TV06925-1

delvo

INSTRUCTION MANUAL

Screw Fastening Counter

Model

DLR5040A-WU

Manufactured by:
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NITTO KOHKI CO.,LTD.

SAVE THESE INSTRUCTIONS

Contents

Note: For instructions on how to handle the electric screwdriver, refer to the instruction manual included with the electric screwdriver.

********** Definitions **********

Count correction:	Function for correctly counting the number of fastened screws with the aid of the correct timer
Correct timer:	Timer for setting the predicted time of screw fastening
Count return:	When a fastened screw is loosened, the number of fastened screws is decremented by one.
Link connection:	Function for fastening screws by using two or more screw fastening counters in the order in which the counters are connected.

Thank you very much for your purchase of this **Nitto Kohki products.**
Before using your tool, please read this manual carefully so that you may use it properly to get the most out of it.
Please keep the manual handy - so you can use it whenever necessary.

The following Safety notations are used throughout the manual to highlight safety precautions for the user and for the tool.

⚠**WARNING:**	Indicates a potentially hazardous situation which, if not avoided by following the instructions given, could result in death or serious injury.
⚠**CAUTION:**	Indicates a potentially hazardous situation which, if not avoided by following the instructions given, could result in injury or material damage.

Please note, however, that failure to observe safety precautions under the "⚠Caution" category could result in a serious occurrence depending on the situation: please observe all safety precautions in the manual.

Caution: Important precautions for tool setup, operation and maintenance.

Safety Symbol Identification


Warning: It might be dangerous to operate the tool if the instructions supplied are not followed.


Using this tool improperly could result in serious injury. Read the instruction manual before using.


Always wear hearing protection.


Always wear eye protection.


Always use only indoor.


Do not allow the main body or the power source to get wet as it will cause electric shock and leakage.

1. Safety Precautions

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

⚠ WARNING

1. Keep work area clean.
- Cluttered work areas and benches invite accidents and injuries.

2. Consider work area environment
- Do not expose the tools or components to water and rain. Do not use the tools in damp locations.
- Use a safety device such as Earth-Leakage Circuit Breaker if it inevitable to power-supply in the wet condition.
- Keep work area well lit.
- Do not operate near flammable liquids or in gaseous or explosive atmospheres.

3. Check the power source.
- Operate under the power source the voltage fluctuating rate of which is within ±10% of the rated voltage, and the frequency of which is 50/60Hz of sinusoidal wave.

4. Be cautious about electric shock.
- When using electric tools, do not touch any which is earthed. (Ex. Pipe, heating apparatus, microwave oven, outside frame of refrigerator)

5. Keep children away.
- Also all visitors should be kept away from work area.
- Do not let visitors contact the tool, or connecting cords.

6. Store idle tools
- Keep the electric tool away from children when you do not use, and do not permit unauthorized personnel, who are unfamiliar to the electric tool or the manual, to operate the tool.

7. Do not force tool
- It will do the job better and safer at the rate for which it was intended.
- Do not use this tool for other purposes than fastening screws.

8. Use the right tool
- Do not use a small tool or attachment to do the job of a heavy-duty tool.
- Do not use tool for a purpose not intended.

9. Dress properly
- Do not wear loose clothing or accessories. They can be caught in moving parts.
- Non-skid footwear are recommended.
- Wear protective hair covering to contain long hair.

10. Always wear eye protection
- Everyday eyeglasses only have impact resistant lenses. They do NOT protect eyes. Also use face or dust mask, if operations create dust.

11. Do not abuse cable
- Never carry tool by connecting cable or yank it to disconnect from receptacle.
- Do not place a cable near a place with high heat, oil , and sharp edges.

12. Secure Work
- Use clamps or a vice to hold the work when practical.
- It is safer than using your hand and it frees both hands to operate tool.

13. Do not overreach
- Keep proper footing and balance at all times.

14. Cautious maintenance is necessary for electric tools
- For safe and efficient work, use the proper bit and check it regularly.
- Check the cable regularly. Contact sales agents to repair it when it is defective.
- When an extension cable is used, check regularly and change it when it is damaged.
- Keep handles dry, clean, and free from oil and grease.

15. Switch off and take off the plug for the following
- When not in use, when repairing, when changing accessories and bits, etc.

16. Do not use a tool violently
- Do not swing the tool around and hold the body firmly when using. If not, it may cause injury. Do not drop or abuse the body. If there is breakage, cracks, or transformation, it may cause injury.

17. Always avoid unexpected start
- Do not carry the tool with a finger on the switch when the power supply is on.

Make sure that the switch is off before plugging in.

18. Use appropriate power cable or an extension cable when it is used outside.

19. Start alert

·Watch what you are doing.

·Bear in mind the way of handling/operation and the circumstances of the surrounding area.

·Use common sense.

·Do not use when you are tired or under the influence of drugs, alcohol or medication.

·Do not bring hand or face close to moving parts such as bit etc. when in use. Otherwise, it may cause injury.

20. Check damaged parts

·Before further use of the tool, an accessory or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended functions.

·Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting and any other conditions that may affect its operation.

·An accessory or other part that is damaged or inoperable should be properly repaired or replaced. When a switch becomes out of order, repairs should be performed only by the sales agent from whom you purchased the tool or an authorized dealer.

·Do not use electric tools which cannot be activated or stopped with a switch.

21. Use recommended accessories

·Consult this manual or the sales agent from whom you purchased the tool or an authorized dealer for recommended accessories. The use of improper accessories may cause risk of injury to persons.

22. Repairs by authorized personnel

·This tool should not be modified as it meets safety requirements.

·Any repairs to the tool or installation of replacement parts should be performed only by the sales agent from whom you purchased the tool or an authorized dealer.

·Failure to utilize the expertise of the sales agent from whom you purchased the tool or authorized dealer or, failure to use genuine replacement parts, may result in an increased risk of injury to the user and may invalidate your warranty.

23. Do not allow the following chemicals to come into contact with the tool housing, as damage will result. For example, trichloroethylene acetone, benzene, thinner, ketone, or other same chemicals.

