

Low Voltage (DC)
 Brush motor **Brushless motor**
 Miniature screw **Precision screw** **Machine screw**
2.5 to 6.0 mm

See page 53 for External Dimensions

Delvo Brushless Type



C Series (Current control type)

Model **DLV45C**

NEW



DCC0241X-AZ



DLV45C12L

DLV45C12P

Features

- Current Controlled Torque System suitable for screw fastening work
- Low-voltage brushless motor
- ESD (Electrostatic Discharge) protection structure
- For both hand-held / automatic machines
- Controller has built in counting function. Prevents human errors
- Nine speed settings available
- Automatic three step speed control function
- Two types of measuring methods (Time/Motor rotation signal)
- Seven color indication LED (At the tip of the screwdriver)
- Two external I/O signal connection ports (NPN ⇄ PNP switchable, RS-232C)
- Various settings can be configured via a PC (Free setting software available on Nitto Kohki website)

Thirty different torque settings can be set on a single screwdriver !

Torque and fastening setting of thirty screwdrivers can be consolidated into one.

1st unit	2nd unit	3rd unit	...	30th unit
1.2 Nm 1000 min ⁻¹	1.8 Nm 500 min ⁻¹	3.0 Nm 800 min ⁻¹		3.0 Nm 400 min ⁻¹

Memorizes thirty patterns !



Torque **0.6 to 4.5 Nm** range [5.3 to 39.8 lbf·in]

Lever Start / Push to Start

- Two types of fastening mode available subject to the workpiece and fastening conditions.
- Coordinate the actual workpieces, screws and operating conditions and determine the fastening mode, torque range and rotation speed.

Specifications

Model		Bit	DLV45C12L-AY : K	DLV45C12P-AY : K
Starting Method			Lever Start	Push to Start
Power Source			From dedicated controller	
Torque Adjustment			From 1 to 100% in 1% increments	
Torque		(Nm [lbf·in])	0.6 to 4.5 [5.3 to 39.8]	
Free speed	SOFT fastening setting	(min ⁻¹)	400 to 1200	
		Speed Level	Level 1 to 9	
	HARD fastening setting	(min ⁻¹)	100 to 700	
		Speed Level	Automatically set by torque setting	
Power Consumption		(W)	44	
Screw Size	Machine Screw	(mm)	3.0 to 6.0	
	Tapping Screw	(mm)	2.5 to 5.0	
Bit Type		(mm)		
Mass		(kg [lbs])	0.63 [1.39]	
Rated Operation			ON: 0.5 seconds / OFF: 3.5 seconds	
Bit Grounding			Equipped as standard	
Standard Accessories			Bit NK35 (No.2x7x75): 1 pc. Connection Cord 2 m (DLW9078): 1 pc. Suspension Bail: 1 pc.	

Model	DCC0241X-AZ
Power Source	100 - 240 V AC, 50/60 Hz
Output Voltage	40 V DC
Input Signal Method	Photocoupler input (24 V DC drive (5 mA/1 input), NPN/PNP switchable)
Output Signal Method	Photocoupler output (30 V DC or less, 80 mA/1 output or less, NPN/PNP switchable)
Service Power Source	24 V DC (Maximum capacity 200 mA)
Serial Signal Method	RS-232C
ESD (Electrostatic Discharge) Protection	Adopted (IEC61340-5-1 compliant)
Mass	(kg [lbs]) 1.8 [3.97]
Power Cord 2 m (Optional)*	DLW9220 / DLW9240 / DLW9250

Caution

*Speed and torque differs depending on the temperature. (Use within the range of +10 to +40°C)

*Do not retighten screws that are already tightened. The torque will become larger than the set torque.

About optional accessories (See page 14)

*The power cord for the controller (DCC0241X-AZ) is sold separately. Ask us for the required power cord when ordering.

*For torque measurements, please use Nitto Kohki's Torque Checker and Soft Joint / Hard Joint (sold separately).



