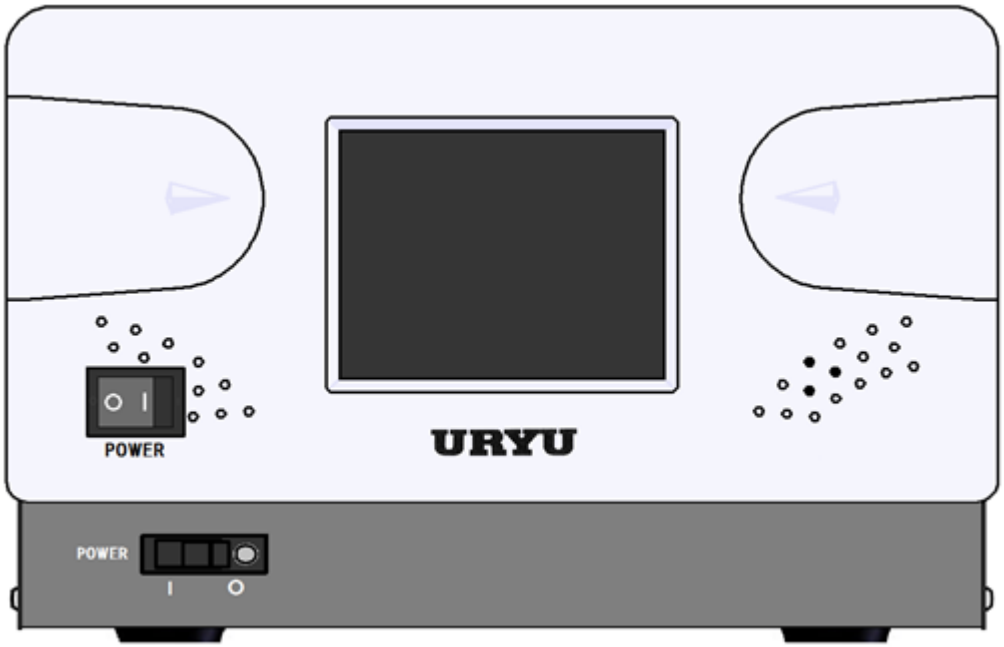
CONTROLLER
for
UCX-AF Electric Oil Pulse Tools
UCX-AF600L, UCX-AF600, UCX-AF700, UCX-AF900

UECP-4900A

Instruction Manual

-Read and understand the safety instructions before installing, operating, repairing, maintaining, changing accessories on or working near the UECP-4900A Torque Controller.
Failure to follow the warnings and instructions in this manual can result in serious bodily injury.
-Do not discard the safety and operating instructions.
Give them to the operator.
Save these instructions for future reference.



V1.1 Edition

URYU SEISAKU, LTD.

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1 Safety Instructions

Read Before Use

Read through this instruction manual and familiarise yourself with the system before installation, operation, maintenance and inspection. Save this instruction manual for quick reference at the time of need.

This instruction manual has classified cautions WARNING and CAUTION for personal injuries and damages caused by operations in disregard of safety instructions.

: A fatality and/or heavy personal injury is highly possible by improper operation. Urgent warning is essential in the event of accident.

: A dangerous situation accompanying mid-slight personal injury and/or property damage is possible by improper operation.

sign also warns the risk of serious consequences depending on the situation. So, follow all instructions given in this instruction manual always.

◆Installation and surroundings

- ●Place on a metal or other incombustible component to prevent fire.
- ●Keep away from the combustibles to prevent fire.
- ●Avoid foreign material intrusion to prevent fire.
- ●Set UECP-4900A on a site that can bear its weight to avoid personal injury from accidental falling.
- ●Keep the workplace well lighted and clean to avoid personal injury.
- ●Never wear loose-fitting clothes or dangling jewelry when using this sytem, and always wear the proper clothes for your job. In addition, be careful not to get your hair caught in tools, tie long hair with a rubber ribbon or the similar, and wear a protective helmet to prevent personal injury.
- ●Securely install and fix this system to avoid personal injury in case of an emergency like an earthquake.

◆Wiring

- ●Be sure to turn off UECP-4900A prior to wiring to avoid electric shock or fire.
- ●Make sure the ground wire is properly grounded to avoid electric shock or fire.
- ●Carry out wiring after you installed UECP-4900A to avoid electric shock or fire.
- ●Expert electricians shall conduct wiring to avoid electric shock or fire.
- ●Always use Y-shape crimp contact or round shape crimp contact when wiring UECP-4900A rear terminals to avoid electric shock or fire.

CAUTION

●Make sure the rated voltage o UECP-4900A is the same as power supply from the socket to avoid electric shock or fire.

●Make sure to carry out correct wiring to avoid electric shock or fire.

◆Handling and operation

WARNING

●Assurance of workplace safety by operators themselves before switching UECP-4900A is essential to prevent personal injury.

●Never touch switching devices with wet hands to avoid electric shock.

●Never touch current-carrying UECP-4900A rear terminals even if the tool is not in operation to avoid electric shock.

●Neither damage, stress, load up, nor pinch power cord to avoid electric shock.

●Never connect and disconnect UECP-4900A and tool while UECP-4900A is in operation to avoid electric shock and tool damages.

CAUTION

●Carry out the operation under setup within the instructed range to avoid personal injury and burn.

●Operate UECP-4900A under good footing and environment. Operation by awkward posture is dangerous.

●Carry out the operation with greatest care. Avoid careless and unreasonable action, operation under fatigued state and long time operation without break because doing so causes sick and personal injury.

◆Maintenance and inspection

WARNING

●Never forget to switch off UECP-4900A first for check or the replacement. Disconnect power cord from the socket to prevent electric shock.

●Only authorized persons do maintenance and inspection. Take off metal products first such as wristwatch, rings, and use insulated tools to prevent electric shock or personal injury. Inspect the cord periodically and repair it by authorized persons when damage is observed.

●Only URYU or its authorized distributors repair UECP-4900A to avoid electric shock, personal injury or fire.

◆Disposal

CAUTION

●Dispose of UECP-4900A as an industrial waste.

WARNING

◆Others

CAUTION

●Never modify UECP-4900A to avoid electric shock, personal injury or fire.

●Immediately stop the operation, turn off UECP-4900A and disconnect power cord from the socket when facing emergencies or feeling abnormalities.

General Precautions

- Note that all graphic explanatios in this manual can show some components unmasked form to explain the interior details which are covered by safety masking always. Be sure to put the masking back to the original position as specified in this manual before operation and run it as intended.
- Keep any unauthorized persons away from UECP-4900A and its system.
- UECP-4900A and its system are not waterproof. Protect them from exposure to water to avoid short circuit creating causes of fire or electric shock.

Disclaimer

●This instruction manual is subject to change without prior notice.

●We warrant that UECP-4900A will conform to the specifications, but disclaim all implied warranties, including, without limitation, all implied warranties of merchantability and fitness for a particular purpose.

2 Software license

Software Licenses Used in This Controller

The software embedded in this controller consists of several independent software components, each of which has a copyright of us or a third party.

Among the software components of this controller, the software we develop or create and the associated documents contain our copyright and are protected by copyright laws, international treaties and other relevant laws.

The instrument also uses software components that are distributed as open source software under the license provisions set by a third party.

Some open source software requires that you make the source code available when you distribute executable software components in its license terms. Such open source software is provided by CD-R.

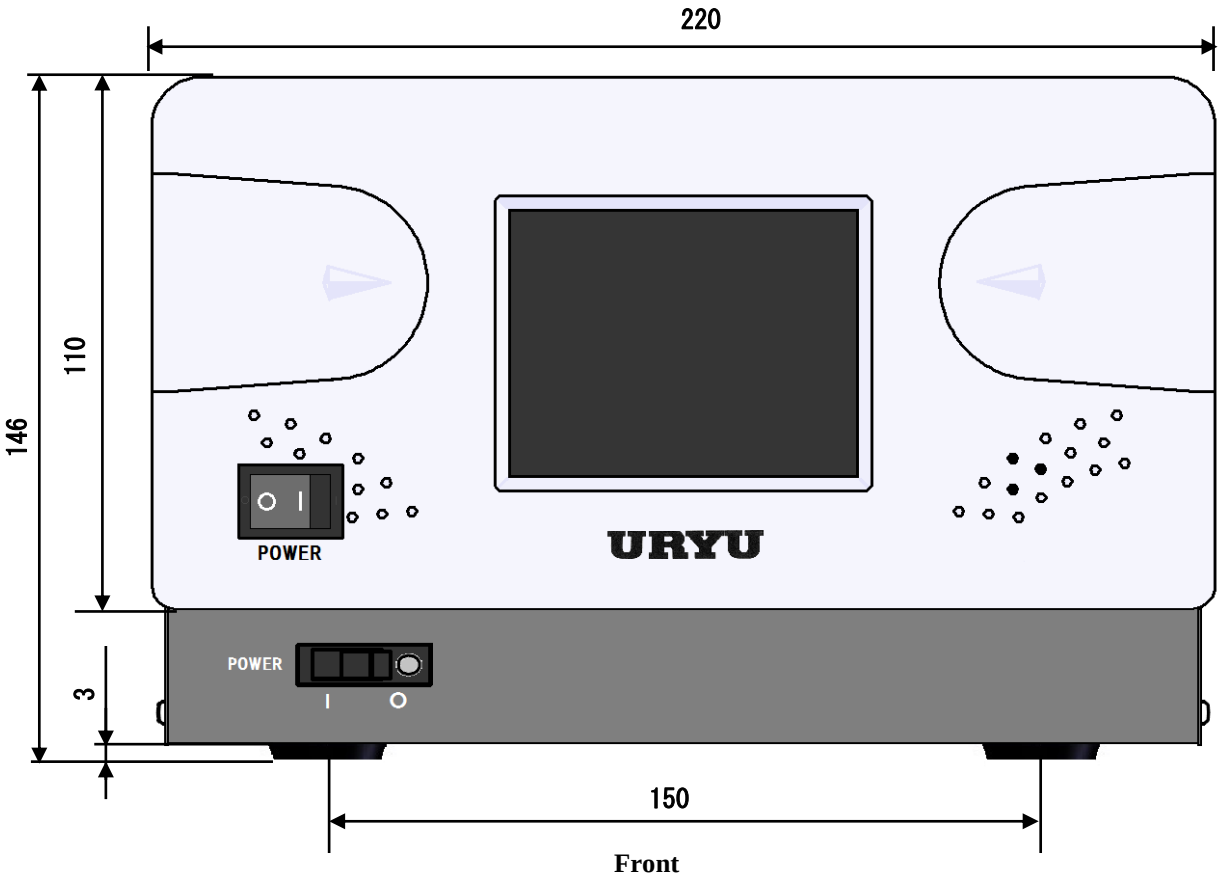
Please refrain from contacting us about the contents of the open source software source code.

Also, software components for which we have copyrights are not covered by the source code.

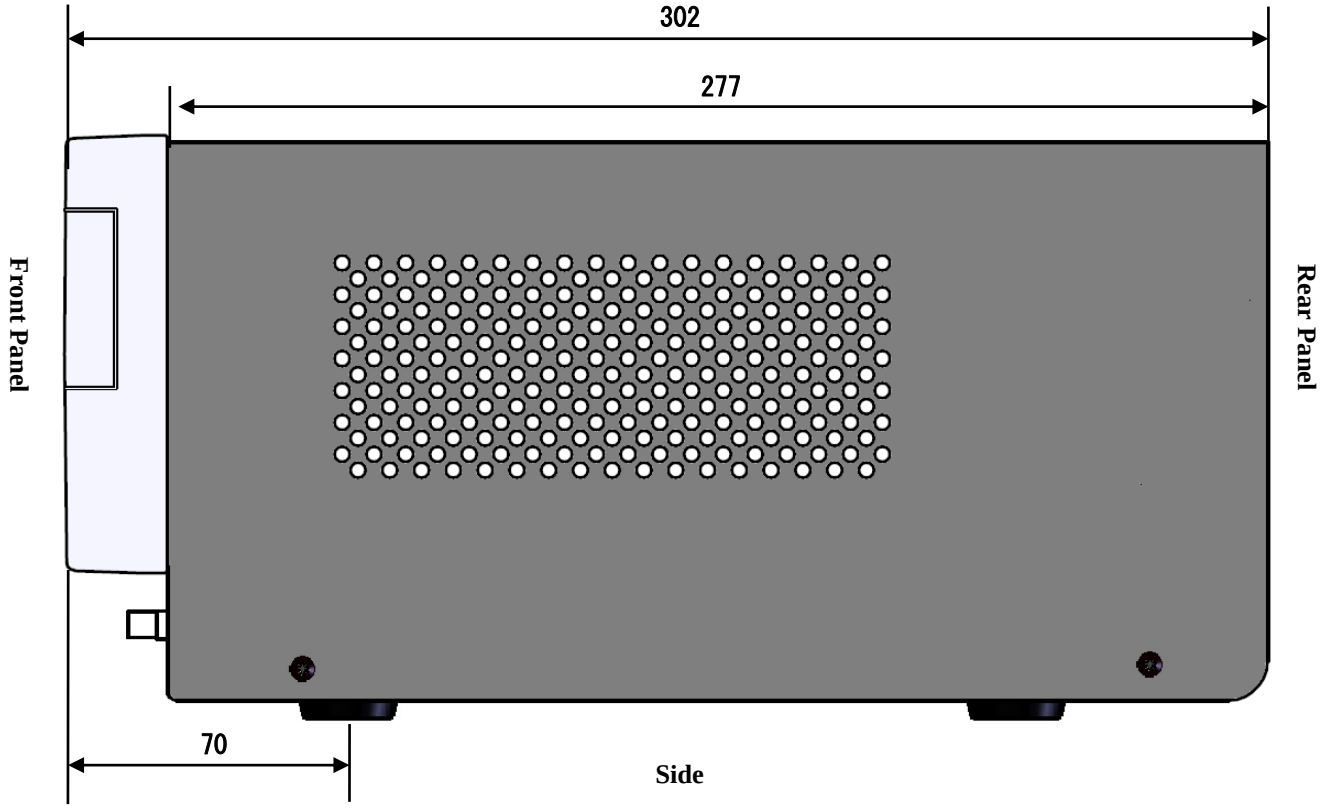
3 Outline

3.1 Overview dimensions

3.1.1 UECP-4900A

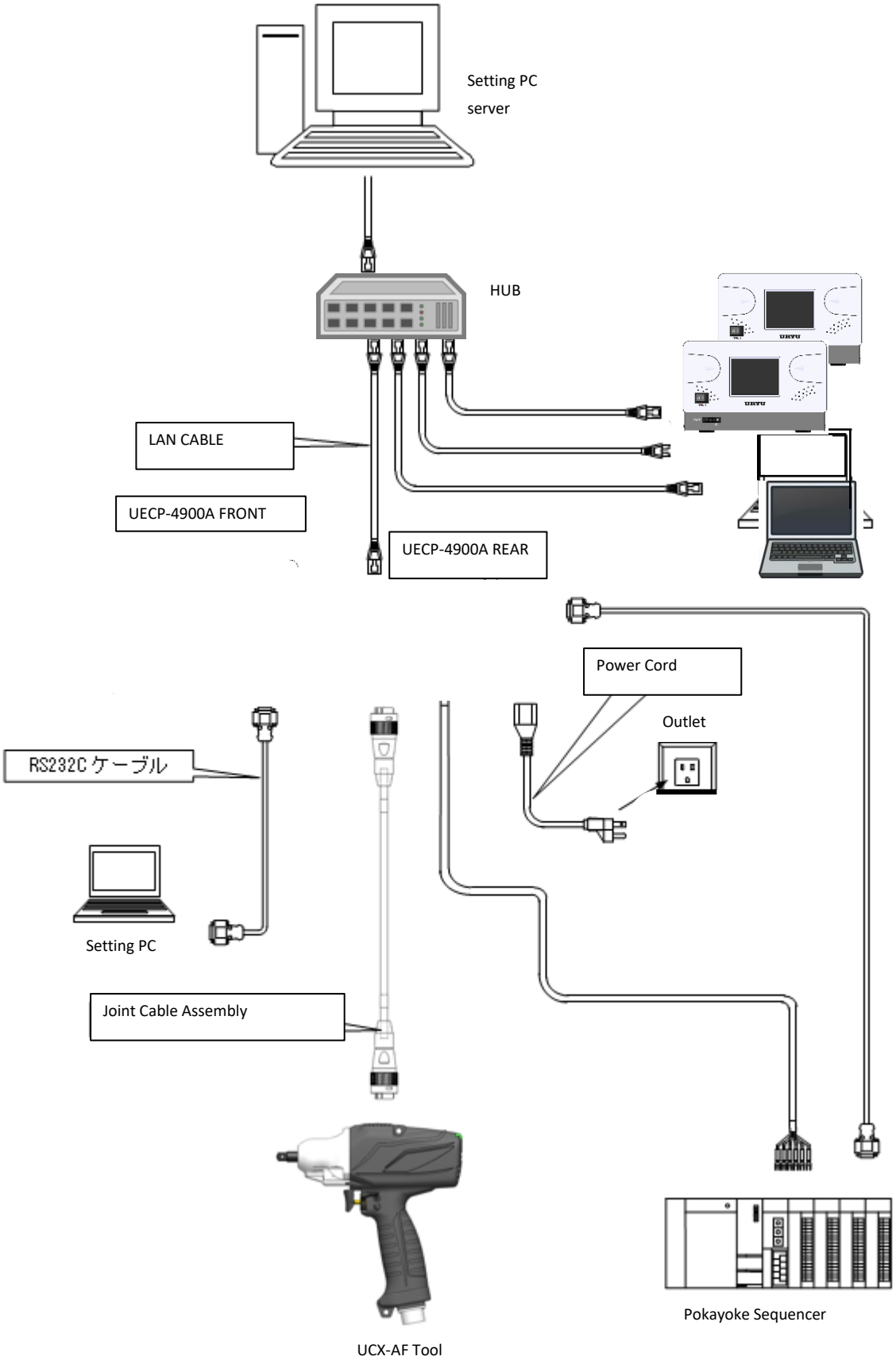


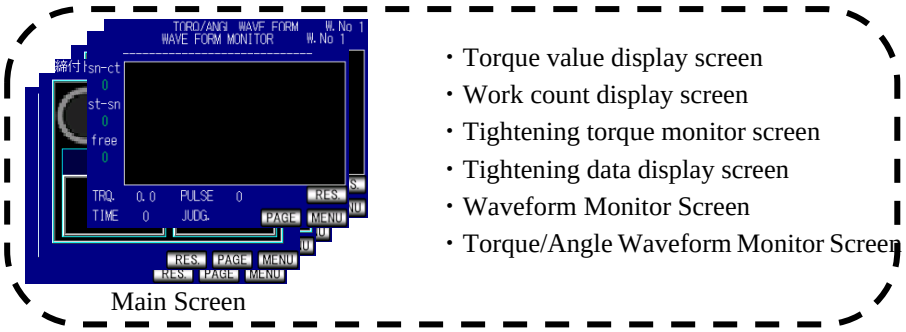
Front

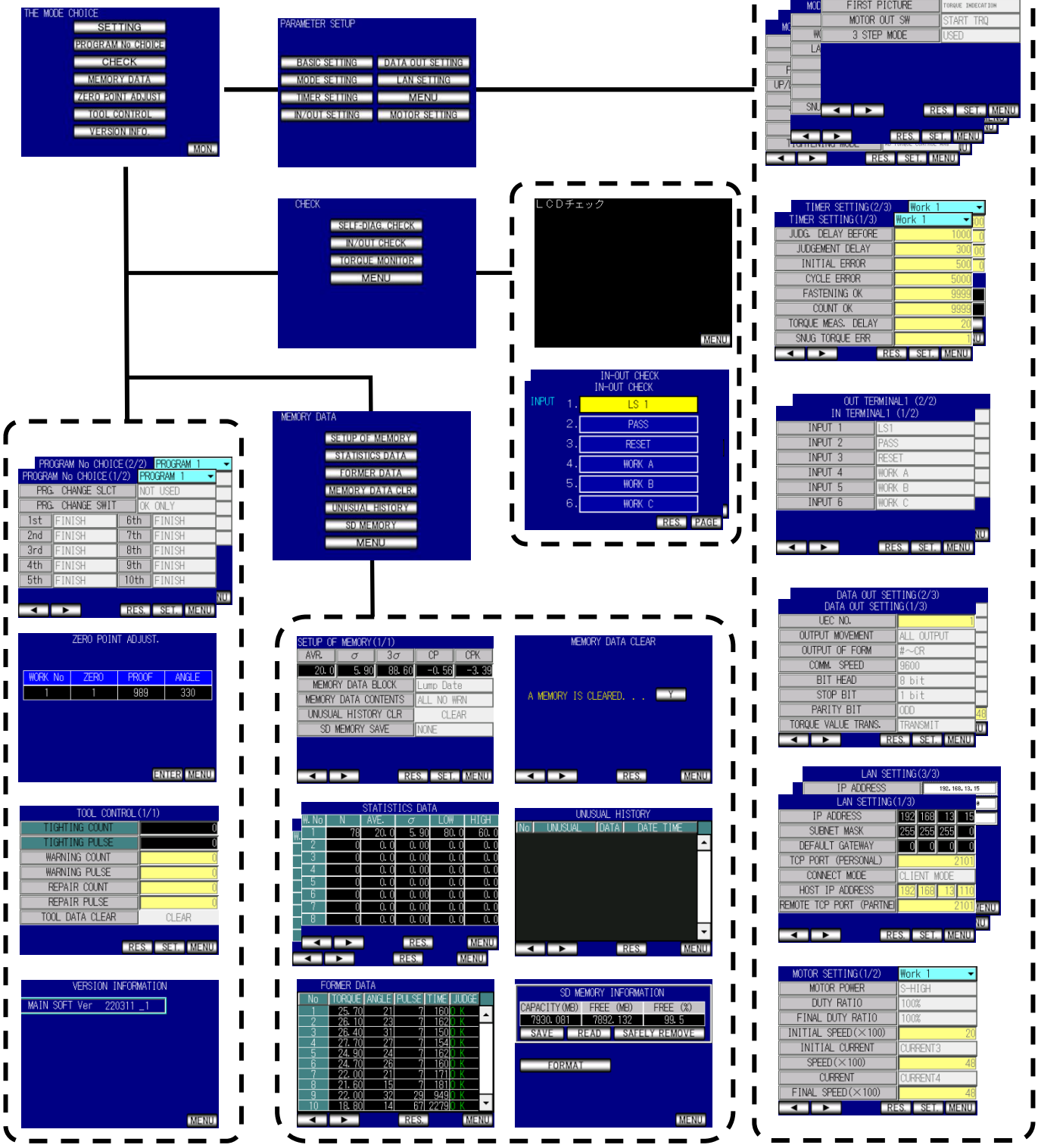


Side

3.2 Constitution




・Torque value display screen
・Work count display screen
・Tightening torque monitor screen
・Tightening data display screen
・Waveform Monitor Screen
・Torque/Angle Waveform Monitor Screen
Main Screen


