WINTRISS ®

User Manual

ProPAC ®

Process Monitor
A SmartPAC ® *Module*
1117500
Rev. B   November 2014

Tech Support Hotline   800-586-8324   8-5 EST

WINTRISS ®

www.wintriss.com

Changes for Revision B of the
Wintriss Brake Monitor User Manual (1096400)

This revision of the ProPAC User Manual covers ProPAC software versions ?.?? and higher. It includes the following changes:

• Added to the cover of the installation manual the URL and QR code user needs to download the user manual

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 line for technical assistance. Call our Wintriss Technical Support Hotline at 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. EST. 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 either fax us a PO 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 out Board Exchange (EX) program. Call our "800" number between 8 a.m. to 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.

Table of Contents

Table of Figures

Table of Tables

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 (LETS/SFC and SBR), 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.

Chapter 1. About ProPAC™ Process Monitor

> **THE NAME "ProPAC"**
>
> This chapter discusses programming SmartPAC with ProPAC Process Monitor. As a shortcut, only the name "ProPAC" may be used in some instances. Keep in mind that when you see "ProPAC," it really means "SmartPAC with ProPAC".

Advantages of Using ProPAC Process Monitor

ProPAC Process Monitor provides automated in-die quality control.

The ProPAC SmartPAC® module measures dimensions, angles and other part parameters in the die. From the moment it's formed you know whether it's a good part or a bad part. In addition, ProPAC can monitor process parameters such as nitrogen and lube pressure, bearing temperature, and perform die protection functions.

With ProPAC you can

- Monitor dimensions and form of parts *in the die*
- Divert bad parts to scrap
- Measure parts at one station and divert them at another
- Stop the press or set off an alarm if too many bad parts are produced
- Measure up to 16 parameters, including form angles and heights, draw depth, material thickness, feed length, temperature, pressure, electric current, and others
- Perform die protection functions
- Monitor process conditions, including nitrogen and lube pressure, bearing temperature, main motor current

ProPAC's operator-friendly interface

- Walks you through setup step by step
- Explains important programming details using help screens
- Names each sensor input by function
- Displays measurements and control limits in true units
- Lets you set manual or automatic parameter limits:

    Manual limits: for measuring parts precisely

    Automatic limits: for detecting changes in process parameters during a run

- Enables you to stop the press if too many bad parts are produced
- Lets you set the bad-parts threshold at a number of consecutive bad parts or a number of bad parts in a specified number of strokes.

While the press is running, ProPAC

- Displays the waveform of any sensor's output
- Allows you to "zoom in" for a close-up view of any waveform
- Enables you to set control limits and timing graphically on the waveform display
- Stops the press, diverts parts to scrap, or activates alarms when it detects bad parts
- Uses "shift registers" to track parts as they pass through a transfer or progressive die
- Can detect a bad part at one station and divert it at another

Automated In-Die QC

The ability to detect and cull bad parts automatically, from the moment they're formed, has long been one of the "holy grails" of press monitoring. ProPAC now puts this goal within reach.

The new ProPAC module for the SmartPAC® Press Automation Control allows you to perform up to 16 precise quality measurements on every stroke. Unlike load-based systems that infer part quality from detectable changes in tonnage, the ProPAC uses precision analog gauging sensors that directly measure parameters such as form angles and heights, draw depth, material thickness, and other distances in the die. The ProPAC compares the readings to the user-programmed control limits to decide whether or not the part meets the tolerances.

Programmable Control Logic

ProPAC can be set either to stop the press or activate its own programmable output when one of ProPAC's sensors detects an out-of-tolerance condition. These outputs can be used to make diverters direct bad parts to a scrap bin, control other automation, control gauging operations or activate warning lights. In addition, ProPAC's stop control logic can be set to stop the press whenever a preprogrammed number of bad parts is detected, either consecutively or over a preset number of strokes.

ProPAC has built in "shift registers" that enable it to track a bad part as it moves through a transfer or progressive die. Program ProPAC to activate an output after a selected number of strokes following detection of an out-of-tolerance condition. This allows you to measure in one station and divert the bad parts in another.

Quick and Easy Setup

ProPAC displays a waveform of each sensor's output. The sensor's measurement timing and control limits are graphically displayed over the waveform, making setup quick and easy. The screen features a cursor line that can be scrolled across the waveform to display the sensor's measurement data for any point in the stroke. The Zoom function lets you take a close-up view of any portion of the sensor's output.

A variety of analog sensors can be connected to measure such parameters as pressure, temperature, electrical current and displacement. This allows ProPAC to monitor important process parameters such as nitrogen pressure, lube pressure, bearing temperature, main motor current and feed length.

ProPAC's easy-to-use operator interface makes setup simple. ProPAC takes you through the programming process step-by-step, with plenty of Help screens available along the way.   It allows you to name each sensor input by function, and displays measurements and control limits in the units you choose.

Manual or Automatic Control Limits

Control limits can be set either manually or automatically for each sensor.

- **Manual limits** allow you to set absolute control limits for in-die part measurements. This is important for quality control.

- **Automatic limits** are useful for monitoring parameters such as die shut height, which are not directly related to part geometry and are likely to change from run-to-run. Automatic limits are set up at the beginning of the job to detect when parameters change by an unacceptable amount during the course of the run.

The SmartPAC front panel

Here is a description of the SmartPAC front panel, including the various keys and displays. See the figure below for an illustration.
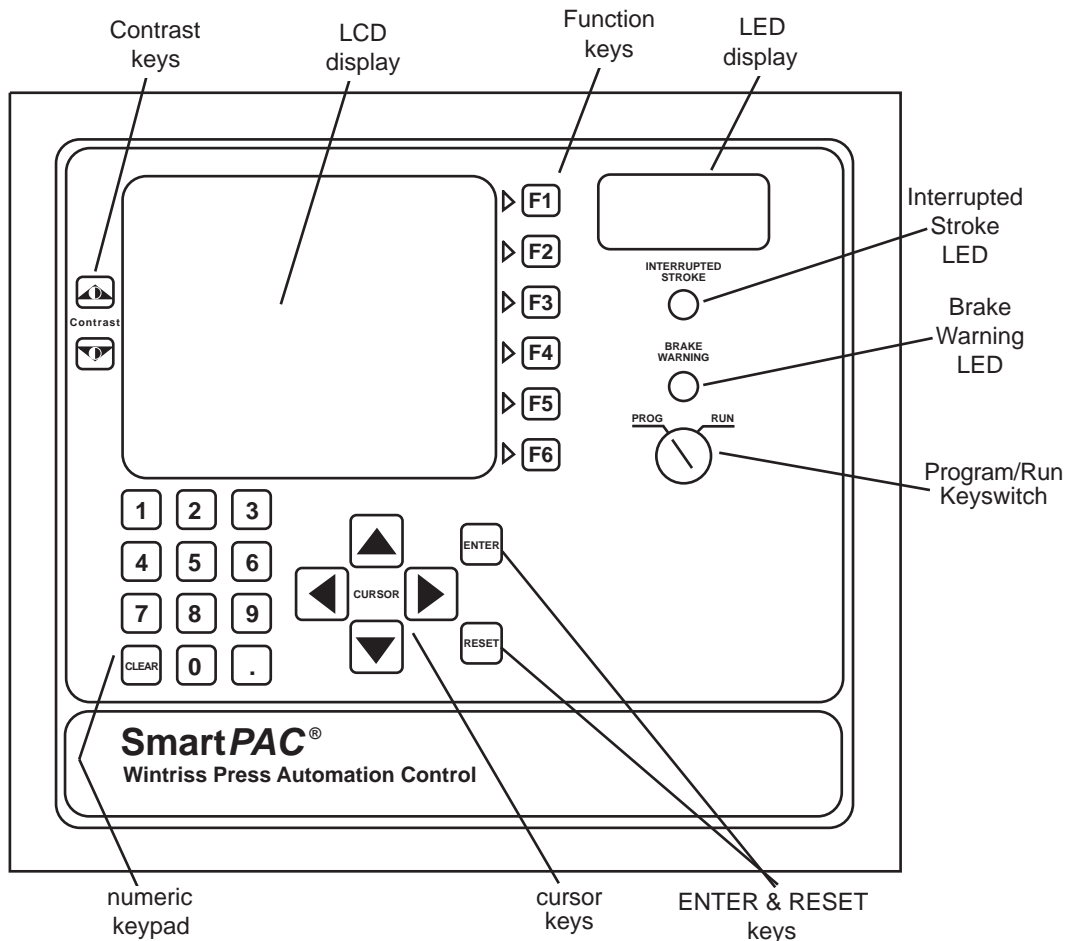
Figure 1-1. SmartPAC Front Panel

LED Display	Three-digit display shows strokes per minute when the press is running; when the press stops, the display shows the crankshaft angle
LCD display	A large, bright 4.88" x 3.69" (10.91 x 9.37 cm) liquid crystal display used along with the keyboard to make and adjust settings, to load tool numbers, and to view diagnostic messages
Screen contrast keys	These adjust the readability of the LCD display; press the up or down contrast key to increase or decrease contrast. Press and hold for large changes.

Program/Run keyswitch   Allows you to lock the Program mode so settings cannot be changed. The key must be set at "Run" to operate the press. Minor adjustments, including loading an existing tool number, can be made in Run mode.

Keyboard   Consists of various keys and a numeric keypad described below. You use these keys along with the LCD display to make settings (covered in detail in Chapter 3).

Cursor keys   Used to move the selection bar over the item on the display you want to select; also used to select alphabetic characters and special symbols when naming the press, tools, cam channels, and sensors.

Numeric keypad   Used to input numeric values, such as tool number and counter presets.

Function keys   Used to perform certain tasks in SmartPAC. The message on the LCD display identifies the specific function key number to depress (from F1 to F6).

ENTER key   Used after making a selection on the display.   You also press Enter after keying in a number to accept the number.

RESET key   Used to reset SmartPAC after fault messages appear on the display. Sometimes used to signal SmartPAC that you are "all done".

SmartPAC 2 and Original SmartPAC

Your ProPAC can be used with either the original SmartPAC or SmartPAC 2. This manual covers ProPAC installation and operation for SmartPAC 1, but you can also use the manual to install and operate ProPAC on SmartPAC 2.

To install ProPAC on SmartPAC 2, follow the instructions in Chapter 2, referring to the appropriate wiring diagrams at the end of the manual. (Wiring diagrams show connections for both SmartPAC 1 and SmartPAC 2.) For ProPAC operation with SmartPAC 2, follow the instructions in chapters 3-5.

ProPAC menu organization in SmartPAC 2 is similar to that in SmartPAC 1, and ProPAC screens are virtually the same in both SmartPACs. As a result, you can refer to the screens and follow the steps provided in chapters 3-5 of this manual to initialize, program, and run ProPAC in both SmartPAC 1 and SmartPAC 2. The main difference between the two SmartPACs is in their panel displays, as shown in Figure 1-2.
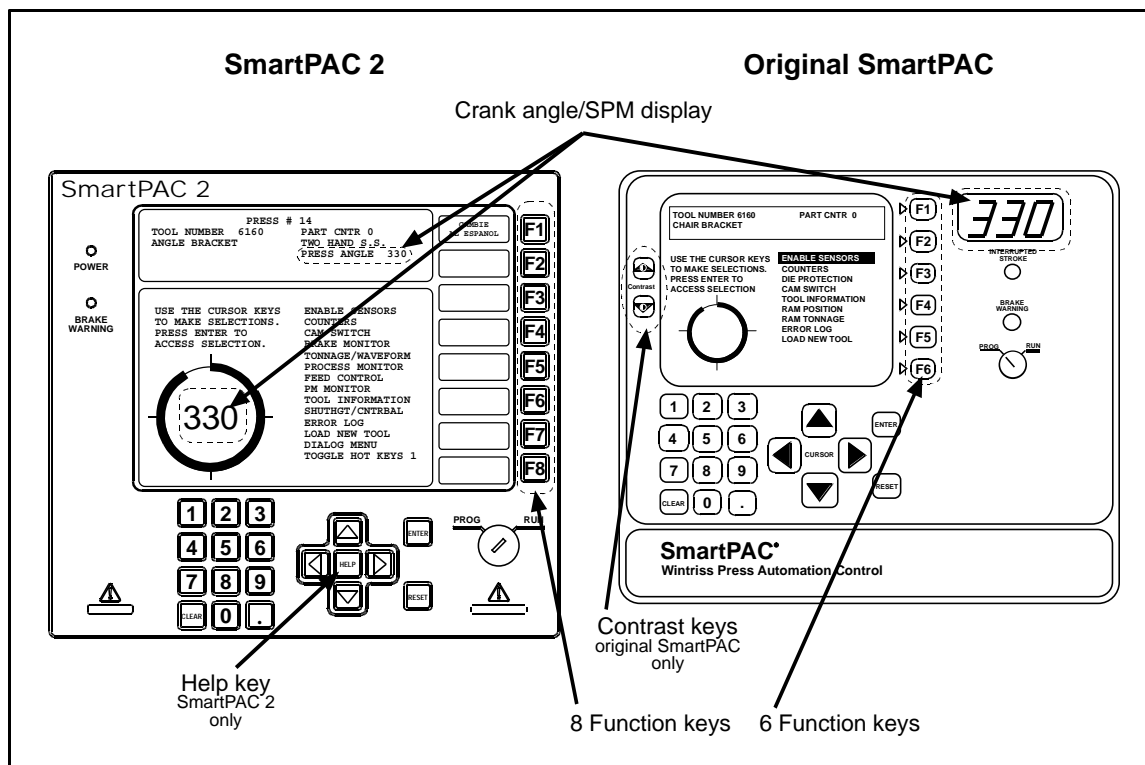
Figure 1-2. Panel Displays, SmartPAC 2 and Original SmartPAC

SmartPAC 1 and SmartPAC 2 panel displays use a different number of function, or "F," keys. SmartPAC 2 has eight function keys, and the original SmartPAC only six. Be sure to read the instructions on the display and the descriptive labels next to the function keys before you press an "F" key.

> **NOTICE**
>
> On many SmartPAC 2 screens, you can press the HELP key (see Figure 1-2) to display instructions showing you how to use the screen.

If you need additional help using ProPAC with SmartPAC 2, refer to the SmartPAC 2 user manual (1126700) or the SmartPAC 2 with WPC 2000 user manual (1128600).

ProPAC Specifications

Enclosure	12.30" x 14.00" x 4.3" (30.99 x 35.56 x 10.92 cm) NEMA 12, shock mounted.
Power	120/240 VAC (switch selectable), 50/60Hz, 60VA.
Inputs	8 or 16 analog sensors: -10 to +10 out max. Also NPN/PNP.
Outputs	2 stop relays: Rating 5A @ 120/240 VAC (N/O, held closed). 1 relay output controlled individually by each input. 2 analog outputs.
Resolution	1 part in 16,384 over −10 to +10 volt range.
Operator Interface	Through the SmartPAC Press Automation Control.
Display	SmartPAC screen: 4.88" x 3.69" (10 x 9.37 cm). 20 line x 40 character backlit LCD.
Sensor Power Supply	+ 15 VDC @ 400mA, -15 VDC @ 200ma. Optional connection for external power supply.
Setpoints	Types: High and low, set manually or automatically with user defined percentages. All setpoints stored in ProPAC.
Waveform Display	A display for each sensor.
Speed	Depends on number of sensors and dwell at measurement point(s).

Chapter 2. Installation

<div style="border:1px solid black">

⚠ WARNING!   PREVENT SHOCK!

Disconnect main power at SmartPAC before installation. All power to the press, press control, and other equipment used with the press must be off during installation. Also "tag out" per OSHA 1910.147 Control of Hazardous Energy (Lockout/Tagout).

Installation must be performed by qualified personnel only.

</div>

Installation Guidelines

These guidelines cover major points that are important for proper ProPAC operation. By following these guidelines, you will eliminate problems that could occur later. The points below are addressed again in the installation procedures.

- Never run wires for 120V and for lower voltages (such as sensor wiring, 24V, 60V) inside the same conduit. Run flexible, liquid-tight conduit for high voltage lines (120V power, input check circuit, relay circuits) to the upper right-hand corner of ProPAC. Run low voltage conduits/wiring to the lower right-hand corner of SmartPAC for the resolver and communications control wires. Because the versions of ProPAC with enclosure 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 with the enclosure.

- The AC power supply and stop circuit wires to ProPAC should be run separately from any DC wiring. Never use the ProPAC power terminals as a junction point to provide power for external devices. In most cases, the AC power supply wires should be connected directly to the press control transformer at the press control.

- The communications and resolver wiring must not be run with any other wires. These wires connect the ProPAC to the SmartPAC.

- The enclosed versions of ProPAC (part #'s 9645901 and 9645903) have grounding lugs attached to the case at several locations within the enclosure. The shields of all shielded cables, including resolver, communications, and ProPAC Sensor Interface (PSI) cables should be connected to the grounding lug closest to their point of entry. If a convenient grounding lug is not available, use on of the special conduit nuts equipped with a grounding screw (included with the system) to ground the shield.

- For the panel-mount version of ProPAC (part # 9645902), install grounding lugs on the panel near the terminal blocks for the PSI wiring and the resolver and communications wiring. Ground the shields of the shielded cables to these lugs.

- The shield from the cable that connects the PSI to the ProPAC should be connected to the grounding lug on the inside of the ProPAC Sensor Interface (PSI) enclosure.

- Do not use the optional output enclosure as a junction box for AC control wires, other than those that are connected to the output assembly. Provide a separate junction box for this purpose.

- Good grounds at ProPAC are important. Make sure the unit is properly grounded.

- The main ground wire should be connected to the main ground point of the press control. This may be in the area where the control transformer is grounded. Finding a good place for a ground is sometimes difficult, but it should be close to where the press receives its ground.

- All relays, solenoids, or other inductive loads that are controlled by ProPAC's optional output assembly must be suppressed. Suppressors should be installed across the load and as close to the load as possible. *Never install a suppressor across relay contacts.* The suppressors can fail shorted. In some cases, suppressors are required in the top stop and emergency stop (E-stop) circuits. Additional suppressors can be obtained from Data Instruments.

Mounting the ProPAC Enclosure (9645901 and 9645903)

To mount the ProPAC enclosure, follow these steps:

1. Find a convenient place for the control enclosure. Make sure the PDP or PSI cable can reach the enclosure. Leave enough room to open the door at least 120°. Mount the enclosure to the press using the rubber shock mounts included with your ProPAC.

2. Drill holes for mounting (see figure, on the next page). Shock mount studs are 1/4–20. Tap holes and mount the enclosure using the enclosed shock mounts. Use a No. 7 drill and 1/4–20 tap.

3. Mount the enclosure.
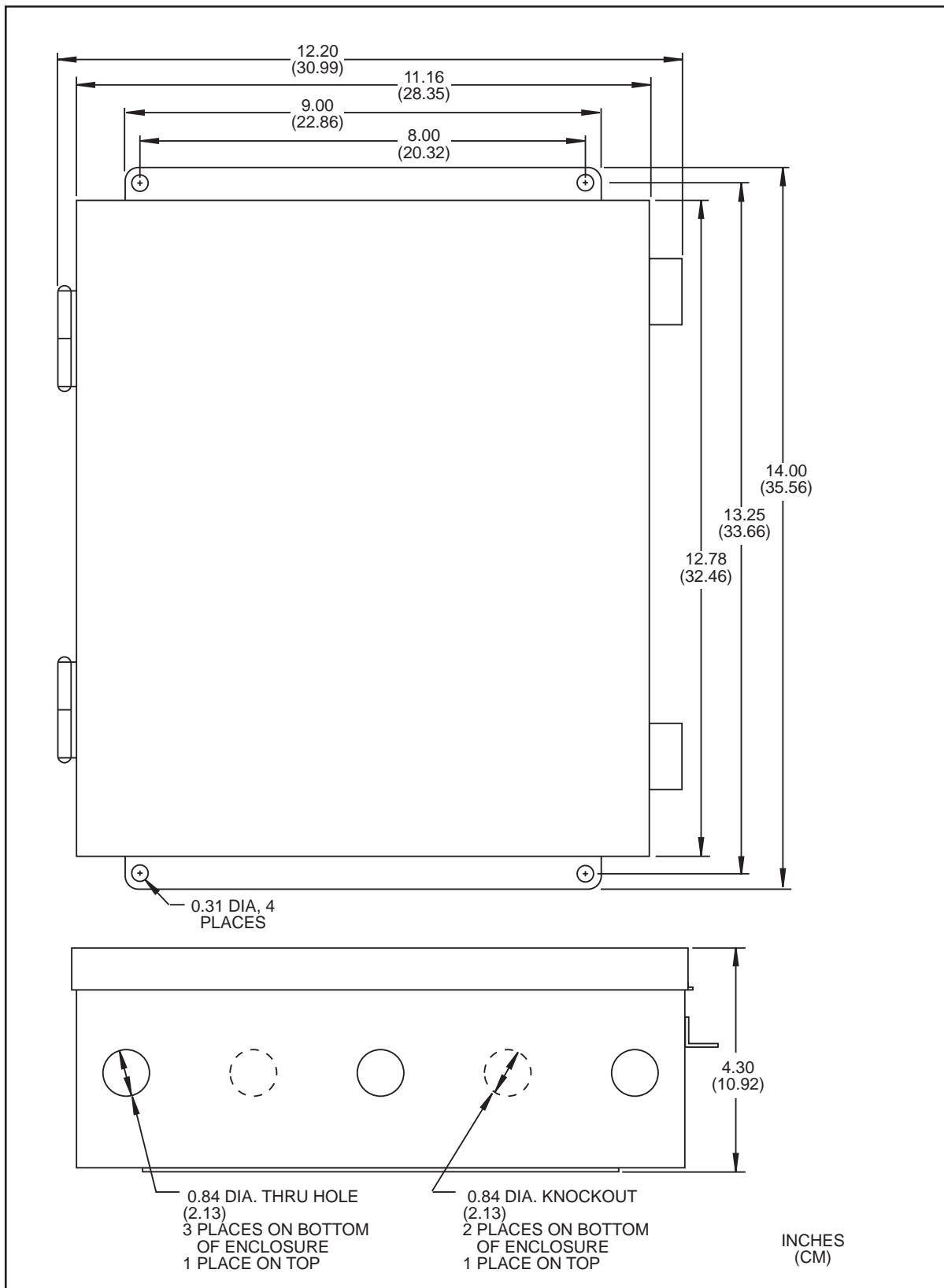
Figure 2-1. ProPAC Enclosure

Mounting the ProPAC Board in customer enclosure (9645902)

1. Find a location for the ProPAC board that is convenient for installation and maintenance.

    -   Allow at least five inches of clearance above the board and one inch of clearance around the board.

    -   Make sure there is at least 1/2" clearance between the board and any metal parts beneath the board.

2. Drill and tap (6-32) a hole in your for each mounting hole on the board, or provide a threaded insert for each.

3. Install the standoffs that come with the board (6-32 x 1/2"), one for each mounting hole on the board. Mount the board to the standoffs with 6-32 x 3/8" screws.

Mounting the ProPAC Sensor Interface (PSI) Junction Box

The PSI enables you to quickly connect and disconnect the ProPAC Die Plug (PDP) junction boxes installed on your dies.

If you are using the ProPAC Sensor Interface (PSI) junction box, install it in a convenient location on the press where you can easily reach the cable connection on the bottom of the PSI housing. Select a location near the die opening of the press, but protected from lubricant and coolant splash or drip.

The PSI is wired permanently to ProPAC.

To install the PSI:

1. Mount the PSI to the press with the shock mounts provided using the mounting holes on each flange. Make sure the PDP cables from the die-mounted junction box can reach the PSI, and the PSI cable can reach ProPAC.

2. In the PSI enclosure, connect the nineteen wires in the PSI cable to the connector shown in the figure below. Refer to the table below and the wiring diagram in Figure 7 at the end of the manual. Ground the cable shield to the ground stud (lug) inside the PSI enclosure.

