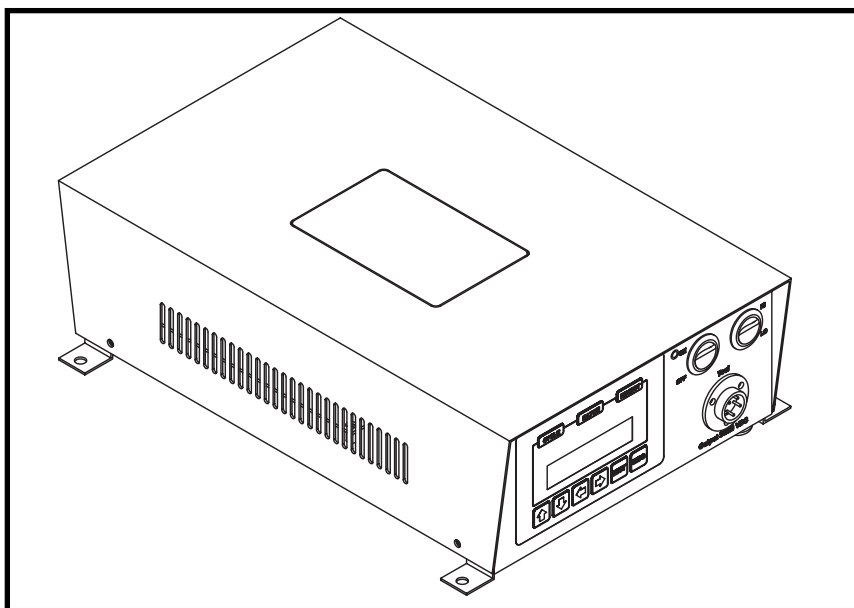




Monitored Power Supply
INSTRUCTION MANUAL



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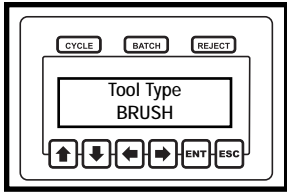


TABLE OF CONTENTS

Quick Start Guide	1
Introduction	3
Warnings	4
Unit Overview	5
Monitor Mode	7
Programming	8
AutoCal™	
Minimum Run Timer	
Maximum Run Timer	
Bump Timer	
Start Current	
Shut-Off Current	
Maximum Current	
Batch Count	
Globilize	
Relay & Beep	
Count Direction	
New Password	
Digital Inputs	
Current Draw	
View Run Time	
LCD Contrast	
Unit Outline & Dimensions	25
Power Supply Specifications	26
I/O Schematic	27
Parameter Selection	28

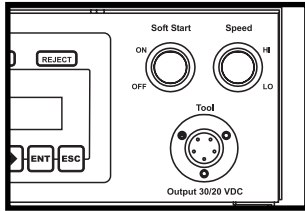


Quick Start Guide SK75-XX



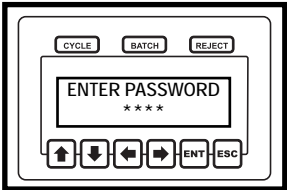
Step 1:

Power up the unit. During power-up the device will identify the tool type for which the unit is configured (either Brush or Brushless). Be sure that the tool to be used with this device matches the tool type.



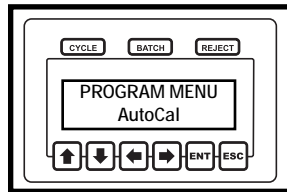
Step 2:

Plug the tool into the tool connector. Select the desired tool speed (HI or LO). Turn the Soft Start either ON or OFF.



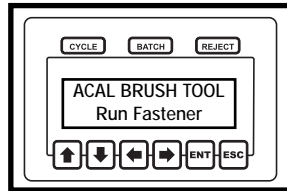
Step 3:

Press the enter (ENT) button and enter the programming mode. Either enter the password (0104 default) or bypass the password by using the key.



Step 4:

Use the arrow keys to navigate to the AutoCal option on the program menu. Once at the AutoCal option, press the enter (ENT) button to select it.



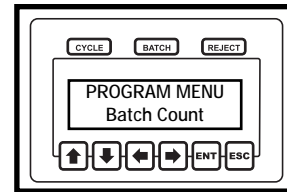
Step 5:

The display will ask for a fastener to be run. Run the tool on the target fastener allowing the clutch to turn the tool off. After the clutch fires, the display should read AUTOCAL COMPLETE Press Any Key.

Pressing a key will return the unit to the program menu.

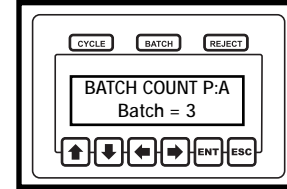


Quick Start Guide (continued)



Step 6:

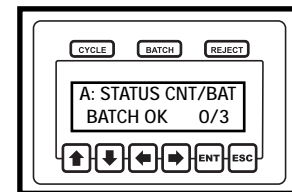
Use the arrow keys to navigate to the Batch Count option on the program menu. Once at the Batch Count option press the enter (ENT) button.



Step 7:

Use the up and down arrows to modify the batch count by one. The left and right arrows modify this value by 10 in either direction (up or down).

When the desired batch count is reached, pressing the enter (ENT) button will store this value.



Step 8:

Pressing the escape (ESC) key several times will return the unit to the main run screens.

Use the arrow keys to select a run screen that works best for the application. The unit can display status/count/batch, total/count/batch, or status/total.



Introduction:

Thank-you for your purchase of the SK75 monitored power supply! We are proud to be included as part of your assembly process.

