Please record the following information, which is specific to this piece of equipment, in the space provided. Our Parts/Service Department will need these numbers to properly respond to any of your requests.


Model #: _____________________________

Serial #: _____________________________

DISCLAIMER: NOVATEC, Inc. shall not be liable for errors contained in this Instruction Manual nor for misinterpretation of information contained herein. NOVATEC shall not, in any event, be held liable for any special, indirect or consequential damages in connection with performance or use of this information.
Table of Contents

1.0 PURPOSE OF THIS MANUAL ........................................................................................................ 2
2.0 SAFETY PRECAUTIONS AND WARNINGS .............................................................................. 2
3.0 GENERAL DESCRIPTION ............................................................................................................ 3
4.0 SPECIFICATIONS ....................................................................................................................... 4
5.0 FEATURES ................................................................................................................................ 7
6.0 TYPICAL APPLICATIONS ........................................................................................................... 9
7.0 PLC OVERVIEW ......................................................................................................................... 9
  7.1 General ..................................................................................................................................... 9
  7.2 Startup and Power Loss ............................................................................................................ 9
8.0 PLC ICONS ................................................................................................................................ 9
9.0 OPERATING PRINCIPLES ......................................................................................................... 12
10.0 INSTALLATION ........................................................................................................................ 13
  10.1 Mechanical Installation ...................................................................................................... 13
  10.2 Electrical Installation ........................................................................................................... 15
11.0 INITIAL SETUP SCREENS ..................................................................................................... 17
  11.1 Accessing SETUP Screens .................................................................................................. 17
  11.2 SETUP PAGE 1 ................................................................................................................... 18
  11.3 SETUP Page 2 (setup level authorization) ....................................................................... 19
  11.4 SETUP Page 3 .................................................................................................................. 21
12.0 RECIPE MANAGEMENT ......................................................................................................... 22
  12.1 Saving Recipe From Production Run (Quick Ops) ............................................................ 22
  12.2 Editing An Existing Recipe ............................................................................................... 23
  12.3 Editing A Current Recipe .................................................................................................. 23
  12.4 Footage Counter Page ....................................................................................................... 24
  12.5 System Diagnostics Screen .............................................................................................. 25
  12.6 AlarmScreen ...................................................................................................................... 28
13.0 PULLER OPERATION .............................................................................................................. 31
14.0 MECHANICAL MACHINE ADJUSTMENTS ....................................................................... 32
  14.1 Verify Pressure Setting for Belt Tension - Overview ...................................................... 32
  14.2 Belt Clamp Pressure Calibration .................................................................................... 32
  14.3 In case a re-calibration of the pressure transducer is required ....................................... 33
  14.4 Setting Belt Gap for Thin-Walled Extrudate .................................................................. 34
  14.5 Pull E-Stop pushbutton ..................................................................................................... 34
  14.6 Setting Up A Production Run .......................................................................................... 35
  14.7 Detailed Setup Screens .................................................................................................... 36
15 MAINTENANCE ......................................................................................................................... 37
  15.1 Replacing Belts .................................................................................................................. 38
  15.2 Trouble Shooting – Air Pressure Switch for Belt Tension ................................................ 38
16 WARRANTY – NOVATEC, INC. - EFFECTIVE DATE 5-1-2013 ERROR! BOOKMARK NOT DEFINED.
1.0 PURPOSE OF THIS MANUAL

This manual describes the installation and operation of the NOVATEC Model NPS Flat Belt Puller. Before installing this product, please read this guide and any additional guides associated with the system’s auxiliary equipment.

Explanation of Symbols

- **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 only.
- NEVER disable or remove safety features. Doing so can result in severe injury.
- Always disconnect power before servicing.
- Refer to the machine serial number nameplate and drawings supplied with this system for actual 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/fuse protection.
- The customer is required to operate the equipment with all safety features in proper working condition.
3.0 GENERAL DESCRIPTION

NOVATEC Precision Belt Pullers pull extruded products through sizing and or cooling tanks and regulate the consistency of the extrusion process. Two independently powered traction drives provide accurately regulated speed control and eliminate the slippage between top and bottom belts. This is achieved by precisely regulating the lower belt with encoder feedback and providing constant torque to the top belt. In this way, speed of belts is precisely synchronized and there is no relative motion between top and bottom belts which will contribute to speed regulation inaccuracies.

Traction assemblies are available in the following sizes:

<table>
<thead>
<tr>
<th>Metric</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.16 cm wide x 76.2 cm traction length</td>
<td>4&quot; wide by 30&quot; traction length</td>
</tr>
<tr>
<td>15.24 cm wide x 101.6 cm traction length</td>
<td>6&quot; wide by 40&quot; traction length</td>
</tr>
</tbody>
</table>

Two 800W [1horsepower] servo motors are powered by independent dual servo drives. Two high efficiency double reduction helical gear reducers provide speed and torque matched to application requirements and traction assembly size.