3. In the ProPAC enclosure, wire the other end of the cable into connectors TB3 and TB4. Refer to the tables on page 15 and the wiring diagram in Figure 7 at the end of the manual. These connectors can only go one way. Double check your connections to make sure you started at the right end when connecting wires.
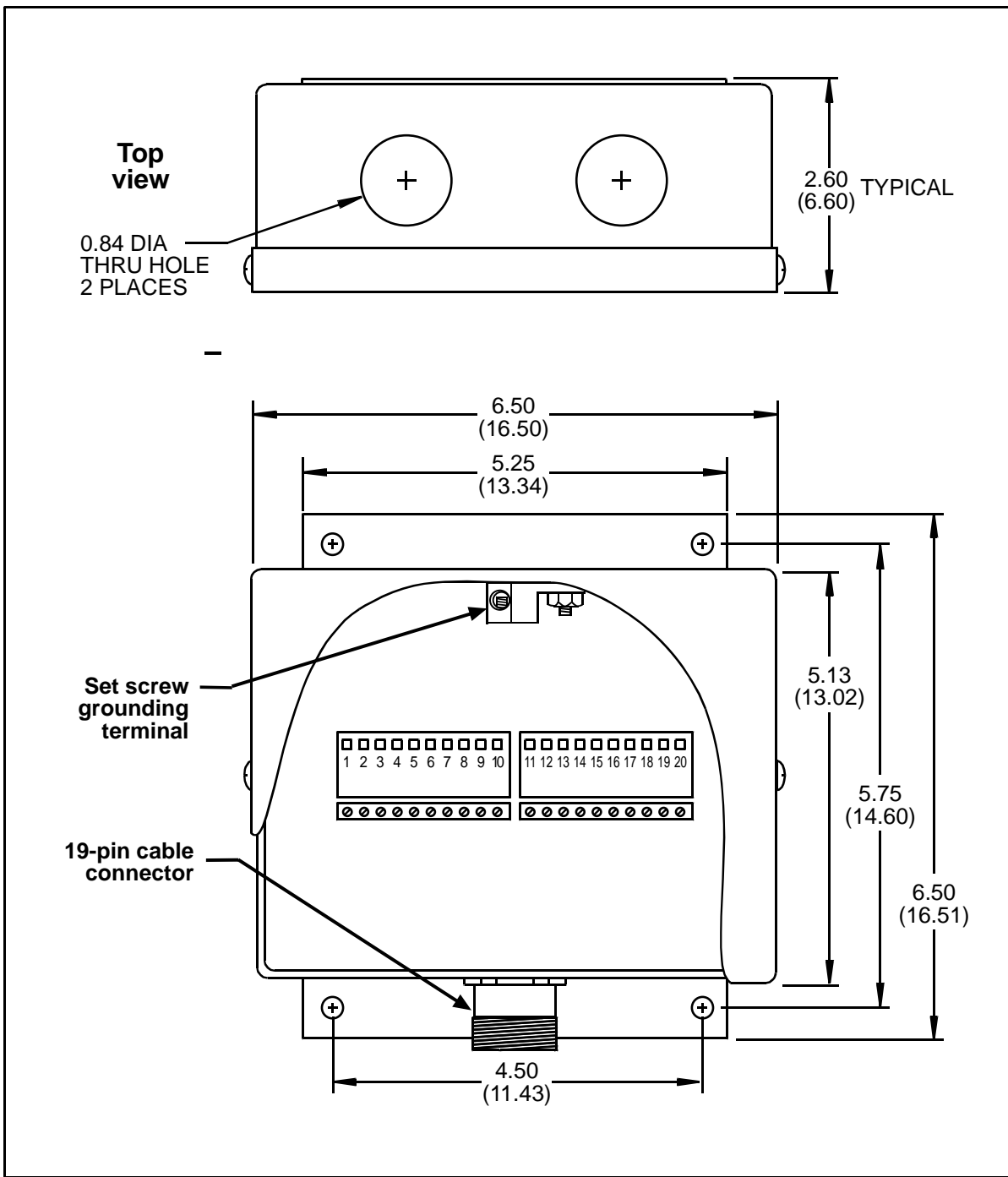
Figure 2-2. ProPAC Sensor Interface (PSI) Junction Box

Wiring Sensors
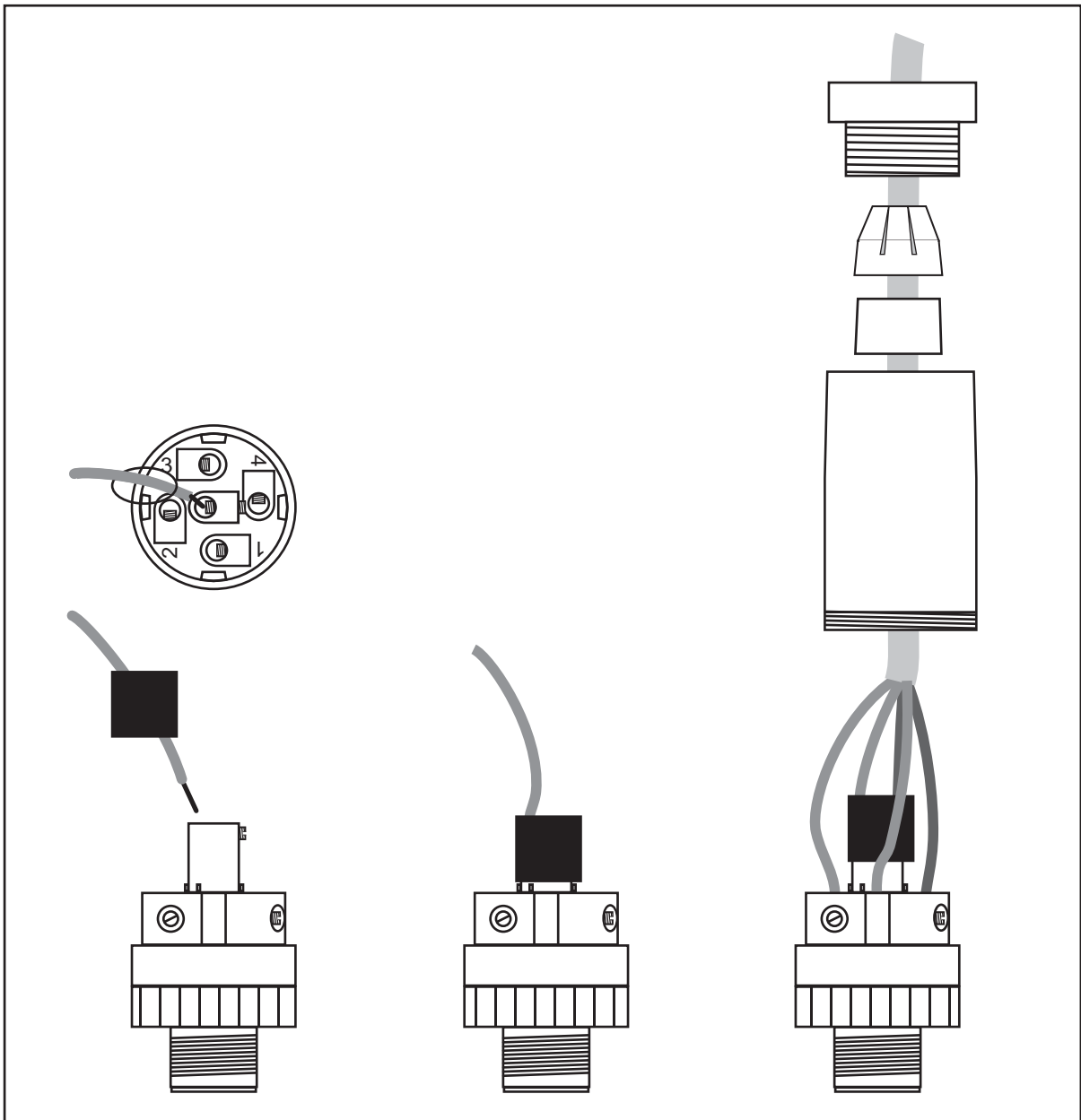
Figure 2-3. Wiring to Sensor Connector

Important

On TB3 and TB4 there is a factory-installed jumper for each pair of sensor connections. Leave the jumper(s) in place unless you connect a sensor to that location. *** show on wiring diagram

---

Table 2-1. ProPAC Sensor Connections at TB3 and TB4

TB3 Sensor Port Sensors 1 - 4		Sensors		TB4 Sensor Port Sensors 5 - 8		Sensors
1	CH 1	SENSOR 1 OUTPUT		1	CH 1	SENSOR 5 OUTPUT
2	GND	GND		2	GND	GND
3	CH 2	SENSOR 2 OUTPUT		3	CH 2	SENSOR 6 OUTPUT
4	GND	GND		4	GND	GND
5	CH 3	SENSOR 3 OUTPUT		5	CH 3	SENSOR 7 OUTPUT
6	GND	GND		6	GND	GND
7	CH 4	SENSOR 4 OUTPUT		7	CH 4	SENSOR 8 OUTPUT
8	GND	GND		8	GND	GND
9	+ 15 V			9	+ 15 V	
10	GND			10	GND	
11	−15 V			11	− 15 V	

Wiring Resistors and Zener Diodes with NPN and PNP Sensors

You can use solid-state (NPN or PNP) sensors with ProPAC if you wire a 10KΩ resistor into the sensor connection. ProPAC has analog inputs that float when connected to an NPN or PNP sensor. In order to have ProPAC correctly interpret the sensor's signal, NPN sensors must be pulled up to 15 V, and PNP sensors must be pulled down to ground.

Wire the resistor, also adding a zener diode, as shown in Figures 1-3 at the back of the manual. Some resistors and zener diodes are shipped with your ProPAC unit.

NOTICE

- If you are using a sensor connector, you can place the resistor and the zener, if needed, inside the connector body (see Figure 1).

- If the same sensor is always connected to ProPAC at the same sensor input (a main-motor current sensor permanently wired there, for example) you can wire the resistor and the zener, if needed, at the ProPAC sensor input terminal block.

Mounting the ProPAC Die Plug (PDP)

1. Find a location on the die for the ProPAC Die Plug (PDP) that meets the following requirements:

    *   Convenience during installation and maintenance

    *   Clearance for the sensor connectors and 19-pin connector that plug into the PDP.

    *   Access for the sensor and PDP cables.

    *   Safety from damage during press operation.

2. Drill and tap holes for three 8-32 PDP mounting screws. See the figure on the next page for hole locations.

3. Mount PDP to the die using #8 screws at least 1.5" long.
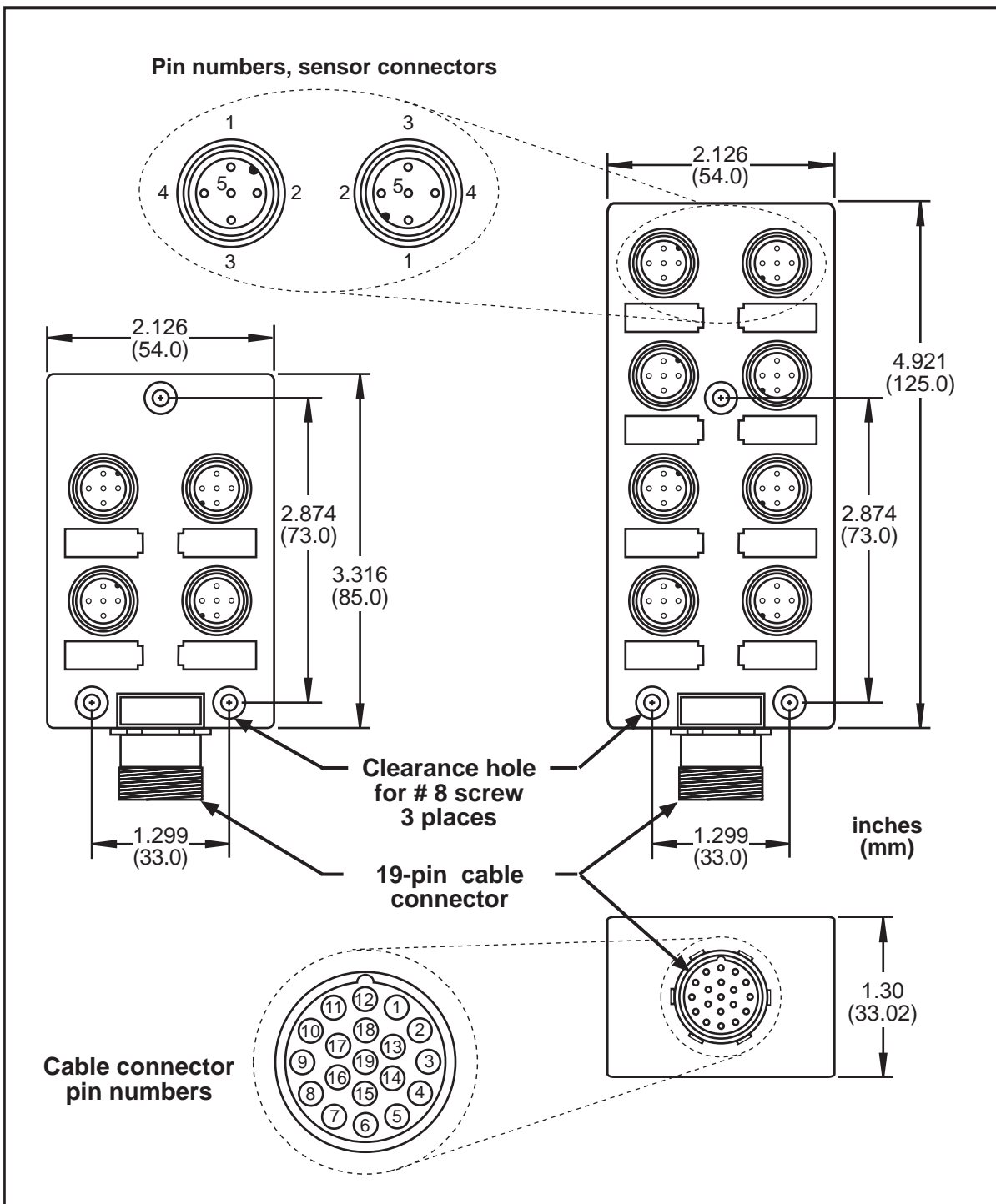
Figure 2-4. ProPAC Die Plug (PDP)

Making Wiring connections

Refer to the ProPAC board illustration below and to the wiring diagrams in the figures at the end of the manual.
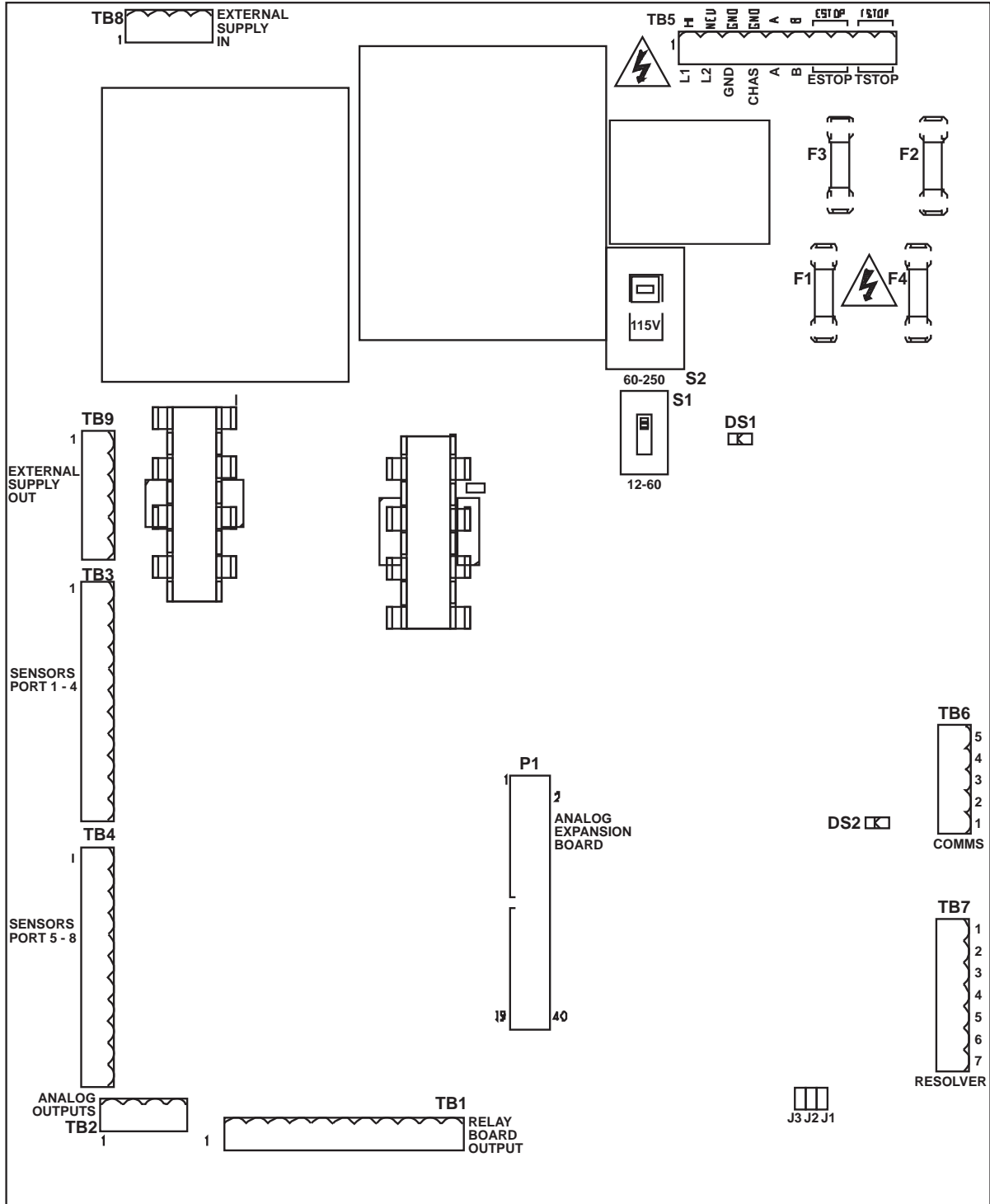
Figure 2-5. ProPAC board

Wiring AC Wiring and Stop Circuits

Follow the steps below to wire the AC power and stop circuit connections on connector TB5. Refer to Figure 2-5. ProPAC board, page 18 and the wiring diagrams at the end of the manual.

WARNING! PREVENT SHOCK!

Disconnect main power at SmartPAC *before* installation. All power to the press, press control, and other equipment used with the press must be off during installation. Also "tag out" per OSHA 1910.147 Control of Hazardous Energy (Lockout/ Tagout). Installation must be performed by qualified personnel only.

---

1. Determine how to bring wiring from your 115 Vac power source (or 230V source if applicable) to ProPAC. For 115 Vac, you need three wires—high (L1, black), neutral (L2, white) and ground (green). No. 16 wire is recommended, no. 14 if local codes require it. For 230 Vac, wires are black and red with green or green/yellow for ground.

2. Determine how you will connect the wires from ProPAC to your press control Estop and top stop circuits. You need four wires, two for each. No. 16 is recommended, no. 14 if local codes require it.

WARNING

ProPAC must be wired into the press's stop circuits. If this is not done, ProPAC cannot stop the press.

Note: *Top stop circuits are active only in continuous (automatic) operations on most press controls. If overload protection is required during inch or single stroke mode, you may have to install an additional control relay so ProPAC will disable the press from further stroking.*

3. Find the 115V-230V voltage selector switch, S2, near the power connection. It is a black rectangular box, with a red handle and a cavity in the middle. At the bottom of the cavity, you should see "115V." This factory setting means ProPAC is set for 115 V operation.

    If you plan to use your ProPAC with 230 Vac power, push the red handle down (away from top of the box). You will see "230V" displayed. With the switch in this position, ProPAC will only work with 230 Vac power.

4. Run the power and stop circuit wires through flexible liquid-tight conduit to ProPAC. If you ordered the enclosure, it 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. Wires go through top right knockout. Leave a small service loop inside this enclosure.

5. First connect the ground (green or green/yellow) wire. It must be connected to the ground block as shown below, not to "GND" terminal on the connector. The ground block is located on the wall of the enclosure. To connect to the ground block, strip the ground wire about 1/4" (6.4 mm), loosen the screw on the block, slide the wire into the hole, and tighten the screw to pin the wire in place.
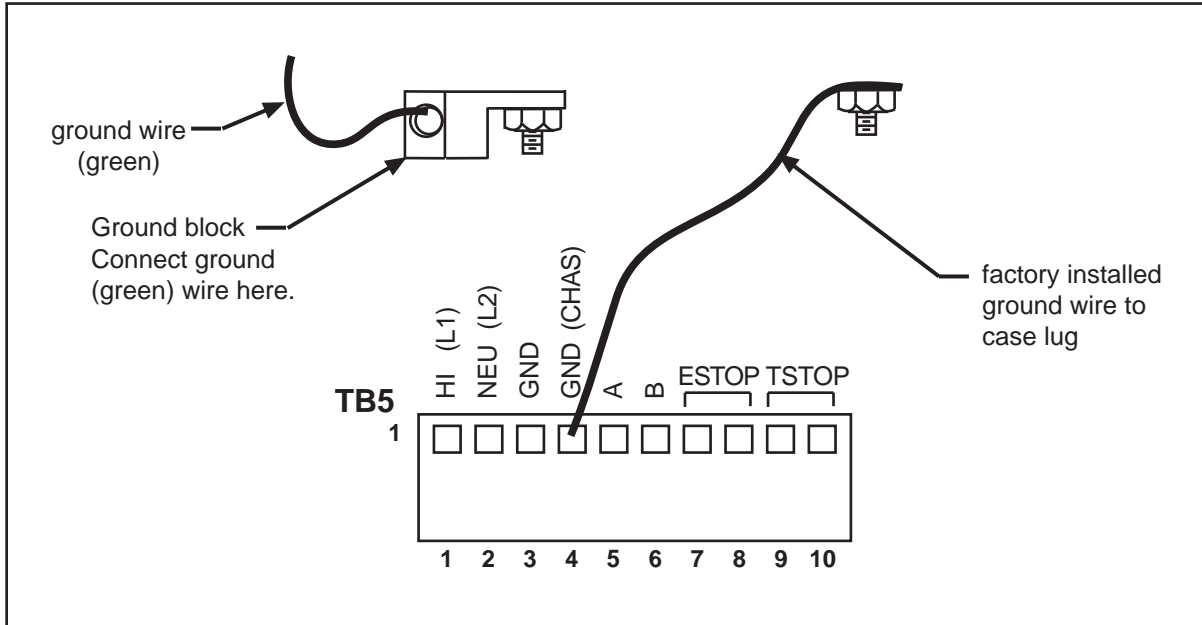
Figure 2-6. Wiring connector and ground block for AC power and stop circuit

6. Now locate the connector TB5 for the AC wires and stop circuit. It is at top right. The connector consists of an L-shaped top section and base. Pull the L-shaped part away from its base. This is the part to which you will connect wiring.

> **Important**
>
> A ground wire is attached from the connector to a case lug as shown in the figure above. Leave the ground wire attached to the connector while making connections. If you remove this wire in order to pull the connector all the way out of the enclosure, be sure to replace it when done.