THE MODE CHOICE
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MON.
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BASIC SETTING
DATA OUT SETTING
MODE SETTING
LAN SETTING
TIMER SETTING
MENU
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MOTOR SETTING
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SELF-DIAG. CHECK
IN/OUT CHECK
TORQUE MONITOR
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LCDチェック
MENU
IN-OUT CHECK
IN-OUT CHECK
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STATISTICS DATA
FORMER DATA
MEMORY DATA CLR
UNUSUAL HISTORY
SD MEMORY
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PROGRAM No CHOICE(1/2)
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PRG. CHANGE SWIT
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2nd FINISH
3rd FINISH
4th FINISH
5th FINISH
6th FINISH
7th FINISH
8th FINISH
9th FINISH
10th FINISH
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ZERO
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WARNING COUNT
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MAIN SOFT Ver 220311 _1
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MEMORY DATA CONTENTS
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FORMER DATA
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SAFELY REMOVE
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BASIC SETTING(1/2)
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TORQUE CUT
TORQUE SENSOR CAL
START TORQUE
ANG SNUG TRQ
COUNT
MODE SETTING(6/6)
TOOL STOP SET
FIRST PICTURE
MOTOR OUT SW
3 STEP MODE
TIMER SETTING(2/3)
TIMER SETTING(1/3)
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JUDGEMENT DELAY
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CYCLE ERROR
FASTENING OK
COUNT OK
TORQUE MEAS. DELAY
SNUG TORQUE ERR
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IN TERMINAL1 (1/2)
DATA OUT SETTING(2/3)
DATA OUT SETTING(1/3)
UEC NO.
OUTPUT MOVEMENT
OUTPUT OF FORM
COMM. SPEED
BIT HEAD
STOP BIT
PARITY BIT
TORQUE VALUE TRANS.
LAN SETTING(3/3)
IP ADDRESS
LAN SETTING(1/3)
SUBNET MASK
DEFAULT GATEWAY
TCP PORT (PERSONAL)
CONNECT MODE
HOST IP ADDRESS
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MOTOR POWER
DUTY RATIO
FINAL DUTY RATIO
INITIAL SPEED(×100)
INITIAL CURRENT
SPEED(×100)
CURRENT
FINAL SPEED(×100)

3.4 Features

①Self-diagnosis function

When the power is turned on, ROM → RAM → A/D → filters are checked for self-diagnosis.

②Various tightening detection functions and tightening number control functions are provided.

③Supports tools using AD torque sensors.

④Tool management by total number of tightening and total number of pulses is possible.

⑤The tool can be operated by input from the I/O terminal.

⑥The input terminal can be switched between the NPN method and the PNP method.

⑦I/O checks and error indications can be checked on the display or sound of the touch panel on the PC or the front.

⑧Settings can be changed or monitored by inputting from a PC or by operation from the touch panel on the front.

⑨Functions of the touch panel

・Display of various tightening data

・Changing and monitoring various set values

・Various check functions

⑩Functions of the dedicated PC software

・Sending and receiving set values

・Receiving and Saving Statistical Data

・Reading SD card data

⑪Ethernet (TCP/IP) is supported.

・Connected to the setting software, sending/receiving the set value, and sending the tightening result/waveform data.

・Connection to the data management system made by Uryu and transmission of the tightening result/waveform data

・Connects to the server and sends the result data of receiving and tightening the tightening instruction data.

・In order to support each user's own network system, the software must be adapted to the specifications.

⑫Supports SD cards

・Saving Tightening Data, Statistical Data, and Waveform Data

・Saving/reading of set value

※It supports card capacity of up to 32GB.

⑬3-step tightening

・When tightening, the motor output is switched in three stages to increase the tightening accuracy and stabilize the axial force.

●The software may be upgraded without prior notice for functional improvement.

●The software version of the main unit can be checked by the sticker next to the power switch or by the screen display when the power is turned on.

3.5 How to install

Be sure to observe the following precautions when installing and installing the product.

3.5.1 Installation location

1)Indoors not exposed to rainwater or direct sunlight. The products are not waterproof.
2)Location that is not exposed to corrosive gas, flammable gas, grinding fluid, oil mist, iron powder, chips, etc.
３） A well-ventilated place free from humidity, dirt, and dust.
４） Vibration-free place.
5)Location where the power cord can be unplugged immediately if an abnormality occurs in the controller.
6)When using the product in a pollution degree 3 (*) environment, install the product inside the enclosure.

3.5.2 Environmental conditions

Item	Conditions
Location of use	Indoor use
Ambient temperature	0.C to 50.C (no freezing)
Ambient humidity	85%RH or less (no condensation)
Storage temperature	-10 to 70 pC (no freezing)
Storage humidity	90% RH or less (no condensation)
Vibration	5.6 m/s^2 or less (10 to 60Hz)
Altitude	1000 m or less
Overvoltage category	Overvoltage category II *
Pollution degree	Pollution degree2 ※

※・・・ The overvoltage category (I, II, III) and pollution degree (1, 2, 3) of the individual components according to IEC664 are classified.
As shown above, this system is overvoltage category II and pollution degree level 2.
(NOTE)IEC・・・ International Electrotechnical Commission

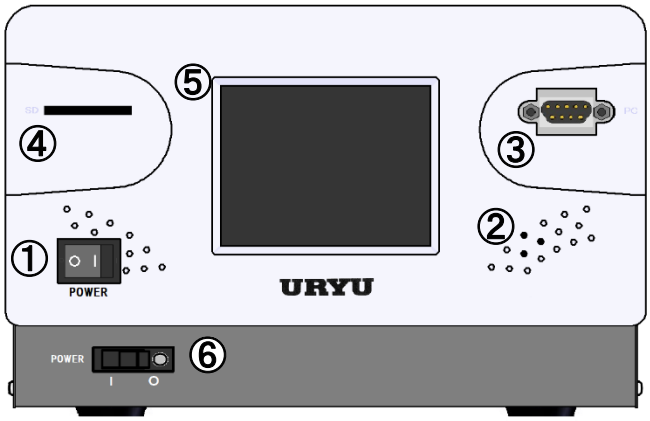
4 Specifications

4.1 UECP-4900A

Item		Content
Power supply voltage		AC 100-115 [V]
Power frequency		50 / 60 [Hz]
Input		10A, 115V, 50/60Hz
Output		7A, 115V
IP Rating		IP3X
Electrical protection		Class I
Insulation resistance		DC 500 [V] 10 [MΩ] or more
Power consumption		18 ～ 710[VA]
Mass		Approx. 4.2 [kg]
External Dimensions		220(W) × 146(H) × 302(D)
Main function		Torque Control/Monitoring, Angle Control/Monitoring, Tightening Quantity Management
Setting method		Operation and setting software via touch panel
Display		3.5-inch liquid crystal (320 × 240 dots) Touch Panel TFT Color LCD
Terminal	Input signal	Operating voltage/current: DC24V/approx. 10mA (NPN/PNP switchable) 6 points (free format) * Input should be done by contact input.
	Output signal	Contact capacity :DC 30 V、1 A 6 points (free format)
Key		Displayed on the touch panel: (ENTER ENTER), (RESET RES.), (PAGE PAGE), 10 keys, etc.
Option		Part Name: Setting PC Cable URYU Part code: 910-219-0 Specifications: Straight cable for RS232C Pin Female-D-sub9 Pin Female
		Part Name: Joint cable Assembly(5m) URYU Part code: 910-727-0 Part Name: Joint cable Assembly (10m) URYU Part code: 910-728-0 Part Name: Joint cable Assembly (20m) URYU Part code: 910-729-0 Specifications: Joint cable for UCX-AF tool
Applicable Standard		EN61800-5-1

5 Name and Functions of Each Component Element

5.1 Front Panel



UECP-4900A

① **Rocker switch**

This is ON/OFF switch for the controller.

② **Buzzer**

This buzzer is activated for various abnormalities.

When an error occurs, touch the screen to stop the buzzer.

③ **PC-connector (D-sub9 pin male)**

This is a RS232C for connecting to a computer for configurations.

Use a straight cable for the communication cable.

④ **SD card slots**

This is a slot for SD cards. Up to 32GB is supported.

⑤ **Touch panel**

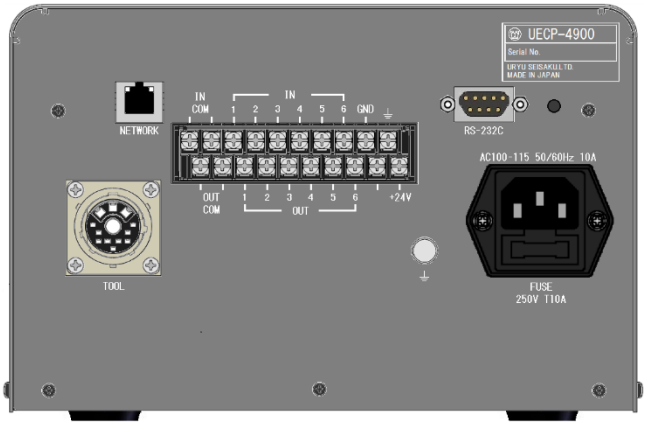
Display tightening data and waveform data, display and input each set value.

If the screen is touched while the buzzer is ON when an error occurs, the buzzer can be stopped without clearing the error.

⑥ **Earth leakage breaker**

Breaker for power supply. The switch is turned OFF in the event of an electric leakage.

5.2 Rear Panel



UECP-4900A

① Power cord terminal

Connect the power cord.

Be sure to ground the power plug.

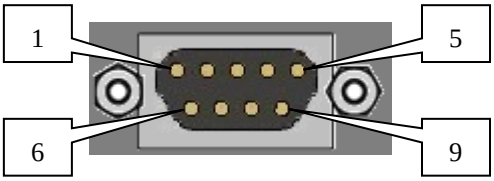
② Fuse holder

Protective fuse (T10A) for controllers.

③ RS-232C connector (D-sub9 pin male)

RS-232C for data input/output.

Connect the programmable controller, PC, etc.



Wiring details	
Pin number	Signal Content
1	
2	TXD (data transmission line)
3	RXD (receive line of data)
4	
5	SG (signal ground)
6	
7	
8	
9	
Frame	FG (Frame ground)

④ Connector for AD torque sensor cable

Connect the sensor cable from the AD tool.

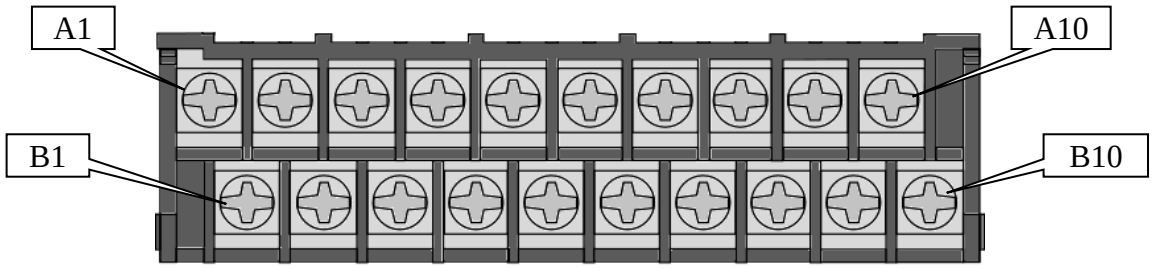
⑤ NET WORK connectors

Connector for Ethernet connection.

Connect to Quality Server, etc.

⑥ Terminal block for Input/Output

The assignment of terminal block signal contents is free format. Signals of IN 1 to 6 and OUT 1 to 6 can be changed by I/O assignment setting.



Terminal Number	Signal Content	Terminal Number	Signal Content
A1	IN COM: Common for input terminals (0V or 24V)	B1	OUT COM: Common for output terminals
A2		B2	
A3	IN 1 to 6: Inputs	B3	OUT 1 to 6: Output terminals
A4		B4	
A5		B5	
A6		B6	
A7		B7	
A8		B8	
A9	GND: Signal GND (0V)	B9	※Not used
A10	FG: Frame GND	B10	DC+24V: Power output

※Input to input terminals A1 and A2 to A6 should be done by contact input.

※Output terminals B1 and B2 to B6 are non-voltage outputs. The wiring must be DC24V or less.

※For wiring to the terminal block, use Y type crimp terminal or round type crimp terminal.

※When the controller is shipped from the factory, the input terminal is set to the NPN method. Refer to 14.6 NPN/PNP Switching (Link) when using the PNP method. When using the PNP-type, the voltage at IN COM terminal changes from 0V to 24V.

⑦ Earth terminal

Grounding terminal. If the power plug cannot be grounded, be sure to ground it at the ground terminal.

⑧ Maintenance button

※Not used

6 How to use

6.1 Operation Preparation

Preparation for operation

①Connect the power cord, joint cable and a UCX-AF Tool.

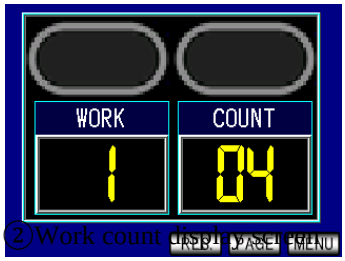
②When the rocker switch and earth leakage breaker are turned on and the power to the controller is turned on, self-diagnosis operation is performed.

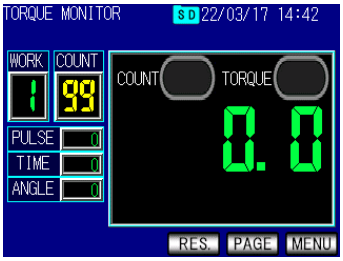
③The torque display screen appears when the self-diagnosis is completed.

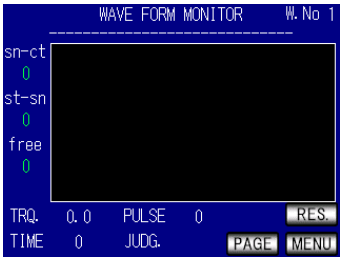
④Perform the setting according to the measurement target.

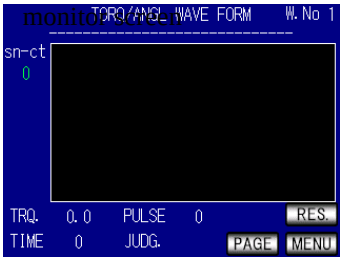
6.2 Main Screen Description

The tightening data display screen consists of the following six screens.









④Tightening data display screen

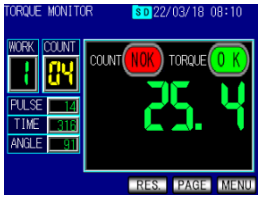
⑤Waveform Monitor Screen

⑥Torque/Angle Waveform Monitor Screen

・The count judgment lamp (left) and the tightening judgment lamp (right) are located at the top of the torque value display screen and the work count display screen. The count judgment lamp lights green when the count is OK, and lights red when the count is NOK. In addition, "COUNT" characters are displayed in the judgment lights.

・The tightening judgment lamp indicates "OK" when the tightening is OK. If a tightening NOK outside the upper and lower limit ranges is reached, the tightening judgment lamp indicates the type of tightening data that has fallen outside the upper and lower limit ranges. In the case of torque, "TRQ" In the case of the number of pulses, "PLS" In the case of tightening time, "TIME" In the case of coasting angle, "FREE" In the case of tightening angle, "ANG" is displayed. Lights up yellow when the tightening judgment is LOW NOK, red when it is HIGH NOK, and green when it is OK.

・At the top of the tightening torque monitor screen, there are a count judgment lamp (left) and a torque judgment lamp (right). The count judgment lamp lights green when the count is OK, and lights red when the count is NOK. In addition, the letters "OK" and "NOK" are displayed in the judgment lamp. TORQUE indicator indicates "OK" when the tightening is OK.



・The waveform monitor screen displays the waveform data of the last tightening.

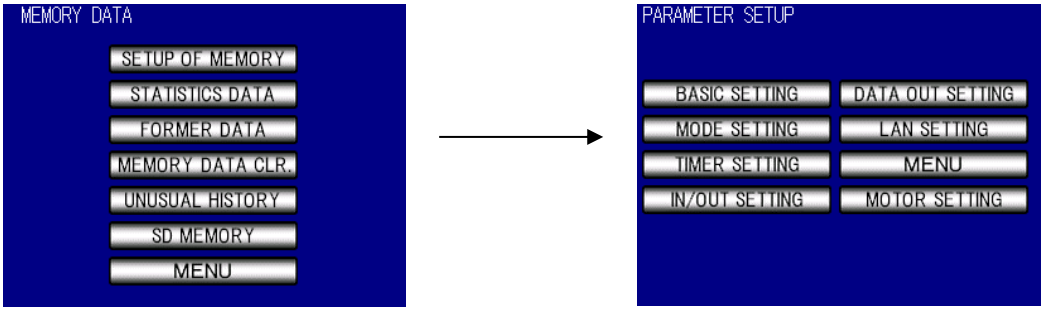
※It takes several seconds to display the waveform data.

6.3 Settings

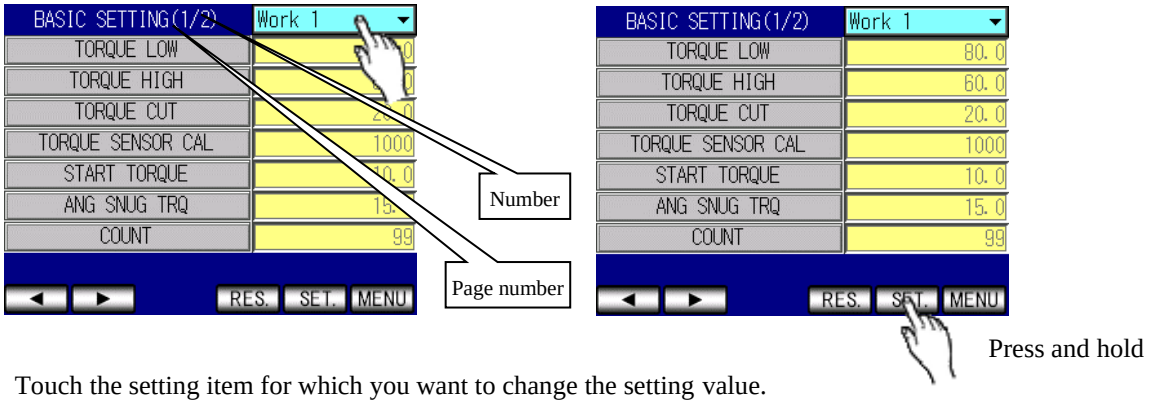
The setting value can be changed using the touch panel operation.

① On the main screen, touch [MENU] to go to the mode selection screen.

②Select the setting item to change the setting value on the mode selection screen.



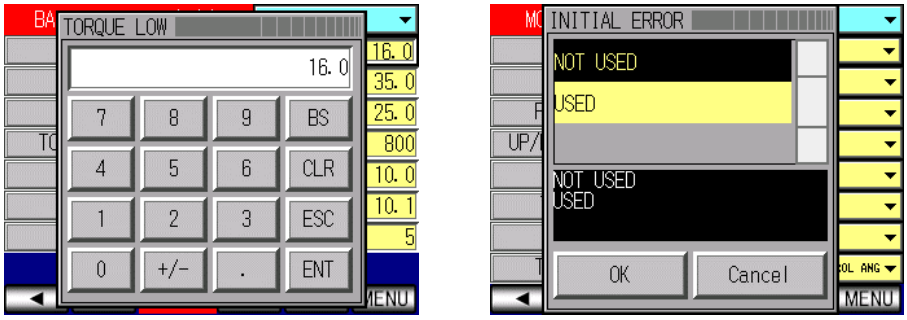
② On the setting screen, each setting item is displayed. Touch [►] to select the next page, touch [◄] to select the previous page, and touch to select the work number to be set by touching the work number on the upper right of the screen. Be located at the bottom of the screen. Press and hold [SET] to enter the setting mode. The setting value can be changed.



