# Fastening Counter UTM-1500

**Instruction Manual** 

Version 3.61

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# Safety Precautions

You should first read this manual thoroughly and become familiar with this System and safety precautions before installing, operating, servicing and inspecting it.

Take note that two different signs; "DANGER" and "CAUTION", are used in this Manual according to the degree of seriousness and urgency.



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



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

CAUTION signs also warn the risk of serious consequences depending on the situation. So, always follow the instructions given in this Manual.

# Installation & Surroundings

Always attach to a metal or other incombustible component to prevent a fire.
Keep away from combustibles to prevent a fire.
Avoid foreign matter intrusion to prevent a fire.
Install Controller on a site that can bear its weight to avoid personal injury from accidental falling.
Keep your workplace well lighted and clean to avoid personal injury.
Never wear loose-fitting clothes or dangling jewelry when using this System, and always wear the right clothes suitable for your job. Be careful not to get your hair caught in tools, and if you wear your hair long, always tie with a rubber ribbon or the like 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



# DANGER

- Make sure that cords and outlets are properly grounded to avoid an electric shock or a fire.
- Carry out wiring after you installed Controller to avoid an electric shock or a fire.
- Wiring must be carried out by an expert electrician to avoid an electric shock or a fire.
- Be sure that Controller rated voltage agrees with AC power source to avoid personal injury and a possible fire.



# CAUTION

- Wires must be routed and fixed properly and securely to avoid personal injury and a fire.
- Always use Y-shape or round crimp terminals when wiring Terminal Block to avoid an electric shock or a fire.
- Supply power from a SELV circuit only.
- Be sure to turn OFF the mains prior to wiring to avoid an electric shock or a fire.

# Handling / Operation





# CAUTION

- Make settings within the prescribed operating range to avoid personal injury and burns.
- Perform operations in safe surroundings while keeping proper footing. Avoid poor postures to prevent danger.
- Perform operations with extra care. Operations in a careless and inappropriate manner and/or long-duration operation are prohibited to avoid personal injury or work-related diseases.

# Maintenance / Servicing



# DANGER

• Turn off and unplug the mains prior to inspection/replacement to avoid an electric shock.

- Maintenance/servicing works only by an expert is allowed. Be sure to take off metal articles (wrist-watch or ring) prior to operation. Inspect cords periodically for damage, and have an expert make repairs or exchange if signs of wear is noticed. Always use insulating tools at the time of servicing to avoid an electric shock and personal injury.
- Always order us or our designated agent when overhauling becomes necessary to avoid an electric shock, personal injury and fire.

# Disposal





## **General Precautions**

- In some cases, all figures in the instruction manual are indicated without covers for safety in order to clarify the details. When operate the product, return the regular covers to the original positions and operate it in accordance with the instruction manual.
- Keep persons irrelevant to System operation away from work-sites.

#### **Escape Clause**

• The contents of this instruction manual may change without notice.

# Overview

#### Overview

The URYU UTM-1500 Fastening Counter (hereunder called UTM-1500) counts the fastener by detecting the air pressure difference inside the connected pneumatic tool motor. This feature warns you about any missing fastener via buzzer and its panel display and provides you with the good tightening.

#### Feature

- UTM-1500 is connected to the pneumatic tools including oil-pulse wrench and impact wrench. UTM-1500 has to be connected to the TM type tools to detect the pressure differences.
- UTM-1500 counts down the fasteners and warns you about any missing fastener via buzzer and its panel display.
- UTM-1500 is programmable via either its key operations of front LCD panel or PC software.

#### Functions

- The automatic setup function provides the easy pressure levels setup.
- The buzzer levels of good tightening, NOK tightening, and press of key are adjustable.
- UTM-1500 provides the work selection function and 4 works are available.
- The inputs and outputs on the rear panel are programmable. This function provides the line control.
- You can upload and download the controller settings, tightening data, torque wave, data in memory, and total fastener counts via the PC programming software. The external pressure sensor provides the pulse numbers.
- UTM-1500 measures the tightening time when it is in conjunction with shut-off tool.
- Power-on and self-diagnosis feature is available with UTM-1500. The LCD display on the front panel reads the version number of controller software in the second line, as shown below when it is in self-diagnosis status.

UTM-1500	
Ver. 1.25	
URYU	
Self-Diagnosis	

#### Memory

UTM-1500 can store at most 1,500 data points including tightening time and judgment.

#### I/O Wiring Diagnosis Feature

This feature helps you verify that the wires on I/O terminals are correctly installed and the I/O terminals work properly. The signals can be monitored and forced to be outputted via the WIRING DIAGNOSIS screen on front panel or I/O Check Screen or I/O Monitor Screen on the PC programming software.

#### ZERO Point Offset

The pressure sensor voltage happens to be slightly out of zero level even when it receives no pressure. UTM-1500 memorizes the no pressure level as 0.0MPa.

Key Operation

Press the  $\square$  and  $\square$  buttons.

• Back to Factory Settings

Follow the below key operation to make UTM-1500 back to factory settings.

Key Operation

Power on UTM-1500 with the ENTER and RESET keys being pressed.

• 7-segment, LCD, and Lamp Test

The 7-segment screen and all the lamps are on. The 7-segment screen reads "B.B." and the LCD is in black.

Key Operation

Power on UTM-1500 with the ENTER key pressed.

Monitoring Mode

The monitoring mode is added to the version 1.23 or later UTM-1500. You can check the parameter settings and I/O status without entering programming mode. This allows you to check the settings with the tool running or monitor the I/O status with line control.

Press the ENTER button for 3 seconds to enter the monitoring mode.

• Incomplete Job Detection

The version 1.25 or later UTM-1500 provides the incomplete job detection feature. This error is detected when the operator releases the trigger prematurely before the tool shuts off automatically.

PS Type and CN Type

The PS type of UTM-1500, called UTM-1500 (PS), has a built-in pressure sensor. The CN type of UTM-1500, called UTM-1500 (CN), has a built-in connector, not a pressure sensor.

"PS" stands for Pressure Sensor.

"CN" stands for Connector.

#### Back Panel

UTM-1500 (PS) has an air hose connector on its back panel as there is a pressure sensor inside UTM-1500 (PS). UTM-1500 (CN) has a cable connector on its back panel as it is used with the external pressure sensor.

Back Panel



UTM-1500 (PS)

UTM-1500 (CN)

The pulse count feature is available with UTM-1500 (CN) with the external pressure sensor. The UTM-1500 (CN) also provides the pulse count control as well as the tightening time control. Note that this pulse count feature can be affected by the tool size and work conditions.

How to install

Install the controller steady paying attention to the following points.

Place to be installed

- 1) Inside building free from rain and direct sunlight. It is not waterproof.
- 2) Place without corrosive, ignitable gas, grinding fluid, mist of oil and dust of steel.
- 3) Ventilated place with less damp, trash and dust.
- 4) Place without vibration.
- 5) Place where the power cable can be plugged off promptly in case something got wrong with the controller.

6) Place this system inside a container when you operate it in a three-level contamination environment.

#### **Environmental Conditions**

Item	Condition
Place	In-house use only
Operation temperature	0 – 36 degrees Celsius
Humidity	Less than 90%RH (no dew)
Preservation temperature	0 – 50 degrees Celsius (no freezing)
Preservation humidity	Less than 90% RH (no dew)
Vibration	Less than 5.6 m/s $^2$ (10-60Hz)
Altitude	Less than 1000m
Installation category (Over voltage category)	Category (Note 1)
Contamination	Contamination degree 2 (Note 1)

Note 1: The above categorization is as per IEC664 category (I, II, III) and contamination degree (1, 2, & 3).

