

WAGNER INDUSTRIES, INC.

Roll To Roll Manufacturing Line
Model #: R2R-1

Manufactured for Purdue University

Manufactured by:
Wagner Industries, Inc.
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Serial #: H3859

Ship Date: April 18, 2018

WAGNER MODEL R2R-1
S/N H3859
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CH 16

WAGNER MODEL R2R-1
S/N H3859

REWIND

SEC 16

THE REWIND MODULE CONSISTS OF A 8" WIDE FILM REWIND SHAFT WITH 3" DIAMETER PNEUMATIC BLADDER CORE CHUCK WITH INFLATION GUN AND COIL HOSE. THE SHAFT CAN HOLD UP TO A 50 POUND ROLL OF PRODUCT AND HAS A CAPACITY OF A 12 INCH DIAMETER ROLL.

THE ROLL CAN REWIND ONLY IN A CCW DIRECTI ON.

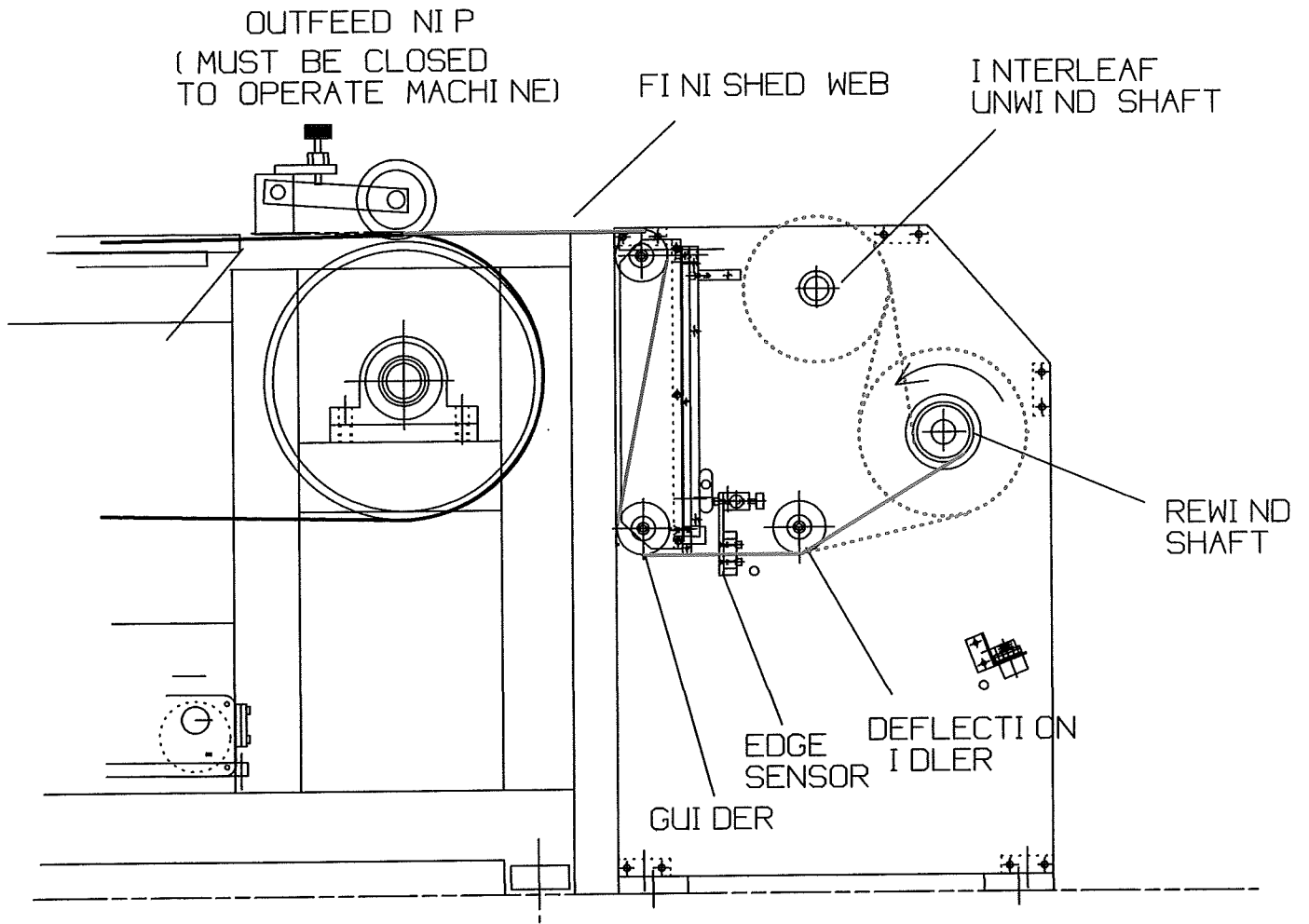
TENSI ON IS CONTROLLED BY A MAGNETIC PARTICLE CLUTCH THAT IS CONTROLLED BY A TENSI ON SET POTENTI OMETER W TH A DIGI TAL READOUT. THE RE W ND TENSI ON IS AUTOMATI CALLY DESI GNE D TO HOLD TAPER TENSI ON.

AN ALL ELECTRI C WAGNER I NDUSTR I ES EDGE GUI DE SYSTEM CONS I STS OF A VI S I BLE LED LI GHT SOURCE AND PHOTORECEI VER I N A "C" SHAPED EDGE SENSOR AT THE FRAME SI DE OF THE REWIND. WHEN THE SENSOR I S HAL F COVERED, I T SENDS A SI GNA L TO THE AMPL I F I ER LOCATED AT THE REAR OF THE RE W ND MODULE. THE AMPL I F I ER THEN SENDS A CORRECTI ON SI GNA L TO A 12 VOLT DC LI NEAR ACTUATOR WHI CH MOVES A POSI TI VE DI S PLACEMENT GUI DER FRAME. THE WEB I S DI VERTED LEFT OR RI GHT DEPEN DI NG ON THE DI RECTI ON OF THE ERROR DETECTED. THE FILM OR WEB LEAVES THE GUI DER FRAME AND I S FED TO THE DEFLECTI ON ROLLER PRI OR TO THE RE W ND SHAFT.

A SECONDA RY SHAFT I S LOCATED JUST ABOVE THE RE W ND SPIN DLE SO THAT A BU FFER WEB OR I NTERLEAF MATERI AL CAN BE ADDED BETWEEN THE RE WOUND LAYERS. THE RE W ND SHAFT W ILL PULL WEB OFF OF THE SECONDA RY SHAFT AS NEEDED. A SI MPLE COLLER ON THE SECONDA RY SHAFTS CONTROL S SI DE TO SI DE POSI TI ONI NG OF THE I NTERLEAF WEB. THREADUP PATH I S SHOWN ON PAGE 2 OF THI S SECTI ON.

R2R-1 MACHINE REWI ND THREADUP

SEC 16



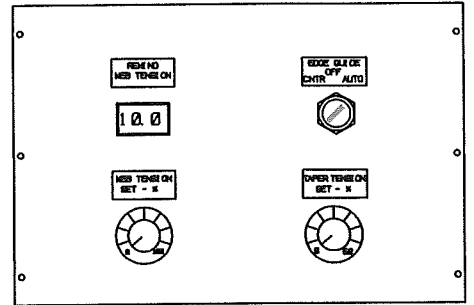
REWIND

REWIND PANEL

3" DEADSHAFT
LOW MASS IDLER

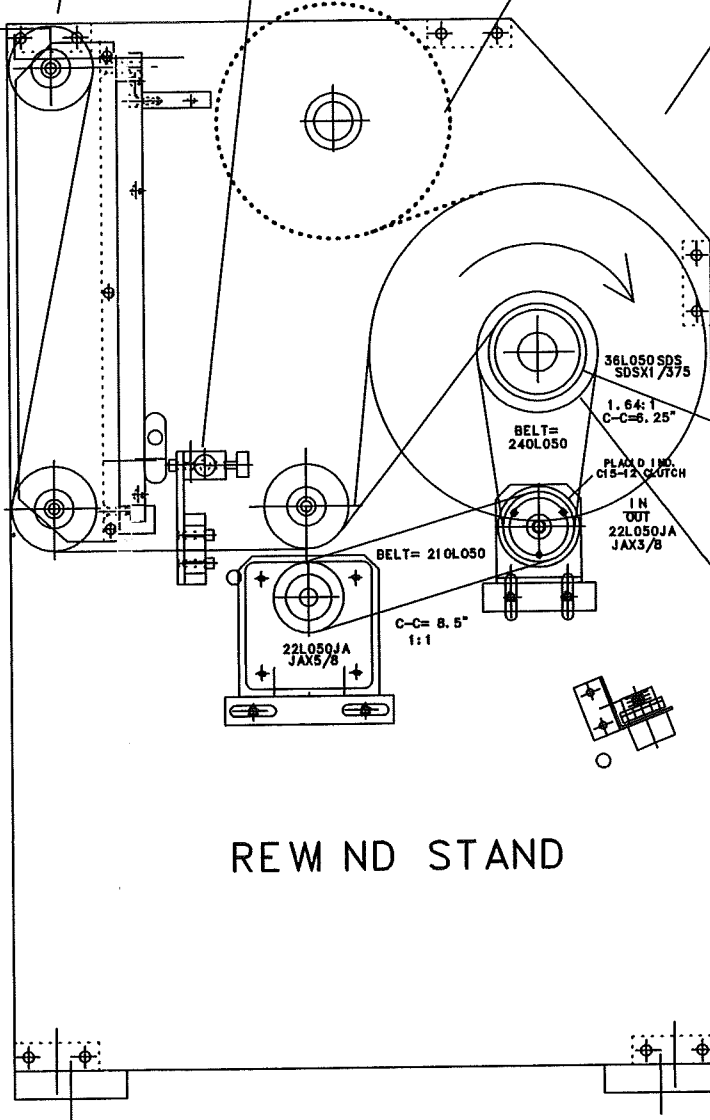
INTERLEAF
PAPER
SHAFT

EDGE SENSOR



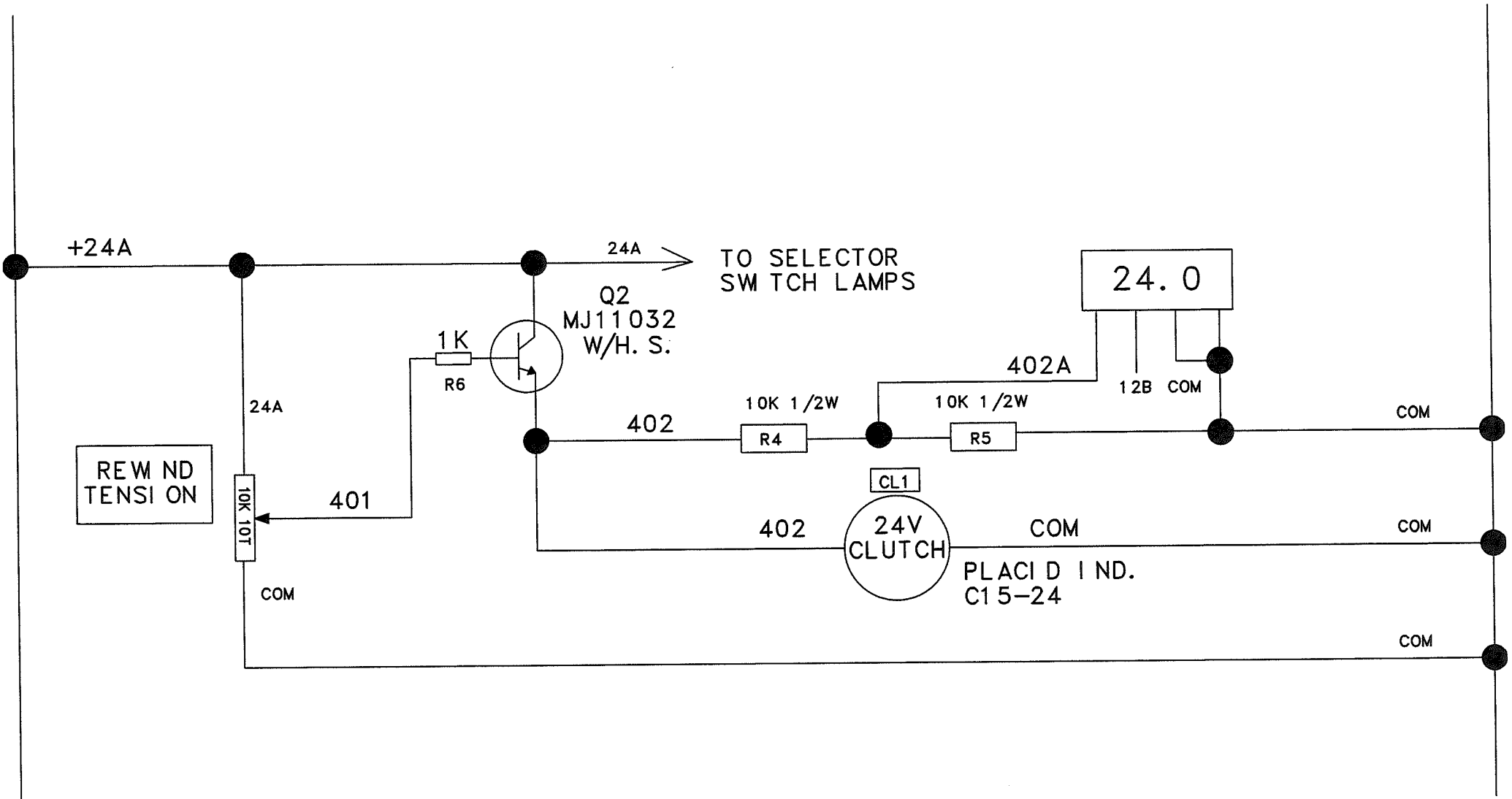
CORE CHUCK
INFLATION GUN
(ON END PANEL)

3" SPINDLE



REWIND STAND

12" OD X
3" ID CORE
TYP.



REW ND
TENS I ON

+24A

24A

10K 10T

401

1K
R6

Q2
MJ11032
W/H. S.

24A

TO SELECTOR
SW TCH LAMPS

402

10K 1/2W
R4

CL1

402

24V
CLUTCH

PLACID I ND.
C15-24

10K 1/2W
R5

402A

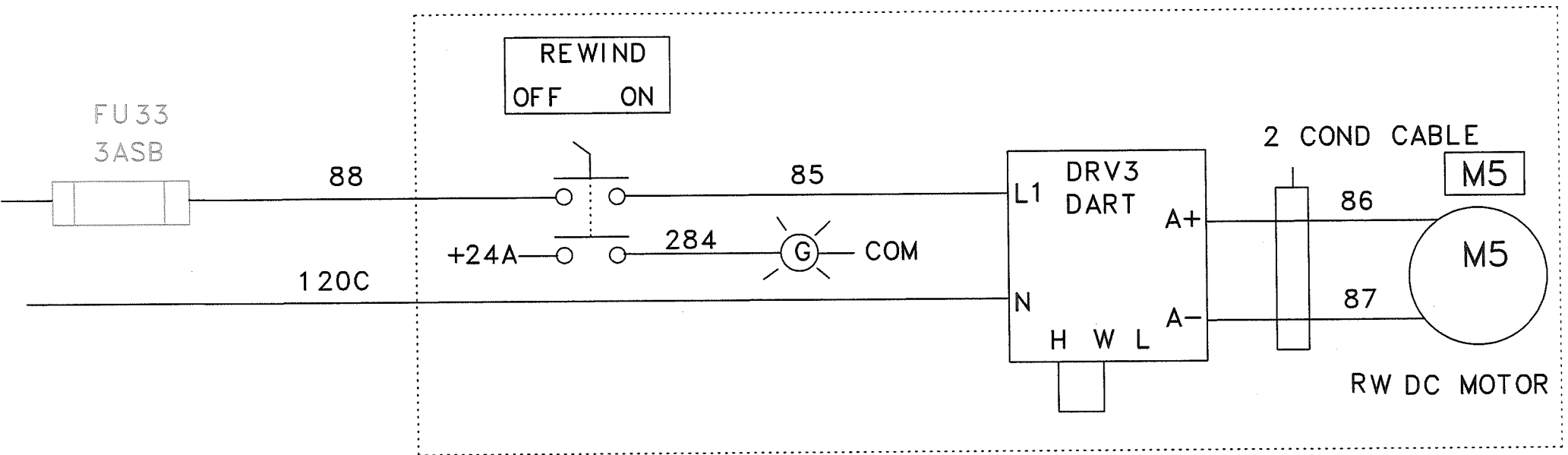
24.0

12B COM

COM

COM

COM



REWIND

EDGE GUIDE
CTR OFF AUTO

290

292

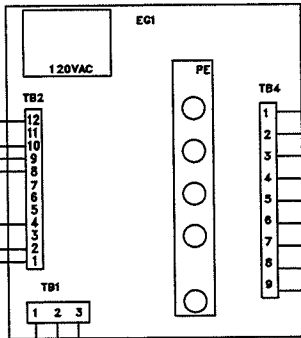
291

94

95

120

120C



TB4

1

2

3

4

5

6

7

8

9

BLK

RED

RED

WHT

BLK

GRN

WHT

BLK

RED

DCSA3

SC3

ESS

R/W EDGE GUIDE

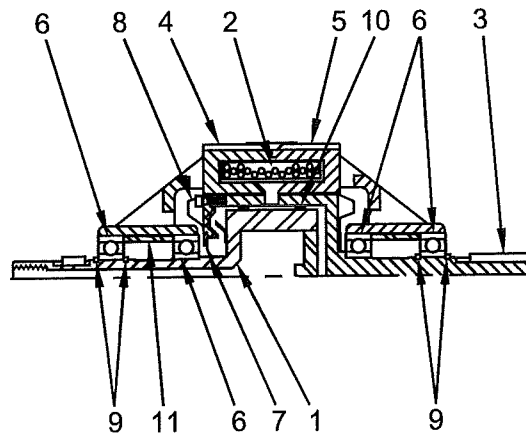
INSTRUCTION MANUAL MAGNETIC PARTICLE CLUTCH MODEL C

CAUTION: This product contains rotating parts which could cause injury. At time of installation, appropriate protective guards should be installed by the user according to his use of this product.

Theory of Operation

The clutch consists of stators, a rotor, drive cylinder, coil, magnetic powder, and bearings which support the drive cylinder and rotor in the stators. The magnetic powder occupies the space between the drive cylinder and rotor, and functions as the adjustable bond or link between them. It is the medium for the transmission of torque.

A current in the coil creates a magnetic field (flux) which passes through the stators, drive cylinder, magnetic powder and rotor. The flux aligns the powder, forming links or bonds between the rotor and drive cylinder. The strength of the bonding action (torque) is proportional to the amount of current in the coil.



Parts List

1 Rotor	7 Seal
2 Coil	8 End Bell
3 Drive Cylinder	9 Snap Rings
4 Left Stator	10 Magnetic Powder
5 Right Stator	11 Spacers
6 Bearings	

Installation

Prior to installation, check the rotation by hand and observe that it is smooth and free of binding or scraping.

1. Mount the clutch to a base using four suitable bolts. The shaft centerline must be within 30° from the horizontal plane.
2. The outer rotating member is the input, since heat dissipation is related to outer rotating member speed.
3. When using couplings or belts, insure clutch is properly aligned. Flexible couplings must be used for in-line installations.

Water Cooled Clutch

GENERAL: Coupling the output (rotor) to the load may be done using gears, sprocket and chain, or pulley and belt systems. The rotary fitting mounted on the end of the shaft does not allow direct coupling to the load. The clutch must be connected through the power transfer device before the water fitting is attached.

To install a water cooled clutch install the water fitting as follows:

1. Install the washer on the threaded shaft and screw the water fitting into the clutch shaft.
2. Connect the input hose which is the end hose to your water source.
3. Connect the drain hose which is the inside hose (hose nearest clutch housing) to your drain outlet.

To prevent internal condensation, control the input water with an electrically operated solenoid valve. Insure that the input water flow is off when the clutch is off.

Electrical Connection

For 24 vdc Devices:

1. Connect the two wires in the clutch junction box to the 24 vdc power source.

For 90 vdc Devices:

1. Connect the 90 vdc power source to the terminals marked 1, 2.
2. Connect the protective bonding circuit to the terminal marked with the P.E. symbol



Environmental Specifications

Temperature Range:

Operating	0°C to 40°C
Storage	-30°C to +80°C

Relative Humidity:	5% to 85%
Pollution Degree:	2 (IEC664-1)
Altitude:	0-2000 meters

Note: The clutch coil system has been changed from Class A to Class F. Refer to the nameplate on your unit to determine which insulation class you have. If you have Class F insulation, the nameplate will denote Class F. If you have Class A, there will be no notation on the nameplate.

Model	Supply Voltage, vdc			
	0 - 24		0 - 90	
	Class A	Class F	Class A	Class F
C1			0.18	0.25
C1S7	0.68	0.97		
C3			0.23	0.29
C10			0.37	0.44
C10S10	1.39	1.67		
C50			0.53	0.86
C50S1	2.12	3.21		
C100			0.61	0.87
C100S4	2.29	3.41		

Maintenance

Due to its small number of moving components and its basic design, maintenance of the brake is generally necessary only after extended service. When a problem appears in the system, ensure that all couplings, belts, etc., and the control device are functioning properly. Use the Troubleshooting guide below to determine the cause of the problem. The clutches can be rebuilt with a repair kit which puts it into "as new" condition. A repair kit includes a new powder charge and the appropriate bearings, seals and snap rings generally needed to rebuild the unit.

NOTE: When ordering parts not contained in the kit, provide the model number, serial number and parts list item number.

Troubleshooting

Problem	Possible Cause	Action
Load has slowed down due to insufficient torque transmitted between motor and load	Power supply voltage output low	Replace or repair power supply
	Magnetic powder has deteriorated or is partially lost	Overhaul clutch using repair kit
Load has stopped and clutch rotor is not running with proper voltage	Coil is open	Replace coil
Load operated intermittently with proper voltage	Coil is intermittently open	Replace coil
Clutch is noisy and has some	Clutch bearings are worn	Overhaul clutch using repair

vibration		kit
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Disassembly

The following step-by-step instructions pertain to the Model C10 clutch. Due to the similarity of clutches covered in this manual, the step-by-step instructions can be used as a guide in disassembly of all other models. Areas of major difference are covered under notations in the text. When disassembling the clutch refer to the figure while following the text.

1. Remove the junction box cover, nameplate, mounting brackets and retaining screws.
2. Remove the screws retaining the end bell on the drive cylinder.
3. Disassemble left stator and right stator by removing screws.
4. Remove coil.

NOTE: The clutch is now disassembled into loose parts plus the rotating group. The following steps outline disassembly of the rotating group.

5. In the following step the powder will be released.
6. Remove screws and empty the powder.

C1 NOTE: The end bell in a C1 is retained in the drive cylinder by a press fit. Use a thin-bladed object and carefully remove the end bell.

7. Remove snap ring and shims. Some clutches will not have a shim. If a shim is found, it should be re-installed at the same place during assembly.
8. Use a bearing puller to remove bearing from rotor. Remove snap ring before pulling bearing. Discard seal. (Some units, C100 and C50 have a snap ring behind the second bearing which must be removed before the end bell.)
9. Remove bearings and snap rings from drive cylinder shaft in same way.

Assembly

Assembly of the clutch should be performed in a clean area. The clutch components must have all old powder scraped or sanded from OD of rotor and ID of drive cylinder, then cleaned with solvent and be totally free of any grease or oil. Discard all bearings and magnetic powder from disassembled clutch.

1. With bearing seal (rubber side) facing shaft fins, use an arbor press and press bearing into shaft. Press on inner race only.
2. Assemble snap ring onto shaft.
3. Install spacer.
4. Press bearing onto shaft with bearing seal facing away from fins. Press on inner race only.
5. Replace snap rings and shims.

6. With seal lip facing away from end bell fins, press seal into end bell until it bottoms.
7. Slide end bell with seal onto rotor shaft. Use a tube such as thin plastic to aid in sliding the seal over the shaft shoulder.
8. Install snap ring if there is a groove next to seal surface.
9. With bearing seal (rubber portion) facing end bell fins, press bearing onto rotor shaft. Press on inner race only.
10. Install snap ring and spacer.
11. Press bearing onto rotor shaft with bearing seal facing away from fins
12. Replace snap ring and shims.
13. Pour magnetic powder into drive cylinder.
14. Place rotor into drive cylinder.

C1 NOTE: End bell is a press fit into drive cylinder. Secure with retaining compound; do not get any retaining compound in the powder.

NOTE: Drive cylinder and end bell are balanced as an assembly. The components are marked and must be aligned during assembly.

15. Align balance marks on end bell with those on drive cylinder. Replace screws.
16. Assemble right stator over rotor end of rotating group and retain with screw into hole in space.
17. Install coil and assemble left stator over drive end of rotating group.
18. Use a scribe to align holes of spacer with holes of left stator. Install screws and lockwashers.
19. Attach mounting brackets and replace hardware, nameplate and junction box cover.
20. Turn the two shafts by hand in opposite directions while alternately elevating the shaft end 45° to distribute the powder evenly along the inside of the drive cylinder.

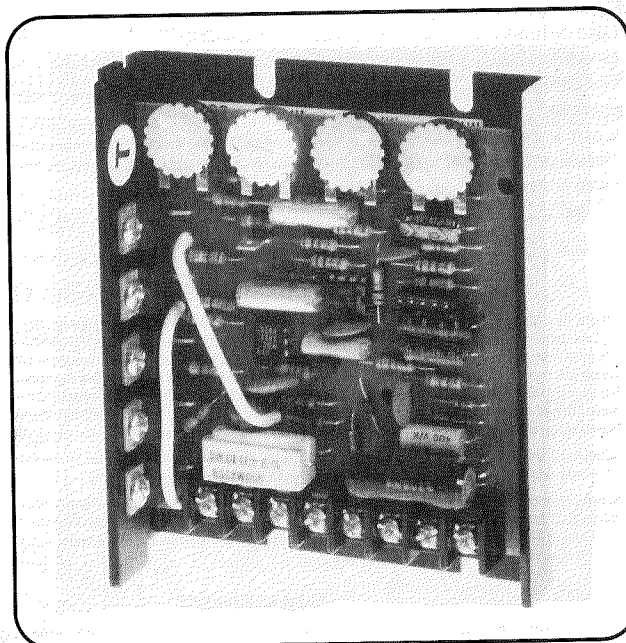
125D CONTROL SERIES

DART

CONTROLS

Instruction Manual

Variable Speed Control



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WARRANTY

Dart Controls, Inc. (DCI) warrants its products to be free from defects in material and workmanship. The exclusive remedy for this warranty is DCI factory replacement of any part or parts of such product which shall within 12 months after delivery to the purchaser be returned to DCI factory with all transportation charges prepaid and which DCI determines to its satisfaction to be defective. This warranty shall not extend to defects in assembly by other than DCI or to any article which has been repaired or altered by other than DCI or to any article which DCI determines has been subjected to improper use. DCI assumes no responsibility for the design characteristics of any unit or its operation in any circuit or assembly. This warranty is in lieu of all other warranties, express or implied; all other liabilities or obligations on the part of DCI, including consequential damages, are hereby expressly excluded.

NOTE: Carefully check the control for shipping damage. Report any damage to the carrier immediately. Do not attempt to operate the drive if visible damage is evident to either the circuit or to the electronic components.

All information contained in this manual is intended to be correct, however information and data in this manual are subject to change without notice. DCI makes no warranty of any kind with regard to this information or data. Further, DCI is not responsible for any omissions or errors or consequential damage caused by the user of the product. DCI reserves the right to make manufacturing changes which may not be included in this manual.

WARNING

Improper installation or operation of this control may cause injury to personnel or control failure. The control must be installed in accordance with local, state, and national safety codes. Make certain that the power supply is disconnected before attempting to service or remove any components!!! If the power disconnect point is out of sight, lock it in disconnected position and tag to prevent unexpected application of power. Only a qualified electrician or service personnel should perform any electrical troubleshooting or maintenance. At no time should circuit continuity be checked by shorting terminals with a screwdriver or other metal device.

INTRODUCTION

- The 123D variable speed control is available in a range of 150mA through 5.5 ADC (or up to 10 ADC if using a suitable external heatsink) at 24 through 36 VAC input.
- The 125D variable speed control is available in a range of 150mA through 1/4 H.P. at 120/240 VAC input.
- The 125DV variable speed control is available in a range of 1/8 through 1 H.P. at 120/240 VAC input. With -HS(125D) or suitable external heatsink (where 125D extrusion temperature does not exceed 70° C.), maximum U.L./C.S.A. rating can be increased to 2 H.P. and 10 Amps DC.
- The control is designed for DC Permanent Magnet, Shunt Wound, and some Universal (AC/DC) motors in the above horsepower ranges.
- Incoming AC voltage is converted to adjustable full wave rectified DC voltage to operate the DC motor. Also, a full wave field voltage is provided for shunt wound motors (see page 11 for voltages).
- The control incorporates transient voltage protection with adjustable current limit which fits into a compact package. It features adjustable minimum and maximum speeds along with adjustable IR compensation and an inhibit function.
- Options are available to change ACCEL/DECEL time (see page 8, -15 / -K options).
- U.L. Recognized under Standard 508, U.L. File # E78180.
- C.S.A. Certified under CAN/CSA-C22.2 No. 0-M91, C.S.A. File # LR 85877.