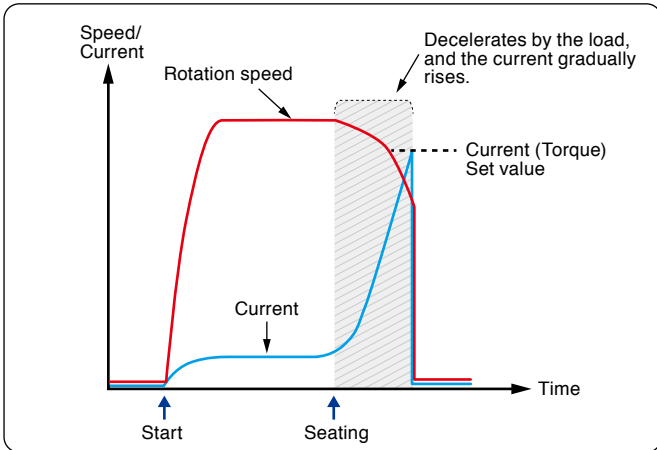
SOFT / HARD fastening Settings

SOFT fastening setting

Suitable for workpieces with high fastening load such as tapping screws or fastening soft objects such as rubber.

Timing chart

The image of the control action, seating the screw at the set rotation speed.

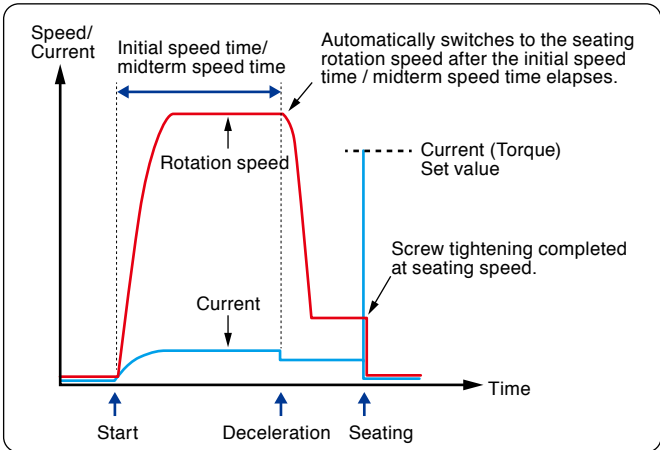


HARD fastening setting

Suitable for workpieces with small fastening load such as threaded holes or rigid bodies such as metal.

Timing chart

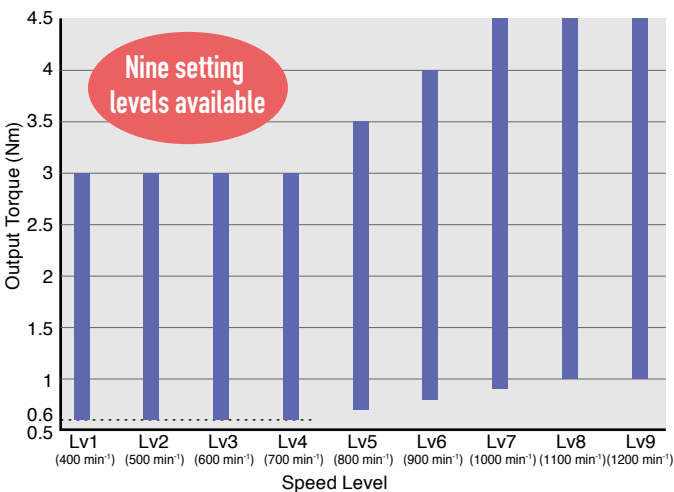
A control that seats the screw at the seating rotation speed according to the torque setting value, when the initial speed time / midterm speed time is elapsed.



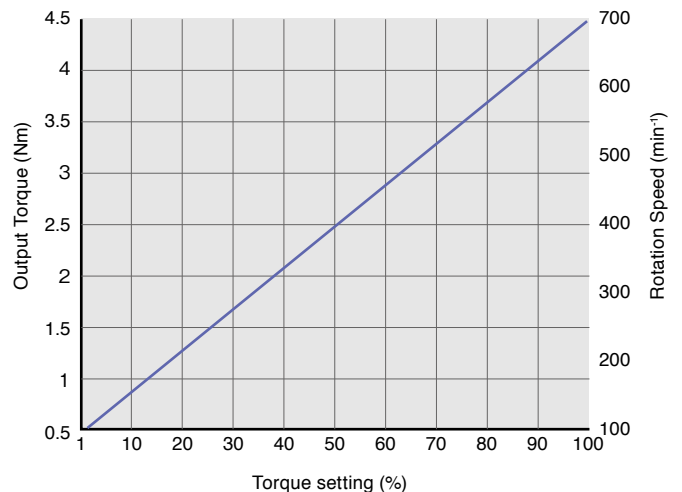
Torque range: Output Torque and Rotation Speed