This system is categorized as above mentioned installation category II and contamination degree 3.

Note: IEC stands for International electric standard committee.

#### Specifications

Items	Particulars	
Power Source	AC100 — 240V ±10% adaptable	
Frequency	50 / 60 Hz	
Electric Current	Approx. 0.3A (when 100V) – 0.2A (when 230V)	
Outer Dimension	210 (W) x 100 (H) x 200 (D) mm	
	Connector Type : about 2.06 kg	
weight	Pressure Sensor On-board Type: about 2.08 kg	
Display	<ul> <li>2-digit digital display</li> <li>Indication : Remaining count number ("WORK No." at the time of setting value inputting)</li> <li>LCD 20 characters × 4 lines</li> <li>Indication : Setting value, pressure value, alarm message, judgment, fastening time, pulse number</li> </ul>	
Lamp	Fastening number judgment: OK (green)/NOK (red), Size 14x14	
Buzzer	High-tone electronic buzzer. This can be changed to low-tone one.	
Setting Method	Front Panel Key Switch	
	PC (use our original software)	
Terminal Block <b>(Note 1)</b>	<ul> <li>(Input 6 points) (IN 1-6) (Contact-type inputs only)</li> <li>Current drive input method by photo-coupler insulation</li> <li>Voltage : DC24V</li> <li>Input resistance : 4.7 kilo ohm</li> <li>(Output 5 points) (OUT 1-5)</li> <li>Relay output</li> <li>Voltage Consumption : less than DC24V</li> <li>Current Consumption : less than 2A</li> <li>(Valve Output) (Valve terminals)</li> <li>Open-collector method by photo-coupler insulation</li> <li>Voltage : DC24V</li> <li>Current : less than 0.5A</li> </ul>	
Pressure Signal Input	UTM-1500 (CN) : Connector type Pressure sensor incorporated in the tool is connected with connector on the rear panel for power supply and input of analog signals.	
(Maximum pressure 1MPa) (Note 2)	UTM-1500 (PS) : Pressure sensor incorporated type Air hose for signals from the tool is connected with connector on the rear panel. Air pressure signals are converted to electric signals by pressure sensor incorporated in the controller.	
Analog Output	Plug Size: JISC6560 (small, single-head plug $\varphi$ 3.5x15)	
Major Functions	Fastening number control Fastening time control Pulse number control <b>(Note 3)</b> Various judgments	
Others	Two types of controllers are available, one is pressure sensor incorporated type and the other is connector incorporated type as follows: Pressure Sensor Incorporated Type : UTM-1500 (PS) Connector Incorporated Type : UTM-1500 (CN)	

Note 1: Connecting circuit must be SELV.

**Note 2**: Use  $4\phi$  air hose for input to pressure sensor with the pressure less than 1MPa.

**Note 3**: For pulse detection, prepare a 30cm or shorter TM signal hose to connect tool to pressure sensor. There are times when pulse detection is impossible in the case that a less pneumatic pressure fluctuation type tool (like a small tool) is in use and/or depending on the work conditions.

# Structure



## **Tool Connection**

- Make the length of TM Signal air hose between Tool and Pressure Sensor (external pressure sensor/main body incorporated sensor) or Air-electric Relay as short as possible. A lengthy air hose may sometimes cause a delay in detecting pneumatic pressure fluctuations or hinder correct detection. (Shorter than 5m is recommended)
- Use  $4\Phi$  air hose to connect pressure sensor with tool.
- In the case of fastening pulse number detection, the length of TM Signal air hose between Tool and Pressure Sensor must be maintained shorter than 30cm. TM Signal air hose of longer than 30cm will interfere with air pulsation taking during pulsing.
- When using TM Tool or Standard Tool, place Solenoid Valve at an adequate point so as the length of the air hose up to Tool will be maintained as short as possible. When the air hose between Solenoid Valve and Tool is unnecessary lengthy, tool stop timing will be delayed due to residual pressure in the hose even though the valve reacted normally.

#### (1) Shut-off Tool (TM)

- 1. When using UTM-1500(CN) and External Pressure Sensor Assembly
- Place External Pressure Sensor Assembly as close as possible to Tool.



- 2. When using UTM-1500 (RA-CN)
- Same wiring as in the case of without a rack (1).





4. When using Air-electric Relay



- Place Speed Controller when using Air-electric Relay.
- Both UTM-1500 (CN) and UTM-1500 (PS) are acceptable.
- Allocate PS to Input Terminal Block and hook up the cable from Air-electric Relay.

# (2) TM Type Tool

1. When using UTM-1500 (RA-CN)

![](_page_13_Figure_2.jpeg)

2. In the case of without a rack

![](_page_13_Figure_4.jpeg)

(3) Standard Tool

1. When using UTM-1500 (RA-PS)

![](_page_14_Picture_2.jpeg)

2. When using UTM-1500 (CN)

![](_page_14_Figure_4.jpeg)

# **Exterior Features**

(1) Front Side

![](_page_15_Figure_2.jpeg)

1. Power Switch

| : ON

o: OFF

2. Power Lamp (green)

The green LED lamp lights up when the power switch is turned ON.

3. Buzzer

The volume of fastening recognition, NOK and key operation sound can be adjusted each independently.

Low-tone buzzer can also be used alternatively. (Always use the low-tone buzzer at the maximum 5 volume setting as the buzzer does not produce audible sound with low settings.) Part Name: Low-tone buzzer unit (Star PMB-06) Part Number: 910-824-0

4. Judgment Lamp	
Count OK	OK Lamp will light up.
Count NOK	NOK lamp will light up.
Fastening OK	Lamps remain off.
Fastening NOK	NOK lamp will light up.
During MENU screen operation	OK and NOK lamps will light up by turns.

5. 2-digit, 7-segment LED Display

Remaining fastening number will be indicated.

("WORK No." will be indicated if "on a WORK No. basis setting" has been specified on MENU screen.)

6. LCD (20-digit x 4 lines) Display

WORK NO 1	
$P1: \Phi P2: O$	
P.VALUE: 0.35MPa	
OK 1000msec—10PLS	

During measurement

First Line : Selected WORK No.

Second Line : P1, P2 monitor indication. Blow start, shut-off detecting status will be indicated. O means "detecting" and ● means "not detecting".

TOOL TYPE	SHUT-OFF (ULT or other shut-off tools)	TM (TM Type Tool)	NON-SHUT (Standard Tool)
P1	BLOW START Blow start	LEVER ON Lever "ON"	
P2	SHUT-OFF Shut-off	BLOW Blov	/ START v start

P1 : Pressure at Blow start detection monitor

P2 : Pressure at Shut-off detection monitor

Third Line : Pressure value monitor

Fourth Line : "Judge", "Fastening Time", "Pulse Number."

Judgment : Judgment related to fastening operation including OK, PLS. LOW, NOK)

Fastening Time : Time interval between blow start and shut-off

Pulse No. : Blow number from blow start to shut-off in the case of Shut-off Tool.

Blow number during ON timer is in action in the case of TM Tool/Standard Tool.

# Note: There are times when pulse detection is impossible depending on Tool types and/or working conditions.

7. Key Switch (for MENU selection and setting value entry)

- **T.** : Move the cursor by pressing the downward-pointing or upward-pointing arrows.
- ▶ : The right-point arrow key enables you to increase setting values.
- The left-point arrow key enables you to decrease setting values.
- ENTER : Press the ENTER key over 3 seconds to enter the programming mode so that it enables you to select the menu. Press the ENTER key for less than 3 seconds to enter the monitoring mode. The settings of each WORK number are available if you press it. Every time you press this button, the WORK number increases from 1 to 4.
- **EXECUTE:** Press the RESET key to clear the fastening count error. Also, press it to bring you to the RUN mode.

