



ICESL6 Screwdrivers with Internal Counter Operation Manual

CAUTION - Please read, understand, and follow all operating and safety instructions in this manual before using the ICESL6 Series Screwdrivers and Controllers.

Applies to the following Screwdriver Models:

ICESL623, ICESL623P, ICESL623F, ICESL623PF, ICESL624, ICESL624P (-ESD)
ICESL628, ICESL628P, ICESL628F, ICESL628PF, ICESL629, ICESL629P (-ESD)

Applies to the following Controller Models:

BECT620N, BECT820N, BECT640NHL

Do not attempt to use these screwdrivers with power supplies/controllers other than as specified in this manual.

If you have any questions or concerns, please contact us at:

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Important - Installation and Safety

Warning - Failure to understand and follow proper installation guidelines, safety requirements, and operating instructions may result in malfunction, component damage, property damage, shock hazard, fire hazard, injury or death.

1. Please read and understand the operation manual and follow all safety and operation instructions.
2. Use these products in a suitable dry, indoor location. Do not use the tools and controllers in damp, wet or high temperature environments. Do not use in the presence of flammable liquids or gases.
3. Ensure that the controller has proper ventilation. Do not expose the tools and controllers to areas subject to airborne contaminants (eg. dust, metal filings).
4. Use only a properly grounded electrical outlet of the correct supply voltage to power the screwdriver controller.
5. Ensure that the supply outlet is overload protected and of sufficient amperage capacity.
6. Use only the correct plug for the controller and outlet. Hold the plug of the power cord when connecting or disconnecting. Do not pull on the cable.
7. Do not expose the cable, tool or controller to oil, chemicals, or heat. Ensure that the cable is routed and used in such a manner as to not be subject to sharp objects that may abrade or cut the cable.
8. Locate the controller in a suitable, safe location on a steady surface. Do not place in a high location where there may be a risk of it falling. Secure the controller in position to prevent possible movement caused by pulling on the power or tool cables.
9. Do not cover the controller or stack any objects on top of or near the controller. Ensure that adequate clearance and ventilation is provided around the perimeter of the controller.
10. The 'BECT6' series controllers are for use exclusively with Delta Regis brand screwdrivers as specified on the following pages. Use of the controller (or screwdriver) with any other screwdriver (or controller) may result in malfunction, damage, or injury.
11. In the event that the controller is overloaded beyond the maximum current rating, an internal fuse will disrupt power. Should the controller stop functioning, or exhibit abnormal or intermittent operation, please discontinue use immediately and send the controller to an authorized service centre for troubleshooting and repair.
12. Excessive duty cycle will cause the tool and/or controller to overheat. If this occurs, discontinue use until cooled down and reduce cycle rate. As a general rule, do not exceed 10-15 screws/minute.
13. The brushless screwdrivers incorporate a protection circuit which stops the electric screwdriver if the tool is switched from forward to reverse while running. Should this happen, the operator must release the tool trigger and restart the fastening cycle.
14. Turn the main power switch off when the controller is not being used. Unplug the controller if it is not being used on a regular basis.
15. Do not attempt to disassemble or repair the screwdriver or controller. Repairs should only be performed by qualified technicians properly trained in the safe operation, troubleshooting, and repair of these devices. Please consult Delta Regis for the location of the nearest service depot.
16. Use only the factory specified Delta Regis brand replacement parts and accessories with these tools and controllers.
17. Any damage to the tool and/or controller resulting from misuse, abuse, or failure to follow these guidelines will void the limited product warranty.

Grounding - This controller (and AC power cord) is equipped with a 3-prong electrical receptacle/plug with ground pin. The controller must be connected to a properly grounded AC electrical outlet. Do not attempt to use this controller without a properly functioning ground connection. Never connect a live circuit to the ground pin or internal yellow-green ground wire.

