CHAPTER 2

MACHINE DESCRIPTION

2.1 GENERAL MACHINE SPECIFICATIONS

Figure 2-1 lists complete general specifications for the 7900 Series models. Please note that these specifications are subject to change without any prior notice.

2.2 OVERALL MACHINE DIMENSIONS

Figure 2-2 shows the basic overall dimensions of the 7900 Series machines. Also shown are the location of the electrical and compressed air supply connections to the machine.

FIGURE 2-1

GENERAL MACHINE SPECIFICATIONS

DESCRIPTION	MODEL 7952	MODEL 7960
Belt Width	56 inches (142 cm)	64 inches (163 cm)
Heater Configuration	12 primary heaters and 2 auxillary heaters Arranged in (2) Zones	
Supply Voltage	208/220 vac, 50/60 Cycles, 3 Phase or 380 vac, 50 Cycles, 3 Phase	
Connected Load	63 amps @ 208/220 vac 39 amps @ 380 vac	71 amps @ 208/220 vac 43 amps @ 380 vac
Suggested Disconnect Size	100 amps @ 208/220 vac 60 amps @ 380vac	
Maximum Belt Speed	6 Feet Per Minute (1.83 Meters Per Minute)	
Tracking System	Automatic photo-electric with safety over-travel switches (operated with compressed air)	
Total Shipping Weight (Export Crated)	1000 Pounds	1200 Pounds
Maximum Recommended Operating Temperature	450 Degrees F (232 Degrees C)	
Compressed Air Requirement	1 CFM @ 80-100 PSI	
Belt Drive System	Variable Speed DC Motor with Solid State Speed Control	

CHAPTER 3

INSTALLATION INSTRUCTIONS

3.1 SETTING UP THE MACHINE

Once the machine has been received, find a suitable location which will allow enough room for servicing the machine from either side as well as room for changing rolls for the unwinds and rewinds. The machine should also be located where there are no noticeable drafts which can affect its proper operation.

Remove the machine from the shipping crate and layout all the individual parts and assemblies. Refer to Figure 3-1 for identification of all shipping items.

Inspect all items and make note of any damage as described in section 1.3.

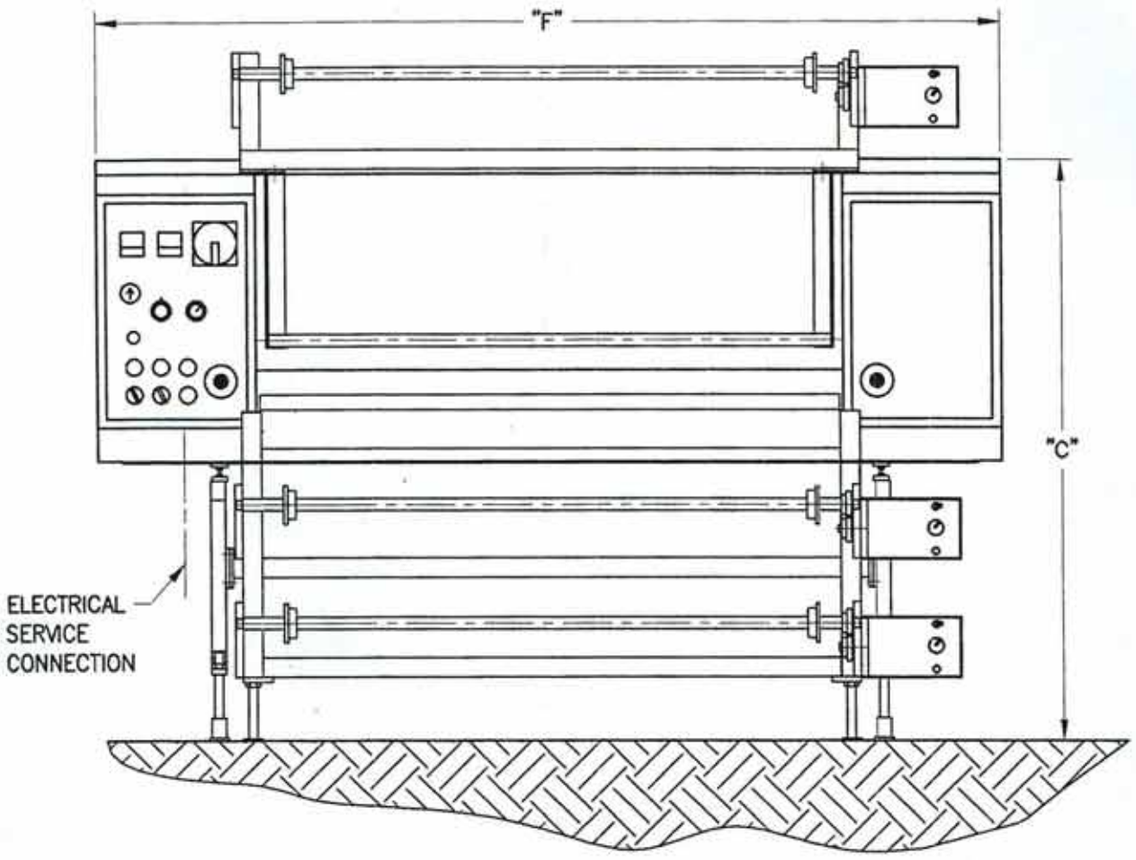
To complete the setup and installation of your printer, follow these steps:

1. Assemble the Printer Stand and place in the position where the machine is to be located. Please note that the side of the stand with the air line installed to the crossbrace should be located on the machine's exit (or rear) side. Also, the side of the stand with the air line installed to the sidebrace must be located on the machine's right side (when viewing the front of the machine). See Figure 3-2.

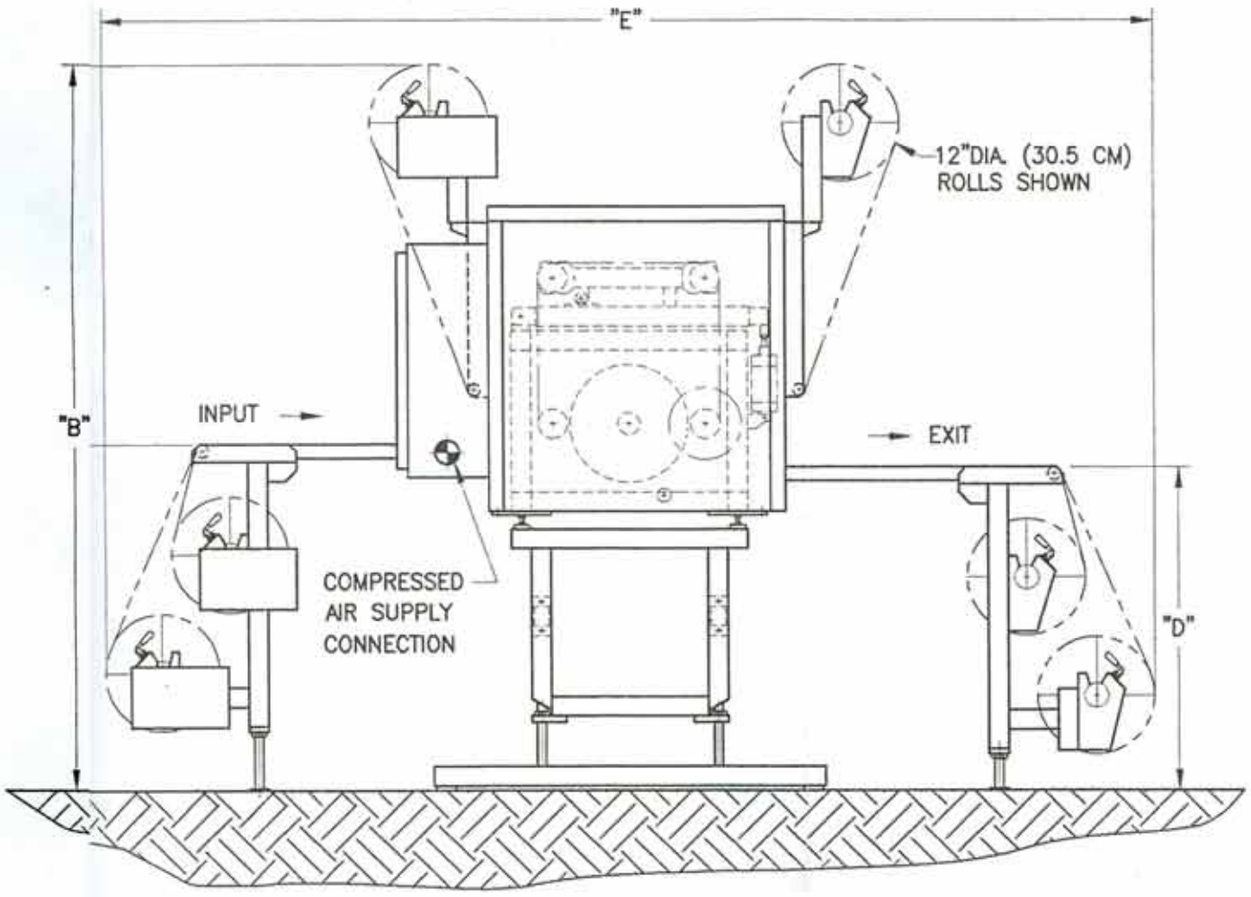
2. Lift the machine and place it on the stand. Refer to Figure 3-3 for location and identification of lifting points.

3. Level the machine. This can be accomplished using the adjustable feet on the stand or those on the machine.

4. Install the Exit Table by connecting the table to the threaded rods of the machine frame. Adjust the height so that the stainless steel stripper blade is located 1/8" to 3/16" from the drum surface. Note: for best operation, the blade should be adjusted as low as possible. See Figure 3-4.



INPUT SIDE



RIGHT SIDE

MODEL	"A" INCH	"A" CM	"B" INCH	"B" CM	"C" INCH	"C" CM	* INCH	* CM	"E" INCH	"E" CM	"F" INCH	"F" CM
7960	34	86	73	185	59	150	3[illegible]	81	92	234	101	257
7952	34	86	73	185	59	150	3[illegible]	81	92	234	93	236

NOTE: ALL HEIGHT DIMENSIONS (A,B,C,D) ARE ADJUSTABLE ± 2" (5 CM).

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TITLE: FIGURE 2-2
MACHINE DIMENSIONAL OUTLINE

PROJECT: 7900 SERIES

DRAWN: IZADI	DATE: 9/20/96	DWG. NO.	REV: A
CHECKED	SCALE		

FILE = 0042290A

3.1 SETTING UP THE MACHINE (continued)

5. Install the Input Table by connecting the table to the threaded rods of the machine frame. Adjust the height so that the stainless steel stripper blade is located 1/8" to 3/16" from the drum surface. Note: for best operation, the blade should be adjusted as high into the pinch point of the drum and blanket (or belt) as possible. See Figure 3-4.

6. Install the Exit Table Legs (with the Rewind units). Attach legs using the hardware provided. See Figure 3-5.

7. Install the Input Table Legs (with the Unwind units). Attach legs using the hardware provided. See Figure 3-5.

8. Install the Upper Rewind Assembly onto the support brackets using the hardware provided. See Figure 3-5.

9. Install the Upper Unwind Assembly onto the support brackets using the hardware provided. See Figure 3-5.

10. Plug the two twist-lock electrical plugs for the rewind units into the two receptacles located on the left rear cover of the machine. See Figure 3-6.

11. Connect all unattached air lines using plug-in connections provided. See Figure 3-6.

12. Check all electrical and pneumatic connections for security.

13. Connect electrical service and air supply lines to the machine.

IMPORTANT !

THE COMPRESSED AIR PRESSURE REQUIRED FOR PROCESS APPLICATIONS IS ADJUSTED BY THE AIR PRESSURE REGULATOR ON THE MACHINE'S OPERATOR CONTROL PANEL. SEE CHAPTER 4.

THE COMPRESSED AIR SETTING FOR PROCESS APPLICATIONS (AS WELL AS THE SUPPLY REGULATOR) SHOULD BE MONITORED WITH RESPECT TO CHANGES IN DEMAND DUE TO COMPRESSED AIR USAGE BY OTHER EQUIPMENT OR MACHINERY IN THE FACILITY.

3.1 SETTING UP THE MACHINE (continued)

THE ASTEX MODEL 7900 SERIES ROTARY TRANSFER PRINTER FEATURES A LOW AIR PRESSURE SAFETY SHUT-OFF DEVICE THAT WILL SHUT THE MACHINE DOWN WHEN THE COMPRESSED AIR SUPPLY IS LESS THAN 60 PSIG THUS PREVENTING DAMAGE OR IMPROPER MACHINE OPERATION.

3.2 MAKING ELECTRICAL CONNECTIONS

WARNING!

THE ASTEX MODEL 7900 SERIES OPERATES ON AN ELECTRICAL SUPPLY VOLTAGE WHICH CAN SEVERELY INJURE OR EVEN KILL. ALWAYS DISCONNECT THE ELECTRICAL SUPPLY TO THE MACHINE BEFORE REMOVING ANY COVERS OR ATTEMPTING TO SERVICE OR ADJUST THE MACHINE. SERVICING OF THIS MACHINE SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL.

Electrical connections should be made to the supply terminals located in the electrical controls enclosure. The machine must be directly hard wired to the electrical power source. IN ALL CASES, THE MACHINE MUST BE CONNECTED EITHER TO A CIRCUIT BREAKER OF PROPER SIZE OR A FUSED DISCONNECT SWITCH CONTAINING FUSES OF THE PROPER SIZE. A PLUG AND RECEPTACLE IS NOT AN ADEQUATE FORM OF ELECTRICAL DISCONNECTION ACCORDING TO CURRENT ELECTRICAL CODES.

Refer to the serial number plate located on the machine for the correct supply voltage required to power the machine. The specifications found in Figure 2-1 will indicate the proper size electrical service required for 208/220 Volt and 380 Volt supply voltages. Consult our Parts and Service Department for information regarding other supply voltages.

Also note that the circuit breaker box or disconnect box should be located no further than 20 feet from the machine.

3.2 MAKING ELECTRICAL CONNECTIONS (continued)

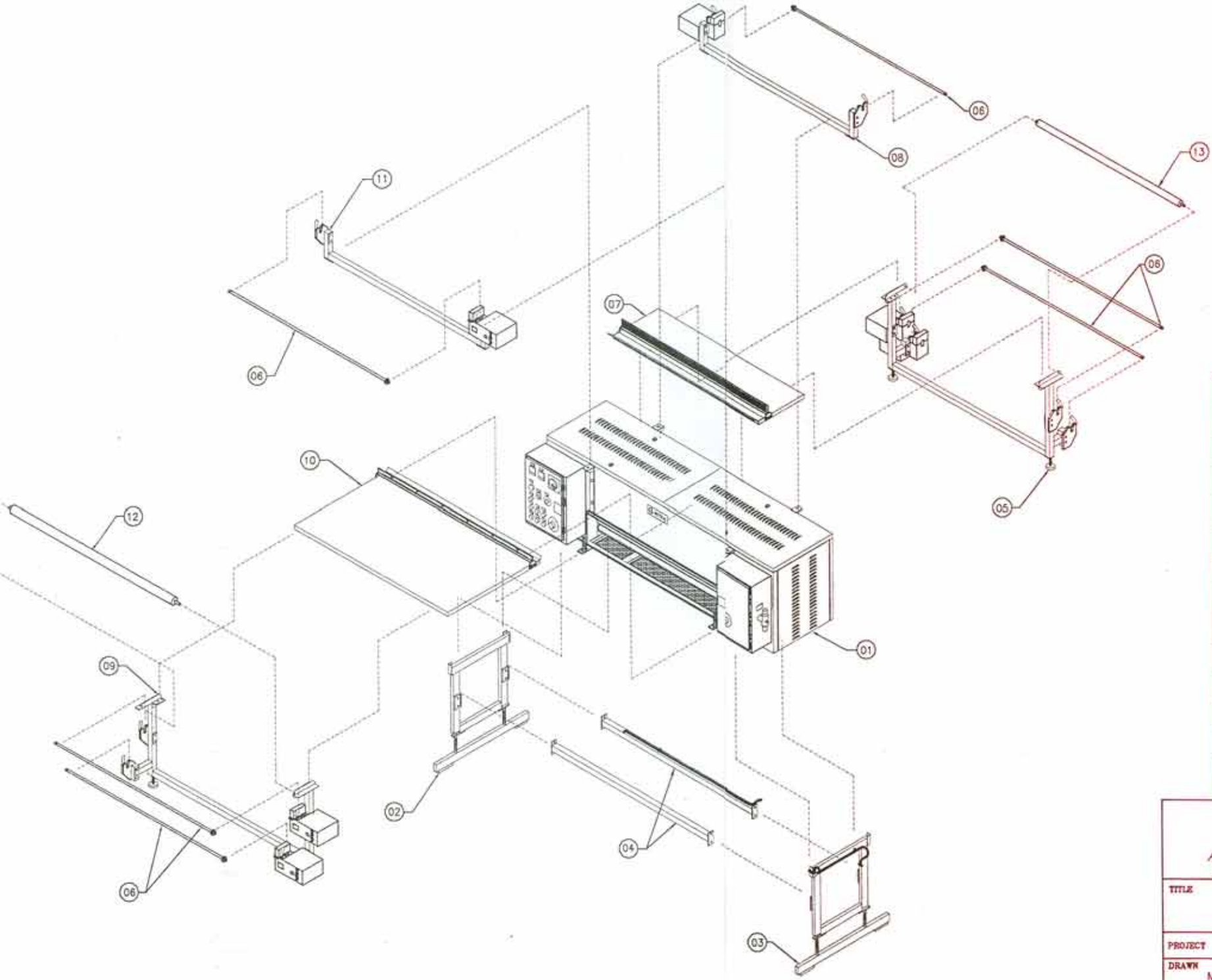
YOU MUST ALSO BE CERTAIN THAT A PROPER GROUND CONNECTION IS MADE FROM THE MACHINE'S POWER CORD THROUGH PLUGS AND RECEPTACLES TO THE CIRCUIT BREAKER OR DISCONNECT BOX.

Once you have completed the installation of your machine, carefully read the following sections of this manual before attempting to turn the power to the machine on.

Initially, run the machine with the heat off to verify the blanket (or belt) is tracking properly. If tracking adjustments are required, refer to section 5.2 for instructions.

3.3 THREADING CONFIGURATION

Depending on your production application, the method of threading the printer will vary. If a "roll to roll" application is required, refer to Figure 3-7 for the recommended threading configuration. If a "cut parts" application is preferred, see Figure 3-8 for the recommended threading configuration.



ITEM NO.	QTY	SHIPPING ITEMS
13	01	EXIT, IDLER ROLLER
12	01	INPUT, IDLER ROLLER
11	01	UNWIND ASSEMBLY,TOP
10	01	INPUT TABLE/GUARD
09	01	UNWIND ASSEMBLY
08	01	REWIND ASSEMBLY,TOP
07	01	EXIT TABLE/GUARD
06	06	UNWIND/REWIND SHAFT
05	01	REWIND ASSEMBLY
04	02	CROSS BRACE
03	01	STAND, RH
02	01	STAND, LH
01	01	HEAT TRANSFER PRINTER

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TITLE: FIGURE 3-1
SHIPPING ITEMS

PROJECT: 7900 SERIES

DRAWN	DATE	DWG. NO.	REV
MJM	8/8/97		A
CHECKED	SCALE: NONE		

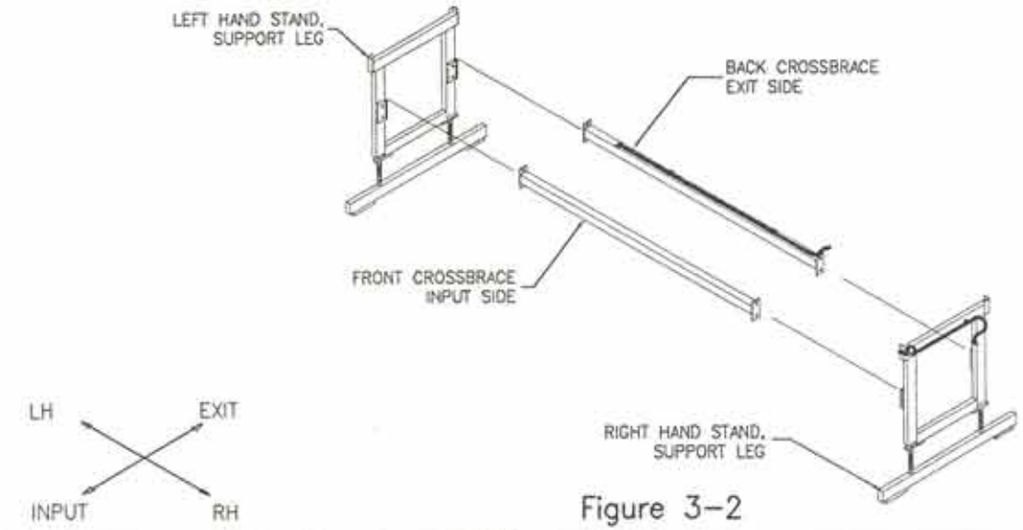
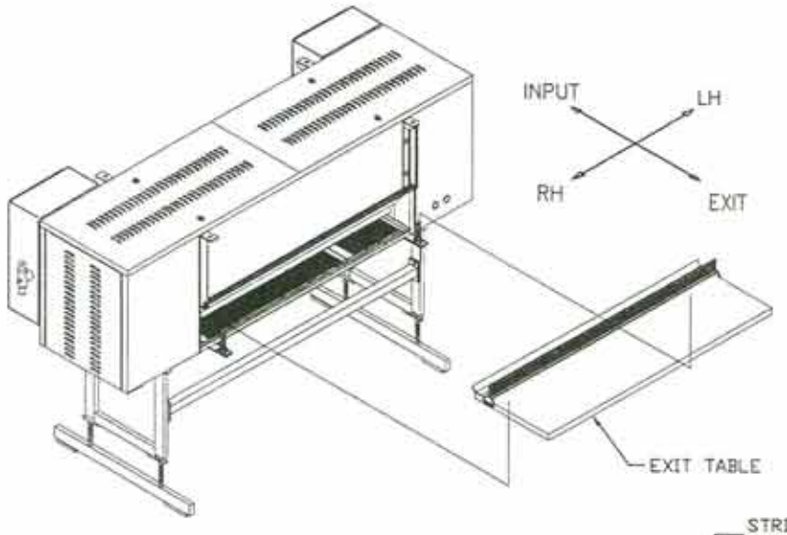
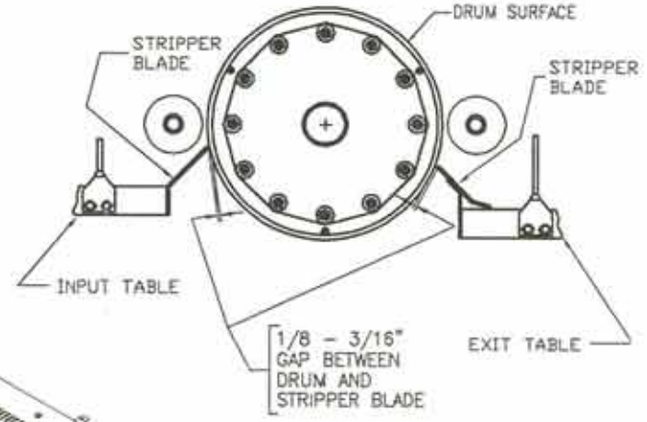


