Super Intelec System Controller UEC–4500 Operation Manual

Second Edition

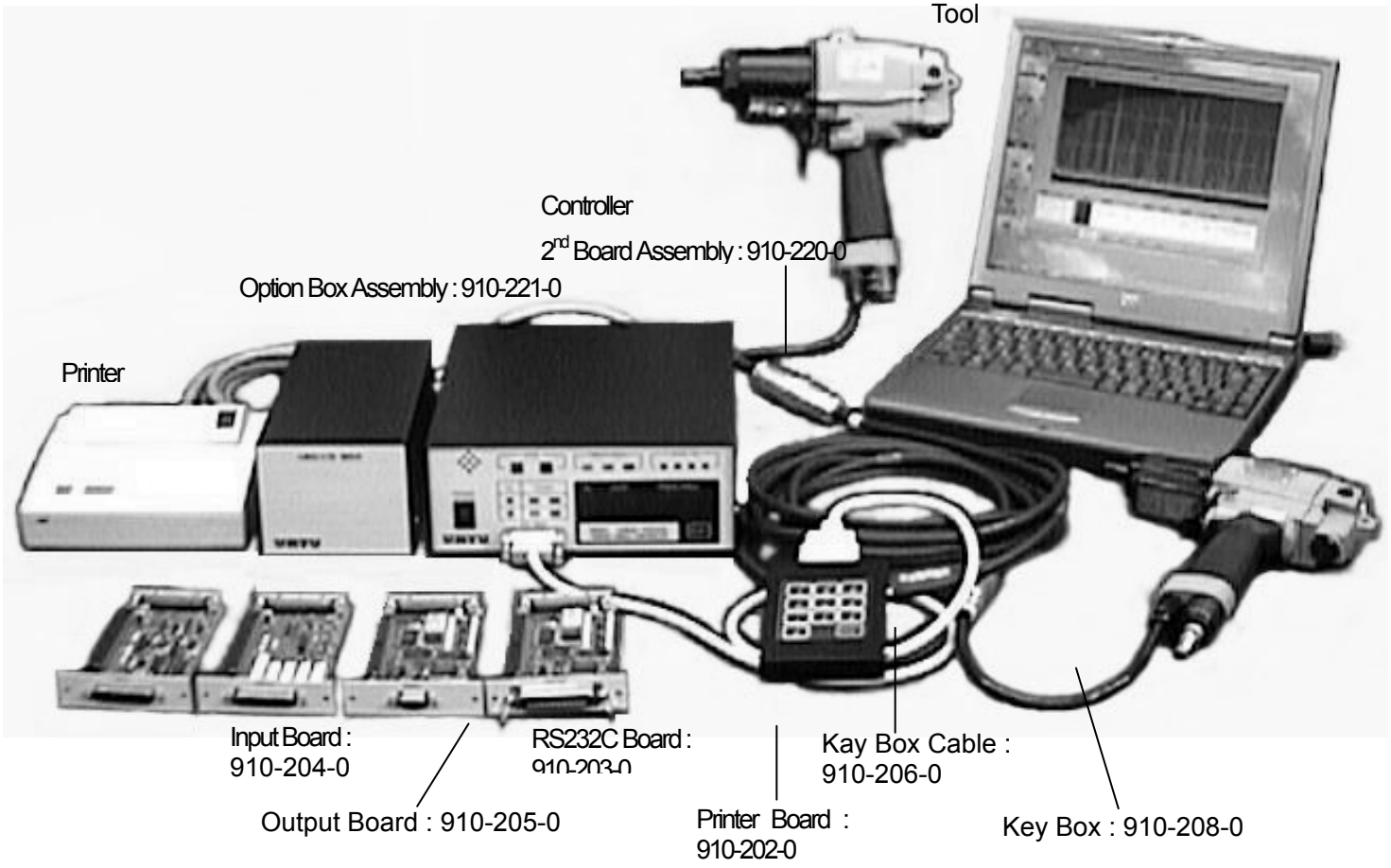
URYU SEISAKU, LTD.

Contents

1. Outline

1.1 System

Personal Computer
PC Cable : 910-219-0
PC Cable Changer : 910-225-0
Set-up CD Rom (Japanese) : 910-223-0



1. 2 Features

① Self-diagnosis function : Turn on the power switch and UEC-4500 will begin self-diagnosis check for ROM-RAM-A/D-D/A-ZERO/CAL check etc. in approx. 5 seconds.

② Fastening system can be select up to 8 types at your choice. Each system has the error detective function and count control function.

③ UEC-4500 can be used with all types of transducerized tools such as EC wrench, MC wrench, Air/or Electric Nutrunner etc.

④ Easy setup and selection for 4 different fastening setup, fastening number and etc.

⑤ All input-output check and error message can be checked either with the personal computer or the front panel with sound.

⑥ Setup parameters can be monitored on both Key box and the personal computer.

⑦ UEC-4500 can be connected with various torque sensors mentioned below.

- SG (Strain Gauge type sensor)
  - 350 ohm
  - 480 ohm
  - 700 ohm
- MS (Uryu magnetostrictive type sensor)

⑧ Maximum of 10,000 fastening data per tool can be stored.

⑨ Various optional boards can be connected. Option box is necessary if two or more boards are connected.

- Centronics printer board
- RS232C board
- Input board
- Output board
- 2nd Board (It can be installed in the main controller.)

2. 2 Features

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- RS232C board
- Input board
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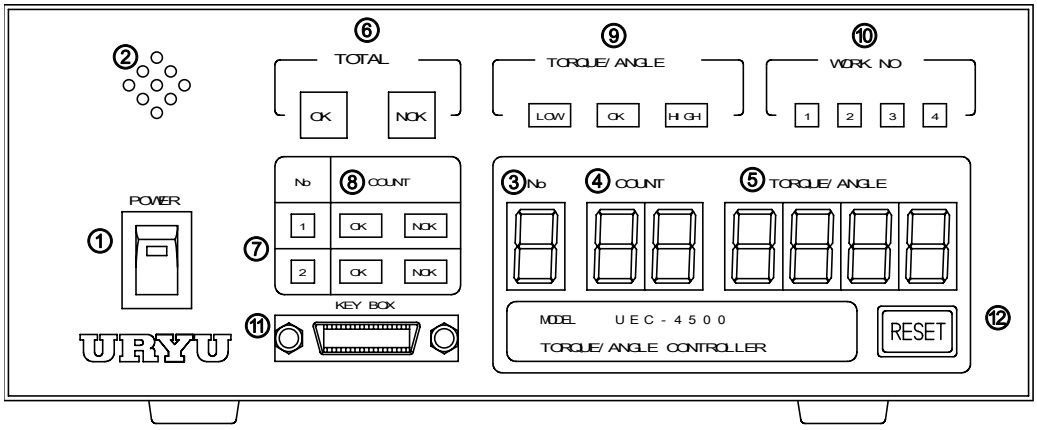
3. Name and function of each part

3.1 Front Panel



① **Power Switch (with LED)**

Led lamp comes on when the power switch turns on.

② **Buzzer**

Alarm buzzer beeps to confirm the fastening, various errors, various NOK, and when inputting by key box.

③ **1-Digit digital panel meter display**

Digital display panel indicates the number of tool (displaying when setting)

④ **2-Digit digital panel meter display**

Digital display panel indicates either fastener count in operation or MODE/TIMER number you are setting.

⑤ **4-Digit digital panel meter display**

Digital display panel indicates the measured torgue/angle or parameters you are setting.

⑥ **TOTAL Lamp**

OK : This lamp comes on when all pre-set number has been fastened.

NOK : This lamp comes on when all pre-set number has not been fastened.

⑦ **Number Lamp**

This lamp tells you the number of tool in operation. This lamp comes on when 1 is set for MODE 31, and goes off when [0] is set for MODE 31.

⑧ **COUNT Lamp**

OK : This lamp comes on per each tool when all pre-set number has been fastened.

NOK : This lamp tells you the tool number when all per-set number has not been fastened.

⑨ **TORQUE/ANGLE Lamp**

LOW : It comes on when the measured torque is lower then the low limit, or blinks when the measured angle is smaller than the low limit at the time of upper-limit judgement.

OK : It comes on when the measured torque/angle is within the upper and low limit.

HIGH : It comes on when the measure torque is higher than the upper limit, or blinks when the measured angle is higher than the upper limit at the time of upper-limit judgement.

⑩ **WORK NO. Lamp**

It tells you the work No. when operation.

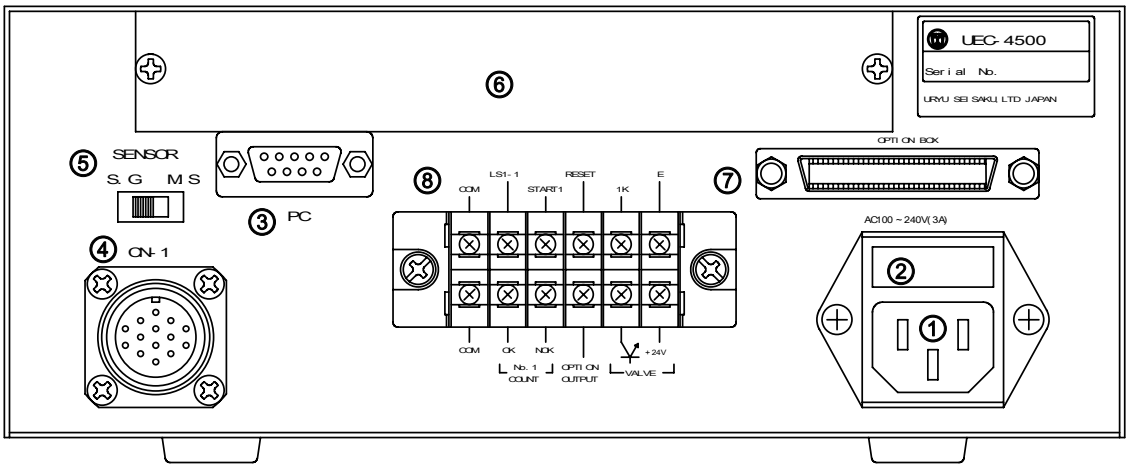
⑪ **Key Box Connector**

Connect key box for parameter set-up.

⑫ **RESET Key**

This is usually to reset all display when OK is provided for last tightening or to cancel NG judgement of last tightening.

3 . 2 Rear Panel



① **Power Plug**

Connect power cable.

② **Fuse Holder**

Protection fuse for UEC-4500 (3A). Another fuse for spare is kept inside the holder.

③ **Personal computer connector**

Connect with RS-232C connector of PC.

As a communication cable, use a straight type PC cable as per type of PC.

④ **Sensor Cable connector**

Connect with a torque sensor or a sensor cable from a tool.

⑤ **Sensor Select Switch**

Set this switch to S.G. (strain gauge type EC tool) or to M.S. (magnetstriction type MC tool) as per the type of tool in operation.

⑥ **Option board space**

Space for setting the optional boards such as 2nd Board or printer board.

⑦ **Option box port**

Connect the option box with UEC-4500.

⑧ **Input-output Terminals**

A1	COM : Input common terminal	B1	COM : Output common terminal
A2	LS 1-1 : Limit switch	B2	No.1 COUNT OK : While TIMER 5 is on.
A3	START 1 : Start signal (external start) when using NR	B3	No. 1 COUNT NOK : Till NG is reset
A4	RESET : Reset signal	B4	OPTION OUT : 1st Tool Torque OK output
A5	1K : Angle signal when using NR	B5	VALVE : 1st Tool valve output
A6	E : Grounding (earth)	B6	VALVE COM : + 24

- According to the setting of MODE 71 – 76, it is possible to change the functions of A2, A3, A4, B2, B3 and B4.
- When 1 is set for MODE 29, B2 becomes WORK 1 COUNT OK for 1st tool .

4. How to operate

4.1 Preparation

① Connect the power cable to power supply.

② Connect the UEC-4500 connector (CN-1) with the sensor cable. Connect the sensor cable with the tool.

③ When the switch of UEC is turned on, self-diagnosis check will be done by approx. five seconds. Check the front panel LED visually. Front panel display indicated [8.] [8.8] [8.8.8.8.], and alarm buzzer beeps.

④ DPM display indicates [1 ** (count number) —0.0] when there is error.