2. Operation Precautions

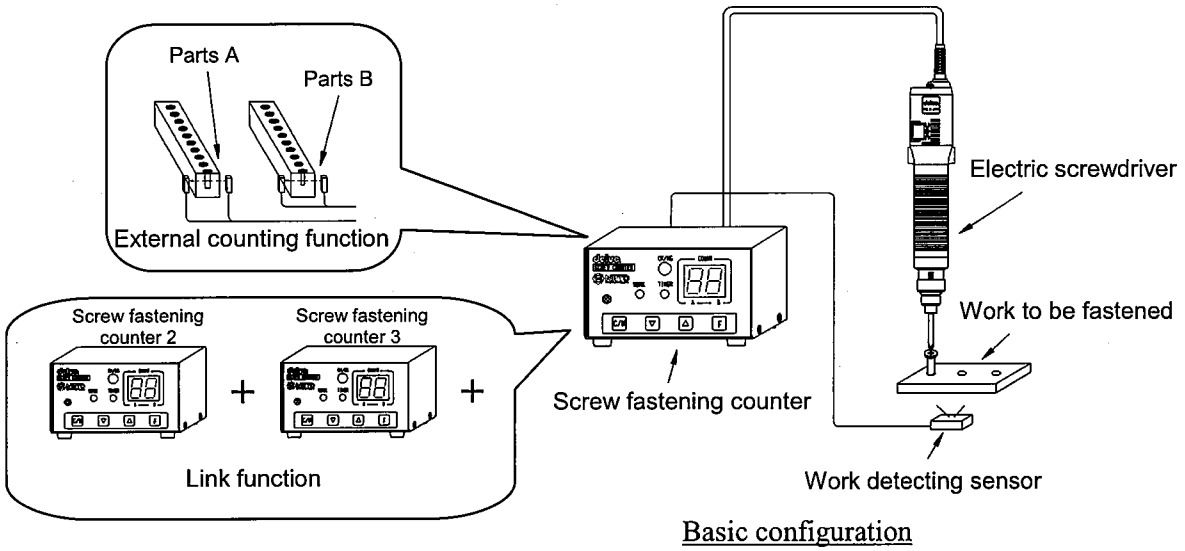
⚠ CAUTION

1. Use at the voltage, which is indicated on the rating plate. If used at a higher voltage than indicated, it may cause damage and accident.
2. When the tool does not work properly, or you hear abnormal sounds during usage, switch off immediately and request the repair work to be done by an authorized service facility. If you keep on using the tool, it may cause injury.
3. Install only bits or accessories in accordance with the operation manual.
4. Grounding is necessary to be assured, especially for the bit earth type.
5. Whenever setting the torque, switch off the tools and components.
6. Whenever changing the bit, ensure the changeover switch is in the "O" (Off) position and the tool is unplugged.
7. If the rest interval is shorter than three seconds, the heat of the motor may increase. However, it differs from the kind of screw or from the fastening torque.
8. Do not adjust the torque setting higher than the number of the torque scale mentioned below.
   The number on the torque scale does not indicate the torque value of the screwdriver. The torque varies according to the type, size, and material of screws and work. Therefore, use the following diagram as references to obtain an appropriate torque.
9. Do not operate the changeover switch when the motor is running.
10. Do not use this screwdriver for tightening wood screws.
11. Whenever a tool is not being used, move the changeover switch to the "O" (Off) position and unplug the screwdriver.
12. Do not overload to the extent that the motor locks or the clutch malfunctions. May cause smoke, fire, failure or injury.
13. If the body is overheating or functioning abnormally, stop using the driver immediately and inspect it to see whether any repairs are necessary. May cause failure or injury.
14. The driver may overheat depending on the type of screw, type of screw-tightened material, or frequency of use. To avoid overheating, stop operating the driver for a time or use several drivers in alternation. Overheating may reduce the life of the product or cause failure, burns, or other injuries.
15. The fastening torque may vary depending on how the product is operated or held, the type of screw, and the fastening conditions. Use a torque wrench or similar tool to check that the fastening torque is appropriate.

3. Overview

The Screw Fastening Counter DLR5040A detects a torque reached signal in its exclusive way to let you fasten screws with confidence. The microprocessor-based counter supports a wide range of fastening conditions to prevent human fastening errors while providing enhanced fastening management accuracy.

To allow application of the counter to a wide variety of assembly work, it is provided with a function of counting two kinds of parts to up to nine each (external counting function) in addition to the fastened screw counting function. A serial screw fastening system can be easily established by connecting some screw fastening counters in series without use of external controls, such as a programmable controller (link connection function).



Basic configuration

4. Product Organization

This screw fastening counter works in a pair with any electric screwdriver (DLV30/45/70□□-SPC Series).

⚠ WARNING

If the counter is used with power other than 100-V, use a screwdriver appropriate to the supply voltage to be applied. For the details, consult our sales department.

* Use of the screw fastening counter in conjunction with a work present signal, such as one transmitted from a work sensor, is recommended. Work sensor signal input to the counter enables it to work to your full satisfaction.

Electric screwdriver + Screw fastening counter + Work sensor (third-party's product)

* Use a screwdriver conforming to the voltage specification.

5. Principles of Operation

The Screw Fastening Counter DLR5040A detects the start signal that is generated by an electric screwdriver and the torque reached signal that is generated at the completion of screw fastening to count fastening times and thus to prevent omissions along with the work sensor signal.

If, because of a fastening error (elevated screw or double fastening), a torque reached signal comes before the fastening time set on the timer built in the counter elapses, no count is recognized (count correction function).

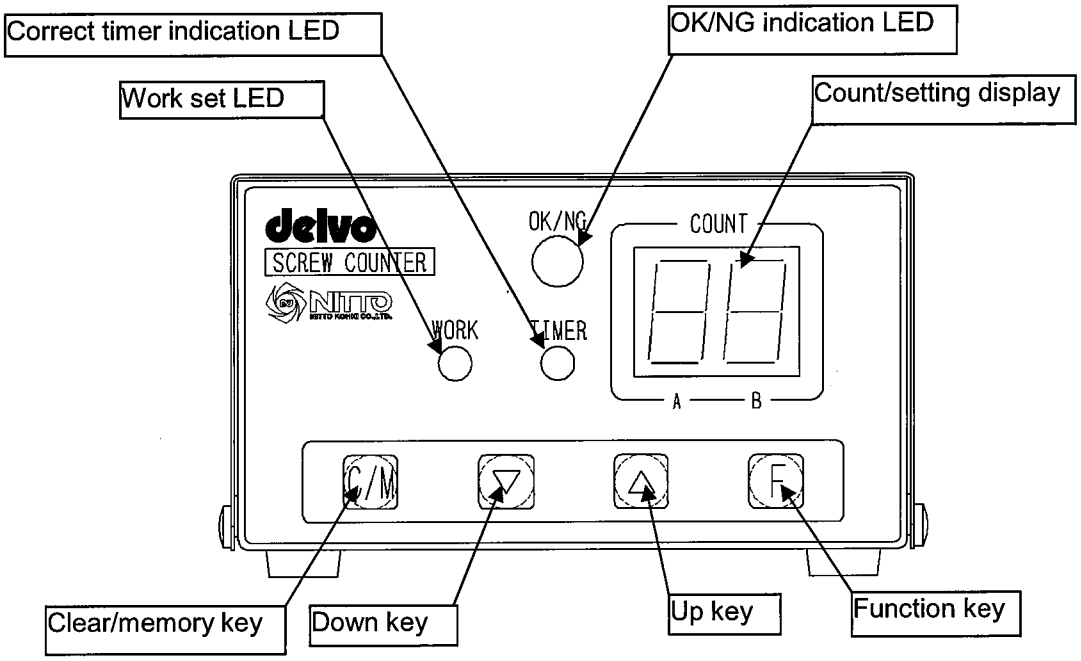
In the event of refastening, a reverse signal that is output from the electric screwdriver reverses the count by one (count return function).

