

# SmartPAC **PRO**

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***Press Automation Control  
Integration with  
WPC 2000 Clutch/Brake Control***

**1143300  
Rev. C March 2022**

# Integration Manual



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Thank you for purchasing a Wintriss product. We appreciate your business and want to do whatever we can to ensure your satisfaction. Wintriss products are built to stay on the job day after day, and are backed by an ironclad guarantee, international standards approvals, and unbeatable support. Whenever you need assistance or service, we back all our products with excellent spare parts inventories, training programs, and prompt repair service. We would like to share with you a list of service options—probably the largest number of service options offered in the industry.

- **Technical Assistance**

We offer a toll-free number for technical support assistance. Call 1-800-586-TECH (8324) should you have any questions about your equipment. Our technical staff is ready to assist you Monday through Friday, 8 a.m. to 5 p.m. Eastern Time. In many cases our experienced technical staff can resolve your inquiry right over the phone.

- **Return Authorization**

Please call our “800” number for a return authorization (RMA) number to return a product for repair. Returned goods must arrive freight prepaid. In order to process your return quickly, we ask that you provide us with the following pertinent information when you call: purchase order number, shipping address, contact name and telephone number, and product type. The assigned RMA number should appear on all packages returned to Wintriss Controls Group to ensure prompt service.

At the time of requesting an RMA, you will be quoted a flat-rate repair price for the product you are returning. We ask that you email a PO to [orders@wintriss.com](mailto:orders@wintriss.com) for that amount or enclose the PO with the returned item. This will enable us to ship the item back to you as soon as the repair has been completed. If the item cannot be repaired or there are additional charges, you will be contacted for approval.

Please be sure to carefully pack all returned items and ship to our Acton, MA location.

- **Expedited Repair Program**

Rush service providing 48 hour turnaround is available for most products upon request. An Expedite Fee will be applied to our standard repair rate.

- **Board Exchange Program**

If your needs are urgent, you can take advantage of our Board Exchange (EX) program. Call our “800” number between 8 a.m. and 5 p.m. EST and we will send a replacement to you overnight. A fee does apply to this service. Contact Wintriss Technical Support at 800-586-8324 for details.

- **Service Center**

Our Service Center for product service is located at our headquarters in Acton, MA. If your equipment requires repair, please contact us at 800-586-8324 to obtain a return authorization number.

Nationwide field service is also available. Contact the Wintriss Technical Support group at 800-586-8324.

- **Product Training**

We also offer both product training and maintenance/troubleshooting courses at our Acton, MA and Chicago-area facilities. On-site training is available from the factory or through your local Wintriss representative.

- **Restocking Charge**

Returned goods are subject to a 20% restocking charge if returned for credit. The minimum charge is \$50, not to exceed \$250 per item.

Whatever the product, we are committed to satisfying you with innovative engineering, quality construction, reliable performance, and ongoing, helpful support. Call us whenever you need assistance.



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## How to Use This Manual

This manual covers any additional information you need to install and operate the SmartPAC PRO with WPC 2000 integrated product. Refer to the SmartPAC PRO and WPC 2000 manuals for most of the instructions on installation, initialization, programming, and operation.

**Chapter 1 – Introduction** introduces the SmartPAC PRO and WPC 2000 integration.

**Chapter 2 – Installation** tells how to wire the SmartPAC PRO and WPC 2000 integration

**Chapter 3 – Initialization** shows you how to perform initialization operations relating to the SmartPAC PRO – WPC 2000 integration.

**Chapter 4 – Programming** shows you how to perform programming tasks relating to the SmartPAC PRO – WPC 2000 integration.

**Chapter 5– Run** shows you how operate the SmartPAC PRO – WPC 2000 integration.

**Chapter 6– Fault Messages** provides explanations of the messages that display when a fault condition occurs or a counter preset is reached, and shows you how to correct faults..

The wiring diagrams at the end of the manual show connections for the SmartPAC PRO – WPC 2000 integration.

### NOTICE

Download Wintriss product documents for the SmartPAC PRO and WPC 2000 integration, at [www.wintrissdocs.com](http://www.wintrissdocs.com)



# Important Highlighted Information

Important danger, warning, caution, and notice information is highlighted throughout the manual as follows:

## **DANGER**

A DANGER symbol indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

## **WARNING**

A WARNING symbol indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

## **CAUTION**

A CAUTION symbol indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

## **NOTICE**

A NOTICE symbol indicates important information that you should remember, including tips to aid you in performance of your job.



# WARRANTY

Wintriss Controls warrants that Wintriss electronic controls are free from defects in material and workmanship under normal use and service for a period of one year (two years for Shadow light curtains) from date of shipment. All software products (SFC/ LETS), electro-mechanical assemblies, and sensors are warranted to be free from defects in material and workmanship under normal use and service for a period of 90 days from date of shipment. Wintriss's obligations under this warranty are limited to repairing or replacing, at its discretion and at its factory or facility, any products which shall, within the applicable period after shipment, be returned to Wintriss Controls freight prepaid and which are, after examination, disclosed to the satisfaction of Wintriss to be defective. This warranty shall not apply to any equipment which has been subjected to improper installation, misuse, misapplication, negligence, accident, or unauthorized modification. The provisions of this warranty do not extend the original warranty of any product which has either been repaired or replaced by Wintriss Controls. No other warranty is expressed or implied. Wintriss accepts no liability for damages, including any anticipated or lost profits, incidental damages, consequential damages, costs, time charges, or other losses incurred in connection with the purchase, installation, repair or operation of our products, or any part thereof.

Please note:

It is solely the user's responsibility to properly install and maintain Wintriss controls and equipment. Wintriss Controls manufactures its products to meet stringent specifications and cannot assume responsibility for consequences arising from their misuse.

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# Chapter 1 – Introduction to SmartPAC PRO with WPC 2000 Integration

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SmartPAC PRO integrated with WPC 2000 provides a comprehensive user interface for the Wintriss Clutch/Brake control, bringing a multitude of press automation functions to one central location.

This manual gives you the information specific to the integration of SmartPAC PRO with WPC 2000.

Most of the information you need to install and use the integrated system is in the following manuals:

- SmartPAC PRO Installation Manual
- SmartPAC PRO User Manual
- WPC 2000 Installation Manual.

This Integration Manual provides the additional information needed to install and use the SmartPAC PRO with WPC 2000 integration.

## **NOTICE**

**BEFORE YOU PROCEED WITH THIS INTEGRATION MANUAL, COMPLETE THE FOLLOWING (SEE ALSO PAGE 23):**

- Install your WPC 2000 according to the installation manual. Follow the installation procedures up to, but not including *Installation Verification*.
- Install your SmartPAC PRO according to the installation manual. Follow the installation procedure through *Final Checkout*.
- See the installation overview, *Figure 1-1*, next page.

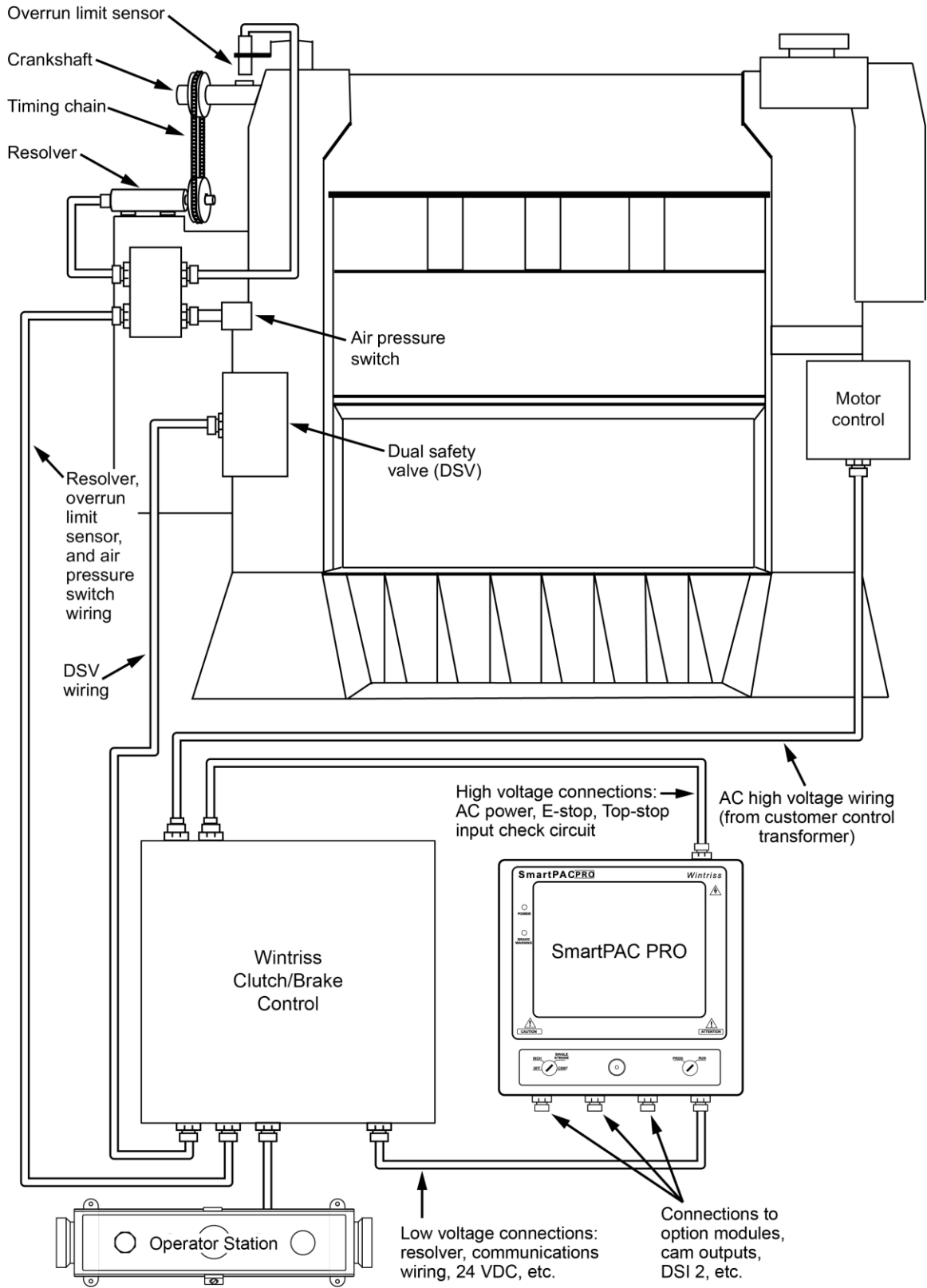


Figure 1-1. Installation Overview

Table 1-1. Options Specifications, SmartPAC PRO-WPC 2000 Integration

<b>DiProPAC</b>	<p>Provides up to 32 die protection sensor inputs</p> <p>Power for electronic sensors (NPN only): 15 Vdc min., 100 mA total</p> <p>DiPro Sensor Interface, DSI 2*: 5.88 x 5.41 x 3.42 in. (149 x 137 x 87 mm)</p> <p>DiProPAC sensor-disabled output: open collector, 8 mA max.</p>
<b>ProCamPAC</b>	<p>Provides up to 16 programmable cam switch output channels</p> <p>Programmable cam output assembly: NEMA 12, holds up to 8 outputs</p> <p>Enclosure: 9 x 11 x 3.5 (229 x 279 x 89 mm) shock-mounted</p> <p>Relay SPDT 0-3 A resistive @ 240V, 5A @ 30 Vdc</p> <p>DC solid state SPST 2A @ 5-60 Vdc</p> <p>AC solid state SPST 1A @ 70-250 Vac</p>
<b>AutoSetPAC* or WaveFormPAC*</b>	<p>10.25 x 12 x 4 in. (260 x 305 x 102 mm)</p> <p>2 or 4 strain link inputs</p> <p>Ability to store high, low, and repeatability setpoints with tool number</p> <p>Displays, adjusts, recalculates “auto” setpoints and displays actual load</p> <p>Displays and saves load signatures</p> <p>With WaveFormPAC: Up to 4 windows to monitor tonnage at points other than the peak</p>
<b>WPC 2000* (Wintriss Clutch/Brake Control)</b>	<p>16 x 16 x 9 in. (406 x 406 x 228 mm)</p> <p>Ability to set press parameters using a keyboard</p> <p>Easy-to-understand error diagnostic messages on display</p> <p>Stroke selector switch</p>
<b>SFI</b>	ServoFeed Interface integrates servofeed
<b>RamPAC*</b>	<p>10.25 x 12 x 4 in. (260 x 305 x 102 mm)</p> <p>Automatically sets shut height and counterbalance and cushion pressures</p>
<b>ProPAC*</b>	<p>12.3 x 14 x 4.3 in. (312 x 356 x 109 mm)</p> <p>Provides up to 16 analog, NPN or PNP inputs</p> <p>Ability to store high, low, and repeatability setpoints with tool number</p> <p>Display and adjust manual or auto setpoints and display actual values</p> <p>Monitor in-die dimensions and other process parameters</p>

<b>SBR</b>	Provides capability to back up tool settings to a Windows laptop PC Requires purchase of SBR software.
<b>USB Disk Backup</b>	Enables backup of programmed tool settings to USB disk
<b>Info Center</b>	With this option Setup sheets and other press information stored on a central server can be displayed on networked SmartPACs.
<b>High Speed (HSP)</b>	Required for presses with speeds higher than 800 SPM; handles speeds from 14-1600 SPM (see Speed and Accuracy, above)
<b>Bilingual*</b>	(English/Spanish) status/adjust menus
<b>Preventive Maintenance (PM) Monitor</b>	Tracks selected press functions requiring scheduled maintenance and alerts the user when maintenance is due
<b>PLC Interface</b>	Enables SmartPAC PRO to transmit additional tool settings to a Programmable Logic Controller for press automation and auxiliary functions
<b>ShopFloor-Connect Asset Utilization Software (SFC)</b>	Provides capability for production information from SmartPAC PRO to be downloaded to SFC data collection software for generation of OEE (Overall Equipment Effectiveness) and other reports. Requires purchase of SFC software.
<b>3rd Party Comms</b>	This option allows SmartPAC PRO to transmit real-time and status information to external software for reporting and other tasks.

\* Consult product user manual. DSI 2: #1121900; AutoSetPAC: #1101600; WaveFormPAC: #1109100; RamPAC: #1115200; ProPAC: #1117500; Bilingual (English/Spanish): #1130600.

# Chapter 2 – Installation

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## **⚠ DANGER**

### **IMPROPER INSTALLATION, USE, OR MAINTENANCE**

- Follow all procedures in this manual. Perform only the tests and repairs listed in this manual. Use only factory-supplied replacement parts.
- Ensure that WPC 2000 clutch/brake control is installed, tested, and repaired by qualified personnel.
- Wire, install and maintain WPC 2000 clutch/brake control in accordance with the applicable safety standards. Carry out all inspection procedures in OSHA 1910.217.
- Wire and install all equipment in accordance with the requirements of OSHA 1910.147 Control of Hazardous Energy (Lockout/Tagout).
- Install and maintain your machine guarding system according to OSHA standard 1910.217, ANSI B11.1, ANSI B11.19 and any other regulations and standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.
- Perform the checkout sequence after installation and after any modification or repair of the WPC 2000 clutch/brake control.
- Lockout/Tagout the press during all installation, modification, repair, or maintenance procedures.
- Ensure that supervisors, die-setters, maintenance persons, machine operators, foremen, and any others responsible for operation of the machinery have read and understood all instructions for use of the WPC 2000 clutch/brake control.
- Disconnect the “Continuous” mode position of your Stroke Select switch and cover the “CONT” label on your control if the press is not properly guarded for use in Continuous mode.

**Failure to comply with these instructions will result in death or serious injury.**

## **⚠ DANGER**

### **FAULTY INSTALLATION**

- Ensure that wiring is correct.
- Use only safety-certified components for safety functions, including interlock switches used in safety applications.
- Install guarding to prevent access to hazardous areas. Prevent access to hazardous areas over, under, or around any guarding devices.
- Ensure that there is one active Operator Station for each operator if you are using Two-hand mode.

**Failure to comply with these instructions will result in death or serious injury.**

**⚠ DANGER****ELECTRIC SHOCK OR HAZARDOUS ENERGY**

- Disconnect main power before installation.
- Remove all power to the press, press control, and other equipment used with the press.
- Remove all fuses and “tag out” per OSHA 1910.147 Control of Hazardous Energy (Lockout/Tagout).
- Ensure that installation is performed by qualified personnel.
- Complete all wiring procedures before connecting to the AC power source.

**Failure to comply with these instructions will result in death or serious injury.**

**⚠ DANGER****PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE**

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

**Failure to comply with these instructions will result in death or serious injury.**

**NOTICE****OPTIONAL MODULES PROCAMPAC AND DIPROPAC INCLUDED IN SMARTPAC PRO MANUAL**

When you order your SmartPAC PRO with WPC 2000 system, you may include the DiProPAC die protection and/or ProCamPAC programmable cam switch option. Your SmartPAC PRO Installation Manual includes instructions for installing both modules. Your SmartPAC PRO User Manual includes instructions on using these options. Remember that they are options and might not be included in your system.

If you ordered SmartPAC with other optional modules such as AutoSetPAC load monitor or ProPAC process monitor, refer to the user manual for that option for complete details on its installation and use.

**NOTICE****READ INSTALLATION INSTRUCTIONS BEFORE STARTING INSTALLATION**

If you install WPC 2000 and SmartPAC PRO yourself, read this installation chapter and the installation instructions in the related manuals carefully, plan your installation, and figure out what steps you will follow before you start drilling holes, running conduit, or cutting wires.

**NOTICE**

When you have completed installation procedures, perform the tests in the Final Checkout sections of your SmartPAC PRO User Manual and Installation Manual, your WPC 2000 manuals, and this manual to ensure that WPC 2000 and SmartPAC PRO are installed correctly and working properly before proceeding to the Initialization (Chapter 3), Program (Chapter 4), and Run (Chapter 5) chapters.

**NOTICE****LEARN TO USE SMARTPAC PRO BEFORE INSTALLING IT ON A PRESS**

If you have not used SmartPAC PRO before, learn how to initialize and program it before installing it on a press. See your SmartPAC PRO User Manual and Installation Manual. On the bench, see your SmartPAC PRO Installation Manual to connect your unit to a resolver and to AC power so that you can access all the menus and make settings.

**NOTICE****PRESS MUST BE AT TDC**

Before starting installation, make sure that the die has been removed from the press and the press ram has been moved to top dead center (TDC). The press must be at TDC when you make final adjustments for the resolver. The TDC setting should be  $0^\circ \pm 2^\circ$ . Use a dial indicator on the face of the ram, if necessary, to ensure that the ram is positioned correctly.

**NOTICE****REFER TO SMARTPAC PRO AND WPC MANUALS**

Refer to your SmartPAC PRO and WPC 2000 User and Installation Manuals for the necessary steps to mount consoles, run and connect wiring, etc.

## Use This Manual Along with Your SmartPAC PRO and WPC 2000 Manuals

Most of the information you need to install and use the integrated product is in the following manuals, available on [www.wintrissdocs.com](http://www.wintrissdocs.com):

- SmartPAC PRO Installation Manual
- SmartPAC PRO User Manual
- WPC 2000 Installation Manual.

This Integration Manual provides the additional information needed to install and use the SmartPAC PRO with WPC 2000 integration.

## Install your SmartPAC PRO According to the SmartPAC PRO Installation Manual

Follow the installation procedures in your SmartPAC PRO Installation Manual through *Setting the Resolver Zero Position*.

## Install Your WPC 2000 According to WPC 2000 Installation Manual

Follow the instructions in your WPC 2000 User Manual or Installation Manual to perform the procedures in *Chapter 2 – Installation*. Then, proceed with the instructions in the following sections.

### Installing the Overrun Limit Switch

These instructions are also in your WPC 2000 manuals. They are included here for your convenience.

#### **DANGER**

##### **MOUNT OVERRUN LIMIT SWITCH SO IT PROVIDES CORRECT TIMING**

Install the overrun limit sensor magnet on a component, such as the crankshaft, that moves independent of the resolver and whose motion is not affected by the condition of the resolver or the resolver's drive mechanism. Safe operation of the press depends on the overrun limit sensor working correctly when the resolver or its drive mechanism fails.

Install the overrun limit sensor magnet in the correct angular location according to the instructions below.

**Failure to comply with these instructions will result in death or serious injury.**

The overrun limit sensor, also called the “overrun sensor,” enables WPC 2000 to monitor operation of the resolver and to stop the press whenever the resolver fails to work properly, as can happen when the resolver drive chain breaks or slips or when the resolver is broken. The overrun sensor provides a signal to WPC 2000 at the same resolver angle on every stroke. Whenever this angle changes, WPC 2000 detects that the resolver is no longer rotating at a 1:1 ratio with the crankshaft and sends an Emergency-stop command to the press, simultaneously displaying an error code.

### Planning Your Overrun Sensor Installation

#### **NOTICE**

Make sure to position the overrun sensor 1/8 in. to 3/16 in. (3 mm to 5 mm) from the magnet. This gap specification is different from that of the flywheel speed sensor (see *Installing the Optional Flywheel Speed Sensor*, page 29).

The overrun sensor consists of a magnetic switch and a magnet. Select a mounting location for both components that ensures that the magnet moves past the switch once on every stroke and within 1/8 in. to 3/16 in. (3 mm to 5 mm) of the switch, close enough for the switch to sense the magnet's presence. The magnet is mounted to the crankshaft or another component that rotates identically on every stroke. The switch is hard-mounted to the press or other surface and remains stationary.

There must be no connection between the overrun limit sensor and the resolver to ensure that the overrun sensor continues to operate if the resolver or its drive mechanism fails.

To obtain an adequate overrun signal at high speeds, the magnet should be mounted so that it can be sensed by the switch for 15° to 25° of the stroke. The interval during which the magnet is sensed, called the “dwell,” decreases as the diameter of the rotating shaft increases (Figure 2-1). Select a shaft whose diameter will allow the sensor to detect the magnet for the required dwell.



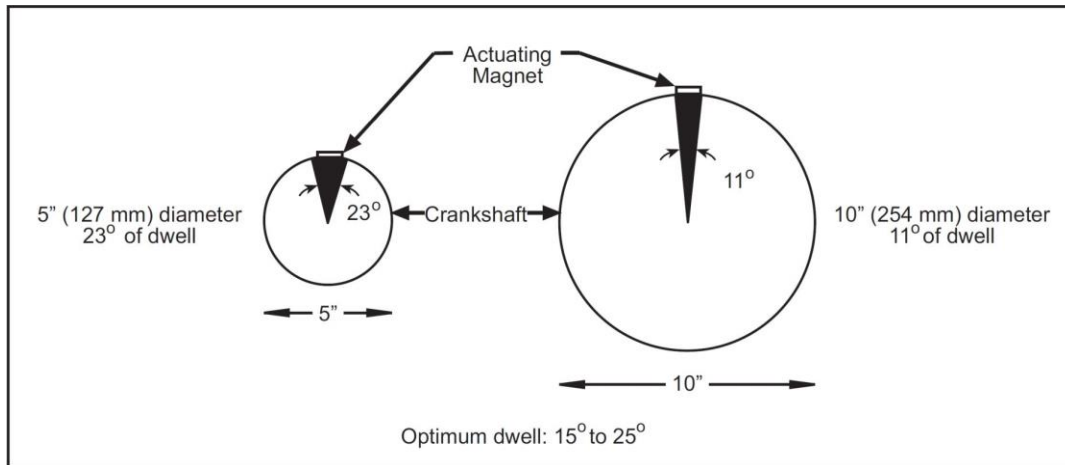


Figure 2-1. Overrun Sensor Magnet Placement: Dwell as a Function of Shaft Diameter

## Mounting the Overrun Sensor Switch

### NOTICE

#### INSTALL MAGNET AFTER MOUNTING SWITCH

Install the overrun magnetic switch as instructed in this section. See instructions below for installing the overrun magnet.

The overrun sensor magnetic switch comes already installed in a bracket. Mount the bracket and switch at a location past which the magnet will pass on every stroke and within 1/8 in. to 3/16 in. (3 mm to 5 mm) of the magnet, referring to Figure 2-2.

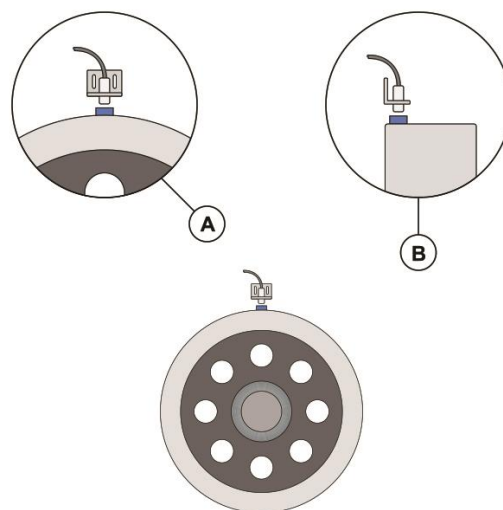


Figure 2-2. Overrun Sensor Magnetic Switch: Installation Example

- A: Mount the sensor 1/8 in. to 3/16 in. (3 mm to 5 mm) from the magnet
- B: Align the magnet so its center passes the center of the sensor.

Place the magnet temporarily on the crankshaft or other mounting surface while you set the gap between the switch face and the magnet. After tightening down the bracket's mounting screws, remove the magnet and put it in a safe place until you mount it permanently.

## Wiring the Overrun Sensor Switch

### NOTICE

- You can run both the resolver wires and the overrun limit sensor cable through the same conduit.
- If you do so, wait to cut the cable and wires until both the resolver and the overrun limit sensor are installed.

Run the cable for the magnetic switch through conduit to the WPC 2000. Connect the wires to terminal blocks on the WPC 2000 Main Processor board, as shown in Table 2-1 and Figure 2 at the end of the manual.

*Table 2-1. Overrun Sensor Switch Wiring Connections*

Pin #	Signal	Wire Color
23	+24 Vdc	Red
24	Overrun input to WPC 2000	White
25	Ground	Black

## Installing the Overrun Sensor Magnet

The following procedure shows you how to

- Determine the correct angle at which to mount the overrun magnet, based on your Top-stop “On” Angle calculations in the previous section
- Determine the setting for option switches 1 and 2, based on your Top-stop “On” Angle calculations
- Install the magnet

Since the Top-stop cam stays on for 20°, the magnet must be mounted at an angle at least 20° greater than the Top-stop “On” Angle you calculated and set (see page 24, and *Setting the Top-stop “On” Angle* in Chapter 2 of your WPC 2000 manual), allowing the Top-stop cam to turn off before the overrun limit sensor turns on. Otherwise, an “80” series fault will display on the SmartPAC PRO screen (see *Top-stop and Overrun Setting Faults*, page 126.)

Perform the following steps:

1. Determine the angle at which to install the overrun sensor magnet by consulting Table 2-2. The first row of the table labelled “Top-stop “On” Angle,” shows Top-stop “On” Angle ranges (i.e., less than 240°, 241° to 270°, etc.). The second row shows the angle at which the overrun sensor magnet should be mounted for each range (i.e., at 270° if the Top-stop “On” Angle is less than 240°, at 300° if the Top-stop “On” Angle is between 241° and 270°, etc.).

Table 2-2. Overrun Sensor Magnet Mounting Angle and Option Switch Settings

Top-stop “On” Angle	< 240°	241° to 270°	271° to 300°	> 301°
Magnet Mounting Angle	270°	300°	330°	359°
Switch 1 Setting	ON	ON	OFF	OFF
Switch 2 Setting	ON	OFF	ON	OFF

**Example**

You calculated that your Top-stop “On” Angle is 284°, which falls in the 271° to 300° column in Table 2-2. The correct mounting angle for the overrun sensor magnet would be 330°.

- Determine the option switch 1 and 2 settings required for your calculated Top-stop “On” Angle, referring to Table 2-2. Row 3 of the table shows option switch 1 settings for each Top-stop “On” Angle range; row 4 shows option switch 2 settings. WPC 2000 uses these settings to determine the angle at which to begin the overrun sensor closure test, which is used to make sure that the overrun limit switch closes at the same angle on every stroke.

**Example**

You calculated that your Top-stop “On” Angle is 284°, which falls in the 271° to 300° column in Table 2-2. The correct switch settings would be OPEN for switch 1 and CLOSED for switch 2.

- Set option switches 1 and 2 to the positions you determined in step 2.
- If you are using the Auto Compensated Top Stop feature, return option switch 4 to its CLOSED setting to enable it (see step 1 of the Setting the Top-stop “On” Angle procedure).
- Power down, then power back up SmartPAC PRO to enable the new option switch settings.
- With the press in Inch mode, press the Run/Inch palm buttons until you have inched them press to the angle you determined in step 1 (i.e., 270°, 300°, 330°, or 359°).
- Using double-sided foam tape or other means, temporarily install the magnet directly beneath the overrun sensor, referring to *Mounting the Overrun Sensor Switch*, page 25.
- Check to make sure that the “Overrun limit Switch” LED in LED Group 6 on the WPC 2000 Main Processor board is lit, referring to the LED map in Figure 2-17, page 48, for location. This LED illuminates when the overrun magnetic switch senses the magnet.

**NOTICE**

Make sure that the overrun limit switch has enough dwell to provide an adequate signal at high speeds. Optimally, the magnet should actuate the switch for 15° to 25°. The larger the diameter of the shaft on which the magnet is mounted, the shorter the dwell is (see Figure 2-1, page 25). The ideal shaft diameter is 4-6 in (102-152 mm).

- Run the press in Inch mode for about 4 strokes, viewing the overrun sensor’s On/Off angles on each stroke. To display On/Off angles, select PRESS CONTROL on the Main Initialization Menu (see Figure 2-11, page 42).

**Example**

If you mounted the magnet at an angle of 330°, the magnetic switch might come “on” at, say, 321°, and go “off” at 337°.

10. Run the press in Inch, Single-stroke, and Continuous modes for about 4 strokes each.
  - If the press cycles in every mode without a fault, go to step 11.
  - If a fault occurs while you are cycling the press in one or more modes, do the following:
    - If a fault occurs on the first stroke after you install the magnet, press RESET and execute another stroke.
    - If the fault code is between F80 and F89 (or H80 through H89), there a problem with the overrun sensor. Re-check your installation of the magnetic switch (see page *Mounting the Overrun Sensor Switch*, page 25) and the magnet (see step 7) and your settings for option switches 1 and 2 (see steps 2 and 3), then press RESET and run the press again for a few strokes. If the press stops and the same error code displays, call Wintriss Technical Support.
    - If another fault code displays, look up the fault in Chapter 6 and follow the suggested remedy. After correcting the problem, press RESET and run the press again for a few strokes, checking for faults. If you need assistance, contact Wintriss Tech. Support.

** WARNING****INJURY FROM MAGNETS THAT DETACH**

Mount the magnets with the brass screws provided. If you mount them with plastic screws or adhesive, the attachment could fail and the magnets become dangerous projectiles, especially on high-speed presses.

**Failure to comply with these instructions could result in death or serious injury.**

**NOTICE**

Use a brass or other non-ferrous screw to mount the magnet. Steel or ferrous screws can cause false signals.

11. Permanently install the magnet in the position in which you temporarily mounted it in step 7.  
Drill and tap a hole, using a No. 36 drill and 6-32 tap. Mount the magnet, plastic side up, with the 6-32 brass screw provided.
12. Cycle the press a few times in Single-stroke and Continuous modes to make sure it operates without error.

## Installing the Optional Flywheel Speed Sensor

### **⚠ WARNING**

#### **INJURY FROM MAGNETS THAT DETACH**

Mount the magnets with the brass screws provided. If you mount them with plastic screws or adhesive, the attachment could fail and the magnets become dangerous projectiles, especially on high-speed presses.

**Failure to comply with these instructions could result in death or serious injury.**

You can monitor the speed of the press's flywheel by installing a latching magnetic cam switch (LMCS), an option available from Wintriss. The LMCS consists of the following parts:

- A sensor mounted on a bracket with wiring for connection to the WPC 2000 Main Processor board (Wintriss part numbers: 9610201 with 30 ft cable, 9610204 with 100 ft cable)
- Two magnets, one red, the other blue, for attachment to the flywheel
- Two brass screws, one for mounting each magnet

To install the LMCS, do the following:

13. Select a mounting location that allows the sensor to detect the magnets as they rotate on the flywheel. The magnets should be mounted approximately 180° apart to ensure that the LMCS transitions from OFF to ON once per revolution.
14. Fabricate a bracket to position the LMCS 3/8 in. to 1/2 in. from the face of the magnets. If possible, make the bracket adjustable.

### **NOTICE**

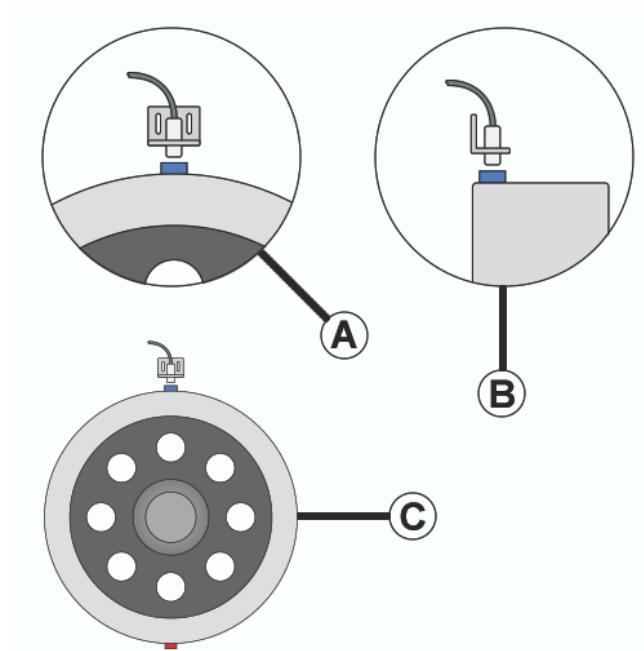
Make sure to position the LMCS sensor 3/8 in. to 1/2 in. (9.5 to 12.7 mm) from the magnets. This gap specification is different from that of the overrun limit switch (see *Installing the Overrun Limit Switch*, previous section and in your WPC 2000 Installation Manual).