4.2 How to setup

There are two ways to set up, through your personal computer or key box.

(1) Personal computer

- Connect the PC cable to the RS-232C [PC] port in the rear panel.
- Turn on the power switch of UEC-4500.
- Run the setup soft ware.
- Change / add the setup parameters. (See the operation manual for setup software for details.)

⑤ Send the setup parameters made in the setup software to UEC-4500.

⑥ When the above sending is completed, setup parameters are changed/added.

(2) Key box

① Connect the key box cable to the key box connector in the front panel, and as well the key box.

② Turn on the power switch of UEC-4500.

③ Enter the writing mode. Press [MODE] [9] [9] [ENTER] [ENTER]

④ UEC-4500 becomes not operative, and blinks TOTAL NOK, tool No. and WORK SELECT lamp when the writing mode.

⑤ Select the tool No. Press [No. SEL] [* (1-2)] [ENTER] [ENTER].

⑥ Select the setup item to be changed. Press [* (LOW, HIGH, CUT ect.)] [ENTER]
How to change MODE or TIMER : Press [MODE] or [TIMER] [*(1-98)] [ENTER]

⑦ Input the setup values (numerical value). Press [* (0 – 0000)] [ENTER]

⑧ Escape from the writing mode. Press [RESET]. It finishes changing/adding the setup values.

4.4 Key input diagnosis

MODE 90 : It is possible to check whether the key box operates in order or not.

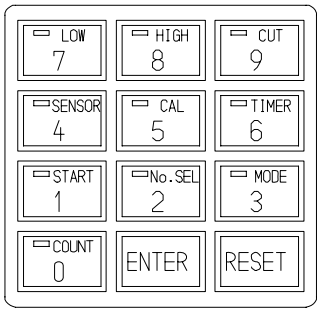
[How to use]

① Connect the Key box to UEC-4500, and turn on the power switch of UEC-4500.

② Enter the key input diagnosis of MODE 90.

Press [MODE] [9] [0] [ENTER].

DPM displays [-] [–] [—].



③ Procedure of key switch check

Press Key		DPM display	Key LED
		[-] [– –] [– – – –]	[0] Key LED turns on
[0] Key ON	→	[-] [– –] [– – – 0]	[1] Key LED turns on
[1] Key ON	→	[-] [– –] [– – 0 1]	[2] Key LED turns on
[2] Key ON	→	[-] [– –] [– 0 1 2]	[3] Key LED turns on
[3] Key ON	→	[-] [– –] [0 1 2 3]	[4] Key LED turns on
[4] Key ON	→	[-] [– 0] [1 2 3 4]	[5] Key LED turns on
[5] Key ON	→	[-] [0 1] [2 3 4 5]	[6] Key LED turns on
[6] Key ON	→	[0] [1 2] [3 4 5 6]	[7] Key LED turns on
[7] Key ON	→	[1] [2 3] [4 5 6 7]	[8] Key LED turns on
[8] Key ON	→	[2] [3 4] [5 6 7 8]	[9] Key LED turns on
[9] Key ON	→	[3] [4 5] [6 7 8 9]	
[ENTER] Key ON	→	[4] [5 6] [7 8 9 9]	

Press [RESET] to escape from the key input diagnosis.

4.5 Terminals/Input output board wiring diagnosis

MODE 91: It is possible to check the external wiring connected to the terminals of UEC-4500 or the optional input board.
MODE 41: It is possible to make the compulsory output of the terminals of UEC-4500 or the optional output board.

[How to do]
Use the key box or your personal computer.

[Key box]
- Connect the key box to the UEC-4500, and turn on the power switch of UEC-4500.
- MODE 91 (Input wiring diagnosis) will start. UEC-4500 becomes not operative, and TOTAL NOK lamp blinks.
  Press [MODE] [9] [1] [ENTER] .
  If there is no input, DPM indicates [-] [- -] [- - - -].
- If an input is made to the terminals / or Input board, DPM indicates 4-digit number corresponding to the terminal No. or pin No. If some inputs are made, smaller DPM display number is given priority to be indicated.
- Input – DPM display

Input terminals		Input board					
Input item	DPM display	Pin No.	DPM display	Pin No.	DPM display	Pin No.	DPM display
LS1-1	- - - 1	1	- - - 11	10	- - 18	17	- - 25
START1	- - - 2	2	- - 12	11	- - 19	18	- - 26
RESET	- - - 3	3	- - 13	12	- - 20		
1K	- - - 4	4	- - 14	13	- - 21		
		5	- - 15	14	- - 22		
		6	- - 16	15	- - 23		
		7	- - 17	16	- - 24		

⑤ After checking, press [RESET] to escape from the terminals/input-output board wiring diagnosis check.

- Enter the output wiring diagnosis on MODE 41/42/43. UEC-4500 becomes not operative, TOTAL NOK lamp blinks.
  Press [MODE] [4] [1 (2,3)] [ENTER].
  DPM indicates [-] [- -] [- - - -].

□ If an input is made, output will be made to the terminal, tool connector or pin of output boards corresponding to an input key.

□ Key input – output

Output terminals		Tool connector		Output board							
MODE 41				MODE 42				MODE 43			
Key	Output item	Key	Output item(Pin)	Key	Pin No.	Key	Pin No.	Key	Pin No.	Key	Pin No.
1	1st Tool COUNT OK	5	1st Tool TORQUE OK(E)	1	1	6	6	1	11	6	16
2	1st Tool COUNT NOK	6	1st Tool TORQUE NOK (F)	2	2	7	7	2	12		
3	OPTION OUT	7	2nd Tool TORQUE OK(5)	3	3	8	8	3	13		
4	VALVE 1	8	2nd Tool TORQUE NOK(6)	4	4	9	9	4	14		
				5	5	0	10	5	15		

⑨ Press [RESET] to escape from the terminal/input-output board wiring diagnosis after checking.

[Personal computer]

□ Connect the personal computer, and run the setup software.

□ Enter the input-output checking. UEC-4500 becomes not operative.

□ Input condition is monitored and wiring check is made by the compulsory output etc.

□ After the above is finished, escape from the input-output checking. Refer to the operation manual for the software setup.

4.6 Input-output board pins

Pin assignement and details of both the optional input board and output board are explained hereunder.

1. Input board

When you make same setting in MODE 71 – 73, only input from the terminals become effective.

Pin details

MODE 29 : In case when 0 is set for this model.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	OPTION INPUT 1	15	WORK 2-2	24	
7	OPTION INPUT 2	16	OPTION INPUT 3	25	
8	COM	17	OPTION INPUT 4		
9		18	2K		

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	WORK 3-1	15	WORK 2-2	24	
7	WORK 4-1	16	WORK 3-2	25	
8	COM	17	WORK 4-2		
9		18	2K		

2. Output board

Pin details

MODE 29 : In case when 0 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Torque Low NOK	19	COM
2	1st Tool Torque NOK	11	1st Tool Torque High NOK	20	COM
3	SV 1	12	Operation Range	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Torque Low NOK	23	
6	2nd Tool Count OK	15	2nd Tool Torque High NOK	24	
7	2nd Tool Count NOK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Work 2 Count OK	19	COM
2	1st Tool Torque NOK	11	1st Tool Work 3 Count OK	20	COM
3	SV 1	12	1st Tool Work 4 Count OK	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Work 3 Count OK	23	
6	2nd Tool Work 1 Count OK	15	2nd Tool Work 4 Count OK	24	
7	2nd Tool Work 2 Count OK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

・ 1st Tool Work 1 Count OK signal is outputted to Count OK of the terminals.

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5	WORK 2-1	14	WORK 1-2	23	
6	OPTION INPUT 1	15	WORK 2-2	24	
7	OPTION INPUT 2	16	OPTION INPUT 3	25	
8	COM	17	OPTION INPUT 4		
9		18	2K		

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	WORK 3-1	15	WORK 2-2	24	
7	WORK 4-1	16	WORK 3-2	25	
8	COM	17	WORK 4-2		
9		18	2K		

4. Output board

Pin details

MODE 29 : In case when 0 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Torque Low NOK	19	COM
2	1st Tool Torque NOK	11	1st Tool Torque High NOK	20	COM
3	SV 1	12	Operation Range	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Torque Low NOK	23	
6	2nd Tool Count OK	15	2nd Tool Torque High NOK	24	
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9	SV 2	18			

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Pin No.	Function	Pin No.	Function	Pin No.	Function
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2	1st Tool Torque NOK	11	1st Tool Work 3 Count OK	20	COM
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4	2nd Tool Torque OK	13	Option Output 1	22	
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4.6 Input-output board pins

Pin assignement and details of both the optional input board and output board are explained hereunder.

5. Input board

When you make same setting in MODE 71 – 73, only input from the terminals become effective.

Pin details

MODE 29 : In case when 0 is set for this model.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	OPTION INPUT 1	15	WORK 2-2	24	
7	OPTION INPUT 2	16	OPTION INPUT 3	25	
8	COM	17	OPTION INPUT 4		
9		18	2K		

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	WORK 3-1	15	WORK 2-2	24	
7	WORK 4-1	16	WORK 3-2	25	
8	COM	17	WORK 4-2		
9		18	2K		

6. Output board

Pin details

MODE 29 : In case when 0 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Torque Low NOK	19	COM
2	1st Tool Torque NOK	11	1st Tool Torque High NOK	20	COM
3	SV 1	12	Operation Range	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Torque Low NOK	23	
6	2nd Tool Count OK	15	2nd Tool Torque High NOK	24	
7	2nd Tool Count NOK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Work 2 Count OK	19	COM
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3	SV 1	12	1st Tool Work 4 Count OK	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Work 3 Count OK	23	
6	2nd Tool Work 1 Count OK	15	2nd Tool Work 4 Count OK	24	
7	2nd Tool Work 2 Count OK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

・ 1st Tool Work 1 Count OK signal is outputted to Count OK of the terminals.

4.6 Input-output board pins

Pin assignement and details of both the optional input board and output board are explained hereunder.

7. Input board

When you make same setting in MODE 71 – 73, only input from the terminals become effective.

Pin details

MODE 29 : In case when 0 is set for this model.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	OPTION INPUT 1	15	WORK 2-2	24	
7	OPTION INPUT 2	16	OPTION INPUT 3	25	
8	COM	17	OPTION INPUT 4		
9		18	2K		

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	LS 2-1	10	LS 1-2	19	COM
2	PASS	11	LS 2-2	20	
3	QL 1	12	START 2	21	
4	WORK 1-1	13	QL 2	22	
5	WORK 2-1	14	WORK 1-2	23	
6	WORK 3-1	15	WORK 2-2	24	
7	WORK 4-1	16	WORK 3-2	25	
8	COM	17	WORK 4-2		
9		18	2K		

8. Output board

Pin details

MODE 29 : In case when 0 is set for this mode.

Pin	Function	Pin	Function	Pin	Function

No.		No.		No.	
1	1st Tool Torque OK	10	1st Tool Torque Low NOK	19	COM
2	1st Tool Torque NOK	11	1st Tool Torque High NOK	20	COM
3	SV 1	12	Operation Range	21	
4	2nd Tool Torque OK	13	Option Output 1	22	
5	2nd Tool Torque NOK	14	2nd Tool Torque Low NOK	23	
6	2nd Tool Count OK	15	2nd Tool Torque High NOK	24	
7	2nd Tool Count NOK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

MODE 29 : In case when 1 is set for this mode.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	1st Tool Torque OK	10	1st Tool Work 2 Count OK	19	COM
2	1st Tool Torque NOK	11	1st Tool Work 3 Count OK	20	COM
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7	2nd Tool Work 2 Count OK	16	CPU Run	25	
8	VALVE 2	17			
9	SV 2	18			

・ 1st Tool Work 1 Count OK signal is outputted to Count OK of the terminals.

4.7 Work No. Change

(1) By the external input

Screen is changed by short-circuiting the each input and COM. It is not required neither to adjust the time of changing nor to input Reset or LS 1 signal. Work is changed at the same time of work input immediately.