(2) Back Side for CN type

![](_page_17_Figure_1.jpeg)

1. Terminal Block (detachable)

Wiring to Input Terminal must be under no-voltage conditions. Wiring to Output Terminal must be less than DC24V. Always use Y-shape or round crimp-style terminals when wiring.

2. Sensor Cable coupling connector

Pressure Sensor can be installed with the connector removed.

#### 3. ANALOG OUT

Analog signals will be output from Pressure Sensor.

External Pressure Sensor for UTM-1500 or PS type	0.5 Volt at 0.0 MPa $\sim$ 4.5 Volt at 1.0 MPa
Pressure Sensor available locally	1.0 Volt at 0.0 MPa ~ 5.0 Volt at 1.0 MPa

4. PC Connector Hook up the cable from PC.

5. Noise Filter5-1 : Power Cable Connector5-2 : FuseIn case of fusing

When fusing, the product cannot be turned on. There is a possibility that internal components are damaged in case of fusing. Return the product for repair without replacing the fuse.

# Functions

#### Self-Diagnosis Function

Self-diagnosis function will run in the main system at power-on. UTM-1500 will be in a running mode if there is no error detected. Press the every key for 3 seconds. UTM-1500 moves to the MENU screen and it is in a programming mode. UTM-1500 will be programmable after entering the programming mode. While UTM-1500 is in the programming mode, the TM type tool and standard tool, as shown on the page 19, are disabled as solenoid is activated.

Press the **RESET** key to move back to the running mode.

The JUDGE and NOK lamps are on alternately while UTM-1500 is in a programming mode.

Press the key for less than 3 seconds to enter the monitoring mode. The tools are still enabled under the programming mode so that the operators can check the setting values and I/O status while the tools are running. Note that the tools are disabled while UTM-1500 is in a programming mode.

![](_page_18_Picture_6.jpeg)

- Press the **V** keys to select the mode that you wish to change from the menu.
- The selected mode is marked with  $\blacksquare$ , as shown above.
- Press the ENTER key to move to each screen.
- The 7-segment display reads the selected work number if the settings are programmable on the individual work number.
- Press the ENTER key in the individual screen to move to other work number. The display reads the settings value on the specified work number.

SET UP

Function Setting

* * * SET UP * * *		
TOOL SHUT-OF	F TYPE	
SENSOR	: NO DISPLAY	
BLOW START	:0.10 MPa	
SHUT-OFF	: 0.30 MPa	
PULSE LV	: 0.000 MPa	
CUT PULSE No.	: 0	
UPPER PULSE	No. : 0	
LOW PULSE No	. : 0	
■COUNT	: 99	
L. CONT.	: LS1	
W.SEL.TIMING	: NO	
ERROR	: REFASTENING	
CHECK BZ OL	: 5	
NOK BZ VOL.	: 5	
KEY BZ VOL	: 5	
DISPLAY:	Standard	

TOOL (Tool Selection)

Initial Setting: SHUT-OFF TYPE

Select any among three selectable tools; SHUT-OFF TYPE / TM TYPE / NON-SHUT TYPE.

- This selection is common among WORK number 1 ~ 4.

SHUT-OFF TYPE (Shut-off Tool)

- Tool will stop operation automatically upon completing bolt fastening operation, and then TM Signal will be output.
- When SHUT-OFF TYPE is selected, ON (Valve ON Timer) and OFF (Valve OFF Timer) initial values will become "0" respectively.

TM TYPE (TM Type Tool)

- TM Signal will be output during fastening operation. Tool will not stop operation automatically, and fastening time controlling via UTM will become necessary.
- When Shut-off Tool is selected, Valve ON Timer and Valve OFF Timer initial values will become "700" and "800" respectively.

NON-SHUT TYPE (Standard Tool)

- As TM Signal will not be output in this case, Tool Blow Start will be sensed using Tool's hand pressure. Tool will not stop operation automatically, and fastening time controlling via UTM will become necessary.
- When Standard Tool is selected, ON and OFF initial values will become "700" and "800" respectively.

SENSOR (Pressure Sensor Input Type) Initial Setting : NO DISPLAY Select any among three selections; NO DISPLAY / DISPLAY / RELAY BOX • This selection is common among WORK number 1 ~ 4.

NO DISPLAY Private external Pressure Sensor Assembly. Sensor incorporated in Tool or Controller.

DISPLAY Pressure sensor with a digital display (Note: Not used normally)

RELAY BOX Select when you use Air-electric Relay (without using Pressure Sensor). Place the input from air-electric relay to the PS input terminal.

![](_page_20_Picture_4.jpeg)

NO DISPLAY (Private external Pressure Sensor)

BLOW START/LEVER ON [MPa] (Blow Start Pressure / Fastening Start Pressure)

Measurement Start Pressure

	Shut-off Tool	0.10
Initial Value	TM Type Tool	0.10
	Standard Tool	0.50

Setting Range 0.00 ~ 1.00

- When using Shut-off Tool, the corresponding name will be BLOW START, and set a pressure value to effect Tool blow detection.
- When using TM Tool (not Shut-off) or Standard Tool, the corresponding name will be LEVER ON, and set a pressure value to effect Tool free-running detection.
- This setting is common among WORK number 1 ~ 4.

SHUT-OFF / BLOW START [MPa]	(Shut-off Pressure/Blow Start Press	ure)
	Shut-off Tool	0.30
Initial Value	TM Type Tool	0.20
	Standard Tool	0.30

Setting Range: 0.00 ~ 1.00

- When using Shut-off Tool, the corresponding name will be SHUT-OFF, and set a pressure value to effect Tool Shut-off signal detection.
- When using TM Type or Standard Tool, the corresponding name will be BLOW START, and set a pressure value to effect Tool blow detection.
- This setting is common among WORK number 1 ~ 4.

PULSE LV [MPa] (Pulse Detection Pressure)

Setting Range : 0.000 ~ 1.000

Initial Value : 0.000

- This is a setting to enable pulse detection.
- PULSE Pulses of less than PULSE LV will not be counted.
- Perform setting works under Auto Setting or by referring to waveforms saved on PC.
- This setting is common among WORK number 1 ~ 4.

**Note:** Pulse detection will sometimes become impossible in the case that Tool of less pneumatic pressure fluctuation type at pulsation (small tool or the like to be more specific) is in use or depending on work conditions.

#### CUT PULSE No. (Cut Pulse Number)

Setting Range : 0 ~ 999

Initial Value : 0

- In the case of  $1 \sim 999$  setting, Valve Output will take place when the pulse number input reached the preset pulse number to stop Tool.
- In the event that you do not use this function, make this setting 0.
- This setting is programmable on each WORK number, which is applicable to the V1.20 or later. If your software is earlier than V1.20, the setting is common amount WORK number  $1 \sim 4$ .

UPPER PULSE No. (Upper Pulse Number)

:0

Setting Range : 0 ~ 999

Initial Value

- This is the upper limit for pulse number judgment. When the pulse number measured stepped across the preset number, Pulse HIGH NOK will result.
- This setting is programmable on each WORK number, which is applicable to the V1.20 or later. If your software is earlier than V1.20, the setting is common amount WORK number  $1 \sim 4$ .

• In the case of 0 setting, pulse number upper limit judgment will not be performed.

Reaction in the case of Pulse HIGH NOK detection:

- LCD Display : [Pulse High Error]
- Buzzer : ON
- Output Terminal : FAS. NOK will be output

- In the case that ERROR (refastening at fastening NOK) is set to REFASTENING (fastening NOK clear at refastening operation start), the next fastening operation will reset error conditions:
- RESET key operation or RESET terminal input.