CONTROL FEATURES

MINIMUM SPEED - Allows adjustment of the motor speed when the speedpot is set at minimum (CCW). This permits the user to eliminate "Deadband" on the main speed control, permitting zero calibration. Clockwise rotation of "MIN" trimpot increases speed.

MAX SPEED (Maximum Speed) - Allows adjustment of the motor speed when the speedpot is set at maximum (CW). This permits the user to eliminate the top end "Deadband", which will provide full speed at maximum rotation. Rotation of the "MAX" trimpot in the clockwise direction increases the maximum motor speed.

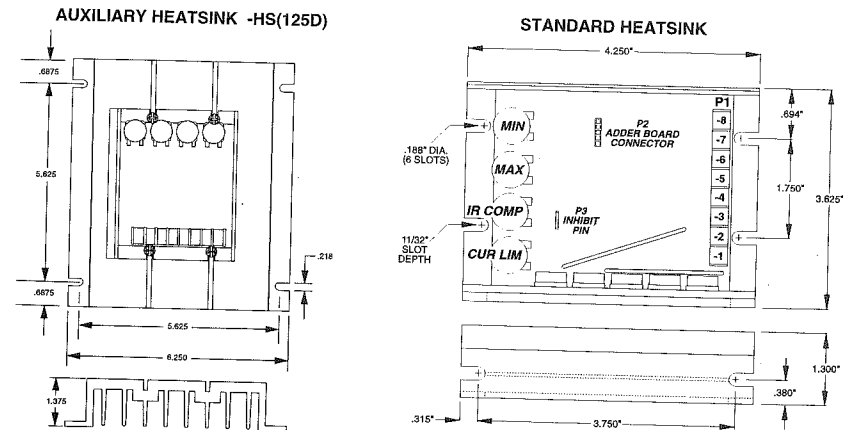
I.R. COMP (Speed Regulation) - This allows for adjustment of the circuitry that controls the speed regulation of the motor. The circuitry controls armature speed by changing the armature voltage to compensate for increased or decreased motor loading. Clockwise rotation of the "IR COMP" trimpot will increase compensation.

CUR. LIM. (Current Limit) - Provides protection from excessive armature current by limiting the maximum armature current the control can provide. This enables adjustment of the maximum torque the motor can deliver. Torque adjustment (Cur. Lim.) is preset at 125% of rated motor torque (current) based on horsepower. Clockwise rotation of the "CUR. LIM." trimpot increases the torque (current) the control will provide.

INHIBIT TERMINAL PIN - Allows the user a choice of stopping and starting hard (fast) or stopping hard with a soft start through an adjustable acceleration ramp, without breaking the AC lines (see page 6).

TERMINAL STRIP - Allows for connection of AC lines, motor leads, motor field (if needed), and speed potentiometer

125D SERIES HEATSINK DIMENSIONS



MOUNTING PROCEDURE

1. Six 3/16" wide slots are provided for control mounting.
2. Control chassis can be used as a template.
3. Use standard hardware to mount.

CAUTION:

DO NOT MOUNT WHERE AMBIENT TEMPERATURE IS OUTSIDE THE RANGE OF -10° C (15° F) TO 45° C (115° F)

MODEL SELECTION

HORSEPOWER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT* AMPS DC	MODEL NUMBER
150mA thru 5.5 A	24 to 36 VAC	0-20 / 0-30 VDC	5.5A	123D-C
1/50 thru 1/8	120/240 VAC	0-90 / 0-180 VDC	1.2A	125D-12C
1/8 thru 1	120/240 VAC	0-90 / 0-180 VDC	5.5A	125DV-C

NOTE: * With -HS(125D) or suitable external heatsink (where 125D extrusion temperature does not exceed 70° C.), maximum U.L. and C.S.A. rating for Output Amps can be increased to 10 Amps D.C.

WIRING PROCEDURE & FUSING

1. Size all wires which carry armature or line currents **AS SPECIFIED BY NATIONAL, STATE, AND/OR LOCAL CODES**. All other wires may be # 18 AWG or smaller as permitted by local code.
2. **Separate control wires** from the armature and AC lines when routed in conduit or in wire trays.
3. **Fusing** - The motor and control are protected against overloads by the current limit circuit and a customer installed fuse in the AC line. **THIS PROTECTION ALREADY MAY BE PROVIDED BY THE CUSTOMER WITH CIRCUIT BREAKERS OR FUSES IN BOTH MAIN LINES. IF NOT:**

FOR 120 VAC INPUT - fuse protection should be added by the customer in AC Line 1 (see following chart)

FOR 240 VAC INPUT - fuse protection should be added by the customer in AC Line 1 and Line 2 (see following chart)

FUSING ADDED BY CUSTOMER (Bussman ABC or Little Fuse 314 Series ceramic fuses)

HORSEPOWER	120 VAC INPUT	240 VAC INPUT
1/50	2 AMP	-----
1/20	2 AMP	1 AMP
1/8	3 AMP	2 AMP
1/4	4 AMP	3 AMP
1/3	6 AMP	3 AMP
1/2	8 AMP	4 AMP
3/4	12 AMP	6 AMP
1.0	15 AMP	8 AMP
1.5	-----	12 AMP
2.0	-----	15 AMP

NOTE: To determine fusing for the 123D-C Series control (24 to 36 VAC input), use 200% of Full Load Current.

TERMINAL STRIP WIRING INSTRUCTIONS

The 125D Series uses an 8 position terminal strip for ease of connection.

- P1-1,2 (AC or L) (AC or N)** 120 VAC - Connect incoming hot AC or L (black wire) to P1-1 and neutral AC or N (white wire) to P1-2. Connect ground (green wire) to CHASSIS of control.
- 240 VAC - Connect both hot sides (L & N), one to P1-1 and one to P1-2. Connect ground wire to CHASSIS of control.
- P1-3 (+Arm)** Connect to PLUS (+) Armature wire on motor. 0-90 VDC for 120 VAC input or 0-180 VDC for 240 VAC input. See "SPECIFICATIONS" for output rating.
- P1-4 (-Arm/-Field)** Connects to MINUS (-) Armature wire on motor and, if necessary, connect MINUS (-) Field wire of SHUNT WOUND MOTOR.

(continued)

P1-5

(+Field) **DO NOT** use for Permanent Magnet Motor. This supplies +Field voltage for a SHUNT WOUND MOTOR (refer to field voltage table). For motors with dual voltage field (ie. 50/100V or 100/200V), make sure highest value is connected.

FIELD VOLTAGE TABLE				
VAC INPUT	24	36	120	240
VDC FIELD	20	30	100	200

- P1-6 (Speedpot HI)** Connects to high side (white wire) of Speedpot (CW end). This is internal +12 volts. For start-stop applications, the connection between this terminal and Speedpot HI can be opened and closed by a SPST switch. **INPUT MUST NOT BE GROUNDED!**
- P1-7 (Speedpot Wiper)** Connects to wiper (red wire) of Speedpot (center lead). For Voltage Follower applications, this **INPUT MUST NOT BE GREATER THAN +12V MAXIMUM AND MUST NOT BE GROUNDED!**
- P1-8 (Speedpot Lo)** Connects to Low side (orange wire) of 5K Speedpot (CCW end). This input is raised and lowered by the MIN. trimpot (5K). Electronic speed input (voltage follower) may be referenced to Speedpot LO if the MIN trimpot adjustments are to be active. Otherwise, inputs may be referenced to -ARM, which will bypass the MIN trimpot. **INPUT MUST NOT BE GROUNDED!**

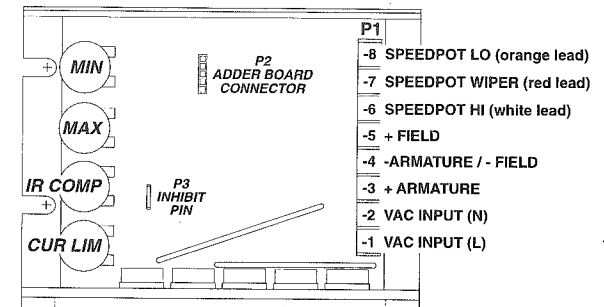
Warning:

1. Be sure the control housing is properly grounded.
2. Armature connections must not be switched or broken while the control is on. Serious control damage may result.
3. For non-speedpot applications, the input connection to the LO, WIPER, and HI terminals must not be grounded! Serious control damage may result from a grounded input.

123D/125D HOOK-UP DIAGRAM

Warning:

Do not attempt to perform Hi-pot test across AC lines with control in circuit. This will result in immediate or long term damage to the control.



CONTROL START-UP

WARNING: ALL POWER MUST BE TURNED OFF BEFORE PROCEEDING!

1. Recheck all wiring. Accidental grounds, loose or pinched wires on armature or speedpot wires may damage the control when power is applied.
2. Check to see that incoming service is of correct voltage.
3. Turn speedpot to zero (fully CCW).
4. Turn power on, and advance speedpot while observing motor. **Power must be off before step 5 can be accomplished!**
5. If motor rotation is incorrect, turn power off at external disconnect and reverse +ARM and -ARM connections.
6. Check for satisfactory operation throughout the speed range.
7. If operation is satisfactory, no readjustments are needed.
8. If instability or surging is observed, or if maximum speed is higher than desired, see "TRIMPOT ADJUSTMENT CHART" on page 5.
9. For other problems, consult page 10, "IN CASE OF DIFFICULTY".

TRIMPOT ADJUSTMENT CHART & PROCEDURE

Settings apply when using a 5K ohm master speedpot. This chart is used in conjunction with the adjustment procedure and is approximate.					Settings apply when using a 5K ohm master speedpot. This chart is used in conjunction with the adjustment procedure and is approximate.						
	C.L.	I.R.	MAX	MIN	HP	HP	C.L.	I.R.	MAX	MIN	
125D-12C 120 VAC input; 0-90 VDC output					1/50	125D-12C 240 VAC input; 0-180 VDC output					125D-12C
					1/20						
					1/8						
125DV-C 120 VAC input; 0-90 VDC output					1/8	125DV-C 240 VAC input; 0-180 VDC output					125DV-C
					1/4						
					1/3						
					1/2						
					3/4*						
					1.0*						
					1.0*						

Operation of the control beyond $\pm 10\%$ of the normal line voltage could result in re-adjustment. These adjustments are permanent; periodic re-adjustment is normally not needed.

* NOTE: ADDITIONAL CUSTOMER HEATSINK REQUIRED FOR 125DV-C (120 VAC INPUT - GREATER THAN 1/2 H.P. MOTORS) AND (240 VAC INPUT - GREATER THAN 1 H.P. MOTORS). 125 EXTRUSION TEMPERATURES SHOULD NOT EXCEED 70 DEGREES C.

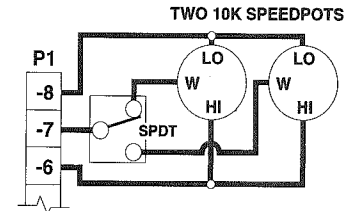
NOTE: FOR DETERMINING TRIMPOT SETTINGS FOR THE 123D-C SERIES, SEE TRIMPOT SETTINGS PROCEDURE BELOW.

TRIMPOT	FUNCTION	ADJUSTMENT
MIN.	Sets minimum motor speed when speedpot is set at zero. CW rotation will increase minimum motor speed.	<ol style="list-style-type: none"> 1. Set Speedpot to zero (fully CCW). 2. Rotate MIN trimpot CW until motor starts to rotate. 3. Slowly rotate MIN trimpot CCW until motor stops. <p>NOTE: If motor rotation is desired, rotate MIN trimpot CW until desired MIN speed is reached.</p>
IR COMP	Provides a means of improving motor speed regulation in the armature feedback mode. If a slowdown due to load change is of no concern, rotate this trimpot fully CCW.	<ol style="list-style-type: none"> 1. Set Speedpot at 50%. 2. Observe motor speed at no load condition. 3. Apply full load to motor. 4. Turn IR COMP trimpot CW to obtain the same motor speed as with no load.
MAX.	Sets maximum motor speed when speedpot is set at maximum (fully CW rotation). CW rotation of MAX trimpot increases maximum motor speed.	<ol style="list-style-type: none"> 1. TURN DRIVE POWER OFF!! 2. Connect a DC Voltmeter: + to +ARM, - to -ARM. NOTE: Meter must not be grounded!! 3. Set meter voltage range: (90 VDC for 120 VAC, 180 VDC for 240 VAC). 4. Turn power on. Set Speedpot at 100%. 5. Adjust MAX trimpot to rated motor armature voltage as shown on meter. NOTE: A tachometer or strobe may be used in lieu of a meter. Follow above steps, except adjust MAX trimpot to rated motor base speed indicated by tachometer or strobe.
CUR.LIM.	Limits DC motor armature current (torque) to prevent damage to the motor or control. The current limit is set for the rated motor current. CW rotation of this trimpot increases the armature current (or torque produced).	<ol style="list-style-type: none"> 1. TURN DRIVE POWER OFF!! 2. Connect a DC Ammeter between A1 on motor and +ARM on control. This is in series with the motor. 3. Turn power on. 4. Set Speedpot at the 50% position. 5. Apply friction braking to motor shaft until motor stalls. 6. With motor stalled, set current at 125% of rated motor armature current by adjusting CUR. LIM. trimpot.

CONTROL MODIFICATIONS

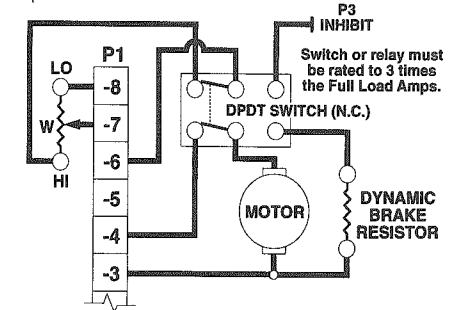
TWO SPEED OPERATION

Two pot operation is done using two 10K ohm speed potentiometers in parallel (both HI's to P1-6, both LO's to P1-8). The WIPER is switched using a SPDT switch.



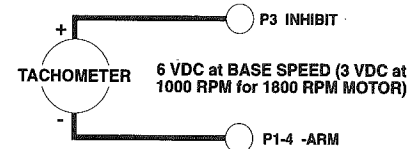
DYNAMIC BRAKING

A DPDT switch is used to inhibit the control and to connect the DBR. Typical values for the DBR (dynamic brake resistor) are 5 ohms for 120V, 10 ohms for 240V (both 35W to 50W). Note that motor horsepower, inertia, and cycle time effect sizing of the DBR. NOTE: This modification cannot be used with any of the -15 options.



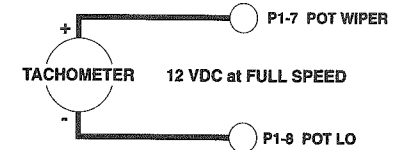
TACHOMETER FEEDBACK

Improves speed regulation to $\pm 1/2\%$ of base speed.



TACHOMETER FOLLOWER

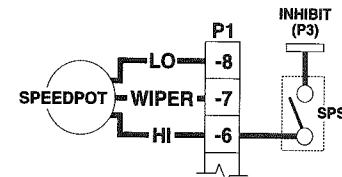
Allows control output to follow tachometer voltage.



NOTE: NEED 1% OR LESS - TACH OUTPUT RIPPLE

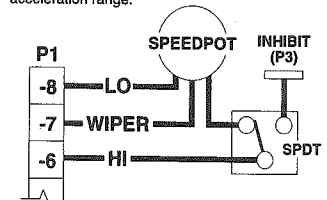
INHIBIT (USED INDEPENDENTLY)

The customer supplied SPST switch is connected in series between the speedpot HI (P1-6) and the Inhibit pin (P3). To inhibit (stop motor), speedpot HI is closed to the Inhibit pin. To restart, the switch is returned to open. NOTE: The control will stop and start fast.



INHIBIT (USED WITH SPEEDPOT)

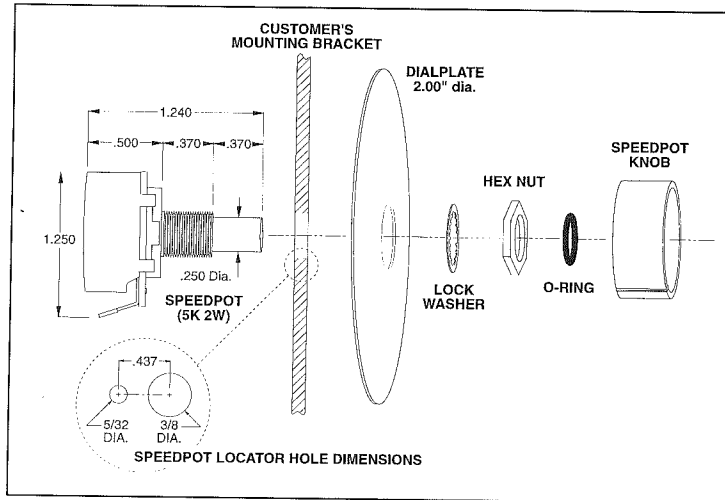
The Common of the SPDT switch is connected to control pot HI and is switched between Speedpot HI and the Inhibit pin (P3). To inhibit (stop motor), speedpot HI is closed to the Inhibit pin. To restart, the switch is returned to Speedpot HI. NOTE: The control will stop fast and soft start through a fixed acceleration range.



NOTE: Permits starting and stopping of motor without breaking AC lines. In the event of SCR failure or false triggering, the Inhibit circuit will not stop motor.

Always use a shielded wire when connecting to the inhibit terminal. The shield should be connected to -Armature or Common of the control.

SPEEDPOT KIT ASSEMBLY



OPTION DESCRIPTIONS

-1 option

Electronic Speedpot Interlock

Field or Factory Installed

Available All Models

The -1 adder board connects to the 125 series board through use of a female connector and plastic standoff support.

When incoming AC power to the control is applied, the Electronic Interlock will prevent the motor from starting until the speedpot is first rotated to the zero position and then rotated clockwise toward the set speed.

Also, should the incoming AC power be interrupted for any reason, then restored, the Electronic Interlock will prevent an automatic restart of the motor. To restart, the speedpot must first be rotated to the zero position and then rotated clockwise toward the set speed.

CAUTION: The Electronic Interlock becomes inoperative if SCR failure should occur.

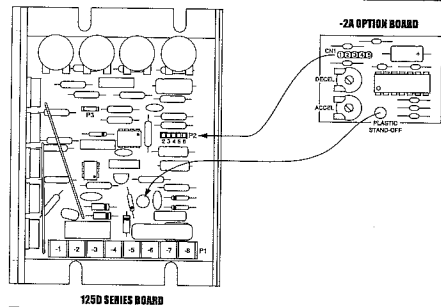
-2A option

Individually Adjustable Linear Accel and Decel

Field or Factory Installed

Available All Models

This option plugs into the five position expansion connector on the 125D main board. The -2A option overrides the fixed accel ramp built into the 125D control, providing independently adjustable linear accel and decel from 0.5 to 8.0 seconds. To install, flip over the -2A option board so the printed circuit lines are visible. Align the male connector CN1 (-2A option) with the female connector P2 (125D board) so terminal CN1-1 fits into P2-5, CN1-2 in P2-5, etc. Align the plastic stand-off on the -2A option board with the hole shown on the 125D main board. Once connectors and stand-off are aligned, snap into place. Adjustment of both trimpots is accomplished via the labeled access holes on the back side of the -2A option board. Full CCW rotation equals minimum accel or decel time and full CW rotation equals maximum accel or decel time. Note: Each trimpot operates independently of the other.



7

-5 option

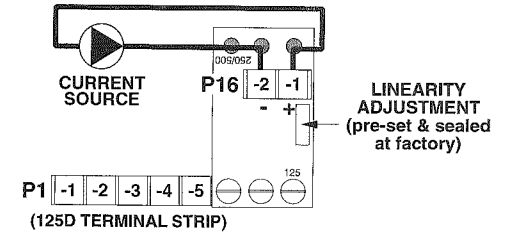
Signal Follower (Current)

Field or Factory Installed

Available All Models

4 to 20 mA -5

DO NOT USE TRIMPOT CHART TO ADJUST MIN AND MAX TRIMPOTS ON MAIN BOARD, USE TRIMPOT ADJUSTMENT PROCEDURE on page 5 (below chart).



The input can be either grounded or ungrounded. The board sets on spacers screwed to terminals P1-6, -7, -8 on the main board using longer screws and spacers. The current source connects to the two position terminal strip on the -5 adder board. This option replaces the speedpot. The trimpot on the -5 board is set at the factory for proper linearity and sealed. - DO NOT ADJUST! - Input impedance equals 500 ohms or less.

-7 option

Signal Follower with Auto / Manual Switch

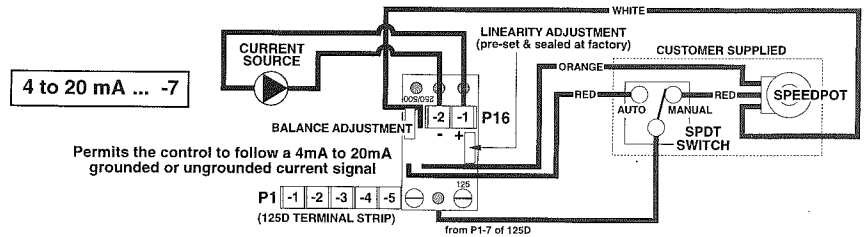
Field or Factory Installed

Customer Wired

DO NOT USE TRIMPOT CHART TO ADJUST MIN AND MAX TRIMPOTS ON MAIN BOARD, USE TRIMPOT ADJUSTMENT PROCEDURE on page 5 (below chart).

This option includes the appropriate -5 option board (with pigtails). With the -7 option, control of the speed is switched by a SPDT Switch between the speedpot (Manual) and the -5 board (Automatic).

CONNECT the current source to the + and - terminals on the adder board. The BALANCE ADJUSTMENT is used to adjust the maximum speed in the Manual Mode. It is adjusted so the maximum speed in Manual equals the maximum speed in Automatic. The MAX TRIMPOT is used to set maximum speed in the Automatic Mode. Input impedance equals 500 ohms or less.



4 to 20 mA ... -7

Permits the control to follow a 4mA to 20mA grounded or ungrounded current signal

-11 option

10 Turn Master SpeedPot

Field Installed

Available All Models

Provides finer control of speed. Use standard Hook-up directions and Trimpot Chart (page 5).

-15B / -K options

Acceleration Time Ranges

Factory Installed

This option provides the Accel times shown below. The standard Accel time is 0.5 seconds.

	-15B OPTION	-K OPTION
ACCELERATION TIME	4 seconds	6 seconds

USE STANDARD HOOK-UP

8

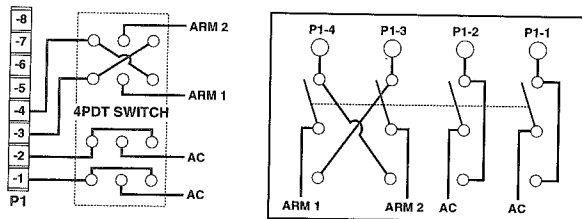
-29B option

Manual Forward-Off-Reverse Switch

Field Installed Only

Permits reversing of motor. This is accomplished using a 4PDT blocked center switch. When switched between the forward/reverse positions, a delay is encountered due to the blocked center position, which protects the control from any voltage that may be at the ARM terminals. The center position is OFF/NEUTRAL.

THE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS. IF THE MOTOR DOES NOT COME TO A COMPLETE STOP, SERIOUS DAMAGE TO THE CONTROL MAY RESULT. BYPASS OF THE SWITCH CENTER BLOCK MAY RESULT IN DAMAGE TO THE CONTROL.



-55G option

Isolated Voltage Input

Factory or Field Installed

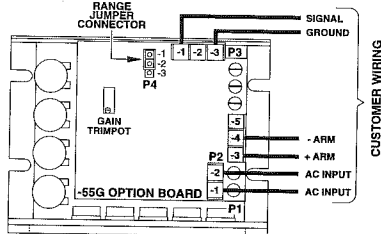
NOTE: This option cannot be used on the 123D-C series control.

This option permits either a grounded or non-grounded remote DC voltage speed command. This DC input can range from 0-5VDC through 0-25VDC or 0-25VDC through 0-250VDC (which can be selected via the range jumper clip and adjusted with the GAIN trimpot). The output of this option board supplies a linear pulse width modulated signal to the control that is proportional to the input signal supplied to the option board. The option replaces the 5K speedpot. Input impedance is 1.2M ohms on high scale, and 150K ohms on low scale.

NOTE: Range jumper connector is used to select input voltage range. When installed from P4-1 to P4-2, the range is 0-25VDC through 0-250VDC; when installed from P4-2 to P4-3, range is 0-5VDC through 0-25VDC.

(FOR SHUNT WOUND MOTOR, SEE PAGE 4 OF MANUAL FOR FIELD CONNECTIONS).

CAUTION: DO NOT use TRIMPOT ADJUSTMENT CHART. Set pots using directions in following SET-UP PROCEDURES.



SETUP PROCEDURE FOR -55G AND -56G OPTIONS

1. With NO power to control, connect a DC Voltmeter (meter must not be grounded) to control outputs as follows: Meter COMMON to the -ARM terminal, Meter POSITIVE to the +ARM terminal. Select correct meter range (0-90V or 0-180V).
2. Preset GAIN trimpot on option board fully CCW, place range jumper clip in proper position.
3. Preset control as follows: MIN, MAX & IR fully CCW, and Current Limit fully CW.
4. Apply AC power of correct voltage to control and option board.
5. With 0 volts into option board, adjust MIN trimpot of control to eliminate deadband. To do this, increase MIN fully CW, then adjust CCW until meter reads 0 volts.
6. Apply maximum input voltage to option board input. Motor will start to rotate.
7. Adjust GAIN until no further change in control output voltage occurs, back off approximately 1 turn, then set control MAX. setting to 90 VDC (180VDC for 240V units).
8. Current Limit is set as shown on "TRIMPOT ADJUSTMENT CHART" on page 5.
9. For Closed Looped systems the IR should remain fully CCW. For Open Looped systems, set IR as needed

-56G option

Isolated Voltage Input with Auto / Manual Switch

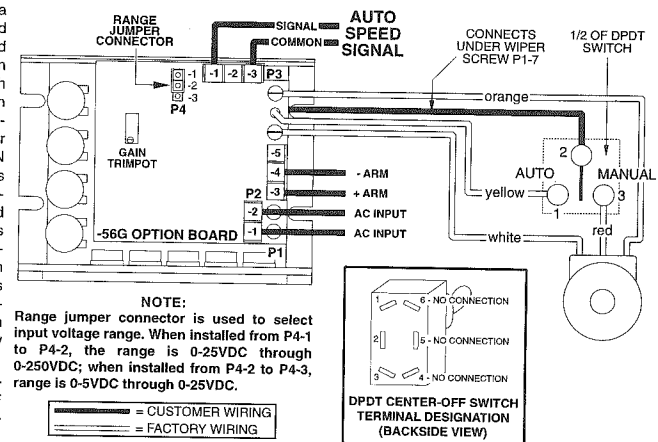
Factory or Field Installed

NOTE: This option cannot be used on the 123D-C series control.

This option permits either a grounded or non-grounded remote DC voltage speed command. This DC input can range from 0-5VDC through 0-25VDC or 0-25VDC through 0-250VDC (which can be selected via the range jumper clip and adjusted with the GAIN trimpot). The output of this option board supplies a linear pulse width modulated signal to the control that is proportional to the input signal supplied to the option board. The option replaces the 5K speedpot. Input impedance is 1.2M ohms on high scale, and 150K ohms on low scale.

(FOR SHUNT WOUND MOTOR, SEE PAGE 4 OF MANUAL FOR FIELD CONNECTIONS).

CAUTION: DO NOT use TRIMPOT ADJUSTMENT CHART. Set pots using directions in following SET-UP PROCEDURES.



