display mode（ＳＴ００）.
2) By , Display item changes in turns as（ＳＴ００）→（ＳＴ０１）→・・・. Select display item （ＳＴ１０）.
3) Selected data of（ＳＴ１０）displays running motor torque.

《Alarm status is confirmed.》

When Alarm occurs. Alarm contents are displayed in Diagnosis display（ＡＬＭ０）.

1) By , display mode changes in turns as Status display（ＳＴ００）→ Diagnosis display（ＴＹＰＥ）→ Operation selection（ＩＴＥＭ）→ Status display（ＳＴ００）→ Select Diagnosis display mode（ＴＹＰＥ）.
2) By , Display item changes in turns as（ＴＹＰＥ）→（ＭＯＤＥ）→・・・. Select display item （ＡＬＭ０）.
3) Selected data of（ＡＬＭ０）displays activated Alarm contents.

2－2－2　Status display mode

⚠In Title display columns, status № (ＳＴ××) , in Setting value display columns, status data, and in Mark display column, a mark are displayed.

Dsp. No.	Display sample	Unit	Display Contents
1	ST00－ P P P P 02000	rpm	Displays actual motor speed. In forward run : P,In reverse run:－ Display range : -9999 ～ 9999
2	ST01－ 10000. 000	※1	Displays current position. Display contents can be set by [P502 : Current posi. display selection]. Display range : -99999999 ～99999999 ※2
3	ST02P P P P P 01000	Pls.	Displays Position deviation pulse. ＋deviation : P,－deviation :－ Display range : -32767 ～ 32767
4	ST03－ P P P 2000. 0	rpm	Displays External speed command input value by rpm. Forward cmmd. : P, Reverse cmmd. : － Display range : -99999 ～ 99999
5	ST04－ P P P P P P 100	%	Displays External torque command input value by % to rated torque. Forward cmmd. : P, Reverse cmmd. : － Display range : -300 ～ 300
6	ST05－ P P P 100. 00	Kpps	Displays Pulse train command input frequency Forward cmmd. : P, Reverse cmmd. : － Display range : -500.00 ～ 500.00
7	ST06－ P 100000000	Pls.	Displays accumulated input pulse numbers of Pulse train command. Forward cmmd. : P, Reverse cmmd. : － Display rang : -99999999 ～ 99999999
8	ST07P P P P P P P 100	%	Displays Forward torque limit command input value by % to rated torque. Display range : 0 ～ 300
9	ST08P P P P P P P 100	%	Displays Reverse torque limit torque. Display range : 0 ～ 300
10	ST09P P P P P P P 080	%	Displays thermal trip ratio by %. Display range : 0 ～ 100 When display exceeds 90 (90%), Over-load warning and 100 (100%), Over-load alarm occurs.

[Tab. 2－3(a)] Display contents of Status display mode 1/2

⚠In this display mode, if ∩ key is pushed once, display data are retained for 1 second, and continuously pushed, display is retained.

※1 : Unit can be set one of「mm」,「°」,and「in(inch)」by the parameter [P301].
※2 : The decimal point location is set by the parameter〔P302〕.

Dsp. No.	Display sample	Unit	Display Contents
11	ST10P PPPPPP100	%	Displays actual Torque command by % to rated torque. Display range : 0 ～ 300
12	ST11P PPPPPP100	%	Displays peak Torque command by % to rated torque. (RST signal becomes「000」.) Display range : 0 ～ 300
13	ST12P PPPPP1500	rpm	Displays actual speed of a turning work. Forward cmmd. : P, Reverse cmmd. : － Display range : -9999 ～ 9999
14	ST13－ P00100.00	※1	Displays actual speed of a machine. Forward cmmd. : P, Reverse cmmd. : － Display range : -9999999 ～ 9999999 ※2

[Tab. 2－3(b)] Display contents of Status display mode 2/2

⚠In this display mode, if key is pushed once, display data are retained for 1 second, and continuously pushed, display is retained.

※1 : Unit can be set one of「mm」,「°」,and「in(inch)」by the parameter [P301].
※2 : The decimal point location is set by the parameter〔P302〕.

2－2－3 Diagnosis display mode

⚠In data display section, message and data are displayed.

Dsp. NO.	Display sample	Unit	Display Contents
1	TYPE␣ FI1m␣STD.	—	Displays name of NCS-FI/FS series. Display sample：ＮＣＳ－ＦＩ１
2	MODE␣ ␣␣␣␣LOCAL	—	Displays selection status of Remote / Local change (PC) signal for control signal. Display sample：Local mode
3	A012␣ ␣␣␣␣␣␣POS	—	Displays execution of Auto. run start, or executing address and its command. Display sample： POS command (Positioning command)
4	JSP1␣ ␣000100. 00	※1	Displays Jog speed selected by Jog speed change signal Display range： 0 ～ 9999999 ※2
5	O. R. ␣ ␣␣␣␣␣␣150	%	Displays Speed override signal input status by Override ratio (%). Display range： 0 ～ 150
6	PSIN␣ ␣01100101 SS1 SS2 SS3 PS4 PS5 PS6 PS7 PS8	—	Displays status of External input signals SS1～3, PS4～8.(1:ON / 0:OFF) Status of Input signals SS1～3, PS4～8 at input signal allocation can be confirmed. Display sample：SS1 and3 ON, PS6 and7 ON, others OFF
7	ORIN␣ ␣␣␣␣0110 OR1 OR2 OR3 OR4	—	Displays status of External input signals OR1～4 (1:ON / 0:OFF) Status of Input signals OR1～4 at input signal allocation can be confirmed. Display sample：OR2 and 3 ON, others OFF
8	CN1O␣ ␣10110000 Rsvd. WNG Rsvd. SZ PN PRF BRK LIM	—	Displays status of External output signals which can be allocated to output signals. (1:ON / 0:OFF) Output signal status at output signal allocation can be confirmed. Display sample：PN,PRF and LIM ON, others OFF

[Tab. 2－4 (a)] Display contents of Diagnosis display mode 1/3

※1：Unit can be set one of「mm」,「°」,and「in(inch)」by the parameter [P301].
※2：The decimal point location is set by the parameter〔P302〕.

Dsp. No.	Display sample	Unit	Display Contents
9	ALM0P IPM ERR.	—	Displays latest Alarm contents. Display sample : IPM fault
10	ALM1P PPENCODER	—	Displays one time old Alarm contents. Display sample : Encoder fault
11	ALM2P OVERPLOAD	—	Displays 2 times old Alarm contents. Display sample : Over load error
12	ALM3P OVERPVOLT	—	Displays 3 times old Alarm contents. Display sample : Over voltage error
13	ALM4P OVERSPEED	—	Displays 4 times old Alarm contents. Display sample : Over speed error
14	WNG0P OVERPLOAD	—	Displays latest Warning contents. Display sample : Over load warning
15 ※3	SQBPP STNo. 6203	—	Displays SQB status information. ※4 Display range : 0 ～ 9999 Display sample : 「Sum check error」 occurs.
16 ※3	SQBPP VerPP1. 00	—	Displays SQB software version. Max. display : 9.99

[Tab. 2－4 (b)] Display contents of Diagnosis display mode 2/3

※3 : NCS-FI/FS 10 and 12 types do not display.
※4 : SQB status information can be referred to the separate manual 『Volume: SQB』.

Dsp. No.	Display sample	Unit	Display Contents
17 ※5	EIO0P P00100101 OUT1/M01 OUT2/M02 OUT3/M04 OUT4/M08 OUT5/M11 OUT6/M12 OUT7/M14 OUT8/M18	—	Displays an output to J5 connector or M output. (1:ON / 0:OFF) Display sample : In case of output, OUT1,OUT3 and OUT6 ON others OFF In case of M output, 25
18 ※5	EIO1P P00000010 Rsvd. MFIN Rsvd. Rsvd. Rsvd. Rsvd. MSTB Rsvd.	—	Displays M strobe output and M complete input of J5 connector. (1:ON / 0:OFF) Display sample : MFIN ON, others OFF
19	HARDP VerPP0. 00	—	Displays hardware version. Max. display : 9.99
20	SOFTP VerPP1. 00	—	Displays software version. Max. display : 9.99

[Tab. 2－4 (c)] Display contents of Diagnosis display mode 3/3

※5 : NCS-FI/FS 10, 13, 22, and 23 types do not display.

2－3　Operation mode

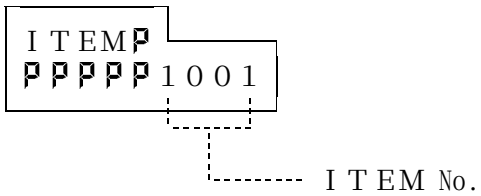
2－3－1　ＩＴＥＭ (Operation mode) list

Selection ITEM (Operation mode) is shown in Tab.２－５.

ＩＴＥＭ Select.No.	Operation mode		
１００１	Index data edit mode（ＩＸ００～ＩＸ９９）		
１００２	Command edit mode		
１００３	Real time gain set mode		
１１０２	Forced jog mode (Refer to separate manual『Volume: Basic function』).		
１１０３	Self-diag. mode (Refer to separate manual『Volume: Basic function』).		
２０００	Group 0	Motor, encoder parameter	Parameter edit mode
２１００	Group 1	Driver adjustment parameter	
２２００	Group 2	ＮＣ adjustment parameter	
２３００	Group 3	Position adjustment parameter	
２４００	Group 4	Run motion parameter	
２５００	Group 5	Display,edit,communi.,parameter	
２６００	Group 6	Pulse train input parameter	
２７００	Group 7	I/O signal parameter	
５１００	ＩＸ１００ ～ ＩＸ１９９		Index data edit mode
５２００	ＩＸ２００ ～ ＩＸ２９９		
５３００	ＩＸ３００ ～ ＩＸ３９９		
５４００	ＩＸ４００ ～ ＩＸ４９９		
５５００	ＩＸ５００ ～ ＩＸ５９９		
５６００	ＩＸ６００ ～ ＩＸ６９９		
５７００	ＩＸ７００ ～ ＩＸ７９９		
５８００	ＩＸ８００ ～ ＩＸ８９９		
５９００	ＩＸ９００ ～ ＩＸ９９９		
３４６７	Auto. tuning level adjustment mode (At GSEL signal ON) (Refer to separate manual『Volume: Basic function』)		
３４６８	Auto. tuning level adjustment mode (Refer to separate manual『Volume: Basic function』)		

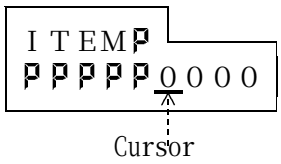
［Tab.２－５］　ＩＴＥＭ (Operation mode) list

① Display sample



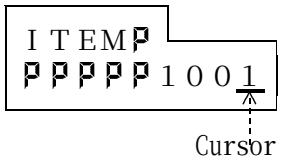
② Setting

◈ITEM No.input 1



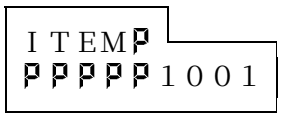
※When ∩ key is pushed, a cursor appears and input can be conducted.
※When ˩ or ˩ key is pushed, numeric value or mark changes.
※When ◘ key is pushed, a cursor moves.
※To cancel input data, push ˩ ˩ keys, together.

◈ITEM No. input 2



※By the above operation, input ITEM No.「Sample：1001」.

◈ITEM No.setting



※When ∩ key is pushed, a cursor disappears and ITEM No.is set.

2－3－2 Real time gain setting

［1］Function

Real time gain setting adjusts various unit gains in the dedicated mode in ‘Real time’, watching motor motion status.
In parameter edit mode, when key is pushed, new gain works on actual motion but in Real time gain setting mode, when or key is pushed, ± 1 step of gain changes and new gain immediately works on actual motion.

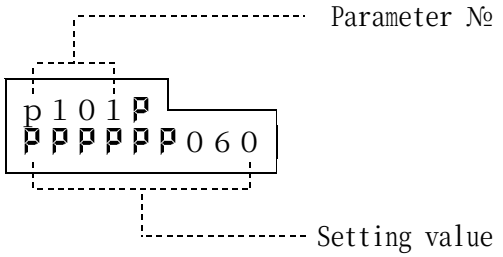
［2］Setting method

Parameters for Real time gain setting are shown in Tab. 2－6.

Para. №	Parameter name	Initial value
p101	Speed loop gain	025
p102	Speed loop integral time constant	020[ms]
p104	Torque command filter frequency	000[Hz]
p105	Speed loop gain / Low speed gain range	025
p106	Speed loop integral time constant / Low speed gain range	020[ms]
p108	Torque command filter frequency / Low speed gain range	000[Hz]
p116	Speed loop gain / at GSEL signal ON	025
p117	Speed loop integral time constant / at GSEL signal ON	020[ms]
p118	Torque command filter frequency / at GSEL signal ON	000[Hz]
p200	Position loop gain	020[1/S]
p201	Servo lock gain	020[1/S]

［Tab. 2－6］ Real time gain setting parameter

① ＩＴＥＭ →１００３ (Selection of Real time gain setting mode) → →
② ｐ＊＊＊ (Selection of setting parameter)
＊ mark is parameter № (Refer to Tab. 2－6.)
③ Data setting of a selected parameter (gain adjustment)
+1 is added every time when key is pushed once.
-1 is deducted every time when key is pushed once.
④ When key is pushed, this mode is escaped.
(At the time display becomes「Status display mode」.)
⑤ Display sample



※ In the display, in order to identify same item of Parameter edit mode, at the top of parameter №, small letter ‘ｐ’ is used.

【Caution!!】

Though the gain value in setting, immediately works on actual motion, it is not written to backup memory. Write of setting data is conducted when or key is pushed.

Chapter 3 Parameter

3－1 Parameter list

No.	Name
P000	Motor type
P001	Encoder type selection
P002	Encoder pulse selection
P004	Encoder pulse output division value
P005	ABS encoder resolution selection
P006	ABS reference data
P007	ABS reference machine position
P008	Carrier frequency selection
P020	Motor type・ Number of poles
P021	Rated torque current
P022	Rated spd.(Field control base spd.)
P023	Max. transit torque ratio
P024	Number of exciting current
P026	Current loop coefficient
P028	R2 compensation change ratio
P030	Phase compensation angle
P037	Torque cmmnd.change limiter value
P040	Primary resistor
P041	Secondary resistor
P042	Primary self inductance
P043	Secondary self inductance
P044	Mutual inductance
P045	Leakage coefficient
P046	Dead time compensation time
P047	Current loop cut of frequency
P048	Current loop derivative time const.
P049	Torque constant
P059	Special encoder pulse number

No.	Name
P100	Low speed gain range
P101	Speed loop gain
P102	Speed loop integral time constant
P103	Speed loop derivative time constant
P104	Torque command filter frequency
P105	Speed loop gain / Low speed gain
P106	Speed loop integral time constant / Low speed gain
P107	Speed loop derivative time constant / Low speed gain
P108	Torque command filter frequency / Low speed gain
P109	Torque limit value 1＋
P110	Torque limit value 1－
P111	Torque limit value 2＋
P112	Torque limit value 2－
P113	Auto.tuning trial run direct.selec.
P114	Auto.tuning trial run speed ratio
P115	Torque limit select.at Alarm stop
P116	Speed loop gain / at GSEL signal ON
P117	Speed loop integral time constant / at GSEL signal ON
P118	Speed loop derivative time constant / at GSEL signal ON
P119	Torque command filter frequency / at GSEL signal ON
P120	R2 compensation selection
P121	Elect. thermal detection selection
P122	Non-coherence control Enable / Disable selection
P124	Speed command gain
P125	Speed command off-set
P126	Torque command off-set
P127	External speed limit Enable / Disable selection
P128	Speed limit value
P129	Spd.cmmnd.val.1(In Spd.cntrl.cmmd.)
P130	Spd.cmmnd.val.2(In Spd.cntrl.cmmd.)
P131	Spd.cmmnd.val.3(In Spd.cntrl.cmmd.)
P132	Spd.cmmnd.val.4(In Spd.cntrl.cmmd.)
P133	Spd.cmmnd.val.5(In Spd.cntrl.cmmd.)
P134	Spd.cmmnd.val.6(In Spd.cntrl.cmmd.)
P135	Spd.cmmnd.val.7(In Spd.cntrl.cmmd.)
P136	Trq.cmmnd val.1(In Trq.cntrl.cmmd.)
P137	Trq.comnd.val.2(In Trq.cntrl.cmmd.)
P138	Trq.commd.val.3(In Trq.cntrl.cmmd.)
P139	Speed loop P gain division ratio
P140	Inertia
P141	Viscosity friction
P142	Speed loop FF2 compensation ratio
P143	Max. speed
P144	Notch filter center frequency
P145	Notch filter band width

[Tab. 3－1 (a)] Parameter list 1/3

No.	Name
P200	Position loop gain
P201	Servo lock gain
P202	Positioning complete range
P203	Positioning time over
P204	Backlash compensation value
P205	Feed forward ratio
P206	Feed forward shift ratio
P207	Over-flow detection pulse
P208	Deviation error detection pulse
P209	Motion selection at Deviation error
P210	S shape Accel./Decel. time
P211	Acceleration time 1
P212	Acceleration time 2
P213	Acceleration time 3
P214	Deceleration time 1
P215	Deceleration time 2
P216	Deceleration time 3
P300	Rotating direction selection
P301	Setting unit selection
P302	Command unit
P303	Electronic gear ratio numerator
P304	Electronic gear ratio denominator
P305	Index positioning range
P306	Forward software OT limit
P307	Reverse software OT limit
P308	Max. Forward positioning amount
P309	Max. Reverse positioning amount
P310	Machine travel amount
P400	Jog speed 1
P401	Jog speed 2
P402	Zero return method selection
P403	Zero point marker selection
P404	Zero return Speed
P405	Zero return creep speed
P406	Zero point constant
P407	Zero point set distance
P408	Position data reference point
P409	Auto.run permit condition selection
P410	Decel. time of Zero return from OT
P411	External trigger level selection