There are nine levels for rotation speed setting. (400 to 1200 min⁻¹)
Corresponds to high torque fastening, even at SOFT fastening setting or slow rotation speed.
(Corresponds to a maximum of 3 Nm at 400 min⁻¹)

Torque Range of SOFT fastening setting



Torque Range of HARD fastening setting



*When measuring the torque with Torque Checker, use Soft Joint (DLW4050) for SOFT fastening setting, use Hard Joint (DLW4040) for HARD fastening setting. (See page 14)

Two safety functions

1. Caution mode

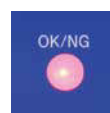
A torque value that alerts the operator can be set. After the channel is switched, if the torque exceeds the preset value, a warning is displayed on the counter and the electric screwdriver will not start.



Flashes in yellow

2. Refastening prohibited time setting

To prevent additional fastening (second tightening, confirmation tightening, etc.), it can be set so that it does not restart after torque-up (for 0.0 to 9.9 seconds). Adjust the set value according to the skill level of the operator and the interval between screw fastening operations.



Controller



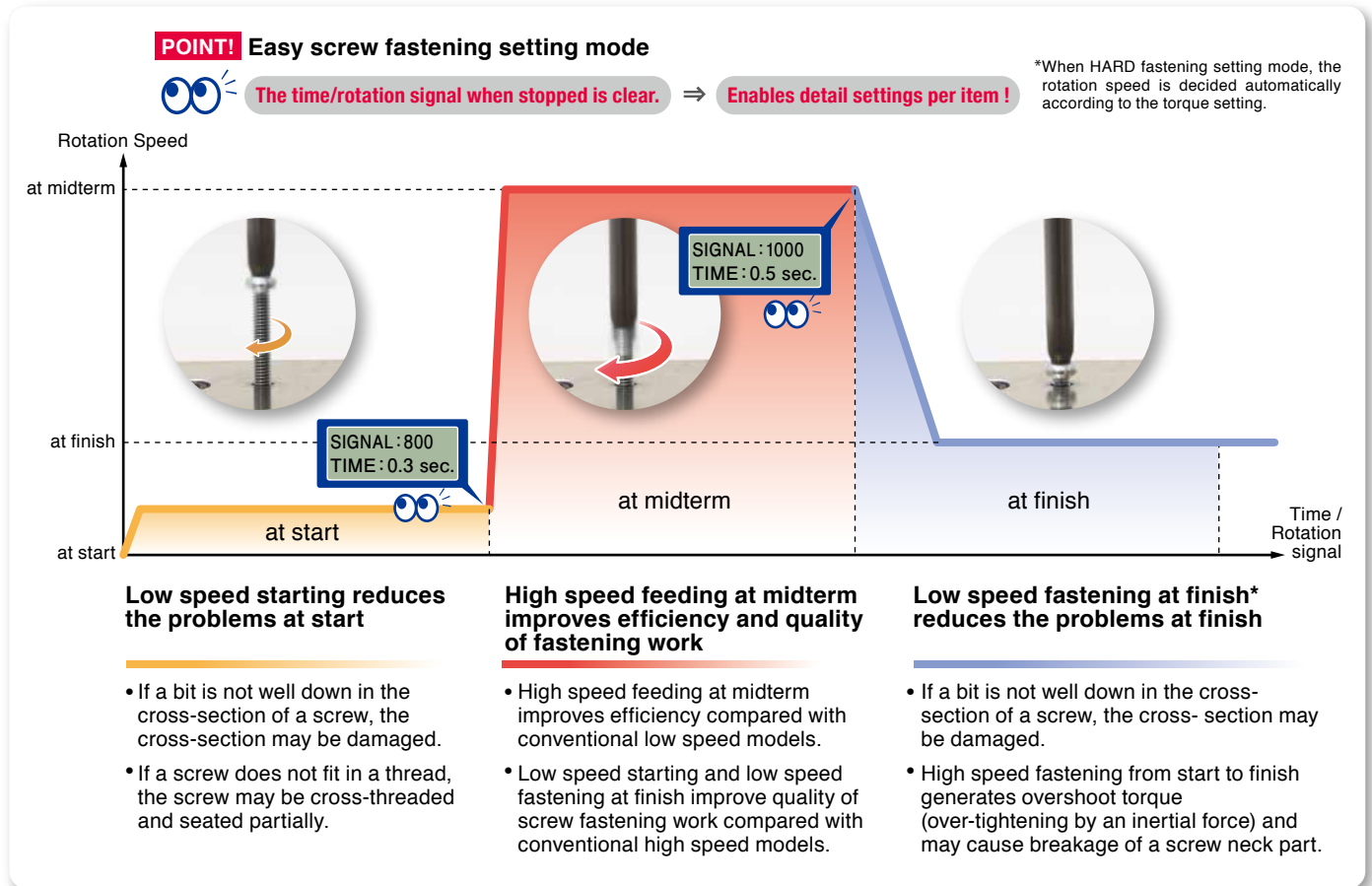
Flashes in red

Rotation speed: Built-in automatic speed control function

