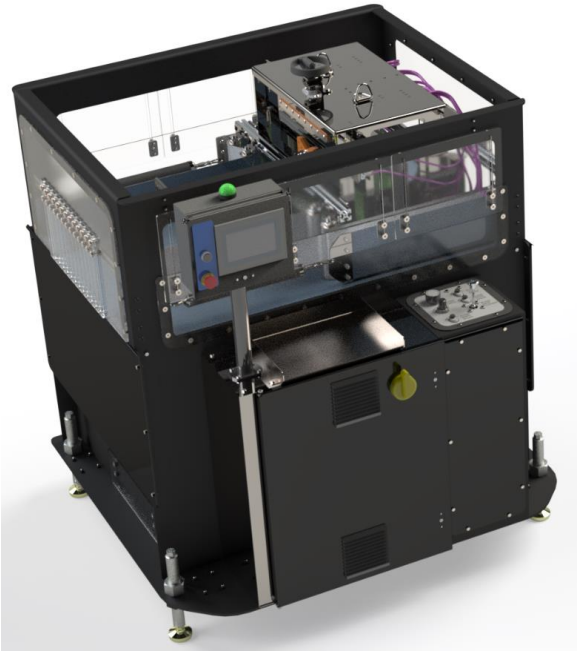
INSTRUCTION MANUAL

Extrusion Up cut Traveling Saw

Model CS-6



Instruction Manual CS-6 IM 22 JAN 2021

NOVATEC™ EXTRUSION

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Instruction Manual: CS-6 IM 22 JAN 2021

Model#: CS-6

Serial #_____

Software Version_____

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Table of Contents

1.0 PURPOSE OF THIS MANUAL

This manual describes the installation and operation of the NOVATEC, CS-6 Saw. Before installation of this product, please read this guide and any additional guides associated with the system's auxiliary equipment.

Explanation of Symbols

This manual includes both general and task-specific safety precautions. These precautions are highlighted in the manual by the following categories:

⚠ **WARNING:** This symbol identifies situations that are potentially hazardous to personnel or equipment.

NOTE: Highlights information provided in text or procedures. This information may or may not be related to safety.

2.0 SAFETY PRECAUTIONS AND WARNINGS

These operating instructions must be read, understood, and implemented by all personnel responsible for this system.

- All mechanical and electrical work MUST be performed by qualified personnel.
- NEVER disable or remove safety features. Doing so can result in severe injury.
- Always disconnect power and lockout power before servicing.
- Always disconnect pneumatic sources before servicing.
- Refer to the machine serial number, nameplate and drawings supplied with this system for correct power requirements.
- Be sure to install the equipment with the proper electrical connections according to all national and local regulations.
- Electric power supply should be through a separate disconnect switch with properly sized overload, circuit breaker or fuse protection.
- The customer is required to operate the equipment with all safety features in place and in proper working condition.
- NOVATEC shall provide no further guarantee for function and safety in the event of unauthorized modifications.

3.0 GENERAL DESCRIPTION

The NOVATEC, CS-6 Saw offers high versatility to cut a wide range of profiles. The extrusions are fed through the saw from an upstream puller. When a pre-determined length of extrusion has been fed, a cut cycle is activated to cut the extrusion to length. It does this in synchronization with the line speed.

3.1 Features

- Servo driven table travel
- Heavy-duty welded steel framing
- Swivel casters for increased mobility
- 120 tooth 20” carbide blade with triple chip grind *
- Access to saw compartment through access panels on 3 sides
- Front and side panel-mounted pneumatic controls
- User friendly touch-panel operation
- 5-Year Warranty

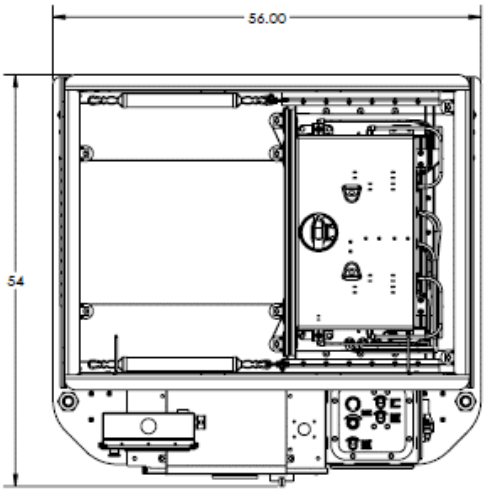
3.2 Specifications Model # CS-6

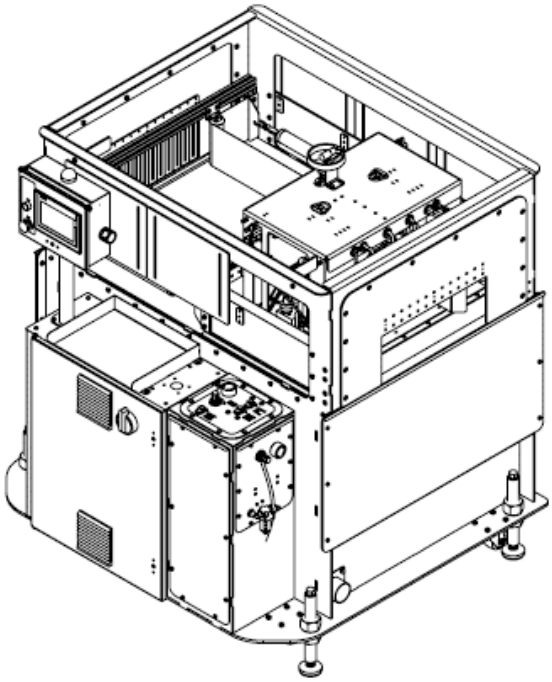
- 42” centerline height with +/- 2” of adjustment
- 24” of Servo Table Travel
- 20” diameter blade
- R-L extrusion flow (L-R option available)
- 460VAC / 3-phase / 60Hz

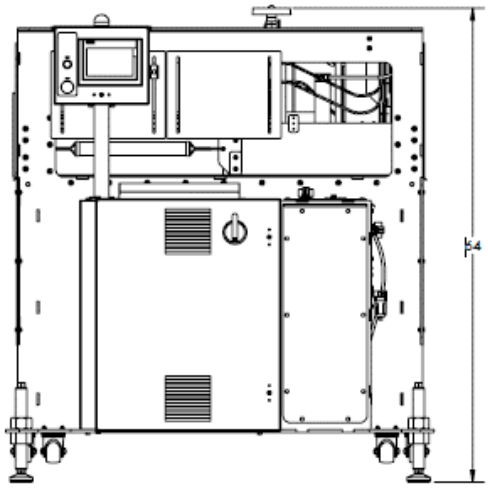
* This type of blade affords the best cut finish for rigid PVC. Toothed blades can be used but create noise. Noise is reduced by dust collection vacuum and adjustment of blade speed.

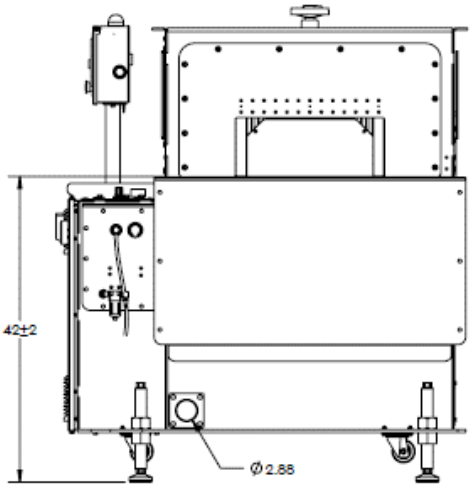
4.0 SPECIFICATIONS

Model Number	CS-6
Blade Diameter	20"
Cut Capacity	See 4.1 Cut Capacity
Saw Arbor Motor	3 HP
Cuts per Minute	15 cpm
Variable Motor Speed	2,275 to 3,500 rpm
Table Travel	24"
Table Travel Speed	45 fpm
Electrical	460VAC 3PH 6.7FLA