③ Touch the setting item for which you want to change the setting value.

Touch to display the numeric entry screen.

The numeric keypad is displayed for the value to be entered. Otherwise, the choices are displayed.



④ Enter the setting value or touch [OK] or [ENT] confirm the content you want to change. If it is possible to change the entered setting, the setting is written.

If you enter a setting that cannot be changed, the buzzer sounds and the setting value is not written. Enter the setting again.

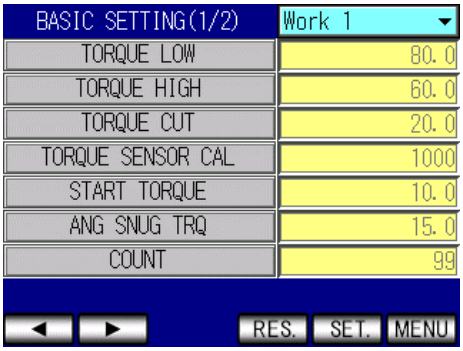
※ If the power is turned OFF immediately after changing the setting, the setting may not be changed. After changing the setting, wait for about 10 seconds before turning the power OFF.

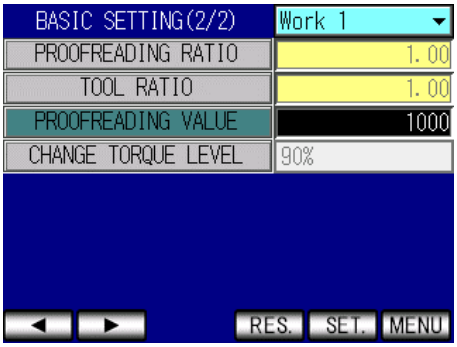
7 Menu

This screen is used to select various functions.

7.1 Basic Configurations

The basic setting screen consists of two screens.





・Torque lower limit

Initial Settings	80.0 [N･m]
Setting range	0.0 ～ 999.5 [N･m]
Setting conditions	Torque lower limit < Torque CUT value
Function description	・This is the setting value for the lower judgement of the measured torque value.

・Torque upper limit

Initial Settings	60.0 [N･m]
Setting range	0.4 ～ 999.9 [N･m]
Setting conditions	Torque CUT value < Torque upper limit
Function description	・This is the set value for the upper judgement of the measured torque value.

・Torque CUT value

Initial Settings	20.0 [N･m]
Setting range	0.3 ～ 999.8 [N･m]
Setting conditions	Torque lower limit < Torque CUT < Torque upper limit Start torque < Snag torque < Torque CUT value
Function description	・This is the set value of the tightening stop torque for torque control.

・CAL value

Initial Settings	1000
Setting range	100 ～ 9999
Function description	・Set the CAL value described in the tool.

・Start torque value

Initial Settings	10.0 [N・m]
Setting range	0.1 ～ 999.6 [N・m]
Setting conditions	Start torque < Snag torque < Torque CUT value
Function description	・Torque measurement starts when a torque signal input greater than or equal to the start torque is detected. ・Use of the setting value a, Judgment delay timer activation start point b, Initial error detection timer operation start point c, Cycle error detection timer operation start point d, Torque measurement delay timer activation start point e, Free-run angle measurement end point ※**Set the start torque to 1/50 or more of the calibration value (CAL value × calibration ratio × tool ratio). If the starting torque is too low, the OK/NOK judgement will not be possible after tightening, and the next tightening operation may not be possible.**

・Snag torque

Initial Settings	15.0 [N・m]
Setting range	0.0 ～ 999.7
Setting conditions	Start torque < Snag torque < Torque CUT value
Function description	・Sets the torque value at which the angle measurement starts. ・When the start torque value is set to a value equal to or greater than the snag torque, the value of the snag torque is automatically set to the value of the start torque value "+0.1N·m".

・No. of fasteners

Initial Settings	99
Setting range	1 ～ 99
Function description	・This is the number of tightening times for one workpiece when the tightening number control function is used. ・This setting is used to determine COUNT OK/NOK.

・Calibration ratio

Initial Settings	1.00
Setting range	0.01 ～ 9.99
Function description	・Correction value used to match the displayed torque and retightening torque. ※To match the displayed torque and retightening torque, calculate the value using the following formula. Current Calibration Ratio × Retightening Torque ÷ Display Torque = New Calibration Ratio

・Tool ratio

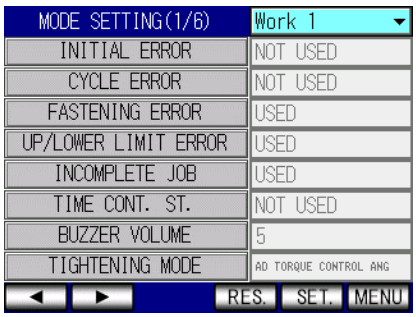
Initial Settings	1.00
Setting range	0.01 ～ 9.99
Function description	・The reduction ratio of the reducer. ・When using a tool with a gear before the torque sensor, such as a gear type of a pulse tool Enter the gear ratio.

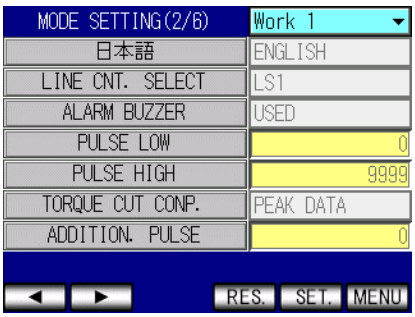
・Calibration value

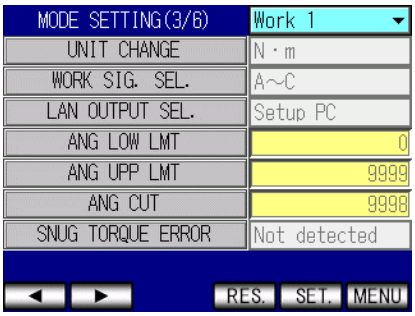
Initial Settings	1000
Function description	・Calibration value = Calibration ratio × Tool ratio × CAL value ・The torque is displayed according to this value and the ratio of the torque signal voltage from the sensor rating.

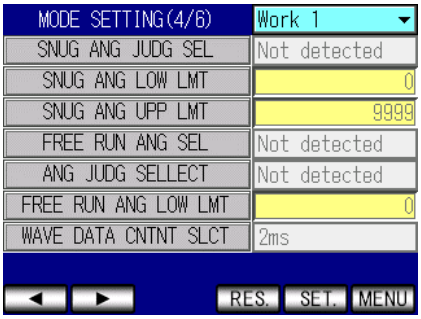
・Second torque level

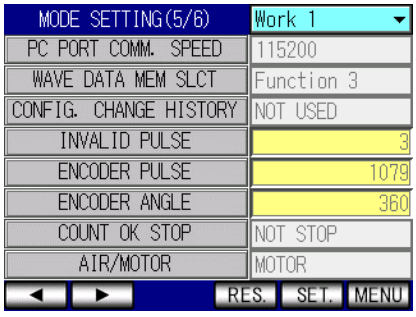
Initial Settings	90
Setting range	55 ～ 95 [%]
Function description	※Displayed when the "3-step mode" setting of MODE setting is "Used". ・With the measured torque for 3-step tightening [Torque CUT value × Second torque level] When it is reached, the motor output switches to the setting of the second current and the second rotational speed.

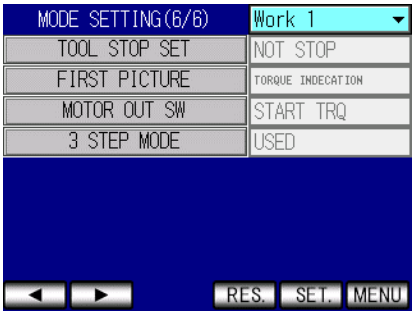












・Initial error detection

Initial Settings	"Not used"
Setting range	"Not used" ・The initial error detection function is not used. "Used" ・The initial error detection function is used.
When an error is detected Operation of	・Touch panel display: "Initial error" "Measured torque value" is displayed alternately ・Judgment LED: Solid yellow, "TIME" is displayed ・ RES. Or input terminal "RESET"
Function description	・The initial error is detected when the tightening time (from start torque to torque CUT) is within the initial error detection timer. ・This setting is used when you want to perform detection such as twice tightening.

・Cycle error detection

Initial Settings	"Not used"
Setting range	"Not used" ・The cycle error detection function is not used. "Used" ・Cycle error detection function is used.
When an error is detected Operation of	・Touch panel display: Alternate display of "Cycle error" and "Measured torque value" ・Judgment LED: Lit in red, "TIME" is displayed ・ RES. or input terminal "RESET" input
Function description	・When the tightening time (from start torque to torque CUT) exceeds the cycle error detection timer Detects a cycle error. ・This setting is used to regulate the tightening time.

・Operation other than upper/lower limit error

Initial Settings	"Used"
Setting range	"Not used" ・The tool stops operating until the error is cleared. "Used" ・While the tool is still usable, perform the following tightening operation to reset the error.
Function description	・Select the action to be taken when a fastening abnormality other than the upper/lower limit error (initial error, cycle error, or fastening interruption error) occurs.

・Operation at upper/lower limit error

Initial Settings	"Used"
Setting range	"Not used" ・The tool stops operating until the error is cleared. "Used" ・While the tool is still usable, perform the following tightening operation to reset the error.
Function description	・Selects the action when the measured value of the tightening data (torque, pulse number, angle) is outside the set upper and lower limits and upper and lower limit errors are detected.

・Fastening interruption abnormality detection

Initial Settings	"Used"
Setting range	"Not used" ・Tightening interruption abnormality detection function is not used. "Used" ・Tightening interruption abnormality detection function is used.
When an error is detected **Operation of**	・Touch panel display: Alternate display of "Fastening interruption abnormality" and "Measured torque value" ・Judgment LED: Lit in red, "TIME" is displayed ・ RES. or input terminal
Function description	・After the measured torque exceeds the starting torque, if the torque input is interrupted before the torque CUT value is reached (when the trigger is released during tightening, etc.), a tightening interruption abnormality is detected. ※If the torque at the time of judgment has not reached the torque CUT value even if it is within the range of the torque lower limit value to the torque upper limit value, a tightening interruption error occurs. ※If the number of pulses is within the value set by the invalid pulse, the measurement will be canceled without a fastening interruption error.

・Forced stop selection

Initial Settings	"Not used"
Setting range	"Used" ・The forced stop function is used. "Not used" ・The forced stop function is not used.
Function description	**※Available only when Cycle error detection is set to "Disabled".** ・This function regulates the tightening time. ・If the cycle error detection timer starts when the measured torque exceeds the start torque and the measured torque has not reached the torque CUT value before the time-up, the tool is forcibly stopped and a judgment is made.

・Buzzer volume selection

Initial Settings	"Maximum"
Setting Range	"Min", "Medium", "Medium", "Large", "Max"
Function description	・Sets the buzzer volume in 5 levels.

・Control method

Initial Settings	"AD Torque Control/Angle Monitoring"
Setting range	"AD Torque Control" ・Uses the AD torque tool to judge and control the measured torque value. "AD Torque Control/Angle Monitoring" ・The AD torque tool is used to judge the measured torque value and monitor the measured rotation angle of the control and tool. "Angle control/AD torque monitoring" ・Uses the AD torque tool to judge the measured angle value and monitor the control and measured torque value.
Function description	**※Setting is required for each work.** ・Selects whether to refer to torque or angle during tool control. ・For "AD Torque Control" and "AD Torque Control/Angle Monitoring", the tool stops when the torque measurement value reaches the torque CUT value. ・When "angle control/torque monitoring" is selected, the tool stops when the measured angle reaches the angle CUT value or the measured torque reaches the torque CUT value.

・ENGLISH

Initial Settings	"Japanese"
Setting range	"Japanese" ・Set the controller display to Japanese. "English" ・Display the controller in English.
Function description	・The item name changes according to the displayed language. "ENGLISH" is displayed for Japanese display, "Japanese" is displayed for English display.

・Line management operation selection

Initial Settings	「LS1」
Setting range	「LS1」 ・The number can be counted at all times. Counting is judged by inputting LS1. 「LS1,LS2」 ・Counting is started by inputting LS1, and counting is judged by inputting LS2. "by LS1" ・When LS1 is entered, counting down of the number of counts and the line-management timer starts. The count is judged by the time-up of the line management timer. "by tightening" ・The number can be counted at all times. The line management timer starts counting down from the point when the tightening judgment is made. Count judgment is made when the time is up. "WORK switching determination" ・Counting is started by inputting WORK1～WORK5, and counting is judged by inputting OFF. "Socket changer" ・Counting is started by inputting WORK1～WORK5, and counting is judged by inputting OFF. The tool will not operate until WORK1～WORK5 is entered and counting of the number of devices starts.
Function description	・For more information, see 14.6 Line Control Selection (Link).

・Buzzer output for checking tightening

Initial	"Used"
Setting range	"Not used" ・The confirmation buzzer does not sound when tightening is judged. "Used" ・The confirmation buzzer sounds when the tightening is judged.
Function description	・Outputs 1 pulse (1sec) of buzzer when tightening is OK. Outputs 2 pulses when COUNT OK.

・Lower limit of pulse number

Initial	0
Setting range	0 ～ 9998
Setting conditions	Pulse count lower limit < Pulse count upper limit
When an error is detected Operation of	・Touch Panel Display: "Pulse Count LOW" and "Torque Measurement Value" are alternately displayed. ・Judgment lamp: Solid yellow, "PLS" is displayed. ・Terminal block: Outputs FASTENING NOK ・RES. or, reset the error by inputting the input terminal "RESET".
Function description	・Set the lower limit of the pulse count measurement value. ・When the measured torque value falls below the pulse count lower limit value from the start torque reaching to the end of torque measurement, a pulse LOW NOK is judged and an error is displayed.

・Pulse count upper limit

Initial	9999
Setting range	1 ～ 9999
Setting Con.	Pulse count lower limit < Pulse count upper limit
When an error is detected Operation of	・Touch panel display: "Pulse count HIGH" and "Torque measurement" are displayed alternately. ・Judgment lamp: Lights in red, "PLS" is displayed. ・Terminal block: Outputs FASTENING NOK ・RES. or, reset the error by inputting the input terminal "RESET".
Function description	・Sets the upper limit of the pulse count measurement value. ・When the measured torque exceeds the pulse count upper limit from the start torque reaching to the end of torque measurement, the pulse HIGH NOK is judged and an error is displayed.

・Torque CUT compensation selection

Initial	"Peak value"
Setting range	"Peak value" ・When additional pulses are performed after reaching the torque CUT value, the peak value of the tightening torque is displayed on the controller. "Torque value of pulse that has reached CUT" ・Displays the torque value of the pulse that first reached the torque CUT value.
Function description	・Set the torque value to be displayed on the controller after the measured torque value reaches the torque CUT value.

・Torque CUT compensation value

Initial	0
Setting range	0 ～ 99
Function description	・After the measured torque value reaches the torque CUT value, pulses are performed by adding the specified number of times. **※Set to "0" when this function is not used.**

・Tightening unit switching

Initial Settings	「N・m」
Setting range	「kgf・cm」 「kgf・m」 「ft・lbf」 「dN・m」
Function description	・Switches the unit of torque value displayed on the measurement screen. **※This function can be changed only for overseas specifications.**

・Workpiece selection combination

Initial Settings	「A～C」
Setting range	「A～C」 ・Switch between WORK 1 and 8 by combining "WORK A"～"WORK C". 「1～5」 ・Switch between WORK 1 and 5 by combining "WORK 1"～"WORK 5".
Function description	・The combination shown in the table below is used to change the workpiece. Selects the workpiece switching method.

Input signal to the terminal block		Selected workpiece No.
Workpiece selection combination For A to C	Workpiece selection combination For 1 to 5	
No input	WORK 1	WORK 1
WORK A	WORK 2	WORK 2
WORK B	WORK 3	WORK 3
WORK A B	WORK 4	WORK 4
WORK C	WORK 5	WORK 5
WORK A C		WORK 6
WORK B C		WORK 7
WORK A B C		WORK 8

・Setting "1 to 5" is used only when the setting of line-management operation selection is "WORK switching judgment" or "socket changer".

・LAN output connection destination selection

Initial Settings	"Not used"
Setting range	"Not used" ・No communication is performed on the LAN. "Setting PC" ・Connect to the configuration software or host system by LAN. "quality server" ・When the data method selection in the data output setting is set to "Global", tightening data is transmitted to Global quality server.
Function description	・Select the LAN connection destination. ・When using the front-panel RS232C port to communicate with the configuration software, set this setting to "Disable". **※If a setting other than "Disable" is selected, you will not be able to connect to the setting software using the front-panel RS232C.**

・Angle lower limit

Initial Settings	0
Setting range	0 ～ 9997
Setting conditions	Angle lower limit < Angle CUT < Angle upper limit
Function description	・Lower judgement of measured angle value. ・When the angle judgement function is "Used", the angle LOW NOK is made if the measured angle at the time of judgement (angle from snag torque to 10msec after the last pulse) has not reached the angle lower limit. ・If it is set to "0", the judgement of the lower angle limit is not performed.

・Angle upper limit

Initial Settings	9999
Setting range	2 ～ 9999
Setting conditions	Angle lower limit < Angle CUT < Angle upper limit
Function description	・Upper judgement of angle measurement value. ・When the angle judgment function is "Used", the angle HIGH NOK is obtained when the measurement angle at the time of judgment (angle from snag torque to 10msec after the last pulse) exceeds the angle upper limit. The tool also stops when an angle value greater than or equal to the upper angle limit is detected.

・Angle CUT value

Initial Settings	9998
Setting range	1 ～ 9998
Setting conditions	Angle lower limit < Angle CUT < Angle upper limit
Function description	・This is the set value of the tightening stop angle for angle control. **※This is enabled when the control method is "Angle control/AD torque monitor"**

・Snag torque error selection

Initial Settings	"Not detected"
Setting range	"Not detected" ・The snag torque error is not detected. "Detect" ・Detects snag torque error.
When an error is detected Operation of	・Touch Panel Display: "Snag Torque Error" ・Judgment lamp: Solid yellow, "TRQ" is displayed. ・Terminal block: Outputs FASTENING NOK. ・ RES or, reset the error by inputting RESET terminal.
Function description	・The snag torque error is detected when the measured torque has not reached the snag torque before TIME UP of the snag torque error detection timer. **※When using this function, set "Angle judgment selection" to "Used".**

・Snag angle judgment selection

Initial	"Not detected"
Setting range	"Not detected" ・Snag angle judgment is not performed. "Detect" ・The snag angle is judged.
When an error is detected **Operation of**	・Touch Panel Display: "Snag Angle LOW/HIGH Error" ・Judgment lamp: When LOW (Yellow ON "ANG" is displayed), When HIGH (Red ON "ANG" is displayed) ・Terminal block: Outputs FASTENING NOK ・ RES. or, reset the error by inputting RESET terminal.
Function description	・Selects whether to perform upper/lower judgement of the snag angle measurement value (measured angle value from when the torque measurement value reaches the start torque until the snag torque is reached). **※When using this function, set "Angle judgment selection" to "Used".**

・Snag Angle Lower Limit

Initial	0
Setting range	0 ～ 9998
Setting conditions	Snag angle lower limit < Snag angle upper limit
Function description	・Set a lower limit to the snag angular measurement value (the Angle Measurement Value from when the Torque Measurement Value reaches the Start Torque to reaching the Snug Torque). ・If the snag angle judgment selection is "Used", an error is detected when the snag angle falls below the lower limit.

・Snag angle upper limit value

Initial	9999
Setting range	1 ～ 9999
Setting conditions	Snag angle lower limit < Snag angle upper limit
Function description	・Set an upper limit to the snag angle measurement value (the angle measurement value from when the torque measurement value reaches the start torque until the snag torque is reached). ・If the snag angle judgment selection is set to "Used", an error is detected when the snag angle exceeds the upper limit.

・Free-run angle detection selection

Initial	"Not detected"
Setting range	"Not detected" ・Free-run angle judgment is not performed. "Detect" ・Free-run angle judgment is performed.
When an error is detected **Operation of**	・Touch panel display: "Free-run angle abnormality" ・Judgment LED: Solid yellow, "FREE" is displayed ・Terminal block: Outputs FASTENING NOK ・ RES. or, reset the error by inputting RESET terminal.
Function description	・Choose whether to make a lower limit determination of the free-run angle (the angle before 400msec of starting tork detection from before to start tork detection). ・When the free-run angle detection selection is set to "Detect", if the free-run angle is lower than the free-run angle lower limit, a free-run angle error is detected.

・Angle judgment selection

Initial Settings	"Not detected"
Setting range	"Not detected" ・Tightening angle judgment is not performed. "Detect" ・The tightening angle is judged.
When an error is detected Operation of	・Touch Panel Display: "Tightening angle LOW/tightening angle HIGH" ・Judgment lamp: When LOW (Yellow ON "ANG" is displayed), When HIGH (Red ON "ANG" is displayed) ・Terminal block: Outputs FASTENING NOK ・ RES or, reset the error by inputting RESET terminal.
Function description	・Selects whether to judge the tightening angle (angle from snag torque detection to 10msec after CUT torque detection). ・Angle error is detected when the angle judgment selection is "Detected" and the tightening angle is outside the range of the angle upper limit value and angle lower limit value. ・When "Snag torque error selection" and "Snag angle judgment selection" are set to "Used", "Angle judgment selection" should also be set to "Used".