No.	Name
P500	Reserved
P501	Reserved
P502	LCD current posi. display selection
P503	MDI current posi. display selection
P504	Dedicated operation selection for MDI Index data edit
P510	Communication function selection
P512	Communication ID No.
P513	Data length select.(Ser.communi.)
P514	Parity select.(Serial communicate.)
P515	Baud rate select.(Ser.communi.)
P516	Extnl.inp.disable select.1 in Local
P517	Extnl.inp.enable select.1 in Remote
P518	Extnl.inp.disable select.2 in Local
P519	Extnl.inp.enable select.2 in Remote
P520	Reserved
P521	Communication group ID set 1
P522	Communicat.group response yes/no 1
P523	Communication group ID set 2
P524	Communicate.group response yes/no 2
P525	Communication group ID set 3
P526	Communicate.group response yes/no 3
P527	Communication group ID set 4
P528	Communicate.group response yes/no 4
P529	Communication group ID set 5
P530	Communicate.group response yes/no 5
P600	CIH signal spec. selection
P601	Pls.train cmmnd. sequence change
P602	Pulse train command multiplication ratio selection
P603	Pulse train command compensation numerator
P604	Pulse train command compensation denominator
P605	Pulse train feed forward ratio
P606	Pls.train feed forward shift ratio
P607	Pulse train feed forward filter time constant
P608	Pulse train communication Received / Transmitted data selection

[Tab. 3－1 (b)] Parameter list 2/3

No.	Name
P700	Monitor 1 selection
P701	Monitor 2 selection
P702	Speed zero range
P703	Rough matching range
P704	SON signal logic selection
P705	Hard.OT Enable/ Disable selection
P706	Delay time of Mode change confirm.
P707	Software limit switch position 1
P708	Software limit switch position 2
P709	Software limit switch position 3
P710	Stop method of Emergency stop
P711	Decel.time at Emergency stop
P712	Servo OFF delay time after Emergency stop
P713	Stop method at AC power cut
P714	Digital switch input spec.selection
P715	ALM/WNG signal logic selection
P716	RDY signal spec. selection
P717	Output signal function selection 1
P718	Output signal function selection 2
P719	PN signal spec. selection
P720	ＳＱＢ Write data 1
P721	ＳＱＢ Write data 2
P722	ＳＱＢ Write data 3
P723	ＳＱＢ Write data 4
P724	ＳＱＢ Read data 1
P725	ＳＱＢ Read data 2
P726	ＳＱＢ Read data 3
P727	ＳＱＢ Read data 4
P728	ＳＱＢ Read data 5
P729	ＳＱＢ Read data 6
P730	Reserved
P731	Reserved
P732	Reserved
P733	Reserved
P734	Brake output delay time
P736	Motor overheat error detection Enable/ Disable selection
P737	Extnl.inp.sig. input allocation
P738	Extnl.inp.sig. input allocation
P739	Extnl.inp.sig. input allocation
P740	Extnl.out.sig. output allocation
P741	Extnl.out.sig. output allocation
P742	Reset signal spec. selection

[Tab. 3－1 (c)]　Parameter list 3/3

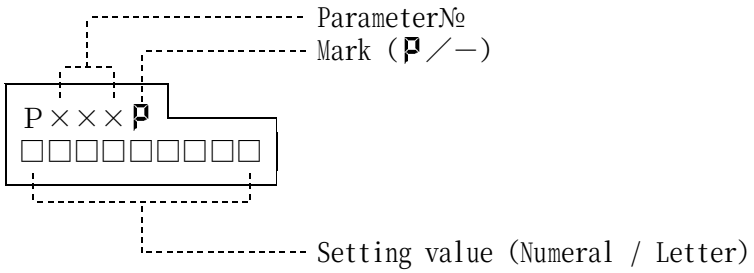
3－2 Parameter setting

［1］Parameter configuration

Group No.	Parameter №	Grroup name
0	P０００～	Motor, Encoder parameter
1	P１００～	Driver adjustment parameter
2	P２００～	NC adjustment parameter
3	P３００～	Position adjustment parameter
4	P４００～	Run motion parameter
5	P５００～	Display,Edit,Communi.parameter
6	P６００～	Pulse train input parameter
7	P７００～	I/O signal parameter

［Tab.３－２］ Parameter configuration

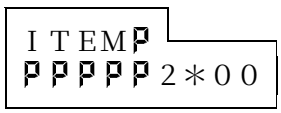
［2］Display



［3］Setting method

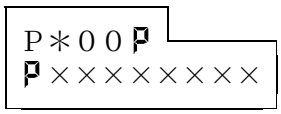
Parameter edition (Numeric input or menu selection) procedure is as follows.

① ＩＴＥＭ No. set



※Set ITEM No.「２＊００」.
＊ mark is a group No. . (Refer to Tab.3-2.)
※After setting, when ◘ key is pushed, it moves to ②.

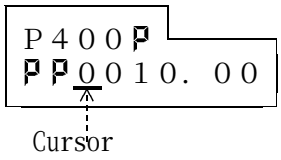
② Parameter selection



※Select a parameter to edit.
When ↑ key is pushed parameter No. increases.
When ↓ key is pushed parameter No. decreases.
※At the time, current setting data are displayed.

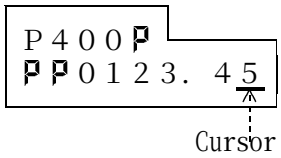
Ⓐ【In case of set by numeric input】

③ Data input 1



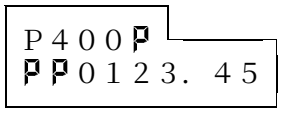
※When key is pushed a cursor appears and input can be conducted.
※When or key is pushed, numeric value or mark changes.
※When key is pushed a cursor moves.
※To cancel input data, push keys, together.

④ Data input 2



※By the above operation, input setting data.

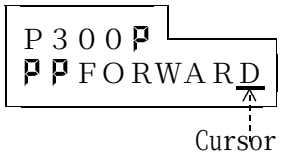
⑤ Data memory



※When key is pushed, a cursor disappears and set data are memorized.

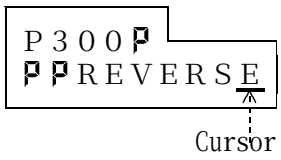
Ⓑ【In case of set by menu selection】

③ Data selection 1



※When key is pushed a cursor appears and selection can be conducted.
※When or key is pushed, menu item is changed.
※To cancel selected data, push keys, together.

④ Data selection 1



※By the above operation, select setting data.

⑤ Data memory

※When key is pushed, a cursor disappears and set data are memorized.

3－3 Parameter specification

Param. №	Parameter name	Timing	Run mode (A M O P / A M Z P)	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 0 》 [Motor, Encoder parameter]							
P000	Motor type	P	A M Z P	S	None	000 ～ 999	000
					Set an applied Servo motor type. Referring to「Ap.-2 Applicable motor list」, please correctly set. To select dedicated motor,input「999」to this No.. Referring to「Setting option spec.」,input dedicated motor parameter to P020～P059. 【Caution】 If wrong value is set, runaway or fire could occur which is very dangerous.		
P001	Encoder type	P	A M Z P	S	None	Menu select. INC／C-ABS／ABS	INC
					Select an applied encoder type. Set: INC — Incremental C-ABS — Compact absolute ABS — Absolute (Reserved)		
P002	Encoder pulse selection	P	A M Z P	S	PPR	Menu select. 1000／2000／2048／2500／4096／6000	6000
					Select number of pulses per encoder 1 turn. 【Caution】 If wrong value is set, runaway or fire could occur which is very dangerous.		
P004	Encoder pulse output division value	P	A M Z P	F	None	01 ～ 32	01
					Set numerator of encoder pulse output division ratio '(N of 1/N)'.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto. A / Manu. M / ORet. Z / Pls.t P)	Level	Setting unit	Setting range	Standard Ship.set (initial)	Function
《Group 0 》 [Motor, Encoder parameter]								
P005	ABS encoder resolution selection	P	A M Z P	F	PPR	Menu select. 2048／4096	2048	Select resolution of ABS encoder 1 turn.
P006	ABS reference data	P	A M Z P	F	Pulse	-16777216 ～ 16777215	00000000	Set absolute data at machine reference position.
P007	ABS reference machine position	P	A M Z P	F	mm/ °/in	-99999999 ～ 99999999	00000000	Set machine position to machine refer. position. (A decimal point position depends on 〔P302〕)
P008	Carrier frequency selection	P	A M Z P	F	Hz	Menu select. 7.5K／10K／15K	10K	Select carrier frequency of PWM.

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (A M O P Autotune / A M Z P)	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group O 》 [Motor, Encoder parameter]							
P020	Motor type・number of poles	P	A M Z P	S	None	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P021	Rated torque current	P	A M Z P	S	10mA	00001～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P022	Rated speed (Field control base speed)	P	A M Z P	S	rpm	00100～20000	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P023	Transit max. torque ratio	P	A M Z P	S	%	100～300	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P024	Exciting current	P	A M Z P	S	10mA	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P026	Current loop coefficient	P	A M Z P	S	None	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P028	R2 compensation change ratio	P	A M Z P	S	0.01%	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P030	Phase compensation angle	P	A M Z P	S	deg	-100～100	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FS type		
P037	Torque command value change amount limiter value	P	A M Z P	S	None	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto. / Manu. / ORet. / Pls.t) A M Z P	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 0 》 [Motor, Encoder parameter]							
P040	Primary resistor	P	A M Z P	S	μΩ	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P041	Secondary resistor	P	A M Z P	S	μΩ	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P042	Primary self inductance	P	A M Z P	S	μH	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P043	Secondary self inductance	P	A M Z P	S	μH	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P044	Mutual inductance	P	A M Z P	S	μH	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P045	Leakage coefficient	P	A M Z P	S	10^{-6}	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FI type		
P046	Dead time compensation time	P	A M Z P	S	10^{-7}sec	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P047	Current loop cut-off frequency	P	A M Z P	S	rad/s	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		
P048	Current loop derivative time constant	P	A M Z P	S	μsec	00000～65535	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode A M O P A M Z P	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group O 》 [Motor, Encoder parameter]							
P049	Torque constant	P	A M Z P	S	10^{-6}Nm/A	00000000～99999999	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 ※Effective only for NCS-FS type		
P059	Special encoder pulse number	P	A M Z P	S	PPR	00000～30000	
					【Referring to Setting option spec., input「999」 to Motor type parameter P000】 When 0 is set, setting value of P002「Encoder pulse selection」is effective.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto tuning / Manual Reset. / ORIGIN Pls.set)	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 1 》 [Driver adjustment parameter]							
P100	Low speed gain range	I	A M Z P	F	rpm	000 ～ 999	000
					Set speed range of low speed gain when GSEL signal is OFF. When motor speed is less than this set,「Speed loop gain」「Speed loop integral time consts.」「Speed loop derivative time const.」「Torque command filter frequency」are changed to parameters in Low speed gain range ([P105],[P106], [P107],[P108]) . But if set value is「0」, they are not changed. And when motor speed is more than this set,control is conducted by parameters ([P101],[P102],[P102],[P104]) .		
P101	Speed loop gain	I	A M Z P	F	None	000 ～ 499	025
					Set Speed loop gain. When it is set larger,though response becomes quicker, vibration may occur depending on machine system rigidly. If set is「0」, a motor is in torque free.		
P102	Speed loop integral time constant	I	A M Z P	F	m sec	000 ～ 999	020
					Set time constant of Speed loop integral compensation. When it is set smaller, response becomes quicker. But if too small, vibration may easily occur. If set is「0」integral compensation is not conducted.		
P103	Speed loop derivative time constant	I	A M Z P	F	μ sec	0000 ～ 9999	000
					Set time constant of Speed loop derivative compensation. When it is set smaller, response becomes quicker. But if too small, vibration may easily occur. If set is「0」derivative compensation is not conducted.		
P104	Torque command filter frequency	I	A M Z P	F	Hz	0000 ～ 1000 (1Hz : unit)	0500
					Set Torque command filter (low pass) frequency. If resonance occurs in combination with a machine, fix it to insert a torque command filter. (anti-vibration) If set is「0」filter is invalid.		
P105	Speed loop gain / Low speed gain range	I	A M Z P	F	None	000 ～ 499	025
					Set Speed loop gain in Low speed gain range. (Description can be referred to [P101].)		
P106	Speed loop integral time constant / Low speed gain range range	I	A M Z P	F	m sec	000 ～ 999	020
					Set time constant of Speed loop integral compensation in Low speed gain range. (Description can be referred to [P102].)		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto / Manu / ORest / Plst / AMZP)	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 1 》 [Driver adjustment parameter]							
P107	Speed loop derivative time constant / Low speed gain range range	I	A M Z P	F	μ sec	0000 ～ 9999	000
					Set time constant of Speed loop derivative compensation in Low speed gain range. (Description can be referred to [P103].)		
P108	Torque command filter frequency / Low speed gain range	I	A M Z P	F	Hz	0000 ～ 1000 (1Hz : unit)	0500
					Set Torque command filter (low pass) frequency in Low speed gain range.. (Description can be referred to [P104].)		
P109	Torque limit value 1+	I	A M Z P	F	%	000 ～ 300 (1% : unit)	300
					Limit motor forward output torque limit value. If set is larger than peak torque, output torque is clamped at the peak torque. If set is「0」, forward torque is not generated.		
P110	Torque limit value 1-	I	A M Z P	F	%	000 ～ 300 (1% : unit)	300
					Limit motor forward output torque limit value. If set is larger than peak torque, output torque is clamped at the peak torque. If set is「0」, reverse torque is not generated.		
P111	Torque limit value 2+	I	A M Z P	F	%	-1 ～ 300 (1% : unit)	-1
					At TL signal ON or Alarm stop (but by parameter「P115: Torque limit selection at Alarm stop」), set Forward torque limit value. -1 set : Limit by lower value of External torque limit +command and parameter [P109:Torque limit value 1+]. Other than -1 : Limit by lower value of this parameter and [P109:Torque limit value1]. And at the above status, If this parameter set is「0」forward torque is not generated.		
P112	Torque limit value 2-	I	A M Z P	F	%	-1 ～ 300 (1% : unit)	-1
					At TL signal ON or Alarm stop (but by parameter「P115: Torque limit selection at Alarm stop」), set Reverse torque limit value. -1 set : Limit by lower value of External torque limit - command and parameter [P110:Torque limit value 1+]. Other than -1 : Limit by lower value of this parameter and [P110:Torque limit value1]. And at the above status, If this parameter set is「0」reverse torque is not generated.		

※ item definition [Reflecting timing] I : Real time / R : Reset or power ON / P : Power ON / S : Motor stop

※ item definition [Level] S:Setting is required / F : Run can be conducted by initial value / M : Reserved

Param. №	Parameter name	Timing	Run mode: Auto out / MAN ORest / PLS.t / AMZP	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 1 》 [Driver adjustment parameter]							
P113	Auto.tuning trial run direction	R	・・・・	F	None	Menu select. BOTH／+ONLY／-ONLY	BOTH
					Select motor trial run direction in Auto.tuning. Set: BOTH — Contents: Both Set: +ONLY — Contents: Forward Set: -ONLY — Contents: Reverse ※Operation methods can be referred to the separate manual 『Volume: Basic function』.		
P114	Auto.tuning trial run speed ratio	R	・・・・	F	None	0.00 ～ 1.00	0.30
					Set trial run speed in Auto.tuning by ratio to rated speed. When 「1.00」 is set a motor runs at rated speed. ※Operation methods can be referred to the separate manual 『Volume: Basic function』.		
P115	Torque limit selection at Alarm stop	I	A M Z P	F	None	Menu select. ALM.TL N／ALM.TL Y	ALM.TL N
					Select torque limit function for motor sudden stop at Alarm occurrence. ◎ALM.TL N：Conducts torque limit in accordance with parameters [P109/ 110:Torque limit value 1 ±」 ◎ALM.TL Y：Conducts torque limit in accordance with parameters [P111/112:Torque limit value 2 ±]		
P116	Speed loop gain/ at GSEL signal ON	I	A M Z P	F	None	000 ～ 499	025
					Sets gain at GSEL signal ON. (Description can be referred to [P101].)		
P117	Speed loop integral time constant / at GSEL signal ON	I	A M Z P	F	m sec	000 ～ 999	020
					Set time constant of Speed loop integral compensation at GSEL signal ON. (Description can be referred to [P102].)		
P118	Speed loop derivative time constant / at GSEL signal ON	I	A M Z P	F	μ sec	0000 ～ 9999	000
					Set time constant of Speed loop derivative compensation at GSEL signal ON. (Description can be referred to [P103].)		
P119	Torque command filter frequency / at GSEL signal ON	I	A M Z P	F	Hz	0000 ～ 1000 (1Hz : unit)	0500
					Set Torque command filter (low pass) frequency at GSEL signal ON. (Description can be referred to [P104].)		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop
※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORest / Plst.	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 1 》 [Driver adjustment parameter]							
P120	R2 compensation selection	I	A M Z P	F	None	Menu select. R2 OFF／R2 ID／R2 TH	R2 OFF
					Select a method of R2 compensation(Output torque error compensation due to temperature drift) . ◎R2 OFF：R2 compensation is not conducted. ◎R2 ID ：Identifies R2 from motor current and voltage and conducts compensation. ◎R2 TH ：Measures motor temperature and conducts compensation. But if a thermister (Temp. sensor) is not equipped with a motor, Alarm occurs. ※Effective only for NCS-FI type		
P121	Electric thermal detection selection	R	A M Z P	F	None	Menu select. STD／BIG	STD
					Select detection method of Electric thermal. ◎STD ： Standard ◎BIG ： Big capacity 【Caution】When BIG is used, install a thermister to a motor and select「Enable」of［P736: Motor over-heat error detection Enable/ Disable selection ］or connect a thermostat or a thermal to protect the unit. ※Detection methods can be referred to the separate manual『Volume: Basic function』.		
P122	Non-coherence control Enable/ Disable selection	R	A M Z P	F	None	Menu select. DECUP OFF／DECUP ON	DECUP ON
					Select Enable/ Disable of Non-conherence control . ◎DECUP OFF ： Disable ◎DECUP ON ： Enable		

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※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manual / ORest. / Plst.	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A / M / Z / P		Function		
《Group 1 》 [Driver adjustment parameter]							
P124	Speed command gain (voltage) Caution : Regardless to this setting DC voltage input range is ±10V.	I	A・・・	F	V	06.00 ～ 10.00(10.01～100.00)	010.00
					Set full scale value (motor rated speed command) of External speed command voltage(DC voltage) . When set command voltage is inputted, motor runs at rated speed. Though value more than 10.0 can be inputted, max. input voltage is ±10V. Motor regenerative motion in the speed range than 10.0 can be conducted at motor max. speed or less, but drive could not be done. Sample) Set value is 100.00/2000rpm (Rate speed), and Speed command voltage input is 10V : Motor drive speed is 2000*10V/100.00=200rpm. Resolutionof Speed command is max.at10V. When 6.00 is set the resolution is 6/10 of that of 10.00 set.		
P125	Speed command off-set	I	A・・・	F	mV	-999 ～ 999	000
					Set off-set voltage of External speed command (DC voltage) . When External speed command voltage has off-set,by the off-set voltage, a motor slowly runs. Set this parameter to stop this motor motion caused by the off-set voltage.		
P126	Torque command off-set	I	A・・・	F	mV	-999 ～ 999	000
					Set off-set voltage of External torque command (DC voltage) .		
P127	External Speed limit Enable/ Disable selection	R	A・・・	F	None	Menu select. SPD.LIM.N／SPD.LIM.Y	SPD.LIM.N
					Select whether motor speed shall be limited or not by External speed command (DC volt.) in Torque control command. ◎SPD.LIM.N : No. Motor speed is limited by 〔P128 : Speed limit value〕 . ◎SPD.LIM.Y : Yes. Motor speed is limited by lower value of 〔P128 : Speed limit value〕 and External speed command.		
P128	Speed limit value	I	A・・・	F	rpm	00000 ～ 99999	1000
					Set motor speed limit value in Torque control command. When 120% or higher of rated speed is set, limit value becomes 120% of rated speed.		