Each traction assembly is mounted to a rigid and accurate steel carriage which rides vertically on 'V' rollers to adjust the traction assembly position. The lower traction assembly is positioned by means of a jack screw and hand wheel to set the centerline height of the extrudate. The upper traction assembly is held open with a gas spring until closed with force applied with an air cylinder. Air cylinder pressure is set by a pressure regulator. A pressure transducer allows a display of the clamp force setting for process repeatability. The upper traction assembly position can be controlled via a hand wheel actuated down stop. In this way, collapse of very thin walled extrudate is prevented.

Each puller belt is accurately tensioned by means of a pair of air cylinders inside the traction assembly. The air cylinders are regulated and acting on the driven pulley at the in-feed end of the belt. The air cylinders are monitored with a pressure switch so that tension is assured before operation of the drive motors. A bleed valve allows relief of the tension cylinders for belt changes.

CE rated machines feature a safety enclosure which prohibit access to hazard zones. Alternately, non CE machines feature walk thru guarding which limit access to in-running nip points at the in-feed entrance when properly adjusted.
4.0 SPECIFICATIONS

NPS Performance Characteristics

Belt Width X Length

- 10.16 cm wide x 76.2 cm [4” x 30”]
- 15.24 cm wide x 101.6 cm [6” x 40”]

Max recommended feed opening: 4” for 4” wide belts, 6” for 6” wide belts

Max possible feed opening: 22.8 cm [9”]

Total horsepower: 1.6 kW [2 hp] - all NPS machines

Drive Type: Dual Servo

Gear Ratio/Belt Speeds (full torque range):

<table>
<thead>
<tr>
<th>Gear Ratio</th>
<th>Speed - meters/minute</th>
<th>Speed – Feet/Minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>58.33:1</td>
<td>0.16-16</td>
<td>0.5-50</td>
</tr>
<tr>
<td>52.50:1</td>
<td>0.18-18</td>
<td>0.6-60</td>
</tr>
<tr>
<td>43.53:1</td>
<td>0.2-20</td>
<td>0.7-70</td>
</tr>
<tr>
<td>29.10:1</td>
<td>0.3-30</td>
<td>1-100</td>
</tr>
<tr>
<td>19.93:1</td>
<td>0.5-50</td>
<td>1.5-150</td>
</tr>
<tr>
<td>15.60:1</td>
<td>0.6-60</td>
<td>2.0-200</td>
</tr>
<tr>
<td>11.42:1</td>
<td>0.8-80</td>
<td>2.75-275</td>
</tr>
<tr>
<td>8.02:1</td>
<td>1.15-115</td>
<td>3.75-375</td>
</tr>
</tbody>
</table>

Dimensions:

- Metric: 109.2 cm wide x 86.4 cm deep
- U.S: 43” wide x 34” deep
- Overall height: 190.5 cm
- 75”
- Centerline height: 106.7 cm ± 5.08 cm
- 42”+/−2”
Weight:

Installed: 544 kg (est.) 1200 lbs. (est.)

Shipping: 590 kg (est.) 1300 lbs. (est.)

Electrical Requirements (full load Amps):

460/3/60: 5 Amps

Belt Cover Material:

- 9.5 mm [3/8”] thick 55 durometer shore A Urethane, standard.

Options

- Remote Belt Speed Control (remote speed potentiometer)
- Remote Touch Screen Controller
- Left to Right Machine Operation
- Input Voltages other than 460/3/60

Belt Cover Options:

- 9.5 mm [3/8”] thick 40 shore A
- 7.9 mm [5/16”] thick 65 or 70 shore A
5.0 FEATURES

- Down Stop Adjustment Hand Wheel
- High resolution touch screen – PLC with digital line rate indicator, recipe management, clamp force setting, setup and process monitoring.
- Upper and Lower Belts
- Horizontally adjustable in-feed
- Lower traction assembly height adjustment hand wheel
- Casters
- Foot Pads for leveling
Belt tension bleed valve with pull ring
And belt tension pressure gauge

Traction Motor Servo Drives

Servo Motor Power and Encoder
Cable Connections.

Air Pressure Switch

Electrical
Enclosure with
Main Power
Disconnect and air
inlet and exhaust fans

Belt Pressure
in psi or bar

Pull Blue Button UP to re-set when necessary

Double Reduction Helical Gear Reducer with optional external encoder mounted on the gear reducer for precise speed reading by other machinery (e.g. cutters).