7. Connect the wires to the L-shaped terminal block as shown in the figure above. For 115 Vac, connect the black wire to the HI (L1) terminal and the white wire to NEU (L2). (For 230 Vac connect the black wire to HI and the red wire to NEU). To connect a wire, find the correct terminal and loosen the screw over that terminal by turning it counterclockwise (see the next illustration). Strip the correct wire for this terminal 1/4" (6.4 mm). Insert the bare wire into the terminal 90% of the way. Tighten the screw. The metal tooth inside the terminal clamps down on the bare wire for a tight connection. Make sure the metal tooth is clamped down on the bare part of the wire, *not* on the insulation. If it is on the insulation, you will have a bad connection. Connect both wires and double check connections when done.
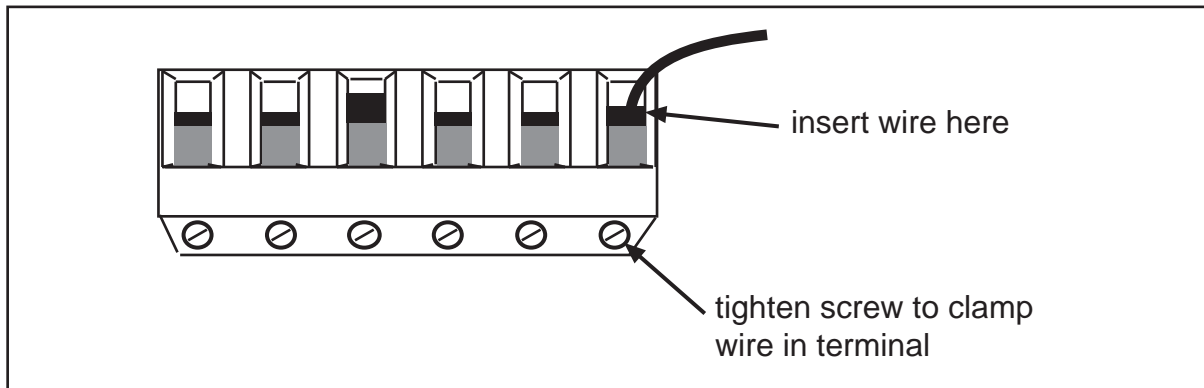
Figure 2-7. Inserting wires into connector

Note: *The connector can only plug in one way. Make sure you do not start at the wrong end when connecting AC wires. Put the connector over the base the way it will plug in and note wire marking next to base before starting.*

8. Connect one of the two wires from the press control Estop circuit to one of the terminals marked ESTOP and the other wire to the other terminal marked ESTOP. It does not matter which wire goes to which terminal.

9. Connect one of the two wires from the press control top stop circuit to one of the terminals marked TSTOP and the other wire to the other terminal marked TSTOP. It does not matter which wire goes to which terminal.

10. Plug the connector back into the terminal block. Double check connections with markings at the connector base to make sure you did not wire it backward.

11. Make all necessary conduit connections to ensure NEMA 12 protection.

12. Do not connect the wires to the AC power source until you are done with all other installation procedures. Also, make sure you number all the wires in a way consistent with your press's electrical prints.

WARNING! PREVENT SHOCK
Do not connect AC wires to the power source until all other installation procedures in this chapter have been completed.

Table 2-2. AC Power and Stop Circuits

	ProPAC TB5 AC Power and Stop Circuits	SmartPAC TB101 Main Power Connector		Machine Control
1	L1 - 120 VAC			
2	L2 - NEUTRAL			
3	GND			
4	CHAS			
5	A			DSV ON Signal
6	B			DSV ON Signal
7	ESTOP			ESTOP Circuit
8	ESTOP	207	ESTOP	
9	TSTOP			TSTOP Circuit
10	TSTOP	209	TSTOP	

Connecting SmartPAC's Resolver to ProPAC

IMPORTANT
The resolver must be wired in parallel between SmartPAC and ProPAC.

1. Run the two 4-conductor shielded cables through 1/2" *low-voltage* conduit between SmartPAC and ProPAC. One cable is used to connect the resolver. The other will be used for communications (see "Wiring Communicatons between SmartPAC and ProPAC," page 24)The cables should be routed through the knockout located at the bottom right of SmartPAC. Both SmartPAC and ProPAC are rated NEMA 12 (protected against dust and oil). Use conduit of the same rating and make proper connections to ensure NEMA 12 protection.

2. Pull the connectors out of their sockets from both SmartPAC (TB106) and ProPAC (TB7) (Figure 2-5. ProPAC board illustrates the location of components).

3. Attach the wires to the connectors as shown in Figure 4 (for SmartPAC 1) or Figure 5 (for SmartPAC 2) at the end of the manual. For convenience, refer to Table 2-3a (for clockwise rotation) or Table 2-3b (for counter-clockwise rotation). You must wire in parallel.

4. Plug in SmartPAC TB106 to ProPAC TB7.

Table 2-3a. Wiring ProPAC to SmartPAC Resolver

(clockwise rotation, facing shaft)

ProPAC TB7			SmartPAC TB106		
Pin #	Connection	Color	Pin #	Connection	Color
	Connect to enclosure at entry point	SHLD		Connect to enclosure at entry point	SHLD
2	S1	BLACK	213	S1	BLACK
3	S2	GREEN	214	S2	GREEN
4	R1	RED	215	R1	RED
5	S3	WHITE	216	S3	YELLOW
6	no connection		217	no connection to ProPAC	
7	no connection		218	no connection to ProPAC	

Table 2-3b. Wiring ProPAC to SmartPAC Resolver

(counterclockwise rotation, facing shaft)

ProPAC TB7			SmartPAC TB106		
Pin #	Connection	Color	Pin #	Connection	Color
	Connect to enclosure at entry point	SHLD		Connect to enclosure at entry point	SHLD
2	S1	WHITE	213	S1	YELLOW
3	S2	GREEN	214	S2	GREEN
4	R1	RED	215	R1	RED
5	S3	BLACK	216	S3	BLACK
6	no connection		217	no connection to ProPAC	
7	no connection		218	no connection to ProPAC	

Wiring Communicatons between SmartPAC and ProPAC

1. Locate the second cable you ran through conduit in the previous section (4-conductor shielded cable without connector).

2. Wire the connections as shown in the table below and Figure 4 (for SmartPAC 1) or Figure 5 (for SmartPAC 2) at the end of the manual. Locate TB102 on the SmartPAC board (consult your SmartPAC manual) and TB6 on the ProPAC board (Figure 2-5. ProPAC board illustrates the location of components).

3. Run the cable through flexible liquid-tight *low-voltage* conduit between ProPAC and SmartPAC.

Table 2-4. SmartPAC Communications Connections

ProPAC TB6		SmartPAC TB102	
Pin #	Connection	Pin #	Connection
1	Connect to enclosure at entry point	240	Connect to enclosure at entry point
2	+TXD	241	+RXD2
3	– TXD	242	– RXD2
4	+RXD	243	+TXD2
5	– RXD	244	– TXD2

External Supply In and Out

This allows you to supply power for sensors that need power different from ± 15 V. Connect your power supply to TB8, External Supply In. Connect your sensor(s) to TB9, External Supply Out. See the table below and the figure on page 18.

Table 2-5. External Supply Connections

TB8 EXTERNAL SUPPLY IN		TB9 EXTERNAL SUPPLY OUT	
Pin #	Connection	Pin #	Connection
1	+ EX IN	1	+ EX OUT
2	– EX IN	2	– EX OUT
3	GND	3	GND
4	CHAS	4	+ EX OUT
		5	– EX OUT
		6	CHAS

Analog Outputs

This feature will be available on a future version of the ProPAC.

Adding a Second ProPAC to Your SmartPAC 2

If you have a SmartPAC 2 with a 16-input ProPAC, now you can add a second ProPAC board with 16 extra inputs, giving you a total of 32 sensor inputs.

NOTICE

If you are adding a second ProPAC, both the first and second units must be 16-sensor ProPACs. You cannot add a 16-sensor ProPAC to an 8-sensor ProPAC.

The second ProPAC will be identified by a higher firmware version number. To wire the second ProPAC to SmartPAC 2, see the wiring diagram in Figure 6.

On the SmartPAC Main Menu, the two ProPACs will be displayed as PROCESS MONITOR 1 and PROCESS MONITOR 2. All displays, including error displays, will identify specific ProPAC sensors first by ProPAC number (i.e., Process Monitor 1 or Process Monitor 2) and then by input number (i.e., Input 1-16).

Wiring the ProPAC Sensor Interface (PSI)

1. In the PSI enclosure, connect the nineteen wires in the PSI cable to the connector shown in the figure on page 13. Refer to the table below and the wiring diagram in Figure 7 at the end of the manual. Ground the cable shield to the ground stud (lug) inside the PSI enclosure.

2. In the ProPAC enclosure, wire the other end of the cable into connectors TB3 and TB4. Refer to the table on page 27 and the wiring diagram in Figure 7 at the end of the manual. Ground the cable shield to the ground stud (lug) inside the ProPAC enclosure.

Note: *Connectors TB3 and TB4 install only one way. Be sure you wire them starting from the correct end. Double check your connections after you are through.*

Table 2-6a. Connections inside PSI Junction Box

Sensor conn.	PDP 19-pin connector pin #	PSI Cable Wire Color
J8 SIG	1	WHITE
J6 SIG	2	BROWN
J4 SIG	3	GREEN
J2 GND	4	YELLOW
J2 SIG	5	GREY
– V	6	PINK
J1 GND	7	BLUE
J3 SIG	8	RED
J5 GND	9	BLACK
J7 GND	10	VIOLET
J7 SIG	11	GREY/PINK
GND	12	RED/BLUE
J6 GND	13	WHITE/GREEN
J4 GND	14	BROWN/GREEN
J1 SIG	15	WHITE/YELLOW
J3 SIG	16	YELLOW/BROWN
J5 SIG	17	WHITE/GREY
J8 GND	18	GREY/BROWN
+ V	19	WHITE/PINK

Connect shield to ground stud (lug) in PSI enclosures

Table 2-6b. Connections at ProPAC TB3 and TB4

PSI Cable Wire Color	Sensor conn.	ProPAC TB3 pin #	ProPAC TB4 pin #
WHITE/YELLOW	J1 SIG	1	
BLUE	J1 GND	2	
GREY	J2 SIG	3	
YELLOW	J2 GND	4	
YELLOW/BROWN	J3 SIG	5	
RED	J3 GND	6	
GREEN	J4 SIG	7	
BROWN/GREEN	J4 GND	8	
WHITE/PINK	+ V	9	
RED/BLUE	GND	10	
PINK	– V	11	
WHITE/GREY	J5 SIG		1
BLACK	J5 GND		2
BROWN	J6 SIG		3
WHITE/GREEN	J6 GND		4
GREY/PINK	J7 SIG		5
VIOLET	J7 GND		6
WHITE	J8 SIG		7
GREY/BROWN	J8 GND		8
no connection			9
BROWN/PINK	GND		10
no connection			11

Connect shield to ground stud (lug) in ProPAC enclosures

Installing the Optional Output Assembly

> **! WARNING!**
>
> SmartPAC with programmable cam capability can be used with Wintriss
> Clutch/Brake Control. However, SmartPAC's programmable cam switch
> should not be used to provide timing signals for any other clutch/brake
> control. It is designed to control auxiliary functions only.

1. Select a convenient location for running conduit from the output assembly to the
    equipment that it will control.

2. Mount the output enclosure using mounting holes on the flanges.

> **!WARNING! NO CONTACT TO METAL**
>
> If you install the output assembly without the enclosure, mount it in a
> clean area where it is safe from damage. There must be 0.5" clearance
> between the board and any metal parts.

3. The relays that control your equipment should already be plugged into the board. The
    type of relays you have is marked on the relay. Decide which relays will be used with
    which channels and arrange them in the box. The relays just pull out of their sockets.
    When inserting, make sure that the pins line up with the socket holes. Then press in
    firmly. *Follow the guidelines below for using relays:*

    a. If you are using only *standard relays* (not optional solid state relays), they are
        plugged into channels 1 through 8 — sockets K301 through K305, K307, K309,
        and K311 (see Figure 2-8. Optional Output Assembly).

    b. If you plan to use solid state relays, then they can only be plugged into channels 5
        through 8 only — sockets K306, K308, K310, and K312.

    c. *Do not* plug both standard and solid state relays in the same channel locations for 5
        through 8. For example, if you plug a solid state relay into channel 5 (location
        "K306"), you cannot plug a standard relay into location "K305". See Figure 2-8.

        Example:
        You wish to use three standard relays and one solid state relay. You would install
        the three standard relays in channels 1 through 3, and the solid state relay in channel
        5 on the cam outputs board assembly.

4. Find the 12-conductor cable that runs from the ProPAC to the terminal blocks marked
    TB301 inside the optional output enclosure.

5. Attach one end of the cable to the connector for ProPAC TB1. Refer to Table 2-7a.
    ProPAC TB1 to Optional Output Assembly TB301 and Table 2-7b. Making
    Connections to Relays in this section for proper wiring.

6. Run the cable through conduit to TB301 in the optional output enclosure. You can use
    the knockouts directly below the connectors on each enclosure.

7. Attach the other end of the cable to the connector for TB301. A wire from CHAS to a lug on the ProCam output enclosure should already be connected (unless you bought the board assembly only).

8. Plug cable connectors into their sockets.

9. To connect the relays to your equipment, use connectors TB302 and TB303. See Figure 2-8. Optional Output Assembly.

How you make connections depends on the type of relay you use. For 120 Vac relays you can connect wires from your equipment to "C" and either the N/O or N/C side of the relay. If you connect to N/O, the equipment will be on for the degrees set on SmartPAC. If you connect to N/C, the equipment will be on except for the degrees set. Generally, you use the N/O terminal; so equipment is off except when you use SmartPAC to turn it on. Use the N/C terminal only if it is more practical to do the reverse.

All solid state relays work only when the C and the N/O side is connected. Polarity must be right for some relays — refer to Table 2-7b. Making Connections to Relays.
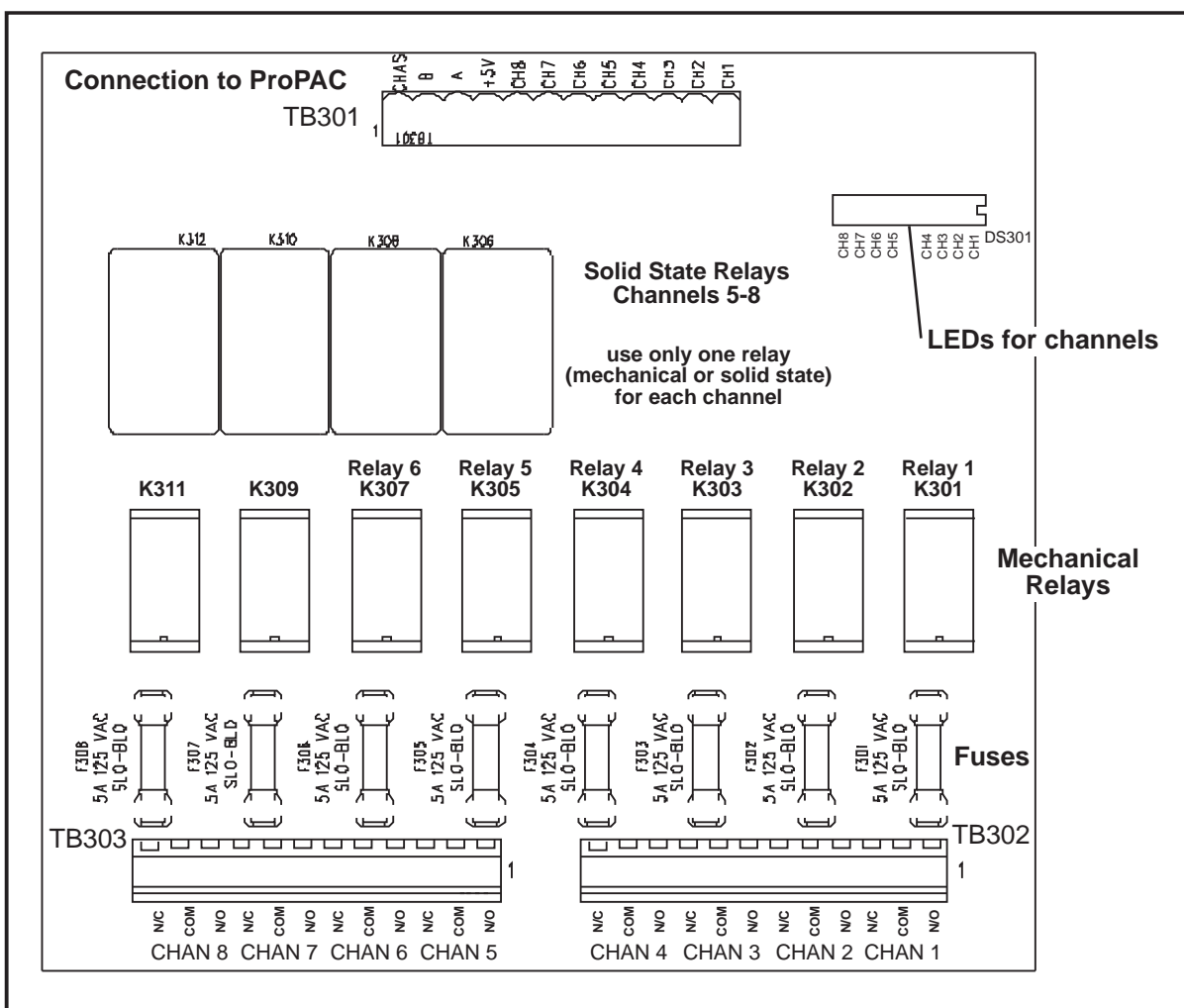
Figure 2-8. Optional Output Assembly

Table 2-7a. ProPAC TB1 to Optional Output Assembly TB301

Wire	ProPAC Board TB1	Optional Output Assembly TB301
		CHAS (1)
White	Relay Pwr (270)	A (3)
Black	Gnd (269)	B (2)
Red	+5 (268)	+5 Vdc (4)
Tan	Ch 8 (267)	Ch 8 (5)
Pink	Ch 7 (266)	Ch 7 (6)
Gray	Ch 6 (265)	Ch 6 (7)
Blue	Ch 5 (264)	Ch 5 (8)
Yellow	Ch 4 (263)	Ch 4 (9)
Orange	Ch 3 (262)	Ch 3 (10)
Purple	Ch 2 (261)	Ch 2 (11)
Brown	Ch 1 (260)	Ch 1 (12)

Table 2-7b. Making Connections to Relays

Module	How to connect	Type
Relay	one wire to C one wire to N/O or N/C polarity does not matter	SPDT
DC Solid State	– to C + to N/O	SPST
AC Solid State	one wire to C one wire to N/O polarity does not matter	SPST

Sensors

Refer to the ProPAC Sensor Handbook.

Powering up ProPAC

Connect AC wires from ProPAC to your AC power source only when you are finished connecting all wiring to ProPAC and have connected the resolver wiring to SmartPAC. If you plan to make other optional connections to ProPAC, go to the procedures that follow later in this section and do the optional wiring first. Then connect AC power.

WARNING!! PREVENT SHOCK
Make sure main power is off when you connect ProPAC to main power source.

What you should see when power is turned on

After connecting ProPAC to a power source, turn power on to SmartPAC and ProPAC. You can access SmartPAC's Program or Run modes and see if "Process Monitor" appears on those menu screens.

If "Process Monitor" does not appear:

1. Locate the LED labeled "DS2" on the ProPAC board (Figure 2-5). Also locate the LED labeled "DS104 on the SmartPAC processor board (see SmartPAC user manual).

2. Both of these LEDs should blink. If they are not blinking at all, this indicates that the connection between SmartPAC and ProPAC is not satisfactory.

3. *Turn off power to SmartPAC and ProPAC.* Re-check wiring connections for power and communications between SmartPAC and ProPAC. Recheck your wiring. Refer to "Wiring Communicatons between SmartPAC and ProPAC," page 24. Make sure the voltage selector switch is set correctly (either 115V or 230V).

4. Turn power back on. See if ProPAC is active as noted above. If ProPAC has power, but is not active, call Wintriss Tech Support for assistance.

If "Process Monitor" does appear, proceed to the next chapter, Initialization, and set up your ProPAC.

CAUTION
When you install your ProPAC, you must initialize ProPAC parameters and zero the resolver before you run the press or perform any other operations. See the next chapter.

Chapter 3. Initialization

> **The name "ProPAC"**
>
> This chapter discusses initialization of SmartPAC with ProPAC process monitor. As a shortcut, only the name "ProPAC" may be used in some instances. Keep in mind that when you see "ProPAC," it really means "SmartPAC with ProPAC."
>
> **Note:** *The names "ProPAC" and "Process Monitor" are used interchangeably.*

This chapter explains how to enter and exit SmartPAC Initialization mode (see next page), and how to use the Process Monitor Initialization menu to:

- **Initialize parameters**, page 35.
- **Set custom names**, page 38.
- **Set custom units**, page 41.

Setting Up ProPAC for the First Time

> **CAUTION**
>
> Before you perform any programming or other operations you *must:*
> - Initialize ProPAC Parameters
> - Zero the resolver

- If you have just installed your ProPAC, follow the instructions in the next two sections, "Initializing ProPAC Parameters," page 35 and "Zeroing the Resolver," page 36.
- If you have already initialized parameters and zeroed the resolver, go to "Accessing Process Monitor Initialization Menu," page 38.

> **Select = Highlight + Press ENTER**
>
> In this manual, "select" means to highlight an item and then press ENTER.

Entering and Exiting SmartPAC Initialization Mode

<div style="border:1px solid black; padding:1em;">

To Enter Initialization Mode

1. If you are in Program mode, press RESET repeatedly until the main Programming menu appears (see Figure 3-1).

    If you are in Run mode, make sure the main Run menu is showing on the display (see Figure 3-1). If it is not, press RESET repeatedly until it appears. Turn the Program/Run key to Prog. The Main Programming menu should appear.

Note: *If you turn the Program/Run key and nothing happens, this means that you were not in the Main Run menu. Press RESET repeatedly until you get to the Main Run menu. Then turn the key to enter Program mode.*

Always back out of one mode before entering another mode.

2. Press both the **"1"** and the **"CLEAR"** keys simultaneously for one second. The Main Initialization menu should appear.
3. If the "ENTER YOUR PASSWORD" display appears, enter the Initialization password to gain access to Initialization mode (see *Security Access* in your SmartPAC manual).

To exit Initialization mode, see the instructions on the next page.

</div>

```
┌────────────────────────────────────────────┐
│ THE CURRENTLY LOADED TOOL IS # 1            │
│ CHAIR BRACKET                               │
│ SENSORS ENABLED                             │
├────────────────────────────────────────────┤
│                                             │
│        PROGRAM OR LOAD TOOL NUMBERS         │
│        DISABLE THE SENSORS                  │
│        DISABLE THE PROCESS MONITOR          │
│                                             │
│                                             │
│   USE THE CURSOR KEYS TO CHANGE SELECTIONS. │
│   PRESS ENTER TO ACCESS TOOL NUMBERS        │
│                                             │
└────────────────────────────────────────────┘
```

Main Programming Menu

```
┌──────────────────────────────────────────────┐
│ TOOL NUMBER 1              PART CNTR   0       │
│ CHAIR BRACKET              TWO HAND            │
│ SENSORS ENABLED                               │
├──────────────────────────────────────────────┤
│                           DISABLE SENSORS     │
│ USE THE CURSOR KEYS       COUNTERS            │
│ TO MAKE SELECTIONS.       DIE PROTECTION      │
│ PRESS ENTER TO            CAM SWITCH          │
│ ACCESS SELECTION          BRAKE MONITOR       │
│                           PROCESS MONITOR     │
│                           SHUTHGT/CNTRBAL     │
│                           ERROR LOG           │
│                           LOAD NEW TOOL       │
│                                               │
└──────────────────────────────────────────────┘
```

Main Run Menu

Figure 3-1. Main Programming and Run Menus

```
┌─────────────────────────────────────────────┐
│            MAIN INITIALIZATION MENU           │
│                                               │
│   USE THE CURSOR     RESOLVER ZERO            │
│   KEYS TO CHOOSE     POSITION SENSOR          │
│   MENU ITEMS. PRESS  INSTALLED OPTIONS        │
│   THE ENTER KEY TO   SELECT CAM NAMES         │
│   SELECT. SWITCH TO  AUTO ADVANCE             │
│   RUN WHEN DONE.     CUSTOM SENSOR NAMES      │
│                      SENSOR ENABLE MODE       │
│                      PROCESS MONITOR          │
│                      RAMPAC INIT              │
│                      PRESS CONTROL            │
│                      SECURITY ACCESS          │
└─────────────────────────────────────────────┘
```
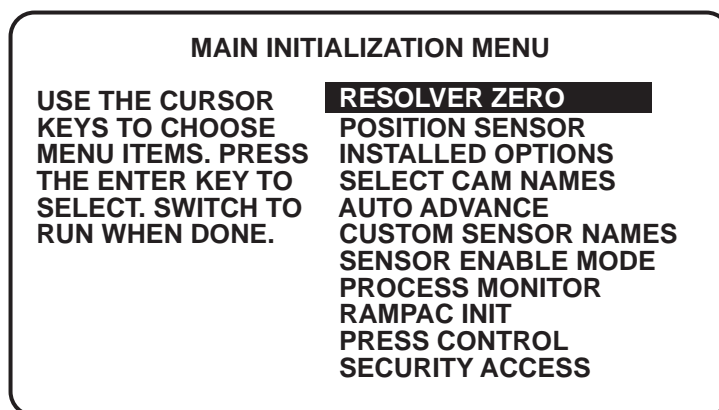
Figure 3-2. Main Initialization Menu

This is the Initialization menu—the first display in Initialization mode. From this display, use the cursor keys to select "PROCESS MONITOR."