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※ item definition [Level] S:Setting is required / F : Run can be conducted by initial value / M : Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORest / Pls.t	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A / M / Z / P		Function		
《Group 1 》 [Driver adjustment parameter]							
P129	Speed command value 1	I	A・・・	F	rpm	-99999 ～ 99999	1000
					Set motor speed and command direction of internal Speed command 1 in Speed control command. (A decimal point position depends on 〔P123〕)		
P130	Speed command value 2	I	A・・・	F	rpm	-99999 ～ 99999	0500
					Set motor speed and command direction of internal Speed command 2 in Speed control command. (A decimal point position depends on 〔P123〕)		
P131	Speed command value 3	I	A・・・	F	rpm	-99999 ～ 99999	0100
					Set motor speed and command direction of internal Speed command 3 in Speed control command. (A decimal point position depends on 〔P123〕)		
P132	Speed command value 4	I	A・・・	F	rpm	-99999 ～ 99999	0050
					Set motor speed and command direction of internal Speed command 4 in Speed control command. (A decimal point position depends on 〔P123〕)		
P133	Speed command value 5	I	A・・・	F	rpm	-99999 ～ 99999	0010
					Set motor speed and command direction of internal Speed command 5 in Speed control command. (A decimal point position depends on 〔P123〕)		
P134	Speed command value 6	I	A・・・	F	rpm	-99999 ～ 99999	0005
					Set motor speed and command direction of internal Speed command 6 in Speed control command. (A decimal point position depends on 〔P123〕)		
P135	Speed command value 7	I	A・・・	F	rpm	-99999 ～ 99999	0001
					Set motor speed and command direction of internal Speed command 7 in Speed control command. (A decimal point position depends on 〔P123〕)		

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※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode Auto Manu ORest Plst. A M Z P	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 1 》 [Driver adjustment parameter]							
P136	Torque command value 1	I	A・・・	F	%	-300 ～ 300	030
					Set command value and direction of internal Torque command 1 in Torque control command.		
P137	Torque command value 2	I	A・・・	F	%	-300 ～ 300	050
					Set command value and direction of internal Torque command 2 in Torque control command.		
P138	Torque command value 3	I	A・・・	F	%	-300 ～ 300	080
					Set command value and direction of internal Torque command 3 in Torque control command.		
P139	Speed loop proportional gain division ratio	I	A M Z P	F	%	000 ～ 100	000
					Set proportional gain division ratio of 2 free degree control in Speed loop. If large value is set, even if gain is set high, over-shoot can be depressed.		
P140	Inertia	I	A M Z P	F	10^{-6} Kg･m^2	00000000～99999999	00000000
					Set control system inertia. 【Caution】 If value is unknown, do not set it.		
P141	Viscosity friction	I	A M Z P	F	10^{-6} N･m/rad/s	00000000～99999999	00000000
					Set control system viscosity friction. 【Caution】 If value is unknown, do not set it.		
P142	Speed loop FF2 compensation ratio	I	A M Z P	F	%	000 ～ 100	000
					Set FF2 compensation ratio of Speed loop. 【Caution】 If proper values are not set to [P140:Inertia] and [P141:Viscosity friction] , do not set this.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORest / Pls.	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 1 》 [Driver adjustment parameter]							
P143	Max. speed	P	A M Z P	F	rpm	00000 ～ 20000	00000
					Set motor max. speed. When「0」is set. motor rated speed becomes max. speed. ◎**In case of NCS-FI type** When value other than「0」is set, Field control is conducted. ◎**In case of NCS-FS type** Set「0」. 【Caution】 ・At speed higher than motor rated speed, motor output torque feature and max. speed depends on individual type. ・When value other than 「0」is set to this set, reference (「Rated speed」in this manual) of Analog monitor and Speed command becomes this set speed.		
P144	Notch filter center frequency	I	A M Z P	F	Hz	0000 ～ 4999	0000
					When resonance occurs in combination with a machine system, by setting the resonance frequency, avoid resonance. When「0」is set, Notch filter is invalid.		
P145	Notch filter band width	I	A M Z P	F	Hz	0000 ～ 4999	0000
					Set band width of P144「Notch filter center frequency」		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / 0Ret / Pls.t	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 2 》 [NC adjustment parameter]							
P200	Position loop gain	I	A M Z P	F	S^{-1}	000 ～ 199	020
					Set Position loop gain of motion in Auto./Manual/ Zero return/Pulse train run mode. When this is set larger, though response becomes quicker, vibration may easily occur. If set is「0」, since Position loop is open, Auto.run can not be conducted.		
P201	Servo lock gain	I	A M Z P	F	S^{-1}	000 ～ 199	020
					Set Position loop gain in Servo lock status, when Position deviation is within〔P202：Positioning complete range〕. When this is set larger, though response becomes quicker, vibration may easily occur. If set is「0」, since Position loop is open, Servo lock can not be conducted.		
P202	Positioning complete range	R	A・Z P	F	Pulse	000 ～ 999	010
					Set output range of Positioning complete signal (PN). Setting unit is 4 times of applied encoder pulse number. 《Sample》 If Positioning complete range is determined ±10 pulse of the encoder, set value is「040」.		
P203	Positioning time over	R	A・Z・	F	sec	0.00 ～ 9.99 (10msec:unit)	0.00
					Set acceptable time to actually reach in completi-on range after a command is completed in Position-ing or Zero return.If Positioning is not completed within the time, Alarm signal (ALM) is outputted. But if set value is「0.00」, Positioning time over detection is not conducted.		
P204	Backlash compensation value	R	A M Z P	F	Pulse	-999 ～ 999	000
					Set backlash compensation amount in machine system. When travel direction reverses in Auto./Manual/ Zero return/Pulse train run, Backlash compensation amount is added/ subtracted to motion.「＋」mark is addition, and「－」mark is subtraction. Setting unit is 4 times of applied encoder pulse number. If set value is「0」 Backlash compensation is not conducted.		

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※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORet / Pls.t	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 2 》 [NC adjustment parameter]							
P205	Feed forward ratio	R	A M Z ・	F	%	000 ～ 120	080
					Set Speed command feed forward ratio in Auto./ Manual / Zero return run mode. When this is set larger, though compliance becomes better in some case vibration may occur due to mis-matching with machine system. In the case, lower set a little and give some deviation to get stable motion. If set is「0」 Feed forward control is not conducted.		
P206	Feed forward shift ratio ratio	R	A M Z ・	F	%	000 ～ 100	001
					Set Speed command feed forward shift ratio in Auto./ Manual / Zero return run.		
P207	Over-flow detection pulse	R	A M Z P	F	Pulse	01000 ～ 32767	24000
					Set Over-flow detection value of Position deviation. Setting unit is 4 times of applied encoder pulse number.		
P208	Deviation error detection pulse	R	A M Z P	F	Pulse	00000 ～ 32767	00000
					Set acceptable range of Position deviation. Setting unit is 4 times of applied encoder pulse number. If set is「0」, Deviation error detection is not detected.		
P209	Motion selection at deviation error	I	A M Z P	F	None	Menu select. STOP／CONTINUE	CONTINUE
					Select motion when Position deviation exceeds〔P208：deviation error detection pulse〕and Deviation error occurs. ◎STOP(Alarm stop) Outputs Alarm signal(ALM) and a motor suddenly stops. ◎CONTINUE(Motion continues.) Controls to lower deviation amount below deviation detection pulse when Deviation error is detected and continues motion. During deviation detection and completion in Auto./ Zero return and during the detection and motion stop in Manual／ Pulse train, Warning signal (WNG) is outputted. When CONTINUE (Motion continues.)is selected, be careful to next points. ①Positioning time becomes long. ②Over-load error may easily occur. ③When excess deviation exists at Decel. , set「000」to Feed forward ratio of parameters [P205] and [P605].		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop
※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORet / Plst.	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 2 》 [NC adjustment parameter]							
P210	S shape Accel./ Decel addition time	R	A M Z ・	F	m sec	0000.0～1000.0 (0.1msec:unit)	0000.0
					Set addition time when ‘ S shape ’ is selected for motor Accel./ Decel. curve, S shape in Auto./ Manual/ Zero return run. When set value is「0」, it is linear Accel./ Decel.. Accel. time becomes S shape addition time longer than set time of parameters [P211], [P212], and [P213]. Decel. time becomes S shape addition time longer than set time of [P214],[P215],and [P216]. Actual control time is set time × 1.5msec unit. For example when 2ms is set, time is 3ms (1.5×2).		
P211	Accel. time 1	R	A M Z ・	F	sec	00.000 ～ 99.999 (1msec:unit)	00.500
					Set Accel. time from zero speed to rated speed. But a motor is accelerated by this parameter set plus set time (addition time) [P210]). It is effective in Auto./ Manual/ Zero return run.		
P212	Accel. time 2	R	A・・・	F	sec	00.000 ～ 99.999 (1msec:unit)	00.500
					※Function is identical to [P211] but effective only in Auto. run.		
P213	Accel. time 3	R	A・・・	F	sec	00.000 ～ 99.999 (1msec:unit)	00.500
					※Function is identical to [P211] but effective only in Auto. run.		
P214	Decel. time 1	R	A M Z ・	F	sec	00.000 ～ 99.999 (1msec:Unit)	00.500
					Set Decel. time from rated speed to zero speed. But a motor is decelerated by this parameter set plus set time (addition time) [P210]). It is effective in Auto./ Manual/ Zero return run.		
P215	Decel. time 2	R	A・・・	F	sec	00.000 ～ 99.999 (1msec:unit)	00.500
					※Function is identical to [P214] but effective only in Auto. run.		
P216	Decel. time 3	R	A・・・	F	sec	00.000 ～ 99.999 (1msec:unit)	00.500
					※Function is identical to [P214] but effective only in Auto. run.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto / Manual / ORest. / Pls. / AMZP)	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 3 》 [Position adjustment parameter]							
P300	Rotating direction selection	R	A N Z P	F	None	Menu select. FORWARD／REVERSE	FORWARD
					Select motor rotating direction to each command. FORWARD: Forward — Motor forward rotation to forward direction or positive data command. REVERSE: Reverse — Motor reverse rotation to forward direction or positive data command		
P301	Setting unit selection	R	A N Z P	F	None	Menu select. [mm]／[°]／[in]	[mm]
					Select basic unit for setting of Positioning data, etc. . All the position and speed settings use this unit. ([mm]:mm/ [°]:degree / [in]:inch)		
P302	Command unit	R	A N Z P	F	mm/ °/in	Menu select. 1／0.1／0.01／0.001	0.01
					Select min. setting unit of Positioning data. By this parameter. decimal point position of each position and speed data is determined and used in those data display.		
P303	Electronic gear ratio numerator	R	A N Z P	F	None	00001 ～ 65535	00001
					Set gear ratio between machine system drive shaft and motor shaft together with〔P304：Electro. gear ratio denominator〕. If a load shaft of machine system rotates 'n' turns when a motor rotates 'm' turns, set 'n' to this parameter. Electronic gear setting sample and cautions can be referred to〔P310： Machine travel amount〕.		
P304	Electronic gear ratio denominator	R	A N Z P	F	None	00001 ～ 65535	00001
					Set gear ratio between machine system drive shaft and motor shaft together with〔P303：Electro. gear ratio numerator〕. If a load shaft of machine system rotates 'n' turns when a motor rotates 'm' turns, set 'm' to this parameter. Electronic gear setting sample and cautions can be referred to〔P310： Machine travel amount〕.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: AUTO / MAN / ORST / PLS. / AMP	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 3 》 [Position adjustment parameter]							
P305	Index data range	R	A N Z P	F	mm/ °/in	00000000 ～ 99999999	00000000
					Set 1 turn data amount to a rotating machine. (A decimal point position depends on〔P302〕.) By the set absolute position data range becomes 0～ ([This set]－1) . Except「Index positioning」or「Spinner」application, set 00000000. When 00000000 is set, Index positioning commands (INDX,SIND) and Spin commands (SPNS,SPNT,SPNP) can not be used.		
P306	Forward software OT limit	I	A N Z P	F	mm/ °/in	-99999999 ～ 99999999	00000000
					Set Forward travel limit point by distance from〔P408：Position data reference point〕. When power is ON and after Zero return complete, this is always effective. (A decimal point position depends on〔P302〕.) But if set is「0」, limit is not detected. 【Caution】 After power is turned ON, be sure to execute Zero return. Though〔P408：Position data reference point〕is reset when Zero return is completed, until the completion, Software OT limit is not detected. Since Software OT limit detects at command position, if delay deviation is large a motor may stop at front of Software OT limit position.		
P307	Reverse software OT limit	I	A N Z P	F	mm/ °/in	-99999999 ～ 99999999	00000000
					Set Reverse travel limit point by distance from〔P408：Position data reference point〕. When power is ON and after Zero return complete, this is always effective. (A decimal point position depends on〔P302〕.) But if set is「0」, limit is not detected. 【Caution】 After power is turned ON, be sure to execute Zero return. Though〔P408：Position data reference point〕is reset when Zero return is completed, until the completion, Software OT limit is not detected. Since Software OT limit detects at command position, if delay deviation is large a motor may stop at front of Software OT limit position.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode Auto / Manu / ORet / Plst. A / M / Z / P	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 3 》 [Position adjustment parameter]							
P308	Max. Forward positioning amount	I	A ・・・	F	mm/ °/in	00000000 ～ 99999999	00000000
					Set max. Forward positioning amount to the below commands by incremental amount. (A decimal point position depends on〔P302〕.) If executed positioning amount of a command is larger than this set, the command is aborted by Alarm. But if set is「0」, Forward positioning amount is not checked. Applicable commands：POS, INDX, SPOS, CONT, REPT SIND		
P309	Max. Reverse positioning amount	I	A ・・・	F	mm/ °/in	-99999999 ～ 00000000	00000000
					Set max. Reverse positioning amount to the below commands by incremental amount. (A decimal point position depends on〔P302〕.) If executed positioning amount of a command is larger than this set, the command is aborted by Alarm. But if set is「0」, Reverse positioning amount is not checked. Applicable commands：POS, INDX, SPOS, CONT, REPT SIND		

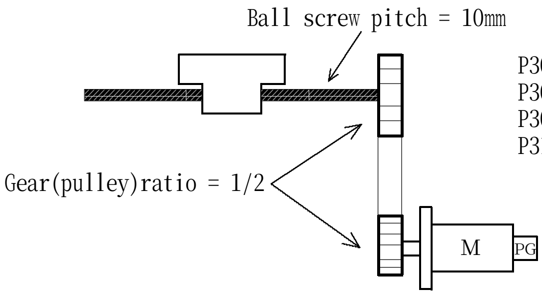
※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop
※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode (Auto / Manu / ORet / Pls.t) A M Z P	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 3 》 [Position adjustment parameter]							
P310	Machine travel amount	R	A N Z P	F	mm/ °/in	00000 ～ 65535	00000
					Set load travel amount per 1 turn of machine system drive shaft (load shaft) . (A decimal point position depends on 〔P302〕 .) But if set is「0」,「Applied encoder pulse number ×4」is used for this set in motion. 【Caution】 When motor rated speed set by Electronic gear ratio and Machine travel amount set is out of 100mm～2M (setting unit:sec) range, Alarm occurs and motion stops. (Setting unit depends on [P301] and [P302])		

P303
P304
P310

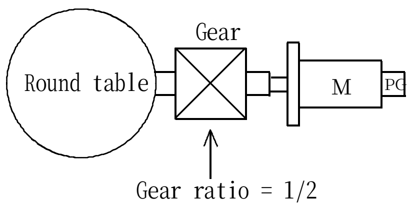
《Electronic gear ratio・machine travel amount parameter setting sample》

《In case of ball screw》



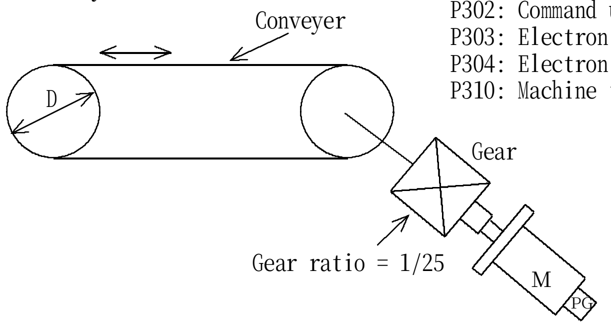
P302: Command unit = 0.01mm
P303: Electronic gear ratio numerator = 1
P304: Electronic gear ratio denominator = 2
P310: Machine travel amount = 10.00mm

《In case of round table》



P302: Command unit = 0.1°
P303: Electronic gear ratio numerator = 1
P304: Electronic gear ratio denominator = 2
P310: Machine travel amount = 360.0°

