# OPERATORS MANUAL FOR
YETC–2ETB ELECTRONIC TORQUE CONTROLLER

NOTICE

This YETC–2ETB Torque Controller is designed to be used with Ingersoll–Rand "Y" series System Wrench Pulse Tools for the accurate tightening, monitoring, and feedback of threaded fasteners.

Ingersoll–Rand is not responsible for customer modification of units for applications on which Ingersoll–Rand was not consulted.

⚠ WARNING
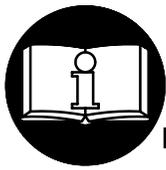
**IMPORTANT SAFETY INFORMATION ENCLOSED.
READ ALL THESE INSTRUCTIONS BEFORE PLACING UNIT IN SERVICE OR
OPERATING THIS UNIT AND SAVE THESE INSTRUCTIONS.
IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION
IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.
WHEN USING ELECTRIC TOOLS, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE
FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK AND PERSONAL INJURY,
INCLUDING THE FOLLOWING.**

PLACING TORQUE CONTROLLER IN SERVICE

- **Always operate, inspect and maintain this unit in accordance with all regulations (local, state, federal and country), that may apply.**
- **Inspect extension cords periodically and replace if damaged.**
- **Do not remove any labels. Replace any damaged label.**

USING THE TORQUE CONTROLLER

- **Always wear eye protection when operating or performing maintenance on this unit.**
- **Power tools can vibrate in use. Vibration, repetitive motions, or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.**

- **Guard Against Electric Shock.** Prevent body contact with earthed or grounded surfaces. For example; pipes, radiators, ranges, refrigerator enclosures.
- **Keep work area clean.** Cluttered areas and benches invite injuries.
- **Consider work area environment.** Don't expose unit and chargers to water. Keep work area well lighted. Do not use unit in explosive or flammable atmospheres.
- **Keep bystanders and children away.** Do not permit unauthorized personnel to operate this unit.
- **Store idle units.** When not in use, units should be stored in a dry, high or locked up place, out of reach of children.
- **Dress properly.** Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and non–skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.

NOTICE

The use of other than genuine Ingersoll–Rand replacement parts may result in personal injury, decreased performance and increased maintenance, and may invalidate all warranties.

Have your unit repaired by a qualified person. This electric unit is in accordance with the relevant safety requirements. Repairs should only be carried out by qualified persons using original spare parts, otherwise this may result in considerable danger to the user.

Repairs should be made only by authorized, trained personnel. Consult your nearest Ingersoll–Rand Authorized Servicenter.

INGERSOLL-RAND®
PROFESSIONAL TOOLS

⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

USING THE TORQUE CONTROLLER
(Continued)

- **Dress properly.** Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and non–skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.
- **Secure work.** Use clamps or a vise to hold work. Operators often need both hands to perform job functions.
- **Don't overreach.** Keep proper footing, balance, and a firm grip on the tool at all times.
- **Maintain unit with care.** Keep unit clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect unit cords periodically and if damaged, have them repaired by an authorized service facility. Inspect extension cords periodically and replace if damaged. Keep handles dry, clean, and free from oil and grease.
- **Do not drop or abuse the unit.**
- **Whenever a unit is not being used, position the Power Switch to the "OFF" position and unplug the power cord.**
- **Stay alert.** Watch what you are doing. Use common sense.
- **Check damaged parts.** Before further use of the unit, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this operation manual.
- **Have defective switches replaced by an authorized service center.**
- **Do not use the unit if the switch does not turn it on and off.**
- **Do not allow chemicals such as acetone, benzene, thinner, ketone, trichloroethylene or other similar chemicals to come in contact with the housing, as damage will result.**
- **The use of any accessory or attachment other than recommended in this manual can present a risk of personal injury.**

GROUNDING INSTRUCTIONS

The tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with a three–conductor cord and three–prong grounding–type plug to fit the proper grounding–type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal.

If your unit is for use on less than 150V, it has a plug that looks like that shown in Figure A.

An adapter (see Figure B) is available for connecting Figure A–type plugs to 2–prong receptacles. The green colored rigid grounding strap must be connected to a permanent ground such as to a properly grounded outlet box as shown in figure C.

GROUNDING PIN

COVER OF GROUNDED OUTLET BOX

FIGURE A

ADAPTER

FIGURE C

FIGURE B

GROUNDING MEANS
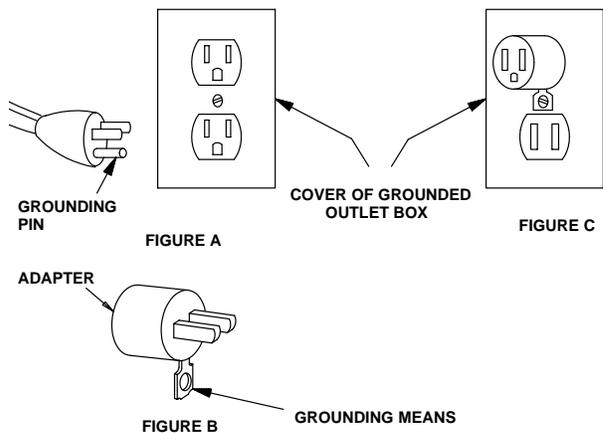
(Dwg. TPD446–2)

⚠ WARNING

For safe use of adapters, the outlet box must be grounded. If there is any doubt, have a qualified electrician check connections.

Use only 3–wire extension cords that have 3–prong grounding type plugs and 3 pole receptacles that accept the controllers plug. Replace or repair damaged cords.

Extension Cords

Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.

The Table below shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.
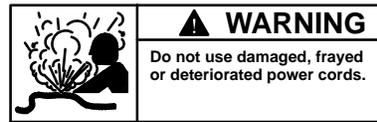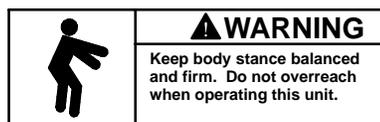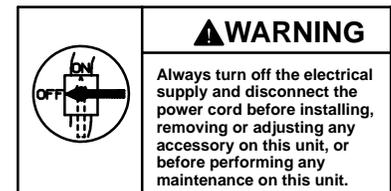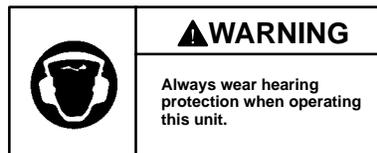
Volts		Total length of cord in feet			
120V		0 – 25	26 – 50	51 – 100	101 – 150
Ampere rating		AWG			
More than	Not more than				
0	6	18	16	16	14
6	10	15	16	14	12
10	12	16	16	14	12
12	16	14	12	not recommended	

CAUTION

FAILURE TO OBSERVE THE FOLLOWING CAUTIONS COULD RESULT IN INJURY.

- **DO NOT store the Torque Controller in relative humidity above 85%.**

- **Have the unit calibrated at least once a year.**
- **Keep the exterior of the Controller clean and dry.**

WARNING LABEL IDENTIFICATION

⚠ WARNING
Always wear eye protection when operating or performing maintenance on this unit.

⚠ WARNING
Always wear hearing protection when operating this unit.

⚠ WARNING
Always turn off the electrical supply and disconnect the power cord before installing, removing or adjusting any accessory on this unit, or before performing any maintenance on this unit.