Figure 3-2



Exit View



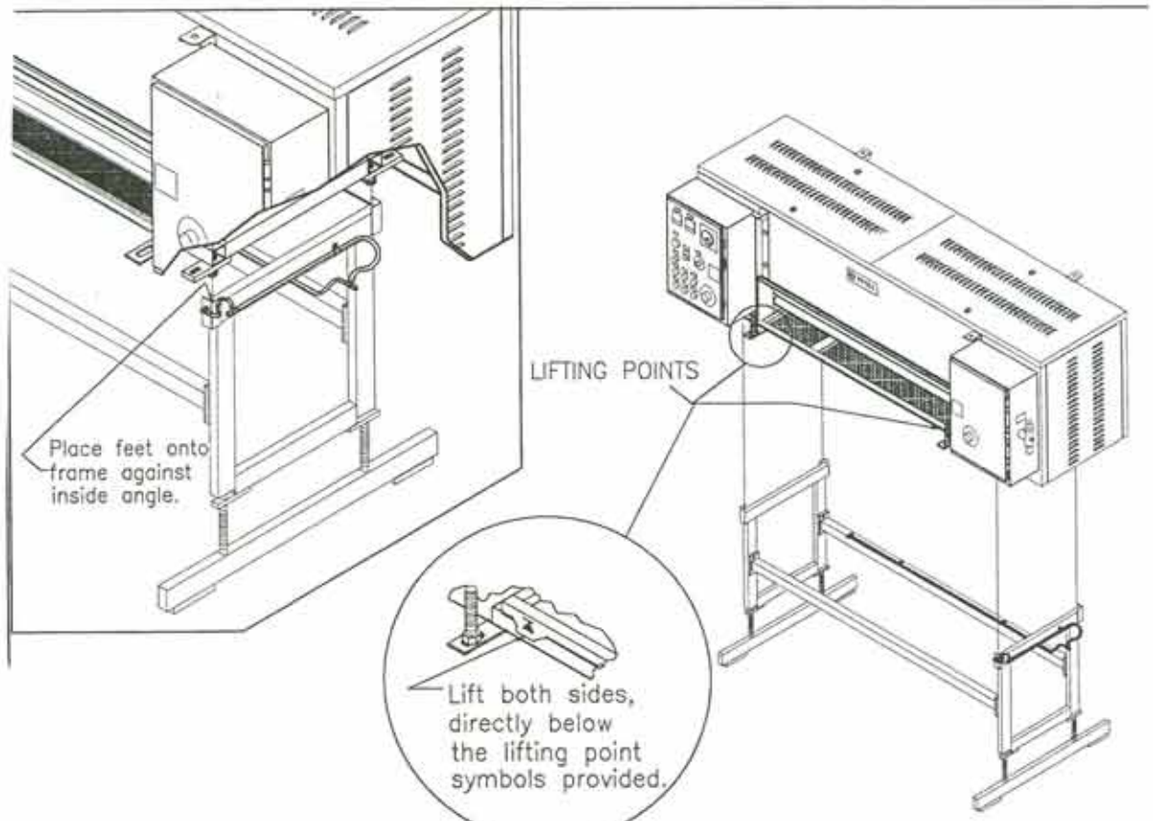
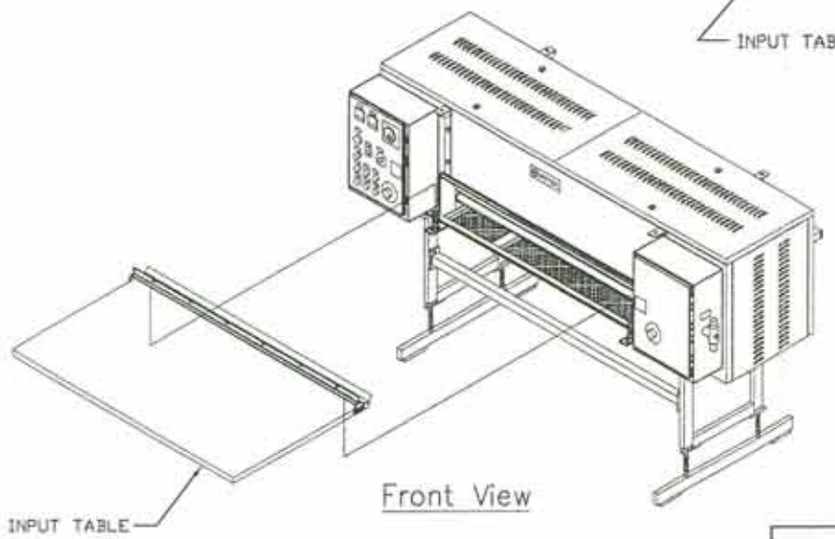
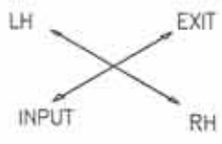


Figure 3-3



Front View

Figure 3-4



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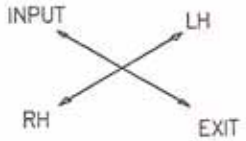
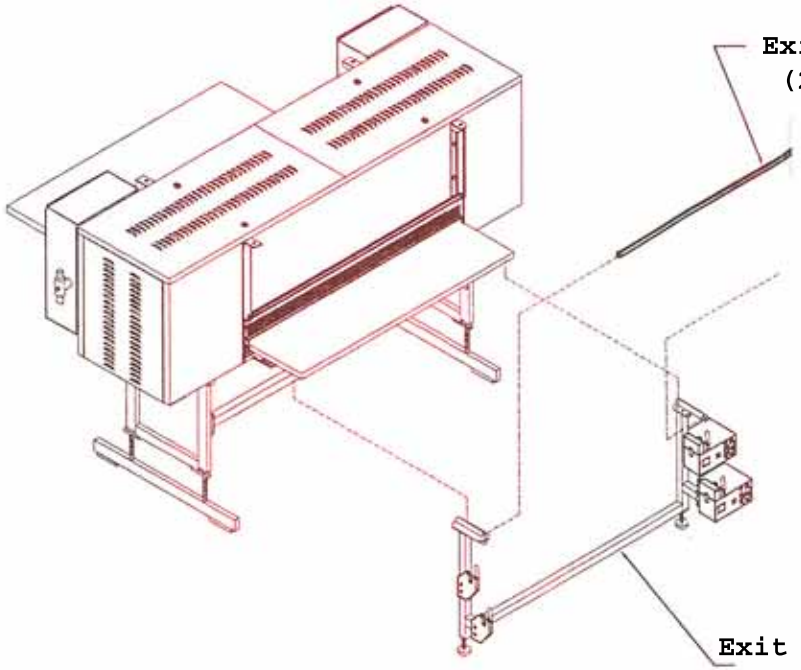
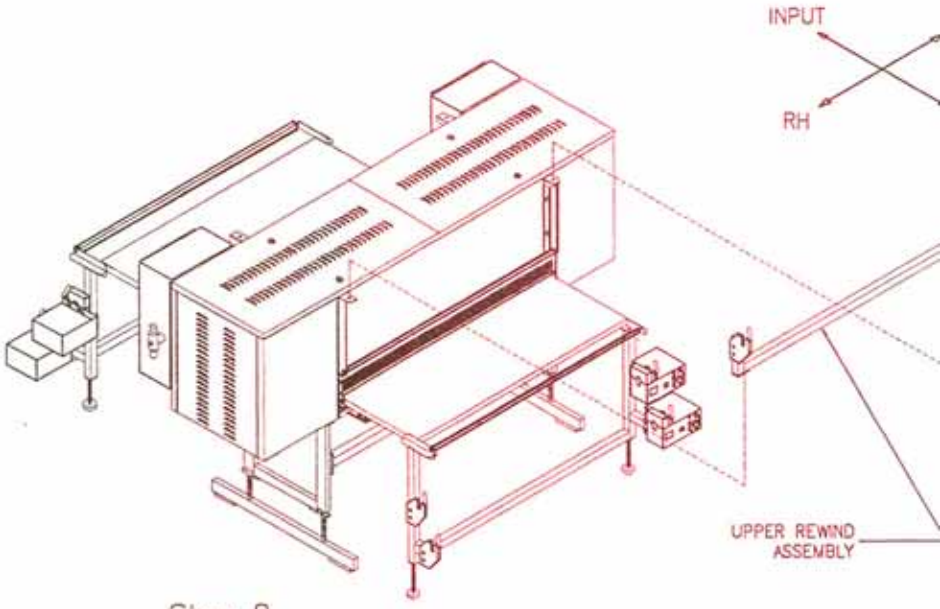
TITLE: FIGURE 3-2, 3-3, 3-4 MACHINE INSTALLATION			
PROJECT: 7900 SERIES			
DRAWN: MJM	DATE: 8/8/97	DWG. NO.	REV: A
CHECKED	SCALE: NONE		

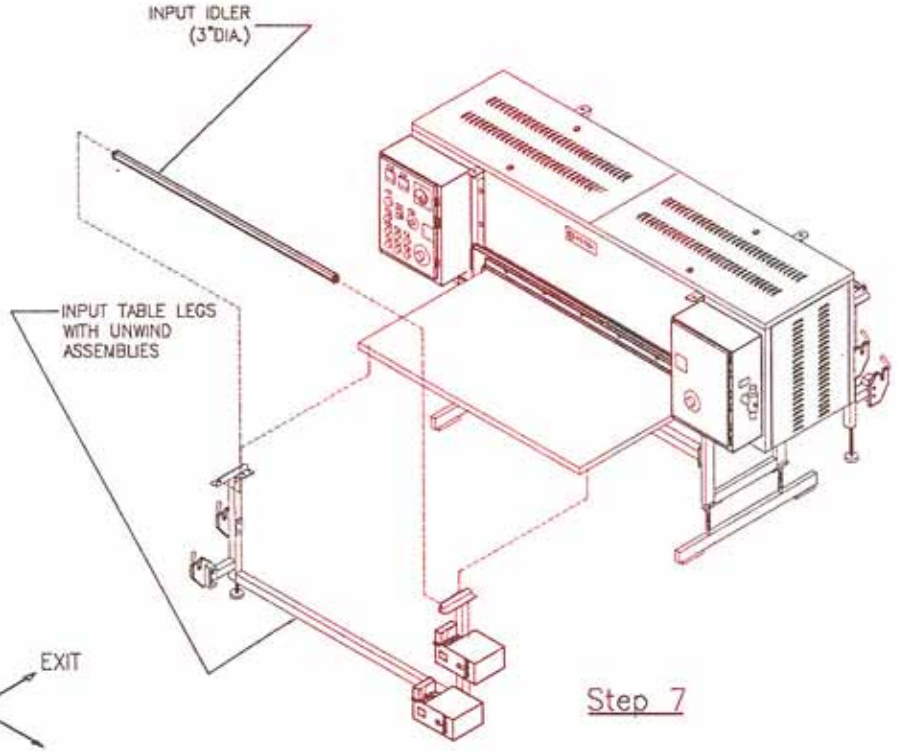




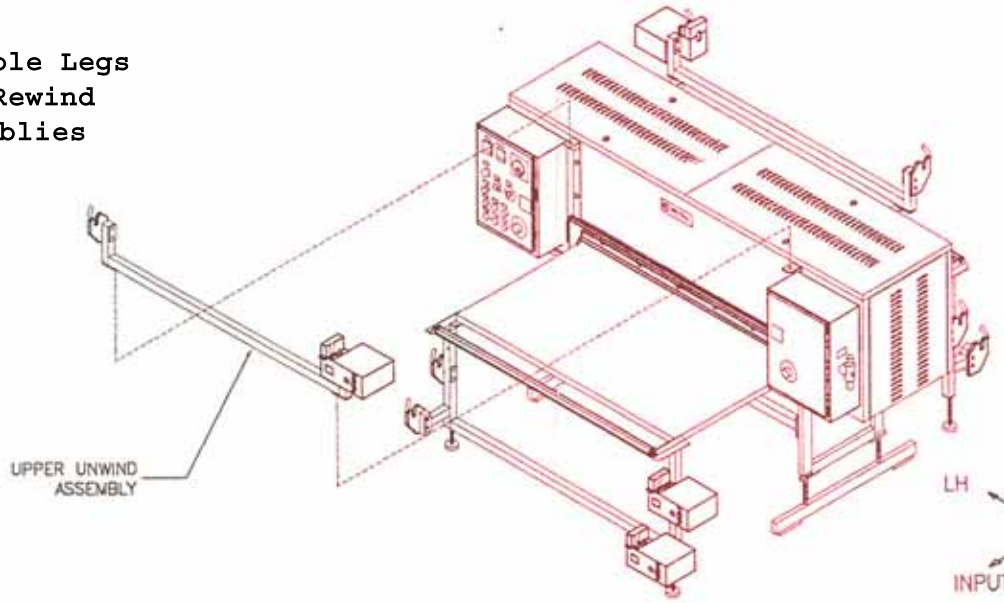
Step 6



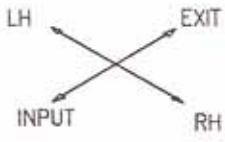
Step 8



Step 7

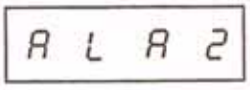


Step 9



Astechnologies
ENGINEERING + MANUFACTURING

TITLE: FIGURE 3-5 MACHINE INSTALLATION		
PROJECT: 7900 SERIES		
DRAWN: NJM	DATE: 8/8/97	DWG. NO.
CHECKED	SCALE: NONE	



Alarm 2 Type

Sets the action for Alarm 2. Same choices as Alarm 1. Default is None.

Output 2 Usage

Sets how Output 2 will be utilized from one of the following choices: (Default is Control Output 2)

Control Output 2 (Out2) - Used as the secondary (COOL) output (for Heat/Cool control)

Loop Reverse (LP_R) - Output is High when Loop break alarm is inactive

Loop Direct (LP_d) - Output is High when Loop alarm is active

Logical AND Reverse (Ad_r) - Output is High when a Logical AND condition between Alarm 1 and Alarm 2 is not present

Logical AND Direct (Ad_d) - Output is High when a Logical AND condition between Alarm 1 and Alarm 2 is present

Logical OR Reverse (Or_r) - Output is High when a Logical OR condition between Alarm 1 and Alarm 2 is not present

Logical OR Direct (Or_d) - Output is High when a Logical AND condition between Alarm 1 and Alarm 2 is present

Alarm 2 Reverse (A2_r) - Output is high when Alarm 2 is inactive

Alarm 2 Direct (A2_d) - Output is high when Alarm 2 is active

Output 3 Usage

Sets how Output 3 will be utilized. Choices are the same as Output 2, plus:

PV Retransmission Output (rEcP) - Retransmission output tracks the Present Value

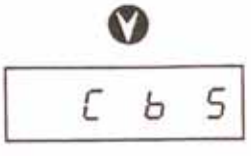
SP Retransmission Output (rEcS) - Retransmission output tracks the Setpoint

Alarm 1 Reverse (Al_r) - Output is high when Alarm 1 is active

Alarm 1 Direct (Al_d) - Output is high when Alarm 1 is inactive

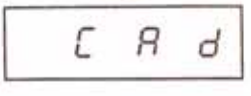
Note: The retransmission output choices will only appear if Output 3 is fitted with a DC module

Additional Information on Alarms can be found in Appendix B.



Comm. Baud Rate

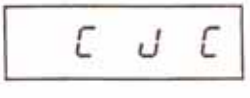
Sets the communication speed with the host device. Choices are 1200, 2400, 4800, 9600. Default is 4800.



Comm. Address

Establishes a Unit number from 1-32 for use in multi-drop communication. Default is 1.

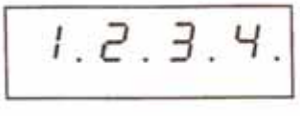
Note: The above two parameters will only appear if the RS-485 option board is installed.



Cold Junction Compensation

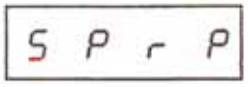
Turns ON or OFF the controller's internal Cold Junction Compensation.

Note: This parameter will only appear if Thermocouple has been chosen as the Input Type.



Note: Making a change in Program Mode will cause the Tune Mode parameters to be reset to their default values. Upon return to Control Mode this will be signified by the decimal point after each digit being lit, as shown at left. To clear this condition, enter the Tune Mode, make a parameter value change and review each parameter for its proper setting.

...NE MODE



Ramping SP Value

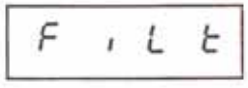
Displays the current Ramping SP being used by the control algorithm. Identical to the display in Control Mode.

Note: This parameter will only appear if Set Point Ramp Rate is not turned OFF

Set Point Ramp Rate

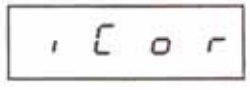
Sets the rate of change for the Setpoint Ramp to a value between 1-9999 units per hour and OFF. This parameter enables setting of the Ramp Rate if it is not accessible in Control Mode due to Setpoint Ramp Rate Enable being set to OFF.

Note: Utilizing the SP Ramp will casue the Pre-Tune Function to be inactive



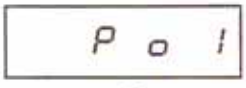
Input Filter

The input may be filtered over a user definable time period in order to minimize the effect on the Process Value of any extraneous impulses. The time period can be set from 0.0 (Off) to 100.0 secs. in 0.5 sec. increments. Default is 2.0 secs.



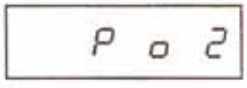
Input Correction

This parameter is used to correct a known offset in the input in order to more accurately display the Process Value. The input correction factor is adjustable within the selected full scale range of the controller. Default value is 0.



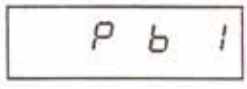
Output 1 %

Displays the current output %, from 0 - 100% for Output 1. This is a read only parameter.



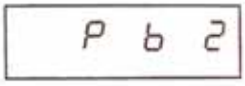
Output 2 %

Displays the present output 2 from 0 - 100% for Output 2. This is a read only parameter.



Output 1 P-Band

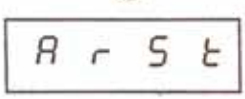
The Proportional Band represents an area distributed around the SP where the output % is proportional to the deviation between the PV and SP. This parameter is used to set the Proportional Band for Output 1 as a percentage of Full Scale, between 0.0% (ON/OFF Control) and 999.9%. Default value is 5.0%.



Output 2 P-Band

Used to set the Proportional Band for Output 2 as a percentage of Full Scale between 0.0% (ON/OFF Control) and 999.9%. Default value is 5.0%

Note: This parameter will only appear if Output 2 is fitted and the Output 2 Usage parameter in Program mode has been set to Control.



Automatic Reset

Sets the Integral time period in a range of 1 sec. to 99 minutes and 59 secs and OFF (A value greater than 99:59). This function is used to check for a constant deviation over time that may be caused by load variations, and biases the proportional output(s) in order to correct the error. Default value is OFF.

rAtE

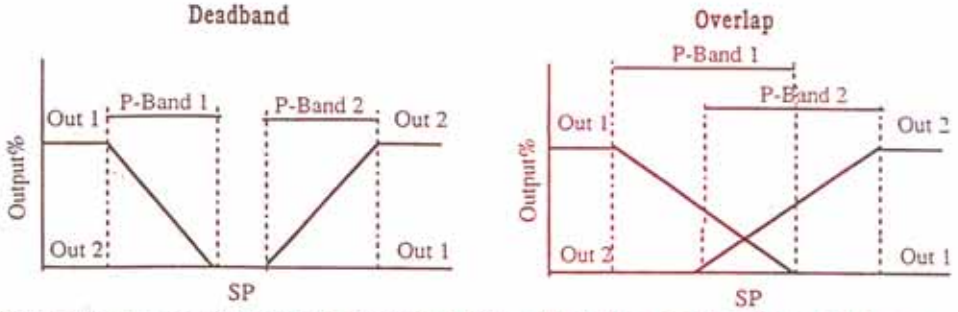
Rate Time

Sets the Rate (Derivative) time in a range of 0 secs. to 99 minutes 59 seconds. This function dictates the control action's response to rate of change of the Process Value. Default value is 0.

FoP

Overlap/Deadband

In Heat/Cool control, defines the distribution of the 2 proportional bands. Setting the value to a negative number, up to -20%, creates an overlap between the two bands, while a positive number, up to 20%, causes a deadband. Default is 0%.



Note: This parameter will only appear if Output 2 is fitted and the Output 2 Usage parameter in Program mode has been set to Control.

rSEt

Manual Reset

Used to manually eliminate an Offset by biasing the output in a range between 0-100% for one output, and -100% to 100% for two control outputs. This parameter can be used in conjunction with, or in place of the Automatic Reset function

HYSt

Hysteresis

If one or both of the control outputs is set to ON/OFF, a differential between the point the Control Output turns OFF and turns ON is settable in a range of 0.1% to 10.0% of the full scale. Default value is 0.5%.

Note: This parameter will only appear if one of the P-Band parameters is set to 0. What is shown as a parameter description on the bottom display is dependent on which output(s) are operating in ON/OFF control.

SPuL

Setpoint Upper Limit

Sets the maximum value that an operator can input as a Setpoint. Adjustable within the Full Scale range. Default is the Full Scale maximum value.

SPLL

Setpoint Lower Limit

Sets the minimum value that an operator can input as a Setpoint. Adjustable within the Full Scale range. Default is the Full Scale minimum value.

Pou

Retransmission Output Upper Value

This parameter creates the upper end of the linear scale for the retransmission output by defining the value equated to the maximum retransmission output signal; for a 4-20 mA output, this would be the value corresponding to 20 mA. Adjustable in a range form -1999 to 9999. Setting this parameter to a value less than the Retransmission Output Lower Value will create an inverse relationship between the retransmitted variable and the output signal. Default value is Input maximum.