15. Install the LMCS as shown in Figure 2-3.

Position the magnets so they are approximately 180° apart. Magnets should be installed plastic side up with a non-ferrous metal screw. A ferrous screw may cause false signals. A brass screw (6-32) is supplied with each magnet. Use a No. 36 drill and a 6-32 tap.

### **NOTICE**

Be sure to position the red and blue magnets on the flywheel approximately 180° apart.



A: Mount the sensor 3/8 in. to 1/2 in. (9.5 mm to 12.7 mm) from the magnets

B: Align each magnet so its center passes the center of the sensor.

C: Mount the red and blue magnets 180° apart on the flywheel

**Figure 2-3 . Installing the LMCS and Magnets**

16. Run the cable from the LMCS sensor through flexible, liquid-tight conduit to the WPC 2000 enclosure. The enclosure is rated NEMA 12 (protected against dust and oil). You must use conduit rated NEMA 12 and make proper conduit connections to ensure NEMA 12 protection.

17. Wire the LMCS to the WPC 2000 Main Processor board as shown in Table 2-3.

**Table 2-3. Flywheel Speed Sensor Wiring Connections**

<b>WPC 2000 Main Processor Bd. Pin #</b>	<b>LMCS Wire Color</b>
23	Red
22	White
25	Black

18. Double-check wiring connections.

Now, proceed to the next section in this manual, *Wiring between WPC 2000 and SmartPAC PRO*.

## Wiring between WPC 2000 and SmartPAC PRO

This section shows you how to make the following wiring connections between WPC 2000 and SmartPAC PRO:

- WPC 2000 resolver wiring
- Communications wiring
- Stop circuit and input check circuit wiring

As shown in *Figure 1-1* page 18, run the low voltage connections through one conduit, (including resolver and communications wiring, and 24 VDC); and high-voltage connections through a separate conduit (such as AC, stop circuit, and input check circuit wiring). Refer to Figure 2-4, Figure 2-5 on page 32, and wiring diagrams Figure 1 or Figure 2 at the end of this manual when making wiring connections.

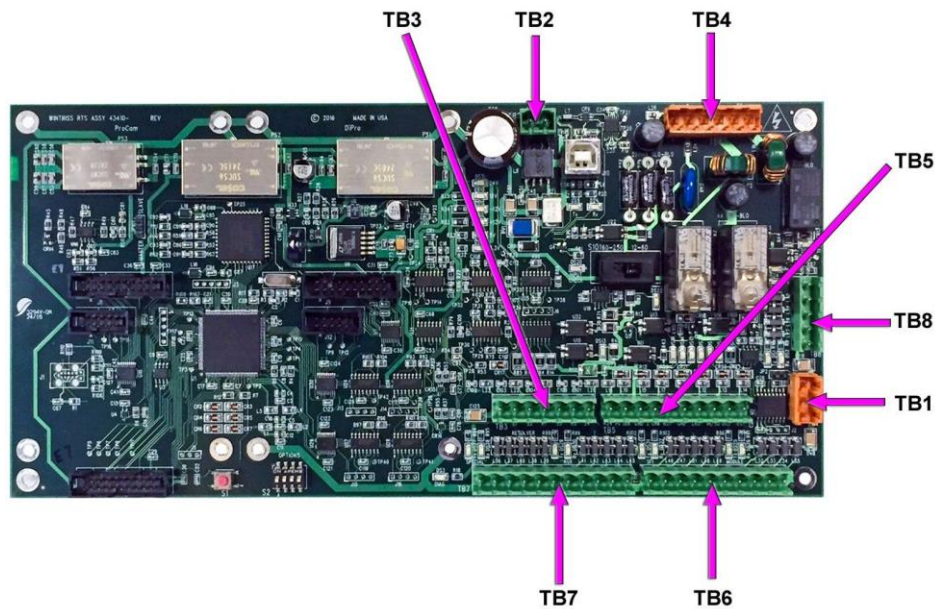


Figure 2-4. SmartPAC PRO Board with Terminal Block Locations

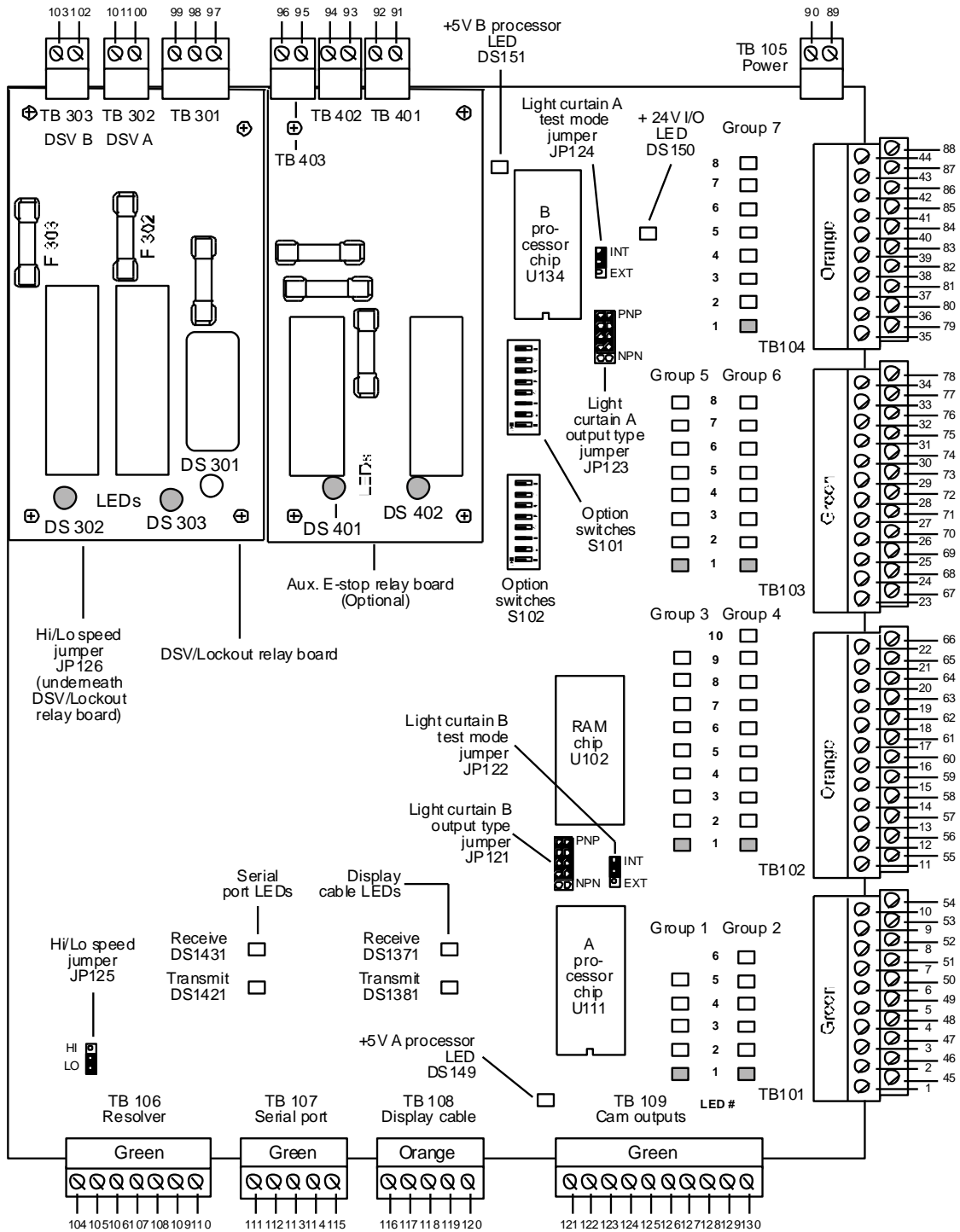


Figure 2-5. WPC 2000 Main Processor Board: Location of Important Components



## Connecting the Resolver Wiring Between SmartPAC PRO and WPC 2000

### NOTICE

Make sure you have already wired the resolver directly to the WPC 2000 (see your WPC manual). In the following procedure, wire in parallel between the “resolver” terminals on TB106 on the WPC 2000 Main Processor board and the “resolver” terminals on TB3 on the SmartPAC PRO board. This wiring scheme makes WPC 2000 the “master,” SmartPAC PRO the “slave.”

To wire the resolver from WPC 2000 to SmartPAC PRO, perform the following steps, referring to Table 2-4 on page 34, Figure 2-4 on page 31, the WPC 2000 Main Processor Board figures in your WPC manuals, and wiring diagrams Figure 1 or Figure 2 at the end of this manual.

1. Make sure the resolver is connected directly to WPC 2000.
2. Find the two 6-conductor shielded cables without connector, and run them through 1/2 in. flexible, liquid-tight conduit from the bottom right of the WPC 2000 enclosure to the bottom right or second-to-right knockout in the SmartPAC PRO enclosure (see Figure 1-1, page 18). One of these cables is used for the resolver wiring, the other is used for communications wiring. (See Table 2-5, page 35). Both WPC 2000 and SmartPAC PRO are rated NEMA 12 (protected against dust and oil). You must use conduit of the same rating and make proper connections to ensure NEMA 12 protection.
3. Remove the resolver connector, TB106, from the WPC 2000 Main Processor board (it is already wired to the resolver) and connect wiring from the 6-conductor cable to terminals 104 through 110, matching brown wire to brown wire, orange to orange, yellow to yellow, and so forth (see Table 2-4, page 34). Then plug the connector back into TB106.

### NOTICE

#### WIRE AND PLUG IN CONNECTOR CORRECTLY

The connector can plug into the receptacle on the PC board in only one direction. Before wiring the connector, mark its left and right ends when it is plugged in to make sure you wire the correct pin numbers.

4. Remove the resolver connector, TB3, from the SmartPAC PRO board (see Figure 2-4, page 31) and connect wiring from the 6-conductor cable to terminals 212 through 218, as shown in Table 2-4. Plug the connector back into TB1 when you are done.
5. Double-check connections when you are finished wiring.
6. Locate jumper JP101 on the SmartPAC PRO board (see Figure 2-6, page 34) and move it to the “Slave” position.

Table 2-4. Resolver Wiring, SmartPAC PRO and WPC 2000

SmartPAC PRO TB3 Pin #	Resolver Cable Wire Color		WPC 2000 TB 106 Pin #
	Clockwise Rotation	Counterclockwise Rotation	
212 (GND)	No Connection		110 (GND)
213 (S1)	Black	Yellow	109 (S1)
214 (S2)	Green		108 (S2)
215 (R1)	Red		107 (R1)
216 (S3)	Yellow	Black	106 (S3)
217 (R2)	Orange		105 (R2)
218 (S4)	Brown		104 (S4)

Terminate the cable shields to the ground stud nearest the cable entry.

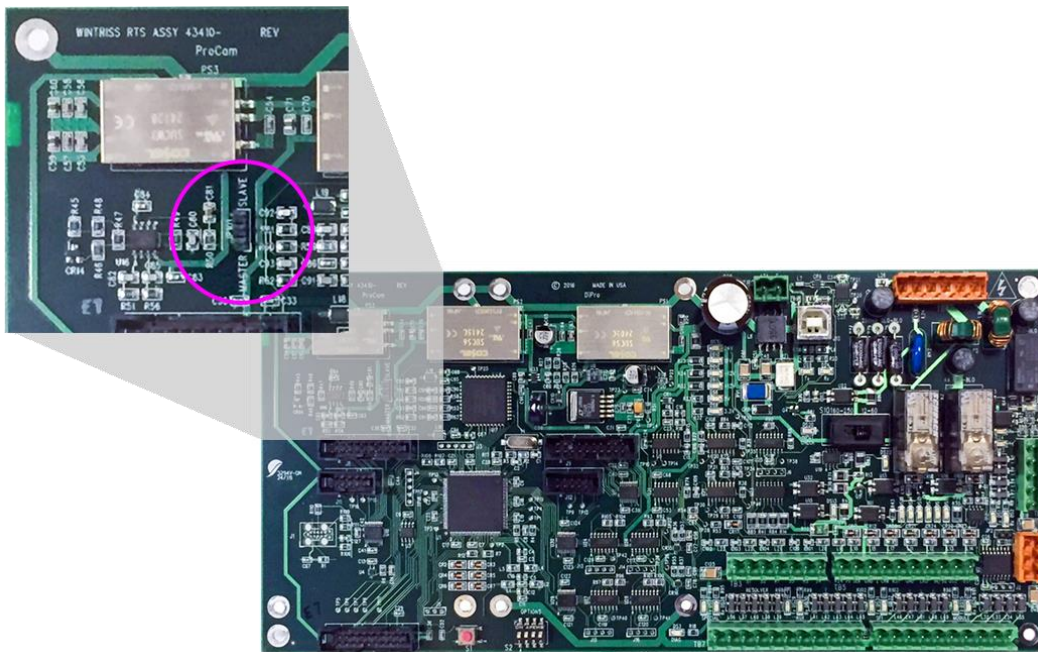


Figure 2-6. Location of the Master-Slave Jumper on SmartPAC PRO Board

## Connecting Communications Wiring

To connect communications wiring between SmartPAC PRO and WPC 2000, perform the following steps, referring to Table 2-5, below, and to wiring diagrams Figure 1 or Figure 2 at the end of the manual:

1. Find the other 6-conductor shielded cable from step 2, page 33.
2. Remove the TB8 connector from the SmartPAC PRO board (see Figure 2-4 page 31 for location), and connect wiring from the 6-conductor cable as shown in Table 2-5. Plug the connector back into TB8 when you are done.
3. Remove the TB107 connector from the WPC 2000 Main Processor board (see the WPC 2000 Main Processor Board figures in your WPC manuals for location) and connect wiring from the 6-conductor cable as shown in Table 2-5. Plug the connector back into TB107 when you are done.
4. Double-check connections when you are finished wiring.

*Table 2-5. Communications Wiring, SmartPAC PRO to WPC 2000*

Pin # on TB8 SmartPAC PRO	Wire Color*	Pin # on TB107 WPC 2000
Shield**	Shield	Shield**
326 (GND)	Black	111 (GND)
327 (+RxD6)	Red	115 (+TxD)
328 (-RxD6)	Green	114 (-TxD)
329 (+TxD6)	Orange	113 (+RxD)
330 (-TxD6)	Yellow	112 (-RxD)

\* Cut off unused brown wire

\*\* Terminate to ground stud nearest entry to enclosure

## Connecting Stop Circuits and Input Check Circuit

To connect stop circuit and input check circuit wiring between WPC 2000 and SmartPAC PRO, perform the following steps:

1. Supplying your own multi-conductor cable (six wires minimum—two for the Emergency-stop circuit, two for the Top-stop circuit, and two for the Input Check circuit), run the cable through the same flexible, liquid-tight conduit as you ran AC wiring (see step 2, page 33) from the bottom right of the WPC 2000 enclosure to the bottom left of the SmartPAC PRO enclosure.

Because SmartPAC PRO is rated NEMA 12 (protected against dust and oil), you must use conduit of the same rating and make proper connections to ensure NEMA 12 protection.

2. Locate connector TB4 on the SmartPAC PRO board (see Figure 2-4 page 31) and unplug it from its socket. Connect the wires for stop and input check circuits to TB4 pin locations, as shown in Table 2-6, below, and wiring diagrams Figure 1 or Figure 2 at the end of the manual. Plug the connector back into TB4 when you are done.

Table 2-6. Stop and Input Check Wiring SmartPAC PRO to WPC 2000

Pin # on TB4 SmartPAC PRO	Circuit	Pin # on WPC 2000
205	Input Check A	41
206	Input Check B	29
207	E-stop	68
208	E-stop	69
209	Top Stop	80
210	Top Stop	81

3. Locate connectors TB103 and TB104 on the WPC 2000 Main Processor board (see the WPC 2000 Main Processor Board figures in your WPC manuals for location) and unplug them from their sockets. Connect the wires for stop and input check circuits to the appropriate pin numbers on TB103 and TB104, as shown in Table 2-6 and Figure 1. Plug the connectors back into TB103 and TB104 when you are done.
4. Double-check connections to make sure that you did not wire the connectors backward (see *Connecting Wires to Terminal Block Connectors*, in your installation manuals).
5. Make all the necessary conduit connections to ensure NEMA 12 protection.

## NOTICE

Be sure to number all wires in a way consistent with your press's electrical prints.

## Setting the Input Check Voltage Switch

If wired to the WPC2000, as in Table 2-6, set voltage for the input check circuit as follows:

1. Find the input check voltage switch, S101, on the SmartPAC PRO board. It is located on the right side of the board just to the left of the E-stop relays.
2. Place S101 in the Left or Right position, depending on the coil voltage of the dual safety valve.
  - For a coil voltage of 60-250V, place the switch in the Left position (this is the factory setting).
  - For a coil voltage of 12-60V coil, place the switch in the Right-position (Figure 2-7).

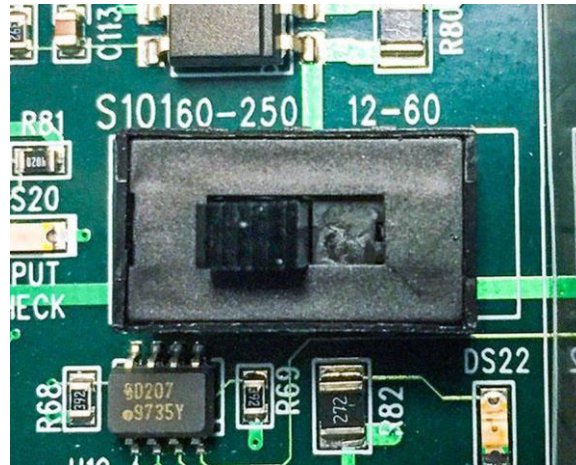


Figure 2-7. Input Check Voltage Switch (S101) in the Factory Default (60-250V) Position

## NOTICE

### HOW THE INPUT CHECK CIRCUIT DETECTS RESOLVER CHAIN BREAKAGE

When the press control energizes the dual safety valve relay to start the press, voltage is induced across the input check circuit. If SmartPAC PRO gets no signal from the resolver within the specified start time limit (resolver not turning), SmartPAC PRO opens the emergency-stop circuit and a “loss of rotation” fault message is displayed on the screen. The fault indicates that the resolver belt or chain is broken or so loose that the resolver shaft cannot move. Other possible reasons for the fault are low air pressure to the clutch or a bad clutch.

## Setting Up SmartPAC PRO with WPC 2000

### **⚠ DANGER**

#### PREVENT INJURY DURING SETUP

- Keep all personnel away from the press during setup.
- Be sure there is no die or other tooling in the press during setup.

**Failure to comply with these instructions will result in death or serious injury.**

### CAUTION

#### PREVENT DAMAGE TO PRESS AND/OR DIE

Ensure that no die is mounted in the press during setup procedures.

**Failure to comply with these instructions could result in property damage.**

## Turning on Power to SmartPAC PRO and WPC 2000

To turn on power to SmartPAC PRO and WPC 2000, do the following:

1. Make sure there is no die in the press.
2. Turn the Program/Run key to PROG.

3. Power up the SmartPAC PRO and WPC 2000.

The green Power light on the SmartPAC PRO front panel illuminates, the display shows various startup screens, and the Brake Warning LED flashes at approximately two-second intervals while SmartPAC PRO completes its startup routine. This can take up to one minute. Eventually, depending on the position of the Program/Run key, the Main Run Menu screen (Figure 5-1, page 81) or Main Program Menu screen appears (Figure 2-8, page 38). If the SmartPAC PRO display remains off, see Problems at Startup, next section.

4. Verify that the “PRESS CONTROL” item appears in the Main Run menu, indicating that SmartPAC PRO is communicating with WPC 2000.
- If “PRESS CONTROL” does not appear in the menu, first double check your communications cable wiring, per Table 2-5, page 35. If the wiring is correct, go to *Problems at Startup*, page 39.
  - If “PRESS CONTROL” appears in the menu and you have the DiProPAC and/or ProCamPAC option(s), go to *Verifying Installation of DiProPAC and ProCamPAC* in your SmartPAC PRO Installation Manual. If you don't have one of these options, go to *Creating a New Tool Setup*, page 45.

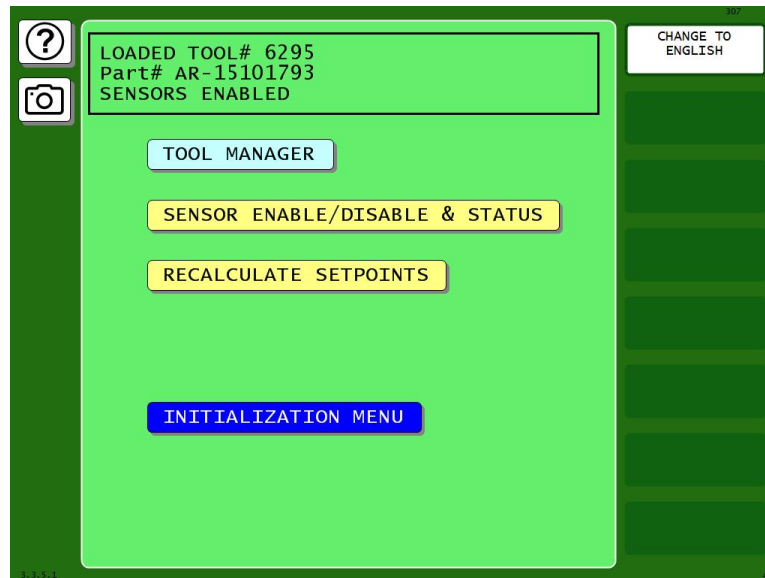


Figure 2-8. Main Program Menu

## NOTICE

- If an error message displays when the SmartPAC PRO starts up, make note of the message before pressing EXIT or OK.
- If the error message continues to appear after you press EXIT or OK, find the message in SmartPAC PRO Fault Messages in your SmartPAC PRO Installation Manual and follow the instructions for correcting the problem. If you cannot find the error message or cannot fix the problem, contact Wintriss Technical Support.

## Problems at Startup

If the SmartPAC PRO display remains off, do the following:

- **If the green Power light on SmartPAC PRO does not illuminate**

Turn off power to SmartPAC PRO and recheck all power connections. Check that the connectors are correctly seated on both ends of the cables between the SmartPAC PRO board and the display. Power up SmartPAC PRO again. If the display remains off, contact Wintriss Technical Support.

- **If the green Power light illuminates, but the display remains off**

Power down SmartPAC PRO and check that the USB connectors are correctly seated on both ends of the cables between the SmartPAC PRO board and the display. Power up SmartPAC PRO again. If the display remains off, contact Wintriss Technical Support.

### “PRESS CONTROL” Does Not Appear in SmartPAC PRO Initialization Menu

1. Leaving power on, open the door of the WPC 2000 enclosure, and check the state of the LEDs on the Main Processor board.
  - If any of the LEDs are illuminated, the WPC 2000 has power. Go to step 2.
  - If none of the LEDs are illuminated, power down the SmartPAC PRO and WPC 2000, and check the AC wiring to the WPC 2000.
    - If the AC wiring checks out, power up both units. If no LEDs are illuminated, contact Wintriss Technical Support. If any LEDs are illuminated, go to the SmartPAC PRO Main Initialization Menu and check for the presence of the “PRESS CONTROL” item.
    - If “PRESS CONTROL” is displayed in the menu, go to the next applicable section to continue setting up your system.
    - If “PRESS CONTROL” is not displayed, go to step 2.

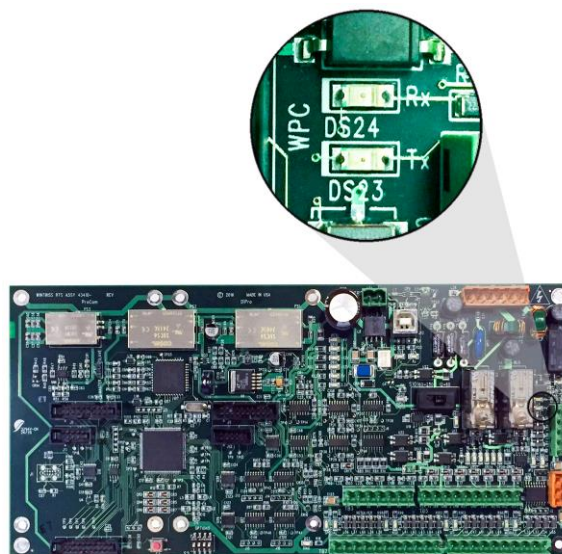


Figure 2-9. SmartPAC PRO board, Rx and Tx LEDs

2. Leaving power on, open the door of the SmartPAC PRO enclosure, and check the state of the WPC LEDS labelled Rx (DS24) and Tx (DS23) on the SmartPAC PRO board, Figure 2-9, above.
  - If both LEDs are blinking, SmartPAC PRO and WPC 2000 are communicating. Check the Main Initialization Menu again for the presence of the “PRESS CONTROL” item.
    - If “PRESS CONTROL” is displayed in the menu, go to the next applicable section to continue setting up your system.
    - If “PRESS CONTROL” is not displayed, contact Wintriss Technical Support.
  - If the green Rx (DS24) yellow LED is not blinking, power down SmartPAC PRO and WPC 2000, and check the communications wiring (see page 35). If communications wiring checks out, power up both units, access the Main Initialization Menu, and check for the presence of the “PRESS CONTROL” item.
    - If the “PRESS CONTROL” item is displayed, go to the next applicable section to continue setting up your system.
    - If “PRESS CONTROL” is not displayed, contact Wintriss Technical Support.

## Verifying the Installation of DiProPAC and ProCamPAC

Follow the instructions in your SmartPAC PRO Installation Manual to verify the installation of DiProPAC and ProCamPAC.

## Initializing WPC 2000 Parameters During Installation

### NOTICE

#### INITIALIZE WPC 2000 PARAMETERS BEFORE PROGRAMMING SMARTPAC PRO/WPC 2000

When you set up a new SmartPAC PRO with WPC 2000, initialize the WPC 2000 press parameters before you start programming your unit. See *Initializing WPC 2000 Parameters During Installation*.

### NOTICE

#### RECORD WPC 2000 SETTINGS BEFORE INITIALIZING PARAMETERS

Record your WPC 2000 settings before installing new firmware or initializing parameters.

### NOTICE

Initializing press parameters resets them to their default values. Initialize press parameters only when you set up a new SmartPAC PRO with WPC 2000 or install new WPC 2000 firmware.

When you first set up your SmartPAC PRO with WPC 2000 or when you install new WPC 2000 firmware, initialize press parameters on the Press Control Parameter Menu (see the sections below for instructions).

Next, go to your SmartPAC PRO Installation Manual and perform the following procedures in Chapter 2: *Creating a New Tool Setup through Setting the Resolver Zero Position*.



The procedures below show you how to initialize parameters and make settings.

See your SmartPAC PRO User Manual for other Initialization settings, which are entered via the Main Initialization Menu (see *Figure 3-2*, page 51).

## NOTICE

For help with any screen, press  in the upper left-hand corner.

## Entering Initialization Mode

Enter Initialization mode from Program mode. See your SmartPAC PRO manual for more information.

3. Set the PROG/RUN keyswitch to PROG. The Main Program screen appears.
4. Press INITIALIZATION MENU. The Main Initialization Menu appears.

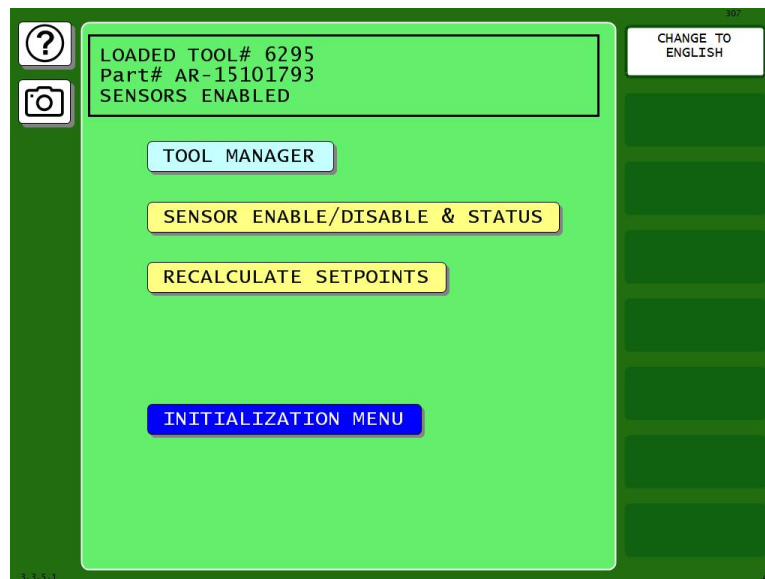
## NOTICE

### TO EXIT INITIALIZATION MODE

Press Back or Exit repeatedly to enter Program mode.

or

Turn the PROG/RUN keyswitch to RUN to enter Run Mode.



*Figure 2-10. Main Program Menu*

1. Enter Initialization Mode by pressing INITIALIZATION MENU on the Main Program Menu screen. The Main Initialization Menu screen appears.

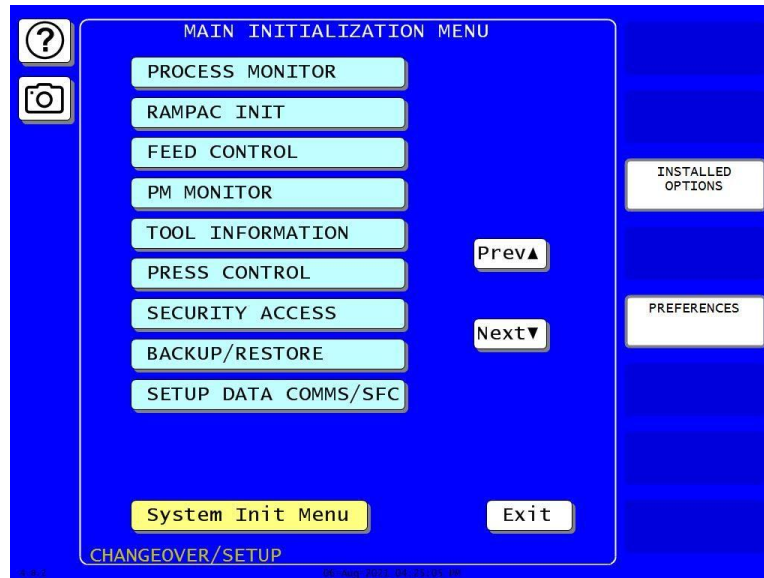


Figure 2-11. Main Initialization Menu

2. Press System Init Menu. The Initialize SmartPAC System screen appears.

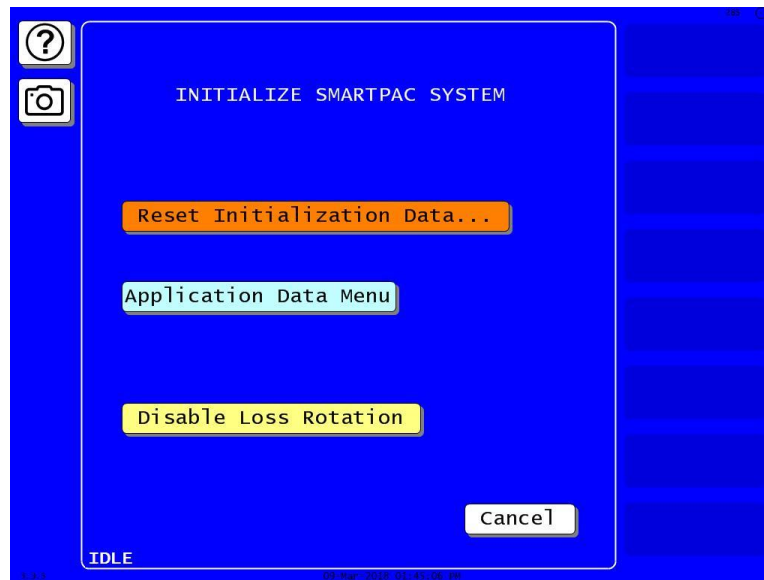


Figure 2-12. Initialize SmartPAC System Screen

3. Press Reset Initialization Data. The Modules to Initialize box appears (Figure 2-13).

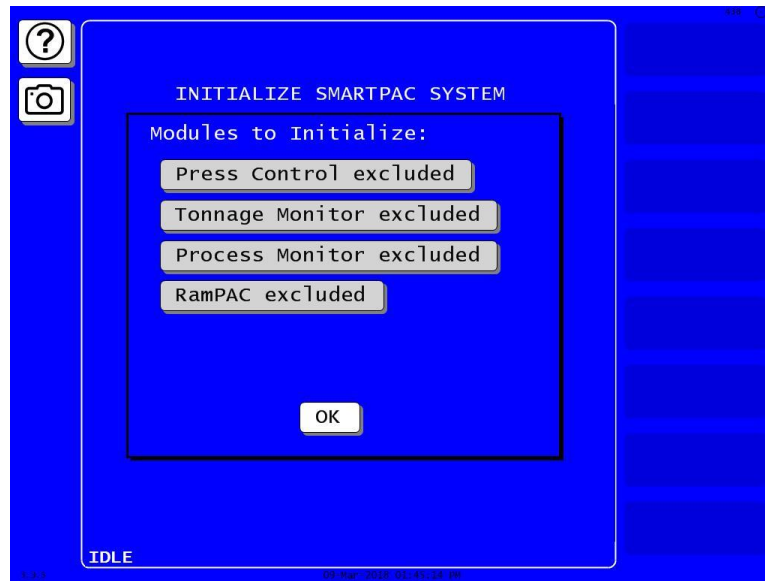


Figure 2-13. Modules to Initialize, Select Module

4. Press the button labeled "Press Control excluded." The button changes color and indicates, "Press Control included."

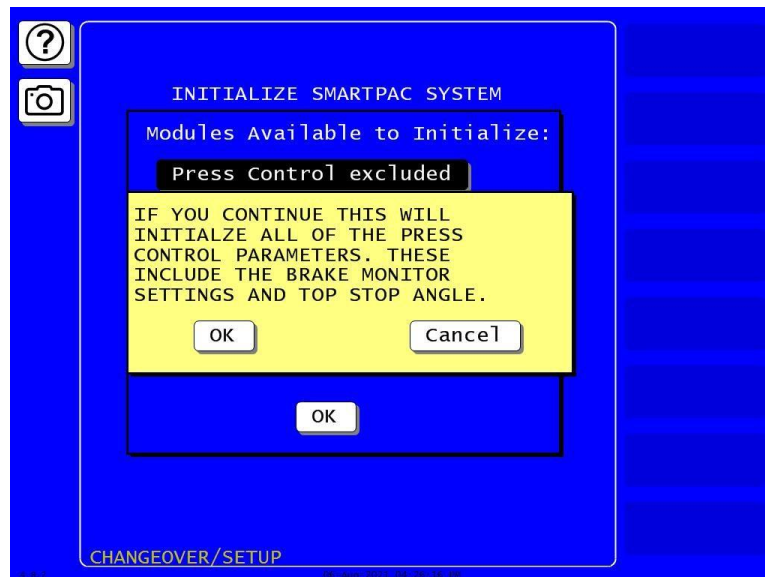


Figure 2-14. Press Control Initialization Warning

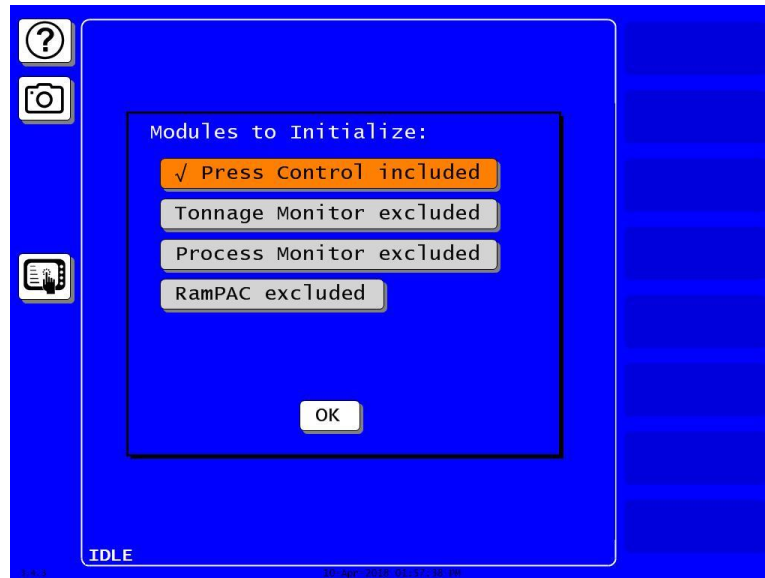


Figure 2-15. Modules to Initialize, Press Control selected

5. Press OK. A warning and confirmation box appears (Figure 2-16).



Figure 2-16. Initialize Press Control Warning and Confirmation

## NOTICE

If you want to exit the System Initialization menu, press Cancel to return to the Main Initialization menu.