6. Specifications

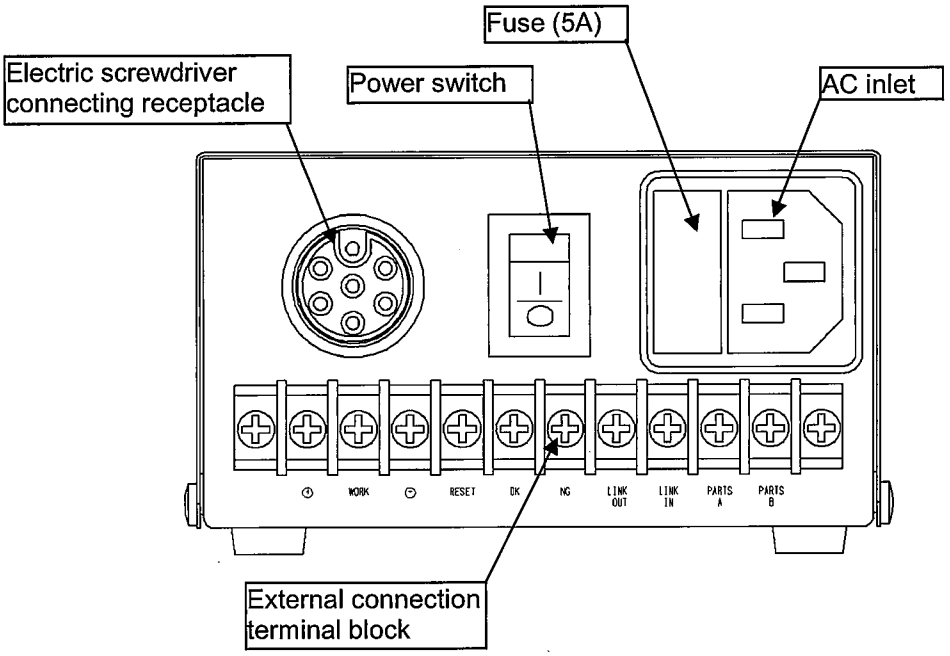
Item	Specification	Remarks
Count	1 to 99	Set with the front-panel switch (including an external count).
External count input	2 inputs (PARTS_A/PARTS_B)	Set with the front-panel switch (count: 0 to 9 for each input)
Counting method	Count-up/Count-down	Set with the rear-panel DIP switch (DIP-SW1).
Count correction function	Counted only on normal fastening	Not counted if the signal comes before the correct timer times out.
Correct timer setting	0.01 to 0.99 second With automatic correct timer	In steps of 0.01 second (set with the front-panel switch) (The automatic correct timer automatically selects the minimum value.)
Work detection function	Yes (1 input)/No	Set with the rear-panel DIP switch (DIP-SW5).
Work set timer setting	0 to 9.5 seconds	In steps of 0.5 second (set with the front-panel switch)
OK output timer setting	0 to 9.5 seconds	In steps of 0.5 second (set with the front-panel switch)
NG buzzer setting	ON(1)/ON(2)/OFF	Set with the front-panel switch.
OK buzzer setting	ON(1)/ON(2)/ ON(3)/OFF	Set with the front-panel switch.
Count return function	ON/OFF	Set with the rear-panel DIP switch (DIP-SW2).
NG evaluation start timing setting	WORK SET/DRIVER ON	Set with the rear-panel DIP switch (DIP-SW3).
Automatic/manual OK evaluation setting	AUTO/MANUAL	Set with the rear-panel DIP switch (DIP-SW4).
Screwdriver lock function	ON/OFF	Set with the rear-panel DIP switch (DIP-SW6).
Link connection	Yes (up to 10 units)	Controlled on a rear-panel terminal block connection.
Terminal block external input	Sensor/RESET/LINK-IN/ PARTS_A/PARTS_B	Photocoupler input (24 VDC 5 mA consumption)
Terminal block external output	OK/NG/LINK-OUT	Open collector output (maximum capacitance 24 VDC 30 mA)
Parameter memory	Parameters stored in internal nonvolatile memory	When power is turned on, the memory is initialized by pressing the C/M key.
Power supply	Input: 100～240 V AC 50/60Hz Output: 100～240 V AC 0.5～0.21 A	Screwdriver unit matched to the available voltage used
Power consumption	65W (Power consumption only for counters is 10 W.)	Single-counter power consumption (included 24V/200mA external power)
Fuse rating	250 V AC/5 A x 2 fuses	ϕ5 x 20 glass-enclosed fuse
Temperature Range [°F]	Operating: 23 to 122 (-5 to +50 °C) Storage : -4 to 158 (-20 to +70 °C)	
Relative Humidity	Free of Dew (during both operation and storage)	
Operating Environment	less than 6557 ft (2000 m) above sea level	
Pollution Degree	degree 3 according to IEC60664-1	
Over Voltage Category	category II according to IEC60664-1	
Dimensions	3.98"(W) x 5.12"(D) x 2.36"(H) 101(W) x130(D) x 60(H) mm	
Mass	1.21 lbs (550 g)	
Compatible screwdriver	DLV30/45□□-SPC(LKU)	Driver dedicated to the Screw Fastening Counter DLR5040A/5340-WU
Accessory	Power cord, 80" (2m)	With 3P earth wire

7. Parts Denomination

Front



Rear



8. Installation

8-1 Installation Location

Install the screw fastening counter in a flat location with good visibility. Lay connections, such as the power cord and the screwdriver cord, along a wall surface or poles and clamp them in firm position.

