

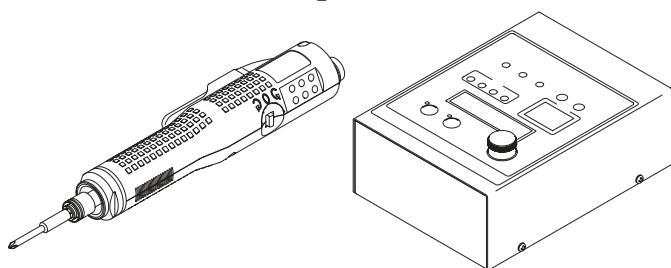
# INSTRUCTION MANUAL

Professional tool ELECTRIC SCREWDRIVER / CONTROLLER

## delvo

Model: DLV04C/10C10L-AY / DCC0101X-AZ

## Product Operational Information



Torque Current Control System

Low-Voltage Brushless Motor

For Both Hand-Held/Automatic Machine

ESD Protection

Indoor Use Only

EN

This instruction manual is written in English.  
Instruction manuals in other languages can be downloaded from the URL below.

FR

Ce manuel d'instructions est rédigé en anglais.  
Les manuels d'instructions dans d'autres langues peuvent être téléchargés à partir de l'URL ci-dessous.

DE

Diese Bedienungsanleitung ist auf Englisch verfasst.  
Bedienungsanleitungen in anderen Sprachen können von der unten genannten URL heruntergeladen werden.

IT

Il presente manuale di istruzioni è redatto in lingua inglese.  
I manuali di istruzioni in altre lingue possono essere scaricati dal seguente URL.

ES

Este manual de instrucciones está escrito en inglés.  
En la dirección URL indicada abajo se pueden descargar los manuales de instrucciones en otros idiomas.

PT

Este manual de instruções está escrito em inglês.  
Pode descarregar os manuais de instruções nos outros idiomas a partir do URL indicado abaixo.

<http://www.nitto-kohki.co.jp/e/>

### [Specifications]

Electric screwdriver		
Model	DLV04C10L-AY	DLV10C10L-AY
Torque [N·m(Lb-in)]	0.05 to 0.4 (0.4 to 3.5)	0.2 to 1.0 (1.8 to 8.8)
Free Speed [min <sup>-1</sup> ] (for reference)	SOFT fastening setting: 600 to 1,000 HARD fastening setting: 100 to 1,000	
Input Voltage	24 V DC	

Controller	
Model	DCC0101X-AZ
Input Power	100 V AC - 240 V AC, 50/60 Hz
Main Functions	<ul style="list-style-type: none"> <li>● 4-channel switching function</li> <li>● Screw fastening count function</li> <li>● Workpiece signal detection function</li> <li>● External input signal startup function</li> <li>● ESD protection</li> </ul>

■ Please refer to p. 8 for details.

- Please read manual carefully before you attempt to use your tool so that you may use it properly and safely.
- Keep the manual handy - so you can use it whenever necessary.

• Due to continuous product development/improvement the specifications and configurations in this document are subject to change without prior notice.

Manufactured by.

**NITTO KOHKI CO., LTD.**

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(Original Instructions)

TV07783-1 06/2017

Thank you very much for your purchase of this **NITTO KOHKI** product.

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.**

## Contents

Product Specific Safety Rules .....	1	Workpiece signal (No.12 WORK-SNSR) .....	31
1 Application .....	3	Count number (No.13 COUNT) .....	31
2 Checking Inside the Package .....	4	Workpiece setup time (No.14 WORK-S-T) .....	31
3 Part Names.....	5	Screw fastening time lower limit value (No.15 CRT-T-L) / Screw fastening time upper limit value (No.16 CRT-T-U).....	32
Electric screwdriver.....	5	Screw fastening confirmation time (No.17 OK-OUT-T) / OK output timing (No.18 OK-TIMING).....	33
Controller .....	6	Operations OK buzzer sound (No.19 OK-BZ) / Operations NG buzzer sound (No.20 NG-BZ) ....	33
4 Specifications .....	8	Count return function (No.21 COUNT-RTN) .....	33
Screw joint .....	10	Buzzer sound volume (No.22 BZ-VOLUME) .....	34
Output torque graph.....	11	Check buzzer sound (No.23 CHECK-BZ).....	34
5 Preparation .....	12	Back light (No.24 BACK LIGHT) .....	34
Attaching a bit .....	12	Setting initialization (No.25 SETUP-RESET) .....	34
Attaching the suspension bail .....	12		
Using the screwdriver with vacuum pickup/ mounted on an automatic screw fastening machine .....	13		
Commercially available fixing tool mounting position.....	16		
6 Basic Operation .....	17	9 Using External Signals .....	35
Start .....	17	Specifications of signal terminal block .....	35
Changeover switch .....	18	External signal specifications .....	38
Start and stop.....	19	Connection example of I/O signal.....	39
Screw tightening .....	20	Using the workpiece signal .....	42
Manual mode .....	21	Resetting operation.....	44
7 Basic Settings.....	22	Operations channel switching .....	45
Operation mode .....	22	Use external signal to start up electric screwdriver.....	45
Setting mode operation.....	22	Locking button or dial operations .....	46
Initialization of settings.....	24		
8 Setting Mode Details .....	25	10 Error Detection .....	47
Operations channel switching method (No.1 CH-CHG).....	25	Detection of connection slip .....	47
Setting target channel (No.2 CH).....	26	Detection of motor startup error.....	47
Screw fastening type (No.3 FSTN-TYPE).....	26	Detection of screw loosened lock .....	47
Torque (No.4 TORQUE) / Speed (No.5 SPEED).....	28		
Soft start level (No.6 SOFT-START) .....	28	11 Appendix .....	48
Fastening timer (No.7 FSTN-T) .....	28	When abnormalities have occurred (Troubleshooting).....	48
Count-up buzzer sound (No.8 COUNT UP-BZ) / Fastening NG buzzer sound (No.9 FSTN-NG-BZ) .....	30	Maintenance and inspection .....	52
Refastening prohibited timer (No.10 REFSTN-T) .....	30	Disposal .....	53
Count function (No.11 COUNT-FNC).....	31	Separately-sold products .....	53
		External dimensions.....	55
		LCD display list .....	57
		Glossary .....	59
		Index .....	62
		Setting memo.....	63

## Product Specific Safety Rules

### WARNING

- **Always use the electric screwdriver and controller as a set.**  
Using other power supplies could result in a fire or accident.
- **Do not look directly into the LED (light-emitting part) from close up.**  
Powerful LED light could damage your eyes. Also, do not point the LED (light-emitting part) at people's or animals' eyes.

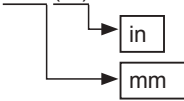
### CAUTION

- **Since this machine uses the motor current to control the torque, individual differences in measurement joints, or the measurement conditions, etc., may lead to fluctuation of the measured torque value. Measurement and control of torque under the same measurement conditions is recommended.**
- **The output torque graph is standard.**  
The output torque range is not guaranteed. Make sure to measure torque.
- **The speed set value is standard.**
- **The torque and speed may show individual differences.**  
Perform the settings and preliminary evaluation, and then use the specified electric screwdriver and controller combination.  
If changing the electric screwdriver and controller combination, again verify the settings and preliminary evaluation before using the new combination.
- **The torque or speed of the electric screwdriver will change over time. Inspect the torque or speed regularly and conform to the value for your use.**  
By using the correct torque, the screwdriver will last longer.
- **The speed or output torque changes based on the temperature of the main body.**
- **The effect of the bit part thrust and radial direction load on the motor may lead to fluctuation in the torque or speed.**
- **Do not apply a shock (such as dropping) or excessive load to the button, switch, or signal terminal block.**  
Doing so could cause a failure.
- **Do not apply refastening to a screw that has already been fastened (second tightening, check tightening). High torque is impressed.**
- **For screw tightening, etc., of screws with short necks, or other screw fastening conditions where the screw is quickly seated after the start, a high torque may be impressed. Perform preliminary evaluations, and then use with caution.**
- **This tool is not an impact type electric screwdriver. Do not tighten twice (refastening). Also, it cannot be used for screw tightening of such things as wood or drywall.**  
Depending on fastening conditions, screws may become loose.  
Improper impacts could decrease product life or cause product failure.
- **Do not use the tool for anything other than screw tightening.**  
It should not be used for tasks such as drilling or threading (such as a taper).
- **Connect the electric screwdriver and controller with a connection cord, and then insert the power source.**  
Note that disconnection of the connection cord during operations will result in an error.
- **For the torque setting, use our Torque Checker and special screw joint. (p. 10)**
- **Use after performing adequate evaluation and verification beforehand to check that the various settings, screw fastening speed, output torque, operability, and control systems, are suited to the usage environment.**
- **To ensure that there are no mistakes in operations channel switching, perform operations using full caution.**
- **Do not perform unnecessary operation of the electric screwdriver (spinning in idle, etc.).**  
This has an effect on the structural working life and motor heating.

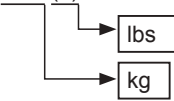
## About Unit Notation

This instruction manual is written using both SI units and the imperial measurement method (yards, pounds). Numeric values outside the ( ) are the value in SI units, while those inside the ( ) are the imperial measurement value.

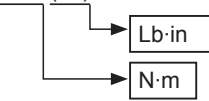
Notation Example: Length 25.4 (1")



Weight: 0.45 (1)



Torque: 1.13 (10)



# 1 Application

This is both a hand-held/automatic electric screwdriver used to tighten screws.

You can detect current flowing to the motor, utilize features controlling the screw fastening torque, and retain the 4-channel torque and speed in memory.

You can switch to the desired torque (operations channel) to match the screw fastening operation, and use a single electric screwdriver to respond to various screw fastening operations.

There are also the features below, which you can utilize to improve the various screw fastening operations' quality, efficiency, and control.

- Environmentally friendly brushless motor mounting
- Secure and safe low-voltage drive
- Bit grounding function
- ESD protection (antistatic performance)
- Screw fastening count
- Measurement of screw fastening time
- Linkage with workpiece detection sensor
- Linkage with facilities based on I/O signal
- For operator hand-held use and mounting on an automatic screw fastening machine (external input signal startup possible)
- Vacuum pickup (sold separately) is mountable

## CAUTION

- **Because it is specified to use the motor current to control output torque, changes in the motor current due to operations conditions or the usage environment can have an effect on output torque.**  
Read this chapter carefully, and fully perform preliminary evaluations and verifications, and then use with caution.

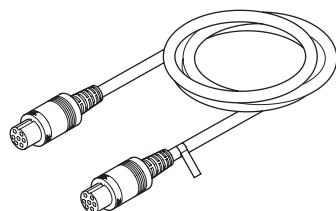
## 2 Checking Inside the Package

When you open the package box, check the content of the package and also check for any damage caused by incidents during transportation.

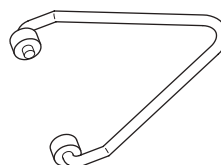
If a problem is found, consult with the store where you purchased the product.

### Package content and list of accessories

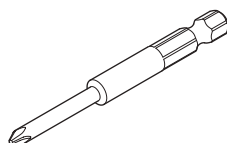
Electric screwdriver	DLV04C10L-AY	DLV10C10L-AY	Controller	DCC0101X-AZ
Package content and accessories	Quantity	Quantity	Package content and accessories	Quantity
Electric screwdriver (main unit)	1	1	Controller (main unit)	1
Connection cord	1	1	Signal terminal block	1
Suspension Bail	1	1	Instruction Manual (this book, Japanese, Chinese)	3
Bit NK35 (No.0 × 4 × 75)	1	-		
Bit NK35 (No.1 × 4 × 75)	1	1		
Bit NK35 (No.2 × 4 × 75) *For torque check	1	1		
Instruction Manual	1	1		



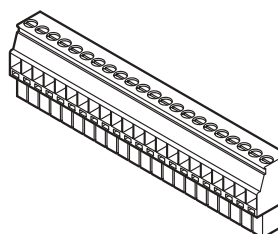
Connection cord



Suspension Bail



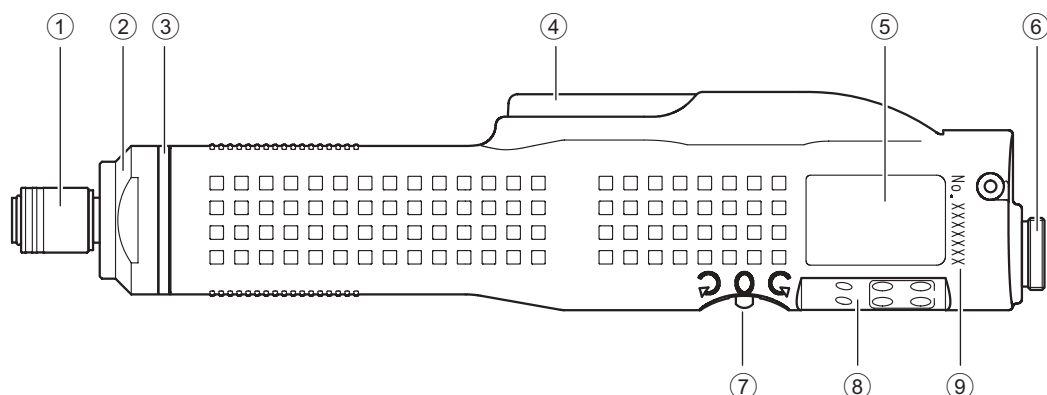
Bit



Signal terminal block

## 3 Part Names

### Electric screwdriver

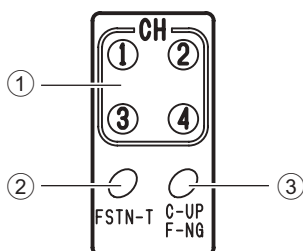


Name	Function
① Sleeve	Pull when mounting or removing bit.
② Coupling	Part for fixing the screwdriver frame. When mounting the separately sold adsorption coupling or flanged coupling, remove this part. (Left-hand thread)
③ Accent Ring ⑤ Rating Plate	Identifies the model (torque band) with color. Gold: DLV10C10L Silver: DLV04C10L
④ Lever Switch	Press when starting.
⑥ Receptacle	Connection cord is used to connect the controller.
⑦ Changeover Switch	Switches between forward rotation, neutral, and reverse rotation.
⑧ LED display	Displays the electric screwdriver status.
⑨ Serial No.	

### LED display

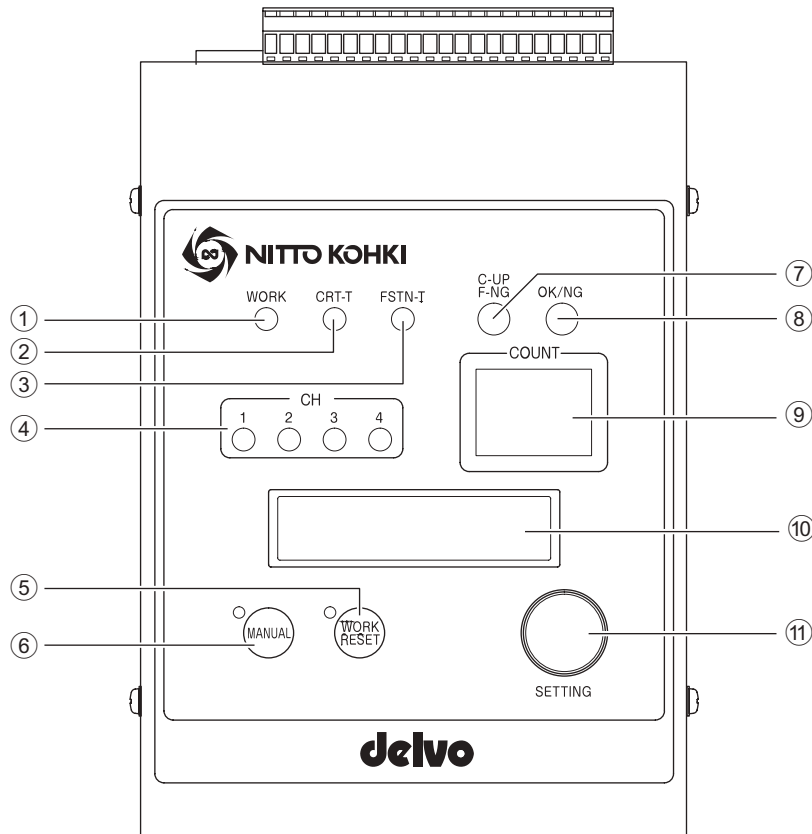
#### ⚠ WARNING

- Do not look at the LED (light-emitting part) from close up. In addition, do not bring it near people's eyes. Powerful LED light could damage people's eyes.



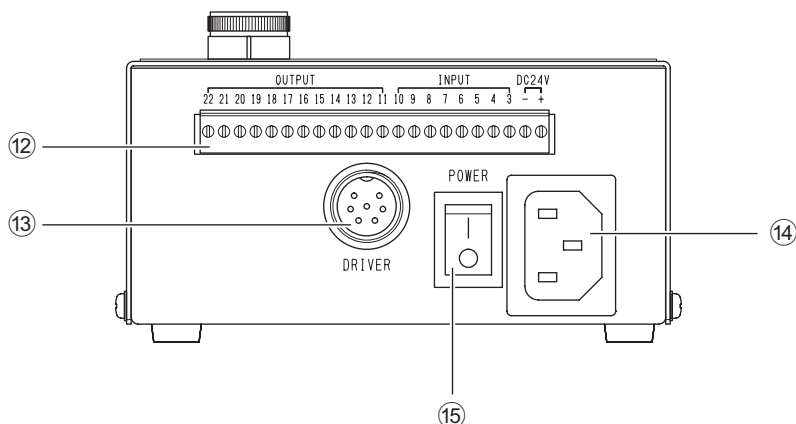
Name	Lighting color	Function
① [CH 1] LED [CH 2] LED [CH 3] LED [CH 4] LED	Red	Lights up when the respective operations channels are selected
② [FSTN-T] LED	Yellow	In "HARD" fastening setting, lights up when moving to seated speed
③ [C-UP / F-NG] LED	Blue	Lights up when screw tightening ends normally
	Red	Lights up when screw tightening was NG

## Controller



Name	Function
① [WORK] LED	Green flashing: "Workpiece setup time" (No.14 WORK-S-T), for input of workpiece signal, in progress Green lighted: Electric screwdriver in operation (rotation) enabled state Unlighted: Electric screwdriver in non-operation (rotation) state
② [CRT-T] LED	Orange flashing: When the current screw fastening time is at "screw fastening time lower limit value" (No.15 CRT-T-L) or less Orange lighted: When current screw fastening time is within the screw fastening time upper/lower limit values (screw tightening OK range) Orange lighted then unlighted: When the current screw fastening time is at "screw fastening time upper limit value" (No.16 CRT-T-U) or more
③ [FSTN-T] LED	Yellow lighted: In "HARD" fastening setting, when moved to seated speed Yellow flashing: Screw fastening time (MEAS-T) measurement in progress
④ [CH 1] LED [CH 2] LED [CH 3] LED [CH 4] LED	Red lighted: When the respective operations channels are selected
⑤ [WORK RESET] button	If pressed for 1 second during screw fastening mode, the count is reset to the start, or the operations channel returned back by 1.
⑥ [MANUAL] button	If pressed for 1 second during screw fastening mode, transits to manual mode.
⑦ [C-UP / F-NG] LED	Blue lighted: Lights up when screw tightening ends normally Red lighted: Lights up when screw tightening was NG
⑧ [OK / NG] LED	Green lighted: When screw fastening operation has completed the set count, and operation was OK Red lighted: When workpiece has been removed during screw fastening operation, and operation was NG
⑨ [COUNT] LED	Displays in count down the screw fastening number (count).
⑩ LCD	Displays the set content or state.
⑪ [SETTING] dial	Dial for the push switch embedded setting. Push operation: Determines transition to the setting mode, and the setting item and setting value Rotation operation: Changes the setting item and setting value





Name	Function
⑫ Signal terminal block	Provides each type of I/O signal, and service power source 24 V DC.
⑬ Receptacle	Connection cord is used to connect the electric screwdriver.
⑭ Inlet	Connects the power cord. Input the rated voltage.
⑮ Power switch	When in use set to the ON ( I ) side.