① MODE 29 : In case when 0 is set for this mode

Display	Input	Display	Input
1st Tool Work 1	No input	2nd Tool Work 1	No input
1st Tool Work 2	Work 1-1	2nd Tool Work 2	Work 2-1
1st Tool Work 3	Work 1-2	2nd Tool Work 3	Work 2-2
1st Tool Work 4	Work 1-1 Work 1-2	2nd Tool Work 4	Work 2-1 Work 2-2

② MODE 29 : In case when 1 is set for this mode

Display	Input	Display	Input
1st Tool Work 1	Work 1-1	2nd Tool Work 1	Work 2-1
1st Tool Work 2	Work 1-2	2nd Tool Work 2	Work 2-2
1st Tool Work 3	Work 1-3	2nd Tool Work 3	Work 2-3
1st Tool Work 4	Work 1-4	2nd Tool Work 4	Work 2-4

(2) By the Key box

In the writing mode (MODE 99), select the number of tool and the work No. you would like to select.

① Select the number of tool.

Press [No. SEL] [ENTER] [ENTER].

DPM displays the number of tool selected.

② Change the setup display.

Press [No. SEL] [* (Work No.)] [ENTER] [ENTER].

Work No. in setting blinks.

5. Mode setting

MODE 1 (Initial trouble detection)

Default : 0

0 = Initial trouble is not detected.

1 = Initial trouble is detected.

Function :

This detects “double hitting” or cross threads.

Initial trouble is detected, when the fastening time after reaching the start torque level till the cut torque level is shorter than the set value of TIMER 2.

Output condition when the initial trouble is detected :

- DPM display : [LO.E] and [Torque value] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : Torque NOK is outputted.

How to clear the error detection :

- MODE 3 : If 1 is set for this mode, start reset is made by the next fastening.
- Press [RESET].
- Input the reset terminal.

MODE 2 (cycle error detection)

Default : 0

0 = Cycle error is not detected.

1 = Cycle error is detected.

Function :

This detects stripped fasteners or “slip-off” condition.

Cycle error is detected, when the fastening torque does not reach CUT level after reaching START level within the set value of TIMER 3.

Output condition when the cycle error is detected.

- DPM display : [CYL.E] and [Torque value] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : TORQUE NOK is outputted.

How to clear the error detection

- MODE 3 : If 1 is set for this mode, start reset is made by the next fastening.
- Press [RESET].
- Input the reset terminal.

MODE 3 (Fastening error – S.L.E./LO.E./CYL.E./CYO.E./F.E.- automatic overriding)

Default : 1

0 = When the fastening error is detected, next fastening operation cannot be made and UEC-4500 becomes not operative unless the error detection is cleared by pressing [RESET] key or inputting the reset terminal. Valve becomes the ON condition.

1 = Next fastening makes the start reset and UEC-4500 operative, even if the error detection is not cleared.

If 0 is set for MODE 11, the start reset is made by the next fastening (torque should be over START level) and the torque is started to be measured. If 1, 2 or 3 is set for MODE 11, next external START input makes the start reset and then fastening torque is started to be measured.

MODE 4 (Upper-lower limit error - torque/angle/pulse number – automatic overriding)

Default : 1

0 = When the upper-lower limit error is detected, next fastening operation cannot be made and UEC-4500 becomes not operative unless the error detection is cleared by pressing [RESET] key or inputting the reset terminal. Valve becomes the on condition.

1 = Starting the next fastening operation makes the error clear and UEC operative, even if the error detection is not cleared.

If 0 is set for MODE 11, the start reset is made by the next fastening (torque should be over START level) and torque is started to be measured. If 1, 2 or 3 is set for MODE 11, the start reset is made by inputting the next external START and the fastening torque is started to be measured.

MODE 5 (Incomplete job detection)

Default : 0

0 = Incomplete job detection is not made.

1 = Incomplete job detection is made.

Function

This is to detect if the fastening torque input is cut before CUT level even if it reaches between START and LOW limit. For instance, if the operator fails to keep pressing the throttle until automatic shut-off, this detection functions.

Note : Even if the final torque value reaches OK range over LOW limit, it detects the error because the fastening torque input is cut before the automatic shut-off.

Output condition when the error is detected.

- DPM display : [F.E.] and [Torque] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : Torque NOK is output.

How to clear the error

- Mode 3 : If 1 is set for this mode, next fastening operation makes the start reset.
- Press [RESET] key.
- Input the RESET terminal.

This function becomes effective when 3 is set for MODE 9.

MODE 6 (Tightening time control from START level)

Default : 0

0 = Tightening time control from START level is not made.

1 = Tightening time control from START level is made.

Function

This is to be used, if you would like to control the fastening time without the cycle error detection.

When the fastening torque does not reach CUT level within the set time of TIMER 3 after reaching START level, UEC compulsory activates tool's solenoid valve to shut-off and makes the judgement.

- Mode 9 : If 2, 5 or 6 is set for this mode, TIMER 1 becomes activate when the set time of TIMER 3 comes.
- MODE 9 : If 1, 3 or 4 is set for this mode, TIMER 1 becomes activate after the set time of TIMER 3 comes and the fastening torque becomes lower than START level

This function becomes effective only when 0 is set for MODE 2.

MODE 9 (Tightening mode)

Default : 3

1 = Torque monitoring
Torque value judgement is made, but not control.

2 = Torque control
Both torque value judgement and control are made.

3 = MC wrench / EC wrench torque control
Use MC wrench / EC wrench, and their torque value judgement and control are made.

4 = Torque / Angle monitoring
Torque and angle value judgement is made, but not control.

5 = Torque control / Angle monitoring
Torque judgement & control and angle judgement are made.

6 = Angle control / Torque monitoring
Angle judgement & control and torque judgement are made.

9 = Shut-off pulse wrench torque monitoring
It is used for the test of shut-off pulse wrench on UFT (URYU tester).

MODE 11 (External start)

Default : 0

0 = External start is not used. Start of measuring is made by the torque start.

1 = After checking the ZERO point and CAL value, valve is outputted and the measuring starts.

2 = After checking the ZERO point and CAL value, the measuring starts without valve output.

3 = Valve is outputted and the measuring starts without checking the ZERO point and CAL value.

- 1 , 2 and 3 activates when the external start (START 1 terminal or START 2 of the Input board) is inputted.

MODE 13 (Printer)

Default : 0

0 = Print all measuring data.

1 = Print only the following errors detected.

Torque / Angle / Number of pulse upper-lower limit errors (LOW/HIGH)

Fastening errors (SLE./LO.E./CYCLE./CYO.E./F.E.)

0.E. (ZERO error)

CAL.E. (CAL error)

- - - E. (Torque cut error in the reverse rotating)

2 = Do not print.

MODE 14 (Fastening counter)

Default : 0

0 = Fastening counter always functions. It is to detect COUNT NOK if the pre-set number of fastener is not fastened when LS-1-1 terminal (if two tools are used, LS1-2 of the optional Input board for 2nd tool) is inputted.

1 = It decides the start and end of the fastening counter. Fastening counter starts when LS1-1 terminal (LS1-2 for 2nd tool) is inputted. It is to detect COUNT NOK if the pre-set number of fasteners are not fastened when LS2-1 (LS2-2 for 2nd tool) is inputted.

2 = TIMER 50 starts when LS1-1 terminal (LS 1-2 for 2nd tool) is inputted. It is to detect COUNT NOK if the pre-set fasteners are not fastened before the pre-set time comes.

3 = TIMER 50 starts when the fastening judgement of the first tightening is made. It is to detect COUNT NOK if the pre-set fasteners are not fastened before the pre-set time comes.

4 = Fastening counter starts when the Work No. change of optional Input Board is inputted. It is to detect COUNT NOK if the pre-set number of fasteners are not fastened before the Work No. change input is off.

If 4 is set for this mode, value of MODE 29 and MODE 30 becomes 1 automatically.

MODE 15 (Alarm buzzer)

Default : 0

0 = Alarm buzzer does not beep to confirm the fastening.

1 = Alarm buzzer beeps to confirm the fastening.

Function
When the fastening is judged OK, alarm buzzer beeps by one pulse. When the pre-set number of fasteners are fastened all, alarm buzzer beeps by two pulses.

MODE 16 (Start level error)

Default : 0

0 = Start level error is not detected.

1 = Start level error is detected.

Function
It is to detect the start level error if the fastening time after the external START is inputted till the fastening torque reaches START level is shorter than the pre-set time of TIMER 7.

Output condition when the start level error is detected.

- DPM display : [SL.E] and [Torque] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : TORQUE NOK is output.

How to clear the error detection

- MODE 3 : If 1 is set for this mode, start reset is made by the following methods.
- Press [RESET] key.
- Input the RESET terminal.

MODE 17 (Cycle over time)

Default : 0

0 = Cycle over time detection is not activate.

1 = Cycle over time detection is activate.

Function
TIMER 8 starts when the START terminal is inputted. If the fastening is not finished when TIMER 8 comes, it is to detect the cycle over time error.

Output condition when the cycle over time error is detected.

- DPM display : [SY.L.E.] and [Torque] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : TORQUE NOK is outputted.

How to clear the error

- MODE 3 : If 1 is set for this mode, next fastening operation makes the start reset.
- Press [RESET] key.
- Input the RESET terminal.

MODE 21 (Angle pulse rate)

Default : 100

Range of setting : 0 – 999 This mode decides the angle exchange rate per angle input (1K, 2K) of

one pulse. This value is fixed subject to the controlled tool type.

EX.) When 100 is set for this mode, DPM display angle of angle input per one pulse becomes 1 degree.

EX.) When 50 is set for this mode, DPM display angle of angle input per one pulse becomes 0.5 degree.

MODE 22 (Angle low limit judgement level) (unit : degree)

Default : 0

Range of setting : 0 – 997 (MODE 22 < MODE 25)

- Setup in this mode the low limit for angle low limit judgement.
- It detects LOW NOK when the angle becomes lower than the pre-set vale of MODE 22 in case that 4, 5 or 6 is set for MODE 9.

MODE 23 (Angle high limit judgement level) (unit : degree)

Default : 999

Range of setting : 2 – 999 (MODE 25 < MODE 23)

- Setup in this mode the upper limit for angle high limit judgement.
- It detects HIGH NOK when the angle becomes higher than the pre-set value of MODE 23 in case that 4, 5 or 6 is set for MODE 9.

MODE 24 (Snug torque level)

Default : 14. 7

Range of setting : 0.1 – 980.4 (START<MODE 24<CUT)

- Setup in this mode the torque level to start and finish measuring the angle.
- If the set-up value of START is higher than that of MODE 24, the set-up value of MODE 24 is automatically changed to [the set-up value of START plus 0.1].

MODE 25 (Angle cut level) (unit : degree)

Default : 200

Range of setting : 1 – 988 (MODE 22<MODE 25<MODE 23)

- Setup in this mode the angle to finish the fastening in case that the angle control is activated.

MODE 27 (Additional pulse function)

Default : 1

Range of setting : 1 – 5

- Tool's solenoid valve is closed when the pre-set additional pulse numbers is detected after the fastening torque reaches CUT level.
- This function is activated when 3 is set for MODE 9.

MODE 29 (Function change of Input board)

Default : 0

0 = Work is changed by the combination of WORK 1-1 and WORK 1-2.

1 = Work is changed by inputting WORK 1-1 - WORK 1-4

MODE 30 (Function change of Output board)

Default : 0

0 = TORQUE OK / NOK and COUNT OK / NOK are output as per each tool.

1 = COUNT OK is output as per each WORK select.

MODE 31 (Number of tool(s) connected)

Default : 1 (For 2nd Tool, Pre-program value is 0.)

0 = Tool is not used (not connected).

1 = Tool is used (connected).

MODE 34 (Pulse number low limit)

Default : 2

Range of setting : 0 – 9998 (MODE 34[max. 9998] < MODE 35[max. 9999])

Function

Setup in this mode the low limit number of pulse. It is to detect PULSE LOW NOK when the number of pulse measured is less than the pre-set number in MODE 34.

Output condition of pulse number lot limit error

- DPM display : [PLS.L.] and [Torque] are displayed in turn.
- Alarm buzzer : Beeping
- Output board if connected : TORQUE NOK is output.

How to clear the error

- MODE 4 : If 1 is set for this mode, start reset is made by the next fastening operation.
- Press [RESET] or input the RESET terminal.

This function activates when 3 is set for MODE 9.