IN CASE OF DIFFICULTY

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION(S)
Motor doesn't operate	- Blown Fuse - Incorrect or no power source - Speedpot set at Zero - Worn motor brushes	Replace Fuse Install proper service Adjust Speedpot CW to start Replace brushes
Armature output voltage cannot be adjusted, output is a constant DC level	- No motor or load connected - Speedpot low connection open	Check that motor or load is connected to armature terminals Check that speedpot low wire is connected
Motor stalls, or runs very slowly with speed control turned fully CW	- Low Voltage - Overload Condition - Worn motor brushes - MAX SPEED set incorrectly	Check-should be above 100V or 208 V Reduce load Replace brushes See ADJUSTMENT PROCEDURE
Motor hunts	- Motor current less than 150mA - Too much IR COMP - Motor is in current limit - Motor speed is above rated speed - Max set too high	Motor current must be greater than 150mA D.C. See ADJUSTMENT PROCEDURE See ADJUSTMENT PROCEDURE Reduce Speed See ADJUSTMENT PROCEDURE
Repeated fuse blowing	- Low Voltage - Overload Condition - Worn motor brushes - Defective motor bearings - Defective electrical components	Check-should be above 100V or 208V Reduce load Replace Replace Call Dart Distributor or Representative

If control still will not operate, consult your Dart Distributor or Representative.

SPECIFICATIONS

AC input voltage	±10% of rated line voltage
Acceleration	0.5 seconds (standard 125D)
Amps - DC output	150 mA to 5.5 ADC*
Controller overload capacity	200% for one minute
Current limit trimpot range	0.3 to 2.5 ADC (125D); 1 to 15 ADC (123D & 125DV)
Deceleration	0.5 seconds (standard 125D)
Dimensions and weights:	

	WIDTH	LENGTH	DEPTH	WEIGHT
ENGLISH	3.625"	4.250"	1.300"	8.00 oz.
METRIC	92mm	108mm	33mm	228 gms.

Drive service factor	1.0
Efficiency	85% typical
Input frequency	50 or 60 Hertz
Max. trimpot speed range	60% to 110% of base speed
Min. trimpot speed range	0% to 30% of maximum speed
Power devices	isolated case tab
Shunt field voltage	20VDC for 24VAC input; 30VDC for 36VAC input; 100VDC for 120VAC input; 200VDC for 240VAC input; 1 amp maximum via 5Kohms 2W potentiometer or 0-10VDC isolated signal
Speed control	50:1
Speed regulation	±1% of base speed
Temperature range	-10° to 45° C. ambient (15° to 115° F.)
Transient protection	G-Mov**
Trigger	opto-coupler
Type ramp of accel/decel	RC time constant

* With -HS(125D) or suitable external heatsink (where 125D extrusion temperature does not exceed 70° C.), maximum U.L./CSA rating for output amps can be increased to 10 amps D.C.

** not used on the 123D-C series control

TYPICAL MOTOR CURRENTS

Horsepower	1/50	1/20	1/8	1/4	1/3	1/2	3/4	1.0	1.5	2.0
Typical AC Amps (120VAC)	0.50	1.00	2.00	3.50	4.40	6.50	9.30	13.20	-----	-----
Typical Arm Amps (120VAC)	0.42	0.81	1.60	2.70	3.40	5.00	8.20	10.90	-----	-----
Typical AC Amps (240VAC)	-----	0.80	1.20	1.80	2.20	3.30	4.80	6.50	9.70	12.90
Typical Arm Amps (240VAC)	-----	0.40	0.60	1.40	1.70	2.50	3.70	5.00	8.20	11.60

125D SERIES PARTS PLACEMENT & LIST

RESISTORS

R1	15K 5W
R2	470 Ω
R3	2.7K
R4	2.7K
R5	82K
R6	5K (MIN TRIM)
R7	300K
R8	180K
R9	1.2M
R10	39K
R11	100K
R12	10K
R13	2.2K
R14	820 Ω
R15	4.7K
R16	470K
R17	1K
R18	100 Ω (I.R. TRIM)
R19	5K (C.L. TRIM)
R20	300K
R21	1K (MAX TRIM)
R22	1K
R23	300K
R24	01 Ω 5W
R25	91K
R26	1K
R27	390 Ω
R28	330 Ω
R29	5K SPEEDPOT*

ACCEL CHANGE

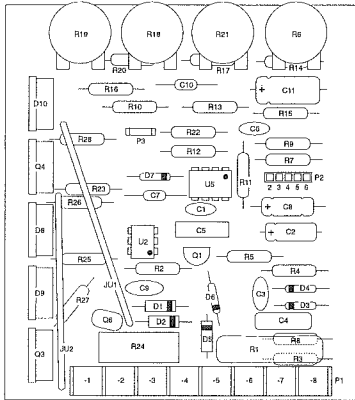
Replace N.P. cap with polarized cap (see above)

-15A ... C8 ... 33uF 16V
 -15B ... C8 ... 15uF 25V
 -15C ... C8 ... 4.7uF 16V
 -K ... C8 ... 22uF 16V

125D-12C (1/50 thru 1/8 H.P.)

CHANGES:

R24062 Ω 5W



MISCELLANEOUS

JU1	18GA. SOLID INSULATED WIRE
JU2	18GA. SOLID INSULATED WIRE
PCB	A-4-2033F PRINTED CIRCUIT
P1 (-1 THRU -8)	8 POS. TERMINAL STRIP
P2 (-2 THRU -6)	5 POS. FEMALE CONNECTOR
P3	3/16" MALE SPADE PIN

ACTIVE DEVICES

Q1	2N6027
U2	3052 MOC
Q3	S4015L
Q4	S4015L
U5	LM358 IC
Q6	275V G-MOV

CAPACITORS

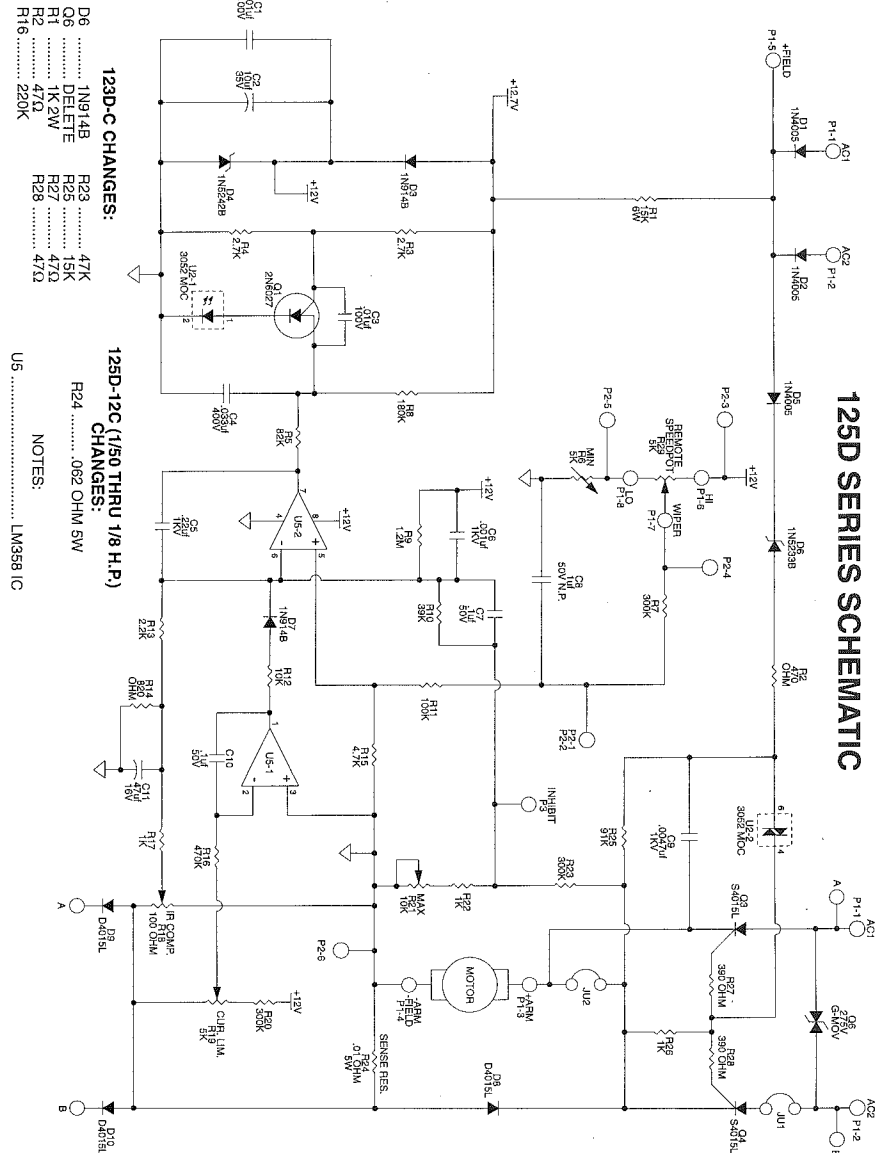
C1	.01uF 100V
C2	10uF 35V
C3	.01uF 100V
C4	.033uF 400V
C5	22uF 1KV
C6	.001uF 1KV
C7	.1uF 50V
C8	1uF 50V N.P.
C9	.0047uF 1KV
C10	.1uF 50V
C11	47uF 16V

DIODES

D1	1N4005
D2	1N4005
D3	1N914B
D4	1N5242B
D5	1N4005
D6	1N5233B
D7	1N914B
D8	D4015L
D9	D4015L
D10	D4015L

123D-C CHANGES:

D6	1N914B
Q6	(reverse direction)
R1	DELETE
R2	47K
R16	220K
R23	47K
R25	15K
R27	47Ω
R28	47Ω



123D-C CHANGES:

D6	1N914B
Q6	DELETE
R1	1K 2W
R2	47Ω
R16	220K
R23	47K
R25	15K
R27	47Ω
R28	47Ω

125D-12C (1/50 THRU 1/8 H.P.) CHANGES:

R24	.062 OHM 5W
-----	-------------

NOTES: LM358 IC

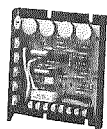
REPAIR PROCEDURE

In the event that a Product manufactured by Dart Controls Incorporated (DCI) is in need of repair service, it should be shipped, freight paid, to: Dart Controls, Inc., 5000 W. 106th Street, Zionsville, IN. 46077, ATTN: Repair Department.

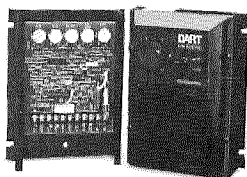
Please include with each order a P.O. number to cover any repair charges (a P.O. is needed even on warranty returns to cover misuse or other failures that have voided warranty), and include a note with a brief description of the problem experienced. **NO WORK WILL BE DONE ON ANY ORDER WITHOUT A P.O. NUMBER.**

Completed repairs are returned with a Repair Report that states the problem with the control and the possible cause. Repair orders are returned via UPS Ground unless other arrangements are made. If you have further questions regarding repair procedures, contact your Dart Distributor or Representative.

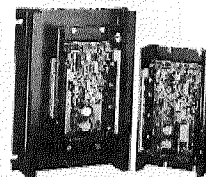
ALSO AVAILABLE FROM DART CONTROLS, INC.



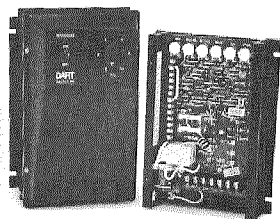
125D SERIES
AC INPUT - VARIABLE DC OUTPUT
1/50 HP through 1.0 HP



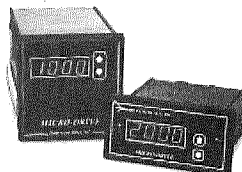
250G SERIES
AC INPUT - VARIABLE DC OUTPUT
1/50 HP through 2.0 HP



65 SERIES
DC INPUT - VARIABLE DC OUTPUT
CURRENT RATINGS OF 20, 40, AND
60 AMPS



500 SERIES
AC INPUT - VARIABLE DC OUTPUT
1/50 HP through 3.0 HP



MDP SERIES
PROGRAMMABLE
CLOSED LOOP DC
SPEED CONTROL



DM SERIES
FIELD PROGRAMMABLE
DIGITAL TACHOMETER

Dart offers the industry's broadest range of electronic DC and AC motor speed controls rated to 3 horsepower, as well as speed control accessories.

Shown above is just a sampling of the expanded line of Dart controls that feature the latest in electronic technology and engineering. Products are manufactured in the U.S.A. at our Zionsville (Indianapolis, Indiana) production and headquarters

facility - with over 2,000,000 variable speed units in the field.

In addition to the standard off-the-shelf products, you can select from a wide variety of options to customize controls for your specific application. For further information and application assistance, contact your local Dart sales representative, stocking distributor, or Dart Controls, Inc.

Dart Controls, Inc.

Manufacturer of high quality DC and AC motor speed controls and accessories since 1963.

P.O. Box 10
5000 W. 106th Street
Zionsville, Indiana 46077
Phone: (317) 873-5211
Fax: (317) 873-1105

CH 17

WAGNER MODEL R2R-1
S/N H3859

WIRING DIAGRAMS

SEC 17

VARIOUS CRITICAL SECTIONS OF THIS MACHINE ARE
BROKEN DOWN INTO INDIVIDUAL SECTIONS SINCE THE
OVERALL WIRING OF THIS MACHINE IS EXTENSIVE AND
RELATIVELY COMPLICATED.
AN OVERALL WIRING DIAGRAM IS PLOTTED ON A LARGER
SHEET AND IS FOUND AT THE BACK OF THIS MANUAL.