### **⚠ CAUTION**

- Do not apply a shock (such as dropping) or excessive load to the [SETTING] dial or signal terminal block. Doing so could cause a failure.

## **LCD display**

The status and setting content are displayed in the controller LCD.

Display example: Screw fastening mode  
(during SOFT setting)

**TORQUE : 100% SOFT**  
**SPEED : 1000min<sup>-1</sup>**

Display example: Screw fastening mode  
(during HARD setting)

**TORQUE : 5% HARD**  
**SPEED : 400min<sup>-1</sup>**

## 4 Specifications

### ⚠ CAUTION

- **The output torque is the value measured in combination with the output torque measurement device.**  
When the output torque is measured by some other measuring device or combination, the value may be different.
- **The output torque and torque that occurs in screws do not match.**  
Use a torque wrench to check the torque generated on screws.

#### Electric screwdriver

Model		DLV04C10L-AY	DLV10C10L-AY
Torque [N·m (Lb-in)] (See p. 11)	SOFT fastening setting: (1000min <sup>-1</sup> setting)	0.05 to 0.4 (0.4 to 3.5)	0.2 to 1.0 (1.8 to 8.6)
	SOFT fastening setting: (600min <sup>-1</sup> setting)	0.05 to 0.35 (0.4 to 3.1)	0.2 to 0.45 (1.8 to 4)
	HARD fastening setting	0.05 to 0.4 (0.4 to 3.5)	0.2 to 1.0 (1.8 to 8.6)
Free Speed [min <sup>-1</sup> ] (for reference)	SOFT fastening setting	600 to 1,000	600 to 1,000
	HARD fastening setting	100 to 1,000	100 to 1,000
Applicable Screws [mm (in)] (for reference)	Machine screw	1.2 to 3.0 (0.05 to 0.12)	1.8 to 4.0 (0.07 to 0.16)
	Tapping screw	1.1 to 2.5 (0.04 to 0.1)	1.6 to 3.5 (0.06 to 0.14)
Suitable Bit Shape		NK35 (HEX 6.35 mm (0.25"))	
Mounted Motor		DC brushless motor	
Input Voltage		24 V DC	
Startup Method		Lever switch, external input signal	
ESD Protection (antistatic performance)*3		Yes (Conformance with International Electrostatics Standards IEC 61340-5-1)	
Bit Grounding Function		Yes (Safe resistor 1MΩ bond within controller)	
Main Unit Weight [kg (lbs)]		0.37 (0.82)	
Rated Operation		ON 0.5 seconds / OFF 3.5 seconds	
Usage Atmosphere Temperature Range [°C (°F)]	Operating	10 to 40 (50 to 104)	
	Storage	-20 to 70 (-4 to 158)	
Noise emission (dB) (According to EN60745)	LPA*1	54.5 (uncertainty :K=3dB)	
	LWA*2	56.3	
Vibration level (m/s <sup>2</sup> ) (According to EN60745)		Less than 2.5	
Relative Humidity		Free of Dew (include time of the Storage)	
Operating Environment		less than 2000 m above sea level	
Pollution Degree (According to IEC60664-1)		Pollution Degree 2	
Over Voltage Category (According to IEC60664-1)		Over Voltage Category I	

## Controller

Model	DCC0101X-AZP
Input Power	100 to 240 V AC, 50/60Hz
Operations Channel Function	Torque and speed setting in 4-channel memory Can switch to any operations channel
Count Function	Screw fastening number can be counted Workpiece detection sensor is connectable
External Startup Control Function	Startup control can be enabled by external input signal
Input Signal Method	Photocoupler input (24 V DC drive (5mA/1 input), respond to PNP output)
Output Signal Method	Photocoupler output (30 V DC or less, 30mA/1 output or less, PNP output method)
Service Power Source	24 V DC (Maximum capacity 200mA)
ESD Protection (antistatic performance)*3	Yes (Conformance with International Electrostatics Standards IEC61340-5-1)
Power Consumption (W)	When on standby: 20 During electric screwdriver rotation (rated): 30
Main Unit Weight [kg (lbs)]	1.1 (2.44)

\*1 LPA; A-weighted surface sound pressure level

\*2 LWA; A-weighted sound power level

\*3 ESD is the abbreviation of Electro-Static Discharge. It means the discharge of static electricity

## Output torque measuring instrument

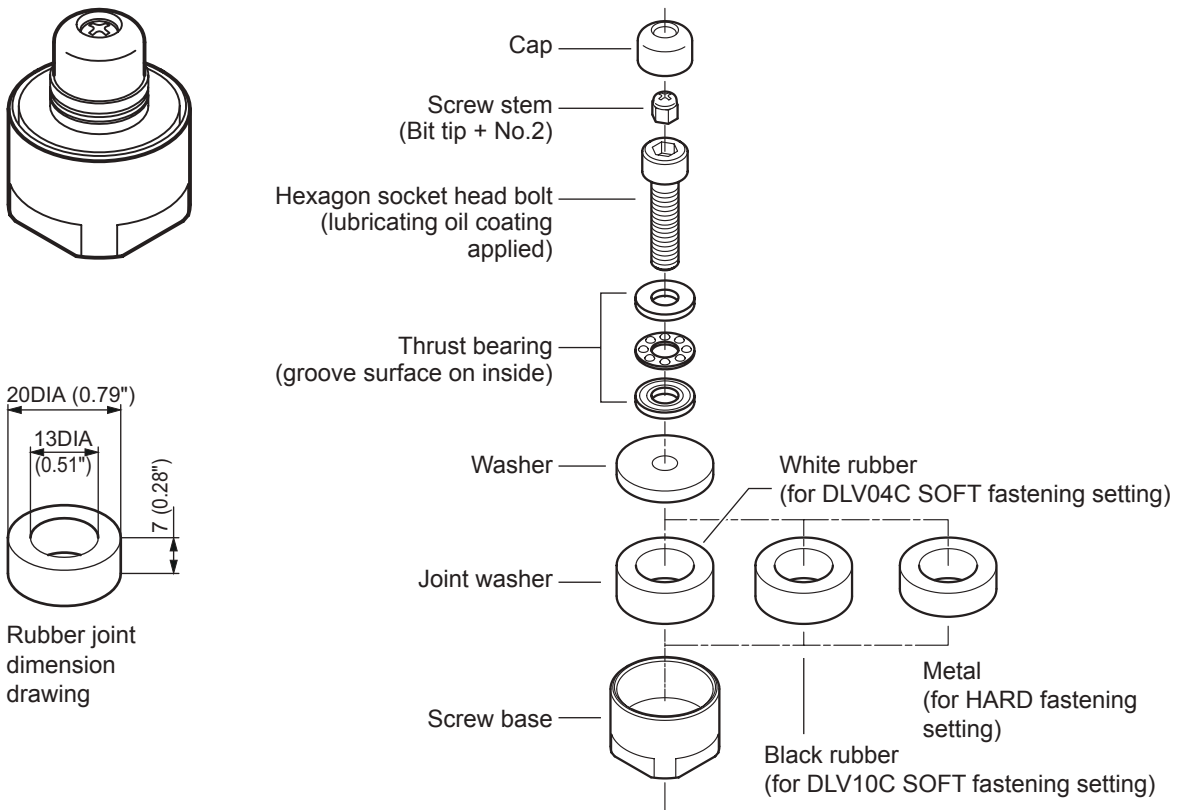
Electric Screwdriver Model	DLV04C10L-AY	DLV10C10L-AY
Measurement Bit	NK35 (No.2 × 4 × 75) (For the bit tip shape, use "+No.2")	
Torque Checker (sold separately)	DLT1173A	
Screw Joint for SOFT Fastening Setting (sold separately)	DLW4540 (with white rubber)	DLW4550 (with black rubber)
Screw Joint for HARD Fastening Setting (sold separately)	DLW4560 (with metal washer)	

## Screw joint

For measurement of the machine's output torque, use the separately sold Torque Checker and screw joint. In alignment with the SOFT/HARD fastening settings, replace the screw joint and perform measurement.

### ⚠ CAUTION

- If the screw joint is disassembled, use care to ensure that no mistakes are made in the parts order or facing when re-assembling.
- Perform regular checks for damage in the internal thrust bearing.
- Perform regular checks for damage (permanent set in fatigue, cracks, deformation) in the internal rubber joint washer.
- If storing the joint without using it, loosen the hexagon socket head bolt.  
If stored with torque applied, it could cause deformation in the rubber joint washer.
- Replacement of the joint is recommended every 2,500 measurements, or every 1 year.



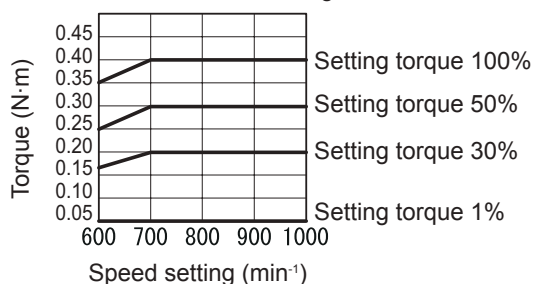
## Output torque graph

### Setting torque/Setting speed/Output torque (standard)

#### ⚠ CAUTION

- The graph is standard. The output torque range is not guaranteed. After setting, always be sure to measure the output torque.
- Use the tool within the specified range.
- Regularly check the output torque and speed, and adjust the settings if changes have occurred.
- “Speed setting value” is standard.  
The actual speed changes by the temperature of the tool, mechanical loss, and grease conditions. It could vary depending on differences in the tool itself.
- When the speed is changed, the motor sound changes. This is not an error.

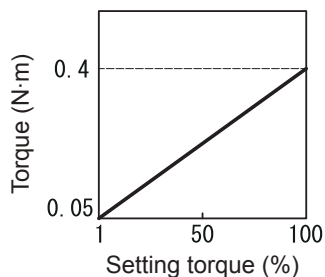
DLV04C10 SOFT setting



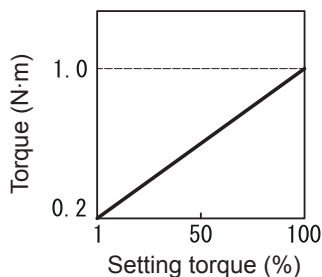
DLV10C10 SOFT setting



DLV04C10 HARD setting



DLV10C10 HARD setting



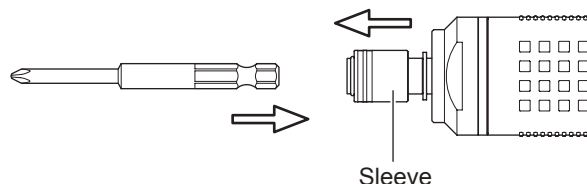
## 5 Preparation

### Attaching a bit

#### ⚠ WARNING

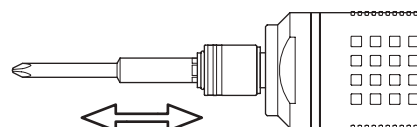
- Before attaching or detaching a bit, always turn OFF the power.

#### 1 Insert a bit while pulling the sleeve



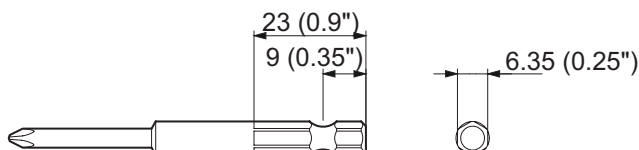
#### 2 Release the sleeve and make sure the bit does not come off

To remove the bit, pull out the bit while pulling the sleeve.



We provide all types of bits. For details, please see the General Catalog.

In addition, aside from our Company's bits, you can also use bits available on the market with the specifications below.



#### ⚠ CAUTION

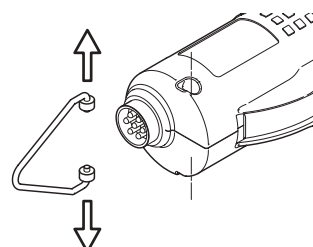
- If the screws and bits do not match, it could lead to wear on the bits and scratches on the screw heads. Use bits that match the screw heads.
- If using a long bit, use caution since bit vibration could increase or excess stress be applied.

### Attaching the suspension bail

#### ⚠ CAUTION

- If the suspension bail is pulled forcefully, it may not return to original status. Use an appropriate strength necessary for attachment or removal.

#### 1 Lightly pull both sides of the suspension bail and fit it into the hole



## Using the screwdriver with vacuum pickup/mounted on an automatic screw fastening machine

### WARNING

- Before removing or mounting the coupling or vacuum pickup, always turn OFF the power.

You can mount the separately sold vacuum pickup.

In addition, mount to the tip an sleeve that matches the shape of the tightening screw, and use an vacuum pump to adsorb the screw. The tube outward form applicable to the tube fitter is Ø6 mm.

Note that the flanged coupling for mounting on the automatic screw fastening machine is also sold separately as a single part. For the outward appearance drawing, see p. 56, and for the external startup control method, see p. 45.

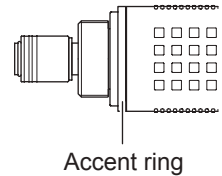
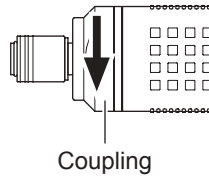
### CAUTION

- The coupling mounting is “left-hand thread”. To prevent it from becoming loose during use, make sure to properly attach it.
- Be careful to avoid tightening the coupling too much.

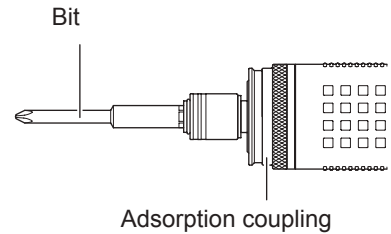
Utilization	Operator hand-held		Mounting on automatic machine		Remarks
	No	Yes	No (Magnetized bit, etc.)	Yes	
Screw adsorption					
Coupling	Standard parts	Adsorption coupling DLW9014 (Accessory for DLP6640)	Flanged coupling DLW9015 (Single part sold separately)	Flanged coupling DLW9015 (Accessory for vacuum pickup DLP6650)	Left-hand thread
Accent ring (standard parts)	○	○	-	-	
Vacuum pickup (sold separately)	-	DLP6640	-	DLP6650	
Sleeve DLS4000 series (sold separately)	-	○	-	○	
Vacuum pump DLP2570 (sold separately)	-	○	-	○	

## Mounting an vacuum pickup (DLP6640) for hand-held use

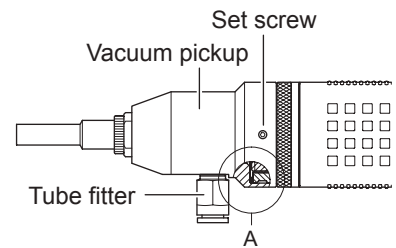
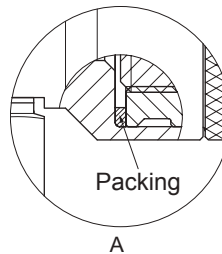
- 1 Remove the coupling**  
The coupling is a left-hand thread.  
Leave the accent ring attached.



- 2 After the bit is mounted, mount the adsorption coupling (DLW9014)**

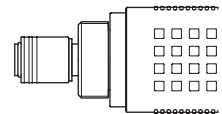
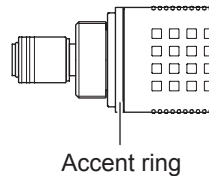
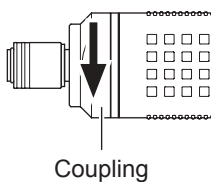


- 3 Mount the vacuum pickup**  
Adjust the tube fitter orientation, and tighten the set screws in 2 places.



## Mounting an vacuum pickup (DLP6650) for automatic machine

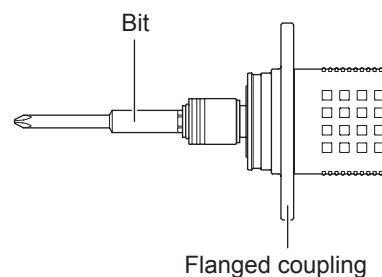
- 1 Remove the coupling and accent ring**  
The coupling is a left-hand thread.





## 2 After the bit is mounted, mount the flanged coupling (DLW9015)

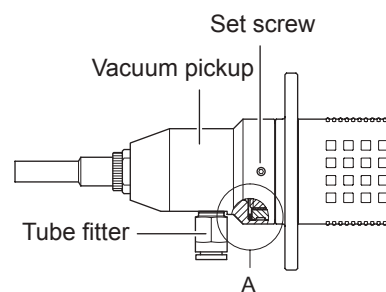
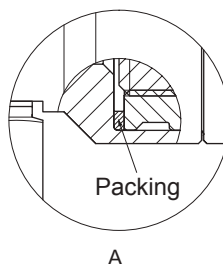
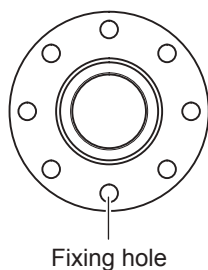
For each dimension, see p. 56.