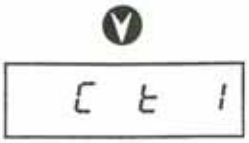
PoL

Retransmission Output Lower Value

This parameter creates the lower end of the linear scale for the retransmission output by defining the value equated to the minimum retransmission output signal; for a 4-20 mA output, this would be the value corresponding to 4 mA. Adjustable in a range from -1999 to 9999. Default is Input minimum.

Output 1% Limit

This parameter defines the maximum output percentage that can be applied to output 1. Settable in a range from 0-100%. Default is 100%.

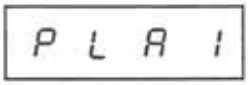


Cycle Time

When time proportioning control (PID control with a relay or DC logic output) is utilized it is necessary to set a time period to which the output % is applied. For example 50% output with a 32 sec. cycle time would cause the output to be ON for 16 secs., then OFF for 16 secs. This parameter should be set based on the dynamics of the process, with a faster acting process requiring a shorter cycle time. Allowable settings are 0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512 secs. It is not recommended to set a value below 8 secs. when using a relay output. Default setting is 32 seconds.

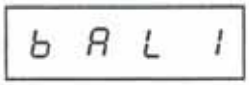
Process High Alarm 1

Applicable only if Alarm 1 is set to Process High in Program mode. Sets a value which if equaled or exceeded by the Process Value will activate alarm 1. Adjustable between input scale minimum and maximum value. Default is maximum scale value.



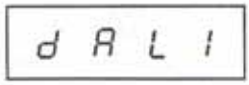
Process Low Alarm 1

Applicable only if Alarm 1 is set to Process Low in Program mode. Sets a value which if the Process Value becomes equal to or less than, Alarm 1 will activate. Adjustable between input scale minimum and maximum value. Default is minimum scale value



Band Alarm 1

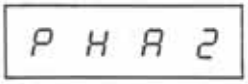
Applicable only if Alarm 1 is set to Band Alarm in the Program mode. Creates a band centered around the Setpoint. If the process variable falls outside this band, Alarm 1 will activate. Adjustable within the input scale. Default value is 5 units.



Deviation Alarm 1

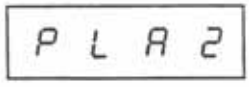
Applicable only if Alarm 1 is set to Deviation Alarm in the Program mode. Defines a value either above (positive value) or below (negative value) the Setpoint; if the Process Value deviates by a margin greater than the value of this parameter, Alarm 1 will activate. Adjustable within the input scale. Default value is 5 units.

Note: Only one of the 4 previously listed parameters will appear.



Process High Alarm 2

Applicable only if Alarm 2 is set to Process High in Program mode. Sets a value which if equaled or exceeded by the Process Value will activate alarm 2. Adjustable between input scale minimum and maximum value. Default is maximum scale value.



Process Low Alarm 2

Applicable only if Alarm 2 is set to Process Low in Program mode. Sets a value which if the Process Value becomes equal to or less than, Alarm 2 will activate. Adjustable between input scale minimum and maximum value. Default is minimum scale value

Band Alarm 2

Applicable only if Alarm 2 is set to Band Alarm in the Program mode. Creates a band centered around the Setpoint. If the process variable falls outside this band, Alarm 2 will activate. Adjustable within the input scale. Default value is 5 units.

EPtn

Enable Pre-Tune

The Pre-Tune function can be programmed to automatically engage on power-up by setting this parameter to 1 (Enabled). Setting this parameter to 0 (Disabled) does not prevent the Pre-Tune function from being manually activated in Control mode. Default is 0 (Disabled)

ESby

Enable Manual Control

Determines whether depressing the A/M key in Control mode will activate manual control. Default is 0 (Disabled).

ESPr

Setpoint Ramp Rate Enable

When this parameter is set to 1 (Enabled), the Setpoint Ramp Rate can be accessed in Control Mode by depressing the Function key. If set to 0 (Disabled), changes to the Setpoint Ramp Rate must be made in Tune mode.

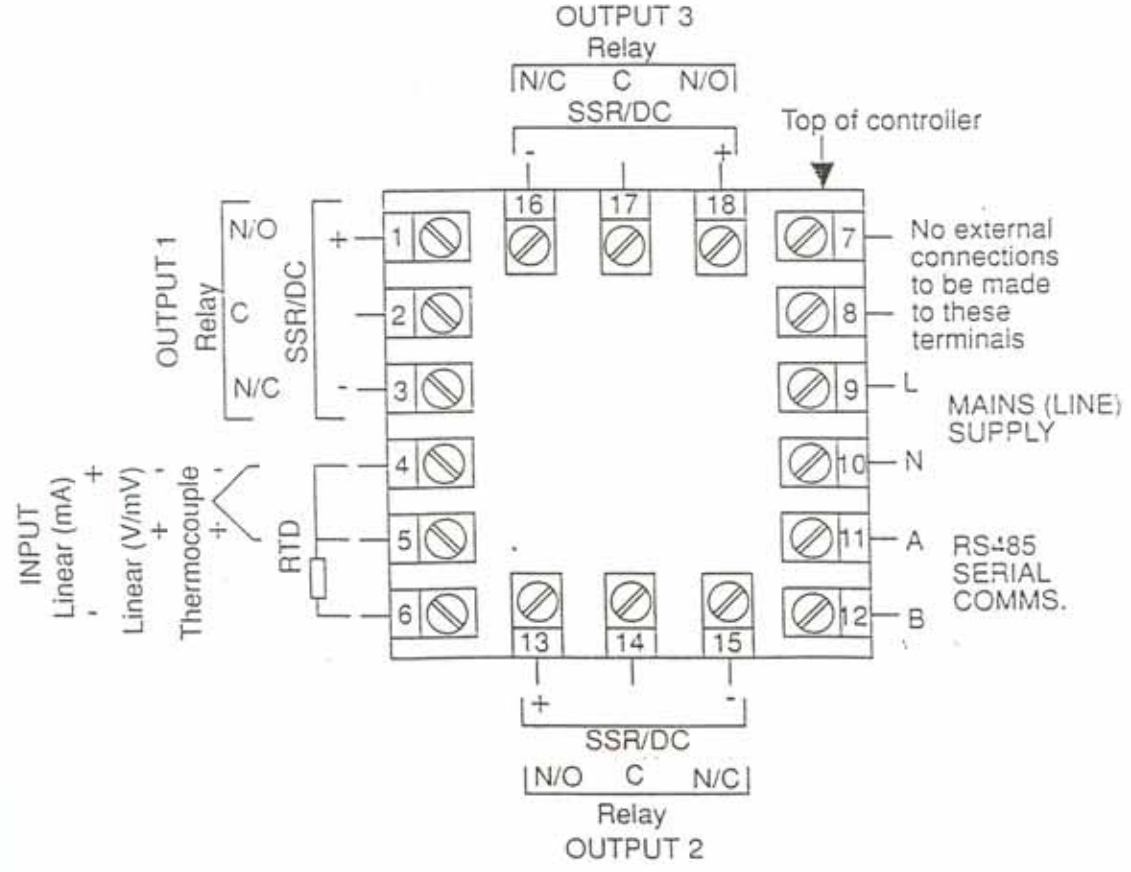
CCon

Serial Communication Enable

When set to 1 (Enabled) the serial communication function is active. Default is 1 (Enabled)

Note: This parameter will only appear if a Serial Communication Board has been installed in the controller.

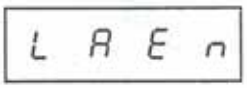
Rear Terminal Connections



Deviation Alarm 2

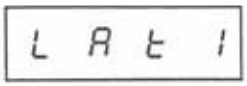
Applicable only if Alarm 2 is set to Deviation Alarm in the Program mode. Defines a value either above (positive value) or below (negative value) the Setpoint; if the Process Value deviates by a margin greater than the value of this parameter, Alarm 2 will be activated. Adjustable within the input scale. Default value is 5 units.

Note: Only one of the 4 previously listed parameters will appear.



Loop Alarm Enable

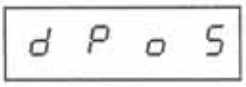
Sets whether the Loop Alarm monitor will be enabled (value set to 1) or disabled (value set to 0). This function can be used to detect failures within the control loop by repeatedly checking the control outputs for saturation (i.e. the output is at the minimum or maximum limit). If the output stays in saturation without causing a corrective action to the Process Value for more than a set period of time, the Loop Alarm will be activated. The time period is equal to twice the Reset Time in PID control, and is settable if ON/OFF control is being utilized. The output coming out of saturation, or a Process Value correction taking place will cause the Loop alarm to be deactivated. Default setting is 0 (disabled).



Loop Alarm Time

When using On/Off control the time period for activating the loop alarm can be set in a range from 1 second to 99 minutes 59 seconds. Default value is 99:59.

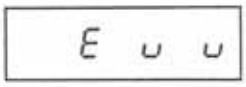
Note: This parameter will only appear if the P-Band has been set to "0" and the Loop Alarm is Enabled.



Decimal Position

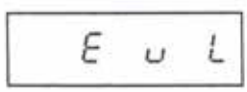
Defines the number of digits that will be displayed right of the decimal point for the Setpoint, Process Value, Alarm Values and Recorder output. Settable in a range from 0 to 3. Default is 1 (XXX.X)

Note: This parameter will only appear if the unit has been configured for a process input.



Engineering Units Upper Value

Creates the upper end of a linear scale used to convert the input signal to meaningful engineering units which will be displayed as the Process Value. The value set in this parameter will be equal to the maximum input signal; for example, with a 4-20 mA input this would be the value corresponding to 20 mA. Adjustable in a range from -1999 to 9999. Setting this parameter to a value less than, but not equal to, the Engineering Units Lower Value will create an inverse relationship between the input and the Process Value. Default is 1000.



Engineering Units Lower Value

Creates the lower end of a linear scale used to convert the input signal to meaningful engineering units which will be displayed as the Process Value. The value set in this parameter will be equal to the minimum input signal; for example, with a 4-20 mA input this would be the value corresponding to 4 mA. Adjustable in a range from -1999 to 9999. Default is 1000.

Note: The Engineering Units Upper and Lower Value parameters will only appear if the unit has been configured for a process input.

HEAT SETTING INSTRUCTIONS FOR NOMEX BELTS

1. Install and center the new Belt on the machine. Set the Tracking Carriage in its neutral position (which is parallel to the Drum and squared up with the main frame). Insure the Belt is not stretched on either side. ***Note:*** *If the Belt cannot be installed without being stretched, the two Pivot Adjusting Bars will have to be adjusted (as described in supplement TB0023).*

2. Shut off power to machine by engaging one of the E-Stops. Disconnect the electrical connection from the E-P regulator and set the fixed air pressure regulator to zero.

3. Restore power to the machine by deactivating the E-Stop. Before setting the machine in motion, apply heat to the Drum and allow the temperature to reach 250°F.

   Note: *Be careful not to greatly exceed this temperature before starting the machine (step 4) as the Belt may otherwise shrink in an irregular manner.*

4. Once the temperature is reached, start the machine at approximately 1/2 yard per minute (this is approximately 30% on the speed dial setting). ***Note:*** *The slower the Belt speed, the better.* Apply only enough air pressure to turn the Belt. Insure the Tracking Carriage is in the neutral position (as indicated in step 1).

   Note: *<u>Do not leave</u> the machine unattended while it is in operation. The machine must be monitored constantly while the tracking is disengaged in order to insure that the tracking frame remains square to the main frame and to prevent the Belt from sliding too far over. Gently nudge the Tracking Carriage manually to adjust.*

   Continue to increase the temperature until it reaches 500°F. Allow the Belt to run at 500°F for 1-1/2 to 2 hours at approximately 1/2 yard per minute or slower if possible.

   Note: *This slow speed in conjunction with a temperature of 500°F is mandatory for proper heat setting.*

5. After running slowly for 1-1/2 to 2 hours a 500°F set the temperature to the correct operating level - normally 400 to 410°F.

Astechnologies **Supplement TB0021-OA**

TECHNICAL BULLETIN

Date: March 30, 1998

Subject: 7900, 8900: 6 Key Points to avoid rippling and creasing.

1. Perform initial heat setting of the Nomex Belt (on the machine) in accordance with the instructions provided.*

2. All subsequent start-ups of the machine must allow for the Drum to reach 200°F prior to turning the Nomex Belt.

3. Use only the minimum amount of tension required to engage the Belt. Even small amounts of superfluous tension can initiate product creasing.

4. Initial "threading" of product materials (fabric, paper, etc.) in an even manner is critical. Cut the leading edge of materials in a bullet or pointed pattern which allows for the center of the material to make the initial contact with the Drum - apply equal and outward pressure by hand to the material on the input table as it moves into the input nip. (Thread the fabric first, then follow with the transfer paper.)

5. Zero to minimum tension on the transfer paper unwind provides for better stability and less rippling feeding into the machine. (Use the idler roller at the input table forward edge for routing transfer paper.)

6. Using a dancer type "free" roller at the input table forward edge (adjacent to the existing idler roller) stabilizes the transfer paper as it travels over the table and into the nip. This roller forces any rippling or inconsistencies to remain "upstream" of the roller. (A standard cardboard core serves well in this capacity.)

* *Accomplished at the factory for all new machines.*

6. Continue to rotate the Belt at approximately 1/2 ypm while the Drum cools down.

7. Once reaching the operating temperature, the Tracking Carriage can be engaged. Shut off the power to the machine by engaging one of the E-Stops. Reconnect the electrical connector to the E-P regulator. Restore power by deactivating the E-Stop. With the belt speed set at zero, restart the machine and immediately adjust the fixed air pressure regulator to 40 psi.

   Note: *The less belt tension air pressure applied, the better it is for the bearings, cylinders and the Belt.*

8. Once step No. 7 is completed, the speed of the Belt may be increased to that of production speed.

9. The Belt should be watched for a few minutes to confirm proper tracking.

10. For subsequent start-up from cold, first bring the Drum temperature up to 200°F before turning the Belt. Once reaching 200°F begin running the Belt slowly, 1 to 2 yards per minute, while the temperature continues to rise to your normal operating temperature . Upon reaching operating temperature proceed to operate normally.

11. To stop production and cool the machine down, we recommend running the Belt until the Drum temperature drops to 200°F. At 200°F the Belt may be stopped, if desired, and the Drum subsequently allowed to cool completely without turning. This is accomplished through the machine's normal 60 minute cool down cycle.

Astechnologies

Supplement TB0022-A

TECHNICAL BULLETIN

Date: March 25, 1998

Subject: 7900, 8900: Fabric Shrinkage Test.

Quality heat transfer printing sublimation dyes requires that the fabric has been "prepared for print" at the fabric mill. In the case of polyester fabric, "prepared for print" is primarily a pre-shrinkage treatment. Fabric shrinkage of more than 2% under normal machine operating conditions will affect the quality of the print.

In the case of excessive shrinkage, the fabric must be pre-shrunk prior to printing. This can be accomplished by running the fabric through the machine at approximately 20° F higher temperature than the operating conditions for printing. Time and pressure remain the same as operating conditions.

To determine the percent of fabric shrinkage of any fabric, use the testing technique which follows below.

FABRIC SHRINKAGE TEST

Using the English measuring system, a 14" x 14" square of shell material should be cut with markings of 12 1/2" x 12 1/2" centered off within the 14" x 14" square (see figure 1).

The square should go through the Heat Transfer Press under normal operating conditions. The square should then be measured, both length and width from the original 12 1/2" x 12 1/2" markings, every 1/8" equaling 1% shrinkage.

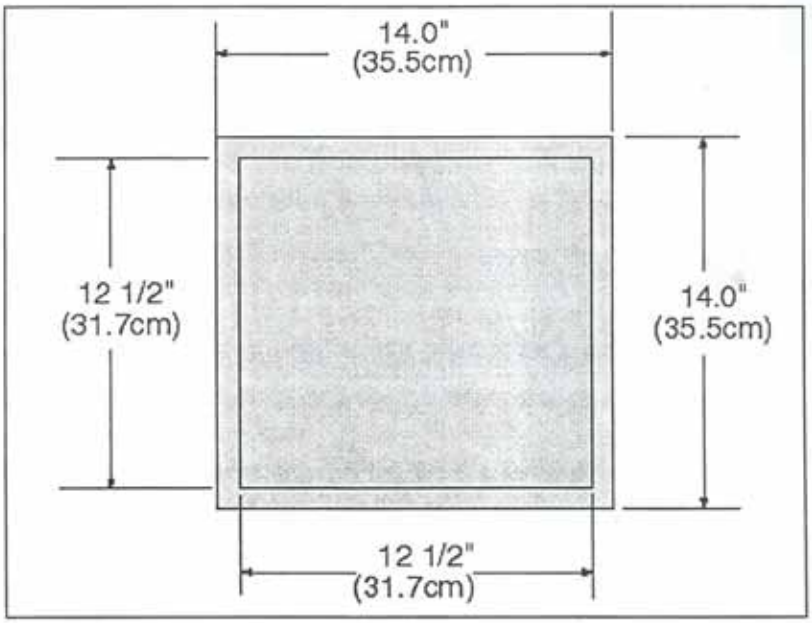


Figure 1

Astechnologies

Supplement TB0023-A

TECHNICAL BULLETIN

Date: April 8, 1998

Subject: 7900, 8900: Pivot Adjusting Bar - Height adjustment

Pivot Adjusting Bar Procedure

Note: *The following operation should be performed by qualified personnel only.*

1. Take the proper steps to shut down the machine, insuring the electrical supply and compressed air supply are disconnected properly.

2. Remove both top covers.

3. Using a 3/4" wrench, loosen the top Jam Nut on the Pivot Adjusting Bar by turning it counter clockwise. See figures 1 and 2.

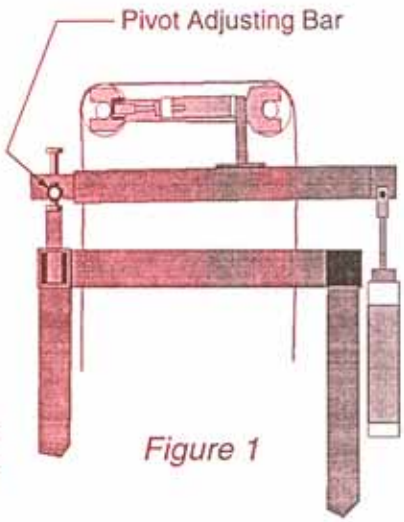


Figure 1

Figure 2

4. Using 3/4" ratchet or wrench, turn bolt at top of Pivot Adjusting Bar clockwise to increase the height of the bars. (This will increase the tension on the belt). ***Note:*** *Do not increase the height of the Bar anymore than absolutely necessary. Excessive belt tension can lead to problems in printing and may damage the Nomex Belt.*

5. Insure the tension on the Belt is even from side to side.

6. Tighten down the top Jam Nut on the Pivot Adjusting Bar. Follow the proper procedures to start the machine up.

7. Run the machine and monitor to insure belt tracks evenly and that belt tension is even across its width.

CHAPTER 5

MAINTENANCE INFORMATION

5.1 PREVENTIVE MAINTENANCE

It is important to perform regular preventive maintenance on your Astex Model 7900 Series Rotary Printer in order to keep the machine in good working order. Figure 5-1 describes recommended maintenance checks along with their suggested frequency, Figure 5-2 identifies recommended spare parts and Figure 5-3 provides information regarding machine lubrication requirements.

5.2 BELT TRACKING ADJUSTMENT

The Astex Model 7900 Series Rotary Printer is equipped with an advanced "State-of-the-Art" belt guide system which allows for less than 1/8" (.318 cm) lateral travel. The belt guide system operates with a photo-electric eye in concert with electro-pneumatic regulators for precise belt control. The operating parameters for the belt guide system are "Factory Set." However, if adjustments are required, only qualified personnel with electronics and pneumatics experience should attempt to service the machine.

To set up, follow the procedure as follows:

A. Set the photo-eye voltage range (0 to 10v):

1. Set the gain to minimum. (approximately 10 turns counterclockwise)
2. Cover the photo-eye so to block the emitter.
3. Adjust the offset until you see a zero LED display.
4. Remove the cover from the photo-eye emitter and adjust the gain until you can control between LED 9 and 10. (If necessary, use a voltmeter to read voltages as adjustments are made.)

B. Electro-pneumatic regulator settings:

1. After completing the adjustments for the photo-eye range, adjustments for "zero" and "span" must be set for the electro-pneumatic regulator.

2. With the photo-eye emitter covered, adjust the "zero" potentiometer so to bring the pressure to 20 PSIG below the "fixed" air pressure. (The Factory Set "fixed" air pressure is set at 40 PSIG.)

3. Remove the cover from the photo-eye emitter and adjust the "span" potentiometer to a maximum pressure of 20 PSIG above the "fixed" air pressure.

4. Repeat steps 2 and 3 at least three times.

5. Adjust the flow control valves as required to ensure the belt guide cylinders operate smoothly.

WARNING!

ALWAYS DISCONNECT THE ELECTRICAL SUPPLY AND COMPRESSED AIR SUPPLY TO THE MACHINE BEFORE REMOVING ANY COVERS OR ATTEMPTING TO CHANGE THE BELT. SERVICING OF THIS MACHINE SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL.

FIGURE 5-2

RECOMMENDED SPARE PARTS

ITEM	QTY	MODEL	PART NO.	DESCRIPTION
1.	1	All	001367	Timer, Cooldown
2.	1	All	001373	Contactor, Heater, 16 Amp
3.	1	All	042863	Contactor, Heater, 50 Amp - 380vac model
4.	1	All	043348	Contactor, Heat, 90 Amp - 208/220vac model
5.	2	All	044620	Temperature Controller, Digital (T506)
6.	1	All	036149	Brush set for DC Motor
7.	2	All	039038	Thermocouple, J type
8.	1	7952	041584	Heating Element, primary
9.	1	7960	043204	Heating Element, primary
10.	1	All	001657	Heating Element, auxillary
11.	1	All	001771	Motor Speed Controller
12.	1	All	035879	Air Regulator, Electro-Pneumatic, tracking
13.	1	All	016578	Air Regulator, tracking
14.	1	All	032570	Air Solenoid Valve, 3 way
15.	1	All	041947	Air Cylinder
16.	1	All	001524	Temperature Indicator Strips (1 pkg. of 20)

FIGURE 5-3

MACHINE LUBRICATION DATA

GENERAL NOTES AND INFORMATION

1. Relubrication frequency values specified are based on a 40 hour work week. Scale relubrication frequencies to suit actual usage.

2. Care should be taken when re-greasing bearings to not over-fill the bearings. Over-greasing can lead to over-heating and/or unsealing the bearing seals. As a general guide, a standard 14.5 ounce grease gun tube contains approximately 411 grams of grease.