《In case of conveyer》



P302: Command unit = 0.001mm
P303: Electronic gear ratio numerator = 1
P304: Electronic gear ratio denominator = 25
P310: Machine travel amount = πDmm

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop
※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORest / Pls.t / AMZP	Level	Setting unit	Setting range	Standard Ship.set (initial)
					Function		
《Group 4 》 [Run motion parameter]							
P400	Jog speed 1	S	・M・・	F	mm/sec °/sec in/sec	0000001 ～ 9999999	0001000
					Set Jog speed when Jog speed selection signal (JOSP signal) is OFF. (A decimal point position depends on 〔P302〕)		
P401	Jog speed 2	S	・M・・	F	mm/sec °/sec in/sec	0000001 ～ 9999999	0002000
					Set Jog speed when Jog speed selection signal (JOSP signal) is ON. (A decimal point position depends on 〔P302〕)		
P402	Zero return method selection	S	A ・Z ・	F	None	Menu select. STD.HOME／LS LESS／STOP HOME／OT HOME	STD.HOME
					Select Zero return method. ◎STD.HOME (Standard Zero return) After Zero point decel. LS is detected, detected position by Marker becomes new Zero point. ◎LS LESS (No LS Zero return) Decel. control by Zero point decel.LS is not made and positioned data by Marker detection becomes new Zero point. ◎STOP HOME(On the spot Zero return) Current place becomes new Zero point without any motion. ◎OT HOME(OT back Zero return) After Zero point decel.LS is detected, detected position by Marker becomes new Zero point. If OT for motion directionis detected before Zero point decel. LS is detected, motion changes to opposite direction. And when「NON.MARK」is set to P403, motion is conducted based on Zero point decel. LS without Marker signal. Description can be referred to「5-5-2 Zero return mode」of the manual Volume: Basic function.		
P403	Zero point marker selection	R	A ・Z ・	F	None	Menu select. ENC.MARK／NON.MARK	ENC.MARK
					Select if Encoder marker is used for Zero point marker. ◎ENC.MARK：Encoder marker ◎NON.MARK：Not marker		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORet / Pls.t	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 4 》 [Run motion parameter]							
P404	Zero return speed	S	A ・Z ・	F	mm/sec °/sec in/sec	0000001 ～ 9999999	0001000
					Set initial speed in Zero return. (A decimal point position depends on〔P302〕) Both of FJ and RJ signals are effective in Zero return start. HOME command speed is this set value. Upper limit of motion speed is applied motor rated speed.		
P405	Zero return creep speed	R	A ・Z ・	F	mm/sec °/sec in/sec	0000001 ～ 9999999	0000100
					Set Creep speed in Zero return after Zero point decel.LS is detected. (A decimal point position depends on〔P302〕) Normally, set it 1/100 or less of motor rated speed. In case of no LS Zero return,from the first, this set value is applied or motion speed.		
P406	Zero point position constant	R	A ・Z ・	F	mm/ °/in	00000000 ～ 99999999	00010000
					Set distance from Zero point decel.LS detection to start Marker signal detection in Zero return. (A decimal point position depends on〔P302〕) Set longer value than the distance to enable deceleration from Zero return speed to Zero return creep speed. And when「NON.MARK」is set to P403,motion is conducted based on Zero point decel. LS without Marker signal. Description can be referred to「5-5-2 Zero return mode」of the manual Volume: Basic function. 【Caution】 If this set value is small when Zero return speed is high, a motor suddenly decelerates or stops. Therefore, set sufficient value to decelerate to Creep speed.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORet / Pls.t	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 4 》 [Run motion parameter]							
P407	Zero point set distance	R	A ・Z ・	F	mm/ °/in	-99999999 ～ 99999999	00000000
					Set＋α travel distance from Marker signal detection point in Zero return. This is used for fine adjustment of Marker signal position and Machine reference point position. (A decimal point position depends on〔P302〕) ◎In case of standard and OT back Zero return Positioning is executed for same direction of Zero return when a mark is「+」and opposite direction when the mark is「-」. ◎In case of no LS Zero return Positioning is executed for same direction of Zeroreturn. When set is「0」,Zero return is completed when Marker signal is detected. When set value is smaller than distance from Zero return creep speed to stop, over-shoot will occur when Zero return is completed. And when「NON.MARK」is set to P403, motion is conducted based on Zero point decel.LS without Marker signal. Description can be referred to「5-5-2 Zero return mode」of the manual Volume: Basic function.	
P408	Position data reference	R	A ・Z ・	F	mm/ °/in	-99999999 ～ 99999999	00000000
					Set Absolute position data reference position by distance from Machine reference point. (A decimal point position depends on〔P302〕) Set value is entered when Zero return is completed. If Positioning is conducted after power is turned ON without executing Zero return, the power ON position becomes Absolute position data reference position . Software OT limit value of parameters [P306] and [P307] refers to this Position data re-ference point.		
P409	Auto. run permit condition selection	S	A ・・・	F	None	Menu select. AUTO.N／AUTO.Y	AUTO.N
					Select Auto. run start permit condition. ◎AUTO.N (after Zero return completion) Auto. run start can be conducted after Zero returnis completed. But if an external not-permit factor exists, this is not permitted. ◎AUTO.Y (No condition) At any time Auto.run can be started. But if an external not-permit factor exists, this is not permitted.		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop
※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Param. №	Parameter name	Timing	Run mode: Auto / Manu / ORet / Plst.	Level	Setting unit	Setting range	Standard Ship.set (initial)
			A M Z P		Function		
《Group 4 》 [Run motion parameter]							
P410	Decel. time of OT back Zero return at OT	R	A ・Z ・	F	sec	00.00 ～ 99.99 (10msec:unit)	00.50
					Set Decel.time from motor rated speed to stop. When S shape decel. Curve is selected by [P210],this set value is added to motor Decel. time. This set is effctive only for reverse motion at OT in OT back Zero return.		
P411	External trigger level selection	R	A ・・・	F	None	Menu select. TRG.EDGE／TRG.LEVEL	TRG.EDGE
					Select 「ON edge」or 「ON level」receipt for External trigger signal. ◎TRG.EDGE ：ON edge receipt for External trigger signal ◎TRG.LEVEL：ON level receipt for External trigger signal (When this signal is ON, in Auto. start or restart from Hold / Block stop, External trigger signal is received.)		

※ item definition [Reflecting timing] I：Real time / R : Reset or power ON / P : Power ON / S：Motor stop

※ item definition [Level] S:Setting is required / F：Run can be conducted by initial value / M：Reserved

Chapter 4 Index data

4－1 Index data list

Index data №	Index data name	Type	Function
IX00 〜 IX49	Index data 0 0 〜 Index data 4 9	Hold	Index data which retains data against Power OFF. But re-writing is max. 10000 times.
IX50 〜 IX53	Index data 5 0 〜 Index data 5 3	0Clear	Voluntary Index data which do not retain data against Power OFF. It is「0」at Power ON.
IX54	Index data 5 4	0Clear	Index data for BCD 8 digits + mark and only for NCS-FI/FS12 type. For other types, it is voluntary Index data.
IX55 IX57	Index data 5 5 Index data 5 7		Index data for Digital switch unit (SWU-500 series) numeric number and only for NCS-FI/FS12 type. For other types, it is voluntary Index data.
IX58 〜 IX60	Index data 5 8 〜 Index data 6 0	0Clear	Voluntary Index data which do not retain data against Power OFF. It is「0」at Power ON.
IX61	Index data 6 1	0Clear	Index data to be off-set No. of Index data No. when Index data 1000〜1999 is specified by Command item data、
IX62	Index data 6 2	0Clear	Index data for data of output voltage to Analog monitor. Data value：Output voltage relation -499:-10V, 0:0V, 499:+10V
IX63	Index data 6 3	0Clear	Index data for data of output voltage to Analog monitor . Data value：Output voltage relation -499:-10V, 0:0V, 499:+10V
IX64	Index data 6 4		Index data for Speed command analog input value. -1707:-10V, 1707:10V
IX65	Index data 6 5		Index data for Torque command analog input value. -2047:-10V、2047:10V

[Tab. 4－1 (a)]　Index data list 1/2

Index data №	Index data name	Type	Function
IX66	Index data 66		Index data for current position
IX67	Index data 67	0Clear	Index data which counts number down every 10msec when inputted numeric value is other than 0.
IX68	Index data 68	0Clear	Voluntary Index data which do not retain data against Power OFF. It is「0」at Power ON.
IX69	Index data 69	0Clear	Index data for output data for General output signal.
IX70 〜 IX99	Index data 70 〜 Index data 99	0Clear	Voluntary Index data which do not retain data against Power OFF. It is「0」at Power ON.
IX100 〜 IX999	Index data 100 〜 Index data 999	0Clear / Hold	Voluntary Index data which do not retain data against Power OFF. It is「0」at Power ON. But if an extended memory (option) is equipped, data contents are retained against Power OFF. And at the time Re-write times are not limited.

[Tab. 4－1 (b)]　Index data list 2/2

[Tab. 4－1] Supplement of Index data list description

①Index data 61 (IX61)
Index data 61 is effective when 1000～1999 is set at Index data setting of each command. In the case,「Index data 61 contents ＋(Set Index data No.－1000)」is actually referred Index data No.

Sample) When Index data 61 contents are「200」and Index data set is「IX1030」, actually referred Index data are as follows.

Actually referred Index data
＝Index data [Index data 61 contents ＋(Set Index data No.－1000)]
＝Index data [200＋(1030－1000)]
＝Index data 230 (IX230)

If different motion of Positioning data, Speed, etc. is planned in the same sequence motion by this Index data, Index data No. change in a command is not required and only by Index data 61 contents change, it can be executed, which can simplify program steps.

②「0 Clear」in Type column
「0 Clear」data in Type column do not retain Index data contents and conduct 0 Clear when power is OFF.
It is suitable for data which can be cleared when power is OFF or varying data as current position, etc. .

4－2 Index data setting

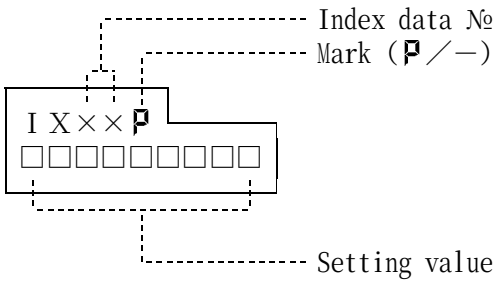
［1］Function

Index data are used on a command as Position/ Speed/ Time/ Output/ Address/ Looping time/ / Processing data and can be specified instead of numeric data.
When Index data are specified on a command, the unit executes the commandcontrols in accordance with numeric contents of the specified Index data.
Index data setting method can be referred to the individual command description.

［2］Unit, Setting range

① Unit　: Depends on each command setting unit.
② Setting range: -99999999 ～ 99999999
(A decimal point position depends on〔P302：Command unit〕.)
③ Initial value　: 00000000

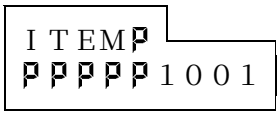
［3］Display



［4］ Setting method

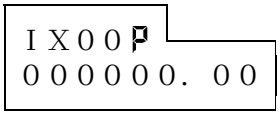
1） Index data edit (IX00～IX99) procedure is as follows.

①ITEM No. setting



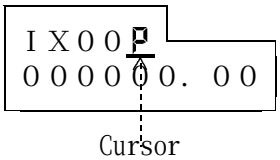
※Sets ITEM No.「１００１」.
※After setting, when ◘ key is pushed, it moves to ②.

② Index data selection



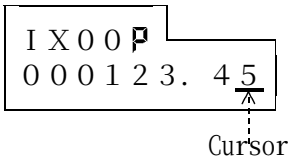
※Select Index data to edit.
※When ↑ key is pushed, Index data No. increases..
※When ↓ key is pushed, Index data No. decreases.
※At the time, currently set data are displayed.

③ Data input 1



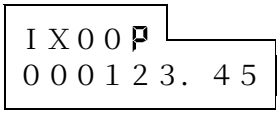
※When ∩ key is pushed, a cursor appears and data can be inputted.
※When ↑ or ↓ key is pushed, numeric value or a mark in the cursor column changes.
※When ◘ key is pushed, the cursor moves.
※To cancel input data, push ↑ ↓ keys at once.

④ Data input 2



※By the above operation, input setting data.

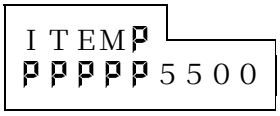
⑤ Data memory



※When ∩ key is pushed, a cursor disappears and setting data is memorized.

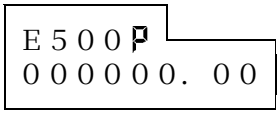
2） Index data edit (IX100～IX999) procedure is as follows.

①ITEM No. setting



※Set ITEM No.「５５００」(IX500～IX599 edit).
※After setting, when ◘ key is pushed, it moves to ②.

② Index data selection



※Select Index data to edit.(E500 is IX500.)
※When ↑ key is pushed, Index data No. increases.
※When ↓ key is pushed, Index data No. decreases.
※At the time, currently set data are displayed.

③ and below No. can be referred to Index data edit (IX00～IX99) procedure ③ and identical No. .

4－3 Index data specification (Handling on each command)

Setting item	Index data handling (Sample: 〔P302：command unit〕 is 0.1.)
Positioning position (data with mark)	※Data are as setting value. 【Sample】Index data setting -125.6 → Position -125.6mm
Positioning position (data without mark)	※When data are +, data are as setting value. 【Sample】Index data setting 125.6 → Position 125.6° ※When data are -, data are as setting value without - mark. 【Sample】Index data setting -325.6 → Position 325.6°
External trigger position (data without mark)	※When data are +, data are as setting value. 【Sample】Index data setting 125.6 → Position 125.6mm ※When data are -, data are as setting value without - mark. 【Sample】Index data setting -325.6 → Position 325.6mm
Speed (mm) (data without mark)	※When data are +, data are as setting value. 【Sample】Index data setting 125.6 → Speed 125.6mm/s ※When data are -, data are as setting value without - mark. 【Sample】Index data setting -325.6 → Speed 325.6mm/s ※When data are 0, data are min. setting unit speed. 【Sample】Index data setting 0.0 → Speed 0.1mm/s ※When data exceed rated speed, data are rated speed.
Speed (rpm) (data with mark)	※Data are as setting value without a decimal point. 【Sample】Index data setting -125.6 → Speed -1256rpm ※When data exceed rated speed, data are rated speed (rpm).
Time (data without mark)	※Data are as setting value without±mark and unit is 10msec.. 【Sample】Index data setting -125.6 → Time 12.56sec ※When data exceed setting range, data are max. value.
General output (data without mark)	※Data are as setting value without a decimal point and ±, and are lower 8 bit binary numbers converted from decimal number. 【Sample】Index data set -52.7 → General output ~~10~~00001111 (binary)
M output (data without mark)	※Data are as setting value without a decimal point and ± and are lower 2 bit binary numbers 【Sample】Index data setting -162.5 → M output 25
Address (data without mark)	※Data are as setting value without a decimal point. 【Sample】Index data setting 1.2 → Address 12 ※When data exceed setting range or「－」,Alarm stop occurs.
Looping times (data without mark)	※Data are as setting value without a decimal point and ±. 【Sample】Index data setting -1.2 → Looping 12 ※When data exceed setting range, data are max. value.
Processing data (data with mark)	※Data are as setting value without a decimal point. 【Sample】Index data setting -1.2 → Processing data -12 ※When processing data exceed Setting range, data are max. value.

［Tab.4－2］ Index data handling

Chapter 5 Command

5－1 Command list

Group	Title	Command name	Function
0 Motion command	NOP	No function [No OPeration]	No motion
	POS	Positioning [POSitioning]	Executes Positioning.
	HOME	Zero return [HOME positioning]	Executes Zero return.
	INDX	Index Positioning [INDeX positioning]	Executes Positioning rotating work to shorter rotating direction.
1 No motion command	M	M output [M out]	Waits for M complete after sending M output and M strobe signals.
	TIME	Timer [TIMEr]	Waits for specified time.
	PEND	Program end [Program END]	Finishes executing Program.
	CALL	Subroutine call [sub-routine CALL]	Repeats Subroutine specified times.
	RET	Subroutine return [sub-routine RETurn]	Indicates completion of specified Subroutine and returns to caller address.
2 processing command	IMOV	Transfer [Indirect MOVe]	Transfers specified data to Index data.
	ADD	Addition [ADDition]	Executes Addition and transfers the results to Index data.
	SUB	Subtraction [SUBtraction]	Executes Subtraction and transfers the results to Index data.
	MUL	Multiplication [MULtiplcation]	Executes Multiplication and transfers the results to Index data.
	DIV	Division [DIVision]	Executes Division and transfers the results to Index data.
	AND	Logical AND [AND]	Executes Logical AND and transfers the results to Index data.
	OR	Logical OR [OR]	Executes Logical OR and transfers the results to Index data.
	XOR	Exclusive logical OR [eXclusive OR]	Executes Exclusive logical OR and transfers the results to Index data.
3 Jump command	JMP	Un-conditional jump [JuMP]	Jumps to specified address without any condition.
	JZ	0 jump [Jump if Zero]	Jumps to specified address if branch decision (Index data) is 0.
	JNZ	Not 0 jump [Jump if Not Zero]	Jumps to specified address if branch decision (Index data) is not 0.
	JG	Greater than 1 jump [Jump if Greater than zero]	Jumps to specified address if branch decision (Index data) is 1 or greater.
	JL	Less than －1 jump [Jump if Less than zero]	Jumps to specified address if branch decision (Index data) is -1 or less.

[Tab. 5－1 (a)] Command list 1/3

Group	Title	Command name	Function
5 Continuous motion command	SPNS	Spin speed [SPiN Speed]	Achieves specified speed (rpm) for set Accel./ Decel. time.
	SPNT	Spin timer [SPiN Timer]	Retains rotating status reached by Spin speed command for specified time.
	SPNP	Spin positioning [SPiN POSitioning]	Executes Positioning from rotating status at Spin speed to specified position for set time.
	SPOS	Positioning [Sequential POSitioning]	Function is same as [POS] command and Program is continued even after the motion is completed.
	CONT	Simple continuous positioning [CONTinue POSitioning]	During this command continues, continues motion without stop. And if this is last or single command, function is same as SPOS.
	REPT	Repeat positioning [REPeaT POSitioning]	Repeats specified Positioning set times.
	SHOM	Zero return [Sequential HOME positioning]	Function is same as [HOME] command and Program is continued even after the motion is completed.
	SIND	Index Positioning [Sequential INDeX positioning]	Function is same as [INDX] command and Program is continued even after the motion is completed.