8-2 Ambient Environment

Install the counter in a well-ventilated indoor place where there are no sources of oil, dust or sparks. If equipment generating noises is installed near the counter, it may not normally count or may output OK/NG signals incorrectly, or it may detect the noises to display "NG" or sound the NG buzzer. Therefore, in such a case, take sufficient measures against noises using electrical insulation or noise source shielding.

9. Making Connections

9-1 Connecting the Power Cord

Insert the power cord all the way into the receptacle on the rear panel. To use the counter safely, earth the power plug without fail.

* Do not turn on power at this stage.

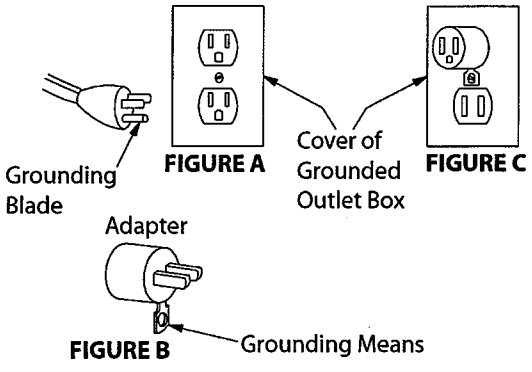
9-2 Connecting an Electric Screwdriver

Use an electric screwdriver dedicated to the screw fastening counter (SPC type).

With the counter powered off, insert the metallic connector of an electric screwdriver into the electric screwdriver connection receptacle.

9-3 Grounding

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 thee-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.



⚠ WARNING

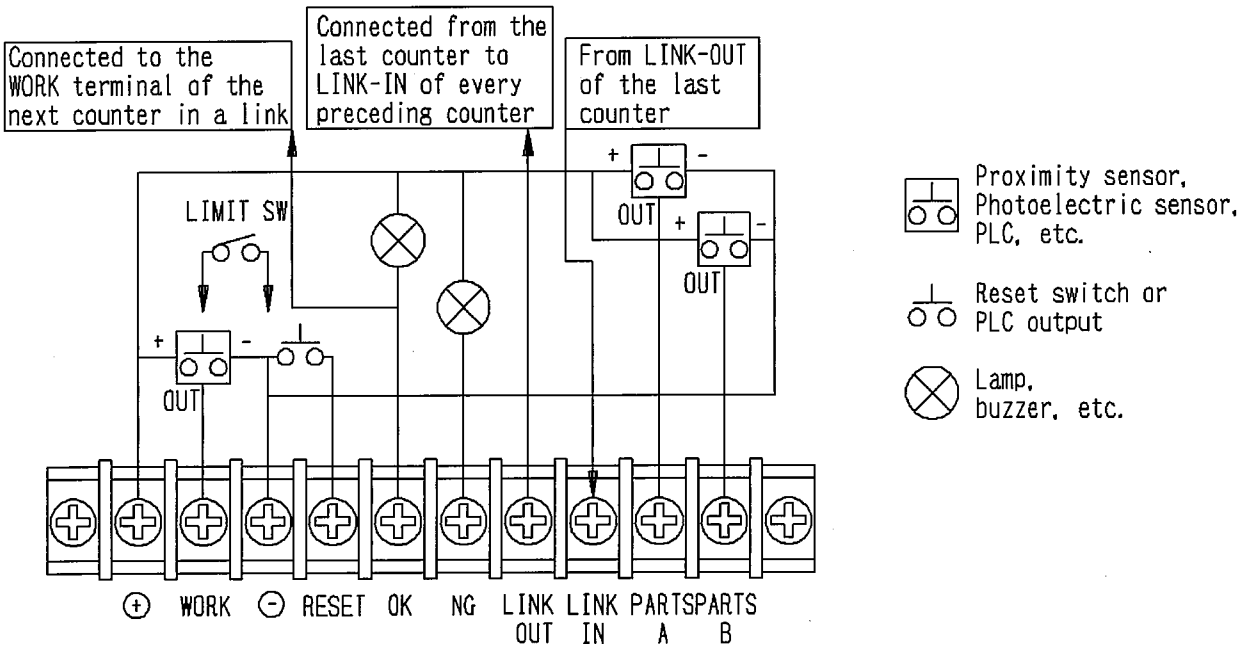
For safe use of adapters, the outlet box must be grounded. If there is any doubt, have a qualified electrician check connections.

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

9-4 Connecting External Signal Lines

Connect the work detecting sensor, OK/NG output signal and external reset input signal lines to the terminal block on the rear panel of the counter.

* The terminal block can be attached and detached with the lines connected.



Sample connection

* Sensors to which work detecting signals can be connected

NPN output type 3-wire sensors, such as photoelectric sensors and proximity sensors, are recommended.(2-wire sensors may not be used.)

* Recommended lead wire diameter of signal lines to be connected to the terminal block

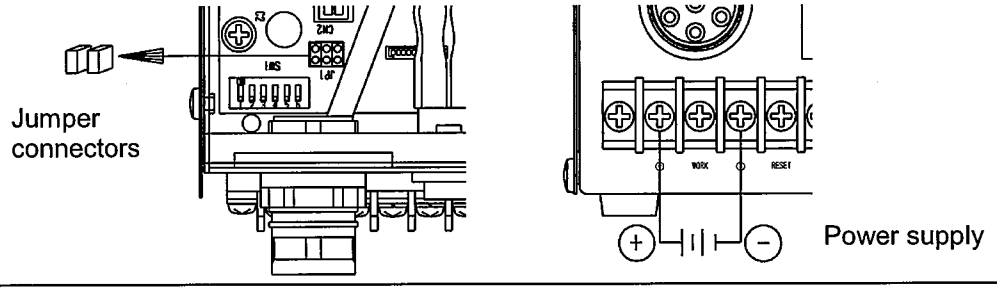
AWG20 or more

<If an external power supply is used>

If an external power supply is connected to the I/O terminal of the counter rear-panel terminal block, it is necessary to disconnect the internal power supply of the counter from the terminal block.

You can find two jumper connectors on the internal PCB-board. Turn the power switch off and remove the case cover.

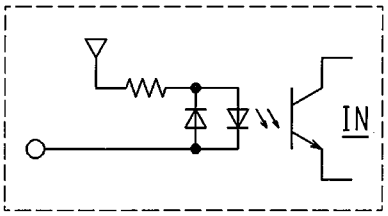
Remove two jumper connectors JP1 and JP3 and connect an external power supply to the ⊕ and ⊖ terminals of the terminal block (power supply: 12 to 24 VDC).