## 3 Mount the vacuum pickup

Adjust the tube fitter orientation, and tighten the set screws in 2 places.

For each dimension, see p. 55

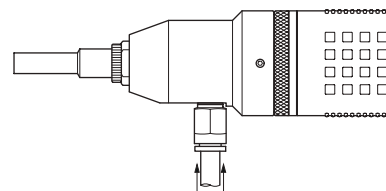


### ⚠ WARNING

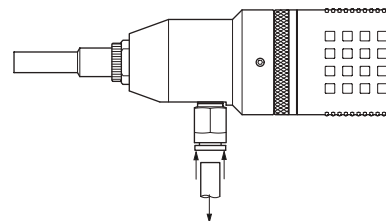
- If mounting on an automatic screw fastening machine with a flanged coupling mounted, position the fixing holes in 2 or more symmetric positions to firmly fix in place.

## Mounting a tube

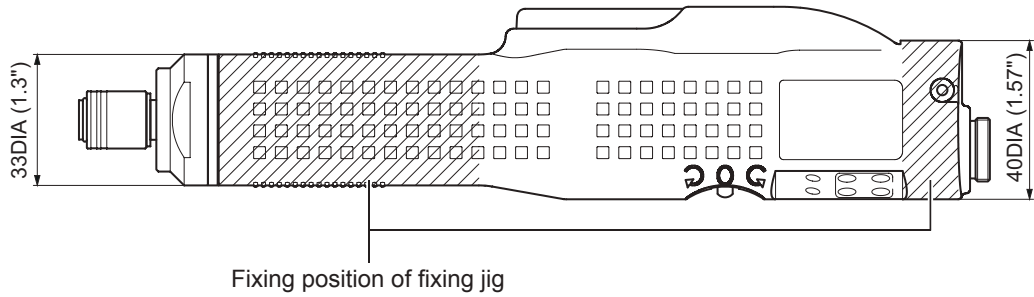
### 1 Insert the tube into the tube fitter



### 2 While pressing on the tube fitter head, remove the tube



## Commercially available fixing tool mounting position



## 6 Basic Operation

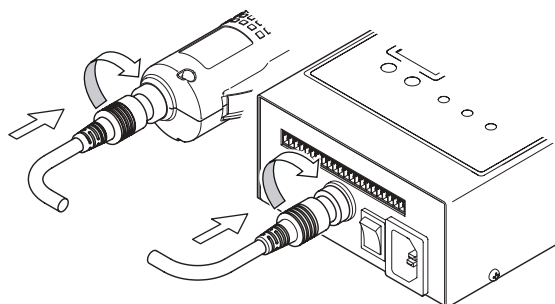
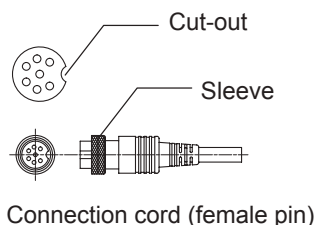
### Start

#### ⚠ WARNING

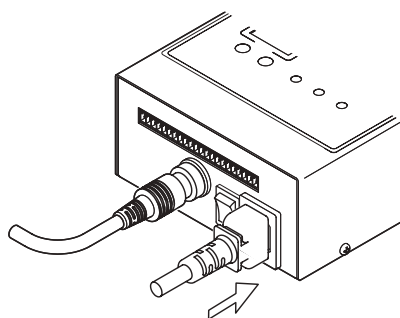
- **Make sure to properly connect the connection plug of the power cord and power plug.**
- **Always make sure the tool is grounded.**  
No grounding the tool could cause failure or electric shock at the time of electrical leakage.  
If you are not sure about the grounding of the outlet, request an electrical contractor to check if it is grounded.  
When an extension cord is used, use a 3-core cord that includes a ground wire.
- **Make sure the connection cord is firmly connected.**  
Other than supplying power, the connection cord is connected to the ground to eliminate static electricity.  
The end metal section of the electric screwdriver is connected to the ground via a 1MΩ safety resistor inside the controller.  
Also, when the tool is used for a long time, the rotation part of the electric screwdriver becomes worn and the ability to remove static electricity decreases. Periodically request our company or your sales agent to perform an overhaul on the tool.

#### 1 Check that the power is turned OFF, and use the connection cord to connect the electric screwdriver and controller

Align and insert the connection cord and receptacle notches, and tighten the sleeve.



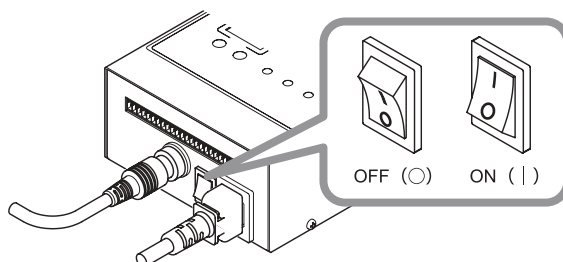
#### 2 Insert the power cord into the controller inlet



#### 3 Insert the power plug into a grounded outlet (100 V AC - 240 V AC) to supply electricity

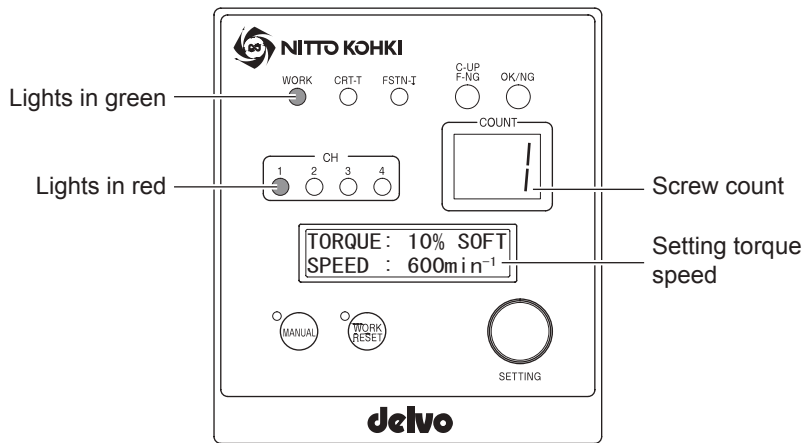
#### 4 Turn ON (I) the power switch

The buzzer sounds, and LED lights up.  
The electric screwdriver and controller model, and program version, are displayed on the LCD.



## Screw fastening mode

The [CH 1] to [CH 4] LED lights up in red, and the setting torque and speed are displayed on the LCD. The screw fastening count is displayed on the [COUNT] LED and the [WORK] LED lights in green. When operation (rotation) is possible, this status is called "screw fastening mode."



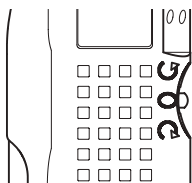
## Changeover switch

### ⚠ CAUTION

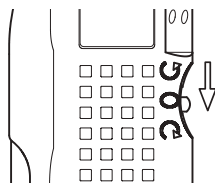
- Do not operate the changeover switch while the tool is rotating. Doing so could cause a failure.
- When the tool is not used, set the switch to neutral position.
- Do not apply a shock (such as dropping) or excessive load to the changeover switch. Doing so could cause a failure.

By sliding the changeover switch, you can change the rotation direction of the electric screwdriver.

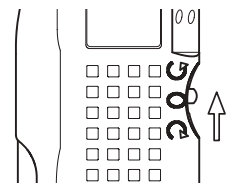
"O" means neutral. The electric screwdriver does not rotate.



Neutral



Forward rotation:  
Rightward rotation at set speed  
(rotates clockwise)



Reverse rotation:  
Leftward rotation at maximum  
speed (rotates counterclockwise)

If started by external input signal, the changeover switch position is invalid.

## Start and stop

Start the electric screwdriver with either the electric screwdriver lever switch or an external input signal .

### **WARNING**

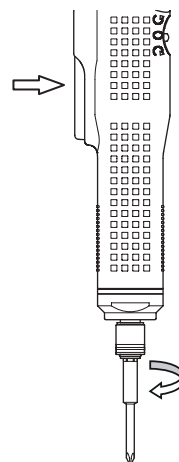
- Never touch the bit while it is rotating.
- Do not direct the bit toward people or animals.

### **CAUTION**

- Make sure to properly press the lever switch.

#### Use the lever switch to start the electric screwdriver

- 1 Slide the changeover switch to the rotating direction**
- 2 Press the lever switch**  
The electric screwdriver rotates.
- 3 Release the lever switch**  
Use the bit breaks function to stop the rotation.



#### Use the external input signal to start

Please refer to “Use external signal to start up electric screwdriver” (p. 45).


## Screw tightening

### ⚠ WARNING

- Firmly hold the main body to avoid losing your grip.

### ⚠ CAUTION

- Properly apply the bit end to the screw head.
- Check that the bit is not worn.

- 1 Slide the changeover switch to the forward rotation side 
- 2 Apply the bit end to the screw head and press the lever switch
- 3 Tighten the screw, and when the electric screwdriver stops, release the lever switch

#### When screw tightening is completed according to the setting

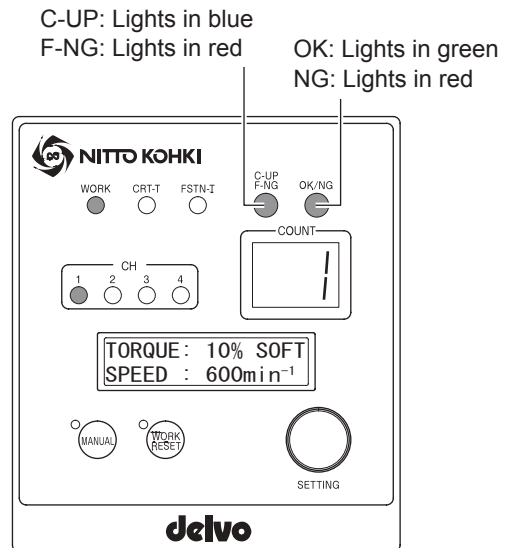
The electric screwdriver becomes torque-up status (the electric screwdriver arrives at the set torque and stops automatically).  
[C-UP / F-NG] LED lights up in blue, count-up buzzer sounds, and [COUNT] LED screw fastening count decreases by 1.

#### When screw tightening is not completed according to the setting

[C-UP / F-NG] LED lights up in red, and F-NG buzzer sounds.

#### Screw tightening is completed up to the set number

The OK signal (the signal that is output when a series of work are completed) is output, the [OK/NG] LED lights in green, and a buzzer sounds. After that, switches to the next operations channel.



## Manual mode

"Manual mode" is a mode for freely switching the operations channel to operate the electric screwdriver. Regardless of the presence or absence of a workpiece signal, electric screwdriver action (rotation) is possible.

Use for temporary screw fastening operations not related to the mass production line operations, and for torque check, etc.

### **1 In screw fastening mode, press and hold the [MANUAL] button**

Manual mode is activated, and the [MANUAL] button lateral LED lights up for a 1 second interval.

### **2 Select and determine the channel to be activated**

The electric screwdriver can now be activated.

### **3 One more time, press and hold the [MANUAL] button**

The mode returns to screw fastening mode.

### **⚠ CAUTION**

- During Manual mode, the screw fastening time setting or operations OK/NG judgment are not activated.
- Even during manual mode, set the screw fastening state output signal (forward, reverse, C-UP, F-NG) to ON.

## 7 Basic Settings

### Operation mode

The tool can be set to handle various screw tightening.

You can enter each mode from the screw fastening mode.

For details on operation and the operation of each function, see the reference page.

Mode	Operation	Operation to return to screw fastening mode	Reference
Setting mode	Press and hold the [SETTING] dial	Press and hold the [SETTING] dial	p. 22
Screw count reset	In count down state, press and hold the [WORK RESET] button	Return automatically	p. 44
Operations channel return	In count set value state, press and hold the [WORK RESET] button	Return automatically	p. 44
Operations channel switching (during INPUT setting)	Channel A/B input signal ON	Return automatically	p. 45
External input signal startup	Forward rotation startup/Reverse rotation startup input signal ON	Return automatically	p. 45
Count return mode (during ON2 setting)	With the changeover switch in the reverse rotation side state, press the [SETTING] dial	After reverse rotation: Return automatically Or changeover switch operation	p. 33
Controller button operation lock/release	Key lock input signal ON/OFF	Return automatically	p. 46
Manual mode	Press and hold the [MANUAL] button	Press and hold the [MANUAL] button	p. 21

### Setting mode operation

#### ⚠ CAUTION

- Always record the set values. Utilize “Setting memo” (p. 63).

If the tool fails, all settings may be initialized. Also, settings may be initialized at the time of repair in order to check operation.

Please note that there is no function to output the set values to an outside device.

- 1 In screw fastening mode, press and hold the [SETTING] dial**  
The mode enters setting mode.

- 2 Rotate the [SETTING] dial, and display the item to change**  
The setting item is displayed in the 1st line on the LCD, and No. flashes.  
If [WORK RESET] button is pressed and held while No. is flashing, it returns to the operations mode without changing the setting.

Flashes

1) CH-CHG : S-AUTO  
2) CH : 1

- 3 Press the [SETTING] dial**  
The set values of the displayed setting item can now be changed.

- 4 Rotate the [SETTING] dial, and change the value**  
The value selected flashes.  
If [WORK RESET] button is pressed while the value is flashing, it returns to Step 2 without changing the setting.

Flashes

1) CH-CHG : S-AUTO  
2) CH : 1



## 5 Press the [SETTING] dial

The set value is determined.

## 6 Repeat Steps 2 to 5 to perform settings

## 7 Press and hold the [SETTING] dial

The settings are saved, and it returns to screw fastening mode.

The following settings are available.

LCD display	Details	Set value	Default	Reference
1) CH-CHG	Operations channel switching method	S-AUTO / C-AUTO / INPUT	S-AUTO	p. 25
2) CH	Setting target channel	CH1 / CH2 / CH3 / CH4	-	p. 26
3) FSTN-TYPE	Screw fastening type	SOFT / HARD	SOFT	p. 26
4) TORQUE	Torque	1 to 100%	10	p. 28
5) SPEED	Speed	SOFT: 600 to 1000min <sup>-1</sup> HARD: 100 to 1000min <sup>-1</sup>	600	p. 28
6) SOFT-START	Soft start level	Lv1 to 9	1	p. 28
7) FSTN-T	Fastening timer (Setting enabled only when No.3 has been set to "HARD")	0.00 to 9.99s	0.00	p. 28
8) COUNT UP-BZ	Count-up buzzer sound	OFF / 1 to 10	CH1: 1 CH2: 2 CH3: 3 CH4: 4	p. 30
9) FSTN-NG-BZ	Fastening NG buzzer sound	OFF / 1 to 10	1	p. 30
10) REFSTN-T	Refastening prohibited timer	0.0 to 9.9s	1.0	p. 30
11) COUNT-FNC	Count function	OFF / ON	CH1: ON CH2: OFF CH3: OFF CH4: OFF	p. 31
12) WORK-SNSR	Workpiece signal	OFF / ON	OFF	p. 31
13) COUNT	Count number	1 to 99	1	p. 31
14) WORK-S-T	Workpiece setup time	0.0 to 9.9s	0.0	p. 31
15) CRT-T-L	Screw fastening time lower limit value	0.00 to 9.99s	0.00	p. 32
16) CRT-T-U	Screw fastening time upper limit value	0.01 to 9.99S / DIS	DIS	p. 32
17) OK-OUT-T	Screw fastening confirmation time	0.0 to 9.9s	0.0	p. 33
18) OK-TIMING	OK output timing	C-F / W-O	C-F	p. 33
19) OK-BZ	Operations OK buzzer sound	OFF / 1 to 11	CH1: 1 CH2: 2 CH3: 3 CH4: 4	p. 33
20) NG-BZ	Operations NG buzzer sound	OFF / 1 to 10	1	p. 33
21) COUNT-RTN	Count return function	OFF / ON1 / ON2	ON1	p. 33
22) BZ-VOLUME	Buzzer sound volume	OFF to MAX	MAX	p. 34
23) CHECK-BZ	Check buzzer sound	OFF / ON	ON	p. 34
24) BACK LIGHT	Back light	OFF / ON	ON	p. 34
25) SETUP-RESET	Initialization of settings	ALL / CH1 / CH2 / CH3 / CH4	-	p. 24

- No.1, No.22 to 24: All channels shared setting
- No.12 to 21: Setting valid only when No.11 is "ON"

Even if the electric screwdriver is used to perform screw tightening during the setting mode, the count-up "C-UP" and screw fastening NG "F-NG" output signals do not go ON.

## Initialization of settings

It is possible to initialize settings to the factory default.  
Initialization can be performed for each channel, or for all channels at once.

### CAUTION

- When initialization is performed, all settings return to the default.  
You cannot restore the settings.

- 1 Select the setting item No.25 “SETUP RESET”**
- 2 When initializing all channels, select “ALL”, and when initializing a specific channel, select “CH1” to “CH4”**  
When “ALL” is selected, all items in all channels are returned to their initial settings.  
When “CH1” to “CH4” is selected, setting items that are shared with all channels (No.1, No.22 to 24) are not initialized.
- 3 If “Really?” is displayed, select “Yes”**  
All settings return to the initial setting.  
When performing cancel, select “No”.
- 4 Press and hold the [SETTING] dial, and restore to the screw fastening mode**

## 8 Setting Mode Details

Describes details of items that can be set in the setting mode.

### Operations channel switching method (No.1 CH-CHG)

The folder where the electric screwdriver motion settings are saved is called a “channel” and 4 channels can be operated by switching.

In the “operations channel switching method” (No.1 CH-CHG), select the operations channel switching method.