[Tab. 5－1 (b)] Command list 2/3

Group	Title	Command name	Function
4 Driver command	TRQ	Torque control [ToRQue]	Executes Torque control by External torque command (Analog input command) or Internal torque command.
	SPD	Speed control [SPeeD]	Executes Speed control by External speed command (Analog input command) or Internal speed command.

[Tab. 5－1 (c)] Command list 3/3

5－2 Command setting

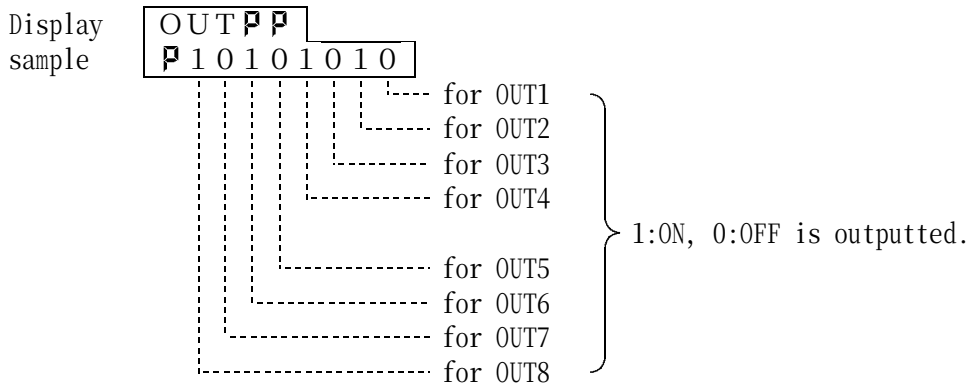
［1］Common setting items

① Accel./Decel. time selection
Conduct setting of Acceleration and Deceleration time by parameters and select a combination from the below tabulation.

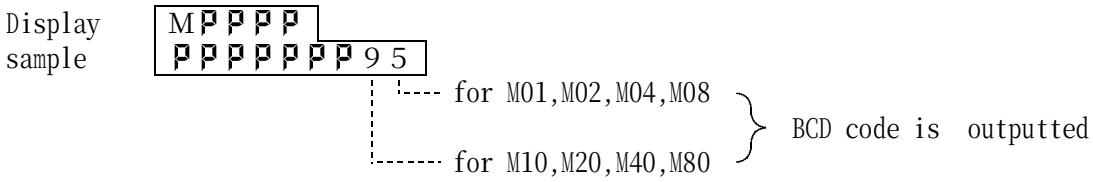
Accel./ Decel. time selection	Accel./ Decel time setting (parameter)
ＳＥＬ． １	Accel.time is set〔P211：Accel.time 1〕. Decel.time is set〔P214：Decel.time 1〕.
ＳＥＬ． ２	Accel.time is set〔P212：Accel.time 2〕. Decel.time is set〔P215：Decel.time 2〕.
ＳＥＬ． ３	Accel.time is set〔P213：Accel.time 3〕. Decel.time is set〔P216：Decel.time 3〕.

［Tab.５－２］Combination of Accel./ Decel. time

② General output



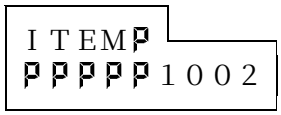
③ M output



[2] Setting method

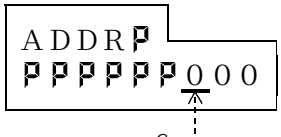
Command Edit procedure is as follows.

①ITEM No. setting



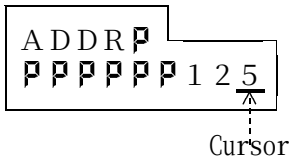
※Set ITEM No.「1002」.
※After setting,when key pushed, it moves to ②.

② Edit address input 1



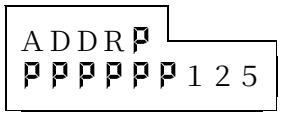
※When key is pushed, a cursor appears and data can be inputted.
※When or key is pushed, numeric value in the cursor column changes.
※When key is pushed the cursor moves.
※To cancel input data, push keys at once.

③ Edit address input 2



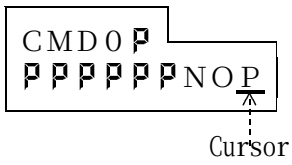
※By the above operation, input Edit address.

④ Edit address decision



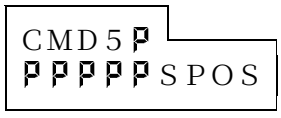
※When key is pushed, a cursor disappears and Edit address is decided.
※After decision, when key is pushed, it moves to ⑤.

⑤ Edit command selection



※When key is pushed, a cursor appears and data can be inputted.
※Push key to select command group.
※Push or key to select Edit command.

⑥ Edit command decision



※When key is pushed, a cursor disappears and Edit command is decided.
※After decision, when key is pushed, it moves to ⑦.

⑦ Edit of each setting item of selected command
→ Refer to the command specification described from next page.
Edit (Numeric value input or menu selection) procedure of each setting item is identical to Parameter edit.

5－3 Command specification

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 0 》 [Motion command]					
NOP	No function [No OPeration]	No ①	None	None	None
			・No motion		
POS	Positioning [POSitioning]	No ②	POS [Positioning position・direction]	mm/°/in	-99999999～99999999 IX0000～IX1999
			A/I [Absolute position /Relative position]	None	ABSOLUTE／INCREMENT
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./Decel.time]	None	SEL.1／SEL.2／SEL.3
			TRG [External trigger position]	mm/°/in	00000000～99999999 IX0000～IX1999
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Executes Positioning. ・External trigger positioning can be conducted. External trigger position sets travel amount from TRG signal input. ・General output can be sent when motion starts. ・Finishes Program after motion is completed.		
HOME	Zero return [HOME positioning]	No ②	TYPE [Zero return method]	None	STD.HOME／LS LESS／ STOP HOME／OT HOME
			DIR [Motion direction]	None	FORWARD／REVERSE
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Executes Zero return. ・Zero return method and direction set can be conducted.・ Except command setting data, this follows Zero return associated parameters. ・General output can be sent when motion starts.。 ・Finishes Program after motion is completed.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 0 》 [Motion command]					
ＩＮＤＸ	Index Positioning [INDeX positioning]	No ②	POS [Positioning position・direction]	mm/°/in	00000000～99999999 IX0000～IX1999
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./ Decel.time]	None	SEL.1／SEL.2／SEL.3
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Executes Positioning rotating work to shorter rotating direction. ・General output can be sent when motion starts. ・Finishes Program after motion is completed.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 1 》 [No motion command]					
M	M output [M out]	Ys ①	M [M output]	None	00～99 IX0000～IX1999
			・Waits for M complete signal after sending M output and M strobe signal. ・Outputted M output retains data until a command in effective setting status for next M output is executed. ・If this command is executed with M complete input, M strobe is not outputted until the input signal is OFF.		
TIME	Timer [TIMEr]	Ys ①	Time [Timer time]	0.01sec	000000.00～999999.99 IX0000～IX1999
			Out [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Waits for specified time. ・General output can be sent when motion starts.		
PEND	Program end [Program END]	No ②	None	None	None
			・Finishes executing Program. ・When this command is completed, Program end signal (PEND) and Auto. run ready signal (PRDY) is outputted. ・General output and M output are retained.		
CALL	Subroutine call [sub-routine CALL]	Ys ④	CADR [Called address]	None	000～279 IX0000～IX1999
			REPT [Looping time]	None	00000～65535 IX0000～IX1999
			・Repeats Subroutine specified by CADR (REPT times). ・Nesting (Looping time of executing this command without conducting return) can be conducted max. 8 times. ・When Looping time is「0」, this command is neglected and next command is executed.		
RET	Subroutine return [sub-routine RETurn]	Ys ①	None	None	None
			・Finishes called Subroutine and returns to caller address. ・When Subroutine is executed specified time, executing address is changed to next address of the caller.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 2 》 [Processing command]					
IMOV	Transfer [Indirect MOVe]	No ①	DST [Transfer destination]	None	IX0000～IX1999
			SOC [Transfer origin data]	None	-99999999～99999999 IX0000～IX1999
			・Transfers specified data to Index data. Expression： ＤＳＴ（Index） ← ＳＯＣ		
ADD	Addition [ADDition]	No ①	DST [Addition results transfer destination]	None	IX0000～IX1999
			SOC1 [Addition factor 1]	None	-99999999～99999999 IX0000～IX1999
			SOC2 [Addition factor 2]	None	-99999999～99999999 IX0000～IX1999
			・Executes Addition and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) ・Processing results are clumped at±99999999. Expression： ＤＳＴ（Index） ← ＳＯＣ１ ＋ ＳＯＣ２		
SUB	Subtraction [SUBtraction]	No ①	DST [Process. results transfer destination]	None	IX0000～IX1999
			SOC 1 [Subtraction factor1]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Subtraction factor2]	None	-99999999～99999999 IX0000～IX1999
			・Executes Subtraction and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) ・Processing results are clumped at±99999999. Expression： ＤＳＴ（Index） ← ＳＯＣ１ － ＳＯＣ２		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 2 》 [Processing command]					
MUL	Multiplication [MULtiplcation]	No ①	DST [Process. results transfer destination]	None	IX0000～IX1999
			SOC 1 [Multiplication factor1]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Multiplication factor2]	None	-99999999～99999999 IX0000～IX1999
			・Executes Multiplication and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) ・Processing results are clumped at±99999999. Expression： ＤＳＴ (Index) ← ＳＯＣ １ × ＳＯＣ ２		
ＤＩＶ	Division [DIVision]	No ①	DST 1 [Division remainder transfer destination]	None	IX0000～IX1999
			DST2 [Division quotient transfer destination]	None	IX0000～IX1999
			SOC 1 [Dividend]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Divisor]	None	-99999999～99999999 IX0000～IX1999
			・Executes Division and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) Expression： ＤＳＴ２ (Index) ← ＳＯＣ１ ÷ ＳＯＣ２ ＤＳＴ１ (Index) ← Remainder		
AND	Logical AND [AND]	No ①	DST [Process. results transfer destination]	None	IX0000～IX1999
			SOC 1 [Logical AND factor 1]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Logical AND factor 2]	None	-99999999～99999999 IX0000～IX1999
			・Executes AND and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) Expression： ＤＳＴ (Index) ← ＳＯＣ１ ＡＮＤ ＳＯＣ２		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 2 》 [Processing command]					
OR	Logical OR [OR]	No ①	DST [Process. results transfer destination]	None	IX0000～IX1999
			SOC 1 [Logical OR factor1]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Logical OR factor2]	None	-99999999～99999999 IX0000～IX1999
			・Executes OR and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) Expression： ＤＳＴ（Index） ← ＳＯＣ１ ＯＲ ＳＯＣ２		
XOR	Exclusive logical OR [eXclusive OR]	No ①	DST [Process. results transfer destination]	None	IX0000～IX1999
			SOC 1 [Exclusive logical OR factor 1]	None	-99999999～99999999 IX0000～IX1999
			SOC 2 [Exclusive logical OR factor 2]	None	-99999999～99999999 IX0000～IX1999
			・Executes Exclusive OR and transfers the results to Index data. ・In case of Index data, a decimal point is neglected and numeric value is handled as integer for processing. (Sample：1.25 is handled as 125 for processing.) Expression： ＤＳＴ（Index） ← ＳＯＣ１ ＸＯＲ ＳＯＣ２		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 3 》 [Jump command]					
JMP	Un-conditional jump [JuMP]	Ys ①	JADR [Jump destination address]	None	000～279 IX0000～IX1999
			・Jumps to specified address without any condition.		
JZ	0 Jump [Jump if Zero]	Ys ①	JADR [Jump destination address]	None	000～279 IX0000～IX1999
			SOC [Branch condition decision data]	None	IX0000～IX1999
			・Jumps to specified address when Branch decision is 0.		
JNZ	Not 0 Jump [Jump if Not Zero]	Ys ①	JADR [Jump destination address]	None	000～279 IX0000～IX1999
			SOC [Branch condition decision data]	None	IX0000～IX1999
			・Jumps to specified address when Branch decision is not 0.		
JG	Greater than 1 jump [Jump if Greater than zero]	Ys ①	JADR [Jump destination address]	None	000～279 IX0000～IX1999
			SOC [Branch condition decision data]	None	IX0000～IX1999
			・Jumps to specified address when Branch decision is 1 or more.		
JL	Less than －1 jump [Jump if Less than zero]	Ys	JADR [Jump destination address]	None	000～279 IX0000～IX1999
			SOC [Branch condition decision data]	None	IX0000～IX1999
			・Jumps to specified address when Branch decision is - 1 or less .		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 5 》 [Continuous motion command]					
SPNS	Spin speed [SPiN Speed]	No ①	RPM [Speed]	rpm	-9999～9999 IX0000～IX1999
			TIME [Accel./ Decel.time]	0.01sec	000.00～655.35 IX0000～IX1999
			M [M output]	None	00～99 IX0000～IX1999
			・Achieves specified speed(rpm) for set Accel./Decel.time. But if Accel./ Decel.time setting exceeds the following stipulated max. value, Accel./ Decel.is conducted at the max. value, and the reached speed is constantly retained during excess time. Stipulated time： Max.Accel.time from 0 rpm to rated speed ：300.00 sec. Max.Decel.time from rated speed to 0 rpm.：300.00 sec. ・Can send M output at Motion start and wait for M completion . ・When Hold (HLD) is inputted in executing this command, a motor decelerates and stops for [P214:Decel.time 1] and at restart M strobe signal output is OFF.		
SPNT	Spin timer [SPiN Timer]	No ①	TIME [Retaining time]	0.01sec	000000.00～999999.99 IX0000～IX1999
			M [M output]	None	00～99 IX0000～IX1999
			・Retains speed status at Spin speed for specified time. ・Can send M output at Motion start and wait for M completion . ・When Hold (HLD) is inputted in executing this command, a motor decelerates and stops for [P214:Decel.time 1] and at restart M strobe signal output is OFF.		
SPNP	Spin positioning [SPiN Positioning]	Ys ①	POS [Positioning position]	mm/°/in	00000000～99999999 IX0000～IX1999
			DOWN [Decel. time selection]	None	SEL.1／SEL.2／SEL.3
			M [M output]	None	00～99 IX0000～IX1999
			・Executes Positioning from rotating status at Spin speed to specified position for set time. ・When Hold (HLD) is inputted in executing this command, a motor decelerates and stops for DOWN setting.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 5 》 [Continuous motion command]					
SPOS	Positioning [Sequential POSitioning]	Ys ①	POS [Positioning position・direction]	mm/°/in	-99999999～99999999 IX0000～IX1999
			A/I [Absolute position /Relative position]	None	ABSOLUTE／INCREMENT
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./Decel.time]	None	SEL.1／SEL.2／SEL.3
			TRG [External trigger position]	mm/°/in	00000000～99999999 IX0000～IX1999
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Motion is identical to POS (Positioning) command. But next address is executed after motion is completed.		
CONT	Simple continuous Positioning [CONTinue positioning]	Ys ②	POS [Positioning position・direction]	mm/°/in	-99999999～99999999 IX0000～IX1999
			A/I [Absolute position /Relative position]	None	ABSOLUTE／INCREMENT
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./Decel.time]	None	SEL.1／SEL.2／SEL.3
			TRG [External trigger position]	mm/°/in	00000000～99999999 IX0000～IX1999
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・When this command continues and motion direction is unchanged, Positioning is continued without stop. ・When this command is single, function is same as SPOS. ・External trigger positioning can be conducted. And External trigger positioning sets travel amount from TRG input. ・General output can be sent when motion starts. ・Accel./Decel.time and External trigger positioning in Continuous motion follows start block of this motion ‘UPDN’ and ‘TRG’.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 5 》 [Continuous motion command]					
REPT	Repeat Positioning [REPeaT positioning]	Ys ③	POS [Positioning position・direction]	mm/°/in	-99999999～99999999 IX0000～IX1999
			A/I [Absolute position /Relative position]	None	ABSOLUTE／INCREMENT
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./ Decel.time]	None	SEL.1／SEL.2／SEL.3
			TRG [External trigger position]	mm/°/in	00000000～99999999 IX0000～IX1999
			M [M output]	None	00～99 IX0000～IX1999
			REPT [Looping time]	None	00000～65535 IX0000～IX1999
			・Repeats specified Positioning set times. ・External trigger positioning can be conducted. And External trigger positioning sets travel amount from TRG signal input. ・Can send M output at Motion start and wait for M completion . ・If Looping time is「0」, Repeat positioning is not conducted.		
SHOM	Zero return [Sequential HOMe positioning]	Ys ①	Type [Zero return method]	None	STD.HOME／LS LESS／ STOP HOME／OT HOME
			DIR [Motion direction]	None	FORWARD／REVERSE
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Motion is identical to 0 HOME (Zero return) command. But next address is executed after motion is completed.		
SIND	Index Positioning [Sequential IND-ex positioning]	Ys ①	POS [Positioning position・direction]	mm/°/in	00000000～99999999 IX0000～IX1999
			F [Positioning speed]	mm, °,in /sec	0000000～9999999 IX0000～IX1999
			UPDN [Accel./Decel.time]	None	SEL.1／SEL.2／SEL.3
			OUT [General output]	Binary number	00000000～11111111 IX0000～IX1999
			・Motion is identical to INDX (Index Positioning) command. Program is finished after motion is completed.		