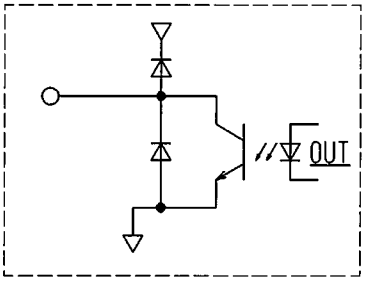
⚠ WARNING

1) Be sure to turn the power switch off and remove the case cover before attempting to remove two jumper connectors. Failure to do so may lead to electric shock.
2) Never let operators remove two jumper connectors or remove the case cover. These operations are dangerous. Only authorized personnel should handle them.
3) Never open the case cover for any purpose other than two jumper connectors removing.

<Terminal block I/O circuit arrangement>



Input circuit (WORK, RESET, LINK IN
PARTS_A, PARTS_B)



Output circuit (OK, NG, LINK OUT)

<Terminal block specifications>

No.	Name	I/O	Definition	Signal timing	Remarks
1	⊕		+24 V power supply		Built-in switched power supply capacity 200 mA max.
2	WORK	Input	Work sensor input	OFF→ON	ON signal is kept input while work is in the fastening position.
3	⊖		Common		
4	RESET	Input	External reset input	OFF→ON	DIP-SW4 Set to auto: Longer than 1 second Set to manual: Longer than 3 seconds
5	OK	Output	OK evaluation external output	OFF→ON	Signal is kept on until work is released.
6	NG	Output	NG evaluation external output	OFF→ON	Signal is kept on until work is re-set or reset switch is pressed.
7	LINK-OUT	Output	Link connection output	ON→OFF	Connected from the last counter to LINK-IN of every preceding counter
8	LINK-IN	Input	Link connection input	ON→OFF	From LINK-OUT of the last counter
9	PARTS_A	Input	Part verification input A	OFF→ON	ON signal is input when parts are removed.
10	PARTS_B	Input	Part verification input B		

<I/O specifications>

Input: Photocoupler input (24 VDC max., 5 mA/1 input)
Output: Open collector (No-voltage contact rating: 24 VDC max., 30 mA/1 output)

⚠ WARNING

Output signals are in an unstable state for about 5 msec after the power switch is turned on until the internal power supply starts up. Note that the output signals may be detected depending on the signal detecting conditions of the sequencer.

⚠ CAUTION

1) Before making connections to the terminal block, turn off the power switch to remove concerns over counter failures or electrical shock hazards.
2) Sensors may malfunction under the influence of noise interferences depending on where they are installed. Implement full protection against noises interferences, as by grounding. For more details, refer to the sensor maker's instruction manual.

10. Setup

When all the connections are established, set up screw fastening counter with its rear-panel switch being turned on.

Setup items are:

1. Count, timers, and buzzer ON/OFF setup (basic settings) → Go to 9-1
2. Parts verification function ON/OFF setup (optional setting) → Go to 9-2
3. Count manual preset mode setup (optional setting) → Go to 9-3

Follow the steps below to invoke the individual setup modes.

Setting

Setup key	Setup mode	How to reset
F+△	Count, timers, and buzzer setup mode	Press the C/M key to reset.
F+▽	Parts verification function ON/OFF setup mode	Press the C/M key to reset.
F+C/M	Count manual preset setup mode	Automatic reset

*Settings are stored on reset.

10-1 Count, timers, and buzzer ON/OFF setup (basic settings)

Enter settings to meet work-specific fastening conditions.

1) Press the F + △ keys to invoke the setup mode.
2) Press the F key in sequence to change the setup items. (See the following table.)
3) To change the setting, press the △ or ▽ key.
4) To enter the settings in the memory and exit from the setting mode, press the C/M key.
5) To check the settings, press the △ key in the standby mode. Then, the settings will be displayed successively at 0.5-sec intervals. (However, when the count external preset mode is effective [9-3], priority is given to the preset mode.)

Setup order	Setup item	Display	Setup range	Description	STEP	Default
F key	Count setting		1 to 99	Setting of number of screws to be fastened	1	1
↓	Work set timer setting	WORK LED (green) on	0 to 9.5 sec.	Setting of time from when work is set until WORK lamp lights up (work is recognized)	0.5	0.0
↓	Correct timer setting	TIMER LED (orange) on	0.01 to 0.99 sec.	Setting of predicted time of screw fastening	0.01	0.05
↓	OK output timer setting	OK LED (green) on	0 to 9.5 sec.	Setting of time until OK signal is output or count is returned after completion of counting	0.5	0.0
↓	NG buzzer ON/OFF	NG LED (red) on	0: OFF 1: ON1 2: ON2	ON1: NG buzzer upon release of work ON2: NG buzzer upon release of work and occurrence of fastening error		1
↓	OK buzzer ON/OFF	OK LED (green) on	0: OFF 1: ON1 2: ON2 3: ON3	ON1: Chime (ding-dong) upon completion ON2: Blip every time screw is fastened, and chime twice upon completion ON3: Do-re-mi upon completion		1

* If the correct timer setting is too small, re-fastened screws may be counted.

<Automatic setting of correct timer>

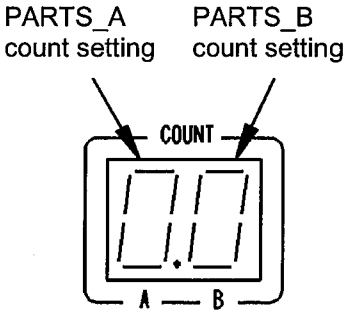
If a screw is actually fastened to work when the correct timer is set, the timer automatically measures the fastening time and reflects the measurement on the timer setting. While screw fastening is repeated, the minimum value is updated successively and displayed as the optimum value.

If an improper time is displayed during automatic setting of the correct timer (for example, when the torque rises earlier than usual owing to dragging of screw), the minimum time can be canceled by pressing the [△] or [▽] key. In this case, the correct timer must be set again.