Setting	Motion
S-AUTO	Performs operations OK output in each channel, links with the count function, and switches to the next operations channel Can switch the operations channel without connecting to a switch, PLC, or other external input signal
C-AUTO	Links with the count function, automatically switches to the next operations channel, and finally performs operations OK output Can switch the operations channel without connecting to a switch, PLC, or other external input signal
INPUT	Uses a switch, PLC, or other external input signal to operate the channel A/B input signal, and switch the operations channel Use this setting for multiple-model, small-lot production, or other situations where workpieces consist of multiple models See “9 Using External Signals” (p. 35)

### “S-AUTO”, “C-AUTO” actions

Action example when CH3 count function (No.11 COUNT-FNC) is OFF

Setting	Motion
S-AUTO	CH1 “OK” → CH2 “OK” → CH4 “OK” → CH1 “OK” ... (OK output at each operations channel end, CH3 jumps)
C-AUTO	CH1 → CH2 → CH4 “OK” → CH1 ... (CH3 jumps, OK output at CH4 end)

#### Valid settings

(For setting items No.12 and 14, the first channel setting when the count function is turned ON is valid, and for setting items No.17 to 19, activation is in accordance with the final channel setting when the count function is ON)

Setting item	Channel			
	CH1	CH2	CH3	CH4
Workpiece signal (No.12 WORK-SNSR)	Valid	←	←	←
Workpiece setup time (No.14 WORK-S-T)	Valid	←	←	←
Screw fastening confirmation time (No.17 OK-OUT-T)	→	→	→	Valid
OK output timing (No.18 OK-TIMING)	→	→	→	Valid
Operations OK buzzer sound (No.19 OK-BZ)	→	→	→	Valid

### “INPUT” actions

Action example when CH3 count function (No.11 COUNT-FNC) is OFF

Channel in progress	When a change has occurred in channel A/B input signal
CH3 (Count function OFF)	At the time the signal changes, immediately moves to the designated, different operations channel
CH1 (Count function ON)	After the CH1 operation ends, moves to the operations channel designated in the channel A/B input signal Even while an operation is in progress, it moves to the designated channel when WORK RESET has been input for 1 second

## Setting target channel (No.2 CH)

Selects the channel for changing the setting in setting mode. Aside from the shared settings in all channels of the setting items No.1 and No.22 to 24, the settings are registered for each channel.

After the channels are selected in the No.2 CH, perform each item setting.

Switching the channels lights up the electric screwdriver and controller [CH1] to [CH4] LEDs.

## Screw fastening type (No.3 FSTN-TYPE)

Sets the screw fastening type to "SOFT" or "HARD".

Which to set depends on the screw type, size, material quality, presence or absence of adhesive, presence or absence of washer or spring washer, material quality of workpiece, presence or absence of tap, hole diameter, rigidity, fastening speed, and other conditions. Using an actual workpiece and screws, attempt adjustment of each setting under operation conditions, to determine the screw fastening type, torque, and speed.

### For "SOFT" case

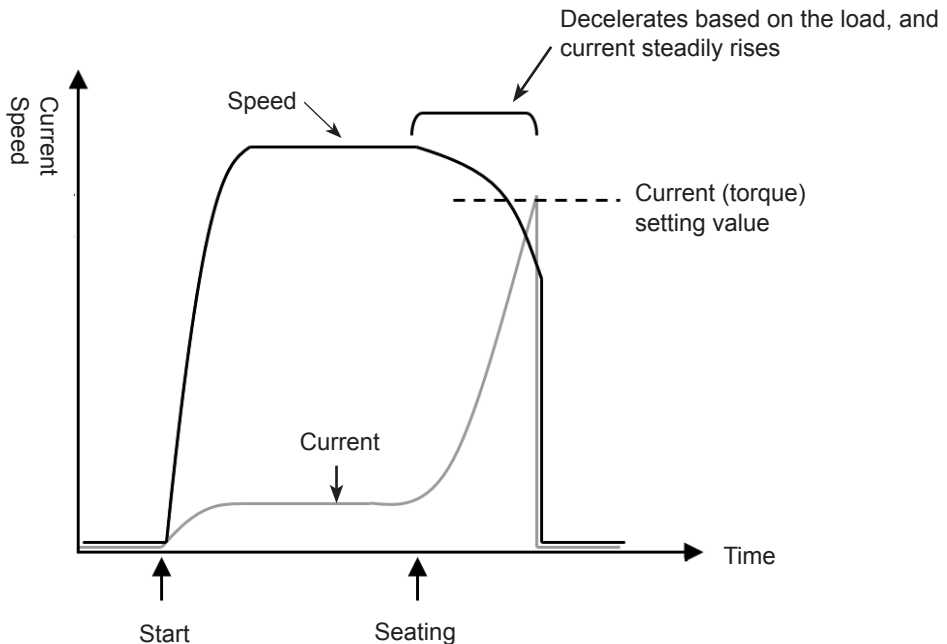
With a tapping screw, and a soft body connecting part such as rubber set for screw tightening, etc., with a fastening load.

For "SOFT", perform the following settings.

Setting item	Set value
Torque (No.4 TORQUE)	1 to 100%
Speed (No.5 SPEED)	600 to 1000min <sup>-1</sup>
Soft start level (No.6 SOFT-START)	Lv1 to 9

### Timing chart

Image of control action seating the screw tightening at the set speed



## For “HARD” case

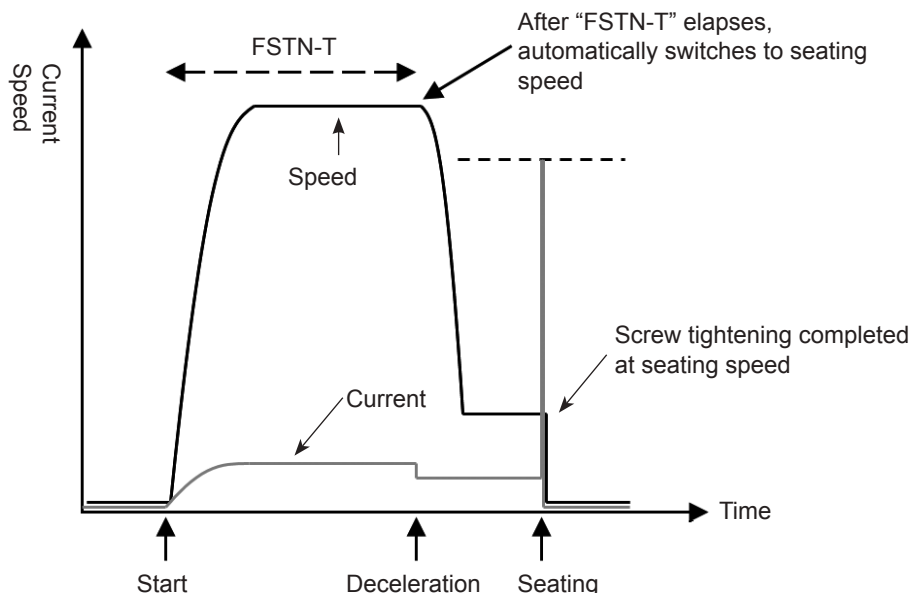
For screw tightening for a tapped workpiece, or tightening of rigid body, etc., perform setting for screw tightening, etc., with small fastening loads.

For “HARD”, perform the following settings.

Setting item	Set value
Torque (No.4 TORQUE)	1 to 100%
Speed (No.5 SPEED)	100 to 1000min <sup>-1</sup>
Soft start level (No.6 SOFT-START)	Lv1 to 9
Fastening timer (No.7 FSTN-T)	0.00 to 9.99s

### Timing chart

Image of start time activated by “speed” (No.5 SPEED), automatic switching to the seating speed in response to setting torque value after “fastening timer” (No.7 FSTN-T), and control action seating the screw tightening



For example, for screw tightening to a tapped workpiece, since the fastening load during screw tightening is small, the relationship “speed during screw seating (inertial force)  $\div$  screw fastening torque” appears.

For this reason, in the “HARD” fastening setting, perform automatic switching to the seating speed in response to the setting torque, and control seating the screw.

If the setting torque is small, the seating speed may slow, and the screw fastening time may become longer. To supplement this, setting the “fastening timer” (No.7 FSTN-T) activates the screw tightening during the FSTN-T time from the screw tightening start, at “speed” (No.5 SPEED).

Note that, since there is a need to firmly switch the speed during seating to the seating speed, perform setting for the switch timing to the seating speed (FSTN-T), and bring it in front of the screw seating. If seated during FSTN-T, it is judged as screw fastening NG (F-NG).

## Torque (No.4 TORQUE) / Speed (No.5 SPEED)

Sets the torque and speed.

For the relationship of the torque and speed setting, and output torque, see p. 11.

### ⚠ CAUTION

- Perform setting while checking the torque on an actual workpiece.
- The electric screwdriver reverse rotation action operates at the maximum speed regardless of the speed setting value.

## Soft start level (No.6 SOFT-START)

Sets the soft start valid time during forward rotation start at Lv1 (about 0.1 sec) to Lv9 (about 0.9 sec). Performance of soft start suppresses occurrence of screw galling at fastening start.

### ⚠ CAUTION

- Torque-up during the soft start startup is fastening NG (F-NG).  
If the screw is short, setting to an Lv as small as possible is recommended.
- For a “HARD” fastening setting, soft start activates only during rotation at the “speed” (No.5 SPEED) during the “fastening timer” (No.7 FSTN-T).

## Fastening timer (No.7 FSTN-T)

When a “HARD” fastening setting is performed, sets the time activated from the screw tightening startup at the “speed” (No.5 SPEED) to 0.00 to 9.99 seconds, in an attempt to shorten the screw fastening time. (p. 27)

If the “fastening timer” time has elapsed, the electric screwdriver and controller [FSTN-T] LED is lighted in yellow, and it automatically switches to the seating speed.

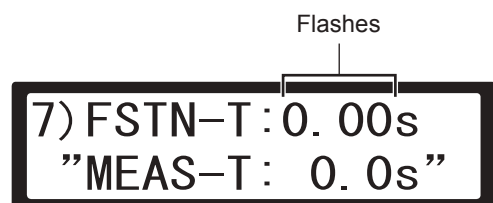
### ⚠ CAUTION

- Since there is a need to perform screw fastening seating after switching to the seating speed, set the “fastening timer” to a value that brings it in front of the screw seating.  
When performing settings, adjust with changes from the small value steadily up to a large value.

### Calculation of FSTN-T setting reference value “REF-T”

You can calculate and display the reference value “REF-T” for setting the fastening timer.

- 1 In setting mode, turn the [SETTING] dial to display No.7, and press the [SETTING] dial**  
The No.7 FSTN-T setting screen is displayed, enabling electric screwdriver action.



## 2 With an actual workpiece and screw, forward rotate the electric screwdriver at a constant low speed to perform tightening, and measure the screw fastening time (MEAS-T)

The electric screwdriver rotates at a constant low speed. During measurement, the controller [FSTN-T] LCD flashes in yellow.

For 4 seconds after measurement, the measured MEAS-T value flashes.

After 4 seconds, a confirmation sound buzzes, and the "RATE" display appears.

7) FSTN-T : 0. 00s  
"MEAS-T : 0. 0s"

Flashes

7) FSTN-T : 0. 00s  
"MEAS-T : 10. 7s"

Flashes

## 3 Input the RATE

Input at 1 to 99. (Initial value: 50%)

7) FSTN-T : 0. 00s  
"RATE : 50%"

Flashes

## 4 Press the [SETTING] dial

When the RATE setting value is determined, a confirmation sound buzzes, and the setting reference value REF-T is calculated.

7) FSTN-T : 0. 00s  
"REF-T : 0. 89s"

Flashes

Setting reference value

## 5 Reference the REF-T value, and set the fastening timer

### ⚠ CAUTION

- Be aware that, if the speed setting is too high, a high torque will be applied during seating and threatening to damage the screw and workpiece.

## Count-up buzzer sound (No.8 COUNT UP-BZ) / Fastening NG buzzer sound (No.9 FSTN-NG-BZ)

To differentiate between the operations channel and surrounding operations, you can set up to 10 different kinds of buzzer sounds.

At the same time as the buzzer sound, the [C-UP / F-NG] LED lights up.

Buzzer sound	[C-UP / F-NG] LED	Conditions for sounding the buzzer sound
Count-up buzzer sound (No.8 COUNT UP-BZ)	Lights in blue	<p>When screw tightening satisfies all of the conditions below, a buzzer sounds.</p> <ul style="list-style-type: none"> <li>● Soft start action end</li> <li>● In "HARD" fastening setting, after "fastening timer" (No.7 FSTN-T) elapses</li> <li>● When the "count function" (No.11 COUNT-FNC) is "ON", between "screw fastening time lower limit value" (No.15 CRT-T-L) and "screw fastening time upper limit value" (No.16 CRT-T-U)</li> </ul>
Fastening NG buzzer sound (No.9 FSTN-NG-BZ)	Lights in red	<p>When any of the conditions below occur during screw tightening, a buzzer sounds.</p> <ul style="list-style-type: none"> <li>● Refastening torque-up</li> <li>● Torque-up during soft start action</li> <li>● Torque-up during "fastening timer" (No.7 FSTN-T) action when "HARD" fastening is set</li> <li>● When the "count function" (No.11 COUNT-FNC) is "ON", torque-up other than "screw fastening time lower limit value" (No.15 CRT-T-L) to "screw fastening time upper limit value" (No.16 CRT-T-U)</li> <li>● When idled in forward rotation (When set to "screw fastening time lower limit value" (No.15 CRT-T-L) or "screw fastening time upper limit value" (No.16 CRT-T-U))</li> <li>● When the forward rotation is started while the "refastening prohibited timer" (No.10 REFSTN-T) is active</li> </ul>

## Refastening prohibited timer (No.10 REFSTN-T)

To prevent refastening (tightening twice, check tightening, etc.), you can set the time for prohibition of forward rotation start after using forward rotation for torque-up, to 0.0 to 9.9 seconds.

Adjust the setting value based on operator familiarity or screw fastening operation interval.

### CAUTION

- **Do not perform refastening for screws that have already been tightened.**

Torque control is not performed for refastening. There will be times when a torque larger than the set torque is applied, which could damage the workpiece or screw.



## Count function (No.11 COUNT-FNC)

You can count the screw fastening number, and judge operations OK. In addition, you can use the workpiece signal (workpiece detection sensor) to judge operations NG.

### ⚠ CAUTION

- When the “operations channel switching method” (No.1 CH-CHG) is “S-AUTO” or “C-AUTO”, the count function jumps to the “OFF” operations channel.

In addition, if the count function of any of the channels is not set to “ON”, LCD is displayed as shown below, and the setting mode cannot be ended.

11) COUNT-FNC: OFF  
SETTING"ON"

- If a workpiece signal is not used, the operations NG judgment (NG output signal ON) cannot be performed.

To improve screw fastening operations control and quality, use of the count function and workpiece signal is recommended. By setting the count function to “ON”, you can perform settings for the setting items No.12 to 21.

## Workpiece signal (No.12 WORK-SNSR)

Sets whether you use the workpiece signal (workpiece detection sensor) or not.

Setting	Motion
OFF	<ul style="list-style-type: none"> <li>● Electric screwdriver can be constantly activated, for automatic screw fastening operations start</li> <li>● After screw fastening operation is completed, OK is activated for 0.3 seconds after “screw fastening confirmation time” (No.17 OK-OUT-T) has elapsed, and automatically switches to the next operations channel (OK output timing is same action as 'C-F' setting)</li> <li>● Operations NG cannot be judged</li> </ul>
ON	<ul style="list-style-type: none"> <li>● Electric screwdriver activates only when workpiece signal has been input (prevention of inadvertent operation)</li> <li>● If the workpiece signal input is set to OFF when the screw fastening operation is not yet completed (count number still remains), operations NG is output (in this case, the workpiece signal input is again set to ON, and the screw fastening operation is restarted, or the operations NG is released by WORK RESET, and the workpiece is moved to line-out)</li> </ul>

For the workpiece signal (workpiece detection sensor) wiring, see “Using the workpiece signal” (p. 42).

### ⚠ CAUTION

- To improve screw fastening operations control and quality, use of the count function and workpiece signal is recommended.

## Count number (No.13 COUNT)

Sets the screw count at 1 to 99.

The count number displayed in the controller [COUNT] LED during screw fastening mode is the countdown method.

## Workpiece setup time (No.14 WORK-S-T)

Sets the time from setting up the workpiece (workpiece signal input ON → [WORK] LED flashing) to the electric screwdriver action being enabled ([WORK] LED lighted) at 0.0 to 9.9 seconds.

Within this time period, the electric screwdriver does not activate (rotate), and even if workpiece signal input ON/OFF repeatedly occurs due to workpiece removal, position adjustment, or redo, etc., operations NG does not occur.

## Screw fastening time lower limit value (No.15 CRT-T-L) / Screw fastening time upper limit value (No.16 CRT-T-U)

Sets the screw fastening time (collect timer) lower limit value (Lower) and upper limit value (Upper). After setting the setting items No.3 FSTN-TYPE to No.7 FSTN-T, set the screw fastening time lower limit value and upper limit value.

Setting	Details
Screw fastening time lower limit value (No.15 CRT-T-L)	<ul style="list-style-type: none"> <li>When the actual screw fastening time is shorter than the setting time, count is not performed (detection of short screw, refastening, screw galling, etc.)</li> <li>Setting at 0.00 to 9.99 seconds (0.00: lower limit value function invalid)</li> <li>Set a value smaller than "CRT-T-U"</li> </ul>
Screw fastening time upper limit value (No.16 CRT-T-U)	<ul style="list-style-type: none"> <li>When the actual screw fastening time is longer than the setting time, count is not performed (detection of mistakenly long screw tightening, etc.)</li> <li>Setting at 0.01 to 9.99 seconds/DIS (DIS: upper limit function invalid)</li> <li>Set a value larger than "CRT-T-L"</li> </ul>

### CAUTION

- To fix the screw fastening time, use the same operations method to perform the screw tightening.

## Measurement of screw fastening time

If you perform screw tightening during the No.15 CRT-T-L/No.16 CRT-T-U settings, you can measure the actual minimum value or maximum value of the screw fastening time.

Since the screw length and electric screwdriver speed vary, you can update the measurement value any number of times to set the optimum value.

Perform measurement for the time from when the electric screwdriver starts rotating until torque-up. Measurement is not performed when stoppage occurs partway through, or for reverse rotation.

When measurement is performed normally, the controller LCD 2nd line is displayed as shown below.

15) CRT-T-L : 0. 00s  
"MEAS-T : 0. 60s"

Each time screw tightening is performed, the CRT-T-L (lower limit value) setting is updated to the minimum value, and the CRT-T-U (upper limit value) setting to the maximum value.

Reference the measured minimum value or maximum value, to set the screw fastening time.

Note that rotating the [SETTING] dial clears the memory of the set minimum value and maximum value.

### CAUTION

- Periodically measure the screw fastening time.
- The electric screwdriver speed includes a solid differential. In addition, it changes due to the effects of heating or mechanical loss, etc.
- As shown below, perform setting with consideration for scattering in screw length or screw fastening operations.  
Screw fastening time lower limit value: -10% from measurement minimum value (Example: set to measurement minimum value 0.6s → 0.54s)  
Screw fastening time upper limit value: +10% from measurement maximum value (Example: set to measurement maximum value 0.7s → 0.77s)  
(-10%, +10% is one example. Take into consideration the screw length tolerance, workpiece individual differential, and operations scatter, etc.)

## Screw fastening confirmation time (No.17 OK-OUT-T) / OK output timing (No.18 OK-TIMING)

Sets the time for outputting the OK signal (0.0 to 9.9 sec), and timing when a series of operations have been completed.