To Exit Initialization Mode

1. Make sure the Main Initialization menu (Figure 3-1) is on the display. If it is not, press RESET repeatedly until it appears.

2. Turn the Program/Run key to "Run" to enter Run mode. If you want to enter Program mode, turn the Program/Run key to "Run" and then back to "Prog."

Note: *If you turn the Program/Run key and nothing happens, this means that you were farther into Initialization mode than the Main Initialization menu. Press the RESET key repeatedly until you get back to the Main Initialization menu. Then turn the key to enter the new mode.*

Always back out of one mode before entering another mode.

Initializing ProPAC Parameters

The first time you set up ProPAC, before you do anything else, initialize the parameters as described below. Normally, you should not perform this operation again, because initializing parameters deletes all ProPAC settings, including resolver zero, all sensor data and custom names and units.
Enter Initialization mode (see page 34). Select "INITIALIZE PARAMETERS" from the Process Monitor Initialization menu.

```
┌──────────────────────────────────────────────┐
│                                                │
│  PROCESS MONITOR INITIALIZATION MENU           │
│                                                │
│          SET CUSTOM NAMES                      │
│          SET CUSTOM UNITS                      │
│         ▐ INITIALIZE PARAMETERS ▌              │
│                                                │
│                                                │
│  USE CURSOR KEYS TO MAKE SELECTIONS.           │
│  PRESS ENTER TO ACCESS THE SELECTION.          │
│  PRESS RESET WHEN DONE.                        │
│                                                │
│                                                │
└──────────────────────────────────────────────┘
```
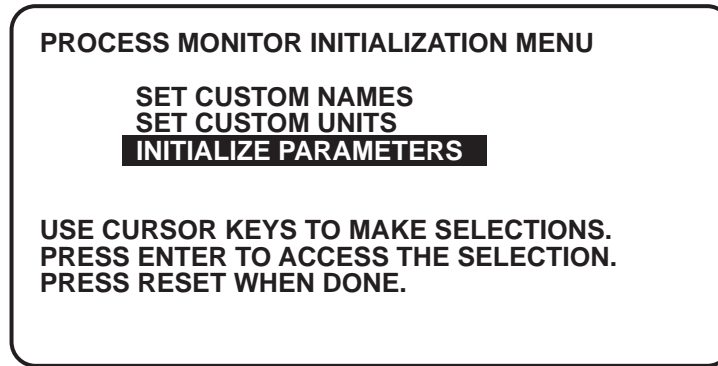
Figure 3-3. Select "INITIALIZE PARAMETERS"

The following warning display appears.

```
┌──────────────────────────────────────────┐
│                                            │
│  IF YOU CONTINUE THIS WILL INITIALIZE      │
│  THE RESOLVER ZERO, CLEAR OUT ALL          │
│  THE CUSTOM NAMES AND CLEAR ALL THE        │
│  PROCESS MONITOR SETUPS. THIS WILL         │
│  TAKE ABOUT 15 SECONDS. PRESS ENTER        │
│  TO CONTINUE. PRESS RESET TO CANCEL        │
│                                            │
└──────────────────────────────────────────┘
```
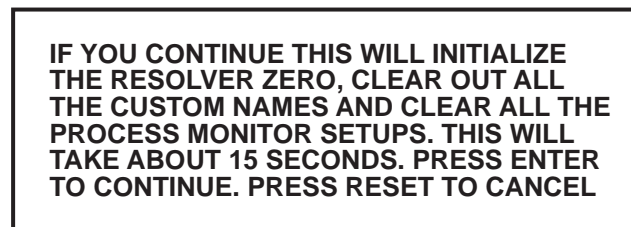
Figure 3-4. Initialize Parameters Warning

- If you want ProPAC to delete all of its settings, including resolver zero, all sensor data, and custom names and units, press ENTER.
- If you want to keep all the settings and cancel the initialization process, press RESET.

Zeroing the Resolver

After you have completed installation of ProPAC, including all communications wiring, you *must* zero the resolver. This synchronizes ProPAC with SmartPAC's resolver zero.

Note: *The procedure below assumes that the resolver was zeroed when SmartPAC was first installed. When you install ProPAC you must zero the resolver again.*

Follow the instructions below to zero (or re-zero) the resolver.

1.   Load a tool number (see Chapters 5 and 6 of your SmartPAC manual).

Note: *If no tools are programmed in your unit, go into Program mode by setting the Program/Run key to "Prog." Create a temporary tool with some counter settings. Then load this temporary tool. (Refer to your SmartPAC manual, Chapter 5.)*

2.   Enter Run mode by turning the Program/Run key to "Run." Inch the press to TDC (0°).

> **Important**
>
> The press must be at top dead center (TDC), at $0° \pm 2°$, before you zero the resolver. If you zero the resolver when the press is at another location in its travel, such as $160°$, ProPAC will not operate properly.

3. Go to SmartPAC's Main Initialization menu (see page 34).

4. Select "RESOLVER ZERO" from the Initialization menu. This is the first item on the menu. The following display appears.

RESOLVER WAS LAST ZEROED AT 356° DEGREES

Before zeroing the resolver, make sure
that the press is at TDC. Try to get the
resolver angle shown in the LED display
as close to zero as possible but the
unit will compensate from 330 to 30 deg.
When you press the enter key, the system
will then always recognize that this is
the zero position.

PRESS THE ENTER KEY TO SET THE RESOLVER
ZERO POSITION. PRESS THE RESET KEY WHEN
YOU ARE DONE.

RESOLVER DIAGNOSTICS ▶ F6

this value can
reflect a ±30° offset.

Figure 3-5. Resolver Zero Display

Note: *The Resolver Zero display shows the actual resolver position. If the resolver is anywhere between 330° and 30°, you can go to the next step. SmartPAC will automatically correct the offset and the angle readouts will indicate the <u>true</u> crank angle.*

6. To zero the resolver, be sure the display shown above is on your screen. Then press ENTER.

7. Press the RESET key to exit and return to the SmartPAC Main Initialization menu.

Accessing Process Monitor Initialization Menu

Enter Initialization mode (see page 34). In the Main Initialization menu, select "PROCESS MONITOR." The Process Monitor Initialization menu appears.

```
┌─────────────────────────────────────────────┐
│                                               │
│      PROCESS MONITOR INITIALIZATION MENU      │
│                                               │
│         ▓▓SET CUSTOM NAMES▓▓                  │
│           SET CUSTOM UNITS                    │
│           INITIALIZE PARAMETERS               │
│                                               │
│                                               │
│      USE CURSOR KEYS TO MAKE SELECTIONS.      │
│      PRESS ENTER TO ACCESS THE SELECTION.     │
│      PRESS RESET WHEN DONE.                   │
│                                               │
│                                               │
└─────────────────────────────────────────────┘
```
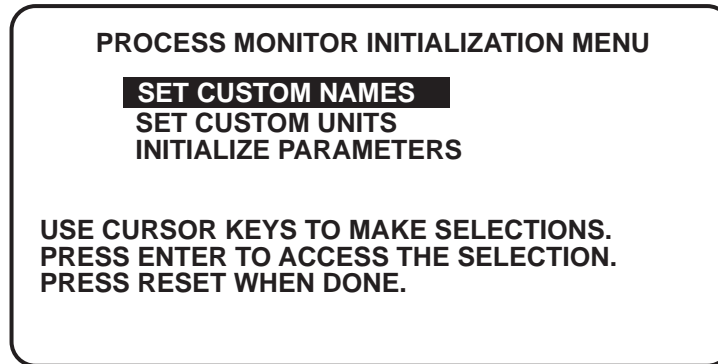
Figure 3-6. Process Monitor Initialization Menu

Follow the instructions in the following sections to set custom names and units.

Entering Custom Sensor Names

ProPAC comes with a number of standard input names (see Table 3-1). If you want to use different names, enter them in the Custom Sensor Names menu (see instructions below). You can enter up to sixteen custom names and use any of them for any of the ProPAC inputs.

Table 3-1. Standard Names for Process Monitor Inputs

NOT USED	END OF STOCK	OVER FEED
"CUSTOM" NAME	FEED LENGTH	OVERLOAD
AIR PRESSURE	FORM ANGLE	PART EJECTION
BEARING 1 TEMP	FORM HEIGHT	PART HEIGHT
BEARING 2 TEMP	GAP WIDTH	PART LENGTH
BEARING 3 TEMP	HIGH LOOP	PART WIDTH
BEARING 4 TEMP	HOLE DIAMETER	PUNCH KNOCKOUT
BLANK FEED	LOOP HEIGHT	SHORT FEED
C/BAL PRESSURE	LUBE PRESSURE	SLUG AIR PRESSURE
CAM DRIVE 1	MATERIAL BUCKLE	SLUG DETECTION
CAM DRIVE 2	MAT/L THICKNESS	STOCK LUBE
CLAMP PRESSURE	MISFEED	STOCK THICKNESS
DIE AIR PRESSURE	MISFEED PILOT	STOCK WIDTH
DIE CUSHION	MOTOR CURRENT	STRIPPER
DIE LUBE LEVEL	NITR. PRESSURE	STRIPPER HEIGHT
DIE OVERLOAD	OIL LEVEL	TRANSFER
DIE SHUT HEIGHT	OIL PRESSURE	

Note: *The custom names you enter in Initialization mode are available for use with any of the sensor inputs when you select "CUSTOM NAME" in Programming mode.*

Enter Initialization mode (see page 34). In the Process Monitor Initialization Menu, select "SET CUSTOM NAMES."

PROCESS MONITOR INITIALIZATION MENU

SET CUSTOM NAMES
SET CUSTOM UNITS
INITIALIZE PARAMETERS

USE CURSOR KEYS TO MAKE SELECTIONS.
PRESS ENTER TO ACCESS THE SELECTION.
PRESS RESET WHEN DONE.
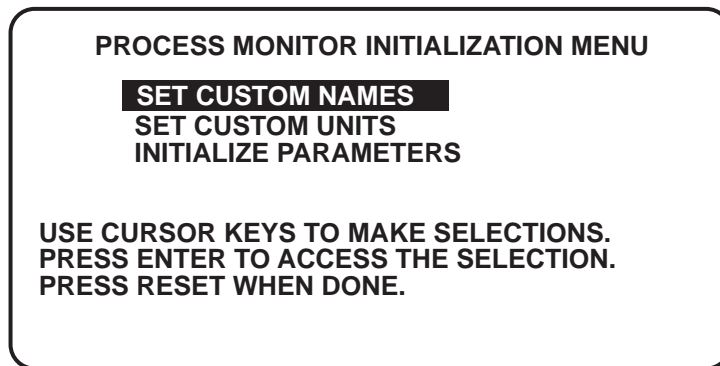
Figure 3-7. Select "SET CUSTOM NAMES"

The Custom Sensor Names menu appears.

CUSTOM 1
CUSTOM   CUSTOM 2
SENSOR   CUSTOM 3
NAMES   CUSTOM 4
          CUSTOM 5
          CUSTOM 6
          CUSTOM 7
          CUSTOM 8
          CUSTOM 9
          CUSTOM 10
          CUSTOM 11
          CUSTOM 12
          CUSTOM 13
          CUSTOM 14
          CUSTOM 15
          CUSTOM 16

USE CURSOR KEYS TO SELECT A CUSTOM
NAME. PRESS ENTER TO SET/CHANGE A NAME.
PRESS RESET WHEN DONE.
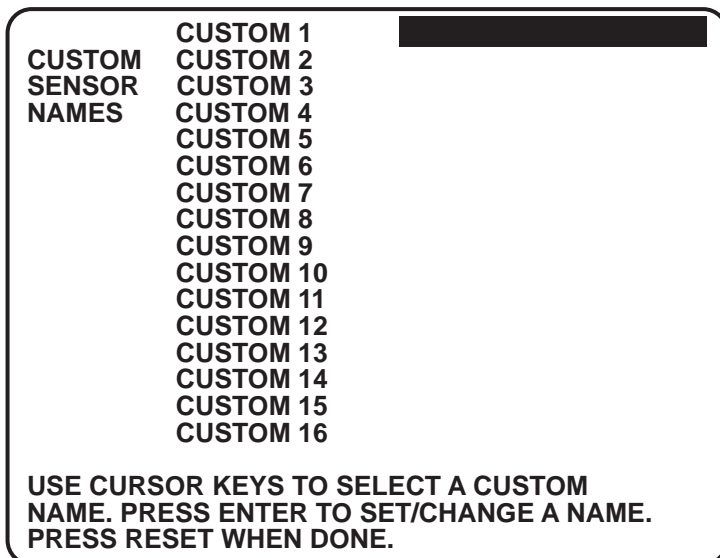
Figure 3-8. Custom Sensor Names Menu

Select a custom name, starting with "CUSTOM 1." (Enter names in order, starting with 1.) The following display appears.

```
       A  B  C  D  E   PRESS CLEAR TO CLEAR
    F  G  H  I  J  K   TEXT. USE THE KEYPAD
    L  M  N  O  P  Q   TO ENTER NUMBERS. USE
    R  S  T  U  V  W   CURSORS TO SELECT THE
    X  Y  Z  ,  -  #   LETTERS. PRESS ENTER
    .  (  )  *  /  &   TO ENTER THE LETTERS.
                       PRESS F6 WHEN DONE.
                       PRESS RESET TO CANCEL.
```
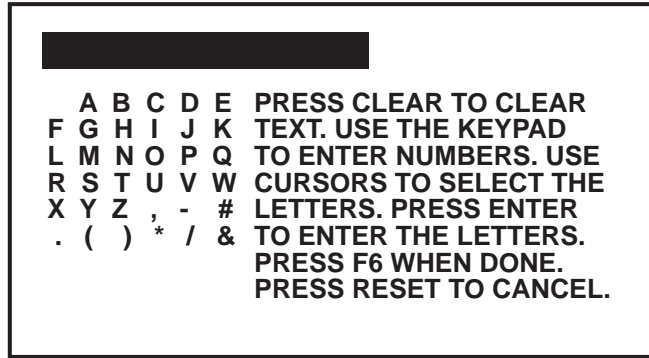
Figure 3-9. Entering Custom Name

Enter one or more custom sensor names, as follows:

- Enter the custom name, character by character.
- Use the numeric keypad to enter numbers.
- Use this display to enter letters, spaces and special characters. Press the cursor keys to highlight the character you want, then press ENTER.
- Press CLEAR to delete a character.
- To exit this display and cancel the name you are entering, press RESET.
- When you have finished entering the name, press the F6 key.

Pressing RESET or F6 returns you to the Custom Sensor Names menu. You can enter more custom names, or press RESET to return to the Process Monitor Initialization menu.

Entering Custom Sensor Units

ProPAC comes with a number of standard unit names for displaying the input values (see Table 3-2). If you want to use different units, enter them in the Custom Sensor Units menu (see instructions below). You can enter up to sixteen custom names and use any of them for any of the ProPAC inputs.

Table 3-2. Standard Process Monitor Units

CUSTOM	AMPS
INCHES	° C
MM	° F
MILS	IN. HG
MICRONS	NPN *
PSI	PNP *
PSIA	

* for discrete (on/off) inputs

Note: *The custom units you enter in Initialization mode are available for use with any of the sensor inputs when you select "CUSTOM UNITS" in Programming mode.*

Enter Initialization mode (see page 34). In the Process Monitor Initialization Menu, select "SET CUSTOM UNITS."

```
PROCESS MONITOR INITIALIZATION MENU

   SET CUSTOM NAMES
   SET CUSTOM UNITS
   INITIALIZE PARAMETERS


USE CURSOR KEYS TO MAKE SELECTIONS.
PRESS ENTER TO ACCESS THE SELECTION.
PRESS RESET WHEN DONE.
```
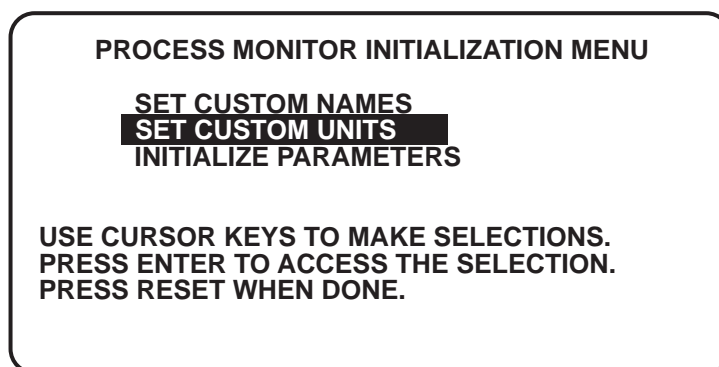
Figure 3-10. Select "SET CUSTOM UNITS"

The Custom Sensor Units menu appears.

```
                    CUSTOM 1      ████████
    CUSTOM          CUSTOM 2
    SENSOR          CUSTOM 3
    UNITS           CUSTOM 4
                    CUSTOM 5
                    CUSTOM 6
                    CUSTOM 7
                    CUSTOM 8
                    CUSTOM 9
                    CUSTOM 10
                    CUSTOM 11
                    CUSTOM 12
                    CUSTOM 13
                    CUSTOM 14
                    CUSTOM 15
                    CUSTOM 16

    USE CURSOR KEYS TO SELECT A CUSTOM
    UNIT. PRESS ENTER TO SET/CHANGE UNITS.
    PRESS RESET WHEN DONE.
```
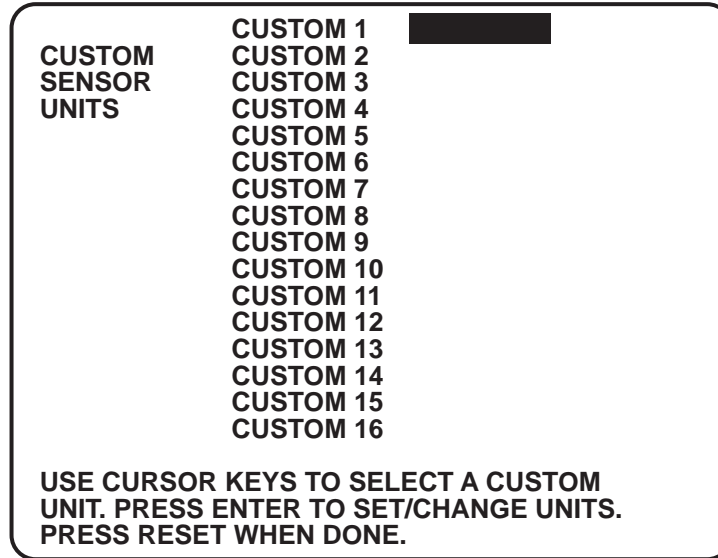
Figure 3-11. Custom Sensor Units Menu

Select one custom unit, starting with "CUSTOM 1." (Enter units in order, starting with 1.)
The following display appears.

```
    UNITS  1

    A B C D E   PRESS CLEAR TO CLEAR
    F G H I J K TEXT. USE THE KEYPAD
    L M N O P Q TO ENTER NUMBERS. USE
    R S T U V W CURSORS TO SELECT THE
    X Y Z , - # LETTERS. PRESS ENTER
    . ( ) * / & TO ENTER THE LETTERS.
                PRESS F6 WHEN DONE.
                PRESS RESET TO CANCEL.
```
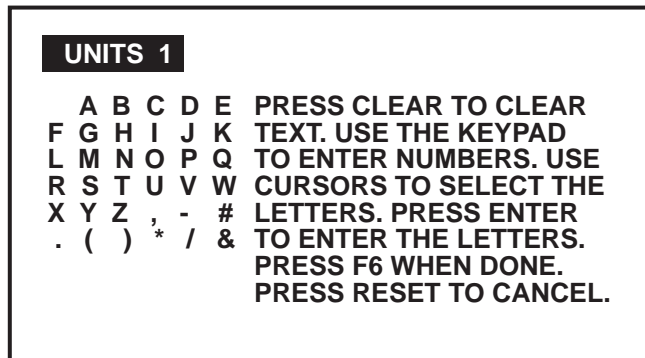
Figure 3-12. Entering Custom Units

Enter one or more custom sensor units, as follows:

- Enter the name of your custom unit, character by character.
- Use the numeric keypad to enter numbers.
- Use this display to enter letters, spaces and special characters. Press the cursor keys to highlight the character you want, then press ENTER.
- Press CLEAR to delete a character.
- To exit this display and cancel the unit you are entering, press RESET.
- When you have finished entering the unit, press the F6 key.

Pressing RESET or F6 returns you to the Custom Sensor Names menu. You can now enter more custom names, or press RESET to return to the Process Monitor Initialization menu.

What's Next?

The next step is to set up your ProPAC sensors in Program mode.
To exit Initialization mode and enter Program mode:

1. Press RESET repeatedly until the Main Initialization menu appears.

2. Turn the Program/Run key to Run and then back to Prog.

Set up the ProPAC sensors according to the instructions in the next chapter, "Programming."

Chapter 4. Programming

<div style="border:1px solid;">

The name "ProPAC"

This chapter discusses the programming of SmartPAC with ProPAC process monitor. As a shortcut, only the name "ProPAC" may be used in some instances. Keep in mind that when you see "ProPAC," it really means "SmartPAC with ProPAC."

Note: *The names "ProPAC" and "Process Monitor" are used interchangeably.*

</div>

This chapter explains how to program (set up) the process monitor sensors for your tools.

- **Enter SmartPAC Programming mode** (see below)
- **Program Process Monitor (ProPAC) inputs**, page 46.

Follow the instructions below to enter Programming mode and program the Process monitor inputs. Refer also to your SmartPAC manual as necessary.

Entering SmartPAC Programming Mode

<div style="border:1px solid;">

To Enter Programming Mode

- If you are in Run mode, make sure the main Run menu is showing on the display (see Figure 3-1). If it is not, press RESET repeatedly until it appears. Turn the Program/Run key to Prog. The Main Programming menu should appear.

- If you are in Initialization mode, make sure the Main Initialization menu is showing on the display. If it is not, press RESET repeatedly until it appears. Turn the Program/Run key to Run, and then back to Prog. The Main Programming menu should appear.

Note: *If you turn the Program/Run key and nothing happens, this means that you were not in the Main menu of Run or Initialization mode. Press RESET repeatedly until you get to the Main menu of the mode that you are in. Then turn the key as instructed above to enter Program mode.*
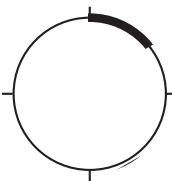
Always back out of one mode before entering another mode.

</div>

Note: *To exit Programming mode and enter Run mode, press RESET repeatedly until the Main Programming menu (Figure 4-1) appears on the display. Turn the Program/Run key to Run.*

Select = Highlight + Press ENTER

In this manual, "select" means to highlight an item and then press ENTER.

Main Run Menu

```
TOOL NUMBER 1              PART CNTR   0
CHAIR BRACKET              TWO HAND
SENSORS ENABLED

                          DISABLE SENSORS
USE THE CURSOR KEYS        COUNTERS
TO MAKE SELECTIONS.        DIE PROTECTION
PRESS ENTER TO            CAM SWITCH
ACCESS SELECTION          BRAKE MONITOR
                          PROCESS MONITOR
                          SHUTHGT/CNTRBAL
                          ERROR LOG
                          LOAD NEW TOOL
```

Main Initialization Menu

```
        MAIN INITIALIZATION MENU

USE THE CURSOR      RESOLVER ZERO
KEYS TO CHOOSE      POSITION SENSOR
MENU ITEMS. PRESS   INSTALLED OPTIONS
THE ENTER KEY TO    SELECT CAM NAMES
SELECT. SWITCH TO   AUTO ADVANCE
RUN WHEN DONE.      CUSTOM SENSOR NAMES
                    SENSOR ENABLE MODE
                    PROCESS MONITOR
                    RAMPAC INIT
                    PRESS CONTROL
                    SECURITY ACCESS
```

Figure 4-1. Main Run and Initialization Menus

Programming Process Monitor Inputs

In the Main Programming menu, shown below, select "PROGRAM OR LOAD TOOL NUMBERS."

```
THE CURRENTLY LOADED TOOL IS # 1234
CHAIR BRACKET
SENSORS ENABLED

        PROGRAM OR LOAD TOOL NUMBERS
        DISABLE THE SENSORS
        DISABLE THE PROCESS MONITOR


USE THE CURSOR KEYS TO CHANGE SELECTIONS.
PRESS ENTER TO ACCESS TOOL NUMBERS
```

Figure 4-2. Main SmartPAC Programming Menu

Selecting Tool to Program

The Select Tool Number menu appears. Do one of the following:

- Select an existing tool number to program.