3. The relubrication frequency for all bearings is every five (5) weeks.
The lubrication type for all bearings is specified as :
Chevron SRI or Chevron FM NLGI #2
The required amount of relubrication is two (2) grams.

4. The relubrication frequency for chain is every four (4) weeks.
The lubrication type for chain is specified as :
Dubois MPO-30. (QTY as required)

5. The speed reducer for the model 7900 series is lubricated at the factory with AGMA # 8 gear oil. For new reducers, change the oil 120 hours after putting the machine into service. After the first change, the oil should be changed every 2,000 operating hours or every six (6) months, whichever occurs first. Where high ambient operating temperatures are present, synthetic AGMA # 7 may be substituted.

   The correct oil level for the speed reducer is at plug height. If the oil level is too low, the reducer bearings will not get enough lubrication. Too much oil in the reducer may cause oil to leak from the air vent, or may cause the oil to churn and foam which may cause overheating. Either too much or too little oil can cause reducer bearing and gear damage.

   If the oil level is low, drain the remaining oil and then fill the reducer to the correct level. Do not mix brands or types of oil (hydro-carbon vs. synthetic).

FIGURE 5-1

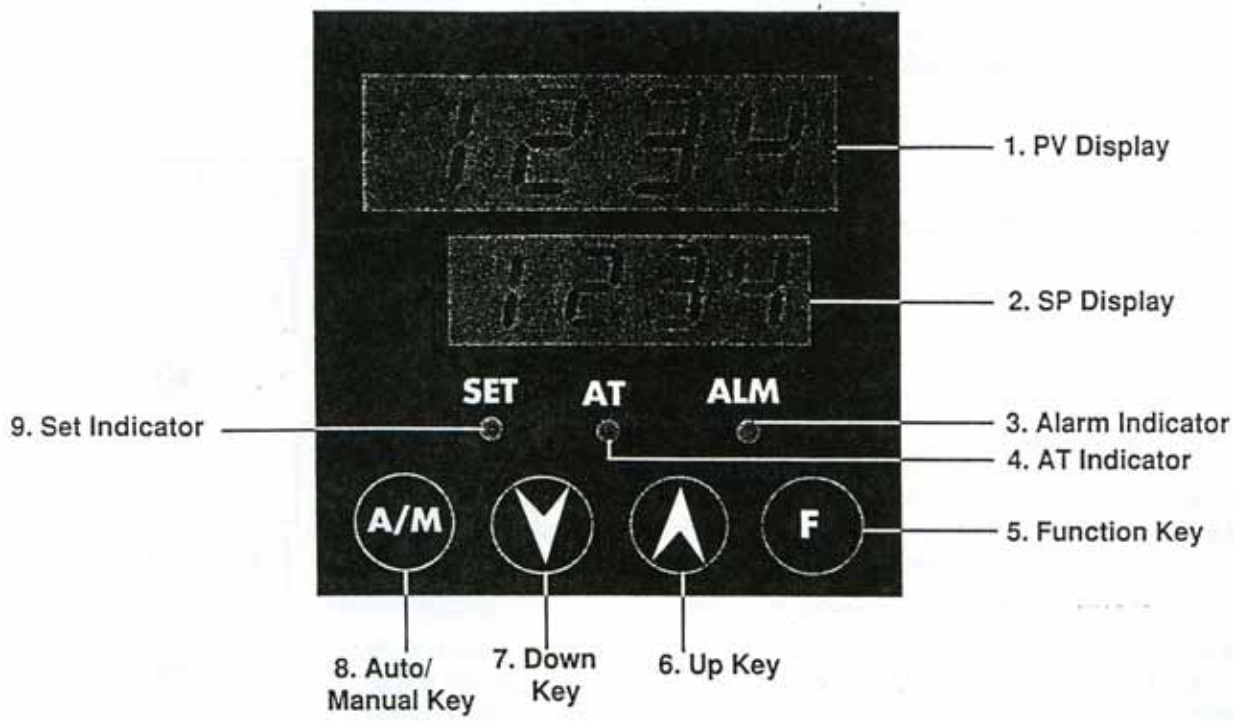
PREVENTIVE MAINTENANCE SCHEDULE

Based on a 40 hour work week

(See Figure 5-3 for Machine Lubrication Requirements)

ITEM	INSPECTION	FREQUENCY	ACTION
Air Line Filter	Check for condensation accumulation.	Daily	Drain filter bowl as required.
Thermocouple Probes	Check for cleanliness.	Daily	Clean probes as necessary.
Temperature Controllers	Check for proper calibration.	Daily	Check process value with temperature strips. Recalibrate as required. (See 4.3)
Tracking	Test photo-eye and regulators for proper operation.	Weekly	Adjust settings for photo-eye and/or regulators if needed. (See 5.2)
General	Cleanliness/Housekeeping.	Weekly	Clean on and around the machine.
General	Cleanliness/Housekeeping.	Monthly	Remove the two top covers and two side covers. Clean any accumulated debris using a compressed air gun.
Thermocouple Probes	Functional check.	Quarterly	Remove thermocouple probes. Clean and polish tips. Reinstall and adjust as necessary. (Approximately 3/16" required for tip compression past contact with drum) Recalibrate temperature controllers as necessary. (See 4.3)
Motor	Brushes.	Quarterly	Visually inspect motor brushes for wear and replace if necessary.
Tables	Proper positioning.	Quarterly	Check for leveling and placement. (See 3.1)

FRONT PANEL OPERATION



1. PV Display: Displays the Process Value (Temperature, Pressure, etc.) in Control Mode. In Program and Tune Mode the parameter value is shown.

2. SP Display: Displays the Setpoint during Control. In Program and Tune Mode the parameter description is shown.

3. Alarm Indicator: Flashes to indicate that an alarm condition is present.

4. AT Indicator: Flashes to indicate that Pre-Tune had been engaged. Illuminates continuously when Adaptive tuning is active.

5. Function Key: Used to move between modes of operation. Once a mode has been selected, this key is then used to move between parameters in that mode. When pressed simultaneously with the Down key the Hardware Definition Code will be displayed if the unit is in Program mode.

6. Up Key: Used to increase the value of the displayed parameter or the setpoint, and in combination with the Down key to activate the tuning functions.

7. Down Key: Used to decrease the value of the displayed parameter or the setpoint, and in combination with the Up key to activate the tuning functions. When pressed simultaneously with the Function key, the Hardware Definition Code will be displayed.

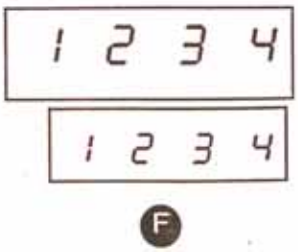
8. Auto/Manual Key: Used to toggle the controller between Automatic and Manual Control in Control Mode. In Program Mode this key is used to confirm a change in a parameter value.

9. Set Indicator: Illuminates continuously when the unit is in Tune Mode, or in Manual operation.

CONTROL MODE

The Control Mode is used for normal day-to-day operation of the controller once it has been programmed and configured as required.

Upon initilization of power, a self-test procedure is conducted during which all LED segments in the two front panel displays and all LED indicators are illuminated. When the self-test procedure is complete, the instrument reverts to normal operation.



PV/SP Display

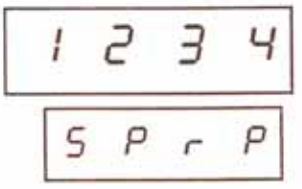
The process value (PV) is shown in the upper display, while the setpoint (SP) is located in the lower display.

Ramping SP

A selectable Ramp Rate function in the range of 1 to 9999 units per hour can be used to limit the rate at which the SP can be changed during operation. This function also applies on start-up to dictate the rate of change between the initial process value and the setpoint.

When ramping is taking place the final SP is displayed with the Process Value. To view the current ramping setpoint, depress the Function key. The top display will be blank and the bottom display will indicate SPrP. Depressing the Function key again will cause the ramping SP to be shown in the top display. This is a read only parameter.

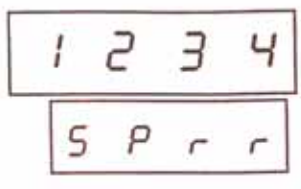
Note: This value will appear in the Control Mode only if Setpoint Ramp Rate is set to a value other than OFF.

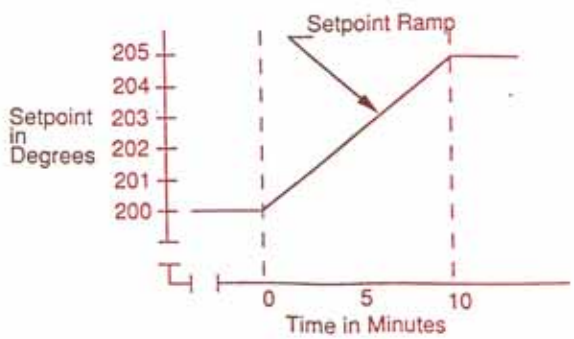


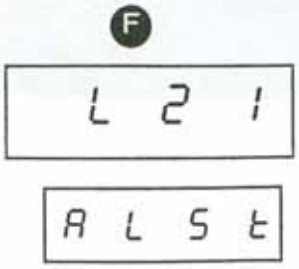
Setpoint Ramp Rate

Depress the Function key so that the top display is blank and the bottom display shows SPrr. The ramp rate can be shown in the upper display by again depressing the function key. Use the Up and Down keys to set the ramp rate in a range between 1 - 9999 units per hour. Attempting to set the value above 9999 will disable ramping and OFF wil be shown in the top display. Default is OFF.

Note: This value will only appear if Setpoint Ramp Rate Enable is turned ON in Tune Mode. Default is OFF.



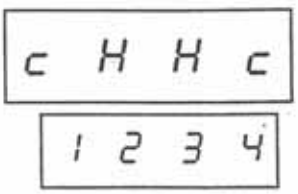




Alarm Status Display

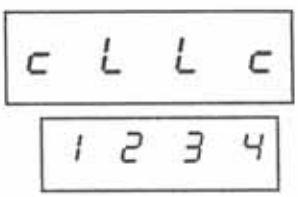
If an alarm condition is present, as signified by the alarm indicator light on the front panel. this display can be access. The top display indicates the status of each of the 3 possible alarms. An L in the left-most digit indicates that the Loop Break alarm is energized. A 2 illuminated in the middle digit indicates Alarm 2 is energized, while a 1 will appear in the right-most digit if Alarm 1 is energized.

Other Operating Displays



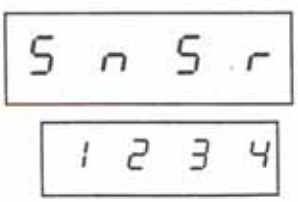
Over Range Display

If the process value attains a value higher than the input full scale value. the top display will appear as at the left.



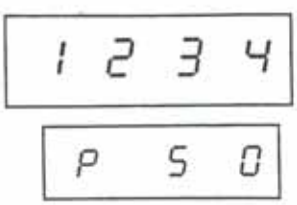
Under Range Display

If the process value attains a value lower than the input scale minimum. the top display will appear as at the left.



Sensor Break Display

If the controller detects a loss of the input signal the top display will appear as at the left. The control output will go to OFF (0% power) and the alarms will operate as if the process value had gone downscale.



Manual Operation

Control can be toggled between automatic and manual operation by depressing the Auto/Manual Key. The transfers between modes are bumpless. When in Manual mode the Set Indicator light will flash. The top display will continue to show the PV, while the bottom display will have a P in the left-most digit and the present output percentage in the next 3 places. The Up and Down keys can be used to adjust the output percentage between 0% - 100% for units with one control output, and between -100% - 100% for units with two control outputs.

Note: Manual Control can only be activated if the Enable Manual Control parameter in the Tune Mode is set to ON. Default is OFF.

TUNING

Pre-Tune

This function uses the process dead time and rate of rise to calculate PID constants which will provide adequate control. These PID constants provide a solid base from which the Adaptive Tune function can optimize controller performance.

The Pre-tune function can be activated through the following sequence:

1. While in Control mode depress and hold both the Up and Down keys for approximately 5 seconds (the display will flash during this period) until the AT indicator flashes once.
2. Release the Up and Down keys, and depress the Function key for approximately 3 seconds, at which time the AT light will flash continuously to indicate that Pre-Tuning is engaged.

Pre-tuning can also be set to automatically operate on start-up by setting the Enable Pre-tune parameter in Tune mode to ON. Since Pre-tune is a single-shot operation it will automatically disengaged once tuning is complete. However, Pre-tuning can be manually disengaged by repeating the key sequence used to start tuning.

Note: Because Pre-Tuning needs to measure a rate of rise, this function will not engage if the PV is within 5% of the SP or if SP Ramping is enabled and active.

Adaptive Tuning

This function is used to optimize tuning while the controller is operating. When engaged the controller monitors the process for deviation from setpoint and oscillations, and adjusts the PID constants to best fit the current process conditions.

Adaptive Tuning can be activated through the following sequence:

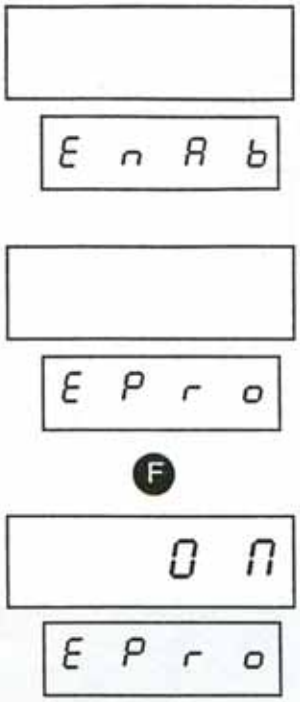
1. While in Control mode depress and hold both the Up and Down keys for approximately 5 seconds (the display will flash during this period) until the AT indicator flashes once.
2. Release the Up and Down keys, and depress the Auto/Manual key for approximately 3 seconds, at which time the AT light will illuminate continuously to indicate that Adaptive-Tuning is engaged.

As Adaptive tuning is a continuous function it will remain ON unless disengaged by repeating the sequence used to initiate the function.

The controller can also be tuned manually by individually adjusting the P-Band, Reset, and Rate in the Tune mode. However, it is not possible to alter the value of these parameters if Adaptive Tuning is active.

ENABLE MODE

The Enable mode is used for security purposes to control access to the Program and Tune modes and to the ability to change the Setpoint.



Enable Mode Operation

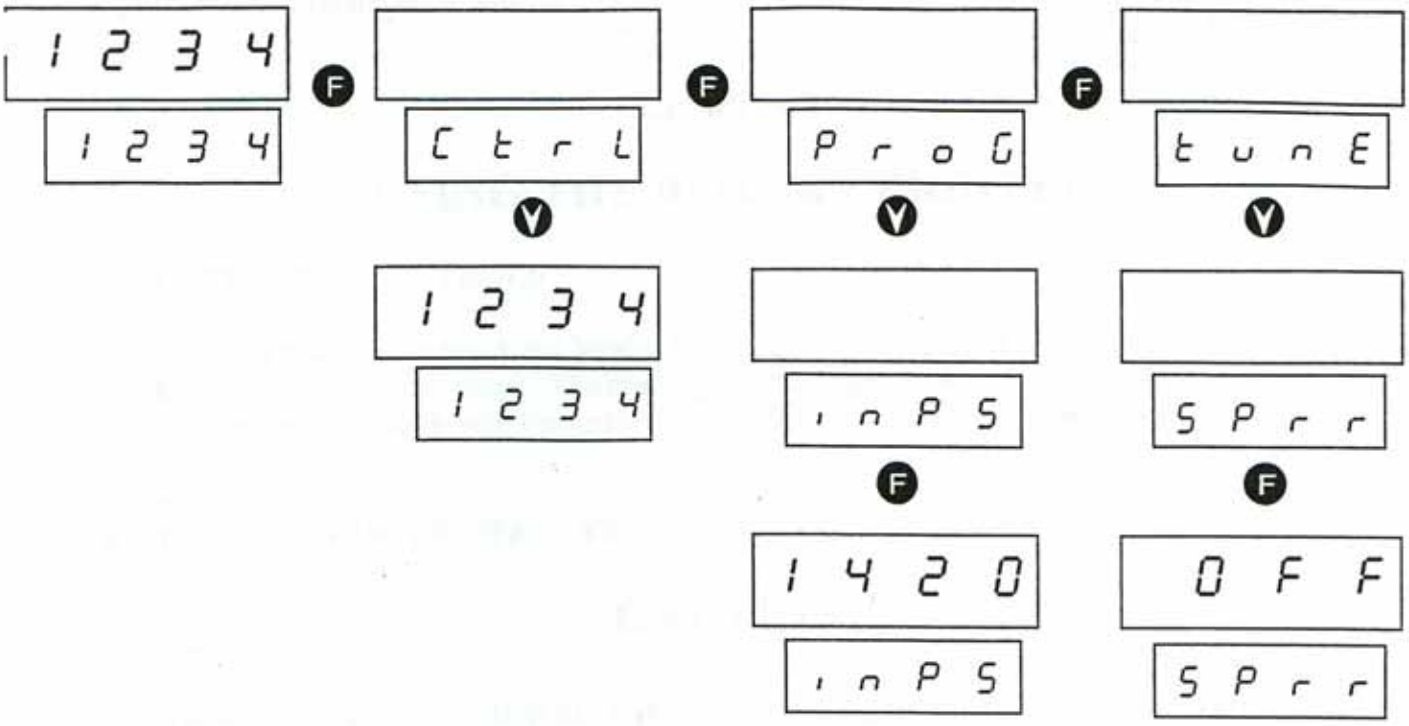
To enter the Enable mode, depress and hold the Up and Down keys for approximately 5 seconds, after which time the AT light will flash once and the display will stop blinking. Continue to hold those keys for 5 more seconds until "EnAb" is shown in the bottom display (as at the left). Releasing the buttons will cause EPro to be displayed. While the top display is blank, depressing the down key will scroll the bottom display between the 3 access areas: Program Mode, Tune Mode and Setpoint Changes. Depressing the Function key will bring up the current access status. At that point the Up key is used to enable access (ON) while the down key is used to restrict access (OFF). Depressing the function key again will scroll to the next access area. Default for all access areas is ON.

PROGRAM/TUNE MODE OVERVIEW

While in Control mode with the Ramping Setpoint function set to OFF, depressing the Function key will access the Mode Selection Menu. The Function key scrolls between the 3 modes (Control, Program and Tune) with the name of the mode being shown in the bottom display. If Ramping Setpoint is turned ON, or the Alarm Condition display is active, it necessary to enter the Mode Selection Menu by depressing the Up key when SPrP or ALSt is shown in the bottom display, and the top display is blank.

When the desired mode is shown on the bottom display it can be entered by depressing the Down key. Continuing to depress the Down key will scroll the bottom display through all the parameter descriptions in that mode. The Function key is used to bring up the present value of that parameter on the top display. The Up and Down keys are then used to adjust the value. After setting the desired value, depress the Function key to advance to the next parameter. To exit the mode, depress the Up key when a parameter description is being shown without a value (top display is blank). This will return the instrument to the Mode Selection Menu. The unit will automatically return to Control mode it there is no key activity for 30 seconds.

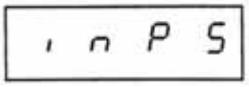
Note: If access to the Program and/or Tune mode has been turned OFF in the Enable mode, that choice will not appear in the Mode Selection menu.



OGRAM MODE

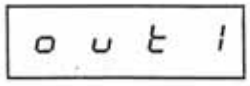
The Program Mode contains parameters that are generally configured prior to initial controller operation.

Movement through the parameters in this mode is accomplished with the use of the Function and Down keys as described in the previous section. After a value has been changed, it is necessary in this mode to depress the Auto/Manual key to confirm the change before depressing the Function key to move to the next parameter.



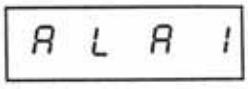
Input Select

Used to determine the input type and range. A full list of codes can be found in Appendix E. Default is dependent on Model # ordered.



Output 1 Action

Determines if the action of the control output will be Direct or Reverse. For Direct Action, the Output % will increase as the Process Value increases, and is typically used for Cooling applications. Heating applications generally utilize Reverse Action, where the Output % decreases as the Process Value increases. Default is Reverse.



Alarm 1 Type

Sets the Action of Alarm 1 to following choices: (Default is Process High)

Process High (P_hi) - Alarm is activated if the PV exceeds the Alarm Value set in Tune mode

Process Low (P_Lo) - Alarm is activated if the PV falls below the Alarm Value set in Tune mode

Deviation (dE) - Alarm is activated if the PV deviates from the SP by more than the Alarm Value set in Tune Mode. Alarm values can be positive or negative.

Band (bAnd) - Creates a symmetrical band centered on the SP. Alarm is activated if the PV falls outside this band.

None - No alarm action

CHAPTER 4

USING THE ROTARY PRINTER

4.1 OPERATING CONTROLS

All operating controls for the Astex Model 7900 Series Rotary Printer are located on the machine's operator control panel. The drawings in this manual identify each of these controls. Study these controls along with the instructions on Rotary Printer operation before attempting to start the machine.

4.2 ROTARY PRINTER OPERATION

CAUTION!

BEFORE OPERATING YOUR MACHINE, ALWAYS BE CERTAIN THAT THE INFEED TABLE IS CLEAR OF FOREIGN OBJECTS SUCH AS SCISSORS, CLIPBOARDS AND THE LIKE. THESE OBJECTS CAN BE DRAWN INTO THE MACHINE WHEN IT IS RUNNING AND DAMAGE THE BELTS AND OTHER PARTS.

Always start-up your Astex Model 7900 Series Rotary Printer using the following procedures:

1. With the Heaters "ON/OFF" and Drive Motor "ON/OFF" Selector Switches both in the "OFF" position, Press the "Power On" Push Button to energize the machine.

2. Adjust the Belt Tension Pressure Regulator so that '0' PSIG is applied to the Nomex Belt.

3. Turn the Heaters "ON/OFF" Selector Switch to the "ON" position.

4. Set the Drum's Operating Temperature (Set Point) to 94° C (200° F) By adjusting both the "Primary" and "Outer" Zone Digital Temperature Controllers. This is accomplished by use of the up and down keys on the face of the Temperature Controllers. Refer to the detailed instructions provided in the T506 technical supplement in this manual.