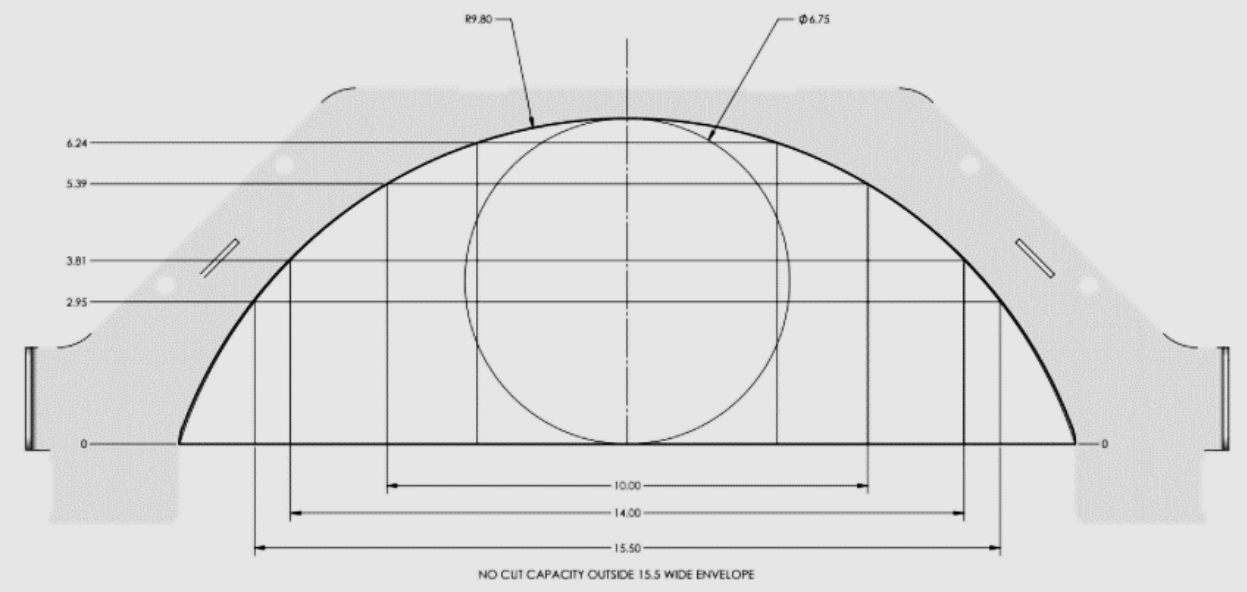




4.1 Cut Capacity

6.75” diameter is larges recommendation for pipe.

Cross-section shows limits for various products. See Capacity Chart. 15.5” is recommended for widest profile.



Capacity	Cross-section
1	6.75" dia
2	6.0" x 6.24"
3	10.0" x 5.39"
4	14.0" x 3.81"
5	15.5" x 2.29"

5.0 INSTALLATION

5.1 Unpacking

1. Carefully unpack the saw and any other components delivered with it. Check all packaging for loose parts, documentation, and other included items. Carefully inspect all parts. Ensure that no wires, bolts, screws, terminals, or other connections have come loose during shipping. Check to ensure that all moving parts are not obstructed by debris or excess packing material. Store documentation where it can easily be retrieved.

2. You may require the following tools to complete the installation:
   a. Adjustable wrench
   b. Phillips and flat blade screwdriver
   c. Hex Wrenches

3. Manually push table from end to end to ensure it is free to travel.

4. All national and local electrical, building, and safety codes need to be followed. Proper grounding of all equipment is important. Check the electrical wiring schematic for wiring numbers and details. The following paragraphs describe installation of typical system components. Some of them are optional and may not be required for your system.

⚠ **CAUTION:** All machines must be grounded for electrical safety and to prevent static electricity shocks that are generated by some materials as they move.

All electronics are susceptible to electrostatic damage. The CS-6 has been designed with electrostatic protection in mind. However, this cannot completely eliminate upsets due to excessive electrostatic voltage induced by the extrusion process. Grounding and use of static eliminators are important.

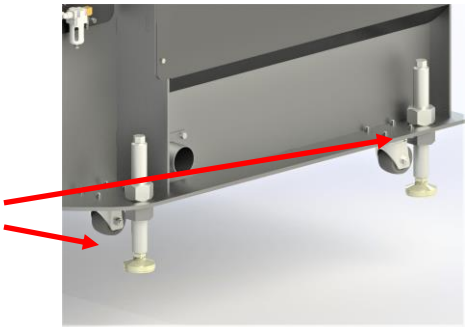
5.2 Mechanical Installation

5.2.1 Positioning the Saw

Determine the required position of the saw. This should be done with consideration to the expected final location and adjacent equipment and the nature of the extrudate. Move saw to this position initially using the castors, align machine with process direction, then lower the stabilizing feet to hold the saw in place.

5.2.2 Final Alignment and Leveling

Carefully align the saw with the extrusion line. It is easiest to adjust this position when on the floor before adjusting the height. Ensure that all equipment is properly aligned (pullers, tanks, etc.). To adjust the centerline height of the saw, adjust the stabilizing feet positioned at each corners of the frame. Once at the desired height, ensure that the saw table is level.

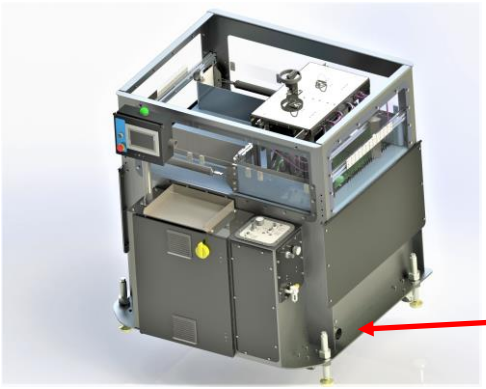


5.2.3 Air

Air from the plant main supply should be hooked up to the port at the lower front right side of the frame. This connection is ¼" NPT female. Turn on air once it is safely connected. Ensure that there are no leaks.

5.2.4 Dust Collector

Install the dust collector 3" diameter tube to the tube on the upstream side of the saw
NOTE: Dust collection MUST be used**.**



Attach 3" hose from dust collection outlet to vacuum dust collector.

NOTE: Inspect dust collector bags regularly. Ensure smooth flow of particulate to collector. Avoid binding of the telescopic ducting in the base of the saw and to the collector.

5.3 Mechanical Operation and Adjustments

The clamp and saw have been adjusted and tested at the factory prior to shipment. Further adjustments should only be made if felt absolutely necessary and with the understanding of what each adjustment does.

Set pressure on the clamp and saw regulators to 55 to 60 psi. **T**hese set the clamp and pushing force of the blade into the profile.

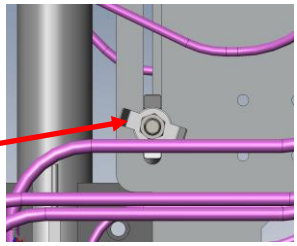
Use the manual controls on the SETUP 2 Pneumatic Controls section on page 30 to test cycle the valves after each adjustment.

Adjust clamp force and down speed with flow regulators. A separate speed control on the rear clamp cylinder is available to balance the front and rear cylinders. Set with a small blade screwdriver after removing the protective cover.

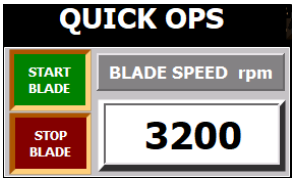
Adjust the blade up speed until it is sufficient for cut quality and cycle rate. A separate speed valve on the rod end of the cylinder is available for coarser speed adjustment. Adjust coarse, then fine.

Adjust the blade down speed to get the blade to drop as fast as possible without banging or bouncing. This does not impact the stop point at the end of forward travel. Air spring cushioning is provided for blade down.

Use thumbscrew at rear of machine to position saw up height limit



Turn on Dust Collector.