- If you want to program a new tool, select "NEW."

- If you want to copy information for an existing tool as the basis for programming a new tool, press F6 to select "COPY TOOL.".

```
TOOL #'S 5 USED  195 AVAILABLE

          NEW
            1
            2
          100
          125
          1234



USE THE CURSOR KEYS TO CHANGE SELECTION.
PRESS ENTER TO SELECT, RESET WHEN DONE.

 CHAIR BRACKET                    COPY TOOL▶  F6
```
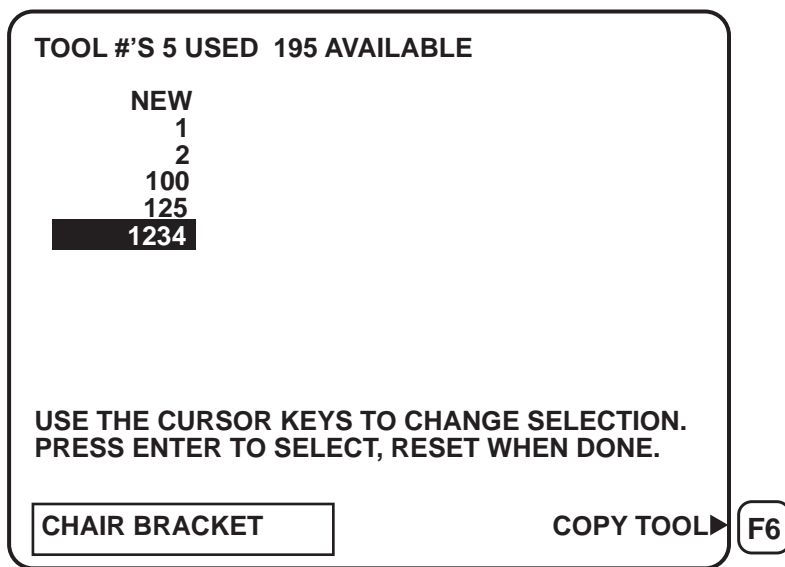
Figure 4-3. Tool Number Selection Menu

The Main Tool Programming menu appears.

```
MAIN PROGRAMMING MENU FOR TOOL # 1234
CHAIR BRACKET


                   PROGRAM:
LOAD THIS TOOL      TOOL NAME
DELETE THIS TOOL    COUNTERS
                    DIE PROTECTION
                    CAM SWITCH
                    PROCESS MONITOR
                    SHUTHGT/CNTRBAL
                    PRESS CONTROL

USE THE CURSOR KEYS TO CHOOSE THE TASK
THAT YOU WANT TO PERFORM. PRESS THE
ENTER KEY TO SELECT IT. PRESS THE RESET
KEY WHEN YOU ARE DONE.
```
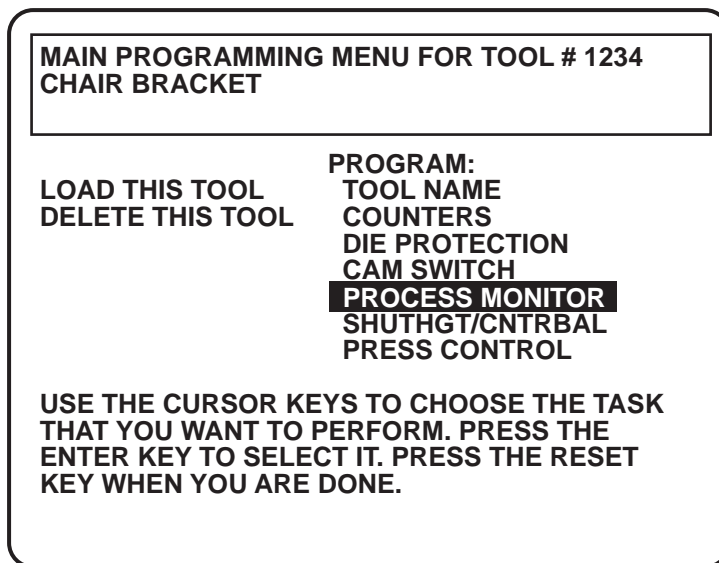
Figure 4-4. Main Programming Menu for Tool Number

Select "PROCESS MONITOR." The Process Monitor Tool Programming menu appears (see next figure).

Selecting an Input to Program

In the Process Monitor Tool Programming menu, select the sensor input that you want to program for this tool. Your unit may show eight or sixteen inputs.

Note: *If you select a previously programmed standard, analog input, the Input Summary display appears. You can set all input parameters in that screen. See* Using Input Summary Screen*, page 61.*
If you select a previously programmed die protection type (on/off) input, ProPAC walks you through the programming steps again. See Programming Die Protection Sensors*, page 63.*

```
┌──────────────────────────────────────────────────┐
│                                                    │
│   ┌─────────────────────┐  ▐PROC MON IN   1▌       │
│   │ TOOL # 1234         │   PROC MON IN   2        │
│   │ CHAIR BRACKET       │   PROC MON IN   3        │
│   └─────────────────────┘   PROC MON IN   4        │
│                             PROC MON IN   5        │
│   ENABLE MODE  AUTO         PROC MON IN   6        │
│           0    STROKES      PROC MON IN   7        │
│                             PROC MON IN   8        │
│                             PROC MON IN   9        │
│                             PROC MON IN  10        │
│   USE THE CURSOR KEYS       PROC MON IN  11        │
│   TO CHOOSE AN INPUT.       PROC MON IN  12        │
│   PRESS ENTER TO            PROC MON IN  13        │
│   PROGRAM. PRESS THE        PROC MON IN  14        │
│   RESET KEY WHEN DONE.      PROC MON IN  15        │
│                             PROC MON IN  16        │
│                                                    │
│                                                    │
└──────────────────────────────────────────────────┘
```

Figure 4-5. Process Monitor Tool Programming Menu

Setting Enable Mode and Timing

You can set the method of enabling the ProPAC sensors in the Process Monitor Tool Programming menu, below.

```
TOOL # 1234                 PROC MON IN   1
CHAIR BRACKET               PROC MON IN   2
                            PROC MON IN   3
                            PROC MON IN   4
ENABLE MODE  AUTO           PROC MON IN   5
        0    STROKES        PROC MON IN   6
                            PROC MON IN   7
                            PROC MON IN   8
                            PROC MON IN   9
                            PROC MON IN  10
USE THE CURSOR KEYS         PROC MON IN  11
TO CHOOSE AN INPUT.         PROC MON IN  12
PRESS ENTER TO              PROC MON IN  13
PROGRAM. PRESS THE          PROC MON IN  14
RESET KEY WHEN DONE.        PROC MON IN  15
                            PROC MON IN  16
```
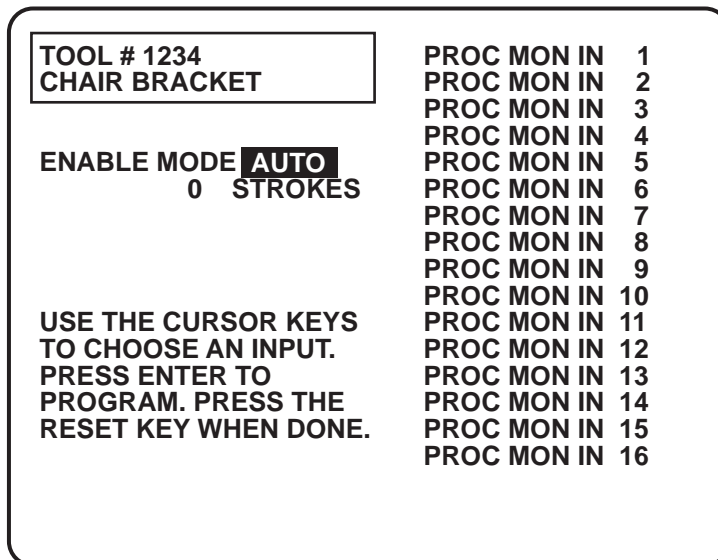
Figure 4-6. Setting Enable Mode and Timing

Using the cursor keys (up or down, and then left) highlight the enable mode. Press ENTER to toggle the mode so it shows the mode you want, "AUTO" or "MANUAL."
If you want to use automatic sensor enabling, set the number of strokes after which the sensors will be enabled when you start up the press. Press the down cursor key to highlight the number of strokes. Press ENTER. A display appears for entering the number of strokes. Use the keypad or cursor keys to enter the number of strokes.

Note: *For manual enabling, the number of strokes is zero (0).*

```
                    0

USE THE KEYPAD TO ENTER NUMBERS.
USE THE UP/DOWN CURSOR KEYS TO
INCREASE/DECREASE. PRESS ENTER
WHEN DONE. PRESS RESET TO CANCEL.
```
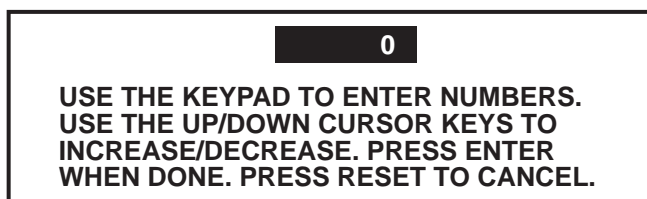
Figure 4-7. Entering Number of Strokes for Automatic Enabling

Selecting Input Name

The Select Input Name menu appears (see figure below). At this menu, select a name. This activates the input. See the table that follows for a list of the standard names available. Do one of the following:

- If you want to use one of the standard names for this input, select the name.

- If you want to use one of the custom names set up in initialization mode (see Chapter 3), select "'CUSTOM' NAME."

Note: *If you leave "NOT USED" highlighted as the input name, ProPAC goes back to the Process Monitor Tool Programming menu when you exit this screen.*

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL # 1234          PROCESS MONITOR INPUT 1 │ │
│  │                      NOT USED            │   │
│  └──────────────────────────────────────────┘   │
│                                                 │
│   SELECT A NAME FOR      ▓NOT USED▓             │
│   PROCESS MONITOR         "CUSTOM" NAME         │
│   INPUT 1                 AIR PRESSURE          │
│                           BEARING 1 TEMP        │
│                           BEARING 2 TEMP        │
│   USE THE CURSOR KEYS     BEARING 3 TEMP        │
│   TO CHANGE SELECTION.    BEARING 4 TEMP        │
│   PRESS ENTER TO SELECT.  BLANK FEED            │
│    RESET KEY TO GO BACK.  C/BAL PRESSURE        │
│                           CAM DRIVE 1           │
│                           CAM DRIVE 2           │
│                           CLAMP PRESSURE        │
│                           DIE AIR PRESSURE      │
│                           DIE CUSHION           │
│          MORE NAMES v     DIE LUBE LEVEL        │
│                                                 │
└─────────────────────────────────────────────────┘
```

Figure 4-8. Select Input Name Menu

Table 4-1. Standard Names for Process Monitor Inputs

NOT USED	END OF STOCK	OVER FEED
"CUSTOM" NAME	FEED LENGTH	OVERLOAD
AIR PRESSURE	FORM ANGLE	PART EJECTION
BEARING 1 TEMP	FORM HEIGHT	PART HEIGHT
BEARING 2 TEMP	GAP WIDTH	PART LENGTH
BEARING 3 TEMP	HIGH LOOP	PART WIDTH
BEARING 4 TEMP	HOLE DIAMETER	PUNCH KNOCKOUT
BLANK FEED	LOOP HEIGHT	SHORT FEED
C/BAL PRESSURE	LUBE PRESSURE	SLUG AIR PRESSURE
CAM DRIVE 1	MATERIAL BUCKLE	SLUG DETECTION
CAM DRIVE 2	MAT/L THICKNESS	STOCK LUBE
CLAMP PRESSURE	MISFEED	STOCK THICKNESS
DIE AIR PRESSURE	MISFEED PILOT	STOCK WIDTH
DIE CUSHION	MOTOR CURRENT	STRIPPER
DIE LUBE LEVEL	NITR. PRESSURE	STRIPPER HEIGHT
DIE OVERLOAD	OIL LEVEL	TRANSFER
DIE SHUT HEIGHT	OIL PRESSURE	

- If you selected a name, skip to *Selecting Units*, page 52.
- If you selected "'CUSTOM' NAME," select one of the custom names as instructed in the next section.

Selecting Custom Name

The Select Custom Name menu appears. The list of custom names includes those you set in ProPAC Initialization mode (see *Entering Custom Sensor Names*, page 38). Select the name you want to use. Press RESET.

```
                    CUSTOM 1        CUSTOM NAME 1
CUSTOM              CUSTOM 2        CUSTOM NAME 2
SENSOR              CUSTOM 3
NAMES               CUSTOM 4
                    CUSTOM 5
                    CUSTOM 6
                    CUSTOM 7
                    CUSTOM 8
                    CUSTOM 9
                    CUSTOM 10
                    CUSTOM 11
                    CUSTOM 12
                    CUSTOM 13
                    CUSTOM 14
                    CUSTOM 15
                    CUSTOM 16

USE CURSOR KEYS TO SELECT A CUSTOM
NAME. PRESS ENTER TO SET/CHANGE A NAME.
PRESS RESET WHEN DONE.
```
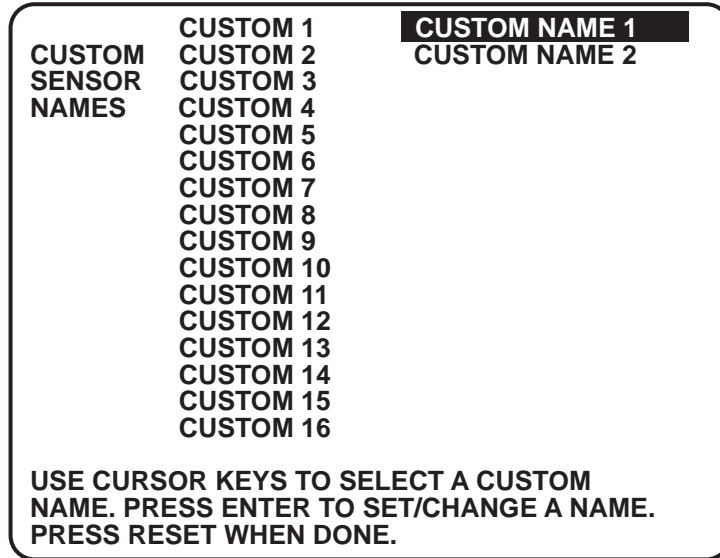
Figure 4-9. Select Custom Name Menu

Selecting Units

The Select Units menu appears. Select the units for this input.

```
TOOL # 1234             PROCESS MONITOR INPUT 1
                        CHAIR BRACKET

SELECT THE UNITS FOR    CUSTOM
THE PROCESS MONITOR     INCHES
INPUT 1                 MM
                        MILS
                        MICRONS
USE THE CURSOR KEYS     PSI
TO CHANGE SELECTION.    PSIA
PRESS ENTER TO SELECT.  AMPS
 RESET KEY TO GO BACK.  º C
                        º F
                        IN. HG
                        NPN
                        PNP
```
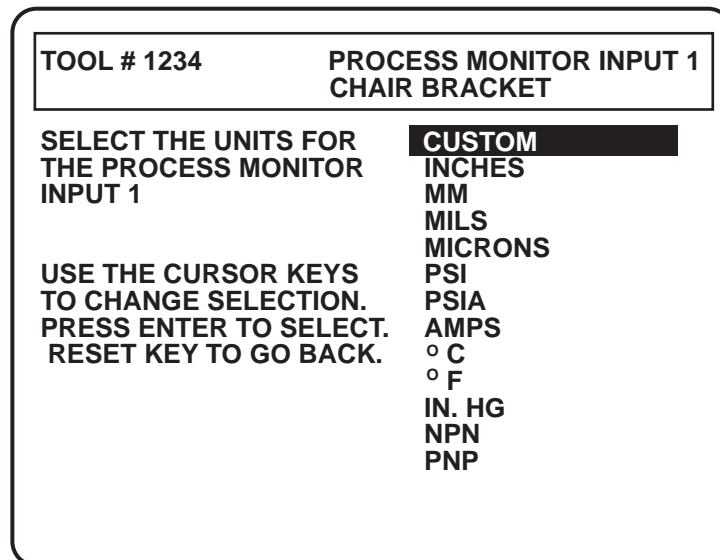
Figure 4-10. Select Units Menu

- If you choose "CUSTOM," select a custom unit that you set in initialization mode by following the instructions in the next section, "Selecting Custom Units."
- If you choose "NPN" or "PNP," skip to Programming Die Protection Sensors, page 63.
- If you choose any other unit, skip to "Entering Range and Offset," page 53.

Selecting Custom Units

The Custom Sensor Units menu appears. The list of custom units includes those you set in ProPAC Initialization mode (see *Entering Custom Sensor Units*, page 41). Select the custom units you want to use. Press RESET.

```
                    CUSTOM 1    UNITS  1
CUSTOM              CUSTOM 2    UNITS  2
SENSOR              CUSTOM 3
UNITS               CUSTOM 4
                    CUSTOM 5
                    CUSTOM 6
                    CUSTOM 7
                    CUSTOM 8
                    CUSTOM 9
                    CUSTOM 10
                    CUSTOM 11
                    CUSTOM 12
                    CUSTOM 13
                    CUSTOM 14
                    CUSTOM 15
                    CUSTOM 16

USE CURSOR KEYS TO SELECT A CUSTOM
UNIT. PRESS ENTER TO PICK A NAME.
PRESS RESET WHEN DONE.
```
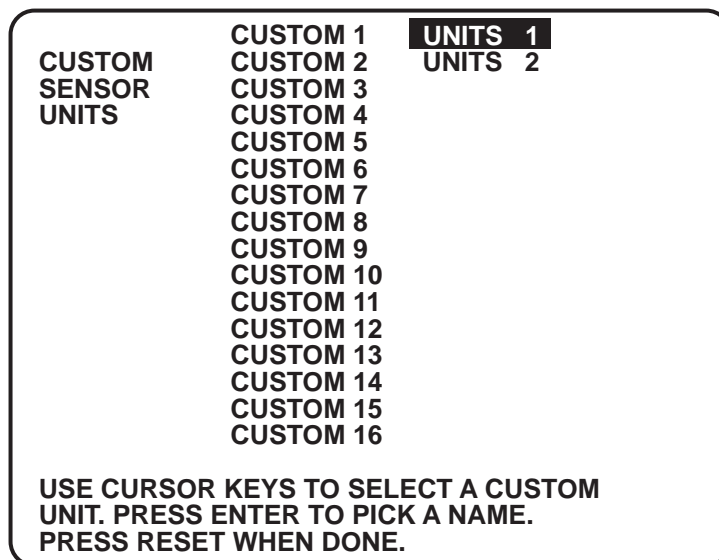
Figure 4-11. Select Custom Units Menu

Entering Range and Offset

The range is the interval between the smallest and largest measurement that the sensor makes. The offset is a value added to the range in order to display the measurement in real dimensions.

Example
If your sensor measures from 0 to 1 inches, and you are using it to measure the last one inch of a six-inch feed, the range is 0 to 1 inches and the offset is 5.000 inches. This causes a sensor measurement of 0.5 inches to be displayed as 5.500 inches.

Setting Number of Decimal Places
Set the number of decimal places ProPAC uses by entering range and/or offset values with the number of decimal places you want to use. The range, offset and setpoint values will all use the same number of decimal places.

Examples
If you want measurements displayed in thousandths of an inch (X.XXX), enter "0 to 1.000 INCHES."
If you want measurements displayed in tenths of an inch (X.X), enter "0 to 1.0 INCHES."

Note: *You can* increase *the number of decimal places later by returning to this screen and entering range or offset with a larger number of decimal places. However, you cannot* decrease *the number of decimal places.*

```
┌─────────────────────────────────────────────┐
│  ┌──────────────────────────────────────┐   │
│  │ TOOL # 1234        PROCESS MONITOR INPUT 1 │
│  │                       [INPUT NAME]    │   │
│  └──────────────────────────────────────┘   │
│                                              │
│    SET THE RANGE/OFFSET OF THE SENSOR        │
│                                              │
│   RANGE =   █0█ TO    0   [UNITS]            │
│   POSITION OFFSET =      0   [UNITS]         │
│                                              │
│   USE THE CURSOR KEYS TO MAKE A              │
│   SELECTION. PRESS ENTER TO SET A            │
│   PARAMETER. PRESS RESET TO CONTINUE         │
│   TO THE NEXT SCREEN                         │
│                                              │
│                                              │
│                                              │
│                                   HELP ▶     │
└─────────────────────────────────────────────┘
```

Figure 4-12. Set Input Range and Offset

Select the item you want to enter. At the following display, use the keypad to enter the value for this item. Use the left/right cursor keys to change the sign. Make sure the range values go from lower to higher.

```
┌─────────────────────────────────────────┐
│              ┌──────────────┐            │
│              │        0     │            │
│              └──────────────┘            │
│   USE THE KEYPAD TO ENTER NUMBERS.       │
│   USE THE UP/DOWN CURSOR KEYS TO         │
│   INCREASE/DECREASE. USE THE             │
│   LEFT/RIGHT CURSOR KEYS TO CHANGE       │
│   THE SIGN. PRESS ENTER                  │
│   WHEN DONE. PRESS RESET TO CANCEL.      │
└─────────────────────────────────────────┘
```

Figure 4-13. Enter Range or Offset Value

When you have entered the range and offset, press RESET to go to the next screen.

Important

You must enter a measurement range for each input. If you do not, the SmartPAC clears the input you have been programming and returns to the Process Monitor Tool Programming menu (see page 48).

The high range value must be higher than the low range value.

Entering Voltage Range

Each sensor may have a different output voltage range. ProPAC can accept sensor voltages from − 10 to + 10 volts DC. In this screen enter the low and high values of the voltage range.

```
TOOL # 1234              PROCESS MONITOR INPUT 1
                              [INPUT NAME]

  SET THE SENSOR OUTPUT VOLTAGE RANGE

      [ 0.000 ]    TO      0.000    VOLTS




  USE THE CURSOR KEYS TO MAKE A
  SELECTION. PRESS ENTER TO SET A
  PARAMETER. PRESS RESET TO CONTINUE
  TO THE NEXT SCREEN
```

Figure 4-14. Set Voltage Range

The output voltage range can go from low to high, or high to low, depending on how your sensor works. The first voltage range value goes with the low end of the measurement range, and the second voltage range value goes with the high end of the measurement range.

Examples:

Your sensor has a measurement range of 0" to 1".
Its voltage output at 0" is –10 volts.
Its voltage output at 1" is +10 volts.
Enter a sensor output voltage range of –10 to +10.
Your sensor has a measurement range of 0" to 1".
Its voltage output at 0" is +5 volts.
Its voltage output at 1" is -5 volts.
Enter a sensor output voltage range of +5 to -5 volts.

1. Select the first (left hand) value (see figure above). The following display appears. Use the keypad and cursor keys to enter the voltage range value. Press ENTER.