LOW PULSE No. (Lower Pulse Number)

Setting Range : 0 ~ 999

Initial Value : 0

- This is the lower limit for pulse number judgment. When tool becomes shut-off condition before the pulse number measured reached the preset number, Pulse LOW NOK will result.
- This setting is programmable on each WORK number, which is applicable to the V1.20 or later. If your software is earlier than V1.20, the setting is common amount WORK number 1 ~ 4.
   In the case of 0 setting, pulse number lower limit judgment will not be performed.

Reaction in the case of Pulse LOW NOK detection:

- LCD Display : [Pulse Low Error]
- Buzzer : ON
- Output Terminal : FAS. NOK will be output

Error Condition Resetting

- In the case that ERROR (refastening at fastening NOK) is set to REFASTENING (fastening NOK clear at refastening operation start), the next fastening operation will reset error conditions.
- RESET key operation or RESET terminal input.

COUNT (Fastening Number)

Initial Value : 99

Setting Range : 0 ~ 99

- Set intended fastening number.
- This is on-a-WORK number basis setting.

Note that the work number can be selected when you press the *ENTER* key in a programming mode. The 7-segment LED reads the work number that is being programmed.

L. CONTR. (Fastening Number Count Operation Mode Selections)

Initial Setting : LS1

- Select Line Control Mode to be used during Fastening Number Count.
- This setting is common among WORK number  $1 \sim 4$ .
- The tool is disabled outside the operating range as the solenoid is activated. Note that the shut-off tool with no solenoid is still enabled even if it is outside the operating range.
- Note that QL Terminal accepts inputs outside the operating range particularly specified using this function.

#### LS1

 All-the-time fastening number counting down ready condition will be rendered, and judgment will be made on Limit Switch input. COUNT OK judgment will be given when the preset fastening COUNT number is attained, and ready-to-start the next work fastening operation status will be brought about when LS1 has been input and the old fastening number has been cleared. If the preset fastening number is not attained at the time of LS1 input, COUNT NOK judgment will be given. In this case, COUNT OK judgment will result when the remaining fastening operation has been completed.

![](_page_23_Figure_8.jpeg)

LS1 · LS2

- Fastening operation range will be defined. Operation will start (counting down ready condition) on LS1 input.
- When the preset fastening number is attained before LS2 input, fastening operation will finish.
- COUNT NOK judgment will be given when the preset fastening number is not attained at the time of LS2 input, and in this case, fastening operation will finish when COUNT OK condition resulted through NG handling operation.

![](_page_24_Figure_4.jpeg)

#### $\text{LS1} \cdot \text{LS3} \cdot \text{LS2}$

• Fastening operation range will be defined. Operation will start (counting down ready condition) on LS1 input. COUNT NOK judgment will be given when the preset fastening number is not attained at the time of LS3 input, and in this case, the range up to LS2 input ON will become NG handling range. Fastening operation will finish at the time of LS2 input.

![](_page_24_Figure_7.jpeg)

## LS1 + TIMER

- Fastening operation will start at the time of LS1 input, and the line control timer will also start. When the preset fastening number is attained, COUNT OK will result, and then LS1 input will be accepted only after COUNT OK terminal output (output duration time can be set by using COUNT OK output timer).
- If the line control timer has become time-out before completing the preset fastening number, COUNT NOK will result. In this case, fastening operation will finish when COUNT OK judgment is given through NOK handling.
- Note that COUNT OK terminal output holding (set value: 0) can not be selected when this function is in use.

![](_page_25_Figure_4.jpeg)

#### TIMER

- In this method, Limit Switch will not be provided, and the line control timer gets started by utilizing the initial fastening judgment or QL wrench input.
- COUNT OK judgment will be given when the preset fastening number is attained, and the next coming work fastening operation will become ready when COUNT OK output (output duration time can be set by using COUNT OK output timer) is turned OFF.
- If the line control timer has become time-out before completing the preset fastening number, COUNT NOK will result. In this case, fastening operation will finish when COUNT OK judgment is given through NOK handling.
- Note that COUNT OK terminal output holding (set value: 0) can not be selected when this function is in use.

![](_page_25_Figure_10.jpeg)

Initial fastening judgment

W. SELECT INPUT

- Fastening operation will start upon WORK SELECT 1 ~ 4 input.
- When the preset fastening number is attained, Work number specific COUNT OK will be output (output duration time can be set by using COUNT OK output timer).
- When the preset fastening number is not attained at the time of WORK switching input OFF condition, COUNT NOK will result.
- In addition, when WORK SELECT input is turned OFF before attaining the preset fastening number, COUNT NOK will result.

![](_page_26_Figure_5.jpeg)

#### W. SEL. TIMING (WORK No. switching timing)

Initial Setting : NO (without timing)

• This setting is common among WORK number  $1 \sim 4$ .

Particulars

NO (without timing)

- WORK number switching will take effect immediately after WORK SELECT input condition has been changed.
  - YES (with timing)
- The following timings will be interposed at the time of WORK number switching.
- 1. At the time of Front Panel RESET key input
- 2. At the time of RESET terminal input
- 3. At the time when COUNT OK lamp is turned off

ERROR (refastening at the time of fastening error)

Initial Setting: REFASTENING (fastening NOK will be cleared upon refastening operation start)

- Select refastening at the occasion of fastening errors.
- This setting is common among WORK number 1 ~ 4.

Particulars

REFASTENING (Fastening NOK clearing at refastening operation start)

- Fastening error will be cleared at the time of refastening operation start. NO RE-F (refastening will not be accepted until Fastening NOK RESET)
- When a fastening error (initial error/cycle error) occurs under this setting, the next fastening signals cannot be accepted until such error condition has been cleared by inputting Fastening NOK RESET. When TM Type Tool or Standard Tool is in use, VALVE ON status will be kept ON until such error condition has been cleared, and the next fastening operation cannot be accepted without error cancellation.

CHECK BZ VOL. (Fastening Operation Check Buzzer Sound)

Initial Value : 5

Setting Range : 0 ~ 5

- This buzzer sounds to give operators a count-down signal at the time of Fastening OK or QL input.
   0: no sound 1: low-volume ~ 5: high-volume
- The buzzer will turn ON for 1-pulse duration at count-down and turn ON for 2-pulse duration at Count OK.
- This setting is common among WORK number 1 ~ 4.
- Be sure to set to Level 5 when you use the low-tone buzzer.

NOK BZ VOL. (NOK Buzzer Sound)

Initial Value : 5

Setting Range : 0 ~ 5

- This buzzer sounds to give operators Fastening NOK or Count NOK signals.
   0: no sound 1: low-volume ~ 5: high-volume
- This setting is common among WORK number 1 ~ 4.
- Be sure to set to Level 5 when you use the low-tone buzzer.

KEY BZ VOL. (Buzzer Sound at Key Operation) Initial Value : 5 Setting Range : 0 ~ 5

This buzzer sounds to give operators power-on and/or key-in signals.

0: no sound 1: low-volume ~ 5: high-volume

- This setting is common among WORK number 1 ~ 4.
- Be sure to set to Level 5 when you use the low-tone buzzer.
- Enter 5 when you use the low-tone buzzer.