⚠ WARNING
Keep body stance balanced and firm. Do not overreach when operating this unit.

⚠ WARNING
Do not use damaged, frayed or deteriorated power cords.

Adjustment of the set screw for the required torque

1. Slide the cover back or remove the regulator cap.
2. Turn the mainshaft to the position where the adjusting screw is visible.
3. Adjust the torque using the torque adjusting pin. Turn the pin **right for increasing** the torque, **left for decreasing** the torque.
    To achieve minimum torque, turn counter–clockwise

four (4) turns <u>from maximum torque</u>. **DO NOT** turn any further; the adjust screw will catch on the transducer.
4. Return the cover to the original position, or replace and tighten the regulator cap.

NOTICE

The hammer case is filled with the exhausted air, be sure to return the cover completely.

Be sure that the air pressure is stabilized; fluctuation influences the accuracy negatively.

The torque output of the impulse wrench is high when the air pressure is high. If the air pressure is low, the torque output of the tool is low. Torque can be **increased** by tightening the adjusting bolt in the impulse mechanism. Torque can be **decreased** by loosening the adjusting bolt. In case of the torque output being too low against the tightening torque (aimed torque), it can never finish the tightening job. If the torque output is too high, it easily causes over–torque and deviation of torque increases. See Dwg. TPD2003.

Improve tightening accuracy by adjusting torque output so that the aimed torque reaches the area where the upward torque curve turns to the horizontal line. To test at auto shut–off [**OFF**], check the torque value when the torque curve turns to a horizontal line.
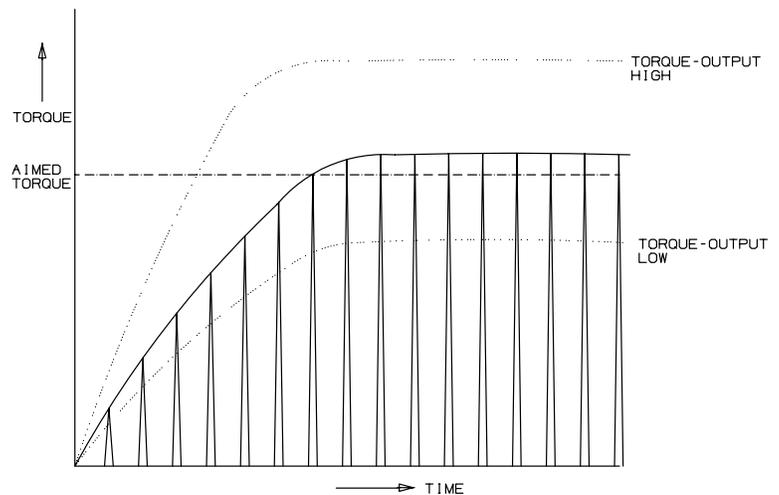
(Dwg. TPD2003)

Available Models

| Model			Bolt Cap. mm	Free Speed RPM	Load Air Cons. l/min.	Torque Adjustable Range Nm	Overall Length mm	Weight (less socket) kg	Spindle Off–set mm	Sq. Drive Hex size of bit mm	Air Inlet Thread	Air Hose size mm	Air Pressure Used Kgf/cm2
	Pistol	Straight											
Square Drive	YEX–150	– –	M 5–6	9000	8.8	6–18	222	1.43	23.0	9.5	PT 1/4"	9.5	6
	YEX–501	– –	M 6–8	8200	11.3	17–48	234	2.00	26.5	9.5	PT 1/4"	9.5	6
	YEX–701	– –	M 8–10	8000	14.1	25–75	246	2.20	26.5	9.5	PT 1/4"	9.5	6
	TEX–901	– –	M 10	6100	14.1	32–88	257	2.70	33.5	12.7	PT 1/4"	9.5	6
	YEX–1400	– –	M 10–12	5900	17.7	52–142	266	3.50	34.0	12.7	PT 1/4"	9.5	6
	YEX–1900	– –	M 12	5800	17.7	58–162	277	4.10	39.0	12.7	PT 1/4"	9.5	6
	YEX–3000	– –	M 16	4000	21.2	122–284	309	6.40	40.0	19.0	PT 1/4"	12.7	6
Square Drive	– –	YEX–150S	M 5–6	9000	8.8	6–18	275	1.35	23.0	9.5	PT 1/4"	9.5	6
	– –	YEX–300S	M 6	8000	10.6	9–22	312	1.80	27.0	9.5	PT 1/4"	9.5	6
	– –	YEX–500S	M 6–8	7800	10.6	13–41	333	2.10	27.0	9.5	PT 1/4"	9.5	6
	– –	YEX–700S	M 8	7500	12.4	20–61	333	2.30	27.0	9.5	PT 1/4"	9.5	6
Hex Drive	YEX–150A	– –	M 5–6	9000	8.8	6–18	223	1.43	23.0	6.35	PT 1/4"	9.5	6
	YEX–501A	– –	M 6–8	8200	11.3	17–48	227	2.00	26.5	6.35	PT 1/4"	9.5	6
Hex Drive	– –	YEX–150SA	M 5–6	9000	8.8	6–18	276	1.35	23.0	6.35	PT 1/4"	9.5	6
	– –	YEX–300SA	M 6	8000	10.6	9–22	313	1.80	27.0	6.35	PT 1/4"	9.5	6
	– –	YEX–500SA	M 6–8	7800	10.6	13–41	224	2.10	27.0	6.35	PT 1/4"	9.5	6

Wiring and Piping for System Wrenches

1. Connect tool cable to the tool and Controller. (The connector with the gray tube should be connected to the Controller.) Be sure to lock the connecting part.
2. Connect solenoid valve cable to the rear of the Controller, using the two connections marked SV1.