・Free-run angle lower limit value

Initial Settings	0
Setting range	0 ～ 9999
Function description	・Free-run angle (angle from 400msec before start torque detection to start torque detection) This is the lower limit of the angle with respect to the measured value. ・Used when Free-run angle detection selection is set to "Detect".

・Waveform data content selection

Initial Settings	「2ms」
Setting range	「100μ」・「1ms」・「2ms」・「5ms」
Function description	・The measured torque waveform is converted into data at 100 μsec per 1msec/2msec/5msec interval, and the torque waveform is then outputted. ・When reception is performed on the waveform data reception screen of the setting software, "100μ" is set, the number of waveform data buffers is up to 5, and the number of other buffers is 50.

・PC port communication speed

Initial Settings	「115200」
Setting range	「9600」・「19200」・「38400」・「57600」・「115200」
Function description	・ Selects the communication speed of the front panel PC-port from the 9600bps/19200bps/38400bps/57600bps/115200bps. **※Set the communication speed with the PC for setting using the PC connector on the front panel. This is not the communication rate of RS232C connector for data outputting on the rear panel.**

・Waveform memory function selection

Initial Settings	"Function 3"
Setting range	"Function 1" ・Waveform data is not stored. "Function 2" ・Waveform data is stored. When the buffer becomes full, a warning is displayed and the buzzer is turned ON. "Function 3" ・Waveform data is stored. When the buffer becomes full, a warning is displayed and the buzzer is not turned ON. "Function 4" ・Waveform data is stored, and warning display and buzzer do not turn ON.
Function description	・Selects "Buffer Full" and "Server Communication Error" display and buzzer operation.

・Password/History Use Select

Initial Settings	"Not used"
Setting range	"Not used" ・The password function/setting change history function is not used. "Used" ・Use the password function/setting change history function.
Function description	・This function performs password authentication when entering the setting mode to change the setting value, and keeps all changed setting items and setting contents in the history. ・Saved history can be received by the setting software. ・For details on how to register passwords and how to delete the change history and the function, see "13. Password Function (Link)".

・Invalid pulse

Initial Settings	3
Setting range	0 ～ 10
Function description	・When the torque input is interrupted until the measured torque exceeds the start torque and reaches the CUT torque, this function disables the tightening without making a judgment when the number of pulses at the time of interruption is less than the set value of the invalid pulse. ・Do not change the set value.

・Pulse count of the encoder

Initial Settings	1079
Setting range	0 ～ 9999
Function description	・Set the number of encoder pulses of the angle sensor used for the tool. ※Do not change the set value.

・Encoder angle

Initial Settings	360
Setting range	0 ～ 9999
Function description	・Set the encoder angle of the angle sensor used for the tool. ※Do not change the set value.

・COUNT OK Tool-Stop Selection

Initial Settings	"Do not stop"
Setting range	"Do not stop" ・You also run COUNT OK. "Stop" ・COUNT OK stops working.
Function description	・Select how the toolbar behaves while COUNT OK is displayed.

・Air/motor switching

Initial Settings	"motor"
Setting range	"Air" ・Use the air tool "motor" ・Use an electric tool.
Function description	**※Do not change the default settings.**

・Tool rotation stop setting

Initial Settings	"Do not stop"
Setting range	"Do not stop" ・Run the tool even if a alive check error occurs during connection using the Uryu standard communication specification. "Stop" ・Stop the tool when a alive check error occurs during connection using the Uryu standard communication specification.
Function description	・Select whether to stop the tool when a alive confirmation error occurs during connection using the standard communication specification. ・When the Tool Rotation Stop setting is "Stop" and TIMER Setting of "Custody Timeout" is used, the tool will be stopped until a reset is entered if an alive check error occurs. **※If a communication error other than the alive check error occurs during communication using the Uryu standard, the tool will be stopped regardless of this setting.**

・Startup Screen Selection

Initial Settings	"Torque value display"
Setting range	"Torque value display" ・Set the first screen to be displayed on the torque display screen. "Workpiece count display" ・Set the first screen to be displayed on the work count display screen. "Tightening torque monitor" ・Set the first screen to be displayed on the tightening torque monitor screen.
Function description	・Selects the first screen to be displayed when the power is turned on or when a reset is input on the menu screen.

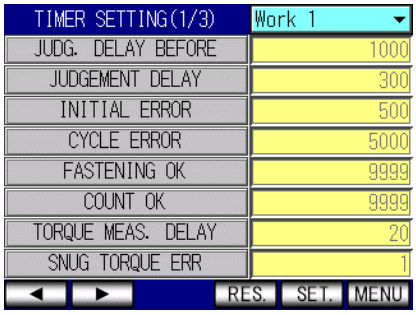
・Motor output switching setting

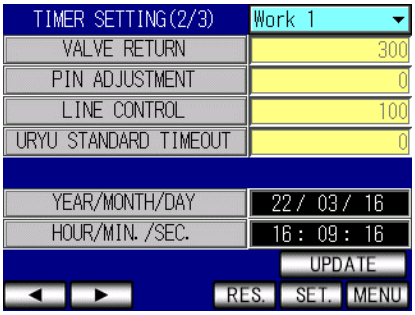
Initial Settings	"Start torque detection"
Function description	・Sets the condition for switching the motor output to the second stage. ※Do not change the set value.

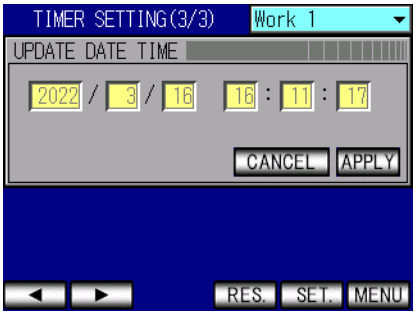
・3-Step Mode

Initial Settings	"Used"
Setting range	"Not used" ・Tighten the output of the motor in 2-step switching without using the 3-step mode. "Used" ・3-step mode is used to tighten the output of the motor in 3-step switching.
Function description	・Selects whether to use 3-step tightening. ・When this function is set to "ON", the following settings are displayed, and the motor output is switched in three stages during tightening. Also, since the waveform screen will not be displayed, use PC setup software to receive the waveform data when checking. ・When "Not used" is set, the following items are hidden, and the motor output is switched in two stages during tightening. ・3 Items to be displayed/hidden in the step mode setting [Basic Settings] ・Second torque level [Motor Settings] ・Motor Power ・Second duty ratio ・Second current ・Second rotation speed

7.3 TIMER Settings







・Pre-CUT Judgment Delay

Initial Settings	1000 [msec]
Setting range	100 ～ 9999 [msec]
Function description	・If the tightening is interrupted after reaching the start torque before reaching the CUT torque, the judgment output is performed after the set time has elapsed from the point when the torque input is finished. ・If the number of pulses at the time of judgment is less than or equal to the invalid pulse, no judgment is made and the data in the middle of tightening is discarded. **※When the torque CUT value is reached, "Judgment delay" functions.**

・Judgement Delay

Initial Settings	300 [msec]
Setting range	100 ～ 9999 [msec]
Function description	・Delay timer from completion of tightening (after reaching CUT) to output of judgment. ・Used as the torque measurement end point during control operation. **※"Pre-CUT Judgment Delay Timer" functions before the torque CUT value is reached.**

・**Initial error detection**

Initial Settings	500 [msec]
Setting range	1 ～ 9999 [msec]
Function description	・The initial error is detected when the tightening time from the start torque to the reaching of the CUT torque is within the set time. ・The timer start point starts when the torque reaches the starting torque. ・This function is enabled by setting "Enable" for the default error detection in MODE window.

・**Cycle error detection**

Initial Settings	5000 [msec]
Setting range	1 ～ 9999 [msec]
Function description	・A cycle error is detected when the torque measurement value has not reached the torque CUT value even after the time set by this timer has elapsed since the measured tightening torque reaches the start torque. ・The timer start point starts when the torque reaches the starting torque. ・This setting is required when Cycle Error Detection in MODE window is set to "Used" or Forced stop selection is set to "Used".

・**Tightening OK output**

Initial Settings	9999 [msec]
Setting range	0 ～ 9999 [msec]
Function description	・This timer setting is used to set FASTENING OK signaloutput time from the terminal block. ・If the next torque measurement is started even within the timer set period, FASTENING OK is turned OFF. ・Set only when the output time affects the external sequence, etc. ・When the timer is set to "0", the output is held until the next tightening start.

・**COUNT OK power**

Initial Settings	9999 [msec]
Setting range	0 ～ 9999 [msec]
Function description	・Timer setting to set COUNT OK pin output ON-time. ・When the timer is set to "0", the output is retained until the reset input or the resetting of the number of counts of LS1, etc. ・Common setting for all workpieces.

・**Torque measurement start delay**

Initial Settings	20 [msec]
Setting range	1 ～ 9999 [msec]
Function description	・When the measured torque reaches the starting torque, the timer starts, and torque measurement starts from TIME UP. (When the external start is used, the timer starts when START pin is turned on.) ・This is used when the torque value jumps when the bolt/nut is seated.

・**Snag torque error detection**

Initial Settings	1 [msec]
Setting range	0 ～ 9999 [msec]
Function description	・The timers start when the measured value reaches the starting Torque, and if the measured Torque value does not reach the snug Torque setting value by TIME UP, snag Torque abnormality will be detected.

・**Valve output**

Initial Settings	300 [msec]
Setting range	0 ～ 9999 [msec]
Function description	・Stops the tool operation from the time-up of the judgment delay timer to the time-up of the valve output timer.

・**Pin alignment**

Initial Settings	0 [msec]
Setting range	0 ～ 9999 [msec]
Function description	・Used to align bolt pins, etc. ・The timer starts when the torque is judged, and the torque is not measured until TIME UP, so adjust the position of the pin by following the torque. **※Set to "0" when this function is not used.**

・**For line management**

Initial Settings	100 [sec]
Setting range	1 ～ 9999 [sec]
Function description	・Used when the line-management operation selection in MODE window is "LS1" or "Tightening." This timer is used to perform line management according to time. ・When the timer starts at the start of the work process and the timer becomes 0, a judgment is made. ・When the count judgment is OK, the count number is reset when the time set by the count OK timer has elapsed after the count is OK. ・Common setting for all workpieces.

・**Standard time-out**

Initial Settings	0 [sec]
Setting range	0 ～ 99 [sec]
Function description	・Set the reception interval of the alive confirmation command when using the standard communication. ・If the next existence check or other command is not received within the set time after receiving the existence check, a survivance check error will occur. ・If a viability check error occurs when the tool rotation stop setting in MODE setting is "Stop", the tool stops until a reset input is made.

・**Date**

Function description	・You can change it with the Update Date and Time button.

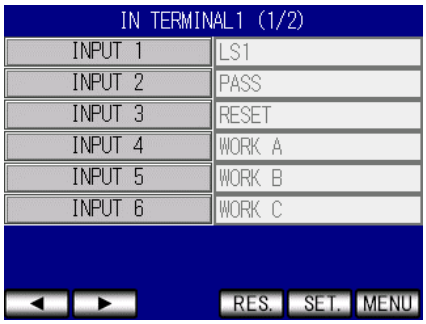
・**Hour, minute and second**

Function description	・You can change it with the Update Date and Time button.

7.4 Input/Output Settings

The input and output contents of the terminal block are free-form, and the I/O contents assigned can be changed according to the setting.

・Input terminal selection 1



Initial Settings

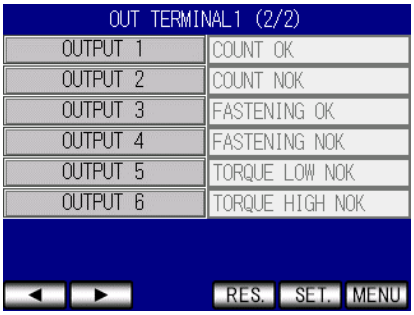
Input1: "LS1"
Input2: "PASS"
Input3: "RESET"
Input4: "WORK A"
Input5: "WORK B"
Input6: "WORK C"

Function description

・Inputs 1 to 6 correspond to the rear-panel I/O terminal IN 1 ～ IN 6 .

Setting name	Content
LS 1	Judgement when line-management operation selection is "LS1" If "LS1,LS2" or "LS1" is selected, the tightening process starts.
START	※ This function is not used.
RESET	Clears NOK, counting, and line management.
LS 2	Judgment (Used when the line-management operation selection is "LS1,LS2")
PASS	The switch is forcibly turned COUNT OK even if there is a residual tightening quantity.
QL	Count down the number of inputs and fasteners for the QL wrench.
WORK A WORK B WORK C	Input for workpiece selection Select WORK No. 1 to 5 according to the combination of WORK A to C. Used when "Workpiece selection combination" of MODE setting is "A to C".
WORK 1 〈 WORK 5	Input for workpiece selection Enter WORK 1 to 5 to select WORK Nos. 1 to 5. Used when "Workpiece selection combination" of MODE setting is "1 to 5".
CUT	Input to stop the tightening operation (tool).
TOOL SW	※ This function is not used.
TOOL LEVER ON	※ This function is not used.
RES	※ This function is not used.
FORWORD(LOW)	Rotates the tool while it is ON. The rotation speed is fixed at 500rpm.
FORWORD(MID)	Rotates the tool while it is ON. The rotation speed is fixed at 1000rpm.
FORWORD(HIGH)	Rotates the tool while it is ON. The rotation speed depends on the motor setting and performs the same operation as when the tool lever is ON.
REVERSE	Reverses the tool while it is ON. The rotational speed depends on the motor setting.

・**Output terminal selection 1**



Initial Settings	Output1: "COUNT OK" Output2: "COUNT NOK" Output3: "FASTENING OK" Output4: "FASTENING NOK" Output5: "TORQUE LOW NOK" Output6: "TORQUE HIGH NOK"

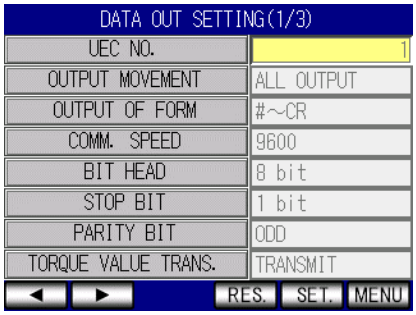
Function description

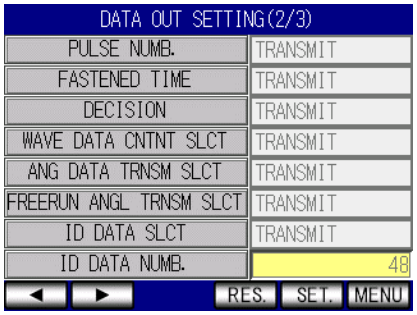
・Outputs 1 to 6 correspond to the rear-panel I/O terminal OUT 1 ～ OUT 6 .

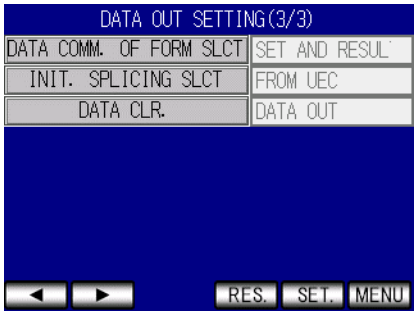
Setting name	Content
COUNT OK	Count OK The output time is set by "COUNT OK output" in TIMER setting.
COUNT NOK	Count NOK It is output until the count NOK is cleared.
FASTENING OK	Tightening OK The output time is set by "Tightening OK Output" in TIMER setting.
FASTENING NOK	Tightening NOK The signal is output until the NOK indication is cleared.
SV	Outputs when the start Torque is reached.
TORQUE LOW NOK	Outputs when the torque judgement is LOW NOK.
TORQUE HIGH NOK	Outputs when the torque judgement is HIGH NOK.
OPERATION RANGE	Lights only in the work process (counting down of the number of fasteners possible).
CPU RUN	Controller operating output Turns OFF when the tool cannot be controlled, such as while the setting value is being written.
CAUTION	Warning output Outputs when the cumulative number of units/pulses reaches the number of units that can be repaired/the number of pulses.
WORK A answer	The corresponding answer signal is output while WORK A to C are input.
WORK B answer	
WORK C answer	
WORK 1 COUNT OK	A COUNT OK signal is output for each WORK number.
WORK 2 COUNT OK	
WORK 3 COUNT OK	
WORK 4 COUNT OK	
WORK 5 COUNT OK	
SV2	Outputs when the measured torque reaches the snag torque.

7.5 Data output Settings

Communications using RS232C connector (RS232C port) on the rear panel and communication settings of the data management system (hereinafter referred to as "data management") and communication using NET WORK connector (LAN port) according to the communication specifications of Uryu-Lio Standard.







・UEC No setting

Initial Settings	1
Setting range	1 ～ 9999
Function description	・Set the number to be assigned to each controller when multiple controllers are connected by the cubic standard and data management.

・Output operation selection

Initial Settings	"All output"
Setting range	"All output" ・All tightening data are RS232C output regardless of whether the tightening is OK/NOK. "Output when abnormal" ・RS232C is outputted only when torque/pulse number/angle upper/lower limit/various tightening abnormalities are detected. "Do not output" ・No RS232C is output.
Function description	・Set the output conditions of the tightening data output from the rear panel PC connector.

・Data method selection

Initial Settings	「#～CR」
Setting range	「#～CR」 ・Put [CR] at the end of the output tightening data. 「#～LF」 ・Finally put [LF] on the output tightening data. 「Global」 ・Communication is performed with communication specifications compatible with global Pokayoke. When "Global" is set, the setting is automatically changed to the optimal setting. 「UEC4500 Type」 ・The tightening data is outputted with the same communication specification as UEC-4500. 「UEC4100 Type」 ・The tightening data is outputted with the same communication specification as UEC-4100.
Function description	・Selects the output operation from the rear panel PC connector. ・When "Communication" or "Communication ProgramNo" is selected as the program selection setting, set this setting to "# to CR".

・Select the baud rate.

Initial Settings	「9600」
Setting range	「4800」・「9600」・「19200」・「38400」・「57600」・「115200」
Function description	・Select the communication speed of the rear panel PC port from 4800 bps/9600 bps/19200 bps/38400 bps/57600 bps/115200 bps. **※It is not the communication speed setting of the front panel PC connector.**

・Bit length selection

Initial Settings	「8bit」
Setting range	「7bit」・「8bit」
Function description	・Selects the bit length of the output data from the rear panel PC connector.

・Stop bit selection

Initial Settings	「1bit」
Setting range	「1bit」・「2bit」
Function description	・Selects the stop bit for output data from the rear panel PC connector.

・Parity bit selection

Initial Settings	"Odd"
Setting range	"Odd" ・Performs parity check (odd number) of output data "even" ・Performs parity check (even number) of output data "None" ・The parity of output data is not checked.
Function description	・Selects the parity check of output data from the rear panel PC connector.

・Torque value transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・Torque measurement is not included in the data to be output. "Send" ・The measured torque value is included in the data to be output.
Function description	・Selects whether the torque value is included in the output data from the rear panel PC connector.

・Pulse Number Transmission Selection

Initial Settings	"Send"
Setting range	"Do not send" ・The output data does not include the number of pulses. "Send" ・The number of pulses is included in the data to be output.
Function description	・Selects whether the output data from the rear panel PC connector includes the number of pulses.

・Tightening time transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・The data to be output does not include the tightening time. "Send" ・Including the tightening time in the data to be output
Function description	・Selects whether the tightening time (elapsed time from the arrival of the start torque value to the arrival of the torque CUT value) is included in the output data content from the rear panel PC connector.

・Tightening judgment transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・The data to be output does not include tightening judgment. "Send" ・Including tightening determination in the data to be output
Function description	・Selects whether to include a tightening judgment in the output data content from the rear panel PC connector.

・Waveform data transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・Waveform data is not included when communicating with the data management system. "Send" ・Includes waveform data when communicating with the data management system
Function description	・When communicating with data management using the LAN port, select whether waveform data is included in the fastening result data to be sent to the host.

・Tightening angle transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・The data to be output does not include the tightening angle. "Send" ・Including the tightening angle in the data to be output
Function description	・Selects whether the tightening angle is included in the output data content from the rear panel PC connector.

・Free-run angle transmission selection

Initial Settings	"Send"
Setting range	"Do not send" ・The data to be output does not include the free-run angle. "Send" ・Including the free-run angle in the data to be output
Function description	・Selects whether the free-run angle is included in the output data content from the rear panel PC connector.

・ID data output selection

Initial Settings	"Send"
Setting range	"Do not send" ・The ID is not included in the data to be output. "Send" ・The data to be output contains an ID.
Function description	・Set whether ID data is included in the data output from the rear panel PC connector.

・Number of digits of ID data

Initial Settings	48
Setting range	1 ～ 48
Function description	・Set the number of digits of ID data. ・Set 32 and 48 when "Communication" and "Communication ProgramNo" are selected.

・Data communication format selection

Initial Settings	"Setting + Result data"
Setting range	"Setting + Result data" ・Uses the setting value received from the upper level in the Uryu standard communication specification. "Result data" ・Do not use the setting value received from the upper level in the Uryu standard communication specification.
Function description	・Selects whether to use the setting value received from the host when communicating with the host system using the Uryu Standard Communication Specification. ・When "Setting + result data" is set, tightening is performed using "Work No," "ID," and "Set value" received from the host PC or PLC...etc. ・When "Result data" is set, the "Work No" and "Set value" received from the host are ignored, and only the transmission of tightening data to the host is performed. In addition, the workpiece No. is switched by the input from the I/O terminal.