Model Numbers and Specifications

ICESL6 Drivers with Internal Counter								
Model Number	Start Type	Range In.Lbs	Range Nm	Speed (RPM) Hi / Lo	Length in / mm	Grip Dia. in / mm	Weight lbs / g	Use with Power Supply model
32VDC Brushless Screwdrivers with Internal Counter								
ICESL623-ESD	Lever	1.3 - 10.5	0.15 - 1.18	1000 / 700	10.6 / 270	1.5 / 37	1.3 / 580	BECT620N or BECT820N (‘F’ fast tools)
ICESL623P-ESD	Push	1.7 - 10.5	0.20 - 1.18	1000 / 700				
ICESL623F-ESD	Lever	1.3 - 10.5	0.15 - 1.18	2000				
ICESL623PF-ESD	Push	1.7 - 10.5	0.20 - 1.18	2000				
ICESL624-ESD	Lever	2.6 - 16.5	0.29 - 1.86	1000 / 700				
ICESL624P-ESD	Push	2.6 - 16.5	0.29 - 1.86	1000 / 700				
40VDC Brushless Screwdrivers with Internal Counter								
ICESL628-ESD	Lever	8.7 - 26.0	0.98 - 2.94	1000 / 750	11.6 / 294	1.6 / 40	1.8 / 820	BECT640NHL
ICESL628P-ESD	Push	8.7 - 26.0	0.98 - 2.94	1000 / 750				
ICESL628F-ESD	Lever	8.7 - 26.0	0.98 - 2.94	2000				
ICESL628PF-ESD	Push	8.7 - 26.0	0.98 - 2.94	2000				
ICESL629-ESD	Lever	17.4 - 43.4	1.96 - 4.90	1000 / 750				
ICESL629P-ESD	Push	17.4 - 43.4	1.96 - 4.90	1000 / 750				

The BECT620N and BECT820N Controllers are specifically for use with Delta Regis 32VDC Brushless Screwdrivers, including models ICESL623-624(P/F/PF). The BECT820N is recommended for use with fast tool models ICESL623F/PF. One controller (ordered separately) is required per screwdriver. Select the appropriate controller for your screwdriver model. CE/RoHS/ETL Approved.

Controllers for 32VDC Brushless Drivers							
Model Number ⁽¹⁾	Outlets	Speeds	Tool Connector	Output	Input	Dimensions L x W x H (mm)	Weight (kg)
BECT620N	1	Hi/Lo	6 pin	32/24V DC	100-240V AC	145 x 60 x 35	0.25
BECT820N	1	Hi/Lo	6 pin	32/24V DC	100-240V AC	195 x 76 x 56	0.45

⁽¹⁾Part number with North American cordset. For EU cord, add suffix ‘E’, UK cord add suffix ‘UK’.



Controller model BECT640NHL provides the power required to run all models of high torque 40VDC Brushless Series Screwdriver. This includes tool models ICESL628(F/P/PF)-629(P).

CE/RoHS/ETL Approved.



Controller for 40VDC Brushless Drivers								
Model Number	Outlets	Speeds	Tool Connector	Output	Input	Dimensions L x W x H (mm)	Weight (kg)	Use only with Screwdriver Models
BECT640NHL	1	Hi/Lo	6 pin	40/30VDC, 220W	100-240VAC, 6.3A	210 x 118 x 85	1.8	All 40V DC Brushless

Power supply shipped with standard North American cordset. For EU cord, add suffix ‘E’; for UK cord, add suffix ‘UK’.



Proper Grip

To prevent damage to your investment, it is essential that all users have a proper and secure grip on the screwdriver at all times. As shown, the user has a firm grip on the screwdriver with the FWD/REV switch easily reached with the thumb and the start lever with the index finger.

Note: A firm grip is required to prevent the tool from spinning and possibly damaging the unit.

Inserting / Removing Bits

Push the bit retainer sleeve inwards and hold - this releases the balls that hold the bit in place. The bit can now be inserted or removed. After inserting a bit, release the bit retainer sleeve and pull back and forth on the bit to ensure that it is properly locked into place.



Getting Started

Connect the 6-pin cable of the ICESL6 Series Screwdriver into a compatible Delta Regis controller. Please see the screwdriver model chart on the preceding page for proper power supply/controller selection. Ensure that the cable is installed in the proper orientation (spring guard at tool end) and that the connectors are seated properly with the fastening rings secured.

Plug the controller into a properly grounded AC outlet. Set the HI/LO speed switch of the controller in the desired position, based on the RPM requirements of the fastening application. Please note that the position of the controller's HI/LO switch will affect screw rundown times and must be set before the screwdriver's time parameters are programmed.

Turn ON the main power switch on the back of the controller. The audible alarm will beep and the display panel will cycle through a start-up sequence, ending with the current batch count value (SC) showing in the display. If the screwdriver has been previously programmed to run a loop of multiple sequences, 'U1' will show in the display. The screwdriver is ready to run the current sequence.