NOTICE

Controller warm–up time is 5 seconds.
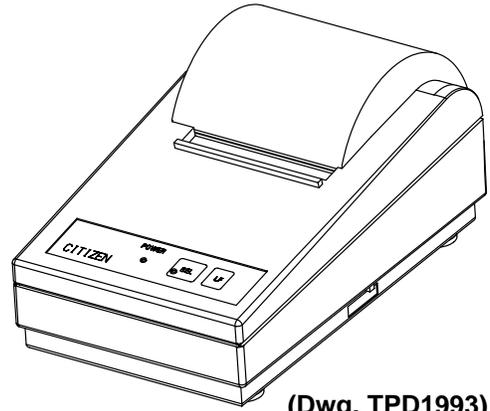

(Dwg. TPB1030)
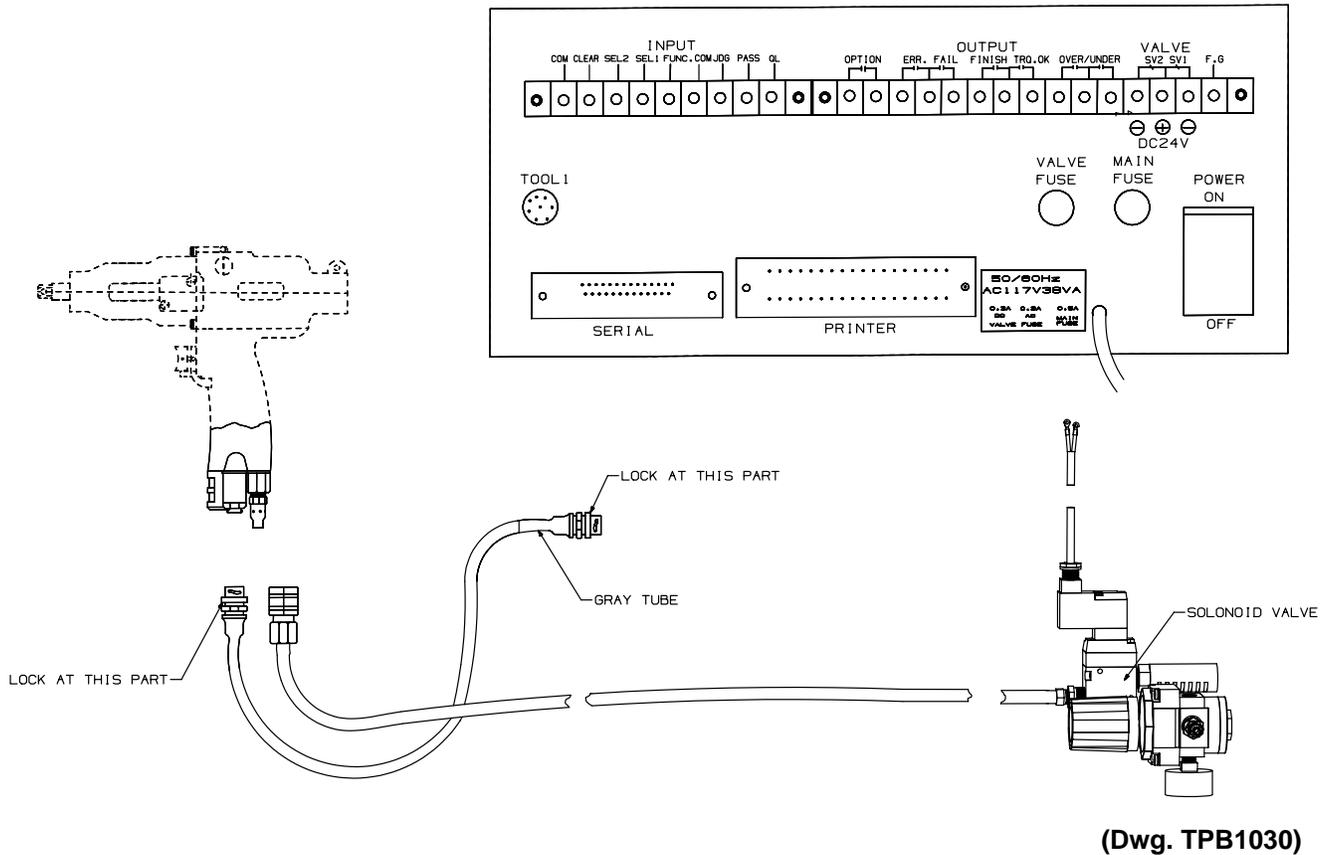
3. Connect air hose to the tool and solenoid valve.
4. Connect air hose from the air supply to the regulator valve of the system wrench. The tool should be as close to a main supply as possible.
5. If you do not use the Controller for long periods, the second battery in the Controller may lose its power. In this case, the panel indication of the Controller turns to **E R R 3.**
   At this time, leave the power source **ON** to charge the battery. Then, turn the **SET/NORMAL** switch to the **SET** side and push the **RESET** key.
   Next, push the **ENT** key and re–enter your data settings as outlined in the DATA INPUT section. Then, turn **OFF** the power source of the Controller and turn it **ON** again.   .
   If it still shows **E R R 3.** , the battery is out of power and must be replaced. (The battery used with this Controller lasts about three years.)

Connecting the Printer

If a printer is used, connect the printer cable to the printer and the Controller.

(Dwg. TPD1993)

IR Y–CTZ Printer

NOTICE

For proper programming, refer to your Printer Users Manual.
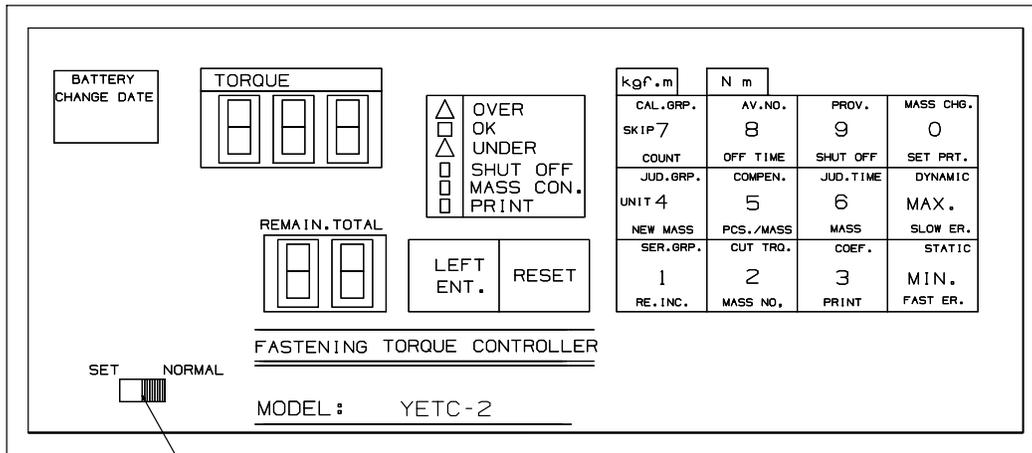
(Dwg. TPB1031)

─────────── **SETTING CONDITIONS** ───────────

Judge Group No. 4 Key			
	Average	No. 8 Key	(1 - 6)
	Compensation	No. 5 Key	(0 - 9)
	Judging Time	No. 6 Key	(0.01 - 0.99 sec.)
	Coefficient	No. 3 Key	(1 - 65535)
	Upper Limit	MAX Key	(0.1 – 99.8 Kgf–m)
	Cut Torque	No. 2 Key	(0.1 - 99.8 Kgf–m)
	Lower Limit	MIN Key	(0.0 - 99.8 Kgf–m)
	Provisional Torque	No. 9 Key	(Less than 50% of min Torque)
	Skip	No. 7 Key	(0–29)

7

Service Group No. 1 Key			
	Off Time	No. 8 Key	(0.0 - 9.9 sec.)
	Bolt No./Workpiece	No. 5 Key	(1 - 99)
	Work No./Total No.	No. 2 Key	(Total No.)
	Bolt Count Mode	No. 7 Key	(1 - 3)
	Slow Error No.	MAX Key	(10 - 255 Pulses)
	Fast Error No	MIN Key	(0–9 Pulses)
	Shut Off Key	No. 9 Key	(ON / OFF)
	Group Control	No. 6 Key	(ON / OFF)
	Print	No. 3 Key	(ON / OFF)
	Printing of Setting Data	No 0 Key	
	Unit	No. 4 Key	(0=Kgf.m 1=Nm)

Calibration Group – No. 7 Key		
	Dynamic Torque	MAX Key (for experiment)
	Static Torque	MIN Key (not to be used)
	Interlock Select	
		0=No Clear (Remaining Qty Clear) signal needed.
		1=Clear (Remaining Qty Clear) signal needed
	Buzzer Sound Select	
	Special Functioning	
		1. Display of loosening torque **ON/OFF**
		2. Torque Curve Detection
		3. Selection of air shifting functioning from low to high air pressure.