5. When the Drum has reached 94° C (200° F), turn the Drive Motor "ON/OFF" Selector Switch to the "ON" position.

6. Rotate the Speed Control Knob to the desired speed (Clockwise to increase, counterclockwise to decrease).

7. Adjust the Belt Tension Pressure Regulator to provide only enough air pressure to engage the Belt and turn the Drum. If no air pressure is necessary to engage the Belt, do not apply any additional air pressure. ***Note: Never apply more than the minimum amount of Belt Tension required to engage and turn the Drum.***

8. Set the "Primary" and "Outer" Zone Digital Temperature Controllers to the desired operating Temperature Set-Point. Follow your transfer paper manufacturer's recommendations regarding proper printer temperature.

9. When the desired Operating Temperature is achieved, run sample prints through the machine. Note: Some minor adjustments in speed or temperature might be necessary (due to your particular operating conditions and the type and weight of materials you are using) in order to achieve the desired results.

4.3 TEMPERATURE CALIBRATION

To help you in setting proper temperatures on your Astex Model 7900 Series Rotary Printer, Astechnologies makes available through our Parts and Service Department a series of temperature indicator strips. These strips, when run through the Rotary Printer in contact with the drum, change color to indicate the actual temperature of the drum's surface.

To obtain an accurate reading of the printing temperature inside the machine, place a temperature indicator strip face-down beneath a long swatch of fabric and feed into the printer. Read the highest temperature recorded inside the machine. Refer to the T506 digital temperature controller technical supplement provided in this manual for calibration instructions.

Refer to Figure 4-1 for instructions on how to read these strips. For information on how to order temperature indicators strips from our Parts Department, see Figure 4-2.

4.4 SHUTTING THE MACHINE DOWN

CAUTION!

NEVER TURN THE MACHINE OFF FOR ANY LENGTH OF TIME WHILE THE DRUM IS UP TO OPERATING TEMPERATURE. THE HEATER TEMPERATURES INSIDE THE MACHINE MAY DAMAGE THE BELT.

Your Astex Model 7900 Series Rotary Printer has an automatic cooldown feature which shuts the machine off after the drum has cooled down. When you are ready to turn the machine off at the end of the day, follow these steps:

1. Turn the cool down timer knob clockwise as far as it will go.

2. Turn the Heat "On/Off" selector switch to the "Off" position.

3. Turn the Drive Motor "On/Off" selector switch to the "Off" position.

   The printer will continue to run even though the Drive Motor "On/Off" selector switch has been turned off. The machine can now be safely left unattended while it cools down and will run for approximately 60 minutes until the cool down timer turns the machine off. If you would like to use the machine again after you have set the cool down timer, simply turn the Drive Motor and Heat "On/Off" selector switches back to the "ON" position. This will override the cool down timer.

4.5 APPLICATION TROUBLE- SHOOTING GUIDE

1. Optimum heat transfer printing cannot be achieved unless the temperature, pressure and time settings are accurately adjusted. If the resulting color in your product is not acceptable, check the following:

   a. Temperature: 380-410 degrees F.
   b. Pressure: 0-MINIMUM psig.
   c. Dwell time speed: 3-5 feet per minute.

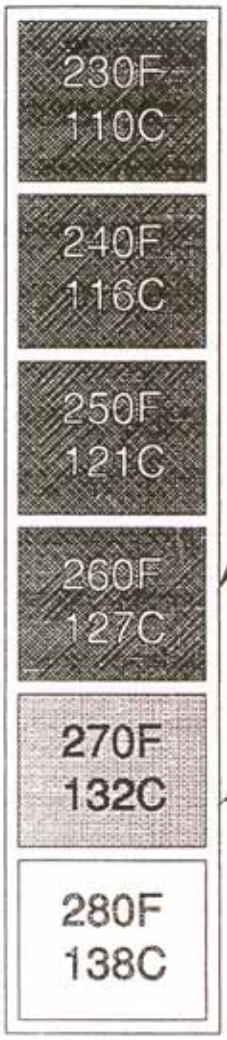
   If you continue to experience problems with color, consult with the supplier of your plotter for proper calibration instructions.

2. "Ghosting" is a term used for double imaging. If you experience this phenomenon, check the following:

   a. Make sure that your fabric is heat set prior to printing.
   b. Excessive temperature can cause "blow out" of inks in the gaseous state resulting in ghosting.
   c. Upon exiting the heated drum, the fabric and transfer paper must be separated simultaneously.

3. If you experience wrinkling or uneven pressure in your fabric or transfer paper during the heat transfer process, check the following:

   a. Make sure the fabric and transfer paper have an even cut on the leading edge prior to threading the machine.
   b. Thread the machine initially with fabric only. This will allow you to preset the tension and insure proper alignment prior to the heat transfer process.
      Next, place the leading edge of the transfer paper face down on top of the fabric.
      Make sure the paper's leading edge is even with the edge of the fabric.
      Apply pressure downward so that the transfer paper will follow the same path as the fabric into the machine.
   c. Make sure that your rolls of fabric have been supplied with an even edge. Rolls of fabric that have "funneled" edges will not track properly - resulting in wrinkling and uneven pressure.
   d. For optimun results, all pneumatic tension controls on unwind and rewind units should be set at 3-5 psig MAXIMUM.



THE HIGHEST TEMPERATURE SQUARE WHICH HAS TURNED COMPLETELY BLACK IS THE CORRECT TEMPERATURE READING.

DISREGARD TEMPERATURE SQUARES WHICH HAVE ONLY PARTIALLY CHANGED COLOR.

FIGURE 4-1

PART #	TYPE	TEMPERATURE RANGE
001521	0	41-104C/105-220F
001522	1	99-138C/210-280F
001523	2	143-182C/290-360F
001524	3	188-232C/370-450F
001525	4	210-260C/410-500F

FIGURE 4-2

ITEM	QTY.	PART NO.	DESCRIPTION

Astechnologies

TITLE: FIGURES 4-1, 4-2
TEMPERATURE INDICATOR STRIPS

PROJECT

DRAWN | DATE | DWG. NO

CHECKED | SCALE —

TECHNICAL SUPPLEMENT

DIGITAL TEMPERATURE CONTROLLER,

T506

Astechnologies provides digital temperature controllers as standard equipment on all models of Astex fusing, laminating and transfer printing machinery. Digital temperature controllers provide precise control of critical heating parameters in a wide variety of commercial and industrial applications.

This technical supplement is provided to assist in understanding the functions and parameter variables specifically associated with the Model T506 Digital Temperature Controller.

All T506 Digital Temperature Controllers are installed, calibrated and factory set for operating parameters by Astechnologies' factory technicians for each machine prior to shipping. Any further adjustments should only be made by qualified service technicians.

WARNING!

ALL ASTEX MODELS OF MACHINERY OPERATE ON AN ELECTRICAL SUPPLY VOLTAGE WHICH CAN SEVERELY INJURE OR EVEN KILL. ALWAYS DISCONNECT THE ELECTRICAL SUPPLY TO THE MACHINE PRIOR TO ATTEMPTING TO SERVICE OR ADJUST THE MACHINE. SERVICING OF THE MACHINE SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL.

The initial Astex "factory set" parameters of the T506 Digital Temperature Controllers are as follows:

Program Mode	
Parameter	**Value**
Input Select	1420 for F (1419 for C)
Output 1	Reverse
Alarm 1 Type	Band
Alarm 2 Type	None
Output 2 Usage	Out 2
Cold Junction Compensation	Enab
Enable Mode	
Parameter	**Value**
EPRO	On
ETUN	On
ESPC	On
Tune Mode	
Parameter	**Value**
Setpoint Ramp Rate	Off
Input Filter	2.0
Input Correction	Variable to suit temperature calibration.

Continued....

Tune Mode	
Parameter	**Value**
Output 1 Pband *	5.0 for F (2.0 for C)
Output 2 P-Band	5.0
Automatic Reset	6.40
Rate Time	1.40
Manual Reset	25
Setpoint Upper Limit	450 F (235 C)
Setpoint Lower Limit	32 F (0 C)
Output 1 % Limit *	75 for Primary zone(s), 80 for Auxiliary
Cycle Time	16
Band Alarm 1	5 to 10
Loop Alarm Enable	0
Enable Pre-Tune	0
Enable Manual Control *	0
Setpoint Ramp Rate Enable	0

The "Set Value" parameter for the T506 Digital Temperature Controller is set and the "Input Correction" values are calibrated to suit the application range by Astechnologies' factory technicians for each machine as follows:

Fusing Applications..... 250° to 350° F
Laminating Applications..... 350° to 400° F
Transfer Printing..... 400° F
Cooling and Chillers..... 60° F

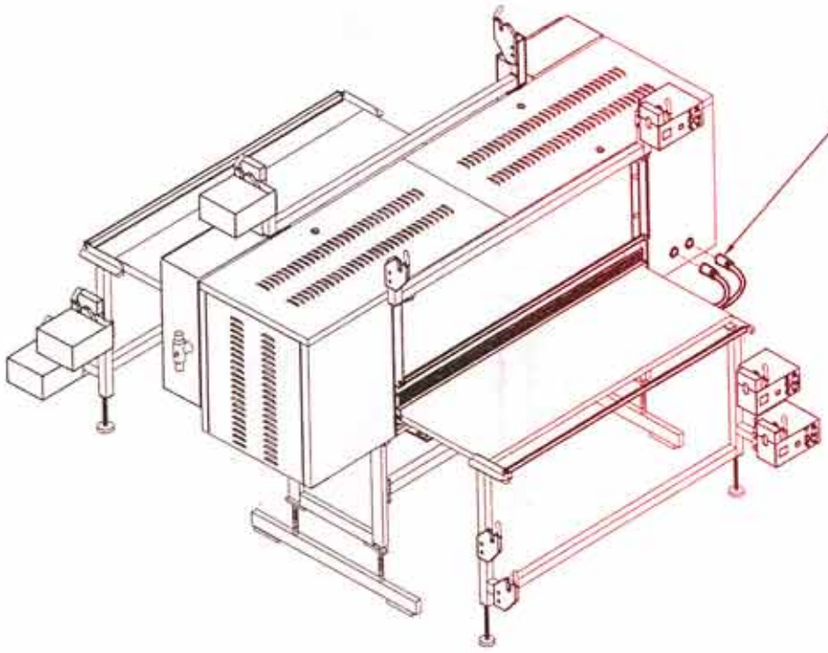
* Revised 11/12/97

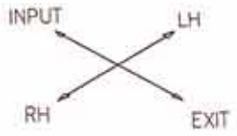
Additionally, the cutsheets provided as part of this technical supplement supply complete descriptions of all parameters and functions associated with the T506 Digital Temperature Controller.

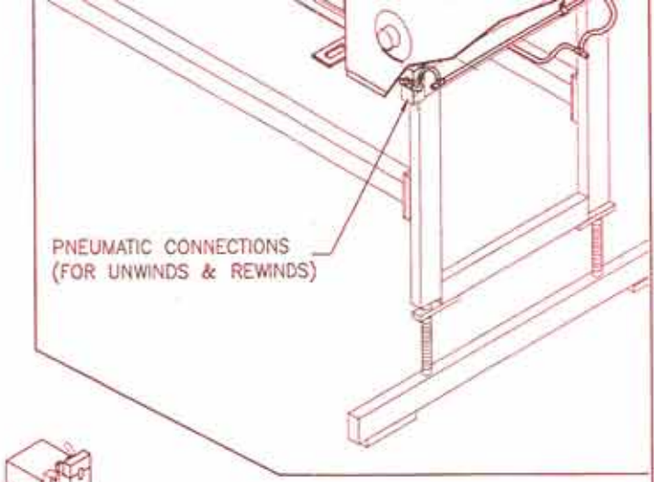
Should you require spare or replacement T506 Digital Temperature Controllers, the technicians in the Parts and Service Department will be glad to assist you. They can be reached at the following address and phone number:

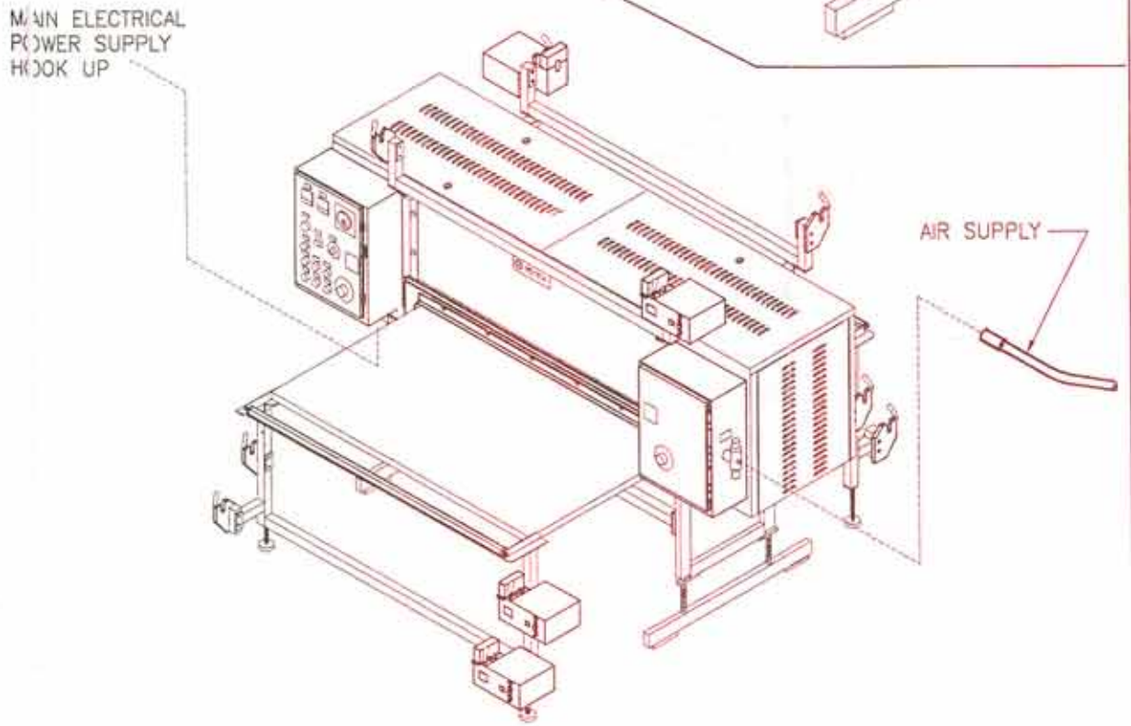
Astechnologies, Inc.
950 Sun Valley Drive
Roswell, GA 30077
Phone: 770-993-5100
Fax: 770-993-8429

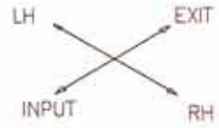
When contacting our Parts and Service Department regarding T506 Digital Temperature Controllers, please specify Astechnologies' part number 044620. It would also be helpful to provide the Model and Serial Number of your machine in order to facilitate identifying the correct parts required.











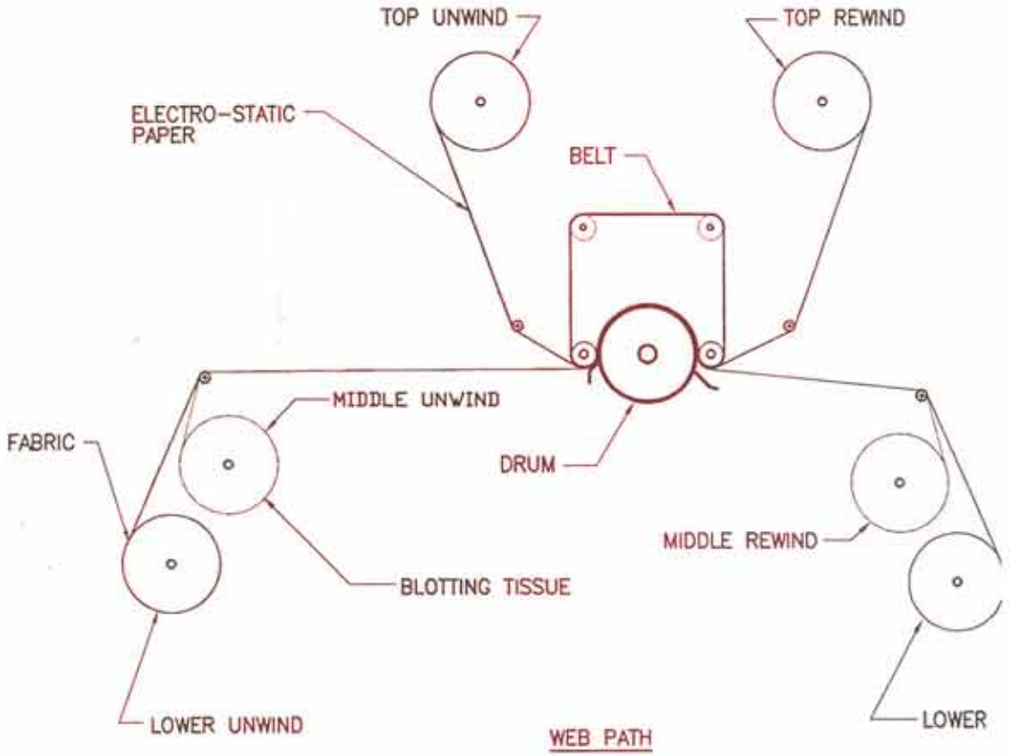
Astechnologies

TITLE: FIGURE 3-6
MACHINE INSTALLATION

PROJECT: 7900 SERIES

DRAWN	DATE	DWG. NO.	REV
MJM	8/8/97		A
CHECKED	SCALE NONE		

WEB CONFIGURATION FOR NARROW COVERAGE FABRIC APPLICATIONS, (Web configuration is shown below)	
ELECTRO-STATIC PAPER	TOP UNWIND
FABRIC	MIDDLE UNWIND
BLOTTING TISSUE	LOWER UNWIND



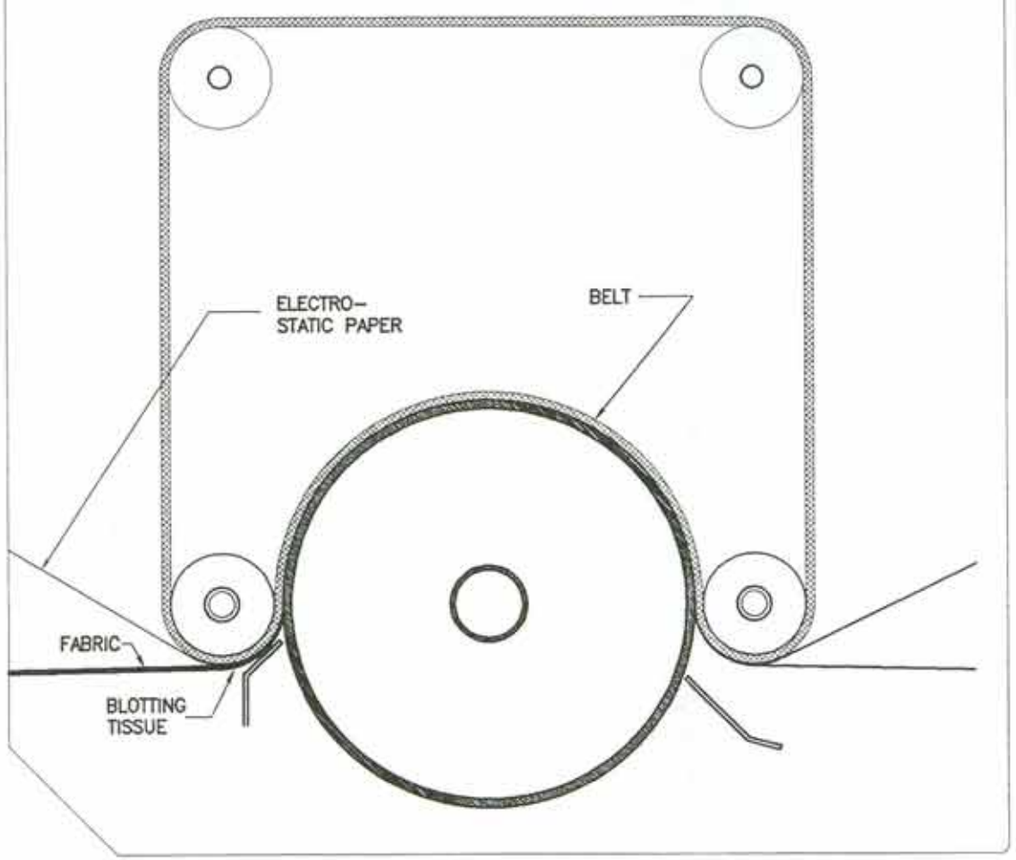


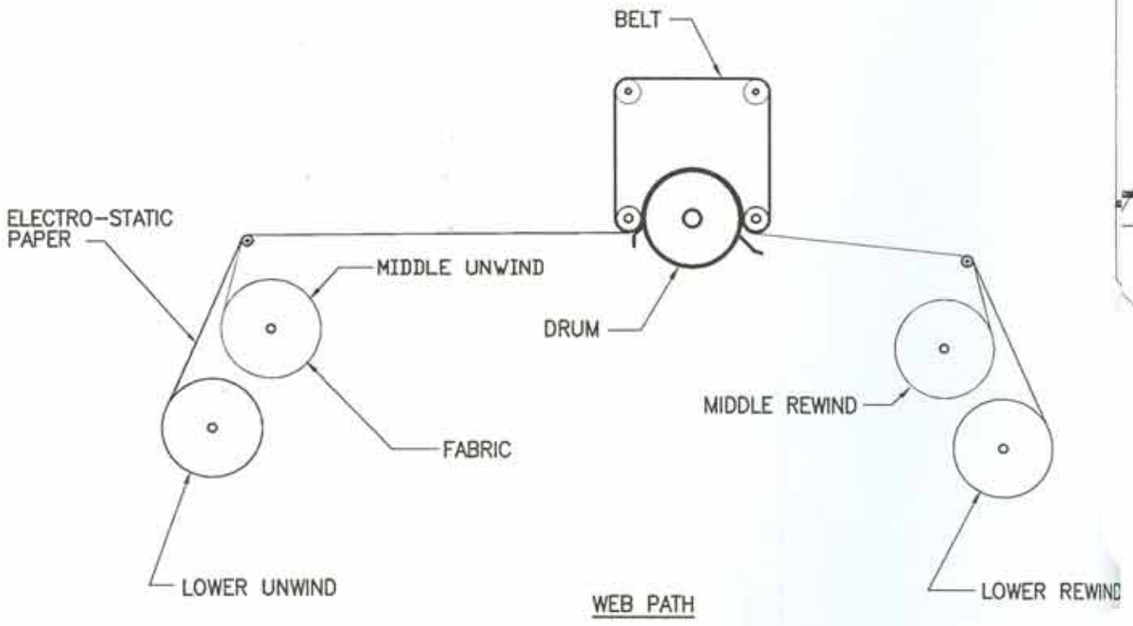
Figure 3-7A

Astechnologies
ENGINEERING + MANUFACTURING

TITLE: FIGURE 3-7 (SHEET 1 OF 2) ROLL TO ROLL WEB PATH - NARROW FABRIC			
PROJECT: 7900 SERIES			
DRAWN: MJN	DATE: 8/8/97	DWG. NO.	REV: A
CHECKED	SCALE: NONE		

WEB CONFIGURATION FOR FULL COVERAGE FABRIC APPLICATIONS, WHEN FABRIC IS WIDER THAN PRINT. (Web configuration is shown below)	
ELECTRO-STATIC PAPER	LOWER UNWIND
FABRIC	MIDDLE UNWIND
BLOTTING TISSUE	NOT REQUIRED

NOTE: TOP UNWIND IS TYPICALLY NOT USED IN THIS CONFIGURATION.