MODE 35 (Pulse number upper limit)

Default : 100

Range of setting : 1 – 9999 (MODE 34[max. 9998]<MODE 35[max. 9999])

Set up the upper limit of pulse number. It is to detect PULSE HIGH NOK when the number of pulse becomes higher than the pre-set number in MODE 35.

Output condition when the pulse number upper limit error is detected.

- DPM display : [PLS.H.] and [Torque] are displayed in turn.
- Alarm buzzer : beeping
- Output board if connected : TORQUE NOK is output.

How to clear the error detection

- MODE 4 : If 1 is set for this mode, the start reset is made by the following methods.
- Press [RESET] or input the RESET terminal.

This function activates only when 3 is set for MODE 9.

MODE 46 (Main controller baud rate)

Default : 2

1 = Baud rate 9,600 bps
2 = Baud rate 19,200 bps
3 = Baud rate 38,400 bps
4 = Baud rate 57,600 bps
5 = Baud rate 115,200 bps

In this mode, the communication baud rate between the main controller and the personal computer is set up.

MODE 50 (Line feed command / print)

Default : 0

0 = Line feed command is made by CR.
1 = Line feed commend is made by LF.
2 = Line feed commend is made by CR plus LF.

MODE 51 (Wave data print)

Default : 0

0 = Wave date is not printed.
1 = Wave data of both 1st Tool and 2nd Tool is printed.
2 = Wave date of 1st Tool is printed.
3 = Wave date of 2nd Tool is printed.

Select the number and input. Press [ENTER] to confirm. Wave date is printed through the printer.

MODE 52 (Angle data print)

Default : 1

0 = Angle data is not printed.
1 = Angle data is printed.

Select whether to include the angle data in the data printed.

MODE 54 (Pulse number print)

Default : 1

0 = Pulse number is not printed.
1 = Pulse number is printed.

Select whether to include the pulse number in the data printed.

MODE 55 (Memory data print)

Default : 0

0 = All data of 1st Tool is printed.

1 = Only NOK data of 1st Tool is printed.

2 = All data of 2nd Tool is printed.

3 = Only NOK date of 2nd Tool is printed.

Select what memory data to be printed.

MODE 57 (Memory data through RSR-232C)

Default : 0

0 = All data of 1st Tool is output.

1 = Only NOK data of 1st Tool is output.

2 = All data of 2nd Tool is output.

3 = Only NOK data of 2nd Tool is output.

Select what memory data to be outputted through RS-232C.

MODE 58 (RS-232C output)

Default : 0

0 = All data are output through RS-232C.

1 = Data is out put through RS-232C only when the following errors are detected.

- Torque / Angle / High-Low limit pulse number error
- Fastening error (SL.E. / LO.E./ CYL.E./CYO.E./F.E.)
- O.E. (ZERO error)
- CAL. E. (CAL error)
- - - - E. (Torque cut error of the reverse rotation)

2 = Signals are not output through RS-232C.

Default : 0

MODE 59 (Data of RS-232C output) 0 = # - CR (per the tool)

1 = # - LF (per the tool)

2 = ENG / Channel No. ACK / NAK – ET.

Select the output way of data1: 0 from RS-232C Board.

MODE 60 (Baud rate of RS-232C output)

Default : 1

0 = 4800 bps

1 = 9600 bps

2 = 19200 bps

Select the baud rate of output from RS-232C board in this mode.

Note : The above is not the baud rate between the setup personal computer and the main controller.

MODE 61 (Bit length of RS-232C output)

Default : 1

0 = 7 bits

1 = 8 bits

Select the bit length from RS-232C board in this mode.

MODE 62 (Stop bit of RS-232C output)

Default : 0

0 = 1 bit

1 = 2 bits

Select the stop bit of RS-232C output.

MODE 63 (Parity bit of RS-232C output)

Default : 0

0 = None

1 = Even number parity

2 = Odd number parity

Select the parity check of output from RS-232C board.

MODE 64 (Torque of RS-232C output)

Default : 1

0 = Not send

1 = Send

Select whether the torque data is included or not in output through RS-232C board.

MODE 65 (Angle of RS-232C output)

Default : 1

0 = Not send

1 = Send

Select whether to include the angle data in the output through RS-232C board.

MODE 67 (Pulse number of RS-232C output)

Default : 1

0 = Not send

1 = Send

Select whether to include the pulse number in the output through RS-232C board.

MODE 68 (Time of RS-232C output)

Default : 1

0 = Not send

1 = Send

Select whether to include the time in the output through RS-232C board.

MODE 69 (Judgement of RS-232C output)

Default : 1

0 = Not send

1 = Send

Select whether to include the judgement in the output through RS-232C board.

MODE 71 (Layout of input terminals)

Default : 1 LS-1-1

1 = LS-1-1

2 = START 1

3 = RESET

4 = LS-2-1

5 = PASS

6 = QL 1

7 = Work Select 1-1

8 = Work Select 2-1

The input function of the second terminal from the left of the upper line on the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 72(Layout of input terminal)

Default : 2 START1

1 = LS-1-1

2 = START1

3 = RESET

4 = LS-2-1

5 = PASS

6 = QL1

7 = Work Select 1-1

8 = Work Select 2-1

Input function of the third terminal pin from left in the upper line of the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 73 (Layout of input terminal)

Default : 3 RESET

1 = LS-1-1

2 = START 1

3 = RESET

4 = LS-2-1

5 = PASS

6 = QL 1

7 = Work Select 11

8 = Work Select 2-1

Input function of the fourth terminal pin from left in the upper line of the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 74 (Layout of output terminal)

Default :1 1st Tool Count OK

1 = 1st Tool Count OK

2 = 1st Tool COUNT NOK

3 = 1st Tool Torque OK

4 = 1st Tool Torque NOK

5 = SV 1

6 = 1st Tool Torque LOW NOK

7 = 1st Tool Torque High NOK

8 = Operation Range

Output function of the second terminal pin from left in the lower line of the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 75 (Layout of Output terminal)

Default : 2 1st Tool Count NOK

1 = 1st Tool Count OK

2 = 1st Tool COUNT NOK

3 = 1st Tool Torque OK

4 = 1st Tool Torque NOK

5 = SV 1

6 = 1st Tool Torque LOW NOK

7 = 1st Tool Torque High NOK

8 = Operation Range

Output function of the third terminal pin from left in the lower line of the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 76 (Layout of output terminal)

Default : 3 1st Tool Torque OK

1 = 1st Tool Count OK

2 = 1st Tool COUNT NOK

3 = 1st Tool Torque OK

4 = 1st Tool Torque NOK

5 = SV 1

6 = 1st Tool Torque LOW NOK

7 = 1st Tool Torque High NOK

8 = Operation Range

Output function of the fourth terminal pin from left in the lower line of the rear panel terminals of the main controller can be changed as per the above function you select.

MODE 80 (Memory data output)

Default : 0

0 = Memory data is not outputted.

1 = Memory date is outputted.

Memory data is outputted in accordance to MODE 55, MODE 57 and MODE 81.

Note) Data output is cancelled when the reset key is pressed while the data is being output.

This function activates when 1 is set for MODE 80 and press [ENTER], or when 1 is set for MODE 80 through the personal computer.

MODE 81 (Memory output select)

Default : 0

0 = Memory is outputted to the centronics printer.

1 = Memory is outputted to the RS-232C communication.

It is to display the average of the data memorized.

MODE 82 (Memory average display) This mode becomes operative in the writing mode (MODE 99).

Note) Calculation is cancelled if the reset key is pressed while calculating.

MODE 83 (Memory sigma display)

It is to display the sigma value of the data memorized.

This mode becomes operative in the writing mode (MODE 99).

Note) Calculation is cancelled if the reset key is pressed while calculating.

MODE 84 (Memory 3 sigma scatter display)

It is to display the 3 sigma scatter of the data memorized.

This mode becomes operative in the writing mode (MODE 99).

Note) Calculation is cancelled if the reset key is pressed while calculating.

MODE 85 (Memory CP display)

It is to display the CP value of the data memorized.

Calculation is made in accordance to the set values (LOW/HIGH) of the work No.

This mode becomes operative in the writing mode (MODE 99).

Note) Calculation is cancelled if the reset key is pressed while calculating.

MODE 86 (CPK display)

It is to display the CPK value of the data memorized.

Calculation is made in accordance to the set values (LOW/HIGH) of the work No.
This mode becomes operative in the writing mode (MODE 99).
Note) Calculation is cancelled if the reset key is pressed while calculating.

MODE 87 (Memory storage allocation)

Default : 0

0 = Regardless of the work No., maximum 10,000 fastening data per each tool can be memorized. When the number of the memorized data becomes over 10,000 per each tool, the data is overwritten from the oldest one in order

1 = Maximum 2,500 fastening data per each tool's work No. can be memorized. When the number of the memorized data becomes over 2,500 per each block, the data is overwritten from the oldest one in order.

- It is to select whether you would like to store the fastening data per each tool or a block of work No. of each tool.
- Statistics such as the average and CPK values are calculated per each block.

MODE 88 (Memory storage type)

Default : 2

1 = Regardless of the process, all fastening data is memorized.
When the number of memorized data becomes 10 before the maximum, the alarm buzzer beeps and COUP is displayed in D.P.M. D.P.M display is cleared by the reset terminal or the reset key, but if the next fastening is made continuously, the alarm buzzer beeps and D.P.M. display is made.

2 = Same function with 1 =, but the alarm buzzer does not beep when maximum.

3 = Only OK fastening data is memorized. Alarm buzzer beeps when maximum.

4 = Same function with 3 =, but the alarm buzzer does not beep when maximum.

It is to select the memorized fastening data, and the alarm buzzer when maximum.

MODE 89 (Memory data clear)

- It is to clear all fastening data of the selected work No. memorized.
- This function becomes operative in the writing mode (MODE 99).
- Press [MODE] [8] [9] [ENTER], so CPM displays [- CLE]. Then, press [ENTER] to clear the fastening data.
- Same can be done in the setup software of your personal computer.

MODE 98 (UEC No.)

Default : 1

Range of setting : 1 – 25 : It is to number each UEC when many UEC-4500 are connected with the personal computers by RS-232C specifications.

6. TIMER setting

TIMER 1 (Judgement delay timer)

Default : 300 [msec]

Range of setting : 50 – 9999 [msec]

- It is used as the end point of torque measuring of controlling condition.
  - This is a delay timer when UEC-4500 comes the possible condition to make the judgement output till it makes the judgement output.
- The torque spike after shut-off should be taken into consideration.
- When 1, 2, 4, 5 or 6 is set for MODE 9, set 500 [msec] in TIMER 1
- When 3 or 8 is set for MODE 9, set 300 [msec] in TIMER 1.

TIMER 2 (Initial trouble –LO.E.- detection timer)

Default : 500 [msec]

Range of setting : 1 – 9999 [msec]

- Please set 1 for MODE 1.
- This is to set the upper limit range of wave when the fastening torque reaches the start level till cut level.
- This timer starts when the fastening torque reaches the start level.

TIMER 3 (Cycle error – CYL.E – detection timer)

Default : 5000

Range of setting : 1 – 9999 [msec]

Mode 2 : Please set 1 for MODE 2.

- This is to set the lower limit range of wave when the fastening torque reaches the start level till cut level.
- This timer starts when the fastening torque reaches the start level.

TIMER 4 (Fastening OK output timer)

Default : 9999

Range of setting : 0 – 9999 [msec]

- This is to set the time when TORQUE OK is outputted from the output board. In case of the normal use, it is not needed to set.
- Set this timer when the external sequence of UEC-4500 will be influenced by the output time.
- Setting 0 means that the output is held till the next fastening operation is started.

TIMER 5 (COUNT OK terminal output timer)

Default : 9999

Range of setting : 0 – 9999 [msec]

- This is to set up the time of COUNT OK output.
- Setting 0 means that the output is held till the next fastening counter starts.

TIMER 6 (Torque measuring delay timer)

Default : 20

Range of setting : 0 – 9999 [msec]

- This timer starts when the fastening torque reaches the start level, and then the torque measuring is started. UEC-4500 does not measure the fastening torque till the timer ends.
- Use this timer if the torque spike is occured when the bolt or nut sets.
- Setting 0 means that the torque measuring is started after the fastening torque reaches the start level.