DATA INPUT

1. Turn Controller's main switch to **ON**. (This takes 5 seconds to warm up.) Then, move switch on front panel to **SET** mode. All data can be input using this mode.

2. Main setting groups are classified in three categories: **Judge Group, Service Group and Calibration Group.** Press one of the **Group** keys. Next, press each element key of the Group and input the necessary number by pressing the **ENTER** key after the number.

KEY OPERATIONS

GRP.	ELEMENT	No.	ENT.
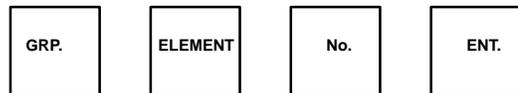
3. After inputting the data, move switch to **NORMAL** mode. The tightening operation can be performed.

1. **Average No. (2 - 6) (AV. No.)**
   Input 3 for hard joints and 5 for soft draw applications as a rough standard. **DO NOT input [1].**

| JUD GRP. 4 | AV. No. 8 | No. | ENT. |

The Controller will take the average torque value of the programmed number of pulses to determine the average torque. When this average value exceeds the cut torque, the Controller closes the solenoid value.

Example 1: At the tightening on Hard Joint
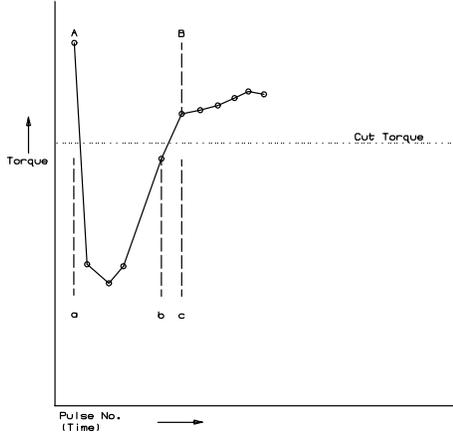
In using a torque value at each pulse, the Controller may detect the impact at seating as the high torque and cut the air supply immediately after seating **[a]** point as left.

$$\frac{a+b+c}{3} = \text{Displayed torque (Cut torque)}$$

In this situation, actual torque will be inconsistent. By inputting 3, the tightening can be done to point **[b]** and actual torque can be stabilized.

(Dwg. TPD1994)

Example 2: At the tightening on Soft Draw
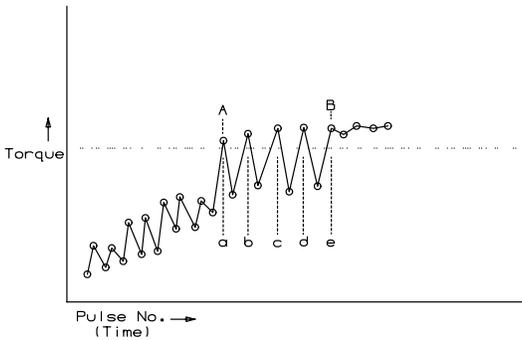
In using a torque value at each pulse (air cut at **[a]**), elasticity may remain and the actual torque may be low. It may take as many pulses (time) until the elastic body of workpiece is compressed.

$$\frac{a+b+c+d+e}{5} = \text{Displayed torque (Cut torque)}$$

By inputting 5, the tightening can be done to point **[b]** and actual torque can be stabilized.

(**Dwg. TPD1995)**

*   Example 1 and 2 are for reference. Every torque per pulse at the actual tightening can be printed out by the printer in the dynamic torque mode.
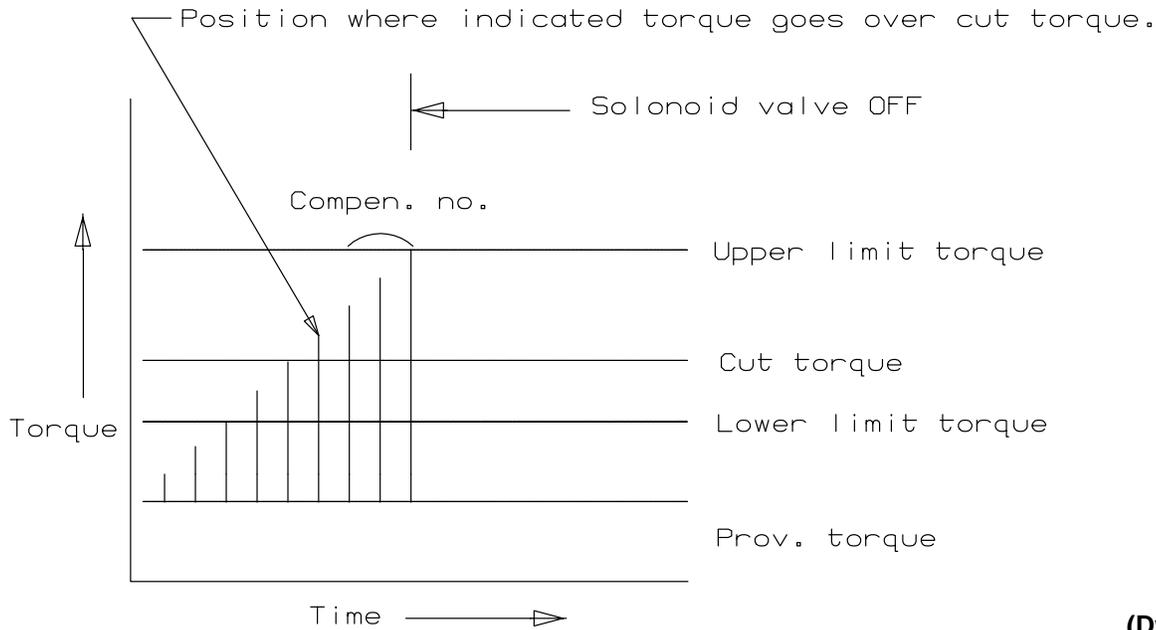
2. **Compensation No. (0 - 9) (COMPEN.)**
   This is the pulse number which impacts after going over the cut torque. (After impacting the number which is set as the compensation number, it shuts the solenoid valve.)
   Normally, set this to **0 (OFF).**