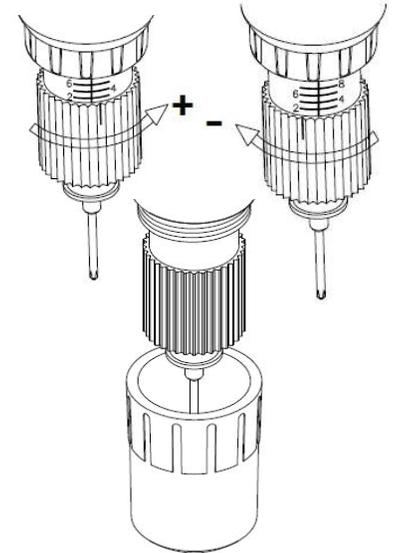
Operating the Screwdriver

Grip the screwdriver firmly and engage the screwdriver bit into the head of the fastener. Keeping the bit in-line with the fastener, apply an appropriate amount of downward force and start the screwdriver (lever or push). Hold the trigger until the fastener seats and the clutch automatically shuts off the driver. Release the trigger. To back out a fastener, switch the FWD/REV switch to the REV position, then trigger the screwdriver until the fastener is backed out. Please note that the clutch will operate in the reverse direction (approx. 30% higher torque than FWD).

Adjusting Torque

1. We recommend the use of an appropriate torque tester and static joint testing after installation (eg - using a torque wrench) to verify proper torque settings at the installed fastener.
2. Increase or decrease the torque by rotating the Torque Adjustment Nut.
3. Rotating the torque adjusting nut clockwise (towards a higher number on torque scale) increases torque output.
4. Rotating the adjusting nut counterclockwise decreases torque output.
5. Verify the new setting. *A number of factors will affect torque output from one application to another. Final torque adjustment should be made on the application through a of series of gradual increases. Always start below the desired torque and work upward.*
6. Remove the housing nut from the electric screwdriver after setting the desired torque and attach the torque locking sleeve. This will help avoid accidental torque adjustment.

Note: The numbers on the torque scale are for reference only and do not indicate actual torque value.



During the break-in period of the screwdriver, output torque may decay somewhat as the mechanical components wear in. It is advisable that the user tests output torque periodically and makes adjustments as necessary to ensure that the tool is meeting the user's requirements.

Keypad and Programming Basics

'P' BUTTON

Pressing and holding the 'P' button for 5+ seconds will cause the display to go blank and the green LED to light up. In this mode the screwdriver will function at HI/LO speed, but there will be no other functionality (counting, etc). Press and hold 'P' from this mode to restore the display and added functionality.

Other uses of 'P' are explained where required throughout this manual.

'S' BUTTON

The 'S' button is used primarily for entering the program editing mode and cycling through the available program settings. Other uses of the 'S' button are explained where required throughout this manual.



UP / DOWN ARROW KEYS

The UP and DOWN arrow keys are primarily used to make adjustments to numeric values when in the program edit mode.

Pressing both keys simultaneously cycles through the available sound options.

'R' (RESET) BUTTON

Pressing the 'R' button resets all programmed values to the initial factory settings.

SOFTWARE KEYPAD LOCK

Pressing S + UP ARROW together will toggle the software keypad lock on/off. This lock limits functionality of the keypad (eg - no entering program edit mode).

'LC' will momentarily display, indicating locked.

'Un' will display indicating unlocked.

SEQUENCE NUMBER (SL)

There are 5 programmable screw fastening sequences (SL='U1' to 'U5') available. In many cases, only the first sequence (U1) will be needed. If the screwdriver is used to install a batch of fasteners with varying requirements, multiple sequences may be necessary. For example, if an assembly requires the installation of 5 screws, where 3 screws are short and 2 screws are long, the controller can be programmed with 2 unique sequences - a sequence for the short screws and one for the long screws. This would allow different time windows to be set-up for the two different screw lengths. Each sequence must be programmed separately, and numbered in the order that the screws will be installed (starting with Sequence U1). In this example, if the 3 short screws are to be installed first, enter the program for Sequence 'U1' with a batch quantity of 3 and time parameters for the short screw. Repeat the program steps for Sequence 'U2' with a batch quantity of 2 and the time parameters for the long screw. Set Sequence 'U3' to a batch quantity of '00' to signify that there are no further fasteners to install. Finally, enter the program edit mode one last time and select Sequence Number 'UU'. When SL is set at 'UU', the program will loop sequentially through the available sequences starting with 'U1' until it encounters a sequence with a batch count setting = 0, signifying the end of the assembly - at this point, the program returns to 'U1' to start the next assembly cycle.