This document is an operations guide for the SK75. The SK75 can be outfitted to supply power for either brush or brushless electric tools. The SK75 is also configured to monitor the tool while it's running. This feature can aid in the manufacturing process by determining if a fastener has been installed properly and also by counting the number of fasteners that have been installed.

Before using the SK75, it is recommended that the user read this manual thoroughly. If this unit is mishandled a fatal accident, bodily injury, or damage to the SK75 may occur.

This manual is intended to be a general guide to the operations of the SK75. If any additional questions or concerns arise, please contact a CE Electronics representative.

Warnings:



Do not disassemble the unit for repair or modifications. There is a high electrical voltage inside the unit that could cause electric shock.



Do not allow any type of liquid to come into contact with any part of the unit.



Immediately discontinue use of the unit if smoke, an abnormal odor, or an unusual sound is detected coming from the unit.



Warnings (continued):



Insert all fittings fully into their mating receptacles. Failure to do so could result in injury.



Do not fold, bend or apply excessive force to any cable or fitting.

Cautions:

Please use caution when handling this or any other electrical appliance.

This unit accepts an AC input voltage from 100VAC to 240VAC. Trying to operate this unit with a voltage outside that range may cause damage to the unit.

Avoid placing or storing this unit in a location where it may become wet or dust covered.

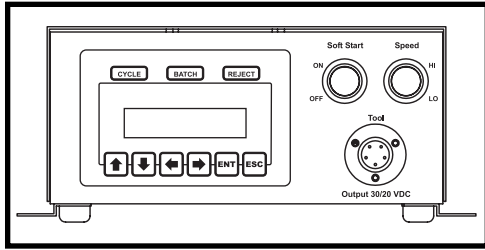
Do not place or mount this unit in an unstable area. Dropping this unit may result in personal injury or damage to the unit.

Before performing any maintenance on the unit, make sure to turn it off and remove the power plugs.

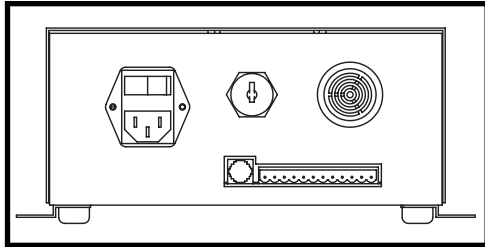
There are no user serviceable parts inside the main enclosure of the unit.



Unit Overview

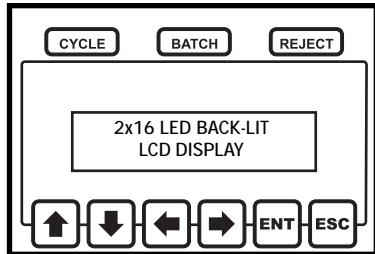


The user interface on the SK75 is equipped with four arrow buttons (up, down, left and right) an enter button and an escape button. These buttons are used during programming.



The arrow keys are used to navigate through menus, raise and lower values during programs, and move the cursor to select items that need to be edited.

The enter (ENT) button is typically used to select an item or save a value once it has been edited. The escape (ESC) button is used to abort an editing process without saving a new value



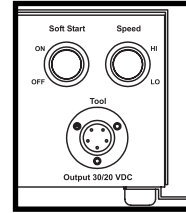
A two line by sixteen character back-lit LCD display is part of the user interface. This display will provide the user with feedback during the run mode and guide the user through programming functions.

Above the LCD display, there are three status indicators. The cycle status indicator will light up each time a fastening process is completed successfully. The batch status indication will be lit when the final fastener is completed in a group. If a fastening process is not completed properly, the reject status indicator will illuminate.

The user interface on the SK75 can be mounted either in the face of the unit or on the lid.



Unit Overview (continued):



A five pin circular connector is located on the face of the unit. This connector is used to supply power to a tool and also to read signals back from the tool.

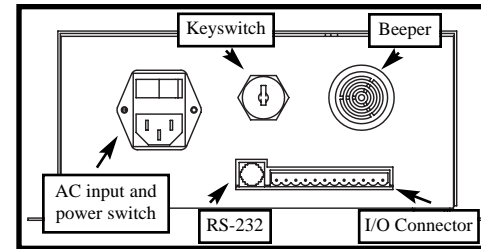
Two selector switches are located above the tool connector. The soft start switch turns the soft start feature on and off. If the soft start feature is enabled, the tool will spin slowly for a revolution or two before jumping up to full speed.

Tool Connector:

1. +VDC (out)
2. Limit (in)
3. DC GND
4. Drive (in)
5. Earth Ground

Tool speed is governed by the speed switch.

When this switch is in the high setting, the VDC out will be 30VDC. On the low setting, the power supply provides 20VDC. The tool's speed is directly proportional to output voltage.



The rear panel on the unit contains several items. The main power switch for the unit and the power entry module are found on the back panel. This unit is capable of running on an

AC input voltage of 100VAC to 240VAC.

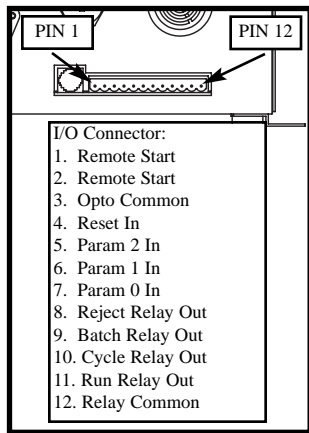
A keyswitch is provided on the unit's back panel. The key switch will allow a user to reach the programmable functions without entering a password.

The unit's beeper provides audible feedback when rejects occur and can provide a double-beep when a batch accept occurs.

The RS-232 port can be used as a secondary means of programming the unit or getting information from the unit.



Unit Overview (continued) :



The 12 pin connector on the back of the unit contains several input and output functions.