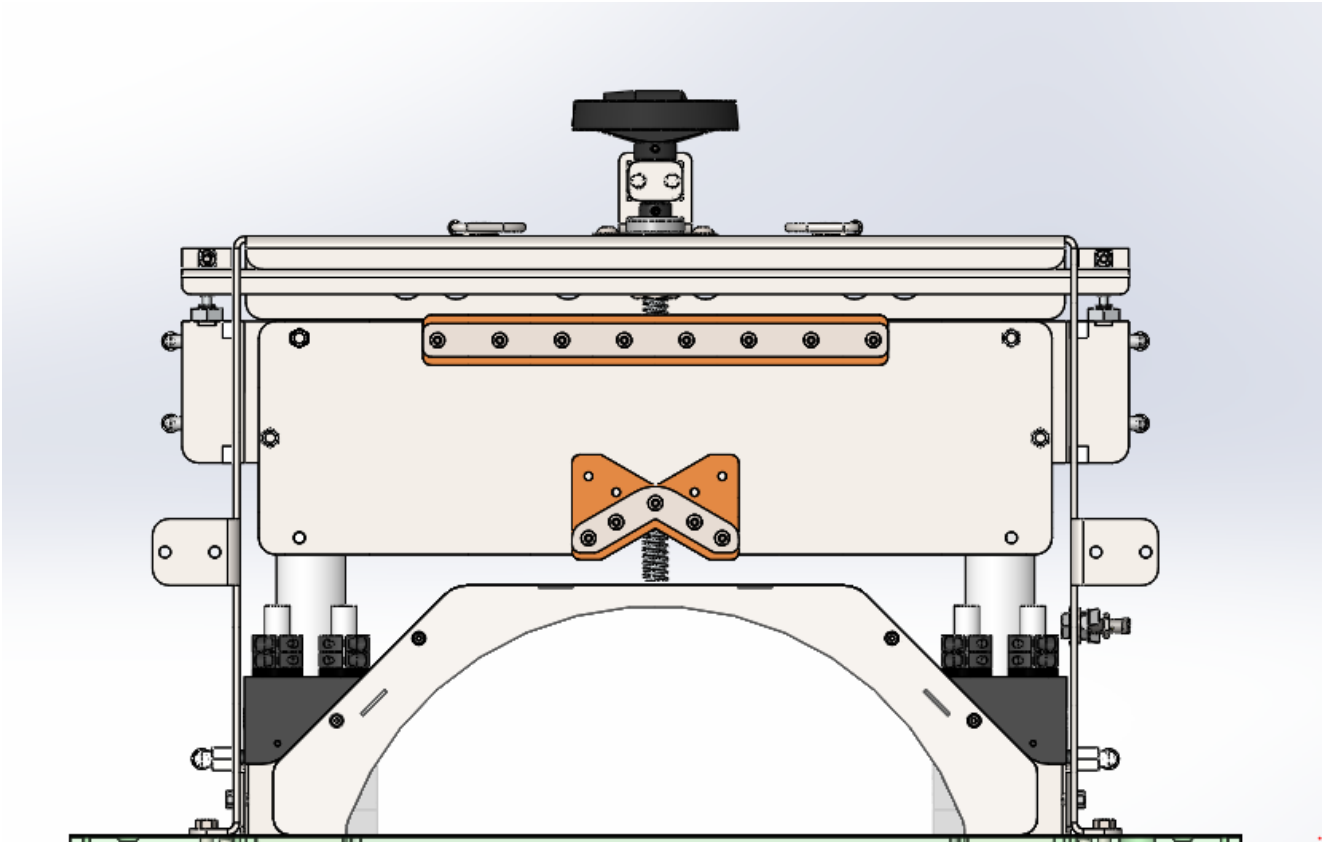


On QUICK OPS screen, initially set a slow blade speed. *NEVER EXCEED RECOMMENDED SAW BLADE SPEED*

Set line speed on CURRENT RECIPE screen if testing in manual mode. *Saw will **not** operate without a speed reference.* Access CURRENT RECIPE by from the Quick Ops screen.

Perform a few test cuts.

5.4 Saw Clamp and Blade Shroud

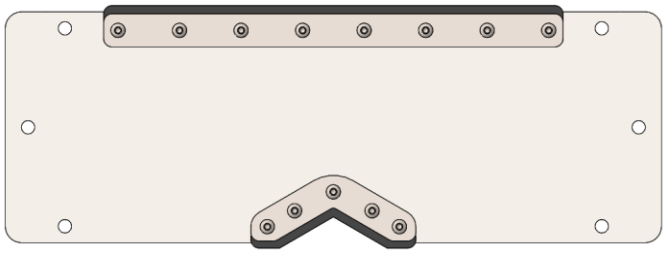


A polycarbonate panel is on each side of the blade cavity. The clamp plate may be inverted for flat extrusions. Orange rubber parts can be flipped over for reuse.

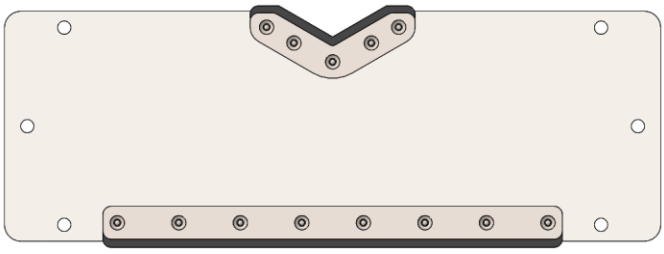
5.4.1 Ensure Products Fit

See Cut Capacity chart on page 8.

5.4.2 Clamp Plate Orientation



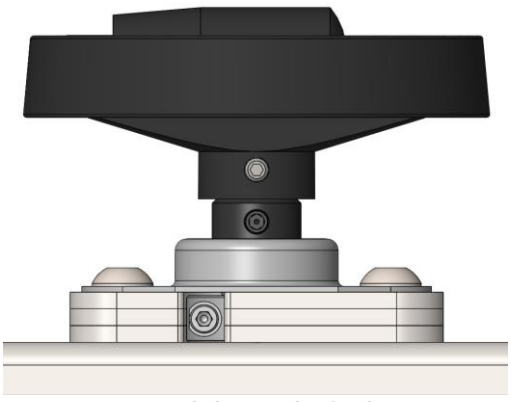
Shaped Products



Flat Products

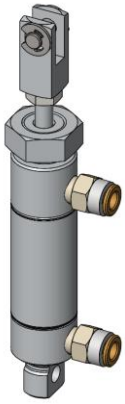
5.4.3 Clamp

Use handle to move clamp to desired height.

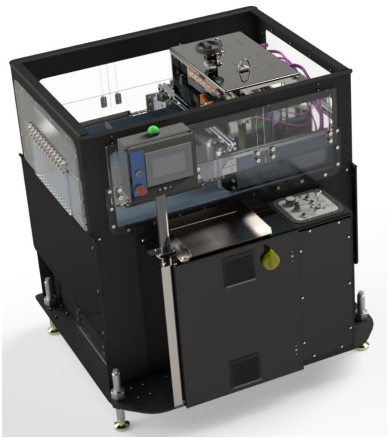


Once set, tighten shaft clamp to prevent unintentional changes.

Air cylinders add ½" of clamping.

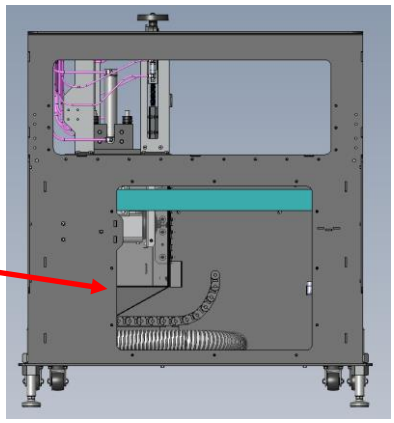


5.5 Mechanical Checks & Pre-Operation Inspection



Front view – removable access panels are at sides and rear.

Example: showing Rear Access Panel removed



- Remove one of the access panels to view inside. These are held by ¼" hex-head bolts, 6 each side, 12 at rear.
- Inspect chamber for proper blade assembly, rotation (clockwise) and blade run-out and for free motion of arbor cover. (See photo) **NOTE:** Arbor shaft has left-hand thread on CS-6 Saw.
- Inspect blade marking for maximum operating speed. Never exceed this speed!
- Refit all access covers that were removed for internal inspection.
- Reinstall the upper blade shroud.
- Reinstall clamp plates and dust shields.
- If using encoder mode install an encoder.

  If not using an encoder, "LENGTH REF SOURCE" and "SPEED REF SOURCE" must be estimated and set at the CURRENT RECIPE screen.

- Options - Install cut signal trigger source (24VDC sourcing). An optional Analog input kit input is available from NOVATEC.

6.0 ELECTRICAL INSTALLATION

Always disconnect and lock out the main power supply before wiring power and control cables between the CS-6 saw and external devices. Refer to the wiring diagram and general arrangement drawings supplied with this system before making electrical connections.

- Use twisted-pair shielded cable for communications wiring, such as for RS-485 or Ethernet.
- Keep communication cables and control wiring as far as possible from high voltage equipment. If cables must run across power lines, keep them at right angles to the line.
- Ensure equipment grounding is properly connected. Shielded cable should be grounded at one end only in the main I/O enclosure to avoid ground loops.

⚠ **WARNING:** Avoid installing communication cable where it can be affected by static electricity!

Open the electrical enclosure and insert the main power through a knockout in the wall of the enclosure. Connect the power cable as indicated on the wiring diagram that was included with the machine. Check that all terminal screws are tight and secure. Close electrical enclosure.

Before powering up the machine, confirm that the placement and wires to the machine conforms to all applicable national and local regulations. When ready, turn on the power drop to the machine, then turn on the main disconnect at the electrical enclosure of the machine. Make sure that E-Stop button(s) are in the OUT position. Press the safety reset button after the machine has booted up.

⚠ **CAUTION:** All machines must be grounded for electrical safety and to prevent static electricity shocks that are generated by some materials as they move.

All electronics are susceptible to electrostatic damage and, although as much protection as possible has been designed into the system; this cannot completely eliminate upsets due to electrostatic voltage being accidentally introduced into the electronic circuitry.

⚠ **CAUTION:** Ensure the blade is rotating in the correct clockwise direction.

7.0 STATUS LIGHT

The domed status light on top of the operator panel is used for machine alarm and status conditions. Below is the meaning behind this light.

Note: A piezoelectric horn is available. It can be configured to activate on warnings, faults or at a preset count. See the machine setup section for information on how to set this.

Status Light	Meaning	Description
Red	Fault	A fault or safety condition has stopped the machine
Orange	Warning	There is a condition that requires operator attention. The machine will continue to operate
Flashing Orange	Table is Homing	The table is moving home after safety reset and start
Off	Waiting to Start	The system has homed but the blade must be started before the saw can operate
Flashing Green	Ready	The saw is ready but not yet running. Choose Run Product or Run Scrap to begin
Green	Running Production	The system is cutting production parts at the preset length.
Flashing Green and Orange	Running Scrap Profile	The saw is cutting Scrap parts

7.1 Safety Information

Caution: The blade should only be accessed after the machine has been powered down and locked out with proper lockout / tag procedures**.**

Caution: Ensure the blade has completely stopped. It may coast for many minutes.