| JUD GRP. 4 | COMPEN 5 | No. | ENT. |

If torque goes over MAX. torque value during **COMPEN** pulses, it closes the valve immediately as **OVER.NG**.

```
        ┌── Position where indicated torque goes over cut torque.



                    ┌── Solonoid valve OFF
                                                          Examples:

                                                          AV. NO.=2
          Compen. no.                                     COMPEN.=3

                          ┌─────── Upper limit torque



                          ─────── Cut torque
                          ─────── Lower limit torque
  Torque



                          ─────── Prov. torque



          Time ──────▷
```
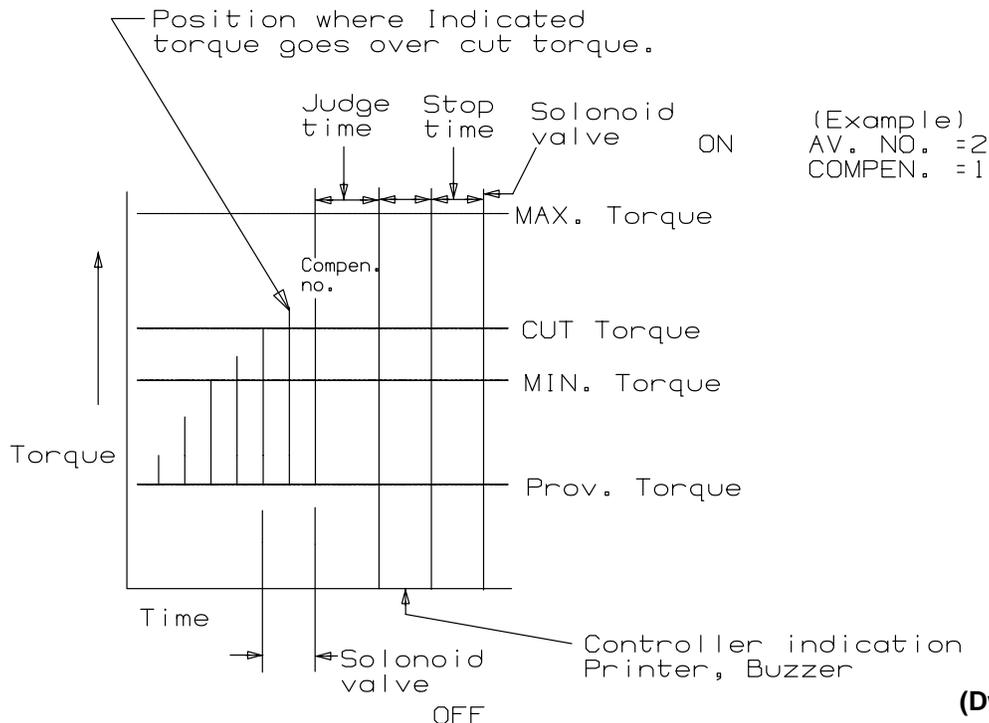
(Dwg. TPD1996)

3. **Judging time (0.01 - 0.99 sec) (JUD.TIME)**
   The tool starts to impulse and after the judging time, if the next pulse does not occur, the Controller indicates that one cycle of the tightening has finished. An electronic buzzer will sound and start to print the data. Set the input value according to the tool size to be used:

YEX–150, 500, 700, 900 and 1400	0.3 Sec.
YEX–1900, 3000	0.5 Sec.

KEY OPERATIONS

JUD GRP. 4	JUD TIME 6	No.	ENT.

```
            ┌── Position where Indicated
            │   torque goes over cut torque.

            Judge  Stop   Solonoid
            time   time   valve      ON      (Example)
                                             AV. NO. =2
                                             COMPEN. =1
                                ─── MAX. Torque
            Compen.
            no.

                                ─── CUT Torque
                                ─── MIN. Torque



  Torque
                                ─── Prov. Torque


  Time
                                    Controller indication
                ◁ Solonoid         Printer, Buzzer
                  valve
                  OFF
```

(Dwg. TPD1997)

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4. **Co–efficient (1 - 65535) (COEF)**
   Input the Coefficient value engraved on the hammer case of
   the tool.
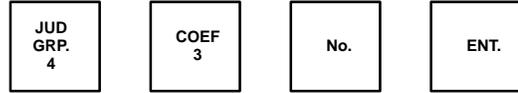
> YEX–900 and smaller tools: One tenth of engraved value. **Do not input small zero.**
> YEX–1400 and larger tools: Engraved value.

Example: When you input co–efficient of YEX–500 with 5000o, the panel indication
will be as follows: (Input value should be 5000)

When upper display is three digits, the first digit of the input number is automatically
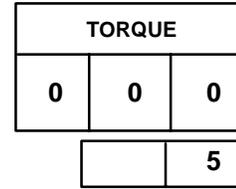moved to the lower level.

TORQUE		
0	0	0
		5

NOTICE

CO–EFFICIENT NUMBER IS DIFFERENT, TOOL BY TOOL, EVEN ON THE SAME MODEL. WHEN CHANGING TOOLS, BE SURE TO INPUT THE NEW NUMBER.

5. **Torque unit. (Selects the torque)**
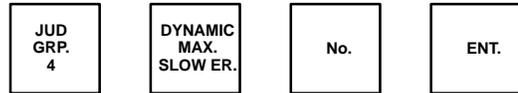   > Inputting **0** = Kgf–m
   > Inputting **1** = Nm
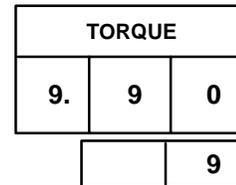
| SER. GRP. 1 | UNIT 4 | No. | ENT. |

6. **MAX. torque (0.1 - 99.9 kgf–m) (MAX)**

   Input the upper limit of the standard torque range of the bolt
   to be tightened. For example, if the torque range is 3.8 -
   5.3 Kgf–m, input the value 5.3.

| JUD GRP. 4 | DYNAMIC MAX. SLOW ER. | No. | ENT. |

   When you input the value, the decimal point is fixed at the
   position as indicated below. For 99.9 Kgf–m, input number as
   9990. **THIS IS THE SAME WHEN USING MIN., CUT.,
   TORQUE and PROVISIONAL TIGHTENING TORQUE**.
   When upper display is of three digits, the first digit of the
   input number is automatically moved to the lower level.

TORQUE		
9.	9	0
		9

7. **CUT torque (0.0 - 99.8) (CUT TRQ)**

   Input the target value of the standard torque range of the bolt
   to be tightened. For example, if the torque standard is
   3.8 - 5.3 Kgf–m, input the center value (4.5 Kgf–m). Next,
   tighten the bolt and check the torque of the bolt with a torque
   wrench.   If the actual value is higher than the center torque,
   REDUCE the cut torque value by the difference.
   If the actual value is lower than the center torque, **INCREASE** the cut torque value by the difference.

| JUD GRP. 4 | CUT TRQ 2 | No. | ENT. |

8. **MIN. torque (0.0 - 99.8) (MIN)**
   Input the lower limit of the standard torque range of the bolt to be tightened.

NOTICE

**The Controller judges torque OK if the torque goes over
MIN level, even when it does not reach CUT torque. To
prevent inconsistent torque, the input value of MIN torque
should be as close as that of CUT torque as possible.**

| JUD GRP. 4 | STATIC MIN. FAST ER | No. | ENT. |

9. Provisional tightening torque (0.0 - 99.7) (PROV.)
   At all lower torque values than the set provisional torque No., the Controller will disregard them as being under provisional tightening and does not indicate or acknowledge the torque. Input a value lower than approx. 50 % of **MIN** torque.
   Refer to the following formula for inputting:
   Provisional torque < MIN ⬚ CUT TORQUE < MAX

KEY OPERATIONS

| JUD GRP. 4 | PROV 9 | No. | ENT. |
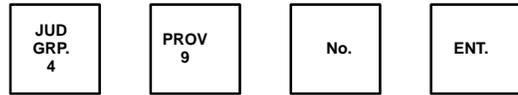
10. **Skip number of pulses (0 - 29) (SKIP)**
    Normally, input 0 . (function is **OFF**)
    The Controller disregards the preset number of pulses at the beginning of tightening. (In the case of inputting 5, the Controller measures the torque after 5 pulses.)
    In the tightening of gas threads (taper thread), the actual torque becomes about 50% against the displayed value on the Controller. **SKIP** number function can stabilize the torque by having the additional pulses preset as **SKIP** number.

KEY OPERATIONS

| JUD GRP. 4 | SKIP 7 | No. | ENT. |

11. **Stop time (0.0 - 9.9 sec) (OFF TIME)**
    This is the time the solenoid value remains closed after each rundown. A normal time is 0.3 sec..