```
                  [ 0 ]
  USE THE KEYPAD TO ENTER NUMBERS.
  USE THE UP/DOWN CURSOR KEYS TO
  INCREASE/DECREASE. USE THE
  LEFT/RIGHT CURSOR KEYS TO CHANGE
  THE SIGN. PRESS ENTER
  WHEN DONE. PRESS RESET TO CANCEL.
```

Figure 4-15. Enter Voltage Value

2.   Select the second (right hand) range value. Use the keypad and cursor keys to enter this
      value. Press ENTER.

3.   Press RESET when you are done setting the voltage range. The next screen appears.

Note: *You must enter a range for the output voltage of each sensor. If you do not,
             the SmartPAC clears the input you have been programming and returns to
             the Process Monitor Tool Programming menu (see page 48).*

Selecting Action to Take When Input Is Outside Limits

In the Select Action to Take menu, select the action you want ProPAC to take if a sensor
input exceeds the limits you set. You can choose to make the press stop or to actuate the
output associated with the sensor that is outside its limits.
In this screen you can also choose to change the critical angle for this press.

   • If you want to change the critical angle, press F5 and follow the instructions in the
     next section, *Changing Critical Angle*.

   • If you do not want to change the critical angle, or have already changed the critical
     angle, select the action you want to happen if the input goes outside its limits.
EMERGENCY STOP: This option tells ProPAC to send a signal to stop the press
immediately when a sensor fault occurs. Select emergency stop (E-stop) for monitoring on
the upstroke, where there is time for the press to stop before the next hit. For example, when
monitoring part ejection on the upstroke, choose EMERGENCY STOP so ProPAC sends a
stop signal to stop the press before the next hit if the part is not ejected.
TOP STOP: This option tells ProPAC to sends a signal to stop the press at the top of the
stroke. Select top stop for items monitored far enough into the downstroke that the press
could not dependably stop before the next hit. In this case, there is some danger of the press
sticking on bottom. For example, when monitoring a feed that takes place well into the
downstroke (like a roll feed), select TOP STOP.
SMART STOP: This option tells ProPAC to initiate either an emergency stop or top stop,
depending on where in the stroke the sensor detected the fault. For example, select SMART
STOP when monitoring the bearing temperature throughout the stroke, since the temperature
can exceed the setpoint at any time.

Note: *The* critical angle *is the angle position in thestroke beyond which the ram
             cannot be stopped before the punches make contact with the material To
             avoid jamming the press at the bottom of the stroke, SMART STOP initiates
             an emergency stop before the critical angle , or a top stop at or after the
             critical angle. The critical angle must be set correctly foreach tool. See
             Changing Critical Angle, page 57.*

ACTUATE OUTPUT: This option tells ProPAC to actuate the relay associated with the
sensor when it detects a fault. For example, when monitoring a critical part dimension, select
ACTUATE OUTPUT to actuate a diverter arm to divert the part into a scrap bin when the
dimension is out of spec.

```
┌─────────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────────┐   │
│  │ TOOL# 1      PROCESS MONITOR INPUT 1          │   │
│  │              [INPUT NAME]                      │   │
│  └──────────────────────────────────────────────┘   │
│                                                       │
│     SELECT ACTION TO TAKE WHEN THE                    │
│     SENSOR EXCEEDS ITS SETPOINT LIMITS:               │
│                                                       │
│          ████████████                                 │
│          TOP STOP                                     │
│          EMERGENCY STOP                               │
│          SMART STOP                                   │
│          ACTUATE OUTPUT              HELP  ▶ (F4)     │
│                                                       │
│                                                       │
│                        CHANGE CRITICAL ANGLE ▶ (F5)  │
│                                                       │
│     USE CURSOR KEYS TO MAKE A SELECTION.              │
│     PRESS ENTER TO SELECT.                            │
│     PRESS RESET TO GO BACK.                           │
└─────────────────────────────────────────────────────┘
```
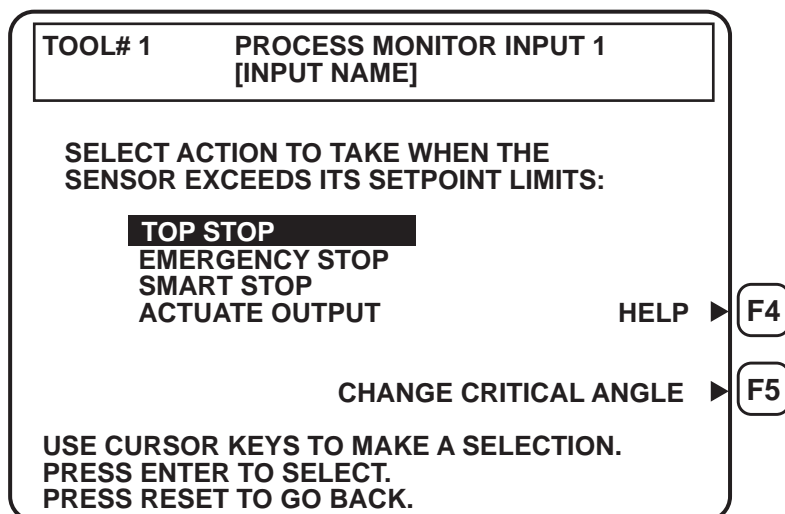
Figure 4-16. Select Action to Take if Sensor Outside Limits

Changing Critical Angle

In the Change Critical Angle screen, change the angle with the up and down cursor keys. Press ENTER when you are done. If you want to cancel the change, press RESET. ProPAC returns to the Select Action to Take menu. Go back to the previous section, *Selecting Action to Take When Input Is Outside Limits*.

```
┌─────────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────────┐   │
│  │ TOOL# 1      PROCESS MONITOR INPUT 1          │   │
│  │              [INPUT NAME]                      │   │
│  └──────────────────────────────────────────────┘   │
│                                                       │
│                                                       │
│              CRITICAL ANGLE FOR THIS TOOL             │
│                   IS ██100██ DEGREES.                 │
│                                                       │
│     THIS CRITICAL ANGLE APPLIES TO ALL                │
│     SENSORS SET FOR SMART STOP FOR THIS               │
│     TOOL. USE THE CURSOR KEYS TO CHANGE               │
│     THE ANGLE.                                        │
│                                                       │
│     PRESS THE ENTER KEY WHEN DONE.                    │
│     PRESS THE RESET KEY TO CANCEL.                    │
│                                    HELP ▶ (F6)       │
└─────────────────────────────────────────────────────┘
```
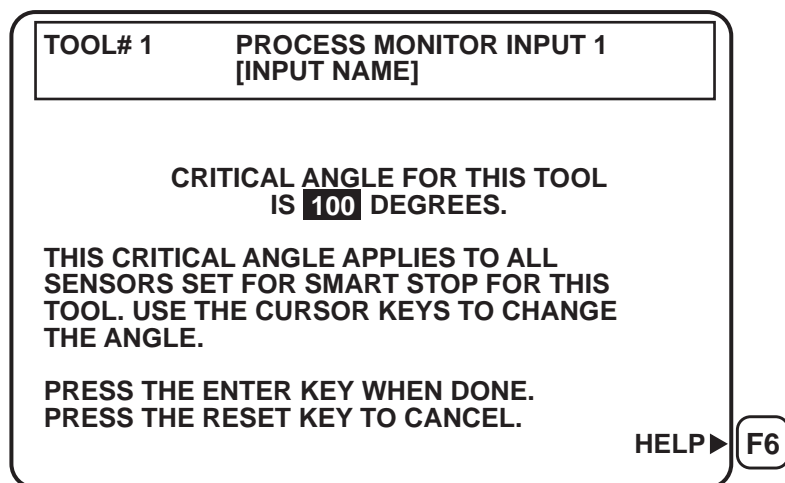
Figure 4-17. Change Critical Angle

Note: *In this screen you can set or change the critical angle for the press. This setting applies to any "Smart Stop" function of this press. You can also set/change the critical angle under the DiPro menu if that option is installed in your SmartPAC (see your SmartPAC manual).*

Setting Measurement Logic

```
TOOL# 1          PROCESS MONITOR INPUT 1
                 [INPUT NAME]


            SET THE MEASUREMENT LOGIC

CONSTANTLY MONITORED THROUGHOUT STROKE
DURING WINDOW FOR HIGHEST PEAK VALUE
DURING WINDOW FOR LOWEST PEAK VALUE
CONSTANTLY MONITORED DURING WINDOW

USE CURSOR KEYS TO CHANGE MEASUREMENT
LOGIC. PRESS ENTER TO SELECT.
PRESS RESET TO GO BACK.
```

Figure 4-18. Set Measurement Logic

```
TOOL# 1          PROCESS MONITOR INPUT 1
                 [INPUT NAME]


            SELECT THE SETPOINT TYPE

              MANUAL SETPOINT
              AUTOMATIC SETPOINT

USE CURSOR KEYS TO SELECT SETPOINT
TYPE. PRESS ENTER TO CHANGE.
PRESS RESET TO GO BACK.
```

Figure 4-19. Select Setpoint Type

```
TOOL# 1          PROCESS MONITOR INPUT 1
                 [INPUT NAME]


            SELECT THE SETPOINT LIMIT

HIGH SETPOINT =            0    [UNITS]
LOW SETPOINT =            0    [UNITS]


USE CURSOR KEYS TO MAKE A
SELECTION. PRESS ENTER TO SET A
PARAMETER. PRESS RESET WHEN DONE.
```

Figure 4-20. Set Manual Setpoint Limits

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL# 1        PROCESS MONITOR INPUT 1   │   │
│  │                [INPUT NAME]              │   │
│  └──────────────────────────────────────────┘   │
│                                                 │
│           AUTOMATIC SETPOINT PARAMETERS         │
│                                                 │
│  SETPOINT  PERCENT =        ▮    0  %           │
│  SAMPLE PERIOD     =             0   STROKES    │
│                                                 │
│  USE CURSOR KEYS TO SELECT PARAMETERS.          │
│  PRESS ENTER TO CHANGE.                         │
│  PRESS RESET WHEN DONE.                         │
│                                                 │
└─────────────────────────────────────────────────┘
```
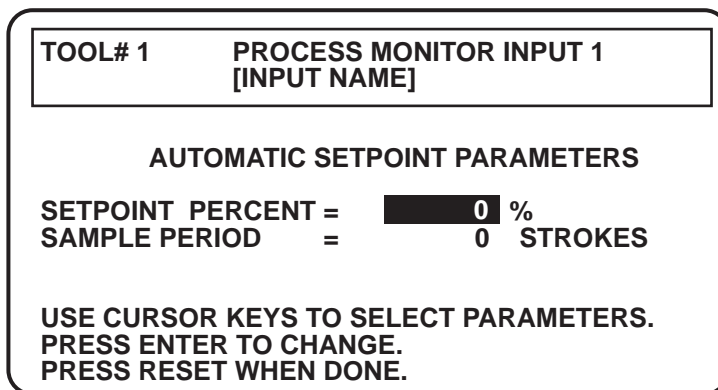
Figure 4-21. Set Automatic Setpoint Parameters

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL# 1        PROCESS MONITOR INPUT 1   │   │
│  │                [INPUT NAME]              │   │
│  └──────────────────────────────────────────┘   │
│                                                 │
│            ▮ PROGRAM ON/OFF ANGLE ▮             │
│                                                 │
│  USE CURSOR KEYS TO CHANGE THE                  │
│  ACTUATION TYPE. PRESS ENTER TO SET.            │
│  PRESS RESET TO GO BACK                         │
│                                                 │
│                                                 │
└─────────────────────────────────────────────────┘
```
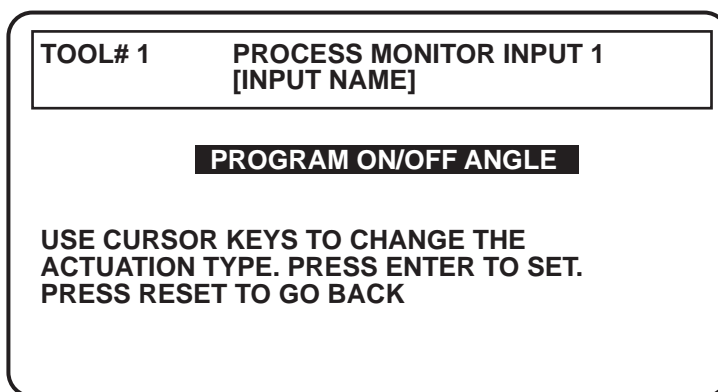
Figure 4-22. Select Actuation Type

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL # 1            PROCESS MONITOR INPUT 1│  │
│  │                     [INPUT NAME]          │  │
│  └──────────────────────────────────────────┘   │
│                              USE THE L/R CURSOR  │
│                0             KEYS TO SET THE     │
│               ╷              ON ANGLE. USE THE   │
│                              U/D CURSOR KEYS TO  │
│                              SET THE OFF ANGLE.  │
│                              PRESS THE RESET     │
│                              KEY WHEN DONE.      │
│            ┌─────────┐                           │
│  270 ─    │ ON    0 │    ─ 90                    │
│           │ OFF   0 │                            │
│            └─────────┘                           │
│                                                 │
│                                      HELP ▶     │
│                180                              │
└─────────────────────────────────────────────────┘
```
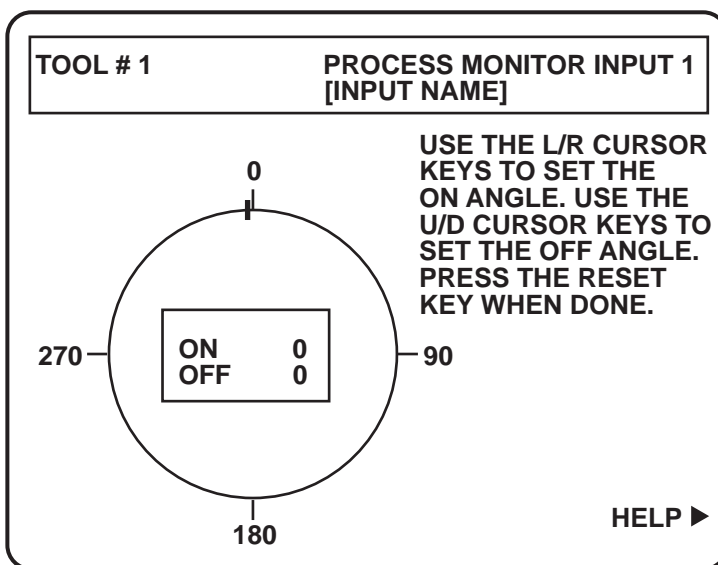
Figure 4-23. Set On and Off Angle for Output Actuation

```
TOOL # 1                    PROCESS MONITOR INPUT 1
                                  [INPUT NAME]

                          TOP STOP CONTROL

SHIFT REGISTER  =      0

TOP STOP PRESS WHEN:

LIMITS ARE EXCEEDED     0 TIMES IN A ROW

OR   0  TIMES IN    0  STROKES



USE CURSOR KEYS TO
MAKE A SELECTION.
PRESS ENTER TO CHANGE.              HELP ▶
PRESS RESET WHEN DONE.
```
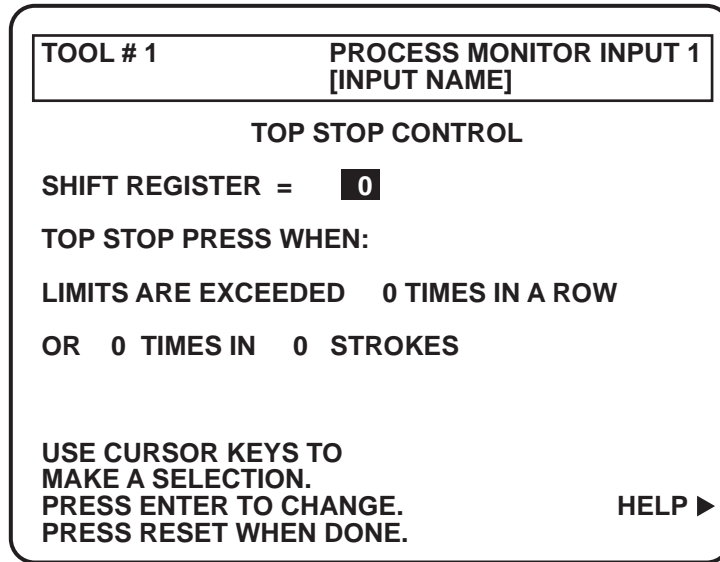
Figure 4-24. Set Up Top Stop Control

```
                          0

USE THE KEYPAD TO ENTER NUMBERS.
USE THE UP/DOWN CURSOR KEYS TO
INCREASE/DECREASE. PRESS ENTER
WHEN DONE. PRESS RESET TO CANCEL.
```
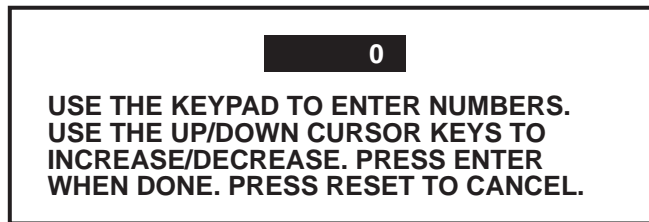
Figure 4-25. Enter Value for Top Stop Control

```
        PROCESS MONITOR TOP STOP
            CONTROL HELP MENU

                            TOP STOP ▶  F2
                            CONTROL

                             SHIFT ▶  F3
                            REGISTER
```
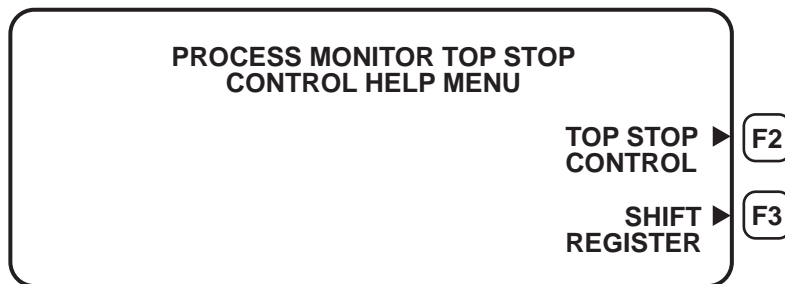
Figure 4-26. Top Stop Control Help Menu

Using Input Summary Screen

When you have completed programming an input, the Input Summary screen appears.

```
┌─────────────────────────────────────────────────┐
│  TOOL#  1       PROCESS MONITOR     INPUT 1       │
│  ┌──────────────────────────────────────────────┐│
│  SENSOR NAME      ▐INPUT NAME▌                    │
│  ENG. UNITS       UNITS                           │
│  SENSOR RANGE     XX TO XX UNITS                  │
│  POSITION OFFSET  XX UNITS                        │
│  SENSOR OUTPUT    XX TO XX VOLTS                  │
│  FAULT MODE       ACTUATE OUTPUT                  │
│  OUTPUT 1 TIMING  XX° TO   XX°                    │
│  MEAS. LOGIC      CONSTANTLY MONITORED            │
│  SETPOINT TYPE    MANUAL SETPOINTS                │
│  HIGH LIMIT       XX  UNITS                        │
│  LOW LIMIT        XX  UNITS                        │
│                                                   │
│  USE CURSOR KEYS TO MAKE SELECTION. PRESS         │
│  ENTER TO CHANGE. PRESS RESET WHEN DONE.          │
│  PRESS CLEAR TO DELETE THESE SETTINGS.            │
└─────────────────────────────────────────────────┘
```

Figure 4-27. Input Summary Screen

You can set any of the input parameters listed, except to change the Eng. Units to NPN or PNP. If you need to make this change, delete all the settings for this input by pressing CLEAR. Then re-program from the beginning (see Figure 4-5. Process Monitor Tool Programming Menu, page 48).

Setting Repeatability Limits

You can also set a repeatability limit (in addition to the existing high and low setpoints) for each ProPAC sensor. Repeatability is defined as the maximum allowable variation in the sensor reading from one machine cycle to the next. Repeatability limits are useful for monitoring parameters such as die shut height or stripper position, where gradual changes over time are normal, but sudden abrupt changes indicate problems.

The repeatability limit has been added to both automatic and manual setpoint types in ProPAC. With automatic setpoints, repeatability is expressed as a percentage of the sensor's range. For manual setpoints, the repeatability limit is entered as an absolute value. Setting its value to "0" will turn off the repeatability limit.

Figure 4-28 shows Repeatability limits entered manually. In this example, the maximum allowable variation in sensor readings on consecutive machine cycles is 0.001" (with a high limit of 0.040" and a low limit of 0.030"). If the sensor changes more than 0.001" from one stroke to the next, a fault will occur.

```
┌──────────────────────────────────────────────────────┐
│  ┌────────────────────────────────────────────────┐  │
│  │ TOOL #1          PROCESS MONITOR      INPUT 1   │  │
│  └────────────────────────────────────────────────┘  │
│                                                        │
│     SENSOR NAME          STRIPPER HEIGHT               │
│     ENG. UNITS           INCH                          │
│     SENSOR RANGE         0.00000 TO 0.04000            │
│     POSITION OFFSET      0.00000                        │
│     SENSOR OUTPUT        0.000 - 10.000 VDC            │
│     FAULT MODE           TOP STOP                       │
│     MEAS. LOGIC          HIGH PEAK                      │
│     MONIT. WINDOW        148 - 214                      │
│     SETPOINT TYPE        MANUAL                         │
│     HIGH LIMIT           0.04000 INCHES                 │
│     LOW LIMIT            0.03000 INCHES                 │
│     REP LIMIT            [0.00100] INCHES               │
│                                                        │
│                                                        │
│     USE CURSOR KEYS TO MAKE SELECTION.  PRESS          │
│     ENTER TO CHANGE, PRESS RESET WHEN DONE.            │
│     PRESS CLEAR TO DELETE THESE SETTINGS.              │
│                                                        │
└──────────────────────────────────────────────────────┘
```

Figure 4-28. Repeatability: Manual Setpoints

Figure 4-29 shows Repeatability limits set as automatic setpoints. Calculations are made during a specified sample period (in this case 50 strokes). In this example a repeatability setpoint will be created that is equal to 0.3% of the highest sensor reading during sample period. For example, if during the 50-stroke sample period the highest reading was 0.030 of an inch, the repeatability limit would be set to 0.3% of this value (0.00009"). After the sample period, the sensor readings on successive strokes will have to be within this limit (0.00009") or a fault will occur.

```
┌──────────────────────────────────────────────────────┐
│  ┌────────────────────────────────────────────────┐  │
│  │ TOOL #1          PROCESS MONITOR      INPUT 1   │  │
│  └────────────────────────────────────────────────┘  │
│                                                        │
│     SENSOR NAME          STRIPPER HEIGHT               │
│     ENG. UNITS           INCH                          │
│     SENSOR RANGE         0.00000 TO 0.04000            │
│     SENSOR OUTPUT        0.000 - 10.000 VDC            │
│     POSITION OFFSET      0.00000                        │
│     FAULT MODE           TOP STOP                       │
│     MEAS. LOGIC          HIGH PEAK                      │
│     MONIT. WINDOW        148 - 214                      │
│     SETPOINT TYPE        AUTO SETPOINTS                 │
│     HIGH / LOW %         5%                             │
│     REP %                [0.3%]                         │
│     SAMPLE PERIOD        50 STROKES                     │
│                                                        │
│                                                        │
│     USE CURSOR KEYS TO MAKE SELECTION.  PRESS          │
│     ENTER TO CHANGE, PRESS RESET WHEN DONE.            │
│     PRESS CLEAR TO DELETE THESE SETTINGS.              │
│                                                        │
└──────────────────────────────────────────────────────┘
```

Figure 4-29. Percent Repeatability: Auto Setpoints

Programming Die Protection Sensors

These sensors provide on/off inputs to the SmartPAC in order to stop the press if something is wrong that could damage the die.

To program die protection sensors, select "NPN" or "PNP" in the Select Units Menu (see *Selecting Units*, page 52.