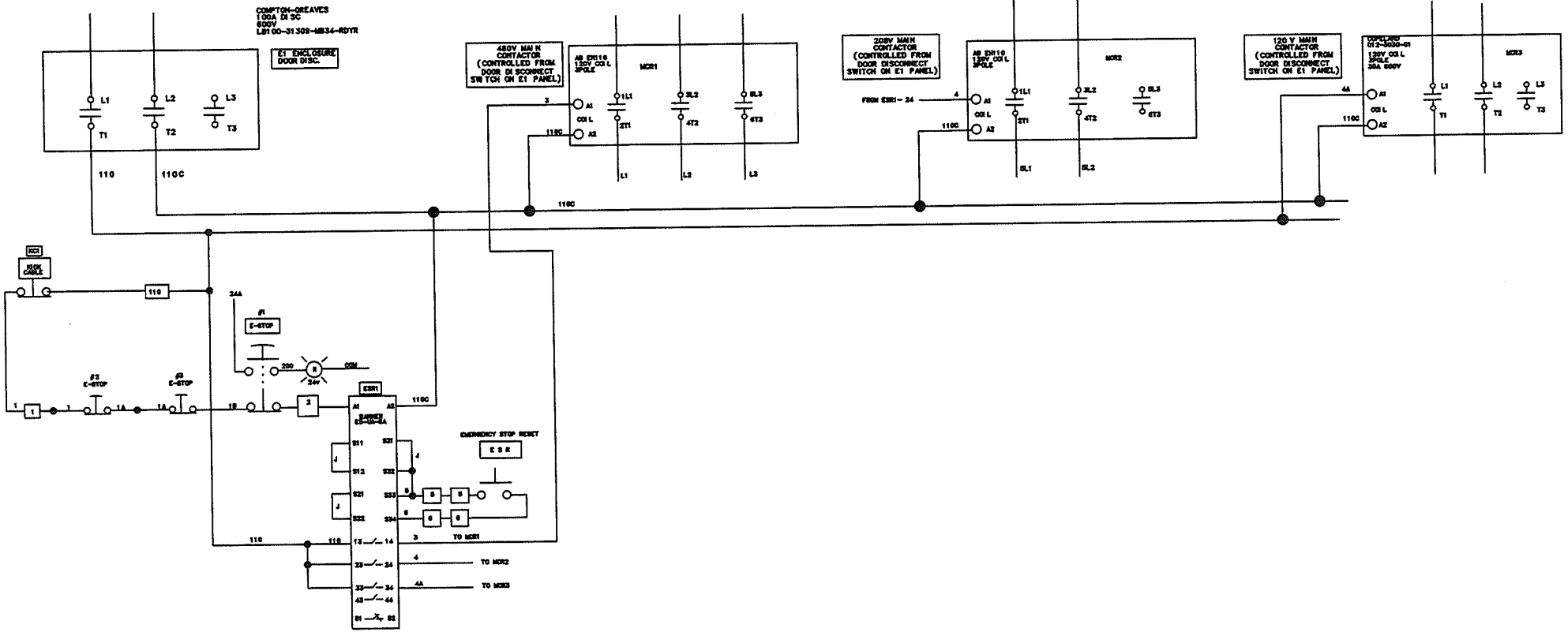
POWER INFEED AND E-STOP CIRCUITS

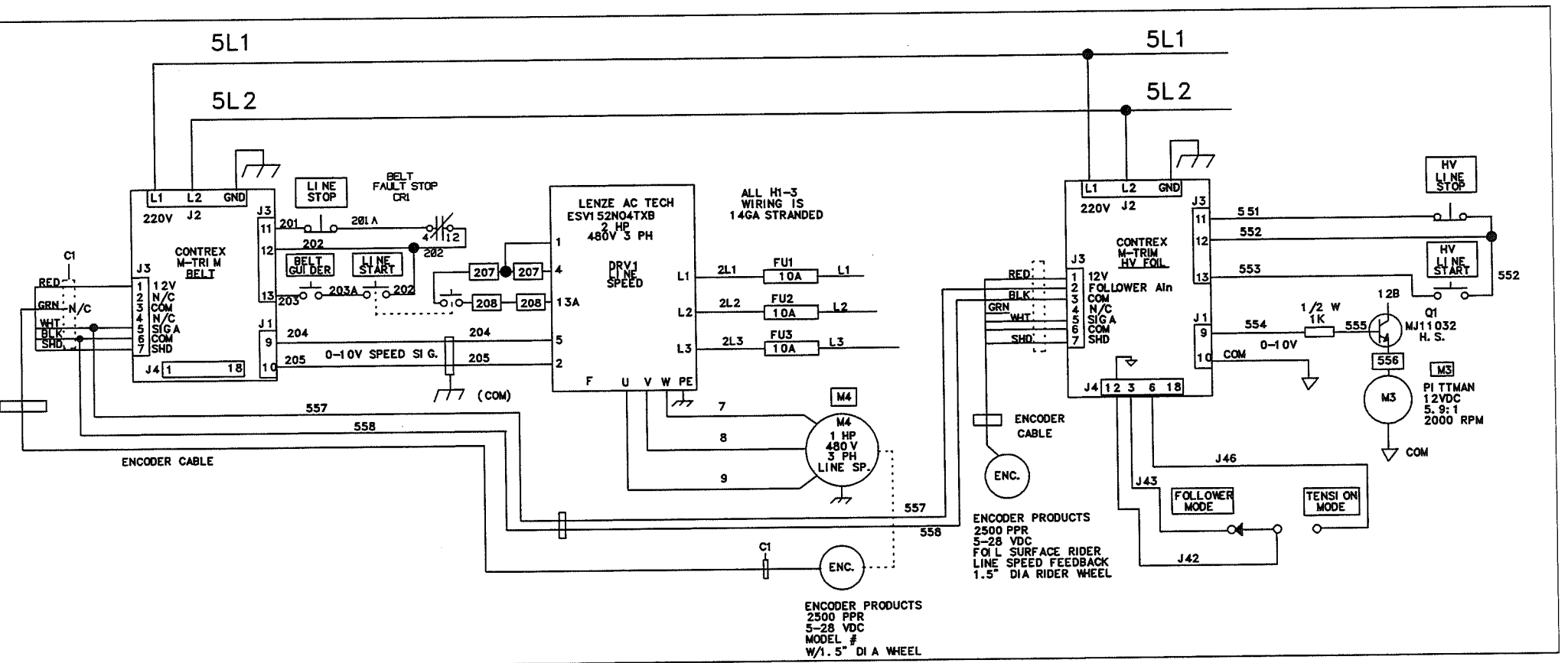
DOOR SW.
120V
30A

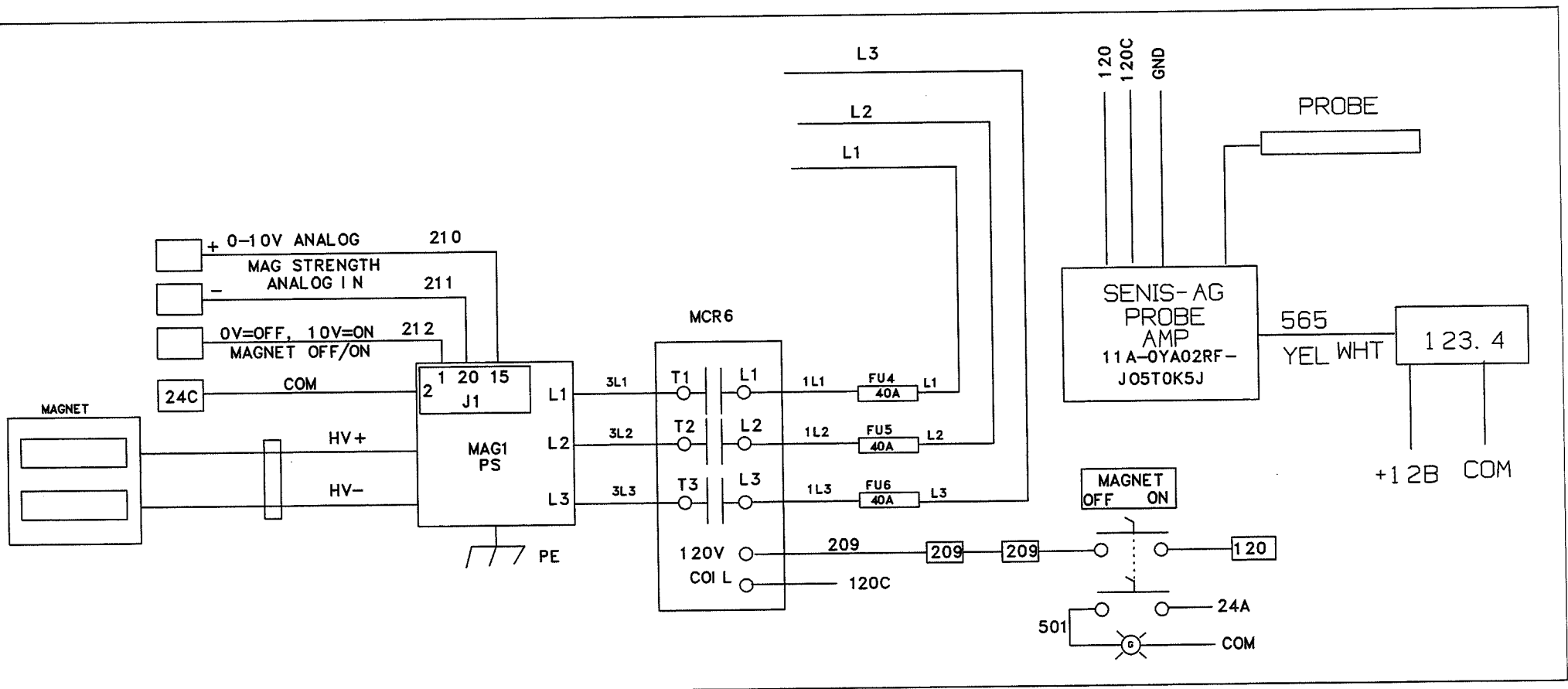
MCR1
480V
100A

MCR2
208V
150A

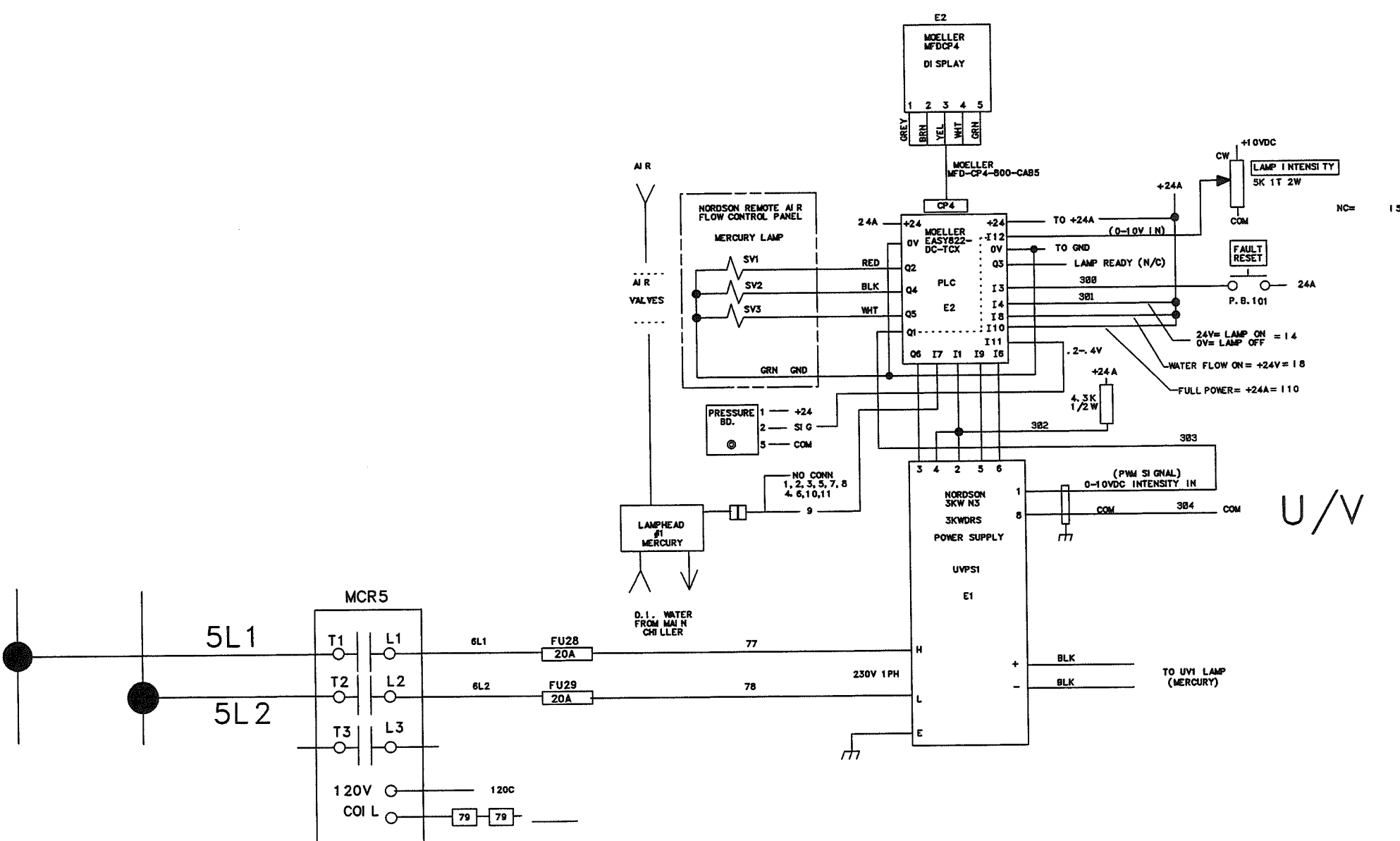
MCR3
120V
30A





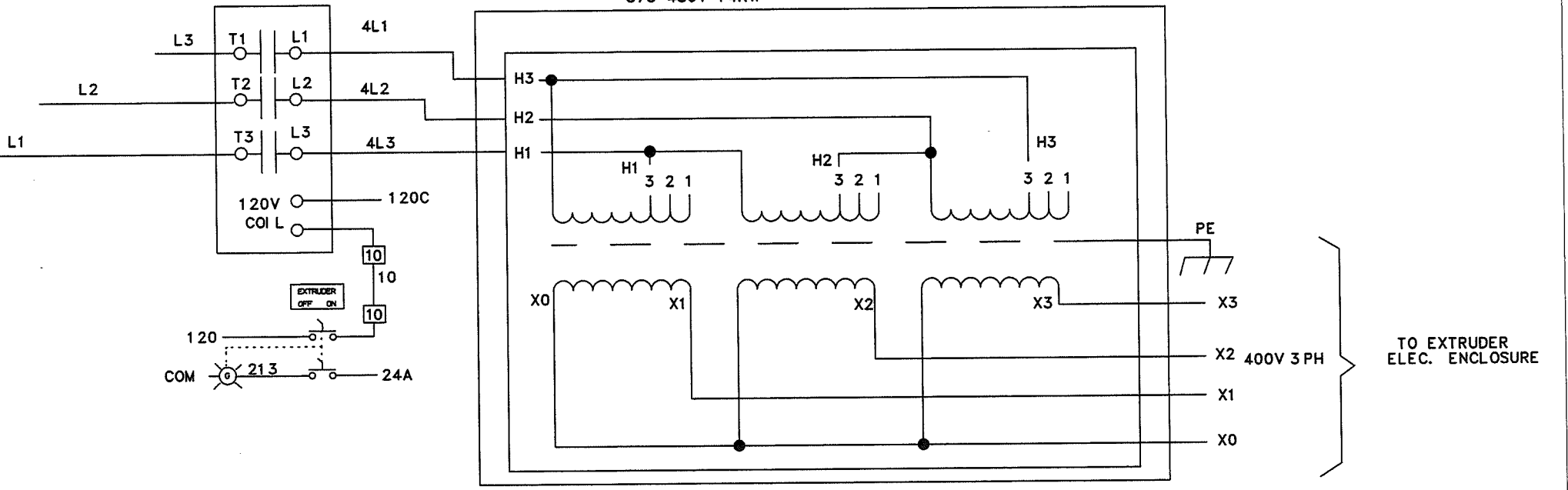


MERCURY

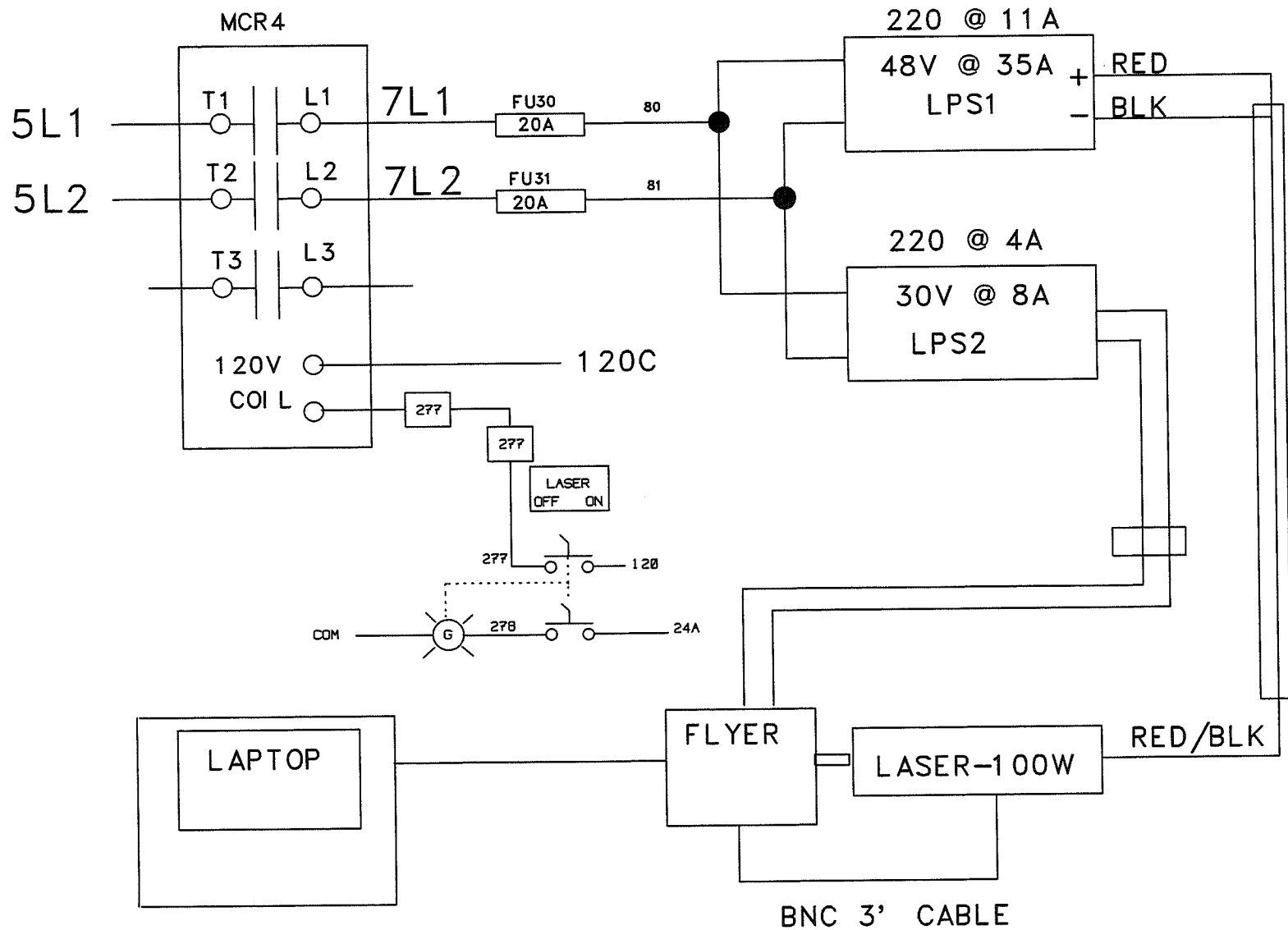


MCR7
480V 3 PH
17A/POLE

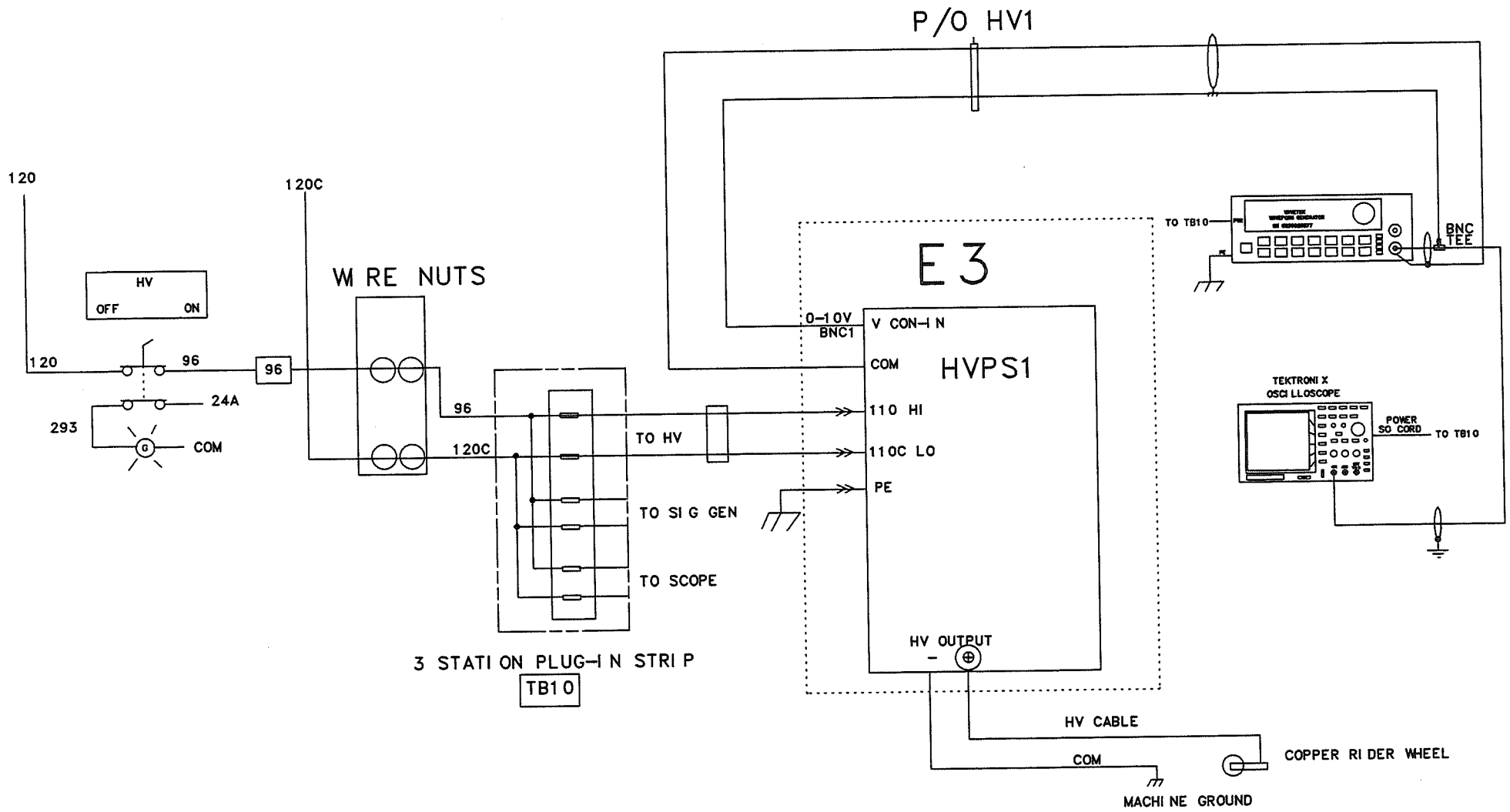
T1
ACME TRANSFORMER
CAT# DTHB-014-25
480 3PH-400V
GROUNDED NEUTRAL
575-480V 14KW

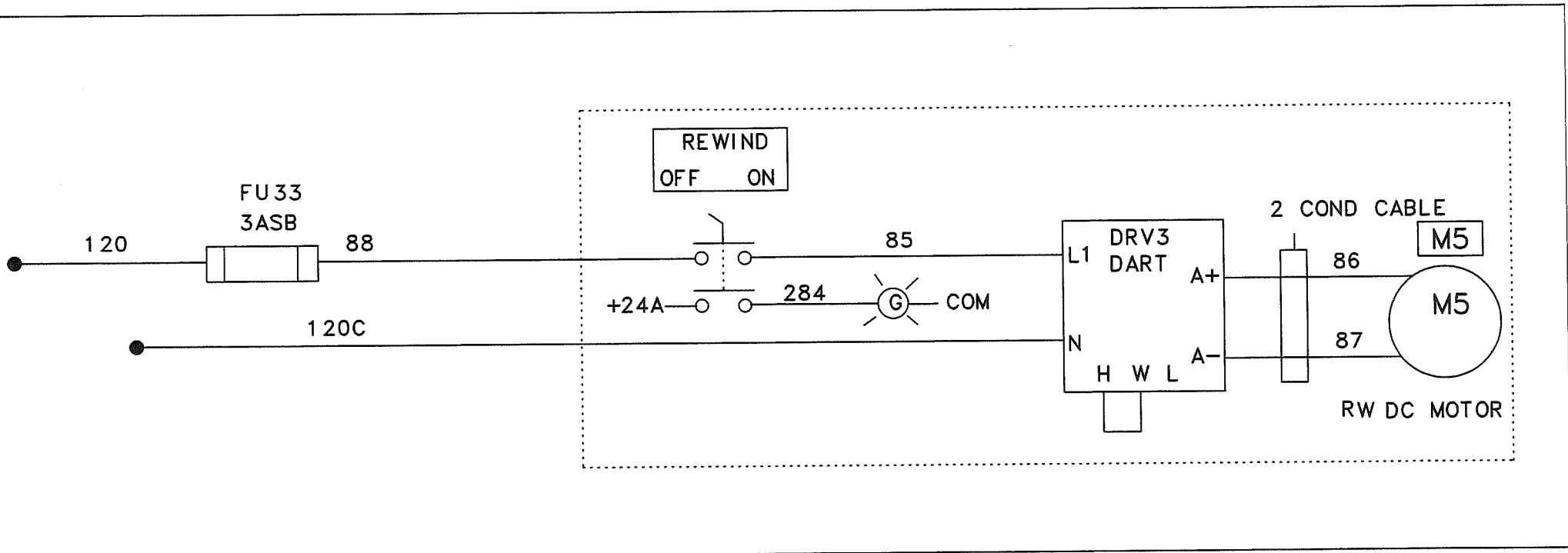


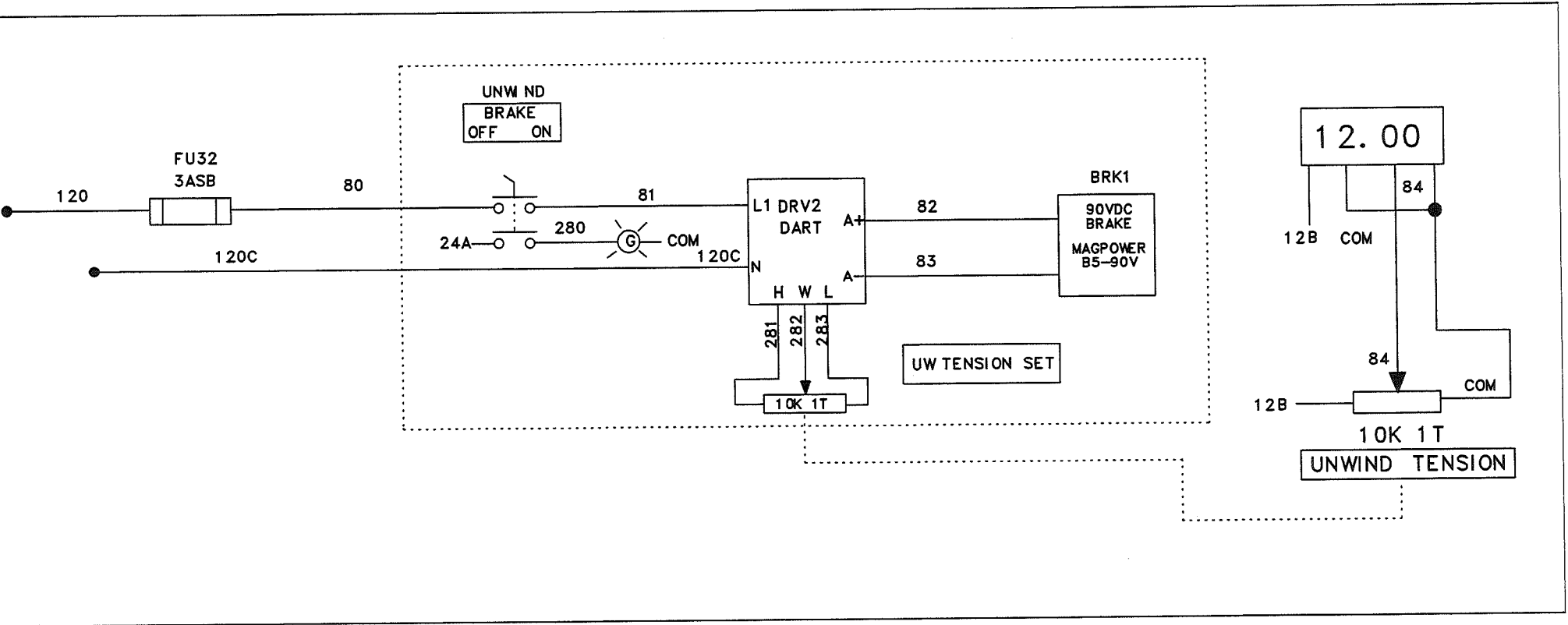
TO EXTRUDER
ELEC. ENCLOSURE



LASER





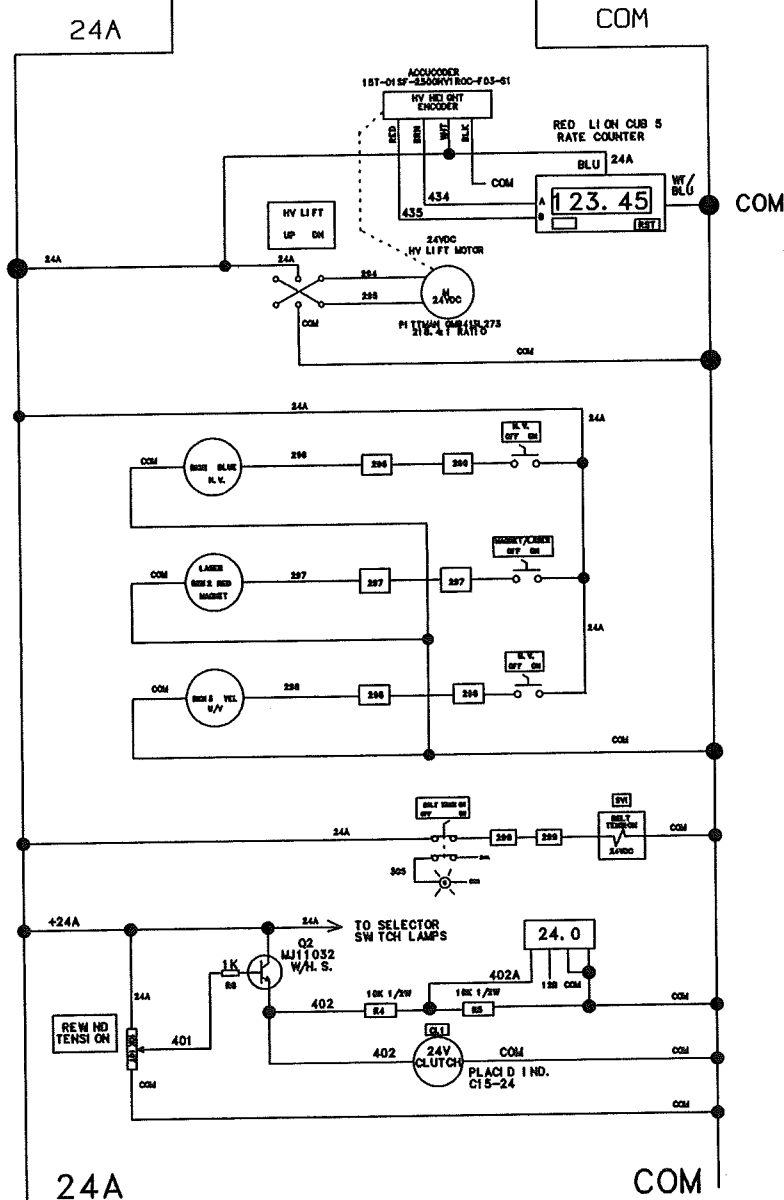


PS1
24V "A"
10A

1 20

1 20C

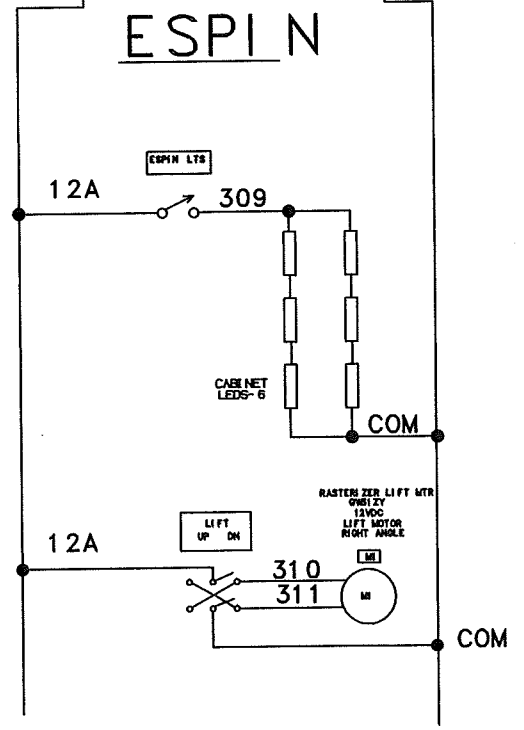
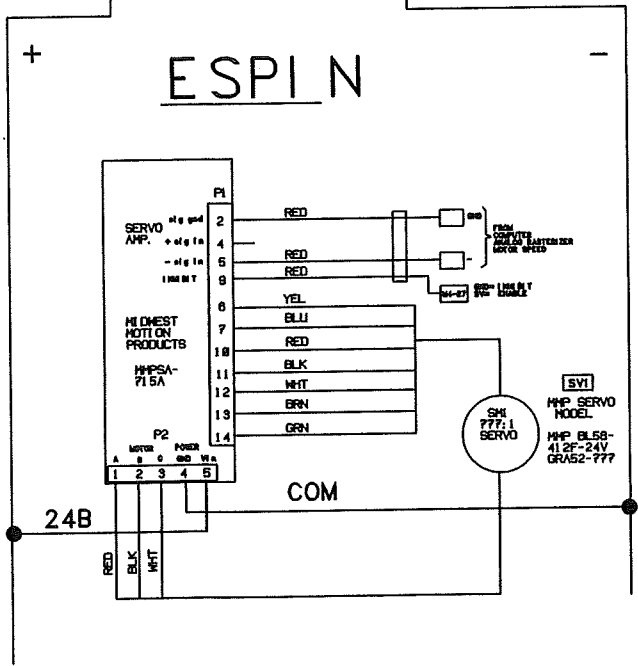
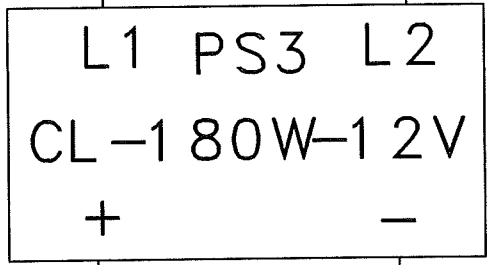
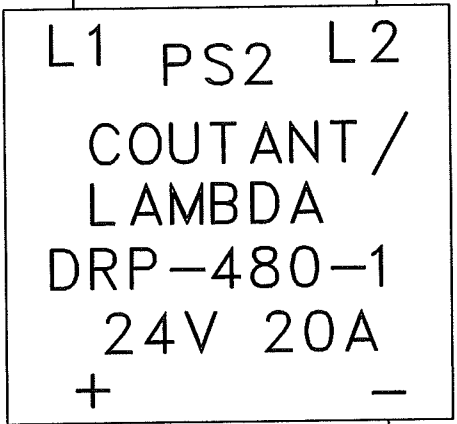
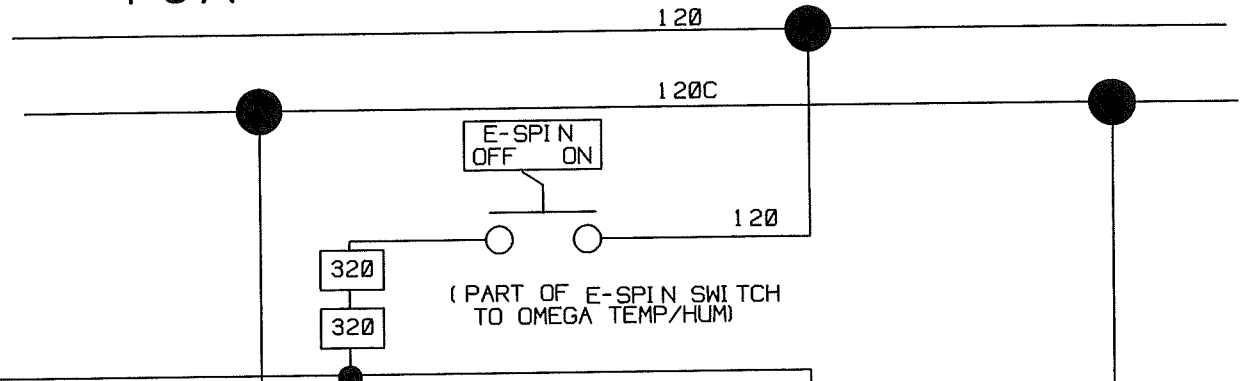
L1 PS1 L2
S-250-24
24V 10A