BATCH COUNT SETTING (SC)

Enter the desired number of fasteners to be installed per batch. The display will show the SC value at the beginning of the assembly process and count down by one as each successful fastener is installed. The count will only decrement (and indicate a 'GOOD' rundown) if the rundown cycle falls within the limits set by the min and max rundown time settings (see below). When all fasteners in the batch have been installed, the controller will indicate that the batch is complete and the count will reset to the SC value for the next cycle.

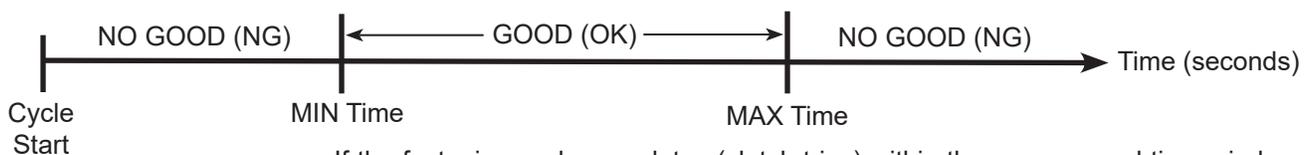
If, after a good rundown, the operator runs the screwdriver in reverse, the batch count value will increment. The count will increment either by 1 only, or by the number of reverse cycles run, depending on the setting of parameter Rn. The batch count can be reset to begin a new batch by pressing the S button.

END OF BATCH RESET TIME (Rt)

When a rundown batch is completed, the controller provides a visual indication (OK light) and audible indication (depending on audible settings) that the batch is complete, followed by a reset of the display count for the beginning of the next batch. The END OF BATCH RESET TIME value determines how long these indicators will stay on before the batch count resets. Please note that the screwdriver cannot be operated during this reset time period.

MAXIMUM AND MINIMUM RUNDOWN TIME SETTINGS (Ht, Lt)

The controller determines whether a fastener rundown is deemed GOOD (OK) or NO GOOD (NG) by comparing the actual time taken for the rundown cycle to a time window programmed by the user. For example, a cross threaded screw will cause the screwdriver to shut-off too early (before min time) and a stripped screw will cause the driver to run too long (beyond max time).



If the fastening cycle completes (clutch trips) within the programmed time window, the rundown cycle will be accepted as GOOD (OK) and the batch count will decrement.

RECONFIRM TIME (LL)

If the assembly process requires that the operator has the ability to 'double-hit' the fastener (release and retrigger the screwdriver on a fastener that has just been installed), a reconfirm time LL can be programmed. During this time period (which immediately follows the completion of the rundown), the operator is able to re-trigger the tool without causing a No Good (NG) error signal to be generated.

EDIT PROGRAM

Press and hold **S** button for 3 seconds until 'SL' displays. Release to view programmed value.

SL = Sequence List Number

S →  →  ▲ Adjust value UP / DOWN (U1 - U5, UU)
▼
 5 available sequences, UU = looping function

SC = Screw Batch Count

Press until 'SC' displays. Release to view value.

S →  →  ▲ Adjust value UP / DOWN (00-99 screws)
▼
 # of screws per batch

Rt = End of Batch Reset Time

Press until 'Rt' displays. Release to view value.

S →  →  ▲ Adjust value UP / DOWN (0.1-9.9 sec.)
▼
 Delay after batch OK - tool inactive

Ht = High Time Setting (max. rundown time)

Press until 'Ht' displays. Release to view value.

S →  →  ▲ Adjust value UP / DOWN (0.1-9.9 sec.)
▼
 Cycle NG if rundown time > Ht

Lt = Low Time Setting (min. rundown time)

Press until 'Lt' displays. Release to view value.

S →  →  →  →  ▲ Adjust value UP / DOWN (0.00-9.90 sec.)
▼
 3 digit value, format 'x.xx', P to toggle left/right, value shown = 1.25

LL = Re-Hit Screw Time (re-tighten screw after OK rundown)

Press until 'LL' displays. Release to view value.