6. Read the warning and press OK to initialize all the press control parameters. When initialization is complete, the Main Initialization Menu screen appears.

## Creating a New Tool Setup

Follow the instructions in your SmartPAC PRO Installation Manual to create a test tool.

## Performing Brake Monitor Tests and Making Settings

Refer to your WPC 2000 manual for

- *Running Brake Monitor Tests and Making Settings*
- *Determining the Stopping Time of Your Press*
- *Calculating the Stop-time Limit*
- *Setting the Stop-time Limit*
- *Determining the 90° Stop Time*

## Final Checkout

### **DANGER**

#### **PREVENT INJURY DURING TESTING**

- Keep all personnel away from the press during testing.
- Be sure there is no die or other tooling in the press during testing.

**Failure to comply with these instructions will result in death or serious injury.**

### **DANGER**

#### **INCORRECT INSTALLATION**

- Perform the necessary checkout procedures according to the instructions in this manual.
- Correct any malfunctions before running the press.
- Ensure that all procedures are performed by qualified personnel.

**Failure to comply with these instructions will result in death or serious injury.**

### **DANGER**

#### **PERFORM ALL CHECKOUT PROCEDURES**

Perform the necessary checkout procedures in this manual and in the following manuals:

- SmartPAC PRO User Manual
- SmartPAC PRO Installation Manual
- WPC 2000 User Manual
- WPC 2000 Installation Manual

**Failure to comply with these instructions will result in death or serious injury.**

**⚠ WARNING****ELECTRIC SHOCK HAZARD WHEN WORKING INSIDE ENCLOSURE WITH POWER ON**

- DO NOT touch electrical connections or circuit boards.
- Use test equipment only on the terminals specified in the instructions.
- Ensure that the tests are performed by qualified personnel.

**Failure to comply with these instructions could result in death or serious injury.**

**⚠ WARNING****TOOLS OR OTHER MATERIAL IN THE DIE**

Ensure that there are no tools or other material in or near the die before running the press.

**Failure to comply with these instructions could result in death or serious injury.**

**NOTICE****PRESS MUST BE IN “TOP-STOP IN INCH” MODE WHEN PERFORMING CHECKOUT TESTS**

If the press does not Top Stop in Inch, make sure there is no connection to pin #13 on the WPC 2000 Main Processor board before running checkout tests. Enable Top-stop in Inch when performing these tests. See *Operating the Press in Inch Mode* in your WPC 2000 manual.

Perform the tests needed to verify that your SmartPAC PRO - WPC 2000 integration is installed and set up correctly. These tests must be performed before you proceed to Initialization procedures.

First, perform the tests given in your WPC 2000 manual. Next, perform the tests in your SmartPAC PRO Installation Manual. Skip any tests for optional components that do not apply to your SmartPAC PRO and WPC 2000 setup. Use the “test” tool you created for setup procedures (*Creating a New Tool Setup* in your SmartPAC PRO Installation manual).

## Installation Verification (WPC 2000 Manual)

Perform the checks and procedures in *Installation Verification* in your WPC 2000 manual, including the following:

- *Checking Safeguarding Devices*
- *Checking Dual Safety Valve (DSV) Wiring*
- *Checking for Faults*
- *Checking the Emergency-stop Circuit*

## Final Checkout (SmartPAC PRO Installation Manual)

Perform the checks and procedures in *Final Checkout* in your SmartPAC PRO Installation Manual, including the following:

- *Check and Set Direction of Rotation of Resolver*
- *Check for Position Sensor (If Installed) Error Messages*
- *Check the Top-stop Circuit*
- *Check the Emergency-stop Circuit*
- *Check Cam Channels (ProCamPAC Only)*

If your SmartPAC PRO with WPC 2000 fails a test, you will be directed to follow step-by-step procedures to isolate and correct the problem. If you are unable to correct a problem, contact Wintriss Technical Support for assistance. Do not run the press until the problem has been corrected. Do not attempt to replace any components in your new WPC 2000 unless instructed to by Wintriss Technical Support.

In order to run the tests, you need to know how to operate the press in Inch, Single-stroke, and Continuous modes using Two-hand, One-hand, or Foot control. Refer to the instructions in *Operating the Press*, starting on page 88, if you need help running the press using these settings.

Many of the tests ask you to check the state of LEDs on the WPC 2000 Main Processor board and status indicators on the screens available from the Display WPC Input Status screen.

- See Figure 2-17, below, for an LED map of the WPC Main Processor board, showing the locations of all LEDs.
- View the input status as instructed in *INPUT STATUS*, page 69.

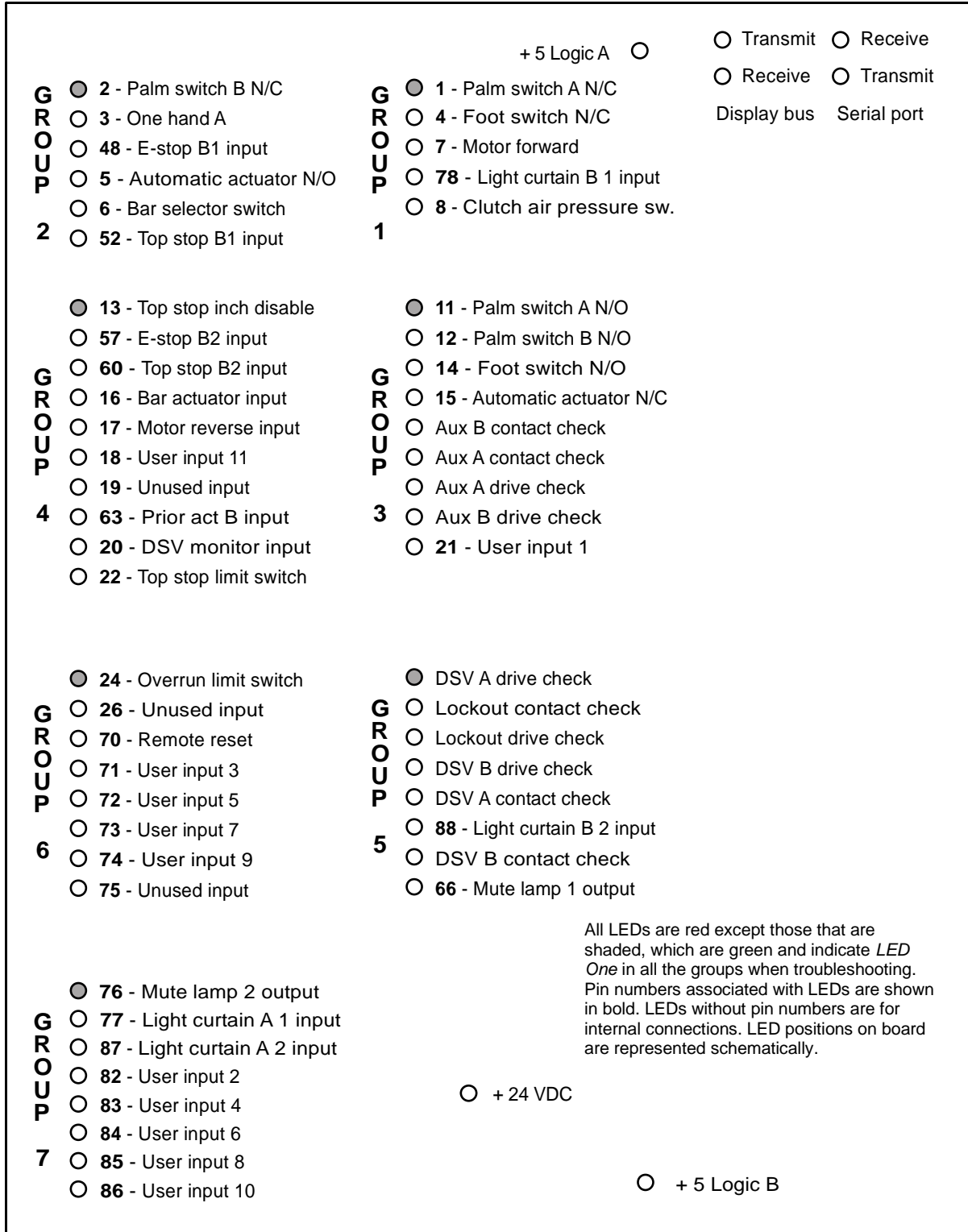


Figure 2-17. LED Map, WPC 2000 Main Processor Board



# Chapter 3 – Initialization

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## NOTICE

### INITIALIZE WPC 2000 PARAMETERS BEFORE PROGRAMMING

When you set up a new SmartPAC PRO with WPC 2000, initialize the WPC 2000 press parameters before you start programming your unit.

## NOTICE

### IF WPC 2000 WAS PREVIOUSLY INSTALLED, RECORD WPC 2000 SETTINGS BEFORE INITIALIZING PARAMETERS

Initializing press parameters sets them to their factory values. Record your WPC 2000 setting so you can reprogram them after initialization.

## NOTICE

Initializing press parameters resets them to their default values. Initialize press parameters only when you set up a new SmartPAC PRO with WPC 2000 or install new WPC 2000 firmware. When you first set up your SmartPAC PRO with WPC 2000 or when you install new WPC 2000 firmware, initialize press parameters on the Press Control Parameter Menu, as shown below.

The procedures below show you how to initialize parameters and make settings.

To initialize all parameters, see *Initializing WPC 2000 Parameters During Installation*, page 40. See your SmartPAC PRO User Manual for other Initialization settings, which are entered via the Main Initialization Menu (see Figure 3-2, page 51).

## NOTICE

For help with any screen, press  in the upper left-hand corner.

## Entering Initialization Mode

Enter Initialization mode from Program mode. See your SmartPAC PRO manual for more information.

1. Set the PROG/RUN keyswitch to PROG. The Main Program screen appears.
2. Press INITIALIZATION MENU. The Main Initialization Menu appears.

### NOTICE

#### TO EXIT INITIALIZATION MODE

- Press Back or Exit repeatedly to enter Program mode.  
or
- Turn the PROG/RUN keyswitch to RUN to enter Run Mode.

## Making Press Control Settings in Initialization mode

The PRESS CONTROL item on the Main Initialization Menu gives you access to the WPC Initialization Menu (see Figure 3-3), which allows you to make settings specific to the WPC 2000 clutch/brake control.

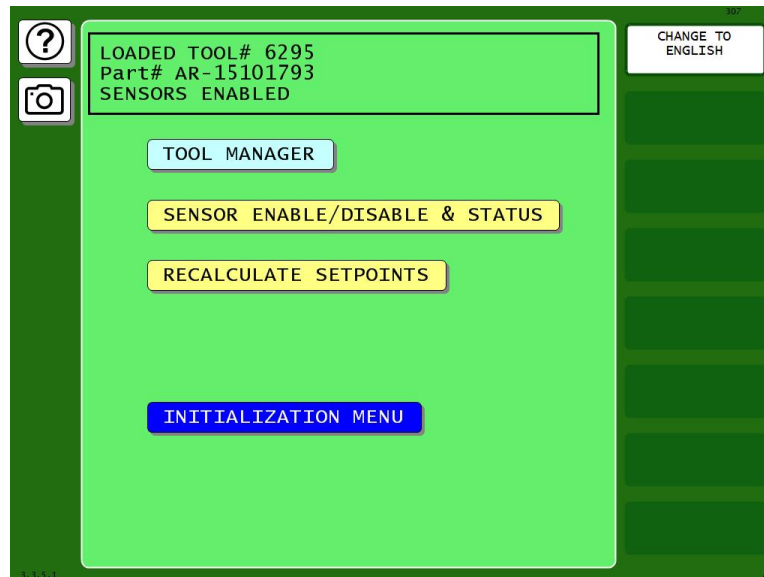


Figure 3-1. Main Program Menu

1. Enter Initialization Mode by pressing INITIALIZATION MENU on the Main Program Menu screen. The Main Initialization Menu screen appears (Figure 3-2).

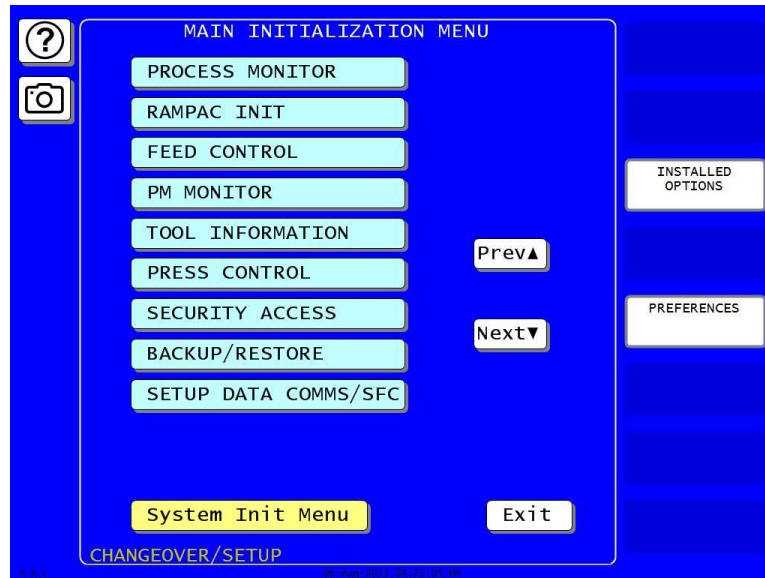


Figure 3-2. Main Initialization Menu

2. If PRESS CONTROL does not appear on the screen, press NEXT or PREV to show it.
3. Press PRESS CONTROL. The WPC Initialization Menu appears.

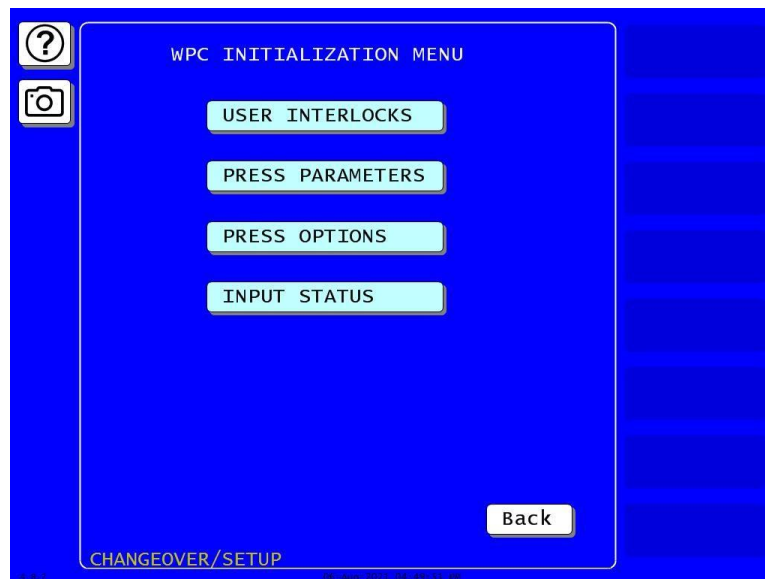


Figure 3-3. WPC Initialization Menu

From WPC Initialization Menu, access

- *USER INTERLOCKS*, next section.
- *PRESS PARAMETERS*, page 56
- *PRESS OPTIONS*, page 63
- *INPUT STATUS*, page 69

## USER INTERLOCKS

### **⚠ DANGER**

#### **USER INPUTS 1 THROUGH 7 NOT SUITABLE FOR SAFETY USE**

DO NOT use inputs 1 through 7 as part of any personnel-protection system. These inputs are not control reliable.

**Failure to comply with these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **INPUT PAIRS 8 & 9 AND 10 & 11 ARE CONTROL RELIABLE ONLY IF WIRED CORRECTLY**

User input pairs 8/9 and 10/11 are control reliable only if wired correctly in a pair according to the instructions in this section.

**Failure to comply with these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **USER INPUTS ADD DELAY TO STOPPING TIME**

DO NOT connect light curtains or other presence-sensing devices to any user inputs. The cross-checked input pairs (8/9 and 10/11), though control reliable, are suitable only for applications such as connecting to safety switches used with interlocking barrier guards.

**Failure to comply with these instructions will result in death or serious injury.**

The USER INTERLOCKS item on the WPC Initialization Menu gives you access to the Press Control User Interlock Menu, on which you can set the stop type and input name for WPC 2000's eleven user inputs. Follow the instructions below to make these settings.

## NOTICE

### **ADDITIONAL USER INPUTS WITH WPC 2000 OPTION 2 BOARD**

WPC has the 11 inputs described above. If you have the WPC 2000 Option 2 Board installed, 39 inputs are available. See *Instruction Sheet WPC 2000 Option 2* and *Appendix C* in your WPC 2000 User Manual.

These eleven inputs are used to connect signals from other equipment in order to monitor auxiliary press functions such as lubrication systems. Two input pairs are cross-checked so they are control reliable when wired correctly to safety devices and can be used to connect equipment such as interlocked barrier guards.

When one of these inputs issues a Stop command by opening a normally closed (N/C) relay, a fault code for the input appears on the SmartPAC PRO display. The type of stop is determined by the setting you make on this screen. For inputs 1 through 7, you can set the stop type to E-stop, Top-stop, or E-stop/Lockout.

If you do not want to use an input, select "UNUSED."

- Cross-checked input pair 8/9 is programmable for E-stop or E-stop/Lockout.
- Cross-checked pair 10/11 is set to E-stop/Lockout and cannot be changed.

These input pairs cause WPC 2000 to E-stop the press and generate errors when one or both inputs in a pair are open or the inputs in a pair “disagree” for longer than 100 msec. (i.e., one input is open and the other is closed).

Input pairs 8/9 and 10/11 are always activated and cannot be turned off. If you do not want to use one or both pairs of inputs, leave them wired to ground, as indicated in the *WPC 2000 User Inputs: Stop Types, Fault Codes, and Wiring Connections* table in your WPC 2000 manual.

As a help to troubleshooting and installation, you can also display the status of the interlocks by selecting the INPUT STATUS item on the WPC Initialization menu (see *Figure 3-4*).

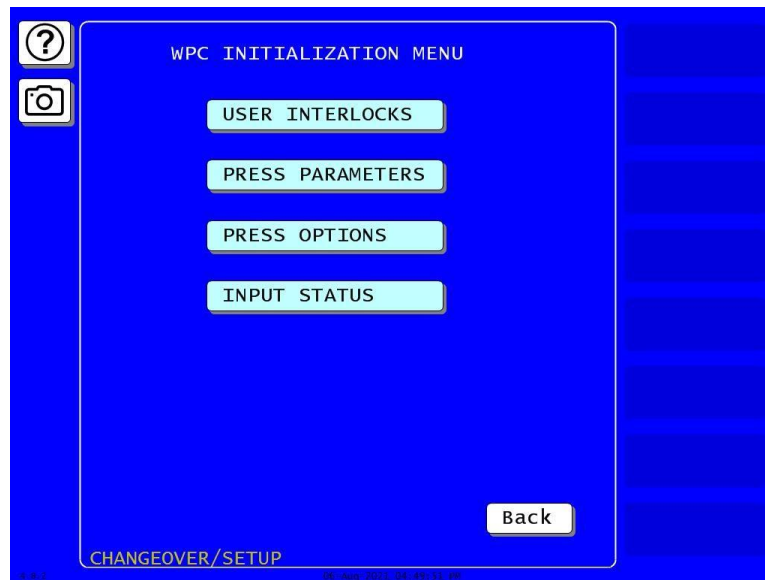
## NOTICE

Input pair 8 & 9 operates as only as E STOP or E LOC. Input pair 10 & 11 operates only as E LOC. If you set the stop type for one of these inputs to UNUSED or T STOP, SmartPAC sets it back to E STOP or E LOC when you exit the User Interlock menu.

## NOTICE

You can connect additional equipment to your WPC 2000 by purchasing the WPC 2000 Option 2 “daughter” board, which you install on the WPC 2000 Main Processor board. The Option 2 board provides up to 20 additional non-control-reliable user inputs and up to 4 additional control-reliable, cross-checked user input pairs. See the Option 2 User Manual for details. If you are interested in this product, contact your local Wintriss representative or call Wintriss Technical Support.

To set the stop type and input name for each of the user inputs, do the following:



*Figure 3-4. WPC Initialization Menu*

1. On the WPC Initialization Menu, select USER INTERLOCKS. The Change User Interlocks screen appears.

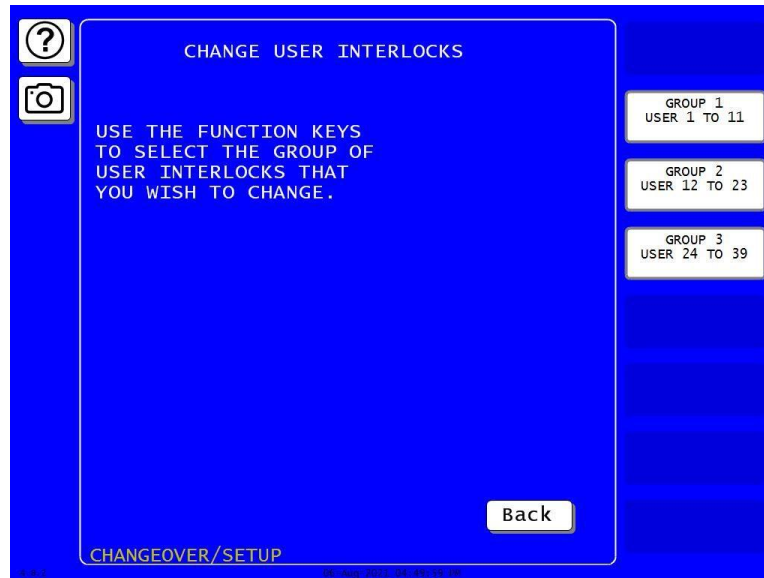


Figure 3-5. Change User Interlocks Screen

2. Press the appropriate Group key. The Press Control User Interlock Menu appears.

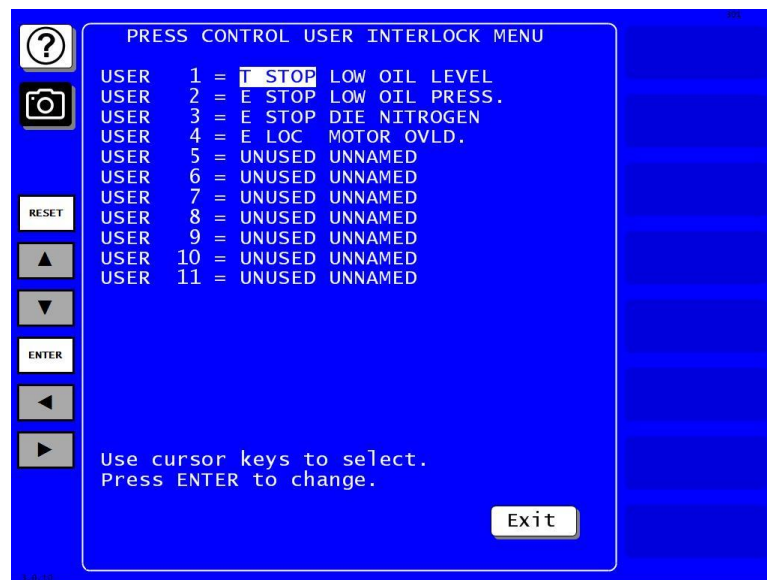


Figure 3-6. Press Control User Interlock Menu

3. Highlight the stop type for the input you want to program. Press ENTER to change the stop type. User Inputs 1 – 7 can be set to UNUSED, T STOP, E STOP or E LOC. Crosschecked pair 8/9 can be set to E STOP or E LOC, cross-checked pair 10/11 to E LOC only.
4. Use the Right (►) cursor key to move the highlight bar to the input's name ("UNNAMED" until you select another name). Press ENTER. The Select Stop Name screen (Figure 3-7) displays.



*Figure 3-7. Select Stop Name Screen*

- Highlight the name you want and press ENTER. You are returned to the Press Control User Interlock Menu with the name you selected displayed next to the appropriate user input.

If you are not using the input, select UNUSED.

To access a name beneath the MORE NAMES indicator, move the highlight bar down past the last item in the list. Additional Custom Name entries display sequentially, one at a time.

## NOTICE

The name you enter for input 8 is applied to both inputs 8 and 9 in the cross-checked pair. The name you enter for input 10 is applied to both cross-checked inputs 10 and 11. Once you have established names for inputs 8 and 10, any name you attempt to enter for input 9 or 11 will be disregarded.

- If you want to enter a name that does not appear in the list, select “CUSTOM” NAME and press ENTER. When the On-screen Keyboard appears (Figure 3-8), key in the name. Press ENTER to accept your entry. You are returned to the Select Stop Name screen.

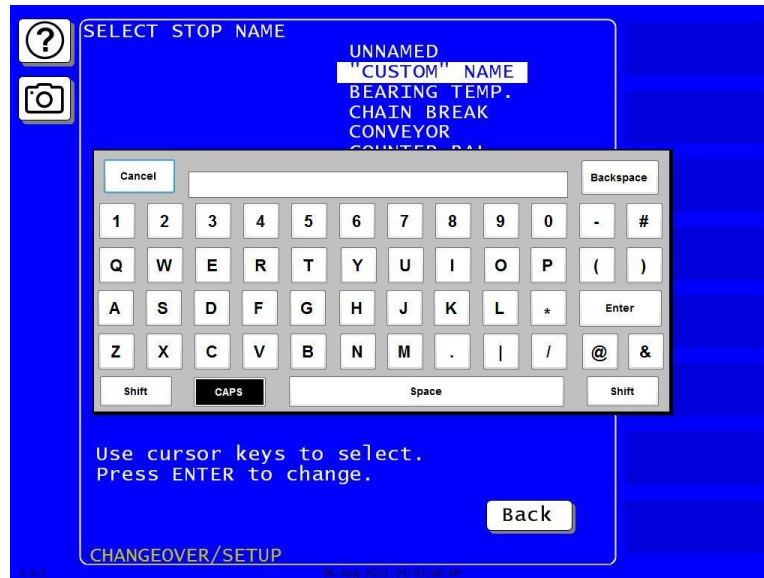


Figure 3-8. SmartPAC PRO On-screen Keyboard

7. Repeat steps 2 through 4 for the other user inputs.
8. When you are finished, press Back twice to return to the WPC Initialization Menu.

## PRESS PARAMETERS

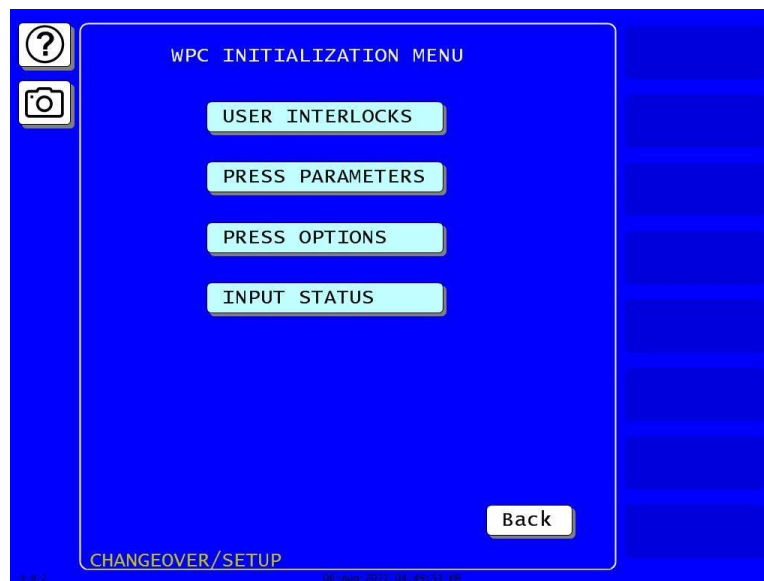


Figure 3-9. WPC Initialization Menu





Figure 3-10. Press Control Parameter Menu

The Press Parameters item on the WPC Initialization Menu gives you access to the Press Control Parameter Menu, above, on which you can make the following WPC 2000 settings:

- *Setting the Top-stop Default Angle*, page 58
- *Setting the Auto Carry-up Angle*, page 58
- *Setting Micro-inch Time and Angle*, page 59
- *Setting Clutch and Counterbalance Air Pressure Limits*, page 60
- *Setting the Stop-time Limit and Start-time Limit*, page 61
- 
- *Setting the Shutdown Time (Optional)*, page 61
- *Setting Flywheel Timer (Optional Hardware Required)*, page 62
- *Setting the ACTS Angle (Optional)*, page 62
- *Selecting Pressure Units*, page 62

You can also select the units used to display pressure on this and other Press Control screens and instruct WPC 2000 to perform an Initialize Parameters operation.

To set any of the bulleted items shown above, perform the following steps:

1. On the Press Control Parameter Menu, select the item you want, using the cursor keys, and press ENTER. A numeric entry window opens.

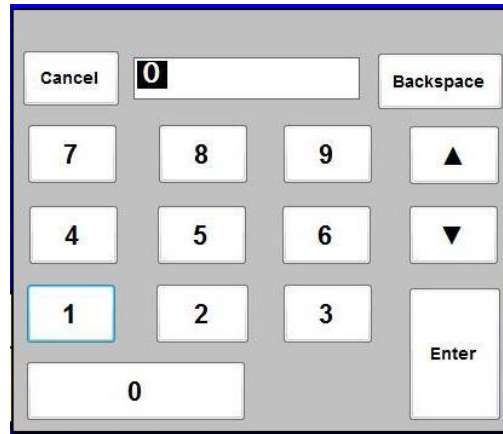


Figure 3-11. Numeric Entry Window

2. Key in a new value. Press Enter
3. Press Back to save your change and return the WPC Initialization Menu.

To initialize press parameters, perform the procedure shown in *Initializing WPC 2000 Parameters During Installation*, page 40.

## Setting the Top-stop Default Angle

The value you enter in this field will be entered in all new tools you create as the top stop angle and should be set to the Top-stop “On” angle you determined. See *Setting the Top-stop “On” Angle* in your WPC 2000 manual.