NOTE: 24A & COM ARE USED
FOR SWITCH LIGHTING AND
OTHER ITEMS

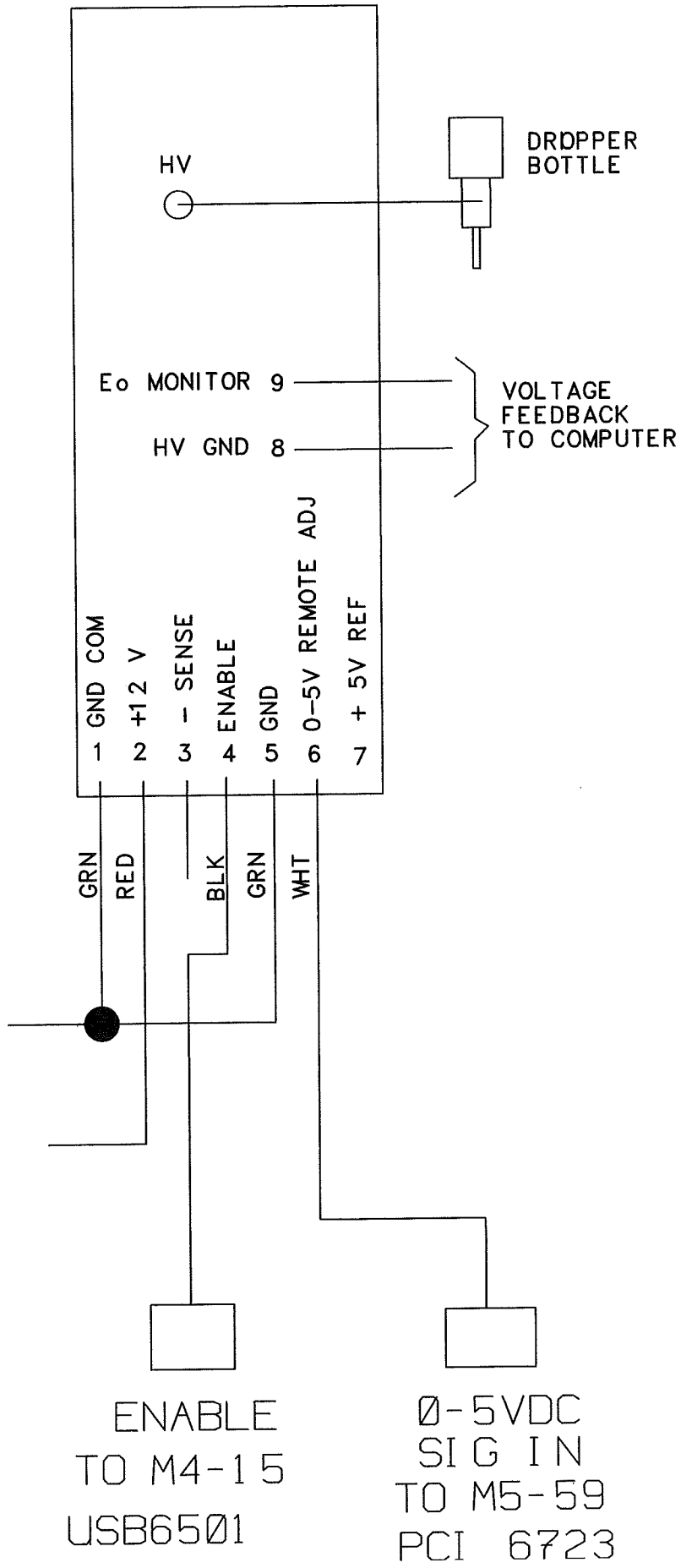
PS2
24V "B"
10A

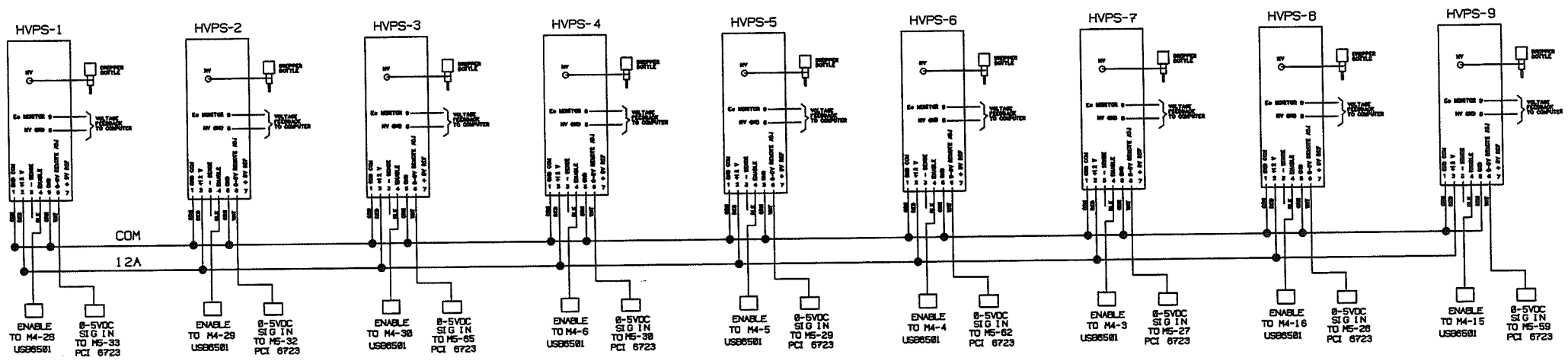
PS3
12V "A"
15A



TYPI CAL

HVPS-9

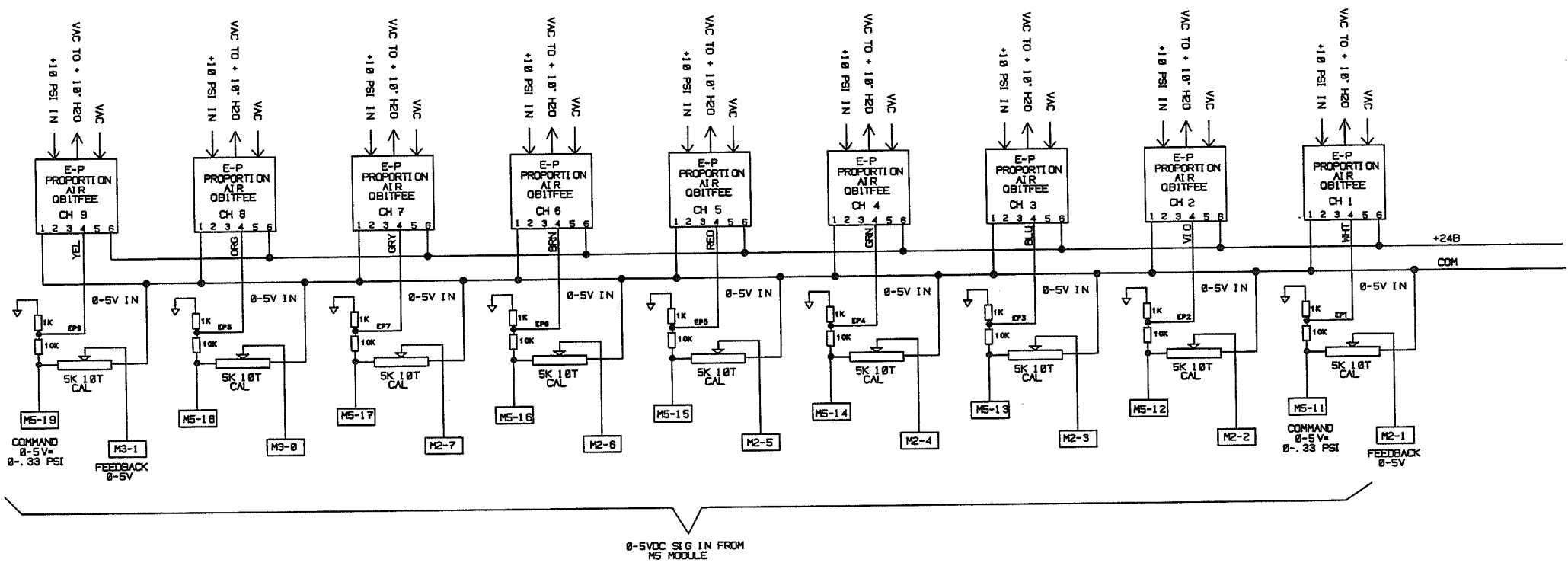




HVPS 1 THRU 9

NOTE: ALL POWER SUPPLIES ARE ULTRAVOLT MODEL # 25A12-P4

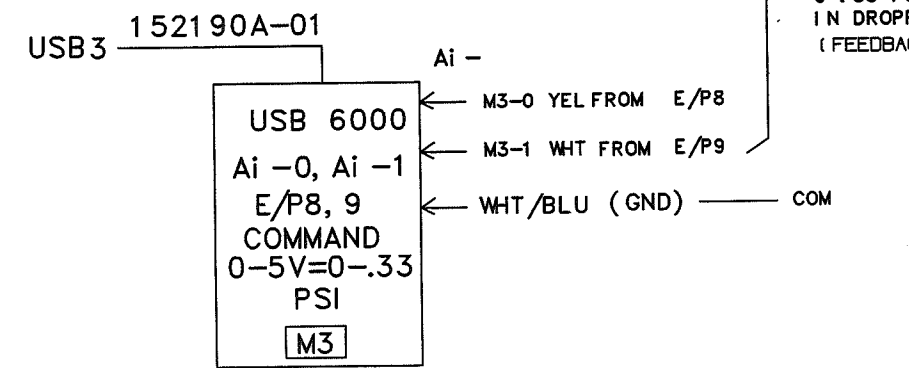
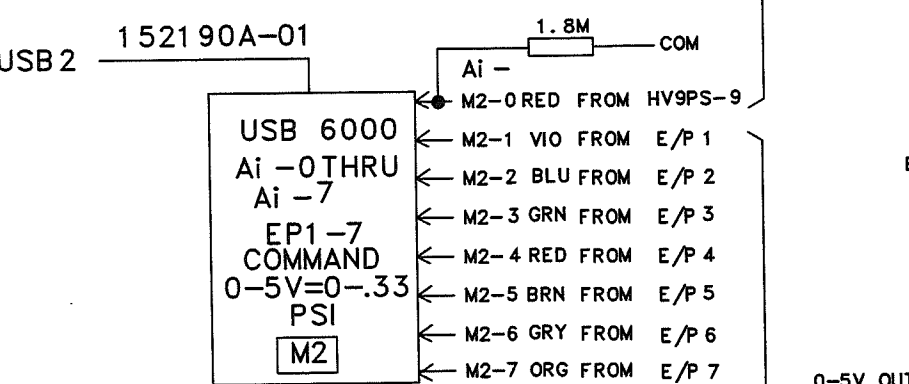
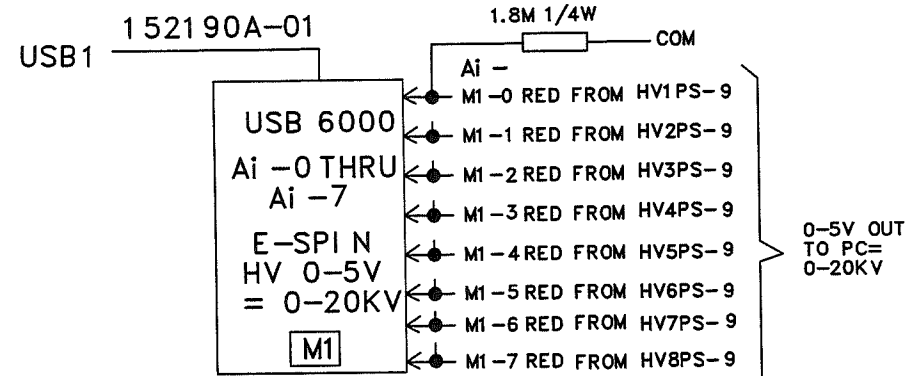
TO PC EXTERNAL MODULES M4 & M5



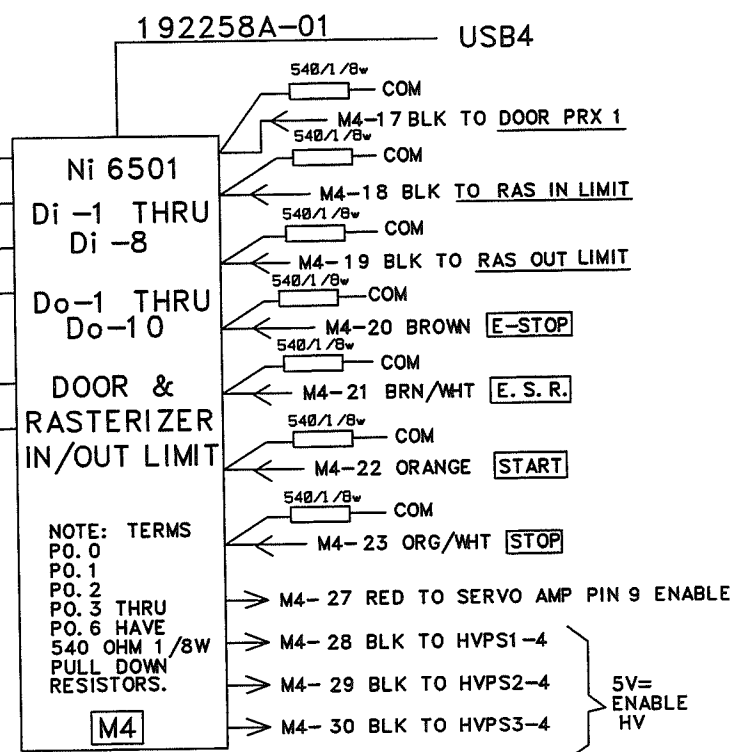
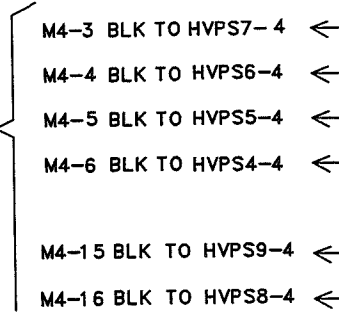
E/P CALIBRATIONS FOR 10PSI IN

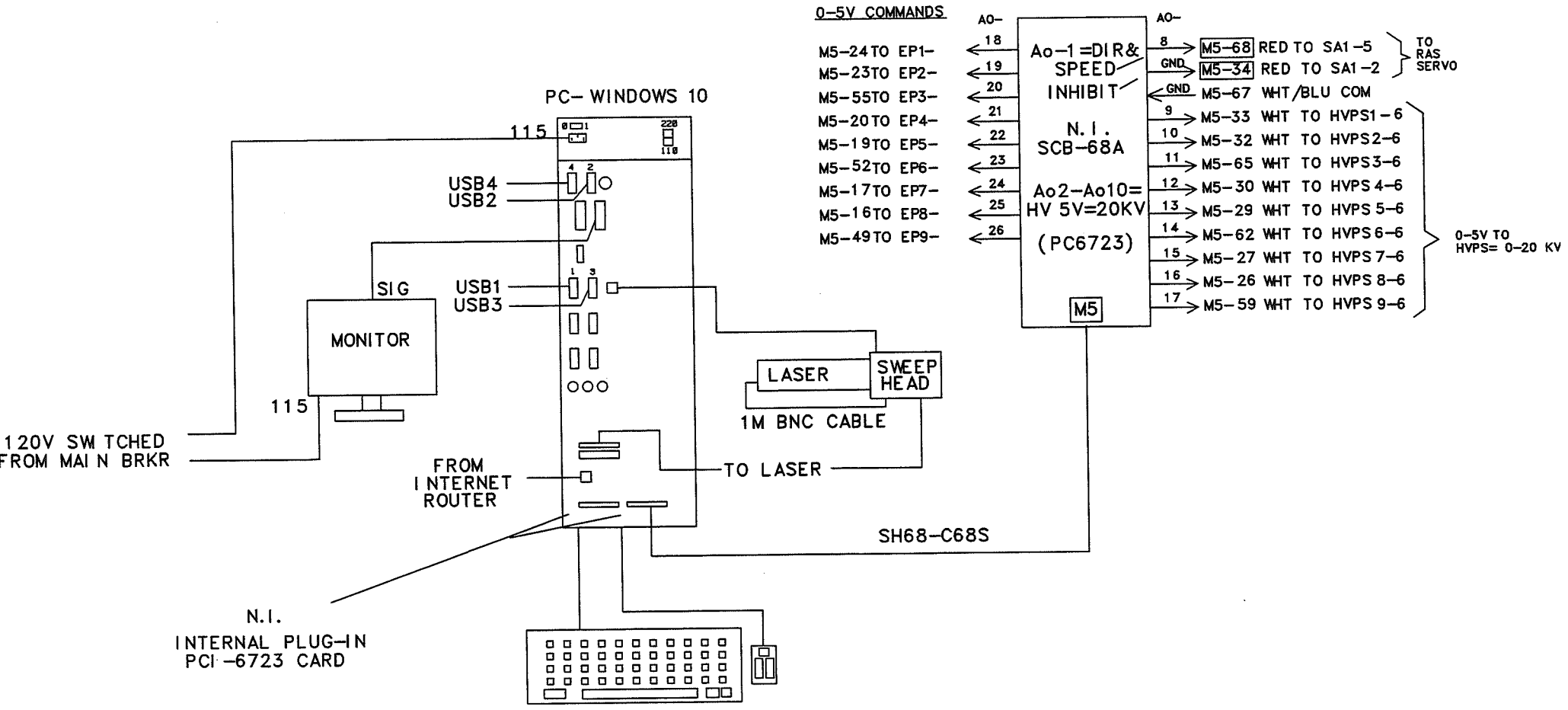
CHANNEL	PSI @	PSI @	PSI @	FEEDBACK
	0V IN	2.5V IN	5.0V IN	@ .34PSI @ 5V
1	0.0	.15	.36	.370
2	0.0	.16	.34	.340
3	0.0	.13	.35	.357
4	0.0	.18	.34	.342
5	0.0	.18	.34	.342
6	0.0	.22	.32	.326
7	0.0	.20	.32	.321
8	0.0	.20	.33	.327
9	0.0	.16	.34	.340

NOTE: 1.8M TO COM ON ALL HV PIN 9 OUTPUTS TO SCALE PROPER READING ON SCREEN



5V= ENABLE HV

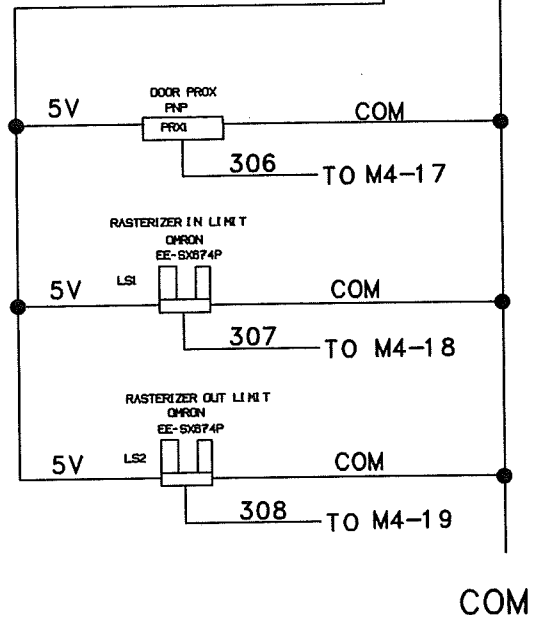
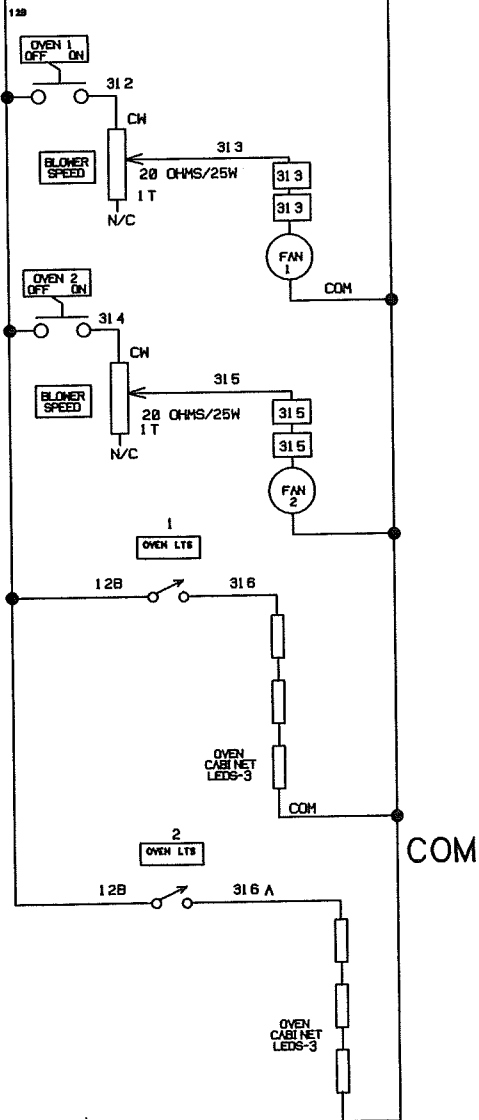
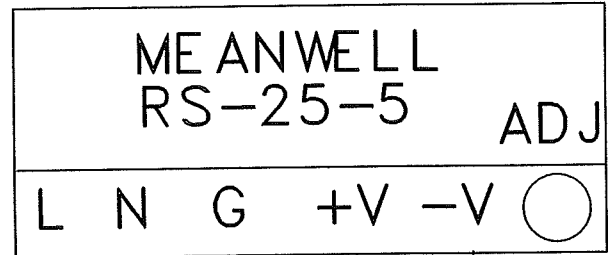
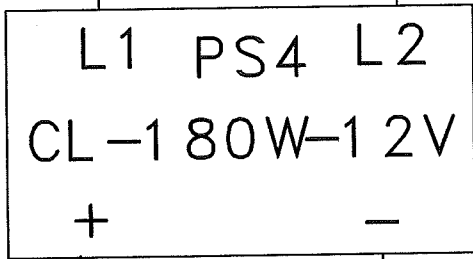




PS4
12V "B"
15A

PS5
5V
5A

120
120C



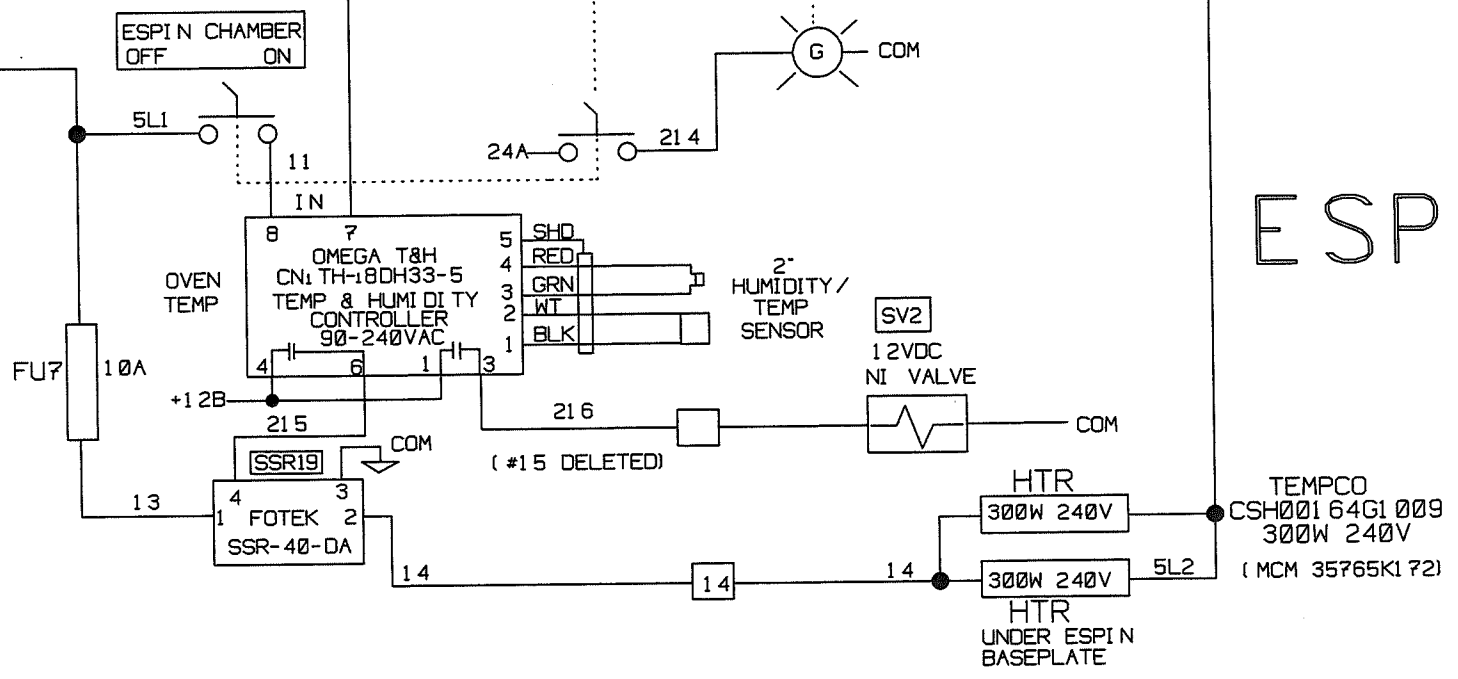
+12B

5L1

5L2

208V

ESPIN



TEMPCO
CSH001 64G1 009
300W 240V
(MCM 35765K1 72)

HTR
300W 240V
HTR
UNDER ESPIN
BASEPLATE

ESPIN CHAMBER
OFF
ON

2" HUMIDITY/
TEMP
SENSOR

SV2
12VDC
NI VALVE

FU7
10A

OVEN
TEMP

8 7
OMEGA T&H
CN1 TH-18DH33-5
TEMP & HUMIDITY
CONTROLLER
90-240VAC

5 SHD
4 RED
3 GRN
2 WT
1 BLK

216
(#15 DELETED)

SSR19
FOTEK
SSR-40-DA

4 3
1 2

HTR
300W 240V

HTR
300W 240V

G COM

5L1

24A

214

11

IN

+12B

215

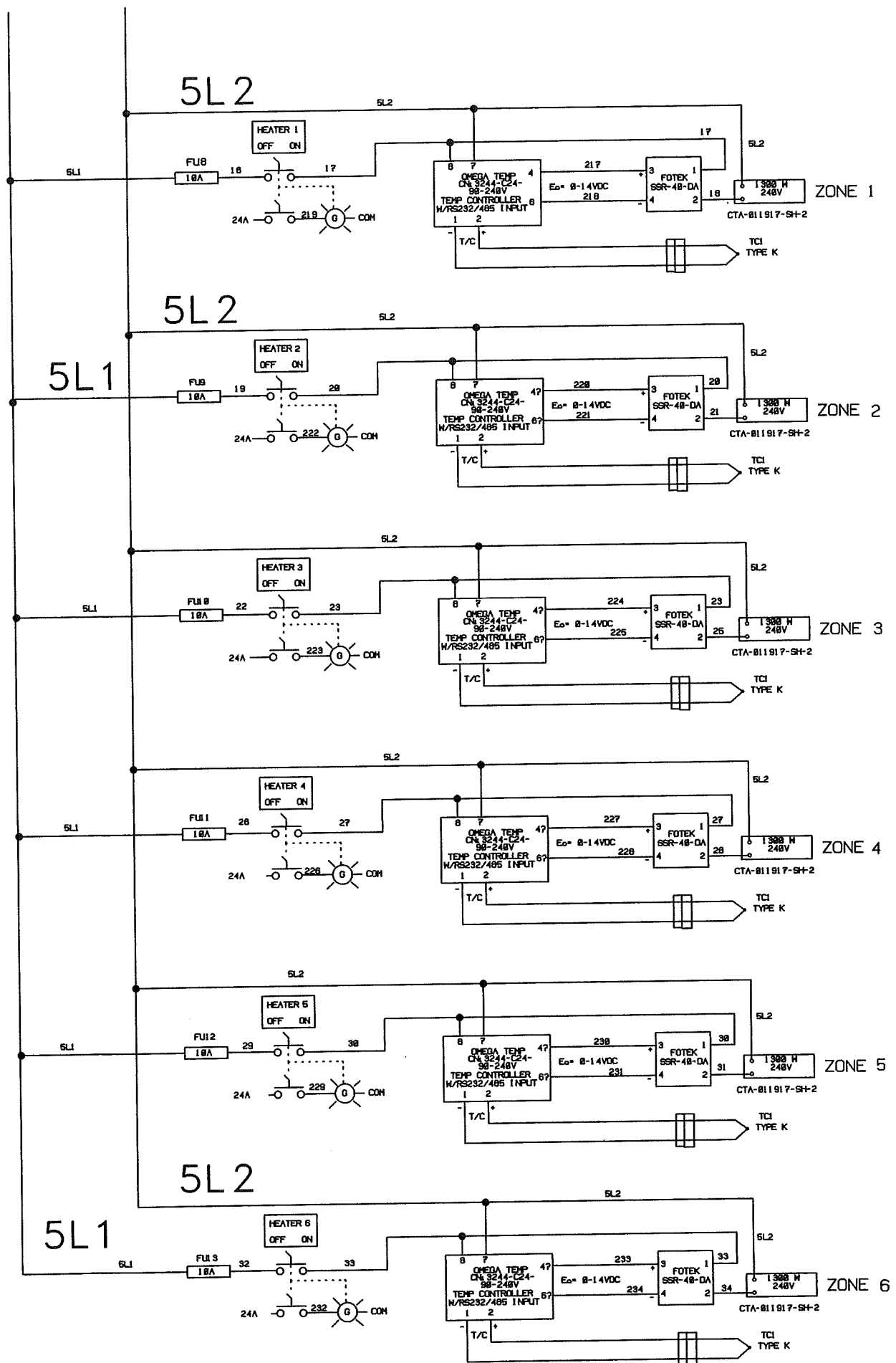
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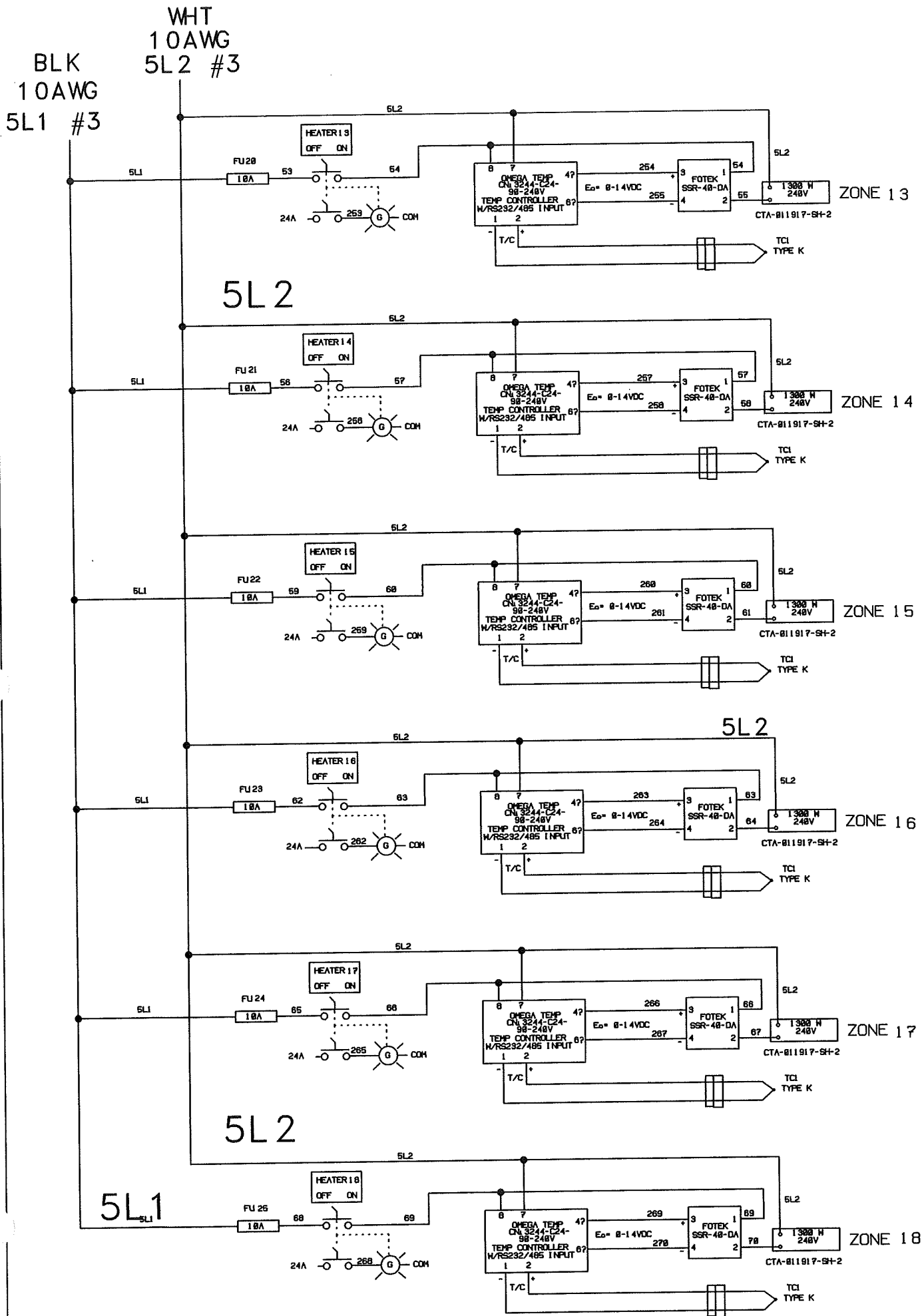
14

14

14

5L2





ZONE 13

ZONE 14

ZONE 15

ZONE 16

ZONE 17

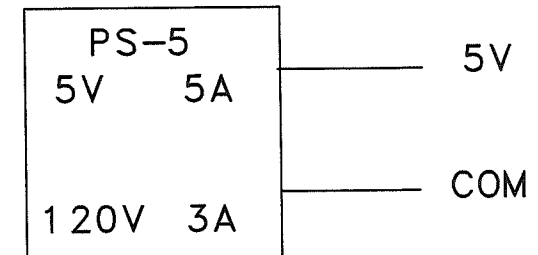
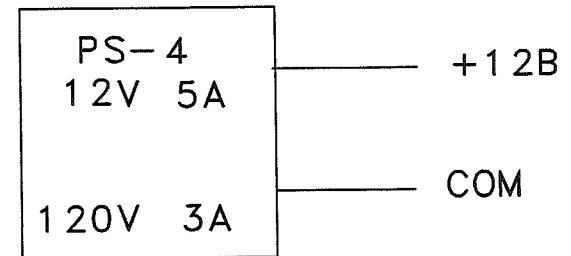
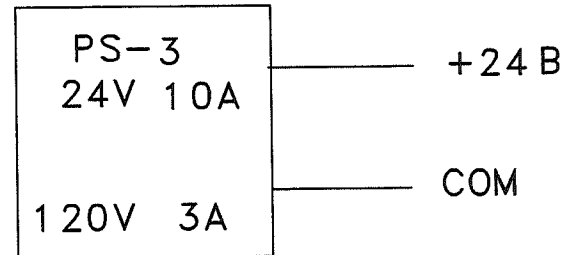
ZONE 18