Industrial RJ-45 socket (shown with cap) for networking Puller PLC with Novatec Cutter or customer's plant PCs (data collection etc.).
6.0 TYPICAL APPLICATIONS

NOVATEC NPS pullers can pull extrudate from a functional extrusion process or from coils. The NPS series of machines can pull tube and profile up to a diameter of about 4” or 6” (depending on belt width). The outer surface (cover) of belt material is important to process consistency. Soft belt cover materials have the best pulling capability and are less prone to slipping; however they are more prone to tearing. Poly V belts are standard on the NPS family of machines and provide better power transmission and tracking as compared with toothed timing belts and flat belts.

7.0 PLC OVERVIEW

7.1 General

The NOVATEC, NPS Series pullers use a Siemens PLC controller to control all functions of the NPS series pullers including recipe management, machine motions, user settings, user display and process monitoring. A high resolution touch screen provides the human to machine interface to the PLC.

7.2 Startup and Power Loss

When power is first applied to the Puller following a power loss, the Puller will return to the Home screen. The last active recipe will remain loaded and can be accessed by pressing the picture of the machine or the button with the puller belts.

8.0 PLC ICONS

The icons used on the touch screen of the PLC are meant to be self-explanatory but the following explanations may be helpful. Touching them will result in the action described.

- **RUN SPEED**
  - Return to Line Speed Set Point

- **RESET TRIM**
  - Reset Speed Trim when in slave run

- **To Next Screen**

- **Back to Last Screen**
View Alarms

To Home Screen

To HELP Screen

Start/Pause Footage Counter for This Run

Start/Pause Footage Counter for Combined Runs

Shortcut to dedicated Footage Counters screen

To System Diagnostics Screen

Backup and Restore Setup Parameters to/from the SD card

To User Management Screen

Terminate HMI Application & Open System Control Panel

Copy & Paste (Edit Recipe Screen)
Activate, Acknowledge or Commit Change

Cancel / Change

Saves Change to Recipe

To Setup 1 Screen

Clamp/Unclamp Upper/Lower Belts

Smart Access Visibility Enabled

Smart Server Enabled

Opens Dashboard
9.0 OPERATING PRINCIPLES

1. The extrusion enters the puller from the upstream side of the puller.
2. Guide rollers or product guides position the extrusion entering the traction belts.
3. A lower hand wheel adjustment adjusts the vertical position of the lower traction assembly.
4. When necessary an upper boom down stop hand wheel adjusts position of the upper boom. (typically, the down stop setting is only used for thin walled sections that would otherwise collapse from excessive clamping force)
5. Upper and lower traction belts move the extrusion through the puller.
6. Pulled material is fed to the cutter.
10.0 INSTALLATION

1. Carefully unpack the puller and any other components delivered with it. Check all packaging for loose parts, documentation, and other included items. Carefully inspect the puller. 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.

2. You may require the following tools to complete the installation:
   a. 16" or 18" adjustable wrench
   b. Metric and Imperial hex wrenches

3. 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 to prevent "shocks" from static electricity that is generated by some materials as they are moved. This is an extremely important step.

   All electronics are susceptible (to varying degrees) 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.

10.1 Mechanical Installation

   **! CAUTION: Lifting hazard/Tip-over hazard:** To avoid personal injury or damage to the puller, lift the puller using a forklift or hoist with straps that been positioned at the pullers center of gravity

   1. **Determine the position of the puller.** Puller position should be selected with consideration to the location of the adjacent cooling tank.

      **WARNING:** Pullers are unidirectional and should only be placed in the product flow direction for which they are designed. Pullers are designed to pull in the direction from the non-motor end toward the motor end of the machine.

      Right to left material flow is the standard machine configuration. Machines designed for right to left material flow will have motors on the left when facing the machine’s touch screen control when properly oriented. The non-motor end of the puller should be closer to the extruder than the motor end of the machine when properly oriented.
Observe all compliance and legal requirements for safety and guarding relating to the machinery installation. Allow at least 300 – 600 mm (12 to 24 inches) between the downstream end of the sizing tank and the input end of the puller so the tank/sizing table can be moved away from the extruder for startup and maintenance. Allow at least 925 mm (36 inches) of clearance in front and back of the puller for user and maintenance access.

Normally, the puller should be as close as possible to the cutter for flexible products, but it may be necessary to allow 6-8 feet between puller and cutter for rigid products. Additional clearance may be required when using electronic sizing gauges.

2. **Once the general position has been determined, carefully align the puller with the extrusion line.** It is easiest to adjust the position on the floor before adjusting to the proper height.

3. **Measure centerline height of extruded product centerline.** Use a laser or liquid level to ensure all equipment is aligned to this height.

4. **Align the puller with the centerline height of this equipment.**

   To adjust the centerline height of the puller, adjust each foot pad at the corners of the base of the puller with a 400-460 mm (16” or 18”) adjustable wrench. Ensure that the puller is level. The bottom of the puller base plate should be positioned 110 mm (4-1/4”) from the floor for a 1067 mm (42”) centerline height.