1. In the Press Control Parameter menu, Figure 3-10, page 57, use the cursor keys to select TOP STOP DEFLT. Press ENTER. A numeric entry window appears.
2. Key in the Top Stop “On” angle you determined.
3. Press Enter to save the value. The Press Control Parameter Menu appears.

## Setting the Auto Carry-up Angle

### NOTICE

For a variable-speed press, you need to determine the latest Top-stop Angle, which is the angle at which the press top-stops at its slowest speed and with the shortest stopping angle/time.

### NOTICE

#### BEFORE YOU SET THE AUTO CARRYUP ANGLE, MAKE SURE THAT

- The press ram has been mechanically set to top dead center (TDC) (see NOTICE on page 23)
- The resolver has been aligned as close as possible to TDC (i.e.,  $0^\circ \pm 2^\circ$ ) (see *Mounting the Resolver* in your WPC 2000 Installation or User Manual)
- The resolver has been zeroed (see *Zeroing the Resolver* in your WPC 2000 Installation or User Manual).

**⚠ DANGER****INCORRECT AUTO CARRY-UP ANGLE**

- Ensure that the Auto Carry-up Angle is correct. If the operator can reach the pinch point, the Auto Carry-up Angle must be set so that any hazardous openings are smaller than 1/4 in. by the time the crankshaft reaches the Auto Carry-up Angle.
- Determine the Auto Carry-up Angle for each tool, based on the crank angle at which the tool's hazardous openings are smaller than 1/4 in.
- Change the Auto Carry-up Angle to the correct value when you change tools.

**Failure to comply with these instructions will result in death or serious injury.**

**NOTICE**

The following Auto Carry-up function also applies to Foot Control. For more information about using Foot Control for Single Stroke mode, see *Single-stroke, Foot Operation*, page 95 and *Enabling Foot Control in a Foot Switch* in your WPC 2000 manual under *Making Settings on Switch Block S101*.

WPC 2000's Auto Carry-up feature (also called Operator Station Mute) enables the press to complete a stroke whenever the operator releases the Run/Inch palm buttons after the ram has passed the Auto Carry-up Angle.

The Auto Carry-up Angle is factory-set to 149° if your WPC 2000 has light curtain firmware. Set it to 170° if you have non-light curtain firmware. If you change the auto carry-up default setting, you must use an angle value that is at or past the crankshaft angle at which the pinch point openings on the press have closed to less than 1/4 in. (6 mm). Pinch points that are less than 1/4 in. (6 mm) are considered non-hazardous to the operator.

With large presses where the stroke is long and press speed is slow, you must ensure that the operator cannot release the buttons and reach the pinch point before it closes. This applies only when Two-hand Control is used to safeguard the point of operation (without light curtain) and only if any opening allowing access to the pinch point is 1/4 in. (6 mm) or larger.

Set the Auto Carry-up Angle at the correct value to protect the operator.

**Setting Micro-inch Time and Angle**

Micro-inch Time is the length of time in milliseconds that the Dual Safety Valve is open when the operator presses the Run/Inch buttons on the Operator Station while the press is in Inch mode.

Normally, when the press is running in Inch (see *Top-stop in Inch*, page 90), the DSV is open and the clutch engaged as long as the Run/Inch palm buttons are depressed. When Micro-inch is enabled, the clutch remains engaged only for the length of time specified in the MICRO TIME setting on the Press Control Parameter Menu unless the operator releases the Run/Inch palm buttons before the period has expired.

Enable Micro-inch via the MICRO ANGLE setting on the Press Control Parameter menu, Figure 3-10, page 57. The Micro Angle default setting is 185°, which disables Micro-inch. To enable this feature, change the Micro Angle to another setting between 186° and 184°. The angle you specify enables Micro-inch for the range of angles between that value and 185°.

**EXAMPLE**

If you set the Micro-inch Angle to 186°, the press will automatically Micro-inch throughout the stroke from 186° to 185°.

If you set the Micro-inch Angle to 300°, the press will Micro-inch from 300° to 185°. Normal inching resumes from 185° to 300°.

You can enter Micro-inch time values from 6 to 600 milliseconds. The default value, set at the factory, is 100 mS.

**Setting Clutch and Counterbalance Air Pressure Limits****NOTICE**

If you set the counterbalance setpoint adjustment (CNTR BAL +/-) to zero (0) it will not appear on the Press Control Parameters screen in Program mode.

The MAIN AIR LIMIT and CNTRBAL +/- items allow you to establish a low setpoint for Clutch Air Pressure and a setpoint range for Counterbalance Air Pressure. Instructions for installing sensors or switches to monitor Clutch and Counterbalance Air pressures are provided in your WPC 2000 manual under *Installing Air Pressure Switches*.

The value you enter in the MAIN AIR LIMIT field sets the low limit for Clutch Air Pressure. If clutch pressure drops below the limit, an F45 fault displays on the SmartPAC PRO screen (see Chapter 5, *Troubleshooting*, in your WPC 2000 manual).

You can view the current Clutch Air Pressure and the Main Air Limit on the Press Control Parameters Screen in Run mode (Figure 5-3, page 84). To disable clutch pressure monitoring, enter zero (0) in the Clutch Air LMT field in the Initialization Menu. When you do so, clutch pressure readings and the Low Limit setting are not displayed in Run mode.

The value you enter in the CNTR BAL +/- field sets the tolerance for the Counterbalance Setpoint you establish in Program mode (see Figure 4-8, page 78). For example, if you program a Counterbalance Setpoint of 40 psi and a Counterbalance Tolerance of +/- 5 psi, Counterbalance Air pressures must remain within a range of 35 to 45 psi whenever the press is at or passing through Top Dead Center (TDC). (Counterbalance pressure can vary outside this range at Bottom Dead Center (BDC)). If the counterbalance pressure falls outside the tolerance you set, an F46 fault appears on the SmartPAC PRO display (see *SmartPAC PRO Fault Messages*, in your SmartPAC PRO manual).

You can view the current Counterbalance Air Pressure and Counterbalance Setpoint on the Tool screen in Run mode (see Figure 5-5, page 85). To disable pressure monitoring, enter zero (0) in the CNTR BAL +/- field in the Initialization Menu. When you do so, the CNTR BAL SETPOINT field will not appear on the Press Control Parameters screen in Program mode, and counterbalance pressure readings and the Counterbalance Setpoint will not display in Run mode.

## Setting the Stop-time Limit and Start-time Limit

### **⚠ DANGER**

#### **RECALCULATE SAFETY DISTANCE WHEN STOP TIME CHANGES**

- Perform a 90° Stop Test any time you change the Stop-time Limit (see *Performing the 90° Stop-time Test* in your SmartPAC PRO User Manual, Chapter 5).
- Recalculate the safety distance based on the new Stop-time Limit and adjust or reinstall safeguarding devices according to the new safety distance.

**Failure to comply with these instructions will result in death or serious injury.**

To calculate the stop time limit and set the stop time and start time limits, see *SET BRAKE MONITOR* in your SmartPAC PRO user manual.

To set the stop time and start time limits, do the following:

1. On the Main Initialization Menu press PRESS CONTROL. The WPC Initialization Menu screen appears.
2. Press PRESS PARAMETERS. The Press Control Parameter menu appears.
3. Use the up and down (▲▼) arrows to highlight the value for STOP LIMIT. Press ENTER. A numeric entry window appears.
4. Key in a value (maximum is 1000 milliseconds) and press Enter. You are returned to the Press Control Parameter menu with the value you entered displayed.
5. Use the up and down (▲▼) arrows to highlight the value for START LIMIT. Press Enter. A numeric entry window appears.
6. Key in a value (maximum is 1000 milliseconds) and press Enter. You are returned to the Press Control Parameter menu showing the value you entered.
7. Press Back twice to return to the Main Initialization Menu.

## Setting the Shutdown Time (Optional)

### **NOTICE**

Auto-compensated Top Stop (ACTS) firmware is required in order for WPC 2000 to implement the Shutdown Time setting.

### **NOTICE**

Since WPC 2000 uses the lockout relay to shut off the press motor when the Shutdown Time has expired, the lockout relay must be wired to the motor starter in order for the Shutdown Time setting to function (see *Wiring the Lockout Relay* in your WPC 2000 manual).

The Shutdown Time setting is the length of time WPC 2000 waits after the DSV de-energizes before shutting off the press motor. When the DSV is de-energized, the motor may still be on even though the press is not actually running. WPC 2000 uses the Shutdown Time value to turn off the press motor if the DSV is not re-energized after the specified length of time. A fault code F10 appears on

the SmartPAC PRO display when the press has been stopped. You can set the Shutdown Time to any value between 0 and 100 minutes.

## Setting Flywheel Timer (Optional Hardware Required)

### NOTICE

A flywheel speed sensor (LMCS) must be installed in order for the Flywheel Timer to function. See *Installing the Optional Flywheel Speed Sensor*, page 29.

The Flywheel Timer setting allows WPC 2000 to prevent the press motor from being reversed or Bar mode from being activated whenever the flywheel is turning at a speed greater than the specified number of seconds per revolution.

A flywheel speed sensor (LMCS) must be installed in order for WPC 2000 to implement the Flywheel Timer setting. The flywheel sensor monitors the length of time it takes the flywheel to turn one revolution. As the flywheel slows down, the time for one revolution increases. The Flywheel Timer should be set to the cycle time below which it is safe to reverse or bar the press. This setting affects both Forward-to-Reverse and Reverse-to-Forward changes in press motor operation.

### EXAMPLE

When the press is running at 60 strokes per minute (SPM), the length of time for one revolution is 1 second (i.e.,  $60/60 = 1$ ). As the press slows down to 3 SPM, the time increases to 20 seconds per revolution (i.e.,  $60/3 = 20$ ). If you set the Flywheel Timer to 20 seconds, WPC 2000 will not allow reversal of the motor or barring of the press until the flywheel has slowed down to less than 3 SPM.

## Setting the ACTS Angle (Optional)

Auto-compensated Top Stop (ACTS) is an optional WPC 2000 firmware feature that automatically adjusts the Top-stop “On” Angle to an earlier point in the stroke to compensate for increases in press speed.

To enable ACTS, set switch 4 to ENABLED on the Press Control Option Switch Menu (see *PRESS OPTIONS*, below).

The ACTS Angle setting allows you to specify the angle at which you want the press to stop. In most variable speed applications, the ACTS angle should be set to  $0^\circ$ , the default value.

However, in top knock-out applications, the angle might be set after  $0^\circ$ , while in some high-speed applications, it might be set before  $0^\circ$ . SmartPAC PRO will accept ACTS Angle entries only between  $330^\circ$  and  $30^\circ$ . If you have questions about where to set the ACTS Angle, contact Wintriss Technical Support.

## Selecting Pressure Units

With the Pressure Units setting you can select the units in which pressure is displayed on Press Control screens in Initialization, Program, and Run modes.

Three Pressure Unit options are available:

- PSI (Pounds per Square Inch)
- Kp (Kilopascals)

- BAR (Bars).

To select a Pressure Unit, do the following:

With the highlight bar on the current PRESSURE UNIT setting, press ENTER until the option you want is displayed. Note that the units in which the MAIN AIR LIMIT and CNTRBAL +/- settings are displayed change to the units you selected.

## PRESS OPTIONS

### NOTICE

#### CYCLE POWER AFTER CHANGING OPTION SWITCH SETTINGS

Whenever you change an option switch setting, you must power down the SmartPAC PRO/WPC 2000 and power it back up again in order to enable the new setting. If you do not cycle power, the previous switch setting will remain in effect.

Under Press Options in the WPC Initialization Menu, you can make settings for the eight option switches as well as the three operator mode settings.

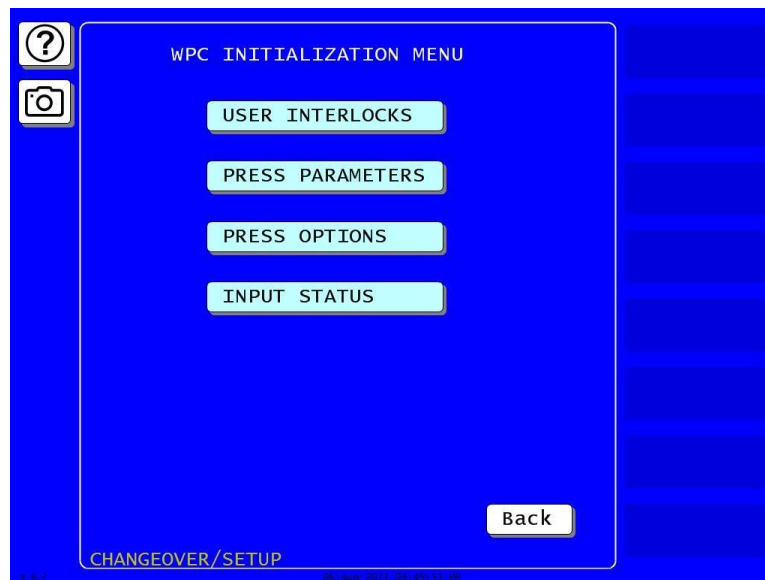


Figure 3-12. WPC Initialization Menu

1. In the WPC Initialization Menu, press PRESS OPTIONS. The Press Control Option Switch Menu appears.

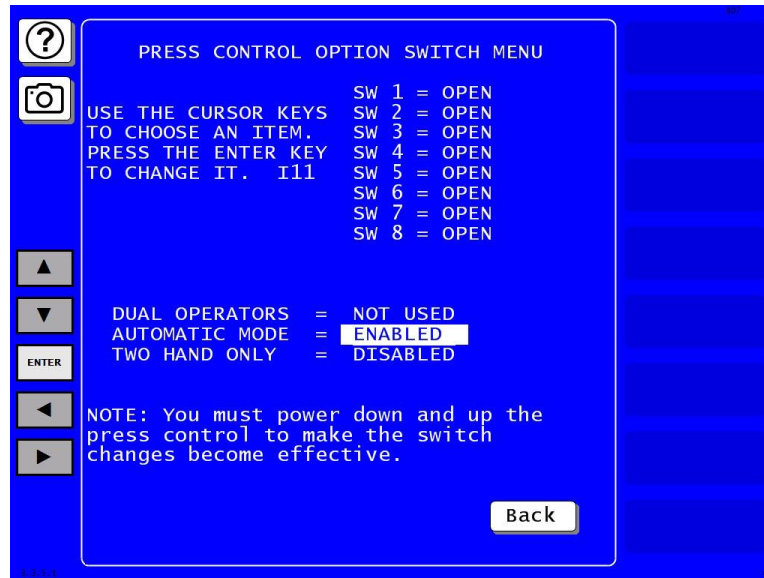


Figure 3-13. Press Control Option Switch Menu

You can set the switches to OPEN or CLOSED. To set a switch, do the following:

2. On the Press Control Option Switch Menu, use the Up (▲) and Down (▼) cursor keys to select the switch you want to set.
3. Press ENTER until the setting you want is displayed.
4. Repeat steps 1 and 2 for each switch you want to set.
5. Press Back when you are finished to save your settings and return to the WPC Initialization Menu.

## Making Operator Mode Settings

In the Press Options screen, Figure 3-13, the DUAL OPERATORS, AUTOMATIC MODE, and TWO HAND ONLY items allow you to make settings that control operator interaction with the WPC 2000. See Table 3-1 and the sections below for more information about these operator settings.

- *Dual Operators*, next section
- *Automatic Mode*, page 67
- *Two Hand Only*, page 68

To set one of these items, do the following:

1. On the Press Control Option Switch Menu, use the Up (▲) and Down (▼) cursor keys to select the operator mode item you want.
2. Press ENTER until the setting you want is displayed.
3. Repeat steps 1 and 2 for each operator mode you want to set.
4. Press Exit when you are finished to save your settings and return to the WPC Initialization Menu.



Table 3-1. Option Switch Settings Table

<b>Top Stop Angle</b>	<b>Less than 240°</b>	<b>241° to 270°</b>	<b>271° to 300°</b>	<b>More than 301°</b>	<b>Your selection</b>
Overrun Limit Switch Location	270°	300°	330°	359°	
Switch 1 Setting	CLOSED	CLOSED	OPEN	OPEN	
Switch 2 Setting	CLOSED	OPEN	CLOSED	OPEN	

<b>Switch 3 Setting</b>	<b>One-hand Control</b>	<b>Foot Switch</b>	<b>Your Selection</b>
OPEN	One-hand Control active all the time	Normal operation (Foot Trip)	
CLOSED	“Light curtain break” mode: One-hand Control active only for 8 sec after light curtain is broken	Enables Foot Control: depress and hold foot switch	

<b>Switch 4 Setting</b>	<b>Press operation Normal / ACTS</b>	<b>Your Selection</b>
OPEN	Normal operation	
CLOSED	Auto Compensated Top Stop feature enabled	

<b>Switch 5 Setting</b>	<b>Prior Act Timing for Automatic Single Stroke</b>	<b>Prior Act Timing for Continuous on Demand</b>
OPEN	30 Seconds	1 Minute
CLOSED	3 Minutes	10 Minutes

Switch 6 Setting	Light Curtain Configuration	Your Selection
OPEN	Single light curtain – normal operation	
CLOSED	Dual light curtains enabled	

Switch 7 Setting	Changes to Stop Time Limit and Auto Carry-up Angle	Your Selection
OPEN	Enabled	
CLOSED	Disabled	

Switch 8 Setting	Top Stop Behavior for F and H Errors
OPEN	If the error occurs after 210°, the control allows the press to complete another stroke before it top stops. If the error occurs before 210°, the control top stops the press on the same stroke.
CLOSED	The control top stops the press on the current stroke, even if the error occurs after 210°

## Dual Operators

With this item (see Figure 3-14) you can enable Dual Operator Stations when two or more Operator Stations are wired to WPC 2000 (see *Installing Multiple Operator Stations* in your WPC 2000 manual) and to specify how the active Operator Station(s) is selected. There are three options:

- NOT USED (Default). The Dual Operator Station feature is disabled. WPC 2000 recognizes only one Operator Station.
- SCREEN MODE. The Dual Operator Station feature is enabled, and the Active Op. Station is selected on the SmartPAC PRO Run mode display.
- REMOTE SWITCH. The Dual Operator Station feature is enabled, and the Active Op. Station is selected via a remote three-position switch. If you use this setting, you must wire a remote selector switch. You can order such a switch from Wintriss (part no. 4325901).

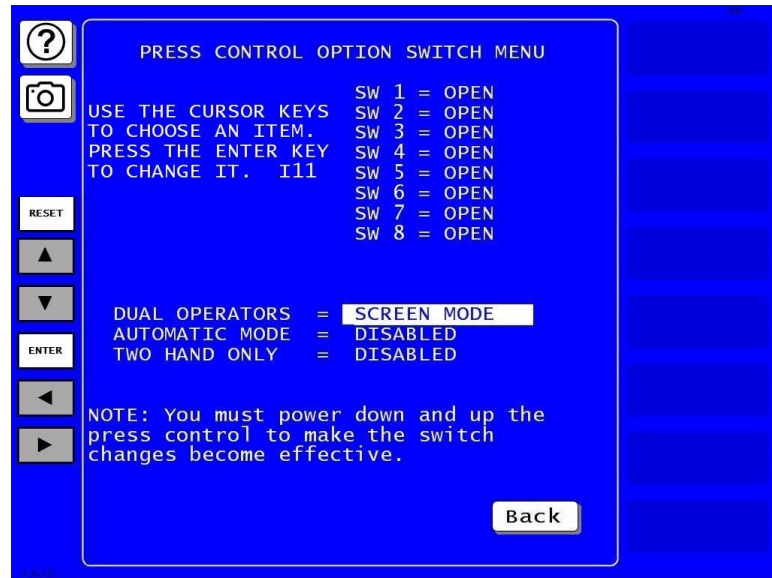


Figure 3-14. Press Control Option Switch Menu – Dual Operators Screen Mode

### Automatic Mode

With this item you can enable Automatic Single-stroke or Automatic Continuous On-demand operating mode if you plan to use one of these options. Refer to wiring instructions in your WPC 2000 manual. For operating procedures, refer to pages 96 and 99 in this manual.

There are two options:

- DISABLED (Default). Automatic modes are disabled.
- ENABLED. Automatic modes are enabled.

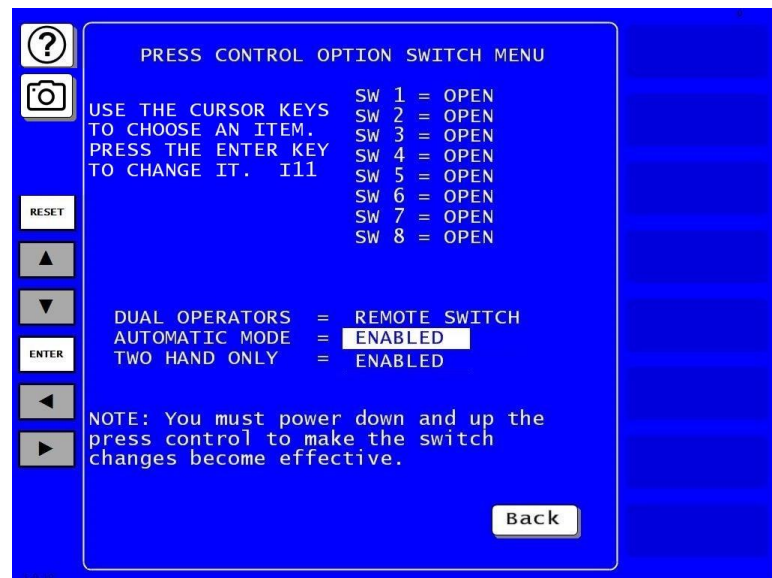


Figure 3-15. Press Control Option Switch Menu – Automatic Mode Setting

## Two Hand Only

### NOTICE

One-hand/Two-hand/Foot firmware must be installed in order for this setting to be functional. Do not set this item if you are running standard firmware.

With this item (see Figure 3-16) you can make One-hand and Foot operating modes unavailable if you are running One-hand/Two-hand/Foot firmware. If you are running standard firmware, this setting is not functional. There are two options:

- **DISABLED (Default).** Two-hand Only operating mode is disabled, allowing the user to select Two-hand, One-hand, or Foot mode to run the press.
- **ENABLED.** Two-hand Only operating mode is enabled, making One-hand and Foot modes unavailable.

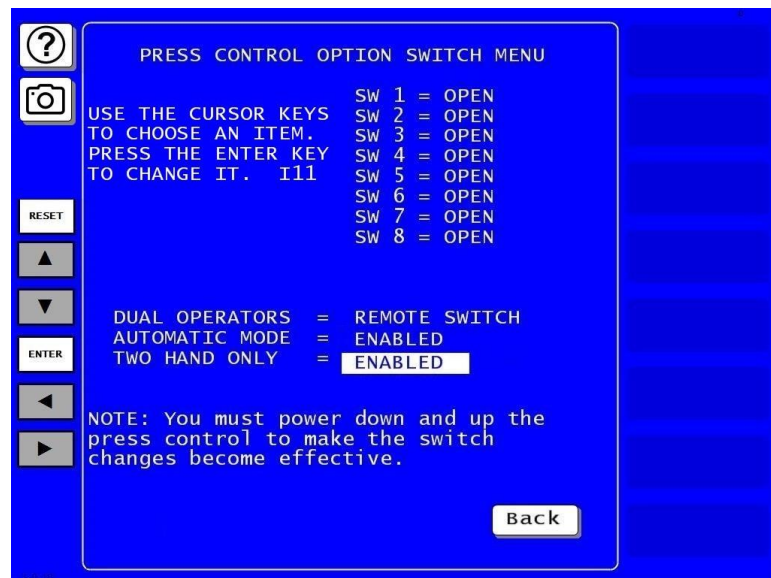


Figure 3-16. Press Control Option Switch Menu – Two Hand Only Setting

## INPUT STATUS

The Input Status item on the WPC Initialization Menu gives you access to the Display WPC Input Status screen (see Figure 3-18), from which you can view the status of WPC inputs, including buttons, switches, E-stops, Top-stops, interlocks, and transducers.

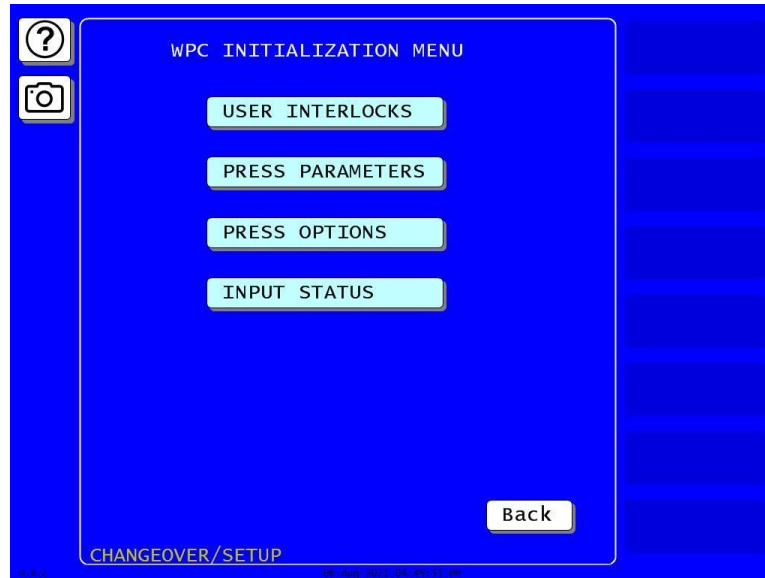


Figure 3-17. WPC Initialization Menu

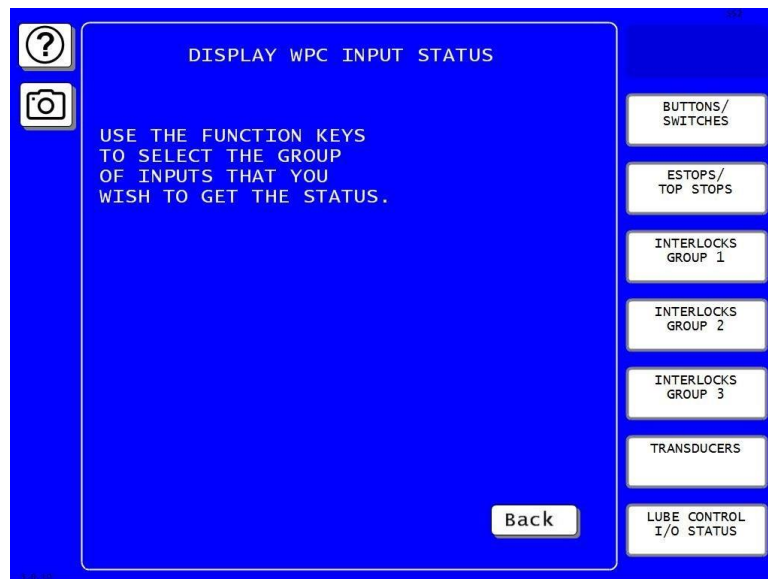


Figure 3-18. Display WPC Input Status Main Screen

Several different input status screens are provided as an aid to installation and troubleshooting. Access the screens by pressing the appropriate buttons on the Display WPC Input Status screen (Figure 3-18).

**NOTICE**

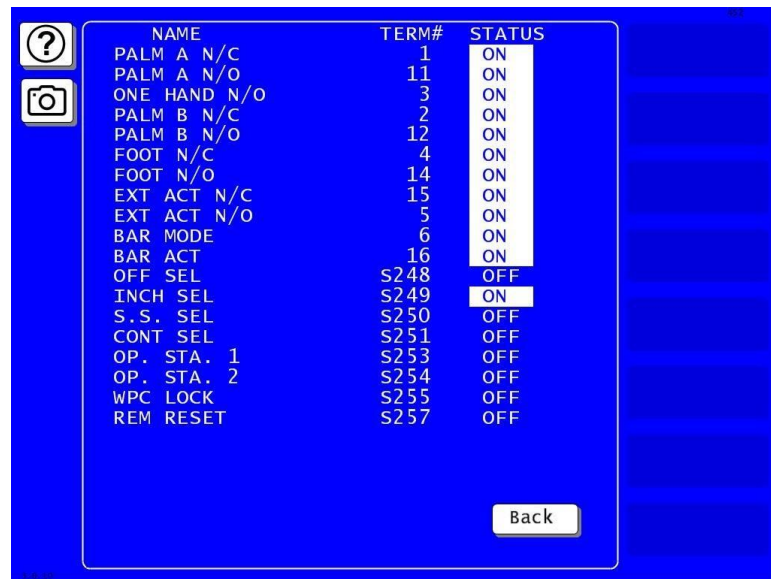
The LEDs on the WPC 2000 Main Processor board also show the status of these inputs. For maps of LED locations see the WPC 2000 LED indicator maps in Chapter 3 of your WPC 2000 User Manual.

**NOTICE**

The TRANSDUCERS button opens a calibration screen required when using pressure transducers not supplied by Wintriss. Refer to the on-screen Help, or contact Wintriss Technical Support if you wish to use non-Wintriss pressure sensors.

**BUTTONS/SWITCHES**

Press **BUTTONS/SWITCHES** to see the WPC Buttons and Switches Input Status screen, Figure 3-19.

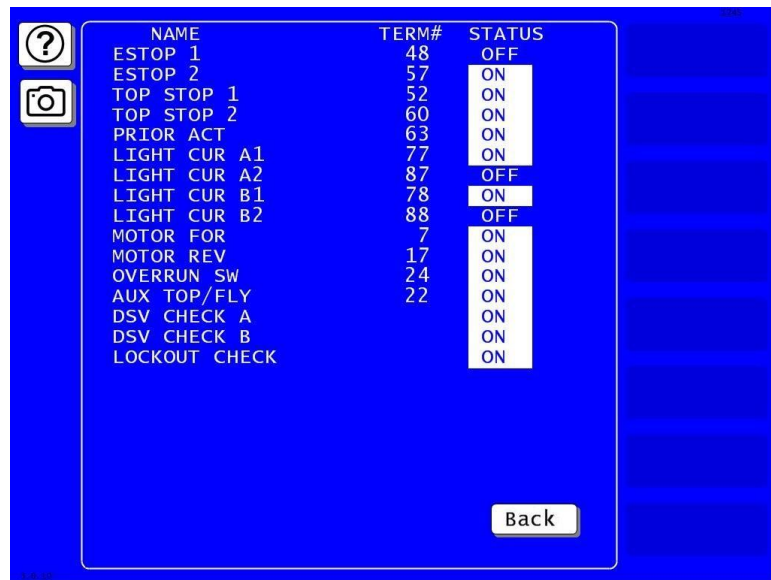


NAME	TERM#	STATUS
PALM A N/C	1	ON
PALM A N/O	11	ON
ONE HAND N/O	3	ON
PALM B N/C	2	ON
PALM B N/O	12	ON
FOOT N/C	4	ON
FOOT N/O	14	ON
EXT ACT N/C	15	ON
EXT ACT N/O	5	ON
BAR MODE	6	ON
BAR ACT	16	ON
OFF SEL	S248	OFF
INCH SEL	S249	ON
S.S. SEL	S250	OFF
CONT SEL	S251	OFF
OP. STA. 1	S253	OFF
OP. STA. 2	S254	OFF
WPC LOCK	S255	OFF
REM RESET	S257	OFF

Figure 3-19. Buttons and Switches Status Screen

## ESTOPS/TOP STOPS

To see the E-Stop and Top Stop input status, press ESTOPS/TOP STOPS in the Display WPC Input Status screen.

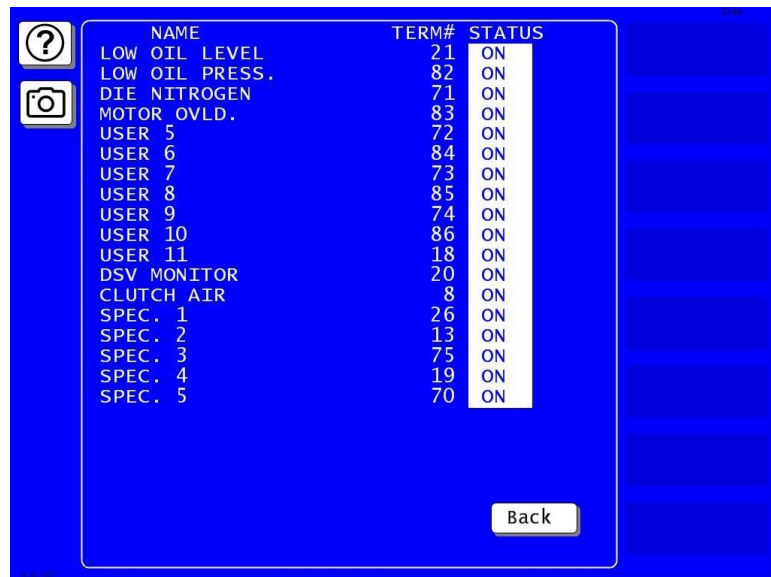


NAME	TERM#	STATUS
ESTOP 1	48	OFF
ESTOP 2	57	ON
TOP STOP 1	52	ON
TOP STOP 2	60	ON
PRIOR ACT	63	ON
LIGHT CUR A1	77	ON
LIGHT CUR A2	87	OFF
LIGHT CUR B1	78	ON
LIGHT CUR B2	88	OFF
MOTOR FOR	7	ON
MOTOR REV	17	ON
OVERRUN SW	24	ON
AUX TOP/FLY	22	ON
DSV CHECK A		ON
DSV CHECK B		ON
LOCKOUT CHECK		ON

Figure 3-20. E-Stops and Top Stops Status Screen

## INTERLOCKS

To see Interlocks status, press INTERLOCKS in the Display WPC Input Status screen.