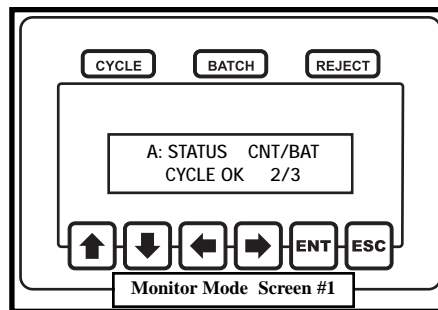
A remote start feature can be accessed by shorting together pins 1 and 2. The remote start feature needs to be enabled by turning on dip-switch 2 on the CE3068X board inside the unit.

All of the inputs are optically isolated. In order to use an input, an external power supply ground must be placed on pin 3 (Opto-Common). Then that supply's same regulated 24VDC can be used to reset the unit on pin 4 or select one of eight parameters on pins 5,6 and 7.

Several relay outputs are provided to notify external systems when events occur. In order to use a relay, a regulated voltage needs to be placed on pin 12, relay common. When an event occurs, that voltage will be returned on the relay pin that is associated with the event. For example, when the tool is running, the voltage that is placed on pin 12 will be returned on pin 11.

Monitor Mode:

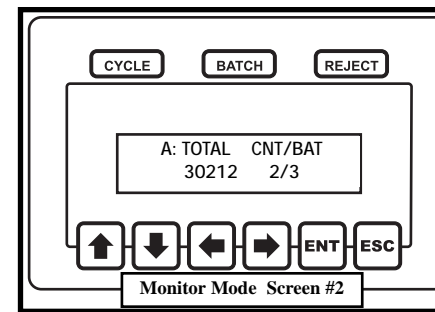
There are three screens associated with the monitor mode. Pressing any of the arrow keys allows the user to change the view on the LCD screen.



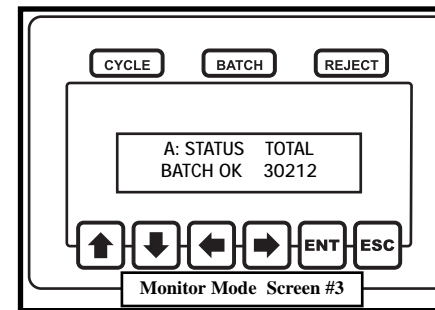
The first of these screens will show the current parameter, status of the last fastening, current count and the number of fasteners in the batch.



Monitor Mode (continued):



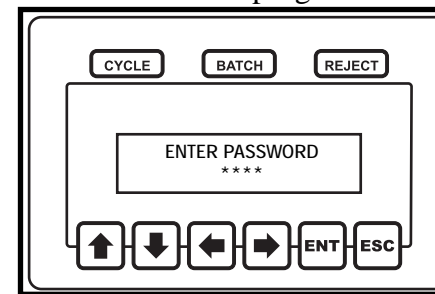
The second monitor screen shows current parameter, total batches completed, current count, and number of fasteners in a batch.



The third monitor screen shows current parameter, status of the last fastening, and total number of fasteners in the batch.

Programming Mode:

Pressing the enter (ENT) button while in the monitor mode will send the unit into program mode.

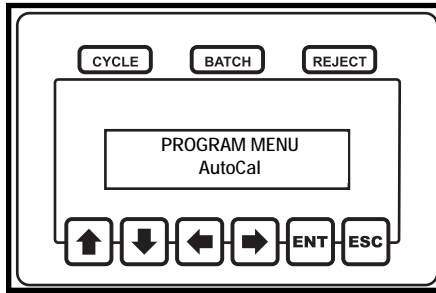


If the keyswitch is in the locked position, the user will be prompted to enter a password before continuing.

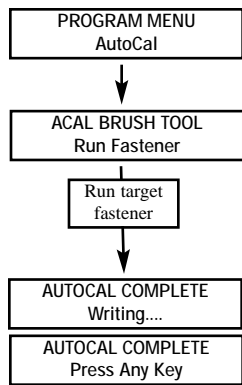
To enter the password, use the left and right arrow keys to highlight a digit, only one number will be revealed at a time the rest of the numbers will be obscured by asterisks. The up and down arrows will allow the user to change the number that is highlighted. Once all of the digits are entered properly, pressing the enter button will allow the unit to proceed to the program menu. Pressing escape will return the unit to the monitor mode.



Programming Mode (AutoCal™):



The first item on the program menu is AutoCal™. AutoCal™ is a calibration routine that is meant to get the unit up and running very quickly. In order to use the AutoCal™ feature press the enter button.



The display will read ACAL BRUSH TOOL or ACAL B-LESS TOOL and Run Fastener. Be sure that the right type of tool is being used with the unit before proceeding.

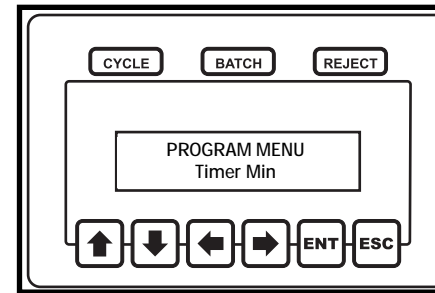
At this point choose a typical fastener and run it to completion allowing the clutch to shut the tool off. Once the unit witnesses the clutch stopping the process, all of the timers and threshold will automatically be calculated and stored to non-volatile memory for the parameter set that the unit was in at the beginning of the process.

While this data is stored, the display will read AUTOCAL COMPLETE, Writing..... Once the variables are stored, the display will read AUTOCAL COMPLETE, Press Any Key. Pressing a key at this point will return the unit to the programming menu.