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL# 1              SENSOR 1  NPN        │   │
│  │ TOOL NAME            SENSOR NAME          │   │
│  │ CRITICAL ANGLE  74   SENSOR TYPE          │   │
│  └──────────────────────────────────────────┘   │
│                                                   │
│    ▓NOT USED▓             GREEN                   │
│     RED (NC)              GREEN QUICK CHECK       │
│     YELLOW (NO)           GREEN CONSTANT          │
│                           GREEN SPECIAL           │
│                                                   │
│                                                   │
│                    CHANGE TO PNP ▶  [F5]          │
│                                                   │
│  USE THE CURSOR KEYS TO CHANGE SENSOR            │
│  TYPE. PRESS ENTER TO SELECT. PRESS              │
│  RESET WHEN DONE.                                │
└─────────────────────────────────────────────────┘
```

Figure 4-30. Select Sensor Type

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────┐   │
│  │ TOOL# 1              SENSOR 1  NPN        │   │
│  │ TOOL NAME            SENSOR NAME          │   │
│  │ CRITICAL ANGLE 129   SENSOR TYPE          │   │
│  └──────────────────────────────────────────┘   │
│    SELECT ACTION TO TAKE WHEN THE               │
│    SENSOR FAULTS:                               │
│                                                   │
│       ▓TOP STOP▓                                 │
│        EMERGENCY STOP                            │
│        SMART STOP                                │
│        ACTUATE OUTPUT           HELP ▶  [F4]     │
│                                                   │
│                      CHANGE CRITICAL ANGLE ▶ [F5]│
│                                                   │
│  USE CURSOR KEYS TO MAKE A SELECTION.           │
│  PRESS ENTER TO SELECT.                         │
│  PRESS RESET TO GO BACK.                        │
└─────────────────────────────────────────────────┘
```
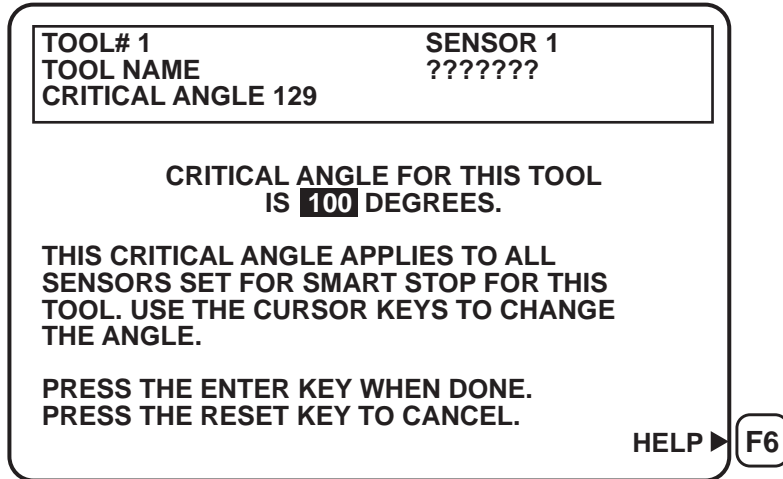
Figure 4-31. Select Action to Take When Sensor Faults

```
TOOL# 1                          SENSOR 1
TOOL NAME                        ???????
CRITICAL ANGLE 129
```

CRITICAL ANGLE FOR THIS TOOL
IS **100** DEGREES.

THIS CRITICAL ANGLE APPLIES TO ALL
SENSORS SET FOR SMART STOP FOR THIS
TOOL. USE THE CURSOR KEYS TO CHANGE
THE ANGLE.

PRESS THE ENTER KEY WHEN DONE.
PRESS THE RESET KEY TO CANCEL.

HELP ▶ F6

Figure 4-32. Change Critical Angle

```
TOOL # 1                         SENSOR 1
TOOL NAME                        SENSOR NAME
CRITICAL ANGLE 129               GREEN    T-STOP
```

USE L/R CURSOR KEYS TO
SET READY ON. USE U/D
CURSOR KEYS TO SET
READY OFF. PRESS
RESET WHEN DONE.

0

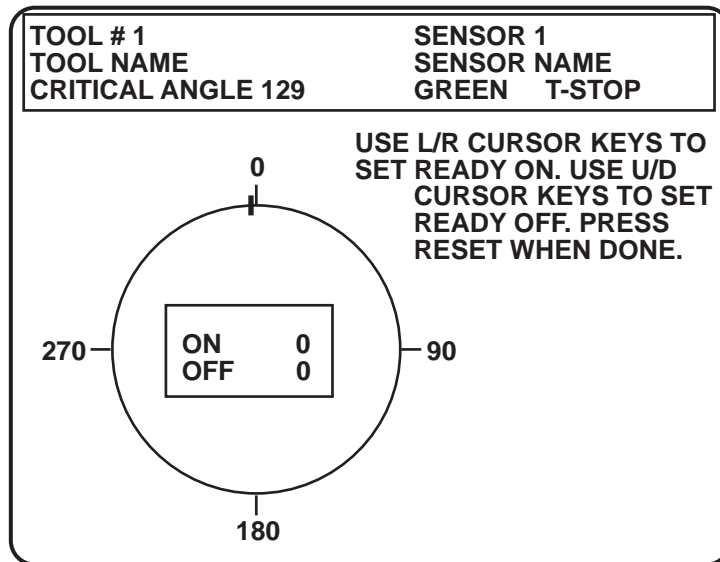270   90

ON   0
OFF   0

180

Figure 4-33. Green Sensors Ready On/Off Angle

What's Next?

When you have finished programming a ProPAC input, you can do one of the following:

- **Program another input for the same tool.** From the input summary screen, press RESET to return to the ProPAC Main Input Programming menu. Follow the instructions at *Selecting an Input to Program*, page 48.

- **Program other tools' ProPAC inputs.** From the input summary screen, press RESET repeatedly until the Main SmartPAC Programming menu appears on the display. Follow the instructions at *Programming Process Monitor Inputs*, page 46.

- **Program other SmartPAC features.** Press RESET repeatedly until the Main SmartPAC Programming menu appears on the display. Refer to your SmartPAC manual.

- **Exit Programming mode and run the press.** To exit Programming and enter Run mode, press RESET repeatedly until the Main Programming menu appears on the display. Turn the Program/Run key to Run. Follow the instructions in your SmartPAC manual and in Chapter 5 of this manual.

Chapter 5. Running ProPAC

<div style="border:1px solid;">

The name "ProPAC"

This chapter discusses running SmartPAC with ProPAC process monitor. As a shortcut, only the name "ProPAC" may be used in some instances. Keep in mind that when you see "ProPAC," it really means "SmartPAC with ProPAC."

Note: *The names "ProPAC" and "Process Monitor" are used interchangeably.*

</div>

<div style="border:1px solid;">

Select = Highlight + Press ENTER

In this manual, "select" means to highlight an item and then press ENTER.

</div>

In Run mode, you can use ProPAC to

- **View waveforms of the sensor inputs**, page 68
- **Adjust the timing window**, page 71
- **Adjust the high and low limits**, page 72
- **Enable or disable sensors**, page 72
- **Calibrate a sensor**, page 73.

Accessing ProPAC in SmartPAC's Run mode

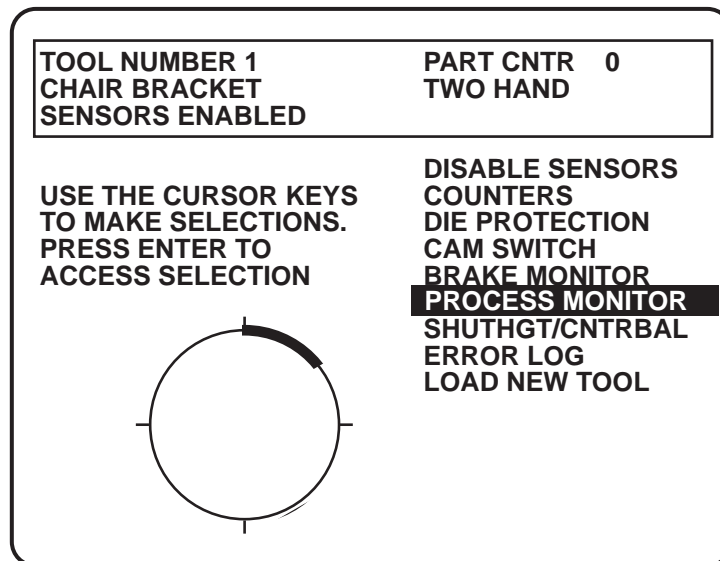Set the Program/Run key to Run. The SmartPAC Run menu appears


```
TOOL NUMBER 1              PART CNTR    0
CHAIR BRACKET              TWO HAND
SENSORS ENABLED


                           DISABLE SENSORS
USE THE CURSOR KEYS        COUNTERS
TO MAKE SELECTIONS.        DIE PROTECTION
PRESS ENTER TO             CAM SWITCH
ACCESS SELECTION           BRAKE MONITOR
                           PROCESS MONITOR
                           SHUTHGT/CNTRBAL
                           ERROR LOG
                           LOAD NEW TOOL
```

Figure 5-1. SmartPAC Run Menu

Select "PROCESS MONITOR." The ProPAC Run menu appears.

Viewing Sensor Waveforms

```
┌─────────────────────────────────────────────────────┐
│  ┌──────────────────────┐   ██BEARING 1 TEMP██       │
│  │ TOOL # 1             │     AIR PRESSURE           │
│  │                      │     FEED LENGTH            │
│  └──────────────────────┘     MAT/L THICKNESS        │
│                               MOTOR CURRENT          │
│                               STRIPPER HEIGHT        │
│                               PART LENGTH            │
│                                                      │
│                                                      │
│     USE THE CURSOR KEYS                              │
│     TO CHOOSE AN INPUT.                              │
│     PRESS ENTER TO                                   │
│     PROGRAM. PRESS THE                               │
│     RESET KEY WHEN DONE                              │
│                                                      │
│                               SENSOR ▶  ┌──┐         │
│                               CAL.      │F6│         │
│                                         └──┘         │
└─────────────────────────────────────────────────────┘
```
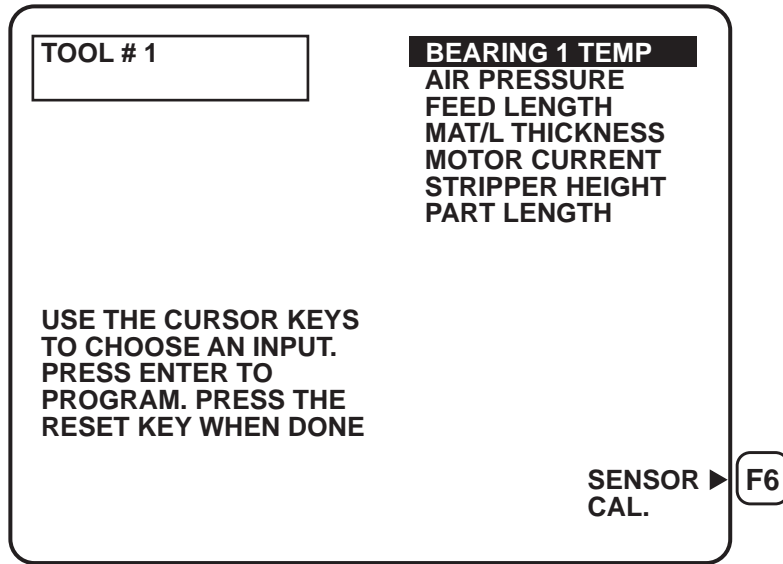
Figure 5-2. ProPAC Run Menu

The ProPAC Run menu shows a list of all the sensors programmed for use with the currently loaded tool. To look at the waveform of a sensor input, select the name of the sensor. The Input Waveform display appears, which looks similar to the following figure.
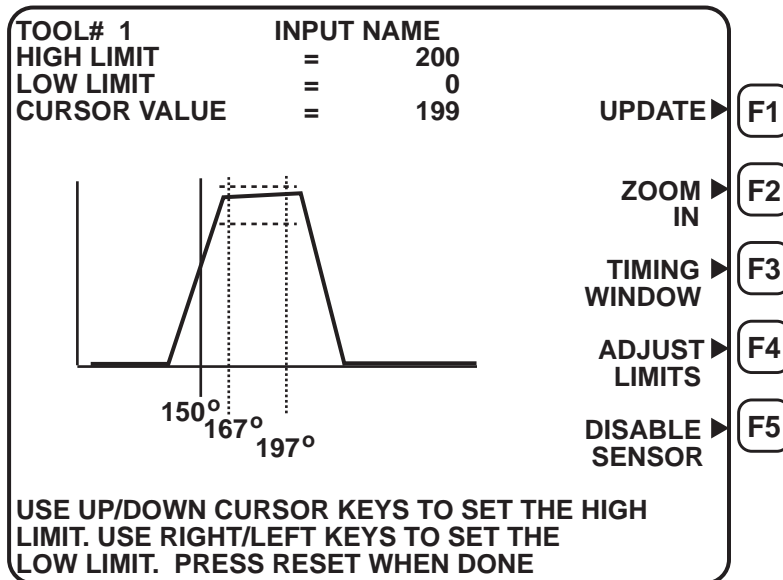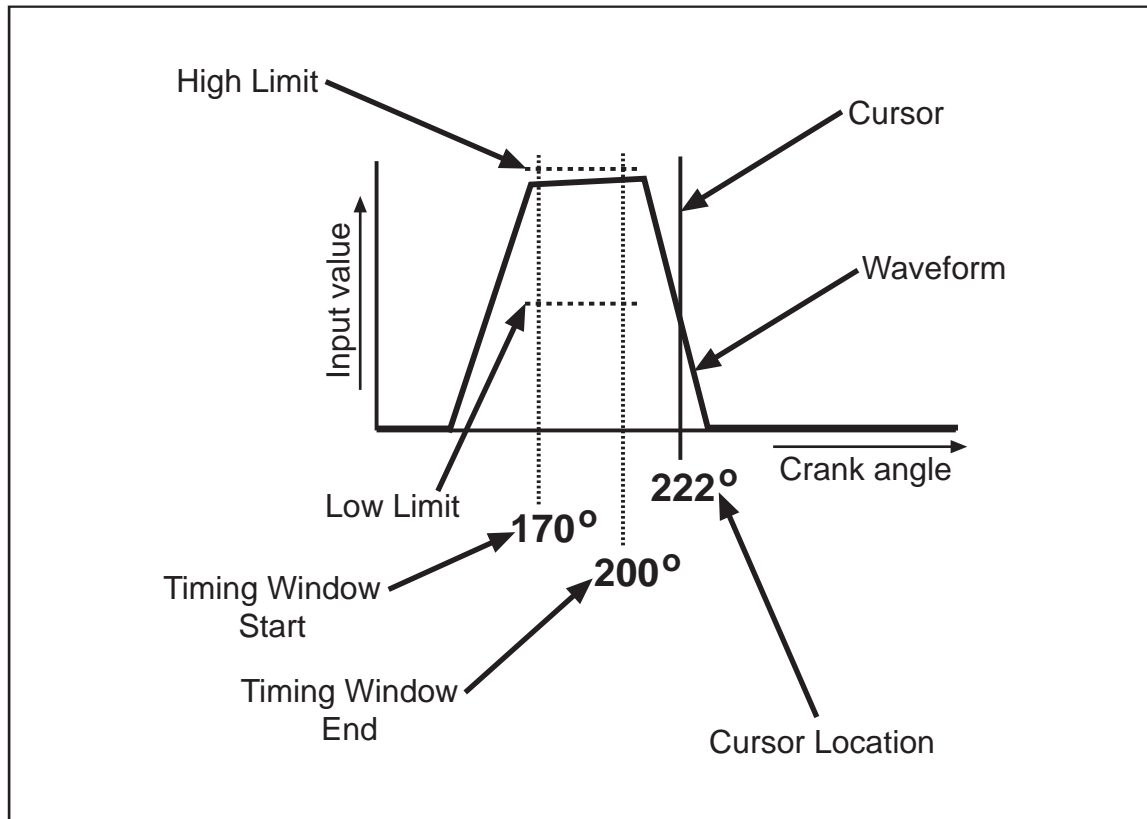
```
┌─────────────────────────────────────────────────────┐
│  TOOL#  1          INPUT NAME                        │
│  HIGH LIMIT        =        200                      │
│  LOW LIMIT         =          0                      │
│  CURSOR VALUE      =        199      UPDATE▶ ┌──┐    │
│                                              │F1│    │
│                                              └──┘    │
│                                       ZOOM ▶ ┌──┐    │
│                                         IN   │F2│    │
│                                              └──┘    │
│                                     TIMING ▶ ┌──┐    │
│                                     WINDOW   │F3│    │
│                                              └──┘    │
│                                     ADJUST ▶ ┌──┐    │
│                                     LIMITS   │F4│    │
│      150°                                    └──┘    │
│         167°                        DISABLE▶ ┌──┐    │
│            197°                     SENSOR   │F5│    │
│                                              └──┘    │
│  USE UP/DOWN CURSOR KEYS TO SET THE HIGH            │
│  LIMIT. USE RIGHT/LEFT KEYS TO SET THE              │
│  LOW LIMIT.  PRESS RESET WHEN DONE                  │
└─────────────────────────────────────────────────────┘
```

Figure 5-3. ProPAC Input Waveform Display

Understanding the Input Waveform

Figure 5-4. Input Waveform Display Detail

The waveform is a graph of the value of the sensor input (vertical axis) versus the crank angle of the press (horizontal axis).
The waveform display also shows

- **High and low limits**
- **Start and end angle of the timing window**
- **"Cursor"**—a vertical line that you can move to read the sensor input value at any point in the stroke. Use the right and left cursor keys to move the cursor.

You can adjust the limits and the timing window in Run mode by following the instructions in this chapter.

Updating the Input Waveform Display

To update the input waveform while the press is running, from the ProPAC Input Display screen, Figure 5-3, press F1. The following notice appears briefly before the updated input waveform appears.

```
Please wait . . .
Loading data
```

Figure 5-5. Updating Notice

Zooming the Input Waveform View

To zoom in for a closeup view of the waveform, press F2 to select "ZOOM IN." This expands the time scale of the display by a factor of two. See the following figure. To zoom back out, press F2 to select "ZOOM OUT."
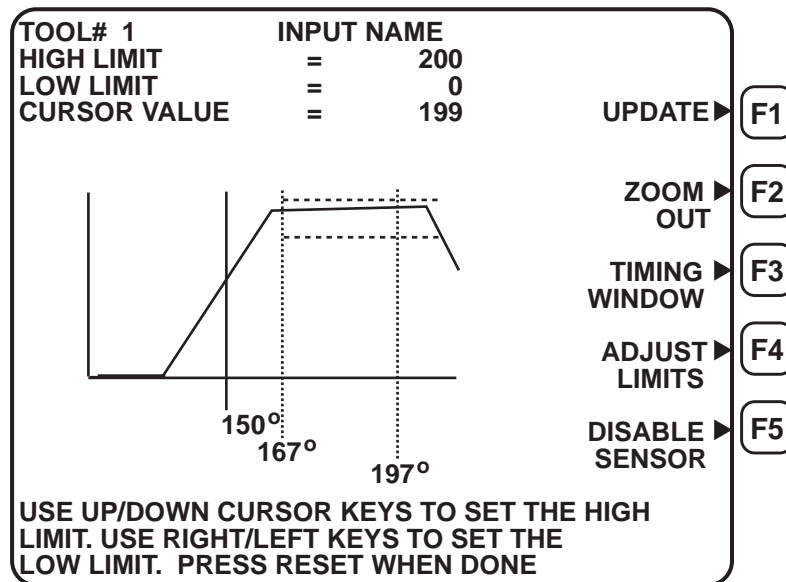
Figure 5-6. Input Waveform Display, Zoomed In

Adjusting the Timing Window in the Waveform Display

You can adjust the timing window for the input you are viewing.
Press F3 to select "TIMING WINDOW" (see Figure 5-3. ProPAC Input Waveform Display, page 68). The Adjust Timing Window display appears.


```
TOOL#  1              INPUT NAME
HIGH LIMIT        =        200
LOW LIMIT         =          0
CURSOR VALUE      =        199
```

167°
197°

```
USE UP/DOWN CURSOR KEYS TO SET WINDOW
START ANGLE. USE RIGHT/LEFT KEYS TO SET
END OF WINDOW.  PRESS RESET WHEN DONE.
```
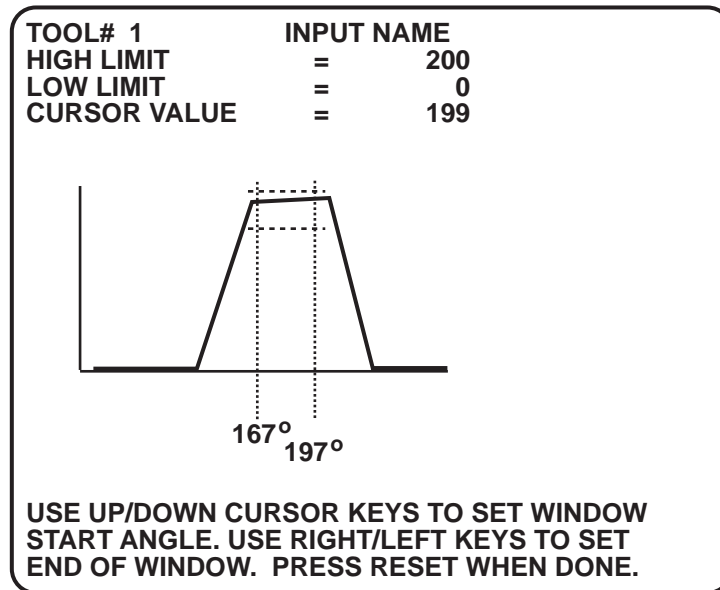
Figure 5-7. Adjust Timing Window

1. Adjust the window **start angle** with the up and down cursor keys.
2. Adjust the window **end angle** with the right and left cursor keys.
3. Press RESET when you are done. The Input Waveform Display reappears.

Adjusting Setpoint Limits in Waveform Display

You can adjust the setpoint limits for the input you are viewing.
Press F4 to select "ADJUST LIMITS" (see Figure 5-3. ProPAC Input Waveform Display, page 68). The Adjust Limits display appears.
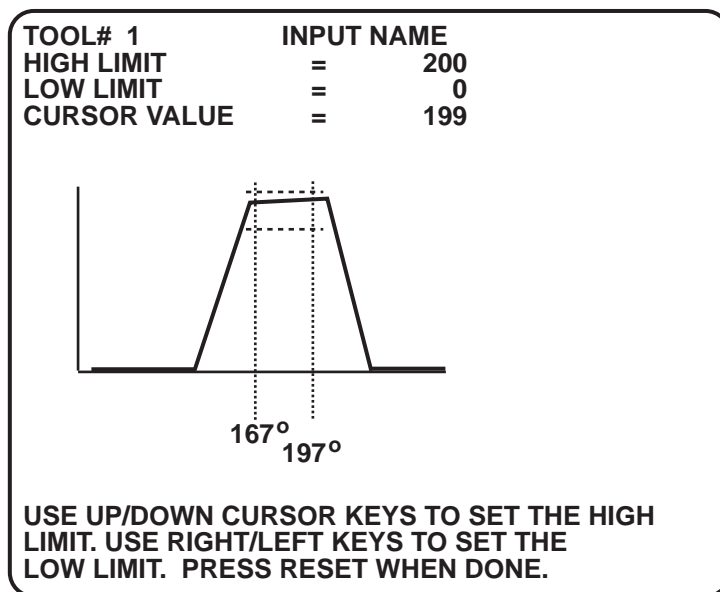
Figure 5-8. Adjust Limits

1. Adjust the **high limit** with the up and down cursor keys.
2. Adjust the **low limit** with the right and left cursor keys.
3. Press RESET when you are done. The Input Waveform Display reappears.

Enabling or Disabling a Sensor

If you want to disable or enable one sensor, you can do so in Run mode.
In the ProPAC Input Waveform display, press F5 to select "DISABLE SENSOR" or "ENABLE SENSOR" (see Figure 5-3. ProPAC Input Waveform Display, page 68). This enables or disables the sensor you have currently selected.