TIMER 7 (Start level error – SL.E.- detection timer)

Default : 500

Range of setting : 1 – 9999 [msec]

- Set 1 for MODE 16 to set this timer.
- It is to set the upper wave limit after the start signal is inputted till the fastening torque reaches the start level.
- This timer starts when the start signal is inputted.

TIMER 8 (Cycle over error – CYO.E.- detection timer)

Default : 9999

Range of setting : 1 – 9999 [msec]

- Set 1 for MODE 17 to set this timer.
- It is to set the lower wave limit after the start signal is inputted till the fastening torque reaches the cut level.
- This timer starts when the start signal is input.

TIMER 20 (Valve return timer)

Default : 300

Range of setting : 1 – 9999 [msec]

- Timer starts when the valve output is made, and returns the valve when the time ends.

TIMER 21 (Reverse rotate completion delay timer)

Default : 300

Range of setting : 0 – 9999 [msec]

- This timer has a function to set up the completion of the reverse rotation of the tool.
  - Set 9 for MODE 9 and 1 for MODE 11 to set this timer. **TIMER 50 (Timer for the line control)**

Default : 100

Range of setting : 1 – 9999 [msec]

- Set 2 or 3 for MODE 14 to set this timer.
- This timer is for the assembly line by time.

7. Standard setting

LOW (Low limit torque)

Default : 78.5 [Nm]

Range of setting : 0.0 – 980.4 (Low[max 978.7]) < Cut[MAX 979.8])

- This is a set value of the low limit for the fastening torque.

HIGH (High limit torque)

Default : 58.8 [Nm]

Range of setting : 0.4 – 980.6 (Cut[min 0.3] < Cut[max 979.8] < High[max 979.9])

- This is a set value of the high limit for the fastening torque.

CUT (Cut torque)

Default : 19.6 [Nm]

Range of setting : 0.2 – 980.5 (Cut[max 979.8] < High[Max 979.9])

- This is a set value of the fastening cut torque when controlling the torque.

CAL (Rated value of torque sensor)

Default : 1000

Range of setting : 100 – 9999

- In accordance to this set value, UEC-4500 calculates torque with referring to the ratio of the rated sensor value and torque output signal voltage for the torque sensor and displays the torque.

SENSOR (Torque sensor resistance / rated strain)

Torque sensor resistance (unit : ohm) [SENSOR 1 setting value]

- This is a resistance, which constructs the torque sensor circuit.
  Default : 700
  Setting value should be 480, 700 or 350 in accordance to the specification of torque sensor connected.

Torque sensor rated strain [SENSOR 2 setting value]
  Default : 750
  Range of setting : 100 – 4400
- This is a contraction of 4 pcs. of strain gauge inside the torque sensor on condition that the torque sensor is under the rated load.
- UEC calculates the unit output voltage of the torque sensor in accordance to the setting value of the strain.
  (EX. Unit output voltage becomes 0.5 [mV/V] against the strain 1000. Unit output voltage becomes 1 [mV/V] against the distortion 2000.)

START (Start level)
Default : 9.8
Range of setting : 0.1 – 980.3 (START[min 0.1] < MODE 24[min 0.2])
- Use of the setting
  a, TIMER 1 Operation start point
  b, TIMER 2 Operation start point
  c, TIMER 3 Operation start point
  d, TIMER 6 Operation start point
  e, TSC data measuring start point
  f, UEC operation start point

COUNT (number of fastening)
Default : 99
Range of setting : 1 – 99
- If you do not need to count the number of fastening, it is not needed to set up.
- Number of fastening per one work
- COUNT OK/NOK judgement is made in accordance to the setting number.

8. Mode for the fastening data display

MODE 19 (Fastening time)

- DPM displays the fastening time, from the start torque till the cut torque) of the previous fastening. Displayed fastening time is automatically changed to the fastening torque after 2 seconds.

MODE 20 (Angle display)

- DPM displays the angle.
- Press [ENTER] to back to display the fastening torque.
- Unit of the angle display is in degree.

MODE 33 (Number of pulse display)

- DPM displays the number of pulse.
- Press [ENTER] to back to display the fastening torque.

- While in the writing mode, select MODE 70 to display the zero point in DPM.
  MODE 70 (ZERO point display) - Press [ENTER] to correct ZERO point. Correction is made if the difference of the zero point is within 20% of CAL value.
- Press [ENTER] to back to display the fastening torque.

9. Functions

9.1 Fastening control

It is possible to select from 7 types of fastening control.

MODE 9 : 1 Torque monitoring

2 Torque control

3 MC/EC wrench torque control

4 Torque / Angle monitoring

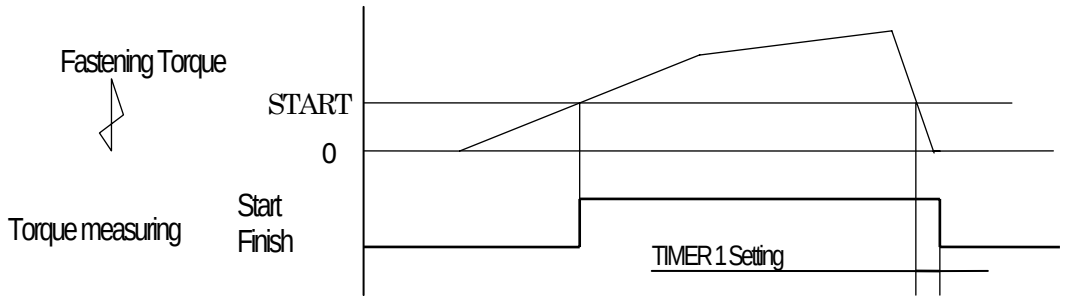
5 Torque control/Angle monitoring

6 Angle control / Torque monitoring

7 Shut-off pulse wrench torque monitoring

1) Torque monitoring (MODE 9 : Setting 1)

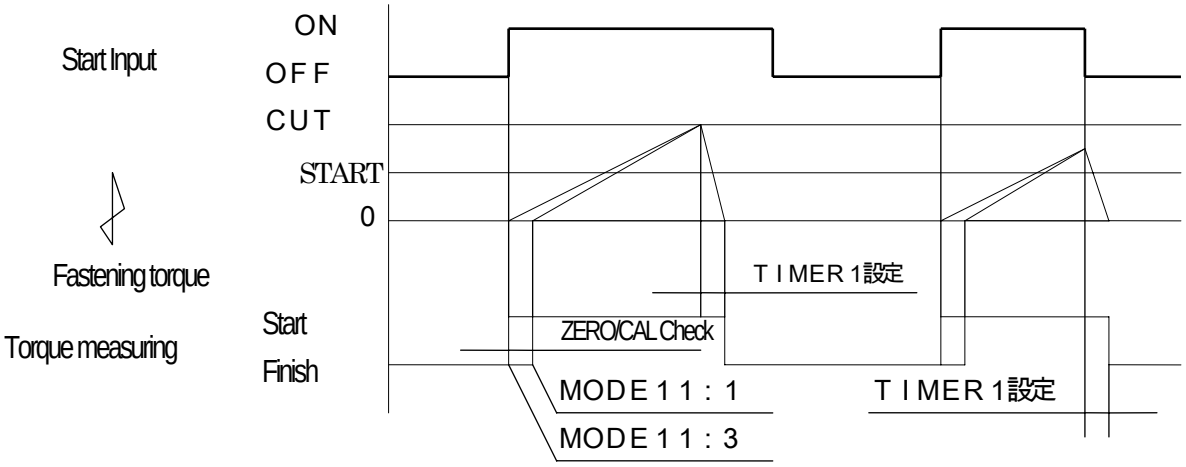
This is mainly used to monitor the fastening torque of the angle nutrunner UAN series, which is cut by the clutch mechanism. If 1 is set for MODE 11, UEC starts to measure the fastening torque when the external start is input. If 0 is set for MODE 11, UEC starts to measure the fastening torque when the fastening torque becomes higher than the start level. Judgement is made when the set time of TIMER 1 comes after the fastening torque becomes lower than the start level.



2) Torque control (MODE 9 : Setting 2)

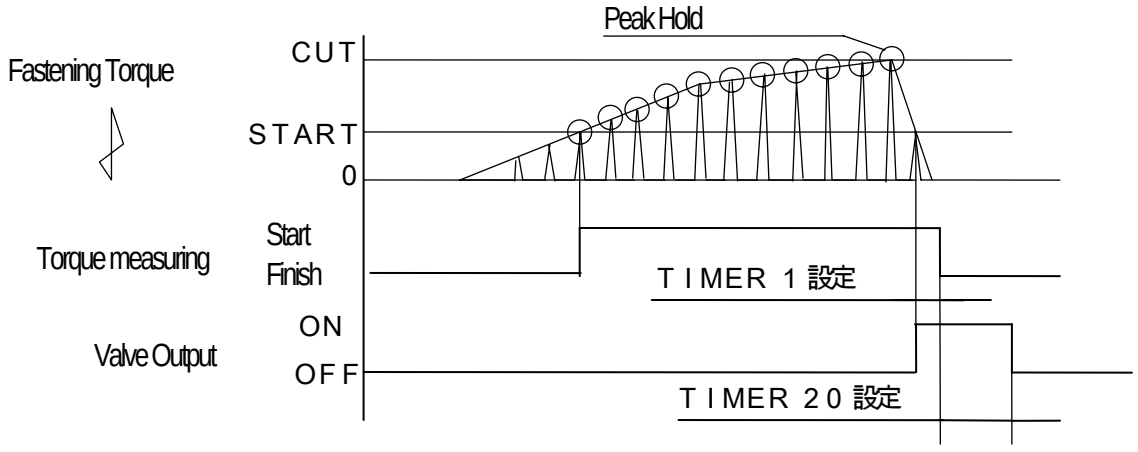
This is mainly used to control the fastening torque of the nutrunner. Nutrunner is started to operate by

the valve output of UEC, and UEC controls its fastening torque. Nutrunner starts rotating by inputting the external start, and UEC starts measuring its fastening torque. Nutrunner rotates till the fastening torque reaches the cut level. Judgement is made when the time of TIMER 1 comes after the fastening torque reaches the cut level.



3) MC/EC Wrench torque control (MODE 9 : Setting 3)

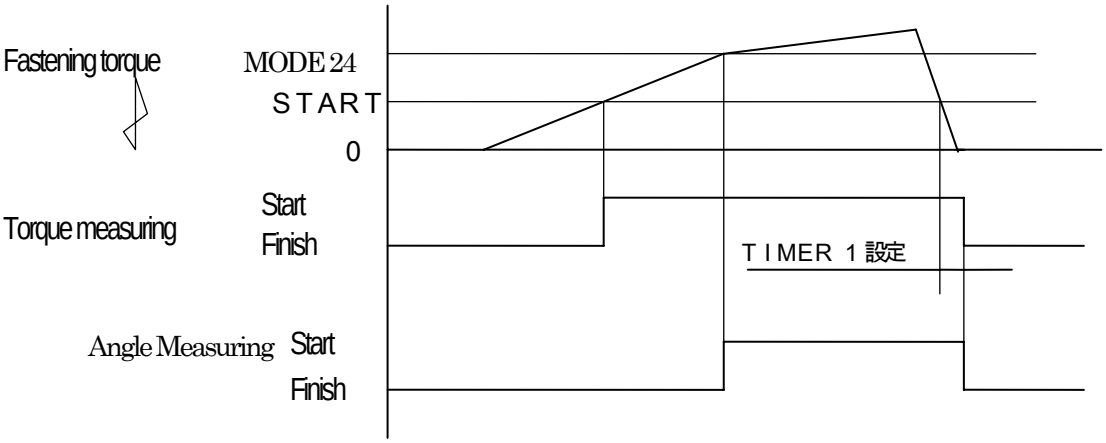
This is to control the fastening torque of MC or EC wrench. UEC starts measuring the fastening torque when the fastening torque becomes higher than the start level, and stops the tool by valve output when the fastening torque reaches the cut level. Judgement is made when the time of TIMER 1 comes after the fastening torque becomes lower than the start level.