DISPLAY (LCD Display Selection)

Select any of the following LCD display options to view under Operation Mode. Selections: Standard (initial setting) or Fas. time

Standard

• Items on display

WORK Number, Pressure Detecting Status, Current Pressure Value, Judgment, Fastening Time and Pulse Number

[Example]

WORK No.: 1 P1:O P2:O P.VALUE: 0.00—MPa OK 1234msec—10PLS

Fas. Time (Fastening Time)

• Items on display

Only fastening time will be displayed at full scale using all 4 lines [Example]

![](_page_28_Picture_16.jpeg)

Display switching is allowable also under Operation Mode. Switch to "Fas. Time" by pressing for longer than 2 seconds and switch to "Standard" by pressing for longer than 2 seconds Incomplete Job Error Detection Initial Setting : NO

Particulars

NO

Incomplete job error will not be detected.

YES

Incomplete job error is detected.

This error is detected when the trigger is released before a shut-off tool shuts off.

This error is detected when the trigger is released before the time settings for TM type tool is up.

Reaction in the case of incomplete job error detection:

- LCD Display : [Incomplete Job Error]
- Buzzer : ON
- Output Terminal : FAS. NOK will be output

Error Condition Resetting

- In the case that ERROR (refastening at fastening NOK) is set to REFASTENING (fastening NOK clear at refastening operation start), the next fastening operation will reset error conditions.
- RESET key operation or RESET terminal input.

Note that you need to make the setting of ST. DELAY to use this function.

# AUTOMATIC SET UP (automatic setting)

This Automatic Set Up function performs automatic pressure setting by utilizing the pressure variation obtained through Tool free running and practical fastening operation.

(1) Select the "NO DISPLAY" setting from SENSOR from the SETUP screen.

(2) Tool Selection

![](_page_30_Picture_4.jpeg)

1. Select Tool you will use and press **ENTER** key.

(3) Measurement of Pressure at Free Running

![](_page_30_Picture_7.jpeg)

- 1. Run your Tool for 2~3 seconds under no-load, and then release the lever. (Run your Tool with the socket and bit removed from Tool end.)
- 2. UTM-1500 reads the pressure level, if the pressure level exceeds 0.05 MPa. Note that the pressure level is 0.1 MPa if the UTM-1500 is version 1.25 or earlier.
- 3. The buzzer sounds when the controller has read pressure value, and the measured pressure value will be on display.
- 4. Run your tool again under no-load when re-measurement is necessary.
- 5. Press ENTER key when pressure value is obtained normally.
- (4) Measurement of Blow Pressure / Shut-off Pressure (in the case of SHUT-OFF selection)

![](_page_30_Figure_14.jpeg)

- 1. Start fastening operation with a bolt seated. In the case that Shut-off Tool is in use, perform fastening operation until shut-off.
- 2. The buzzer sounds when the controller has read pressure values, and the measured pressure values will be on display.
- 3. Return to 1 when re-measurement is necessary, and press key when pressure values are obtained normally.

(5) Set Value Display

LEVER ON	: 0. <b>* *</b> Mpa
SHUT-OFF	: 0. <b>* *</b> Mpa
PULSE LV	:0. <b>* * *</b> Mpa
1 – PULSE	: * * * * msec

- 1. Pressing **ESET** key will call up the previous screen (Blow/Shut-off Pressure Measurement).
- 2. Pressing key will call up MENU screen upon rewriting the setting values.
- 3. You may perform re-measurement also at this stage by repeating fastening operation.

#### TIMER

																		Þ
*	*		*		т	I	М	Е	R		*		*		*			
I N	I	Т	I	А	L		E		:			0		m	s	е	с	
CY	С	L	Е		E		:					0		m	s	е	с	
L.	С	0	Ν	Т	R		:			1	0	0		s	е	с		
WA	R	Ν	I	Ν	G		:					0		m	s	е	с	
ΟN							:			7	0	0		m	s	е	с	
OF	F						:			8	0	0		m	s	е	с	
ОК							:		1	0	0	0		m	s	е	с	
СО	U	Ν	т		0	K	:		1	0	0	0		m	s	е	с	
1 —	Ρ	U	L	S	Е		:		1	0		0		m	s	е	с	
QL		t	i	m	е		:			1	0	0		m	s	е	с	
																	_	4

INITIAL. E [msec] (initial error detection timer)

Initial Value : 0

Setting Range  $: 0 \sim 9999$  (0 setting when you do not use this function)

Functions

- Timer will start at the time when the pressure attained the preset fastening start pressure, and error will be detected when the preset shut-off pressure is attained before time-out.
- This function is used for re-hit and cross-thread detection.
- This is on-a-WORK number basis setting.

CYCLE. E. [msec] (cycle error detection timer)

Initial Value : 0

Setting Range  $: 0 \sim 9999$  (0 setting when you do not use this function.) Functions

- Timer will start at the time when the pressure attained the preset fastening start pressure, and cycle error will be detected before the preset shut-off pressure is attained.
- This is on-a-WORK number basis setting.

L. CONTR. [sec] (line control timer)

Initial Value : 100 Setting Range : 1 ~ 999 Functions

- This function is used to effect fastening number count operation based on timer control.
- This is on-a-WORK number basis setting.

#### WARNING [sec] (alarm output timer)

Initial Value : 0

Setting Range : 0 ~ 999

- Use this function when an alarm output before line control timer time-out timing is necessary.
- Terminal outputs allocated to alarm outputs will turn ON before the alarm output timer preset time from the line control timer time-out. Alarm outputs will turn OFF at the time of line control timer time-out timing or at the time of Count OK (line control judgment).
- This is on-a-WORK number basis setting.

ON [msec] (ON Timer)

Initial Value : 0

Setting Range : 0 ~ 9999

• This is on-a-WORK number basis setting.

OFF [msec] (OFF Timer)

Initial Value : 0

Setting Range : 0 ~ 9999

• This is on-a-WORK number basis setting.

OK [msec] (Fastening OK Output Timer)

Initial Value : 1000

Setting Range  $: 0 \sim 9999$  (Output will be held up to the next fastening start point in the case of 0 setting.)

Functions

- This is fastening OK terminal's output time.
- Output will be turned OFF even before time-out timing in the case that the next fastening operation gets started during Fastening OK Output.
- This is on-a-WORK number basis setting.

COUNT OK [msec] (Count OK Output Timer)

#### Initial Value : 1000

Setting Range:  $0 \sim 9999$  (Output will be held up to the next fastening start point in the case of 0 setting.)

Functions

- This is Count OK terminal's output time.
- Output time will be 1000msec at the maximum when the next fastening operation got started during Count OK output or when Count OK resulted after Count NOK. (In the case of less than 1000msec settings, Turn OFF at the time when the preset time has been attained.)
- You are not able to set the COUNT OK (Count OK Output Timer) to 0 when the L.CONT. of SET UP is set to the TIMER.
- This is on-a-WORK number basis setting.

1-PULSE [msec] (Lowest Pulse Range)

Setting Range : 0 ~ 9999

Functions

- This is Pulse Detection Timer.
- Pulses with a pulse fall time of longer than 1-pulse will be judged as a pulse.
- Perform setting works under Auto Setting or by referring to waveforms saved on PC.

Note: Pulse detection will sometimes become impossible in the case that Tool of less pneumatic pressure fluctuation type at pulsation (small tool or the like to be more specific) is in use or depending on work conditions.

QL time [msec] (QL Wrench Anti-chattering Timer)

Setting Range : 0 ~ 9999 Functions

- This setting is specifically designed to avoid duplicate count at one time QL due to chattering during QL wrench operation.
- Even though Input is turned ON within the preset time after QL terminal Input is turned OFF, countdown will not be performed.