NOTE: The Emergency stop will immediately stop table motion and the blade power will turn off. However, the blade will continue to coast for many minutes.

NOTE: Quicker method: While the machine is still powered and safe, Use Stop then "Stop Blade" on the Quick Ops screen. This will stop the blade in about 45 seconds using the brake power control in the drive. After this period, the saw can be safely powered down and locked out.

Please contact NOVATEC if there are any questions or concerns.

8.0 SCREEN CONVENTIONS AND COMMON ELEMENTS

8.1 Button Borders

Buttons with a function have a raised border. When grey, there is no function. Pressing a button with a grey border causes a popup screen to appear with the prompt to enter a username, followed by password.

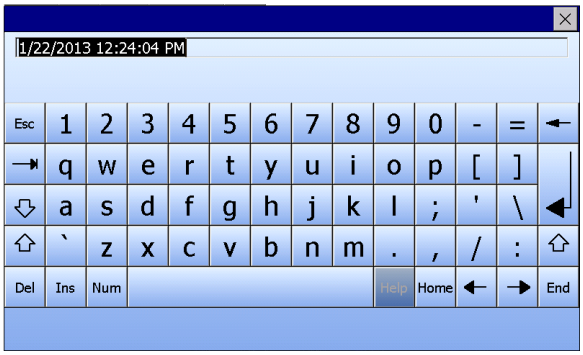
Pressed buttons change their border shadow to indicate to the operator that the press was recognized. A greyed button or field indicates that there is no function associated at the current access level. A higher-access level might allow access. Information prompts are also on a grey background.

8.2 Logon, Password levels & Alphanumeric keypad for entering username / password

These procedures are common to all NOVATEC Pullers and Cutters.
Press 

in upper right-hand corner of the screen.

An alphanumeric keyboard appears …



NOTE: If the user access is not at a sufficient level, the operator will be prompted to enter a higher access level. A username and password must then be entered before any changes can be made.

Default Usernames and Passwords
level1: 1111 (Operator)
level2: 2222 (Production Supervisor)
level3: 3333 (Maintenance)
setup: 4444 (Setup for factory presets)

NOTE: Access levels should be assigned to specific levels of personnel to avoid unwanted changes being made to sensitive settings.


is used to log out and secure the system.

8.3 Screen Title

A Title is shown in the top center or every screen.

8.4 Machine Status

Machine Status is shown in the top right-hand corner of every screen.

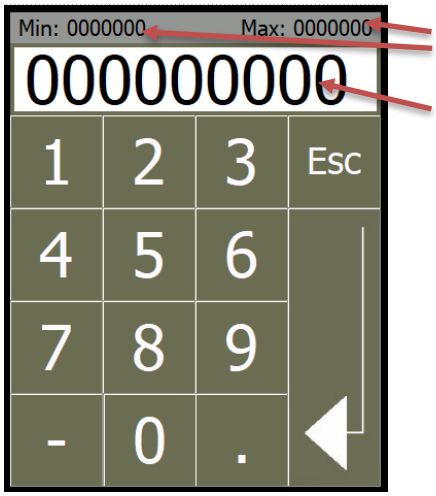
8.5 Standard Navigation Buttons

Four common buttons appear at the bottom of every screen. These provide quick navigation to other screens.

To previous screen	To Home Screen	To QUICK OPS screen	To Alarms screen

8.6 Numeric Keypad (template)

Numeric parameters can be changed by the operator. Use Enter to accept the value that is typed in, otherwise use Esc to leave the previous setting unchanged.



Maximum
Minimum

Current Value shows here when keypad first appears and is seen changing when a new value is typed in. Value entered cannot exceed limits.

8.7 HOME Screen

Quick Ops - opens the quick ops screen.

Recipe Select - opens the recipe select screen.

System Setup - opens the system setup screen (requires Level 3).

Batch Counters - opens the batch counter screen.

CS-6

Center text and image shows model number and image for this saw. If the picture remains blank, there is likely a problem with communications.

Software Version – quote your revision number when contacting NOVATEC service.

9.0 POWER UP SEQUENCE

When powering up, a series of boot up operations take place to ensure that the safety system is functioning properly.

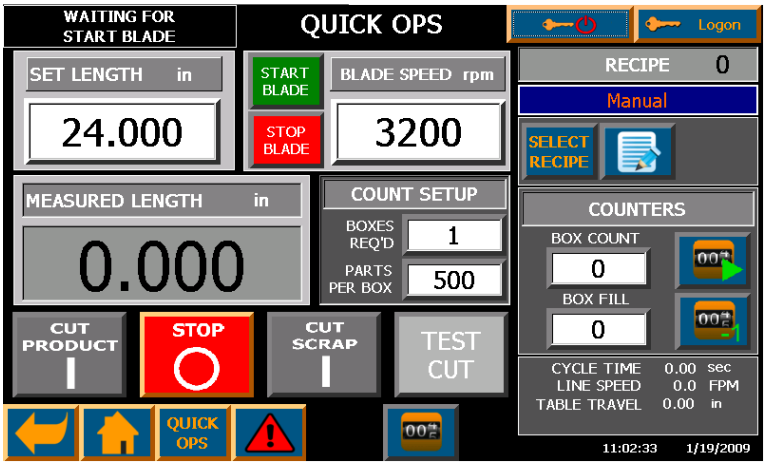
Splash Screen – is shown during boot up.
The screen is initially blue with a few icons and then the splash screen appears for about 3 seconds. If the splash screen remains on for too long maintenance should check for problems.

Reset System to Home - in the top-left corner instructs the operator to Reset the System to home the saw table.

Follow along with on screen instructions – if safe to move the saw it will begin HOMING (searches for home sensor, then forward to offset).

The status light on top of the machine will blink orange while homing. When home has completed, the screen will change to the Quick Ops screen and the status light will turn off.

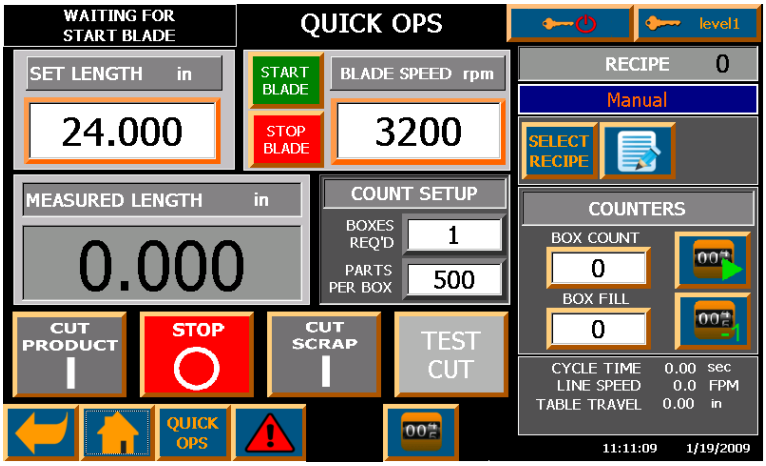
10.0 QUICK OPS EXAMPLE SCREENS



This is the default screen on startup after the splash screen. Quick Ops can also be accessed by using the Quick Ops button on the bottom of any screen.

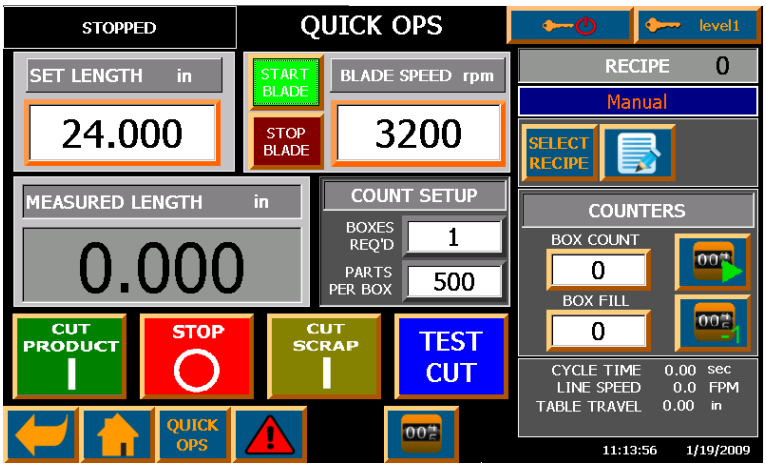
It provides a quick overview and provides buttons and information relevant to the current mode.

Example: the screen before an operator has logged in. Its appearance is based on operating conditions and user setup options.



Example: level1 user. The grey borders around the buttons are now orange to indicate that the user has the proper authority to access them.

NOTE: Cut buttons are grey in the first picture because the saw has not been homed or started. They are available in the second picture – after saw has homed.



Example: level 1 user after saw has been started.

In this view the line is not running yet.

NOTE: Line Speed is indicated in the bottom right-hand corner of the screen and must be > 0.1 FPM in order to operate.

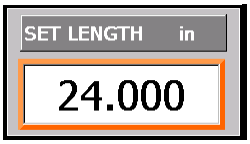
Example: system is running and cutting product. The red Stop button has dimmed, and the green Cut Product button has lit. The status box in the top left-hand corner has changed to indicate that the machine is now running and using an encoder.

