v.3.2
2021.05

NEWTORK INSTRUCTION MANUAL

General instruction manual for NEWTORK's electric actuators
NTI Series / NTIT Series / NTIR Series

NEWTORK
VALVE AUTOMATION

The purchaser/user of this product must read and understand this manual to ensure safe and proper use of the product.
After reading, please keep this manual in a location where users of the product can access at any time.
The manual can ensure the safety of installers and users and prevent property damage.

Preface

The product manual provides instructions on how to install, operate, use and maintain this electric actuator product. The manual should be kept in a location where users of the product can access at any time. Before using the product, the user must read and fully understand this user's manual to ensure safe and proper use of the product.

Since this manual has been prepared based on the standard specifications, some of the contents may vary depending on the specifications of the individual product purchased. In addition, since NEWTORK KOREA continuously improves the product design, its contents and specifications are subject to change without prior notice. NEWTORK KOREA takes no responsibility for any situations caused by inaccurate content or typos.

Please refer to the final test report sent together with the product for actual specifications. For the wiring diagram, please refer to the diagram .enclosed in the product's terminal cover.

Please contact us if you have any questions about product specifications or parts, or if you would like more information.

NEWTORK KOREA CO., LTD.

Tel: +82-31-711-3107
Fax: +82-31-711-3057
Email: newtork@newtork.co.kr
Website: www.newtork.co.kr

Note

Please observe the following cautions to prevent property damage caused by misuse or overuse of this product and ensure the safety of users.

Cautions for installation

- Install the product according to this manual. Only trained personnel should install, operate, and maintain the product.
- Transport and install this product in the correct way according to its weight while paying attention to safety.
- Keep the product safe from strong impacts
- Do not install in an area where gas is emitted or the ignition temperature is 135°C (275°F) or below.
- Do not allow anyone other than an installation specialist to change the preset values arbitrarily.
- Do not allow any foreign objects or substances, such as bolts, metal or oil, to enter the product interior.
- Be sure to check the rated voltage and specifications when installing or commissioning the product. Failure to comply with the specifications may result in damage or malfunction.
- In any event, if the product is dismantled, modified or retrofitted, the warranty provided by us will be deemed as void.
- In the case of explosion-proof products, they should not be repaired, modified or retrofitted to prevent damage to the joint surface.

Cautions for connecting power

- Be sure to shut off power to the product before performing electrical work, such as wiring, terminals, etc.
- Be sure to shut off power to the product before mounting or removing the PCB.
- Changes to mains power phase will not affect operation of the product.
- Perform electrical wiring work in accordance with the information in the electrical wiring diagram to avoid damage to the product or valve.
- Loose bolt fasteners may cause short circuit, fire or malfunction of the product, so exercise care when wiring.

Note & Revision History

Cautions for operation

- Check to ensure a safe operating environment and take care not to expose the product to danger.
- Do not touch the terminal compartment or disassemble the product while the power is connected.
- Check various preset values before commissioning.
- Do not use any other tools when using the handwheel or hand lever to avoid user injury and damage to the product or valve.
- The default settings are: Clockwise - close; Anti-clockwise - open. These can be changed in the product settings. Check settings before commissioning.
- Do not disassemble, modify or retrofit the product arbitrarily.
- Do not change the various setting values of the product arbitrarily.
  If changes are required, please contact us
- If this product operates differently from what is described in this manual, please contact us to ensure the correct course of action.
- We are not responsible for any problems caused by us of products not approved by our company.
- If you need to repair, inspect, or maintain this product, please contact us after checking the product information, such as model name, serial number and specifications on the nameplate for rapid processing.

Cautions for product storage

- Store the product in a dry and clean environment. In case of outdoor storage, protect and store the product with a tarpaulin or cover.
- Do not store the product in an enclosed area or expose to direct sunlight, rain or snow.
- Be sure to cap the cable entries.
- Store carefully so that foreign substances, such as water, moisture, or gas, do not enter the product.
- Periodically check the exterior of the product so as to prevent any rusting.

Revision History

No.	Document No.	Revision Contents	Rev. No.	Rev. Date	Creator	Remarks
01	NTK-QEP-760-06	Manual Drafting	0.0	2007- 08- 24	SK	
02	NTK-QEP-760-06	Manual	1.0	2018- 12- 03	JH	

Contents

1. Product Introduction

NTI Series (Multi- turn)	NTIT Series (Part- turn)	NTIR Series (Part- turn)
This is a multi- turn electric actuator that is used for globe valves, gate valves, water gates, etc. It can also be used in combination with a gearbox for 90° rotating valves.	This is a 90° rotating electric actuator used for dampers, ball valves, butterfly valves, etc.	This is used for 90° rotating valves and dampers, designed specifically for a small size.

- The product is made of lightweight, corrosion- resistant aluminum.
- The non- intrusive design allows setting by infrared tool without opening the cover of the electronic control unit, thus preventing dust and moisture from entering the product.
- The double waterproof design protects the internal control room from dust and flooding even when the terminal compartment cover is opened.
- The waterproof and dustproof construction offers the highest rating of IP68, which is the highest level in the industry with water resistance of 90 hours at depth of 15 meters. (NTIR- IP67 Grade)
- Accurate torque and position measurement is possible using a special encoder and pressure sensor. Changes are displayed in 1% increments on the display window.
- All data settings are possible without connecting the power supply.
- Standard options include a 4- 20mA valve position transmit function and various product protection features.
- Handwheel design suitable for efficient manual operation has been adopted. It has half a wheel clearance to facilitate manual operation by using the Hammer Blow effect.
- It is a smart product that has an auto detection and removal function for foreign substances buildup on the valve.
- It provides a MODBUS, PROFIBUS, and FOUNDATION FIELDBUS compatible with all communications

2. Product Composition and Layout: Describes the components that make up this product.

< NTI Series - Multi-turn >

< NTIT Series - Part-turn >

< NTIT Series - Part-turn >

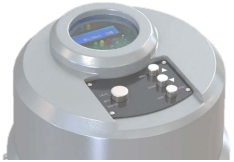
① Display window
② Operation mode switch (Local/Stop/Remote) or button (Local/Menu/Remote)
③ Command switch (Open/Close) or button (Open/Close/Stop)
④ Handwheel
⑤ Hand auto lever
⑥ Motor
⑦ Terminal compartment
⑧ Electronic control unit
⑨ Cable entries
⑩ Base

* The schematic diagram of this product is for reference of a standard model and may differ from the actual product configuration.

2.1 Control Unit

Configuration of the control unit, which controls the operation and displays the state, is as follows:

1) **Display window**: This display window allows you to check valve opening degree, batteries, torque detection, command, alarm, mode, etc. This window also shows the user the process of setting the product using the infrared setting tool.
2) **Command switch/button**: The user can perform valve opening and closing by turning the rotary switch. (For NTIR, the product can be operated by pressing the button.)
3) **Operation mode switch/button**: The user can specify the remote, stop, and local mode of the product by turning the rotary switch.
   (For NTIR, press the button to select REMOTE, MENU or LOCAL mode.)
4) **Operating mode locking device**: After selecting the operation condition, push the lock lever to the top and lock the product to prevent any unauthorized operation (operating to STOP is possible).



2.1.1 Notification Lamps

The notification lamps consist of three parts and are configured as shown below. The setting allows you to switch between the values of the red and green lamp, and in the case of the yellow lamp, the values can be changed to illuminate even during the alarm display. (For NTIR, the lamp color cannot be changed.)

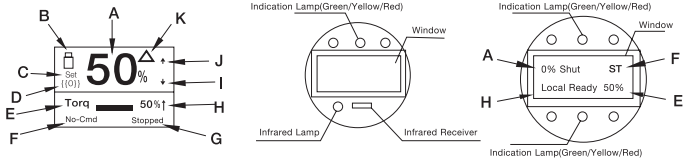
Red lamp	Yellow lamp	Green lamp
Full Open	Mid-operating	Full Close

In addition to the top lamps related to product operation as above, NTIR has bottom lamps related to the product operation mode. The bottom lamps are as follows:

Red lamp	Yellow lamp	Green lamp
LOCAL Mode	MENU Mode	REMOTE Mode

2.1.2 LCD Screen

When power is supplied, a bright blue back-light appears on the back of the LCD and one of the three LED lamps lights up. When the power supply is cut off, degree of valve opening will still be displayed by the internal battery, but the back light and LED lamp will disappear to maintain battery life.



(A) The ⎓ icon appears when the valve is fully open. The ⎓ icon appears when the valve is fully closed. The value of 0% to 99% is displayed depending on the opening degree while the product is in operation.

(B) Appears when the battery capacity of the built-in battery is 15% or less. When the battery is 10% or less, the light blinks repeatedly.

(C) When you input the password before setting up the product, the letter **set** appears. This letter must appear before you can proceed to the next step.

(D) The ((•)) icon appears when 2 wire-communications are connected properly.

(E) When torque is detected from the torque display window, a horizontal bar and a number (%) are displayed.

(F) Displays the current command or action.

(G) Shows the current status of the product or the alarm content.

(H) displays the current operation mode (LOCAL, STOP or REMOTE) of the product.

icon	Operation Mode	Description
←	LOCAL	Local control mode. You can control the operation or set up the product using the control unit switches and the setting tool.
↑	STOP	Stop mode. It stops the operation of the product. You can set the product in this state.
→	REMOTE	Remote control mode. You can control the operation of the product using external signals from the terminal compartment. In this mode, you can only check the setting status of the product with the setting tool. You cannot control the operation of the product or make new product settings.

(I) ↓ indicates the closing direction.

(J) ↑ indicates the opening direction.

(K) The ⚠ icon appears when an alarm sounds from the product.

2.1.3 Command

When the command signal is received, the status is displayed in the lower left of the display window as shown below.

No.	Command Displayed	Command Name	State	Description
1	LO-ST	Local Control - Stop	Stopped	Appears when a stop command is received in local control mode.
2	LO-OP	Local Control - Open	Opening	Appears when an open command is received in local control mode.
3	LO-CL	Local Control - Close	Closing	Appears when a close command is received in local control mode.
4	IR-ST	Setting Tool Control - Stop	Stopped	Appears when a stop command is received from the setting tool in local control mode.
5	IR-OP	Setting Tool Control - Open	Opening	Appears when an open command is received from the setting tool in local control mode.
6	IR-CL	Setting Tool Control - Close	Closing	Appears when a close command is received from the setting tool in local control mode.
7	RE-ST	Remote Control - Stop	Stopped	Appears when a stop command is received in remote control mode.
8	RE-OP	Remote Control - Open	Opening	Appears when an open command is received in remote control mode.
9	RE-CL	Remote Control - Close	Closing	Appears when a close command is received in remote control mode.
10	MAN-ST	Manual Operation - Stop	Stopped	Appears when a stop operation starts in the manual operation state.
11	MAN-OP	Manual Operation- Open	Opening	Appears when an opening operation starts in the manual operation state.
12	MAN-CL	Manual Operation - Close	Closing	Appears when a closing operation starts in the manual operation state.
13	NO-COM	No Command Signal	Stopped	Appears when there is no command signal.
14	ERR-ST	Stopped due to Error	Stopped or Alarm	Appears when the operation stops due to a problem with the product.
15	REV-ST	Pause for Reverse Rotation	Stopped	Appears when the product pauses to protect itself when a reverse direction command is received during operation.
16	TORQ-OP	Open due to Torque Detection	Opening	Appears when the product rotates in the reverse or forward direction using the Intelligent Mode.
17	TORQ-CL	Close due to Torque Detection	Closing	Appears when the product rotates in the reverse or forward direction using the Intelligent Mode.

2.1.4 Product Diagnosis and Alarms

When a problem occurs with the product, you can analyze the cause of the problem by looking at the following symbol in the lower right corner of the display window. This feature increases ease of use and educes troubleshooting time.

No.	Alarm Displayed	Alarm Name	Description
1		Battery alarm	Appears when the battery capacity is 15% or less and blinks when the battery capacity is 10% or less, reminding you to replace the battery.
2	PhaseLst	Single phase alarm (when using three phases)	If one or more phases of the three-phase power is lost, this alarm will sound and product operation will cease. Check the power cable connection to make sure the power is on.
3	TempErr	Motor overheat alarm	If the temperature sensor inside the motor breaks down or the temperature of the motor measures at 135°C or above, the alarm appears and the product stops operating. When you lower the motor temperature and restart operation, the alarm will disappear.
4	TorqTrip	Torque trip alarm	If a value exceeding the set torque value is detected, the product stops and this alarm sounds. When you remove the cause of excessive torque and operate the product in the proper direction, the alarm will disappear automatically.
5	Stall	Stall alarm	This alarm is displayed when the actual line speed is 70% or below the rated speed. When you operate the product in the opposite direction, the alarm will disappear temporarily.
6	LockRotor	Rotor locked alarm	When the rotor is idle for 5 seconds or longer while running, this alarm appears and the product stops operating. Check if the Hand Auto lever is caught at the end of the worm gear and is in the manual operation state, or open the control room cover and check whether the magnetic contactor is properly connected during open/close operation.
7	24vErr	24V alarm	When there is a problem with 24V inside the product, this alarm appears and the product stops operating. If DC power is not available at No. 4 and 5 terminals, replace the Power Board. If power is available, replace the Main Board.
8	NoOpenIL	No open interlock	This alarm appears when an open signal is received while the Close Interlock function is activated. * Close Interlock: A function that prevents open operation until close operation is complete.
9	NoCloseIL	No close interlock	This alarm appears when a close signal is received while the Open Interlock function is activated. * Open Interlock: A function that prevents close operation until open operation is completed.

No.	Alarm Displayed	Alarm Name	Description
10	CPUTemp	CPU overheat alarm	If the internal temperature of the product rises above 80°C, this alarm appears and the product stops operating. This alarm will be cleared when the internal temperature of the control room drops to 80 °C or below.
11	SensorErr	Pressure sensor error	If there is a problem with the torque sensing device, this alarm appears. In this case, you need to check the cable jack or replace the Torque Transducer.
12	PosErr	Valve position error	This alarm appears when the situation of the valve's opening degree cannot be confirmed. When you reset the full open and full close position of the valve and re- energize the power, this alarm will be cleared.
13	EPROMErr	Storage device error	If the storage device fails, this alarm appears. In this case, you need to replace the Main Board.

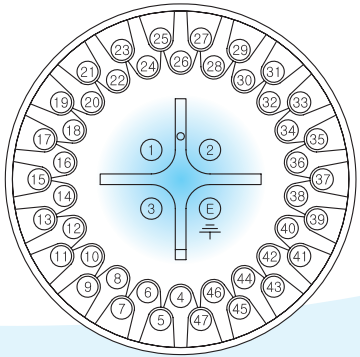
* Note: If two or more alarms occur at the same time, they are displayed alternately.

2.2 Terminal Compartment

The terminal compartment is independent to protect the internal parts, so even if the cover is opened for local connection, the internal electronic control unit remains completely waterproof and dustproof.
Depending on the product specifications, the shape, number of terminals, and layout of the terminal compartment may vary.
For detailed specifications, please refer to the wiring diagram enclosed the terminal compartment.
Before connecting the power, check the rated voltage on the nameplate attached to the products follows:

* 380V 3Ph: Connect power to 1, 2 and 3
* 440V 3Ph: Connect power to 1, 2 and 3
* 220V 1Ph: Connect power to 1 and 2

Please be sure to check that the power is off when wiring.



1	Power Line 1#	25	ESD
2	Power Line 2#	26	Analogue Input Signal +Ve
3	Power Line 3#	27	Analogue Input Signal -Ve
4	24vdc-Ve	28	
5	24vdc+Ve	29	
6	Monitor Relay S1-1	30	Remote Torque Feedback -
7	Monitor Relay S1-2	31	Common -Ve 20~60v Ac/Dc
8	Monitor Relay S2-1	32	common -Ve 20~120v AC
9	Monitor Relay S2-2	33	Remote Closing Signal Input End
10	Monitor Relay S3-1	34	Remote Stopping / Maintaining Signal Input End
11	Monitor Relay S3-2	35	Remote Opening Signal Input End
12	Monitor Relay S4-1	36	Common -Ve 20~60v Ac/Dc
13	Monitor Relay S4-2	37	Open Interlock
14		38	Close Interlock
15		39	Manual / Automatic
16		40	Common +Ve 20~120v Ac
17		41	
18		42	Common Monitor Relay
19		43	Common Monitor Relay Normally Closed
20		44	Common Monitor Relay Normally Open
21		45	
22	Remote Position Feedback +	46	
23	Remote Position Feedback -	47	
24	Remote Torque Feedback +	E	Grounding

2.3 Base

The base, which connects the valve and the product, consists of a flange that connects the body and a bush that connects the stem of the valve.