ST. DELAY [msec] (Start Delay Timer)

Setting Range : 0 ~ 9999

Functions

- The incomplete job error will not be detected while this timer is activated after the tool is triggered.
- The incomplete job error can be detected when UTM-1500 (CN) is used. When you pull the trigger, the external pressure sensor picks up the hike in air pressure that is as close as the pressure level of tool shut-off. Use this timer to disable the incomplete job error.
- Run the tool to check the pressure level on the programming software (Incomplete Job of SETUP screen). Decide the best duration based on the actual pressure level.

![](_page_33_Figure_17.jpeg)

TERMINAL ALLOCATION (Terminal Block Input / Output Alternatives)

TER	MINAL ALLOCATION
∎IN1	:LS1
IN2	:RESET
IN3	:NOK RESET
IN4	:QL
IN5	:W.SEL.A
IN6	:W.SEL.B
OUT1	COUNT OK
OUT2	COUNT NOK
OUT3	:FASTENING OK
OUT4	:FASTENING NOK
OUT5	:BUZZER

(1) Choice among terminal block input alternatives

- Choose input signal alternatives for use in Input Terminal Block IN1 ~ 6.
- This setting is common among WORK number 1 ~ 4.

**Initial Setting** 

IN1 : LS1	IN2 : RESET	IN3 : NOK RESET
IN4 : QL	IN5 : WORK SELECT A	IN6 : WORK SELECT B

Alternatives (Pick up 6 among the following alternatives)

●LS1	●LS2	•LS3	<ul> <li>RESET</li> <li>NOK RESET</li> </ul>
●QL	<ul> <li>PASS</li> </ul>	•W. SEL. A	●W. SEL. B
•W. SEL. 1	- W. SEL. 4	●PS	
Particulars			
LS1/LS2/LS3			

- Limit Switch 1  $\sim$  3. These inputs are used for line control. Refer to P16  $\sim$  19 for more details on Line Control.

#### RESET

- Count balance/judgment, fastening judgment and others will be cleared entirely and System will be placed in the initial state at power-on.

NOK RESET

• Fastening NOK status will be cleared. Fastening error conditions like an initial error and cycle error will be cleared.

QL

- Fastening numbers remained due to Tool breakdown or inadvertent fastening omission will be counted down when additional fastening operation has been performed with a micro-switch installed Torque Wrench connected to QL terminal.
- It will be counted down regardless of operating range.

PASS

Inputting PASS will forcefully bring about COUNT OK status.

WORK SELECT A / WORK SELECT B (Not usable with W. SEL. 1 ~ 4 simultaneously)

- These inputs are used to allow work number selection and useful to switch 4 types of works with 2 inputs.
- WORK No. Selection Patterns

	WORK SELECT – Input Status				
	A	В			
1	OFF	OFF			
2	ON	OFF			
3	OFF	ON			
4	ON	ON			

WORK SELECT  $1 \sim 4$  (Not usable with W. SEL. A & B simultaneously)

- These inputs are used to allow work number selection and useful to switch 4 types of works with 4 inputs.
- WORK Number Selection Patterns

	WORK SELECT – Input Status					
	1	2	3	4		
1	ON	OFF	OFF	OFF		
2	OFF	ON	OFF	OFF		
3	OFF	OFF	ON	OFF		
4	OFF	OFF	OFF	ON		

PS

• For Air-electric relay signal inputting.

(2) Choice among terminal block output alternatives

- Choose output signal alternatives for use in Output Terminal Block OUT1 ~ 5.
- This setting is common among WORK number 1 ~ 4.

Initial Setting OUT 1 : COUNT OK OUT 2 : COUNT NOK OUT 3 : OK (Fastening OK) OUT 4 : NOK (Fastening NOK) OUT 5 : BUZZER (Buzzer Output)

Alternatives (Pick up 5 among the following alternatives)

●COUNT OK	•COUNT NOK	●OK	<ul> <li>NOK</li> </ul>
<ul> <li>BUZZER</li> </ul>	<ul> <li>WARNING</li> </ul>		
•W. 1. C. OK	•W. 2. C. OK	•W. 3. C. OK	•W. 4. C. OK
•CYCLE COUNT 1	<ul> <li>CYCLE</li> </ul>	COUNT 2	
•PULSE NOS. 1		•PULSE NOS. 2	

## Particulars

COUNT OK

- COUNT OK external output signal
- Output duration can be set on Count OK Output Time Timer.

### COUNT NOK

- COUNT NOK external output signal. This signal will be output when the predetermined fastening number has not been attained before judgment.
- This output signal will be kept on during COUNT NOK.
- This output signal remains on until the remaining fastening number has been cleared by adding fastening operation or OK condition has resulted by using PASS or NOK status has been cleared by RESET inputting.

OK

- Fastening OK external output signal
- Output duration can be set on Fastening OK Output Time Timer.

## NOK (Fastening NOK)

- This signal will be output at the time of an initial or cycle error.
- This output signal remains on until Fastening OK will be given by performing additional fastening operation or error conditions have been cleared by RESET or Fastening NOK RESET inputting.

BUZZER (output for Buzzer)

- Use this option when an external buzzer will be used.
- Signal output ON timing is the same as the buzzer mounted on System. This buzzer does not produce sound at the time of key operation.

WARNING (alarm output)

- This signal will be output from the Warning Output Timer's time-out to Count OK or to Line Control Timer's time-out.

W. \*. C. OK (WORK \* COUNT OK) \* : 1 ~ 4

• Select this output when COUNT OK output becomes necessary on a Work No. basis.

#### CYC. COUNT 1/2 PULS. NOS. 1/2

• This signal will be output when Cycle Count or Cumulative Pulse attained the value preset using Tool management OUT SET.

# WIRING DIAGNOSIS (Terminal Block Wiring Diagnosis)

Wiring diagnosis will be performed through monitoring input status of external wires mated to UTM-1500 Input Terminal Block and through Output Terminal Block forced output.

![](_page_37_Picture_2.jpeg)

1 ~ 6 : Terminal Block No. (IN1 ~ 6  $\cdot$  OUT1 ~ 6)

- V : VALVE Terminal
- O : Terminal's input or output is OFF condition.
- : Terminal's input or output is ON condition.

(1) Input Wiring Diagnosis

- O indicate the absence of Terminal Block input.
- • Indicate the presence of Terminal Block input.

(2) Output Wiring Diagnosis

- Select any of the terminals by touching 
   "\_" at the bottom.
- Press ENTER key to switch between the selected output terminal's ON/OFF.
- At the start of WIRING DIAGNOSIS screen, OUT 1~6 will be under OFF "O" state and VALVE will be under ON "●" status.

Note that you will see the input / output monitor screen under the monitoring mode. UTM-1500 is not forced to send the compulsory output and you can monitor the input / output status.

MEMORY

* *	*	MEMORY	*	*	*	
■WORK		: 1 (125)				
DISPLAY		: DATA				
ERASE		: 1				

WORK

Make a choice among 1, 2, 3, 4, and ALL alternatives by using keys and specify WORK No. to call up on DISPLAY column.

When ALL is selected, data pertaining to WORK  $1 \sim 4$  will be displayed altogether. Numbers to be shown in parenthesis indicate data number.

#### DISPLAY

Select any of the items to call up.

DATA : Numeric data in memory will be displayed.

ANALSIS : Mean values and/or sigma values will be displayed.

• When INTER is pressed down, the particulars of the item selected at DISPLAY column according to the Work No. selected at WORK column will be displayed.

ERASE

Make a choice among 1, 2, 3, 4, and ALL (1~4 all inclusive) by using keys and specify WORK No. of which memory data you intend to erase.

When **EXTER** is pressed, memory data corresponding to the selected WORK No. will be erased.