WEB PATH

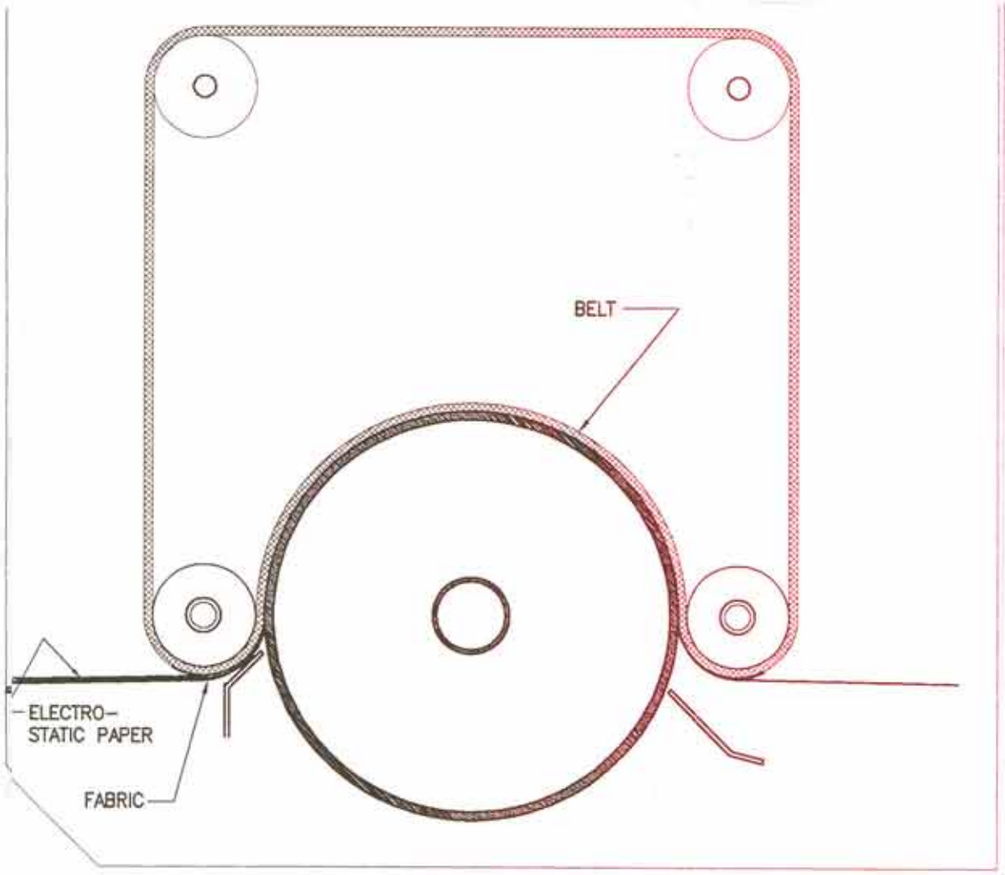
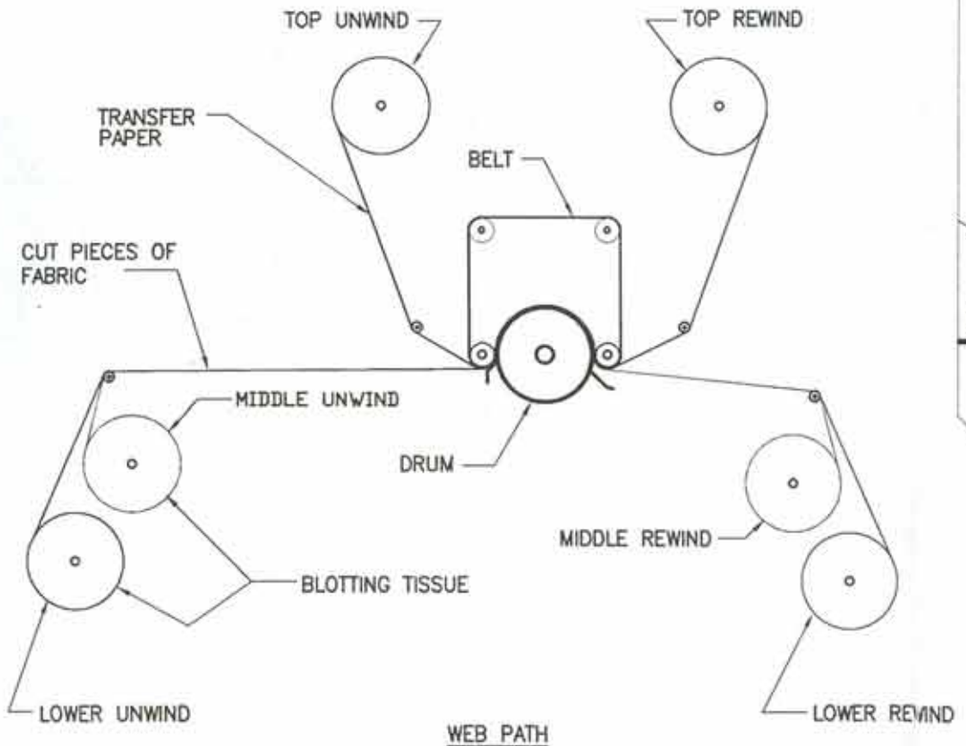


Figure 3-7B

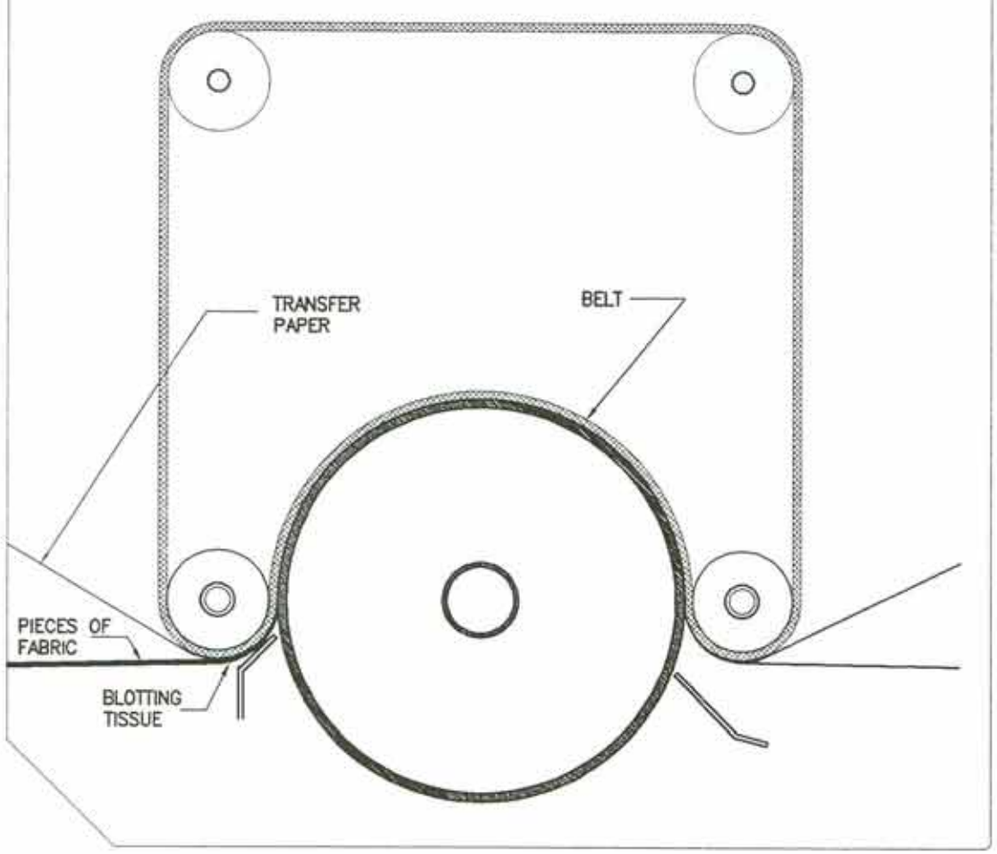
Astechnologies
ENGINEERING + MANUFACTURING

TITLE: FIGURE 3-7 (SHEET 2 OF 2) ROLL TO ROLL WEB PATH - FABRIC WIDER THAN PRINT			
PROJECT: 7900 SERIES			
DRAWN: MJN	DATE: 8/8/97	DWG. NO.	REV: A
CHECKED	SCALE: NONE		

WEB CONFIGURATION FOR CUT PIECES OF FABRIC APPLICATIONS, (Web configuration is shown below)	
TRANSFER PAPER	TOP UNWIND
BLOTTING TISSUE	MIDDLE UNWIND OR LOWER UNWIND



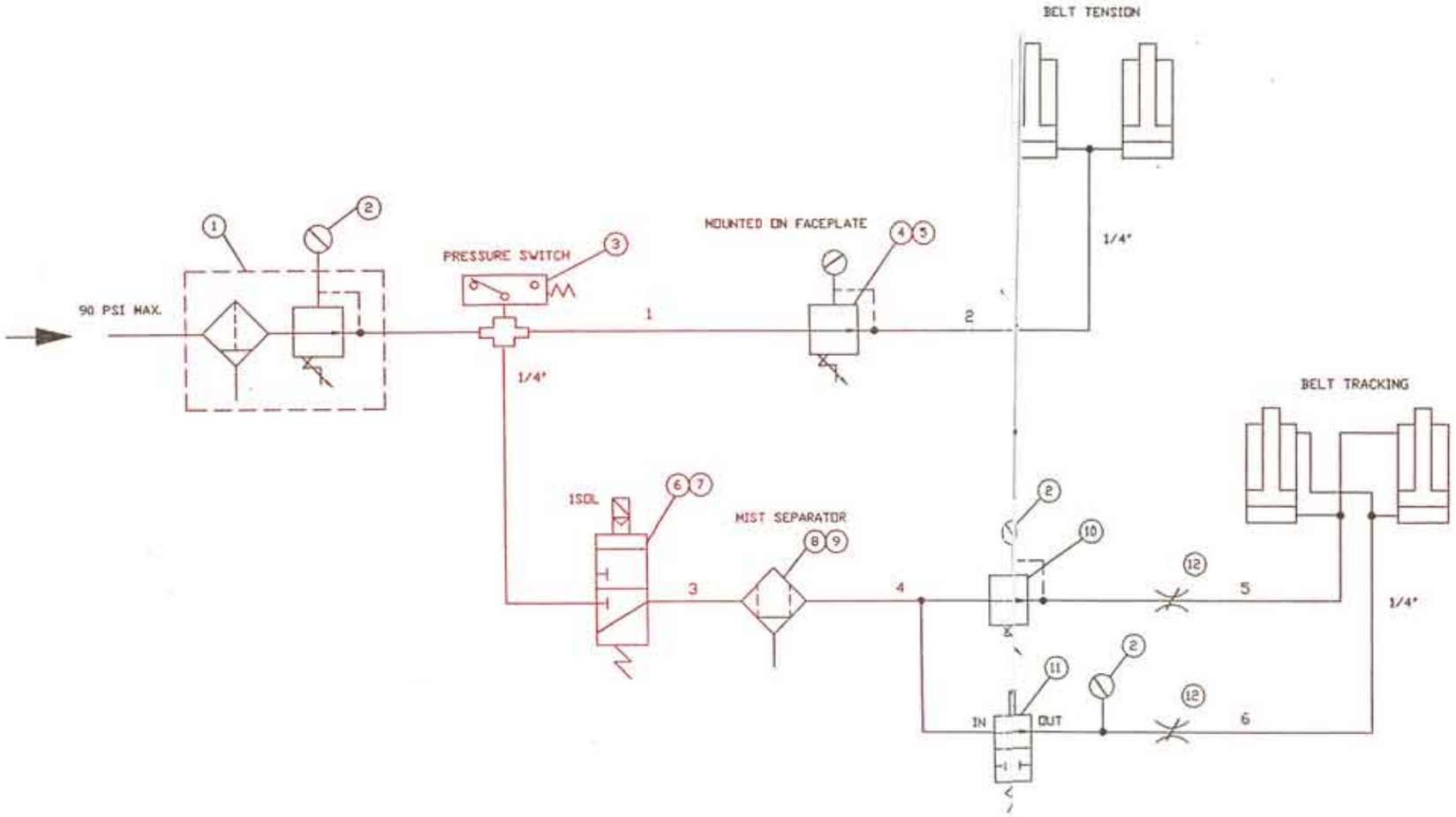
WEB PATH



Astechnologies
ENGINEERING + MANUFACTURING

TITLE: FIGURE 3-8 ROLL TO ROLL WEB PATH - CUT PIECES OF FABRIC			
PROJECT: 7900 SERIES			
DRAWN: MJM	DATE: 8/8/97	DWG. NO.	REV: A
CHECKED	SCALE: NONE		

REVISIONS			
LETTER	DESCRIPTION	NAME	DATE
A	INITIAL DWG	B.2H	7/96



ITEM	QTY.	DESCRIPTION	PART #
12	2	FLOW CONTROL	001981
11	1	E/P REGULATOR	035879
10	1	NORGREN REGULATOR	016578
9	1	BRACKET	026901
8	1	MIST SEPARATOR	024070
7	1	SOLENOID	032570
6	1	CONNECTOR	032571
5	1	GAUGE	001915
4	1	REGULATOR	038535
3	1	PRESSURE SWITCH	032577
2	3	GAUGE	001897
1	1	1/4" FILTER/REGULATOR COMBO.	001905

ITEM	QTY.	PART NO.	DESCRIPTION

TOLERANCES
FRACTIONS ± 1/64 | ANGLE ± 1/2
TWO PLACE DECIMALS ±.010 | THREE PLACE DECIMALS ±.005

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Astechnologies

TITLE: SCHMTC,PNEU,7952,CE

PROJECT: 7952CE

DRAWN: B.2H. DATE: 7-15-96

CHECKED

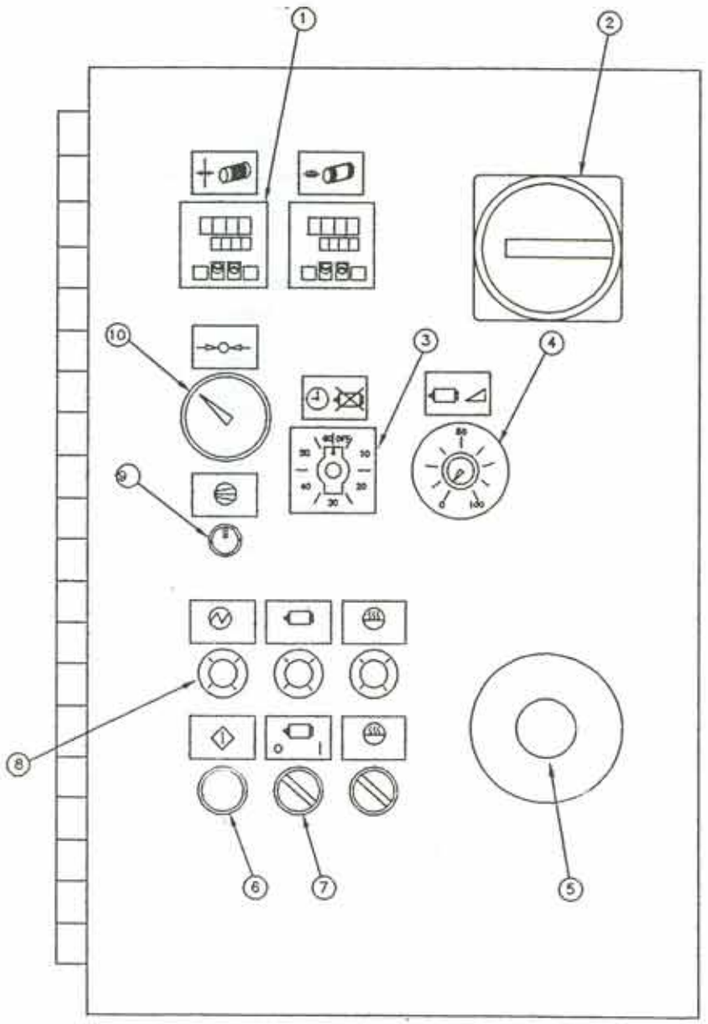
SCALE

DWG. NO. D042969 REV. A

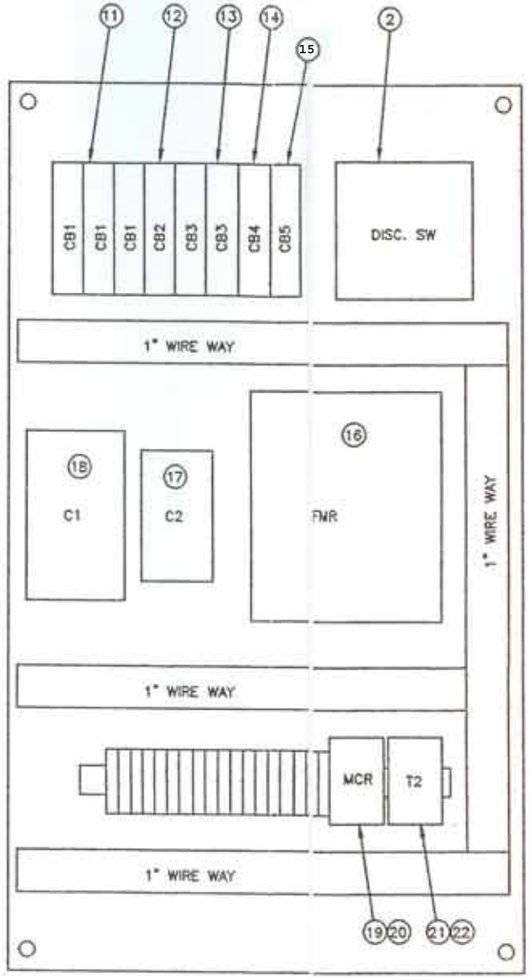
QTY. 1 NEXT ASSY.

REVISIONS			
LETTER	DESCRIPTION	NAME	DATE
A	INITIAL DWG	B.ZH	7/96
B	ADD 220V/50/3 MODEL; ADD 7960 MODEL	B.ZH	9/96
C	CHANGE TC.(1) FROM #035835 TO #044620 CHANGE TIMER FROM #001245 TO #001367	JM	9/97

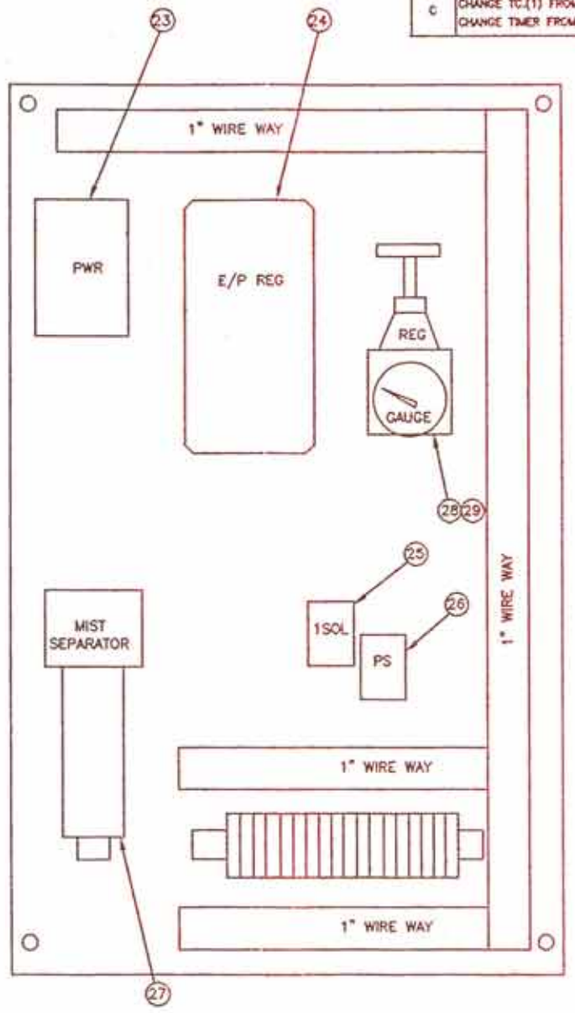
ENCLOSURE A-241608LP



Control Encl SubPanel



PNEU. SUBPANEL



ITEM	QTY.	DESCRIPTION	PART #
1	2	TEMPERATURE CONTROLLER	044620
2	1	DISC. SW, SEE DWG B042968	
3	1	TIMER, 60 MIN. MECHANICAL	001376
4	1	DC MOTOR DRIVE	001771
5	1	EMERGENCY STOP	042867
6	1	PUSH BUTTON, GREEN	042869
7	2	SELECTOR SWITCH	042870
8	3	PILOT LIGHT, GREEN	042871
9	1	REGULATOR	038535
10	1	GAUGE	001915
11	1	SEE DWG B042968	
12	1	SEE DWG B042968	
13	1	SEE DWG B042968	
14	1	CIRCUIT BREAKER, 10A, 1P	042858
15	1	CIRCUIT BREAKER, 4A, 1P	042859

QTY.	DESCRIPTION	PART #
1	CONTACTOR, 16A	001373
1	CONTACTOR, 50A,3P (380V MODEL)	042863
1	CONTACTOR, 90A,3P (220V MODEL)	043348
1	RELAY	006472
1	RELAY SOCKET	006473
1	ON DELAY TIMER	001384
1	TIMER SOCKET	001420
1	POWER SUPPLY	043108
1	E/P REGULATOR	035879
1	SOLENOID VALVE, 3 WAY	032570
1	PRESSURE SWITCH	032755
1	MIST SEPARATOR	024070
1	GAUGE	001897
1	REGULATOR	016578