2.3.1 Maximum Flange Size and Bush Machining Allowance

Please check the following information before stem machining for smooth valve connection:

Model			NTI-01~03	NTI-04 ~05	NTI-06	NTI-07~10G	
Flange	ISO 5210		F10	F14	F16	F25	F30
Maximum Bush Machining Allowance							
Type A	Rising	mm	Ø 32	Ø 38	Ø 54	Ø 70	Ø 83
	Non- rising	mm	Ø 26	Ø 32	Ø 45	Ø 60	Ø 73
Type B	Rising	mm	-	Ø 51	Ø 67	-	-
	Non- rising	mm	-	Ø 38	Ø 51	-	-
Type B4	Non- rising	mm	Ø 26	Ø 32	Ø 45	Ø 60	Ø 73

Model			NTIT-01	NTIT- 02	NTIT-03	NTIT-04~05	NTIT-06	NTIR-200	NTIR-500
Flange	ISO 5211		F07	F07/F10	F10	F12/F14	F14	F05/F07	F07/F10
Maximum Bush Machining Allowance									
Key type		mm	28	28/42	42	50/60	60	22	33
Square type		mm	19	19/27	27	32/36	36	15	23

2.3.2 Thrust Bush - Type A and Z

1) Small product dismantling (NTI-01 to NTI-06):
   Before machining the bush, remove the bush after dismantling the base according to the following procedure:
   ① Remove the white plastic handwheel cap on the top of the product, turn the product upside down, and place down carefully.
   ② Dismantle the 4 hex bolts of the flange and separate the base from the product body.
   ③ Unscrew the two head screws of the flange and take out the retaining ring.
   ④ After dismantling the two stripper bolts of the steel bearing stop ring, carefully separate it from the contents while rotating it.
   ⑤ Remove the remaining contents one by one and keep them in order for future assembly. Handle the part carefully to avoid damage, remove the last bush and machine it. Take extra care not to damage the threads of the bush after machining.

2) Small Product Assembly (NTI-01 to NTI-06):
   After machining the bush, reassemble the base in accordance with the following procedure:
   ① Remove all foreign substances on the surface of the bush, check that the contents are in good condition, place the bush in a safe place, arrange, and assemble the stored contents in the reverse order of dismantling.

② Tighten the steel bearing stop ring while rotating it carefully, and tighten the two stripper bolts.
③ Insert ② into the flange and finally, fasten the two head screws after assembling the retaining ring. At this time, adjust the groove of the bush to be assembled to the protrusion of the center column.
④ Adjust the base and the body to fit well and tighten the 4 hex bolts.

3) Large Product Dismantling (NTI- 07 to NTI-10G)
① Switch the product into manual mode and carefully lay the terminal compartment facing the floor, paying attention for risk of hand pinching and damage to the exterior.
② Turn the handwheel such that the retainer can be lifted from the base.
③ Remove the two head screws of the flange, lift up the retainer and dismantle it. Be sure to keep the ground and bush clean at all times.

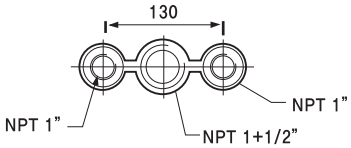
4) Large Product Assembly (NTI- 07 to NTI-10G)
① Assemble the machined bush grooves to the protrusion of the center column.
② Turn the retainer clockwise, assemble it, use a (rubber) hammer to ensure it is fully engaged, and then tighten two head screws.

2.3.3 Drive Bush - Type B4

1) Dismantling: Remove the bush after dismantling the base in accordance with the following procedure before machining the bush:
① Remove the white plastic handwheel cap on the top of the product, turn the product upside down and place down carefully.
② When removing the flange from the body after removing the four wrench bolts of the flange, you can see the snap ring and bush.
③ Open the snap ring using snap ring pliers and pull out the bush.

2) Assembly: After machining the bush, reassemble the base in accordance with the following procedure:
① Assemble the groove of the bush to fit the protrusion of the center column.
② Open the snap ring and assemble it to the bush.
③ Tighten the four wrench bolts and connect the flange to the body.

2.4 Cable Entries



Flexible adapters should be of appropriate size considering the diameter of the cable, and cable entry caps and flexible should be tight and waterproof. For explosion-proof areas, Exdb IIC T4 or higher explosion-proof flexible adapter should be used. For cable entry caps, explosion- proof certified products should be used as well.

Please be sure to cap unused cable entries and keep them capped. If the product is installed but the cable is not connected, block the cable with the cable entry caps and seal it with PTEE tape. The cable entry size is 2 x NPT 1", 1 x NPT 1+1/2" for NTI series and 2 x NPT 1" for NTIT and NTIR series.

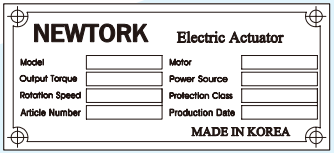
For explosion proof products, the installation requirements in the table below must be met.

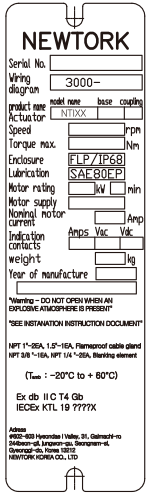
Tread Joint	Thread Size	Precision	Thread Engaged	Depth of Engagement
Flameproof Thread 1	NPT 1”	6g/6h	5≤X	5mm≤X
Flameproof Thread 2	NPT 1.5”	6g/6h	5≤Y	5mm≤Y

2.5 Nameplate

Please check the information on the nameplates attached to the top of the product to ensure that the specifications of the product you ordered match with the information provided. The information on the nameplate can vary depending on the product line.

- ✓ Manufacturer's name
- ✓ Serial number
- ✓ Wiring Diagram
- ✓ Model name
- ✓ RPM
- ✓ Max torque
- ✓ Enclosure structure
- ✓ Nominal motor current
- ✓ Lubricant type
- ✓ Motor rating
- ✓ Power specifications
- ✓ Weight
- ✓ Year and month of manufacture
- ✓ Tag number
- ✓ Contact capacity





3. Setting Tool (Infrared Setting Tool)

When the operating mode of the product is Local, you can use the setting tool to give various commands to the product. At this time, the setting tool must always face the infrared receiver at the bottom of the product's display window. When commanded via the setting tool, the red lamp at the bottom of the status window will blink. However, NTIR is not operated by the setting tool.

* Operating distance: 0.75m

* Power: AAA 1.5V x 2 (Standard supply)

Button	Button Name	Description
	Previous/Up Button	Return to the previous menu or to increase the setting value.
	Next/Down Button	Move to next menu or decrease setting value.
	Enter/Stop Button	Enter an option or setting value or to stop the product operation.
	Close Button	Close operation of the product.
	Open Button	Use it to open the operation of the product.
	Infrared Communication Window	Communicates with the product by sending an infrared signal to the display window.

3.1 How to Replace the Setting Tool Batteries

If the infrared communication window does not light up red when the setting tool button is pressed, the batteries must be replaced. Use a Phillips-head screwdriver to loosen the bolt on the back of the setting tool, open the cover and replace the two AAA1.5V batteries. At this time, be sure to replace them in a safe area.

4. Product Specifications

Product specification information is subject to change without notice to improve performance.

4.1 Internal Specifications

Item	Description		Remarks
Rated voltage	See the product nameplate		
Motor	3- phase AC motor	Single phase AC motor	
Motor control	Standard: Magnetic Contactor	Option: Solid State Starter	
Motor protection	Thermostat: activated at motor surface temperature of 132°C(270°F).		
Position sensor	Remembering the number of rotations in the Counting PCB method		
Torque sensor	Torque Transducer through Strain Gauge detects minute torque in% Detects fine torque in % increments using Torque Transducer method via the Strain Gauge		
Input command signal	Standard: 24VDC	Option: 110VAC	
Emergency command	Can be set during product setting (Full Open or Full Close)		

Item	Description		Remarks
Position display	Position is expressed by connecting directly to the output axis.		
Relay	Standard: Monitor Relay and 4 more	Option: Up to 8 contacts can be added	Function can be changed.
Analog output	4-20mA or 20-4mA		
Local control	Operation Mode Switch/ Button	3 LED lamps and 1 infrared receiver lamp	
	Motion Switch/Button	LCD screen	
Manual/auto operation mode switch	Manual → Auto: When the motor is driven, it switches to auto operation mode		
	Auto → Manual: Press the Hand/Auto lever to switch the manual operation mode by the clutch.		
Enclosure	NTI, NTIT series: IP68 (submersible for 90 hours at 15 m water depth), NTIR series: IP67		EN60529:1991/ A2:2013

4.2 External Specifications

Item	Description	Remarks
Composition and material	Aluminum/stainless steel alloy fasteners; cast iron thrust base	
Operable temperature	-30°C ~ +70°C (-22°F ~ +158°F)	
Load operation cycle	On-Off rating: S2- 15 minutes: Run 60 times per hour	
	Modulating rating: S4- 30 minutes: 1,200 runs per hour	
Life cycle	At least 30,000 cycles with Open- Close- Open in one cycle	
Noise	61dB (A) or less within 1m	
Vibration	Cumulative vibrations over 10MHz to 1000MHz frequency range: less than 1 gms	
Shock	Maximum acceleration 5g	
Painting	Polyester powder paint (body: RAL 9006, handwheel and Hand /Auto lever: RAL9005)	

5. Product Checks

Describes the items to be checked upon receiving the product, as well as how to store and handle the product.

5.1 Initial Check

Upon receipt, check the condition of the product and make sure that the product name on the product nameplate matches that on the order sheet. In addition, check that the test report and electrical drawings are enclosed.

☞ Remove the packaging carefully. Check for damage to the appearance of the product that may have occurred during transportation.
☞ Check the specifications of the product you ordered and those you received. If a product that is different from the one you ordered has been shipped, please contact us immediately for appropriate action.

5.2 Transport and Storage of the Product

- ☞ Please transport the product in packed condition to avoid damage.
- ☞ The recommended temperature for transport and storage of the product is - 20°C to + 60°C (- 4°F to 113°F).
- ☞ If the product cannot be installed immediately after receipt, keep it in a clean and dry place and avoid places where the temperature and humidity are likely to change.
- ☞ Keep the product packed and seal the cable entries tightly.
- ☞ Do not store close to chemicals, acidic and alkaline products, batteries, or breakers.
- ☞ Take care to keep the product dust-free. If you use the product outdoors, location to avoid rain and snow.
- ☞ All products are tested before shipping to the customer. Therefore, if you use the product according to the manual, the product will be installed and operated smoothly.
- ☞ If you remove the cover of the electronic control unit, the warranty of this product will be deemed as void.

6. Product Installation

Installing and setting up the product properly, considering the installation location, orientation, and size of the surrounding space, can extend the life of the product and prevent performance degradation.

6.1 Installation and Setup Overview

The installation, setup and commissioning of the product should proceed as follows:

Be sure to read this manual thoroughly before installing, operating using and maintaining the product. If necessary, this product can be easily mounted using a lifting device and the product must be installed under the guidance of experienced and skillful personnel.

1) Before installing the product, be sure to check again if the product fits into the valve.
2) Check the rated voltage and specifications of the product by referring to the information on the nameplate and observe the specification range of the power supply allowed for the product.
3) Assemble the base. Flanges in the base shall comply with ISO5210 or Ms. sp-102.
4) Install the product to the valve and damper. At this time, the drive bush must match the stem and flange of the valve completely. The yoke material between the product and the valve must be able to withstand ISO Class 8.8 and 628 N/sq mm of pressure, and, after installation, lift the entire valve, not just the product.
5) Connect the power line and control line referring to the wiring diagram attached to inside the terminal cover. The product has a built-in auto-syncrophase, so it works correctly in the driving direction even when reversed phase is connected.
6) Set the position limit with the valve to fully open and closed. When setting the position limit, the valve must be operated manually.
7) Set the closing and opening torque values.

6.1.1 Power Connection: Describes how to supply power to the product.

☞ Observe the specification range of allowable power of the product. (± 10% range of nameplate power supply)
☞ Remove the terminal compartment cover and the electric shock prevention plate from the product body.
☞ Connect all necessary wires to the terminal compartment by referring to the wiring diagram attached to inside the terminal cover. As a default option, auto-syncrophase is built-in. It is not necessary to check the position of the three phases and the direction of rotation of the output axis. (Clockwise - close, anti-clockwise - open)
☞ Clean the terminal cover and fastening surface and fix them with bolts.
☞ Seal the wire entry part for waterproofing when connecting the wires.
☞ Check the remote connection status with the central control system.
☞ Connect the ground wire to the ground terminal inside the terminal compartment as well as the external ground terminal located at the product cable entries. If the product is not grounded properly, electric shocks may occur or the product may malfunction.

6.1.2 Base Assembly and Mounting

☞ Keep all parts clean when mantling or assembling the bush. Foreign objects inside the parts can damage components, such as bearings or O- rings.
☞ Apply grease or rust-proof paint to machined or unpainted surfaces exposed to the outside to prevent rust.
☞ Apply general heavy duty grease to the inside of the stem and bush.
☞ Check the valve flange diameter, depth, bolt specification, stem, key size, etc.
☞ Machine the bush to fit the valve stem.

☞ If the valve flange and the base of the electric actuator do not match, make and connect an intermediate connection adapter.
☞ After inserting the product to the valve flange, fix it firmly with bolts.
☞ Wrap PTFE tape on the handwheel cap and tighten it to prevent moisture from entering the product and center column. In case of a rising-type valve whose valve stem protrudes, make a stem cover separately, wrap with PTFE tape and tighten it for safety.
☞ For NTIR, align the valve and the product in the full open or full close state and then tighten them.

6.2 Installing the Product on the Rising-type Valve

6.2.1 Valve-Product Installation
(When the stem of the valve is a left- handed screw)

1) Join the machined bush to the product flange and place it on the valve stem.
2) Switch the product to manual operation mode.
3) While turning the handle in the open direction, adjust the bush to engage the stem of the valve.
4) Turn the handle in the open direction until the flange of the product and the valve come into contact with each other, and then fix it with bolts.

6.2.2 Valve-Base-Product installation
(When the stem of the valve is a left-handed screw)

1) Remove the product body and base and then attach the machined bushes to the product flange.
2) Place the base on the valve stem and while rotating it in the open direction, adjust the bush to engage the stem of the valve.
3) Turn the base in the open direction until the base contacts the flange of the valve, and then fix it completely with bolts.
4) Adjust the center column protrusion of the main body to engage with the groove of the bush, and manually operate the handle for about two turns in the open direction so that the base and the main body are in close contact.
5) Tighten the four hex bolts connecting the body and the base to secure them.

6.3 Installing the Product on Non-rising-type Valve

6.3.1 Valve-Product Installation

1) Attach the machined bush to the product flange.
2) Lift up the product, align the machined part of the bush with the shape of the valve stem, and insert.
3) Carefully lower the base and valve to prevent damage, and then fix the flange completely with bolts.

6.3.2 Valve-Base-Product Installation

1) Separate the base from the product body and attach the machined bush to the product flange.
2) Lift the base, align the machined part of the bush with the shape of the valve stem and insert.
3) Carefully lower the base and valve to prevent damage and then fix the flange thoroughly with bolts.
4) Adjust the center column of the product body to fit into the groove of the bush.
5) Manually operate the handle for about two turns in the opening direction so that the base and the main body come into close contact with each other.