Since you can perform reverse rotation action of the electric screwdriver during the screw fastening confirmation time, you can check the operation and loosen the screw (forward rotation action cannot be performed). If loosening the screw, the count return function (No.21 COUNT-RTN) is activated. After the screw fastening confirmation time, an OK signal is output, and the electric screwdriver does not operate.

If an OK signal is output, the controller [OK / NG] LED lights in green.

### OK output timing

Setting	Details
C-F	(Count Finish) When screw tightening at the set count number has been completed, and the "screw fastening confirmation time" (No.17 OK-OUT-T) has elapsed, an OK signal is output
W-O	(Work Off) When screw tightening at the set count number has been completed, and the workpiece signal is set to OFF, an OK signal is output Valid only when "workpiece signal" (No.12 WORK-SNSR) is "ON"

When WORK RESET is input during the screw fastening confirmation time, an OK signal is immediately output.

## Operations OK buzzer sound (No.19 OK-BZ) / Operations NG buzzer sound (No.20 NG-BZ)


You can set the OK buzzer sounds (11 types) when an operation is completed, and the NG buzzer sounds (10 types) when an operation is not completed.

## Count return function (No.21 COUNT-RTN)

If the tightened screw has become loosened, you can return the count number. Reverse rotation of the electric screwdriver is detected, and the count return function activates.

Setting	Details
OFF	Set when the loosening operation is not performed and the count return function is not necessary Even when reversed, the count number does not return
ON1	Regardless of the number of screws loosened (number of rotations reversing the electric screwdriver), the count number is returned by 1 count only (Same Count return method as the screw fastening counters DLR5640-WN/DLR5040A-WN/DLR5340-WN)
ON2	The count number is returned by the number of screws loosened (number of rotations reversing the electric screwdriver) (Same count return method as the multifunction brushless Delvo DLV30S12P-AA series)


### "ON2" operations procedure

- 1 In a state where 1 or more screws are tightened and the count number has decreased, slide the changeover switch to the  (reverse rotation side)**
- 2 Press the [SETTING] dial**  
The LCD is displayed as shown below.

"COUNT-RTN MODE"

- 3 Either press the lever switch, or set the external reverse start input signal to ON**  
If reverse-rotated, after returning by 1 unit, it returns to operations mode.  
Repeating Steps 2 to 3 further restores the unit number.

To cancel count return mode, perform any of the following operations.

- Slide the changeover switch to neutral or  (forward rotation side)
- Use external signal to set the forward rotation start input signal to ON (starts forward rotation at same time as cancellation of count return mode)

### CAUTION

- **Have the operator perform a visual check on whether the screw is loose or not.**  
To maintain the count number adjustment, perform the operations while checking whether the screw is loose.
- **To loosen the screw, loosen it completely from the screw hole. If not, the screw fastening time (CRT-T) and the fastening time (FSTN-T) will not match when tightening the screw again.**
- **When even one screw has not been tightened (when “current count number = set count number”), the count number cannot be returned.**

## Buzzer sound volume (No.22 BZ-VOLUME)

You can set the buzzer sound volume in 6 steps. Each buzzer sound is set in same volume.

If the sound volume is small even at “MAX”, use the output signal (C-UP, F-NG, OK, NG) to externally mount the lamp or buzzer.

### CAUTION

- **To be able to perform operations while confirming the action state, setting the sound volume to “MAX” is recommended.**
- **If set to “OFF”, all buzzer sounds are turned OFF.**

## Check buzzer sound (No.23 CHECK-BZ)

You can set whether to have the action check buzzer sound or not. If set to “ON”, a “beep” is sounded at the timing below.

- In the “HARD” fastening setting, when the “fastening timer” (No.7 FSTN-T) is passed and switches to seating speed
- When the workpiece No. is recognized, and the electric screwdriver can be activated (controller [WORK] LED lights up)
- When the count number is returned by 1 on the count return function

## Back light (No.24 BACK LIGHT)

You can perform setting for whether the controller LCD back light is lighted or not.

When an automatic screw fastening machine is mounted, etc., if there is no need to view an LCD during the screw fastening operation, you can set the back light to OFF.

## Setting initialization (No.25 SETUP-RESET)

Initializes the setting. See “Initialization of settings” (p. 24).

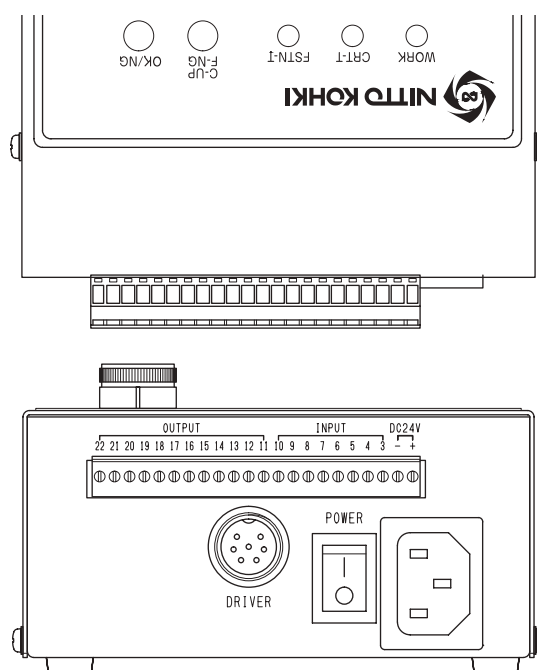
## 9 Using External Signals

You can input or output external signals via a signal terminal block.

### ⚠ CAUTION

- In the I/O circuit drive, you can use a built-in service power source (24 V DC, 200mA or less).  
If cabling a load with capacity exceeding 200mA, use an external power source.
- Before connecting the wire for the external signal, always turn OFF the power.

## Specifications of signal terminal block



### Content of signal terminal block

Terminal No.	Function	Details	I/O
1 (+)	+24 V DC	Built-in service power source (Capacity: Maximum 200mA) ● Use in power source for input/output signal common wire, or for the workpiece detection sensor, etc.	Service power source
2 (-)	0 V DC		

Terminal No.	Function	Details	I/O
3	Channel A	In the 2-bit input signal, specify the operations channel (CH1 to CH4) ● Valid only when “operations channel switching method” (No.1 CH-CHG) is set to “INPUT” (p. 25)	Input
4	Channel B		
5	Forward rotation startup	Startup with external input signal (p. 45)	
6	Reverse rotation startup		
7	WORK	Input the workpiece signal (workpiece detection sensor output) ● With “count function” (No.11 COUNT-FNC) and “workpiece signal” (No.12 WORK-SNSR) set to ON, the workpiece signal input is valid (p. 42)	
8	WORK RESET	Reset operations (same as controller [WORK RESET] button (p. 6))	
9	Keylock	Lock the controller button operation ● Disable the controller button operation, and prevent setting changes by the operator (p. 46)	
10	Input signal negative common wire	Connect 0 V DC ● Service power source (terminal No.2) or external 0 V DC power source can be connected (see circuit drawing on p. 40)	
11	Forward rotation signal	Set output signal during forward rotation to ON	Output
12	Reverse rotation signal	Set output signal during reverse rotation to ON	
13	Count-up (C-UP)	Performance of normal screw tightening (torque-up) sets output signal to 0.3 seconds ON	
14	Screw fastening NG (F-NG)	If screw fastening NG, sets output signal to 0.3 seconds ON	
15	Operations channel 1 (CH1)	Set the channel output signal to ON during operations or settings	
16	Operations channel 2 (CH2)		
17	Operations channel 3 (CH3)		
18	Operations channel 4 (CH4)		
19	Operations OK	If the set count screw tightening is judged to be completed and operations OK, the output signal is set to ON ● For OK output timing, see p. 33	
20	Operations NG	When the WORK input signal is OFF during an operation, and the operation is judged to be NG, the output signal is ON	
21	Space	Connection impossible	
22	Output signal positive common wire	Connect +24 V DC ● Service power source (terminal No.1) or external +24 V DC can be connected (see circuit drawing on p. 40)	

## Signal terminal block wiring and mounting

Wires the lead wires to the signal terminal block.

You can mount the signal terminal block to the controller, or remove it, while in a wired state.

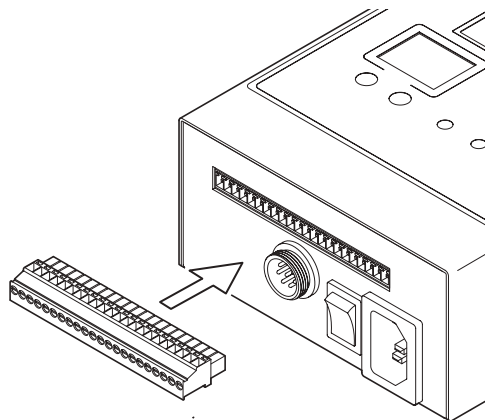
### WARNING

- Before connecting the wire for the external signal, always turn OFF the power.

### CAUTION

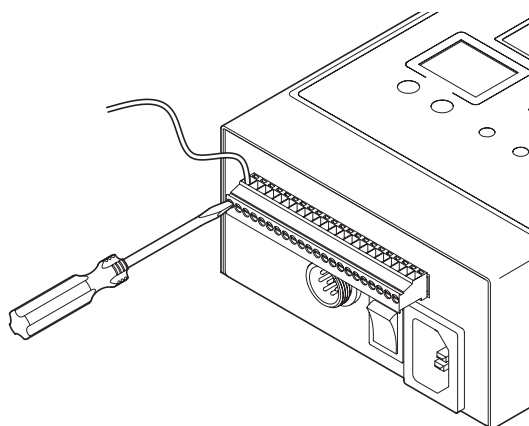
- When mounting, removing, or wiring the signal terminal block, be careful to avoid applying excessive force to the signal terminal block or lead wires.
- Periodically check if there are any lead wire disconnections or looseness.

## 1 Mount the signal terminal block on the controller back surface



## 2 Insert the core wire of the lead wire into the terminal area, and use a flat screwdriver to tighten

Check that the lead wire has not slipped out.



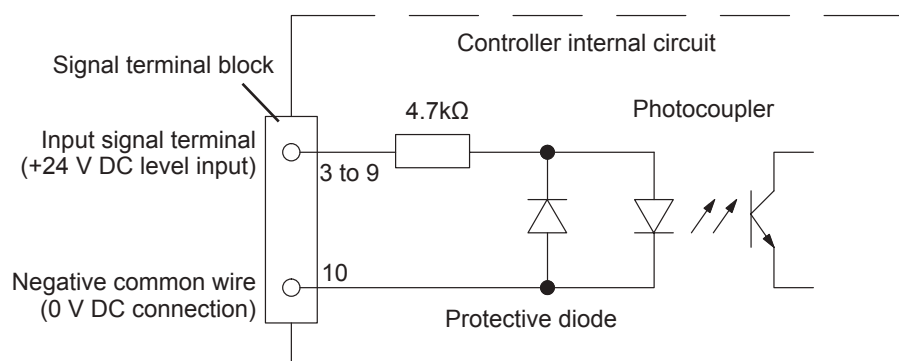
## External signal specifications

### I/O circuit

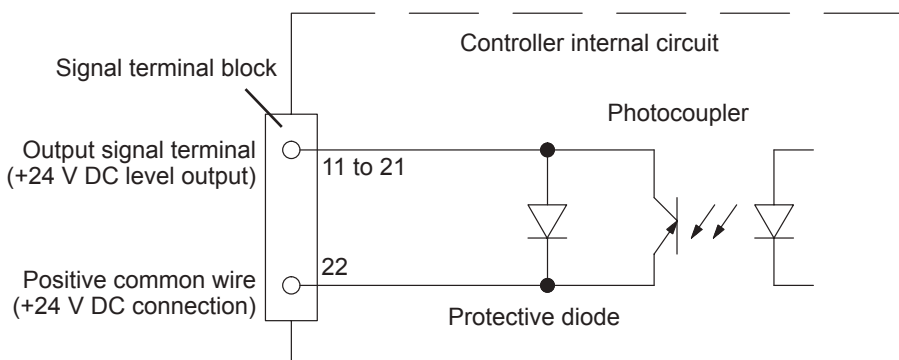
#### ⚠ CAUTION

- In the I/O circuit drive, you can use a built-in service power source (24 V DC, 200mA or less). If connecting a load with capacity exceeding 200mA, use an external power source.
- The I/O signal circuits (terminal No.3 to 22) is insulated by a photocoupler from the controller internal circuit. However, the service power source (24 V DC) is connected to the controller internal circuit (primary side commercial power source and secondary side circuit are insulated). As a result for the I/O signal circuit wiring, use an external power source as necessary.
- Be careful about applying excess voltage or noise, etc., to each terminal.

Input circuit



Output circuit



### I/O signal specifications

Input signal	Photocoupler input 24 V DC 5mA consumption per input
Output signal	Open collector 24 V DC or less Maximum 30mA per output



## Connection example of I/O signal

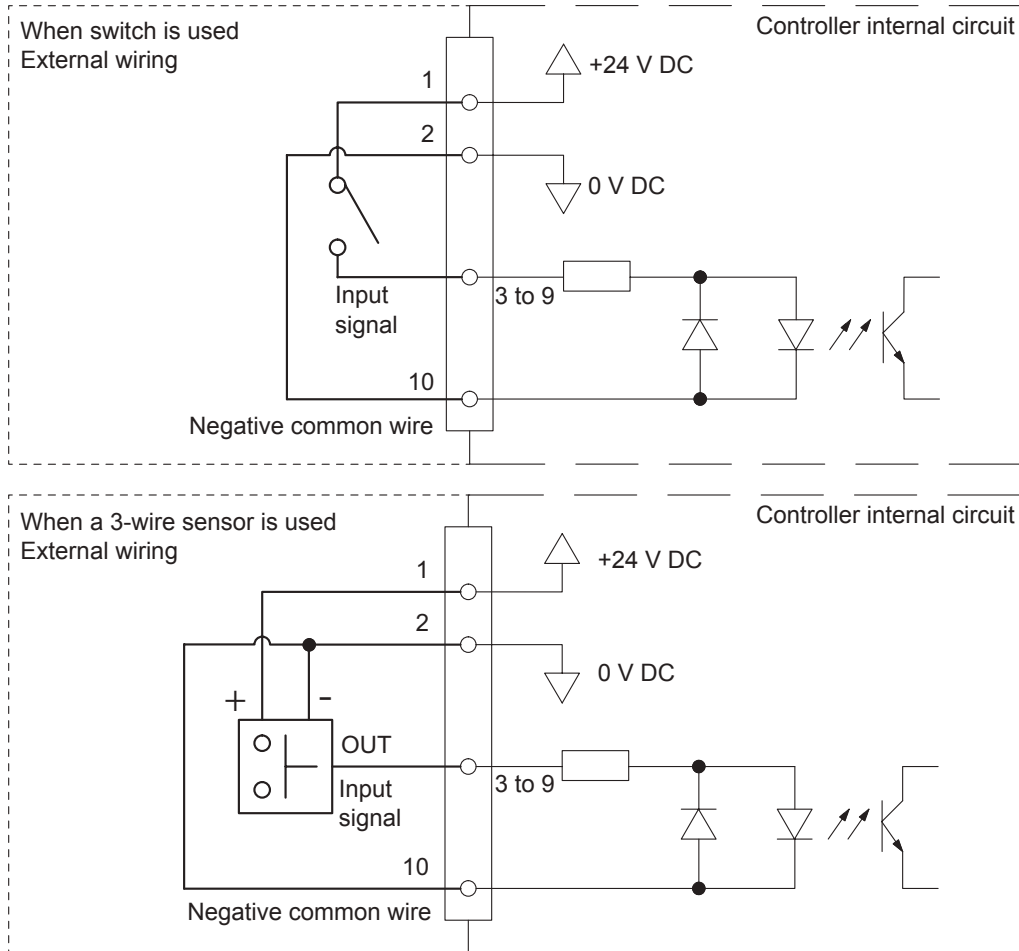
### **WARNING**

- Before connecting the wire for the external signal, always turn OFF the power.

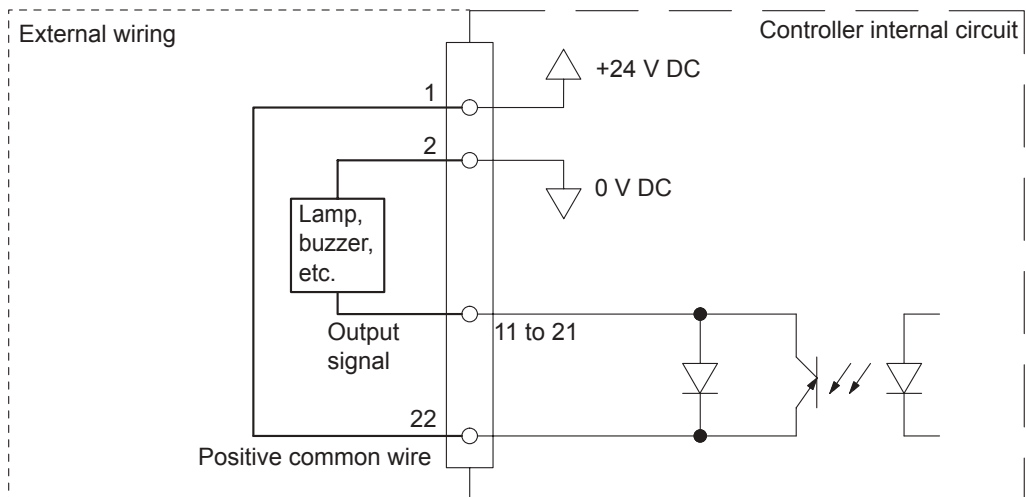
### **CAUTION**

- **The drawing is a connection example using the built-in service power source.**  
Components such as resistance are omitted.  
Add resistance, etc. according to the electronic parts to be used.
- **For connection, use thick wire as much as possible. (AWG20 or more is recommended)**
- **A 2-wire sensor cannot be used.**  
A 2-wire sensor has a flow of fine current even while OFF, and could cause a malfunction.
- **For the sensor, use an PNP output type 3-wire sensor.**
- **Depending on the sensor installation environment, a malfunction could occur due to noise. Make sure to take sufficient noise measures such as grounding (earth), etc.**  
For details, read the instruction manual of the sensor to be used.