Title	Command name	B S	Setting data: Data	Setting unit	Setting range (Direct data) (Index data)
			Function		
《Group 4 》 [Driver command]					
TRQ	Torque control [ToRQue]	Ys ①	TRQ [Torque command selection]	None	SEL0～SEL3
			M [M output]	None	00～99 IX0000～IX1999
			・Executes Torque control in accordance with Torque command selection. ・When「SEL0」is selected by Torque command selection, motion is conducted by External torque command ・When「SEL1～3」is selected by Torque command selection, motion is conducted by parameters [P136～P138: Torque command 1～3]. ・Sends M output at Motion start and becomes Complete motion by M completion (MFIN) input. ・Complete motion conducts Servo lock after Decel.stop and executes next command. ・When Hold (HLD) is inputted in executing this command, a motor decelerates and stops. ・Decel. stop at Complete motion and Hold (HLD) is conducted by [P216: Decel. time 3].		
SPD	Speed control [SPeeD]	Ys ①	SPD [Speed command selection]	None	SEL0～SEL7
			M [M output]	None	00～99 IX0000～IX1999
			・Executes Speed control in accordance with Speed command selection. ・When「SEL0」is selected by Speed command selection, motion is conducted by External speed command ・When「SEL1～7」is selected by Speed command selection, motion is conducted by parameters [P129～P135: Speed command 1～7]. ・Accel./ Decel. is conducted by [P213: Accel.time 3], [P216: Decel. time 3]. ・Sends M output at Motion start and becomes Complete motion by M completion (MFIN) input. ・Complete motion conducts Servo lock after Decel.stop and executes next command. ・When Hold (HLD) is inputted in executing this command, a motor decelerates and stops. ・Decel. stop at Complete motion and Hold (HLD) is conducted in accordance with [P216: Decel. time 3].		

Supplement of Command specification description

BS column indicates Block stop function at each command end.
(Block stop function executes stop motion at command end by Block stop signal (BTSP) in Auto. run.)

「No ①」neglects Block stop signal and executes next address command.

「No ②」neglects Block stop signal and executes commands to Program end.

「Ys ①」makes wait condition for restart when a command is completed.
Next address command is executed by restart.

「Ys ②」makes wait condition for restart when Continuous motion is completed and a motor stops.
Next address command of Block stop completion is executed by restart.

「Ys ③」makes wait condition for restart when all the Repeat positioning is completed.
Next address command is executed by restart.

「Ys ④」makes wait condition for restart after calling specified address.
Specified address command is executed by restart and this command is continued or restarted.

Cautions common to commands

Caution 1) Program run is terminated by input of one of 「POS」/「HOME」/「INDX」/「PEND」commands.

Caution 2) Available range of General output and M output depends on a controller type.

Controller type	Local control output (connector:J5)	Serial communication (connector:J1)	Sequence control (aux.relay M)	Remote sequence control (output relay X)
NCS-FI/FS10	No	Yes ②	No	No
NCS-FI/FS12	Yes ①※1	Yes ②	No	No
NCS-FI/FS13	No	Yes ②	No	Yes ②※2
NCS-FI/FS22	No	Yes ②	Yes ②※2	No
NCS-FI/FS23	No	Yes ②	Yes ②※2	No

Yes ①：Either General outputs or M outputs can be outputted externally.
Yes ②：All of General outputs and M outputs can be outputted remotely.
No：General outputs and M outputs can not be outputted.

※1：OUT or M output of Local control output may not be conducted by the parameter 〔P717：Output signal function selection 1〕setting.
Description can be referred to「3-3 Parameter specification」.

※2：External output can be conducted by sequence program.

Caution 3) More detailed specification than this manual can be referred to the separate manual『Volume: Command』.

5－4　Driver command description

5－4－1 【TRQ】 Torque control

『Function』

⚠This command executes Torque control which has next function.
(Next address command is executed after this command is completed.)

① Torque control is executed in accordance with Torque command selection.

② When「SEL0」is selected by Torque command selection, motion is conducted by External torque command (TQH).

③ When「SEL1～3」is selected by Torque command selection, motion is conducted by parameters [P136～P138:Torque command value 1～3].

④ M output is sent at this command start and Complete motion is achieved by M completion input (MFIN).
Complete motion conducts Servo lock after Decel. stop and executes next command.

⑤ When Hold (HLD) is inputted in executing this command, deceleration stop is conducted and then Servo lock works.

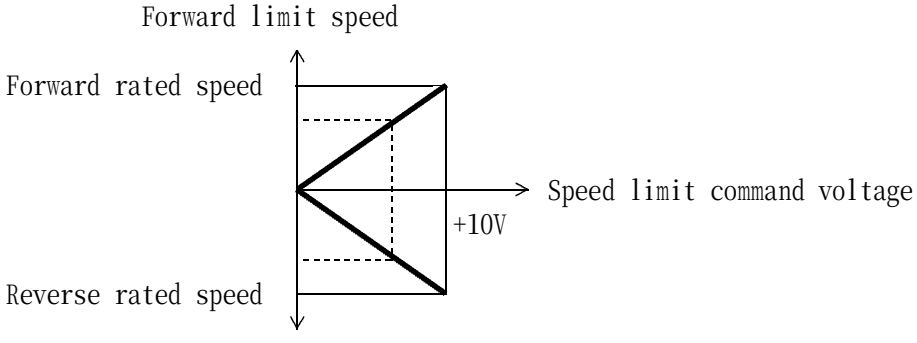
⑥ Decel.stop at Complete motion and Hold (HLD) are conducted for [P216:Decel.time 3].

⑦ When restart is conducted after Hold (HLD) is executed, Torque control continues. However if M complete is inputted in executing Hold (HLD) , this command will be completed at restart.

⑧ Torque limit value can be changed by Torque limit signal (TL) in executing this command.

⑨ Positioning complete signal (PN) and Rough matching signal (PRF) is OFF at this command start.

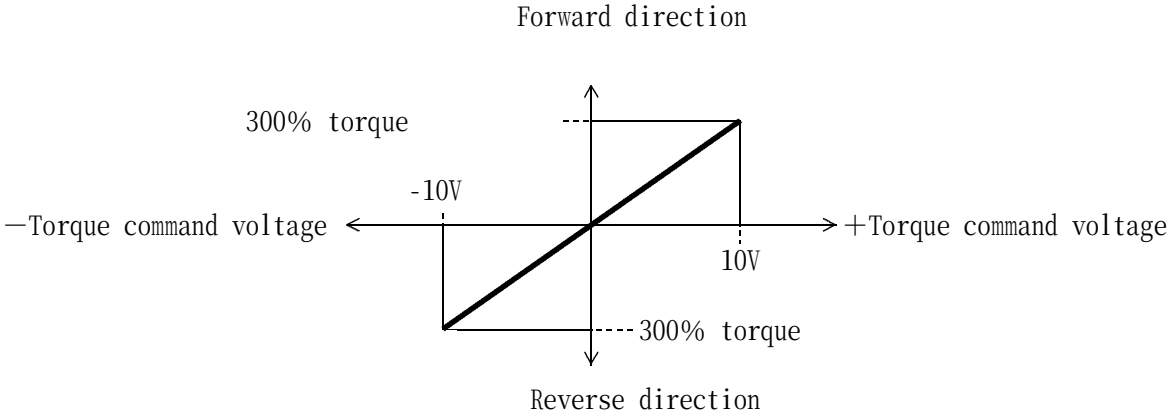
⑩ Relation of Speed limit command and motor max. speed.
- In order to depress motor speed increase at light load, etc. in Torque control, motor max. speed can be limited.
- Limit value is lower value of External speed limit command (common to External speed command (INH) value and the parameter P128「Speed limit value」.
- Motor max. speed is proportional to External speed limit command value and rated speed at DC+10V input.
- External speed limit command and P128「Speed limit value」is common set for both forward and reverse directions.
- Enable / Disable of External speed limit command can be selected by the parameter P127「External speed limit command enable/ disable selection」.



[Fig.5－1] Relation of Speed limit command and motor speed

⑪ Relation of External torque command and Motor output torque

- Motor output torque is proportional to External Torque command voltage and 300% output torque at DC±10V input.(When rated torque is 100%.)
- By positive External torque command voltage, a motor generates forward output torque.
- By negative External torque command voltage, a motor generates reverse output torque.



[Fig. 5－2] Relation of External Torque command and Motor output torque

『Setting』

① Title display	Setting contents		
↑ Display sequence	Setting unit	Setting range (Direct data) (Index data)	Initial value
	Reference (Details and supplement of Setting description)		

《Group４：ＴＲＱ》

① ＴＲＱP P	Torque command selection		
	None	SEL.0 ～ SEL.3	SEL.0
	⚠SEL.0～SEL.3 of Torque command		

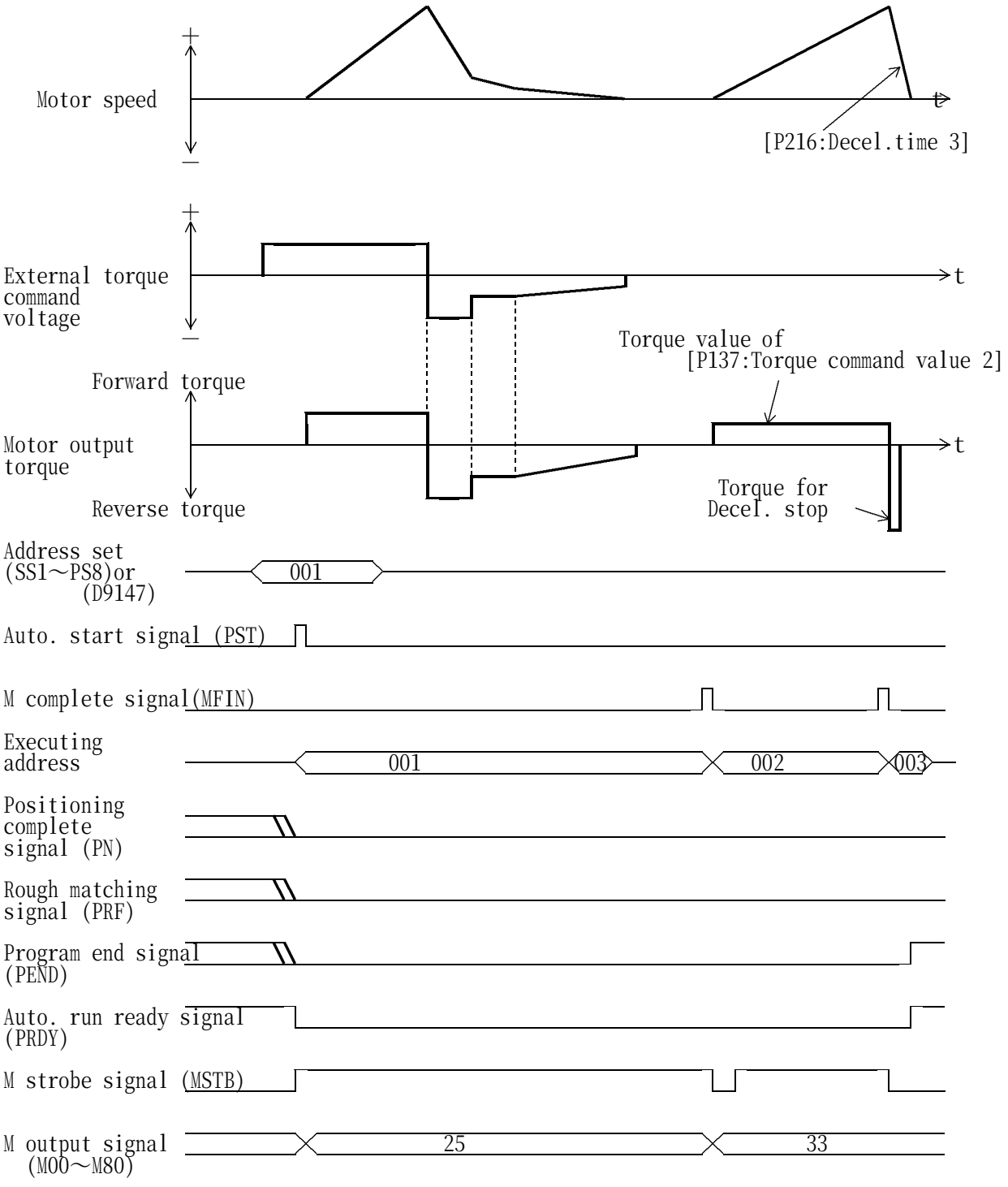
Torque command selection	Torque command value
SEL.0	External torque command (TQH signal)
SEL.1	Parameter [P136:Torque command value1]
SEL.2	Parameter [P137:Torque command value2]
SEL.3	Parameter [P138:Torque command value3]

② MP	M output data		
	Bcd 2 digits	00～99 IX0000～IX1999	/00
	⚠When M output data are disabled, M output data are not sent but M strobe (MSTB) is ON and M completion is waited.		

『Motion sample』

《Torque control motion sample》

ADDR	CMD	TRQ	M			Reference
001	TRQ	SEL.0	25			
002	TRQ	SEL.2	33			
003	PEND	-----	-----			



5－4－2 【SPD】 Speed control

『Function』

⚠This command executes Speed control which has next function.
(Next address command is executed after this command is completed.)

① Speed control is executed in accordance with Speed command selection.

② When「SEL0」is selected by Speed command selection, motion is conducted by External Speed command (INH).

③ When「SEL1～7」is selected by Speed command selection, motion is conducted by parameters [P129～P135:Speed command value 1～7].

④ M output is sent at motion start and Complete motion is achieved by M completion input (MFIN).
Complete motion conducts Servo lock after Decel. stop and executes next command.

⑤ When Hold (HLD) is inputted in executing this command, deceleration stop is conducted.

⑥ Decel.stop at Complete motion and Hold (HLD) are conducted for [P216:Decel.time 3].

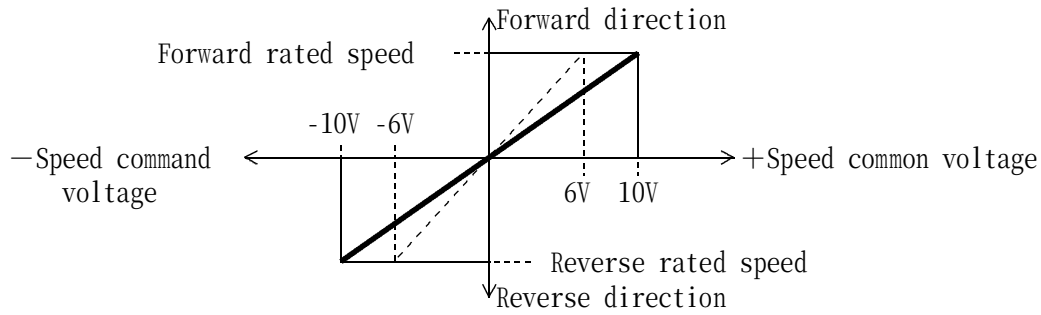
⑦ When restart is conducted after Hold (HLD) is executed, Speed control continues. However if M complete is inputted in executing Hold (HLD) , this command will be completed at restart.

⑧ Positioning complete signal (PN) and Rough matching signal (PRF) are OFF at this command start.

⑨ Accel./ Decel time in Speed control is determined by parameters [P213: Accel. time 3] and [P216:Decel.time 3].

⑩ When「SEL1～7」is selected by Speed limit command selection and motion is conducted, Override (OR1～OR4) is effective to Speed command value in real time.. For instance, when Override is set 70% to Speed command value 1000 rpm, motor speed is 700 rpm.

⑪ Relation of External speed command and Motor speed
・Motor speed is proportional to External speed command voltage and is rated speed at DC±10V input.
And by the parameter P124「Speed command gain」, Speed command voltage to rated speed can be set at DC±6V～±10V input.



[Fig.5－3] Relation of External Speed command and motor speed

『Setting』

① Title display	Setting contents		
↑ Display sequence	Setting unit	Setting range (Direct data) (Index data)	Initial value
	Reference (Details and supplement of Setting description)		

《Group４：ＳＰＤ》

① ＳＰＤ𝗣𝗣	Speed command selection		
	None	SEL.0 ～ SEL.7	SEL.0
	⚠SEL.0～SEL.7 of Speed command		

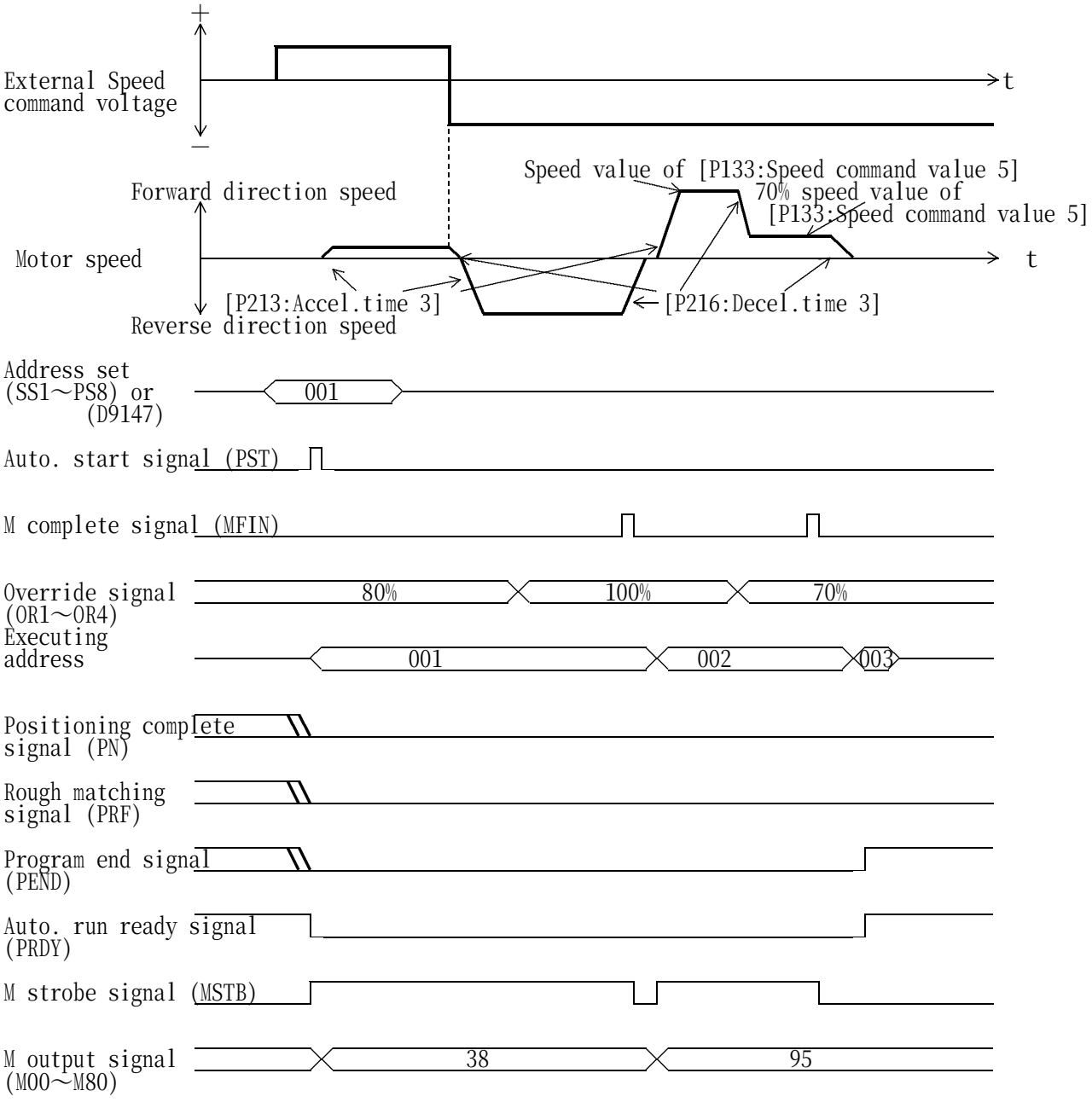
Speed command selection	Speed command value
SEL.0	External Speed command (INH signal)
SEL.1	Parameter [P129:Speed command value 1]
SEL.2	Parameter [P130:Speed command value 2]
SEL.3	Parameter [P131:Speed command value 3]
SEL.4	Parameter [P132:Speed command value 4]
SEL.5	Parameter [P133:Speed command value 5]
SEL.6	Parameter [P134:Speed command value 6]
SEL.7	Parameter [P135:Speed command value 7]

② M𝗣	M output data		
	BCD 2 digits	00～99 IX0000～IX1999	/00
	⚠When M output data are disabled, M output data are not sent but M strobe (MSTB) is ON and M completion is waited.		