6.4 Installing with a Gearbox

Typically, a 90° Worm gearbox is used for the part-turn valve, and a Bevel or Spur gearbox is used for the rising valve that requires high torque. The gearbox is also equipped with a removable bush, which is machined to fit the valve stem and connected to the valve.

7. Product Operation

Describes how to switch the operation mode and operate the product.
This product has many operation methods, such as operation using the switch on the control unit, operation using the setting tool, operation using remote control, modulating, and communication (Modbus or Profibus). This manual focuses on the operation of the switch on the control unit, setting tool and remote control. Modulating and communication can be added through optional specifications.

7.1 Motor Operation

Before operating in auto mode, make sure that the product is set. If the motor is operated without setting, the valve may be damaged.

7.1.1 Local Control

In this mode, the user operates this product directly on site. Set the operation mode selector switch (or push button) on the right side of the control unit to Local. Control the operation of the product using the command switch (or push button) on the left. If you want to stop the product in the middle of operation, turn the command switch to STOP. If no other command is input during the opening or closing operation of the valve, the valve stops automatically after operating up to the end position of the open or close.

7.1.2 Setting Tool Control

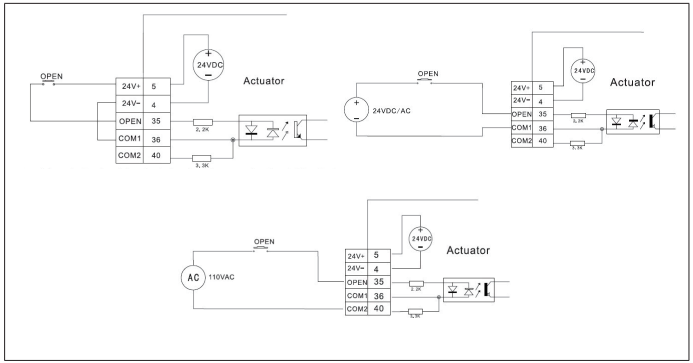
When the product is in the local control mode, you can operate and set the product using the setting tool. Press the button to close, or press the button to open. Press the button while the product is running to stop in the current position.
The setting screen can be accessed by using the button and the setting value can be changed only in the local control mode or in the STOP state.

7.1.3 Remote Control

This mode is to control the product remotely from the central control system. This function is activated by placing the operation mode selector switch (or pushbutton) on the right side of the control unit in the Remote state. The product is controlled by signals, such as open, close, stop, valve position transmit (4-20mA) and modulation depending on the control specification of the product. (Please refer to the wiring diagram and terminal compartment diagram in the appendix.) At this time, product operation is not controlled locally.

7.1.4 Remote ON/OFF Control

1) Signal input terminal circuit.



The picture shows the receiver of the remote signal. Terminals 4 and 5 are 24V internal power and 35 is the open signal reception terminal. 36 is the common terminal of the control signal, usually connected to terminal 4 (Jumper). The Open contact is the control contact that directs open operation. When the Open contact is connected, current flows through terminal 5 to terminal 35 and the product executes an Open command.

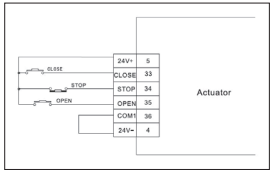
The Close contact is a control contact that directs close operation. When the Close contact is connected, current flows through terminal 5 to terminal 33 and the product executes a Close command.

Terminal 35 and 33 accept both 24vdc and 24vac. Therefore, the product can be operated not only by internal power but also by external power. Please refer to the left circuit diagram for wiring method.

In case of controlling the product by using external 110V power, connect terminal 40, the common terminal of 110V product control, instead of terminal 36.

2) General wiring method

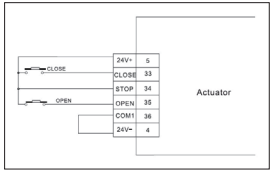
(A) Automatic control: Open, Close and Stop



NOTE

- When the Open contact is connected, the product executes the Open command and continues to operate in the open direction even if disconnected.
- When the Close contact is connected, the product executes the Close command. The product continues to operate in the close direction even if disconnected.
- When the Stop contact is disconnected, it stops operation.

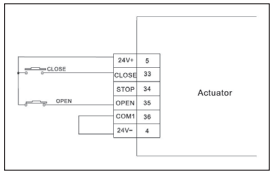
(B) Automatic control: Open and Close



NOTE

- When the Open contact is connected, the product executes the Open command and continues to operate in the open direction even if disconnected.
- If the Close contact is connected, the product executes a Close command. The product continues to operate in the close direction even if disconnected.

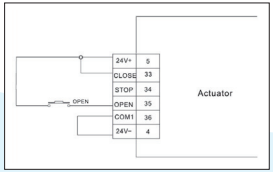
(C) Inching control: Open and Close



NOTE

- When the Open contact is connected, the product executes an Open command, When disconnected, it stops operation.
- When the Close contact is connected, the product executes a Close command. When disconnected, it stops operation.

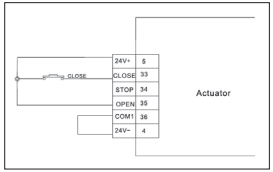
(D) Two wire control (Open first)



NOTE

- Set the two-wire control to Open among setting items.
- When the Open contact is connected, the product executes an Open command. When disconnected, it executes a Close command.

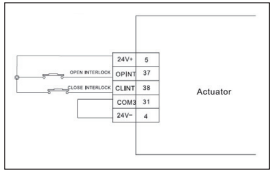
(E) Two wire control (close first)



NOTE

- Set the two wire control to Close among setting items.
- If the Close contact is connected, the product executes a Close command. When disconnected, it executes an Open command.

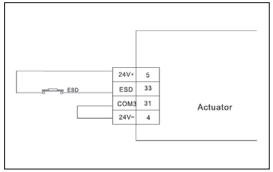
(F) Interlock Control



NOTE

- When terminal function 1 is set to open interlock and terminal function 2 is set to close interlock, interlock control is activated.
- Only when the Open Interlock contact is connected does the product execute Open command or generate an alarm.
- Only when the Close Interlock contact is connected does the product execute a Close command or generates an alarm.

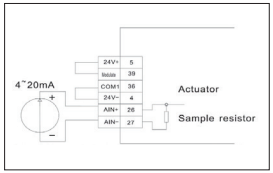
(G) ESD Control



NOTE

- When terminal function 0 is set to ESD, the ESD function is activated.
- The user can specify the operation mode of the product through the “Panel Set” function. In this case, engaging the operation mode switch on the front of the product is invalid and can only be operated in the operation mode specified by the “Panel Set” function.

(H) Modulating (Option)



NOTE

- This function is enabled when the modulating model is installed and the modulating setting item is set to Enabled.
- If there is no separate connection to terminal 39, the product defaults to On-Off control and when connected to terminal 5, it is converted to modulating function.
- Terminal 26 and 27 are connected to the positive and negative terminals of the control signal, respectively.
- Input impedance of the analog signal input terminal is 200Ω.

7.2 Manual Operation

In case of motor or power failure, the product can be operated directly using the manual handle.

First, set the operation mode switch (or push button) on the control unit of the product to STOP. Never place the operation mode switch (or push button) in the remote state because the remote control may cause the product to operate unexpectedly, resulting in personal injury or damage to the product. In addition, operating the product while the motor is running may cause problems, such as failure of internal components. Be sure to switch the operation mode only when the motor is stopped and do not press the Hand/Auto switching lever when the product is being operated by a motor. After completing the manual operation, operate, rotate the product three to four times in the open and close directions to check for any abnormalities.

7.2.1 Manual Operation of the NTI Series

Push the Hand/Auto switching lever down to engage the clutch to the handwheel. If the lever is not lowered enough, press the lever gently while turning the handwheel to easily engage the clutch. If the valve’s opening degree in the display window changes when the handwheel is turned in this state, it is set to manual operation and then the lever can be released. Even if the lever returns to its original position, the power transmission system maintains manual operation by the clutch, so there is no need to operate the lever again. When the motor is

running, the manual operation method is automatically released and changed to the auto operation method. If necessary, the Hand/Auto switching lever can be locked with a 6.5mm latch.

7.2.2 Manual Operation of the NTIT Series

Press the handwheel to switch to manual operation. After manual operation, when the pressed handwheel is moved to its original position, the product automatically switches to auto operation mode.

7.2.3 Manual Operation of the NTIR Series

You must operate it with the handwheel while pressing the Hand/Auto switching lever continuously. Check the direction indicated on the handwheel, and then turn it in the desired direction to operate the product. When the Hand/Auto switching lever is moved to its original position, it automatically switches to Auto mode.

8. Signal Feedback

8.1 ON-OFF Signal Feedback

1) This product informs its operation status through 4 relay feedback contacts (optionally up to 8 contacts). The parameters of these contacts are as follows:

Rated Voltage	Rated Current
250VAC	5A
30VDC	5A

The four feedback contacts are set to open and close by default, but can be changed to different functions depending on user needs.

2) There is one SPDT monitor relay contact for alarm feedback. The parameters of this contact are as follows:

Rated Voltage	Rated Current
50VAC	8A
30VDC	8A

The monitor relay contacts are set to Local Fault (Normally close) and Remote (Normally open) by default, but can be changed to different functions depending on user needs.

8.2 Analog Signal Feedback

This product can use the 4-20mA valve position transmitter for the valve feedback signal, and provides the following parameters:

Maximum output allowable resistance value	650Ω
Current reply accuracy	±2%
Current straightness accuracy	±1%

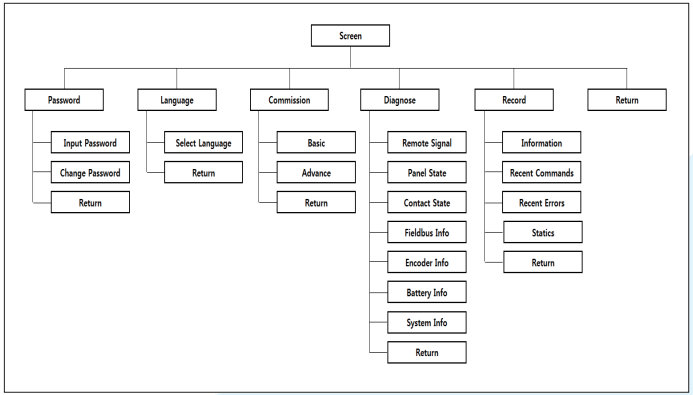
The user can specify 4mA as full open or full close by setting the valve position transmitter among the setting items.

Analog feedback can change the signal of the valve position transmitter to a voltage signal instead of a current at the request of the customer. Please contact us for further information on the valve position transmitter voltage.

9. Product Settings

Describes how to check and change various product settings.

9.1 Setting Item Structure



9.2 Cautions for Settings

☞ You can check the operation information and status of the product, and set the operation method and special functions only when the product operation mode is STOP and LOCAL.

☞ For NTI and NTIT, press and on the setting tool, and for NTIR, use the push buttons ▲ and ▼ on the front of the product to move to the desired setting item or change the setting value.

☞ After moving to the desired setting item, press or (Enter) to change the setting value of the item.

☞ The initial setting value blinks repeatedly when the setting value becomes changeable. At this time, change the setting value with and (or ▲ and ▼).

☞ After changing the setting value, save it by pressing or (Enter) again.

☞ The product settings are divided into the basic and option settings. Most of the settings can be completed with the basic settings. Option settings are necessary when optional features are added or when you use the product's features in detail.

9.3 How to Enter the Setting Screen

1) The initial screen shows the valve's opening degree value of 1 to 99%, or or .

2) Change the product operation mode to STOP or LOCAL using the operation mode selector switch. For NTIR, use the Menu button to switch to MENU. (The bottom lamp color of NTIR depending on the operation mode: MENU - Yellow lamp lights up/LOCAL- Red lamp lights up/REMOTE- Green lamp lights up)

3) Press on the Setting Tool to enter the setting screen from the initial screen.

4) When ▶**Password**◀ appears, press or (Enter) to enter the lower item, and when ▶**Input Password**◀ appears, select the item using or (Enter).

5) When the initial setting value is blinking, enter the password using and (or ▲ and ▼) (The initial password is 0000).

6) Press again or (Enter), then set will appear on the top left of the display window. For NTIR, the yellow lamp at the bottom goes out.

7) Press (or ▼) twice, then ▶**Return**◀ will appear. Press or (Enter) to return to ▶**Password**◀.

9.4 Setting Items

9.4.1 Password

1) Input Password

Parameters: 0 to 9

NOTE: To prevent unauthorized changes to the setting values, the settings are password protected. If you enter the wrong password, you will not be able to set up the product; you will only be able to view the setting items.

2) Change Password

Parameters: 0 to 9

NOTE: This entry is for changing the password. This item will only be visible if you enter the correct password in ▶Input Password◀, then you can change the password of the product.

9.4.2 Language

1) Select Language

Parameters: English, Chinese

NOTE: This product supports English and Chinese (Chinese Characters), and this entry allows you to set the language displayed on the product. The initial setting is English.

9.4.3 Settings

1) Basic setting

(1) Valve

① Setting Valve Close Direction

Parameters: Clockwise, Anti- clockwise

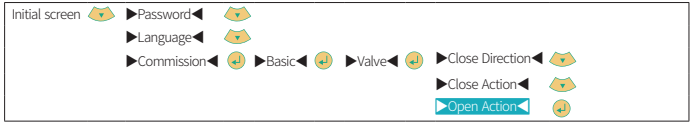
NOTE: In this section, the valve close direction can be selected between Clockwise Close and Anti-clockwise Close. The default setting is Clockwise Close.

② Setting Valve Close Action

Parameters: Position Limit, Torque Trip

NOTE: In this entry, the valve closing method can be selected between Position Limit and Torque Trip. The initial setting value is Position Limit. 90° rotary valves, including butterfly and ball valves, use Position Limit, and lifting-type valves, including gate and globe valves use Torque Trip in some cases.

③ Setting Open Action

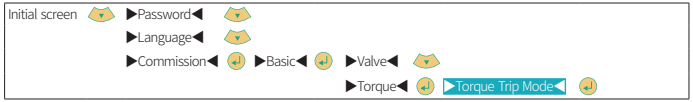


Parameters: Position Limit, Torque Trip

NOTE: In this entry, the valve opening method can be selected between Position Limit and Torque Trip. The initial setting is Position Limit.

(2) Torque

① Setting Torque Trip Mode

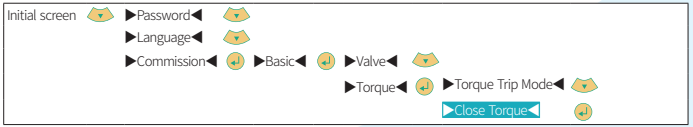


Parameters: Normal, Intelligent

NOTE: In this entry, the torque trip mode can be selected as Normal or Intelligent. The default setting is Normal. Normal is a function that stops the product and generates an alarm when the output torque exceeds the set torque value. Intelligent is a function that rotates the valve backward or forward a certain distance and number of times depending on the value set in the sub-entry without immediately stopping the product in the same situation. If the excessive torque value persists after this function has occurred, the product will stop and an alarm will be generated.

E.g.) When the setting value is: reverse rotation distance: 5%; number of reverse rotations: 2; position tolerance: ± 1% in Intelligent mode, if excessive torque is detected at position A while the product is open, it records the position, and after the reverse rotation (close action) of 5%+ of degree of valve opening, it repeats the same action if excessive torque is detected again within ±1% of the tolerance in the recorded position. Even if this function has been performed for the set number of times, if it still detects excessive torque within the tolerance range, it stops operation and generates an alarm. If excessive torque is detected outside the tolerance range, this product recalculates the corresponding number of reverse rotations and performs this operation again.

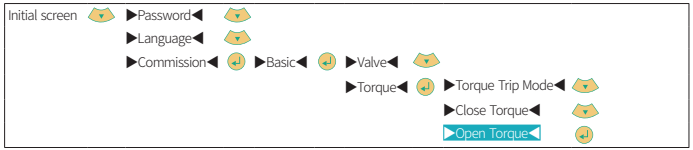
② Setting Close Torque Value



Parameters: 40 to 100 (unit: percent)

NOTE: This entry allows you to set the close torque value within 40% to 100% of the torque value provided by this product. If the calculated torque exceeds the setting value, different actions are taken depending on the **▶Torque Trip Mode◀**.