   **! CAUTION:** Never operate puller while on casters. Always set Foot Pads Puller MUST be Securely Anchored to Floor Before Operation.

5. **Check that Centerline height of the machine allows proper vertical travel for the upper traction assembly.** Some processors attempt to run at higher centerline heights so the material runs over the top edge of an immersion tank. This is permissible as long as there is sufficient travel in the upper traction assembly to allow agglomerates and oversized materials to pass by lifting the upper traction assembly.

   **CAUTION:** Failure to ensure that the upper traction assembly has sufficient vertical travel can lead to premature belt wear/tearing of belt cover.

   **CAUTION:** Failure to ensure that the upper traction assembly has sufficient vertical travel will also prevent opening of the booms and present a crushing hazard for machines with walk thru style guards.

6. **Install puller belt suitable to application.**

   Ensure the recommended belt is installed before start up. Refer to the “Replacing Belts” section of instruction manual if required. Typically soft belts are used for thinner walled more fragile parts and hard belts are used for parts that are less
prone to deformation due to greater compression force. 40 or 55 durometer belts are typically used for general use where machines are not dedicated to particular extrudate geometry. 55 durometer belts are offered as standard for NPS pullers.

7. Install Guarding and adjust product guides

Fully enclosed guarding is provided for machines for use in the European Economic Zone. Each style guard is designed to prevent access to the in-running nip point hazard zones.

CAUTION: Never use equipment without properly installed guarding which is appropriate to its location of use and compliant with local law and compliance guidelines.

Adjust the belt puller guide roller or product guide so that the product is positioned in the center of the belt.

10.2 Electrical Installation

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

- Use shielded cable for communications wiring.
- Keep communication cables and control wiring as far as possible from high voltage equipment. If you must run cable across power lines, run the cable at right angles to the line.
- Ensure the equipment grounding is properly connected. Shielded cable should be grounded at one end only and is typically grounded in the main I/O enclosure.

WARNING: Do not install communication cable where it will come into contact with any buildup of electrical charge!

It may be tempting to run the wire next to the material conveying lines, but a substantial buildup of electrical charge can and will occur, especially with certain types of plastic resins and, if the conveying lines are not grounded, they can arc to the cable disrupting communications and/or possibly causing damage.

Open the puller’s electrical enclosure and insert the main power through a knockout in the wall of the enclosure. Connect the power wire as indicated on the included wiring diagram. Check that all terminal screws are secure. Close electrical enclosure.
Before testing the machine, confirm that the placement and wiring of the puller conforms to all applicable national and local regulations. When ready, turn on the main disconnect. Make sure that the E-Stop button is in the out position. Press the reset button.

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 to prevent "shocks" from static electricity that is generated by some materials as they are moved. This is an extremely important step.

All electronics are susceptible (to varying degrees) 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.
11.0 INITIAL SETUP SCREENS

11.1 Accessing SETUP Screens

Please follow ALL installation and safety procedures described in manual. Turn Main Power Disconnect (●) to “ON” 12 O’clock position. (Light turns Red) QUICK OPS screen (below) will appear.

An alpha/numeric screen will appear.

**NOTE:** If the proper level of password protection has not been entered prior to attempting changes, the alpha/numeric password entry keypad will appear, prompting the user to input the proper user name and password before changes can be made.

User name and Password factory defaults:
- level1 : 1111  (Operator)
- level2 : 2222  (Production Supervisor)
- level3 : 3333  (Maintenance)
- setup : 4444 (Factory Presets – Setup Group)

Enter 4444 then touch to return to the HOME Screen.

Press to access SETUP PAGE 1.
11.2 SETUP PAGE 1
Level 3 or Setup user login is required to make changes to this page.

- Calibration Points for Air Pressure Transducer for Upper Boom (3+)
- Belt Thickness Factor (3+) Pre-set at factory.

**Time & Date**
It is important that time and date are correct. If they are not press either button and the entry screen will appear. Enter date as xx/xx/xx and time as: xx:xx:xx am or pm. Press after each entry.

**Note:**
Whenever user name is changed, logoff and logon with the new user name is required for the system to backup a new user name.

**Recipes Can Be Saved To/From SD Card**

**Users Management**
You may want to create your own passwords for various levels of access. Press USERS MANAGEMENT icon and follow instructions below.

To replace Level 1, 2, or 3 with an individual’s name, press that button and enter the name on the alpha/numeric screen that will appear. A minimum of 4 and a maximum of 9 letters can be used. Touch the arrow after your entry to return to the User Management screen.

To set User Passwords, double tap in the password block and you will be prompted to enter the new password twice.