## Connection example of input signal


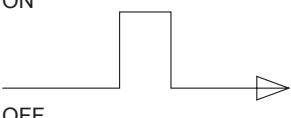

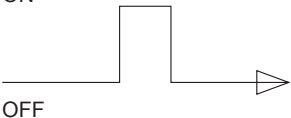



## Connection example of output signal



## Timing of I/O signal

Terminal No.	Input signal	Signal timing	Remarks
3	Channel A		While the input signal is ON, channel A/B is ON
4	Channel B		
5	Forward rotation startup		While the input signal is ON, electric screwdriver is active (rotates)
6	Reverse rotation startup		
7	WORK		While the input signal is ON, the workpiece signal is ON
8	WORK RESET		With input signal 1 sec. ON, WORK RESET is ON
9	Keylock		While input signal is ON, controller button operation is locked

Terminal No.	Output signal	Signal timing	Remarks
11	Forward rotation signal		During forward rotation/reverse rotation, ON
12	Reverse rotation signal		
13	Count-up (C-UP)		During normal torque-up, ON for 0.3 sec.
14	Screw fastening NG (F-NG)		During screw fastening NG, ON for 0.3 sec.
15	Operations channel 1 (CH1)		Channel is ON during operations, during settings
16	Operations channel 2 (CH2)		
17	Operations channel 3 (CH3)		
18	Operations channel 4 (CH4)		
19	Operations OK (OK)		When the OK signal is output, ON for 0.3 sec. Or until the workpiece is removed, ON (See "OK output timing" (p. 33))
20	Operations NG (NG)		During Operations NG, ON

## Using the workpiece signal

### CAUTION

- **A 2-wire sensor cannot be used.**  
A 2-wire sensor has a flow of fine current even while OFF, and could cause a malfunction.
- **For the sensor, use an PNP output type 3-wire sensor.**
- **Depending on the sensor installation environment, a malfunction could occur due to noise.**  
Make sure to take sufficient noise measures such as grounding (earth), etc. For details, read the instruction manual of the sensor to be used.

By using the workpiece signal (workpiece detection sensor), it is possible to prevent human errors and improve work quality.

### 1 Turn off the power of the controller

### 2 Connect (wire) the external signal

Referring to the connection example of I/O signal (p. 40), connect the sensor or switch, and PLC output signal, etc.

Terminal No.	Connected input signal	Connection example
7	WORK	Connect the sensor or switch, and PLC output (input the +24 V DC level)
10	Input signal negative common wire	Connect 0 V DC (connectable to terminal No.2)

### 3 Turn ON the power of the controller

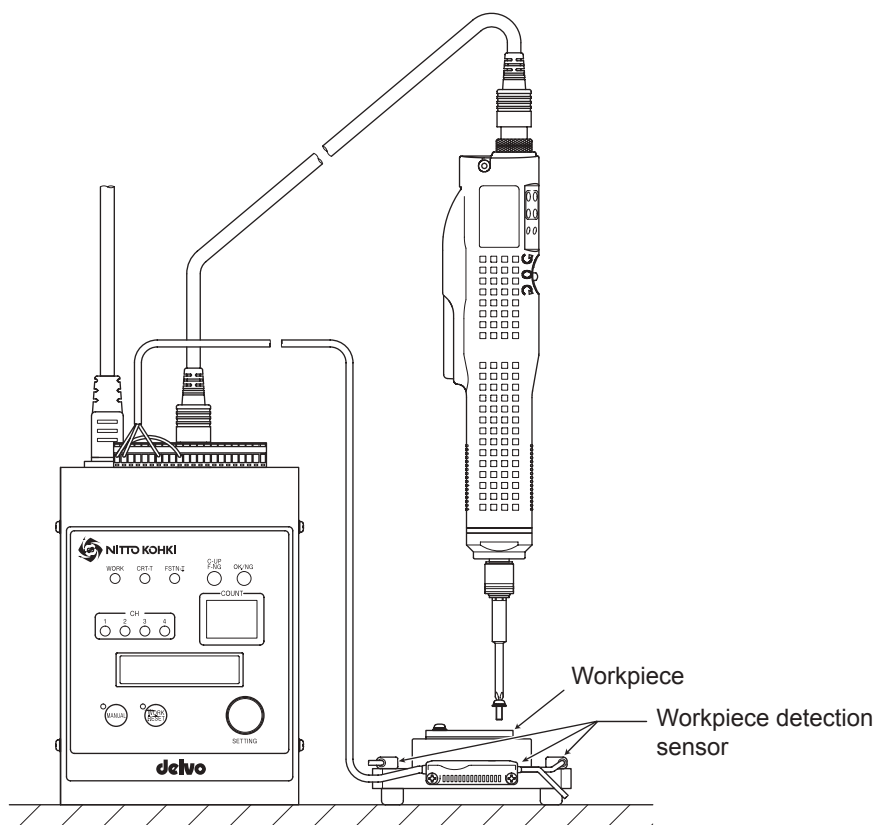
### 4 Press and hold the [SETTING] dial

The mode enters setting mode.

### 5 Change the settings below

Setting item	Set value
Count function (No.11 COUNT-FNC)	ON
Workpiece signal (No.12 WORK-SNSR)	ON

### 6 Press and hold the [SETTING] dial, and preserve the setting



## Basic operation

When workpiece is detected, the [WORK] LED lights in green and the electric screwdriver becomes operable.

When workpiece is not detected ([WORK] LED lights off), the electric screwdriver is not operable.

If workpiece is removed before completing a series of screw fastening operations (before the screw count reaches the set value), NG occurs and an NG signal is output. Set up the workpiece again or insert WORK RESET to cancel the NG.

If workpiece is removed after completing a series of screw fastening operations (after the screw count reaches the set value), it becomes operations OK.

## Setting related to workpiece signal

If the workpiece signal is used, the settings below are valid.

Setting item	Reference
Workpiece setup time (No.14 WORK-S-T)	p. 31
Screw fastening confirmation time (No.17 OK-OUT-T)	p. 33
OK output timing (No.18 OK-TIMING)	p. 33
OK buzzer sound (No.19 OK-BZ)	p. 33
NG buzzer sound (No.20 NG-BZ)	p. 33

## Resetting operation

If a problem occurs on the workpiece during screw tightening and the workpiece needs to be removed, you can reset the operation.

### ⚠ CAUTION

- For connection, use thick wire as much as possible. (AWG20 or more is recommended)

## Resetting the screw fastening count

If a problem occurs during screw tightening, and the workpiece is removed and line-out occurs, you can reset the series of operations.

Pressing and holding the controller [WORK RESET] button, or setting the WORK RESET input signal to ON for 1 second, returns to the screw fastening count of the operations channel setting.

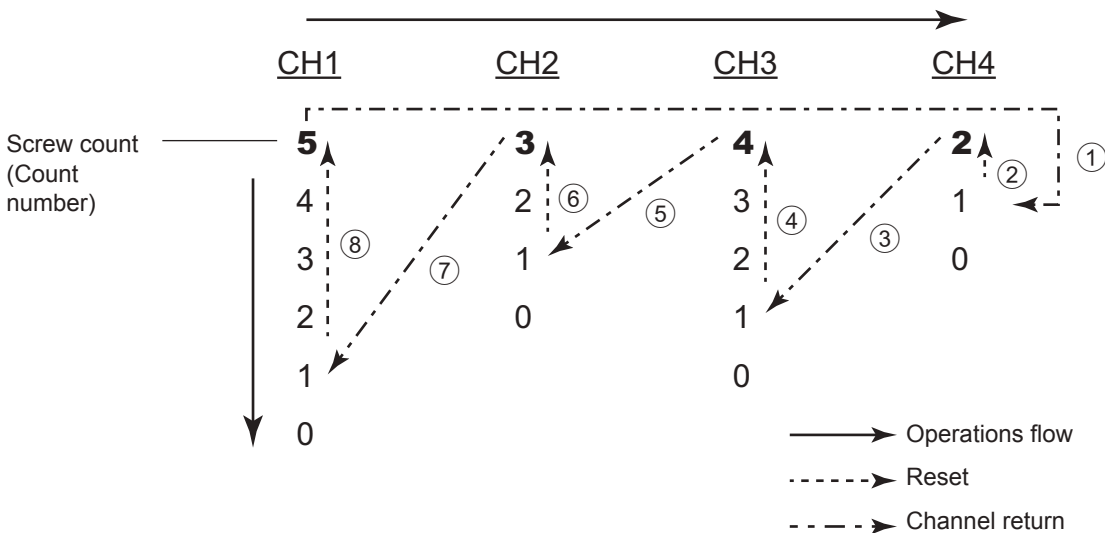
You can perform reset even during the screw fastening confirmation time (No.17 OK-OUT-T) after completion of screw tightening.

## Restore and change the operations channel

When the “operations channel switching method” (No.1 CH-CHG) is set to “S-AUTO” or “C-AUTO”

When at screw fastening count setting, pressing and holding the controller [WORK RESET] button, or setting the WORK RESET input signal to ON for 1 second, returns the screw fastening count of the 1 previous channel where the count function was set to “ON”, to a 1 remainder state.

### Example of reset and channel restore action



Reference the connection example of I/O signal (p. 40) for wiring.

Terminal No.	Connected input signal	Connection example
8	WORK RESET	Connect the switch or PLC output (input the +24 V DC level)
10	Input signal negative common wire	Connect 0 V DC (connectable to terminal No.2)

When the “operations channel switching method” (No.1 CH-CHG) is set to “INPUT”

When an operations channel separate from the current channel is specified in the channel A/B input signal, pressing and holding the controller [WORK RESET] button, or setting the WORK RESET input signal to ON for 1 second, switches the operations channel. (p. 45)

## Operations channel switching

When the “operations channel switching method” (No.1 CH-CHG) is used to set “INPUT”, the operations channel is switched with an external input signal.

At time of the following, the channel is not switched.

- During a screw fastening operation when the “count function” (No.11 COUNT-FNC) is “ON” (When the following operations channel input signals (channel A/B) are set to ON during the screw fastening operation, it switches to a channel specified at the time the following operation starts)
- During an electric screwdriver operation (rotation) at time of the count function OFF setting (switches when the lever switch is released)

When forcibly switching the operations channel during a screw fastening operation, insert WORK RESET.

Terminal No.	Connected input signal	Connection example
3	Channel A	Connect the switch or PLC output (input the +24 V DC level)
4	Channel B	
10	Input signal negative common wire	Connect 0 V DC (connectable to terminal No.2)

### CAUTION

- For connection, use thick wire as much as possible. (AWG20 or more is recommended)

### Specified operations channel and input signal

Specified operations channel	Input signal	
	Channel A	Channel B
CH 1	OFF	OFF
CH 2	ON	OFF
CH 3	OFF	ON
CH 4	ON	ON

- 1 Press and hold the [SETTING] dial**  
The mode enters setting mode.
- 2 Select the “operations channel switching method” (No.1 CH-CHG), and set to “INPUT”**
- 3 Select “setting target channel” (No.2 CH), and select channels “CH1” to “CH4” to change the setting**
- 4 Perform other settings as necessary**
- 5 Press and hold the [SETTING] dial**  
The settings are saved, and it returns to screw fastening mode.

## Use external signal to start up electric screwdriver

You can use an external input signal for forward/reverse rotation startup of the electric screwdriver.

You can mount the separately sold flanged coupling (vacuum pickup for automatic machine), for mounting on automatic screw fastening machine. (p. 13)

Use connection of each type of I/O signal to PLC, etc., to achieve automation of the various screw fastening operations.

Terminal No.	Connected input signal	Connection example
5	Forward rotation startup	Connect the switch or PLC output (input the +24 V DC level)
6	Reverse rotation startup	
10	Input signal negative common wire	Connect 0 V DC (connectable to terminal No.2)

When started by external input signal, the electric screwdriver changeover switch is invalid.

## Locking button or dial operations

To prevent careless incorrect operation, you can lock the operations below (Keylock).

- [SETTING] dial: Prohibit setting changes
- [MANUAL] button: Prohibit manual mode
- [WORK RESET] button: Prohibit screw fastening operation reset, operations channel return (WORK RESET with input signal is valid)

Terminal No.	Connected input signal	Connection example
9	Keylock	Connect the switch or PLC output (input the +24 V DC level)
10	Input signal negative common wire	Connect 0 V DC (connectable to terminal No.2)

Even among key locks, the [SETTING] button press operation is valid at time of the count return function ON2 setting.



## 10 Error Detection

You can detect the controller and electric screwdriver states, judge it to be an error, and stop the action. Even in cases where automatic machine control is performed with PLC, in conditions where the two F-NG and NG output signals are ON at the same time, you can judge it to be in error mode.

Terminal No.	Connected input signal	Connection example
14	Screw fastening NG (F-NG)	Connect the LED or PLC input (output the +24 V DC level) ● State where two output signals are set to ON at the same time
20	Operations NG	
22	Output signal positive common wire	Connect +24 V DC (connectable to terminal No.1)

### Detection of connection slip

When the controller and electric screwdriver connection during the machine operation slips out, it is detected as an error and operations stop.

When in error mode, a warning sounds and the [C-UP / F-NG] LED and [OK / NG] LED lights up in red, and the F-NG and NG output signal turns ON.

The message below is displayed on the LCD.

**CONNECT DLV AND  
POWER OFF AND ON**

To release an error mode, turn off the power and check the connection of electric screwdriver and controller, and then re-insert the power.

If you cannot release the error mode, there is a possibility of a connection cord disconnection, or failure in the main machine, etc. (p. 48)

### Detection of motor startup error

If a state is detected where the motor will not rotate even when the electric screwdriver is operated, it is detected as a motor startup error, and operations stop.

When in error mode, a warning sounds and the [C-UP / F-NG] LED and [OK / NG] LED lights up in red, and the F-NG and NG output signal turns ON.

The message below is displayed on the LCD.

**FUSE IS OPEN OR  
MOTOR FAILURE**

To release an error mode, turn off the power and remove the bit, re-insert the power, and then perform startup operation in no-load state to check the action. (Remove the bit to exclude the effects of bit inertia.)

If the error mode repeatedly occurs, there is a possibility of failure in the main machine, etc. (p. 48)

### Detection of screw loosened lock

Reverse rotation startup for the device rotates at the maximum speed (maximum lock).

If the screw tightened by a forward rotation torque larger than the reverse rotation output torque of this device is loosened, the motor stops at the point where the reverse rotation lock is detected.



At this time, the F-NG buzzer sounds, the [C-UP / F-NG] LED lights up in red for 0.3 seconds, and the F-NG output signal is ON for 0.3 seconds.

#### CAUTION

- When a screw loosening lock error has occurred, use a separate screwdriver to loosen the screw.

# 11 Appendix

## When abnormalities have occurred (Troubleshooting)

Symptoms	Location to investigate	Solution
Controller power won't turn on	Is the power plug inserted into an outlet? Is the power cord slipped out of the inlet? Has the rated voltage been input? Is the power switch set to OFF (O side)?	Check the power supply. Firmly insert the power cord, and set the power switch to ON (I side).
An error is displayed in the controller	Is the electric screwdriver and controller correctly connected?	Use the connection cord to connect the electric screwdriver and controller, and then re-insert the power source.
Controller button operation cannot be performed	Is the keylock input signal set to ON?	Set the external signal key lock input signal to OFF. (p. 46)
The electric screwdriver does not operate	Is the [WORK] LED lighted up?	If using the workpiece signal, either set up the workpiece (workpiece signal ON) or set the "workpiece signal" (No.12 WORK-SNSR) to "OFF". (p. 31)
	Is the workpiece signal set to "ON"?	Either set up the workpiece (workpiece signal ON) or set the "workpiece signal" (No.12 WORK-SNSR) to "OFF". (p. 31)
	Is the changeover switch set to "o" (neutral)?	Slide the changeover switch to the  (forward rotation side) or  (reverse rotation side).
	If starting up with external input signal, is there a mistake or error in cabling, or a disconnection? Is 0 V DC connected to the input signal negative common wire (terminal No.10)? Is the input signal (switch or PLC output signal) firmly set to ON?	Check the wiring. (p. 35) Check the external input signal.device being used.
	Is the setting value for the workpiece setup time too long?	Even if the workpiece signal is set to ON, the tool does not operate during the workpiece setup time. Set the "workpiece setup time" (No.14 WORK-S-T) to a shorter time. (p. 31)
	Is the refastening prohibited timer active immediately after screw tightening?	While the "refastening prohibited timer" (No.10 REFSTN-T) is active, forward rotation cannot be started. (p. 30)
	Is the electric screwdriver in error mode and displays an error message on the LCD?	Check the error message content. (p. 47)
	Has each setting been set according to the instruction manual?	Review each of the settings. (p. 25) To initialize the settings, execute "setting value initialization" (No.25 SETTING RESET). (p. 24)
Count not performed	Is the count function setting set to "ON"?	If the "count function" (No.11 COUNT-FNC) is set to ON, you can use the count function.
	Is the torque-up condition for count-up satisfied?	Check the count conditions and activation. (p. 30)
When a screw is loosened (reverse-rotated), the count number does not return	Is the "count return function" (No.21 COUNT-RTN) setting set to "ON1" or "ON2"?	Review the settings. (p. 33)
	Is the current count number less than the setting number?	Return cannot be performed if the count is not 1 unit or higher. (p. 33)
	Is the current count number and the setting number the same?	If at the setting number or higher it cannot be returned. (p. 33)
	If the "count return function" (No.21 COUNT-RTN) is set to "ON2", is it in count return mode?	Check the count return mode procedure. (p. 33)

Symptoms	Location to investigate	Solution
Stop during the screw fastening rotation	Aren't burrs, dregs, or particles caught in the screw hole or screw part?	Check the screw or workpiece.
	Is the tapping screw tightened?	It is possible that the setting torque was exceeded when tightening the screw (before seating). Check the screw fastening state, and raise the setting torque.
	Have you attached a heavy jig or a jig having a large radius at the bit tip?	It is possible that the jig inertial force has boosted the motor current, to attain the setting torque. Either review the jig (make it lighter, make it smaller), or boost the setting torque.
	Can it be stopped by idling (free rotation state)?	It is possible that some sort of load can be applied to the bit area, to boost the motor current, and attain the setting torque. Either cancel the load applied to the bit area, or boost the setting torque.
	Is a load applied to the bit area during screw tightening?	
The output torque is low Screws cannot be tightened	Are you correctly combining the measuring devices for measurement? In addition, are the types of joint washers (white rubber, black rubber, metal) incorporated into screw joints, or the incorporated sequence, correct?	Use a combination of NITTO KOHKI designated measuring devices for measurement. (p. 8) Check whether the screw joints are correct, and perform measurement. (p. 10)
	Has the permanent set in fatigue, cracks, deformation, and hardening occurred in the joint washers (white rubber, black rubber, metal) incorporated into screw joints? (p. 10)	In cases where changes have occurred in the rubber, there is a need to replace with new joint washer parts.
	Has the output torque changed?	The output torque changes over time. Regularly check the output torque, and adjust the setting torque. (p. 11)
	Did you check the correlation between the output torque occurred on screws and the output torque measured using a measurement device?	The output torque occurred on screws and the output torque measured by the measurement device are different. Adjust the output torque according to the screw fastening conditions. (p. 11)
	Are there differences in the screw fastening operation methods (operator, force for handling or pressing the electric screwdriver, fixing method, etc.)?	Torque conveyed to the motor current or screw changes depending on the operations method. Perform the screw tightening under fixed operation conditions.
	Is the bit worn out?	When the bit is worn out, it becomes difficult to convey the torque to screws. Replace the bit.
	Are you tightening while crushing a part between the screws? Has regression loosening occurred?	Torque may not be transmitted. Crush the part once and then tighten the screw.
	Has axial force occurred to the screw?	Without axial force, even though the output torque is increased, screws are not tightened. Review the screw fastening conditions.
	Has initial loosening occurred?	Initial loosening occurs as a result of permanent set in fatigue when fine irregularities such as surface roughness are lost over time after the screw is tightened or outside force is applied. Remove the screw and tighten it again.
	Has the permanent set in fatigue occurred due to permanent deformation of sealing material such as the gasket?	Carefully check the screw fastening conditions and set the output torque.
	Has the temperature surrounding the electric screwdriver, screw, or workpiece changed?	Change in temperature can deform the workpiece, stretch or loosen the screws, or cause changes in the electric screwdriver characteristics. Review the screw fastening conditions and process.
	Are there occurrence or impressions of vibrations or external force?	Loosening of screw occurs if no measures are taken for vibration or outside force. Take appropriate loosening prevention measures, as necessary.