#### BAUD RATE (transmission speed)

![](_page_38_Picture_14.jpeg)

Set data transmission speed matching PC you will use.

Initial Value : 38400 [bps] Setting Values : 19200, 38400, 57600, 115200

## **Tool Management**

This function is specifically designed to notify operators of Tool maintenance timing, and when the preset Cycle Count or Cumulative Count has been attained, the timing will be notified through the means of LCD display, Buzzer and Terminal Block output.

Cycle Count : Current total fastening number of Tool now in use.

"CYC. COUNT" will be indicated on LCD display.

Cumulative Count

: Current total pulse number of Tool now in use. "PULS. NOS." will be indicated on LCD display.

![](_page_39_Picture_6.jpeg)

## (1) TOOL

Make entries necessary to specify Tool; including Tool No. and Model.

![](_page_39_Picture_9.jpeg)

How to make entries

- Put the cursor on any alphanumeric, space, "-"and "." character arranged on the 3<sup>rd</sup> and 4<sup>th</sup> lines by moving the arrow key and press **EXTER** key.
- To erase the last character of TOOL column, touch RESET key.
- To return to Tool Management MENU screen, press [INTER] key while putting the cursor on END.
- Up to 15 characters can be entered.

(2) OUT SET

Enter Cycle Count and Cumulative Pulse Number intended for maintenance works.

* OUT CYC. 0 CYC. 0 PULS. PULS.	SET * COUNT1 COUNT2 NOS. 1 NOS. 2	: 100000 : 200000 : 1000000 : 2000000
CYC. COUNT1	: Cycle Co	ount 1
CYC. COUNT2	: Cycle Co	ount 2
Setting Range	: 0 ~ 999	9999

You must make setting CYC. COUNT1 < CYC. COUNT2. Making a check of Tool at CYC. COUNT1

timing and exchanging Tool at CYC. COUNT2 timing is one example of use of this setting. When you do not use this function, set the numbers "0".

PULS. NOS. 1 : Cumulative Pulse 1

PULS. NOS. 2 : Cumulative Pulse 2

Setting Range : 0 ~ 9999999 pulses

You must make setting PULS. NOS. 1 < PULS. NOS. 2. Making a check of Tool at PULS. NOS. 1timing and exchanging Tool at PULS. NOS. 2 timing is one example of use of this setting. There are times when pulse detection is impossible depending on Tool types and the working conditions and/or according to the distance between Tool and Pressure Sensor. When you do not use this function, set the numbers "0".

Reaction in the event that Cycle Count or Cumulative Pulse number is attained the preset values:

1. Window Display

![](_page_40_Picture_7.jpeg)

- Corresponding messages like "CYC. COUNT1" or "PULS. NOS.2" will flash on the right of "P1 :
   P2 : O". (Messages to display can be altered on your PC.)
- When CYC. COUNT and PULS. NOS. were output at one time, CYC. COUNT and PULS. NOS. messages will be displayed by turns.

2. Buzzer

- When CYC. COUNT1, PULS. NOS. 1 has been attained, the buzzer will turn ON for 1 second and OFF for 1 second repeatedly until you press key.
- When CYC. COUNT2, PULS. NOS.2 has been attained, the buzzer will be kept ON until you
  press ENTER key.

#### 3. Terminal Block Output

In the case that the following output items were allocated to Terminal Block as explained earlier in "TERMINAL ALLCATION" section, outputs will be produced when Cycle Count and Cumulative Pulse attained preset values.

CYCLE COUNT 1 CYCLE COUNT 2 PULSE NOS. 1 PULSE NOS. 2

## (3) CUMULATIVE COUNT

Current Cycle Count and Cumulative Pulse Number Display and Clear:

![](_page_41_Figure_2.jpeg)

CYC. COUNT : Current cycle count

PULS. NOS. : Current cumulative pulse number

CLEAR : Cycle count and cumulative pulse number clearing

- Selecting CLEAR will call up the following window.
- Selecting YES will clear the current cycle count and cumulative pulse number and then call back CUMULATIVE COUNT screen.
- Selecting NO will call back CUMULATIVE COUNT screen without clearing the numbers.

![](_page_41_Picture_9.jpeg)

## Pressure Value Setting

Pressure value setting without using Automatic Setting Function

(1) In the case of Shut-off Tool (TM)

- Connect tool in the first place
- Touch **EXTER** key for more than 3 seconds and start "MENU" screen.
- Set TOOL to SHUT-OFF TYPE on "SET UP" screen.
- Then, select "SENSOR". Select "NO DISPLAY" when a private pressure sensor will be used and select "DISPLAY" when a digital pressure sensor will be used.
- Return to "MENU" screen by touching **RESET** key, and touch **RESET** key again to return to the measurement screen.
- Read Free Running, Blow and Shut-off pressure values on the measurement screen.
- Enter a midrange value between Free Running and Blow pressures in the "LEVER ON" column on the "SET UP" screen.
- Enter a midrange value between Blow and Shut-off pressures in the "SHUT-OFF" column.
- Check operating conditions on the measurement screen.

(2) In the case of TM Type Tool

- Connect Tool in the first place.
- Touch **EXTER** key for more than 3 seconds and start "MENU" screen.
- Set TOOL to TM TYPE on "SET UP" screen.
- Then, select "SENSOR".
- Return to "MENU" screen by touching **RESET** key, and touch **RESET** key again to return to the measurement screen.
- Read Free Running and Blow pressure values on the measurement screen.
- Enter a value not exceeding Free Running pressure in LEVER ON column on "SET UP" screen.
- Enter a midrange value between Free Running and Blow pressures in the "BLOW START" column.
- Check operating conditions on the measurement screen.

(3) In the case of Standard Tool

- Connect Tool in the first place.
- Touch **EXTER** key for more than 3 seconds and start "MENU" screen.
- Set TOOL to NON-SHUT TYPE on "SET UP" screen.
- Then, select "SENSOR".
- Return to "MENU" screen by touching **RESET** key, and touch **RESET** key again to return to the measurement screen.
- Read Tool Stop, Free Running and Blow pressure values on the measurement screen.
- Enter a midrange value between Tool Stop and Blow pressures in the "LEVER ON" column on "SET UP" screen.
- Enter a midrange value between Free Running and Blow pressures in the "BLOW START" column.
- Check operating conditions on the measurement screen.

# Analog Output

How to measure the pressure waveform

You can learn how to measure the pressure waveform from UTM-1500 using Memory HiCORDER or digital storage oscilloscope.

1. Make sure to verify that the correct settings are entered into UTM-1500.

Set the SENSOR settings on the Set-up screen to NO DISPLAY (private external pressure sensor) or DISPLAY (locally available type). Make sure to match the sensor with the selected sensor type.

2. Connect the measuring device to the Analog Out terminal of UTM-1500.

![](_page_43_Figure_6.jpeg)

Black end of UK-PLUG : Pressure Signal Black end of UK-PLUG : 0V for GND

3. Measure the pressure waveform.

#### ANALOG OUT Terminal

The analog signal from pressure sensor is output in real time.

1) To calculate the pressure value from the analog output use formula:

Analog Output [MPa] = (Output Voltage – 0,5V) x 0.25

Note that the output voltage from URYU external pressure sensor ranges from 0.5V at 0.0MPa to 4.5V at 1.0MPa.

2) ANALOG OUTPUT Terminal

Plug Size JIS C6560 sub-miniature phone plug 3.5mm diameter x 15mm

Error

#### Tightening Error message

Initial E (Initial Error)

![](_page_44_Figure_3.jpeg)

Particulars

- This function is used for re-hit and cross-thread detection.
- This error is detected when a tool shuts off before the initial error timer is up. This timer starts after the pressure reaches the blow start level.