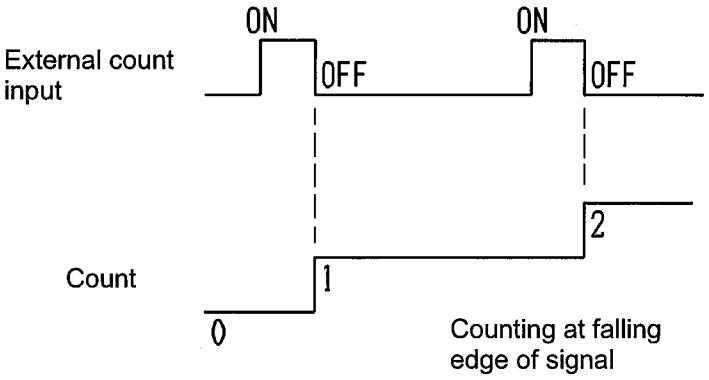
10-2 External count input function ON/OFF setup (optional setting)

This function feeds an external count input signal to PARTS_A or PARTS_B in the counter rear-panel terminal block to count both the screw fastening and external counts, thereby preventing screw fastening errors in a small-scale workshop.

1) Press the [F] + [▽] keys to invoke the setup mode.
2) The current setting displays first (between 0.0 and 9.9).
3) The digit in each position sets a count of PARTS_A or PARTS_B. (0 = disable, 1 to 9 = count enabled)
4) Press the [△] or [▽] key to change the setting.
   The setting changes from 0.0 to 0.1 and from 9.8 to 9.9.
   (The [▽] key changes the setting in reverse direction)
5) Press the [C/M] key to save the setting and quit.



6) If an external count input signal is enabled, connect an external count input signal line to the appropriate terminal of the counter rear-panel terminal block.
7) Enter a sum total of the screw fastening and external counts as a count in 9-1.



External count input timing chart

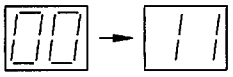
⚠ CAUTION

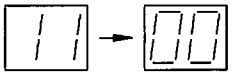
1) The external count input and the screw fastening count are not prioritized.
2) If an external count input comes before work is set when a work present signal is programmed, an NG signal is generated to prevent an unloading error.
   In this case, cancel the NG display with the [C/M] key.
3) If the screw fastening count completes without external input when external count is programmed, an NG signal is generated.
   In this case, re-set the work, and remove the parts, or cancel the NG display with the [C/M] key.
4) An NG signal is also generated if an external count input comes after the external count has completed.
   In this case, cancel the NG display with the [C/M] key.

10-3 Count manual preset mode setup (optional setting)

If a worker needs to change counts frequently during the screw fastening work for a day (high-mix low-volume production), turn on this function to ease the work of changing counts.

1) Press the [F] + [C/M] keys to change the setting automatically.
2) The setting is enabled if the indication has changed from 00 to 11 and is disabled when the indication has changed from 11 to 00.
3) While the counter is in the standby state with the setting enabled, press the [△] or [▽] key to change count. To accept the new setting, press the [C/M] key.

Setup enabled 

Setup disabled 

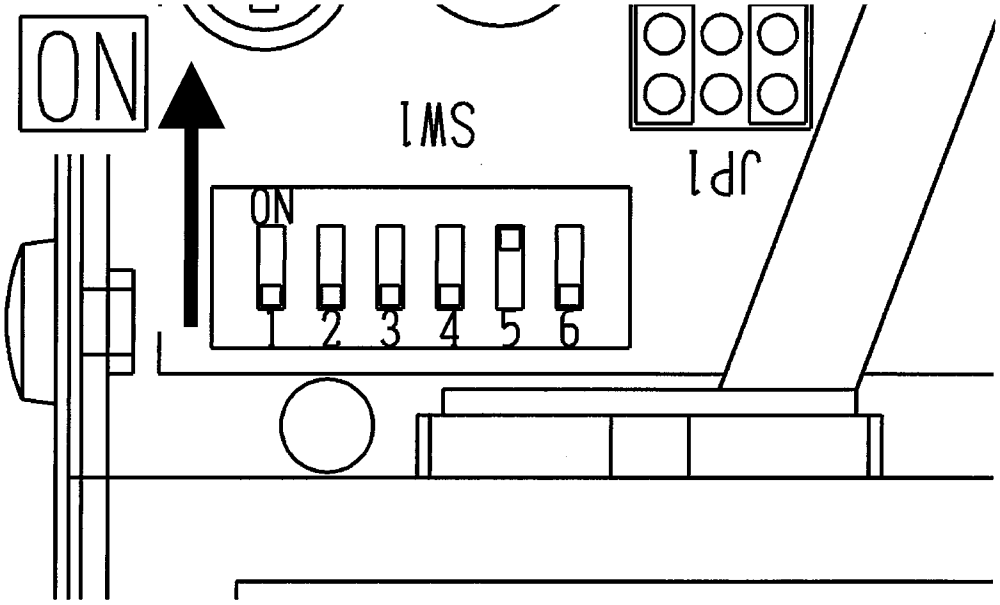
CAUTION

1) It is recommended that this function be disabled, except when it is needed, to prevent operator mistakes.
2) The counter cannot be set to the manual preset mode when the work sensor is disabled (DIP-SW5 is on). To use the counter in this mode, enable the work sensor (turn off DIP-SW5).
3) When the present mode is effective, the basic settings cannot be displayed (by pressing the [△] key in the standby mode) because the preset mode has priority.

10-4 Setting Counter Rear-Panel DIP Switches

SW	Item	OFF	ON
1	Counting method setting	Count-down	Count-up
2	Count return function reset	Count return enabled	Count return disabled
3	Count evaluation timing setting	Enabled after work is set	Enabled after the screwdriver rotates
4	Automatic/manual OK setting	OK output (when count = setting)	OK output when work is released
5	Work sensor signal input available/disable setting	Sensor signal input available	No sensor signal input available
6	Screwdriver interlock reset	Interlocked with the setting of work	Interlock reset

***You can find the DIP switches on the internal PCB-board. Turn the power switch off and remove the case cover. You can now set the DIP switches.**



⚠ WARNING

2) Be sure to turn the power switch off and remove the case cover before attempting to set the DIP switches. Failure to do so may lead to electric shock.
3) Never let operators change the DIP switch settings or remove the case cover. These operations are dangerous. Only authorized personnel should handle them.
4) Never open the case cover for any purpose other than DIP switch setting.

<DIP switch explanation>

SW-1 Counting method setting (when shipped: set to count-down)

The fastening counting method can be changed to count-down (remaining count displayed) or to count-up (fastened count displayed). In most situations, the count-down method would be easiest to manage.

* For users of the screw fastening counters (DLR5031/5030), use of the count-up method is recommended to avoid confusion.