NAME	TERM#	STATUS
LOW OIL LEVEL	21	ON
LOW OIL PRESS.	82	ON
DIE NITROGEN	71	ON
MOTOR OVLD.	83	ON
USER 5	72	ON
USER 6	84	ON
USER 7	73	ON
USER 8	85	ON
USER 9	74	ON
USER 10	86	ON
USER 11	18	ON
DSV MONITOR	20	ON
CLUTCH AIR	8	ON
SPEC. 1	26	ON
SPEC. 2	13	ON
SPEC. 3	75	ON
SPEC. 4	19	ON
SPEC. 5	70	ON

Figure 3-21. Interlock Group 1 Input Status

### NOTICE

If you have the WPC OPTION 2 installed, you can press INTERLOCKS GROUP 2 or INTERLOCKS GROUP 3 to see the additional User Interlocks.

## TRANSDUCERS

To see the status of the Transducers, press TRANSDUCERS in the Display WPC Input Status screen.

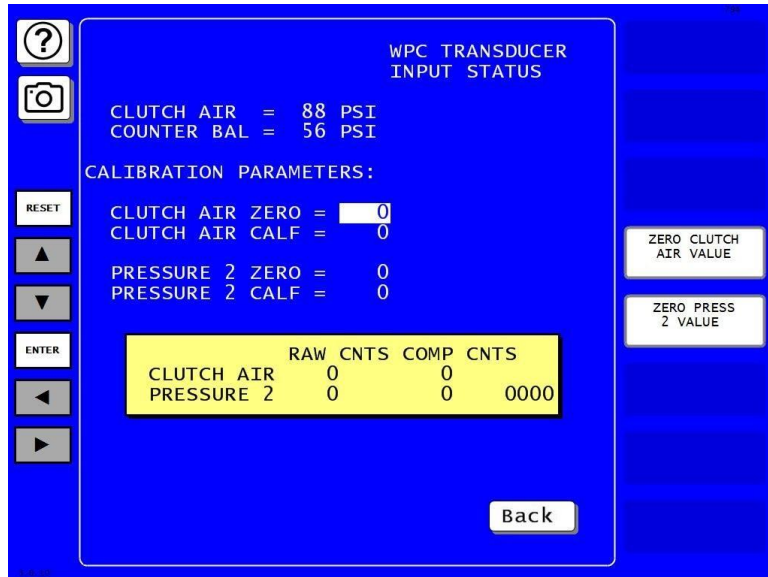


Figure 3-22. WPC Transducer Input Status

## LUBE CONTROL I/O STATUS

In the Display WPC Input Status screen, press LUBE CONTROL I/O STATUS.

If you have the WPC Option 2 installed, to see the status of the Lube Control I/O Status, press LUBE CONTROL I/O in the Display WPC Input Status screen.

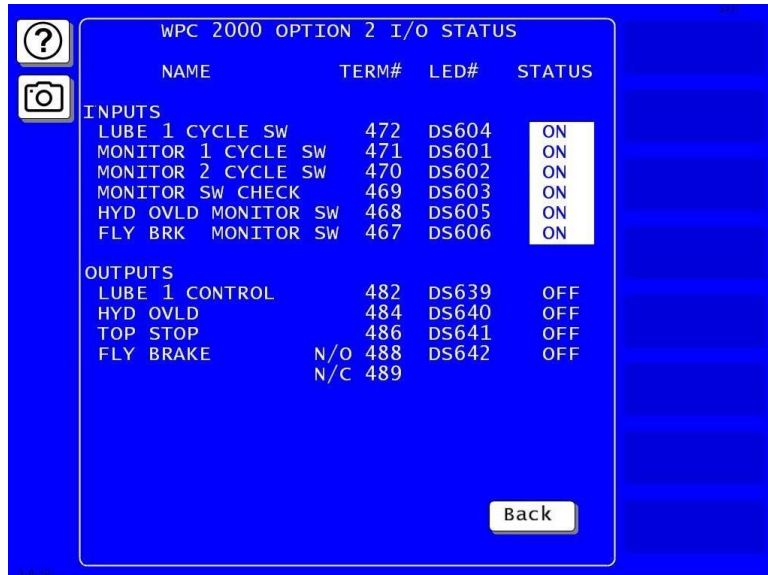


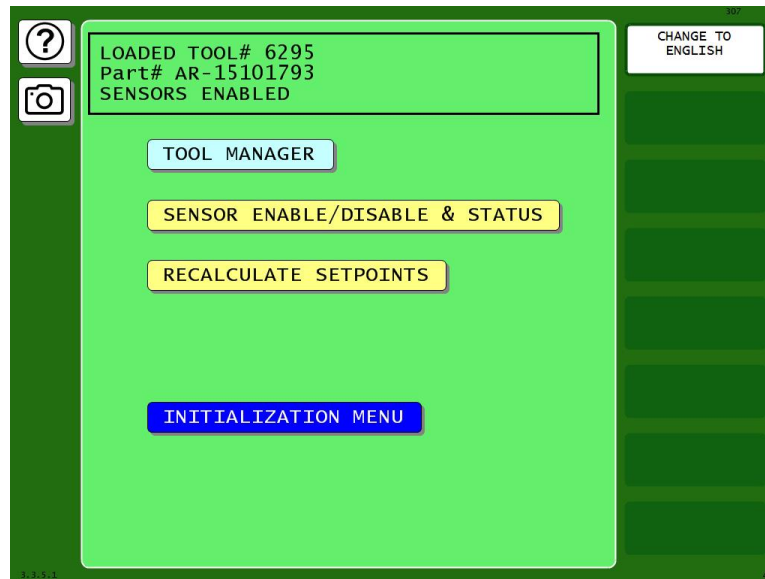
Figure 3-23. Lube Control I/O Status



# Chapter 4 – Program

## NOTICE

For help with any screen, press  in the upper left-hand corner.



*Figure 4-1. Main Program Menu*

Follow the instructions in your SmartPAC PRO User Manual for most programming operations. The instructions below cover programming operations that apply to your SmartPAC PRO – WPC 2000 integration. Refer to your SmartPAC PRO User Manual for other programming operations.

## Entering and Exiting Program Mode

To enter the Program Mode, set the keyswitch in the lower right corner of the front panel to “PROG.” The first display you see in Program mode is the Main Program Menu (*Figure 4-1*).

## PRESS CONTROL

(PROGRAM – TOOL MANAGER – select tool – EDIT TOOL – PRESS CONTROL)

### NOTICE

For help with any screen, press  in the upper left-hand corner.

1. In Program mode, press TOOL MANAGER. The Tool Manager screen appears.



Figure 4-2. Tool Manager Screen

2. Select a tool. Press EDIT TOOL. The Tool Program Menu appears.

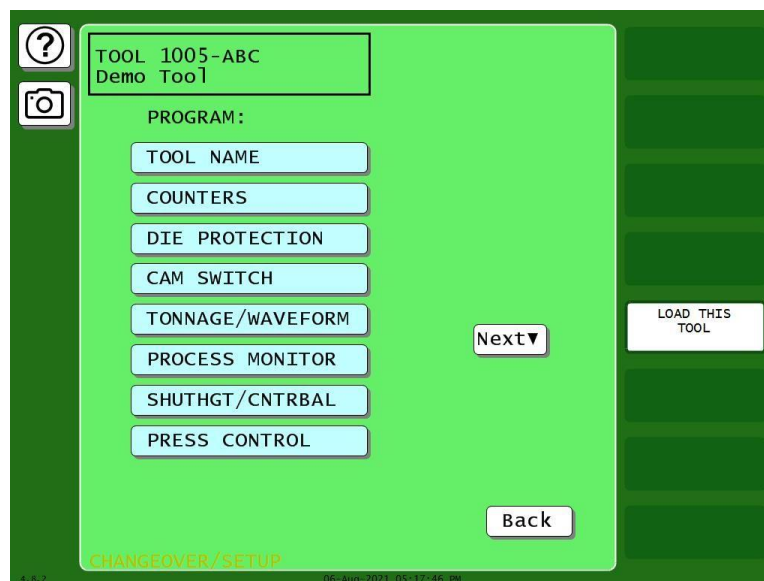


Figure 4-3. Tool Program Menu

3. Press PRESS CONTROL. The Press Control Parameters screen appears. This screen allows you to program the following for the selected tool:
  - Top-stop angle
  - Continuous speed
  - Single stroke speed
  - Inching speed
  - Max. press speed
  - Min. press speed
  - Counterbalance setpoint

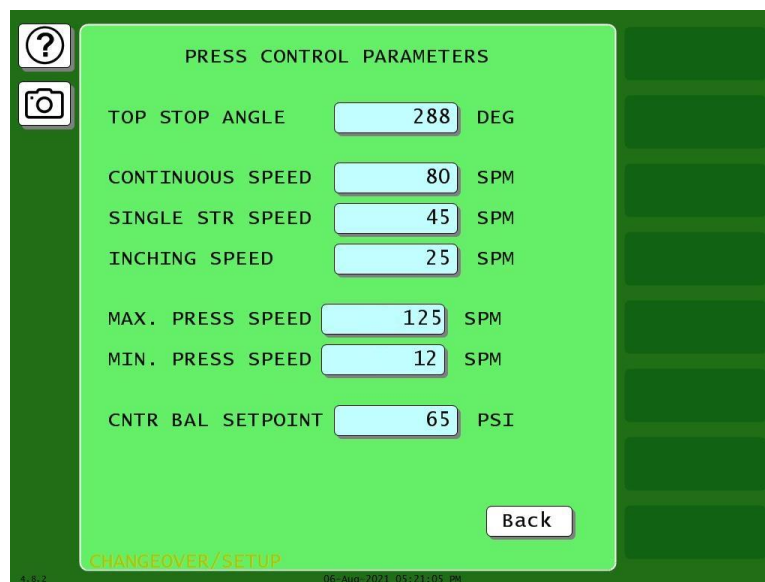


Figure 4-4. Press Control Parameters Screen

## Setting Top Stop Angle for the Selected Tool

The top-stop angle is the crankshaft angle at which the top-stop command is given on your press. This value is initially the top-stop default setting you made in Initialization mode, *Setting the Top-stop Default Angle*, page 58. You can make a new setting for the selected tool to account for differences in die weight, press speed, etc.

1. In the Press Control Parameters screen (Figure 4-4), press the entry box next to TOP STOP ANGLE. A numeric entry window appears.

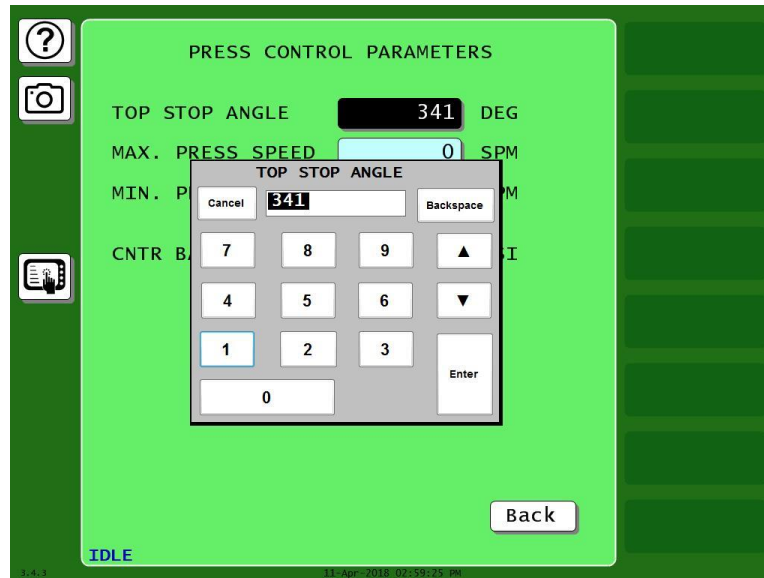


Figure 4-5. Change Top Stop Angle

2. Key in the desired Top-stop angle for the tool.
3. Press ENTER. The Press Control Parameters screen appears showing the new value for Top Stop Angle.

## Setting the Stroke Speed for Continuous, Single Stroke and Inch Modes

1. In the Press Control Parameters screen (Figure 4-4), press the entry box next to CONTINUOUS SPEED. A numeric entry window appears.
2. Key in the desired value and press Enter.
3. Repeat this process for SINGLE STROKE and INCHING speeds.
4. Press Back when done.

## Setting Maximum and Minimum Press Speed for the Selected Tool

The maximum and minimum speed limit settings are provided to allow programming of tools run on a variable-speed press. They apply to all Run operating modes – Continuous, Single-stroke, and Inch. When the speed of the press exceeds the maximum limit, SmartPAC PRO stops the press and displays the fault message “Maximum press speed exceeded.” When the speed of the press drops below the minimum limit, SmartPAC PRO stops the press and displays the fault message “Minimum press speed exceeded.” These fault messages are documented in your SmartPAC PRO User Manual, Chapter 6.

1. In the Press Control Parameters screen (Figure 4-4), press the entry box next to MAX. PRESS SPEED. A numeric entry window appears, Figure 4-6.

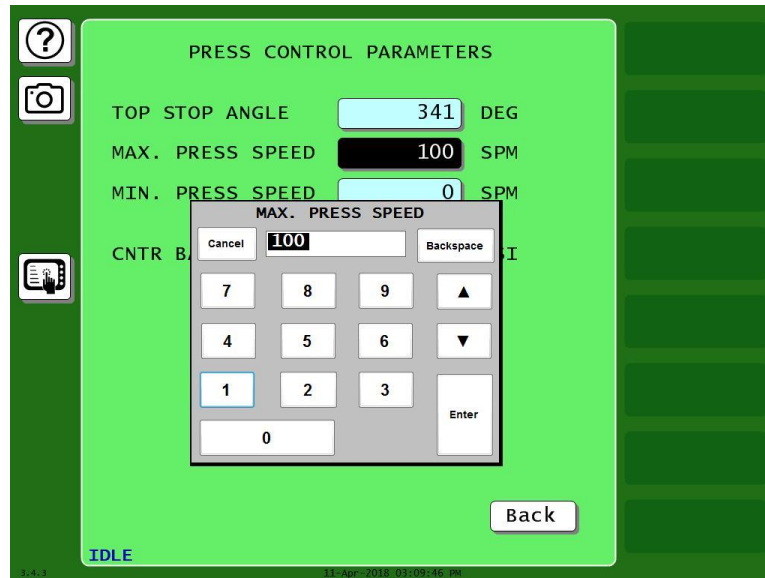


Figure 4-6. Change Maximum Press Speed

2. Key in the desired maximum press speed for the tool.
3. Press ENTER. The Press Control Parameters screen appears showing the new value for maximum press speed.

Set the minimum press speed in similar fashion. See Figure 4-7.

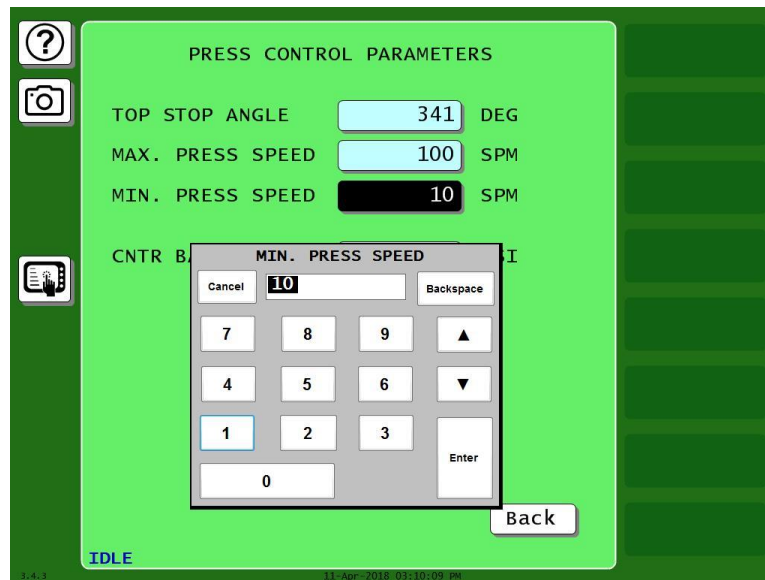


Figure 4-7. Change Minimum Press Speed

## Setting Counterbalance Setpoint for the Selected Tool

Set the Counterbalance Setpoint for the selected tool as follows:

1. In the Press Control Parameters screen (Figure 4-4), press the entry box next to CNTR BAL SETPOINT. A numeric entry window appears.

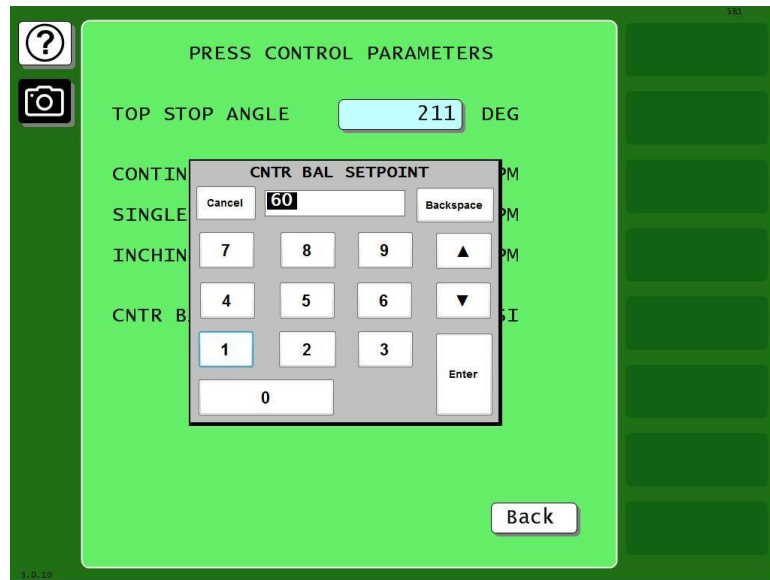


Figure 4-8. Change Counterbalance Setpoint

2. Key in the desired Counterbalance Setpoint for the tool.
3. Press ENTER. The Press Control Parameters screen appears with this tool's new value for Counterbalance Setpoint.

Refer to your SmartPAC PRO User Manual for other programming operations, including *Loading a Tool*, Chapter 5.

A tool must be loaded before SmartPAC PRO will allow the press to run. If you attempt to switch from Initialization or Program mode to Run mode with no tool loaded, the error message below appears.

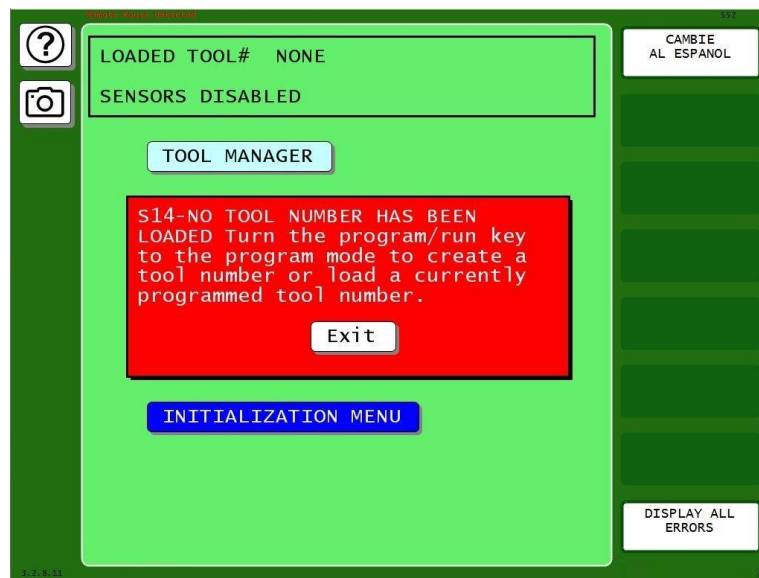


Figure 4-9. No Tool Loaded Warning Window

To respond to this error, do the following:

4. Turn the Program/Run key to PROG.
5. On the Main Program Menu, press EXIT to clear the message.

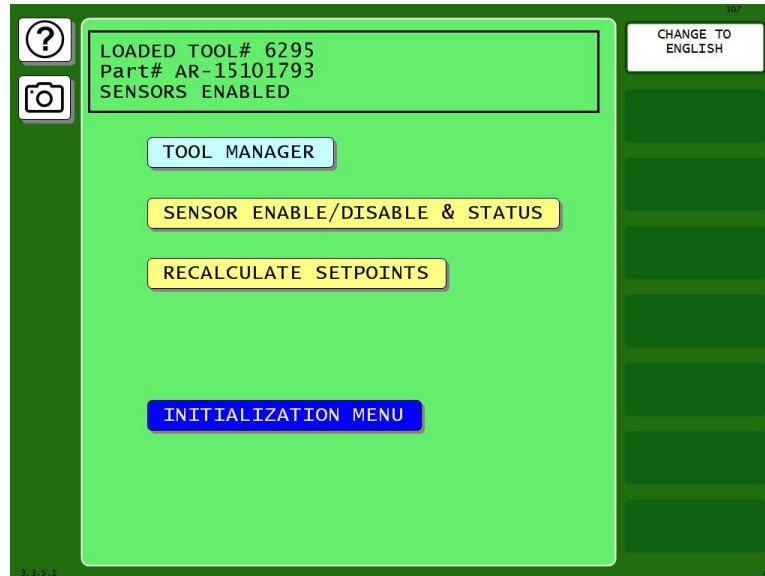


Figure 4-10. Main Program Screen

6. Load a tool (see *Loading a Tool*, in your SmartPAC PRO manual, Chapter 4).
7. Turn the Program/Run key to RUN. SmartPAC PRO switches to Run mode.

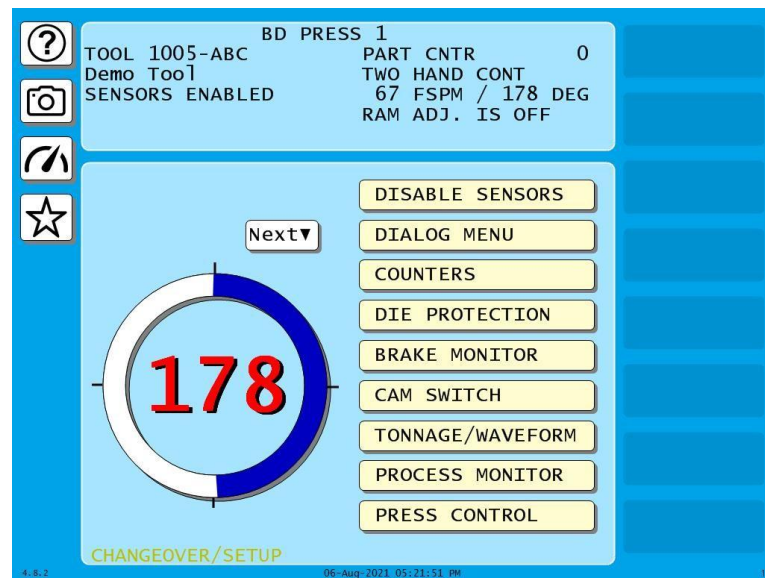


Figure 4-11. Tool Screen

Refer to your SmartPAC PRO User Manual for other programming operations.





# Chapter 5 – Run

For most operating instructions, refer to the Run chapter in your SmartPAC PRO User Manual. This chapter gives information for operating the WPC via the SmartPAC PRO in the SmartPAC PRO with WPC 2000 integration.

## NOTICE

For help with any screen, press  in the upper left-hand corner.

Run mode displays are accessible via the Main Run Menu, which is shown in Figure 5-1.

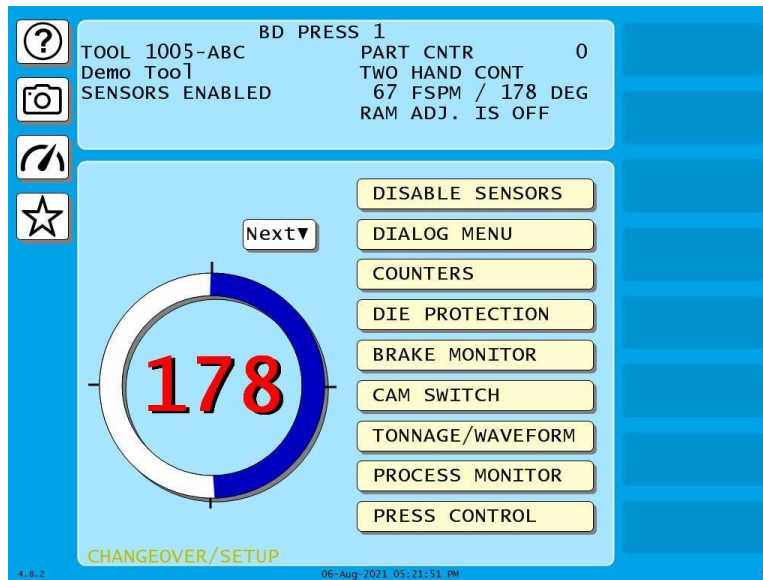


Figure 5-1. Main Run Menu

## Entering and Exiting Run Mode

Follow the instructions shown in Table 5-1 to enter and exit Run mode.

Table 5-1. Instructions for Entering and Exiting Run Mode

To Enter Run Mode	To Exit Run Mode
From Program mode: Turn the Program/Run key to RUN.*	To go to Program mode: Turn the Program/Run key to PROG.*

\* If you turn the key and nothing happens, Press EXIT or BACK repeatedly until SmartPAC PRO changes modes.

## Settings Locked, or Password Required

When a Run mode setting is locked, the screen shown in Figure 5-2 displays if the PASSWORD REQUIRED is set for that item on the Security Access Menu in Initialization (see *SECURITY ACCESS*, in Chapter 3 of your SmartPAC PRO manual).

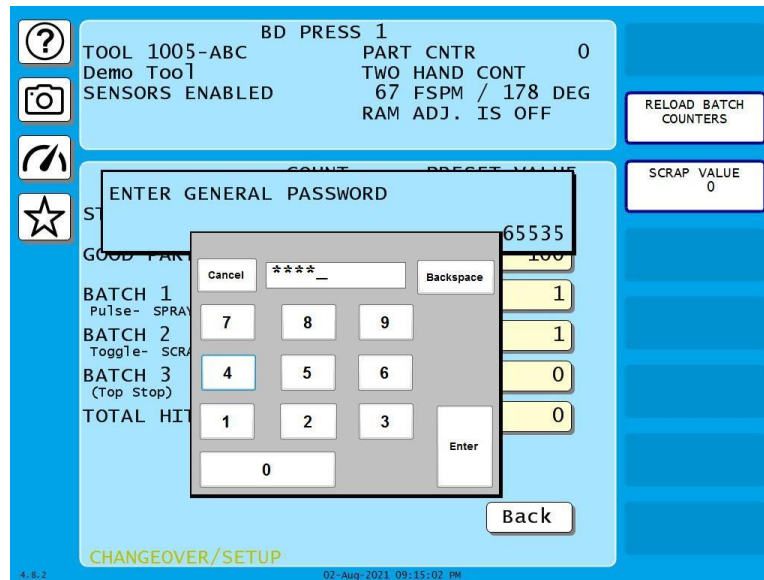


Figure 5-2. Enter Password Screen

Enter the correct password and press ENTER. You are given access to the item.

### NOTICE

When a Run mode item's security access is set to PROGRAM MODE ONLY, NO CHANGES ALLOWED, ALLOW RECALC ONLY, or NO RECALC/ADJUST, you are prevented from gaining access to that item. No message is displayed to indicate that the setting is locked, but when you press ENTER to access the item or press the cursor keys to make an adjustment, nothing happens. When the LOAD NEW TOOL item is locked out, that entry does not appear on the Main Run Menu.

## BRAKE MONITOR

See BRAKE MONITOR in the Run Mode chapter of your SmartPAC PRO User Manual.

### **⚠ DANGER**

#### **RECALCULATE SAFETY DISTANCE WHEN STOP TIME CHANGES**

- Perform a 90° Stop Test any time you change the Stop-time Limit.
- Recalculate the safety distance based on the new Stop-time Limit and adjust or reinstall safeguarding devices according to the new safety distance.

**Failure to comply with these instructions will result in death or serious injury.**

## Determining the Stopping Time of Your Press

See *Determining the Stopping Time of Your Press* in your SmartPAC PRO User Manual, Chapter 5.

## Performing the 90° Stop-time Test


See *Performing the 90° Stop-time Test* in your SmartPAC PRO User Manual, Chapter 5.

## Calculating the Safety Distance

See *Calculating the Safety Distance* in your WPC 2000 manual, Chapter 3.

# PRESS CONTROL

### NOTICE

For help with the Press Control Parameters screen, press  in the upper left-hand corner.

This item enables you to adjust the top-stop angle, maximum and minimum press speed limits, and counterbalance setpoint established for the selected tool in Program mode, *PRESS CONTROL*, page 74. (The Counterbalance Setpoint field does not display if the Counterbalance Tolerance has been set to zero (0) in Initialization mode.) Make these adjustments on the Press Control Parameters screen, Figure 5-3.

You can also view (but not adjust) the angles at which the overrun sensor turns on and off (see Figure 5-8, page 87).

In addition, the current Counterbalance air pressure may be displayed if the Counterbalance Tolerance is set to a value other than zero (0) in Initialization, and the Main Air pressure setpoint and current Main Air pressure are shown if the Main Air Limit has been set to a non-zero value in Initialization (see Figure 5-3).

## Adjusting Program Settings

Follow the instructions below to set the following in Run mode:

- Top stop angle
- Maximum press speed
- Minimum press speed
- Counterbalance pressure and setpoint (tolerance)
- Clutch air pressure and setpoint (tolerance)

The top-stop angle is the crankshaft angle at which the Top-stop command is given on your press. The top-stop angle default value is set in Initialization (see *Setting the Auto Carry-up Angle*, page 58) and adjusted in Program mode to account for differences in die weight, press speed, etc. for each tool.

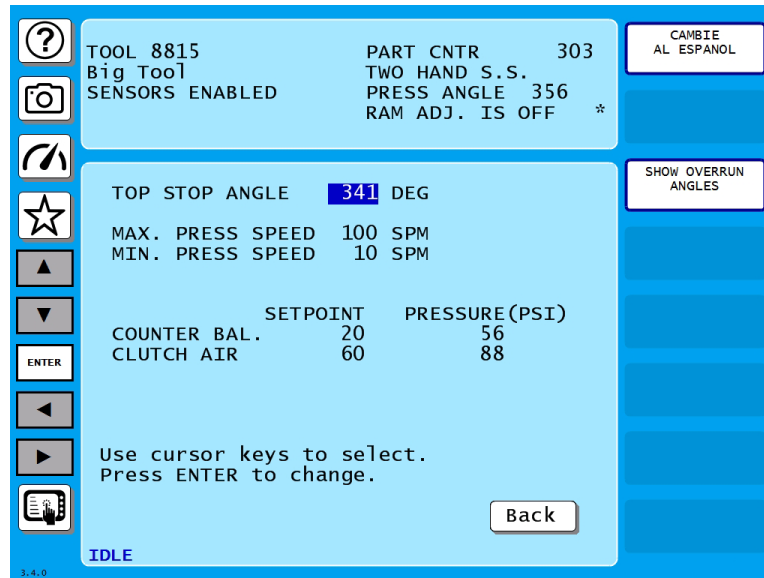


Figure 5-3. Press Control Parameters Screen

The maximum and minimum speed limit settings are used to monitor press speed for tools run on a variable-speed press. They apply to all Run operating modes—Continuous, Single-stroke, and Inch. When the speed of the press exceeds the maximum limit, SmartPAC PRO stops the press and displays the fault message “Maximum press speed exceeded” (Figure 5-7, page 87). When the press speed drops below the minimum limit, SmartPAC PRO stops the press and displays the fault message “Minimum press speed exceeded.” These fault messages are documented in your SmartPAC PRO Installation Manual under *Miscellaneous Fault Messages* and in your SmartPAC PRO User Manual in Chapter 6.

The counterbalance setpoint is used together with the counterbalance tolerance you set in Initialization (see *Setting Clutch and Counterbalance Air Pressure Limits*, page 60) to specify the pressure range outside of which an F46 (Counterbalance Air Outside Sensor Limits) error displays on the SmartPAC PRO. This field does not display if the Initialization tolerance value is set to zero (0), disabling the Counterbalance Setpoint feature.