Note: *You can also disable or enable all the sensors at the same time in SmartPAC Run mode or Programming mode (see your SmartPAC manual).*

Calibrating a Sensor

To calibrate a sensor, go to the ProPAC Run menu as instructed at the beginning of this chapter.
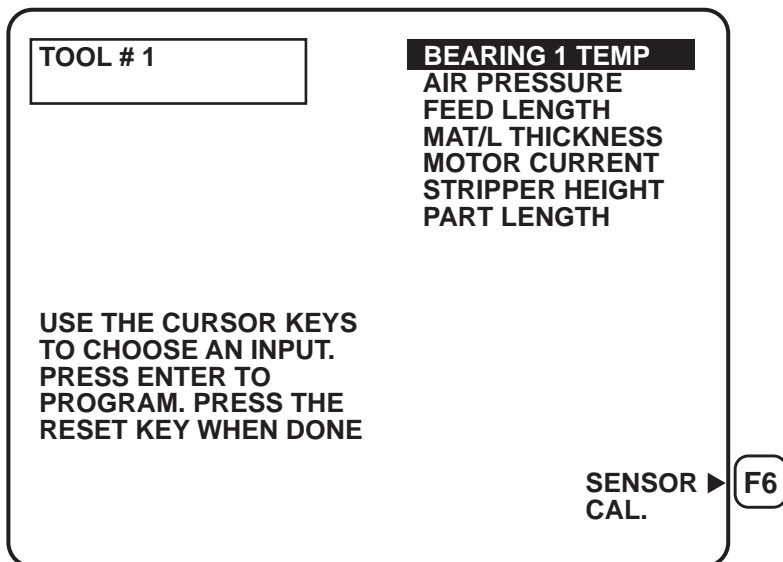
Figure 5-9. ProPAC Run Menu

Highlight the sensor that you want to calibrate. Press F6 to select "SENSOR CAL." The Calibration Screen for this sensor appears, showing a "live" picture of the sensor's reading, voltage output, highest and lowest reading, as well as the range and offset settings.
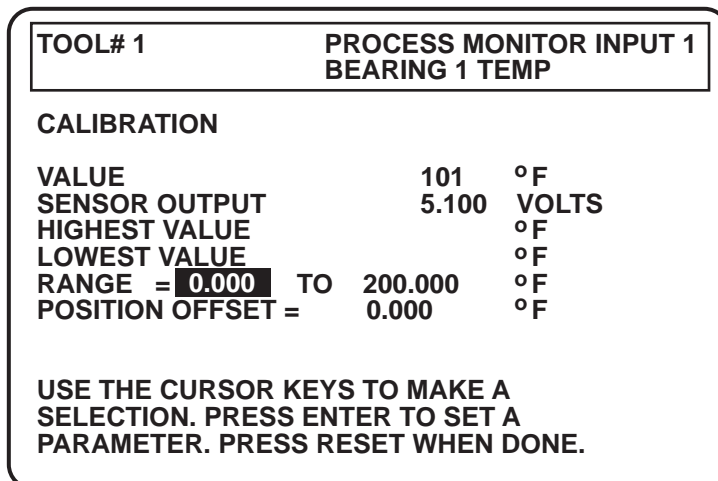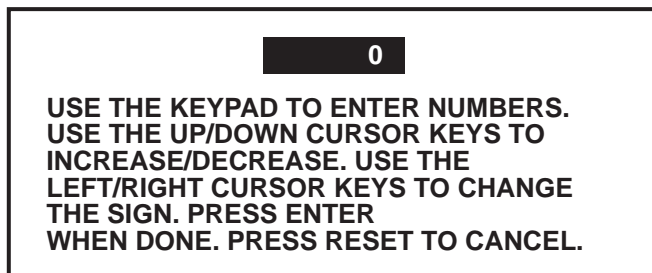

Figure 5-10. Sensor Calibration Screen

0

USE THE KEYPAD TO ENTER NUMBERS.
USE THE UP/DOWN CURSOR KEYS TO
INCREASE/DECREASE. USE THE
LEFT/RIGHT CURSOR KEYS TO CHANGE
THE SIGN. PRESS ENTER
WHEN DONE. PRESS RESET TO CANCEL.

Figure 5-11. Enter Value for Range or Offset

Wintriss Manuals

Wintriss Product	Installation Manual Doc. No.	User Manual/CD Doc. No.
AutoSet (1500, 1500 Plus, 1504, 1504 Plus)	DA71747	DA71447
AutoSetPAC (Tonnage Monitor)	DA71413	DA71443
Die Protection Handbook	N.A. *	1130300 *
DiPro 1500	DA71428	DA71447
DSI 2 Sensor Interface	N.A. *	DA66970 *
LETS Machine Interface (LMI)	N.A. **	DA71974 **
MultiPAC Types 1 and 2	DA71409	DA71443
MultiPAC Types 4 and 5	DA71410	DA71443
ProCam 1500	DA71430	DA71447
ProPAC (Process Monitor – In-die Measurement)	DA71411	DA71443
RamPAC (Shut Height, Counterbalance & Cushion Control)	DA71412	DA71443
Servofeed Interface – Coe/Wintriss	DA71415	DA71443
Servofeed Interface – CWP/Wintriss	DA71416	DA71443
Servofeed Interface – DiPro 1500	DA71429	DA71447
Servofeed Interface – Electrocraft/Wintriss	DA71417	DA71443
Servofeed Interface – Indramat/Wintriss	DA71418	DA71443
Servofeed Interface – ProCam	DA71431	DA71447
Servofeed Interface – SmartPAC	DA71420	DA71443
Servofeed Interface – Waddington/Wintriss	DA71419	DA71443
SFC Machine Interface (SMI)	N.A. **	1140800 **
Shadow V Safety Light Curtain	DA71433	DA71449
Shadow VI Safety Light Curtain	DA71422	DA71445
Shadow VII Safety Light Curtain	N. A. *	1129400 *
Shadow 8 Safety Light Curtain	N. A. *	1139300 *
SmartPAC (w/ DiProPAC & ProCamPAC)	DA71439	DA71454
SmartPAC Hydraulic	DA71435	DA71451
SmartPAC Run Mode (Spanish)	N. A. *	DA71443
SmartPAC w/ WPC II Integration	DA71440	DA71455
SmartPAC 2 (w/ DiProPAC & ProCamPAC)	DA71406	DA71441
SmartPAC 2 Hydraulic	DA71436	DA71451
SmartPAC 2 Servo	DA71437	DA71452
SmartPAC 2 w/ WPC 2000 Integration	DA71407	DA71442
SmartPAC 2 w/WPC 2000 Run Mode (Spanish)	N. A. *	DA71443
WaveFormPAC (Advanced Load Analyzer)	DA71414	DA71443
Wintriss Brake Monitor	DA71432	DA71448
Wintriss Clock Display	N. A. *	DA67206 *
WPC II Wintriss Press Control	DA71438	DA71453
WPC 1000 Wintriss Press Control	DA71423	DA71446
WPC 2000 Wintriss Press Control	DA71421	DA71444
WPC 2000 Option 2	DA71408	DA71442

* Installation Manual not available; User Manual available in hard copy only. Die Protection Handbook available in hard copy (1102400) and on CD (1130300).
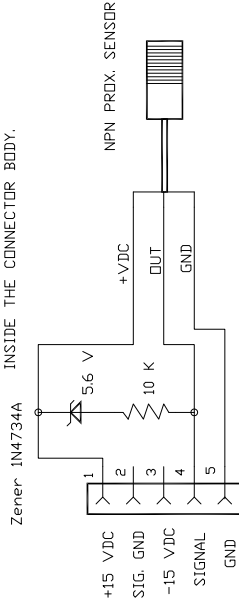
** Installation Manual not available. User Manual available for downloading.

FIGURE 1 — ProPAC ON/OFF SENSORS WIRED TO PDP CONNECTORS

REVISIONS

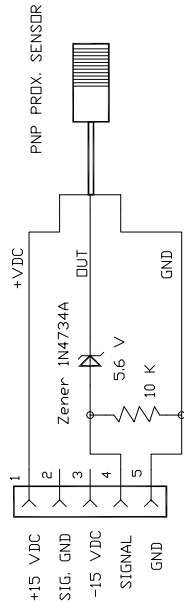| REV	DESCRIPTION	DATE	APP'D

NOTE: THE MAXIMUM INPUT VOLTAGE FOR ANY PROPAC INPUT IS 10 VDC. SINCE +15 VDC IS PROVIDED THEN WE MUST REDUCE THIS VOLTAGE TO THE INPUT BY USING A 5.6 VOLT ZENER DIODE.

NPN PROX. SENSOR
+VDC
OUT
GND
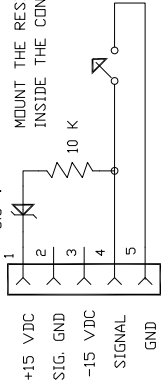Zener 1N4734A 5.6 V 10 K

MOUNT THE RESISTOR AND ZENER INSIDE THE CONNECTOR BODY.

TYPICAL FOR NPN DISCRETE SENSORS WITH SINGLE POWER SUPPLY, SINGLE GROUND AND SIGNAL OUTPUT.
PROGRAM AS NPN TYPE.

+15 VDC
SIG. GND
-15 VDC
SIGNAL
GND

Zener 1N4734A 5.6 V 10 K

MOUNT THE RESISTOR AND ZENER INSIDE THE CONNECTOR BODY.

USE THIS FOR UNSWITCHED PROBES. THESE PROBES ARE GROUNDED BY THE PART OR THE PRESS FRAME.
PROGRAM AS NPN TYPE.

+15 VDC
SIG. GND
-15 VDC
SIGNAL
GND

PNP PROX. SENSOR
+VDC
OUT
GND
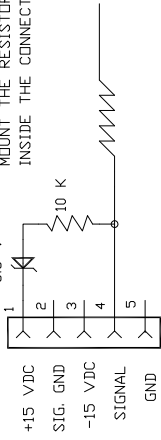Zener 1N4734A 5.6 V 10 K

MOUNT THE RESISTOR AND ZENER INSIDE THE CONNECTOR BODY.

TYPICAL FOR PNP DISCRETE SENSORS WITH SINGLE POWER SUPPLY, SINGLE GROUND AND SIGNAL OUTPUT.
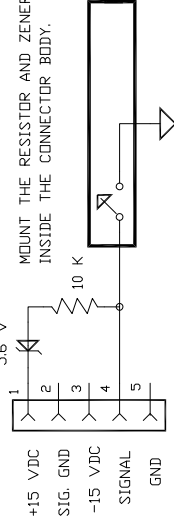PROGRAM AS PNP TYPE.

+15 VDC
SIG. GND
-15 VDC
SIGNAL
GND

Zener 1N4734A 5.6 V 10 K

MOUNT THE RESISTOR AND ZENER INSIDE THE CONNECTOR BODY.

TYPICAL FOR SENSORS WITH MECHANICALLY SWITCHED OUTPUTS.
PROGRAM AS NPN TYPE.

+15 VDC
SIG. GND
-15 VDC
SIGNAL
GND

Zener 1N4734A 5.6 V 10 K

MOUNT THE RESISTOR AND ZENER INSIDE THE CONNECTOR BODY.
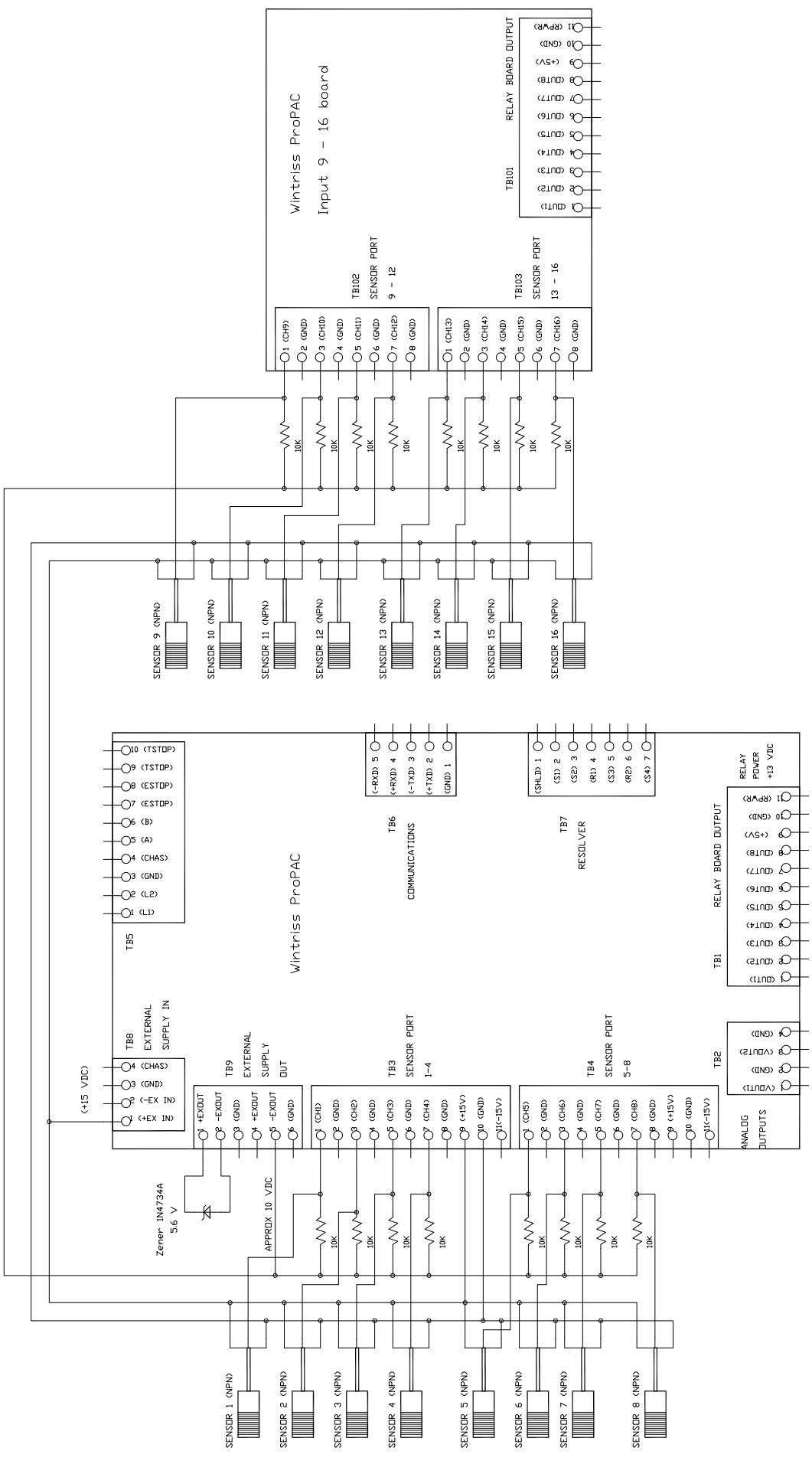
TYPICAL FOR SWITCHED PROBES. WHEN THESE PROBES TURN ON THE OUTPUT IS SWITCHED TO GROUND THROUGH THE PROBE BODY.
PROGRAM AS NPN TYPE.

WINTRISS CONTROLS GROUP

TITLE: ProPAC ON/OFF SENSORS WIRED TO PDP CONNECTORS

DRAWN	ADB	DATE	6/11/10
CHK.			
APPROVALS			
ENG.			
MFG.			
FILENAME			
REL			

CODE IDENT NO. | SIZE B | DRAWING NUMBER | REV
FIGURE 1
SCALE | SHEET | OF

WINTRISS CONTROLS GROUP

TITLE: ProPAC NPN SENSORS WIRED DIRECT TO INPUT CONNECTORS

DRAWING NUMBER: FIGURE 2

SIZE: C

DATE: 6/11/10

DRAWN: ADB

PROPRIETARY RIGHTS. This document discloses subject matter in which Wintriss Controls Group has proprietary rights. Neither receipt nor possession thereof confers or transfers any right to reproduce or disclose the document, any part thereof, any information contained therein or any physical article or device or to practice any method or process, except by written permission or written agreement with Wintriss Controls Group.

THE BLACK BAND ON THE ZENER DIODE GOES TOWARD THE +15 VDC CONNECTION.

THE ZENER DIODE DROPS THE +15 VDC DOWN TO APPROX. 10 VDC. THIS IS THEN USED TO CONNECT THE 10K PULL UP RESISTORS.
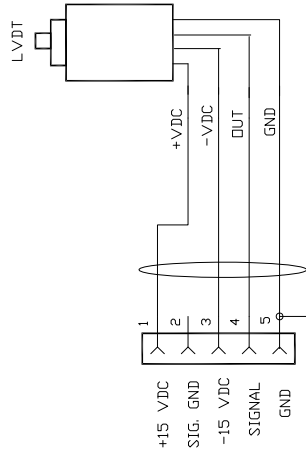
Wintriss ProPAC
Input 9 - 16 board
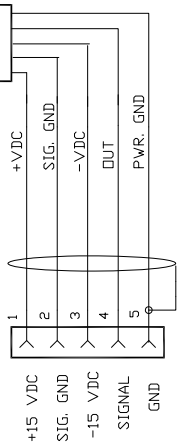
Zener 1N4734A
5.6 V

APPROX 10 VDC

REVISIONS

REV	DESCRIPTION	DATE	APP'D

TYPICAL FOR ANALOG SENSORS WITH DUAL
POWER SUPPLIES, SINGLE GROUND AND
SIGNAL OUTPUT.

LVDT

+VDC
-VDC
OUT
GND

1 +15 VDC
2 SIG. GND
3 -15 VDC
4 SIGNAL
5 GND

TYPICAL FOR ANALOG SENSORS WITH SINGLE
POWER SUPPLY, SINGLE GROUND AND
SIGNAL OUTPUT.

SA Pressure Transducer
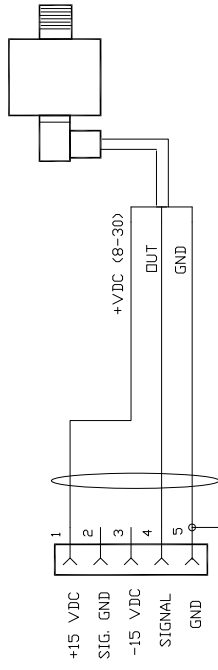
+VDC (8-30)
OUT
GND

1 +15 VDC
2 SIG. GND
3 -15 VDC
4 SIGNAL
5 GND

LVDT

+VDC
SIG. GND
-VDC
OUT
PWR. GND

1 +15 VDC
2 SIG. GND
3 -15 VDC
4 SIGNAL
5 GND

TYPICAL FOR ANALOG SENSORS WITH DUAL
POWER SUPPLIES, POWER GROUND,
SIGNAL GROUND AND SIGNAL OUTPUT.

WINTRISS CONTROLS GROUP

TITLE
ProPAC ANALOG SENSORS WIRED
TO PDP CONNECTORS

DRAWN	ADB	DATE 6/11/10
CHK.		
APPROVALS		
ENG.		
MFG.		

CODE IDENT NO.	SIZE B	DRAWING NUMBER FIGURE 3	REV
FILENAME			
REL			
SCALE		SHEET OF	

REVISIONS

REV	DESCRIPTION	DATE	APPD

SHOWN FOR CCV ROTATION FACING SHAFT.
FOR CCV ROTATION SWAP THE BLACK
AND YELLOW WIRES AT SMARTPAC AND
THE BLACK AND WHITE AT THE PROPAC

RESOLVER CABLE

BRN ORG YEL RED GRN BLK SHIELD

CONNECT SHIELDS TO THE ENCLOSURE
AT THE CONDUIT ENTRY POINT

TO BSV ON SIGNAL
TO ESTOP CIRCUIT
TO TSTOP CIRCUIT

Wintriss SmartPAC

MAIN POWER CONNECTOR TB01
211 (Zero)
210 (TSTOP)
209 (TSTOP)
208 (ESTOP)
207 (ESTOP)
206 (B)
205 (A)
204 (Chas)
203 (Grd)
202 (L2)
201 (L1)

GND
L2 (NEU)
L1 (120VAC)

WPC PORT TB04
223 (P-P)
222 (-TXD)
221 (+TXD)
220 (-RXD)
219 (+RXD)

RESOLVER PORT TB06
218 (S4)
217 (R2)
216 (S3)
215 (S2)
214 (S1)
213 (R1)
212 (PNS)

POSITION SENSOR TB07
247 (Grd)
246 (Pos)
245 (+V)

MODULE PORT
244 (-TXD2)
243 (+TXD2)
242 (-RXD2)
241 (+RXD2)
240 (Grd)

SFI PORT TB02
239 (-TXD1)
238 (+TXD1)
237 (TXD)
236 (-RXD1)
235 (RXD1)
234 (-TXD1)
233 (+TXD1)

CPR PORT TB03
232 (-RXD1)
231 (+RXD1)
230 (-TXD1)
229 (Grd)
228 (-TXD3)
227 (+TXD1)
226 (TXD3)
225 (-TXD3)
224 (-RXD3)

SPARE PORT TB01
252 (GRD)
251 (CONT)
250 (S.S.)
249 (INCH/SETUP)
248 (OFF)

TB03
258 (GRD)
257 (REMOTE RES.)

TB02
256 (GRD)
255 (LOCKOUT)
254 (OP STA 2)
253 (OP STA 1)

CONNECT SHIELDS TO THE ENCLOSURE
AT THE CONDUIT ENTRY POINT

WINTRISS ProPAC

TB5
10 (TSTOP)
9 (TSTOP)
8 (ESTOP)
7 (ESTOP)
6 (B)
5 (A)
4 (CHAS)
3 (GND)
2 (L2)
1 (L1)

GND
L2 (NEU)
L1 (120VAC)

TB6 COMMUNICATIONS
(-RXD) 5
(+RXD) 4
(-TXD) 3
(+TXD) 2
(GND) 1
GRN WHT BLK RED

TB7 RESOLVER
(SHLD) 1
(S) 2
(S) 3
(R) 4
(S) 5
(R) 6
(S) 7
BLK GRN RED WHT

TB8 EXTERNAL SUPPLY IN
4 (CHAS)
3 (GND)
6 (-EX IN)
5 (+EX IN)

TB9 EXTERNAL SUPPLY OUT
+EXOUT
GND
+EXOUT
GND

TB3 SENSOR PORT 1-4
GND
GND
GND
GND
+15V
GND

TB4 SENSOR PORT 5-8
GND
GND
GND
GND
+15V
GND

TB1 RELAY BOARD OUTPUT
RELAY POWER +13 VDC
(RP/AV)
(GND)
(+5V)
OUT8
OUT7
OUT6
OUT5
OUT4
OUT3
OUT2
OUT1

TB2 ANALOG OUTPUTS
(GND)
(VOUT2)
(GND)
(VOUT1)

CONNECT SHIELDS TO THE ENCLOSURE
AT THE CONDUIT ENTRY POINT

WINTRISS CONTROLS GROUP

TITLE ProPAC/SMARTPAC 2 INTERCONNECTION WIRING DIAGRAM

DRAWING NUMBER FIGURE 5

SIZE D

REV

SCALE SHEET OF

FIGURE 6

Figure 7 — ProPAC WITH PSI, PDP, AND OPTIONAL OUTPUT ASSEMBLY WIRING DIAGRAM

AN 8 SENSOR CONNECTION MODULE IS SHOWN BUT A 4 SENSOR MODULE CAN BE USED.

ALL MODULES HAVE THE SAME 19 PIN CONNECTOR SO THAT THE MODULE SIZE CAN VARY ACCORDING TO THE NEEDS OF EACH TOOL.

THIS PDP CONNECTOR IS MOUNTED ON THE BOTTOM OF THE PROPAC ENCLOSURE. PART #9645903 ONLY.

SEE PROPAC / SMARTPAC INTERCONNECT DRAWING

WINTRISS ProPAC

PDP CABLE

PDP - DIE MOUNTED BOX

TURCK VB 805-CS

1 - +V
2 - SIGNAL GND
3 - -V
4 - SIGNAL
5 - GND

RELAY BOARD OUTPUT

OPTIONAL OUTPUT ASSEMBLY

8 CHANNEL CAM I/O ASSEMBLY

ANALOG OUTPUTS

AN 8 SENSOR CONNECTION MODULE IS SHOWN BUT
A 4 SENSOR MODULE CAN BE USED.

ALL MODULES HAVE THE SAME 19 PIN CONNECTOR
SO THAT THE MODULE SIZE CAN VARY ACCORDING
TO THE NEEDS OF EACH TOOL.

Wintriss ProPAC
Input 9 - 16 board

RELAY BOARD OUTPUT

TB101
TB102   SENSOR PORT 9 - 12
TB103   SENSOR PORT 13 - 16

CONNECT TO GROUND LUG

PSI - PRESS MOUNTED JUNCTION BOX

PDP CABLE

PDP - DIE MOUNTED JUNCTION BOX

TURCK VB 80.5-CS

1 - +V
2 - SIGNAL GND
3 - -V
4 - SIGNAL
5 - GND

OPTIONAL OUTPUT ASSEMBLY

8 CHANNEL CAM I/O ASSEMBLY

CONNECT TO GROUND LUG