The status area in the bottom right-hand corner status shows the last cycle time, line speed and the distance that the table traveled during last cut.

Each cutter is pre-programmed via the SETUP screens.

10.1 Quick Ops Buttons

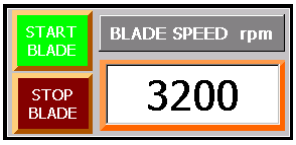
10.1.1 Cut Parameter – is used to enter the cut interval. The actual parameter shown depends on the cut mode.



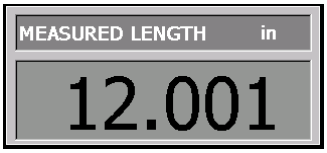
Example: Encoder mode uses Set Length.
Set Length is shown whether the machine is running or stopped.

Cut Mode	Parameter	Units
Encoder	Set Length	in / mm
End Sense	Delay Time	sec
Timer	Cycle Time	sec

10.1.2 Blade Controls – are used to start and stop the blade and to set blade speed rpm.



10.1.3 Measured Length - shows actual length.
Options are to latch the last cut length or to hold the last cut length for a time before showing accumulated length. When an encoder is not used this parameter will remain zero.



10.1.4 Control Buttons

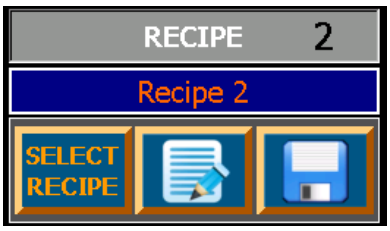
Cut Product – is used to start cutting good product. If count is enabled, pieces will be counted.

Stop – is used to stop the cutter. If a cut cycle has already begun, it will continue running until the table has returned home.

Cut Scrap – is used to start cutting using the scrap settings. These pieces are not counted. Scrap can be used to change modes. The Cut Scrap button may be hidden from the operator – see System Setup.

Test Cut - causes a test cut. The test cut can be executed at any time. It is not counted. The method for executing a test cut can be set in two ways in the system setup – see System Setup.

10.1.5 Recipe Functions



Recipe Number - the grey field at the top shows the active recipe number.

Recipe Name - the blue field shows the active recipe name associated with recipe number.

By default, recipe names are “Recipe” followed by recipe number. A level 2 operator can set a recipe from the Recipe Management page.

is used to access a preconfigured recipe. On power up, recall recipe is shown. This allows a quick recovery of a recipe after a power outage.

is used to edit the current recipe. Cut parameter, blade speed and count setup values are part of the recipe. Some items in a recipe can be changed by a level 1 operator, others require a level 2 operator. All parameters are visible.

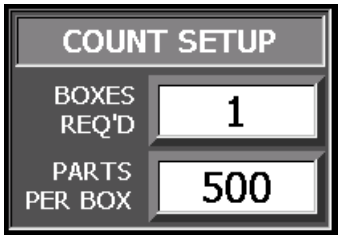
is used to update the recipe. It is blue when active for level 2 and higher operators. This button will remain grey if no changes were made. Confirmation to save is required as current recipe will be overwritten.

Update Recipe popup appears with options - Yes, No or Save As.

Special Manual / Default Recipe - a special recipe is available for when the operator wants to manually enter values without accidentally overwriting an existing recipe. This is known as the "Default" recipe. The recipe number for the default recipe is 0 and its name is "Manual". This recipe is factory set with known good starting values for a typical new product - see Recipe Select.

10.1.6 Count Setup

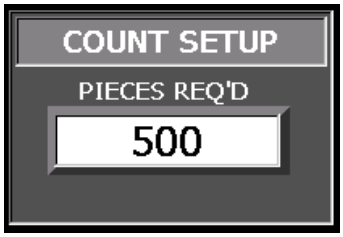
- is used to determine when a batch and / or a job has finished. The appearance of this section depends on the box count option.



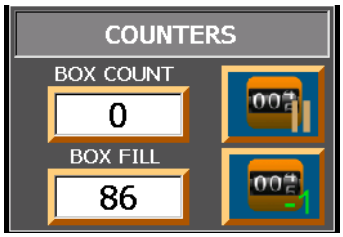
Counts can be set up to activate functions, alarms, and outputs based on when a box or production run has finished.

If "Boxes Req'd" or "Pieces Req'd" are reset to 0, the production run will never provide a finished event.

"Parts Per Box" must always be greater than zero in order to be active.

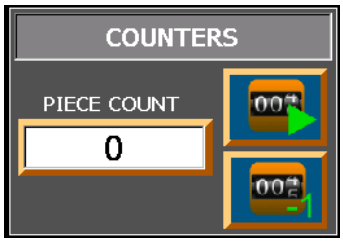


10.1.7 Counters – Quick Ops version



These parameters are for the batch counter. The choice will depend on whether box counting is used. Press a count value to change it. Standard numeric keypad appears.

The button in the top-right corner is for pause or run.

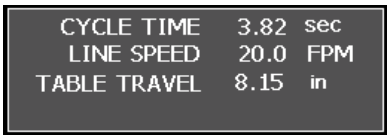


The button in the bottom-right corner is used to remove one part from the count, for example operator notices a damaged part so removes it and subtracts 1.

 is available to access counters from home screen.

10.1.8 **Batch Counter Setup -** accesses batch count features - see Counters section.

10.1.9 Production



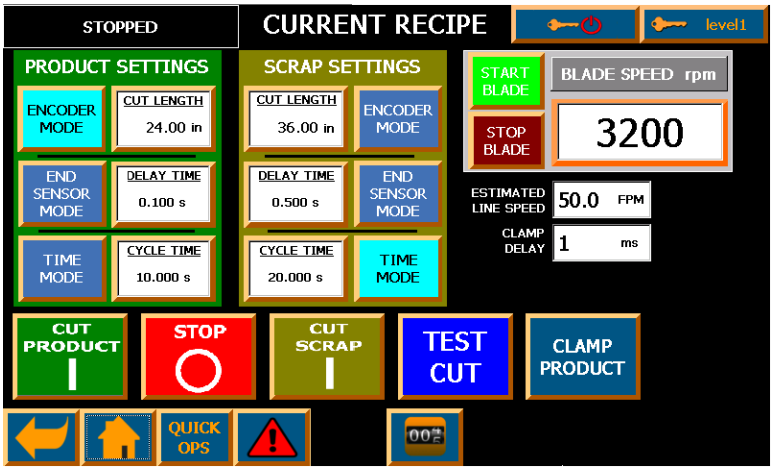
This status area displays useful information about the process.

- **CYCLE TIME** measures how long it took to execute the entire cut cycle from leaving to returning to the home position.
- **LINE SPEED** is the calculated line speed – typically based on encoder scale.
- T**ABLE TRAVEL** indicates the forward travel that the table used on the last cut (maximum forward travel is 21 inches).

11.0 RECIPE SCREENS

11.1 Current Recipe

is used to access the current recipe. Product and Scrap have the same options, which can be set different from one another.



Encoder Mode – sets a mode based on a measured length interval. Length is typically provided by an encoder mounted on an upstream Puller. Other methods are available.

Cut Length – is used to set the part length when in Encoder Mode.

End Sensor Mode – is used to trigger a cut from a sensor input.

Delay Time – Set the time in seconds after the end sensor activates before the cut is activated. 0.000 s causes the cut to occur instantly.

Time Mode – sets a mode based on a time interval.

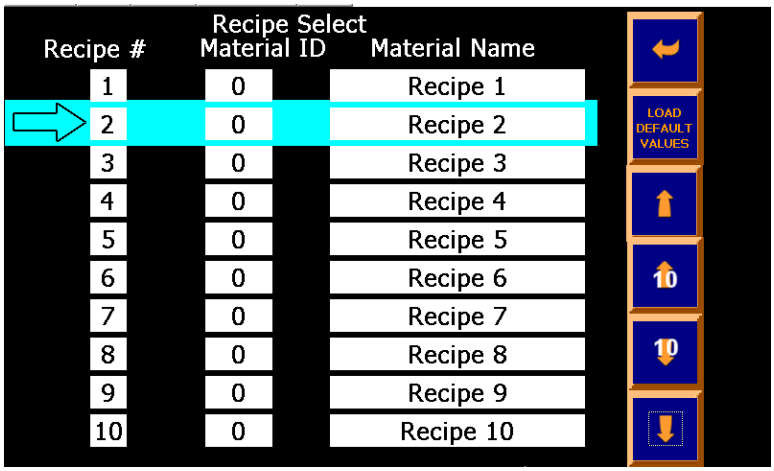
Cycle Time – sets the time interval.

Blade Controls – this section is used to start and stop the blade and to set the blade speed. Blade speed can affect cut quality and minimum length possible.

Estimated Line Speed – calculates line speed from an encoder source. This can be set manually when not using an encoder. Speed can also be via a ProfiNet source, for example provided from upstream Puller.

Clamp Delay - is used to delay the saw activation.