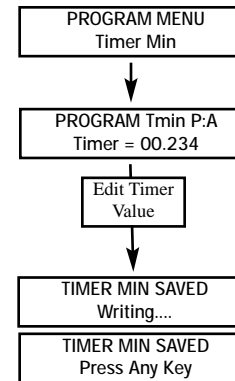
The escape key can be pressed at any time during this process to abort the calibration and return to the program menu without changing the parameter data.



Programming Mode (Minimum Run Timer):



The minimum run timer defines the minimum amount of time a tool has to run during a fastening process in order to be considered a good fastening. If a fastening process is shorter than timer min, a Tmin reject will be issued.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Timer Min.

Press the enter button in order to edit the minimum run timer's value.

After the enter button is pressed, the display will read PROGRAM Tmin P:Y, Timer = XX.XXX (where Y is the current parameter

and X is the current timer's value).

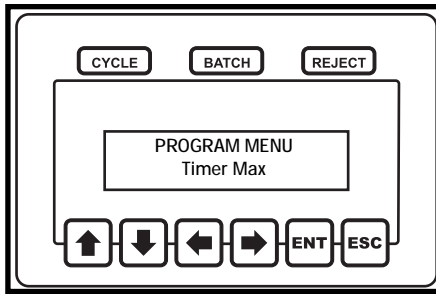
Using the left and right arrow keys select the digit in the timer value that needs edited. Once the appropriate digit is highlighted, press the up and down arrows to change the digit's value. Proceed in this manner until all of the desired digits are edited.

Once the display shows the appropriate timer value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

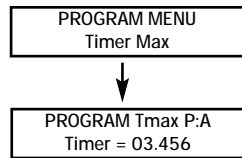
During the editing process, if the escape button is pressed, the unit will abort programming the minimum run time and return to the main programming menu.



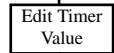
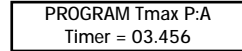
Programming Mode (Maximum Run Timer):



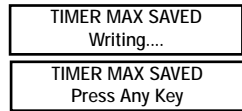
The maximum run timer defines the maximum amount of time a tool can run during a fastening process and still be considered a good fastening. If a fastening takes longer than timer max, a Tmax reject will be issued.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Timer Max.



Press the enter button in order to edit the maximum run timer's value.



After the enter button is pressed, the display will read PROGRAM Tmax P:Y, Timer = XX.XXX (where Y is the current parameter and X is the current timer's value).

and X is the current timer's value).

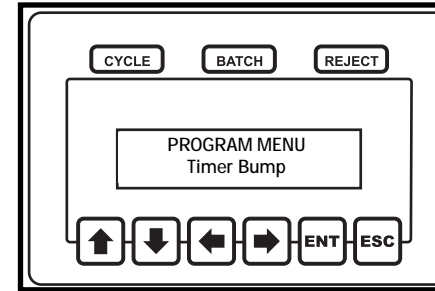
Using the left and right arrow keys select the digit in the timer value that needs edited. Once the appropriate digit is highlighted, press the up and down arrows to change the digit's value. Proceed in this manner until all of the desired digits are edited.

Once the display shows the appropriate timer value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

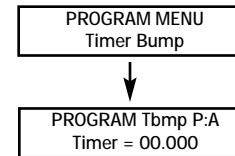
During the editing process, if the escape button is pressed, the unit will abort programming the maximum run time and return to the main programming menu.



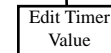
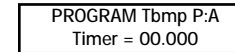
Programming Mode (Bump Timer):



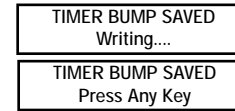
The bump timer defines an amount of time that a tool can run and that run will be ignored if the clutch does not fire (i.e. torque is not achieved). This timer may be used to eliminate nuisance rejects.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Timer Bump.



Press the enter button in order to edit the bump timer's value.



After the enter button is pressed, the display will read PROGRAM Tbmp P:Y, Timer = XX.XXX (where Y is the current parameter and X is the current timer's value).

and X is the current timer's value).

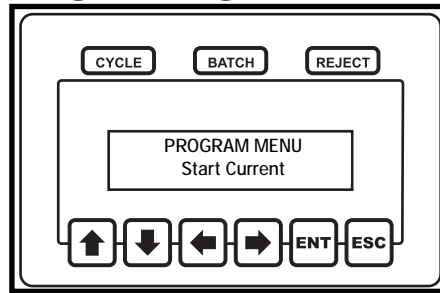
Using the left and right arrow keys select the digit in the timer value that needs edited. Once the appropriate digit is highlighted, press the up and down arrows to change the digit's value. Proceed in this manner until all of the desired digits are edited.

Once the display shows the appropriate timer value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort programming the bump timer and return to the main programming menu.

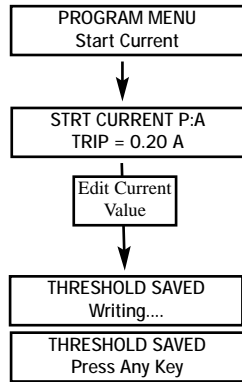


Programming Mode (Start Current):



The start current defines the amount of current that needs to be drawn by a brushless tool before the unit is considered to be in cycle. Once the tool starts drawing this amount of current, the run-timers will start. **The start current value**

is only used with brushless tools.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Start Current.

Press the enter button in order to edit the start current's value.

After the enter button is pressed, the display will read STRT CURRENT P:Y, TRIP = X.XX A (where Y is the current parameter and X is the amperage value in amps).