KEY OPERATIONS

| SER. GRP. 1 | 8 OFF TIME | No. | ENT. |

12. **Bolt No./workpiece (1 - 99) (PCS./MASS)**
    Input quantity of bolts to be tightened in one group or workpiece.
    Example: If you input 3, after 3 pieces have achieved **TORQUE OK** with **MASS** control on, a group finish signal will be sent out.

KEY OPERATIONS

| SER. GRP. 1 | 5 PCS/ MASS | No. | ENT. |

13. **Work No. (Total Quantity) (1–99999) (MASS NO.)**
    When the group control is **ON,** it shows the number of the group which is being tightened or to be tightened in the next turn. At the group control **OFF,** it shows the total number that has been tightened. Immediately after the power switch is **ON,** [1] will be input.

KEY OPERATIONS

| SER. GRP. 1 | 2 MASS No. | No. | ENT. |
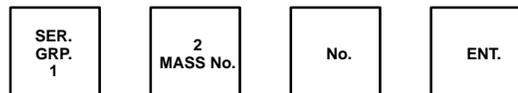
14. **Bolt count mode (Count) (1 - 3)**
    Input 1. (If any number other than 1 is input, a group finish signal will be sent out even with the torque **NG** tightening.)

    Input 1   Counts the bolts if torque is - OK only
    Input 2   Counts the bolts if torque is - OK and OVER
    Input 3   Counts the bolts if torque is - OK, OVER and UNDER

KEY OPERATIONS

| SER. GRP. 1 | 7 count. | No. | ENT. |
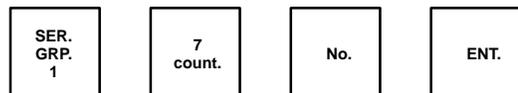
15. **Slow Error No. (10 - 255 Pulses)**
    Normally, input 50. With extremely soft joint, input a larger number since more pulses are required before reaching the necessary torque.
    When the torque does not turn to **OK** after preset pulse number (does not go over the lower limit torque), the Controller judges the tightening as cycle **ABNORMAL**. The panel indication turns to **[LO.E]** and the torque lamp lights with **TORQUE UNDER**.

KEY OPERATIONS

| SER. GRP. 1 | DYNAMIC MAX SLOW ER | No. | ENT. |
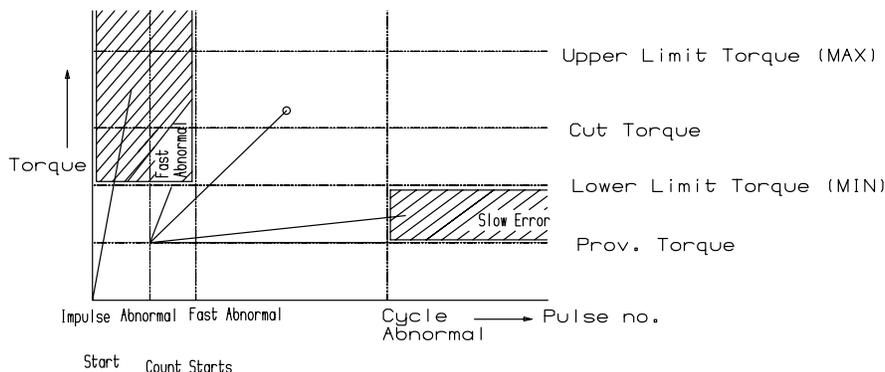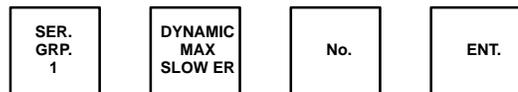
(Dwg. TPD1998)

16. **Fast ABNORMAL Check Pulse No. (0 - 9 pulses) (FAST ER)**
    Normally, input 0. (function is **OFF**)
    When the torque goes over the lower limit before pulsing the pre-
    set No., the Controller judges it as **Fast ABNORMAL.** It is use-
    ful to check against double tightening. The panel indication be-
    comes **[FA. E]**. Input larger number than average number
    (AV. NO.) when using this function. Counting the pulses will start after
    going over the provisional tightening torque.

| SER. GRP. 1 | STATIC MIN FAST ER | No. | ENT. |

17. **Auto Shut–Off ON/OFF (SHUT OFF)**
    It should always be **ON**. The indication lamp on the front panel of Controller will
    light when **ON**. For reversing **ON/OFF**, repeat the key operation.

| SER. GRP. 1 | 9 SHUT OFF |

18. **Work control ON/OFF (MASS)**
    This selects **ON/OFF** of work control
    When **ON**, after tightening preset bolt quantity, the group finish signal will be sent
    out. When **ON** the indication lamp on front of Controller panel lights up.
    When **OFF**, work control is disabled.
    For reversing **ON/OFF**, repeat the key operation.

| SER. GRP. 1 | 6 MASS |

19. **Print ON/OFF (PRINT)**
    Enable and disables the printer signal.
    At **ON**, the indicator lamp on front of Controller panel lights up.
    For reversing **ON/OFF**, repeat the above key operation.

| SER. GRP. 1 | 3 PRINT |

20. **Print–out of setting data. (SET PRT.)**
    This prints out the parameter (setting data) input in the Controller.
    This confirms the inputted data.

| SER. GRP. 1 | 0 SET PRINT |

21. Interlock Select
    Two kinds of selection: (Factory set at **0**)
                    With Clear (remaining Qty Clear) signal
                    Without Clear signal

[0] Is input. (Normal method) Interlock **Without Clear** signal.
    After the input, Remaining Quantity Clear is **ON.** While in
    the current work, the remaining quantity will be initialized. Or,
    when one of the input terminals for work **[a]** or **[b]** or **[c]** is
    ON with the selected work, it immediately starts initializing
    the quantity automatically.

| CAL GRP 7 | JUD TIME 6 MASS | 0 | ENT. |
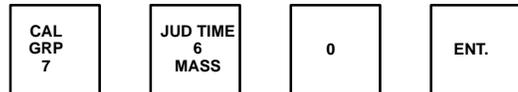
[1] Is input. Interlock **With Clear** signal.
    When inputting the remaining data, Quantity Clear is **ON**.
    Front Panel has the Display **CLR** and the Solenoid Valve will
    be closed. After one of the input terminals for work **[a]** or **[b]**
    or **[c]** is **ON,** the solenoid valve will open and with the selected
    work, it starts. Once it starts with selected work, the work will
    not be changed even if the input terminal for other work is **ON**.
    To change the work, after the clear signal, another work selec-
    tion should be made.

| CAL GRP 7 | JUD TIME 6 MASS | 1 | ENT. |

22. **Buzzer Sound Select**

Depending on the input No., conditions on buzzer can be selected.

| CAL GRP 7 | COEF. 3 PRINT | No. | ENT. |

Sound Selection Chart								
Input No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Torque OK	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Work Finish	ON	ON	OFF	OFF	ON	ON	OFF	OFF
Clear*	ON	ON	ON	ON	OFF	OFF	OFF	OFF

* Clear = Remaining Quantity

Example:
    Inputting [1]   No Sound at Torque OK; Sound at Work Finish and Clear
    Inputting [5]   No Sound at Torque OK and Clear; Sound at Work Finish

23. **Group Change at Data Setting**

Three kinds of parameters can be input (work a, b and c). This will enable one tool to be used on different joints, providing the torque levels are within the range of the tool.