Symptoms	Location to investigate	Solution
The output torque is high Screws are tightened too much	Are you correctly combining the measuring devices for measurement? In addition, are the types of joint washers (white rubber, black rubber, metal) incorporated into screw joints, or the incorporated sequence, correct?	Use a combination of NITTO KOHKI designated measuring devices for measurement. (p. 8) Check whether the screw joints are correct, and perform measurement. (p. 10)
	Has the permanent set in fatigue, cracks, deformation, and hardening occurred in the joint washers (white rubber, black rubber, metal) incorporated into screw joints?	In cases where changes have occurred in the rubber, there is a need to replace with new joint washer parts.
	Has the output torque changed?	The output torque changes over time. Regularly check the output torque, and adjust the setting torque. (p. 11)
	Did you check the correlation between the output torque occurred on screws and the output torque measured using a measurement device?	The output torque occurred on screws and the output torque measured by the measurement device are different. Adjust the output torque according to the screw fastening conditions. (p. 11)
	Are there differences in the screw fastening operation methods (operator, force for handling or pressing the electric screwdriver, fixing method, etc.)?	Torque conveyed to the motor current or screw changes depending on the operations method. Perform the screw tightening under fixed operation conditions.
	Has the temperature surrounding the electric screwdriver, screw, or workpiece changed?	Change in temperature can deform the workpiece, stretch or loosen the screws, or cause changes in the electric screwdriver characteristics. Review the screw fastening conditions and process.
	Have you attached a heavy jig or a jig having a large radius at the bit tip?	After the torque reaches the set torque, the inertial force of the jig might have been transmitted to screws. Review the jig (make it lighter, make it smaller).
	Are you performing an refastening or tightening of short head length screws?	To ensure that a high torque is output, do not perform these operations. Perform adequate evaluations and verifications on actual workpieces, and then use with caution.
	Is this a soft start?	Torque control is not performed for soft start (rotation speed rise in progress). Lower the "soft start level" (No5 SOFT-START). (p. 28)
	In the case of a "HARD" fastening setting, has the fastening time elapsed?	After the fastening time has elapsed, and switched to the seating speed, set the "fastening timer" (No.7 FSTN-T) value shorter.
The output torque graph and actual output torque do not match	The graph value is standard. The output torque range is not guaranteed. The output torque range sometimes differs from the graph but this is not a product error. (p. 11)	
The speed setting value and actual speed do not match	Speed setting value is a standard for no-load speed. The actual speed is not guaranteed. The actual speed sometimes differs from the setting value but this is not a product error. (p. 11) Note, if the electric screwdriver motor is warm, it has the property of free speed rising.	
	Is it reverse rotation?	Reverse rotation rotates at the maximum speed.
	Is this a "HARD" fastening setting?	The setting speed rotates for just the fastening time period only.
	Is the "fastening timer" (No.7 FSTN-T) set?	If the fastening time is exceeded, it automatically switches to the seating speed.
The speed is not stable	Is the electric screwdriver generating heat? Is this the case where a load is applied to the bit area? Is this the case of a comparison with a separate electric screwdriver?	The specification value and setting value is standard. The speed of electric screwdrivers varies depending on the temperature of the unit, mechanical loss and grease conditions. If a load is applied to the bit part, the speed drops. In addition, the electric screwdriver speed includes a solid differential. (p. 11)

Symptoms	Location to investigate	Solution
Input signal does not react	Is there a mistake or error in cabling, or a disconnection? Is 0 V DC connected to the input signal negative common wire (terminal No.10)?	Check the wiring. (p. 35)
	Is the input signal (switch or PLC output signal) firmly set to ON?	Check the external input signal.device being used.
	Does the product setting and state match the conditions receiving the input conditions?	Check each type of setting or state, and input a signal at the suitable timing.
The output signal is not output	Is there a mistake or error in cabling, or a disconnection? Is +24 V DC connected to the output signal positive common wire (terminal No.22)?	Check the wiring. (p. 35)
	Does the output signal specifications (output circuit or output time, etc.) match the input device or load specifications detecting the output signal (input circuit or reaction speed)?	Check the connecting external device or load.
	Is the load in excess of the output signal rating (30 V DC, 30mA), or the capacitive load or inductive load, connected?	Since the output terminal (built-in photocoupler) has the possibility of breaking down, do not perform its connection.
When you want to use a 2-wire sensor	A 2-wire sensor cannot be used.	
I want to connect with the NPN signal method machine	The signal method is PNP. Use the signal converter, etc., to perform connection.	
The service power source +24 V DC cannot be extracted	Is there a mistake or error in cabling, or a disconnection?	Check the wiring. (p. 35)
	Has the output current capacity (200mA) been exceeded for use?	Do not exceed the output current capacity for use. If the output current capacity is not sufficient, use a separate external power source.
Buzzer sound is small	Is the buzzer sound setting too small?	Set the "buzzer sound volume" (No.22 BZ-VOLUME) larger. If the sound is still too small, attach a buzzer or lamp to the output signal. (p. 34)
LCD display is difficult to read	Is the back light (yellow-green color) lighted up?	Set the "back light" (No.24 BACK LIGHT) to "ON".
The electric screwdriver gets hot	Is the ON (rotation) time of the electric screwdriver too long? Or is the OFF time too short?	Review the operation time. The rated operating time is 0.5 sec. ON/3.5 sec. OFF. Aim at 15 screws or less for the screw tightening per minute. (p. 8)
	Is the tapping screw tightened?	If the load is high during tapping screws and other screw tightening, the electric screwdriver temperature will also tend to become higher. Review the operations time, and lengthen the OFF (stop) time.
	Is the rated voltage input?	Check the power source voltage, and input the rated voltage.
	Does it become so hot that it cannot be touched?	If so much heat is generated as to be too hot to touch, even if the screw fastening load is not heavy, and the rated operation time is maintained, a failure is suspected.
Cannot be extracted from the setting mode	Is the "operations channel switching method" (No.1 CH-CHG) set to "S-AUTO" or "C-AUTO", and the "count function" (No.11 COUNT-FNC) set to all channels "OFF"?	Set any of the channel "count function" (No.11 COUNT-FNC) to "ON". (p. 31)
An error message is displayed on the LCD	Check the error message (p. 47), and re-insert the power.	
The setting conditions are unknown It does not activate as expected	Did you make a note of the settings?	Review each of the settings. (p. 25) To initialize the setting values, execute "setting value initialization" (No.25 SETTING RESET). (p. 24) After the setting, write down the settings on the setting memo. (p. 63)

## Maintenance and inspection

### WARNING

- Before performing maintenance and inspection, always turn off the power.
- Do not disassemble or alter the tool.
- Use genuine parts.

### CAUTION

- **For repair or part replacement, contact the retailer where you purchased the tool.**  
Repair requires special knowledge and skills. If repair is performed at a place other than a specialty store, the tool may not demonstrate its full performance or it could lead to an accident or injury.
- **Request repair with the failed status kept intact.**  
When requesting a repair, do not throw away damaged parts. It could be important information for investigating the failure cause so do not change the status.

Inspection locations	CAUTION
Cable	Failure to perform inspection could result in fire or electric shock. <ul style="list-style-type: none"> <li>● Check if cables are damaged and if found, stop using the tool.</li> <li>● Do not store the cord by wrapping it around the main unit. If it is stored with the cable wrapped around the main unit, immediately change the storage method.</li> </ul>
Power plug	Failure to perform inspection could result in fire or electric shock. <ul style="list-style-type: none"> <li>● Check for damage on the power plug. If damaged, stop using it.</li> <li>● Check if the power plug has dust or metallic material adhering to it. If attached, disconnect the power plug and use a dry cloth to remove it.</li> <li>● Check that the power plug is properly inserted into the outlet all the way to the base.</li> <li>● Check for play in the power plug and outlet.</li> </ul>
Bit	<ul style="list-style-type: none"> <li>● Check for wear or damage on the bit end. Using the tool as is, the screw head could be damaged or torque may not be transmitted. Replace with a new bit.</li> </ul>
Main unit	<ul style="list-style-type: none"> <li>● Check for damage, cracks or breaks on the main unit.</li> <li>● Check the screws on the main unit. If screws are loose, tighten them.</li> </ul>
Output torque	<ul style="list-style-type: none"> <li>● Use a combination of NITTO KOHKI's measuring devices to measure the output torque.</li> <li>● If the output torque value has changed, adjust the setting torque.</li> </ul>
Screw fastening time	<ul style="list-style-type: none"> <li>● Use the screw fastening time measurement function to check if the screw fastening time has not changed.</li> <li>● The speed is a standard. It changes by the temperature of the tool, mechanical loss, and grease conditions.</li> </ul>
Care	<ul style="list-style-type: none"> <li>● If the main unit is stained, use a cloth soaked in soapy water and wrung out well to wipe off the stain. The tool does not have a waterproof structure and if water enters inside, it could fail.</li> <li>● Because the main unit uses plastic, the following chemicals cannot be used. Acetone, benzene, thinner, ketone, ether, trichlorethylene and other similar chemicals</li> </ul>

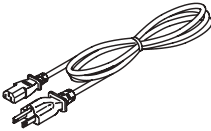
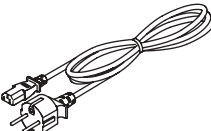
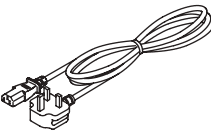

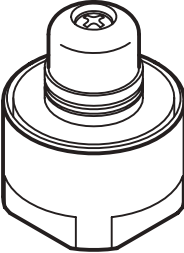
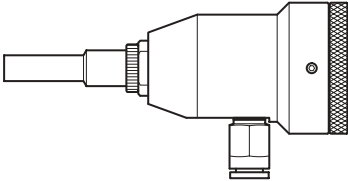
## Disposal

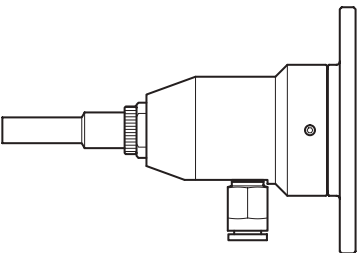
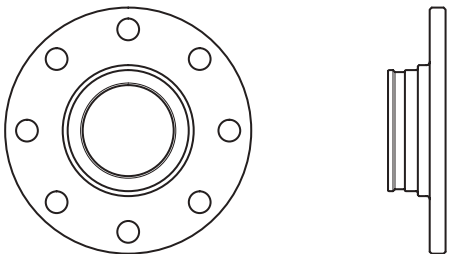
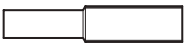
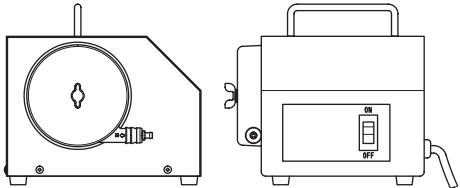
- Separate power tools, accessories, and packing materials for environmentally-friendly recycling.
- Do not dispose of the power tool as household garbage.
- When disposing of electric tools, give them to NITTO KOHKI or your dealer.
- Within the EU region, Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC is rolled out in domestic laws and it is prescribed to separately collect power tools, which are recycled and reused.



## Separately-sold products

The following products are sold separately. To purchase these items, please contact your dealer where you purchased your electric screwdriver.

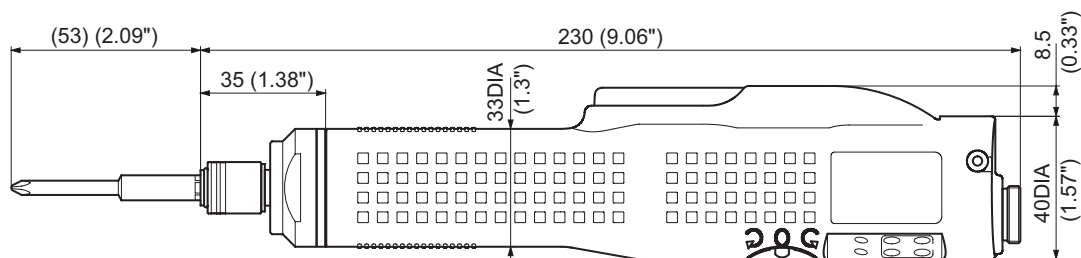
Product name (model)	Appearance	Specification, etc.
Power cord DLW9220		Grounded 3-prong power cord set (North America)
Power cord DLW9240		Grounded 3-prong power cord set (Europe)
Power cord DLW9250		Grounded 3-prong power cord set (UK)
Bit		With various shapes
Screw joint DLW4540		For DLV04C10L-AY SOFT fastening torque measurement ● "Joint washer (white rubber)" incorporation completed (p. 10)
Screw joint DLW4550		For DLV10C10L-AY SOFT fastening torque measurement ● "Joint washer (black rubber)" incorporation completed (p. 10)
Screw joint DLW4560		For HARD fastening torque measurement of both DLV04/10C10L-AY ● "Joint washer (metal)" incorporation completed (p. 10)
Vacuum pickup for hand-held DLP6640		Attachment for adsorption of screw in operator hand-held operation (p. 13) ● With adsorption coupling (DLW9014) ● Attached sleeve: DLS4225 / DLS4227

Product name (model)	Appearance	Specification, etc.
Vacuum pickup for automatic machine DLP6650		Attachment for adsorption of screw in automatic screw fastening machine (p. 13) <ul style="list-style-type: none"> <li>● With flanged coupling (DLW9015)</li> <li>● Attached sleeve: DLS4225 / DLS4227</li> </ul>
Flanged coupling DLW9015		For automatic screw fastening machine mounting
Sleeve DLS4000 series		Sleeve for screw adsorption <ul style="list-style-type: none"> <li>● Mount at the vacuum pickup tip</li> <li>● Selection matching the screw or bit shape</li> </ul>
Screw vacuum pump DLP2570		Connect the tube to the vacuum pickup, and use vacuum pressure to adsorb the screw



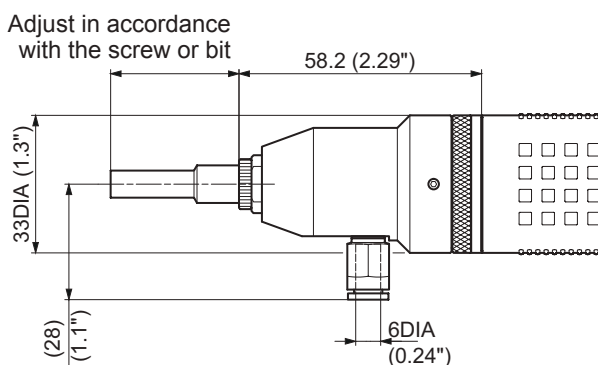
## External dimensions

DLV04C10L - AY / DLV10C10L - AY

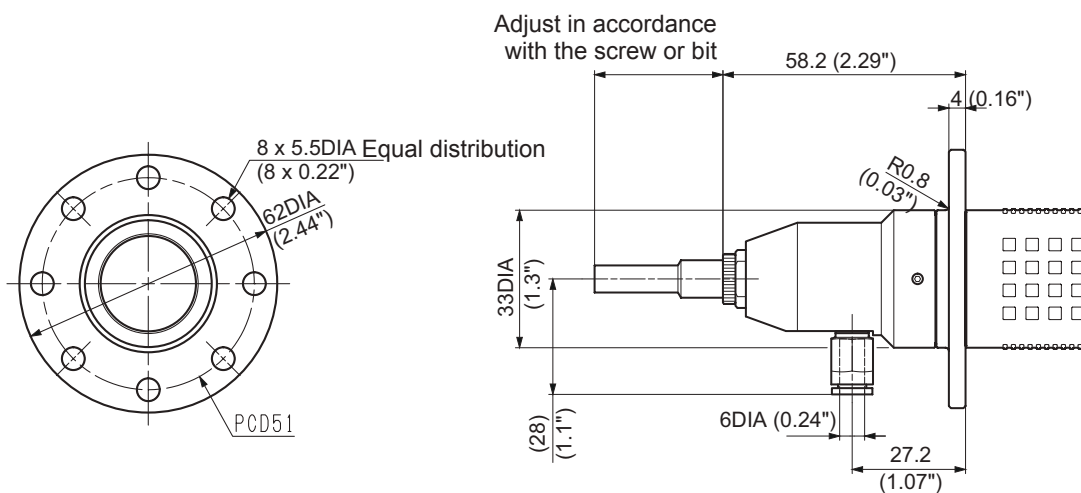


- When a 75mm bit is mounted

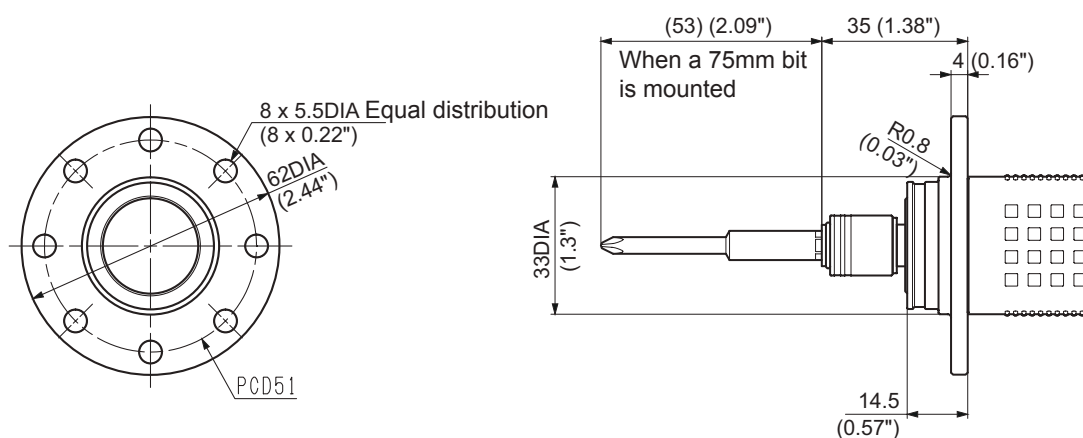
When vacuum pickup for hand-held DLP6640 is mounted