Built-in automatic three step variable speed control function. Enables compatibility of "quality of slow speed" and "efficiency of high speed".

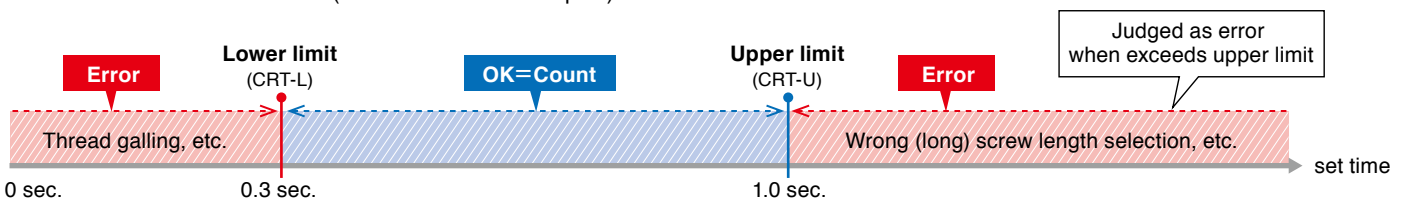


◇ **Timing chart** (Below rotation speeds and times are examples)



Screw fastening time measuring (Upper / Lower limit)

The upper / lower limit of screw fastening time (correct timer) can be set. It will be judged as "correct fastening" only when the measured time is between the upper limit and lower limit. Either limit can be switched off. (Below times are examples)



Two types of measuring methods

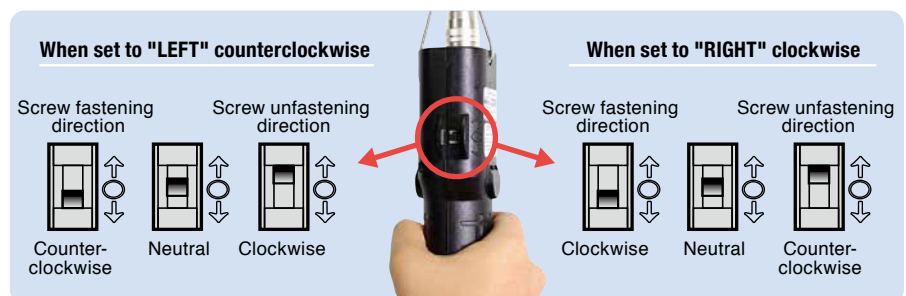
There are two methods to measure the setting time of start and midterm.

TIME
Measure by time. You can decide the setting value intuitively.

MOTOR SIGNAL
Measure by the motor rotation signal. Even if you change the rotation speed, you do not need to set the measurement time or rotation time.

Rotation direction setting

Specify the rotation direction of forward rotation. "RIGHT" for clockwise, "LEFT" for counterclockwise.





Channel setting

The unit of fastening work performed continuously under the same conditions is called a "channel". Up to thirty channels can be registered in the memory.