『Motion sample』

《Speed control motion sample》

ADDR	CMD	TRQ	M			Reference
001	SPD	SEL.0	38			
002	SPD	SEL.5	95			
003	PEND	-----	-----			



5－5 Driver command format

Driver command format in communication is described.
And as for「commands other than Driver」, please refer to the separate manual『Volume : Communication protocol』.

Device No. corresponding to each Command data item starts first device No. of the specified Command data address.

＜Sample＞
When Command data address is 「0」, first device № is「R0800」and following Command data device № is {[First №]+0＝R0800} ～ {[First №]+9＝R0809} .
In the below tabulation, Command data address ＝「0」and [First №]＝R0800 are introduced as a sample.

[Torque control command (ＴＲＱ)]

Device No. (sample)	Device №	(bit) Item F E D C B A 9 8 7 6 5 4 3 2 1 0			
R0800	[First №]+0	Command･code:40H		Index set flag Bit (0:Direct, 1:Index) 3：DT3 Direct/ Index set Set 0 for other than above.	
R0801	[First №]+1	DT5：Set 0. (Un-used)	DT6：Torque command selec. 0:SEL0 1:SEL1 2:SEL2 3:SEL3	DT7：Set 0. (Un-used)	DT8： M output 0: Disable 1: Enable
R0802	[First №]+2	DT0：Set 0. (Un-used) High order data			
R0803	[First №]+3	Low order data			
R0804	[First №]+4	DT1：Set 0. (Un-used) High order data			
R0805	[First №]+5	Low order data			
R0806	[First №]+6	DT2：Set 0. (Un-used) High order data			
R0807	[First №]+7	Low order data			
R0808	[First №]+8	DT3：M output data (Only bits 0～7 are used.)			
R0809	[First №]+9	DT4：Set 0. (Un-used)			

[Tab.５－３] Torque control command (TRQ) data type

[Speed control command (ＳＰＤ)]

Device No. (sample)	Device №	(bit) Item F E D C B A 9 8 7 6 5 4 3 2 1 0			
R0800	[First №]+0	Command code : 41H		Index set flag Bit (0:Direct, 1:Index) 3 : DT3 Direct/ Index set Set 0 for other than above.	
R0801	[First №]+1	DT5 : Set 0. (Un-used)	DT6 : Speed command selec. 0:SEL0, 4:SEL4 1:SEL1, 5:SEL5 2:SEL2, 6:SEL6 3:SEL3, 7:SEL7	DT7 : Set 0. (Un-used)	DT8 : M output 0 : Disable 1 : Enable
R0802	[First №]+2	DT0 : Set 0. (Un-used) High order data			
R0803	[First №]+3	Low order data			
R0804	[First №]+4	DT1 : Set 0. (Un-used) High order data			
R0805	[First №]+5	Low order data			
R0806	[First №]+6	DT2 : Set 0. (Un-used) High order data			
R0807	[First №]+7	Low order data			
R0808	[First №]+8	DT3 : M output data (Only bits 0～7 are used.)			
R0809	[First №]+9	DT4: Set 0. (Un-used)			

[Tab. 5－4] Speed data command (SPD) data type

Chapter 6 Protective function

6－1 Protective function and error treatment

The controller has various Protective function to prevent a controller or a motor from damage, and Error treatment function to inform operation error, etc. .
Protective function consists of 「Alarm treatment」and 「Warning treatment」
And Error treatment function has 「Error display」.

① Alarm treatment
when an error is detected, a motor stops (sudden stop or Torque free based on an error type) and Alarm signal output and Alarm message display are conducted, simultaneously.

② Warning treatment
If it is supposed to probably become error if current operation is continued, Warning of error notice will be made.
The controller outputs Warning signal when Warning occurs and display Warning message but does not stop motor motion.

③ Error display
When operation error, input error, etc. occurs, Error message is displayed on the spot.

	Treatment description when Error occurs (detected).		
	Motor motion status	Control out. signal	LCD display
Alarm treat	Sudden stop or Torque free	Alarm signal ON	Alarm message
Warning treat.	Current motion continues.	Warning signal ON	Warning message
Error display	Current motion continues.	Un-changed	Error message

[Tab. 6－1] Error occurrence and treatment

6－2 Protective function list

6－2－1 Alarm list

Name / Display	Contents	Motion and output signal status	Way to release
I PM error ALM. P I PM ERR.	Due to line-to-ground of motor or same and short-circuit of U,V,W cables between controller and motor over-current flows in main circuit transistor or cooling heat sink for power element is over-heated.	Motor torque free. Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Control power under voltage error ALM. P UNDRVOLT1	Control power (+5V、+15 V) voltage dropped. DC+5V：About +4.75V or less DC+15V：About +13.5V or less	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Main power source under voltage error ALM. P UNDRVOLT2	Main circuit DC bus voltage dropped less than 180[370]V. In [ ], value of 400V type (In case of controller combined with main power type detects Alarm.)	Motor stops and torq. free by〔P713〕. Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Over-voltage error ALM. P OVERPVOLT	Due to excess load inertia, etc.at motor stop or decel. regenerative energy is beyond capacity and DC power voltage of main circuit exceeds about 400 [820]V. In [ ], value of 400V type	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Motor over-heat error ALM. P OVERHEAT2	Motor temp. detection thermister is 150°C or more.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Wait until motor becomes cool, then ①Power reinput ②Reset signal (RST) input
Disconnection of thermister ALM. P THERMIST.	Cable of motor temp. detection thermister is broken or disconnected.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Confirm wiring, then ①Power reinput ②Reset signal (RST) input
Encoder fault ALM. P PPENCODER	①Encoder fault ②Disconnect. or break of encoder cable or loose fitness of connector. ③Wrong encoder selection by parameter, etc. occurred.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Confirm encoder, encoder cable and parameter「P001」, then ①Power reinput

[Tab. 6－2 (a)] Alarm list 1/9

Name / Display	Contents	Motion and output signal status	Way to release
Motor shaft error at ALM. P PW. ONPENC power input	Motor shaft has been rotated or vibrated when power is turned ON. In the case, encoder can not be initialized. 【Detection only for NCS-FS type】	Motor torque free Alarm ON Warning OFF Servo ready OFF	Power reinput
Overspeed error ALM. P OVERSPEED	Motor speed is more than about 130 % of rated speed.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Over-load error ALM. P OVERPLOAD	Due to over-load, or too frequent ON/OFF than allowable times, internal electric thermal is activated.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
AC loss detection error ALM. P PPACPDOWN	AC power voltage dropped less than about 145[290] V for 50ms or more. (Black out occurred.) In [ ], value of 400V type	Motor stops and torque free by[P713]. Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Deviation over-flow ALM. P POVERFLOW	Position deviation exceeds setting value of 〔P207：Over-flow detection pulse〕.	Sudden motor stop and torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Deviation error ALM. P VARI. OVER	Position deviation exceeds setting of 〔P208：Deviation error detection pulse〕. ※ But it is applied when「STOP :Alarm stop」is selected by 〔P209：Motion selection at Deviation error〕.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Power reinput ②Reset signal (RST) input

*1：Status when「RDY1」is selected by [P716: RDY signal spec. selection].
If other is selected, status could be different.

[Tab. 6－2 (b)]　Alarm list 2/9

Name Display	Contents	Motion and output signal status	Way to release
Forward over travel ALM. P +HARDPOT.	Forward over travel signal(FOT) is detected.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Motor moves to reverse by Jog motion and release forward over-travel.
Reverse over travel ALM. P −HARDPOT.	Reverse over travel signal(ROT) is detected.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Motor moves to forward by Jog motion and release reverse over-travel.
Forward software over travel ALM. P +SOFTPOT.	Current position exceeds setting value of〔P306 :Forward software OT limit〕.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Motor moves to reverse travel limit by Jog motion.
Reverse software over travel ALM. P −SOFTPOT.	Current position exceeds setting value of〔P307 :Reverse software OT limit〕.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Motor moves to forward travel limit by Jog motion.

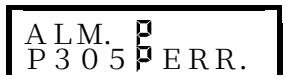
*1 : Status when「RDY1」is selected by [P716: RDY signal spec. selection] .
If other is selected, status could be different.

[Tab. 6 − 2 (c)] Alarm list 3/9

Name / Display	Contents	Motion and output signal status	Way to release
No set of motor type ALM. P MOTRTYPE1	Setting of〔P000：Motor type〕is「000」.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Set motor type, then ①Power reinput
Motor type error ALM. P MOTRTYPE2	Combination of motor and controller selected by〔P000：Motor type〕is wrong.	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Set motor type correctly, then ①Power reinput
Extended memory cell under voltage error ALM. P RAM BATT.	Voltage of data hold cell for extended memory (option) dropped. (Only once, Alarm is outputted in power ON status.)	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Reset signal (RST) input. Immediate replacement of extended memory by us is required.
EEPROM (nan-volatile) write error ALM. P WR. EEPROM	Write of data to EEPROM (in controller) was failed.	Sudden motor stop and Servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Power reinput ②Reset signal (RST) input
Rated speed command error 1 ALM. P STD. SPD. 1	Speed at motor rated speed set by〔P303,P304: Electric gear ratio〕and〔P310：Machine travel amount〕exceeds 2M (setting unit / sec).	Motor torque free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Correct〔P303, P304：Electric gear ratio〕and〔P310： Machine travel amount〕, then ①Power reinput ②Reset signal (RST) input
Rated speed command error 2 ALM. P STD. SPD. 2	Speed at motor rated speed set by〔P303,P304: Electric gear ratio〕and〔P310：Machine travel amount〕is less than 100mm (setting unit / sec).		
Address set error ALM. P ADDRP ERR.	Command out of 0～279 range was specified and tried.	Motor servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Correct to right address, then ①Power reinput ②Reset signal (RST) input

*1：Status when「RDY1」is selected by〔P716: RDY signal spec. selection〕.
If other is selected, status could be different.

〔Tab. 6－2 (d)〕 Alarm list 4/9

Name / Display	Contents	Motion and output signal status	Way to release
Positioning time over 	Positioning is not completed after set time 〔P203：Positioning time over〕 passed.	A motor sudden stops and in servo lock. Alarm ON Warning OFF Servo ready ON *1 Brake release ON	①Power reinput ②Reset signal (RST) input
Positioning data over-flow 	Simple continuous positioning is tried to execute continuous travel distance out of range 2147483647～ -2147483647.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Set continuous travel distance in the range. ①Power reinput ②Reset signal (RST) input
No 1 rotation data set error 	Without setting of 〔P305：Index positioning range〕, i.e.「0」, Index positioning or Spin command is tried to execute.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Set 〔P305：Index positioning range〕correctly, then, ①Power reinput ②Reset signal (RST) input
No program end command set error 	In executing command other than 0, address becomes 280 due to no PEND command set.	A motor sudden stops and in servo lock. Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct program, then, ①Power reinput ②Reset signal (RST) input
Subroutine call nesting over 	Subroutine call is tried to execute 9 times without executing Subroutine return.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct program, then, ①Power reinput ②Reset signal (RST) input
Subroutine return error 	Subroutine call is tried to execute without executing Subroutine return.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct program, then, ①Power reinput ②Reset signal (RST) input

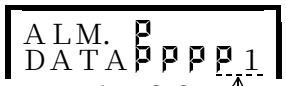
*1：Status when 「RDY1」 is selected by [P716: RDY signal spec. selection].
If other is selected, status could be different.

[Tab. 6－2 (e)]　Alarm list　5/9

Name / Display	Contents	Motion and output signal status	Way to release
Jump address error ALM. P JUMP P ERR.	Jump to address or Subroutine addresses is set other than range 0～278 and was tried to execute the command.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct address, then, ①Power reinput ②Reset signal (RST) input
Spin command error ALM. P P SPN. ERR.	Without executing SPNS command, SPNT or SPNP is tried to execute. Or in Spinning, command other than SPNS, SPNT, SPNP is tried to execute. Or, SPNS or SPNT is executed by Address 279.	A motor sudden stops and in servo lock. Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct program, then ①Power reinput ②Reset signal (RST) input
Division error ALM. P 0 DIV. ERR.	「0」is tried to execute as divisor.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct divisor, then ①Power reinput ②Reset signal (RST) input
Positioning amount error ALM. P P POS P OVER	Positioning command is tried to execute by the setting over Parameter 〔P308：Max. Forward positioning amount〕or 〔P309：Max. Reverse positioning amount〕.	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct data, then, ①Power reinput ②Reset signal (RST) input
Error command ALM. P CMND. ERR.	Command which can not be identified is tried to execute. (It occurs when an error command is registered by communication)	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct data, then, ①Power reinput ②Reset signal (RST) input
Index data № error ALM. P IXNO. ERR.	Command specified Index data No. out of 0～999 is tried to execute. (It occurs when Index data offset No. is used or error index data No. is registered by communication.)	Motor in servo lock Alarm ON Warning OFF Servo ready ON *1 Brake release ON	Input correct data, then, ①Power reinput ②Reset signal (RST) input

*1：Status when 「RDY1」is selected by [P716: RDY signal spec. selection].
If other is selected, status could be different.

[Tab. 6－2 (f)] Alarm list 6/9

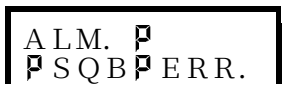
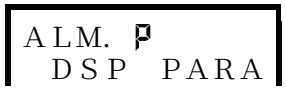
Name / Display	Contents	Motion and output signal status	Way to release
Stored data error 1～39, 42  1～39、42	Stored data are broken.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Reset data, then ①Power reinput ②Reset signal (RST) input But since DATA39 error release is impossible, consult us.

Display	Description
DATAPPPP1	Parameter data (Group0／P000～99) were broken.
DATAPPPP2	Parameter data (Group1／P100～199) were broken.
DATAPPPP3	Parameter data (Group2／P200～299) were broken.
DATAPPPP4	Parameter data (Group3／P300～399) were broken.
DATAPPPP5	Parameter data (Group4／P400～499) were broken.
DATAPPPP6	Parameter data (Group5／P500～599) were broken.
DATAPPPP7	Parameter data (Group6／P600～699) were broken.
DATAPPPP8	Parameter data (Group7／P700～799) were broken.
DATAPPPP9	Command data (Address 000～009) were broken.
DATAPPP10	Command data (Address 010～019) were broken.
DATAPPP11	Command data (Address 020～029) were broken.
DATAPPP12	Command data (Address 030～039) were broken.
DATAPPP13	Command data (Address 040～049) were broken.
DATAPPP14	Command data (Address 050～059) were broken.
DATAPPP15	Command data (Address 060～069) were broken.
DATAPPP16	Command data (Address 070～079) were broken.
DATAPPP17	Command data (Address 080～089) were broken.
DATAPPP18	Command data (Address 090～099) were broken.
DATAPPP19	Command data (Address 100～109) were broken.
DATAPPP20	Command data (Address 110～119) were broken.
DATAPPP21	Command data (Address 120～129) were broken.
DATAPPP22	Command data (Address 130～139) were broken.
DATAPPP23	Command data (Address 140～149) were broken.
DATAPPP24	Command data (Address 150～159) were broken.
DATAPPP25	Command data (Address 160～169) were broken.
DATAPPP26	Command data (Address 170～179) were broken.
DATAPPP27	Command data (Address 180～189) were broken.
DATAPPP28	Command data (Address 190～199) were broken.
DATAPPP29	Command data (Address 200～209) were broken.
DATAPPP30	Command data (Address 210～219) were broken.
DATAPPP31	Command data (Address 220～229) were broken.
DATAPPP32	Command data (Address 230～239) were broken.
DATAPPP33	Command data (Address 240～249) were broken.
DATAPPP34	Command data (Address 250～259) were broken.
DATAPPP35	Command data (Address 260～269) were broken.
DATAPPP36	Command data (Address 270～279) were broken.
DATAPPP37	Index data (IX00～IX49) were broken.
DATAPPP39	Adjustment data for unit shipment were broken.
DATAPPP42	Index data (IX100～IX999) were broken. Only units equipped with extended memory can detect.