S →  →  →  →  ▲ Adjust value UP / DOWN (0.00-9.90 sec.)
▼
 3 digit value, format 'x.xx', P to toggle left/right, value shown = 0.50

ns = Disable Screwdriver when Error (NG) occurs

Press until 'ns' displays. Release to view value.

S →  →  ▲ Select from:
n = no (off, driver stays enabled)
y = yes (on, disable FWD upon error)
▼
 Forward rotation only, if ns = y, operator must press 'S' to continue use after an error

Rn = Effect of Running Driver in Reverse on Count Value

Press until 'Rn' displays. Release to view value.

S →  →  ▲ Select from:
n = count back once only
y = count for each reverse cycle
▼
 Count change if tool is run multiple times in reverse (excludes after NG)

rt = Auto Reverse Time (after clutch shut-off, LL must be set to 0.00)

Press until 'rt' displays. Release to view value.

S →  →  →  →  ▲ Adjust value UP / DOWN (0.00-9.90 sec.)
▼
 3 digit value, format 'x.xx', P to toggle left/right, value shown = 0.25

NOTES / GUIDELINES:

Programming Mode Locks

To view / edit the sequences, the software lock (toggled by pressing S+UP simultaneously) must be unlocked (Un). If the lock is on when you attempt to enter programming an LC will be displayed.

(Rt) Batch Reset Time

At batch completion, the screwdriver will not operate for the length of the batch reset time setting.

(Ht) High Time and (Lt) Low Time

The Ht and Lt settings establish a time window for OK/NG evaluation of a fastener rundown. Low Time (Lt) must be set to a value lower than High Time (Ht) during programming or an error will occur. Ht value must be > Lt.

3-digit time values

The values for Lt, LL, and rt are 3-digit time values in seconds, with a format of **x.xx**.

To view/edit the entered value, toggle left and right using the 'P' button. The position of the decimal point on the screen indicates whether you are viewing the 'ones' and 'tenths' digits, or the 'tenths' and 'hundredths' digits respectively. Note that the 'tenths' digit appears on both screens.

EXIT PROGRAM MODE

Once the value for 'rt' (or Rn) is set, press **S** to return to normal operation. The display will show the batch count value. (Note - if 'LL' is set to a value other than 0.00, 'rt' will not be available for programming and the last option will be 'Rn')

Audible Alarm Settings / OK and NG Lights

Along with the two digit count display, the screwdriver also provides visual and audible indication of rundown OK, rundown NG, and batch complete.

The multi-color LED above the display illuminates green for OK and red for NG (no good) to indicate whether the fastening cycle was acceptable based on the programmed parameters. When the fastening batch is successfully completed, the LED will light green for OK and the batch count value will reset after a time delay determined by the value programmed into Rt (End of batch Reset Timer).

To suit individual user preferences, four variations of the audible alert are available. When active, the audible alert provides a single short beep for rundown OK, a single long beep for batch complete, three short beeps for rundown NG (below MIN time setting) and five short beeps for rundown NG (above MAX time setting).

The four selectable settings are:

ON	<i>sounds when...</i> OK / NG / Batch Complete
OF	<i>sounds when...</i> NG
FF	<i>sounds when...</i> NG / Batch Complete
EF	<i>sounds when...</i> OK / Batch Complete

-  Press the UP & DOWN arrow keys simultaneously to choose the next available audible alarm setting.
- 

To change the audible alert setting, with the screwdriver in operating mode (not in programming mode), press the UP and DOWN arrow keys simultaneously. The controller will loop to the next available audible setting and show the new current audible setting value in the display.

Optional 'dt' and 'tt' Cycle Time Alarms

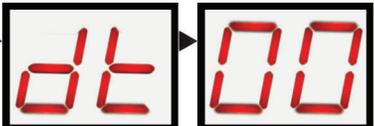
Two optional alarms are provided to alert the operator if too much time is being taken to run the screws into the assembly. The 'dt' Standby Time alarm can be set in 1 second intervals. It is the allowable time to run each screw cycle. If, during the batch, the screwdriver remains idle for a time exceeding the 'dt' value, an audible alarm will sound and the display will flash 'dt' until the driver is triggered for the next cycle. (Note: depending on other program settings, the operator may need to press 'S' to continue driving screws if 'dt' is flashing in the display.)