Register up to 30 channels //



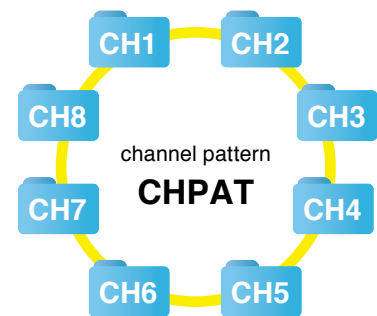
◇ Example of motion setting

Channel	CH1	CH2	CH3	CH4	.....	CH30
1: Screw fastening mode	SOFT	SOFT	HARD	SOFT	.....	HARD
2: Number of screw fastening	2 pcs.	13 pcs.	5 pcs.	3 pcs.	.....	20 pcs.
3: Speed level at finish	Lv5	Lv9	AUTO	Lv1	.....	AUTO
4: Torque	10%	80%	30%	45%	.....	20%
5: Speed level at start	Lv1	OFF	Lv9	Lv3	.....	Lv1
6: Rotation time at start	0.1 sec.	—	0.3 sec.	0.8 sec.	.....	1.0 sec.
7: Speed level at midterm	Lv9	OFF	OFF	Lv8	.....	Lv7
8: Rotation time at midterm	0.5 sec.	—	—	1.2 sec.	.....	0.5 sec.
9: Speed level at reverse rotation	Lv9	Lv9	Lv7	Lv5	.....	Lv5
⋮	⋮	⋮	⋮	⋮	⋮
26: Rotation direction	RIGHT	RIGHT	RIGHT	LEFT	.....	RIGHT

Channel pattern setting

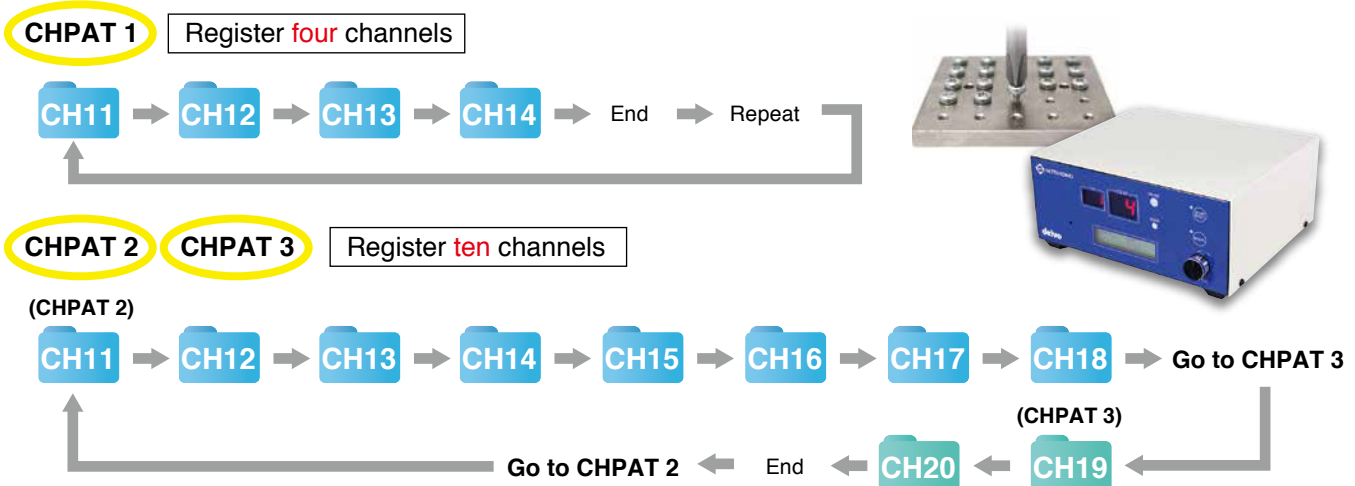
A series of operations combining each channel is called a "channel pattern". Up to eight channels can be registered per channel pattern. Up to thirty channel patterns can be set. When combining nine or more channels, use multiple channel patterns.

Combination up to eight channels //



- CHPAT 1 CH3 CH25 CH11 CH10 CH8 CH22 CH15 CH18 **8 channels**
- ⋮
- CHPAT 30 CH5 CH30 CH20 CH13 **4 channels**

◇ Example of channel pattern



Easy setting with dedicated software

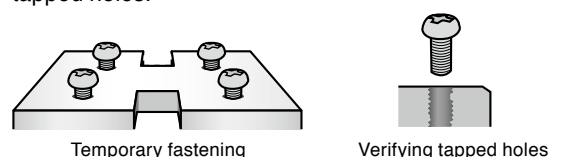
Channels and Channel patterns can be easily set with dedicated software. Download free from our website.



www.nitto-kohki.co.jp/e/prd/delvo/software/

Auto reverse function

The screwdriver automatically reverses after torque-up or reaching the preset time. Auto reverse mode can be used for temporarily fastening screws or verifying tapped holes.