MAIN E1 ELEC. ENCLOSURE

E-STOP RELAY
HV FRAME LIFT MOTOR
RED BEACON
YELLOW BEACON
BLUE BEACON
PANEL SWITCH LTS
U/S1 & U/S2
HV LIFT ENCODER
RW CLUTCH

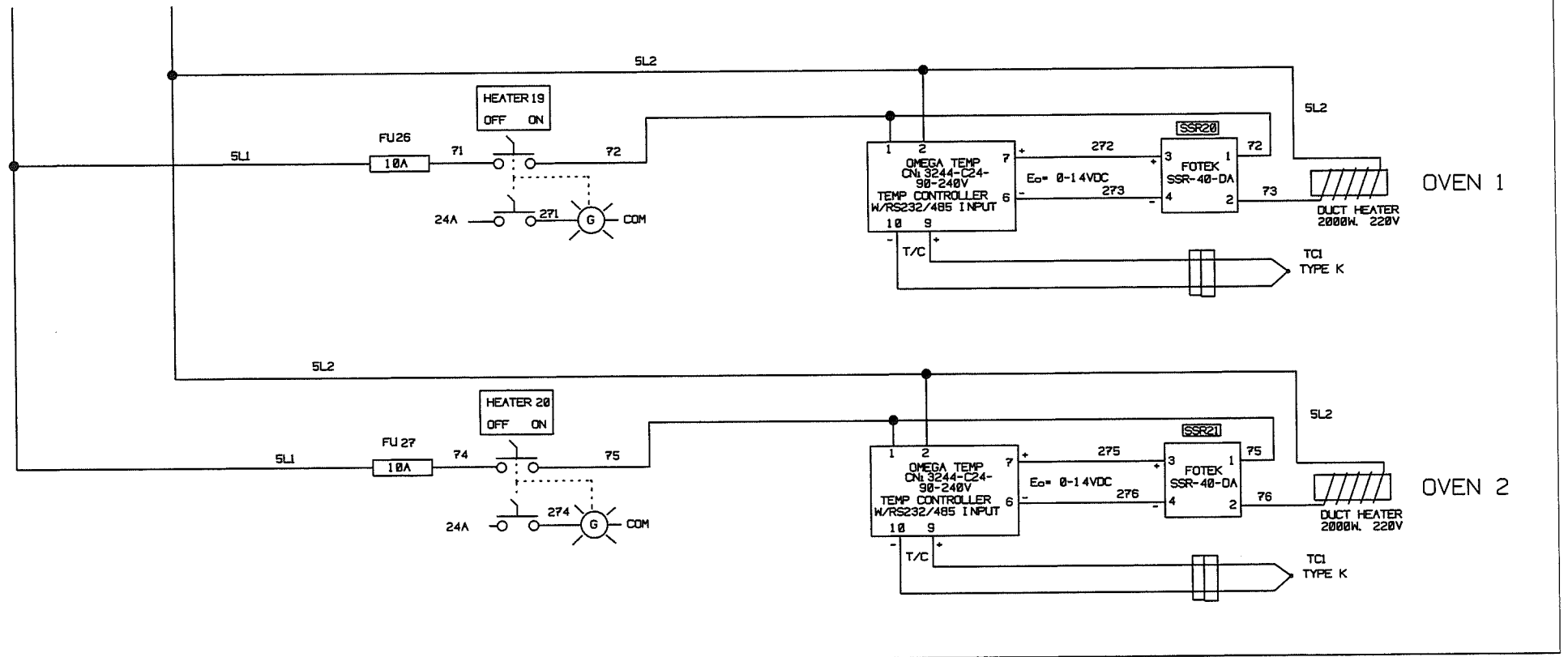
OVEN BLOWERS 4A

METERS



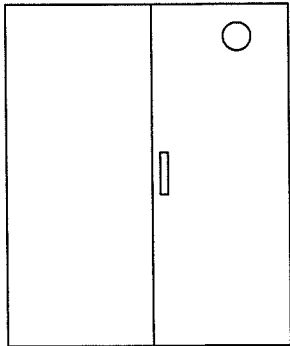
5L1

5L2



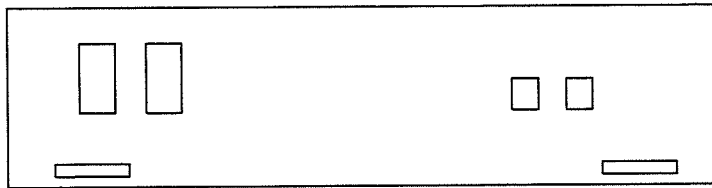
E1

ELECTRICAL DISCONNECT
BREAKER ENCLOSURE



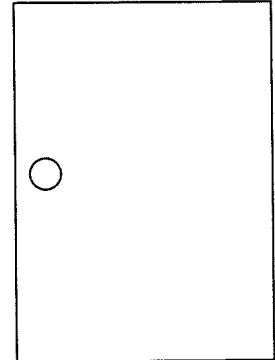
E2

MAIN OPERATOR CONTROL PANEL



E3

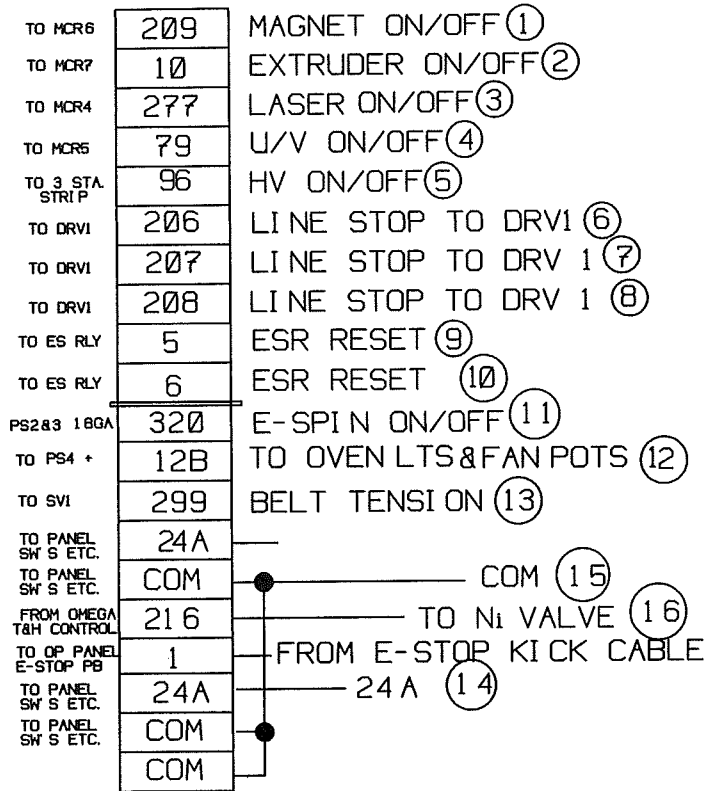
EXTRUDER ENCLOSURE



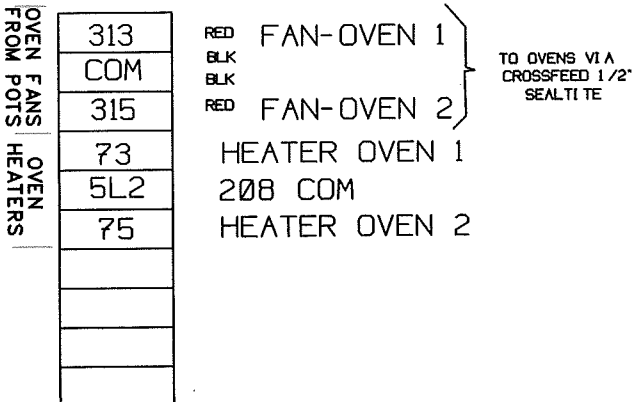
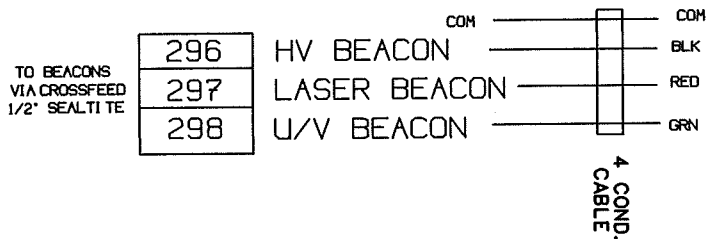
ELECTRICAL PANELS LOCATED AT REAR OF MACHINE

E2-TB2

OPERATOR PANEL TO E1 INTERFACE
TERMINAL STRIP

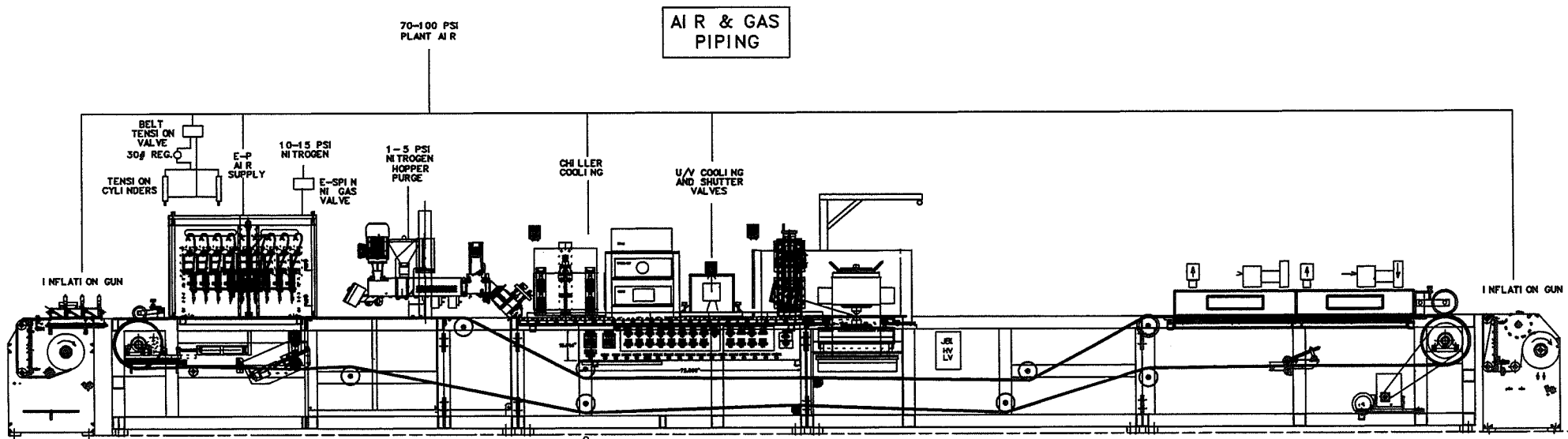


FROM HV, LASER & U/V SW'S



E2-TB3

CH 18



AIR & GAS PIPING

70-100 PSI PLANT AIR

BELT TENSION VALVE
30# REG.

TENSION CYLINDERS

E-P AIR SUPPLY

10-15 PSI NITROGEN

E-SPIN NITROGEN VALVE

1-5 PSI NITROGEN HOPPER PURGE

CHILLER COOLING

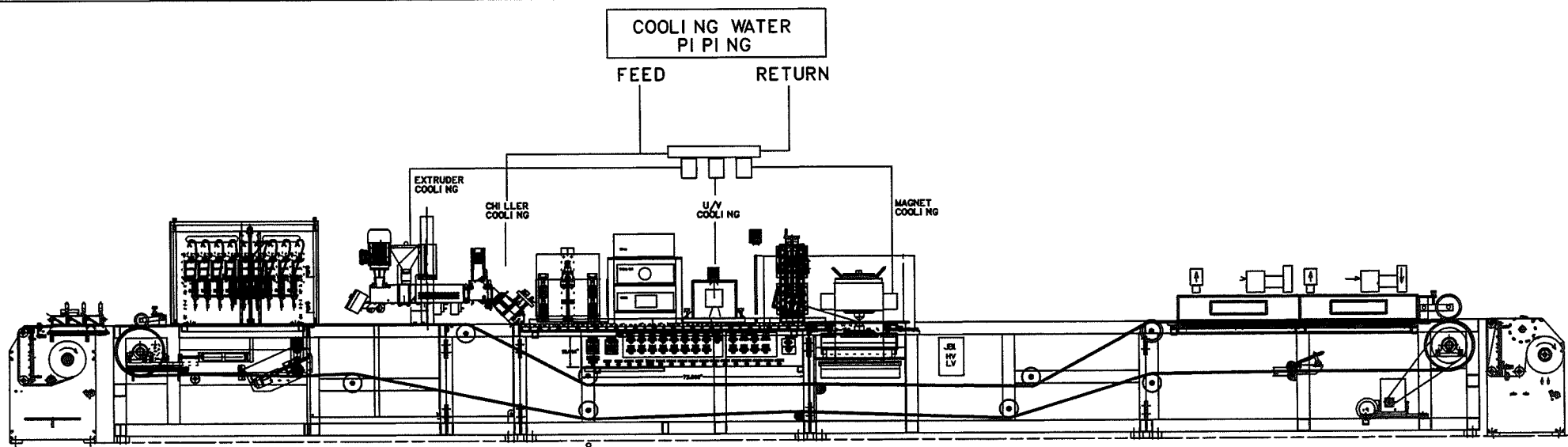
U/V COOLING AND SHUTTER VALVES

INFLATION GUN

INFLATION GUN

E-23

CH 19



CH 20

THREADUP PROCEDURE FOR
MAXWELL R2R MACHINE

1. TURN ON MACHINE POWER. REMOVE DOCTOR KNIFE COATER HEAD.
2. TURN UNWIND GUIDER SWITCH TO CENTER.
3. TURN UNWIND BRAKE SWITCH OFF.
4. PLACE KAPTON PRODUCT ROLL ON UNWIND SPINDLE SHAFT SO THE DIRECTION OF UNWINDING IS CLOCKWISE.
5. BEFORE INFLATING AIR SHAFT, CHECK TO SEE THAT PRODUCT ROLL IS AT APPROXIMATELY CENTER WITH THE EDGE GUIDE ROLLERS.
6. CAREFULLY PULL WEB MATERIAL (KAPTON) OFF OF THE ROLL SO IT MATCHES THE WEB PATH DIAGRAM SHOWN IN FIGURE 1.
7. AGAIN, CHECK THAT WEB IS CENTERED ON GUIDER ROLLERS AND EDGE OF KAPTON IS IN CENTER OF EDGE SENSOR LIGHT BEAM.
8. INFLATE THE UNWIND SPINDLE BY INSERTING THE INFLATION GUN RUBBER TIP INTO THE CUP INFLATION VALVE ON THE OUTER END OF THE CORE CHUCK.
9. HOLD THE INFLATION GUN HARD AGAINST THE INFLATION BUTTON AND PULL THE GUN TRIGGER TO INFLATE.
10. HOLD AIR ON FOR AT LEAST 2 SECONDS AND WHILE AIR IS STILL ON, QUICKLY PULL THE GUN AWAY FROM THE CHUCK. RELEASE THE TRIGGER.
11. CAREFULLY MEASURE THE DISTANCE FROM THE REAR EDGE OF THE KAPTON ROLL TO THE MACHINE UNWIND SIDEPLATE TO ESTABLISH THE NORMAL RETHREAD DISTANCE FOR FUTURE ROLLS OF 8" WIDE KAPTON FILM.
12. TURN UNWIND BRAKE TO THE ON POSITION. SET THE TENSION SET POT TO A SETTING OF BETWEEN 1.5 TO 2.5. THIS WILL GIVE A SLIGHT DRAG TO THE FILM AS YOU THREAD UP THE REST OF THE MACHINE.
13. WHILE KEEPING THE UNWIND EDGE GUIDE IN A "CENTERED" FUNCTION, THE KAPTON CAN BE HAND FED THRU THE E-SPIN CABINET AND OUT THE EXTRUDER SIDE OF THE ENCLOSURE. KEEP THE FILM CENTERED ON THE STEEL BELT. NOTE: THERE MAY BE A STATIC DRAG OF THE KAPTON AGAINST THE STEEL BELT RESULTING IN HIGH DRAG THRU THE CABINET. IF THIS OCCURS, A LAYER OF CLEANROOM APPROVED PAPER CAN BE PLACED BETWEEN THE STEEL BELT AND THE KAPTON. THIS SHOULD REMAIN UNTIL THE ENTIRE MACHINE THREADUP IS COMPLETED.
14. THE KAPTON FILM WILL BE THREADED UNDER THE EXTRUDER AND ON TOP OF THE FIRST HEATER PLATE (#1). SEE FIGURE 3 FOR THE THREADUP OF THIS SECTION AND THE REMAINING HEATED SECTIONS. THE E-FIELD HEAD SHOULD BE RAISED TO AT LEAST .040" (1MM) TO ALLOW UNOBSTRUCTED THREADUP OF THE KAPTON IN THIS SECTION.

THREADUP PROCEDURE FOR
MAXWELL R2R MACHINE

CON' T

15. BEFORE COMPLETING THE KAPTON THREADUP, CHECK TO SEE THAT THE STEEL 10" BELT IS CENTERED THRU THE MACHINE AND THAT "BELT TENSION" SWITCH ON THE OPERATOR PANEL IS ON. THE STEEL BELT SHOULD BE TAUGHT AND NOT LOOSE. BOTH ENDS OF THE MACHINE SHOULD HAVE THE STEEL BELT AT APPROXIMATELY CENTERED ON THE 16" DIAMETER DRUMS. FIG. 4 OPEN BOTH OVEN COVERS AND OPEN EXIT NIP BY RELEASING THE HOLD DOWN SCREWS ON BOTH SIDES OF THE NIP FRAME.
16. AFTER KAPTON IS THREADED OVER ALL OF THE HEATERS AND CHILLER PLATE JUST BEFORE THE MAGNET, IT WILL BE THREADED THRU THE MAGNET AND OVER THE MAGNET EXIT CHILLER PLATE. THEN PROCEED UNDER THE U/V HEAD AND OUT TO THE OVENS.
17. THE KAPTON FILM IS PULLED THRU THE MACHINE BY HAND, CENTERED ON THE STEEL BELT AT THE ENTRANCE TO THE OVENS AND OUT TO THE REWIND EDGE GUIDE. SEE FIG 5.
18. THE KAPTON IS THREADED AROUND THE TOP ROLLER IN A CLOCKWISE DIRECTION, THEN "S" WRAPS TO THE BOTTOM GUIDER ROLLER IN A COUNTER-CLOCKWISE DIRECTION TO THE BOTTOM OF THE LAST ROLLER BEFORE THE REWIND SHAFT. SEE FIG 6.
19. PLACE THE REWIND EDGE GUIDE IN "CENTER" MODE.
20. TURN REWIND MOTOR TO "OFF".
21. ADJUST REWIND TENSION SETTING TO BETWEEN 1.5 AND 2.5 ON THE DIGITAL METER.
22. PLACE AN EMPTY 3" X 8" FIBER CORE ON THE REWIND SPINDLE SO IT IS AGAINST THE REAR CORE STOP FLANGE. INFLATE THE CHUCK. NOTE: THE KAPTON FILM MAY EXTEND BEYOND THE OUTER EDGE OF CORE AFTER THE MACHINE HAS RUN FOR A SHORT TIME. THIS CAN BE COMPENSATED FOR BY ADJUSTING THE PLACEMENT OF THE CORE IN FUTURE INSTALLATIONS.
23. NOTE THE POSITION OF THE KAPTON IN THE EDGE SENSOR AND THE GUIDER ROLLERS. THE SAME METHOD IS USED HERE AS WAS USED IN THE UNWIND EDGE GUIDE SETUP.
24. USING A PIECE OF CLEANROOM SAFE TAPE, PULL THE WEB TIGHT THRU THE GUIDER. CENTER THE FILM ON THE ROLLERS AND CORE AND TAPE THE FILM TO THE CORE. ADJUST THE TENSION SET TO A READING OF AROUND 6 TO 8 ON THE METER. WHEN THE REWIND IS TURNED ON, THE WEB WILL TENSION UP AND THE "FEEL" OF THE WEB CAN BE SET BY THE OPERATOR. NORMAL SETTINGS ARE AROUND 6 TO 8 ON THE DIGITAL METER.

THREADUP PROCEDURE FOR
MAXWELL R2R MACHINE

CON' T

25. THE NIP ROLLER ASSEMBLY AT THE EXIT OF THE LAST OVEN CAN BE LOWERED AND THE HAND KNOBS TIGHTENED SLIGHTLY SO THAT THE STEEL BELT IS USED TO "PULL" THE KAPTON FILM ALONG THE MACHINE AT THE CORRECT SPEED. IF THE FILM STARTS TO SKEW TO ONE SIDE WHICH CAN BE SEEN AS DIAGONAL WRINKLES IN THE FILM JUST BEFORE THE NIP ROLLER, AN ADJUSTMENT MIGHT BE REQUIRED USING THE SLOTTED BOLT HOLES IN THE OPERATOR SIDE OF THE ROLLER ARMS.

NOTE: IF THE FILM IS TRACKING TOWARD THE OPERATOR SIDE OF THE MACHINE, LOOSEN THE DOWN PRESSURE ADJUSTERS. THEN LOOSEN THE END BOLT IN THE SLOT AND MOVE THE ROLLER SHAFT AT THAT SIDE TOWARD THE REWIND. THIS WILL "STEER" THE WEB IN THE OPPOSITE DIRECTION. TYPICAL ADJUSTMENTS SHOULD BE ABOUT 1/4 OF AN INCH AT A TIME. ALSO, BE CAREFUL TO KEEP THE NIP DOWN PRESSURE ADJUSTERS AT ABOUT THE SAME PRESSURE.

(SEE FIG 5)

26. AFTER THE KAPTON FILM HAS BEEN INSTALLED IN THE MACHINE, REVIEW THE FOLLOWING ITEMS BEFORE STARTING THE MACHINE:
- A) CHECK UNWIND TENSION SETTING (1.5 TO 3.5)
 - B) PLACE UNWIND EDGE GUIDE SWITCH TO AUTO POSITION
 - C) REMOVE PAPER FROM UNDER KAPTON IN E-SPIN CABINET
 - D) CHECK TO SEE THAT BELT TRACKER SWITCH ON OPERATOR PANEL IS IN AUTO MODE
 - E) CLOSE OVEN COVERS AND ADJUST SILICON BAFFLES AROUND STEEL BELT
 - F) BE SURE THAT EXIT NIP ASSEMBLY IS ADJUSTED PROPERLY
 - G) PLACE REWIND EDGE GUIDE SWITCH IN AUTO MODE
 - H) CHECK REWIND TENSION ADJUST SETTING FOR 5-8 ON THE DIGITAL METER
 - J) CONFIRM REWIND SPINDLE MOTOR DRIVE IS ON AND THAT WEB TENSION IS PRESENT
 - K) FILM THREADUP IS NOW COMPLETE AND READY FOR FUNCTION SETUP TO BEGIN. REFER TO MODE OF OPERATION FOR PROPER INSTRUCTIONS.

MAXWELL THREADUP PROCEDURE

UNWIND MODULE

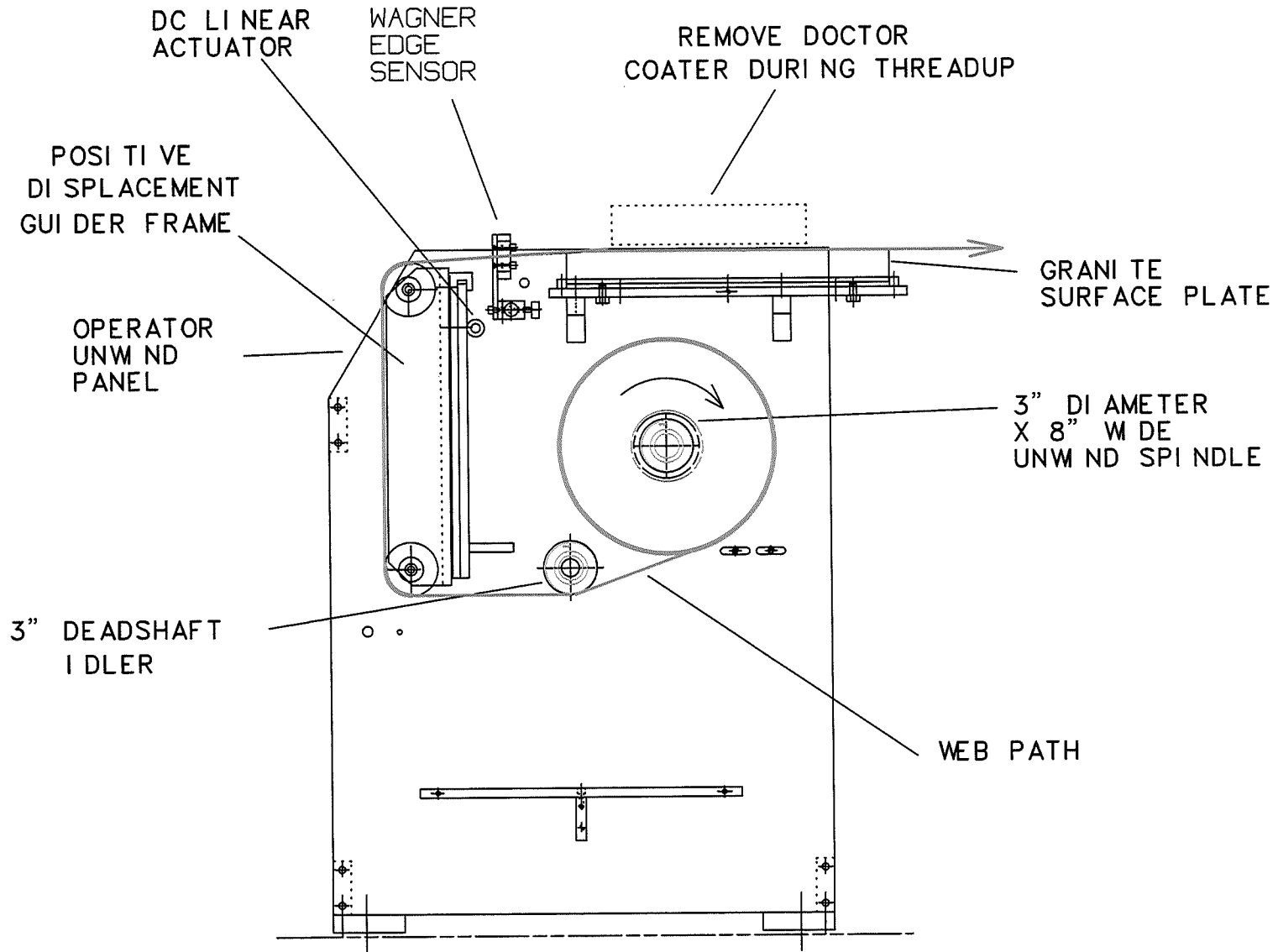
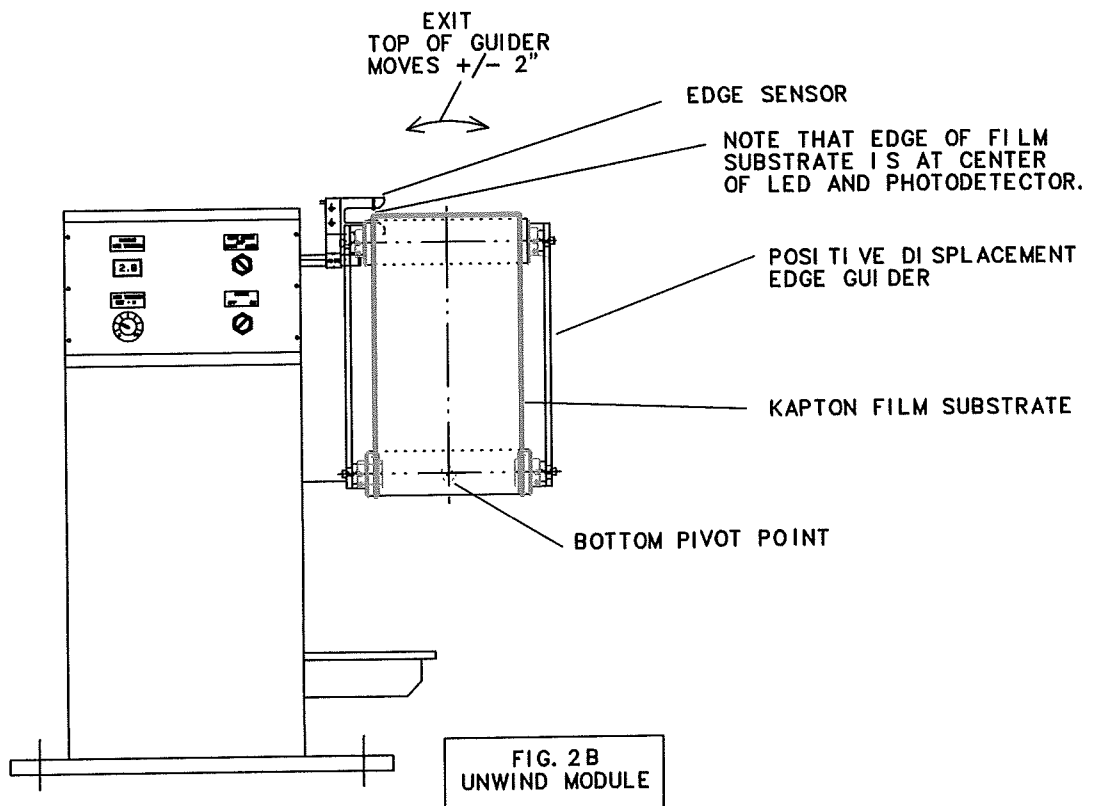
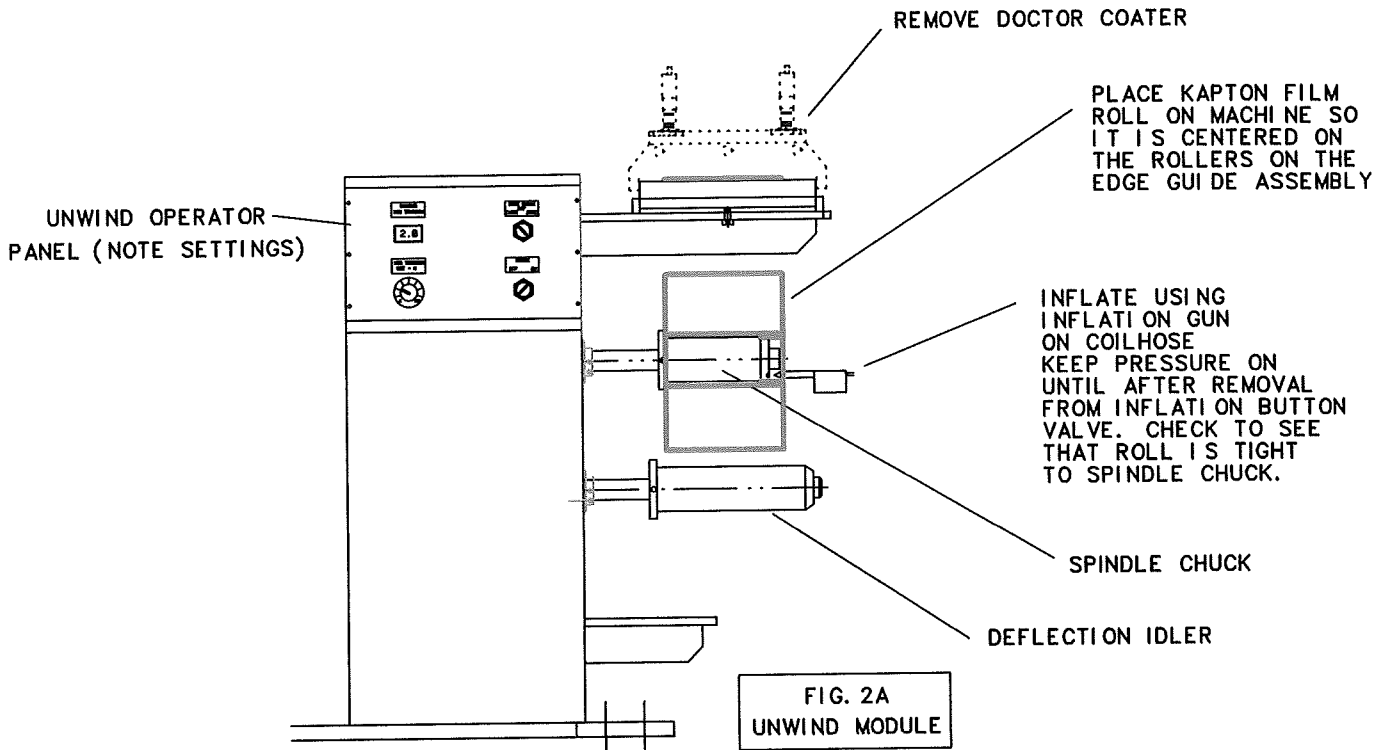