ITEM	QTY.	PART NO.	DESCRIPTION

TOLERANCES: FRACTIONS ±1/64; ANGLE ±1°; TWO PLACE DECIMALS ±.010; THREE PLACE DECIMALS ±.005

Astechnologies

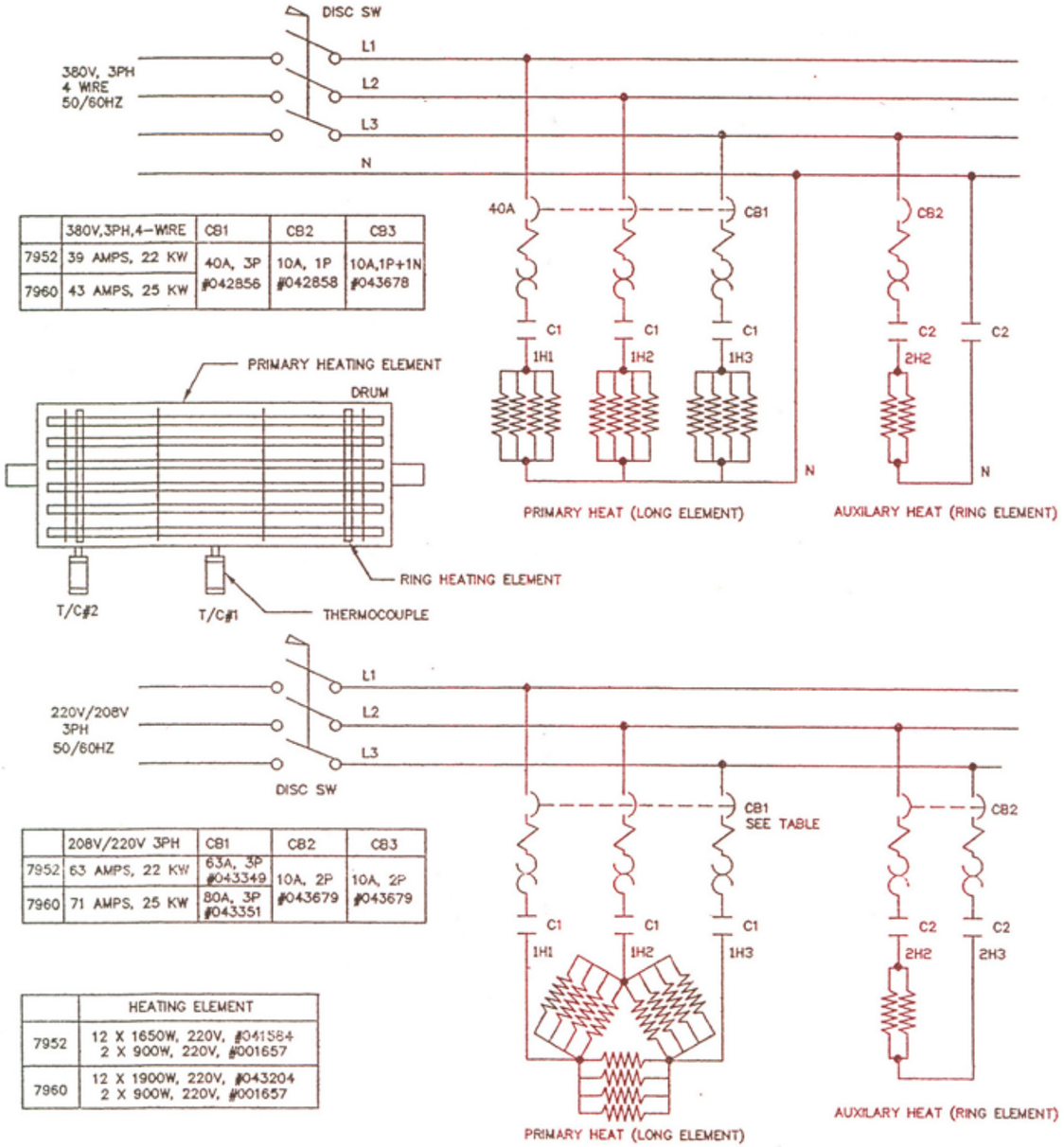
TITLE: LAYOUT, PANEL, CE7952/7960

PROJECT: CE7952/7960 (220V/380V MODEL)

DRAWN: B.ZH | DATE: 7/15/97 | DWG. NO.: B042970 | REV: C

QTY: 1 | NEXT ASSY: | CHECKED: | SCALE:

I J K SHEET 1 OF 2 L



	380V,3PH,4-WIRE	CB1	CB2	CB3
7952	39 AMPS, 22 KW	40A, 3P #042856	10A, 1P #042858	10A,1P+1N #043678
7960	43 AMPS, 25 KW			

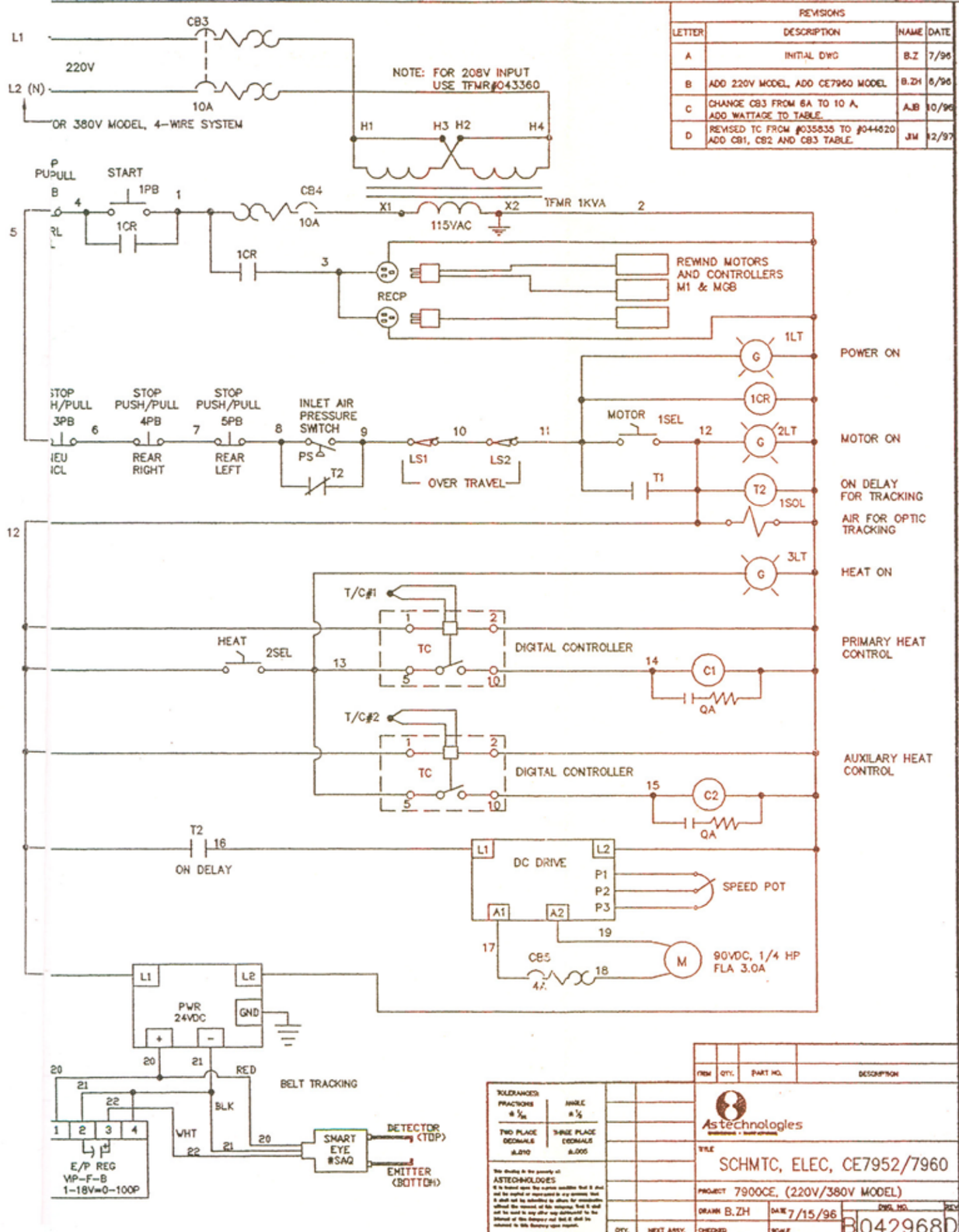
	208V/220V 3PH	CB1	CB2	CB3
7952	63 AMPS, 22 KW	63A, 3P #043349	10A, 2P #043679	10A, 2P #043679
7960	71 AMPS, 25 KW	80A, 3P #043351		

	HEATING ELEMENT
7952	12 X 1650W, 220V, #041584 2 X 900W, 220V, #001657
7960	12 X 1900W, 220V, #043204 2 X 900W, 220V, #001657

ITEM	QTY.	DESCRIPTION	PART #
CB4	1	CIRCUIT BREAKER, 10A, 1P	042858
CB5	1	CIRCUIT BREAKER, 4A, 1P	042859
T1	1	TIMER,60MIN. MECHANICAL	001367
T2	1	TIMER	001384
1-2SEL	2	SELECTOR SWITCH	042870
DC DRIVE	1	DC MOTOR DRIVE	001771
LS1-2	2	LIMIT SWITCH	042953
1-3LT	3	LIGHT, GREEN	042871
DISC SW	1	DISC SW,3P,63A,(FOR 380V MODEL)	045460
		DISC SW,3P,100A,(FOR 220V MODEL)	042860
TC	2	TEMPERATURE CONTROLLER	044620
2-5 PB	4	PUSH/PULL E-STOP SW	042867
M1	3	MOTOR,120V.W/CONTROLLER	043873
MGB	3	REDUCER, GEAR 60:1	001872

C1	1	CONTACTOR, 50A (380V MODEL)	042863
	1	CONTACTOR, 90A (220V MODEL)	043348
C2	1	CONTACTOR,16A,	001373
QA	2	SUPPRESSOR	001873
T/C	2	THERMOCOUPLE, J	039038
PS	1	PRESSURE SWITCH	032577
TFMR	1	TFMR, 1000VA, FOR 220V INPUT	042955
		TFMR, 1000VA, FOR 208V INPUT	043360
1PB	1	PUSH BUTTON, GREEN	042869
PWR	1	TRI-TRONICS POWER SUPPLY	043108
E/P	1	ELECTRO REGULATOR	035879
EYE	1	SMART EYE	024067
DETECTOR	1	DETECTOR	024065
EMITTER	1	EMITTER	024066
MCR	1	RELAY	006472

REVISIONS			
LETTER	DESCRIPTION	NAME	DATE
A	INITIAL DWG	B.Z	7/96
B	ADD 220V MODEL, ADD CE7960 MODEL	B.ZH	8/96
C	CHANGE CB3 FROM 6A TO 10 A, ADD WATTAGE TO TABLE.	AJB	10/96
D	REVISED TC FROM #035835 TO #044620 ADD CB1, CB2 AND CB3 TABLE.	JM	12/97



ITEM	QTY.	PART NO.	DESCRIPTION

TOLERANCES:
FRACTIONS ±1/64 | ANGLE ±1°
TWO PLACE DECIMALS ±.010 | THREE PLACE DECIMALS ±.005

Astechnologies

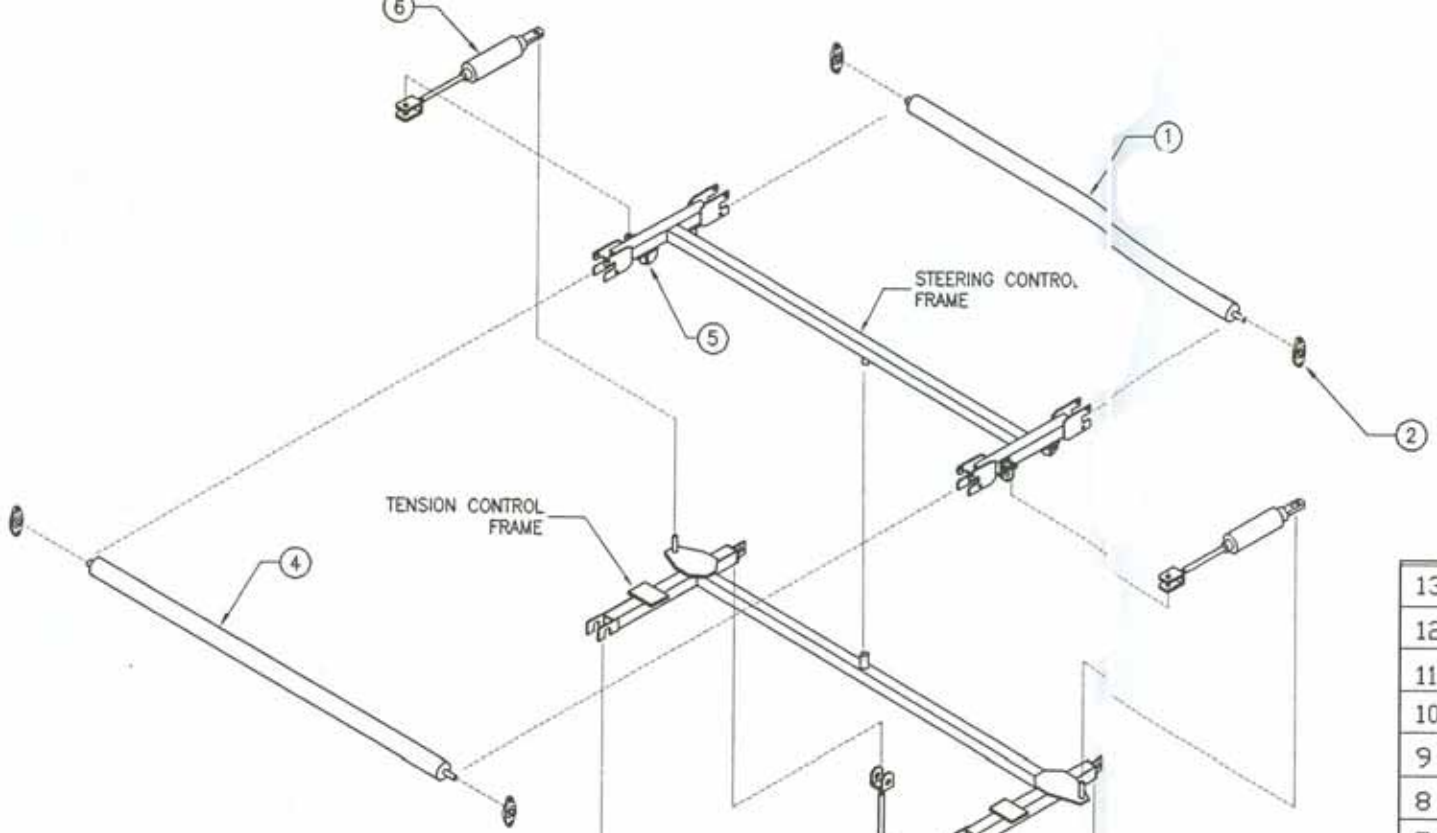
TITLE: SCHMTC, ELEC, CE7952/7960

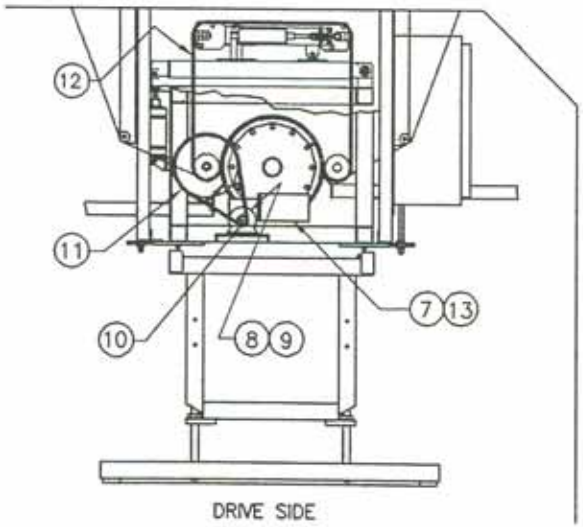
PROJECT 7900CE, (220V/380V MODEL)

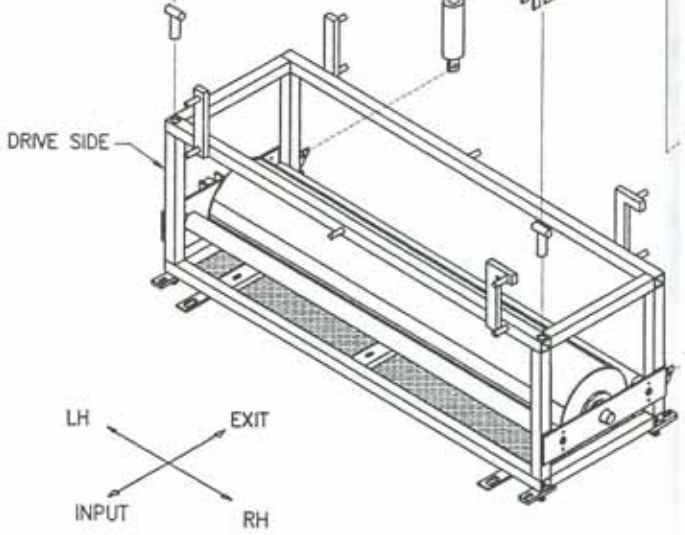
DRAWN B.ZH | DATE 7/15/96 | DWG. NO. B042968D | REV. D

QTY. | NEXT ASSY. | CHECKED | SCALE

SHEET 1 OF 1







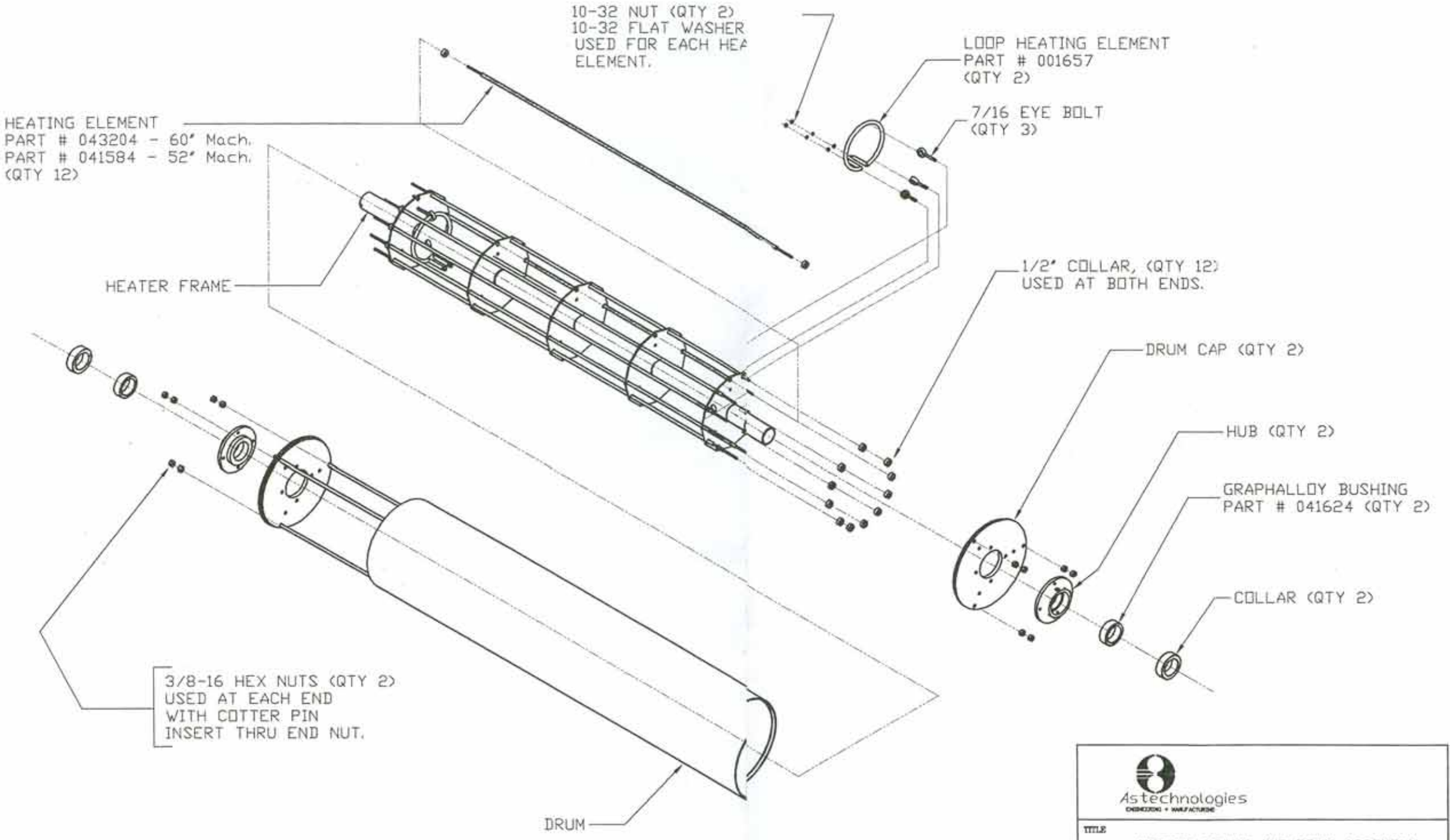
ITEM NO.	QTY	PART NO.	TRACKING ASSEM
13	1	042302	REDUCER, 40:1
12	1	043159	BELT
11	1	042233	SPROCKET, 35B6
10	1	003520	SPROCKET, 35B1
9	1	026660	MASTERLINK CH
8	1	003583	CHAIN, #35
7	1	001752	MOTOR
6	2	041947	AIR CYLINDER,
5	4	041732	PIVOT WHEEL
4	3	043242	IDLER, ROLLER
3	2	002461	AIR CYL, BELT
2	8	003461	BEARING,FLANGE
1	1	043153	DRIVE, ROLLER