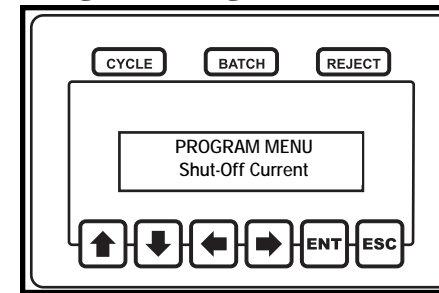
Use the left or down arrow key to lower this value. The right or up arrow key will raise the value. Proceed in this manner until the appropriate current is displayed.

Once the display shows the appropriate amperage value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort programming the start current and return to the main programming menu.

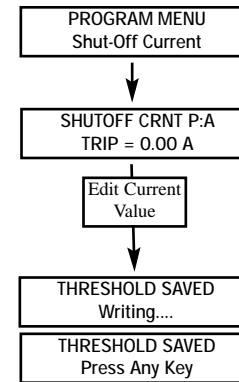


Programming Mode (Shut-Off Current):



The shut-off current defines the minimum amount of current that needs to be drawn by a brushless tool when the tool clutches out. This threshold can be used as a secondary check for the tool's clutch setting. **The shut-off current**

value is only used with brushless tools.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Shut-Off Current.

Press the enter button in order to edit the shut-off current's value.

After the enter button is pressed, the display will read SHUTOFF CRNT P:Y, TRIP = X.XX A (where Y is the current parameter and X is the amperage value in amps).

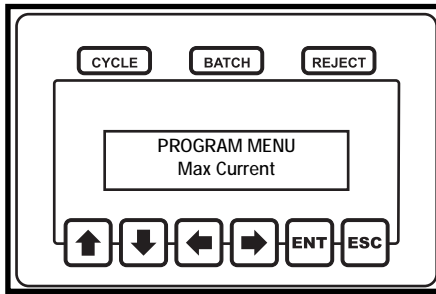
Use the left or down arrow key to lower this value. The right or up arrow key will raise the value. Proceed in this manner until the appropriate current is displayed.

Once the display shows the appropriate amperage value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort programming the shut-off current and return to the main programming menu.

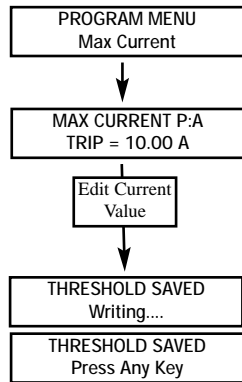


Programming Mode (Max Current):



The maximum current defines the maximum amount of current that can be drawn by a brushless tool when the tool clutches out. This threshold can be used as a secondary check for the tool's clutch setting. **The max current value**

is only used with brushless tools.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Max Current.

Press the enter button in order to edit the max current's value.

After the enter button is pressed, the display will read MAX CURRENT P:Y, TRIP = XX.XX A (where Y is the current parameter and X is the amperage value in amps).

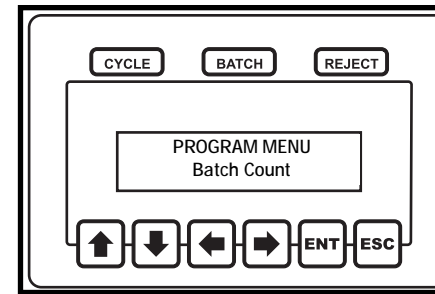
Use the left or down arrow key to lower this value. The right or up arrow key will raise the value. Proceed in this manner until the appropriate current is displayed.

Once the display shows the appropriate amperage value, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort programming the max current and return to the main programming menu.

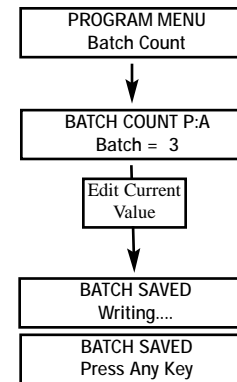


Programming Mode (Batch Count):



The Batch Count is typically programmed to be the number of fasteners in a given assembly. A Cycle Accept signal will be generated each time a proper fastening occurs. A Batch Accept however, will occur when the count reaches the

batch value.



In order to edit this value enter the program mode and press an arrow key until the display reads PROGRAM MENU, Batch Count.

Press the enter button in order to edit the batch count's value.

After the enter button is pressed, the display will read BATCH COUNT P:Y, Batch = X (where Y is the current parameter and X is the number of fasteners in a batch).

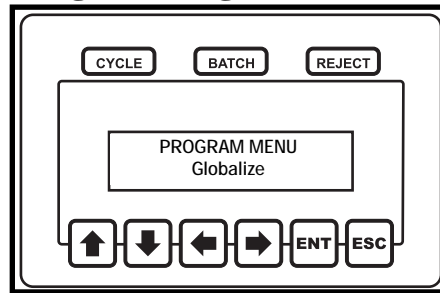
Use the up or down arrow key to raise or lower the batch value by 1. The left and right arrow keys will raise or lower the value by 10. Proceed in this manner until the appropriate batch value is displayed.

Once the display shows the appropriate batch, pressing the enter button will store the new value to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

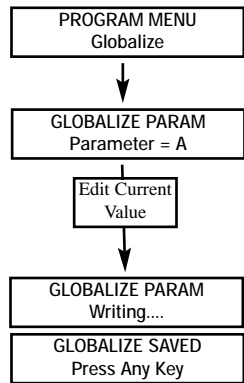
During the editing process, if the escape button is pressed, the unit will abort programming the batch value and return to the main programming menu.



Programming Mode (Globalize):



Often, when multiple parameter sets are used, only one or two variables within the parameter sets needs to vary. It's very common to have everything within multiple parameter sets be identical except for a variation in the batch count. If this



is the case, globalizing a parameter set may help to speed the programming process. When globalization is used one parameter set is copied to all of the other parameters.