The 'tt' Total Batch Time alarm can be set in 1 minute intervals. If the batch is not completed within the 'tt' time setting, an alarm will sound and the display will flash 'tt' until the operator runs the driver and completes the batch. Only one of the two optional alarms can be selected for use.

dt = Standby Time between rundowns



Press UP arrow and 'P' until 'dt' or 'tt' displays. Release to view value.



standby time in seconds between rundown cycles

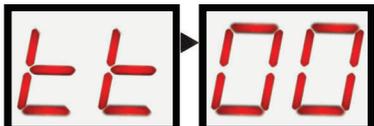
 Adjust value UP / DOWN (00-99 seconds)


 Press 'S' to exit setting of 'dt' value.. If 'dt' value is greater than '00', tool will return to run mode and display will show the count value. If 'dt' = 00, program will stay in edit mode and switch to editing of 'tt' value.

tt = Total Batch Time



Press UP arrow and 'P' until 'dt' or 'tt' displays. Release to view value.



overall allowable batch time in minutes

 Adjust value UP / DOWN (00-99 minutes)


 Press 'S' to exit setting of 'tt' value. Tool will return to run mode and display will show the count value.

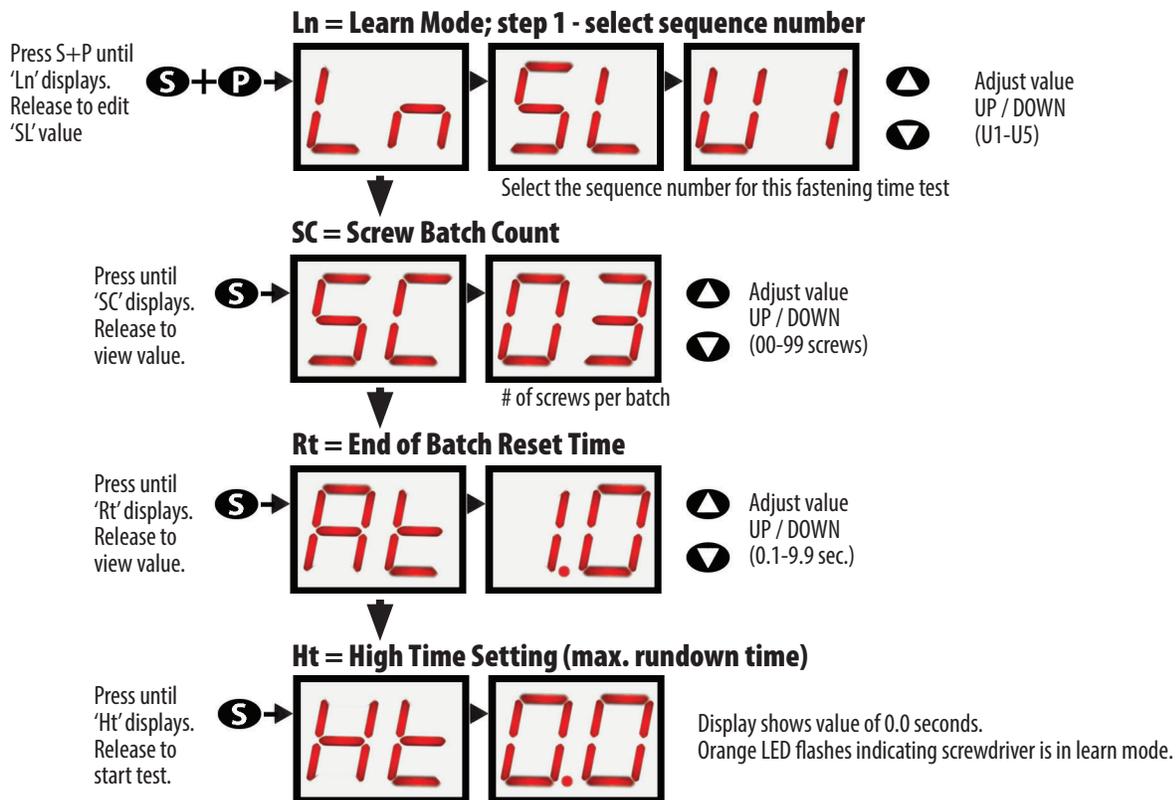
Clear / Reset Batch Count

While the screwdriver is in the normal operational mode, the batch count value can be reset to start a new batch by pressing and holding the 'P' button for 3 seconds. The software keypad lock must be off (Un) in order for the P button to function.