**Recipe Can Be Saved To/From SD Card**

Press to return to SETUP PAGE 1 and then button.
11.3 SETUP Page 2 (setup level authorization)
The main purpose of this section is to demonstrate the degree of control you have over the NPS Puller parameters.

**SETUP PAGE 2**

**MACHINE CONFIGURATION PARAMETERS:**

- **GEAR RATIO** – Pertains to installed gearboxes.
- **POWER OPTION** - STANDARD/ HI-POWER/230V;
- **DIRECTION OF ROTATION** – STANDARD (Material Flow from Right to Left)
- **MACHINE VERSION** – US or EU for European version
- **UNITS** – US or METRIC
- **AUTOMATIC LOGON** – When enabled, basic machine operation is allowed without a LOGON. (Level 1 User always logged in.)

**OUTPUT REFERENCE**

- **CUTTER COMMUTER** – **DISABLED**
- **CUTTER OUTPUT** – **DISABLED**
- **CUTTER PLATE DELAY** – 80 ms
- **CUTTER PLATE SCALE** – 0 ms
- **CUTTER RPM** – 100
- **OUT. REF. SCALE** – **DISABLED**
- **OUT. REF. DELAY** – 4,000

**EXTERNAL REFERENCE**

- **INTERNAL SPEED** – 0.000 fpm
- **EXTERNAL REF.** – **DISABLED**
- **INTERNAL** – **DISABLED**

**USER LINE SPEED LIMITS**

- **MIN. LINE SPEED** – 0.50 fpm
- **MAX. LINE SPEED** – 50.00 fpm

**NOTE:** User defined speed limits can’t be lesser or greater than system speed limits (those depend on the gear reducer size – refer to page 4).
OUTPUT REFERENCE:

CUTTER COM. –
Enable/Disable Ethernet communication with NOVATEC cutter. When enabled, actual line speed will be transmitted to the cutter via network.

OUT REF.TYPE –
Selection of speed or torque for optional analog output signal.

USER LINE SPEED LIMITS:
Minimum and Maximum line speeds are set based on selected gear ratio. It can be further limited by the user, if necessary.

OUT.REF.TYPE – configuration of optional analog output module – DISABLED/SPEED SP/SPEED PV where speed SP is speed set point, speed PV is speed process value (calculated based on feedback from the drive)

OUT.REF.FILTER DELAY – filter for optional analog out signal

EXTERNAL REFERENCE
This parameter set is used whenever there’s a requirement to control Puller speed from an external source (e.g. from extruder). Usually, these parameters may require adjustment at the plant.

REF. SOURCE – Possible choices are:
INTERNAL - reference is controlled from Puller’s HMI)
ANALOG IN - 0-10 VDC analog signal from external device is used to provide reference
COMMS - reference is received through Ethernet. (Option currently available for Novatec equipment only).

EXT.REF.TYPE – External reference type with possible SPEED or TORQUE selections (TORQUE reference currently possible with NOVATEC equipment only).

EXT.REF.MAX LINE SPD. – Scaling factor for speed reference. Number entered corresponds to maximum requested line speed at 10 VDC analog signal value.

EXT.REF.FILTER DELAY – time value in seconds for analog signal smoothing. When set to 0, analog signal smoothing is disabled.

REMOTE REF. SWITCH – optional setting. When ENABLED, second reference source can be used. An selector switch or external discrete signal has to be wired to the Puller. With this discrete signal reference sources can be switched (e.g. between internal and external speed reference).

REMOTE REF. SOURCE – second external reference source. Like in the case of REF.SOURCE it can be selected between INTERNAL, ANALOG IN or COMMS (Novatec equipment only). This is valid only when REM. REF. SWITCH is enabled.

SPEED RAMP RATE – Puller’s acceleration/deceleration rate (in seconds). Specifies time required to achieve maximum line speed (maximum machine speed depending on the gear ratio, not user limited speed).
11.4 SETUP Page 3

ENCODER PARAMETERS - ENCODER PPR (encoder pulse/rev.) WHEEL DIAMETER (encoder wheel diameter [in])

OPTIONAL DI/DQ FUNCTIONS - For commands & status bits to external system (i.e. extruder). Where I0.2 FUNCTION can be set to DISABLE/REMOTE START, I0.3 FUNCTION can be set as DISABLED/REMOTE STOP, Q0.6 FUNCTION can be set as DISABLED/STATUS RUN;

CLAMP OPTION - (selection if clamp option is installed) BUTTON DELAY (configurable pushbutton delay for STOP, RUN and CLAMP buttons – 1,2,3 sec.) and POWER UP SETTINGS (LAST/DEFAULT recipe loaded after system powered on)

Press Quick Ops button to return to Quick Ops Page or to access Dashboard

Load to or from SD Card

Smart Access Visibility Enabled

Smart Server Enabled

Load to or from SD Card

Smart Access Visibility Enabled

Smart Server Enabled
12.0 RECIPE MANAGEMENT

NOVATEC NPS Pullers can be programmed with up to 30 recipes. After recipes are entered, the Level 1 operator can select and load a recipe and the startup speed, run speed as well as the clamp set point will be entered automatically so production startup time will be greatly reduced. Level 2 personnel can save new recipes or modify existing recipes.