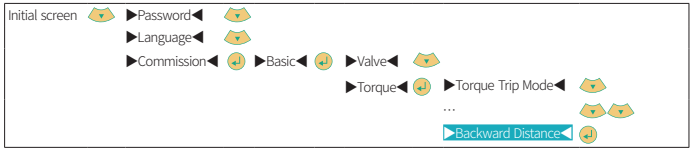
③ Setting Open Torque Value



Parameters: 40 to 100 (unit: percent)

NOTE: This entry allows you to set the open torque value within 40% to 100% of the torque value provided by this product. If the calculated torque exceeds the setting value, different actions are taken depending on the **▶Torque Trip Mode◀**.

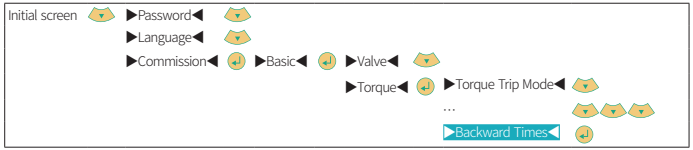
④ Setting Backward Distance
(only available when Torque Trip Mode is set to Intelligent)



Parameters: 1 to 10 (unit: percent)

NOTE: This entry is displayed only when the **▶Torque Trip Mode◀** is set to Intelligent, and the reverse rotation distance of the valve for Intelligent Function from within 1 to 10 when excessive torque value is detected.

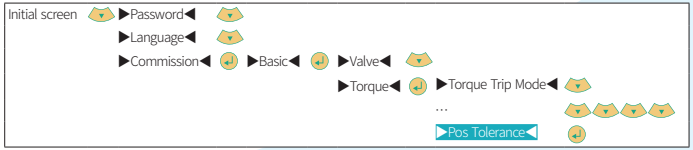
⑤ Setting Backward Times
(only available when Torque Trip Mode is set to Intelligent)



Parameters: 1 to 10 (unit: times)

NOTE: This entry is displayed only when the **▶Torque Trip Mode◀** is set to Intelligent. You can set the number of reverse rotations of the valve for Intelligent Function within 1 to 10 times when excessive torque value is detected.

⑥ Setting Position Tolerance
(only available when Torque Trip Mode is set to Intelligent)

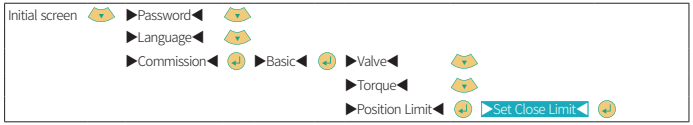


Parameters: 1 to 5 (unit: percent)

NOTE: This entry is displayed only when **▶Torque Trip Mode◀** is set to Intelligent. You can set the position tolerance for the Intelligent Function within ± 1 to ± 5% when detecting excessive torque value.

(3) Position limit

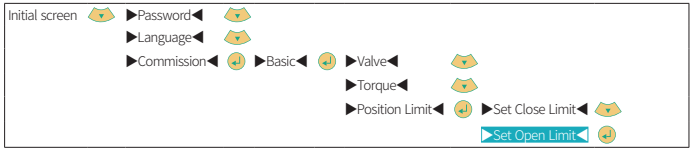
① Setting Close Limit



Parameters: Set, Cancel

NOTE: This entry sets the current valve position to full close. Therefore, access this entry after closing the valve completely. When the word "Set" blinks, press to save the position. When the setting is complete, the green lamp lights up and the valve opening degree display changes to .

② Setting Open Limit

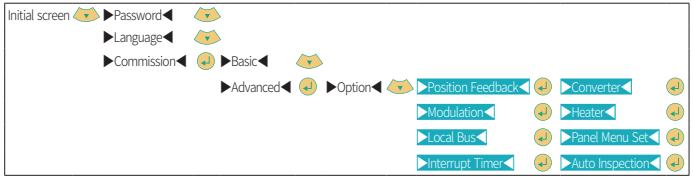


Parameters: Set, Cancel

NOTE: This entry sets the current valve position to full open. Therefore, access this entry after opening the valve completely. When the word "Set" blinks, press to save the position. When the setting is complete, the red lamp lights up and the valve opening degree display changes to .

2) Advanced settings

(1) Options



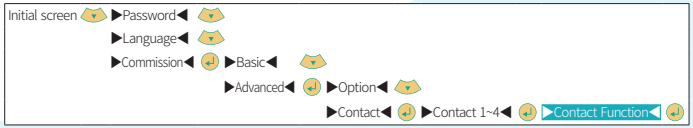
Parameters: Enable, Disabled

NOTE: To use a special function, set the desired item to Enabled to display the corresponding submenus. If you set it to Disabled, it automatically hides the function. For NTIR, **▶Interrupt Timer◀**, **▶Converter◀**, **▶Heater◀**, **▶Auto Inspection◀** are not applicable.

(2) Contacts

① Contacts 1 to 4: Four basic contacts are provided for checking the product status from the central control room.

A. Contact Function setting

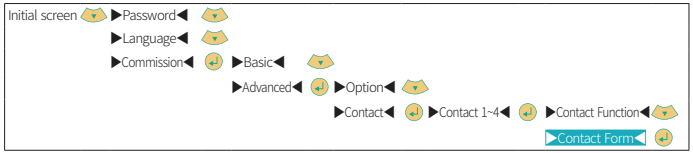


Parameters: See below

NOTE: This entry allows you to select the display contact to check via On-Off signal feedback.

- Close Limit: full close position
- Open Limit: full open position
- Middle Position: Middle opening position. When you select this variable, hidden sub-items ▶ **Low Position** ◀ and ▶ **High Position** ◀ appear, which is the range of the opening degree set in this entry
- Torque Trip Close: Product alarm state of “Torq Trip” during valve closing
- Torque Trip Open: Product alarm state of “Torq Trip” during valve opening
- Torque Trip: Product alarm state of “Torq Trip” regardless of the opening degree
- Torque Trip Mid: Product alarm state of “Torq Trip” at 0 to 99% opening degree
- Opening: Open direction operation state
- Closing: Close direction operation state
- Running: Product operating state regardless of direction.
- Stall: “Stall” product alarm state
- Low Battery: “ ” product alarm state
- Handwheel: Manual operation state
- Running Blink: product running state. However, unlike running, the contact opens and closes at 0.5 second intervals.
- Stop State: When the operation mode switch on the front of the product is STOP or ▶ **Panel Menu Select** ◀ is set to Stop
- Open Interlock: The product has received an Open Interlock signal
- Close Interlock: The product has received a Close Interlock signal
- Interlock: The product has received an open or close interlock signal.
- ESD Signal: The product has received an ESD signal
- Phase Lost: A “PhaseLst” product alarm state (Open phase or single phase)
- Local State: The operation mode switch on the front of the product is “LOCAL” or ▶ **Panel Menu Select** ◀ is set to Local
- Remote State: The operation mode switch on the front of the product is “REMOTE” or ▶ **Panel Menu Select** ◀ is set to Remote
- Inspecting: ▶ **Auto Inspection** ◀ set value, a sub-item of ▶**Option**◀, is enabled.
- 24V Error: “24VErr” product alarm state (control power alarm)
- Motor Running: The power is connected to the motor regardless of the operation of the motor
- Motor Temp Error: “TempErr” product alarm state
- Sensor Error: “SensorErr” product alarm state
- CPU Temp Error: “CPUTemp” product alarm state
- Integrated Error: All product alarm conditions that cause the product to stop operating.

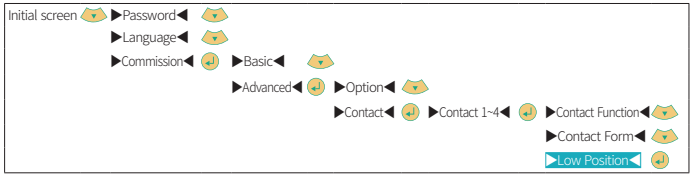
B. Setting the Type of Contact 1 to 4



Parameters: Normally Open, Normally Close

NOTE: Contact 1 uses terminal 6 - 7; contact 2 terminal 8 - 9; contact 3 terminal 10 - 11; contact 4 terminal 12 - 13, and Normally Open means 'contact operation = circuit connected' and Normally Close means 'contact operation = circuit cut off'.

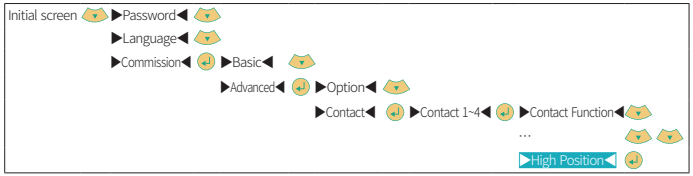
② Low Position (only available when Contact Function is set to Middle Position)



Parameters: Close Limit, 0 - 99%, Open Limit

NOTE: When **▶Contact Function◀** is set to Middle Position, you can set the minimum opening degree value in the range of Middle Position in this entry.

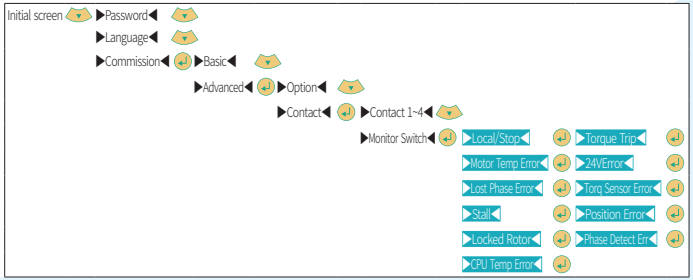
③ High Position (only available when Contact Function is set to Middle Position)



Parameters: Close Limit, 0- 99%, Open Limit

NOTE: When **▶Contact Function◀** is set to Middle Position, you can set the maximum opening degree value in the range of Middle Position in this entry.

④ Setting the State Monitor (Not applicable for NTIR)

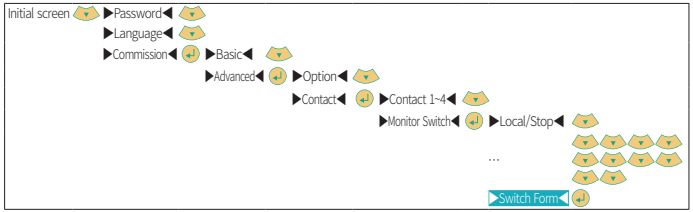


Parameters: Enabled, Disabled (except for **▶Switch Form◀**, see below)

NOTE: This entry has 12 sub-items and you can activate the state monitor and operate the contact by selecting Enabled among the parameters. The sub-items are as follows:

- ▶**Local/Stop**◀: The operation mode switch on the front of the product is LOCAL or STOP or ▶**Panel Menu Select**◀ is REMOTE
- ▶**Motor Temp Error**◀: Motor temperature shows overheating or a product alarm for “TempErr” occurs.
- ▶**Lost Phase Error**◀: Open phase of the product or a product alarm for “PhaseLst” occurs.
- ▶**Stall** ◀: The motor of the product stops.
- ▶**Locked Rotor**◀: The rotor idles for 5 seconds or longer while the motor is running.
- ▶**CPU Temp Error**◀: The internal temperature of the product shows overheating or a product alarm for “CPUTemp” occurs.
- ▶**Torque Trip**◀: A product alarm for “TorqTrip” occurs.
- ▶**24VError**◀: A product alarm for “24VErr” occurs.
- ▶**Torq Sensor Error**◀: A product alarm for “SensorErr” occurs.
- ▶ **Position Error**◀: A product alarm “PosErr” occurs.

⑤ Setting State Monitor Contact Type



Parameters: Normally Open, Normally Close

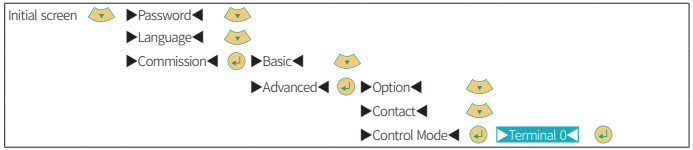
NOTE: Terminal 42 (Common), 43 and 44 are used in this entry. Normally Open means ‘contact operation = circuit connected’ and Normally Close means ‘contact operation = circuit cut off’.

Normally Open: Terminal 42- 44 is connected during contact operation (terminal 42- 43 are cu t off)/

Normally Close: Terminal 42- 44 are cut off during contact operation (terminal 42- 43 are connected)

(3) Control mode

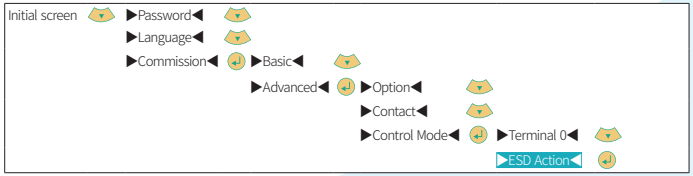
① Setting ESD Function



Parameters: ESD Control, Disable

NOTE: In this entry, you can assign the ESD control function to terminal 25 and set it by selecting Disable if you do not use the function.

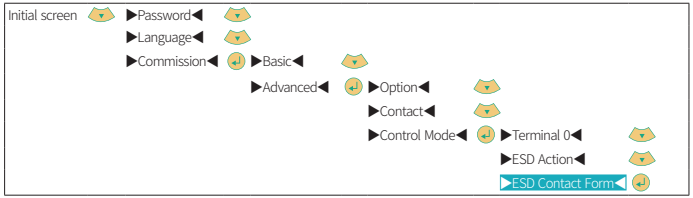
② How to set the ESD function (only available when Terminal 0 is set as ESD Control)



Parameters: Stay Put, Close, Open

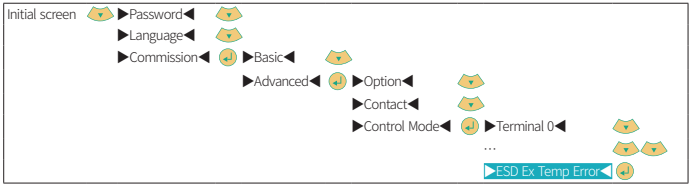
NOTE: This entry selects how the ESD function is activated when Terminal 0 is set to ESD Control. Stay Put stops at the last position; Close moves to Full Close; Open means Move to Full Open. When the ESD signal is connected, the product operates as set in this entry, and other signals cannot control the product.

③ Setting the ESD Contact Type
(only available when Terminal 0 is set as ESD Control)



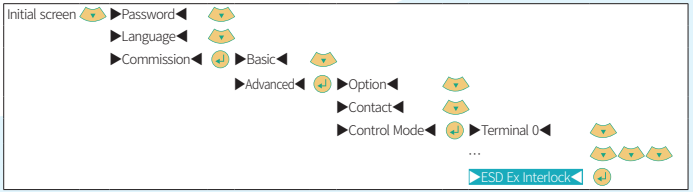
Parameters: Normally Open, Normally Close
NOTE: This entry sets the contact type when ▶ Terminal 0 ◀ is set to ESD Control. Terminal 25 is used for this entry. Normally Open means circuit connection during contact operation and Normally Close means circuit cut off during contact operation.
Normally Open: Terminal 25 - voltage signal is connected during contact operation → performs ESD function (i.e., does not perform ESD function when disconnected).
Normally Close: Terminal 25 - voltage signal is interrupted during contact operation → performs ESD function (i.e., does not perform ESD function when connected)

④ Setting the ESD Function Priority - TempErr
(only available when Terminal 0 is set as ESD Control)



Parameters: Enabled, Disabled
NOTE: When this entry is set to Enabled, the ESD function will take priority over the motor overheat alarm (TempErr). That is, even if the motor is overheating, pressing the ESD button will operate the product according to the setting value of ▶ **ESD Action** ◀.
When this entry is set to Disabled, the ESD function will not take priority over the motor overheat alarm (TempErr). That is, if the ESD button is pressed while the motor is overheating, the product stops operating regardless of the setting value of ▶ **ESD Action** ◀.