11.2 Recipe Select



Up and Down arrows are used to navigate to the required recipe. Arrows with ‘10’ in them provide navigation one page at a time.

Recipe 1 requires that the down button be pressed once followed by the up button.

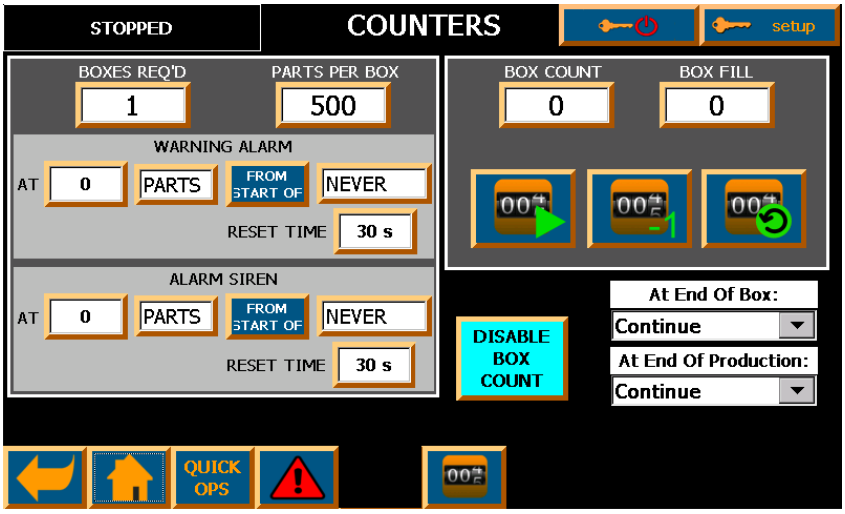
is used to activate the highlighted recipe. Example: Recipe 2 is highlighted above so will be loaded by this button.

An alternative option is to use "Load Default Values" – this activates the manual recipe.

Recipe Save As

is available to save a recipe. The Recipe Save As screen is the same as the Recipe Select screen except that the LOAD DEFAULT VALUES option is replaced by the check box. Select the recipe where to save, then press the check box button.

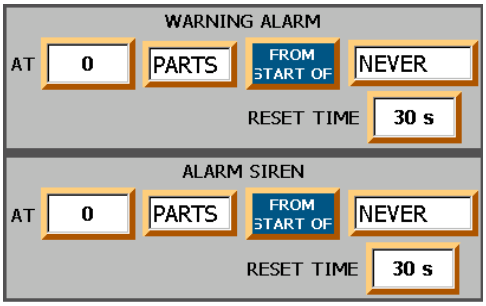
12.0 COUNTERS



Many presets here are duplicates to those available in the Quick Ops section. The following explains the extra options not mentioned in Quick Ops section.

Press and hold to reset counters.

Alarms



Options are available to activate a warning message or sound a siren when a production reaches a certain count.

Enter the time or number of parts required to activate the event – by using the “At” preset.

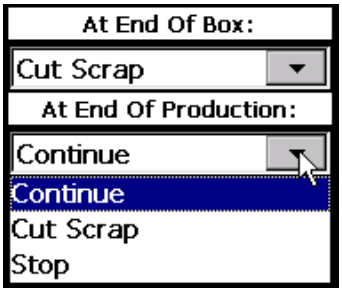
The second preset sets whether the event will activate by part count or by time in seconds or minutes.

The third preset sets whether the count will be from the start or the end of a selected event.

The fourth preset can be set to Never, End of Box, End of Production, or Both.

The Warning Alarm actives a warning message.

The Alarm Siren activates the horn, which can be silenced in the Quick Ops section. The siren must be configured in System Setup. Enter how long this alarm should remain activate in the Reset Time field. A setting of zero will latch the event until the operator acknowledges it or the condition is no longer present.



At End of Box: - is used to determine the action of the saw when the part count reaches the end of box. End of Box requires box count to be enabled.

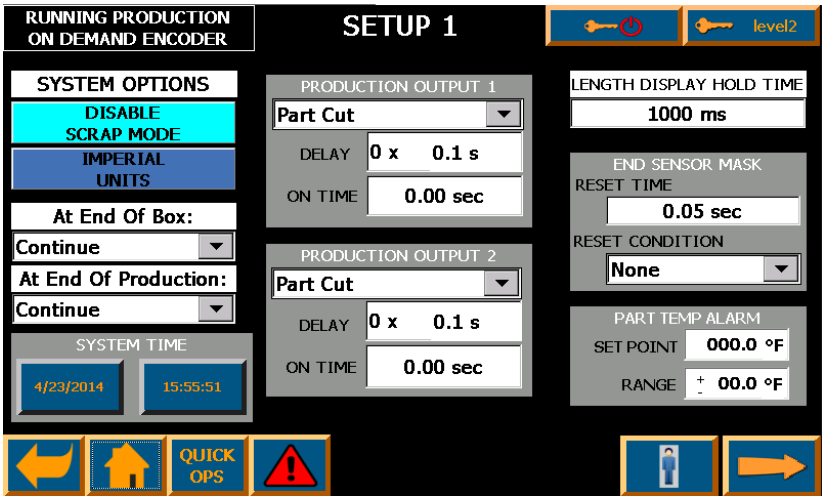
At End of Production: – is used to determine the action of the saw when the part count has reached the total pieces setting.

- **Continue** – the saw keeps cutting the same product and counter continues to increment.
- **Cut Scrap** – if scrap mode is enabled, the saw will now execute the scrap recipe and the piece counter will stop.
- **Stop – stops the saw**.

Box Count – has a toggle action and is used to enable or disable the box counting method. Box count is enabled when the button is lit.

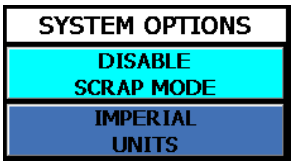
13.0 SETUP SCREENS

13.1 SETUP 1



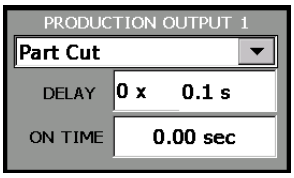
Level 2 or higher is required to access.

The arrow to go to the second setup page will appear for users with level 3 or higher.



Enable / Disable Scrap Mode – has a toggle action.
Scrap Mode is enabled when lit.

Imperial / Metric Units – has a toggle action and is used to select units between English (inches) or Metric (millimeters).

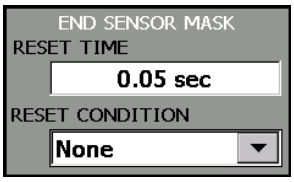


Production Outputs - two dry contact outputs are provided at the PLC - DQ8 relay extension module (page 7 of schematics – econn18 M12 F 5-pin is available for remote quick connect). An optional Analog output is available.

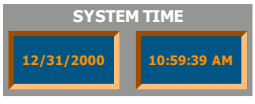
Production Output 1 = Q8.0
Production Output 2 = Q8.1

Each output can be configured to trigger on many events including Part Cut, Box Change, Production Done, Running, Run Product, Run Scrap, Stopped or Faulted. These signals can be delayed and held using the time settings. These outputs are low priority with a typical latency of about 30 ±10 msec.

this setting determines how long the display will hold the last cut before showing the next accumulated cut length.
Set to zero to only show the last cut length.



this setting is similar to a filter or anti-bounce and is used to prevent unwanted triggers from the sensor input. Reset time acts like an ignore period. A good rule of thumb is to set this to 75% of the expected time between cuts so that it is ready just before the next trigger. This mask can be configured to use the positive or negative signal edge. End Sense is on PLC Input 0.3 (page 4 of schematics – econn17 M12 F 5-pin is available for remote quick connect).

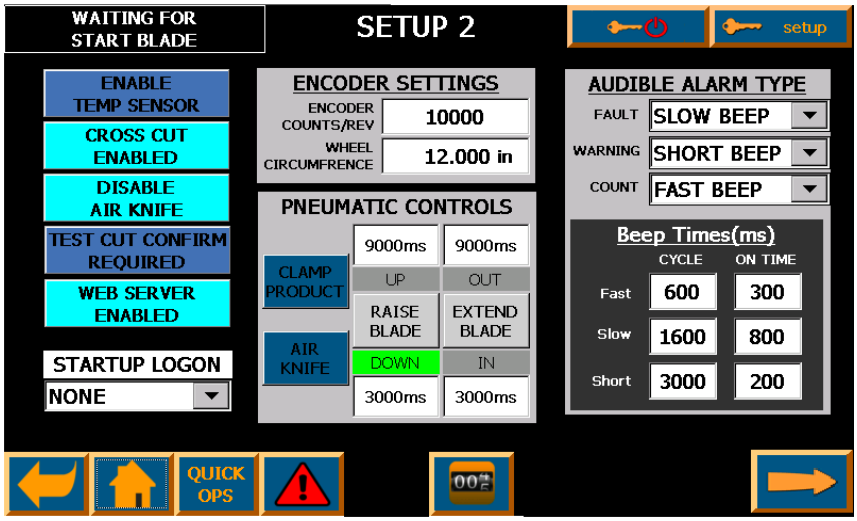


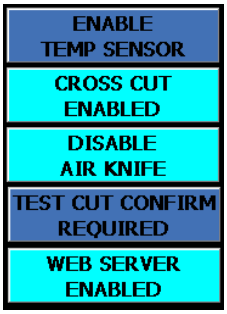
use to set system date and time.