4) Torque / Angle monitoring (MODE 9 : Setting 4)

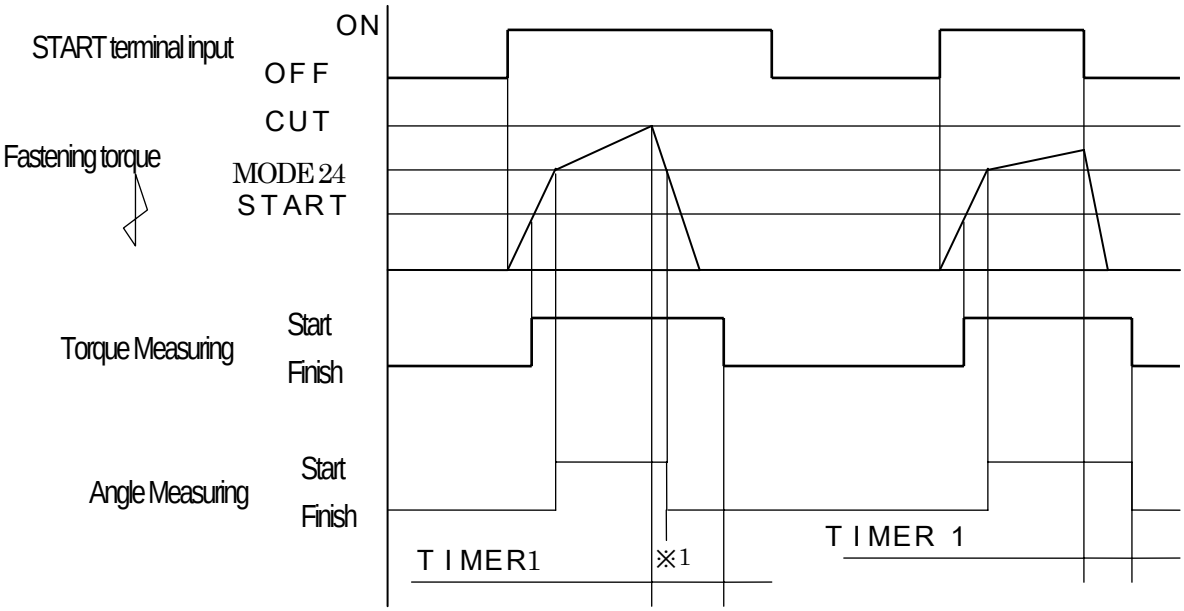
This is the function 1) Torque monitoring plus Angle monitoring.

UEC starts to measure the angle when the fastening torque reaches the set value in MODE 24 till the judgement is made. It is necessary to use the tool with the angle sensor to use this function.



This is the function 2) Torque control plus Angle monitoring.

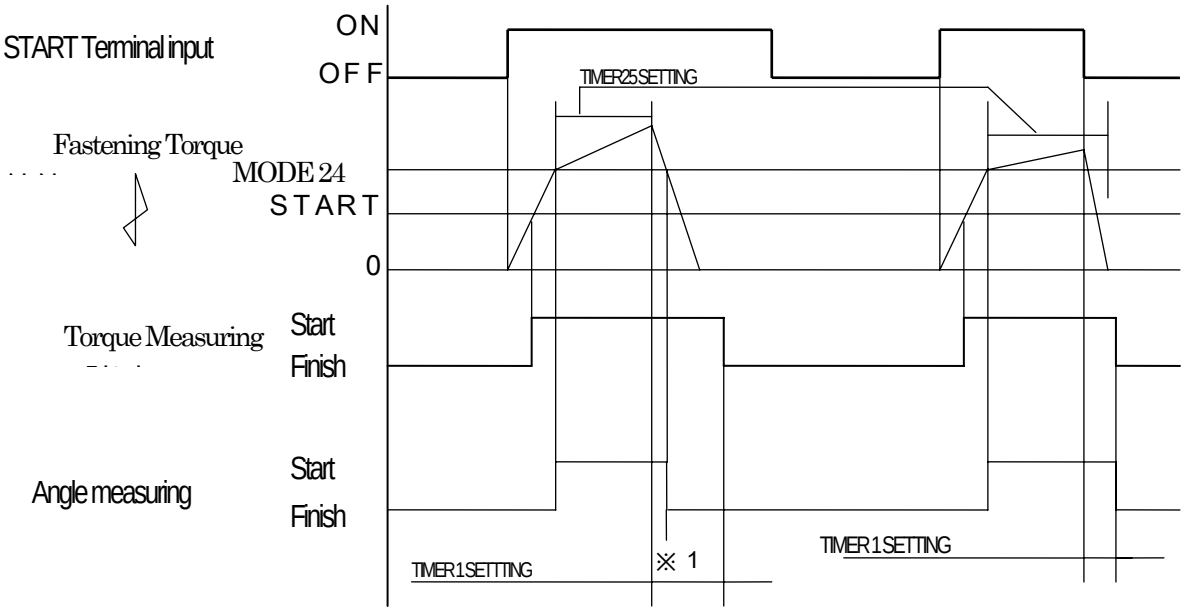
5) Torque control / Angle monitoring (MODE 9 : Setting 5) UEC starts to measure the angle when the fastening torque reaches the set value in MODE 24. UEC finish measuring the angle when the remaining torque becomes lower than MODE 24 in case that the fastening torque reaches the cut level. In case that the fastening torque does not reach the cut level, UEC finish measuring the angle when the judgement is made.



6) Angle control / Torque monitoring (Mode 9 : Setting 6)

This is used to control the fastening angle of the nutrunner.

Nutrunner is operated by the valve terminal output from UEC, and controlled.
By the start input, nutrunner starts rotating and the torque measuring is begun. Angle measuring is started when the fastening torque reaches the set value of MODE 24. Till the angle reaches the set value of MODE 25, fastening torque and rotating speed are measured. Judgement is made after the set time of TIMER 1 comes after the angle reaches the set value of MODE 25. If the angle does not reach the set value of MODE 25, judgement is made when the set time of TIMER 1 comes after the start input becomes off. Torque is measured till the judgement is made.



Note) ※1 In the condition of shutting off, if the fastening torque becomes lower than the set value of MODE 24, the angle measuring is finished when the tool is shut-off. If the fastening torque becomes higher than the set value of MODE 24, angle measuring is finished when the time of TIMER 1 comes.

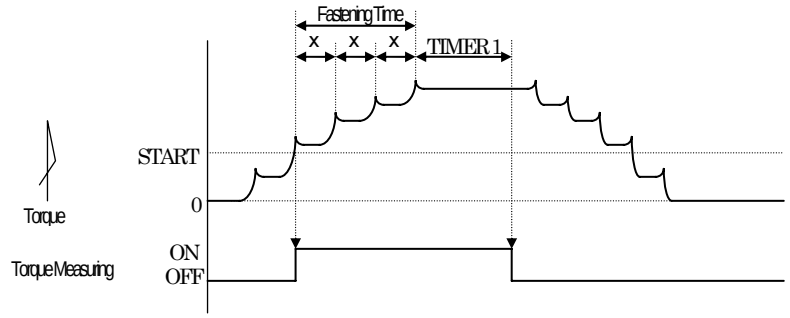
☆ Timing of torque measuring

Torque is the peak hold torque in the measuring zone. It is displayed in DPM in real time.
Even if the torque is lower than the peak hold torque in the measuring zone, UEC holds the peak hold torque.
Sample measuring is made approx. every 30μS in the measuring zone.

☆ Timing of angle measuring

Count measuring is made every angle pulse.
Angle measuring is calculated from the angle pulse input in the measuring zone and the set value of MODE 21.
Start / finish timing of the angle measuring is different in accordance to the set value of MODE 9.

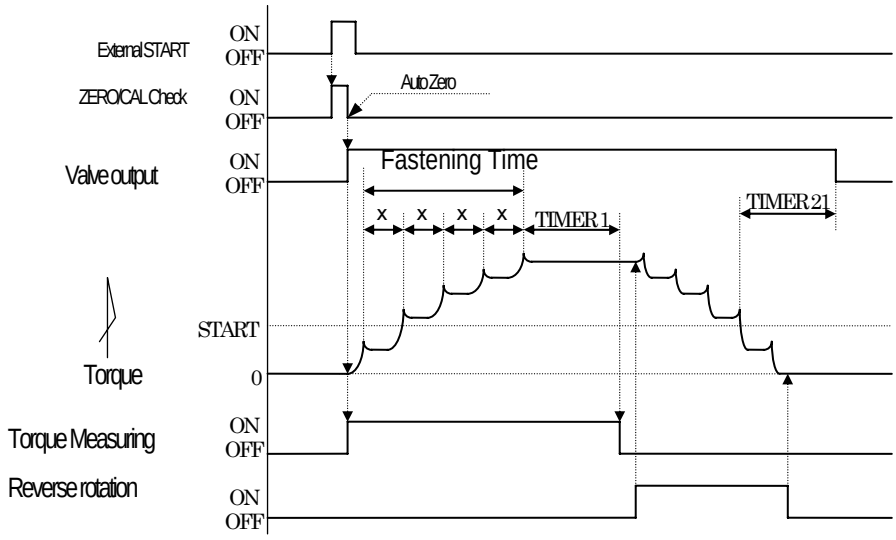
7) Shut-off pulse wrench fastening torque / time measuring (MODE 9 : Setting 9)
This is to monitor the fastening torque and time of the shut-off pulse wrench.



MODE 11 : Setting 0

UEC-4500 starts measuring the fastening torque when the fastening torque becomes higher than the start level. It judges that the tool is shut off when the measuring time (x) between the peak and peak torque becomes longer than the set time of TIMER 1, and makes the judgment output.

Note) In case if 0 is set for MODE 11, valve output is not made.



MODE 11 : Setting 1

Fastening time

By inputting the external start, UEC-4500 clears the last data and does the ZERO/CAL check and auto-ZERO. UEC-4500 makes the valve output on and the tool becomes operative. Torque measuring is started. When the measuring time (x) between the peak and the peak torque becomes longer than the time of TIMER1, UEC judges that the tool is shut off and makes the judgement output. After the judgement output is made, when the remaining loaded torque becomes lower than the start level because of the reversing rotation of the tool, TIMER 21 starts. UEC-4500 judges that the reverse rotation is finished when TIMER 21 comes, and clears the start condition of tool operation by making the valve output off.

Note) TIMER 21 functions only when 9 is set for MODE 9 and 1 for MODE 11.

- Start point of measuring

When the fastening torque reaches START level

- Finish point of measuring

Measuring time till the judgement output minus the set time of TIMER

9.2 High/low limit judgement

For the fastening torque, high limit is set in HIGH and low limit in LOW.

UEC-4500 can judge whether the measuring values of torque, angle and number of pulse are within the range of high & low limit or not.

For the angle, high limit is set in MODE 23 and low limit in MODE 22.

For the number of pulse, high limit is set in MODE 35 and low limit in MODE 34.

[Judgement]

(1) Measured value is within high & low limit (OK)

- OK LED (green) of the front panel turned on.
- Tool's LED (green) turns on.
- TORQUE OK per each tool of the output board is outputted.

(2) Fastening torque is higher than the high limit (HIGH NOK)

- HIGH LED (red) of the front panel turns on.
- Tool's LED (red) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(3) Angle is higher than the high limit

- HIGH LED (red) of the front panel turns on.
- Tool's LED (red) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(4) Number of pulse is more than the high limit

- DPM [PLS.H.] and [Torque] are displayed in turn.
- Tool's LED (red) turns on.
- Alarm buzzer keeps.
- TORQUE NOK per each tool of the output board is outputted.

(5) Fastening torque is lower than the low limit (LOW NOK)

- LOW LED (yellow) of the front panel turns on.
- Tool's LED (yellow) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(6) Angle is lower than the low limit

- LOW LED (yellow) of the front panel turns on.

- Tool's LED (yellow) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(7) Number of pulse is less than the low limit
- DPM [PLS.L.] and [Torque] are displayed in turn.
- Tool's LED (yellow) turns on.
- Alarm buzzer keeps.
- TORQUE NOK per each tool of the output board is outputted.

9.3 High/low limit judgement

For the fastening torque, high limit is set in HIGH and low limit in LOW.

UEC-4500 can judge whether the measuring values of torque, angle and number of pulse are within the range of high & low limit or not.

For the angle, high limit is set in MODE 23 and low limit in MODE 22.

For the number of pulse, high limit is set in MODE 35 and low limit in MODE 34.

[Judgement]

(2) Measured value is within high & low limit (OK)

- OK LED (green) of the front panel turned on.
- Tool's LED (green) turns on.
- TORQUE OK per each tool of the output board is outputted.