SW-2 Count return function reset (when shipped: set to count return enabled)

This screw fastening counter has a built-in function to reverse one count when a screw is loosened after it has been once fastened. If this function is not used, it should be disabled to avoid faulty operations.

* The count would reverse, for example, even if a screwdriver is idled by reversing after it has been fastened.

> ⚠CAUTION
>
> The count would not reverse if the screwdriver is reversed when it has not been fastened at all. The screwdriver would reverse only one count even if the screwdriver is reversed twice.

SW-3 NG evaluation start setting (when shipped: set to enable after work is set)

* This setting is enabled only if a work sensor signal line is connected to the counter rear-panel terminal block and the DIP switch (DIP-SW5) is set to work sensor signal input available.)

An NG indication and an NG signal are generated if work is unloaded without the preset count and the fastened count not equaling with the counter set to use a work sensor signal.

You can choose when to start the NG evaluation process; that is, start the evaluation process from the moment at which work is mounted on the jig or after the screwdriver is rotated.

If the NG evaluation process is programmed to work after work is set, an NG indication is generated when the work is inadvertently unloaded as a finished product after the fastening work is resumed from a pause.

If work has to be temporarily unloaded after it has been set, the NG evaluation might be inconvenient. In this usage mode, the NG evaluation process can be programmed to work after the screwdriver is rotated to suppress the NG evaluation.

SW-4 Automatic/manual evaluation setting (when shipped: set to automatic setting)

With the normal setting (automatic evaluation), an OK indication and an OK output are automatically generated when the preset count and the fastened count equal. The work is unloaded on the basis of the OK indication and fastening of the next work begins. However, equal even though fastening has been carried out at positions other than the specified fastening position, successful fastening would be assumed as long as the two counts equal.

The manual evaluation process lets you visually check the fastening work and then unload then work for OK output. The manual evaluation setting renders an OK evaluation of the work after its fastening has been verified to ensure positive fastening performance.

* If the manual evaluation process is set, an NG evaluation would be generated if work is unloaded without the preset count and the fastened count not equaling. Further, if further fastening is attempted in a 0 count state in count-down mode, 99 would be displayed. If the improperly fastened screw is removed by reversing, an OK evaluation would result with the preset count and the fastened count equaling, but the screw cannot be reversed by the fastened count exceeds the preset count by two or more (only one count return allowed). (This also holds true in count-up mode.)

SW-5 Work sensor signal input available/disable setting (when shipped: set to sensor signal input available)

Though this screw fastening counter evaluates fastening conditions on the basis of the correspondence between the work sensor signal and the fastened count. It can count fastening times in a simplified manner even when work sensor signal input is not available.

In this situation, an NG evaluation cannot be produced because only an OK evaluation is displayed and generated when the preset count and the fastened count equal. OK output is produced for the period of time set by the OK output timer in 9-1.

* The combined use of a work sensor signal is recommended to render an NG evaluation.

> CAUTION
>
> If work sensor signal input unavailable is set (ON), the automatic evaluation process overrides the manual OK evaluation setting (DIP-SW4 OFF) unconditionally.

SW-6 Screwdriver ON (interlock)/OFF (reset) (when shipped: set to interlock with work setting)

The screw fastening counter keeps the work powered on only for the duration of its fastening after it is mounted in position (WORK lamp being lit) to prevent fastening errors. Its purpose is to prevent accidents or physical injury caused by screwdrivers in times other than fastening. When using a screwdriver temporarily in operations other than assembly, release the driver lock. (DIP-SW6: ON)

11. Operating Instructions

11-1 Work Sensor Signal Input Available and Normal Fastening

1) Connect work sensor output or a work sensor signal to the counter rear-panel terminal block. Connect external I/O signal lines to meet your usage conditions.
2) Turn on the power switch but not before verifying the correct connections.
3) Set the front-panel setup mode to meet your usage conditions.
4) Set the counter rear-panel DIP switches to meet your usage conditions (set DIP-SW5 and 6 to OFF).
5) Mount the work to be fastened on the jig.
6) When the front-panel WORK lamp (green) lights up after the work is mounted, start fastening. The count on display will count down (up) as the work is fastened successfully.
7) The OK lamp (green) lights up when a preset count of fastening has been attained.
8) Unload the work from the jig and set new work in its place.

<Fastening NG>

1) The NG lamp (red) lights up when the work has been under-fastened or when the work is unloaded without a fastening defect being corrected.
2) The OK lamp (green) lights up when the work is remounted on the jig and then refastened to achieve the preset count of fastening after the defect has been verified.
3) To remove the work out of line as being defective, press the front-panel C/M key or an external reset switch for longer than 1 second (or longer than 3 seconds if DIP-SW4 is ON).

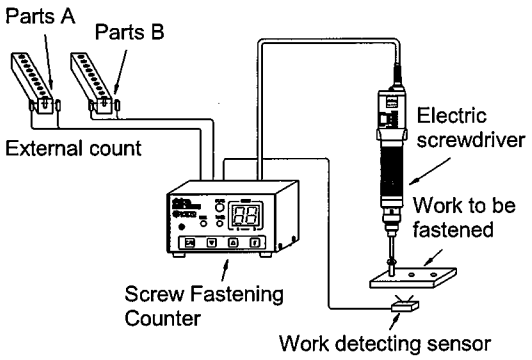
11-2 Work Sensor Signal Input Unavailable and Normal Fastening

1) Set the counter rear-panel DIP switch (DIP-SW5) to ON.
2) The OK lamp lights up automatically.
3) Carry out fastening the same way as described in 10-1.
4) The OK lamp (green) lights up when the fastening is completed.

> ⚠CAUTION
>
> 1) Without work sensor signal input available, no NG evaluation is produced when the work is unloaded. Always watch for the OK signal in fastening work.
> 2) The rear-panel DIP switch DIP-SW4 has no effect (fixed to automatic evaluation).

11-3 Screw Fastening with External Counting Function

1) Connect a sensor or the like for detecting parts to PARTS_A or PARTS_B on the terminal block.
2) If you want to detect work, set the counter in accordance with 10-1. If you do not want to detect work, set the counter in accordance with 10-2.
3) Set the conditions of each external counter in accordance with 9-1 and 9-2.
4) After the WORK lamp lights up, start the screw fastening operation or part removing operation.