・Initial connection selection

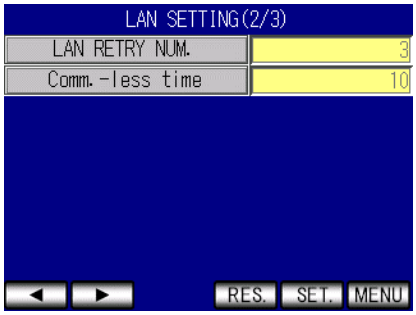
Initial Settings	"Connection from UEC"
Setting range	"Connection from UEC" ・Default connection is made from UECP-4900A. "Connect from Server" ・Initial connection is performed from the host side.
Function description	・This bit is used to select whether to send the initial-connection command from UECP-4900A or the host when performing communication using the Uryu-standard communication specification.

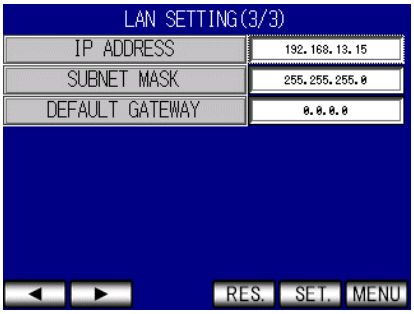
・Data clear setting

Initial Settings	"Data output"
Setting range	"Data output" ・Outputs the fastening data that is temporarily stored when communication is established with the Ukisha standard communication specification. "Data clear" ・The fastening data stored temporarily when the communication is established by the Uryu standard communication specification is not output and discarded.
Function description	・ Selects whether to delete the tightening data that cannot be transmitted to the host when communicating with the Uryu standard when communication is established.

7.6 LAN Settings

The IP address, subnet mask, and default gateway cannot be changed from the setting software, and can be changed on the third page of this setting. After the change, the configuration is applied by rebooting the controller.





- **IP address**

Initial Settings	192.168.0.1
Setting range	0.0.0.0 ～ 255.255.255.255
Function description	・The IP address set for the controller. ※You can only change the settings on the third page of the LAN settings screen. ※ Restart the controller after changing the IP address.

- **Subnet Mask**

Initial Settings	255.255.255.0
Setting range	0.0.0.0 ～ 255.255.255.255
Function description	・The subnet mask set for the controller. ※You can only change the settings on the third page of the LAN settings screen.

- **Default gateway**

Initial Settings	0.0.0.0
Setting range	0.0.0.0 ～ 255.255.255.255
Function description	・The default gateway configured on the controller. ・Set this when connecting the PC and the controller via a router. ※You can only change the settings on the third page of the LAN settings screen.

- **TCP port (own station)**

Initial Settings	2101
Setting range	0 ～ 9999
Function description	・Sets the TCP port of the controller.

- **Connection mode**

Initial Settings	"Client"
Setting range	"host" ・Set the controller side to host "Client" ・Configure the controller side to the client
Function description	・When using the setting software, set it to "Client".

・**Host IP Address**

Initial Settings	120.0.100.2
Setting range	0.0.0.0 ～ 255.255.255.255
Function description	・Set the IP address of the access point (setting software, etc.).

・**Remote TCP port (remote station)**

Initial Settings	2101
Setting range	0 ～ 9999
Function description	・Sets the TCP port of the access point (setting software, etc.).

・**Number of LAN retries**

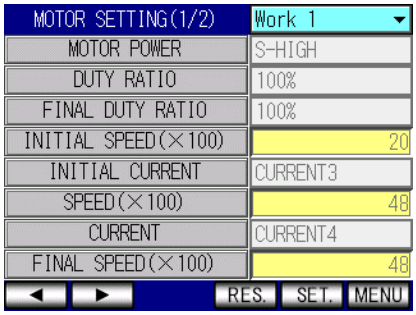
Initial Settings	3
Setting range	0 ～ 10
Function description	・Set the number of retries to be performed when an error occurs in LAN communication.

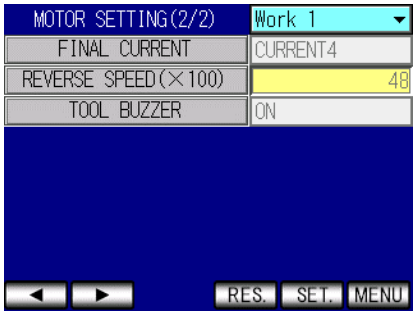
・**LAN no response limit time**

Initial Settings	10(sec)
Setting range	0 ～ 10
Function description	・Set the time to wait when there is no response in LAN communication.

7.7 Motor Settings

This setting is used only when the "Air/Motor Switch" setting in MODE setting is set to "Motor".
When "Air" is set, the "Motor setting" item is not displayed. In addition, some settings can be displayed or hidden depending on the 3-step mode setting of MODE setting.





・Motor Power

Initial Settings	「S-HIGH」
Setting range	「CUSTOM」 ・Manually enter the settings in the various motor setting items. 「LOW」 ・Enter low output preset values for various motor setting items. 「MIDLLE」 ・Enter the preset value of the medium output in the various motor setting items. 「HIGH」 ・Input high-output preset values to various motor setting items. 「S-HIGH」 ・Enter the preset value of the maximum output in the various motor setting items.
Function description	・Enter the preset values in the table below to the various motor settings according to the setting. ・When the setting is changed from the preset value, it is automatically changed to "CUSTOM".

Setting name	LOW	MIDLLE	HIGH	S-HIGH
Initial rotation speed	15	20	20	25
Initial current	2	2	3	3
Rotational speed	17	30	40	48
Current	3	3	4	4
Second rotation speed	17	25	35	48
Second current	2	2	3	4

・Duty ratio

Initial Settings	100 [%]
Setting range	55 ～ 100 [%]
Function description	・Set the duty ratio after the measured torque value has reached the torque CUT value x the second torque level. ・Set the input voltage to the motor and adjust the output.

・**Second Duty Ratio**

Initial Settings	100 [%]
Setting range	55 ～ 100 [%]
Function description	・Set the duty ratio after the measured torque value has reached the torque CUT value x the second torque level. ・Set the input voltage to the motor and adjust the output.

・**Initial rotation speed (×100)**

Initial Settings	25
Setting range	10 ～ 48
Function description	・This is the rotation speed setting of the tool until the measured torque reaches the start torque. ・The setting is in 100rpm increments. (4800rpm for setpoint 48)

・**Initial current**

Initial Settings	3
Setting range	1 ～ 4
Function description	・Sets the amount of current flowing through the motor until the measured torque reaches the start torque.

・**Rotational speed (×100)**

Initial Settings	35
Setting range	13 ～ 48
Function description	・This is the rotation speed after the measured torque reaches the starting torque. ・The setting is in 100rpm increments. (4800rpm for setpoint 48) ・The lower limit varies depending on the "Current" setting. 「1」: 13 ～ 「2」: 17 ～ 「3」: 21 ～ 「4」: 25 ～ ・When the "3-step mode" setting of MODE setting is "Used", the lower limit is 15 regardless of the "Current" setting.

・**Current**

Initial Settings	4
Setting range	1 ～ 4
Function description	・Sets the amount of current flowing to the motor after the measured torque reaches the start torque. The lower limit of "Rotational speed" changes according to the set value. When the current value is "1", the lower limit of "rotation speed" is 1300rpm. When the current value is "2", the lower limit of "rotation speed" is 1700rpm. The lower limit of "rotation speed" is 2100rpm when the current value is "3". When the current value is "4", the lower limit of "rotation speed" is 2500rpm. ・When the "3-step mode" setting of MODE setting is "Used", the lower limit is 15 regardless of the "Current" setting.

・**Second Rotation Speed (×100)**

Initial Settings	35
Setting range	15 ～ 48
Function description	・This is the rotation speed after the measured torque value has reached the torque CUT value x the second torque level. ・The setting is in 100rpm increments. (4800rpm for setpoint 48)

・**Second current**

Initial Settings	4
Setting range	1 ～ 4
Function description	・Sets the amount of current flowing to the motor after the measured torque has reached the torque CUT value x the second torque level. The lower limit of "Rotational speed" changes according to the set value.

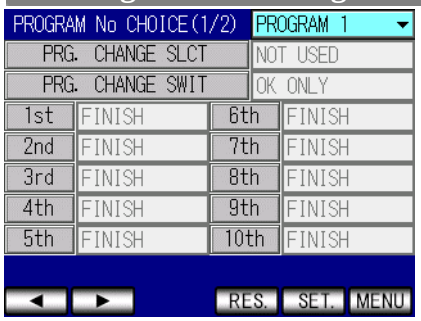
・**Reverse rotation speed (×100)**

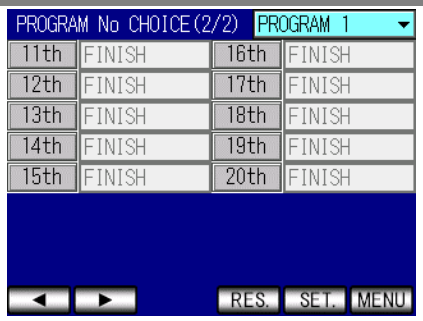
Initial Settings	48
Setting range	10 ～ 48
Function description	・Set the rotation speed when the tool is reversed. ・The setting is in 100rpm increments. (4800rpm for setpoint 48)

・**Tool buzzer**

Initial Settings	「ON」
Setting range	「ON」・「OFF」
Function description	・Switches ON,OFF of the tool buzzer. ・The tool buzzer is output continuously for 1 pulse (1sec) when the tightening is OK, and continuously when the tightening is NOK.

7.8 Program No. Change





・Program switching selection

Initial Settings	"Not used"
Setting range	"Not used" ・Program No. switching is not used. "external" ・Switches the program to be used by input from the terminal block. Switching is done by "WORK A"～"WORK C" and "WORK 1"～"WORK 5". "Communication" ・Select the program number to be used by receiving data (32 byte) from the rear panel PC connector. "Communication ProgramNo" ・Select the program number to be used by receiving data (48 Byte) from the rear panel PC connector.
Function description	・Set whether to use the program No. switching and how to change the program No. ・When the setting is changed from "Disable" to another setting or from another setting to "Disable", the memory data is cleared to record a new program number. ※When the setting is "Communication" or "Communication ProgramNo", set "Data type selection" in the data output setting to "# to CR", "ID data output selection" to "Send", and "ID data digit number" to "32". Refer to the separate "RS232C Communication Formats" for the switching data specifications.

・Program switching transition

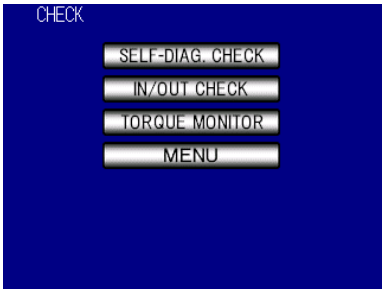
Initial Settings	"OK only"
Setting range	"OK only" ・Only when the tightening is OK, the operation proceeds to the next tightening setting. "Even in OK,NOK" ・In addition to the tightening OK, even when the tightening NOK is selected, the tightening setting will shift to the next one. "OK, partially NOK" ・When torque HIGH is used in addition to tightening OK, the following tightening setting will be entered.
Function description	・Set the condition under which the workpiece switches when the program No. switching is used.

・1st line to 20th line

Setting range	「WORK 1」～「WORK 8」 ・Use WORK 1 ～ WORK 8 settings. "End of tightening" ・End the workpiece switching by the program No. switching function.
Function description	・Set the workpiece No. to be tightened in each program. ・Automatically switches in the order of the entered workpiece number each time tightening is performed. ・When tightening is finished with less than 20 bolts, input the required work No. and set the remaining set value to "End tightening".

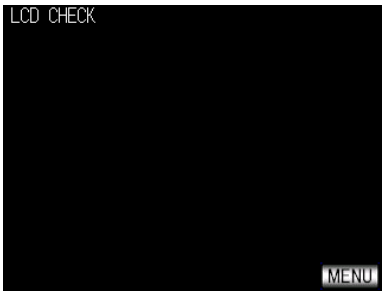
8 Check

Make sure that the function of the controller main unit is working properly. Perform self-diagnosis check and I/O check to check for any abnormality in the main unit.



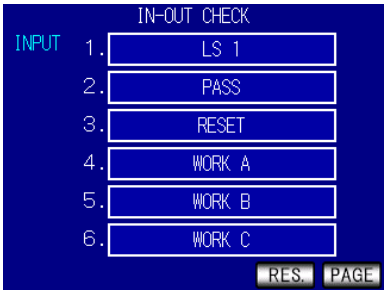
8.1 Self-diagnosis Check

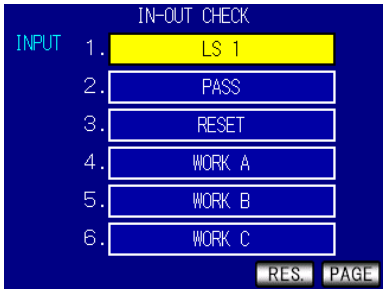
The controller main unit is checked, and after the check is finished, the touch panel is checked. During the touch panel check, touch the screen to change the color of the screen and check for missing cells. Finish the self-test with the MENU button at the bottom right of the screen and return to the menu screen.

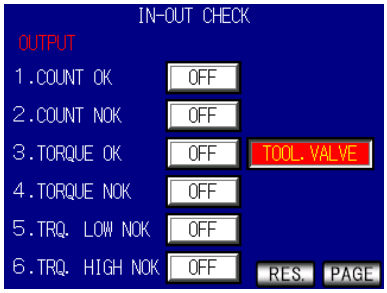


8.2 Input/Output Check

Check the I/O output of the I/O terminal block on the rear panel.
On the input check screen, items that are ON change to yellow while the input signal is ON.
Be careful not to confuse NPN/PNP method when checking the input terminals.
On the Output Check screen, you can switch the output ON/OFF by touching the item you want to perform an output check.
Output terminals 1 to 6 on the left, TOOL OK and TOOL NOK on the right are the built-in tool lamps, and TOOL VALVE is the check of the valve output. Items whose output is ON change color to red, and when touched, the output turns OFF and changes to white.

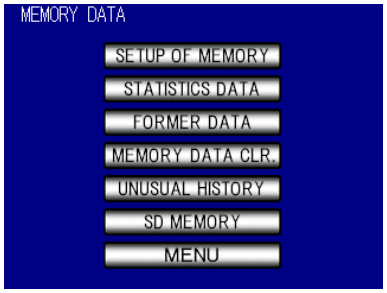






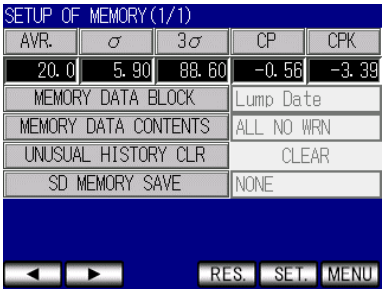
9 Memory Data

Settings related to memory data and checking and deleting recorded data are performed.



9.1 Memory-related Settings

Set the settings related to the fastening data to be saved in the memory of the controller main unit.



- **Mean value**

Function description

・Displays the average value of the data of the memory contents.

$$\bar{x} = \frac{x_1 + x_2 + \sim + x_n}{n}$$

$\bar{x}$: Mean value

n:Number of data

- **σ value**

Function description

・The σ value (standard deviation) of the data in memory is displayed.

$$\sigma = \sqrt{\left[\frac{1}{n-1}\sum(x_n - \bar{x})^2\right]}$$

σ: Standard deviation

- **3σ value**

Function description

・The 3σ/average value (variation) of the data of memory contents is displayed.

$$3\sigma\text{値} = \frac{3\sigma}{\bar{x}} \times 100\%$$

3σ value: Rate of variation

• CP value

Function description

・Displays the CP value (Process Capability Index) of the data in the memory.
・Calculated based on the set value (torque LOW/torque HIGH) of the selected WORK No.

$$CP = \frac{\text{Upper limit} - \text{Lower limit}}{6\sigma}$$

Cp :process capability factor

• CPK value

Function description

・Displays the CPK value (single-sided process capability index) of the memory contents data.
・Calculated based on the set value (torque LOW/torque HIGH) of the selected WORK No.

$$CPK = \frac{B}{3\sigma}$$

B 1:Upper Limit-Average
B 2:Average-Lower Limit
B : The smaller of B and B
CPK value: Process Capacity Index (including bias in average value)

• Memory Data Block

Initial Settings

"Collective date and time"

Setting range

"batch"
・Memory, with date and time, and without ID in all work batches.

「W.No」
・Memory, no date/time, no ID for each work No.

"Collective date and time"
・Memory, with date and time, and without ID in all work batches.

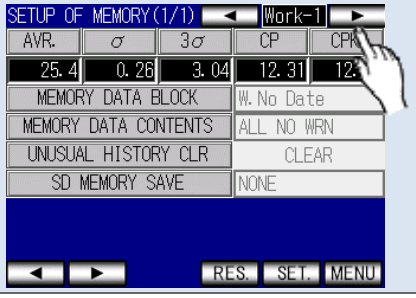
"W.No. date and time"
・Memory, date and time exist for each work No. and no ID.

"Batch date & time + ID"
・Memory, with date and time, and ID in all work batches.

"W.No. Date and time + ID"
・Memory, date and time exist and ID exist for each work No.

Function description

・It is possible to select whether to perform memory of measurement data collectively up to workpiece No.1 to 8, to execute in the block for each workpiece No., or to execute the date and time data for which tightening was performed, or to execute the memory for ID.
・The maximum number of saved items is 12,000 for batch saving.
・When memory is performed for each work number, the maximum number of data items that can be stored in memory is 1500 per work.
・If fastening is done more than the maximum number of data, it will be updated from the old data.
・When setting to save tightening data for each workpiece No., calculation of average value, CPK, etc. is performed for each block, and the workpiece No. to be displayed can be switched by touching the switch button ◄ ► at the top left of the screen.



・Memory data content

Initial Settings	"All without warning"
Setting range	"No memory" ・Tightening data is not stored in memory. "All warnings found" ・All the tightened data are stored in memory. The buzzer is turned on and a warning is displayed when the remaining 10 free data are available. The indication disappears when RESET terminal or RESET button is pressed, but the buzzer turns ON and the warning indication is displayed when tightening is performed again. "All without warning" ・The buzzer does not sound when there is 10 remaining free data with the same content as "All warnings found". "OK warning found" ・When tightening is performed, the data when tightening is OK will be stored. The buzzer turns ON and a warning is displayed when there are 10 remaining data. "OK No warning" ・The buzzer will not turn ON and the warning will not be displayed when there are 10 remaining free data in the same way as "OK warning found".
Function description	・You can select whether or not to display a warning when the memory contents and available memory data become the remaining 10. ・When the set value is changed, all data stored in the memory is cleared.

・Error history clear

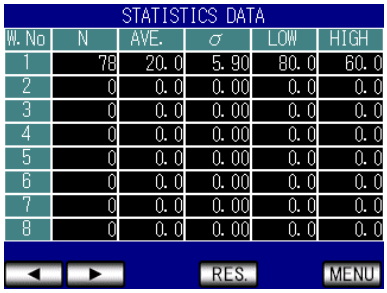
Function description	・Touch the clear button in the setting mode to delete all the alarm history stored in the controller.

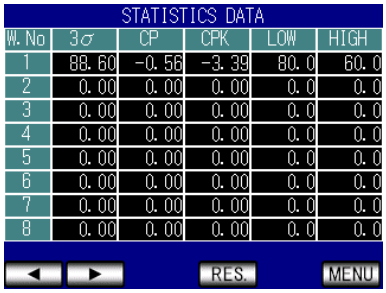
・SD memory storage

Initial Settings	"Do not save"
Setting range	"Do not save" ・Tightening data is not saved on the SD card. "Results and Waveforms" ・Save the tightening result data and waveform data to the SD card. "Result only" ・Save the tightening result data to the SD card. "Waveform only" ・Save waveform data to SD card.
Function description	・If you insert an SD card and set it to other than "Do not save", you can store the tightening data in the SD card. ・Up to 32 GB of SD card can be used. ・If the setting value is changed from "Do not save" to any other setting, the waveform data of the tightening performed after the setting is changed will be saved. ・The saved data can be read by UECP-4900A setting software.

9.2 Statistical Data

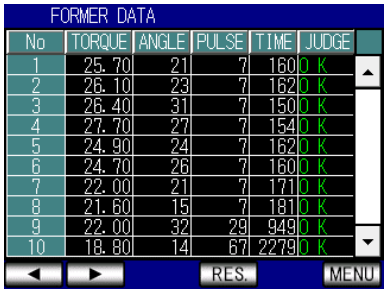
"N" (number of data)/"average value"/"σ value"/"torque lower limit value"/"torque upper limit value"/"3σ value" (3σ/average value variation)/"CP value" (process capability index)/"CPK value" (single-sided process capability index)
When the "Memory data block" setting in MODE setting is set to "WOOC," "WOOB date and time," or "WOOB date and time + ID," the tightening data is individually stored for each tightened work number. When "Memory data block" is set to "Batch", "Batch date/time", "Batch date/time + ID", all tightening data is saved without distinction of work.