(3) Fastening torque is higher than the high limit (HIGH NOK)

- HIGH LED (red) of the front panel turns on.
- Tool's LED (red) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(5) Angle is higher than the high limit

- HIGH LED (red) of the front panel turns on.
- Tool's LED (red) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(6) Number of pulse is more than the high limit

- DPM [PLS.H.] and [Torque] are displayed in turn.
- Tool's LED (red) turns on.
- Alarm buzzer keeps.
- TORQUE NOK per each tool of the output board is outputted.

(6) Fastening torque is lower than the low limit (LOW NOK)

- LOW LED (yellow) of the front panel turns on.
- Tool's LED (yellow) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

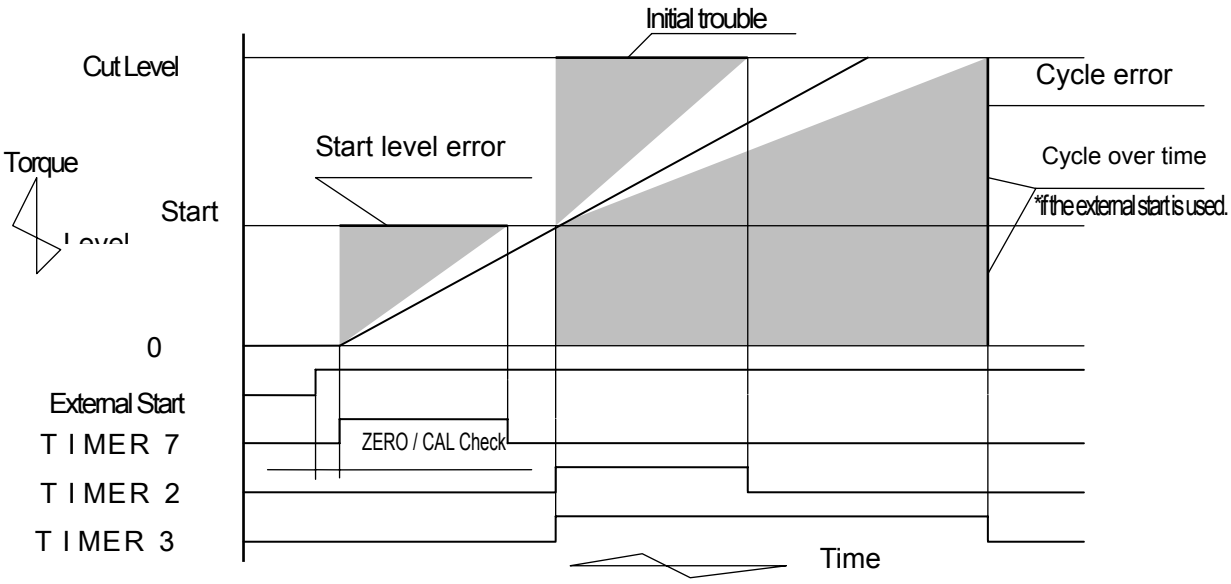
(8) Angle is lower than the low limit

- LOW LED (yellow) of the front panel turns on.

- Tool's LED (yellow) turns on.
- Alarm buzzer beeps.
- TORQUE NOK per each tool of the output board is outputted.

(9) Number of pulse is less than the low limit
- DPM [PLS.L.] and [Torque] are displayed in turn.
- Tool's LED (yellow) turns on.
- Alarm buzzer keeps.
- TORQUE NOK per each tool of the output board is outputted.

9.3 Zone watching of the torque change value



Note) In case of the liner torque change

1) Start level error detection [SL.E.]

It is to detect the time after the external start is inputted till the torque reaches the start level. If the measured time is shorter than the set time of TIMER 7, UEC detects the error.

(Note)

- UEC-4500 may not detect the error because of the difference of the tentative fastening condition of the bolt / nut.
- UEC-4500 may not detect the error if the timing when the socket of nutrunner enters the work is delayed.

(Setting)

- MODE 16 : 1
- TIMER 7 : Range of setting 1 – 9999 [msec]

(How to set)

- Refer to the passing time after the external start input till the torque start level passing in case of the normal fastening, and decide the set value.

2) Initial trouble error detection [LO.E.]

It is to detect the error if the passing time from the torque reaches the start level to the cut level is shorter

than the set time of TIMER 2.

(Setting)

- MODE 1 : 1
- TIMER 2 : Setting range 1 – 9999 [msec]

(How to set)

- Refer to the passing time between when torque reaches the start level and the cut level in case of normal fastening, and decide the set value.
- Decide the measurement of passing time by MODE 19 (press [MODE] [1] [9] [ENTER]] or TSC data of the centronics printer.

3) Cycle error detection [CYL.E.]

It is to detect the error if the passing time between when torque reaches the start level and the cut level is not over when the set time of TIMER 3 comes.

(Setting)

- MODE 2 : 1
- TIMER 3 : Range of setting 1 – 9999 [msec]

(How to set)

- Refer to the passing time between when torque reaches the start level and the cut level in case of normal fastening, and decide the set value.
- Decide the measurement of passing time by MODE 19 (press [MODE] [1] [9] [ENTER]) or TSC data of the centronics printer.

4) Cycle over time error [CYO.E.]

It is to detect the error if the judgement output is not made when the set time of TIMER 8 comes after the external start is input.

This function is used in case that the socket part of nutrunner idles because it does not enter the work.

(Setting)

- MODE 17 : 1
- TIMER 8 : Range of setting 1 – 9999 [msec]

(How to set)

- Refer to the time between the external start input and the judgement output in case of normal fastening, and decide the set value. Decide the set value taking into some time to space into your consideration.

10. Torque sensor wire diagnosis

This is a function to detect the breakage of torque sensor, damage of torque sensor cable and short-circuit of torque sensor. Error detection is made by Zero/CAL check.

10.1 Error detection

1) ZERO check

It functions to check the regulation from the output voltage 0[V] of the torque sensor in the condition that the torque sensor is not loaded by torque. Condition of error detection is when the regulation of zero point (zero point display value on DPM display) is not within ± 6% of CAL value.

2) CAL check

It is to check the matching with the torque sensor wire / sensor spec. connected to UEC-4500 and the set value of SENSOR.

UEC-4500 deliberately makes the torque sensor to the same condition of rated impress load, and check if the output signal of torque sensor is within 100 ± 6% of CAL value.

Depending on the sensor value, it selects the sensor specification type to make the deliberate torque sensor rated impress load condition.

By the above operation, if UEC-4500 is not connected to the torque sensor in order, it detects the matching error of the sensor specification and the sensor value.

10.2 ZERO/CAL check timing

- When the power switch of UEC-4500 is turned on, and the self-diagnosis check is made.
- When the reset terminal is inputted
- When [RESET] key is inputted
- When START 1 (terminal), START 2 (input board) is input on condition that 0 or 1 is set for MODE 7
- When [F6 Zero/Cal] key on the [Zero point adjustment] screen of the setup software is pressed

Output condition when the error is detected

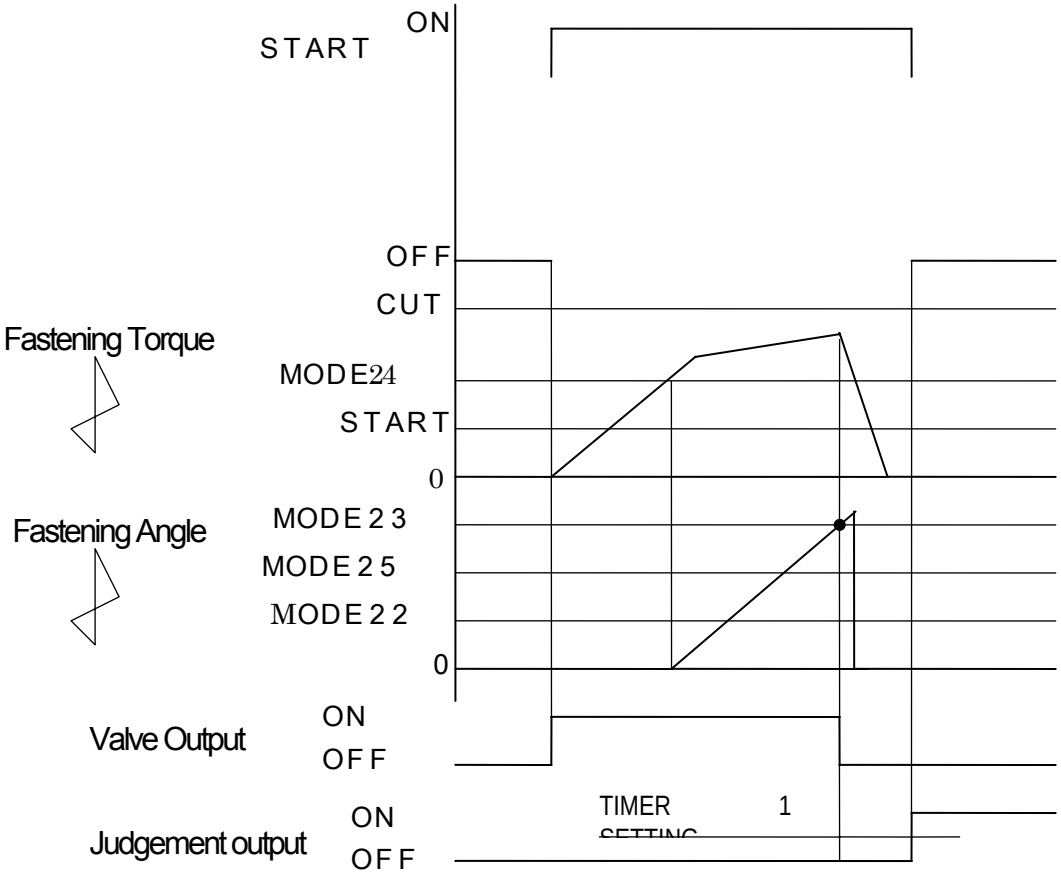
- DPM display (ZERO error) : [0.E.] and [Torque] are displayed in turn.
- DPM display (CAL error) : [CAL.E.] and [Torque] are displayed in turn.
- Alarm buzzer beeps.
- Output board if connected : TORQUE NOK is outputted.

11. Recovery cut

Valve cut is made when the angle reaches the set value of MODE 23.

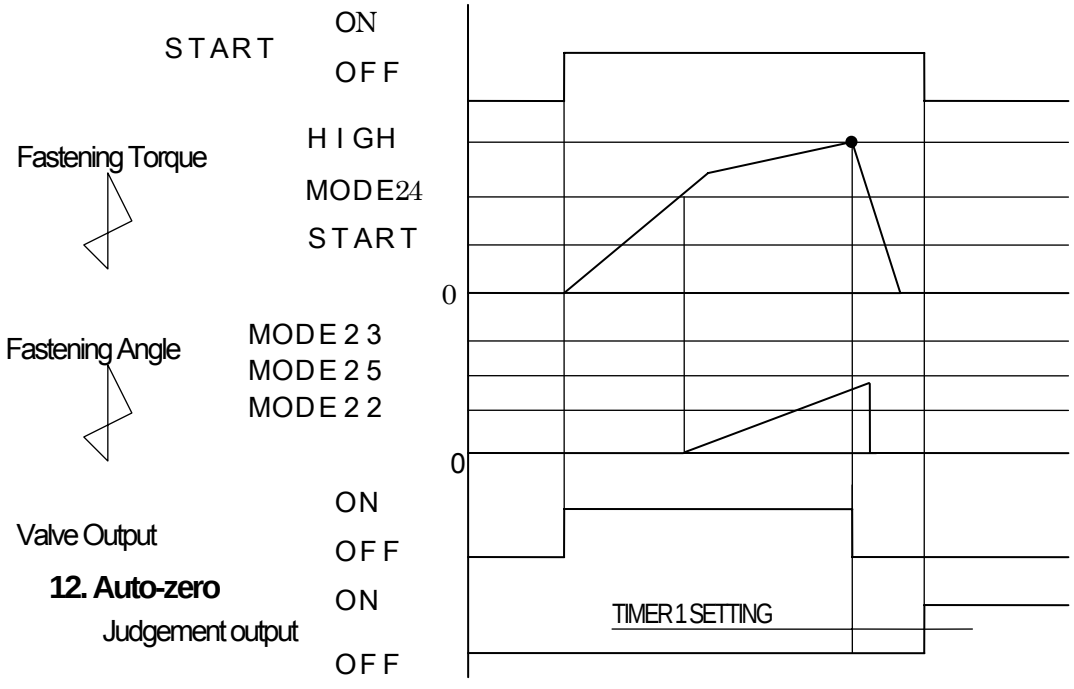
Recovery cut stands for the function to terminate the fastening by the valve cut which is not the fastening type in MODE 9. It makes the valve cut when the fastening torque does not reach the control cut level of the setting fastening specification, and besides when the monitoring value out of control reaches the high limit level.