Rundown Evaluation (Learn) Mode

The screwdriver's learn mode assists in determining proper Ht time window settings for the specific fastening application. The operator will be allowed to run multiple rundown cycles (as many as desired) and the display will show the actual cycle time for each rundown.

To enter Learn Mode:



Run the screwdriver on the fastening application - the display will show the cycle time to complete the rundown.

Repeat running the screwdriver on the application as many times as necessary to establish an acceptable time value for 'Ht'.

When finished running test cycles, press 'P' to exit learn mode. The last recorded value will be stored as 'Ht' for the applicable sequence number. 'Lt' will be set to zero.

Enter the Programming Mode (press and hold 'S' for 3 sec) to review/verify the settings and make any final adjustments to the time window values. Please refer to the programming flow chart for further details on settings and values.

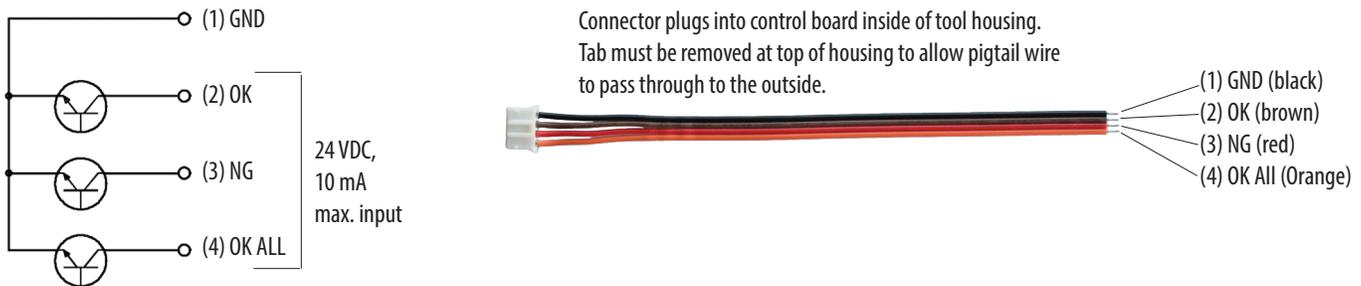
Display Codes

The LED display may show one of a several codes, signifying that an error has occurred and operator action is required.

- En** - A set-up error has occurred and requires correction. eg - Lt value entered is greater than Ht value.
- dt** - the Standby Timer has timed out - run the screwdriver to complete the cycle.
- tt** - the Total Batch Time has timed out - run the screwdriver to complete the batch.
- tr** - option 'ns=y' and operator has pressed 'S' to continue after a NG rundown, then switched to reverse. Cycling in reverse at this time will not change the count value as reverse was initiated after a NG.

Output Signal Connection

An output signal pigtail connector is included in the box with the screwdriver for connecting to a PLC, if required. Outputs are available for OK (good rundown cycle), NG (no good), and OK ALL (batch complete). Outputs are open collector, sinking type - user supplied input must not exceed 24VDC, 10mA max.



Service

Delta Regis BECT6 Series Controllers are not user serviceable. Any repairs must be performed by a Delta Regis authorized service center. Please consult Delta Regis Tools for further information and the location of the nearest authorized service center.

Repairs to brushless DC screwdrivers must be performed by trained personnel, knowledgeable and qualified in the repair of DC electric screwdrivers. Use only genuine Delta Regis parts when servicing these products. Do not attempt to modify the tools or controllers.

Warranty

The ICESL6 Series Tools and Controllers are warranted for one year from the date of purchase against defects in material and workmanship. In addition, the brushless motor in the ICESL6 Series Screwdrivers is warranted for three years from the date of purchase against defects in material and workmanship. This warranty does not cover damage due to transportation, abuse, misuse, or improper service. Our sole remedy is to repair or replace (at our discretion) any unit found to be defective due to defects in material or workmanship. It is the responsibility of the user to return any product thought to be defective, freight prepaid, to our warehouse for inspection and evaluation.

There is no warranty of merchantability or fitness of purpose. In no event will Delta Regis Tools, Inc. be liable for business interruptions, loss of profits, harm, injury, damage, personal injury, cost of delay, or any other special, indirect, incidental, or consequential losses, costs, or damages.