To adjust one or more of these settings, do the following:

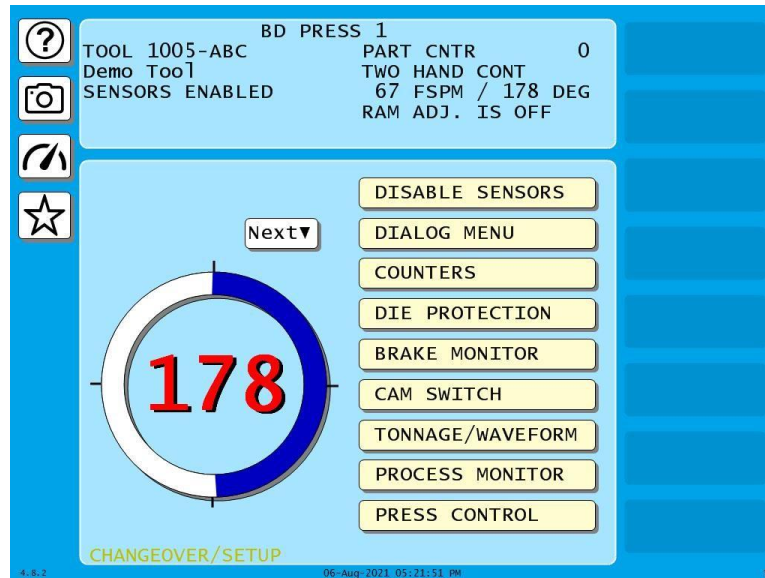


Figure 5-4. Main Run Menu

1. Press **PRESS CONTROL** on the Main Run Menu. The Press Control Parameters screen displays.

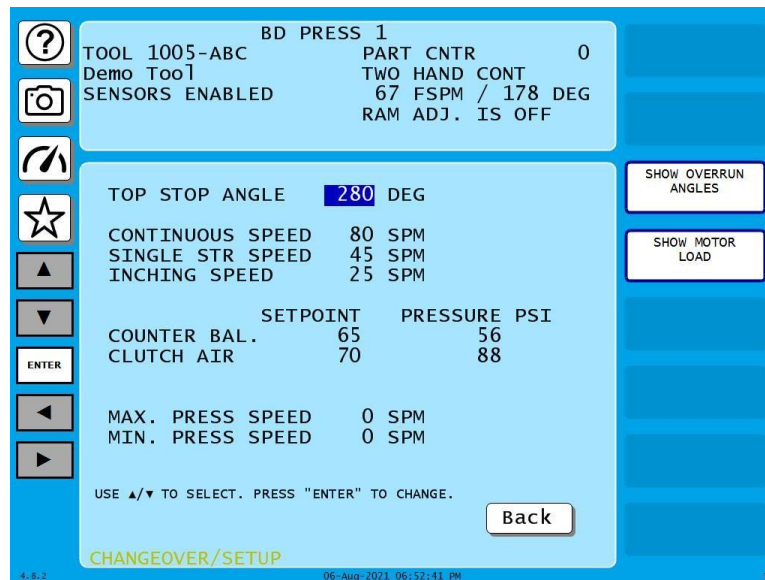


Figure 5-5. Press Control Parameters Screen

#### ARE YOU LOCKED OUT?

Access to items on this screen may be limited to Program mode or may require a password. The security access settings in Initialization mode determine when changes can be made. See *SECURITY ACCESS*, in Chapter 3 of your SmartPAC PRO manual.

2. Select the item you want to adjust, and press ENTER. The Numeric Entry window appears.

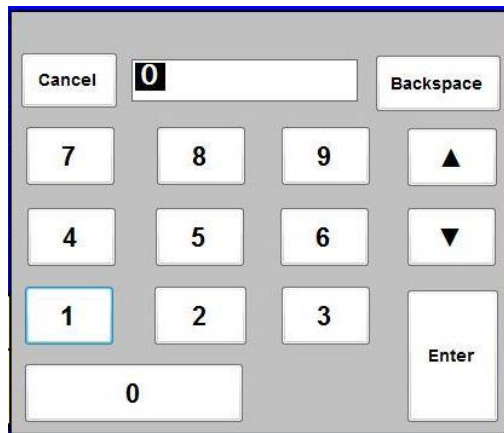


Figure 5-6. Numeric Entry Window

### NOTICE

The value you enter in the MAX. PRESS SPEED field must be greater than the Minimum Press Speed value. If the Maximum Speed setting is less than or equal to the Minimum Speed value, SmartPAC PRO changes the Maximum Speed to one Stroke per Minute greater than the Minimum Speed.

3. Key in a new value and press ENTER. The entry window closes, and your change appears in the field you selected in step 2.
4. Repeat steps 2 and 3 for each item you want to adjust.
5. When you are finished, press EXIT to return to the Main Run Menu.

### NOTICE

If the press speed exceeds the maximum or goes below the minimum, an error message appears similar to Figure 5-7, below. This error is described in your SmartPAC PRO Installation Manual under *Miscellaneous Fault Messages* and in your SmartPAC PRO User Manual in Chapter 8.

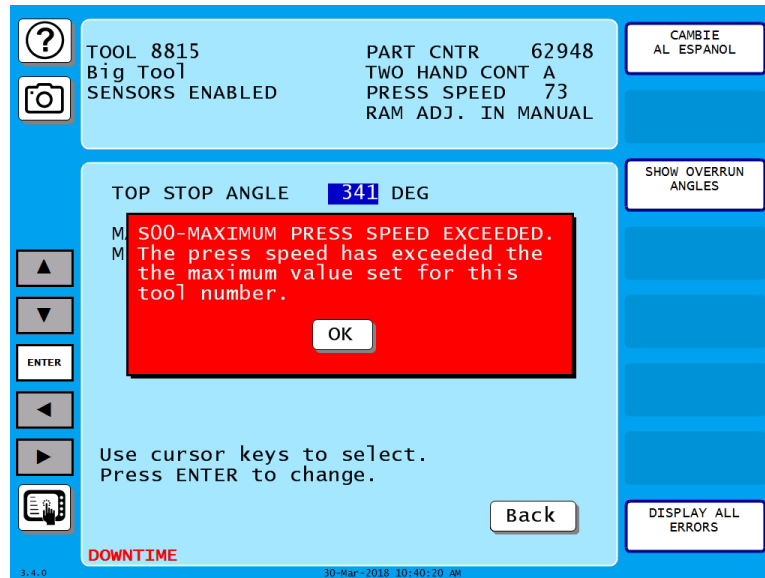


Figure 5-7. Maximum Press Speed Exceeded Error Message

## Displaying Overrun Sensor On/Off Angles

You can display the angles at which the overrun sensor turns on and off, in order to verify that you have installed the overrun sensor magnet correctly. To do so, perform the following steps:

1. Run the press in Inch mode for about 4 strokes, viewing the overrun sensor's On/Off angles on each stroke.
2. On the Press Control Parameters screen, press SHOW OVERRUN ANGLES. A window like the one shown in Figure 5-8 displays.

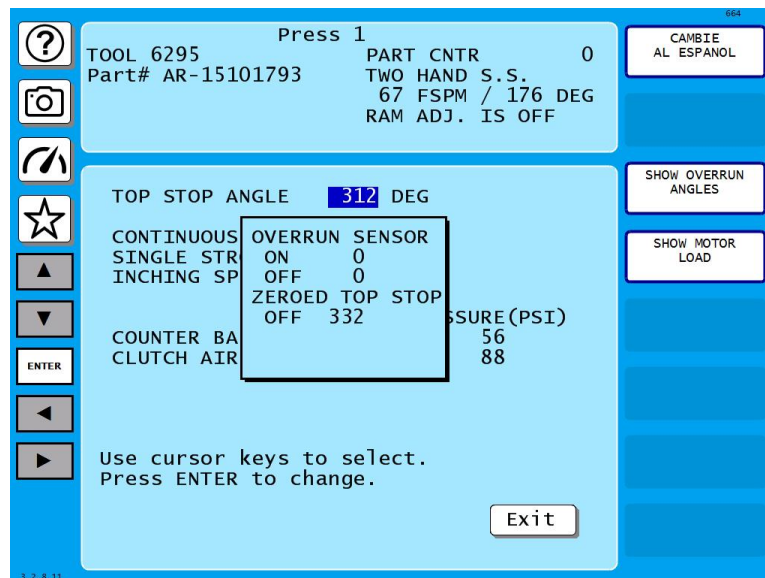


Figure 5-8. Press Control Parameters Screen Showing Overrun Angles Window

In addition to the Overrun Sensor On and Off angles, the window displays the angle at which the Top-stop cam turns off. The value displayed in the Zeroed Top Stop Off field allows you to verify that the Top-stop cam, which normally stays on for 20°, turns off before the overrun sensor turns on.

## Operating the Press

### Responding to an Interrupted Stroke

See your WPC User Manual for *Responding to an Interrupted Stroke*.

### Selecting Operating Mode

Select Inch, Single-stroke, or Continuous operation with the Stroke Select key switch on the SmartPAC PRO front panel. To choose an operating mode for one of these stroke selections, go to the Mode Select Menu (Figure 5-9), which you access by turning the Stroke Select switch to OFF with SmartPAC PRO in Run mode.

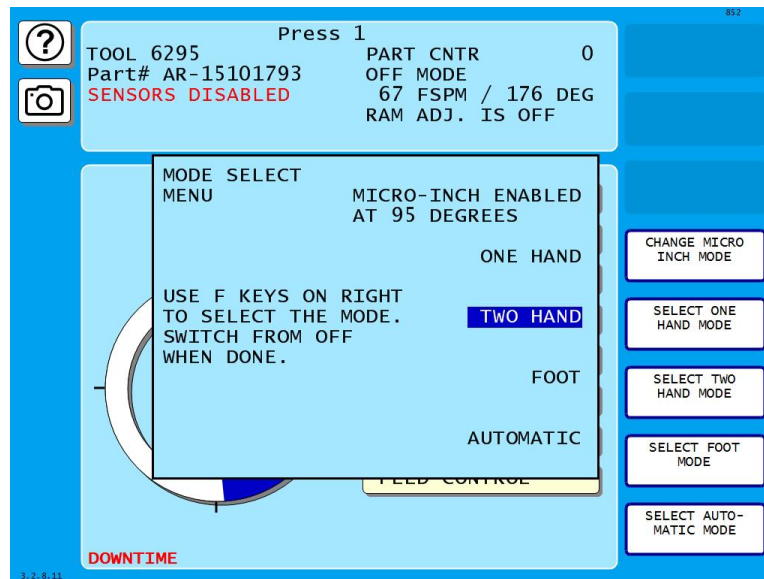


Figure 5-9. Mode Select Menu

The Mode Select Menu may display up to five operating mode selections, depending on the firmware and hardware options you have installed:

- Two-hand
- One-hand (Requires Two-hand/One-hand/Foot firmware and a Shadow light curtain)
- Foot (Requires Two-hand/One-hand/Foot firmware and a Shadow light curtain)
- Micro-inch Enabled (Must also be enabled in SmartPAC PRO Initialization—see Setting Micro-inch Time and Angle, page 59)
- Automatic (Must be enabled in SmartPAC PRO Initialization—see page 67)

To select an operating mode on the Mode Select Menu, do the following:

1. Turn the Program/Run key switch on the SmartPAC PRO front panel to RUN. Turn the Stroke Select key switch to OFF to display the Mode Select Menu.



2. Press to enable the desired operating mode:
  - MICRO-INCH
  - ONE-HAND MODE
  - TWO-HAND MODE
  - FOOT MODE
  - AUTOMATIC MODE
3. Turn the Stroke Select switch the desired setting (i.e., Inch, Single-stroke, or Continuous).

## Operating the Press in Inch Mode

### **DANGER**

#### **IMPROPER SAFEGUARDING**

Ensure that the machine guarding system is installed and maintained according to OSHA regulation 1910.217, ANSI standards B11.1 and B11.19, and any other regulations or standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

### **DANGER**

#### **INCH MODE NOT SUITABLE FOR PRODUCTION**

DO NOT use INCH mode as a production mode, per ANSI B11.1-2009.

**Failure to comply with these instructions will result in death or serious injury.**

To operate the press in Inch mode, do the following:

1. Make sure the Program/Run key switch is set to RUN.
2. Turn the Stroke Select key switch to OFF.
3. Select one of the following options on the Mode Select Menu (see page 88):
  - If a light curtain is installed on the press, select “TWO HAND” or “ONE HAND.” The light curtain will be muted on the upstroke if WPC 2000 has the muting option.
  - If no light curtain is installed, select “TWO HAND.” If you set the switch to “ONE HAND,” WPC 2000 defaults to Two-hand mode.
4. Turn the Stroke Select key switch to INCH. There are four different ways to operate the press in Inch mode:
  - Top-stop in Inch
  - Top-stop Bypass
  - Micro-inch
  - Dead Motor Inch

## Top-stop in Inch

### NOTICE

Top-stop in Inch is enabled when there is no connection to pin #13 on the WPC 2000 Main Processor board. This is the factory setting.

Top-stop in Inch is the default Inch mode. To run the press in Top-stop in Inch, do the following:

1. To move the ram a short distance, press and hold both Run/Inch palm buttons on the Operator Station at the same time, releasing them when the ram has reached the desired point in the stroke.

### NOTICE

If you are running the press in One-hand mode, you need to depress the left Run/Inch button only.

The ram moves only as long as both Run/Inch buttons are depressed. Releasing one of the buttons stops the ram immediately.

### NOTICE

The ram will also stop if the light curtain is blocked during the non-muted portion of the stroke, or if a system fault is detected.

2. Repeat the previous step to continue “inching” the ram.
3. To move the ram to Top-stop, press and hold both Run/Inch palm buttons until the ram comes to a stop at the top of the stroke.
4. To initiate another stroke, release the Run/Inch buttons, then press and hold them until the ram again comes to rest at the Top-stop position.

### NOTICE

When “inching” the press, you may not notice when the ram top-stops.

## Top-stop Bypass (Top-stop in Inch Disabled)

### NOTICE

To disable Top-stop in Inch, connect pin #13 on the WPC 2000 Main Processor board to +24 Vdc.

Top-stop in Inch can be disabled so that the ram continues to cycle, without coming to a Top-stop, as long as the Run/Inch buttons on the Operator Station are depressed. In this alternative Inch mode, called Top-stop Bypass, the ram stops only when one or both buttons are released.

## Micro-inch

Micro-inch allows finer adjustments than are possible in Top-stop in Inch or Top-stop Bypass and is designed to facilitate setup on high-speed or short-stroke presses. In Micro-inch, the distance the ram moves is controlled by the time setting you make on the Press Control Parameter Menu in Initialization mode (see *Setting Micro-inch Time and Angle*, page 59).

When that time has elapsed, the ram comes to a stop even though the Run/Inch palm buttons are still depressed.

The ram can be stopped before the end of the Micro-inch time by releasing one or both Run/ Inch buttons. To move the ram through a complete stroke in Micro-inch, you must “inch” the press to Top-stop. Micro-inch has no Top-stop feature.

Micro-inch is enabled via the MICRO ANGLE setting on the Press Control Parameter Menu (see *Setting Micro-inch Time and Angle*, page 59) and *CHANGE MICRO INCH MODE* on the Mode Select Menu (see page 88).

## Dead Motor Inch

Dead Motor Inch is a feature that allows you to operate the press in Inch mode for a short time after the main motor is turned off, using the energy stored in the flywheel. Dead Motor Inch allows the press to be inched in smaller increments than is possible when the press is running and is useful during setup. To activate Dead Motor Inch, do the following:

1. Turn off the press motor.
2. Turn the Stroke Select switch to “INCH.”
3. Press both Run/Inch buttons to initiate a stroke, releasing them when the ram has moved the desired distance. Repeat this process until the flywheel has stopped turning.

## Operating the Press in Single-stroke Mode

### DANGER

#### IMPROPER SAFEGUARDING

Ensure that the machine guarding system is installed and maintained according to OSHA regulation 1910.217, ANSI standards B11.1 and B11.19, and any other regulations or standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

To operate the press in Single-stroke mode, do the following:

1. Make sure the Program/Run key switch is set to RUN.
2. Turn the Stroke Select key switch to OFF.
3. Select one of the following options on the Mode Select Menu (see page 88):
  - Choose “TWO HAND” if you want to run the press in Two-hand mode
  - Choose “ONE HAND” if you want to run the press in One-hand mode
  - Choose “FOOT” if you want to run the press in Foot mode.

### NOTICE

If you are running Two-hand Only firmware, One-hand and Foot modes are not available.

4. Turn the Stroke Select switch to “SINGLE STROKE.”

Instructions for operating the press in each Single-stroke mode are provided below.

## Single-stroke, Two-hand Operation

### DANGER

#### OPERATOR STATION WIRED INCORRECTLY

Run all necessary tests to verify that each Operator Station is wired correctly and provides proper anti-tie-down and anti-repeat protection. See your WPC 2000 for *Anti-tie-down Test* and *Anti-repeat Test*.

**Failure to comply with these instructions will result in death or serious injury.**

### DANGER

#### MORE OPERATORS THAN OPERATOR STATIONS

- Ensure that there are the same number of active operator stations as there are operators if the press is not equipped with properly installed and operating light curtains.
- During setup, lockout/tagout the press if there are more operators than operator stations.
- Verify at every shift change that there are the same number of active operator stations as there are operators if the press is not equipped with properly installed and operating light curtains.

**Failure to comply with these instructions will result in death or serious injury.**

### DANGER

#### TWO-HAND CONTROL TOO CLOSE TO HAZARDOUS AREA

Verify at each shift change that any moveable Two-hand controls are located at least the safety distance from the pinch point or hazardous area.

**Failure to comply with these instructions will result in death or serious injury.**

When performing the following procedure, make sure to press both Run/Inch buttons on each installed Operator Station within the 1/2-second palm time (“synchronous” time in ANSI terminology) and all pairs of Run/Inch buttons on all installed Operator Stations within the 5-second concurrent time. Also, confirm that the setting on S102 switch 6 is correct for your Operator Station setup (see your WPC 2000 manual, *Making Settings on Switch Block S102*).

To run the press, using Single-stroke, Two-hand operation, do the following:

1. With “TWO HAND” highlighted on the Mode Select Menu, initiate a stroke by pressing both Run/Inch buttons, holding them until the ram reaches the Auto Carry-up Angle, then releasing them (see Setting the Auto Carry-up Angle, page 58). The ram completes its stroke automatically, stopping at Top-stop.

### NOTICE

Both Run/Inch palm buttons on each Operator Station must be pressed within 1/2 second. Each pair of Run/Inch buttons on all Operator Stations must be pressed within 5 seconds.

**Make sure that the setting on S102 switch 6 is correct for your setup.**

If one or both Run/Inch buttons are released before the ram reaches the Auto Carry-up Angle, the press stops. The press will also be stopped on the downstroke if a system fault is detected or a light curtain is blocked.

## Single-stroke, One-hand Operation

### **DANGER**

#### **INCORRECT INSTALLATION**

You must install a Shadow light curtain correctly and connect it to WPC 2000 properly in order to run the press in Single-stroke, One-hand mode.

**Failure to comply with these instructions will result in death or serious injury.**

Single-stroke, One-hand operation can only be used with WPC 2000 systems running Two-hand/One-hand/Foot firmware and employing a Shadow light curtain to guard the point of operation. To run the press in this mode, do the following:

With “ONE HAND” highlighted on the Mode Select Menu, initiate a stroke by pressing the left Run/Inch palm button, then releasing it. The ram completes its stroke automatically, stopping at Top-stop.

The press is stopped if a system fault is detected or if a light curtain is blocked during the downstroke.

## Single-stroke, One-hand Control Operation

### **DANGER**

#### **INSUFFICIENT SAFEGUARDS ALLOWING ACCESS TO HAZARD**

- Follow all applicable OSHA and ANSI regulations for safeguarding your press system. Point-of-operation safeguarding is the single most important factor in the prevention of injuries.
- Follow all applicable OSHA and ANSI regulations when installing a One-hand Control.
- Ensure that proper safeguarding devices are installed and working properly. Wintriss takes no responsibility if safeguarding devices are not installed or working correctly.
- DO NOT use WPC 2000 or a One-hand Control as a safeguarding device.
- Install and operate WPC 2000 and a One-hand Control in accordance with OSHA and ANSI regulations.

**Failure to comply with these instructions will result in death or serious injury.**

### **DANGER**

#### **PREVENT OPERATOR FROM STANDING BETWEEN LIGHT CURTAIN AND HAZARDOUS AREA**

Ensure that the operator cannot position himself between the light curtain and the hazardous area.

Use another pair of light curtains or a mechanical barrier at knee to waist height to prevent the operator or a passerby from being “trapped” between the light curtain and the hazard.

**Failure to comply with these instructions will result in death or serious injury.**

**⚠ DANGER****INCORRECT INSTALLATION**

You must install a Shadow light curtain correctly and connect it to WPC 2000 properly in order to run the press in Single-stroke, One-hand Control mode.

**Failure to comply with these instructions will result in death or serious injury.**

**NOTICE**

When a One-hand Control is installed, you cannot use the Run/Inch palm buttons on the Operator Station while the press is in One-hand mode. All other modes work normally as described in this manual.

One-hand Control is a switch available from Wintriss. This option can only be used with WPC 2000 systems running Two-hand/One-hand/Foot firmware and employing a Shadow light curtain to guard the point of operation.

One-hand Control can be used in two different modes. In Normal mode, the press cycles in Single-stroke whenever you push the One-hand Control button. In “Light Curtain Break” mode, the press cycles only when you push the One-hand Control button within 8 seconds of removing your hand(s) from the light curtain. If the button is pushed after this interval expires, the press does not cycle.

Light Curtain Break mode prevents inadvertent operation of the press when an operator is loading or unloading parts.

Select the mode by setting option switch 3 on the Press Control Option Switch Menu (see step 1, below).

To run the press in Single-stroke, One-hand Control mode, do the following:

1. Set option switch 3 on the Press Control Option Switch Menu to OPEN to operate the press in Normal One-hand Control mode.

Set switch 3 to CLOSED to operate in Light Curtain Break mode, (see in your WPC 2000 manual *Enabling Light Curtain Break Mode in a One-hand Control* for more information on this setting).

**NOTICE**

If the “Interrupted Stroke” message flashes on the SmartPAC PRO display, press and hold the Run/Inch palm buttons on the Operator Station to return the press to Top-stop. The “Interrupted Stroke” message should disappear.

2. With “ONE HAND” highlighted on the Mode Select Menu (page 88), use the One-hand Control to operate the press as follows:
  - Press and release the One-hand Control button if option switch 3 is set for Normal operation.
  - Break the light curtain, then remove your hand and press the One-hand Control button within 8 seconds if option switch 3 is set for Light Curtain Break mode.

The press will make a complete stroke, coming to rest at Top-stop.

**NOTICE**

The Prior Act lamp illuminates after the light curtain has been broken and stays on for 8 seconds. If the One-hand Control button is not pushed within that time, the Prior Act lamp will turn off. The press will not start until you break the light curtain again and push the One-hand Control button within 8 seconds of removing your hand.

**NOTICE**

If the press does not run, turn off power to the press and WPC 2000. Recheck all wiring connections. Try One-hand Control again. If the press still does not run, call Wintriss Technical Support.

**Single-stroke, Foot Operation**** DANGER****INCORRECT INSTALLATION**

You must install a Shadow light curtain correctly and connect it to WPC 2000 properly in order to run the press in Single-stroke, Foot mode.

**Failure to comply with these instructions will result in death or serious injury.**

Single-stroke, Foot operation can only be used with SmartPAC PRO/WPC 2000 systems running Two-hand/One-hand/Foot firmware and employing a Shadow light curtain to guard the point of operation.

Two modes are available when you run the press in Single-stroke Foot. In Foot Trip mode, you can initiate a complete stroke by simply pressing and releasing the Foot Switch. In Foot Control mode, you must press and hold the Foot Switch through the Auto Carry-up Angle to complete a stroke. You select the mode by setting option switch 3 on the Press Control Option Switch Menu (see step 1, below).

To run the press in Single-stroke, Foot mode, do the following:

1. Set option switch 3 on the Press Control Option Switch Menu to OPEN to operate the press in Foot Trip mode (see *Enabling Foot Control in a Foot Switch* in your WPC 2000 manual for more information on this setting). Set switch 3 to CLOSED to operate in Foot Control mode.
2. With “FOOT” highlighted on the Mode Select Menu (Figure 5-9, page 88), depress the Foot Switch to initiate a stroke, releasing or holding the pedal depending on the option switch 3 setting.
  - Release the Foot Switch if option switch 3 is set for Foot Trip
  - Hold the Foot Switch through the Auto Carry-up Angle if option switch 3 is set for Foot Control

The ram completes the stroke, coming to rest at Top-stop.

**NOTICE****INTERRUPTED STROKE**

In Foot Control mode, if you remove your foot from the Foot Switch before the ram reaches the Auto Carry-up Angle, the press will stop, the “Interrupted Stroke” message will flash on the SmartPAC PRO display, and WPC 2000 will switch to Two-hand Maintained Single-stroke mode for the remainder of the stroke. To clear the “Interrupted Stroke” message and return to Single-stroke, Foot operation, press both Run/Inch palm buttons on the Operator Station and hold them until the press returns to Top-stop.

**Operating the Press in Automatic Single-stroke Mode**** DANGER****IMPROPER SAFEGUARDING**

Ensure that the machine guarding system is installed and maintained according to OSHA regulation 1910.217, ANSI standards B11.1 and B11.19, and any other regulations or standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

** DANGER****PRESS STARTING UNEXPECTEDLY**

Ensure that light curtains and other safeguards are properly installed and operating to protect operators when using Automatic Single-stroke. Since an external trigger initiates press operation, a stroke can occur unexpectedly.

**Failure to comply with these instructions will result in death or serious injury.**

The Automatic Single-stroke function allows an external event to automatically initiate a single stroke within a 30-second or 5-minute window, depending on the setting of option switch 5 on the Press Control Option Switch Menu (see step 1, below). Generally, material feed is used as the signaling event. However, other events such as part ejection or positive part transfer can be used.

There are three requirements for Automatic Single-stroke:

- Automatic Single-stroke must be enabled in Initialization (see Figure 3-15, page 67).
- There must be a trigger mechanism.
- Proper guarding equipment, such as a Shadow light curtain and fixed guards, must be installed to protect personnel.

As a triggering mechanism, you can use a single-pole, double-throw (SPDT) contact (switch or relay) or two solid-state switches (NPN, open collector).

If you intend to use Automatic Single-stroke, contact Wintriss Technical Support.

To run the press in Automatic Single-stroke, first install the sensors and other components required for this function, then do the following:



1. Set option switch 5 on the Press Control Option Switch Menu to OPEN to select 30 seconds as the prior act timing or to CLOSED to select 5 minutes (see Figure 3-13, page 64 and *Switch 5 – Prior Act Time for Automatic Stroke Modes* in your WPC User Manual).
2. Select “AUTOMATIC” on the Mode Select Menu (page 88).
3. Set the Stroke Select key switch to “SINGLE STROKE.”
4. To initiate the first stroke, depress the Prior Act button—the Prior Act lamp will blink when Prior Act is armed—then press and hold the Run/Inch palm buttons until the ram passes bottom dead center.

The up stroke and all other strokes will be automatic.

The press may pause at Top Stop; it is waiting for the “go” signal from the external switch.

The external signal, which will toggle 24Vdc from pin 15 (N/C) to pin 5 (N/O), must occur after Top Stop within the time selected on switch 5 (30 seconds or 5 minutes). If WPC 2000 does not receive the signal within this period, it assumes a problem has occurred and will not start the next stroke. If this happens, repeat step 4.

## Operating the Press in Continuous Mode

### DANGER

#### IMPROPER SAFEGUARDING

Ensure that the machine guarding system is installed and maintained according to OSHA regulation 1910.217, ANSI standards B11.1 and B11.19, and any other regulations or standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

To operate the press in Continuous mode, do the following:

1. Make sure the Program/Run key switch is set to RUN.
2. Turn the Stroke Select key switch to OFF.
3. Select “TWO HAND” on the Mode Select Menu (page 88) if you want to run the press in Two-hand mode; select “FOOT” if you want to run the press in Foot mode (see page 88).
4. Turn the Stroke Select switch to “CONT.”

Instructions for operating the press in each Continuous mode are provided below.

### Continuous, Two-hand Operation

To run the press in Continuous, Two-hand mode, do the following:

#### NOTICE

You must press both Run/Inch palm buttons on the Operator Station within 8 seconds after you press the Prior Act button in order to initiate Continuous mode operation. Otherwise, the press will not start. The Prior Act lamp illuminates when you press the Prior Act button and turns off after 8 seconds.

With “TWO HAND” highlighted on the Mode Select Menu (page 88), press the Prior Act button on the Operator Station, then, within 8 seconds, press both Run/Inch palm buttons and hold them through the Auto Carry-up Angle. The ram will complete the stroke and continue stroking until one of the following events occurs:

- You press the Top Stop button
- You press the Emergency Stop button
- A system fault is detected
- The light curtain is blocked during the non-muted portion of the stroke

The ram will stop in mid-stroke if you do not hold the Run/Inch palm buttons through the Auto Carry-up Angle.

## NOTICE

If the press is Emergency-stopped, WPC 2000 automatically changes to Two-hand Maintained Single-stroke mode and the “Interrupted Stroke” message flashes on the SmartPAC PRO display. To clear the “Interrupted Stroke” message, press and hold both Run/Inch buttons to complete the stroke and return the ram to Top-stop.

## Continuous, Foot Operation

### DANGER

#### INCORRECT INSTALLATION

You must install a Shadow light curtain correctly and connect it to WPC 2000 properly in order to run the press in Continuous, Foot mode.

**Failure to comply with these instructions will result in death or serious injury.**

Continuous, Foot operation can be used only with WPC 2000 systems running Two-hand/One-hand/Foot firmware and employing a Shadow light curtain to guard the point of operation.

Option switch 3 settings, which govern Foot operation in Single-stroke (see *Single-stroke, Foot Operation*, page 95), **do not** apply to Continuous, Foot operation.

To run the press in Continuous, Foot mode, do the following:

## NOTICE

You must depress the Foot Switch within 8 seconds after you press the Prior Act button in order to initiate Continuous mode operation. Otherwise, the press will not start. The Prior Act lamp illuminates when you press the Prior Act button and turns off after 8 seconds.

**Failure to comply with these instructions will result in death or serious injury.**

1. With “FOOT” highlighted on the Mode Select Menu (page 88),” press the Prior Act button on the Operator Station, then, within 8 seconds, depress and hold the Foot Switch pedal. The ram will complete the stroke and continue stroking until you release the Foot Switch, at which point the press will return to Top-stop.

As long as the Foot Switch is depressed, the press will continue to stroke but will stop if one of the following events occurs:

- You press the Top Stop button
- You press the Emergency Stop button
- A system fault is detected
- The light curtain is blocked during the non-muted portion of the stroke

## NOTICE

If the press is Emergency-stopped, WPC 2000 automatically changes to Two-hand Maintained Single-stroke mode and the “Interrupted Stroke” message flashes on the SmartPAC PRO display. To clear the “Interrupted Stroke” message, press and hold both Run/ Inch buttons on the Operator Station to complete the stroke and return the ram to Top Stop.

## Operating the Press in Continuous On-demand Mode

### DANGER

#### IMPROPER SAFEGUARDING

Ensure that the machine guarding system is installed and maintained according to OSHA regulation 1910.217, ANSI standards B11.1 and B11.19, and any other regulations or standards that apply. Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

### DANGER

#### PRESS STARTING UNEXPECTEDLY

Ensure that light curtains and other safeguards are properly installed and operating to protect operators when using Continuous On-demand. Since an external trigger initiates press operation, a stroke can occur unexpectedly.

**Failure to comply with these instructions will result in death or serious injury.**

The Continuous On-demand function allows an external event to automatically initiate the press running in continuous mode.

There are three requirements for Continuous On-demand:

- Automatic mode must be enabled in Initialization (see Figure 3-15, page 67).
- There must be a trigger mechanism.
- Proper guarding equipment, such as a Shadow light curtain and fixed guards, must be installed to protect personnel.

As a triggering mechanism, you can use a single-pole, double-throw (SPDT) contact (switch or relay) or two solid-state switches (NPN, open collector).

To run the press in Continuous On-demand, first install the sensors and other components required for this function, then do the following:

2. Set option switch 5 on the Press Control Option Switch Menu to OPEN to select 30 seconds as the prior act timing or to CLOSED to select 5 minutes (see Figure 3-13, page 64 and *Switch 5 – Prior Act Time for Automatic Stroke Modes* in your WPC User Manual).
3. Select “AUTOMATIC” on the Mode Select Menu (page 88).
4. Set the Stroke Select key switch to “CONT.”
5. To initiate the first stroke, depress the Prior Act button—the Prior Act lamp will blink when Prior Act is armed. The press is now ready to run in Continuous On-demand and is waiting for the “go” signal from the external switch.

The external signal, which will toggle 24Vdc from pin 15 (N/C) to pin 5 (N/O), must occur after Top Stop within the time selected on switch 5 (30 seconds or 5 minutes). If WPC 2000 does not receive the signal within this period, it assumes a problem has occurred and will not start the next stroke. If this happens, repeat step 5.

For information on using Continuous On-demand mode, call Wintriss Technical Support.

## Operating the Press in Bar Mode

### DANGER

#### INJURY WHEN USING BAR MODE

- Keep all personnel away from the press while it is being barred
- Use a spring-loaded turnover bar when you bar the press.

**Failure to comply with these instructions will result in death or serious injury.**

To operate the press in Bar mode, you must have the Bar Mode Control option. To activate Bar mode and bar the press, do the following:

1. Make sure the Program/Run key switch is set to RUN.
2. Turn the Stroke Select key switch to OFF.
3. Select “TWO HAND” on the Mode Select Menu (page 88).
4. Turn the Stroke Select switch to “INCH.”
5. Turn off the press motor.
6. On the Bar Control enclosure (see *Mounting and Wiring the Bar Control Enclosure* in your WPC 2000 manual), turn the Select switch to “ON.”
7. When the flywheel stops turning, press the Operate button on the Bar Control enclosure.
8. Bar the press using a spring-loaded bar or other means.

### NOTICE

When barring the press, do not rotate the flywheel too quickly. If the crankshaft moves faster than 6 SPM, WPC 2000 will stop the ram and fault code F26 will appear on the SmartPAC PRO display. Press RESET or EXIT to continue barring the press. See your WPC 2000 manual for details about this fault code.

9. If an F26 error appears in the display, press OK to clear it, and continue with the barring operation.

## Multiple Operator Stations

### DANGER

#### HAZARDS EXPOSED BY NON-WORKING OPERATOR STATION

- Safeguard the point of operation exposed by the non-working Operator Station when using multiple operator stations. The exposed area near a disabled Operator Station must be properly guarded.
- Ensure that guarding is properly installed to prevent access to the machine over, under or around any guarding device.