1] Group Name (Work Name) displays at bottom–left.

2] | MASS CHG. 0 SET PRT. | This key can select group (work) name.
                    Every time the key is pushed, the group is changed: a–>b–>c–>a

3] After the selection of group (Work), input the necessary data for the parameters of the joint.

24. **Dynamic torque mode at front switch SET**

The torque value (peak value) prints out at every impulse when the tool is operated.
(Set print to **ON** and connect the printer.)

| CAL GRP 7 | DYNAMIC MAX SLOW ER |

1] Push **CAL.GRP** key and **DYNAMIC** torque key.
2] Pull the throttle lever of the tool and tighten the bolt.
3] Release the throttle lever at proper timing. (The Solenoid Valve does not shut off automatically.)
4] This prints the torque value, which is calculated on the preset average number as well as the torque values of all impacts, within 255 impacts.
5] The buzzer gives a sound according to the results of the torque judgement.
6] Push the **RESET** key when finished tightening.

25. **Input/Output terminals (Rear of Controller)**
    Three kinds of work selections (a, b and c) are available with each work finish **[FIN]** output per work.

INPUT TERMINAL

```
 COM     CLEAR     SEL2      SEL1     FUNC.   COM   JUDG    PASS   QL
  |        |         |         |        |      |     |       |     |
  |        |         |         |        |      |     |       |     |
  O        O         O         O        O      O     O       O     O
```
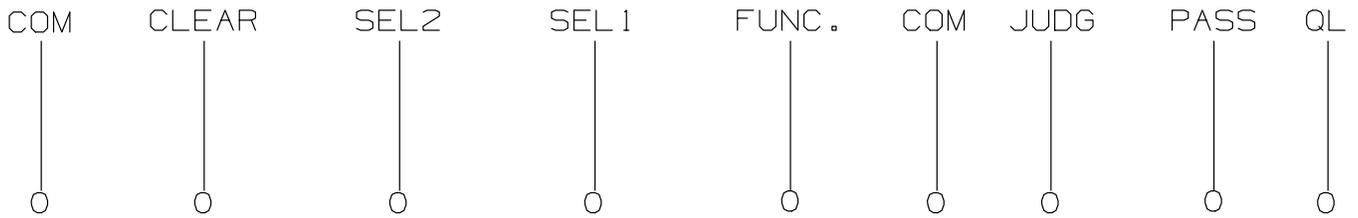
(Dwg. TPD2017)

CLEAR   Remaining quantity clear
JUDG   Judgement with missing tightening with line LS switch
PASS   Forced clear of remaining quantity
QL   QL wrench mode

NOTICE

Input terminal consists of 7 points. By making a short of the COM and the signal terminal, input is ON. As the voltage is supplied from the Controller, DO NOT add external voltage.

OUTPUT TERMINAL

```
                                                            VALVE
OPTION   ERR.    FAIL      FINISH TRQ OK   OVER/UNDER   SV2   SV1   F.G
 |  |   |   |   |   |      |   |   |        |   |   |    |  |   |    |
 O  O   O   O   O   O      O   O   O        O   O   O    O  O   O    O
```
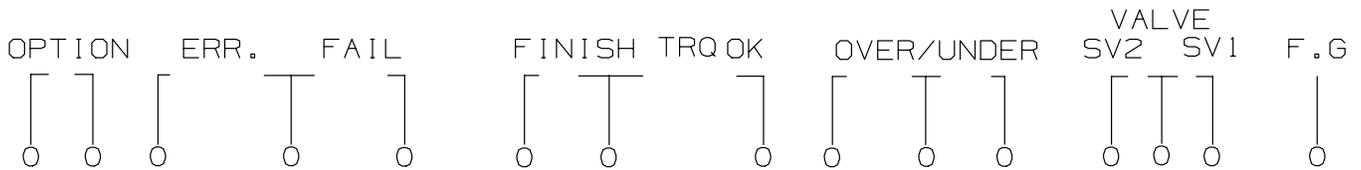
(Dwg. TPD2018)

FAIL   Missing tightening

NOTICE

Output terminal consists of 7 points. All signals are pulse output of approx. one (1) second. The output is a non–voltage contact signal, so it is necessary to prepare the voltage separately.

	Item	key operation				(input range)	INPUT FIGURE		
							a	b	c
B	Average No. (Av.No.)	JUD.GRP 4	AV.NO. 8	No. *	ENT	(1~6) Normally, input-2-3			
B	Compensation No.(COMPEN.)	JUD.GRP 4	COMPEN 5	No. *	ENT	(0~9) Normally, input-0-2			
B	Judge time (JUD.TIME)	JUD.GRP 4	JUD.TIME 8	No. *	ENT	(0.01~0.99) YEX-150~YEX-1400-0.3 YEX-1900~3000-0.5			
A	Co-efficient (COEF.)	JUD.GRP 4	COEF. 3	No. *	ENT	(1~65535) YEX-150~YEX-900 ENG.NO./10 YEX-1400~YEX-3000 ENG.NO.			
D	Upper limit (MAX)	JUD.GRP 4	MAX SLOW ER	No. *	ENT	0.1~99.9 Kgf.m			
A	Cut torque (CUT TRQ)	JUD.GRP 4	CUT TRQ. 3	No. *	ENT	0.0~99.8 Kgf.m			
B	Lower limit (MIN)	JUD.GRP 4	MIN FAST ER	No. *	ENT	0.0~99.8 kgf.m			
B	Provisional torque (PROV.)	JUD.GRP 4	PROV. 9	No. *	ENT	(0.0~99.7) Normally, less than 50% of MIN.			
D	Stop time (OFF TIME)	SER.GRP 1	8 OFF TIME	No. *	ENT	(0.0~9.9) Normally, 0.1 0.3			
D	Bolt T'ty/lwork (PCS./MASS)	SER.GRP 1	5 PCS./MASS	No. *	ENT	(1~99) Tightening No. per 1 work			
D	BOLT COUNT MODE (COUNT)	JUD.GRP 4	7 COUNT MODE	No. *	ENT	(1~3) 1. Within range OK 2. OK or OVER 3. All (OK,OVER, UNDER)			
D	Cycle abnormal Check pulse No. (SLOW ER)	SER.GRP 1	MAX SLOW ER	No. *	ENT	(10~255) 255 - No Function Normally, 50			
D	Fast abnormal Check pulse No. (FAST ER)	SER.GRP 1	MIN FAST ER	No. *	ENT	(0~9) 0 - No Function Normally, 0 IN USE NO. IS MORE THAN AV.NO.			
A	AUTO SHUT-OFF (SHUT-OFF)	SER.GRP 1	MIN SHUT-OFF			(ON/OFF) Normally, "ON".			
A	WORK CONTROL (MASS)	SER.GRP 1	6 MASS			(ON/OFF)			
B	PRINT (PRINT)	SER.GRP 1	3 PRINT			(ON/OFF)			
A	Air pressure	Adjust regulator.							
D	UNIT	SER.GRP 1	UNIT 4	NO *	ENT	0 = Kgf.m 1 = N.m			
D	SKIP NO.	JUD.GRP 4	SKIP 7	NO *	ENT	0 AT NORMAL TIGHTENING			

— A: Sometimes, change data.   C: When you change tool, change data.
— B: seldom, change data.   D: Input data at initial setting.