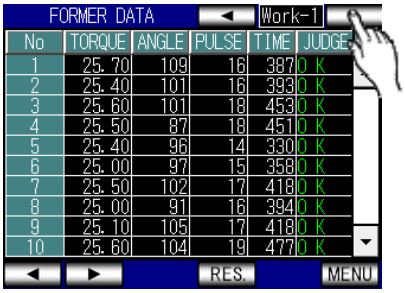




9.3 Original Data

Displays "Torque", "Angle", "Pulse", "Time" and "Judgment" of the tightening data stored in the controller body.
When the "Memory Data Block" setting is "W.No.", "W.No. Date/Time", "W.No. Date/Time+ID", the work No. is displayed in the upper right of the screen. The workpiece to be displayed can be switched by the key ◄ ► next to the workpiece No.

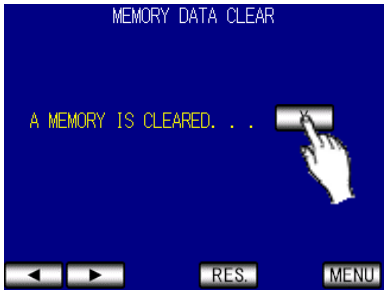




Workpiece switching

9.4 Memory Data Clear

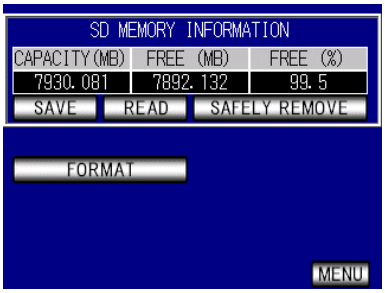
Select Y on the right of the screen in the Memory Data Clear screen to delete all the stored tightening data. Do not turn off the power while the memory data is being cleared.
In addition to deleting data on this screen, the memory data is automatically cleared when the memory data block is changed or the program number selection setting is changed.
Memory data can also be cleared from the setting software.



9.5 Error History

Displays the history of the last 50 errors. Displays "error details", "data" (detected torque when an error occurs) "date and time of occurrence". If there are more than 10 records, the screen can be forwarded with the scroll bar at the right of the screen. Error logs can be deleted by "Error log clear" of the memory relationship setting. The setting software can also receive and delete error logs.

9.6 SD Memory



- **Storage**

Function description	・Saves all the current settings of the controller to the SD card. If the settings that have already been saved are on the SD card, they will be overwritten.

- **Read**

Function description	・Reads the settings saved on the SD card and rewrites the controller settings.

- **Safe Removal**

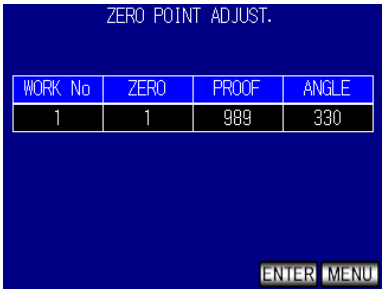
Function description	・Remove the SD card safely. Make sure that the indicated capacity is "0.0" before removing.

- **Format**

Function description	・Format the SD card. Deletes all data on the SD card and creates a folder to save various data.

10 Zero Point Adjustment

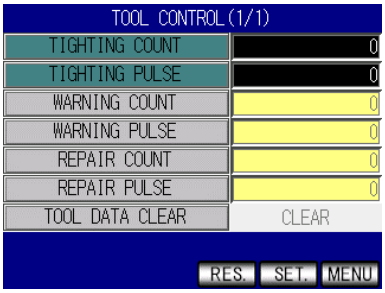
Displays the value at the time of ZERO checking of the torque sensor and the value at the time of CAL checking.
The display is an absolute value display.



"ZERO" shows the value of the present zero point, and "Calibration Value" shows the value of [CAL × Calibration Ratio × Tool Ratio].
If the zero point deviates from the vicinity of "0", the deviation of ZERO point is corrected by pressing the ENTER button.

11 Tool Management

Set the tool maintenance timing. Displays the cumulative number of tightening and the cumulative number of pulses judged by the controller.



・Total number of fasteners

Display range	0 to 99999 [million pcs]
Function description	・Displays the total number of all fasteners judged by the controller. ・The minimum number that can be displayed is 10000. ・You can display it in units of 1 by receiving it with the setting software. ・It is recommended to perform tool maintenance every 0.4 million lines. **※Not a setting** **※The recommended number of tool maintenance varies depending on the operating environment.**

・Total number of tightening pulses

Display range	0 to 99999 [million pulses]
Function description	・Displays the cumulative number of pulses for all tightening judged by the controller. ・The minimum number that can be displayed is 10000 pulses. ・It can be displayed in 1-pulse units by receiving with the setting software. ・It is recommended to change the oil every 5 million pulses or half year. ・It is recommended to request disassembly adjustment at 10 million pulses or every year. **※This is not the setting.** **※The number of pulses recommended for tool maintenance varies depending on the operating environment.**

・Number of warnings

Setting range	0 to 9998 [million pcs]
Function description	・A warning is displayed when the total number of fasteners reaches the set value. ・Screen display: "Warning number error" ・The buzzer remains OFF.

・Number of warning pulses

Setting range	0 to 9998 [million pulses]
Function description	・A warning is displayed when the total number of fasteners reaches the set value. ・Screen display: "Warning Pulse Number Error" ・The buzzer remains OFF.

- **Number of fasteners for repair**

Setting range	0 to 9999 [million pcs]
Function description	・A warning is displayed when the total number of fasteners reaches the set value. ・Screen display: "Number of units to be repaired abnormal" ・The buzzer turns on.

- **Number of pulses for repair**

Setting range	0 to 9999 [million pulses]
Function description	・A warning is displayed when the total number of tightening pulses reaches the set value. ・Screen display: "Pulse count for repair abnormal" ・The buzzer turns on.

- **Tool data clear**

Function description	・The stored cumulative number of tightening and the number of pulses are deleted. ・Deletion is also possible from the configuration software.

12 Version Information

Displays the version of the controller.

13 Password Function

This function requires a password when entering the setting mode to change the setting value, and retains the change history (item name, setting value before change, and setting value after change) when the setting is changed.

To use the password function, the user ID + password must be registered. User IDs and passwords can be set as 4-digit integers (0000 to 9999), and up to 16 pairs can be registered.

If the setting value is changed while the password function is set to "Enable", the user name entered when entering the setting mode, the name of the changed setting item, the date and time before and after the change, and the date and time of the change are retained in the history.

The change history can be checked with the setting software.

Registration procedure

Example) When registering the user ID and password with "1234"

When "Password/History" of MODE Setting is set to "Enable", "User Registration" is displayed on the Setting Mode screen. Select the "User Registration" item to proceed to the user ID list. If you have already registered the user, you must enter the user ID and password to proceed to the user ID list. If you have not registered the user, do not enter anything and select "OK".

The description of each item on the user registration screen is shown below.

"Added" ・・・Register a new user and password.

"Change" ・・・ Change the password of an already registered user.

"Remove" ・・・Deletes the registered information of the selected user.

"All deleted" ・・・Deletes all registered users/passwords.

"Delete change history" ・・・Deletes all the change history of the recorded setting value.

To register a user/password, select "Add" on the right of the screen to display the user/password registration screen. You can register by entering the user ID and password to be registered on this screen and pressing OK. When registration is completed, the user ID registered in the user ID list is displayed.

14 Feature Description

14.1 Tightening control specifications

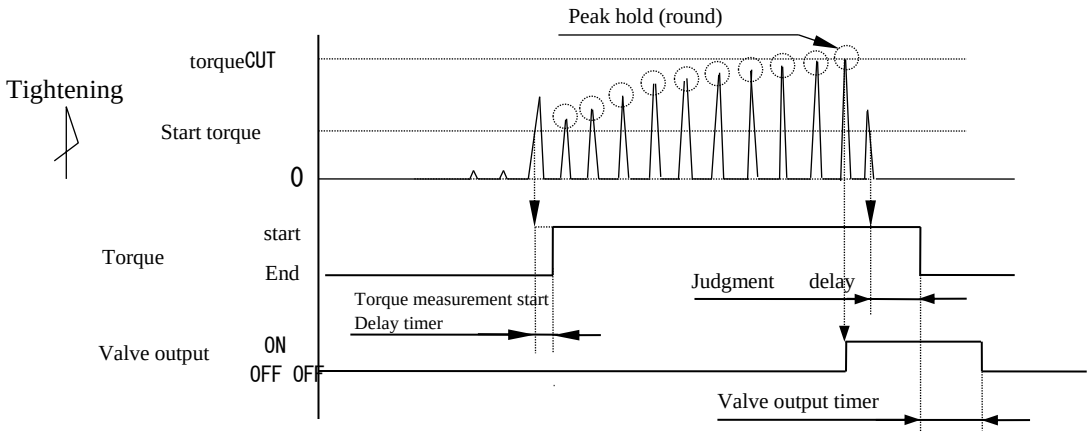
Three types of tightening control specifications are available.

1)AD Torque control

Executes torque control by the AD torque sensor. Measurement starts after a torque equal to or greater than the start torque value is input. When the measured torque reaches the torque CUT value, a VALVE is output and the tool is stopped. The judgement output is TIME UP of the judgement delay timer after the measured torque falls below the start torque value.

When the torque measurement start delay timer is set, the torque measurement delay timer starts when a torque higher than the start torque value is input, and torque measurement starts after TIME UP of the torque measurement start delay timer to ignore the jump of the torque display value when the bolt is seated.

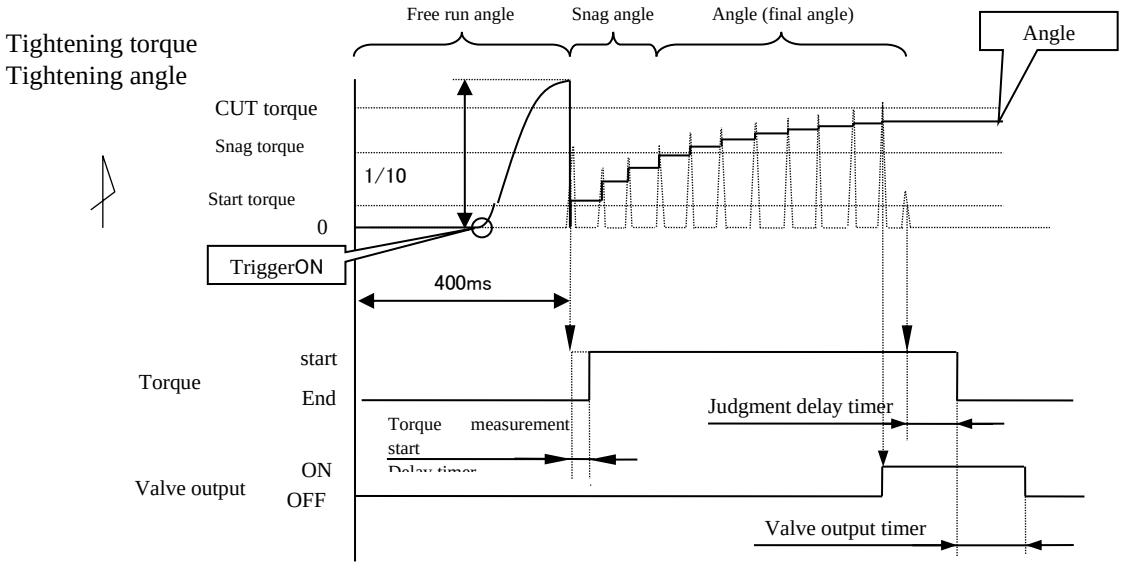
When the tightening is stopped with 3 pulses or less from the start torque, the "invalid pulse" function is activated to terminate the measurement without judging OK/NOK, etc. "Inactive Pulse" can be changed from MODE setting.



2)AD Torque Control/Angle Monitor

Torque control/angle measurement value monitor is performed. Starts measurement after a torque equal to or greater than the start torque value is input, stops the tool when the measured torque reaches the torque CUT value, and stops measurement of the rotation angle in 10msec after it stops. Judgment output is made after the measured torque falls below the start torque value and the judgment delay timer is up. Judgment output is performed after the time of the judgment delay timer is up after the measured torque falls below the start torque. When the judgment delay timer is set, the angle is measured even while the timer is operating.

※Only the free-run angle waveform within the tightening waveform is displayed in the vertical axis range of one tenth.

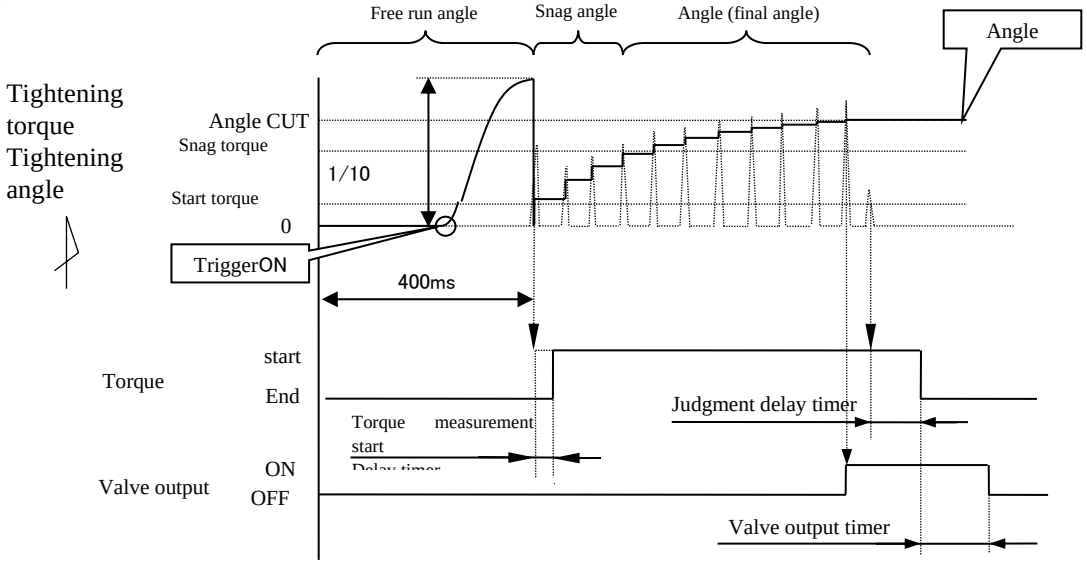


Free-run angle: Angle from 400msec before start torque detection to start torque detection.
Snag angle: The angle from the start torque detection to the snag torque detection.
Angle (final angle): Measured angle from snag torque to 10msec after CUT.

3)Angle control/AD torque monitor

Conducts angle control and torque measurement value monitoring. Measurement starts after a torque equal to or greater than the start torque value is input. When the measured torque reaches the torque CUT value or the tightening angle after the torque exceeds the snag torque reaches the angle CUT value, the tool stops and judgement is made. The determination output is performed after the determination delay timer is timed up after the measured torque value falls below the start torque value. At the time of judgement, as in the case of Torque Control, Torque Upper/Lower Limit, Pulse Upper/Lower Limit, Upper/Lower Angle, Free Run Angle Lower Limit, and Various Tightening Abnormal Conditions shall be Tightened NOK. When the judgment delay timer is set, the tightening angle is measured even while the timer is operating.

※Only use the product in an environment where the angle can be measured stably, such as when the tool or workpiece is fixed.



14.2 Judgement of U&L limits

UECP-4900A can determine whether the measured values of torque/pulse number/angle/free-run angle are within the upper and lower limits.
The upper/lower limit judgement is made by the measured value of the torque and pulse number from when the start torque is reached to when the tightening is finished.
The upper and lower limit ranges of the measured torque values are set by setting the "Lower Torque Limit" and "Upper Torque Limit" on the "Basic Settings" screen.
The upper and lower limit ranges of pulse number measurement values are set by "Lower limit value of pulse number" and "Upper limit value of pulse number" on the "MODE setting" window.
The upper and lower limits of the angle measurement value are set by "Angle lower limit value" and "Angle upper limit value" in the "MODE setting" window.
The lower limit of the measured free-run angle is set by the "Free-run angle lower limit" in the "MODE setting" window.

[Judgment]
(1)Judgment when the measured value is within the upper/lower limit range (OK)

- The judgment lamp on the touch panel lights in green and "OK" is displayed.
- The tool LED lights green.
- FASTENING OK terminal is turned on.
- When the tightening confirmation buzzer is set to "Used", one pulse of the buzzer output turns ON. (2-pulse ON when COUNT OK)

(2)Judgment when the measured torque is outside the upper and lower limits (torque HIGH NOK, LOW NOK)

- The judgment lamp on the touch panel lights up and "TRQ" is displayed (HIGH: Red ON LOW: Yellow ON).
- The tool LED lights in red.
- The buzzer output turns ON.
- HIGH : FASTENING NOK・TORQUE HIGH NOK terminal outputs.
- LOW : FASTENING NOK・TORQUE LOW NOK terminal is outputted.

(3)Judgment when the measured pulse count is outside the upper/lower limit (pulse HIGH NOK, LOW NOK)

- The judgment lamp on the touch panel lights up and "PLS" is displayed (HIGH: Red ON LOW: Yellow ON).
- The tool LED lights in red.
- The buzzer output turns ON.
- FASTENING NOK terminal outputs.

(4)Judgment when the measured angle is outside the upper and lower limits (angle HIGH NOK, LOW NOK)

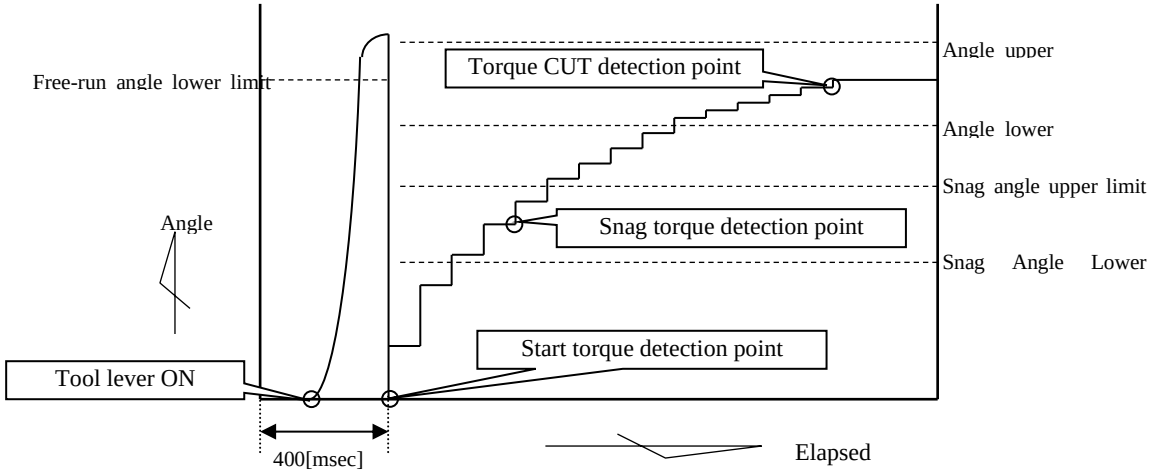
- The judgment lamp on the touch panel lights up and "ANG" is displayed (HIGH: Red ON LOW: Yellow ON).
- The tool LED lights in red.
- The buzzer output turns ON.
- FASTENING NOK terminal outputs.

(5)Judgment when the measured free-run angle is less than or equal to the lower limit (free-run error)

- The judgment lamp on the touch panel lights up in yellow and "free" is displayed.
- The buzzer output turns ON.
- FASTENING NOK terminal outputs.

14.3 Angle measurement value upper

UECP-4900A can be used to determine whether the measured angular value is within the upper and lower limits.
The upper and lower limit judgement is based on the angle at the time of free-running, the angle from the reaching of the start to the reaching of the Snag Torque, and the measured value of the angle from the Snag Torque to the end of tightening.
The upper and lower limits of the angle measurement value are set by the "Free Run Angle Lower Limit," "Snag Angle Lower Limit," "Snag Angle Upper Limit," "Angle Lower Limit," and "Angle Upper Limit" on the "MODE Settings" window.
The vertical axis range of the free-run angle measurement displayed on the waveform screen is one tenth of the vertical axis range of the angle measurement value.



[Judgment]

(1)Determination when the measured free-run angle is less than the free-run angle lower limit
・Free-run angle error (When Free-run angle detection selection is "Detected")

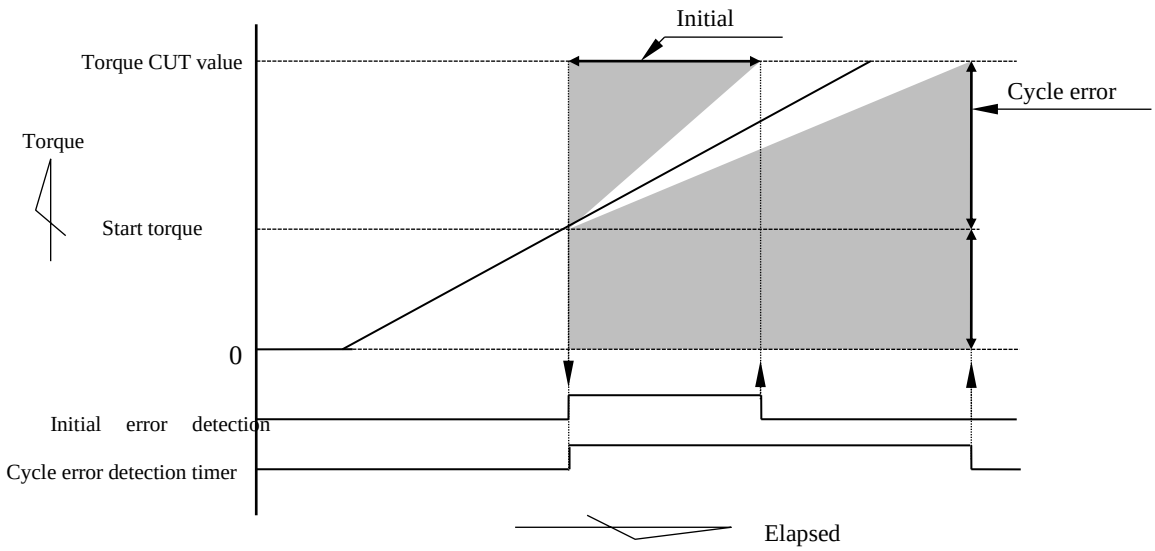
(2)Judgment when the angle from the start torque to the snag torque exceeds the upper limit of the snag angle
・Snag angle HIGH error (When Snag angle judgment selection and Angle judgment selection are "Detected")

(3)Judgment when the angle from the start torque to the snag torque is less than the lower limit of the snag angle
・Snag angle LOW error (When Snag angle judgment selection and Angle judgment selection are "Detected")

(4)Judgment when the measured angle value exceeds the upper limit
・Tightening angle HIGH (When the angle determination selection is "Detected")

(5)Judgment when the measured angle from the snag torque to the end of tightening is less than the lower limit value
・Tightening angle LOW (When the angle judgment selection is "Detected")

14.4 Torque Change Zone



NOTE)For linear torque change.