In order to select a parameter for globalization enter the program mode and press an arrow key until the display reads PROGRAM MENU, Globalize.

Press the enter button in order to the globalization option.

After the enter button is pressed, the display will read GLOBALIZE PARAM, Parameter = Y (where Y is the parameter that will be copied to all other parameters if selected).

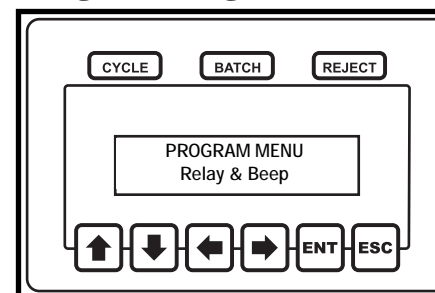
Using the arrow keys select the parameter set to be copied.

Once the display shows the appropriate parameter, pressing the enter key will copy that parameter to all of the other parameters and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

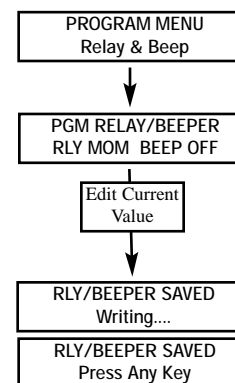
During the editing process, if the escape button is pressed, the unit will abort the globalization and return to the main programming menu.



Programming Mode (Relay & Beep):



The output relays in this system can be programmed to be either momentary or latching. If the relays are momentary the will close briefly (200ms) when an event occurs. When set to latching, the relay closes and remains that way until the tool starts running again.



The beeper in this system can be programmed to double-beep when a batch accept occurs.

In order to edit these items enter the program mode and press an arrow key until the display reads PROGRAM MENU, Relay & Beep. Press the enter button in order to edit relay or beeper settings.

After the enter button is pressed, the display will read PGM RELAY/BEEPER, RLY XXX BEEP YYY (where X is either MOM for momentary or LAT for latching and Y is either ON or OFF).

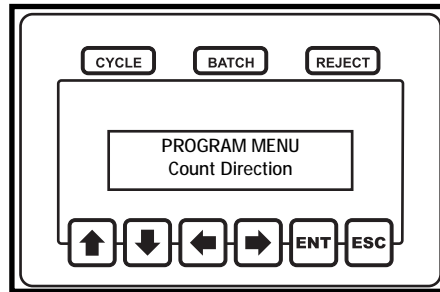
Using the arrow keys set the desired relay and beeper setting.

Once the display shows the appropriate settings, pressing enter will save the settings to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort this particular programming process and return to the main programming menu.



Programming Mode (Count Direction):



This unit can be programmed to count up from zero until the batch is reached or count down from the batch to zero.

In order to edit this function, enter the program mode and press an arrow key until the

PROGRAM MENU
Count Direction

display reads PROGRAM MENU, Count Direction. Press the enter button in order to edit the Count Direction.

COUNT DIRECTION
Count UP

After the enter button is pressed, the display will read COUNT DIRECTION/Count XXX (where X is either UP or DOWN).

Edit Current
Value

COUNT DIRECTION
Writing....

Using the arrow keys set the desired count direction (either up or down) .

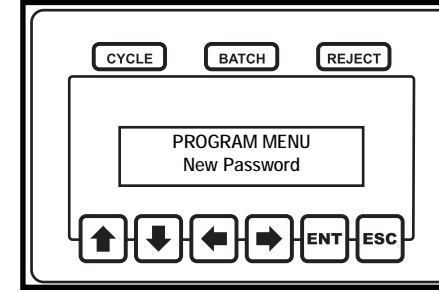
DIRECTION SAVED
Press Any Key

Once the display shows the appropriate setting, pressing enter will save the settings to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort this particular programming process and return to the main programming menu.



Programming Mode (New Password):



In order to enter the programming mode, either the key-switch was used or a password was entered. The default password of 0104 can be overwritten and set to any four digit number.

PROGRAM MENU
New Password

In order to change the password, enter the program mode and press an arrow key until the display reads PROGRAM MENU, New Password. Press the enter button in order to edit the password.

PROGRAM PASSWORD
0 * * *

Edit Current
Value

PROGRAM PASSWORD
Writing....

After the enter button is pressed, the display will read PROGRAM PASSWORD/0***.

PROGRAM PASSWORD
Press Any Key

The left and right arrow keys can be used to select any of the four digits in the password.

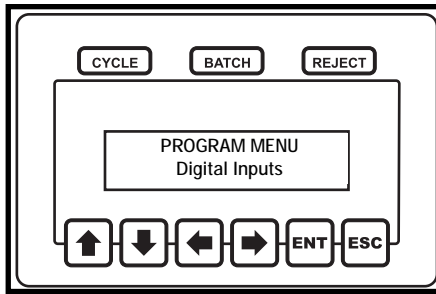
Once the desired digit is high-lighted, the up and down arrow keys will allow the user to change that digit. Only the digit being edited will be visible. The other digits will be obscured and an asterisks will appear as a place holder.

Once the desired password has been entered, pressing enter will save the settings to non-volatile memory and the user will be prompted to Press Any Key. At this point any button may be pressed and the unit will return to the program menu.

During the editing process, if the escape button is pressed, the unit will abort this particular programming process and return to the main programming menu.

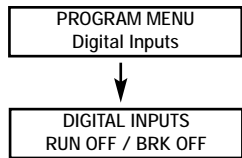


Programming Mode (Digital Inputs):



The Digital Inputs menu option is a trouble shooting mode. If this item is selected, the signals that the tool is sending the SK-75 can be monitored.