12.1 Saving Recipe From Production Run (Quick Ops)
Once your production parameters for a job are finalized, LOGON as Level 2. Click the SAVE icon and a pop-up will appear. You can choose SAVE CURRENT, SAVE AS… or CANCEL.

NOTE: SAVE CURRENT button is unavailable when default recipe is loaded (RECIPE 0).

If you are saving a new recipe… click SAVE AS and the SELECT RECIPE MENU will appear.

Click on a Recipe ID (up to 4 characters) and or RECIPE NAME (up to 10 characters) to select location where recipe will be saved then click and the recipe is saved. Edit Recipe screen will be open and recipe can be re-named.
12.2 Editing An Existing Recipe
To edit an existing recipe, select the recipe by pressing the recipe #. Note that you can scroll through the recipes, 10 at a time, by pressing the or buttons.

Then press the EDIT icon and the EDIT RECIPE screen (below) will appear. Simply enter the new material ID and/or recipe NAME along with the new parameters. If you press the icon, the recipe will be simply saved for future use. If you press the icon, the recipe will be saved and start to RUN immediately.

NOTE: A Default recipe is installed in each NOVATEC NPS Puller. It is intended as a default startup recipe for any production run. It can be changed.

12.3 Editing A Current Recipe
You can make changes to the recipe of a product during the RUN mode by pressing the EDIT WORKING RECIPE icon on the Quick Ops screen and modifying parameters in the usual manner. You can then save the changes as a DEFAULT Recipe or press and SAVE AS or CANCEL on the pop-up screen that will appear.
NOTE: Pressing SAVE also automatically activates changes made on the screen.
NOTE: SAVE CURRENT button is unavailable when default recipe is loaded.

When saving as a default recipe a pop-up will appear prompting user to activate recipe as well.

Check mark symbol can be used to activate modified recipe.

### 12.4 Footage Counter Page

Press Footage Counter button at bottom of HOME page.

The footage counters start automatically when the NPS Puller is in the RUN mode.

The footage counter readings from the Quick Ops page also appear on the main Footage Counters page (above).
SECTION CURRENT records the footage run during the current shift (or until the counter is re-set.
BATCH CURRENT records the combined totals from the SECTION CURRENT readings.

Either of the above can be paused and resumed or re-set to ZERO by pressing respective A or B counter PLAY/PAUSE of reset buttons.

Any time the SECTION CURRENT or the BATCH CURRENT is re-set, those values are transferred as the SECTION LAST and the BATCH LAST readings. These can also be re-set to ZERO by pressing and holding the respective buttons.

This information can be helpful in determining the total footage being produced by each shift and from one day to another. These footages can also be compared to the useable product produced to calculate the amount of scrap being produced at any given time.
12.5 System Diagnostics Screen

Press System Diagnostics icon on HOME page to access this page. This screen has three different views that can be changed by pressing tabs in the upper part of the screen (System Info, I/O Status and Actual Values).

System Info view shows all machine setup parameters.
I/O Status view shows current LED status of PLC discrete inputs and outputs as well as current voltages read at analog inputs AI0 and AI1.

Actual Values view shows most actual machine values (e.g. motor speeds, torques etc.).

A full range of diagnostics can be accessed including:
- BOT DRV SPD REF – is commanded speed of bottom drive
- TOP DRV SPD REF – is commanded speed of top drive
- BOT DRV TQ ACT – actual torque of the bottom belt motor [%]
- TOP DRV TQ ACT – actual torque of the top belt motor [%]
- TOP DRV U TQ LIM – maximum torque limit of upper drive
- TOP DRV REF TRM[%] – additional torque trim applied to factory settings increase to provide additional torque assist, decrease to reduce torque assist from top belt
- LINE SPD REF [ft./min] – set line speed
- LINE SPD ACTUAL [ft./min] – calculated line speed based on the current motor rpm, pulley diameter, belt thickness and gear ratio
- PSS TRANS AI [V] – actual voltage read at analog input AI0 (voltage of the pressure transducer)
- BOT DRV SPD ACT – is instantaneous speed of bottom drive [rpm]
- TOP DRV SPD ACT – is instantaneous speed of top drive [rpm]
- BOT DRV SPD AVG – is moving average speed of bottom drive [rpm]
- TOP DRV SPD AVG DRV – is moving average speed of top drive [rpm]
- LINE SPD AVG – aggregate average of top and bottom drive averages [rpm]
12.6 Alarm Screen
If the alarm light flashes, pressing the button or VIEW ALARM button whenever New Alarm Present pop-up window is present on the Quick Ops screen, displays Current Alarms screen. All current alarms are shown in the table together with short alarm descriptions.