1)Initial abnormality

An error is detected when the elapsed time from when the measured tightening torque reaches the starting torque value to when the measured tightening torque reaches the torque CUT value is shorter than the specified time (initial error detection timer setting).

[Setting]

・Initial error detection selection: "Detect"

・Default error detection timer: 1 to 9999 [msec]

[Setting Method]

・Determine the set value by referring to the tightening time from the starting torque value at normal tightening to the torque CUT value.

2)Cycle error

An abnormality is detected when the elapsed time from the start torque value until the torque reaches the torque CUT value exceeds the specified time (cycle abnormality detection timer).

[Set Value]

・Cycle error detection selection: "Detect"

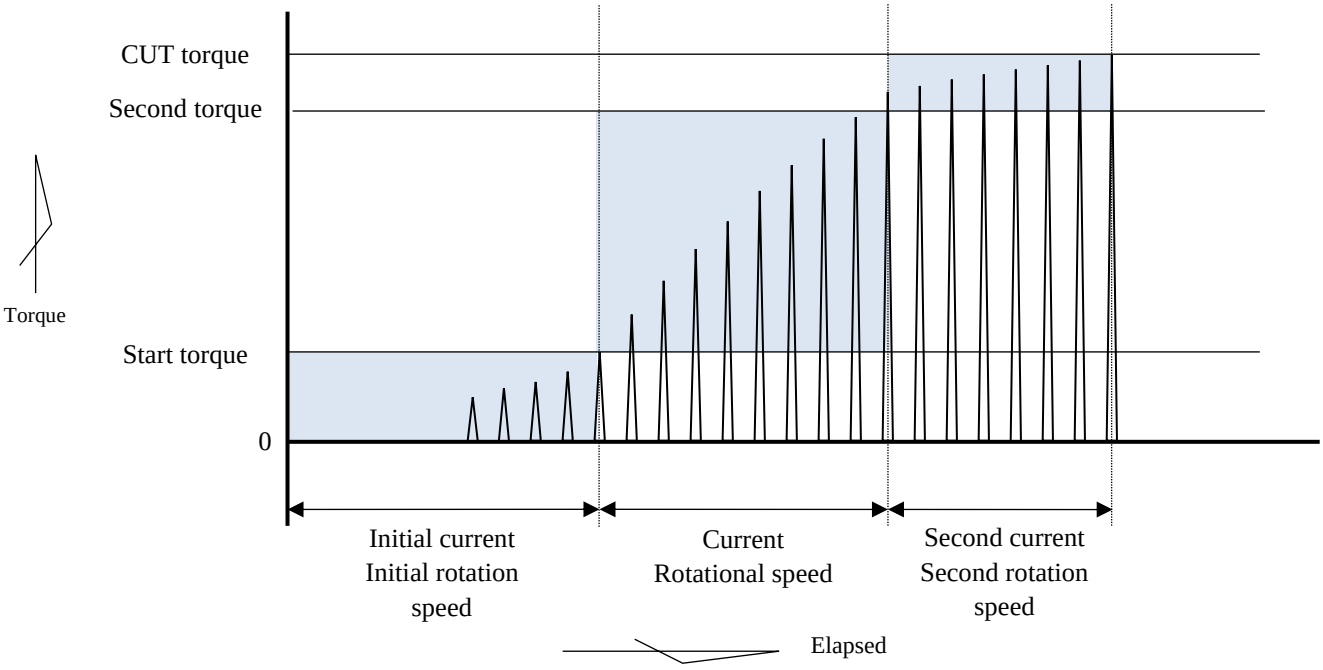
・Cycle error detection timer: 1 to 9999 [msec]

[Setting Method]

・Determine the set value by referring to the tightening time from the starting torque value at normal tightening to the torque CUT value.

14.5 3-Step Mode

When "3-step mode" of MODE setting is "Used", switching of motor output is operated in 3 stages, and output is dropped in the stage just before tightening completion, and retightening torque is stabilized by increasing the number of pulses.
"Initial speed," "Initial current," →, "Rotational speed," "Current," →, "Second speed," and "Second current."
Switches in the order shown below.
※The value of the second torque in the figure below is "second torque level × torque CUT value".



0-Start Torque : Operates at "Initial current"/"Initial rotation speed".
Start Torque to Second Torque : Operates with "current"/"rotation speed".
Second Torque to CUT Torque : Operates with "Second current" • "Second speed".

※If the object to be tightened is a soft body, the CUT torque may not be reached if the "Second Current" and "Second Speed" are set low. In this case, set the above setting value to the same or higher than the setting of "Current" and "Rotational speed".

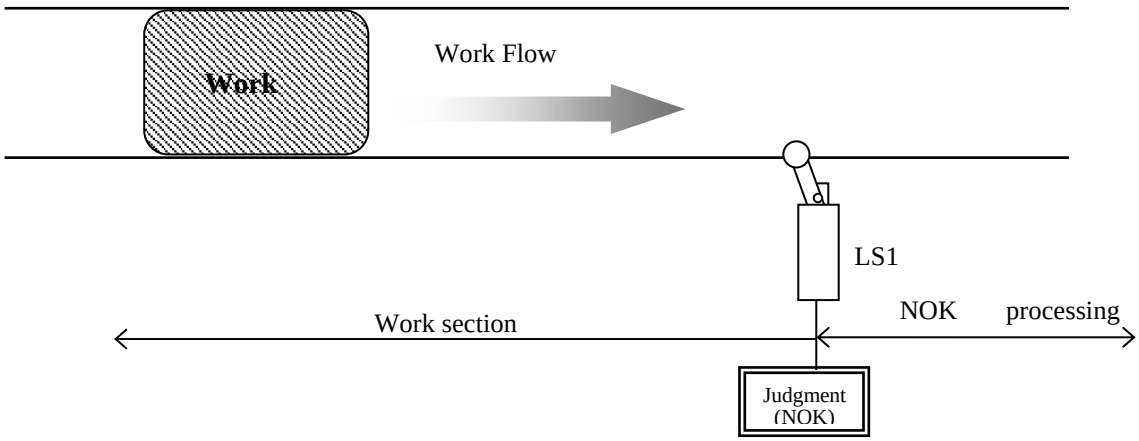
14.6 Line Control Selection

The controller operation can be changed with the setting of "Line management operation selection" in "MODE setting". Fastening counts can be reset by inputting RESET in addition to line judgment.

Setting: LS1

The count is judged by the input of the limit switch while the tightening countdown is possible at all times. After completing the tightening of the set number of bolts, a COUNT OK occurs. When the LS (limit switch) 1 terminal is inputted, the number of bolts to be tightened is cleared and the next workpiece can be tightened. If LS1 is not fully tightened for the set number of screws, a COUNT NOK will occur, and insufficient tightening will cause COUNT OK.

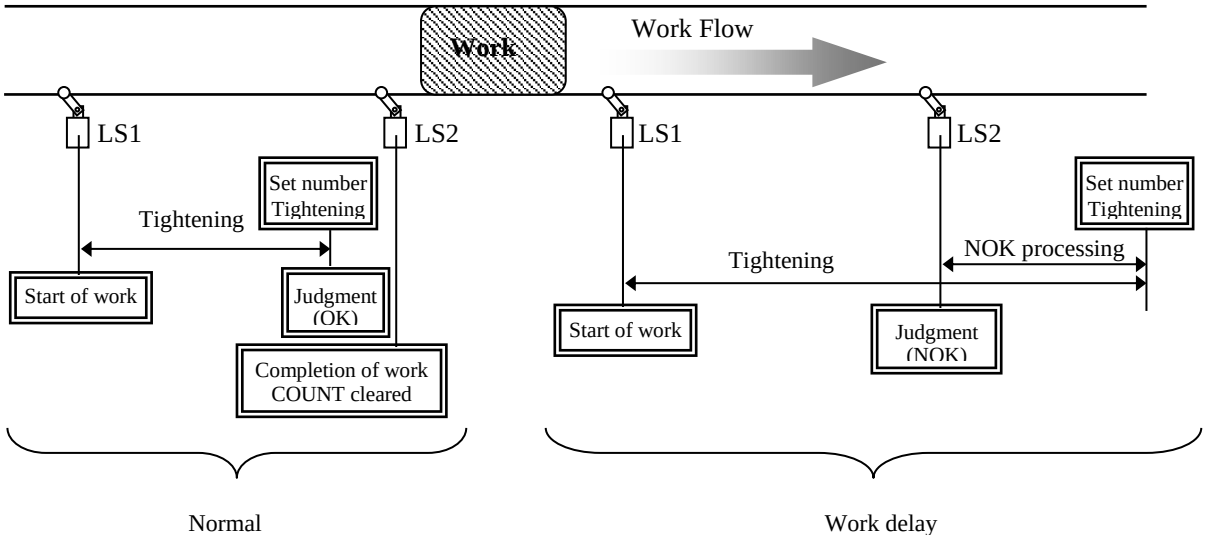
※ When COUNT NOK is → OK, COUNT OK output is one pulse (1sec).



Setting: LS1, LS2

Provide a tightening work range. The work is started by inputting LS 1 terminal, and the work is finished when the tightening of the set number is completed before inputting LS 2 terminal. When inputting LS2 terminal, if the tightening of the set number is not completed, a COUNT NOK occurs, and when it becomes COUNT OK due to NOK-treatment, the work is finished. Even if tightening is performed outside the work range, the number of tightening bolts will not be counted down.

※ When COUNT NOK is → OK, COUNT OK output is one pulse (1sec).

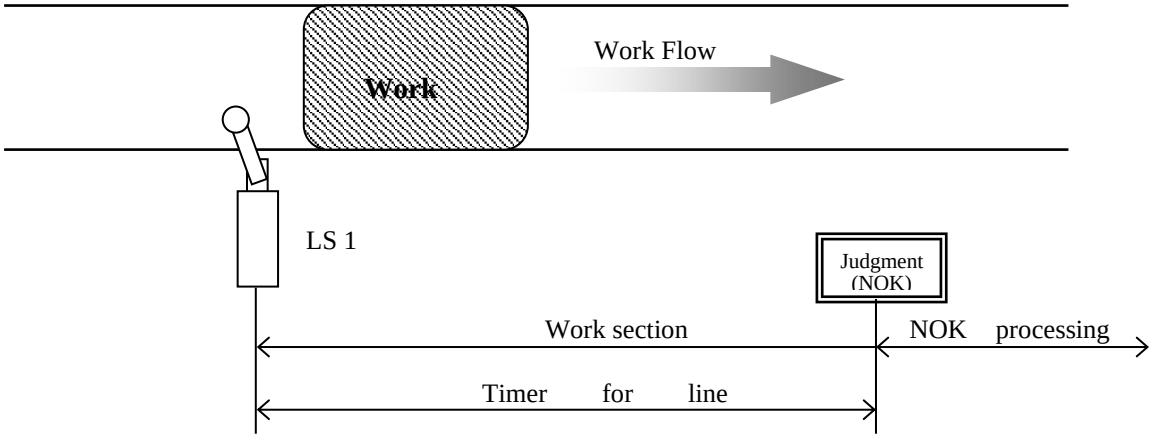


Settings: by LS1

A tightening work range is provided and judgement is made by a timer.

When LS 1 terminal is entered, the tightening operation starts and the line-control timer starts. If the line-management timer turns TIME UP prior to the completion of the tightening of the set number, a COUNT NOK occurs.

※ When COUNT NOK → is enabled, COUNT OK is 1-pulse (1sec).



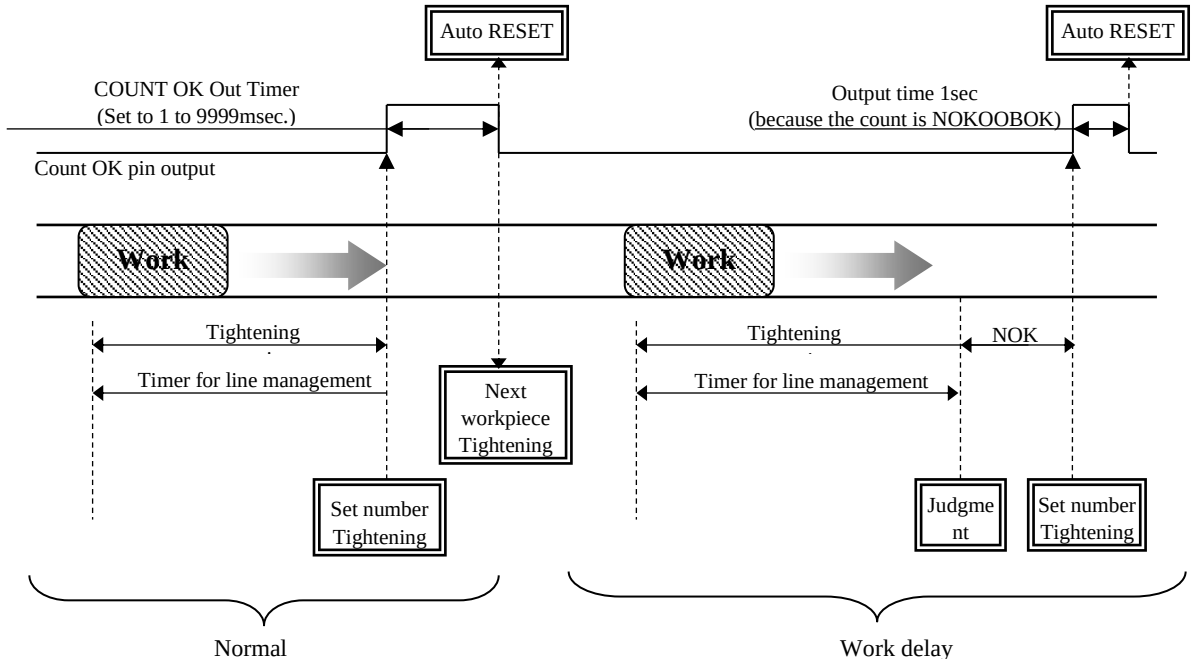
Setting: Tightening

Start the timer for judgment by the first tightening without setting the limit switch.

The line management timer starts from the first tightening judgment or the input of the QL wrench. After the set number of tightening operations is completed, COUNT OK occurs and RESET process is automatically performed when COUNT OK output (the output time is set by COUNT OK terminal output timer) is turned OFF. Then, the next work piece can be tightened. If the line-management timer turns TIME UP prior to the completion of the tightening of the set number, a COUNT NOK occurs.

※ When the line-management operation selection is set to "by tightening", the output holding of COUNT OK (COUNT OK output timer: 0) cannot be set.

※ When COUNT NOK is → OK, COUNT OK output is one pulse (1sec).



Setting: WORK No Change judgment

Enter WORK 1 to 5 to switch WORK No. and begin tightening. (Set the workpiece selection combination to "1 to 5")

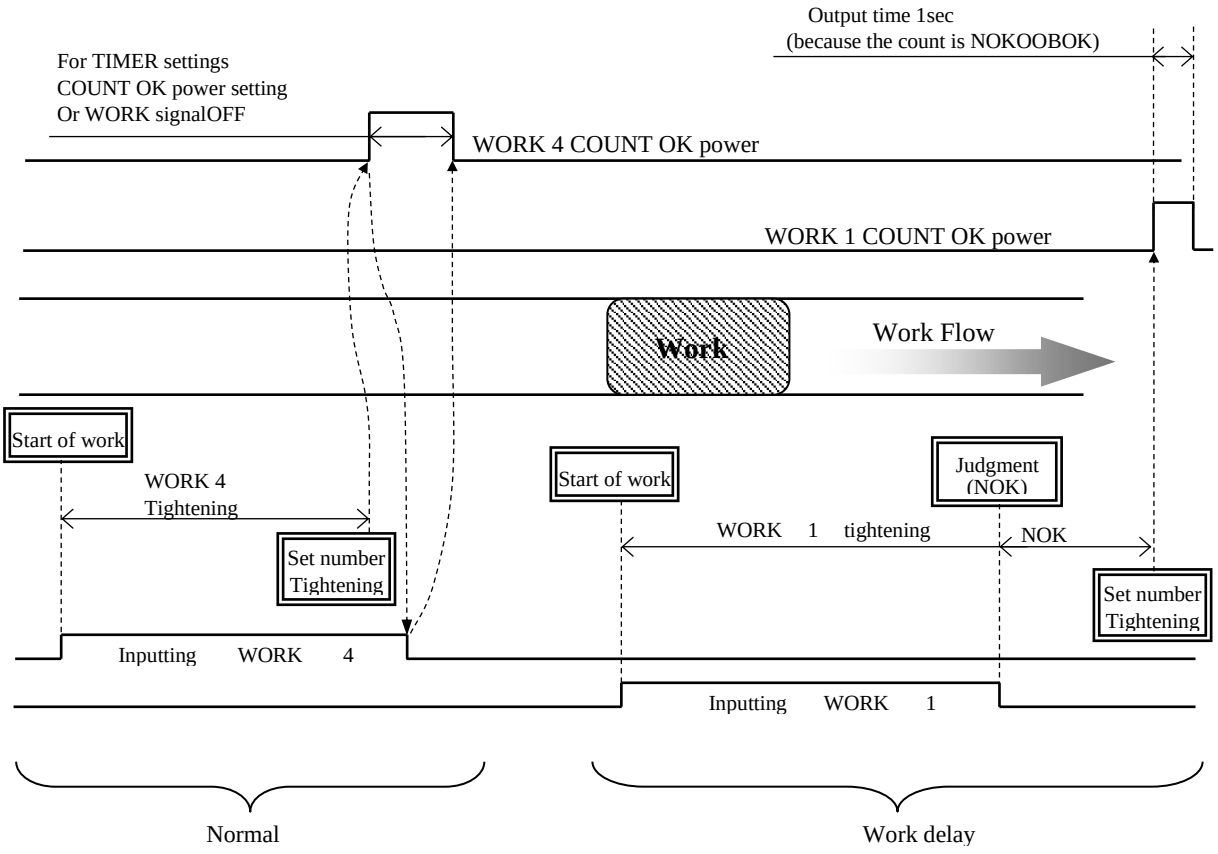
When the set number of screws is tightened, COUNT OK terminals corresponding to the respective WORK numbers turn ON. ("WORK 2 COUNT OK" pin is turned ON when it is turned COUNT OK by WORK No.2.)

COUNT OK output time is set for each TIMER number in WORK setting COUNT OK output.

When NOK treatment (tightening the remaining count or inputting PASS terminal) is COUNT OK from COUNT NOK, COUNT OK output is 1sec.

Turn off WORK SELECT when COUNT OK is turned on. When the input of WORK SELECT is turned OFF, COUNT OK output is turned OFF.

Turns COUNT NOK when inputting WORK 1 to 5 is turned OFF prior to completion of tightening for the set number of bolts.



Setting: Socket changer

Perform line management using a socket changer. When WORK1 to 5 are input from the socket changer, ZERO/CAL of the torque sensor is checked and operation starts. (Set the workpiece selection combination to "1 to 5")

When the set number of screws is tightened, COUNT OK terminals corresponding to the respective WORK numbers turn ON. ("WORK 2 COUNT OK" pin outputturns ON when it is turned COUNT OK by WORK No. 2.)