In order to view these signals, enter the program mode and



press an arrow key until the display reads PROGRAM MENU, Digital Inputs. Press the enter button in order to monitor the tool's digital signals.

Once in this mode, the left side of the display will show the state of the tool's run request signal. That side of the display will either read RUN ON or RUN OFF. In a brush tool, this signal should be off until the run switch is activated (either through a lever or push to start).

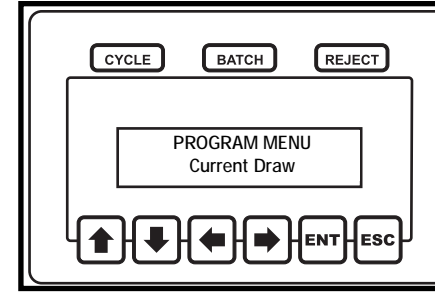
In a brushless tool, the left side of the display will always read RUN ON because most brushless tools constantly issue a run request even if the tool's run switch is off.

The right side of the display shows the state of the tool's clutch or limit switch. This message will read BRK OFF most of the time. When a tool clutches out (either brush or brushless) this message will briefly read BRK ON.

The unit will exit this mode if any key is pressed.

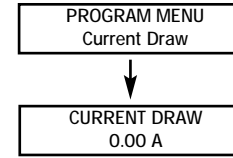


Programming Mode (Current Draw):



The Current Draw menu option is a trouble shooting mode.

This mode can be particularly handy when deciding how to program the Start Current, Shut-Off Current, and Max Current for a brushless tool.



If this item is selected, the SK-75 will act like a current meter showing the user how much current is being drawn by the tool (either brush or brushless).

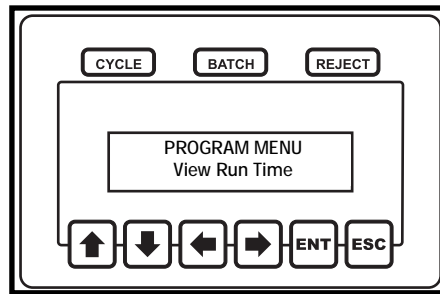
In order to view this value, enter the program mode and press an arrow key until the display reads PROGRAM MENU, Current Draw. Press the enter button in order to monitor the tool's current use.

Once in this mode, the bottom line of the LCD will display the current draw in amps. This value will be constantly updated while in this mode.

The unit will exit this mode if any key is pressed.

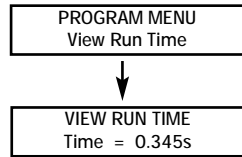


Programming Mode (View Run Time):



Another trouble shooting mode/programming aid is the “View Run Time” mode.

In this mode, the display will show how long the tool ran during the previous fastening cycle.



In order to view this value, enter the program mode and press an arrow key until the display reads PROGRAM MENU, View Run Time. Press the enter button in order to

monitor the tool’s current use.

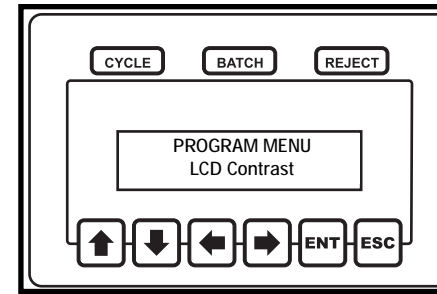
Once in this mode, the bottom line of the LCD will display the amount of time that elapsed during the last fastening cycle. This value will be updated automatically each time the tool runs.

This information can be very useful in determining what values should be used for the minimum and maximum run times.

The unit will exit this mode if any key is pressed.

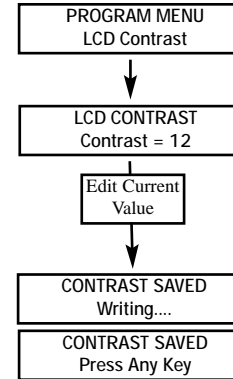


Programming Mode (LCD Contrast):



The LCD display can be adjusted so that the text is darker or lighter by accessing the LCD Contrast feature.

In this mode, the display will show a value that represents a contrast setting for the display.



As that value is altered the user can see what effect it has on the view-ability of the display.

In order to view this value, enter the program mode and press an arrow key until the display reads PROGRAM MENU, LCD Contrast. Press the enter button in order to adjust the display’s contrast.