Error Condition Resetting

- Re-tighten the incorrect fastener.
- Check the work condition to correct re-hit and cross-thread fastener.
- Check the fastener and work condition.
- Review the blow start level or shut-off level.
- Review the INITIAL E timer settings if the tightening is correct. Determine the timer range based on the actual time.
- Enter 0 if you do not use this function.

Cycle E (Cycle Error)

![](_page_44_Figure_15.jpeg)

Particulars

- Tool performance down
- Slip-off or cam-out
- A tool runs without tightening a fastener.
- This error is detected when a tool has not shut off although the cycle error timer is up. This timer starts after the pressure reaches the blow start level.

- Re-tighten the incorrect fastener.
- Check the work condition to correct misaligned fastener.
- Check the fastener and work condition.
- Review the CYCLE E timer settings if the tightening is correct. Determine the timer range based on the actual time.
- Enter 0 if you do not use this function.

PULSE HIGH Error

![](_page_45_Figure_1.jpeg)

Particulars

- Tool performance down
- This error is detected when UTM-1500 reads more pulses than the preset UPPER PULSE limit.

Error Condition Resetting

- Re-tighten the incorrect fastener.
- $\cdot$  Check the work condition to correct misaligned fastener.
- Check the fastener and work condition.
- Review the UPPER PULSE number settings if the tightening is correct. Determine the pulse range based on the correct tightening.
- Enter 0 if you do not use this function.

PULSE LOW Error

![](_page_45_Figure_12.jpeg)

Particulars

- This function is used for re-hit and cross-thread detection.
- This error is detected when the tool shuts off without exceeding the preset LOWER PULSE limit.

- Re-tighten the incorrect fastener.
- Check the work condition to correct re-hit and cross-thread fastener.
- Check the fastener and work condition.
- Review the blow start level or shut-off level.
- Review the LOWER PULSE number settings if the tightening is correct. Determine the pulse range based on the correct tightening.
- Enter 0 if you do not use this function.

Incomplete Job Error

![](_page_46_Figure_1.jpeg)

Particulars

• The trigger is released before the tool shuts off.

- Re-tighten the incorrect fastener.
- Check the fastener and work condition.
- Review the blow start level or shut-off level.

Possible Unit Error

RAM Error

![](_page_47_Picture_2.jpeg)

Particulars

• The RAM chips on PC board are down and / or malfunctioning.

Error Condition Resetting

- Power on UTM-1500 to clear the error. If it still fires the error, send the unit for repair.
- The UTM-1500 can still run if you can clear the error by pressing the  $\mathbb{R}^{\text{RESET}}$  key.

**ROM Error** 

![](_page_47_Picture_9.jpeg)

Particulars

The ROM chips are down and malfunctioning.

Error Condition Resetting

- Power on UTM-1500 to clear the error. If it still fires the error, send the unit for repair.
- The UTM-1500 can still run if you can clear the error by pressing the  $\mathbb{R}^{\text{RESET}}$  key.

**EEPROM Error** 

![](_page_47_Picture_16.jpeg)

Particulars

• The changes in the settings will not be stored on the EEPROM unit.

- Replace the UTM-1500 by new one.
- The error can be cleared if you press the key. However, the settings changes will not be effective correctly.

#### Other Errors

Phenomenon

• Air pressure value will not be displayed.

Probable Cause

• The SENSOR is set to RELAY BOX, not NO DISPLAY.

Error Condition Resetting

• Verify that the SENSOR is set to NO DISPLAY.

Phenomenon

• No decimal point in the pressure level will be displayed.

Probable Cause

• The PC board inside UTM-1500 may have the A/D error.

Error Condition Resetting

- Replace the UTM-1500.
- The broken pressure sensor cable may cause this error. Replace the pressure sensor cable, if necessary.

Phenomenon

• AUTOMATIC SET UP is not programmable.

Probable Cause

- Incorrect settings of SENSOR and / or TOOL entered
- The pressure difference inside tool is so small that UTM-1500 cannot pick up the differences.
- The pressure sensor may be broken.

Error Condition Resetting

- Review the settings of SENSOR and / or TOOL.
- Replace the pressure sensor, pressure sensor cable, or UTM-1500.
- · Make the individual settings, without using this function.

Phenomenon

• The pressure sensor will not change or change very little. Probable Cause

- The pressure sensor may be clogged with drain or fluid.
- The pressure sensor may be broken.
- The UTM-1500 may be down.

- Clean the pressure sensor.
- Replace the pressure sensor and / or UTM-1500.

Phenomenon

• The pressure level will not change (remain around -0.12) even if the tool is triggered. Probable Cause

• The pressure sensor may not be connected to UTM-1500 or be broken.

• The pressure sensor cable may not be connected to UTM-1500 or be broken.

• The UTM-1500 may be down.

Error Condition Resetting

• Verify the connection and replace the UTM-1500, pressure sensor, and / or pressure sensor cable.

Phenomenon

• The pressure sensor reads -0.12 even though the tool is not running.

Probable Cause

• The SENSOR is set to DISPLAY, not NO DISPLAY.

Error Condition Resetting

• Verify that the SENSOR is set to NO DISPLAY.

Phenomenon

• The WORK number is not changeable.

Probable Cause

• The W. SEL. TIMING is set to YES.

• The inputs are not allocated correctly.

Error Condition Resetting

- If you wish to make the work number changes using inputs, set W. SEL. TIMING to NO.
- Verify that the signals are correctly programmed on terminal allocation screen.

Phenomenon

• UTM-1500 will not talk to the PC programming software.

Probable Cause

- A straight cable may not be used.
- The baud rate settings may not be correct.
- The incorrect port may be picked up.

Error Condition Resetting

- Use the RS-232C straight cable only.
- Verify that the baud rate value of UTM-1500 agrees with the one of PC programming software. Or, select the AUTO setting of ENVIRONMENT setting screen and restart the PC programming software.

Check the port number used to connect UTM-1500 to PC on Device Manager and make sure that the same port number is selected on the PC programming software.

🔞 UTM-1500 - [環境設定]	
ファイル名:uryu	設備/ワーク名:
通信ボート	
通信速度	
	COM6 COM7 COM8 💌

#### Associated Parts

External Pressure Sensor Assembly Part Number: 878-845-1 • External pressure sensor assembly for UTM-1500(CN)

![](_page_50_Picture_2.jpeg)

Internal Pressure Sensor Unit Part Number: 910-822-0

Pressure sensor built into UTM-1500(PS)

Internal Connector Unit Part Number: 910-827-0

Connector built into UTM-1500(CN)

A/E Signal Relay Box Assembly Part Number: 909-851-0

![](_page_50_Picture_8.jpeg)

Pressure Sensor Cable Assembly (5M) Part Number: 910-820-0

![](_page_50_Figure_10.jpeg)

長サ識別用ビニールテープ(水色)

Pressure Sensor Cable Ass	embly (10M)
Part Number: 910-821-0	

Extended Sensor Cable Assembly (5M) Part Number: 910-829-0

- Extended sensor cable assembly for Pressure Sensor Cable Assembly

Extended Sensor Cable Assembly (10M) Part Number: 910-830-0

Extended sensor cable assembly for Pressure Sensor Cable Assembly

Polyurethane Hose (F1504) Part Number: 935-350-0 • 4mm diameter air signal hose

Solenoid Valve Assembly (VP542) Part Number: 909-749-0

Low-tone Buzzer (PMB-06) Part Number: 910-824-0

Speed Controller (AS100F-04) Part Number: 909-449-0

![](_page_50_Picture_20.jpeg)