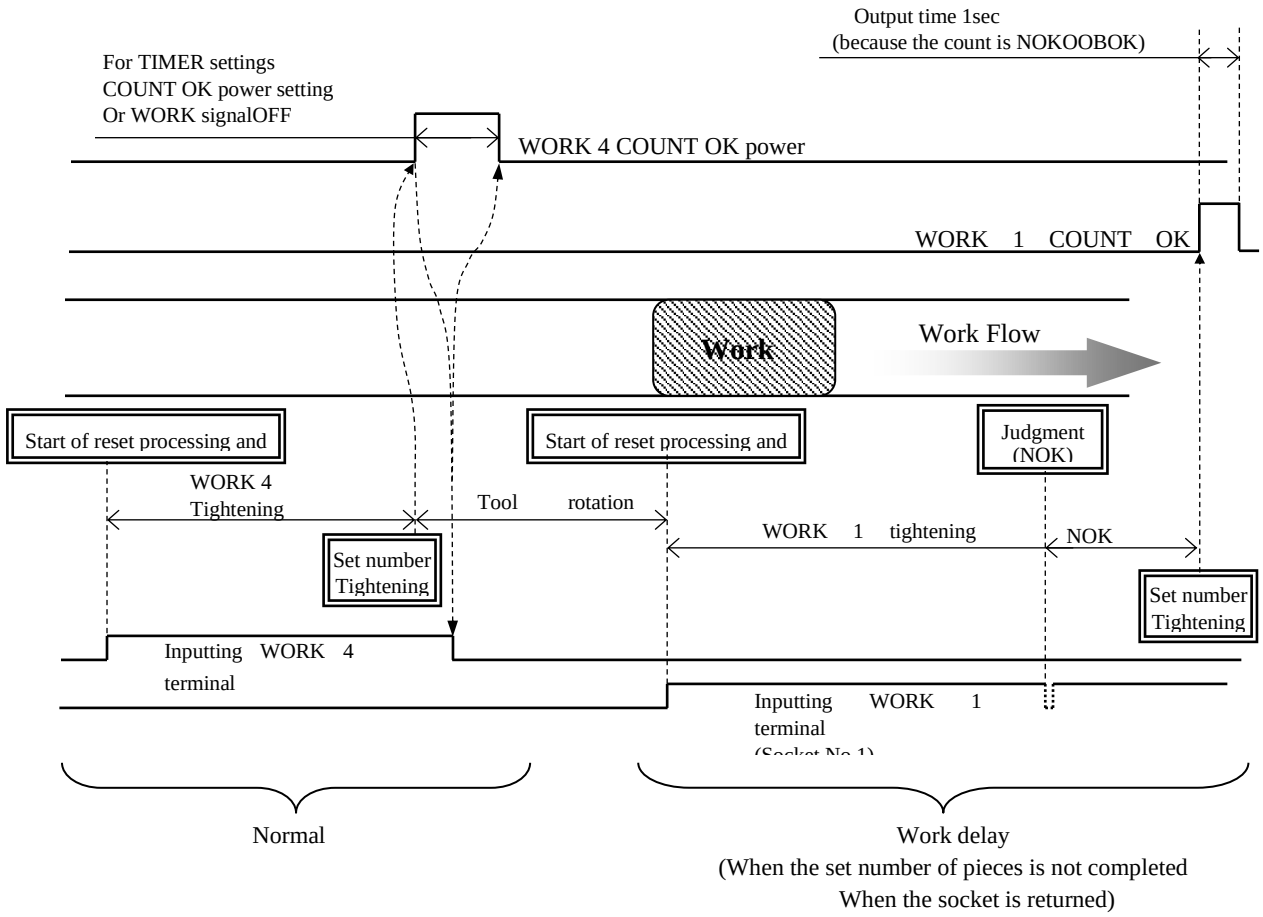
COUNT OK output time is set in TIMER setting COUNT OK output.

When NOK treatment (tightening the remaining count or inputting PASS terminal) is COUNT OK from COUNT NOK, COUNT OK output is 1sec.

Turn off WORK SELECT when COUNT OK is turned on. When the input of WORK SELECT is turned OFF, COUNT OK output is turned OFF.

Turns COUNT NOK when inputting WORK 1 to 5 is turned OFF prior to completion of tightening for the set number of bolts. Turn ON the work instruction again and tighten it to turn it COUNT OK, or clear NOK by inputting the touch panel key RES. minal block RESET on the front.

Outside the work process, the tool cannot be rotated.

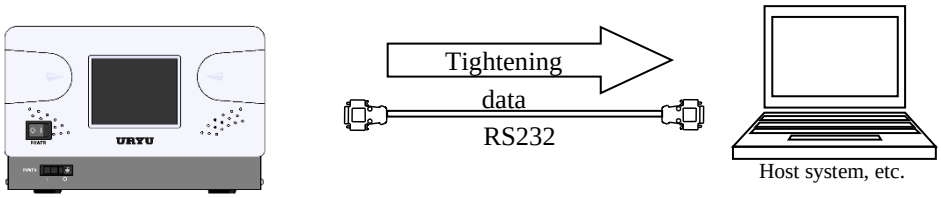


14.7 Tightening Data Output

This function uses various communication ports to communicate with the host system. It is possible to output the measured tightening data, change the set value of the controller by communication, and set the ID. Some setting values need to be changed according to the function to be used.

1)Data-out (RS232C)

This function outputs the tightening data from the PC connector on the rear panel. The content of the tightening data to be output can be changed by the setting of "DATA OUT", and the tightening data is output every time the tightening is OK. Refer to the separate sheet "Data output RS232C communication specifications sheet" for the details of communication such as the output format of the tightening data output from the controller.

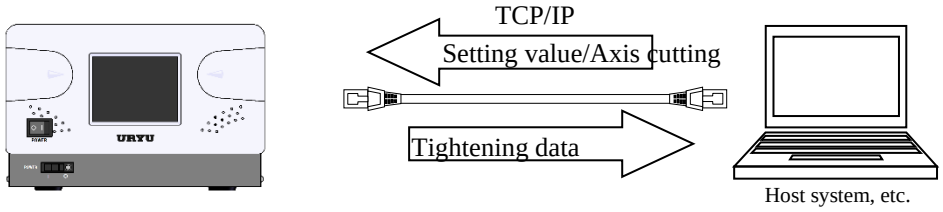


[Items requiring setting]
Data Output Setting screen (all three pages)

- Output operation selection, data method selection (setting: # to CR, # to LF), "Communication speed selection," "Bit length selection," "Stop bit selection," "Parity bit selection," and "Torque value transmission selection"
  ・・・ 1/3
- "Pulse Number Transmission Selection", "Tightening Time Transmission Selection", "Tightening Judgment Transmission Selection", "Tightening Angle Transmission Selection", "Free-run Angle Transmission Selection"
  ・・・ 2/3

2)TCP/IP standard

This function communicates with the host system from NETWORK connector on the rear panel. The host system partially changes the set value, sets the ID, and cuts off the axis (tool stop), and the controller outputs the tightening data every time the tightening is OK. For details, refer to Attachment "4900 Ethernet Data Communication Specification Sheet, 1.1 Edition."



[Items requiring setting]
MODE Settings window (all 6 pages)

- "LAN output destination selection (setting: "setting PC")" ・・・ 3/6
- "Tool rotation stop setting" ・・・ 6/6

Data Output Setting screen (all three pages)

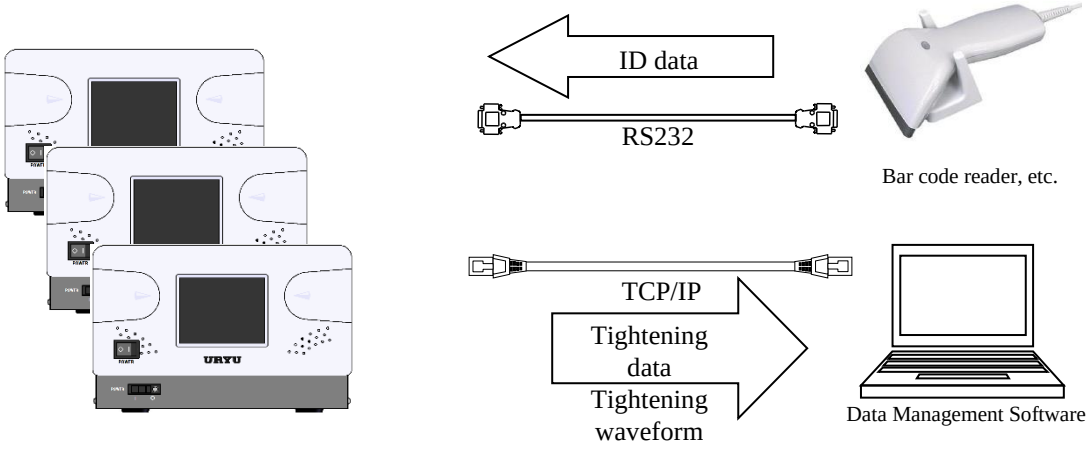
- "UEC No. SETTING" ・・・ 1/3
- Data communication format selection "Initial connection selection" "Data clear" ・・・ 3/3

LAN Settings window (all 1-page)

- "IP address" "Subnet mask" "TCP port" "Connection mode" "Host IP address" "Remote TCP Port"

3)Data-Management (TCP/IP)

This function outputs the tightening data from NETWORK connector on the rear panel. Outputs various measurement data and tightening waveform data to the upper side. The data can be received by using the data management software made by Olympus, and the tightening data can be managed by connecting to multiple controllers. ID can be added to the tightening data output by receiving ID from the rear panel PC connector with a bar code reader, etc. When using a bar code reader, connect the wires with cross-wired RS232C cables. For details on the communication specifications of data management, refer to the separate "4900 Data Management Specifications".



[Items requiring setting]

MODE Settings window (all 6 pages)

・"LAN output destination selection (setting: "Setting PC")"...3/6

Data Output Setting screen (all three pages)

・"UEC No setting" "Data method selection (setting: "# to CR")" ・・・ 1/3

・"Waveform data transmission selection" ・・・ 2/3

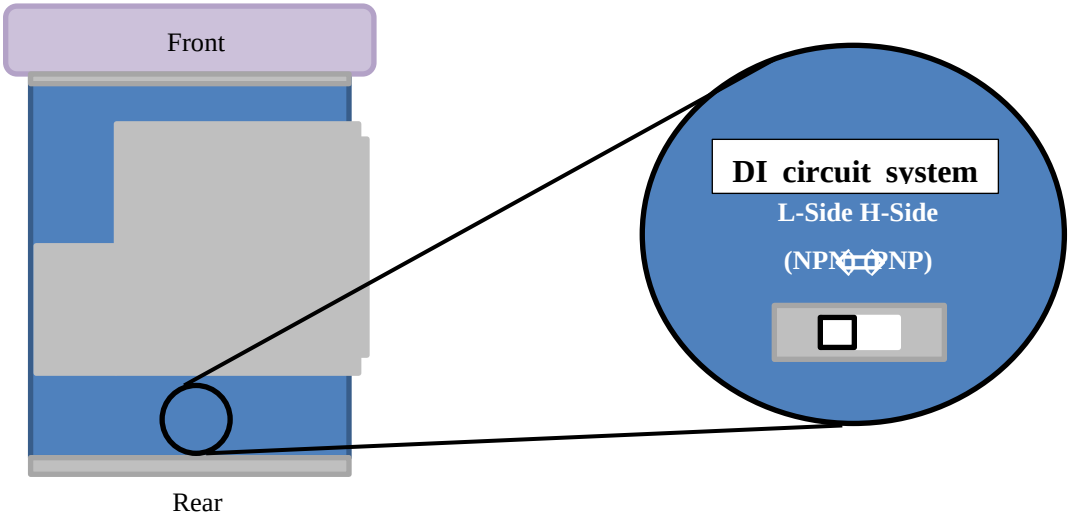
LAN Settings window (all 1-page)

・"IP address" "Subnet mask" "TCP port" "Connection mode (setting: "Client") "Host IP address" "Remote TCP port"

14.8 NPN/PNP Switching

The default input terminal is NPN. NPN/PNP method can be switched by opening the main unit lid and using the DI-circuit method selector switch on the board.

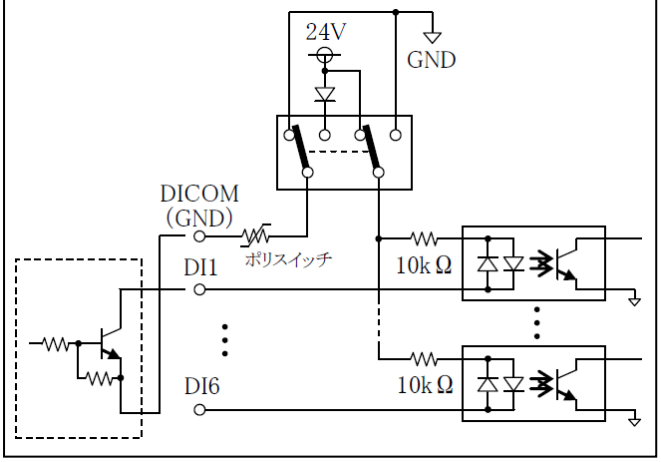
※ When using the PNP-type, IN COM terminal voltage changes from 0V to 24V. In both cases of NPN/PNP, IN COM terminal and IN1～IN6 can be shorted.



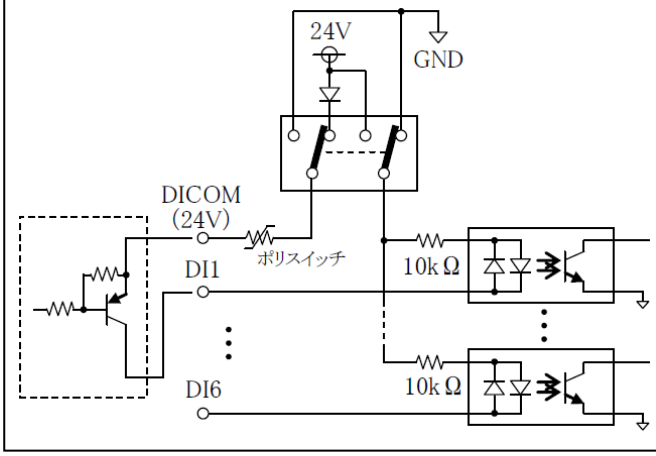
・Circuit diagram

Low-side output (NPN type)

※Default setting



High side output (PNP type) compatible



15 Errors

15.1 Errors and Contents

◎ZERO failure

・When there is a difference of ±6% or more of the rating at the time of ZERO checking.

◎CAL error

・When there is an error of 100±6% or more of the rating at the time of CAL check.

◎Buffer full

・Displayed when the buffer for waveform data output becomes full. The number of buffers depends on the setting of waveform-data selection in MODE setting. Not displayed when the waveform memory function selection setting in MODE setting is 1 or 4.

◎Pulse number LOW

・The measured pulse count value has fallen below the lower limit of the pulse count.

◎Pulse number NOK

・The measured pulse count exceeded the upper limit of the pulse count.

◎Tightening angle LOW

・The measured angle value has fallen below the lower angle limit.

◎Tightening Angle HIGH

・The measured angle exceeded the upper angle limit.

◎Initial abnormality

・When the tightening torque reaches the torque CUT-value before TIME UP of the early abnormality detecting timer.

◎Cycle error

・When the tightening torque does not reach the torque CUT value even if the cycle error detection timer turns TIME UP.

◎Interruption of tightening

・When tightening is interrupted until the measured torque value reaches the torque CUT value.

◎Snag torque error

・When the snap-torque abnormality detection timer is turned TIME UP but the snap-torque is not reached.

◎Snag angle LOW error

・The measured angle from the start torque to the snag torque fell below the lower limit of the snag angle.

◎SNAG ANGLE HIGH ALARM

・The measured angle from the start torque to the snag torque exceeded the upper limit of the snag angle.

◎Free-run angle error

・The free-run angle has fallen below the free-run angle lower limit.

◎Uryu standard communication error

・Communication with the host side cannot be performed normally using the standard communication specifications.

◎Survival confirmation error

・Survival confirmations cannot be received from the host within the intervals set in "Creative Standard Timeout" of TIMER setting.

◎GP Communication error

・Communication with Global Pokayoke was disconnected.

◎Server communication error

・Data cannot be output to the server.

◎Remaining number error

・The completion notification from GP was received even though the tightening of the specified number of bolts was not completed.

◎Fastening program error

・The tightening result was transmitted in the program No. different from the instruction. (Error code received from GP)

◎No. of warnings abnormality

・The total number of fasteners reached the number set for the number of warnings.

◎Warning pulse number error

・The total number of tightening pulses has reached the number set for the number of warning pulses.

◎Abnormal number of repairs

・The total number of tightening reaches the number set for the number of repairs.

◎Abnormal number of repair corresponding pulses

・The total number of tightening pulses has reached the number set for the number of repair-compatible pulses.

◎Remaining memory warning

・The remaining amount of memory data is "-10" or less from the maximum number of data that can be stored in memory.

◎ROM error

・The ROM in the board fails or operates abnormally for some reason.

◎RAM error

・The RAM in the board fails or operates abnormally for some reason.

◎Sum check error
・The RAM in the board fails or operates abnormally for some reason.
◎Filter error
・Failure of the filter IC on the board.
◎SD card error
・Faulty SD card or slot.
◎SD card data full
・The remaining capacity of the SD card is insufficient.
◎SD card not installed
・The SD card is set to write data, but the SD card is not inserted.
◎Write protect
・The card is in LOCK and cannot be written to.
◎A/D error
・Defective AD torque sensor.
◎Motor not responding
・No response from motor in tool.
◎Motor NAKA abnormality
・There was a NAK-response from the tool (motor) for the survival check from UECP-4900A.
◎Motor NAKB abnormality
・There was a NAK-response from the tool (motor) for sending the setpoint from UECP-4900A.
◎Motor NAKC abnormality
・There was a NAK-response from the tool (motor) for various command-sending from UECP-4900A.
◎Blown fuse
If the fuse for AC (5.2 on the rear panel ②) is turned off, the power will not be turned on.

15.2 Error countermeasures

Error description	Error countermeasures
ZERO failure	・Turn off the power to the controller and replace the tool and sensor cable. ・Check if the tool rotates during ZERO/CAL checking, etc.
CAL error	・Check that no RESET is input during tightening.
Buffer full	・Check the communication cable ・Set "Waveform memory function selection" in "MODE setting" to "Function 4".
Initial/Cycle Abnormality	・Tighten twice and check for galling. ・Check tool capacity/workpiece and bolt. ・Check the start torque value/torque CUT value. ・Check the initial/cycle error detection timer set value. ・Pulse count upper/lower limit setting value, angle upper/lower limit setting value check. ※Examine the tightening time (elapsed time from the start torque value to the torque CUT value), the number of pulses, and the tightening angle during normal tightening, and use them as a reference for the set value.
Pulse count LOW/HIGH	・Tighten twice and check for galling. ・Check tool capacity/workpiece and bolt. ・Check the start torque value/torque CUT value. ・Check the initial/cycle error detection timer set value. ・Pulse count upper/lower limit setting value, angle upper/lower limit setting value check. ※Examine the tightening time (elapsed time from the start torque value to the torque CUT value), the number of pulses, and the tightening angle during normal tightening, and use them as a reference for the set value.
Tightening angle LOW/HIGH	
Fastening interruption abnormality	・Has the tool lever been released before reaching the CUT setting value? ・Checking tool capabilities. ・Is the judgment delay timer too short? ・Increase the set value of the pre-CUT judgment delay timer. ・Check the start torque setting.
Snag torque error	・Check tool capacity/workpiece and bolt. ・Check start torque value and snag torque value.
Snag angle LOW error	・Check for 2-degree tightening galling. ・Checking the Snag Angle Lower Limit, Start Torque Value, and Snag Torque Value.

SNAG ANGLE HIGH ALARM	・Check of tool capacity, workpiece and bolt. ・Check for galling. ・Check the Snag Angle Upper Limit, Start Torque Value, and Snag Torque Value.
Free-run angle error	・Check for 2-degree tightening galling and temporary tightening. ・Check the start torque value.
Communication error	・Checking the host side, checking and replacing the LAN cable ・Checking the setting of TIMER setting "Padding time-out"
GP Communication error	・Checking the Global Pokayoke Side (Power Supply, etc.) ・Checking and replacing the communication cable with Global Pokayoke.
Server communication error	・Check that the LAN settings (IP address, etc.) are set correctly. ・Check the LAN cable. ・When data output to the quality server is not used, the setting of "LAN output destination selection" is changed to "Disable".
Remaining number error	・Completed forcibly or canceled with the key. RES.
Fastening program error	・Completed forcibly or canceled with the key. RES. ・Confirm settings. Check by monitoring the communication contents.
Warning: Number of pulses abnormal	・Perform maintenance such as tool oil change/replenishment and O-ring replacement, and set the number of warnings (pulses) to the number of pulses to be maintained next time.
Abnormal number of repairs (pulses)	・Repair/replace the tool and clear the total number of pulses to be tightened.
Remaining memory warning	・Receive and save the memory data and clear the memory. ・When the remaining amount warning is not required, the setting value of the memory data content is revised.
ROM/RAM error	・Replace the main unit of the controller.
Filter error	・Replace the controller.
Sum check error	・If the unit functions normally by RES. turning the power off and on again, the memory may be rewritten due to noise. After recovery RES., the set values are initialized. Perform all settings again.
SD card error	・When using the SD card for the first time, format it once using UECP-4900A. ・The SD card or slot may be faulty. Replace the SD card/controller. ・If you do not use an SD card, set "Do not save" to "Save SD memory". ・This unit is compatible with SD cards with a capacity of 32GB or less. Check the capacity.
SD card data full	・The remaining capacity is insufficient. Replace the SD card or format it.
SD card not installed	・Check that the SD card is installed. If it is not used, check the setting value of SD memory saving.
Write protect	・Remove the SD-Card and release LOCK status.
A/D error	・Replace the tool.
Motor not responding	・Replace the tool sensor cable.
Motor NAKA abnormality	・Replace the tool sensor cable. ・Check that the product is properly grounded.
Motor NAKB abnormality	
Motor NAKC abnormality	
Tool does not rotate	・Check that the work instruction is input. ・Check the set number of tightening bolts and the actual number of tightening bolts.

Controllers for UCX-AF Series Tool

UECP-4900A

Instruction Manual V1.1 Edition

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