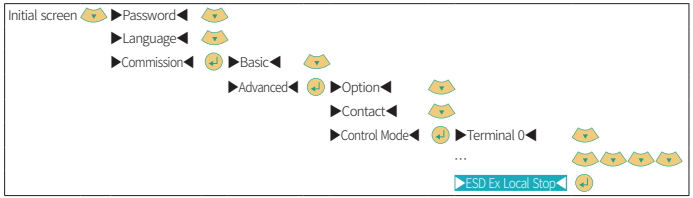
⑤ Setting the ESD Function Priority - Interlock
(Only available when Terminal 0 is set to ESD Control. Not applicable for NTIR.)



Parameters: Enabled, Disabled

NOTE: When this entry is set to Enabled and the interlock function is enabled, the ESD function takes precedence regardless of the presence of the interlock signal. If it is set to Disabled, the ESD function is used only with an interlock signal.

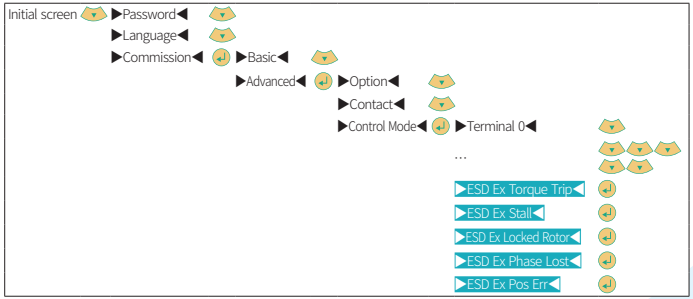
⑥ Setting the ESD function Priority - Local Stop (only available when Terminal 0 is set as ESD Control)



Parameters: Enabled, Disabled

NOTE: When this entry is set to Enabled, the ESD function takes priority even when the operation mode switch on the front of the product is set to STOP.

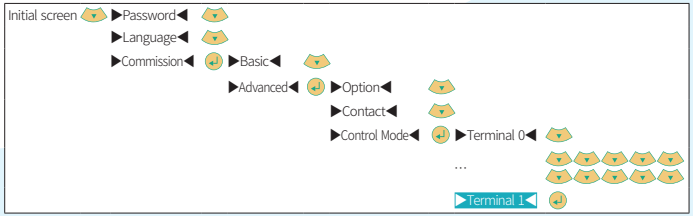
⑦ Setting the ESD Function Priority - Torque Trip, Stall, Locked Rotor, Phase Lost and Pos Err (only available when Terminal 0 is set to ESD Control)



Parameters: Enabled, Disabled

NOTE: When this entry is set to Enabled, the ESD function takes priority even when the alarm occurs.

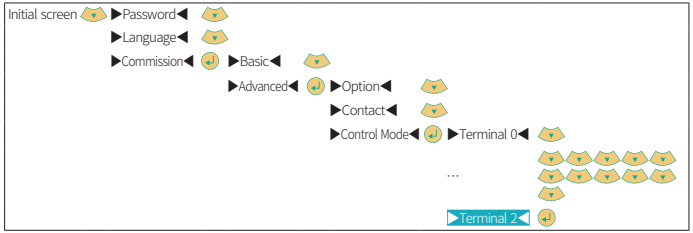
⑧ Setting the Open Interlock Function (not applicable for NTIR)



Parameters: Open Interlock, Disabled

NOTE: When this entry is set to Open Interlock, you can use the Open Interlock function via Terminal 37. This function prevents malfunctions by blocking unauthorized open command signals.

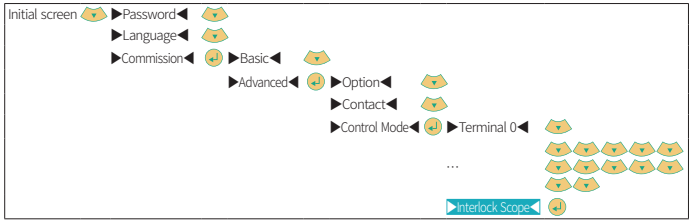
⑨ Setting the Close Interlock Function (not applicable for NTIR)



Parameters: Close Interlock, Local Bus Select, Disabled

NOTE: When this entry is set to Close Interlock, the Close Interlock function can be enabled via Terminal 38. When it is set to Local Bus Select, the Localbus function can be used. When set to Disable, Terminal 38 is disabled. This function prevents malfunction by blocking unauthorized close command signals.

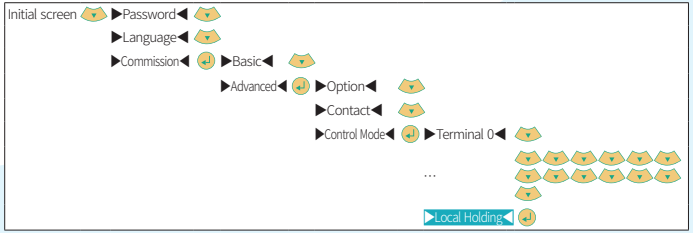
⑩ Interlocks Scope (not applicable for NTIR)



Parameters: Local/Remote, Remote

NOTE: When this entry is set to Local/Remote, the Interlock signal controls the product regardless of the product operation mode. That is, when the interlock signal is received, this product gives priority to the signal. When set to Remote, the Interlock signal has priority over the signal only when the product operation mode is REMOTE. When the product operation mode is LOCAL, the local control has priority regardless of the reception of the interlock signal.

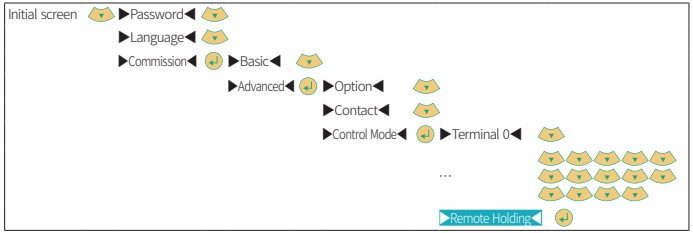
⑪ Local Holding



Parameters: Enabled, Disabled

NOTE: This entry sets the switch operation method on the front of the product. When this entry is set to Enabled, the product is operated in the local holding state, which is operated to full open or full close position even when the operation changeover switch is turned and released when the product is controlled from the local. When the switch is set to Disabled, it defaults to Inching control state in which the operation is stopped immediately after the operation changeover switch is released.

⑫ Remote Holding



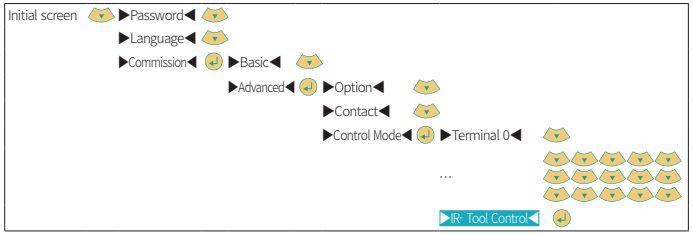
Parameters: Enabled, Disabled

NOTE: When controlling the product remotely, this product basically uses B contact (Normal Close) during STOP operation. Therefore, when terminal 34 is connected, the product operates as 'auto control circuit (self-holding)' and when terminal 34 is not connected, it operates as an 'inching control circuit'. However, when this entry is set to Enabled, the product is controlled only by 'auto control circuit (self- holding)' using A contact (Normal Open) during STOP operation.

** Auto Control Circuit (Self-Holding Circuit)': Once the circuit is operated, it keeps operating until another value is input, even when the switch is reset.

** Inching Control Circuit: The circuit operates only when a start signal is input.

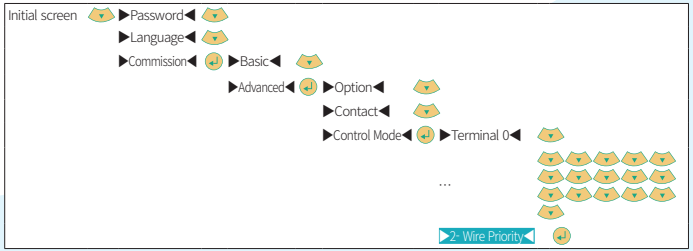
⑬ Setting the Infrared Setting Tool (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry specifies the range of use of the Infrared Setting Tool. When this entry is set to Enabled, the Infrared Setting Tool can be used for product setting and product operation commands. When it is set to Disabled, it can be used only for product setting.

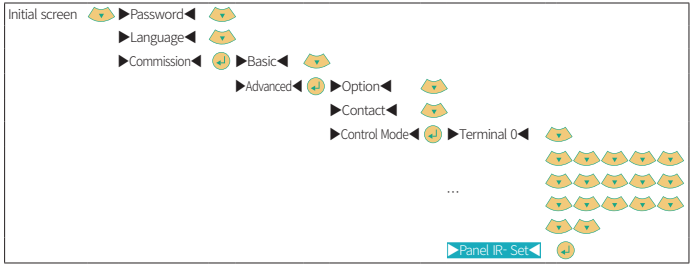
⑭ 2- Wire Priority



Parameters: Open, Close

NOTE: This entry is used to set which command has priority over the opening and closing operations when controlling the product with only two command lines, In order to give priority to the open operation, set this entry to Open, and then connect terminal 5 and 33 to the terminal compartment internally (jumper) and connect terminal 5 and 35 externally. In order to give priority to the close operation, set this entry to Close, and then connect terminal 5 and 35 internally (jumper) at the terminal compartment and connect terminal 5 and 33 externally.

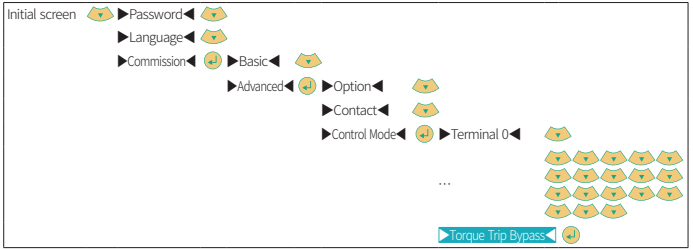
⑮ Setting Operation Mode Selector Switch (not applicable for NTIR)



Parameters: Default, Local, Stop, Remote

NOTE: When this entry is set to Default, the product operation mode is switched to LOCAL, REMOTE or STOP depending on the adjustment of the switch. When it is set to Local, Stop, or Remote, the operation mode selector switch is deactivated.

⑯ Torque Trip Bypass (not applicable for NTIR)

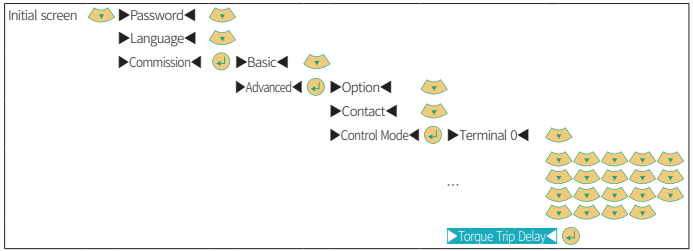


Parameters: 0 to 5%

NOTE: This entry is used to specify the range of the valve opening degree to operate with a drive torque that is 1.4 to 2 times higher than the rated torque when driving the product to move a stopped valve. E.g.) 3% Setting:

It is operated with drive torque up to 3% opening degree in open operation with a valve fully closed and up to 97% opening degree in close operation with a valve fully open.

⑰ Torque Trip Delay



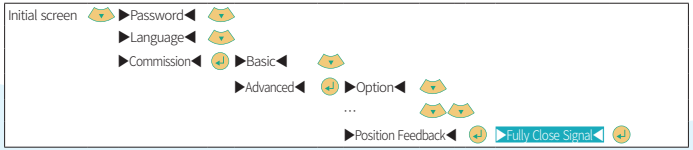
Parameters: 0 to 100 (unit: 0.1 second)

NOTE: This entry prevents the occurrence of the torque protection function due to the high drive torque generated when moving a stopped valve. When this entry is set to 15, the torque protection function will occur 1.5 seconds after the product is operated.

(4) Valve Position Transmit Function

(appears only when Position Feedback, a sub-entry of Option, is set to Enabled)

① Full Close Signal

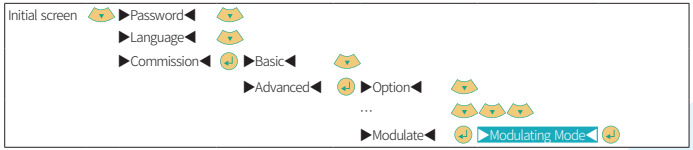


Parameters: 4mA, 20mA

NOTE: This entry specifies the value of the outgoing current that the product will emit when the valve position is 'full close'. When the parameter in this entry is set to 4mA, it will be '4mA-full close (i.e. 20mA- full open)'. When set to 20mA, it will be '20mA- full close (i.e. 4mA- full open)'.

(5) Modulating (appears only when Modulation, a sub-section of Option, is set to Enabled.): It is a paid option.

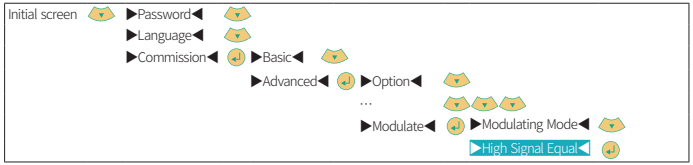
① Modulating Mode



Parameters: Position Control, Threshold Control

NOTE: This entry specifies the use of the current signal received by the product. When this entry is set to Position Control, it is used to adjust the valve position (4mA: Opening degree 0%; 8mA: Opening degree 25%; 12mA: Opening degree 50%; 16mA: Opening degree 75%; 20mA: Opening degree 100%). When it is set to Threshold Control, it is used to control the operation of the product, that is, On-Off function (4- 8mA: Close command; 8 - 16mA: Stop command; 6 - 20mA: Open command).

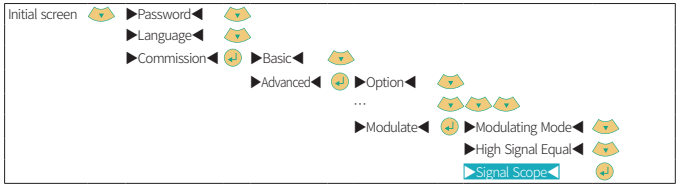
② Specifying the valve position corresponding to the maximum current value (When Modulating Mode is Position Control)



Parameters: Open Limit, Close Limit

NOTE: This entry specifies the valve position corresponding to the maximum current value among the current signals received by the product. When the parameter in this entry Open Limit, it is set to 'maximum current value- full open (i.e. minimum current value - full close). When Close Limit is selected, it will be set to 'maximum current value - full close (i.e. minimum current value - full open)'.

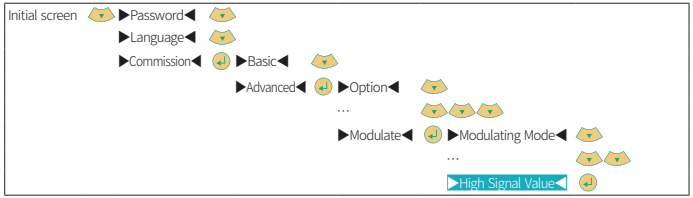
③ Signal Scope



Parameters: Factory Setting, User Define

NOTE: This entry is to specify the scope of the current signal received by the product. When this entry is selected as Factory Setting, the current signal scope is set to 4- 20mA. When it is set to User Define, It is set by user according to the set value of **▶High Signal Value◀** and **▶Low Signal Value◀**.

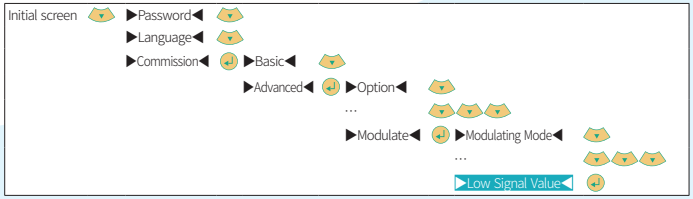
④ Setting the Maximum Current Value (only available when Signal Scope section is User Define)



Parameters: 0 to 4095 (unit: mA)

NOTE: When **▶Signal Scope◀** is set to User Define, the user defines the maximum current value of the product control signal in this entry. For example, when you want to set 18mA as the maximum value instead of 20mA, which is the maximum current value when setting the factory setting, send 18mA to the current signal receiving terminals, which are terminal 26 and 27, press ↵ in the setting tool and wait for the signal to stabilize. Then press ↵ again to save the current value.