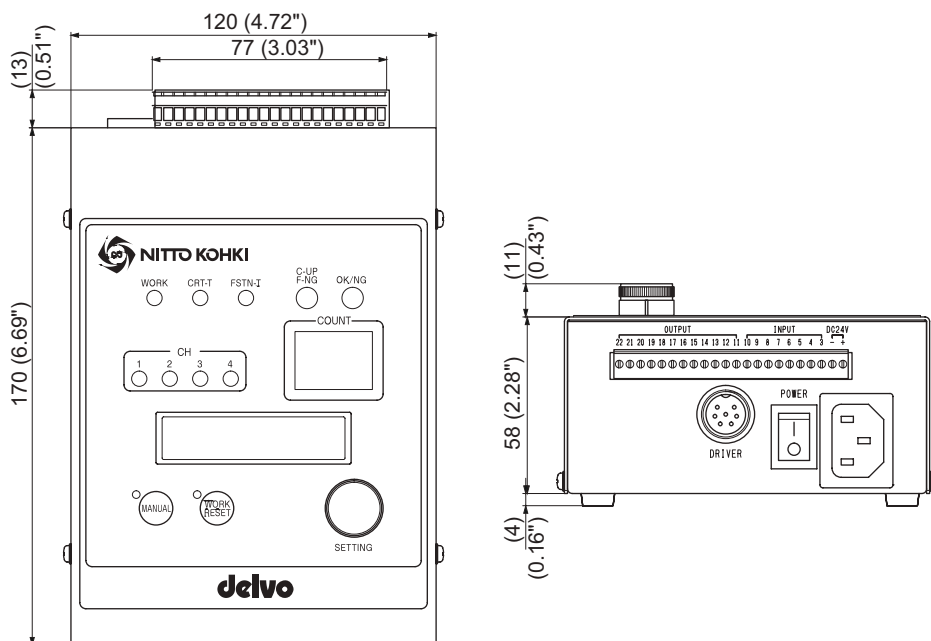
When vacuum pickup for automatic machine DLP6650 is mounted



### When only flanged coupling is mounted



### DCC0101X - AZ



## LCD display list

LCD display	Details	Reference
BACK LIGHT	LCD back light	p. 34
BZ-VOLUME	(Buzzer Volume) Buzzer sound volume	p. 34
C-AUTO	(Continue Auto) Setting to determine as screw fastening operations OK if all operations channels are implemented and completed in sequence	p. 25
C-F	(Count Finish) Setting to output OK signal at time the screw fastening operations are completed	p. 33
CH1 CH2 CH3 CH4	(Channel) The folder in which the settings are saved	—
CH-CHG	(Channel Change) Operations channel switching method	p. 25
CHECK-BZ	(Check Buzzer) Check buzzer sound	p. 34
COUNT	Screw count	p. 31
COUNT UP-BZ	(Count-up Buzzer) Count-up (normal torque-up) buzzer sound	p. 30
COUNT-FNC	(Count Function) Count function	p. 31
COUNT-RTN	(Count Return) Count return (return to screw fastening count number) function	p. 33
CRT-T	(Correct Timer) Screw fastening time judgment function Count up the screw fastening within the upper and lower limit setting values	p. 32
CRT-T-L	(Correct Timer Lower) Screw fastening time lower limit value Screw fastening NG (count not performed) for screw tightening shorter than the setting value	p. 32
CRT-T-U	(Correct Timer Upper) Screw fastening time upper limit value Screw fastening NG (count not performed) for screw tightening longer than the setting value	p. 32
DIS	(Disable) Setting value when CRT-T-U (screw fastening upper limit value) function is set to invalid	p. 32
FSTN-NG-BZ	(Fastening NG Buzzer) Fastening NG buzzer sound	p. 30
FSTN-T	(Fastening Timer) Fastening timer Fastening time setting value at setting speed when at the HARD fastening mode setting	p. 28
FSTN-TYPE	(Fastening Type) Setting of fastening type, "SOFT" and "HARD"	p. 26
HARD	HARD fastening mode	p. 26
INPUT	Setting to call the specified channel (setting) using input signal channel A/B	p. 25
MEAS-T	Fastening time measurement value at constant low speed, for calculating the fastening timer setting reference value "RET-T"	p. 28
NG-BZ	(NG Buzzer) Operations NG buzzer sound	p. 33
OK-BZ	(OK Buzzer) Operations OK buzzer sound	p. 33
OK-OUT-T	(OK Out Timer) Screw fastening confirmation time Possible time for reverse rotation action confirming the screw fastening operation after screw tightening up to the set count number (time until OK is output)	p. 33
OK-TIMING	OK output timing Timing setting for outputting the OK signal	p. 33
RATE	Rate for calculating the fastening timer setting reference value "RET-T"	p. 28
RET-T	Fastening timer setting reference value	p. 28

LCD display	Details	Reference
REFSTN-T	(Refastening Timer) Refastening prohibited timer Prohibit forward rotation start during the setting time after completion of screw tightening, and prevent inadvertent refastening	p. 30
S-AUTO	(Single AUTO) Setting to judge the screw fastening operation OK in each operations channel unit, and automatically move to the next operations channel	p. 25
SETUP-RESET	Setting value initialization	p. 34
SOFT	SOFT fastening mode	p. 26
SOFT-START	Soft start level Function for slowly raising the speed after the rotation start time	p. 28
SPEED	Speed, free speed Setting speed for electric screwdriver forward rotation	p. 28
TORQUE	Torque	p. 28
W-O	(Work Off) Setting to output OK signal at time the workpiece signal is set to OFF	p. 33
WORK-SNSR	(Work Sensor) Workpiece signal, workpiece detection sensor Sets the sensor for detecting workpiece setup, or switch use yes/no	p. 31
WORK-S-T	(Work Set Timer) Workpiece setup time Sets the time for operator to check whether workpiece is incorrectly set up or not	p. 31

## Glossary

Term	Description
<b>A</b>	
Accent ring	Ring for identification of electric screwdriver model
Adsorption coupling (DLW9014)	Coupling mounted when vacuum pickup is mounted during hand-held operation
Antistatic performance	Refers to "ESD protection" Electro-static discharge prevention function in electric screwdriver and controller body
<b>B</b>	
Bit	Fitting part that conveys torque to the screw It is also known as a socket
Bit Breaks function	A function to prevent the bit from inertial rotation when the start switch is released
Bit grounding function	Refers to structure connecting the electric screwdriver tip metal part (bit part) to the ground Via resistor 1MΩ within controller
<b>C</b>	
C-UP	(Count UP) Torque-up is performed normally
Channel	Refers to "CH 1" to "CH 4" The folder in which the settings are saved
Channel A/B input signal	When "operations channel switching method" (No.1 CH-CHG) is at "INPUT" setting, refers to input signal setting the operations channel
Channel return function	Function for returning operations channel by 1 unit Execute "WORK RESET" with 1 sec input
Coupling	The part that secures the frame handle so that it does not open
<b>E</b>	
ESD protection	(Electro-Static Discharge) Electro-static discharge prevention function in electric screwdriver and controller body
External signal	Signal with external device connected to the signal terminal block
External startup control function	Function using input signal for forward rotation or reverse rotation startup of electric screwdriver
<b>F</b>	
F-NG	(Fastening NG) Screw fastening NG (when torque-up is not performed normally)
Fastening timer	Setting item No.7 "FSTN-T" Fastening time setting value at setting speed when at the HARD fastening setting
Flanged coupling (DLW9015)	Attachment for automatic screw fastening machine Vacuum pickup is mountable on tip
Forward rotation signal	Output signal showing that the electric screwdriver is in forward rotation
Forward rotation startup input signal	Input signal starting up forward rotation of the electric screwdriver
Frame handle	The resin part of the main unit Also called a cover or housing
Free speed	Speed in state where load is not applied to the electric screwdriver
Function for detection of motor startup error	Function for warning of error when startup operation was performed and the motor did not start up normally
Function for detection of electric screwdriver connection	Function displaying an error when the electric screwdriver and controller connection slips out
<b>I</b>	
Input signal	Signal for inputting to the controller signal terminal block
Input signal negative common wire	Input signal negative common wire Signal terminal block No.10
<b>J</b>	
Joint washer	Washer incorporated into the screw joint Usage divided by electric screwdriver model and setting <ul style="list-style-type: none"> <li>● DLV10C, in SOFT fastening setting: Black rubber</li> <li>● DLV04C, in SOFT fastening setting: White rubber</li> <li>● DLV04C/DLV10C, in HARD fastening setting: Metal</li> </ul>

Term	Description
<b>K</b>	
Keylock function	Function for locking the controller front surface button operation
<b>L</b>	
LCD	Controller liquid crystal screen
Lever switch	Press when starting
Loosening torque methods	Torque measurement method for measurement of torque value when the tightened screw is loosened with a torque wrench, and the screw is rotated
<b>M</b>	
[MANUAL] button	Pressing and holding in screw fastening mode switches to manual mode
Manual mode	Mode that temporarily switches to desired channel, regardless of the line operation, to enable activation (rotation) of the electric screwdriver
<b>N</b>	
NG	Workpiece setup NG, screw fastening operation NG NG state where workpiece signal is OFF during operations
NG signal	Signal that is output when screw fastening operation is NG
<b>O</b>	
OK	Screw fastening operation OK State when series of screw fastening operations is complete
OK signal	Signal that is output when screw fastening operation is OK
Open collector	One electronic circuit output method With this output method, the collector of an output transistor is not connected inside and signals are output as is to one terminal
Operations channel	Channel during operations (while settings are valid)
Output signal	Signal for outputting from the controller signal terminal block
Output signal positive common wire	Output signal positive common wire (Signal terminal block No.22)
<b>P</b>	
PLC	Programmable logic controller Electronic device performing sequential control according to a program
Photocoupler	Element that internally converts electric signals to light and then returns it to electric signals to transmit signals while performing electrical insulation
PNP output signal	Output signal method for type connecting the load between power supply 0 V and transistor output
<b>R</b>	
Receptacle	Connector for connecting the connection cord
Reverse rotation signal	Output signal showing that the electric screwdriver is in reverse rotation
Reverse rotation startup input signal	Input signal starting up reverse rotation of the electric screwdriver
Refastening prohibited timer	Setting item No.10 "REFSTN-T" Prohibit forward rotation start during the setting time after completion of screw tightening, and prevent inadvertent refastening
Refastening torque methods	Torque measurement method for measurement of torque value when the tightened screw is further tightened with a torque wrench, and the screw is again rotated
<b>S</b>	
Seating speed	Refers to speed for screw tightening (seating) in HARD fastening setting Automatically switches after "fastening timer" (No.7 FSTN-T) elapses
Screw fastening confirmation time	Setting item No.17 "OK-OUT-T" Possible time for reverse rotation action confirming the screw fastening operation after screw tightening up to the set count number (time until OK is output)
Screw fastening mode	Mode for implementation of screw fastening operation
Screw fastening NG	"F-NG" Refers to screw tightening when torque-up not performed normally
Screw fastening time	Setting item No.15 "CRT-T-L", No.16 "CRT-T-U" Refers to "Self-adjustable timer" Count up the screw fastening within the upper and lower limit setting values
Screw fastening time measurement function	Function for measurement of screw fastening time, when screw tightening is performed during the screw fastening time
Screw joint (DLW4540/4550/4560)	Jig for measurement of the DLV04C/DLV10C output torque

Term	Description
Screw tightening completion sound	Setting item No.8 "COUNT UP-BZ" Sound buzz when each screw tightening is completed
Screw stem	Screw head mounted on the screw joint upper part When performing the torque measurement, use the +No.2 bit for the bit tip shape
Self-adjustable timer	Setting item No.7 "CRT-T-L" (Screw fastening time lower limit value), No.8 "CRT-T-U" (Screw fastening time upper limit value) Measure the screw fastening time, and judge count-up of screw fastening within the upper limit and lower limit setting values only
Service power source	24 V DC power supply (current capacity 200mA) Power source for I/O signal drives, or for sensor and other external device drives
[SETTING] dial	Pushbutton built-in dial performing various settings
Setting mode	Mode performing each setting
Signal terminal block	Terminal block for connecting the I/O signal on the controller
Sleeve	Electric screwdriver tip parts Pull out to enable bit mounting and removal
Sleeve (DLS4000 series)	Sleeve for adsorption of screw Select according to the screw size and bit shape
Speed	Setting item No.5 "SPEED" setting Setting speed for forward rotation, free speed
<b>T</b>	
Torque Checker	Torque measuring instrument
Torque-up	Reaches the set torque, and automatically stops
<b>V</b>	
Vacuum pickup (DLP6640/6650)	Attachment for adsorption of screw (sold separately)
<b>W</b>	
WORK	Target item for screw tightening, screw fastening operation
[WORK] LED	Lights when the electric screwdriver becomes operable (rotatable)
Workpiece	Target object for screw tightening
Workpiece detection sensor	Refers to Setting item No.12 "WORK-SNSR" Refers to opto-electronic sensor, infrared sensor, or mechanical switch, etc., for detection of the workpiece setup
Workpiece reset button Workpiece reset input signal	Refers to "WORK RESET" Function for resetting the screw fastening operation, at 1 sec input
Workpiece setup NG	Refers to screw fastening operation NG Workpiece not completed state where workpiece signal is OFF during operations
Workpiece setup time	Refers to Setting item No.14 "WORK-S-T" A period during which whether the workpiece is incorrectly set up is checked During this period, even when the workpiece is removed, NG does not occur (the electric screwdriver does not operate)
Workpiece signal	Signal input when workpiece is set up
[WORK RESET] button WORK RESET input signal	Function for reset of the screw fastening operation, or returning back one operations channel

## Index

### A

Accent ring ..... 5

### B

Back light ..... 34  
Bit ..... 4, 12  
Buzzer sound volume ..... 34

### C

Changeover switch ..... 5, 18  
Channel setting mode ..... 25  
Check buzzer sound ..... 34  
Connection cord ..... 17  
Connection slip ..... 47  
Count function ..... 31  
[COUNT] LED ..... 6  
Count number ..... 31  
Count return function ..... 33  
Count-up buzzer sound ..... 30  
Coupling ..... 5  
[CRT-T] LED ..... 6  
[C-UP / F-NG] LED ..... 5, 6

### E

Error detection ..... 47  
External signal ..... 35

### F

Fastening NG buzzer sound ..... 30  
Fastening timer ..... 28  
Fixing jig ..... 16  
[FSTN-T] LED ..... 5, 6

### I

Initialization ..... 24  
Inlet ..... 7  
I/O circuit ..... 38

### K

Keylock ..... 46

### L

LCD display ..... 7, 57  
LED display ..... 5

### M

Manual mode ..... 21  
[MANUAL] button ..... 6, 21  
Motor startup error ..... 47

### O

[OK / NG] LED ..... 6  
OK output timing ..... 33  
Operation mode ..... 22  
Operations channel switching method ..... 25  
Operations NG buzzer sound ..... 33  
Operations OK buzzer sound ..... 33  
Output torque ..... 11, 21

### P

Power cord ..... 17  
Power switch ..... 7

### R

Receptacle ..... 5, 7  
Refastening prohibited timer ..... 30  
Reset ..... 44

### S

Screw fastening confirmation time ..... 32  
Screw fastening mode ..... 18  
Screw fastening time lower limit value ..... 32  
Screw fastening time upper limit value ..... 32  
Screw fastening type ..... 26  
Screw joint ..... 10  
Screw loosening lock error ..... 47  
Separately-sold products ..... 53  
Setting memo ..... 63  
Setting mode ..... 22  
Setting target channel ..... 26  
[SETTING] dial ..... 6, 22  
Signal terminal block ..... 7, 35  
Sleeve ..... 5, 54  
Soft start level ..... 28  
Speed ..... 28  
Suspension Bail ..... 4, 12

### T

Torque ..... 28  
Torque-up ..... 20

### V

Vacuum pickup ..... 13, 53

### W

[WORK] LED ..... 6  
Workpiece setup time ..... 31, 43  
Workpiece signal ..... 31, 42  
[WORK RESET] button ..... 6



## Setting memo

Copy, and then perform entry of the set values.

Entry date (yyyy/mm/dd):

Affiliation:

In charge:

Process name		1	2	3	4
Targeted torque					
Speed					
Setting item	Setting range	Set value			
1) CH-CHG	S-AUTO / C-AUTO / INPUT				
2) CH		CH1	CH2	CH3	CH4
3) FSTN-TYPE	SOFT / HARD				
4) TORQUE	1 to 100%				
5) SPEED	SOFT: 600 to 1000min <sup>-1</sup> HARD: 100 to 1000min <sup>-1</sup>				
6) SOFT-START	Lv1 to 9				
7) FSTN-T	0.00 to 9.99s				
8) COUNT UP-BZ	OFF / 1 to 10				
9) FSTN-NG-BZ	OFF / 1 to 10				
10) REFSTN-T	0.0 to 9.9s				
11) COUNT-FNC	OFF / ON				
12) WORK-SNSR	OFF / ON				
13) COUNT	1 to 99				
14) WORK-S-T	0.0 to 9.9s				
15) CRT-T-L	0.00 to 9.99s				
16) CRT-T-U	0.01 to 9.99S / DIS				
17) OK-OUT-T	0.0 to 9.9s				
18) OK-TIMING	C-F / W-O				
19) OK-BZ	OFF / 1 to 11				
20) NG-BZ	OFF / 1 to 10				
21) COUNT-RTN	OFF / ON1 / ON2				
22) BZ-VOLUME	OFF to MAX				
23) CHECK-BZ	OFF / ON				
24) BACK LIGHT	OFF / ON				