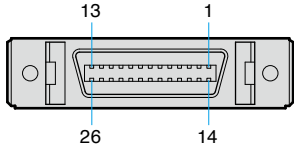


External I/O signal

When connecting to an external device, it can be connected in two ways.

1. External I/O Cable

Use External I/O Cable DLW9091. Compatible with both NPN/PNP. It can be wired according to the externally connected equipment.

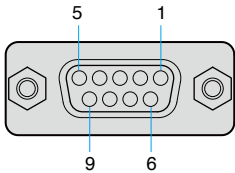


Connector: IEEE1284 half pitch connector (26-pin)

Terminal No.	Function	Details	I/O	
1	+24 V DC	Built-in service power supply (Capacity: Maximum 200 mA)	Service Power Supply	
2	0 V DC			
3	Input signal common terminal	Input signal common terminal (See page 49 of instruction manual)	Input	
4	Output signal common terminal	Output signal common terminal (See page 50 of instruction manual)		
5	Switching signal A	Specify channel or channel pattern using a 5-bit input signal.		
6	Switching signal B			
7	Switching signal C			
8	Switching signal D			
9	Switching signal E			
10	Forward rotation start	Startup with external input signal.		
11	Reverse rotation start	The electric screwdriver operates while the input signal is ON.		
12	Workpiece	Input workpiece signal (workpiece detection signal output). Workpiece signal is ON while input signal is ON.		
13	External reset	Input external reset signal		
14	N/A	No connection	-	
15	Channel A	The channel being operated or being set is ON		
16	Channel B			
17	Channel C			
18	Channel D			
19	Channel E			
20	Forward rotation signal	Output signal is ON during forward rotation		Output
21	Reverse rotation signal	Output signal is ON during reverse rotation		
22	Operation OK	Output signal is ON when the screw fastening of the set count is complete and judged as operation OK (PASS).		
23	Count up	Output signal ON for 0.3 seconds when screw fastening is normal (at torque-up).		
24	Operation NG	Output signal ON when workpiece signal is OFF during operation and judged as operation NG (FAIL).		
25	Screw fastening NG	Output signal ON for 0.3 seconds when screw fastening is NG (FAIL).		
26	N/A	No connection		

2. RS-232C

Use Communication Cable (Straight-through) DLW9092 to connect with PCs or sequencers (PLC).



Connector pin layout (D-SUB 9-pin (female))

Specifications (RS-232C)

Transmission method	Asynchronous (asynchronous communication)
Communication line	Full duplex
Transmission speed	38400 bps
Number of data	8
Parity	None
Stop bit	1
Handshake	None
Delimiter (communication separator)	Receive: CR+LF (\r\n) Send: CR+LF (\r\n)

Pin No.	Signal name	I/O
2	TxD	OUT (This tool→PC)
3	RxD	IN (PC→This tool)
5	GND	GND

*Other pins are not used

Send / receive commands

Operation	Send command	Response from controller
Forward rotation drive	FWD\r\n	FWD\r\n
Reverse rotation drive	RVS\r\n	RVS\r\n
Drive stop	STP\r\n	STP\r\n
Switching channel / channel pattern *1	MOV:p\r\n (p=1 to 30)	At channel switching CH :p\r\n At channel pattern switching CHP:p\r\n
Screw count reset	CRT\r\n	CRT\r\n
Workpiece reset	WRT\r\n	WRT\r\n
Workpiece signal ON	WIN\r\n	WIN\r\n
Workpiece signal OFF	WOT\r\n	WOT\r\n
Resend request *2	RSD:p\r\n (p=1 to 10)	Command sent nth time before, specified by the parameter value

*1 The switching target differs depending on the setting of the common setting "Channel change type" (CH CHANGE).

When the channel pattern is switched, the channel is also switched, so the responses are sent continuously.

*2 Up to the latest ten commands sent from the controller to the PC or sequencer are stored.

When signals could not be received correctly due to noise or some other reason, the command of nth time before, specified by the parameter will be sent from the PC or sequencer.

[Example] Send command "RSD:3\r\n" → Returns the command sent by the controller three times before.

Since control is performed even when communication between the controller and PC or sequencer fails, use this function when you wish to maintain the reliability of transmission and reception. This command transmission is not included in the ten commands that are stored.