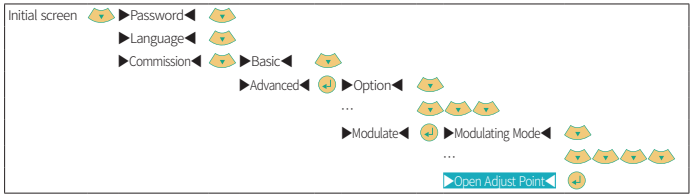
⑤ Setting the Minimum Current Value (only available when Signal Scope section is User Define)



Parameters: 0 to 4095

NOTE: When ▶**Signal Scope**◀ is set to User Define, the user defines the minimum current value of the product control signal in this entry. The setting method is the same as the ▶**High Signal Value**◀ above.

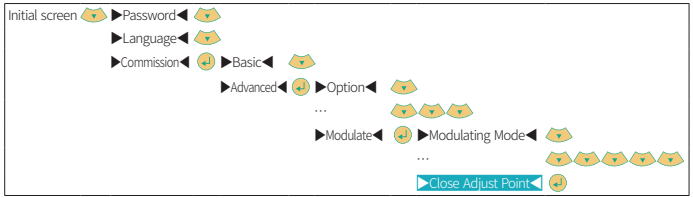
⑥ Setting Open Adjustment Point



Parameters: 0 to 20 (unit: Pulse)

NOTE: Set the start point for the section where the signal is intermittently adjusted so that the command signal is within the dead band when the valve is opened. For example, when the open adjustment point is set to 5 and inching control is performed, adjust the inching pulse when it reaches 5 points away from the dead band during open operation. The adjustment time can be set at 0 to 1 seconds in ▶**Adjust Pulse Width**◀.

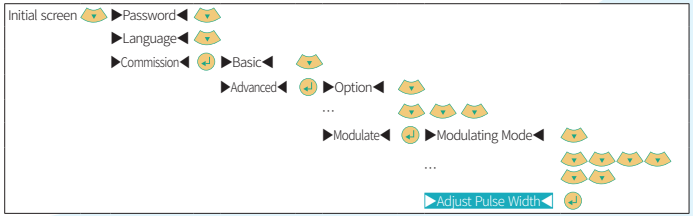
⑦ Setting Close Adjustment Point



Parameters: 0 to 20 (unit: Pulse)

NOTE: Set the start point for the section where the signal is intermittently adjusted so that the command signal is within the dead band when the valve is closed. The setting method is the same as the ▶**Open Adjust Point**◀ above.

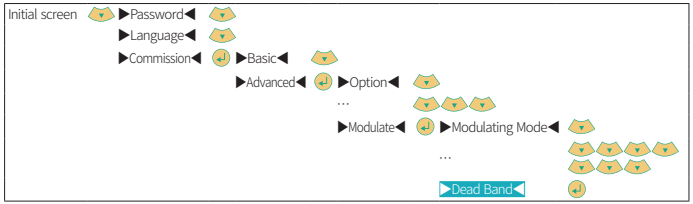
⑧ Setting Adjust Width Adjustment



Parameters: 0 to 10 (unit: 0.1 second)

NOTE: Set the time to adjust the command signal to the open and close adjustment points. The signal is adjusted every time set in this entry.

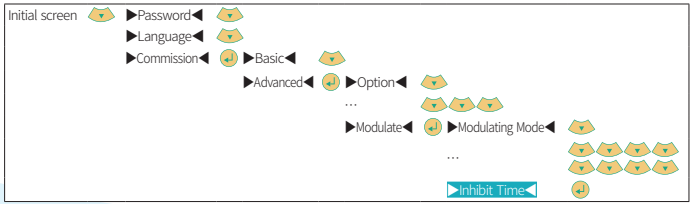
⑨ Setting Dead Band



Parameters: 1 to 50 (unit: 0.1%)

NOTE: This entry is used to specify the scope of the current value dead band. It can be set from 0.1 to 50. When the product vibrates or reacts to unwanted signal changes, increase the set value. When you need more precise control, decrease the set value. Increasing the total stroke time increases the accuracy of the dead band.

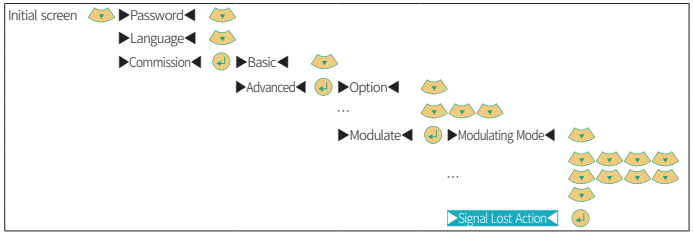
⑩ Inhibit Time



Parameters: 0 to 50 (unit: 0.1 second)

NOTE: This entry sets the amount of time to wait for the product to react until the signal is stable so that the product does not operate unnecessarily by suddenly changing signals. After the set time, the product responds to the necessary signal change and the default value is 10 (1 second).

⑪ Setting Signal Lost Action

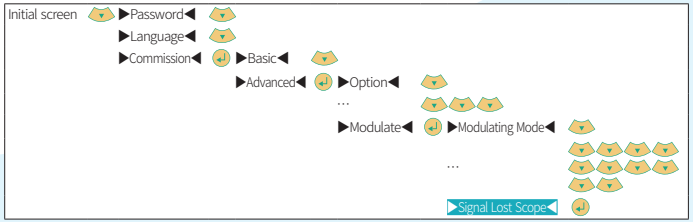


Parameters: Stay Put, High-Position, Low-Position

NOTE: This entry specifies the action to be taken by the product when a signal is lost. It is set as follows depending on the parameter.

Stay Put - Stop in the current state; High-Position - Move to the position corresponding to the maximum current value; Low - Position - Move to the position corresponding to the lowest current value

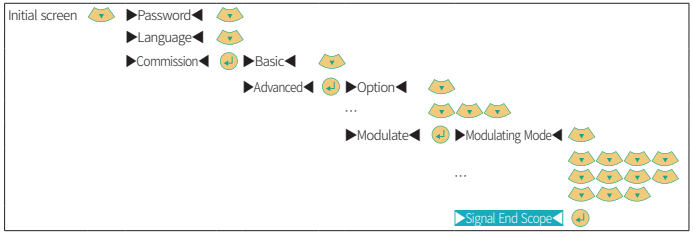
⑫ Setting Signal Lost Scope



Parameters: 0 to 200%

NOTE: When the current signal receives a signal that is higher or lower than the maximum or minimum current value, the product considers the signal to be disconnected. At this time, the scope is specified. The default value is 100%.

⑬ Setting the Scope of Signal (Current) Ends

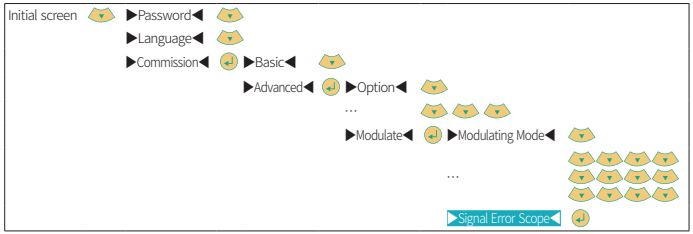


Parameters: 0 to 100%

NOTE: When the current signal is in the range of 'min value to min value + (max value - min value) * set value', the product will consider the signal as the min. signal value, and when in the range of 'max value - (max value - min value) * set value to max value, the product will consider the signal as the max signal value. The default setting value is 20%.

e.g.) Maximum signal value: 20mA; Minimum signal value: 4mA; Set value: 20% → Minimum signal scope is 4 to 7.2mA; maximum signal scope is 16.8 to 20mA.

⑭ Setting Signal Error Scope (not applicable for NTIR)



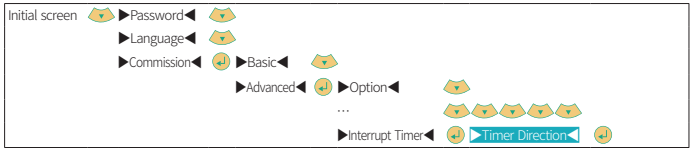
Parameters: 0 to 100%

NOTE: When the change in the current signal exceeds the '(maximum- minimum)*set value and varies rapidly, the product records it as a Signal Error.

(6) Local Bus: This is a paid option. Please contact us for details.

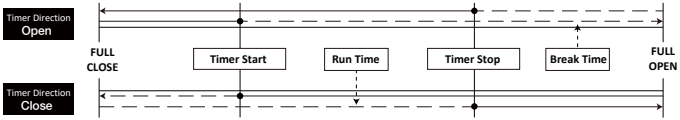
(7) Interrupt Timer: This function repeats operation - stop - operation in a certain section. This feature effectively adjusts the stroke time and avoids problems that seriously affect the fluid in the pipe, such as water shock. (Appears only When Modulation, a sub-section of Option, is set to Enabled. Not applicable for NTIR.)

① Timer direction (not applicable for NTIR)



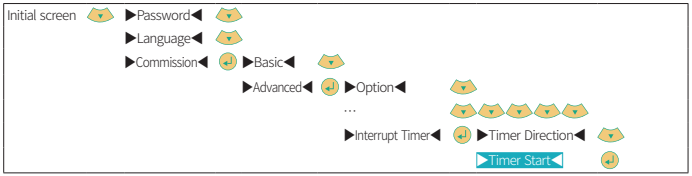
Parameters: Open, Close

NOTE: This entry determines the direction in which the Interrupt Timer will be used. The default setting is Open.



- OPEN - Valve opens: Timer operates from starting point to full open point; Valve close: Timer operates from full open point to ending point
- CLOSE - Valve opens: Timer operates from full close point to end point; Valve close: Timer operates from starting point to full close point

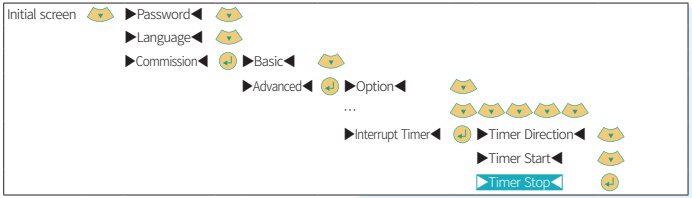
② Timer Starting Point (not applicable for NTIR)



Parameters: 0 to 100 (unit: percent)

NOTE: This entry specifies the starting point of the Interrupt Timer. The default value is 2%.

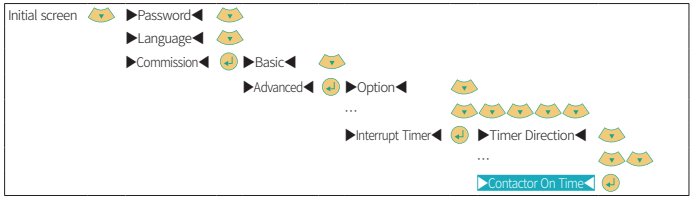
③ Timer Ending Point (not applicable for NTIR)



Parameters: 0 to 100 (unit: percent)

NOTE: This entry specifies the position where the interrupt timer ends. The default value is 5%.

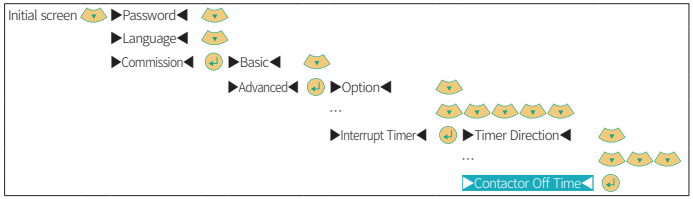
④ Timer operation time (not applicable for NTIR)



Parameters: 1 to 99 (unit: seconds)

NOTE: This entry specifies the time in seconds that the motor is driven during timer operation.

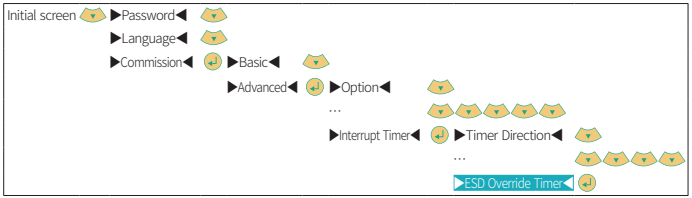
⑤ Timer Off time (not applicable for NTIR)



Parameters: 1 to 99 (unit: seconds)

NOTE: This entry specifies the time in seconds that the motor stops during timer operation.

⑥ ESD Override Timer (Not applicable for NTIR)

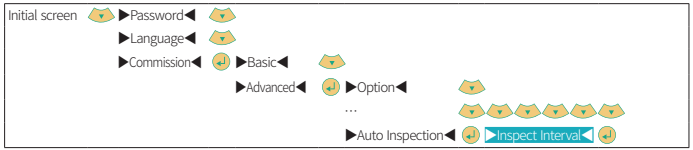


Parameters: 1 to 99 (unit: seconds)

NOTE: When this entry is set to Enabled while the ESD function is enabled, the interrupt timer is overridden when receiving ESD signals and the valve moves to the specified position. When set to Disabled, the valve moves to the specified position while using the interrupt timer.

(8) Automatic inspection: When the product has been stopped for a long time, it automatically finely moves the product to prevent a valve jam and protect the valve and the product. However, please decide carefully whether to use this function depending on the process. (Appears only when Modulation, a sub-entry of Option, is set to Enabled. Not applicable for NTIR.)

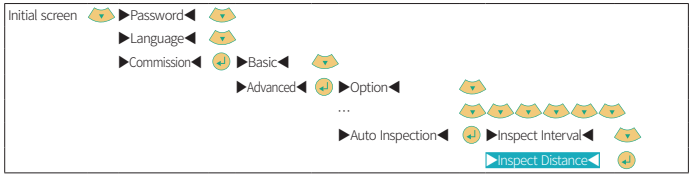
① Automatic Inspection Interval



Parameters: 1 to 99 (unit: Day)

NOTE: This is a setting section for the automatic inspection interval. The priority of automatic check is the lowest and this function is available only when terminal 34 is connected and operated as 'Auto Control Circuit (Self- holding)' by remote control. The automatic inspection is performed only in the full close or full open positions and the inspection period is calculated from the latest time of reaching the full close or full open position.

② Automatic Inspection Distance

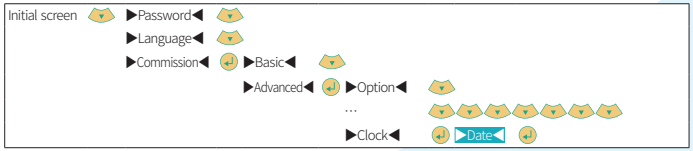


Parameters: 1 to 20

NOTE: This entry specifies the distance for automatic inspection.

(9) Date and Time (not applicable for NTIR)

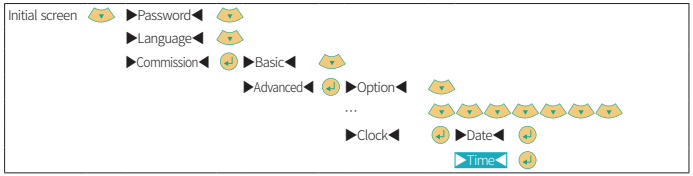
① Setting Date (not applicable for NTIR)



Parameters: YYYY/MM/DD

NOTE: This entry allows you to enter the current date of four digits for year, two digits for month, and two digits for date.

② Setting Time (Not applicable for NTIR)

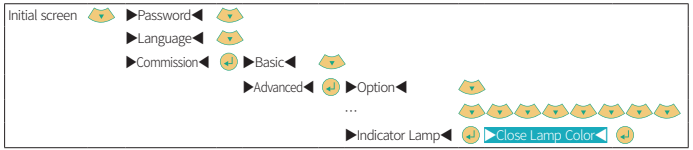


Parameters: HH: MM

NOTE: This entry allow you to enter the current time of two digits for 'hour' and two digits for 'minute'.