[Tab. 6－2 (g)] Alarm list 7/9

Name / Display	Contents	Motion and output signal status	Way to release
Absolute encoder preload error ALM. P ABS. PRE. L	Preload is not completed after preload of Absolute encoder works. ※Applied when Absolute encoder is used.	Motor in servo lock Alarm ON Warning OFF Servo ready ON Brake released OFF	①Power reinput ②Reset signal (RST) input
Absolute encoder battery error ALM. P ABS. BATT.	External battery voltage for Absolute encoder data back up dropped. 『Detected when power is turned ON.』 ※Applied when Absolute	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	Replace external battery, then, ①Power reinput ②Reset signal (RST) input
Absolute encoder count error ALM. P ABS. COUNT	Counter error of Absolute encoder occurs. ※Applied when Absolute encoder is used.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input
Absolute encoder over-flow error ALM. P PABS. OVER	Rotating amount of Absolute encoder is more than ±4095 turns. ※Applied when Absolute encoder is used.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input Initialize setting of Absolute encoder.
Absolute encoder data back up error ALM. P ABS. BAKUP	Absolute position data backed up in Absolute encoder is gone. ※Applied when Absolute encoder is used.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input Initialize setting of Absolute encoder.
Absolute encoder communication error ALM. P ABS. COMM.	Data Absolute encoder can not be received. ※Applied when Absolute encoder is used.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Reset signal (RST) input

[Tab. 6－2 (h)]　Alarm list　8/9

Name / Display	Contents	Motion and output signal status	Way to release
SQB (Sequence control section) Alarm 	①Access from SQB has been lost for 10 sec. at power ON, and 1 sec. in normal condition. ②Self-diagnostic or Forced jog mode is changed.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput
Remote sequ.control IC fault 	IC part to control communication of Remote sequence control is broken.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF	Repair it by our service sec. .
Remote sequ.cont.commun.error 	Communication of Remote sequence control can not be used. It occurs when power of a controller using Sequence control is turned OFF first.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF	Reinput power to whole system where Sequence control is remotely connected.
CPU fault     	Unit is out of order.	Motor in torq. free Alarm flashes Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Replace or repair the unit by us.
CPU fault Front LED is lit. 	Due to fault of CPU, memory (ROM,RAM), etc. Watch dog timer alarm is activated.	Motor in torq. free Alarm ON Warning OFF Servo ready OFF Brake release OFF	①Power reinput ②Replace or repair the unit by us.

[Tab. 6－2(i)] Alarm list 9/9

6－2－2 Warning list

Name / Display	Contents	Motion and output signal status	Way to release
Over load warning WNG. P OVER. LOAD	If current running conditions are continued, Over-load error will occur.	Current motion continues. Alarm OFF Warning ON Servo ready ON Brake release ON	①Delete cause of Over-load.
Deviation error warning WNG. P VARI. OVER	Position deviation exceeds set of〔P208：Deviation error detection pulse〕. ※Applied when『Continuous motion』is selected by [P209:Motion selection at Deviation abnormal].	Current motion continues. Alarm OFF Warning ON Servo ready ON Brake release ON	①Delete cause of Deviation error. (Load increase, wrong setting ofgain, Accel./Decel/ time, etc.)
Main power under voltage detection warning WNG. P UNDRVOLT2	Main circuit DC bus voltage becomes 180[370]V or less. In [ ], value of 400V type (In case of controller not combined with power source, this warning is detected.)	Motor in torq. free Alarm OFF Warning ON Servo ready OFF Brake release OFF	Recover main power source tonormal voltage range.
Zero return incomplete auto. start warning告 WNG. P HOME. ERR.	Since Auto. run started in Zero return incomplete status, Start signal is ignored. ※When〔P409：Auto.run permit codit-ion selection〕is no condition, this is not detected.	Neglects Auto. start signal. Alarm OFF Warning ON Servo ready ON Brake release ON	①Execute Zero return. (When mode other than Auto. modeis selected, Warning is OFF.)
Absolute encoder battery error warning WNG. P ABS. BATT.	External battery voltage for Absolute encoder data back up dropped. 『Detected,always.』 ※Applied when Absolute encoder is used.	Current motion continues. Alarm OFF Warning ON Servo ready ON Brake release ON	①Replace external battery.
Absolute encoder preload incomplete warning WNG. P ABS. PRE. L	Preload and preset of Absolute encoder is not completed. ※Applied when Absolute encoder is used.	Current motion continues. Alarm OFF Warning ON Servo ready ON Brake release ON	①Execute preload and preset program.
Remote sequence control commun. waiting warning WNG. P NET NORDY	Communication for Remote sequence control is not started. This occurs when controller for Remote sequence control is not functioning.	Current motion continues. Alarm OFF Warning ON Servo ready ON	Turn power of control ON for Remote Sequence control.

[Tab. 6－3] Warning list

6－2－3 Error list

Name / Display	Contents	Motion and output signal status	Way to release
Data input range error ERR. P PPPEDITP1	Inputted parameter and data value is out of setting range.	In Edit mode, motor continues present motion. Output signal is not changed.	①Release error by input of anykey and reset correct data.
Data setting value error ERR. P PPPEDITP2	Computed results with plural associated values are out of setting rang e.	In Edit mode, motor continues present motion. Output signal is not changed.	①Release error by input of anykey and reset correct data.
Duplicate operation error ERR. P PPPEDITP3	Same address command is edited by LCD module and MDI, simultaneously.	In Edit mode, motor continues present motion. Output signal is not changed.	①Release error by input of anykey and operate by only either one.

[Tab. 6－4] Error list

Appendix

Appendix－1　Input and output signal list

［1］Input signal

Signal name	Code	Inp./Out.	Device No.		
			Serial communi.	Sequence control	Remote sequence control
Reset	RST	Inp.	X0000	M9144	Ymn00
Emergency stop	EMG*		X0001	M9145	Ymn01
Servo ON	SON(*)		X0002	M9146	Ymn02
Auto. start	PST		X0003	M9147	Ymn03
Hold	HLD		X0004	M9148	Ymn04
Deviation clear	CLR		X0005	M9149	Ymn05
Forward O.T	FOT*		X0006	M9150	Ymn06
Reverse O.T	ROT*		X0007	M9151	Ymn07
Address set 1	SS1		X0008	M9152	Ymn10
Address set 2	SS2		X0009	M9153	Ymn11
Address set 3	SS3		X000A	M9154	Ymn12
Address set 4	PS4		X000B	M9155	Ymn13
Address set 5	PS5		X000C	M9156	Ymn14
Address set 6	PS6		X000D	M9157	Ymn15
Address set 7	PS7		X000E	M9158	Ymn16
Address set 8	PS8		X000F	M9159	Ymn17
Forward jog	F　J		X0018	M9168	Ymn30
Reverse jog	R　J		X0019	M9169	Ymn31
Speed override 1	OR1		X001C	M9172	Ymn34
Speed override 2	OR2		X001D	M9173	Ymn35
Speed override 3	OR3		X001E	M9174	Ymn36
Speed override 4	OR4		X001F	M9175	Ymn37
Mode select. 1	MD1		X0020	M9176	Ymn40
Mode select. 2	MD2		X0021	M9177	Ymn41
Jog speed selec.	JOSP		X0022	M9178	Ymn42
Torque limit	T　L		X0023	M9179	Ymn43
Cmmd pls input inhibit	CIH(*)		X0024	M9180	Ymn44
M complete	MFIN		X0031	M9193	Ymn61
Block stop	BSTP		X0033	M9195	Ymn63
Block cancel	PCAN		X0034	M9196	Ymn64
Auto. start inh.	EPIH		X0035	M9197	Ymn65
Forced brake ON	BRON		X0036	M9198	Ymn66
Spd gain select.	GSEL	↓	X0037	M9199	Ymn67

※1　Device No. column shows a device number of Remote control data area corresponding to individual signal.

※2　And regardless to positive-true or negative-true logic, Remote control signal is "ON" to data "1" and "OFF" to data "0".

※3　Mn of Ymn device is 2 digit numeral displayed by octal number for connection node ID No.

[2] output signal

Signal name	Code	Inp./Out.	Device No.		
			Serial communi.	Sequence control	Remote sequence control
Alarm	ALM(*)	Out.	X0060	M9208	Xmn00
Warning	WNG(*)		X0061	M9209	Xmn01
Servo ready	RDY		X0062	M9210	Xmn02
Speed zero	SZ		X0063	M9211	Xmn03
Position. complete	PN		X0064	M9212	Xmn04
Rough matching	PRF		X0065	M9213	Xmn05
Brake release	BRK		X0066	M9214	Xmn06
In Torque limit	LIM		X0067	M9215	Xmn07
Program end	PEND		X0068	M9216	Xmn10
Auto. run ready	PRDY		X0069	M9217	Xmn11
In Manual run	MMOD		X006A	M9218	Xmn12
In Zero return run	HMOD		X006B	M9219	Xmn13
In Auto. run	AMOD		X006C	M9220	Xmn14
In Pulse train run	PMOD		X006D	M9221	Xmn15
In Remote control	RMOD		X006E	M9222	Xmn16
General output 1	OUT1		X0070	M9224	Xmn20
General output 2	OUT2		X0071	M9225	Xmn21
General output 3	OUT3		X0072	M9226	Xmn22
General output 4	OUT4		X0073	M9227	Xmn23
General output 5	OUT5		X0074	M9228	Xmn24
General output 6	OUT6		X0075	M9229	Xmn25
General output 7	OUT7		X0076	M9230	Xmn26
General output 8	OUT8		X0077	M9231	Xmn27
Soft.lim. switch A	SLSA		X007E	M9238	Xmn36
Soft.lim. switch B	SLSB		X007F	M9239	Xmn37
M output 01	MO1		X0080	M9240	Xmn40
M output 02	MO2		X0081	M9241	Xmn41
M output 04	MO4		X0082	M9242	Xmn42
M output 08	MO8		X0083	M9243	Xmn43
M output 10	M1O		X0084	M9244	Xmn44
M output 20	M2O		X0085	M9245	Xmn45
M output 40	M4O		X0086	M9246	Xmn46
M output 80	M8O		X0087	M9247	Xmn47
M strobe	MSTB	↓	X008E	M9254	Xmn56

※1 Device No. column shows a device number of Remote control data area corresponding to individual signal.

※2 And regardless to positive-true or negative-true logic, Remote control signal is "ON" to data "1" and "OFF" to data "0".

※3 Mn of Xmn device is 2 digit numeral displayed by octal number for connection node ID No.

Appendix－２　Applicable Motor List

【ＮＣＳ－ＦＩ　２００Ｖ system controller applicable motor selection list】

Controller capasity	Ｐ０００ set value	Applicable motor Motor type	Rate out.	Rated speed	Peak torque
ＮＣＳ－ＦＩ＊＊Ｍ＊	２１１	NA30-13F-15	０．２ Kw	１５００ rpm	３００％
－４０１	２１２	NA30-25F-15	０．４ Kw	１５００ rpm	３００％
Capacity：０．４ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｍ＊	２２１	NA100-20F	０．６ Kw	３０００ rpm	３００％
－８０１	２２２	NA100-40F	０．８ Kw	２０００ rpm	３００％
Capacity：０．８ｋｗ	２２３	NA100-75F-10	０．８ Kw	１０００ rpm	３００％
In.voltage：２００Ｖ	２２４	NA30-50F-15	０．８ Kw	１５００ rpm	３００％
ＮＣＳ－ＦＩ＊＊Ｍ＊	２３１	NA100-75F	１．５ Kw	２０００ rpm	３００％
－１２２	２３２	NA100-110F-10	１．２ Kw	１０００ rpm	２００％
Capacity：１．５ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｍ＊	２４１	NA100-110F	２．２ Kw	２０００ rpm	３００％
－２４２	２４２	NA100-180F-10	１．９ Kw	１０００ rpm	３００％
Capacity：２．２ｋｗ	２４３	NA30-110F-15	１．６ Kw	１５００ rpm	３００％
In.voltage：２００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｍ＊	２５１	NA100-180F	３．７ Kw	２０００ rpm	２００％
－４０２	２５２	NA100-270F-10	２．８ Kw	１０００ rpm	３００％
Capacity：３．７ｋｗ	２５３	NA100-370F-10	３．７ Kw	１０００ rpm	２００％
In.voltage：２００Ｖ	２５４	NA30-180F-15	２．８ Kw	１５００ rpm	３００％
ＮＣＳ－ＦＩ＊＊Ｍ＊	０１１	NA100-180F	３．７ Kw	２０００ rpm	３００％
－７５２	０１２	NA100-270F	５．５ Kw	２０００ rpm	２００％
Capacity：７．５ｋｗ	０１３	NA100-370AF	７．５ Kw	２０００ rpm	２００％
In.voltage：２００Ｖ	０１４	NA100-370F-10	３．７ Kw	１０００ rpm	３００％
	０１５	NA100-550F-10	５．５ Kw	１０００ rpm	２００％
	０１６	NA100-750F-10	７．５ Kw	１０００ rpm	２００％
ＮＣＳ－ＦＩ＊＊Ｍ＊	０２３	NA100-270F	５．５ Kw	２０００ rpm	３００％
－１１３	０２４	NA100-550F-10	５．５ Kw	１０００ rpm	３００％
Capacity：１１ｋｗ	０２５	NA100-750F-10	７．５ Kw	１０００ rpm	２９０％
In.voltage：２００Ｖ	０２１	NA100-550AF	１１ kw	２０００ rpm	２００％
	０２２	NA100-1100F-10	１１ kw	１０００ rpm	２００％
ＮＣＳ－ＦＩ＊＊Ｍ＊	０３４	NA100-370F	７．５ Kw	２０００ rpm	３００％
－１５３	０３１	NA100-750AF	１５ kw	２０００ rpm	２００％
Capacity：１５ｋｗ	０３２	NA20-1500-10	１５ kw	１０００ rpm	２００％
In.voltage：２００Ｖ	０３３	NA100-550F	１１ kw	２０００ rpm	３００％
ＮＣＳ－ＦＩ＊＊Ｍ＊	０４１	NA100-1100AF	２２ kw	２０００ rpm	２００％
－２２３	０４２	NA20-2200-10	２２ kw	１０００ rpm	２００％
Capacity：２２ｋｗ	０４３	NA100-750F	１５ kw	２０００ rpm	２９０％
In.voltage：２００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｍ＊	０５１	NA20-1500	３０ kw	２０００ rpm	２００％
－３０３	０５２	NA20-2700-10	３０ kw	１０００ rpm	２００％
Capacity：３０ｋｗ	０５３	NA100-1100F	２２ kw	２０００ rpm	３００％
In.voltage：２００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｍ＊	０６１	NA20-1800	３７ kw	２０００ rpm	２００％
－３７３	０６２	NA20-3700-10	３７ kw	１０００ rpm	１９０％
Capacity：３７ｋｗ					
In.voltage：２００Ｖ					

【ＮＣＳ－ＦＩ　４００Ｖ system controller applicable motor selection list】

Controller capasity	Ｐ０００ set value	Applicable motor Motor type	Rate out.	Rated speed	Peak torque
ＮＣＳ－ＦＩ＊＊Ｈ＊	１２１	NA100-550F-20H	１１　kw	２０００ rpm	２００ %
－１１３	１２２	NA100-1100F-10H	１１　kw	１０００ rpm	２００ %
Capacity：１１ｋｗ	１２３	NA100-550F-20H	１１　kw	２０００ rpm	３００ %
In.voltage：４００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｈ＊	１３１	NA100-750F-20H	１５　kw	２０００ rpm	２００ %
－１５３	１３２	NA20-1500-10H	１５　kw	１０００ rpm	２００ %
Capacity：１５ｋｗ					
In.voltage：４００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｈ＊	１４１	NA100-1100F-20H	２２　kw	２０００ rpm	２００ %
－２２３	１４２	NA20-2200-10H	２２　kw	１０００ rpm	２００ %
Capacity：２２ｋｗ	１４３	NA100-750F-20H	１５　kw	２０００ rpm	３００ %
In.voltage：４００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｈ＊	１５１	NA20-1500-20H	３０　kw	２０００ rpm	２００ %
－３０３	１５２	NA20-2700-10H	３０　kw	１０００ rpm	２００ %
Capacity　：３０ｋｗ	１５３	NA100-1100F-20H	２２　kw	２０００ rpm	３００ %
In.voltage：４００Ｖ					
ＮＣＳ－ＦＩ＊＊Ｈ＊	１６１	NA20-1800-20H	３７　kw	２０００ rpm	２００ %
－３７３	１６２	NA20-3700-10H	３７　kw	１０００ rpm	２００ %
Capacity：３７ｋｗ					
In.voltage：４００Ｖ					

【ＮＣＳ－ＦＳ ２００Ｖ system controller applicable motor selection list】

Controller capasity	Ｐ０００ set value	Applicable motor Motor type	Rate out.	Rated speed	Peak torque
ＮＣＳ－ＦＳ＊＊Ｍ＊	５５１	NA720-122	１．２ kw	２０００ rpm	３００ %
－１２２					
Capacity１．２ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＳ＊＊Ｍ＊	５７１	NA720-182	１．８ kw	２０００ rpm	３００ %
－２４２	５７２	NA720-242	２．４ kw	２０００ rpm	３００ %
Capacity：２．４ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＳ＊＊Ｍ＊	５８１	NA720-372	３．７ kw	２０００ rpm	２００ %
－４０２	５８２	NA720-402	４．０ kw	２０００ rpm	２００ %
Capacity：４．０ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＳ＊＊Ｍ＊	７０１	NA720-372	３．７ kw	２０００ rpm	３００ %
－７５２	７０２	NA720-402	４．０ kw	２０００ rpm	３００ %
Capacity：７．５ｋｗ	７０３	NA720-552	５．５ kw	２０００ rpm	２００ %
In.voltage：２００Ｖ	７０４	NA720-752	７．５ kw	２０００ rpm	２００ %
ＮＣＳ－ＦＳ＊＊Ｍ＊	７１１	NA720-552	５．５ kw	２０００ rpm	３００ %
－１１３	７１２	NA720-113	１１ kw	２０００ rpm	２００ %
Capacity：１１ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＳ＊＊Ｍ＊	７２１	NA720-752	７．５ kw	２０００ rpm	３００ %
－１５３	７２２	NA720-153	１５ kw	２０００ rpm	２００ %
Capacity：１５ｋｗ					
In.voltage：２００Ｖ					
ＮＣＳ－ＦＳ＊＊Ｍ＊	７３１	NA720-223	２２ kw	２０００ rpm	２００ %
－２２３					
Capacity：２２ｋｗ					
In.voltage：２００Ｖ					