1) MODE 9 : Setting 5 (Torque control / Angle monitoring)



Valve cut is made when the fastening torque reaches the high set level.

2) MODE 9 : Setting 6 (Angle control / Torque monitoring)

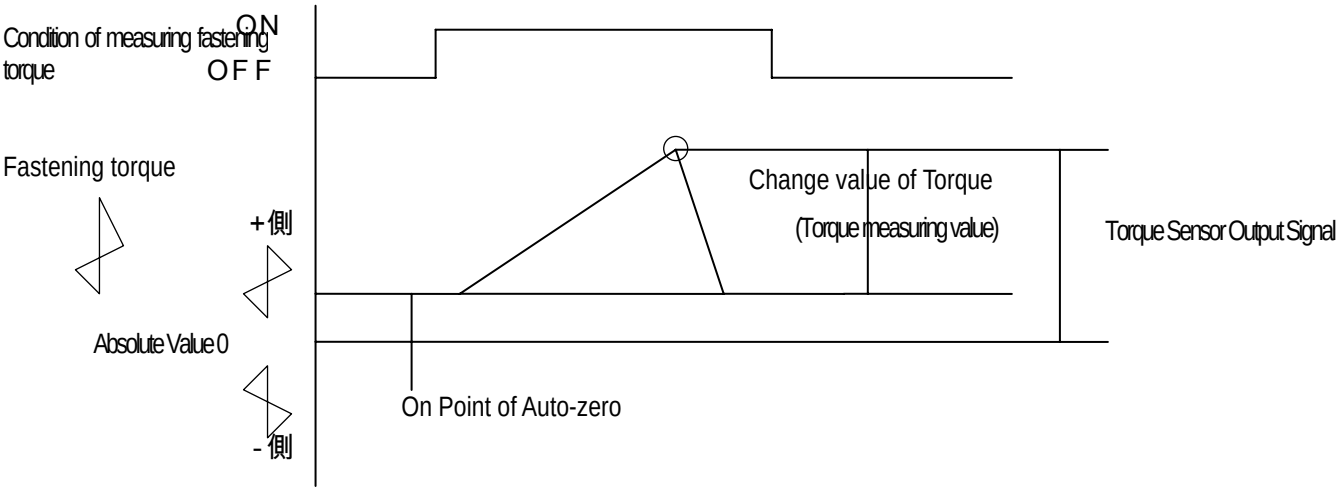


12. Auto-zero

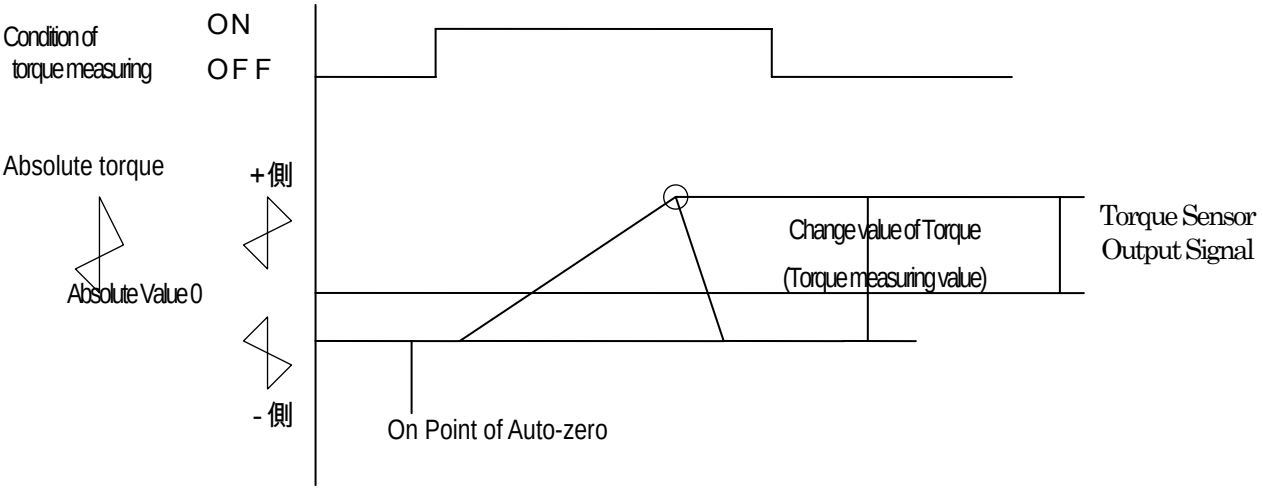
This is a function to measure the fastening torque precisely. It automatically corrects the measuring difference of fastening torque caused by the regulation of zero point in torque sensor. It memorizes the regulation of zero point when checking the zero point, and corrects (addition and subtraction) the regulation of zero point when calculating the torque from the torque sensor signal output. The above enables to measure the torque change value only when the fastening control is on.

Examples of Auto-zero

1) If the regulation of zero point is plus when auto-zero is on



2) If the regulation of zero point is minus when auto-zero is on



On timing point of Auto zero

After the zero / cal check is made, auto zero is done.

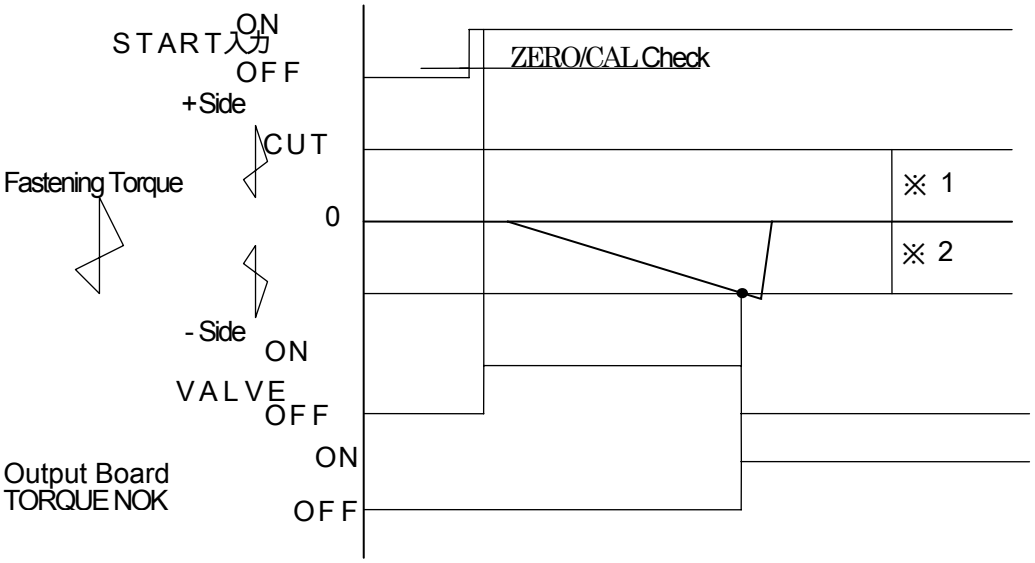
- When the power switch of UEC is turn on, and the self-diagnosis check is made.
- When the reset terminal is input
- When [RESET] key is input
- When START 1 terminal is input. For 2nd tool, when the START 2 of input board is input.

13. Torque cut of counter-clockwise rotation

This is a function to terminate the fastening operation compulsory when the pole condition of the torque sensor wire is different or when the fastening operation is made in the condition that the selection of the torque measuring pole on UEC-4500 is different.
UEC-4500 makes the tool stop by valve output and detects the error if the torque reaches the cut level in the minus side when the external start is inputted.

(1) Error output
- DPM displays [- - - E.].
- Alarm buzzer beeps.
- Output board if connected : TORQUE NOK is outputted.

(2) How to detect



Note) ※ 1 = ※ 2 Change value is same with each other.

(3) Condition of error detection
- When 0 is set for MODE 11, the above does not function even if the external start is input. Only ZERO/CAL check is made, but not the fastening operation.

14. Errors

14.1 Error display and its meaning

(1) Zero error ([O.E.] and [Value of NG detection] are displayed in turn.)
In case when the difference is over ±6% of the rated value when zero check is made
(2) Cal error ([CAL.E.] and [Value of NG detection] are displayed in turn.)
In case when he difference is over 100±6% of the rated value when Cal check is made.
(3) Setting error ([S.E.] is displayed.)
In case when the not applicable setting value, Mode or Timer is inputted, or the numerical value which is beyond the limits or causes the inter lock error is inputted.
For example, when not exist mode such as Mode 60 is selected, when Mode 80, 82 – 86 or 89 is selected by not entering the writing mode, when the low limit is set higher than cut level etc.
(4) Initial error ([LO.E.] and [Value of NG detection] are displayed in turn.)
Initial error detection timer (Timer 2) starts when the fastening torque reaches the start level, and the fastening torque reaches the cut level till Timer 2 comes.
(5) Cycle error ([CYL.E] and [Value of NG detection] are displayed in turn.)
Cycle error detection timer (Timer 3) starts when the fastening torque reaches the start level, and the fastening torque does not reach the cut level when Timer 3 comes.
(6) Fastening interruption error ([F.E.] is displayed.)
In case when the fastening is interrupted before it reaches the cut level
(7) Start level error ([S.L.E.] is displayed.)
Timer 7 starts when the external start is on, if the fastening torque does not reach the start level when the set time of Timer 7 comes.
(8) Cycle over time error ([CY.O.E.] is displayed.)
Timer 8 starts when the external start is on, and if the fastening is not finished when the set time of Timer 8 comes.
(9) ROM error ([Er.01] is displayed.)
ROM in the board has a trouble by any reason or makes the error operation.
(10) RAM error ([Er.02] is displayed.)
RAM in the board has a trouble by any reason or makes the error operation.
(11) A/D error ([Er. 03] is displayed.)
A/D in the board has a trouble by any reason or makes the error operation.
(12) D/A error ([Er. 04] is displayed.)
D/A in the board has a trouble by any reason or makes the error operation.
(13) Some check error ([Er. 05] is displayed.)
Setting data which is memorized in RAM has a trouble.
(14) Reverse rotation error ([—E] is displayed.)
Reverse load torque reaches Cut level.

14.2 Trouble Shooting

Error	Countermeasure
Zero Error	· Adjust Zero Point · Check the sensor cable and torque sensor. · Make sure if the tool does not rotate while zero check.。
CAL Error	· Make sure of the switch [M.S.] and [S.G.]. · Check the sensor cable and torque sensor. · Make sure if the sensor set value and torque sensor value match. · Make sure if the tool does not rotate while zero check.。
Setting value error	· Repeat the setting again.
Initial error	· Check the work and bolt condition. · Check START level and CUT level. · Check TIMER 2. ※1 · Make sure if double fastening is not made.
Cycle error	· Check the work and bolt condition. · Check START level / CUT level. · Check TIMER 3. ※1
Fastening interruption error	· Check the tool capacity and air pressure. · Make sure if the value of TIMER 1 is not too small. · Make sure if the tool lever is released before reaching the CUT level.
Start level error	· Check the work and bolt condition. · Check the tool capacity and air pressure. · Check TIMER 7.
Cycle over time error	· Check the tool capacity and air pressure. · Check the set value of TIMER 8.
Rom / Ram error A/D / D/A error	· Change the controller.
Some check error	· If works in order by turning on the power switch again or pressing [RESET], RAM memory may be overwritten by noise.
Reverse rotation torque error	· Check the orientation of rotation of the tool. · Check the tool side, sensor cable ad the torque measuring poles in UEC-4500 side

※1 : Check the proceeding time of CUT by MODE 18 or TSC date of Print out. Refer to this data for Timer setting.