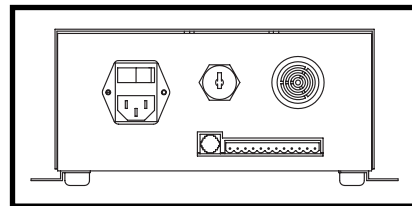
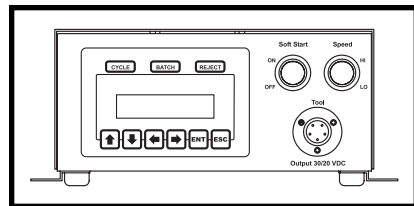
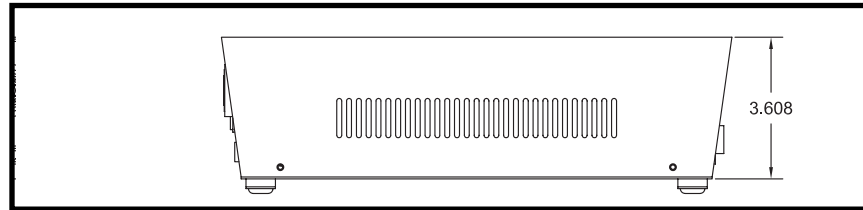
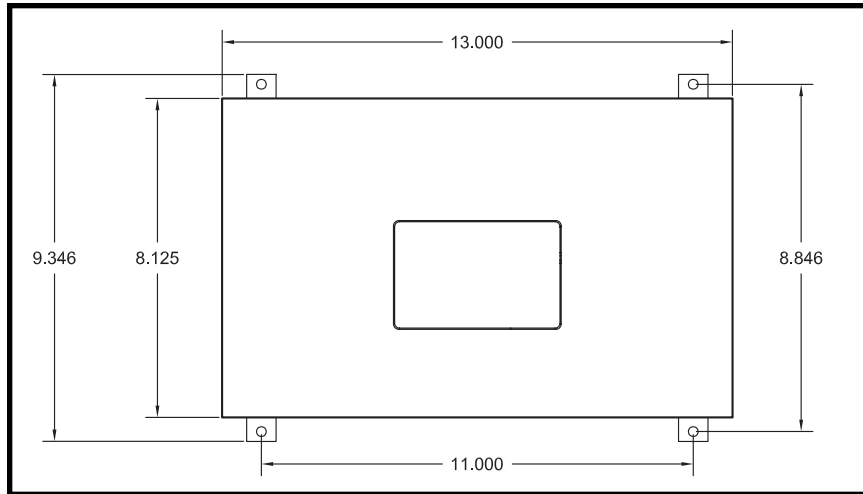
Once in this mode, the bottom line of the LCD will display the Contrast = X (where X is a number that represents the current setting). Using an arrow key, the contrast value can be adjusted.

Once the display’s contrast suits the user, that new contrast can be saved to non-volatile memory by pressing the enter key.

The unit will exit this mode without saving a new contrast setting if the escape key is pressed.



Unit Outline and Dimensions:



Power Supply Specifications:

Input Specifications:

Input Voltage Range	85-264 VAC
Input Current	2.2A/115VAC 1.1A/230VAC
Frequency	47-440Hz
Power Factor	>=0.96/230V, >=0.98/115V

Output Specifications:

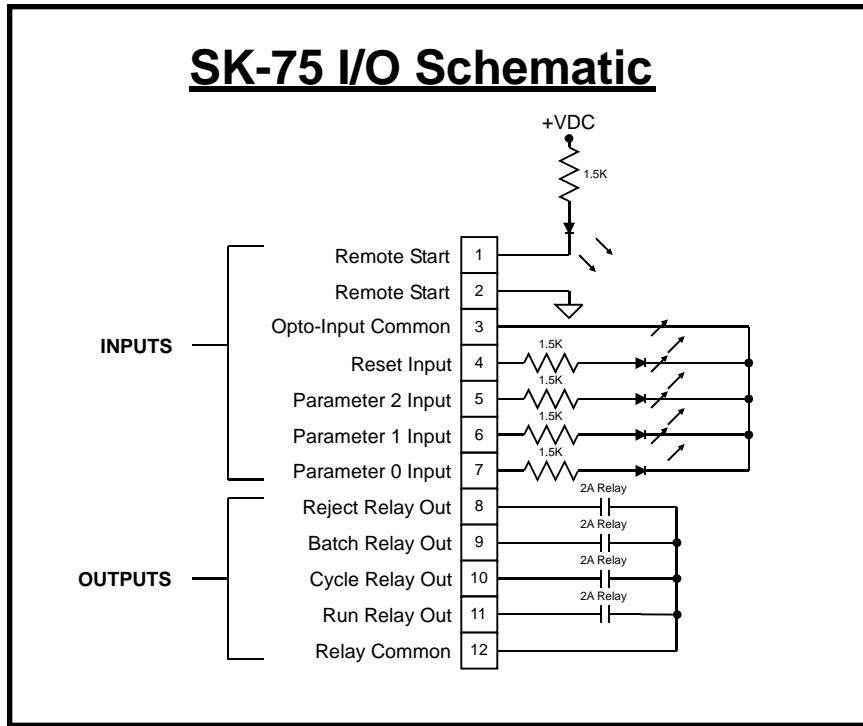
Output Voltage (Low)	20VDC
Output Voltage (High)	30VDC
Output Power	150 Watts
Minimum Load	0A
Output Tolerance	+/- 2%
Ripple Noise	150mVp-p, typical
Overload Protection	105~150%, Constant Current Limit Auto Recovery
Setup/Rise/Holdup(230VAC)	600ms/30ms/20ms

General Specifications:

Input/Output Isolation	I/P-O/P 3000VAC I/P-G 1500VAC O/P 0.5KVAC
Efficiency	80% typical
Switching Frequency	135Khz (fixed, typical)
MTBF	191,800 Hrs (21.9 years)



I/O Schematic:



Input Specifications:

- All Inputs: Optically Isolated
- Remote Start: Short Pin 1 to Pin 2 to use
- Reset: Ground Pin 3 & Apply 24VDC to Pin 4 (Momentary)
- Parameter Inputs: Ground Pin 3 & Apply 24VDC to Pins 5 and/or 6 and/or 7 (Maintained)
- Binary Parameter Selection

Output Specifications:

- Relay Specification: 2A Max Current
- 220VDC Max Switching Voltage
- 60W Max Switching Power



Parameter Section:

Parameter	Parameter 2 Input	Parameter 1 Input	Parameter 0 Input
A	0VDC	0VDC	0VDC
B	0VDC	0VDC	24VDC
C	0VDC	24VDC	0VDC
D	0VDC	24VDC	24VDC
E	24VDC	0VDC	0VDC
F	24VDC	0VDC	24VDC
G	24VDC	24VDC	0VDC
H	24VDC	24VDC	24VDC