(Dwg. TPB1032)

Controller

1. Use with the indicated voltage. The supplied should be kept within approx. 10 % difference. The frequency of the power source can be used both 50 Hz and 60 Hz.
2. Take out the ground from the plug of the power source code, or from the back panel of the controller to avoid noise from the controller.
3. Pay attention to the placement of the controller.
   A. Avoid high temperature areas.
   B. Unstable stand or shelf
   C. Avoid any area of vibration.
   D. Avoid dusty areas.
   E. Keep controller away from loud noises.
4. Avoid chemicals and water. If water gets inside the controller, it may cause a short circuit.
5. Relay output terminal should not be rated by more than the restricted loading. (relay Izumi RW22–GU used)
6. The output terminal is used at the voltage of 100V causing the YETC–2ETB to work incorrectly by the noise. Put the noise killer (S1201) as near by the loading as possible. The noise killer (S1201) should not be used by 200V.

Tool

1. To reduce the risk of electronic shock, take care of cover plate, the electronic–buzzer, the connection part of the connecting cable and the inside of hammer case, because electronic parts are built in them.
2. Check the tightening torque regularly with a torque wrench. If the indicated torque and the torque measured by torque wrench are different, do the job after changing the co–efficient.
3. Keep the difference of the supplied air pressure as low as possible using a pressure reducing valve.(We recommend that the constant air–pressure is used by 4–6 kg/cm2). Supply the machine oil, VG–10 (previously called spindle oil #60) to the connection part of the hose. Oil tools daily .
4. To prevent the possible oil leakage and torque down due to wearing of O–ring or oil deterioration, we recommend the service is done according to a certain period or an amount of tightening job.
   (At air pressure 5 kg/cm2) see service manual as follows:

The period –	Three months or 75,000 tightening cycles.
	(YEX–300S and smaller tools: 50,000 cycles).
The items of examination –	Change or add the oil for impulse mechanism.
The period –	Six months or the total number of tightening: 150,000 pcs.
	(YEX–300S and smaller tools 100,000 cycles)
The items of examination –	Change oil, O–rings, springs, and adjust the motor parts, etc.

5. Use the socket which does not have clearance, as much as possible. (snap connector)
6. Since the vent hole of coupler's is small, it is easy to reduce the pressure. Therefore, use the coupler only at the connection with tool (system wrench).

Be sure that the connecting cable covered with grey tube is connected to the controller. Do not give any external shock, pressure, extension force against the cables. When you make the wiring, do not bend, stretch or give pressure against the cables and the root part of the connector. Tool cable is taped on air hose. It is bound around an air hose with 1.5–2 rolls in the place, 30 cm length, which is connected to tool. (See drawing A) Do not stretch tool cable, even if it is swung.

How to inspect the system wrench when something is wrong at normal mode

Case 1

The indication lamp does not light, even if you switch on the power source.

Cause: The power source plug may be off from the power source.
Solution: Ensure plug is fitted correctly. Ensure power is on.

Cause   Check power line fuse.
Solution: Replace fuse with same value.

Cause: The controller may be out of order.
Solution: It has to be repaired or changed.

Case 2

External signals (Torque NG, Torque OK, Work Finish) are not indicated.

Cause: The signals are put out on the terminal table.
Solution: Change the cable for the outside signal.

Cause: The controller may be out of order.
Solution: It has to be repaired or changed.

Case 3

The buzzer built in the tool does not sound.

Cause: If the print–out of the data on the indicated panel is not printed out, be sure that the printer is in SEL situation.
Solution: The printer cable should be connected correctly.

Cause: The buzzer does not sound even when the keys of the upper limit and lower limit are pushed.
Solution: The controller may be out of order, so it has to be repaired or changed.
Other Solution: Change the tool cable or the tool

Case 4

The system wrench does not work even if you pull the throttle knob of the tool

Causes: In the middle of warming–up process. Await the warming–up process, or cancel this process. The print–out LED is turned **ON** and **OFF**.
Solution: The printer should be in SEL condition. Make sure that the printer cable is connected correctly.

E	r	r
	9	9

Program of controller is incorrect. Take off noise which caused incorrect running and start from "POWER ON" again.

E	r	r
		5

The controller is not in good state with its A/D converter. It has to be repaired or changed.

E	r	r
		4

The controller (RAM) is not in good state. It has to be repaired or changed.

E	r	r
		3

Setting data are changed.
If the controller is not used for a long period, push the following keys: **[RESET]** key and **[INPUT]** key. If the controller was used for a long period, repair the controller or change the battery.

E	r	r
		2

The controller (ROM) is not in good state. It has to be repaired or changed.

The tool is not in good state with its electric part. It has to be repaired or changed.

Cause: The switch of set–normal mode may be on the set–mode.
Solution: Switch the mode to normal side.

Cause: The solenoid valve fuse may be blown.
Solution: Change the solenoid valve fuse.

Cause: No air may be supplied to the solenoid valve.
Solution: Open the cock

Cause: When you connect the tool to the other hose without a solenoid valve, and pull the throttle knob, the tool operates.
Solution: Change the solenoid valve (due to broken cable and stuck), or change the solenoid valve cable (due to broken wires).

Case 5

The tool cannot stop automatically

Cause: The auto–shut–off LED does not light.
Solution: Turn ON the auto shut–off.

Cause: The tool may be set at judge group and the dynamic torque mode.
Solution: Use tool with normal mode.

Cause: The torque is indicated incorrectly.
Solution: Change the tool or the tool cable due to broken wires.

Cause: The tool works when you pull the throttle when power off.
Solution: Change the solenoid valve (due to stuck spool)

Cause: The controller may be out of order.
Solution: It has to be repaired or changed.

Case 6

It gives the sign of OVER torque frequently
Cause: The figure of the upper torque is incorrect.
Solution: Reset new value of the upper limit torque.
Cause: An incorrect figure of co–efficient is set.
Solution: Input the correct figure or tool
Cause: The air pressure is incorrect.
Solution: Readjust the air pressure.
Cause: The bolt is not tightened according to the required torque.
Solution: Reset the asjustment of the tool.
Other Solution: Change the tool or the tool cable.

Case 7

It gives the sign of UNDER torque frequently

	The fiqure of the lower limit torque is incorrect.
Solution:	Reset the figure required.
Cause:	An incorrect figure of co–efficient is set.
Solution:	Reset the correct figure or tool.
Cause:	The air pressure is incorrect.
Solution:	Re–adjust the air pressure.
Cause:	The judging time is too short.
Solution:	Reset the judging time.
Cause:	The bolt is not tightening according to the required torque.
Solution:	Reset the adjust bolt of the tool.
Other Solution:	Change the tool or the tool cable (Due to broken wires)

Case 8

The printer cannot print out.

Cause:	The print–out LED does not light.
Solution:	Turn on the print–out.
Cause:	SEL lamp of the printer does not light.
Solution:	The printer should be in SEL condition
Cause:	If you cannot make it be SEL situation,
Solution:	change the printer.
Cause:	The printer cable is connected incorrectly.
Solution:	Connect the printer cable correctly.
Cause:	When you check the printer cable with a circuit tester, and shows the line is broken.
Solution:	Change the printer cable.
Other Cause:	The controller may be out of order, so it has to be repaired or changed.