**Failure to comply with these instructions will result in death or serious injury.**

If you have wired two Operator Stations to your WPC 2000 (see *Installing Multiple Operator Stations* in your WPC 2000 manual) and option switch 6 on S102 is set to OFF (see *Setting Option Switches on S102* in your WPC 2000 manual), the Run/Inch palm switches on each Operator Station must be pressed within a 1/2-second “palm time” (“synchronous time” in ANSI terminology), and both pairs of palm switches must be pressed within a 5-second “concurrent time” window.

### NOTICE

Do not attempt to install more than two Operator Stations until you have contacted Wintriss Technical Support. All Operator Stations in a multi-Op.-Station configuration except the Op. Station wired to the “A” inputs must contain a Two-hand Control module.

If you have installed more than two Operator Stations, you must set option switch 6 on S102 to ON to establish a 5-second concurrent time for all Op. Stations (see *Setting Option Switches on S102* in your WPC 2000 manual). In addition, all Operator Stations except the Op. Station connected to the “A” inputs must contain a Two-hand Control module to provide the required 1/2-second palm time (“synchronous” time in ANSI terminology).

If you have dual Operator Stations, make sure to set the Operator Station Select Switch on the front panel of your WPC 2000 to enable either the first station, the second station, or both stations.

For Fault Message information, see Chapter 6 in this manual and

- *Chapter 6 SmartPAC PRO Fault Messages* in your SmartPAC PRO User Manual
- *SmartPAC PRO Fault Messages* in your SmartPAC PRO Installation Manual.



# Chapter 6 – Fault Messages

## **DANGER**

### **PRESS MALFUNCTION**

Correct or repair any fault before running the press again.

**Failure to comply with these instructions will result in death or serious injury.**

## **DANGER**

### **IMPROPER REPAIR PROCEDURES**

- Follow all procedures in this manual.
- Perform only the tests and repairs listed in this manual.
- Lockout/Tagout the press during all installation, modification, repair, or maintenance procedures.
- Use only factory-supplied replacement parts.
- Ensure that all safety procedures are followed during installation, operation, and repair of SmartPAC PRO and WPC 2000.
- Ensure that SmartPAC PRO and WPC 2000 are installed, tested, and repaired by qualified personnel.
- Perform the final checkout tests (see page 45) after every modification, repair, or change to the press, press control or other equipment.

**Failure to comply with these instructions will result in death or serious injury.**

## **DANGER**

### **IMPROPER SAFETY SWITCHING RELAY REPAIR**

Replace the DSV/Lockout Relay board or Auxiliary E-stop Relay board (see Figure 2-5, page 32) before placing the WPC 2000 back into operation after the first occurrence of a fused relay.

If a relay fuses

- DO NOT reset the WPC 2000 to restart the machine.
- Remove the WPC 2000 from operation immediately and replace the defective relay board before operating the press again.

**Failure to comply with these instructions will result in death or serious injury.**

## **NOTICE**

### **IMPORTANT INFORMATION TO PROVIDE WHEN CALLING WINTRISS TECHNICAL SUPPORT**

When you contact Wintriss Controls for technical assistance, be ready to provide the following information to expedite a resolution to the problem: product name (e.g. SmartPAC PRO with WPC 2000 Integration); installed options (e.g. DiProPAC, ProCamPAC, etc.); and firmware version number (e.g., Vs. 7.77). You can determine the last two items by accessing the Installed Options screen in Initialization mode (see your SmartPAC PRO user manual). Instructions for downloading your diagnostics data also appears in *Downloading Diagnostic Information to USB*, page 136.

**NOTICE****E-MAIL TROUBLESHOOTING INFORMATION TO WINTRISS TECHNICAL SUPPORT**

You can send an e-mail containing the error log and other information to Wintriss Technical Support.

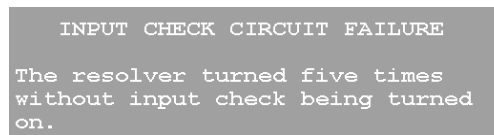
- If your SmartPAC PRO is networked, you can e-mail files directly from the control. See your SmartPAC PRO user manual.
- If your SmartPAC PRO is not networked, you can load the files onto a USB disk (see your SmartPAC PRO user manual.), take them to a networked computer, and e-mail them.

This chapter documents the fault messages that display on the SmartPAC PRO LCD or in the Error/Event Log, providing a brief explanation of each message and a remedy for correcting the problem.

**Responding to Fault Messages****NOTICE****INFORMATION ON ERROR NUMBERS EQUAL TO OR GREATER THAN 120**

Error numbers equal to or greater than 120 are covered in the WPC 2000 Option 2 Manual (1130700) and the WPC 2000 Option 2 Additional Inputs Only Instruction Sheet (1141900).

When an error occurs, a red message window like the one shown in Figure 6-1 displays, indicating the type of error and providing a brief explanation.



*Figure 6-1. Error Code Window*

If the press stops because one of the counter presets has been reached, a yellow message window like the one shown in Figure 6-2 displays

STROKE COUNTER PRESET REACHED

*Figure 6-2. Counter Preset Message Window*

When an error message displays, correct the malfunction or other problem, consulting the Problem and Remedy descriptions for the appropriate error message in the sections that follow. When the problem has been corrected, press RESET or EXIT (or Remote Reset Button, if installed) to clear the message. If the problem has been solved, you will be able to run the press. Otherwise, you will get the fault message again.

If the problem persists, contact Wintriss Technical Support. Do not attempt to run the press before correcting the problem.



## Lockout Message

Certain press control faults, called Lockout faults, generate the message “PRESS CONTROL IS IN LOCKOUT MODE” on the SmartPAC PRO display after the fault is cleared. These are serious error conditions and require an additional step. When the problem has been corrected and the fault cleared, perform the following steps to clear the Lockout condition, following the instructions in the message.

1. Turn the Stroke Select switch to “OFF.”
2. Turn the Stroke Select switch to “INCH” or one of the other stroke selections. The Lockout message is cleared.

Press control fault codes that generate the lockout message are identified by an asterisk (\*) in documentation of the faults (see *Messages for Press Control Problems*, page 106).

## Brake Monitor Faults

### Brake Warning LED

When the Stopping Time of the press increases to within 10 mS of the Stop-time Limit set in SmartPAC PRO Initialization (see *Setting the Stop-time Limit and Start-time Limit*, page 61) the amber Brake Warning LED will flash. Illumination of this LED often means that the brake is wearing and/or defective. To respond to this error, do the following:

1. Contact your maintenance crew immediately and have them investigate the condition of the brake.
2. If the brake checks out, your Stop-time Limit is too tight, not allowing for normal wear. Set a new Stop-time Limit, following the instructions starting in SET BRAKE MONITOR in your SmartPAC PRO user manual.
3. Power down the WPC 2000, then power the unit back up to turn off the Brake Warning LED.

### Stop Time Exceeded

#### DANGER

##### INCORRECT SAFETY DISTANCE DUE TO INCORRECT STOP TIME

- Perform a 90° Stop Test any time you change the Stop-time Limit. See *Performing the 90° Stop-time Test* in your SmartPAC PRO User Manual, Chapter 5 for instructions.
- Recalculate the safety distance based on the new Stop-time Limit and adjust or reinstall safeguarding devices according to the new safety distance. See *Calculating the Safety Distance* in Chapter 3 of your SmartPAC PRO User Manual.

**Failure to comply with these instructions will result in death or serious injury.**

#### DANGER

##### PRESS MALFUNCTION

Correct or repair any press malfunction or wiring error before restarting the press.

**Failure to comply with these instructions will result in death or serious injury.**

When the Stopping Time of the press exceeds the Stop-time Limit, the following message displays on the SmartPAC PRO display

The Stopping Time of the press has exceeded the Stop Time Limit. Check the brakes and make sure that the press is safe to operate.

and WPC 2000 prevents the press from being operated until the brake has been completely repaired.

## NOTICE

### BRAKE WARNING

The Brake Warning LED alerts you when the Stopping Time of the press is within 10 mS of the Stop-time Limit.

To respond to this fault, do the following:

## NOTICE

If you try to run the press without first repairing the brake, WPC 2000 will stop the press on the next stroke and again display the Stop Time Exceeded fault on the SmartPAC PRO display. The fault will continue to appear until the brake has been repaired.

1. Contact your maintenance crew and have them repair the brake immediately.
2. When the brake has been repaired, press RESET or EXIT to clear the Stopping Time fault.
3. When the Lockout message displays (see page 105), turn the Stroke Select switch to “OFF,” then to “INCH” to clear the message.
4. Run the press several times to determine its Stopping Time, and compare this value to the result of your last Stop-time tests, referring to See *Performing the 90° Stop-time Test* in your SmartPAC PRO User Manual, Chapter 5.
5. Determine whether you need to adjust the previous Stop-time Limit, and make adjustments if necessary.

## Messages for Press Control Problems

### DANGER

#### PRESS MALFUNCTION

Correct or repair any press malfunction or wiring error before restarting the press.

**Failure to comply with these instructions will result in death or serious injury.**

Whenever WPC 2000 detects a problem with the clutch/brake control, the press, or peripheral equipment, it sends a Stop command to the press and generates a fault on the SmartPAC PRO display. Most of these faults include a three-character alphanumeric code (see Figure 6-3 for an example). The initial letter E, F, or H indicates how to clear the fault after it has been corrected and, in the case of F and H faults, specifies the processor (WPC 2000 has two processors) that reported the problem, as shown in Table 6-1.

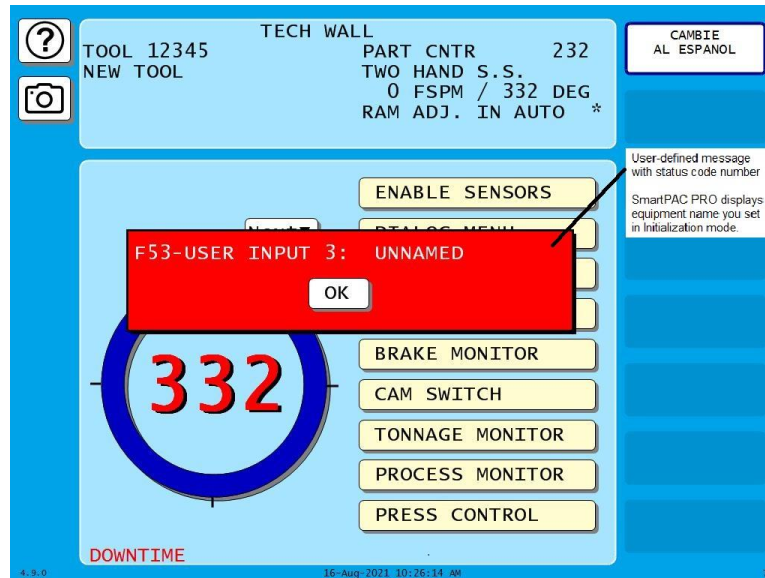


Figure 6-3. Display Showing Fault Code

Table 6-1. Fault Codes: Significance of Initial Letter

Initial Letter	Significance
E	To clear the fault, you must power down the WPC 2000, then power the unit back up. The fault cannot be cleared by pressing RESET or EXIT.
F	Generated by the main processor. To clear the fault, press RESET or EXIT.
H	Generated by the second processor. To clear the fault, press RESET or EXIT.
S	Generated by the SmartPAC PRO. To clear the fault, press RESET or EXIT. See your SmartPAC PRO manual for details.

The two-digit number following the initial letter identifies the specific WPC 2000 fault. For example, fault code F53, which is shown in Figure 6-3, indicates a problem with the equipment connected to User Input 3, the name of which (i.e., “Die Nitrogen”) has been programmed by the user in SmartPAC PRO Initialization (see *USER INTERLOCKS*, page 52). Each of the 7 non-control-reliable user inputs and each pair of the 2 cross-checked control-reliable inputs is provided with a unique status code. Fault codes also document problems with the resolver, Dual Safety Valve (DSV), Operator Station, and other WPC 2000 components.

To respond to a fault, do the following:

1. Correct the problem that caused the fault.

2. Clear the fault code or message on the SmartPAC PRO display by doing one of the following:
  - To clear F, H, and S faults, press RESET or EXIT on the display or a Remote Reset switch if one is installed.
  - To clear E faults, power down SmartPAC PRO and WPC 2000, then power the units back up.

All E, F, and H faults are documented in numerical order in the following sections.

## Resolver Faults

### NOTICE

#### CLEARING "E" FAULT CODES

To clear E fault codes, do the following:

1. Power down SmartPAC PRO and WPC 2000.
2. Power up SmartPAC PRO and WPC 2000.

### E06

*Problem:* The press is running faster than 1000 SPM, the resolver has failed, or the wiring in the resolver circuit to WPC 2000 is loose or bad.

*Remedy:* If WPC 2000's rated press speed is exceeded, reduce the speed. If press speed is not the problem, check the resolver wiring for shorts, breaks, or loose connections (see *Wiring the Resolver* in your SmartPAC PRO User Manual, Chapter 2). If wiring is not the problem, the resolver is probably bad and will have to be replaced. If necessary, contact Wintriss Technical Support for assistance or replacement of the resolver.

### F04 or F05

*Problem:* Resolver wiring is faulty, or the resolver itself is bad.

*Remedy:* Check resolver wiring, making sure that the screws on the terminals are tightened on bare wire and not on insulation (see *Wiring the Resolver* in your SmartPAC PRO User Manual, Chapter 2). Also check the resolver. If necessary, contact Wintriss Technical Support for assistance or replacement of the resolver.

### E07

- Problem:* During zeroing, the resolver has been set outside the range of 330° to 30°.
- Remedy:* Re-zero the resolver at top dead center (see *Zeroing the Resolver* in your WPC 2000 Installation or User Manual).

## Operational Faults

### NOTICE

#### CLEARING LOCKOUT MESSAGE

To clear the Lockout message, do the following:

1. Turn the Stroke Select switch to “OFF”
2. Turn the Stroke Select switch to “INCH”.

**F10\***

### NOTICE

This code is not displayed when Two-hand Inch operating mode is selected to enable Dead Motor Inch.

- Problem 1:* If the message accompanying the fault code is “PRESS MOTOR IS OFF,” the main motor has been turned off by the operator or as the result of Lockout (see page 105). This message displays following Lockout only when you have wired the lockout relay to the motor starter as instructed under *Wiring the Lockout Relay* in Chapter 2 of your WPC manual.
- Remedy 1:* Turn the motor back on to reset the fault, clearing the Lockout message first (see NOTICE, below) if necessary. If the motor won’t turn on, you may need to replace the Forward contact blocks on the starter with new ones. To access Run menus without starting the motor, set the press to Two-hand Inch operating mode (*Selecting Operating Mode*, page 88).
- Problem 2:* If the message accompanying the fault code is “ENERGY SAVER SHUT DOWN,” the main motor has been turned off by WPC 2000 to save energy. You will only get this message if you have wired the lockout relay to the motor starter (see *Wiring the Lockout Relay* in Chapter 2 of your WPC manual) and specified a shutdown time on the Press Control Parameter Menu in SmartPAC PRO Initialization (see page 61).
- Remedy 2:* Clear the Lockout message, then turn the motor back on to reset the fault. Set the press to Two-hand Inch operating mode to access Run mode without restarting the motor. If you continue to get this message, you may need to increase the Shutdown Time setting.

**F11\***

*Problem:* The resolver moved when the output relays to the Dual Safety Valve (DSV) were off (i.e., open) and the DSV was de-energized.

*Remedy:* Check clutch, brake and DSV components for correct operation. Correct or repair any malfunction.

**F13**

*Problem:* The Emergency Stop button on the WPC 2000 Operator Station has been depressed, the E-Stop circuit was open after initiation of the stroke, or the E-Stop relay circuits are not working properly.

*Remedy:* If another control is connected to the WPC 2000 E-stop circuit, refer to the user manual for that control to check for a specific error condition, and correct the error. If the error persists, contact Wintriss Technical Support.

**F14**

*Problem:* The Prior Act button on the Operator Station was depressed (i.e., switch was open) after initiation of the stroke.

*Remedy:* Press RESET or EXIT. If the problem persists, check the wiring from the Operator Station to WPC 2000. If necessary, Contact Wintriss Technical Support.

**F16**

*Problem:* The Top Stop button on the Operator Station was depressed or the Top-stop circuit was open after initiation of the stroke.

*Remedy:* Check other equipment (e.g. DiPro 1500, AutoSet, etc.) wired into the Top-stop string. Correct the problem. Reset the other equipment first; then reset SmartPAC PRO with WPC 2000, and restart the press.

**F17**

*Problem:* Cross-checked inputs 8 & 9 were in different states (i.e., open or closed) for longer than 100 mS.

*Remedy:* Diagnose and correct the condition that the inputs are monitoring (see Table 6-2, page 120) and reset the connected equipment; then press RESET or EXIT.

**F18**

*Problem:* Cross-checked inputs 10 & 11 were in different states (i.e., open or closed) for longer than 100 mS.

*Remedy:* Diagnose and correct the condition that the inputs are monitoring (see Table 6-2, page 120) and reset the connected equipment; then press RESET or EXIT.

**F19 or H19**

*Problem:* Auxiliary E-stop relay did not open properly.

**⚠ DANGER****IMPROPER SAFETY SWITCHING RELAY REPAIR**

Replace the Auxiliary E-stop Relay board (see Figure 2-5, page 32) before placing the WPC 2000 back into operation after the first occurrence of a fused relay.

If a relay fuses

- DO NOT reset the WPC 2000 to restart the machine.
- Remove the WPC 2000 from operation immediately and replace the Auxiliary E-stop Relay board before operating the press again.

**Failure to comply with these instructions will result in death or serious injury.**

*Remedy:* Press RESET or EXIT. If the problem persists, contact Wintriss Technical Support for assistance or replacement of the relay board,

**F20**

*Problem:* You are attempting to run the main motor in reverse without selecting Two-hand Inch mode.

*Remedy:* Select TWO HAND on the Mode Select Menu (see Figure 5-9), set the Stroke Select switch to “INCH,” then run the motor in reverse.

**F21**

*Problem:* The N/C input is not seeing 24 Vdc-  
The N/O inputs from the Run/Inch palm buttons on the Operator Station do not turn off (i.e., open) when they should.

*Remedy:* Check to make sure that the palm buttons are the correct switch type. Check and correct the palm switch wiring. If the error persists, call Wintriss Technical Support.

**F22**

*Problem:* The operating mode was changed while the press was running.

*Remedy:* Make your operating mode selection before running the press. Check your Motor Fwd (pin 7) or Rev (pin 17) for a consistent 24 Vdc; make sure it is not intermittent.

**F23**

*Problem:* The operating mode you selected (i.e., One-hand, Two-hand, or Foot) is not valid for your stroke selection (i.e., Inch, Single-stroke, or Continuous) or two conflicting modes are selected.

*Remedy:*

1. Go to the Initialization menu of the SmartPAC PRO.
2. Press PRESS CONTROL.
3. Press INPUT STATUS.
4. Press BUTTONS/SWITCHES.



5. Observe which inputs are on and look for any conflicting modes. Correct them. Some examples:

Motor Fwd. and Motor Rev. are both selected.

Two operating modes are selected (inch and off).

No operating mode is selected.

Bar mode with motor fwd is still running.

Continuous mode with one hand is selected.

Foot switch with inch mode is selected-

## F24

*Problem:* Both Run/Inch palm buttons on the Operator Station were pressed in One-hand mode

or

Run/Inch buttons on an unselected Operator Station were pressed in a dual Operator-Station setup.

*Remedy:* Press only one Run/Inch palm button when running the press in One-hand mode

or

Select both Operator Stations in a dual-Operator-Station setup, then initiate a stroke.

## F25

*Problem:* The flywheel speed sensor is not turning off and on properly while the flywheel is turning.

*Remedy:* Check the installation and wiring of the flywheel sensor (see *Installing the Optional Flywheel Speed Sensor*, page 29), and make corrections. You can disable flywheel speed sensing by setting the Flywheel Timer to 0 (zero). See *Setting Flywheel Timer (Optional Hardware Required)*, page 62.

**F26**

*Problem:* The flywheel turned faster than 6 SPM while the press was in Bar mode, creating a potentially unsafe barring condition.

*Remedy:* After clearing the error, bar the press more slowly. Refer to *Operating the Press in Bar Mode*, page 100.

**F27**

*Problem:* E-stops inputs were in different states (i.e., open or closed) for longer than 100 mS.

*Remedy:* Check the E-stop circuit wiring and the E-stop buttons.

**F28**

*Problem:* The flywheel was still in motion when the motor was started in the opposite direction or Bar mode was selected.

*Remedy:* Press RESET or EXIT, wait for the flywheel to stop turning, then try again to perform the desired operation. You may need to set the Flywheel Timer to a lower value (see *Setting Flywheel Timer (Optional Hardware Required)*, page 62.).

**F29**

*Problem:* A flywheel sensor is installed, but the Flywheel Timer has been set to 0 (zero), disabling the sensor.

*Remedy:* Disconnect the flywheel sensor (see *Installing the Optional Flywheel Speed Sensor*, page 29), or set the Flywheel Timer to a value greater than 0 (zero). See *Setting Flywheel Timer (Optional Hardware Required)*, page 62.

## Inter-processor Failures

### F30\* through F37\* and H38\* and H39\*

*Problem:* One of the following processor errors has occurred:

- F30 Resolver angles for A and B processors disagree by more than 2°
- F31 No reply to Check Start request received from second processor
- F33 Incorrect reply to Mode Change message received from second processor
- F34 No reply to Mode Change message received from second processor
- F35 Incorrect reply to Power-up message received from second processor
- F36 No reply to Reset Error message received from second processor
- F37 No reply to Compare Input Buffers message received from second processor
- H38 Second processor did not receive Power-up information correctly
- H39 Second processor did not receive Mode information correctly

*Remedy:* Try pressing RESET or EXIT. If error persists, contact Wintriss Technical Support.

## Input Buffer Test Failures

### F41

*Problem:* **Input buffer one failed test**

At the start of each stroke, processor A and processor B each does a check on the five inputs listed below. Processor A checks these five inputs and comes back with a value, processor B does the same check and comes back with its value. If these two values do not match, this error code will be issued. This test checks System Air Pressure and User Inputs 4, 6, 9, & 11.

1. System air pressure (Pin #8)
2. User input 11(Pin #18)
3. User input 4 (Pin #83)
4. User input 9 (Pin #74)
5. User input 6 (pin #84)

*Remedy:* The most common cause for this fault is induced voltage across the input wires to the controller. All of the above inputs are connections to ground. To determine which

input is causing the problem, jump out each input, one at a time, until the fault is corrected. **This is not the permanent solution to the problem.** After you determine the faulty input, isolate the wires that run to that input. If the problem reoccurs contact Wintriss Technical Support for further assistance.

## F42

*Problem:* **Cause: Input buffer two failed test.**

At the start of each stroke, processor A and processor B each does a check on the two inputs listed below. Processor A checks these two inputs and comes back with a value; processor B does the same check and comes back with its value. If these two values do not match, this error code is issued. This test checks remote reset and bar mode selector inputs.

1. Remote reset input (Pin #70)
2. Bar mode selector switch input (Pin #6)

*Remedy:* The most common cause for this fault is induced voltage across the input wires to the controller. To determine which input is causing the problem, jump out each input, one at a time, until the fault is corrected. These two inputs can be disconnected from the board. **This is not the permanent solution to the problem.** After you determine the faulty input, isolate the wires that run to that input. If the problem reoccurs contact Wintriss Technical Support for further assistance.

## F43

*Problem:* **Input buffer three failed test.**

At the start of each stroke, processor A and processor B each does a check on the three inputs listed below. Processor A checks these three inputs and comes back with a value; processor B does the same check and comes back with its value. If these two values do not match, this error code is issued. This test checks the motor reverse, DSV monitor input and user input 3.

1. Motor Reverse (Pin #17)
2. User input #3 (Pin #71)
3. DSV monitor input (Pin #20)

*Remedy:* The most common cause for this fault is induced voltage across the input wires to the controller. All of the above inputs are connected to +24VDC (motor reverse only if press is in reverse). To determine which input is causing the problem, jump out each input, one at a time, until the fault is corrected. **This is not the permanent solution to the problem.** After you determine the faulty input, isolate the wires that run to that input. If the problem reoccurs contact Wintriss Technical Support for further assistance.

## F44

*Problem:* **Input buffer four failed test.**

At the start of each stroke, processor A and processor B each does a check on the six inputs listed below. Processor A checks these six inputs and comes back with a value: processor B does the same check and comes back with its value. If these two values do not match, this error code is issued. This test checks the motor forward input and user inputs 2, 5, 7, 8, & 10.

1. User input #2 (Pin #82)
2. Motor Forward (Pin # 7)
3. User input #7 (Pin #73)
4. User input #5 (Pin #72)
5. User input #10 (Pin #86)
6. User input #8 (Pin # 85)

*Remedy:* The most common cause for this fault is induced voltage across the input wires to the controller. To determine which input is causing the problem, jump out each input, one at a time, until the fault is corrected. User input #2 and the motor forward input need to be jumped to 24VDC. All other inputs can be jumped to ground. **This is not the permanent solution to the problem.** After you determine the faulty input, isolate the wires that run to that input. If the problem reoccurs contact Wintriss Technical Support for further assistance.

## Air Pressure Limits Exceeded

### F45 or H45

*Problem:* Clutch Air Pressure is below the setpoint established in SmartPAC PRO Initialization.

*Remedy:* Check your Clutch Air Pressure level. You may need to adjust the Main Air Limit setting (see *Setting Clutch and Counterbalance Air Pressure Limits*, page 60).

## F46 or H46

**Problem:** Counterbalance Air Pressure is outside the Counterbalance Setpoint tolerance established in SmartPAC PRO Initialization.

**Remedy:** Check your Counterbalance Air Pressure level. You may need to adjust the Counterbalance +/- setting (see *Setting Clutch and Counterbalance Air Pressure Limits*, page 60).

### NOTICE

#### RAMPAC USERS

This error should not occur if you use RamPAC to monitor Counterbalance Air Pressure.

If you do get this error, make sure that RamPAC is wired correctly to its pressure sensor and that WPC 2000 is wired correctly to its pressure switch. For pressure switch wiring instructions, see *Installing a Counterbalance Air Pressure Switch* in Chapter 2 of your WPC manual. Contact Wintriss Technical Support if you need further assistance.

## Component Failures

### F47 and F48

**Problem:** Failures have occurred to standard equipment connected to WPC 2000.

F47 Dual Safety Valve (DSV) monitor switch input open (pin #20).

F48 Clutch air pressure switch input open (pin #08).

**Remedy:** Correct the problem, then press RESET or EXIT. If the error persists, contact Wintriss Technical Support.

For F47 errors, try resetting the unit by pressing RESET or EXIT and turning the Stroke Select key switch to OFF, then back to one of the other operating modes. If the DSV continues to fault, check to make sure that the air pressure is not set too low, and correct if necessary. Also, check to make sure that there are no restrictions in the air supply line (e.g., restrictive fittings, quick-disconnect fittings, low flow filters or regulators, or clogged filter elements) and that the supply line is sized to match the DSV inlet port. If the air pressure and air supply are sufficient, check for dirt or water in the DSV, and rebuild the valve if necessary.

For F48 errors, check to see whether the air pressure is turned off or set too low, and correct if necessary. If you are using a pressure sensor instead of a pressure switch to monitor Clutch Air Pressure, this fault will occur when pin #8 has not been wired to ground (see step 5 of the *Installing a Clutch Air Pressure Sensor*

procedure, under *Installing a Counterbalance Air Pressure Switch* in Chapter 2 of your WPC manual.).

## Customized Status Codes

### NOTICE

You can display the status of user inputs via the F4 (Interlocks) function key on the Display WPC Input Status screen (see *USER INTERLOCKS*, page 52).

## F50 through F58

*Problem:* A failure has occurred in an auxiliary press function (e.g., lubrication system) wired to a WPC 2000 user input. Refer to Table 6-2, page 120 for specific faults. See also the separate remedies for faults F17, F18, F50, and F58, which apply to the cross-checked input pairs 8/9 and 10/11.

*Remedy:* Diagnose and correct the condition that the input is monitoring (see *Wiring WPC 2000 User Inputs* in Chapter 2 of your WPC manual). If the error persists after you reset the unit, contact Wintriss Technical Support.

Table 6-2. Fault Codes for User Inputs

Fault Code	User Input (Interlock)	Stop Type *	Pin #	Jumper Connection (Bypass)
51	User 1		21	+24 Vdc
52	User 2		82	+24 Vdc
53	User 3		71	+24 Vdc
54	User 4		83	Ground
55	User 5		72	Ground
56	User 6		84	Ground
57	User 7		73	Ground
58, 17	User 8 paired with 9		85	Ground
	User 9 paired with 8		74	Ground
50, 18	User 10 paired with 11	E-stop/ Lockout	86	Ground
	User 11 paired with 10		18	Ground

\* Stop types for all inputs except input pair 10/11 are set to E-Stop by default; input pair 10/11 is set to E-Stop/Lockout. All inputs except input pair 10/11 can be reconfigured by the user. If you have SmartPAC PRO firmware version 3.32 or higher and WPC 2000 firmware version 1.70 or higher, an additional stop type option, Top-stop/Lockout, is available for user inputs 1-7. To set these inputs to Top-stop/Lockout or to change the stop type setting for any user input, (see *USER INTERLOCKS*, page 52).

## F50

**Problem:** A failure has occurred in an auxiliary press function wired to WPC 2000 cross checked input pair 10 and 11 (see Table 6-2). One or both inputs are open.

**Remedy:** Diagnose and correct the condition that the inputs are monitoring. If the error persists after you reset the unit, contact Wintriss Technical Support.



**F58**

*Problem:* A failure has occurred in an auxiliary press function wired to WPC 2000 cross checked input pair 8 and 9 (see Table 6-2). One or both inputs are open.

*Remedy:* Diagnose and correct the condition that the inputs are monitoring. If the error persists after you reset the unit, contact Wintriss Technical Support.

**Light Curtain Faults****F60 or H60****-and-****F61 or H61**

*Problem:* Light curtain A (fault #60) or light curtain B (fault #61) failed the WPC 2000 internal test.

*Remedy:* Check to make sure that the light curtain is wired correctly, referring to figures 4, 14, 15, 20, 21, 23, 24, 26, 27, and 28 at the end of your WPC manual, if you have Shadow light curtains, referring to the appropriate user manual if you have another product. If you need additional assistance, contact Wintriss Technical Support.

**F62**

*Problem:* Two pairs of light curtains are wired to WPC 2000, but only one pair has been enabled on option switch 6 on the Press Control Option Switch Menu.

*Remedy:* Set option switch 6 for dual light curtains (see *Switch 6 – Enabling Dual Light Curtains* in Chapter 3 of your WPC manual).

**F63**

*Problem:* Light curtain A is obstructed during the stroke.

*Remedy:* Remove the obstruction.

**F64**

*Problem:* Light curtain B is obstructed during the stroke.

*Remedy:* Remove the obstruction.

**F65**

*Problem:* A light curtain is connected with Two-hand Only firmware installed in WPC 2000.

*Remedy:* Remove the Two-hand Only firmware, and install a firmware version intended for use with a light curtain, referring to *Installing Revised Firmware in WPC 2000*, in Chapter 2 of your WPC manual. Contact Wintriss Technical Support for help in selecting the right firmware for your application.

**E-stop Circuit Failed the Pulse Test at Start of Stroke****F66 or H66**

*Problem:* The E-stop input circuit failed the pulse test at stroke start. The estop circuit was tested at the start of the stroke and did not turn off.

*Remedy:* This is usually caused by 24Vdc being connected directly into the Estop string. Check Estop circuit wiring, and correct any problems. If the error persists after you reset the unit, contact Wintriss Technical Support for assistance.

## Top-stop Circuit Driver Failure

**F67 or H67**

*Problem:* The Top-stop input circuit driver has failed or is about to fail.

*Remedy:* This is usually caused by 24Vdc being connected directly to the Top Stop string. Check Top-stop circuit wiring, and correct any problems. If the error persists after you reset the unit, contact Wintriss Technical Support for assistance or replacement of the driver.

## Shadow Light Curtain Input Faults

**F68 or H68**

**-and-**

**F69 or H69**

*Problem:* Shadow light curtain A (fault #68) or B (fault #69) inputs to WPC 2000 are not in the same state (i.e., one input is “on,” the other is “off”).

*Remedy:* Check “Light curtain A1 input” and “Light curtain A2 input” LEDs on the WPC 2000 Main Processor board if light curtain A is generating the fault, or check “Light curtain B1 input” or “Light curtain B2 input” LEDs if light curtain B is generating the fault (see Figure 2-17, page 48).

If one of the two LEDs is unlit, receiver wiring is bad or one of the receiver outputs may be shorted. Check the wiring at the receiver and correct if necessary.

If the wiring is good, either the receiver needs to be replaced, or there is a problem with WPC 2000. Contact Wintriss Technical Support for assistance.

## DSV Interface and Lockout Relay Failures

**F70\* through F78\***

**- or -**

**H72\* through H76\***

### **DANGER**

#### **IMPROPER SAFETY SWITCHING RELAY REPAIR**

Replace the DSV/Lockout Relay board (see Figure 2-5, page 32) before placing the WPC 2000 back into operation after the first occurrence of a fused relay.

If a relay fuses

- DO NOT reset the WPC 2000 to restart the machine.
- Remove the WPC 2000 from operation immediately and replace the DSV/Lockout relay board before operating the press again.

**Failure to comply with these instructions will result in death or serious injury.**

*Problem:* The following errors indicate failures on the WPC 2000 Main Processor board or the DSV/Lockout Relay board. Error codes F70, F71, F72/H72, F73/H73, and F76/H76 indicate failures with the DSV driver logic on the Main Processor board. Codes F74/H74, F75/H75, and F77 indicate failures with the relays on the DSV/ Lockout Relay board. F78 indicates an issue with the poppet position sensors in the DSV valve itself.