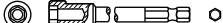

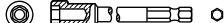









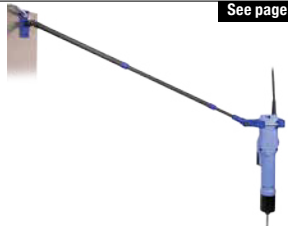
Notification command

Operation	Notification from controller
At forward rotation drive start	FWD\r\n
At reverse rotation drive start	RVS\r\n
At drive stop completion	STP\r\n
Operation OK (PASS) notification	OK\r\n
Workpiece signal ON	WIN\r\n
Workpiece signal OFF	WOT\r\n
Count up (screw fastening completes normally) notification p = Measured fastening time or signal is output	CUP:p\r\n (p=1 to 60000)
Operation NG (workpiece out while fastening count remaining) notification	WNG\r\n
Screw fastening NG (FAIL) notification p1=Screw fastening NG (FAIL) No. p2=Measured fastening time or signal is output	FNG:p1:p2\r\n
At channel switching	CH :p\r\n (p=1 to 30)
At channel pattern switching	CHP:p\r\n (p=1 to 30)
When a non-supported command or parameter is input	CER\r\n

In addition to RS-232C signals, commands are sent from the controller to the PC or sequencer (PLC) when processing is performed manually or by contact signals.



Optional Accessories

<p>Grounded 3-Prong Power Cord 2 m</p>	<p>Diamond Shape Flange Coupling DLW9017</p>	<p>Flange Coupling DLW9019</p>	<p>Screw Vacuum Pump DLP2530 (100 V AC) DLP2570 (230 V AC)</p>
<p>DLW9220 North America DLW9240 Europe DLW9250 UK</p> 	<p>See page 54</p>  <p>For mounting on automated screw fastening machines</p>	<p>See page 54</p>  <p>For mounting on automated screw fastening machines</p>	<p>See page 51</p>  <p>Connect the tube to the vacuum pickup port. The vacuum will pick up the screw.</p>
<p>Vacuum Sleeve DLS4000 series</p>	<p>Vacuum Pickup DLP7401-K</p>	<p>Torque Checker DLT1673A</p>	<p>Pistol Grip DLW2300ESD</p>
<p>See page 49</p>  <p>Select according to the screw shape</p>	<p>See page 49</p>  <p>For screw vacuum pickup *DLS4220/DLS4221 included</p>	<p>See page 46</p>  <p>For torque control of screwdrivers</p>	<p>See page 51</p>  <p>ESD Protection</p> <p>For operator fatigue reduction, suitable for horizontal fastening</p>
<p>Soft Joint DLW4050</p>	<p>Hard Joint DLW4040</p>	<p>Extension Cord 3 m DLW9310</p>	<p>Connection Cord 2 m DLW9078</p>
<p>See page 46</p>  <p>Bit is included</p> 	<p>See page 46</p>  <p>Bit is optional</p> 		<p>Standard accessory of screwdrivers</p> 
<p>The bit for measuring is included. (NK35BN 13x19x10x75)</p> <p>For SOFT fastening torque measurement</p>	<p>The bit for measuring is not included. (NK35BN 13x19x10x75)</p> <p>For HARD fastening torque measurement</p>	<p>Extends cord length between controller and screwdriver</p>	<p>Connects controller and screwdriver</p>
<p>External I/O Cable 3 m DLW9091</p>	<p>Communication Cable 3 m (Straight-through) DLW9092</p>	<p>Communication Cable 3 m (Crossover) DLW9093</p>	<p>Screw Fastening Monitor DTM45</p>
 <p>Connect when using external signals</p>	 <p>Connect to PCs and PLCs (sequencers) when using external signals</p>	 <p>Connect controllers to transmit settings</p>	<p>See page 50</p>  <p>For traceability management! Outputs torque value from a screwdriver (converted value)</p>
<p>Torque Reaction Arm DRA-SW-650 (Swing type)</p>	<p>Torque Reaction Arm DRA-SL-650 (Slide type)</p>	<p>Torque Reaction Arm DRA-TS-1000 (Telescope type)</p>	
<p>See page 50</p>  <p>For reducing reaction force to an operator Vertical tightening to the workpiece improves quality of the work</p>	<p>See page 50</p> 	<p>See page 50</p>  <p>For reducing reaction force to an operator</p>	