User Configuration - selects the User Configuration screen.

13.2 SETUP 2

Set up 2 is available for level 3 and higher users.





Temperature Sensor – currently unavailable on saws.

Cross Cut – for cross-cut saws. Uses a different valve sequence than standard.

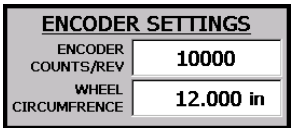
Air Knife - for air knife option.

Test Cut Confirm Required – option for popup window to confirm a test cut.

Web Server – for access by another HMI or web browser. A license is required - a message will appear every few minutes if the license is missing and access will be blocked.

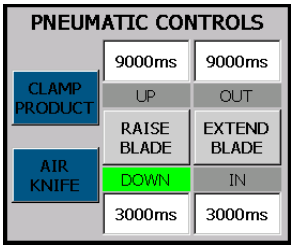
All machines ship with user login set to NONE. This means an operator must log in to start the machine at power up. The saw can be fixed to start up at level 1, 2 or 3. **NOTE:** Be wary of using a higher than needed setting as this will give operators access to areas which they do not need.

Encoder Scale



Counts per Revolution – this sets the number of quadrature counts per revolution of the encoder. Example: A 5,000-ppr Quadrature Encoder, using the method known as Quadrature x 4 provides 20,000 counts per revolution. Quadrature Encoders use two inputs known as channel A and channel B.

Wheel Circumference – this is the linear distance for one turn of the encoder measure wheel. If an encoder is attached to a pulley drive shaft use pulley diameter x pi.

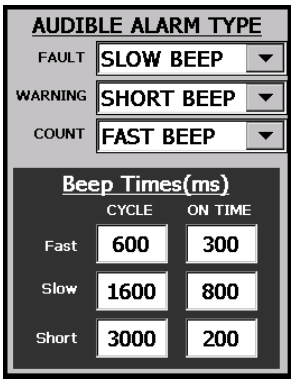


Pneumatic Controls – this area is available for manual test of the pneumatics. Air Knife and Extend Blade options are included when installed.

Buttons appear red when active.

Sensors when installed light up green when on.

Timers are available to set duration of each activity.

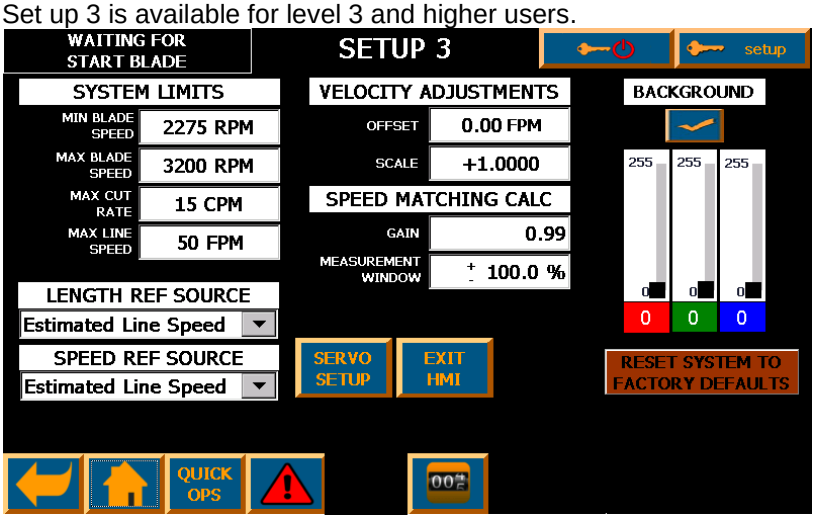


Audible Alarm Type - is used to configure the horn sounds. Different sounds can be set for Fault, Warning, and Count complete.

Alarm choices are None, Slow Beep, Short Beep, Fast Beep, and Continuous. Each beep duration and frequency (cycle time) can be customized.

13.3 SETUP 3

Set up 3 is available for level 3 and higher users.



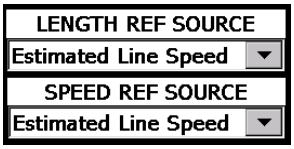
System Limits – defines blade speed and cut-rate limits.

Min Blade Speed - sets the minimum blade speed that can be entered on the recipe screen. Factory default is 2,275 rpm.

Max Blade Speed - sets the maximum blade speed that can be entered on the recipe screen. Factory default is 3,500 rpm.

Max Cut Rate – this determines the minimum time between cuts. Example: 15 CPM = 15 pieces may be cut per minute (60 / 15 = 4 seconds per cut).

Max Line Speed – sets the maximum line speed allowed. This also sets the speed for the table to return to home. Factory default is 50 fpm.



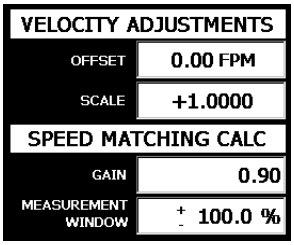
Length Reference Source– sets the source measuring method.

Speed Reference Source - has the same options as the length reference but is used for table speed.

Estimated Line Speed – provides a line speed simulator.

Encoder – uses the encoder counts for length and / or line speed.

ProfiNet – is for a communication connection between a NOVATEC supplied puller and saw. The puller transmits its actual speed as a ProfiNet telegram to the saw every tenth second.

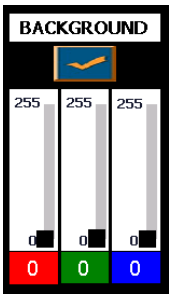


Velocity Adjustments – is available for calibration of input reference velocity.

- **Offset** – adds a signed value to the input reference.
- **Scale** – scales the input reference. This is a multiplier value.

Speed Matching Calc – is used to set response.

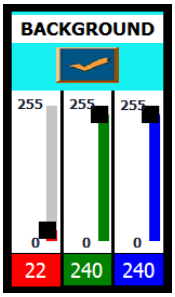
- **Gain -** determines how fast the cutter responds to changes in line speed. Setting 0.99 provides immediate reaction but can cause oscillation. A typical setting it between 0.5 and 0.8.
- **Measurement Window** – determines range. Three line speed readings outside the expected range window will cause the saw to stop. A setting of 100% overrides this check.



Screen Background Color - color mix - the Red, Green and Blue content for the background can be mixed by using these sliders. Alternatively, enter RGB values directly at the bottom.

The area around the check box shows the color mix result. When the color is as desired, use the checkbox to update the background color for all pages. Black (0,0,0) is the default background color.

CAUTION: Care should be taken when using very bright colors or colors that match other presets because this can cause a bleach out of some items.



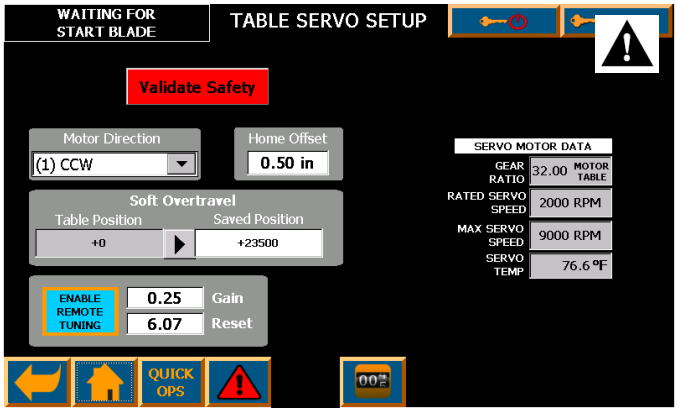
Example: RGB set to 22, 240, 240

this button will reset all setup values back to factory default. A drop-down box appears with the option to accept or cancel. Use only if the setup values are altered such that the saw does not run properly.

SERVO SETUP – this is for maintenance and experienced operators. Aa detailed setup information page is provided for the cutter servomotor. This button is greyed out while the system is running.

EXIT HMI – this is for maintenance personnel only. The operator interface program (saw program) quits, and the Windows CE operating system begins. All control of the machine is lost until the operator exits from Windows CE or machine is recycled.

13.4 Servo Setup Page



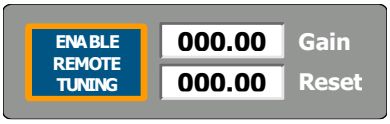
CAUTION: Care should be taken when accessing this page. Incorrect values set on this page by unqualified personnel could make the saw unusable

Validate Safety - is used when commissioning the servo system or after a component is replaced. The procedure checks the components of the system against the stored safety program to ensure they match. Since components and software can be upgraded, this test must be performed even if the component being changed is the same type. The validation of components is required for the servo motor, encoder, power module, control unit, program, and compact flash (CF) card. The safety license is stored on the CF card. If missing, a warning is shown but the saw will still operate.