Pressing View Alarm button on the New Alarm Present pop-up window will close pop-up and open Current Alarm screen. Pressing IGNORE will close pop-up only.
Pressing alarm name selects it. To acknowledge and reset selected alarm, press button.

To get more information on the selected alarm, press button. A small pop up window will show up with more detailed alarm description and suggested actions to clear it.

Pressing ALARM HISTORY button located in the right bottom corner of the alarm screen will change view from Current Alarm to the Alarm History.
Alarm History view shows more detailed information like time and date when alarm, when alarm was acknowledged, when alarm condition was cleared (alarm is gone) as well as system alarms and events (like when user tried to logon but entered wrong username or password). Alarm History buffer can be cleared by the user by pressing CLEAR ALARM HISTORY button (this action requires Level3 authorization).

Symbols in column Status represent status of the alarm event:
- I – means alarm occurred
- A – means alarm was acknowledged
- O – means alarm condition was cleared (alarm is no longer present)
DANGER! PINCH POINT
Never get clothing or any part of your body near pinch points.

DANGER: Never remove or disable safety devices to sustain production. Operating without these safety devices could lead to hazardous conditions that can cause severe injury. Take all necessary precautions when working around moving parts to prevent body parts and clothing from being pulled into the machine.

1. Make sure all components properly installed and hardware is tight.
2. Check that puller is firmly anchored with floor locks.
3. Ensure machine is properly wired and all enclosure doors are closed.
4. Push E-Stop pushbutton.
5. Power on the machine.

6. The following System Overview screen will appear on the control panel.
14.0 MECHANICAL MACHINE ADJUSTMENTS

14.1 Verify Pressure Setting for Belt Tension - Overview
Adjust lower regulator to 80-85 psi (5.86 bar). A pressure switch setting has been factory adjusted to prevent operation without properly tensioned belts. A check valve ensures that the tension is maintained during periods without service air pressure. Setting regulator pressure will ensure that cylinders internal tensioning cylinders set the proper tension without any manual adjustment.

14.2 Belt Clamp Pressure Calibration
Belt clamp pressure (upper boom) or compression force is set by adjusting upper pressure regulator located next to the touch screen. This pressure regulator has built in electronic transducer connected to the PLC and it is used to calculate compression (clamping) force. Pressure transducer is calibrated at the factory. See next page in case re-calibration is required.

PULL knob UP. Turn to adjust clamp pressure. Push knob down to lock.
14.3 In case a re-calibration of the pressure transducer is required:

Press \( \square \) on the HOME screen to access SETUP screen (Level 3+ authorization required)

Dial down boom pressure (upper regulator) to low number (e.g. 0.68 Bar or 10 psi) and then enter transducer reading as **LO PSS POINT** on the SETUP SCREEN. Next, dial boom pressure up to high number (e.g. 80 - 5.5 bar psi) and then enter value from transducer’s display to **HI PSS POINT** on the SETUP SCREEN. Close upper boom and then set required pressure for zero clamping force.

![Setup Screen Image](image)

Adjust upper regulator knob until desired clamp force setting is achieved. Setting should be approximately 2x maximum expected pull force or greater or else belts may slip on the extrudate and cause pull speed to be different from the belt speed. Clamp pressure should be sufficient to make upper belt contact lower belt. Actual clamping force (at the cylinder) will be shown on the SYSTEM OVERVIEW screen.

**Relative zero clamping force can be set by pressing ZERO CLAMP FORCE OFFSET.**

**NOTE:** If upper belt does not contact lower belt, check to see if lower traction assembly is set to the correct height for the material being extruded.

Clamp pressure should not provide so much clamp pressure as to deform the material being extruded or adversely affect traction belt cover life.
14.4 Setting Belt Gap for Thin-Walled Extrudate
In cases where thin walled tube is used, Set the belt clamp pressure as indicated above but in order to prevent damage to the extrudate, use the upper hand wheel to limit the downward travel of the upper boom.