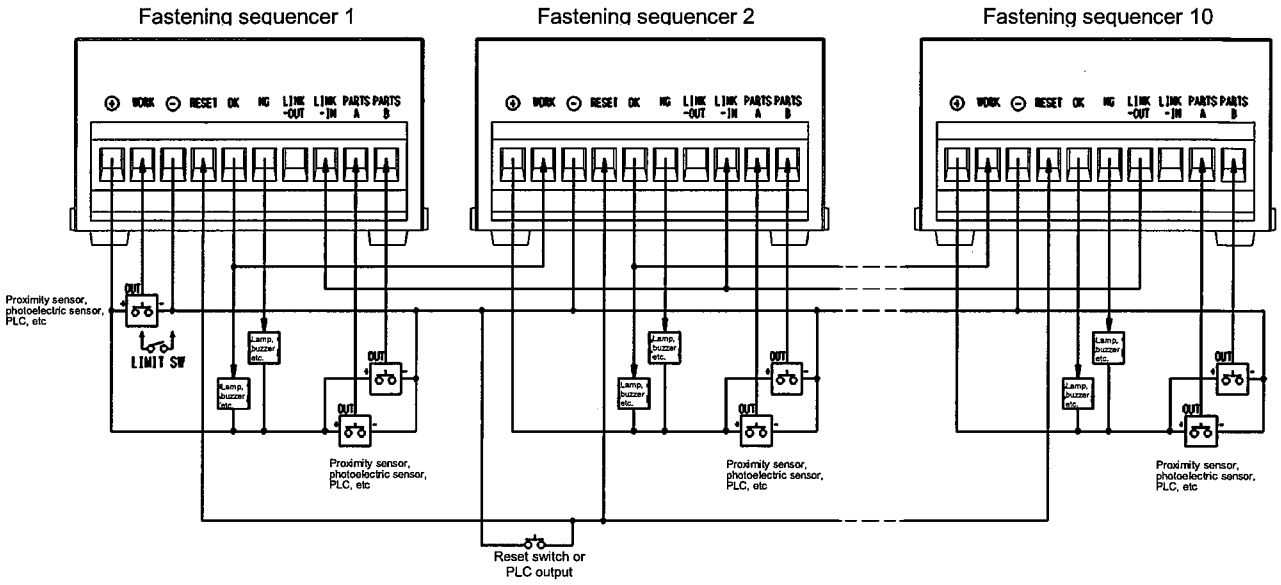
5) When the sum of the number of fastened screws and the external count reaches the setting, the OK lamp lights up. (If DIP-SW4 is on, the OK lamp lights up when work is released.)

> ⚠ CAUTION
>
> 1) If parts are removed before the WORK lamp lights up, the NG lamp lights up. In this case, press the C/M key to cancel the error.
> 2) If the OK lamp does not light up even when the counter's value is 0 or the set number, the sum of the external count and the number of fastened screws may not be identical to the counter's value. Re-check the setting.
> 3) If the NG lamp lights up upon removal of parts, the number of removed parts may exceed the external count. Check the external count setting
>
> If too many parts have been removed, press the C/M key to cancel the error.

11-4 Link Connection

Use the [LINK-IN] and [LINK-OUT] terminals of the counter rear-panel terminal block to hook up multiple counters on a single link. Using this function, only worker can fasten multiple screwdrivers in the order in which counters are connected.

* Up to 10 counters can be connected.



Typical link connection

⚠ CAUTION

1) External OK and NG output can be individually produced for each screw fastening counter on the link or in a batch for all. Choose the method of connection to meet your usage conditions.
2) Use a single reset input for shared use among all the screw fastening counters on the link.
3) If the counter rear-panel DIP switch SW-6 "screwdriver lock" is set to enable (OFF), only the electric screwdrivers interlocked with the fastening sequence are enabled. Use of SW-6 being set on is recommended to avoid the use of electric screwdrivers from the wrong sequence.

12. Usage Tips

1) Complete terminal block connections before powering on the counter, because making such connections with the counter switched on would be most hazardous.
2) If you press the C/M key while mounting work, the count and the counter status would be reset to their defaults.
3) Making changes to the setting conditions while fastening work could cause the counter to malfunctions. If such changes are necessary, make them while the counter is in the standby state or before powering it on.
4) If you discontinue the push or lever operation immediately before the electric screwdriver torque rises, the counter would be unable to recognize the signal when the torque rise due to an inertia force, so that the count would remain unchanged. Continue the operation until the electric screwdriver stops completely.
5) Avoid idling or additional fastening immediately after the start of counting to avoid incorrect counting.
6) If you turn on the power switch while the C/M key is pressed, all the settings are reset to their defaults.

13. Troubleshooting

	Symptom	Possible causes and checks	Repairing
1	The WORK lamp does not light.	- Is the sensor connected to the terminal board? - Is the sensor powered on? - Does the sensor detect a work? - Is the Work Set timer value too great?	- Check and correct the connection. - Supply power to the sensor. - Adjust so that the sensor may detect the work. - Set an adequate Work Set timer value.
2	No counting	- The WORK lamp remains OFF. - The collection timer has not been expired. - The screwdriver is removed before the torque is complete. - The screwdriver is frequently applied and detached to fasten the screw.	- Cause the sensor to detect the work. - Set an adequate collection timer value. - Be sure to apply the screwdriver to the screw until the torque is complete. - Be sure to complete each screw fastening without a break.
3	Counting is complete but "OK" is not displayed.	- Check whether DIP SW-4 is ON (Evaluation Manual).	- Set DIP SW-4 to the OFF (Evaluation Auto) position.
4	"NG" is displayed when a work is released.	- The count value is not equal to the number of actually fastened screws. - An external count has been set.	- Fasten the preset number of screws. - Set the external count to OFF (0.0).
5	Inactive screwdriver	- The sensor does not detect the work. - The FORWARD/BACKWARD switch of the screwdriver is OFF. - The count is 0.	- Place the sensor on an adequate detecting position. - Turn on the FORWARD/BACKWARD switch. - Release the work or press the [C/M] key.
6	The preset values cannot be displayed (although the [△] key is pressed while the screw fastening counter is standby).	- The Count Manual Preset mode has been set.	Press the [F] and [C/M] keys to reset the Manual Preset mode.
7	Unknown setting		Turn on the power switch while pressing down the [C/M] key to clear all setting in memory.

*A parts list is enclosed with this manual for your reference.
*If the abnormality remains, contact the sales representative from whom you purchased the tools.

⚠ WARNING
Please have the product inspected periodically at the store of purchase or a Nitto Kohki-approved service center. Failure to perform periodic inspections may result in short circuiting.