Motor Direction – the motor direction is set when the machine is first commissioned

Home Offset – saws require a home reference. This is a sensor near the start end of the table. On initial startup the saw table moves to the home sensor. The table then moves forward to the Home Offset position and stops. This final position is the table home position (absolute zero). The home sensor now acts as a travel limit in case the table does not stop at home.

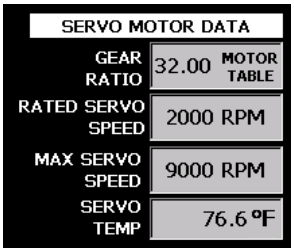
Soft Over-travel – provides a soft over-travel position of the table relative to the home position. Manually move the table to the desired position and press the arrow to save. A confirmation message appears in the numeric field.
NOTE: Home must be done first.



Remote tuning – is used to change tuning parameters for the table servo. These values can be adjusted to account for load and aging of the equipment.

WARNING - Improper settings could cause the servo to become unstable, or to lose torque or continuously fault. Remote tuning can be turned on or off.

Servo Motor Data– These values are for reference only and are dependent on the equipment installed.



Gear Ratio - Shows the gearbox / reducer ratio. Example: 32:1 gearbox.
Rated Servomotor Speed – is the rated speed of the motor at the rated torque and 400V - can be affected by ambient temperature and supply voltage.
Max Servomotor Speed – is the nameplate maximum speed of the motor.
Servomotor Temperature – actual temperature of the motor. *Most motors can handle temperatures up to 140°C (284°F).*
WARNING - Frequent heating and cooling of the motor can cause premature damage due to expansion and contraction.

14.0 MAINTENANCE

It is recommended that maintenance and inspection be performed on a scheduled basis. Maintenance requirements vary for each installation and operating condition. It is suggested that a complete inspection be performed with necessary maintenance at the end of the first month, first three months, and first six months. These inspections will indicate how often future maintenance might be necessary.

- ❑ All electrical, mechanical repairs and tests MUST be performed by qualified personnel.
- ❑ Disconnect electric power from the machine before accessing the electrical enclosure.
- ❑ Depressurize pneumatic system before performing maintenance or repairs on pressure containing components.
- ❑ Do not disable or bypass equipment safety features.
- ❑ Refer to system component manuals for additional information.

WARNING: Before beginning repair work, disconnect all power sources (electric and pneumatic) and secure against inadvertent reconnection.

WARNING: Auxiliary equipment may contain moving parts that may cut, crush, or otherwise injure personnel if safety access covers are removed. Do not place hands or limbs in equipment during operation.

Installation

- ❑ Record equipment serial numbers and program revision level. Space is reserved on page 2 for this.

At Startup

- ❑ Verify all guards are in place and fully closed.
- ❑ Ensure hoses are attached securely.

Daily

- ❑ Clean debris from around the saw and inspect the cabinet for debris which would affect proper saw motion. In severe circumstances do this more than once daily.

Weekly

- ❑ Inspect belt tension - if necessary, readjust.

Every 100 Hours

- ❑ Lube the CS-6 saw cylinder guide bearings with sae 10w general purpose oil.

Every 3 Months

- ❑ Check all electrical connections to make sure that they have not become loose, especially connections at contactors (motor starters).
- ❑ Check all air lines to make sure they have not come loose.
- ❑ Use machine oil to flush / lubricate linear pillow block bearings.

15.0 WARRANTY NOVATEC, INC. - EFFECTIVE DATE 8 MAY 2017

NOVATEC, INC. offers COMPREHENSIVE PRODUCT WARRANTIES on all of our plastic's auxiliary equipment. We warrant each NOVATEC manufactured product to be free from defects in materials and workmanship, under normal use and service for the periods listed under **"Warranty Periods".** The obligation of Novatec, under this warranty, is limited to repairing or furnishing, without charge, a similar part to replace any part which fails under normal use due to a material or workmanship defect, within its respective warranty period. It is the purchaser's responsibility to provide Novatec with immediate written notice of any such suspected defect. Warranted replacement parts are billed and shipped freight pre-paid. The purchaser must return the suspect defective part, freight prepaid and with identifying documentation to receive full credit for the part returned. Novatec shall not be held liable for damages or delay caused by defects. No allowance will be made for repairs or alterations without the written consent or approval of Novatec.

The provisions in equipment specifications are descriptive, unless expressly stated as warranties. The liability of Novatec to the purchaser, except as to title, arising out of the supplying of the said equipment, or its use, whether based upon warranty, contract, or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided. All such liability shall terminate upon the expiration of said warranty periods. Novatec shall not in any event be held liable for any special, indirect, or consequential damages. Commodities not manufactured by Novatec are warranted and guaranteed to Novatec by the original manufacturer and then only to the extent that Novatec is able to enforce such warranty or guaranty. Novatec, Inc. has not authorized anyone to make any warranty or representation other than the warranty contained here. Non-payment of invoice beyond 90 days will invalidate the warranty. A renewed warranty can be purchased directly from Novatec.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any issues in connection with our equipment.

Warranty Periods:

Note: All warranty periods commence with the shipment of the equipment to the customer.

5-Year

Resin Drying to Include

NovaWheel™ Dryers *
Dual Bed Dryers
NovaDrier *
NDM-5 Membrane Dryer
Gas-Fired Process Heaters
Gas-Fired Regeneration Heaters
Drying Hoppers
Central Drying Hopper Assemblies
Heater/Blower Units and Hot-Air Dryer
Silo Dehumidifiers
NovaVac Dryers *

Resin Blending and Feeding to Include

WSB Blenders, MaxiBatch & Feeders *
Gaylord Sweeper Systems

Resin Conveying to Include

GSL Series Vacuum Loaders
GlassVu Loaders, Receivers and Hoppers

Downstream Extrusion Equipment to Include

C and NC Bessemer Series Cutters
NPS Bessemer Series Pullers
NPC Mini Puller/Cutter
All NS Series Servo Saws
All Cooling and Vacuum Tanks Manufactured by Novatec

3-Year

When a Prophecy data plan is activated for VPDB and SVP pumps with PumpSense™, Novatec automatically extends the warranty to 3 years. The data plan must be activated within 60 days after pump shipment and remain active through the warranty period to maintain extended warranty eligibility. The first 6-months of data plan usage is free from Novatec.

2-Year

Central System Controls to Include

FlexTouch™ Series Controls
FlexXpand™ Series Controls
OptiFlex™ Series Controls
PLC Communications Modules
Greenboard Communications Modules
LOGO! Mini PLC

Moisture Measurement Equipment to Include

MoistureMaster®

PET Resin Crystallizers

Resin Conveying and Systems Components to Include

VL/VLP Series Loaders
VRH, VR, VR-FL & VRP Series Receivers
Compressed Air Loaders
AL-B Barrel Loader
Cyclone Dust Collectors
Conveying System Accessories
Surge Bins
Valves and Accessories
Electronic Metal Separators
Quick Select Manifolds
Tilt Tables
Filter Dust Collectors
Drawer Magnets

1-Year

Resin Conveying System Components to Include

*VPDB Vacuum Positive Displacement Pumps
*SVP Vacuum Pumps
MVP Vacuum Pumps
UltraVac Vacuum Pumps
Vacuum Regenerative Blower Pumps
Velocity Control Valves

*See 3-Year Warranty above

Central System Controls to Include

MCS-600 Series Controls – (Distributed I/O)
MCS-400 Series Controls
CL Silo Manager

Infrared Drers
Custom Eqipment of any kind unless otherwise specified.
Railcar Unloading System

Exclusions:
Routine maintenance/replacement parts are excluded from the warranty. These include, but are not limited to hoses, desiccant, filters, filter elements, wiper seals, gaskets, dew point sensors, infrared lamps, motors, internal solenoids, fuses and motor brushes. Use with abrasive materials will void the warranty of any standard product. Wear resistant options may be available to extend usable service life with abrasive materials. Novatec reserves the right to limit the warranty if the customer installs replacement parts that do not meet the specifications of the original parts supplied by Novatec.

***Specific Exclusions:**

1. NovaDrier warranty is void if coalescing filters are not replaced on a 6-month or yearly basis (per instruction manual) and / or membrane has been exposed to ozone.
2. NovaVac Dryer -The ability of the canisters to hold vacuum will be compromised if the vacuum seal edge is damaged. from mishandling. We do not warranty canisters damaged from improper handling. We do, however, warranty the seals.
3. LOAD CELLS on our WSB's are covered by Novatec standard warranty as long as they have not been damaged from improper handling.
4. Desiccant Wheel Warranty will be void if the wheel has been exposed to plasticizer, dust, or other contaminants as a result of negligence on the part of the processor.

This warranty shall not apply to equipment:

1. Repaired or altered without written approval of NOVATEC unless such repair or alteration was, in our judgment, not responsible for the failure.
2. Which has been subject to misuse, negligence, accident, or incorrect wiring by others.
3. Warranty is void if processing rates exceed manufacturer-recommended levels or if damage is caused by ineffective power isolation and/or power spikes/sags or incorrect installation.

NOTE: All conditions and content of this warranty are subject to changes without notice.