14.5 Pull E-Stop pushbutton (at this point light should go green)

If light does not turn green, try pulling the blue safety switch up (shown below)

Press Reset E-STOP pushbutton Enter speed setpoint or activate recipe
14.6 Setting Up A Production Run

- Press SPEED Reference and enter speed you want to run in ft./min.
- For thin-walled extrudate - Adjust Upper Hand Wheel to prevent downward travel
- Press CLAMP to lower UPPER Boom
- Press RUN to start puller
- The Footage Counter begins when the PULLER is started.
- Press Date or Time to reset clock – Important for Alarm Time Stamp.
- Increase or decrease speed in 10% or 0.1 fpm increments.
- Press RECIPE NUMBER to access Recipe screen
- Press then to access detailed setup screens.

Speed can be increased or decreased in small increments of 0.1 fpm by pressing the UP or DOWN arrows.

Speed is increased or decreased in 10% increments by pressing +10% or -10%.

Return to Line Speed Set Point / Reset Speed Trim

Access to Recipe Screen

To Recipe Selection

To Footage Counter

To Time & Date Setup

Access to Recipe Screen

Run Machine

Stop Machine

Clamp / Unclamp

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Document: NPS IM 10 FEBRUARY 2016
14.7 Detailed Setup Screens

Press the button when access to parameters is desired.

NOTE: If the proper level of password protection has not been entered prior to attempting changes, the alpha/numeric password entry keypad will appear, prompting the user to input the proper password before changes can be made. Press to log out.

Level 3+ required to make changes to this page.

All parameters on this page are pre-set at the factory and any change requires “SETUP” authorization.
15 MAINTENANCE

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

- All electrical, mechanical repairs and tests are to be performed by qualified personnel only.
- Disconnect electric power from control box before opening panel for maintenance.
- Depressurize pneumatic system before performing maintenance or repairs on pressure containing components. Check all pressure gauges and ensure bleed valves have been actuated to ensure that depressurization has occurred.
- Cutter enclosure and gear reducers may be hot. Components inside the enclosure will be hotter than the air inside, especially the servomotor and resistor.
- 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 and secure against inadvertent reconnection.

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

At Startup
- Verify all guards are in place and able to be fully closed.
- Ensure belt tension and pressure switch are properly set
- Record equipment Serial Numbers and the NPS Controller program revision level.

Every Belt Change
- Inspect condition of line pace encoder if used.

Daily
- Inspect belts for wear and tear
- Check belt tension pressure
- Verify puller alignment
- Verify full travel available in upper traction assemblies step 5 section 9.1 above

Every 3 Months
- Check all electrical connections to make sure that they have not become loose, especially those connections at contactors, like motor starters.
- Monitor gear reducer temperature. Gear reducer temperature should not exceed 200°F (93°C) at any time or operating condition. See gear reducer manual for further maintenance instructions.
15.1 Replacing Belts

Turn down pressure in lower regulator. Remove air service to the machine and remove guarding that prevents belt from being removed. Relieve pressure in traction assembly by pulling ring on pressure relief valve (see section 10.1 above) push upstream pulley to the rear to loosen the belt. Remove the belts and replace after inspecting inside of each traction assembly. Attach machine supply air. Reset lower regulator to proper pressure. Adjust pressure switch if necessary. Manually check the proper alignment and installation of traction belts.

Loosen these knobs to remove safety shrouds.

15.2 Trouble Shooting – Air Pressure Switch for Belt Tension

The air pressure switch is pre-set at factory. If pressure is out of specification and alarm will appear. Adjustment can be made with an Allen wrench.

Alternately, the belt gap may be tensioned by looking down the belt gap from the upstream end of the traction assemblies. The gap will be convex if too loose and concave if too tight. The pressure switch will need to be readjusted if a pressure other than the factory set pressure for belt tension is set. Turn down pressure on regulator to desired setting. Remove machine air supply. Relieve pressure in traction assembly by pulling ring on pressure relief valve. Attach machine supply air. With power to the machine, but machine unlocked, adjust pressure switch counterclockwise until light goes out, then clockwise so light remains on at new, lower pressure setting. The pressure switch is located on the lower traction assembly at the pneumatic “T” fitting.
16.0 WARRANTY – NOVATEC, INC. - EFFECTIVE DATE 21 JAN 2016

NOVATEC, INC. OFFERS COMPREHENSIVE PRODUCT WARRANTIES ON ALL OF OUR PLASTICS 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 Period:
Note: All warranty periods commence with the shipment of the equipment to the customer.

5 YEARS
NPS Bessemer Series Pullers NVT Vacuum Tanks C Bessemer Series Cutters
NCT Cooling Tanks NC Bessemer Series Cutters NS Series Upcut Saws
NPC Puller Cutters

1 YEAR
Custom Equipment

Exclusions:
Routine maintenance/replacement parts are excluded from the warranty. These include, but are not limited to: belts, rollers, bushings, knives, hoses, gaskets, seals, motors, internal solenoids, fuses and motor brushes. Use with abrasive materials will void the warranty of any standard product. 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.

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.

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