F70	DSV relay driver A was not off at start of stroke
F71	DSV relay drivers A and B did not turn on properly or have shorted
F72 or H72	DSV Control Flip-flop is not functioning properly
F73 or H73	DSV Missing Pulse Detector window is not functioning properly
F74 or H74	DSV relay A or B did not close properly at start of stroke
F75 or H75	DSV relay A or B did not open properly at end of stroke
F76 or H76	Lockout relay driver did not turn on properly during testing
F77	Lockout relay check contacts were not closed before lockout relay was turned on
F78	The position of the DSV poppets is incorrect (Minster version only).

*Remedy:* Press RESET or EXIT. Try reseating and/or replacing the DSV Relay board if you have a spare on hand. If the error persists, contact Wintriss Technical Support for assistance or replacement of either board.

## Loss of Rotation

**F79**

*Problem:* The Dual Safety Valve (DSV) has been activated, but the resolver did not start rotating within the Start-time Limit set on the Press Control Parameter Menu (see *Setting Stop Time and Start Time Limits* in Chapter 4 of your SmartPAC PRO User Manual).

*Remedy:* Check the Start-time Limit setting, and increase if necessary. Check the resolver and resolver drive, and replace the resolver if necessary. Check the clutch and repair if necessary. If these solutions do not work, contact Wintriss Technical Support.

## Internal Timing Input Failures

**F80 or H80**

**- and -**

**F82 or H82**

*Problem:* There is an internal problem with the WPC 2000 timing inputs.

*Remedy:* Press RESET or EXIT. If the error persists, contact Wintriss Technical Support for assistance or replacement of the timing inputs.

## Top-stop and Overrun Setting Faults

**F81, F83, F84, F86  
and F87**

**- and -**

**H81, H83, H84, H86  
and H87**

*Problem:* The overrun limit switch has turned on before the Top-stop “On” Angle timing has turned off. The Top-stop Angle internal dwell is 20°.

*Remedy:* Check to make sure that the Top-stop “On” Angle has been set correctly (see *Setting the Top-stop “On” Angle* in Chapter 3 of your WPC manual) and that the overrun sensor magnet has been installed at the correct angle (see *Installing the Overrun Sensor Magnet* in Chapter 3 of your WPC manual). If settings are correct and the error persists, contact Wintriss Technical Support.

## Overrun Limit Switch Fault

**F85**

*Problem:* The overrun limit switch has provided more than one signal to WPC 2000 during a stroke. The switch should open and close only once per stroke.

*Remedy:* Check the overrun limit switch installation to make sure that the switch opens and closes only once per stroke, referring to *Installing the Overrun Limit Switch* in Chapter 2 of your WPC manual and the LED map, Figure 2-17, page 48. Check to make sure that the switch is installed correctly, referring to *Mounting the Overrun Sensor Switch* in Chapter 2 of your WPC manual, and that the magnet is installed at the correct angle (see *Installing the Overrun Sensor Magnet* in Chapter 3 of your WPC manual). Also, check to make sure that the magnet is attached using a brass or other non-ferrous screw.

Check the diameter of the shaft on which the magnet is mounted to make sure there is enough dwell for the overrun limit switch to provide an adequate signal (see *Planning Your Overrun Sensor Installation* in Chapter 2 of your WPC manual). An ideal diameter is 4 in. to 6 in. If the shaft is larger than this, mount the magnet on a shaft with a smaller diameter.

Check to make sure that the press is not encountering excessive shock and vibration due to operations such as blanking. If you cannot resolve the problem, contact Wintriss Technical Support.

## Overrun Limit Switch Test Angle Fault

### F88 or H88

**Problem:** The overrun limit switch was not closed during the overrun sensor closure test window (see the table under *Installing the Overrun Sensor Magnet* in Chapter 2 of your WPC manual)-

**Remedy:** The resolver drive may have slipped or broken. If this is the case, the resolver needs to be repaired or replaced. If the resolver drive checks out, also check the wiring and installation of the resolver (see *Installing the Resolver* in your WPC manual).

Check the diameter of the shaft on which the magnet is mounted to make sure there is enough dwell for the switch to provide an adequate signal (see *Planning Your Overrun Sensor Installation* in Chapter 2 of your WPC manual). An ideal diameter is 4 in. to 6 in. If the shaft is larger than this, mount the magnet on a shaft with a smaller diameter.

Check installation of the overrun sensor and magnet and wiring of the overrun sensor, referring to *Installing the Overrun Limit Switch* in Chapter 2 of your WPC manual and *Installing the Overrun Sensor Magnet* in Chapter 3 of your WPC manual.

## Overrun Limit Switch Setting Fault

### F89 or H89

**Problem:** The angle range (e.g., 271° to 300°) within which the Top-stop “On” Angle must fall is not set correctly on option switches 1 and 2 on the Press Control Option Switch Menu.

OR

The Top Stop window and Overrun Sensor timing overlap. The overrun sensor is not seen turning on at all.

**Remedy:** Set switches 1 and 2 for the correct Top-stop “On” Angle window, referring to the table under *Installing the Overrun Sensor Magnet* in Chapter 2 of your WPC manual.

Check the overrun sensor wiring and functionality, as well as when it turns on, to be sure it does not overlap with the Top Stop window.

If the error persists, contact Wintriss Technical Support.

## Internal Memory Failures

**F90\* through F98\***

**- or -**

**H90\* through H98\***

*Problem:* There is a problem with the main or second processor on the WPC 2000 Main Processor board. The board may need to be serviced or replaced. Errors are as follows:

F90 or H90	Program memory checksum 1 is incorrect
F91 or H91	Program memory checksum 2 is incorrect
H93	Auxiliary relay check contacts OPEN when they should be closed
F95 or H95	Angle table memory checksum is incorrect
F96 or H96	RAM memory failed memory test
F97 or H97	No angle setup is loaded
F98 or H98	The option switch image changed during operation
F99 or H99	+24 Vdc failed, or the fuse blew

*Remedy:* Press RESET or EXIT. If the error persists, contact Wintriss Technical Support for assistance or replacement of the Main Processor board or firmware chip.

### **NOTICE**

#### **INFORMATION ON ERROR NUMBERS EQUAL TO OR GREATER THAN 120**

Error numbers equal to or greater than 120 are covered in the WPC 2000 Option 2 Manual (1130700) and the WPC 2000 Option 2 Additional Inputs Only Instruction Sheet (1141900).



## Counter Preset Reached Messages

### “Good parts counter preset reached”

*Problem:* The value set for the parts counter has been reached. The press should stop at top dead center.

*Remedy:* Press RESET or EXIT to clear the message. If your part run is complete, you need to change tooling, material, etc. before you re-start the press.

#### **NOTICE**

When this message appears, the good parts count is automatically reset to 0.

### “Strokes counter preset reached”

*Problem:* The value set for the strokes counter has been reached. The press should stop at top dead center.

*Remedy:* Press RESET or EXIT to clear the message. If your part run is complete, you need to change tooling, material, etc. before you re-start the press.

#### **NOTICE**

When this message appears, the strokes count is automatically reset to 0.

### “Batch # counter preset reached”

*Problem:* The value set for one of the three batch counters when the output type is set to TOP STOP has been reached. The press should stop at top dead center. See *Setting Batch Counter Output and Increment Modes* in Chapter 5 of your SmartPAC PRO User Manual.

*Remedy:* Press RESET or EXIT to clear the message.

#### **NOTICE**

When this message appears, the corresponding batch count is automatically reset to 0.

## Messages for Equipment or Brake Monitor Problems

The following messages cover resolver and input circuit faults, problems with the way the press is running, brake monitor faults, and internal problems with SmartPAC PRO.

### “Loss of rotation detected”

*Problem:* The resolver did not start rotating within the start time limit set in Initialization (see *Setting Stop Time and Start Time Limits* in Chapter 4 of your SmartPAC PRO User Manual) or stopped rotating while the press was running.

SmartPAC PRO knows when the Dual Safety Valve (DSV) is energized. If it sees that the DSV is energized but the resolver is not turning, this message appears.

One possible cause is that the resolver’s drive belt is loose or broken. Another is that you may have low air pressure to the clutch or a bad clutch. An internal SmartPAC PRO problem could also have occurred, or the resolver could be defective.

*Remedy:* Check the resolver, the resolver drive, chain, belt, and coupling for tightness and the clutch and counter balance air pressures. Repair if necessary. If these solutions do not work, an internal problem may have occurred. Call Wintriss Technical Support.

### “Angle Resolver Failure”

*Problem:* The wiring in the resolver circuit to SmartPAC PRO may be loose or bad, or the resolver may have failed.–

*Remedy:* Check the resolver wiring and connections for shorts, breaks, or loose connections. If SmartPAC PRO’s rated press speed has been exceeded, reduce the speed. Contact the factory for assistance.

### NOTICE

To clear this fault, you must power down SmartPAC PRO, then power the unit back up. Pressing RESET or EXIT does not work.

### “Input check circuit failure”

*Problem:* The resolver turned five times, indicating that the press was running, but SmartPAC PRO received no signal from the input check circuit.

The input check circuit may not have been connected or wired properly. If this message occurs when the press stops, the brake may be worn.

*Remedy:* Check the wiring of the input check circuit and rewire, if necessary, following the instructions in *Connecting Stop Circuits and Input Check Circuit*, page 35. Make sure the input check voltage switch (S101) is set correctly, as shown in the figure under *Setting the Input Check Voltage Switch* in your SmartPAC PRO Installation Manual. If the input check circuit is not the problem, check your brake for wear.

## E-Stop errors

*Problem:* If the word “ESTOP” appears in a message, one or both of the emergency stop relay circuits is not working satisfactorily and may be defective.

*Remedy:* Check both stop relay circuits. To reset SmartPAC PRO, turn the unit off, then on again. (You cannot use the RESET or EXIT key to reset this error.) If the error recurs, contact Wintriss Technical Support.

## “Inboard ram test failure”

*Problem:* Something is wrong with the SmartPAC PRO main processor board. The board may need to be serviced or replaced.

*Remedy:* Try turning the power off, then on again. (You cannot use the RESET or EXIT key to reset this error.) If the message continues to appear, contact Wintriss Technical Support for assistance or replacement of the board.

## “Resolver signals incorrect” or “Resolver drive signal incorrect”

*Problem:* There is a problem with the resolver assembly.

*Remedy:* Check to make sure that the Master/Slave jumper, JP101, on the SmartPAC PRO board (see Figure 2-6, page 34) is set to the following position:

- MASTER for a SmartPAC PRO without WPC Clutch/Brake control integration
- SLAVE for a SmartPAC PRO with WPC Clutch/Brake control integration

Check the resolver and wiring. Make sure that the terminals are tightened on bare wire and not on insulation (see *Connecting the Resolver Wiring Between SmartPAC PRO and WPC 2000*, page 33). If necessary, contact Wintriss Technical Support for assistance or replacement of the resolver.

## “Stop time exceeded”

*Problem:* The stopping time of the press has exceeded the limit set in SmartPAC PRO Initialization. You should have been pre-warned of this condition by the brake warning LED, which flashes whenever the stopping time is within 10 milliseconds of the stop-time limit.

This message displays when the stop-time limit is not sufficient to allow for normal brake wear, or the brake is excessively worn and needs servicing. If the brake is worn, a dangerous safety problem may exist and should be corrected immediately.

*Remedy* First, perform several 90° stop-time test runs to get an actual reading for your press’s stop time. Compare these results with the results you got the last time you performed the test. Decide if the current stop-time limit is realistic or needs to be changed slightly. See *Calculating the Stop-time Limit* in Chapter 3 of your WPC manual to calculate the correct stop-time limit and *Performing the 90° Stop-time Test* in Chapter 6 of your SmartPAC PRO User Manual to perform the 90° stop-

time test. If you change the limit, you may have to relocate your light curtains and/or two hand controls. Refer to the appropriate manual for assistance.

If the brake is worn, you should have your maintenance personnel service the brake immediately.

## Messages for Programming Problems

These messages indicate that there is a problem with the tool, the tool is not properly loaded, or there is an internal problem with SmartPAC PRO.

### “No tool number has been loaded”

*Problem:* You are attempting to access Run mode without a tool being loaded. A tool must be loaded before you can enter Run mode.

*Remedy:* Turn the Program/Run key to PROG to access Program mode, then load the appropriate tool, and turn the Program/Run key back to RUN.

### “Tool number table checksum error”

*Problem:* The programming for the loaded tool has become corrupted.

This error can occur when SmartPAC PRO has been turned off while you are in the middle of programming a setup, or when you have not properly exited (i.e., by pressing RESET or EXIT) from a Program or Run menu.

The error can also occur when you upgrade SmartPAC PRO. Sometimes the information in the older firmware does not synchronize properly with the information in the new firmware. Settings can also be damaged due to an internal SmartPAC PRO malfunction.

SmartPAC PRO creates a “checksum” for every tool to check that the tool settings stored in memory are the same as the settings that are loaded with the tool. The checksum value calculated when tool settings are stored in memory must be the same as the value calculated when the settings are loaded.

*Remedy:* Access Program mode, and double-check the tool settings. If settings are correct, reload the tool.

If the error was caused because the system was turned off while in Program or Run modes, perform these steps:

1. Press RESET or EXIT to clear the fault message.
2. Access Program mode, and select GO TO THE TOOL MANAGER.
3. On the Tool Manager screen, highlight the tool, and press F4 (Edit Tool).
4. On the Tool Program Menu, select CAM SWITCH.
5. Press RESET or EXIT. SmartPAC PRO will create a new checksum for the tool.

6. Select the tool again, access the Tool Program Menu, and select CAM SWITCH. Verify that all settings are correct.
7. Reload the tool. You should no longer get this fault message.

If the problem is due to a system malfunction, the tool settings will have to be created again from scratch. If this happens more than once, contact Wintriss Technical Support for assistance.

## Messages for Sensor Faults

### “Green sensor missed”

*Problem:* A green or green quick check sensor did not turn on during the Ready signal nor within 50 milliseconds after the Ready signal. No stroke angle is displayed for this error since the sensor never turned on.

*Remedy:* Check for the malfunction that the sensor was supposed to detect (part ejection problem, misfeed, transfer problem, etc.). If a malfunction is not the cause, check to be sure that the Ready signal is set properly for this sensor. Check that a sensor is actually plugged into this input on the DSI 2. If no sensor is connected to a sensor input, that input must be set to UNUSED. Check connections between sensors and the controller.

### “Green sensor actuated late”

*Problem:* A green or green quick check sensor turned on late, that is, within 50 milliseconds after the end of the Ready signal.

If a green or green quick check sensor does not come on during its Ready signal, SmartPAC PRO continues to look for the sensor signal. If it sees the sensor come on within 50 milliseconds after the Ready signal, this message displays. The angle at which the sensor turned on is shown in the message.

*Remedy:* Check for the malfunction the sensor was supposed to detect (like a part ejection problem or misfeed, etc.). Check that the Ready signal is set properly, and adjust if necessary.

### “Green sensor failure”

*Problem:* A green or green constant sensor has stayed on from the end of one Ready signal to the beginning of the Ready signal for the next stroke. No stroke angle is shown with this fault.

*Remedy:* Check for a shorted sensor. Make sure the Ready signal has been set correctly. Check to see if a press or equipment malfunction is causing the sensor to stay on—for instance, a part wedged against a sensor or a pinched wire.

**“Green constant fault”**

*Problem:* A green constant sensor was not on at the beginning of its Ready signal or turned off during the Ready signal. Green constant sensors must stay on throughout the Ready signal. The angle at which the sensor turned off is displayed.

*Remedy:* Check for the malfunction that the sensor was supposed to detect.

If no malfunction has occurred, check to make sure that the Ready signal is set properly. Remember, for green constant sensors, the Ready signal must be a little shorter than the sensor’s actuation angle. Check that a sensor is actually plugged into this input. Check connections between the DSI 2 and the controller.

**“Green quick check sensor actuated outside ready”**

*Problem:* A green quick check sensor actuated or stayed on outside the Ready signal. The stroke angle at which the sensor was first detected on outside the Ready signal is shown.

*Remedy:* Check for the malfunction the sensor was supposed to detect (part ejection problem, misfeed, etc.). Check for a part wedged against the sensor, a shorted sensor, a pinched wire, or other cause that would keep the sensor on or cause it to go on outside its Ready signal. Make sure the Ready signal is set correctly.

**“Green special fault”**

*Problem:* A green special sensor did not actuate (i.e., there was no contact closure to ground) within the maximum number of strokes set in Program mode.

*Remedy:* Check for the press or equipment malfunction that the sensor was supposed to detect. Check for any cause that would keep the sensor from going on. Make sure the maximum stroke count is set correctly, especially that it is not set too low. See *Setting the Counter Value for a Green Special Sensor* in Chapter 5 of your SmartPAC PRO User Manual.

**Fault message for yellow sensors: “This N/O sensor is grounded”**

*Problem:* A yellow sensor turned on (i.e., there was a contact closure to ground). When this message is displayed, the angle at which the condition was detected is shown.

*Remedy:* Check for the press or equipment malfunction that the sensor was supposed to detect. If no malfunction has occurred, check for a shorted sensor or pinched wire.

**Fault message for red sensors: “This N/C sensor is open”**

*Problem:* A red sensor has actuated (i.e., is open to ground). When this message is displayed, the angle at which the condition was detected is shown.

*Remedy:* Check for the press or equipment malfunction that the sensor was supposed to detect. If no malfunction has occurred, check for a problem with the sensor. Check for loose or detached wiring at the DSI 2 or controller. Check for a severed wire from the sensor to the DSI 2 or controller.

## Miscellaneous Fault Messages

### “Maximum press speed exceeded”

*Problem:* The press is running at a speed greater than the maximum limit programmed for this tool.

*Remedy:* After clearing the error, either run the press at a slower speed, or adjust the limit set in Program mode (see *PRESS CONTROL*, page 83).

### “Minimum press speed exceeded”

*Problem:* The press is running at a speed less than the minimum limit programmed for this tool.

*Remedy:* After clearing the error, either run the press at a higher speed, or adjust the limit set in Program mode (see *PRESS CONTROL*, page 83).

### “The resolver position is different from when the unit was turned off”

*Problem:* This message will only appear if SmartPAC PRO detects that the resolver angle when the press is turned on is different from the angle when the press was turned off. This can happen when you move the press or upgrade SmartPAC PRO firmware.

*Remedy:* Press RESET or EXIT to clear. If the message reappears, call Wintriss Technical Support.

### “One of the sensor auto enable counters is greater than 99”

*Problem:* Normally, this fault will never occur since SmartPAC PRO does not let you enter a value greater than 99. However, this message could display if your tool parameters have become corrupted or there is an internal problem with SmartPAC PRO.

*Remedy:* First press RESET or EXIT. If the message reappears, contact Wintriss Technical Support.

### “Loss of Communication at Address X”

*Problem:* SmartPAC PRO is unable to communicate with the optional module identified by “X” in the message (see Table 6-3).

*Remedy:* Check the wiring of the specified module. If you continue to get this error message, call Wintriss Technical Support.

Table 6-3. Communication Errors: Option at Fault

Message	Option Identified by Address
Loss of Communication at Address 1	AutoSetPAC or WaveFormPAC Channels 1 - 4
Loss of Communication at Address 2	AutoSetPAC or WaveFormPAC Channels 5 - 8
Loss of Communication at Address 4	RamPAC
Loss of Communication at Address 5	ProPAC

## Troubleshooting Using the Error/Event Log

The Error/Event Log, which you can view in Run mode, is a useful troubleshooting aid. You can use the Error/Event log to help you diagnose the cause of a problem, or you can send the log to Wintriss Technical Support to help them narrow down probable causes. See *ERROR/EVENT LOG* in Chapter 6 of your SmartPAC PRO User Manual and *Sending E-mail to Wintriss Technical Support*, also in Chapter 6 of that manual.

## Downloading Diagnostic Information to USB Disk

To obtain your diagnostics date before contacting Wintriss Technical Support, follow the instructions below. This data includes error/event log, screen captures, and other data maintained in a special SmartPAC PRO buffer.

1. Install a USB disk in the USB connector on the SmartPAC PRO's front panel. A window opens showing two buttons.
2. Press Save Diagnostic Data.
3. Three diagnostic .txt files are sent to the USB disk. Note: depending on your firmware, you may need to press **ADVANCED** to see this option. The following messages appear in succession:

PLEASE WAIT WHILE THE DATA IS BEING TRANSFERRED TO THE USB DISK. THIS MAY TAKE UP TO ONE MINUTE TO COMPLETE . . .

THE USB DISK TRANSFER HAS FINISHED AND WAS SUCCESSFUL. The USB disk device can now be removed.

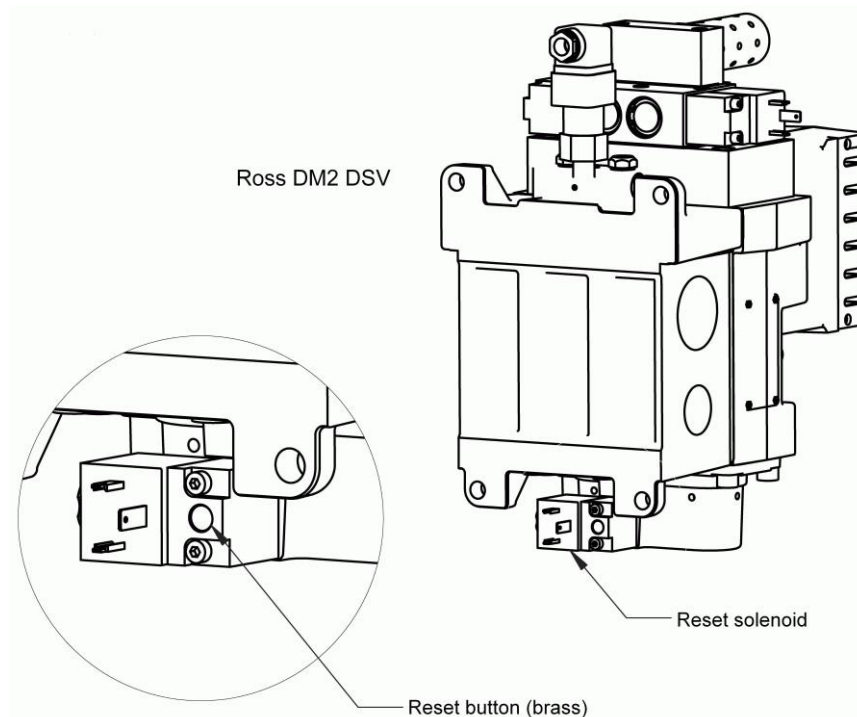
4. When the second message appears, press **OK** to return to the Diagnostic Menu. You can then remove the USB disk and transfer the data to a computer.



## Resetting Ross DM2 DSV Faults

If your Ross DM2 DSV faults when air is first applied to the unit, one or both poppets may have been jarred into a faulted position during shipment. When the poppets are faulted, input air can escape through the muffler port. To reset the fault, air must be applied to DSV to return the poppets to their unfaulted position.

If the fault occurs before the unit has been wired, the problem will be signaled by air escaping from the muffler port when input air is applied to the DSV. To reset the unit, press the brass button on the bottom of the Reset solenoid while air is being applied to the DSV (see Figure 6-4).



*Figure 6-4. Ross DM2 DSV Showing Reset Button*

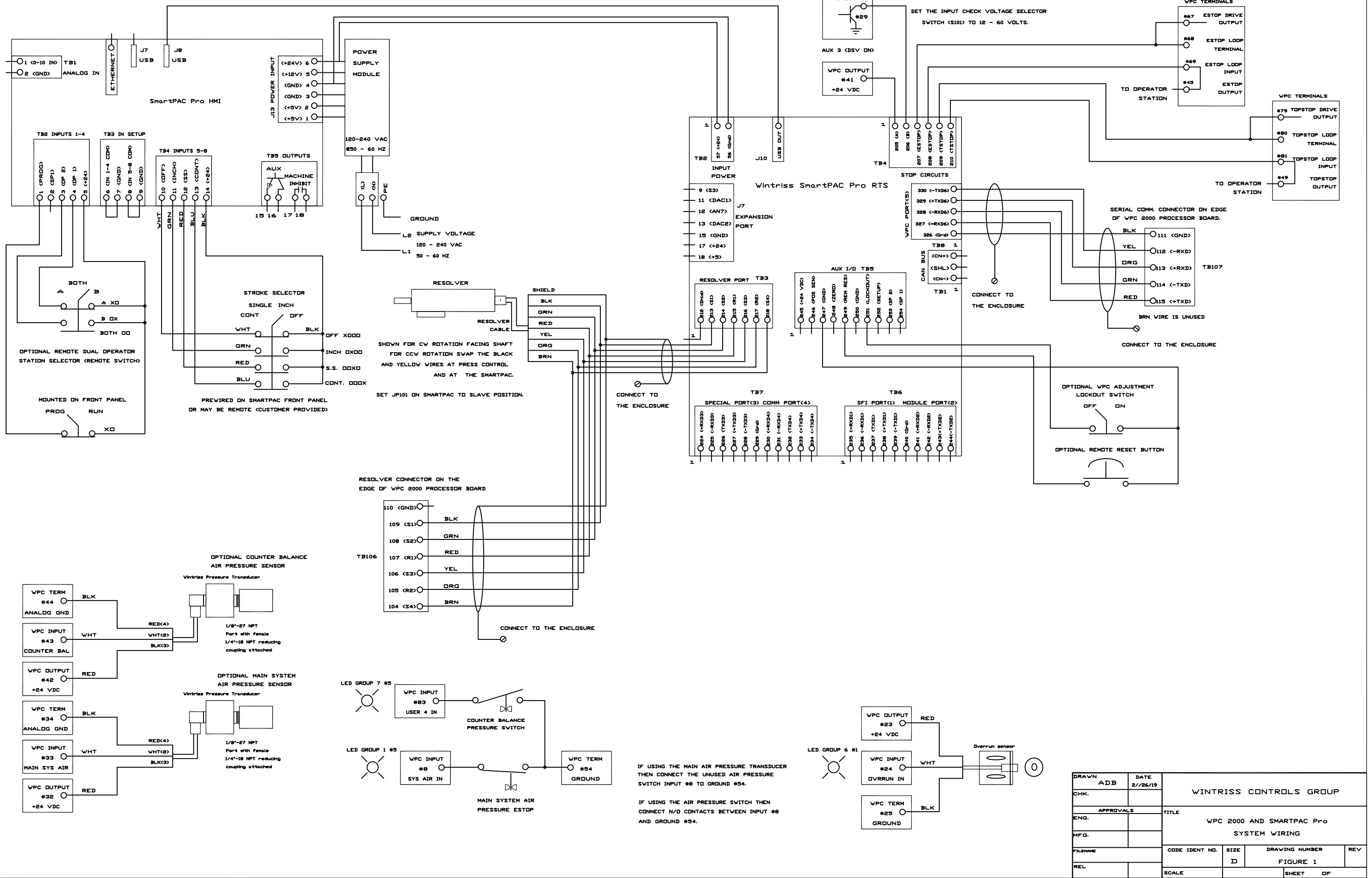
If the fault occurs after the unit has been wired, an F47 error will appear on the SmartPAC PRO display. To clear the fault and reset the DSV, press RESET or EXIT and turn the Stroke Select key switch to OFF, then to one of the other operating modes (see page 118).

If you have trouble resetting the DSV, the problem may be that both poppets are faulted, requiring more air for a reset than can be supplied by the system. In this case, try resetting the unit with the muffler port obstructed. Place your hands or a rag or plastic packaging material over the muffler to restrict the escape of air, then actuate the Reset solenoid.

If the DSV still will not reset, check to see if there are restrictions in the air supply line (e.g., restrictive fittings, quick-disconnect fittings, low flow filters or regulators, or clogged filter elements) and correct if necessary. Also, check to make sure that the air supply line matches the inlet port size of the DSV, and replace with a properly-sized supply line if it doesn't.



REVISIONS			
REV	DESCRIPTION	DATE	APP'D



SHOWN FOR CW ROTATION FACING SHAFT  
FOR CCW ROTATION SWAP THE BLACK  
AND YELLOW WIRES AT PRESS CONTROL  
AND AT THE SMARTPAC.

SET JP101 ON SMARTPAC TO SLAVE POSITION.

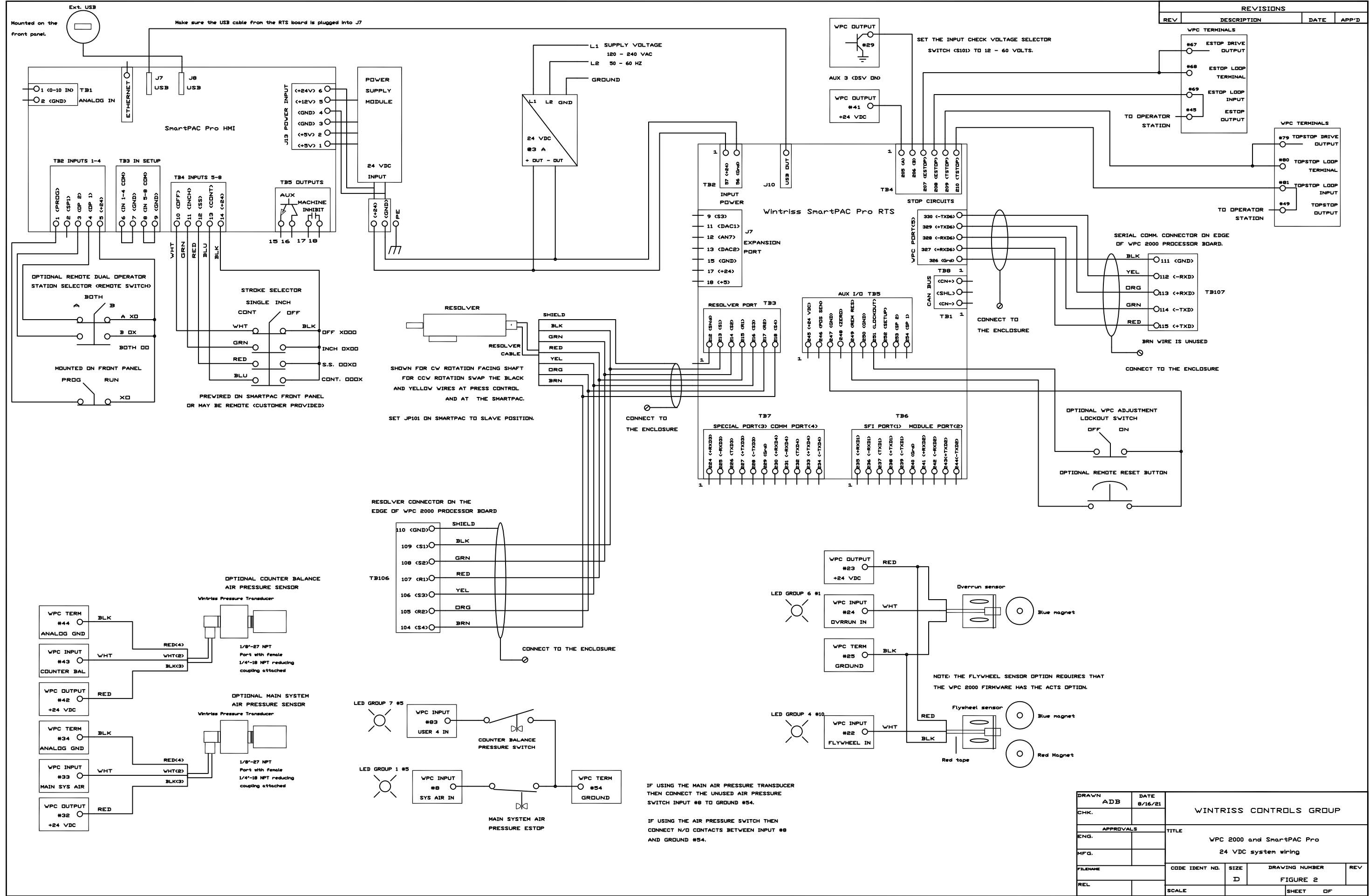
IF USING THE MAIN AIR PRESSURE TRANSDUCER  
THEN CONNECT THE UNUSED AIR PRESSURE  
SWITCH INPUT #8 TO GROUND #54.

IF USING THE AIR PRESSURE SWITCH THEN  
CONNECT N/O CONTACTS BETWEEN INPUT #8  
AND GROUND #54.

DRAWN	ADB	DATE	2/26/19		
CHK.			WINTRISS CONTROLS GROUP		
APPROVALS		TITLE			
ENG.		WPC 2000 AND SMARTPAC Pro			
MFG.		SYSTEM WIRING			
FILENAME		CODE IDENT NO.	SIZE	DRAWING NUMBER	REV
REL			D	FIGURE 1	
SCALE		SHEET OF			



REVISIONS			
REV	DESCRIPTION	DATE	APP'D



DRAWN	ADB	DATE	8/16/21	WINTRISS CONTROLS GROUP			
CHK.							
APPROVALS				TITLE WPC 2000 and SmartPAC Pro 24 VDC system wiring			
ENG.							
MFG.				CODE IDENT NO.	SIZE	DRAWING NUMBER	REV
FILENAME					ID	FIGURE 2	
REL				SCALE		SHEET	OF

IF USING THE MAIN AIR PRESSURE TRANSDUCER THEN CONNECT THE UNUSED AIR PRESSURE SWITCH INPUT #8 TO GROUND #54.

IF USING THE AIR PRESSURE SWITCH THEN CONNECT N/O CONTACTS BETWEEN INPUT #8 AND GROUND #54.