(10) Notification Lamp

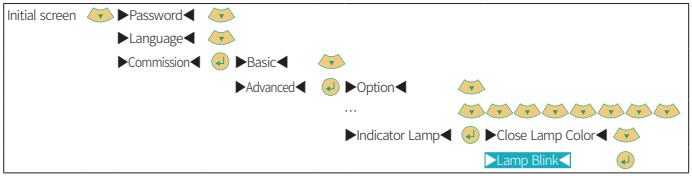
① Setting Full Close Lamp



Parameters: Green, Red

NOTE: The setting of this entry specifies the color of the lamp to be lit when fully closed. The default setting is Green. (Full Close - Green; Full Open - Red)

② Setting Yellow Lamp Blink (not applicable for NTIR)

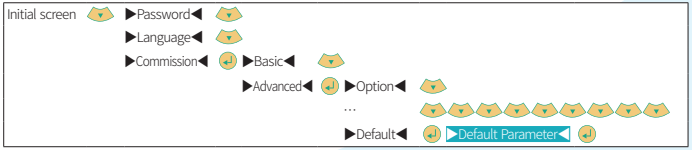


Parameters: Disabled, Error, Running

NOTE: This entry specifies the state under which the yellow lamp blinks. Disabled - Not set; Error - Blinking on product error; Running - Blinking on product operation

(11) Initialization

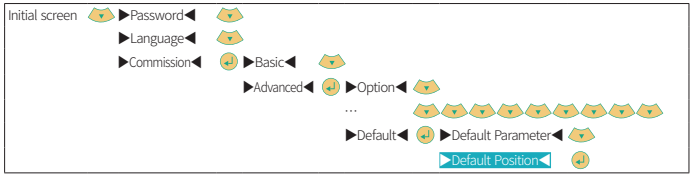
① Initializing Set Values



Parameters: Set, Cancel

NOTE: This entry is to initialize the setting value of each setting item. When Set is selected, all setting items are reset to the factory defaults. When Cancel is selected, the initialization is canceled and returned to the previous state.

② Initializing Limit Setting



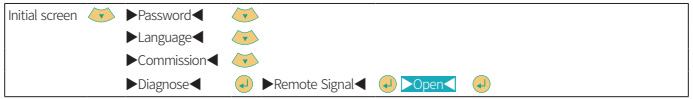
Parameters: Set, Cancel

NOTE: This entry initializes the open and close limit values. When Set is selected, each limit value is reset to 50%. When Cancel is selected, the initialization is canceled and returned to the previous level.

9.4.4 Diagnosis

1) Remote signal

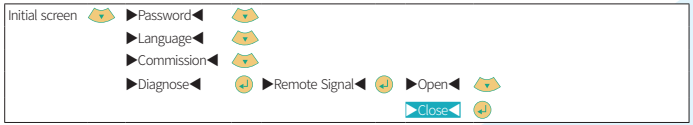
(1) Remote open signal



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the remote open signal is used. The Enable mark indicates the remote open signal is enabled and the Disable symbol indicates the disabled state.

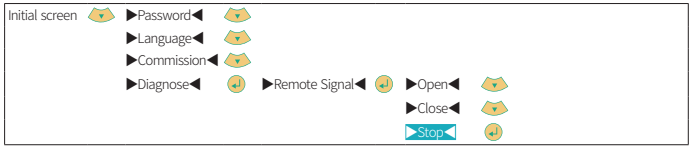
(2) Remote close signal



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the remote close signal is used. The Enable mark indicates the remote close signal is enabled and the Disable symbol indicates the disabled state.

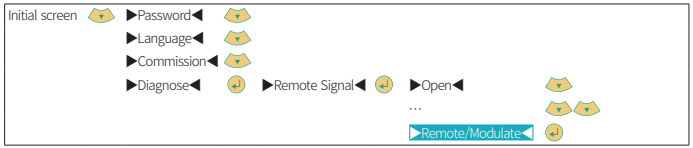
(3) Remote stop signal



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the remote stop signal is used. The Enable mark indicates the remote stop signal is enabled and the Disable symbol indicates the disabled state.

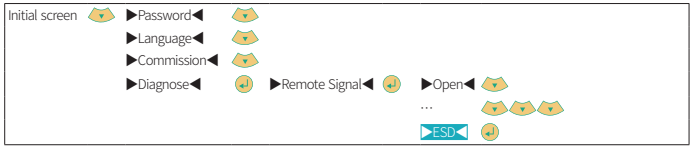
(4) Remote modulating signal (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the remote modulating signal is used. The Enable mark indicates the remote modulating signal is enabled and the Disable symbol indicates the disabled state.

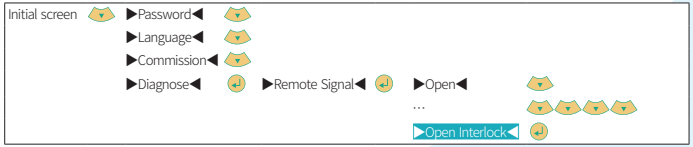
(5) ESD signal



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the ESD signal is used. The Enable mark indicates the activation of the ESD function in LOCAL or REMOTE operation mode, and the Disable mark indicates the deactivated state.

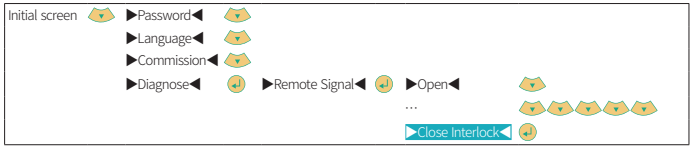
(6) Open Interlock (Not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry is to check whether the open interlock signal is used. The Enable mark indicates the open interlock signal is enabled and the disable mark indicates that the signal is disabled.

(7) Close Interlock (Not applicable for NTIR)

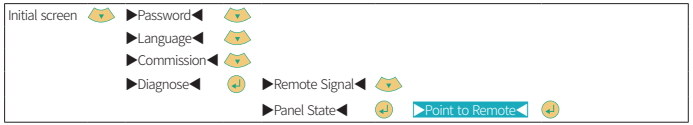


Parameters: Enabled, Disabled

NOTE: This entry is to check whether the close interlock signal is used. The Enable mark indicates the close interlock signal is enabled and the disable mark indicates that the signal is disabled.

2) Switch State of the Control Unit (not applicable for NTIR)

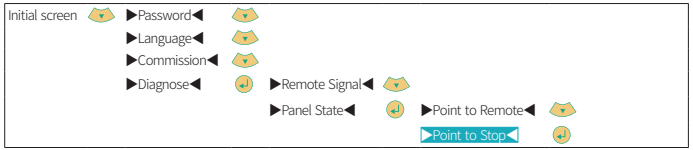
(1) Remote Operation Mode (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry checks the operation mode switch state. The Enable mark indicates that the operation mode switch is in the REMOTE position and the Disable mark indicates that it is in another position.

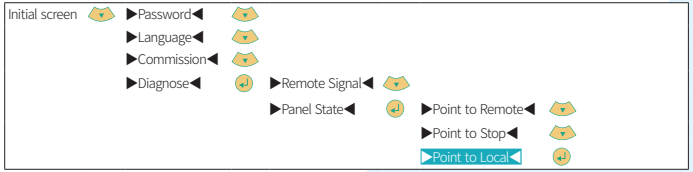
(2) Stop (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry is to check the operation mode switch state. The Enable mark indicates that the operation mode switch is in the STOP position and the Disable mark indicates that it is in other positions.

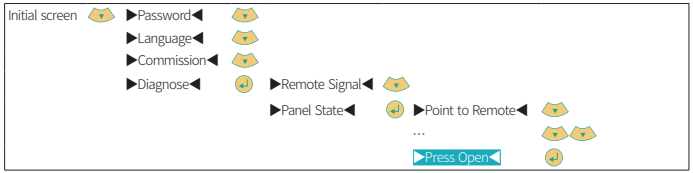
(3) Local Operation Mode (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry is to check the operation mode switch state. The Enable mark indicates that the operation mode switch is in the LOCAL position and the Disable mark indicates that it is in another position.

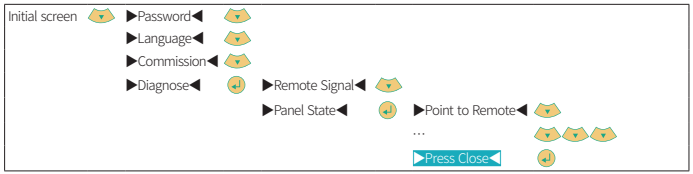
(4) Open Operation (not applicable for NTIR)



Parameters: Enabled, Disabled

NOTE: This entry is to check the operation changeover switch state. The Enable mark indicates that the operation changeover switch is in the Open position and the Disable mark indicates that it is in another position.

(5) Close Operation (not applicable for NTIR)

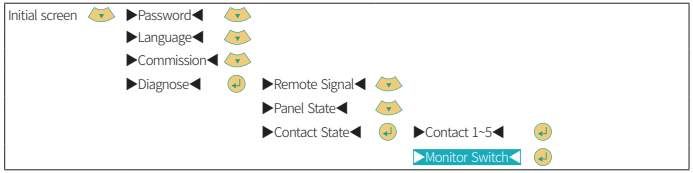


Parameters: Enabled, Disabled

NOTE: This entry is to check the operation changeover switch state. The Enable mark indicates that the operation changeover switch is in the CLOSE position and the Disable symbol indicates that it is in another position.

3) Contact State

(1) Contact 1 to 5 and monitor switch (the monitor switch is not applicable for NTIR.)

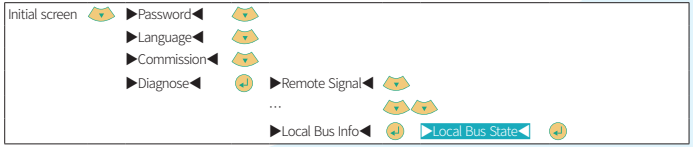


Parameters: OFF, ON

NOTE: This entry is to check the state of the display contact and monitor switch. OFF means a disconnected state and ON a connected state.

4) Localbus Information

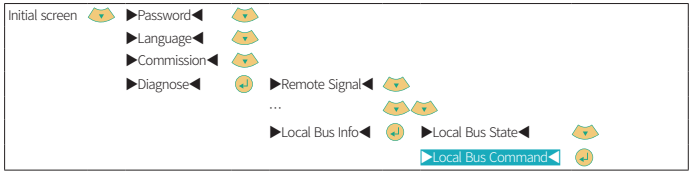
(1) Localbus State



Parameters: Enable, Disable

NOTE: This entry is to check whether communication control is used. Enable mark indicates connection with the communication control system and Disable indicates no connection.

(2) Localbus Command

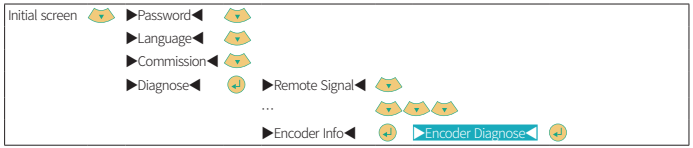


Parameters: Enable, Disable

NOTE: This entry is to check whether the communication control system command is used. The Enable mark indication indicates that the communication control system command is enabled and the Disable mark indicated that it is disabled.

5) Encoder Information

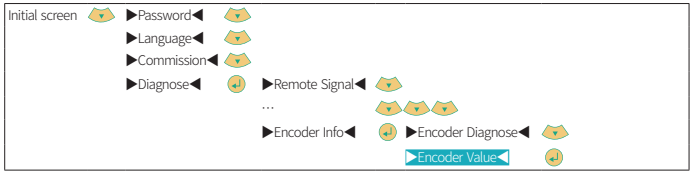
(1) Encoder Diagnosis



Parameters: Ok, Error

NOTE: This entry is to check the encoder state. The Ok mark indicates that there is no error in the encoder, and error indicates there is an error.

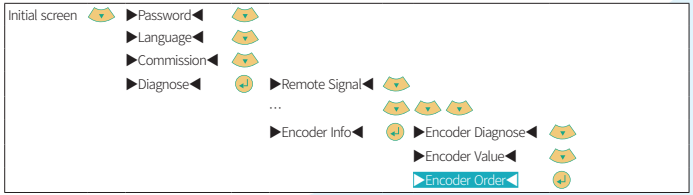
(2) Encoder Value



Parameters: 0 to 4095

NOTE: This entry is to check the current encoder value. It increases during an open operation and decreases during a close operation.

(3) Encoder Order (retain)

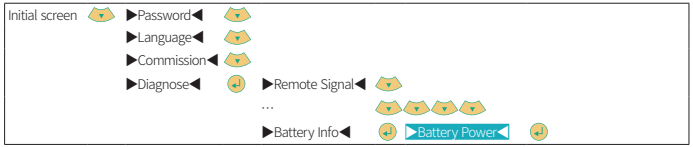


Parameters: 0 to 3

NOTE: This entry is displayed for a professional operator to determine the condition of the product. It is used to check the hall sensor for abnormality.

6) Battery Information (Not applicable for NTIR)

(1) Battery Power (not applicable for NTIR)

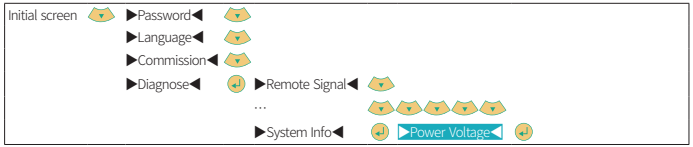


Parameters: 0 to 100%

NOTE: The battery power is displayed from 0 to 100%.

7) System Information

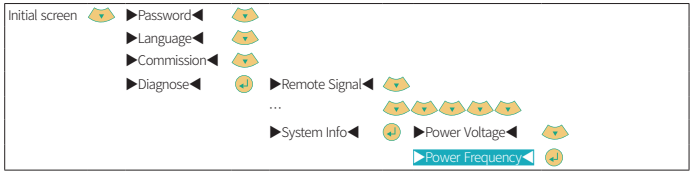
(1) Power Voltage



Parameters: 0 to 999 (unit: Voltage)

NOTE: Indicates the current supply voltage.

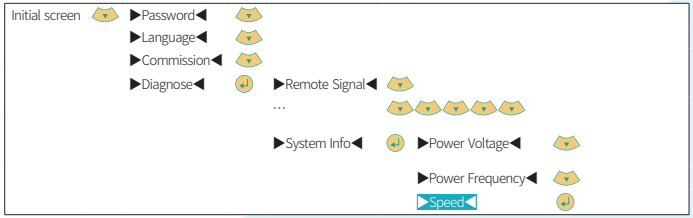
(2) Power Frequency



Parameters: 0 to 99 (unit: Hz)

NOTE: Indicates the current frequency and can only be checked on 3-phase power. 0 appears when not confirmed.

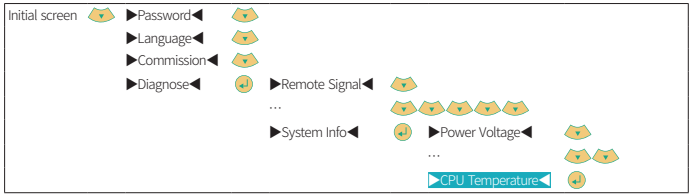
(3) Speed



Parameters: 0 to 999 (unit: rpm)

NOTE: The current speed of the product is displayed in rpm, and only the NTI series can be checked.

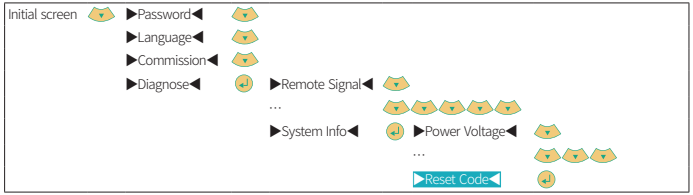
(4) CPU Temperature



Parameters: 0 to 999C°

NOTE: Indicates the current CPU temperature.