Astechnologies

TITLE: DRIVE AND TRACKING ASSEM

PROJECT: 7900 SERIES

DRAWN	DATE	DWG. NO.
MJM	8/8/97	
CHECKED	SCALE	
	NONE	



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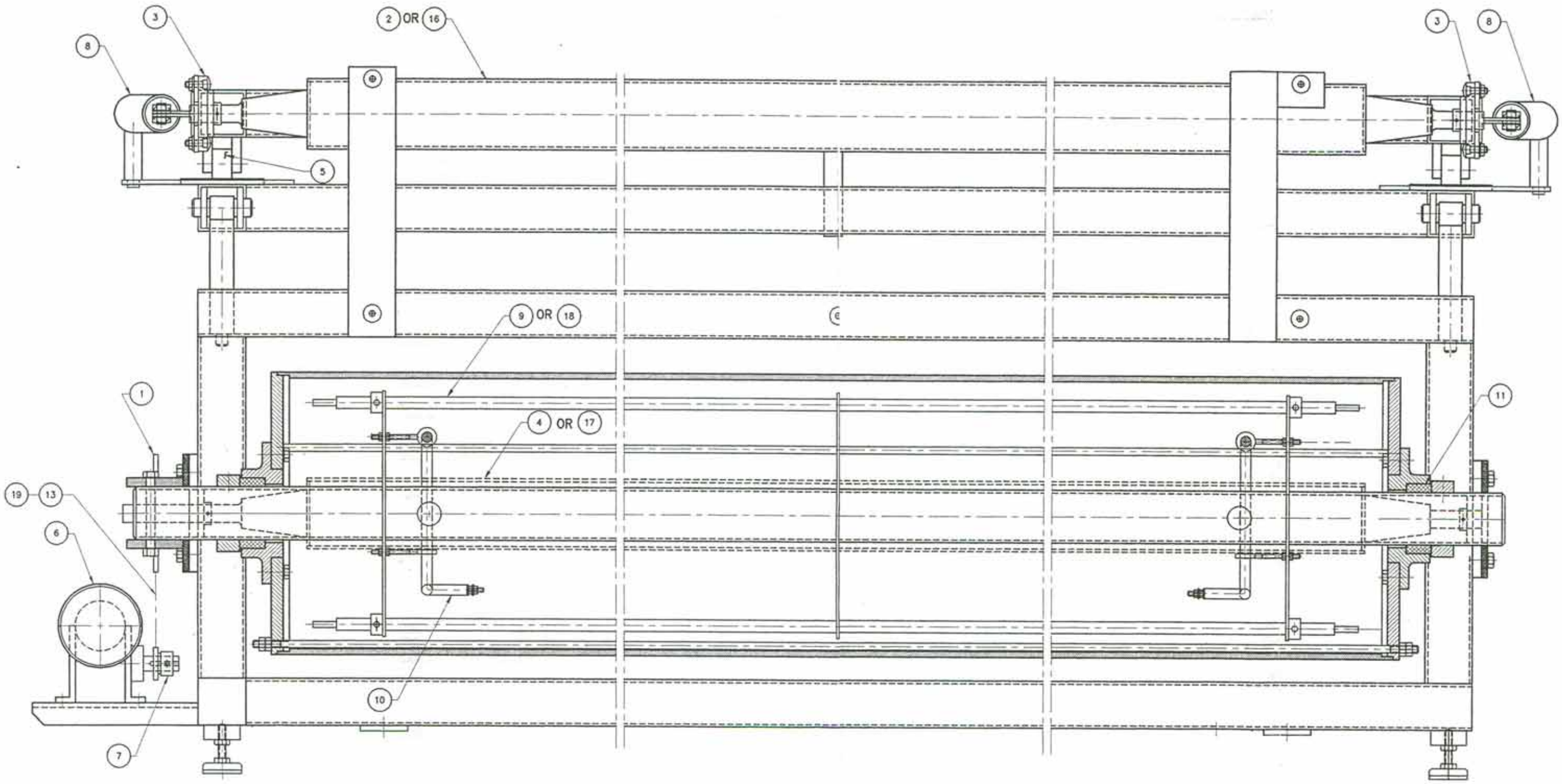
ENGINEERING + MANUFACTURING

TITLE: HEATER FRAME AND DRUM ASSEMBLY			
PROJECT: 7900 SERIES			
DRAWN: MJM	DATE: 8/8/97	DWG. NO.	REV: A
CHECKED	SCALE: NONE		



19	1	026660	MASTERLINK, CHAIN, #35
18	12	043204	ELEC. HEATING ELEMENT, 7960
17	1	043153	DRIVE ROLLER, 7960
16	3	043242	IDLER ROLLER, 7960
15	1	043159	BELT, 7960 (NOT SHOWN)
ITEM	QTY.	PART NO.	DESCRIPTION

14	1	041612	BELT, 7952 (NOT SHOWN)
13	1	003583	CHAIN, #35
12	2	002461	AIR CYL, BELT TEN (NOT SHOWN)
11	2	041624	GRAPHALLOY BUSHG
10	2	001657	LOOP HEATING ELEMENT
9	12	041584	TUBULAR HEATING EMENT, 7952
8	2	041947	AIR CYL., STEERING
ITEM	QTY.	PART NO.	DESCRIPTION

7	1	003520	SPROCKET, 35B10
6	1	032101	GEARMOTOR
5	4	041732	PIVOT WHEEL
4	1	041704	DRIVE ROLLER, 7952
3	8	003461	BEARING, FLANGE, 3/4 DIA.
2	3	041703	IDLER ROLLER, 7952
1	1	042233	SPROCKET, 35B60
ITEM	QTY.	PART NO.	DESCRIPTION

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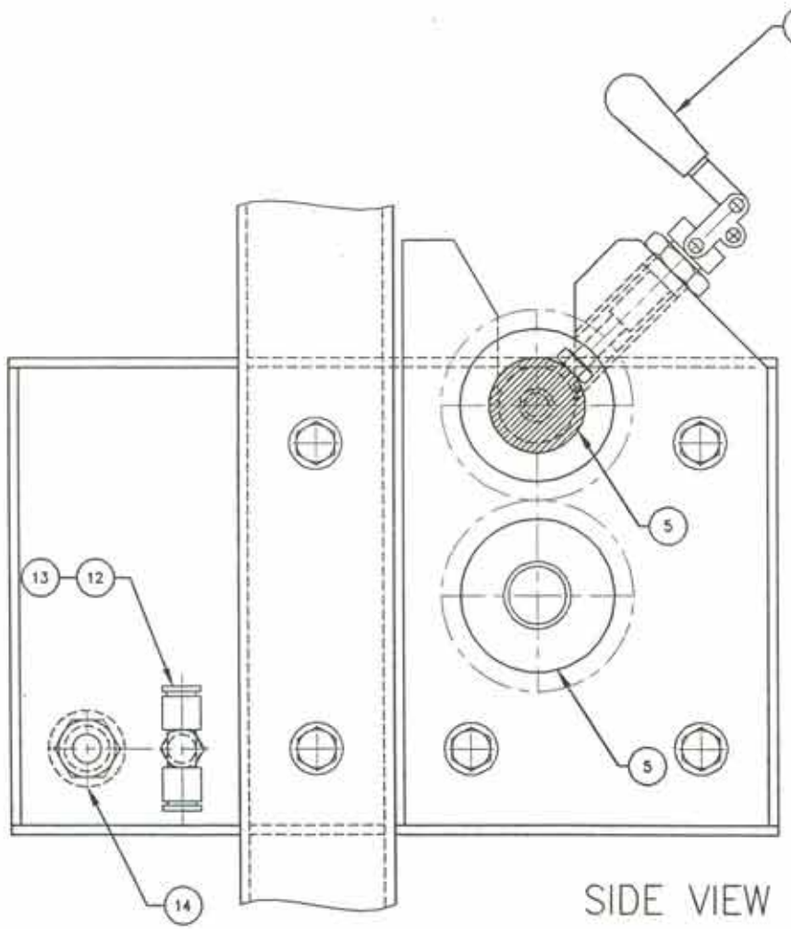
ENGINEERING • MANUFACTURING

TITLE
MECHANICAL ASSEMBLY

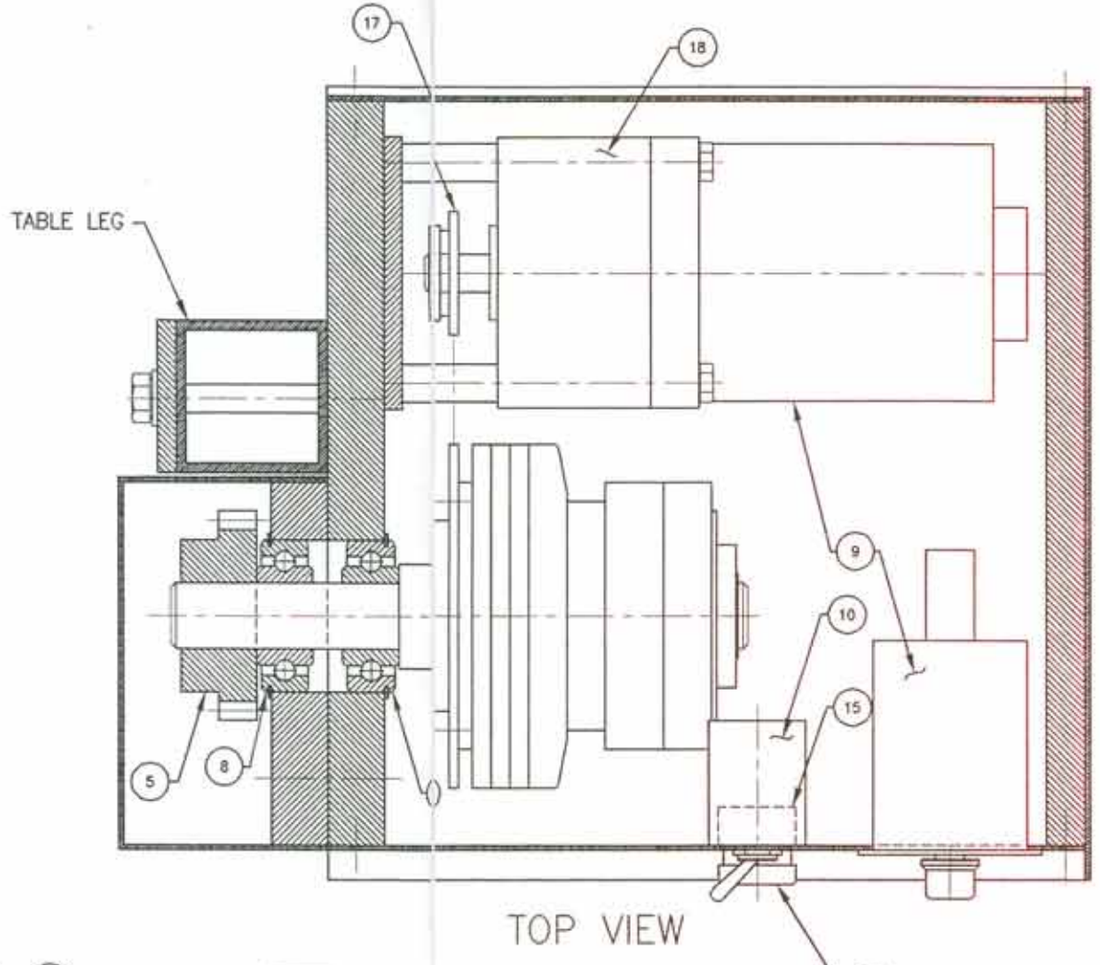
PROJECT	7900 SERIES		
DRAWN	IZADI	DATE 9/23/96	DWG. NO. / REV
CHECKED		SCALE	A

FILE = ASSYGEN

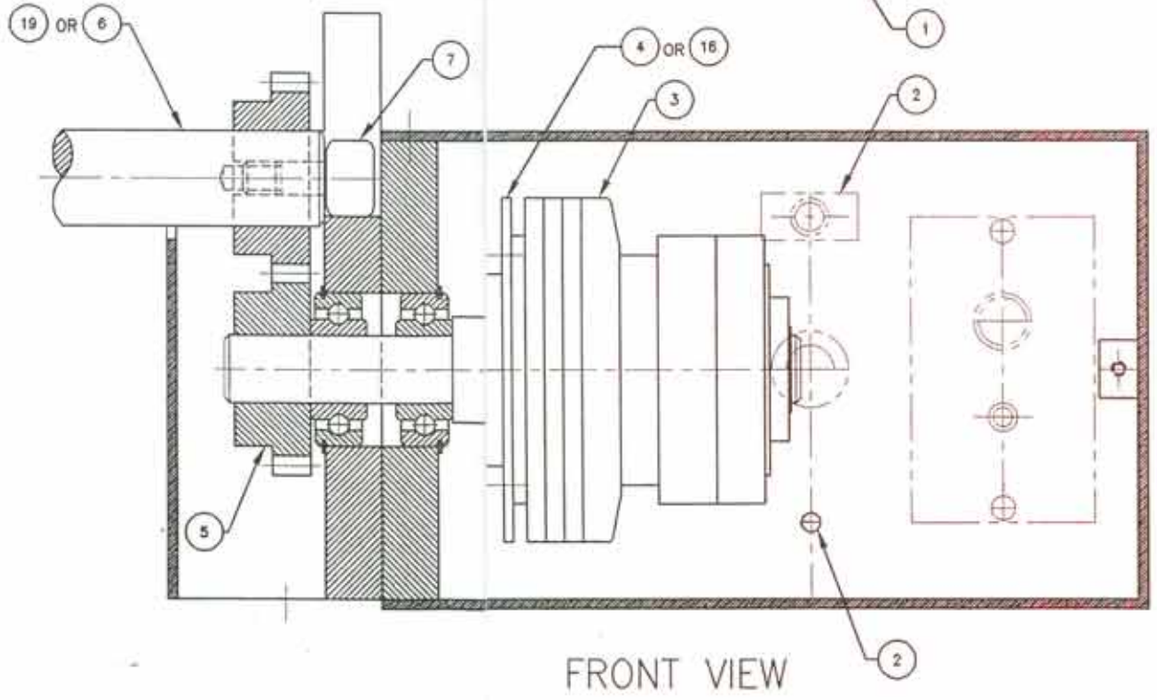
NOTE: REWIND SHOWN, UNWIND SIMILAR (NOT DRIVEN).



SIDE VIEW



TOP VIEW



FRONT VIEW

ITEM	QTY.	PART NO.	DESCRIPTION
19	1	043383	ASSY , SHAFT FOR 7960
18	1	001872	REDUCER , GEAR , 60 : 1
17	1	003512	SPKT , 35 B 12
16	1	034823	SPKT, DRIVE, RWD
15	1	042057	GAUGE MOUNT
14	1	001804	STRAIN RELIEF CONNECTOR
13	1	018434	FTG , STRAIGHT, 1/4 X 1/8 NPT
12	1	016470	FTG , TEE, 1/4X 1/8 NPT
11	1	041983	CLAMP TOGGLE
10	1	000764	AIR , SWITCH
9	1	001871	MOTOR W/ CONTROLLER
8	2	041976	BALL BRG , 7/8 DIA.
7	2	005713	BRG. , CAM FOLLOWER
6	1	042129	ASSY , SHAFT FOR 7952
5	1	041974	WLDMT , DR. SHAFT
4	1	042044	ARM, ANTI-ROTATE, UWD
3	1	004714	AIR CLUTCH
2	1	042077	REGULATOR , AIR
1	1	042115	GAUGE , AIR

TOLERANCES
FRACTIONS ± 1/64 | ANGLE ± 1°
TWO PLACE DECIMALS ± .010 | THREE PLACE DECIMALS ± .005

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QTY. | NEXT ASSY.

Astechnologies

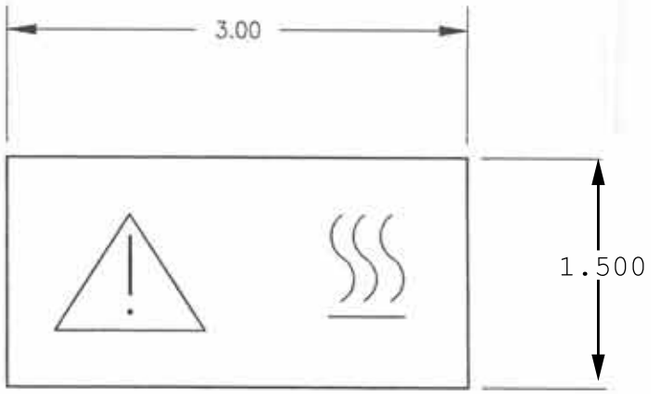
TITLE REPLACEMENT PARTS UNWINDS AND REWINDS

PROJECT 7900 SERIES

DRAWN IZADI | DATE 9/23/96 | DWG. NO. | REV

CHECKED | SCALE

REV	DESCRIPTION	NAME	DATE
A	INITIAL RELEASE	MJM	8/1/96



SPECS:

1. BACKGROUND : YELLOW (OR BRUSHED ALUMINUM)
2. LETTERING : BLACK
3. MATERIAL: ALUMINUM

ITEM	QTY.	PART NO.	DESCRIPTION
1	AR	043161	CAUTION, HEAT

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ENGINEERING • MANUFACTURING

TITLE
LABEL, ALUM, PICTOGRAMS

PROJECT CE, PICTOGRAMS

DRAWN	SCALE	DWG. NO.	REV
IZADI	1/1	B043161	A
DATE 8/1/96			

REV	DESCRIPTION	BY	DATE
A	INITIAL ISSUE	K.I.	8/1/96
B	ADDED #20,#21,#22	KI	2/5/97
C	ADDED #23	KI	2/25/97
D	ADDED #24 & #25	MJM	6/27/97

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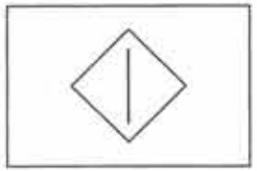

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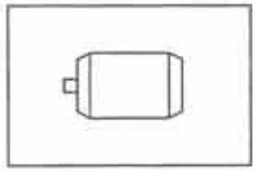

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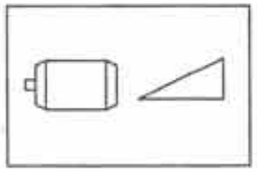

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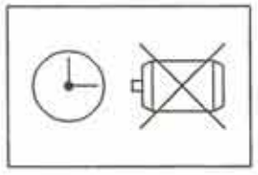
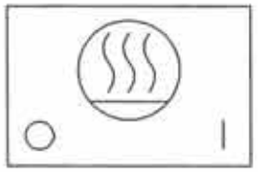


NO.(5)

NO.(6)

NO.(7)



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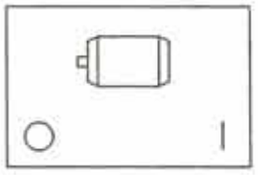

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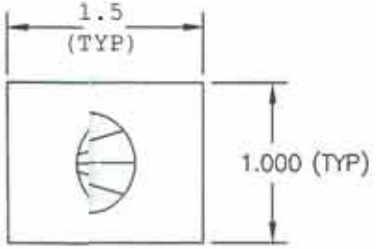
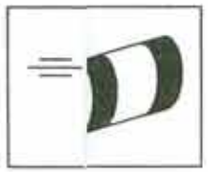


NO.(10)

NO.(11)



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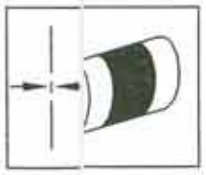

SPECS:

1. BACKGROUND : BLACK
2. LETTERING : WHITE
3. LABEL THICKNESS : 1/16
4. EDGES : BEVELING
5. SELF-ADHESIVE BACK

ITEM	QTY.	PART NO.	DESCRIPTION
12	AR	043141	CENTER HEAT ZONE
11	AR	043140	OUTER HEAT ZONES
10	AR	043139	PRESSURE
9	AR	043138	PNEUMATIC CONTROL
8	AR	043137	MOTOR SELECTOR SWITCH
7	AR	043136	HEAT SELECTOR SWITCH
6	AR	043135	ELECTRICAL POWER INDICATOR
5	AR	043134	HEAT INDICATOR
4	AR	043133	COOL DOWN TIMER
3	AR	043132	MOTOR SPEED CONTROL
2	AR	043131	MOTOR INDICATOR
1	AR	043130	START

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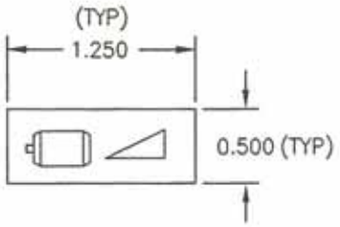
ENGINEERING • MANUFACTURING

TITLE
LABEL, GRAVEL-PLY, PICTOGRAMS

PROJECT CE, PICTOGRAMS

DRAWN	SCALE	DWG. NO.	REV
IZADI		B043123	D
DATE 8/1/96	1/1		

NO.(17)



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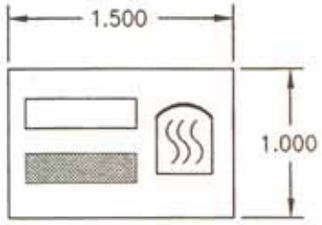
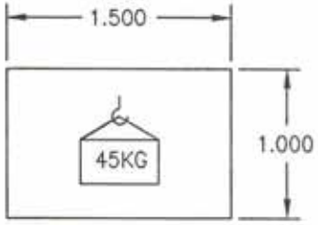
No. (25)



NO.(16)

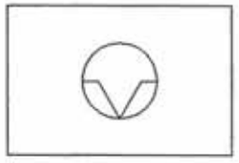
NO.(18)



NO. (19)

NO.(13)

NO. (20)



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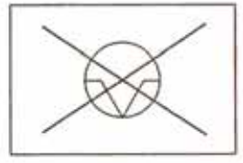
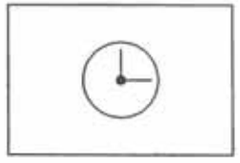
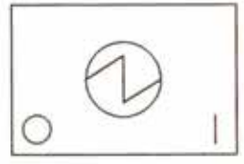


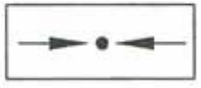
NO. (22)



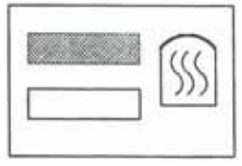
NO. (23)



NO.(14)



NO. (24)



SPECS:

1. BACKGROUND : BLACK
2. LETTERING : WHITE
3. LABEL THICKNESS : 1/16"
4. EDGES : BEVELING
5. SELF-ADHESIVE BACK

ITEM	QTY.	PART NO.	DESCRIPTION
25	AR	045056	BOTTOM HEATED PLATE
24	AR	045054	TOP HEATED PLATE
23	AR	044484	ELECTRICAL POWER SELECTOR SW.
22	AR	044295	TIMER
21	AR	044294	RESET
20	AR	044293	INTERUPTION
19	AR	043168	DO NOT TOUCH
18	AR	043167	MAX. WEIGHT
17	AR	043166	MOTOR SPEED CONTROL
16	AR	043165	MOTOR SWITCH
15	AR	043164	TENSION ADJUST
14	AR	043163	PRESSURE
13	AR	043162	AIR TOGGLE SWITCH

Astechnologies
ENGINEERING • MANUFACTURING

TITLE: LABEL, GRAVEL-PLY, PICTOGRAMS

PROJECT: CE, PICTOGRAMS

DRAWN	SCALE	DWG. NO.	REV
IZADI		B043123	D
DATE 8/1/96	1/1		