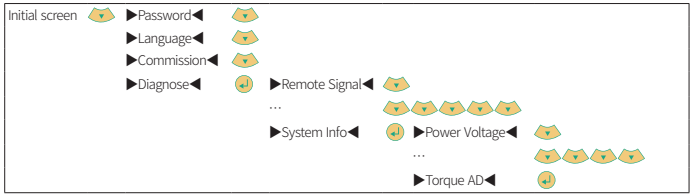
(5) Reset Code



Parameters: 0 to 4

NOTE: This entry is displayed for a professional operator to determine the condition of the product. It is used to check the system reset history.

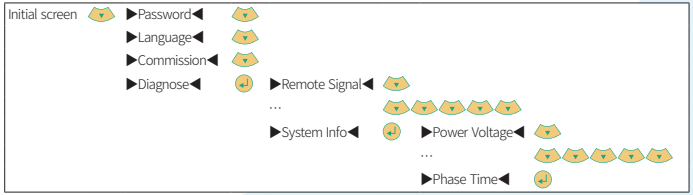
(6) Strain Gauge



Parameters: 0 to 4096

NOTE: This entry is displayed for a professional operator to determine the condition of the product. It is used to check the strain gauge performance.

(7) Phase Time



Parameters: 133, 66, 111, 56

NOTE: This entry is displayed for a professional operator to determine the condition of the product. It is used to check the phase time.

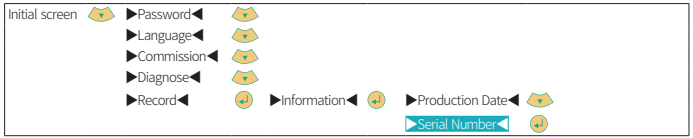
9.4.5 Records

1) Information

(1) Date of Manufacture

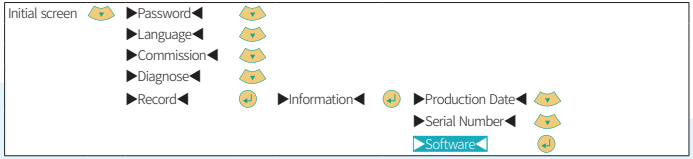
NOTE: The date of manufacture of the product is recorded.

(2) Serial Number



NOTE: The product serial number is recorded.

(3) Software

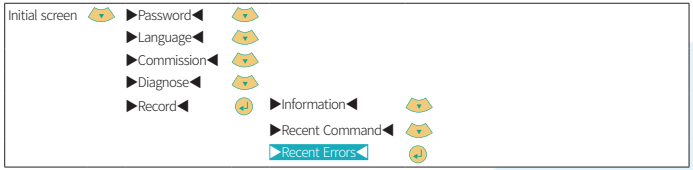


NOTE: The version of the software is recorded.

2) Recent Commands (not applicable for NTIR)

NOTE: The last 10 commands, date and time are recorded. You can check 10 commands using the buttons.

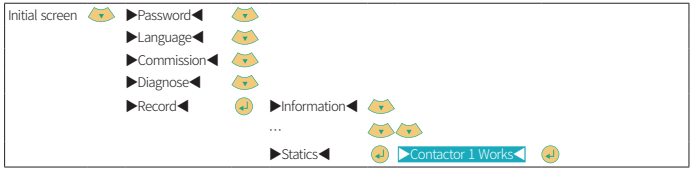
3) Recent Errors (not applicable for NTIR)



NOTE: The last 10 errors, date and time are recorded. You can check 10 errors using the button.

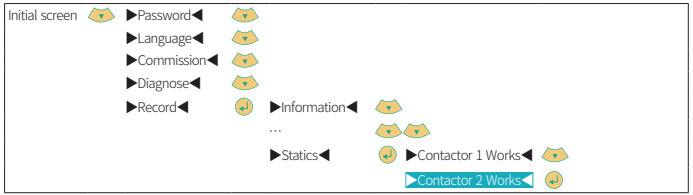
4) Statistics

(1) Contactor 1 Works



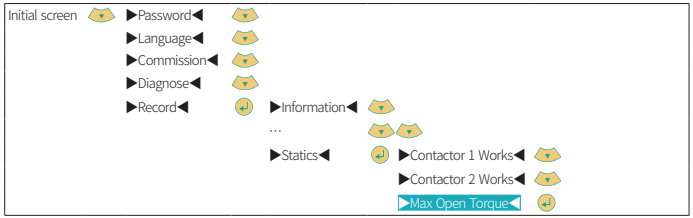
NOTE: The number of times the product has been run anti-clockwise is recorded.

(2) Contactor 2 Works



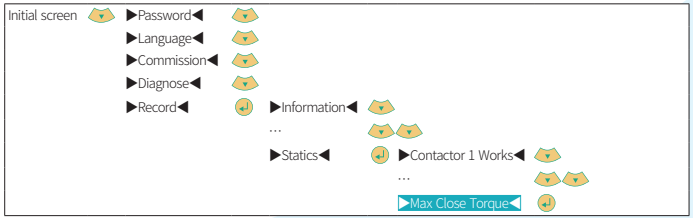
NOTE: The number of times the product has been operated clockwise is recorded.

(3) Max Open Torque



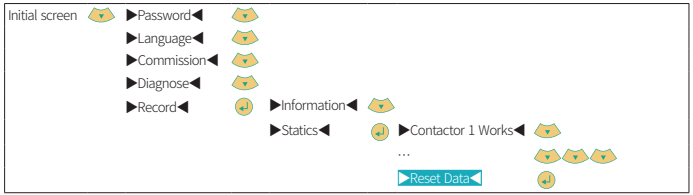
NOTE: The maximum output ratio of the open torque during operation is recorded.

(4) Max Close Torque



NOTE: The maximum output ratio of close torque during operation is recorded.

(5) Reset Data



NOTE: Reset the parent data to zero.

10. Maintenance, Inspection and Troubleshooting

In order to operate the equipment without failure for long periods, regular inspection and repair must be performed. In addition, all products shall be installed, tested, and operated in accordance with the instructions.

1) Since all products are inspected before shipping from the factory, normal installation in accordance with this manual will allow problem-free usage.
2) When setting up the product, there is no need to open the cover of the electronic control unit; the terminal is double- sealed, so moisture does not penetrate during installation.
3) The user must not open the terminal cover or adjust any electrical components inside the terminal cover without commercial inspection.
4) Use correct cable glands and make sure the cables are securely fastened to maintain enclosure performance.
5) Before product inspection and/or maintenance, power other than the battery must be disconnected.

10.1 Periodic Inspection and Operation

1) Keep the product power supplied.
2) When the power cannot be supplied for a long time because the product is not used for a long time or due to other reasons, it is recommended to test the product regularly to check the operation state of the product.
3) Conduct a comprehensive inspection once a year to check the product for abnormality and carry out repairs as required.
4) Check whether the bolts on the product and the valve are properly tightened.
5) Check the cleanliness of the valve stem and coupling lubricant.

10.2 Batteries

NTI and NTIT are equipped with three 1.5V AA batteries. They are an auxiliary power that memorizes the valve's opening degree value and enables the product setting in non-power situation and shows the valve's opening degree during manual operation. Therefore, battery installation is not essential to the operation of the product, and batteries do not need to be installed at all times since they are not consumed in the constant power environment. The battery can be used for up to five years, but it is recommended that you replace it every three years.

10.2.1 Cautions for Batteries

When replacing the battery, the memory value is not deleted even when it is removed, but it is recommended to replace it while the power is on because the memory value may be changed by incorrect operation. When the battery is removed while the main power is not connected, check the valve opening degree after replacement. However, in explosion-proof areas, turn off the power and then replace the battery; the battery cover located outside the product must not be damaged in the explosion-proof area. Also, remove the battery sheet after disconnecting the product power.

10.2.2 Removal of the Battery

1) Change the operation mode of the product to Stop.

2) Remove the battery plug located on the top of the body with an 8mm L wrench.

3) Pull out the red string and take out the plastic container inside.

4) Replace the batteries with new ones. (3 AA 1.5V)

5) When the replacement is complete, put the plastic container back and close the plug.

10.3 Weight and Lubricants

- ☞ Gal- 5 75W90 specification lubricant is used, which is suitable for 30°C to 70°C (22°F to 160°F) unless a special order is requested due to extreme weather.
- ☞ Since semi-permanent grease is injected, it is not necessary to add or change grease separately during normal operation.
- ☞ Re-inject grease when reassembling the product after dismantling it for regular inspection or repair.
- ☞ You may use the same kind of grease even if the products of grease are different, but do not mix different classes of grease.

MODEL	CAPACITY
NTI-01	03.L
NTI-02	
NTI-03	
NTI-04	0.8L
NTI-05	
NTI-06	1.1L
NTI-07	6.5L
NTI-08	7.0L
NTI-09 and NTI-09.1	
NTI-10 and NTI-10G	
NTIT-01	1.5L
NTIT-02	
NTIT-03	
NTIT-04	
NTIT-05	
NTIT-06	
NTIR-200	400g
NTIR-500	

10.4 Storage

When the product will not be used for an extended period, store it correctly in the following way:

- ☞ Keep the product indoors if possible. When you need to store it outdoors, place the product on a level above the ground and install a cover or screen.
- ☞ Store the product in a clean and dry place with good ventilation.
- ☞ Do not store it in dusty, sandy, damp or salty places
- ☞ Do not store it in locations exposed to high temperatures or direct sunlight, or near hazardous gases or fire.

10.5 Other

- ☞ When a problem occurs while using the product, refer to the XXX section and take the appropriate action.
- ☞ Do not dismantle or modify the product arbitrarily.
- ☞ When you need to repair or maintain the product, check the product specification information, such as the model number, electrical specifications, and serial number, and contact us to take appropriate measures.
- ☞ For any other inquiries or technical requests, please contact us.

10.6 Fault Diagnosis and Troubleshooting other than Alarms

Phenomenon	Diagnosis	Solutions
The motor does not rotate.	Power is off	Check the power line.
	The product's voltage and incoming voltage are different.	Check the nameplate to make sure that the voltage required by the product and the power connected to the product are the same.
The motor stops during open/close operation.	The torque switch engage due to overload	Check the cause of the overload and remove it. Contact us to increase the set value of the torque switch.
	EOCR is operating.	Readjust the setting value of EOCR.
	Poor valve stem lubrication	Clean the valve stem and refill grease.
	Foreign matter inside the valve	Remove foreign matter inside the valve.
	Foreign matter in the valve thread (in- screw type valve)	Dismantle the valve and check the threads.
	Excessive tightening of the valve gland packing	Loosen the gland packing and refill grease.
The motor rotates but the valve does not operate (opening degree gauge works).	Bolt wear on stem bush due to poor machining	Replace the bolts on the worn stem bush.
The limit switch does not stop the motor.	Motor's reverse rotation (not occurring in one piece-type)	Place it in the middle opening position manually and re-connect 2 of 3 wires of the motor by switching them.
	Poor limit switch setting	Readjust the setting of the limit switch.
	The electronic switchgear malfunctions	Replace the electronic switchgear.
	Control line is grounded.	Measure the resistance between grounds.
	The micro-switch malfunctions.	Replace and install the micro-switch + PCB and check the fixation state.

11. Product Lifespan

The lifespan (duration of use) of this product may vary depending on the conditions of use and environment of each product. Please contact our sales team for any questions regarding this lifespan of this product.

12. Disposal of the Product

☞ When the lifespan of this product has passed, it is classified as industrial waste in accordance with the regulations for the disposal of electric wastes. You may dispose of this product at your own expense or contact us.
☞ There is a risk of high voltage inside the product even when the product's power is turned off when disposing of it. Therefore, before dismantling this product, be sure to stop operating it and do not touch the internal parts of the product or the power system when turning the product's power On/Off.
☞ Do not install, dismantle or dispose of this product without qualified professional personnel.

13. Quality Assurance (Warranty and Spare Part Policy)

NEWTORK KOREA CO., LTD. provides free and/or paid services based on the consumer damage compensation standards of each country.

13.1 Free Services:

We will compensate you for damages in accordance with the Consumer Damage Policy as follows:

- ☞ When a product that is different from the specifications ordered or approved by the user is delivered;
- ☞ When the quality documents issued by our company and the actual quality of the product do not match;
- ☞ When any defects of the product (parts, assembly) are found;
- ☞ Other cases where our company fully accept that it is under our responsibility.
- ☞ The warranty period is 18 months from the date of shipment or 12 months after commissioning, whichever is earlier, unless otherwise prescribed.

13.2 Paid Services:

will apply to the following cases

- ☞ Failure caused by application different from the specifications at the time of selecting this product;
- ☞ Failure caused by user's intention or negligence (arbitrary alteration, change, dismantling or assembly);
- ☞ Failure caused by arbitrarily changing our company's standard electrical connection;
- ☞ Failure caused by not following the procedures and cautions of the installation manual provided by our company;
- ☞ Failure caused by fire, flood or natural disaster;
- ☞ Poor performance or failure after the warranty period has expired;
- ☞ Please consult with us in advance when you need to dismantle or adjust this product or replace parts.

Program Default Settings

Default Set		
Main Menu	Submenu	Default
Basic	Basic	
Valve	Close Direction	Clockwise
	Close Action	Position Limit
	Open Action	Position Limit
Torque Trip Mode	Close Torque	100%
(Normal)	Open Torque	100%
Torque Trip Mode	Close Torque	100%
(Intelligent)	Open Torque	100%
	Backward Distance	3%
	Backward Times	2
	Pos Tolerance	1%
Advanced		
Contact 1	Contact Function	Close Limit
	Contact Form	Normally Open
Contact 2	Contact Function	Open Limit
Contact 2	Contact Form	Normally Open
Contact 3	Contact Function	Close Limit
	Contact Form	Normally Open
Contact 4	Contact Function	Open Limit
	Contact Form	Normally Open
Monitor Switch	Local/Stop	Enabled
	Motor Temp Error	Enabled
	Lost Phase Error	Enabled
	Stall	Enabled
	Locked Rotor	Enabled

Monitor Switch	CPU Temp Error	Enabled
	Torque Trip	Enabled
	24VError	Enabled
	Torq Sensor Error	Enabled
	Position Error	Enabled
	Switch Form	Normally Close
Control Mode	Terminal 0	ESD Control
	ESD Action	Stay Put
	ESD Contact Form	Normally Open
	ESD Ex Temp Error	Enabled
	ESD Ex Interlocks	Enabled
	ESD Ex Local Stop	Enabled
	ESD Ex Torq Trip	Enabled
	ESD Ex Stall	Enabled
	ESD Ex Locked Rotor	Enabled
	ESD Ex Phase Lost	Enabled
	ESD Ex Pos Err	Disabled
	Terminal 1	Disabled
	Terminal 2	Disabled
	Interlocks Scope	Local/Remote
	Local Holding	Enabled
	Remote Holding	Disabled
	IR- Tool Control	Enabled
	2- Wire Priority	Open
	Panel Menu Select	Default
	Torque Trip Bypass	3%
	Torque Trip Delay	30
Indicator Lamp	Close Lamp Color	Green
	Lamp Blink	Disabled

Optional Function (Only display when functions are set Enabled in Options menu under Advance menu)		
Pos feedback	Fully Close Signal	4mA
Modulate	Modulating Mode	Position Control
	High Signal Equal	Open Limit
	Signal Scope	Factory Setting
	Open Adjust Point	5
	Close Adjust Point	5
	Adjust Pulse Width	3
	Dead Band	10‰
	Inhibit Time	10
	Signal Lost Action	Stay Put
	Signal Lost Scope	15‰
	Signal Ends Scope	20‰
	Signal Error Scope	100‰
LocalBus	Localbus Type	Profibus
	Localbus Address	11
	Localbus Rate	9600
	Open Adjust Point	5
	Close Adjust Point	5
	Adjust Pulse Width	3
	Dead Band	10‰
Interrupt Timer	Timer Direction	Open
	Timer Start	2%
	Timer Stop	5%
	Contactor On Time	1
	Contactor Off Time	2
	ESD Override Timer	Enabled
Auto Inspection	Inspect Interval	15
	Inspect Distance	1

NEWTORK
VALVE AUTOMATION

NEWTORK KOREA

TEL +82-31-711-3107 **FAX** +82-31-711-3057

51, SEPINAE-GIL, OPO-EUP, GWANGJU-SI, GYEONGGI-DO, REPUBLIC OF KOREA 12790