FIG. 1

MAXWELL THREADUP PROCEDURE



MAXWELL THREADUP PROCEDURE

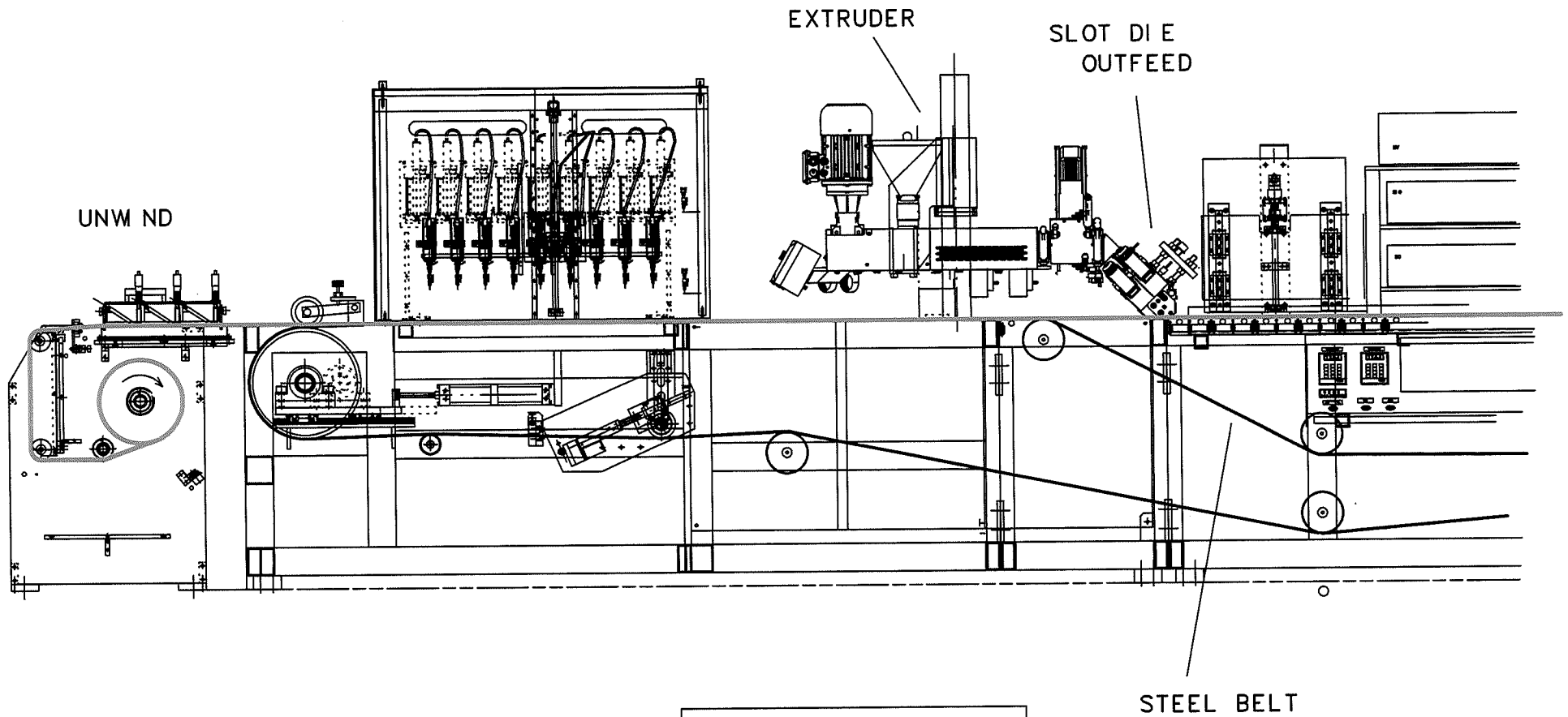


FIG 3
INFEED THREADUP

THREADUP PROCEDURE FOR MAXWELL R2R MACHINE

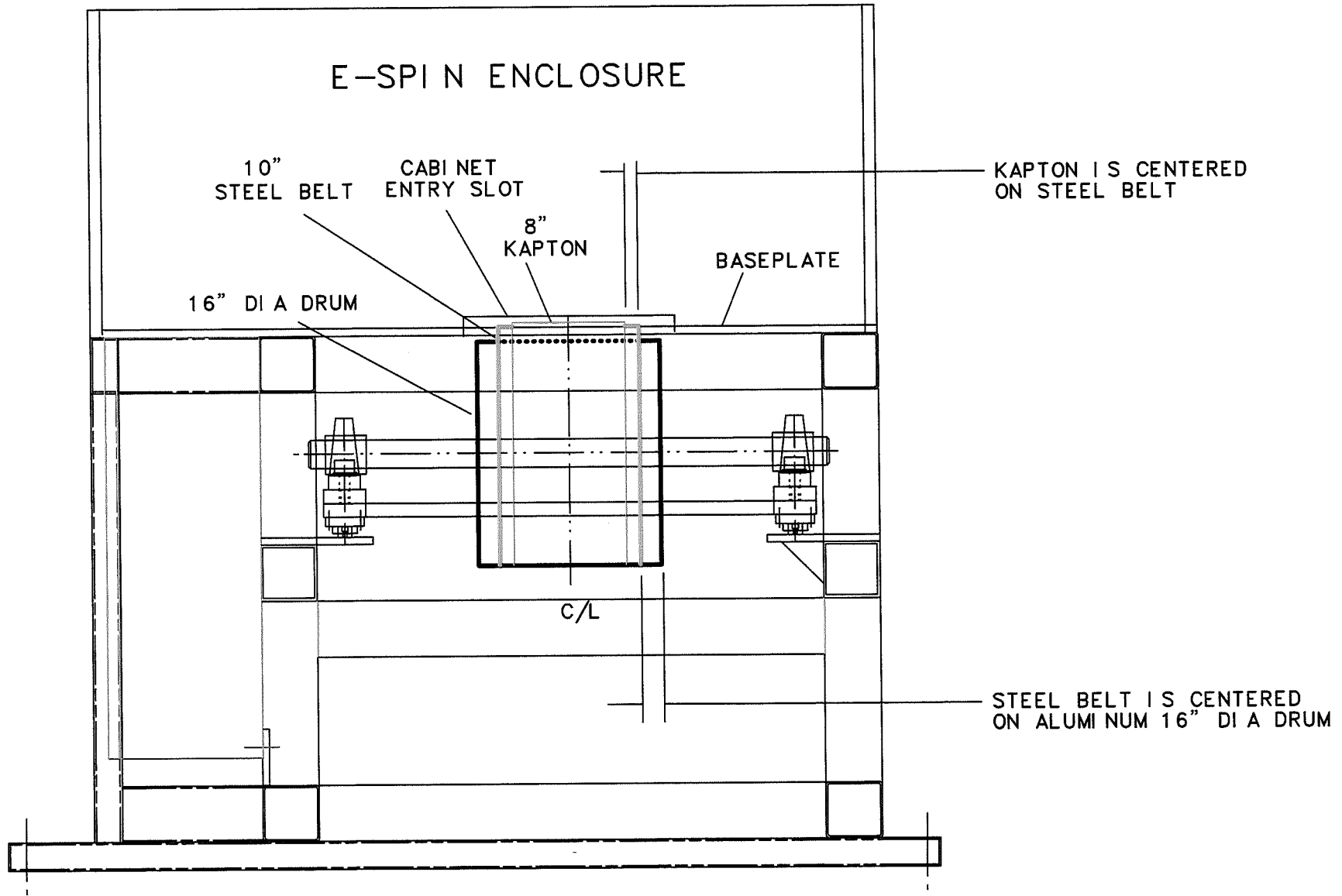


FIG 4

THREADUP PROCEDURE FOR
MAXWELL R2R MACHINE

THREADUP- CONTI NUED THRU TO REW ND

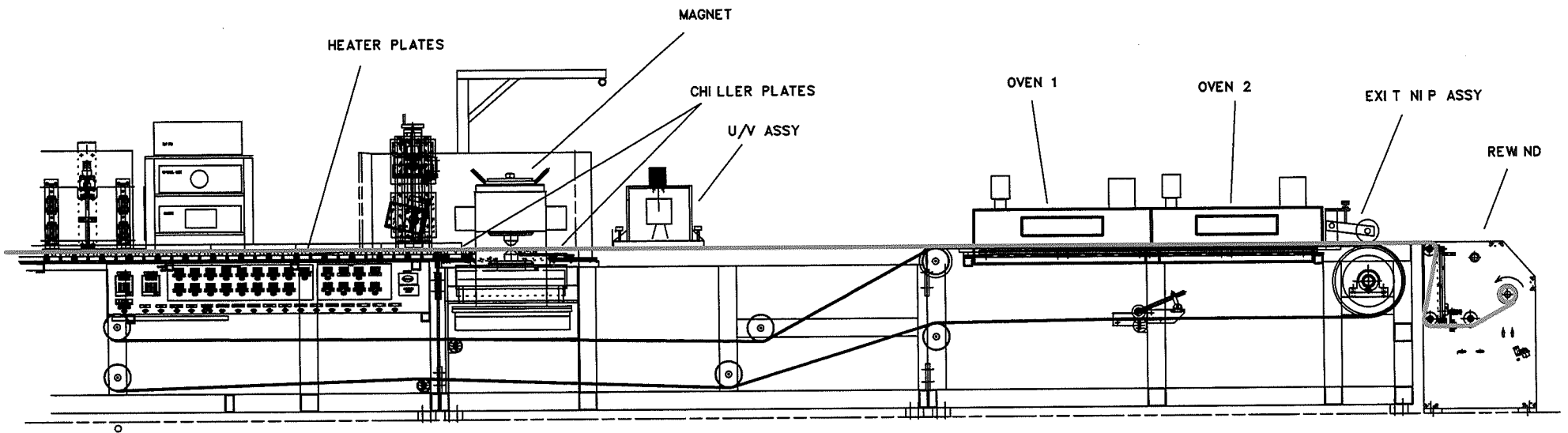


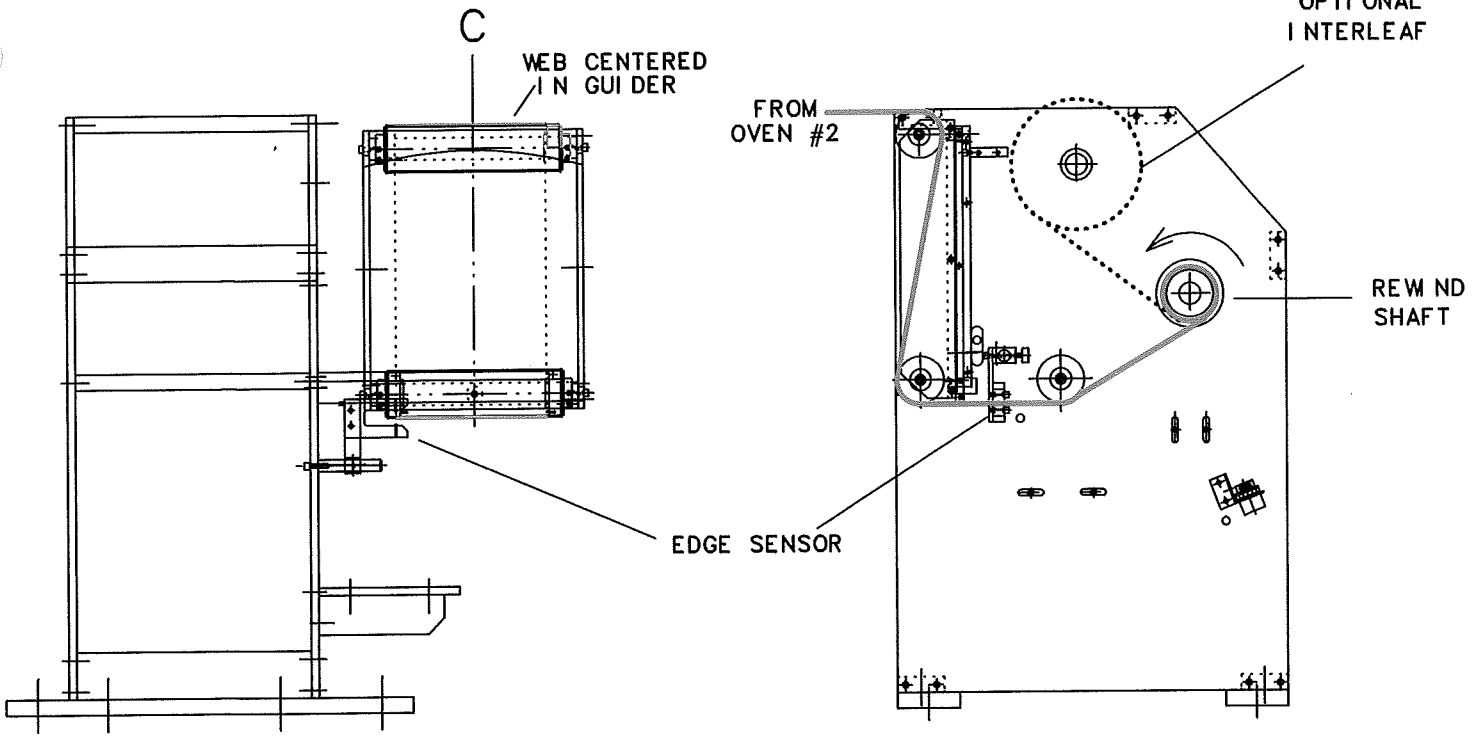
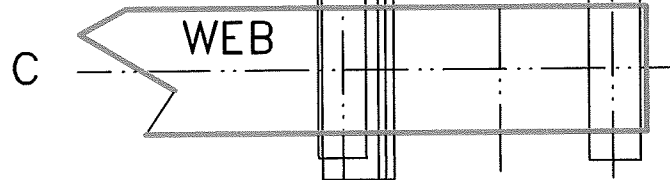
FIG 5

THREADUP PROCEDURE FOR MAXWELL R2R MACHINE

REWIND

TOP VIEW

REFERENCE
DIMENSION



END VIEW
VIEWED FROM
OUTFEED OF
OVEN #2

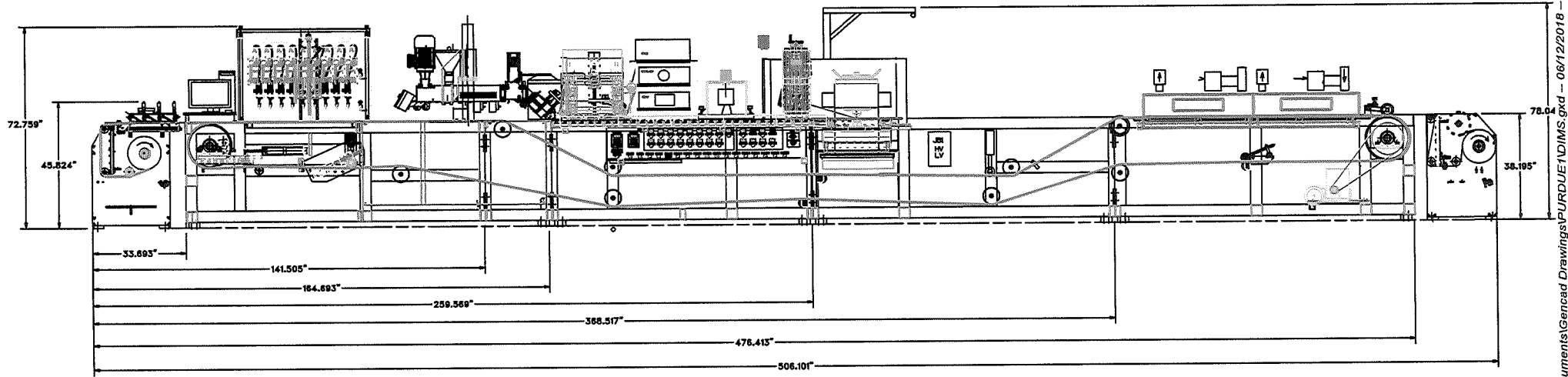
FRONT VIEW

FIG 6

CH 21

OVERALL DIMENSIONS

WIDTH = 68.25"



CH 22

WAGNER MODEL R2R-1
S/N H3859

NOTES

SEC 22

WAGNER MODEL R2R-1
S/N H3859

NOTES

SEC 22

1. STAINLESS STEEL ENDLESS BELT REPAIR OR REPLACEMENT

IF BELT BECOMES DAMAGED AND/OR NEEDS REPLACEMENT, NEVER ATTEMPT THIS REPAIR WITHOUT HAVING A CERTIFIED BELT REPAIR TECHNICIAN PRESENT. THERE ARE SPECIFIC TOOLS AND FIXTURES THAT ARE REQUIRED FOR THIS OPERATION.

OVER THE LIFE EXPECTANCY OF THE BELT (IE; 10-20 YEARS), THERE MAY BE INSTANCES OF CRACKS THAT DEVELOP IF AN OBJECT GETS TRAPPED BETWEEN THE BELT AND ONE OF THE ROLLERS OR DRUMS. THE ONLY WAY TO REPAIR THAT CONDITION IS TO WELD AND FLATTEN THE REPAIR AREA. ONCE THAT IS DONE, A CRITICAL POLISHING FINISHES THE REPAIR. ALL OF THE STEPS MENTIONED REQUIRE DEDICATED TOOLING, FIXTURES AND YEARS OF EXPERIENCE BY THE PERSON DOING THE REPAIR.

IN THE EVENT A REPAIR IS NECESSARY, CONTACT WAGNER INDUSTRIES AT 973-347-0800

OR; BELT TECHNOLOGIES INC. AGAWAM, MASS. 413-786-9922

BELT SPECIFICATIONS ARE: 10" WIDE X 914" LONG, ENDLESS, .015" THICK, GRADE 301 FULL HARD STAINLESS STEEL.

2. DATE OF INSTALLATION: MAY 2018.

INTERIM PROTOCOL FOR GOWNING AND WORKING IN E-BAY**Goal**

- To provide a temporary protocol for users of E Bay. The primary concern is the contamination of the main cleanroom from E-bay due the 'dirty' nature of the R2R process (Maxwell). E Bay will eventually be isolated from the main cleanroom and the protocols will reflect an ISO 7 level.

Scope

- All persons using the E Bay facilities are required to follow the procedures listed here or posted in the Bay.

Gowning and entrance:

- Please follow the clean room gowning protocol.

Working in E-Bay:

- Users will double glove upon entering E Bay. Don purple gloves on top of regular cleanroom gloves.
- Users will dispose of purple gloves prior to exiting E-bay. Avoid touching doorknobs or door push bars with outer glove. When possible use your hip to push open door when exiting.
- Minimize time in main cleanroom during exit.
- Minimize time in DE return air chase areas (refer to E Bay zone layout).
- During operation of the Maxwell do not enter EE return air chase which may contaminate your cleanroom gown. (Refer to E Bay zone layout)
- Launder cleanroom gowns after working with extruder or other processes, which may generate particulate matter.
- Use E-Bay pass-through for materials ie. Extruder hopper, electro-spin solutions.
- Ensure all materials and solutions have been approved by the Birck safety officer - Stephen Jurss.

Extruder cleaning:

- Extruder screws and components that need cleaning are to be placed on a cart and wheeled through the adjacent DE chase by one person. That person will exit through the emergency exit in the chase wearing their cleanroom gown. Transfer the components to another cart so the cleanroom cart can be pushed back into the chase. Do not reenter the chase. Remove the cleanroom gown in the foyer and return to the laundry bins in the gowning room.

Additional Notes:

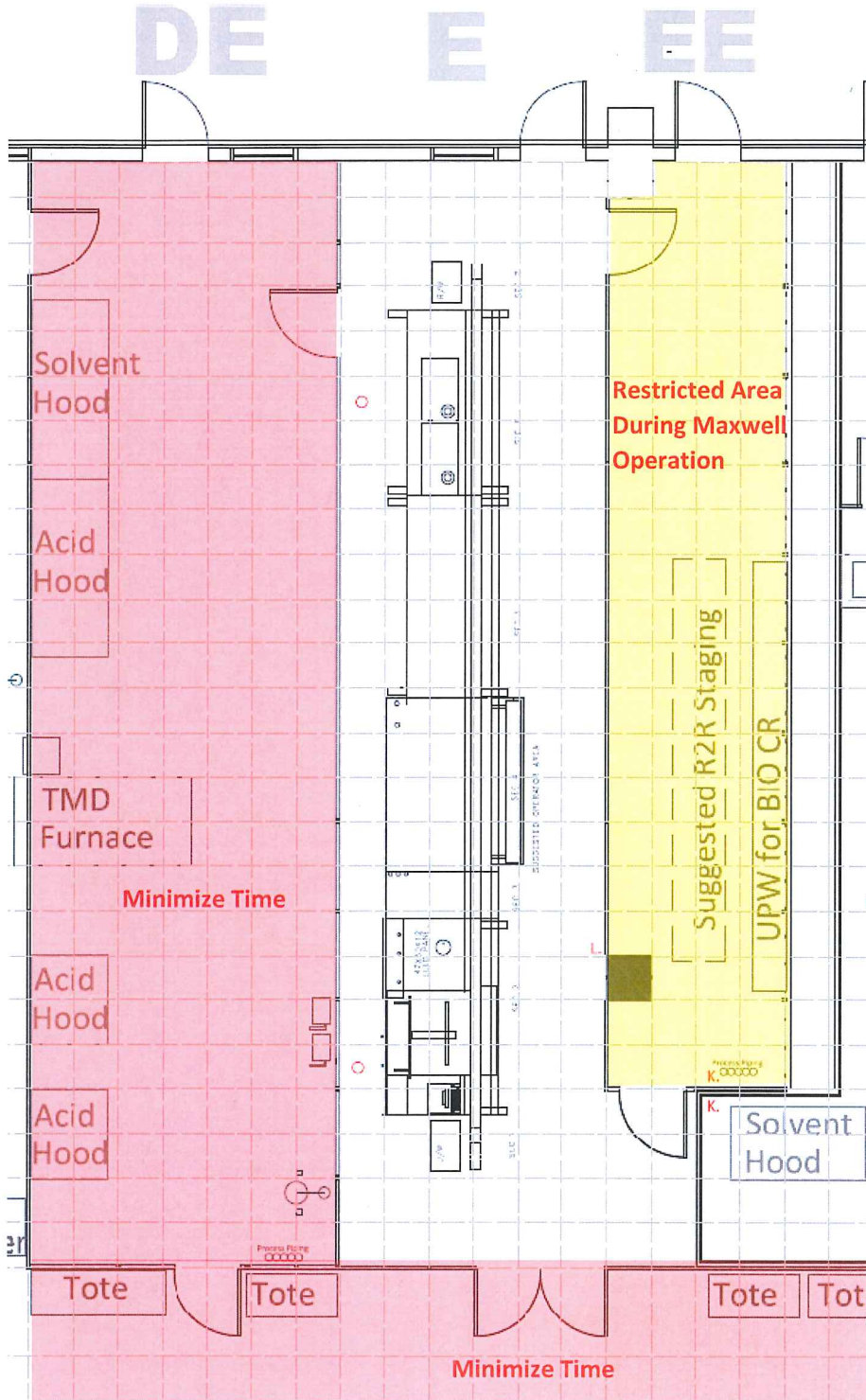
As in the main cleanroom, anything that sheds particles is not allowed in the E-Bay. Some examples of prohibited materials are:

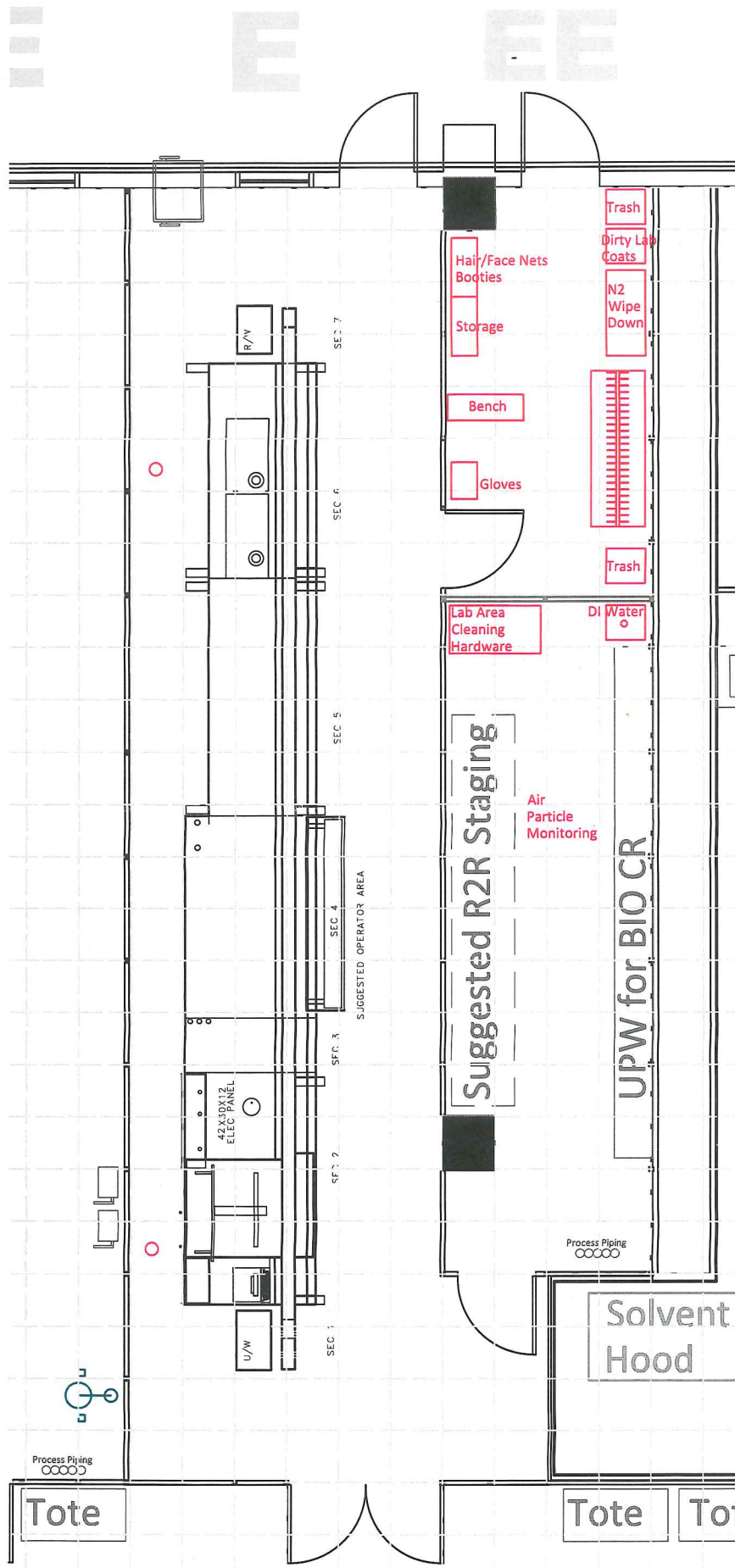
- Cardboard or its products
- Paper (only cleanroom notebooks allowed)
- Napkins (only clean room wipes allowed)

- Lead pencil and eraser (cleanroom pens allowed)
- Leather
- Wood or its product
- Fine powders

If you are not sure about an item, please ask staff

E Bay Zone Layout

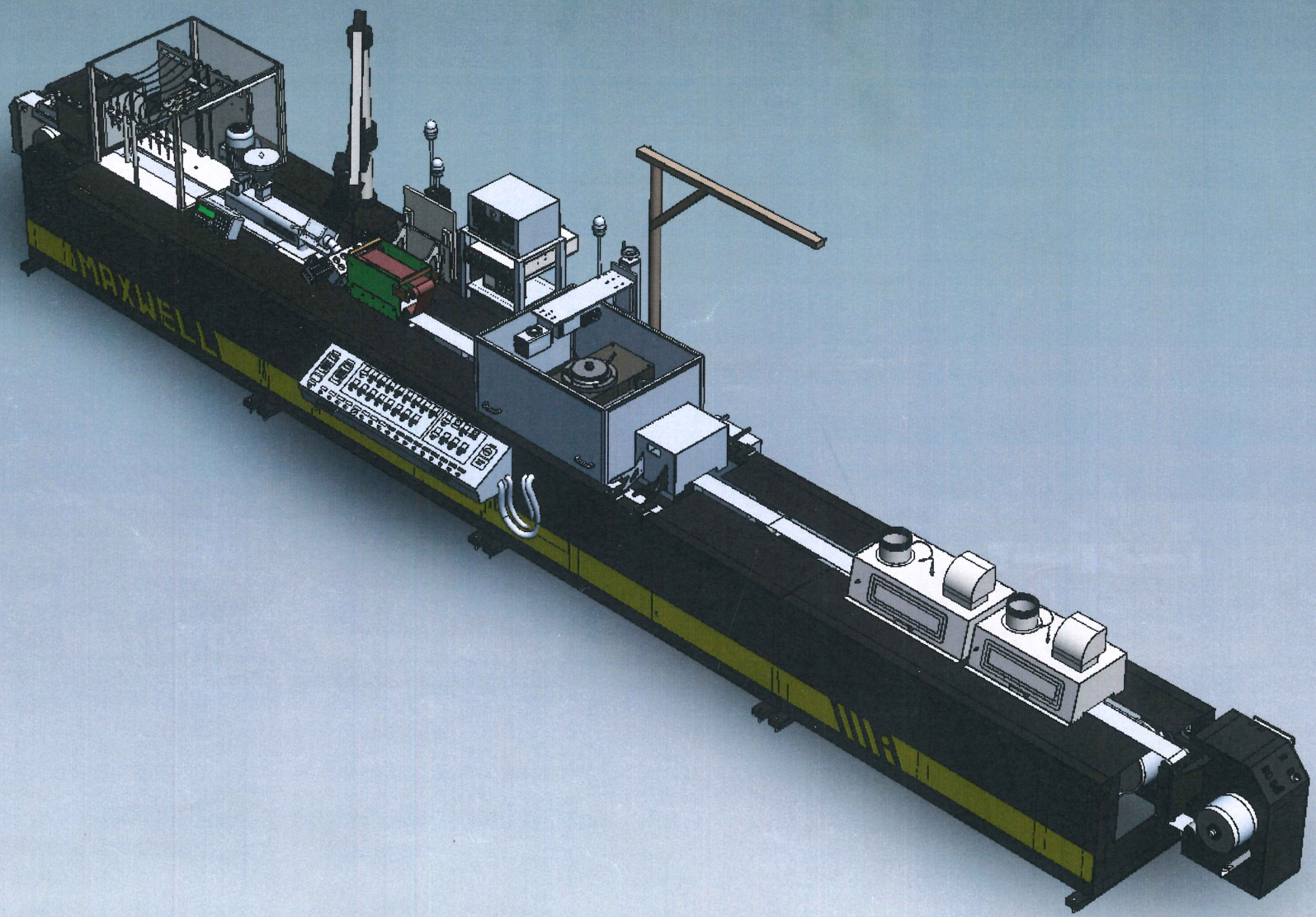
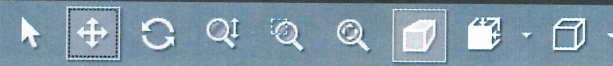




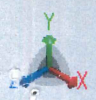
Tote

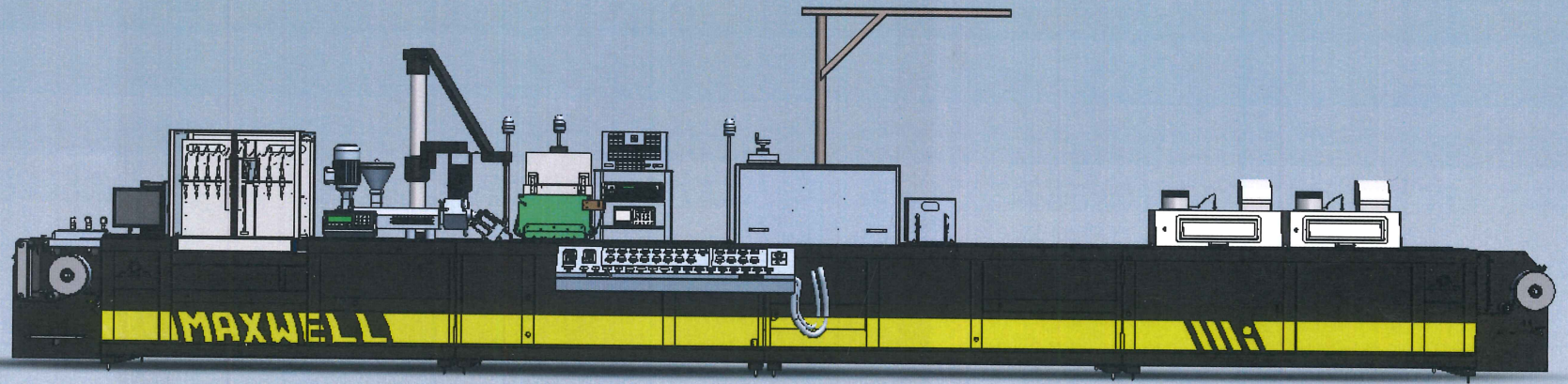
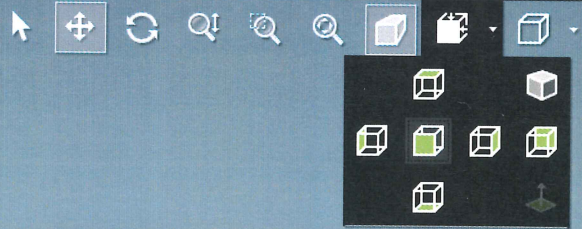
Tote

Tote



This document may be out-of-date because it has file references that may have been updated. (more...)

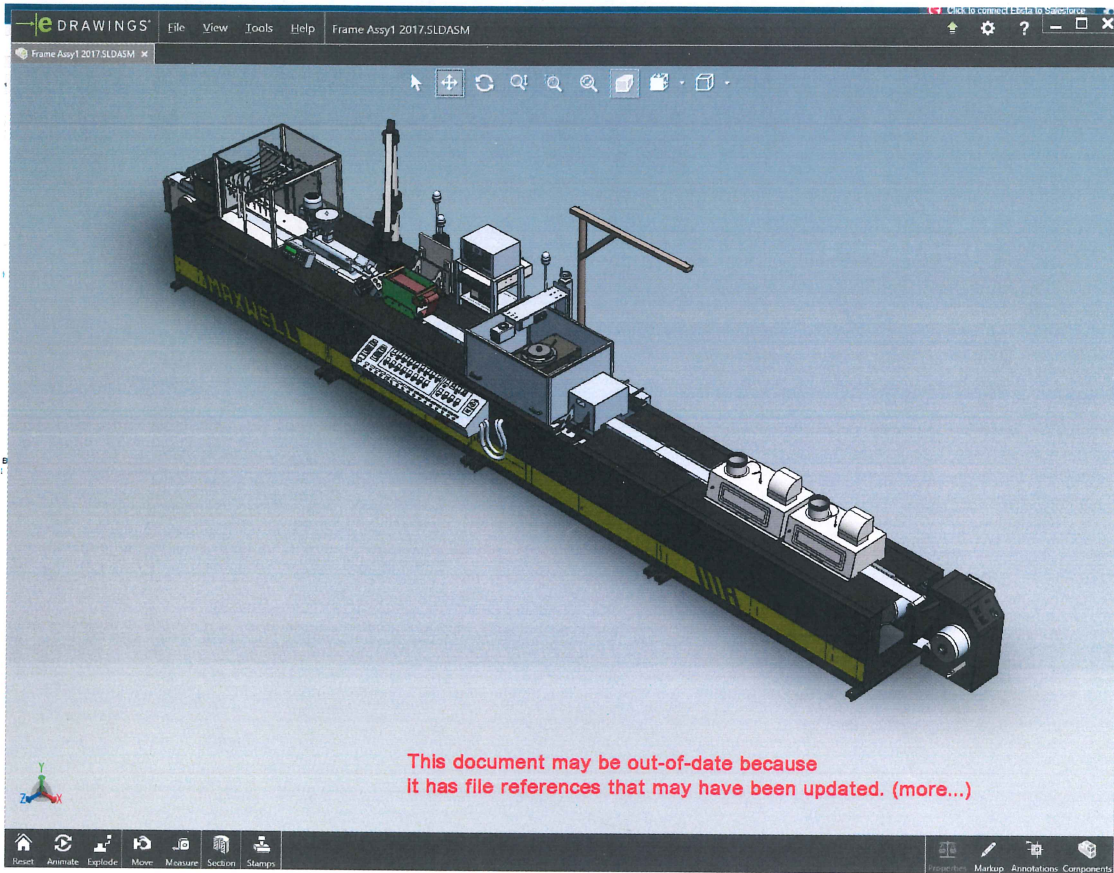


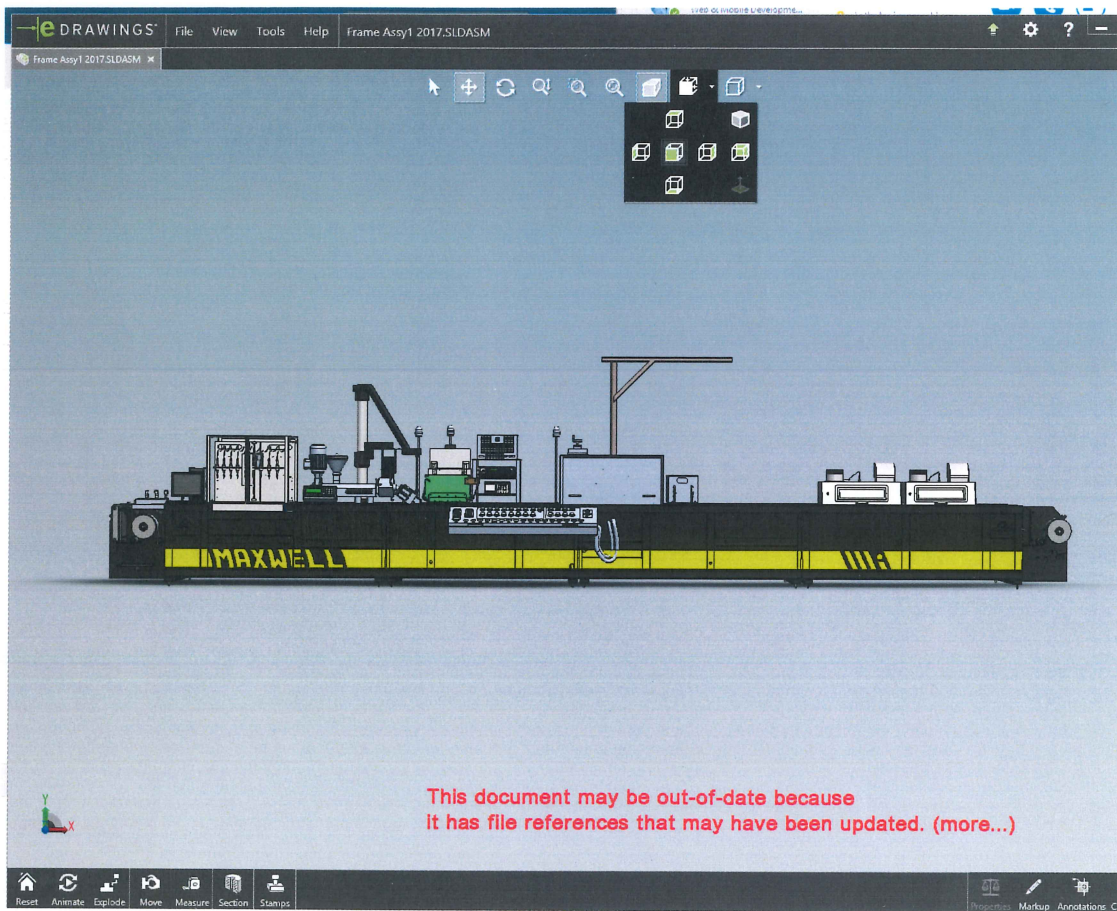


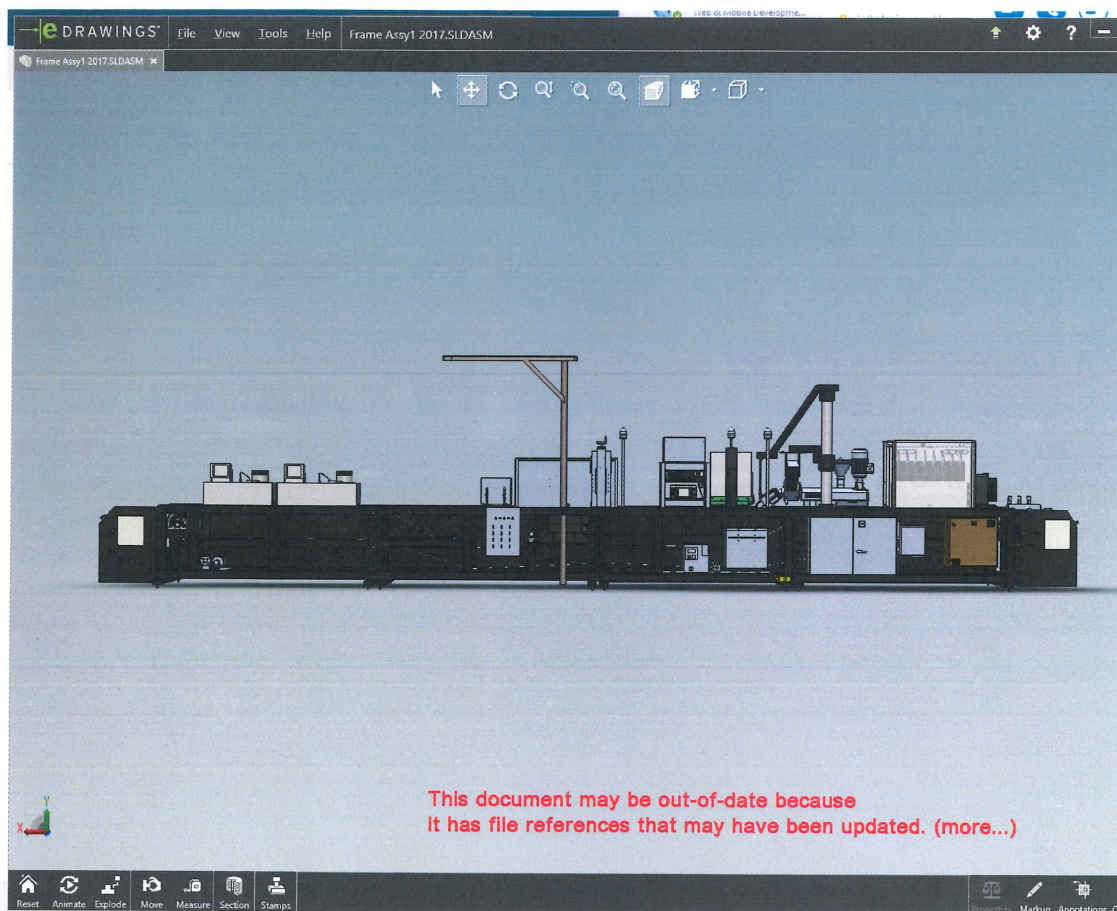
This document may be out-of-date because it has file references that may have been updated. (more...)

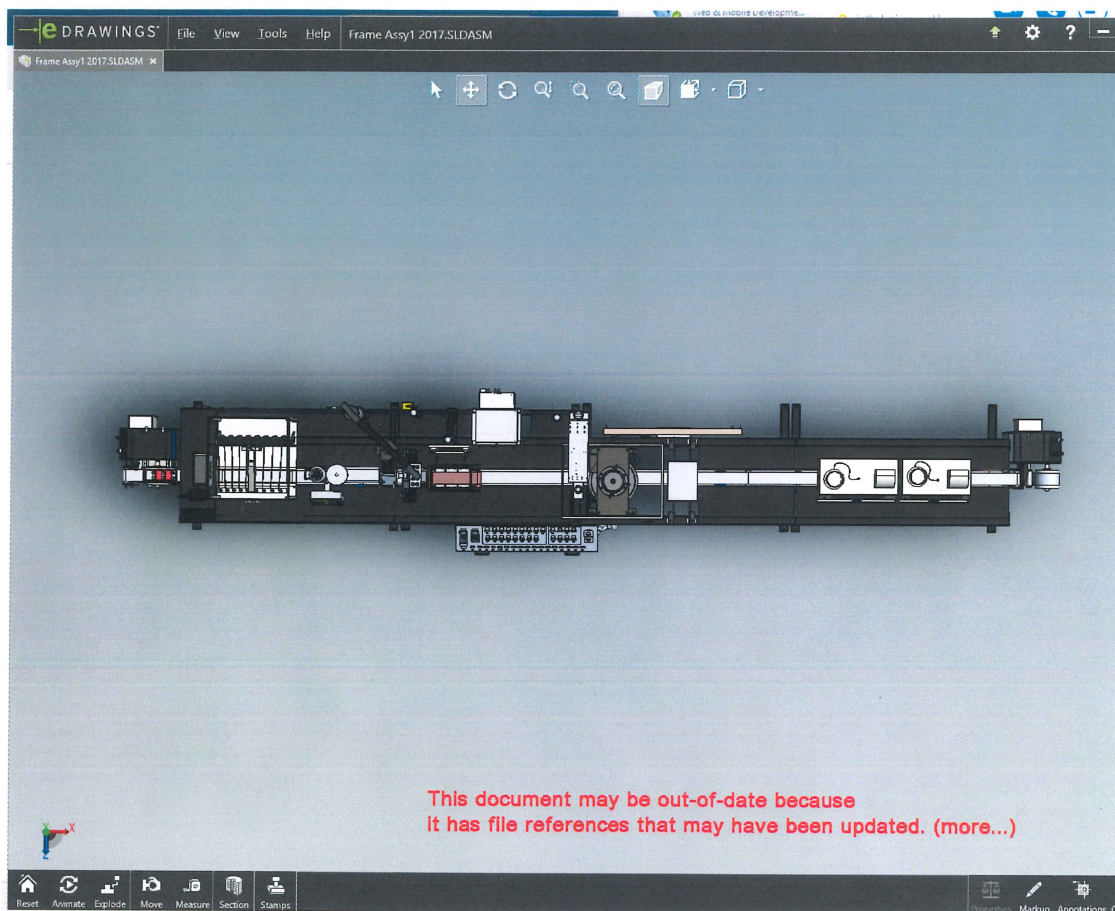
Subj: **Re: (no subject)**
Date: 9/15/2017 3:05:01 P.M. Eastern Daylight Time
From: rojprasad@webepoch.com
To: WIndust300@aol.com

Check ur email for confirmation.









Rajiv Prasad
Chief Innovation Officer
Web Epoch
2001 Rt. 46
Waterview Plaza, Suite 310
Parsippany, NJ 07054

Phone: 973.335.7775
skype: [webepoch](#)

<http://webepoch.com> - web and mobile application development

<http://iclickpoint.com> - slide library management *plus* drag & drop presentation builder

"Celebrating 20 years providing; Web Development, Mobile Apps, 3D Visualization and 3D Printing services."

On Fri, Sep 15, 2017 at 2:18 PM, <WIndust300@aol.com> wrote:

Roj

Please send me photos of the front, top, rear and bottom of the machine. I am still waiting for a confirmation number from the 3D website.

Thanks

Bill

Friday, September 15, 2017 AOL: WIndust300

Wagner Industries, Inc.

(973) 347-0800:phone

(973) 347-0885:fax

51 Sparta Road

Box 1 of 2

Packing Slip

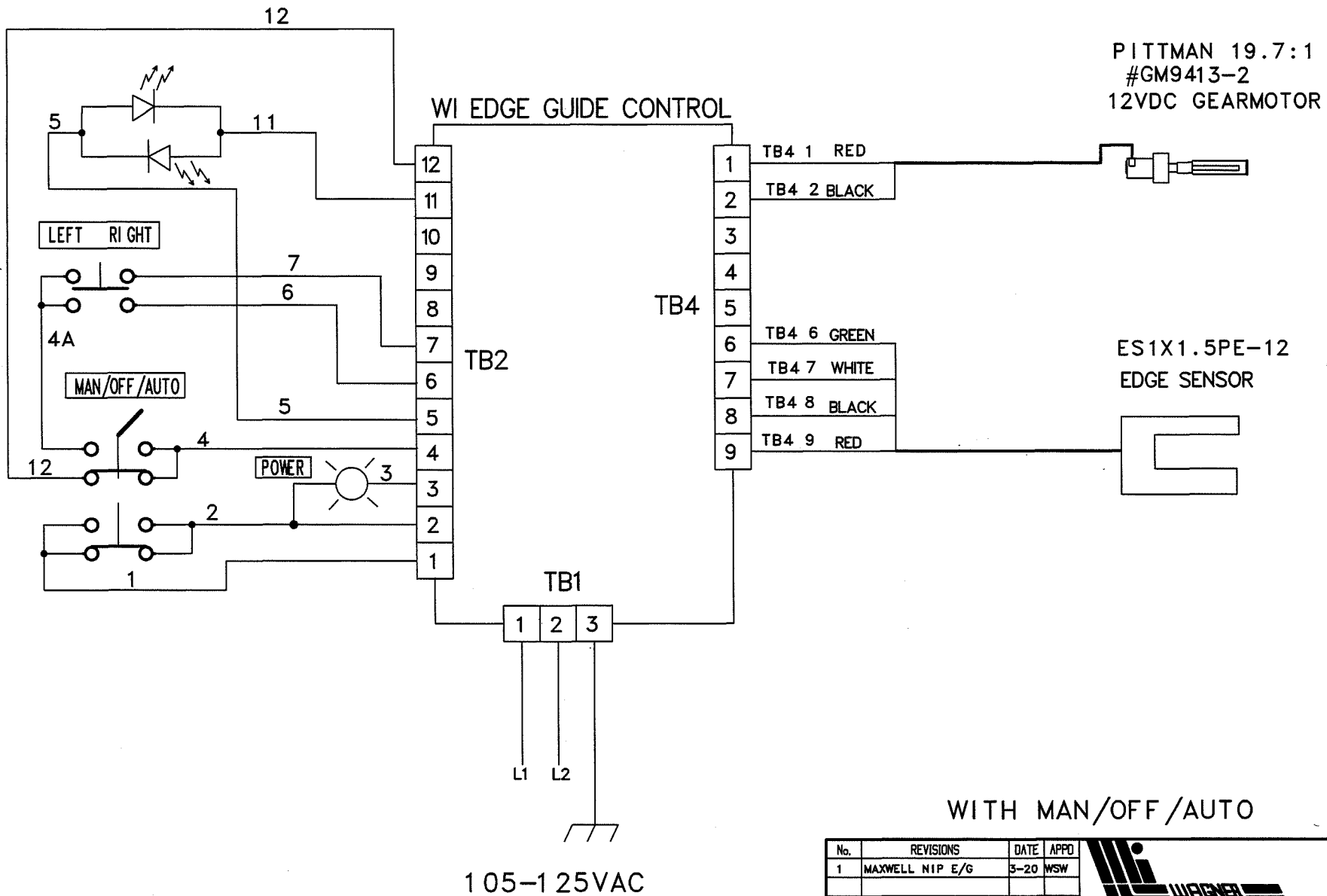
Date	Invoice #
3/12/2020	H3996

Ship To
Birck Nanotechnology Center 1205 W. State Street West Lafayette, IN 47907 Att: Nick Glassmaker

P.O. No.	Ship	Via	FOB	Project
4500825164	3/12/2020	UPS	Factory	H3996


Quantity	Item Code	Description
1	guider	Wagner Edge Guide system customized to Maxwell, including film steering assembly and edge sensor with the amplifier enclosure as a complete system package BOX 1 of 2 = E/G Controller, Edge Sensor & Edge Sensor Bracket BOX 2 of 2 = Nip Assembly

Order Complete! Thank you for your business!



WITH MAN/OFF/AUTO

No.	REVISIONS	DATE	APPO
1	MAXWELL NIP E/G	3-20	WSW



WIRING DIAGRAM
PURDUE MAXWELL R/W
NIP EDGE GUIDE

C:\EDGEGUID\ PURDUNIP	DATE: 3-10-20	DRWN BY: WSW	CHKD: WSW	SCALE: N/A
-----------------------	---------------	--------------	-----------	------------

WAGNER INDUSTRIES, INC.
51 SPARTA ROAD
STANHOPE, N.J. 07874

TEL: (973) 347-0800
FAX: (973) 347-0885
E-MAIL: windust300@aol.com
WEBSITE: www.wagner-industries.com

**INSTALLATION AND OPERATING INSTRUCTIONS FOR WAGNER INDUSTRIES
PHOTOELECTRIC, ULTRASONIC, NARROW WIDTH EDGE GUIDE CONTROLS,
LINE GUIDE AND LASER VERSIONS.**

MODEL #: *EG 100*

SERIAL #: *H 3996*

CUSTOMER: *PERDUE MAXWELL R/W*

SHIP DATE: *3/11/2020*

GENERAL INSTRUCTIONS

READ ALL INSTRUCTIONS FIRST BEFORE DOING ACTUAL INSTALLATION.

Install edge sensor, line sensor, servo actuator and servo centering unit (if ordered with this option), as per wiring diagram.

To change from a PHOTO ELECTRIC to ULTRASONIC system or vice versa, simply remove (disconnect) the original PLUG-IN CARD and SENSOR. Install new PLUG-IN CARD and SENSOR. If using line guide, plug in amplifier card and connect line sensor to TB4. Follow SET UP procedure for the type of system now installed.

MAIN CONTROLS AND INDICATORS

- A.) Auto/off/manual switch – selects mode of operation.
- B.) Left/right switch – in manual moves guider frame in direction indicated.
- C.) Servo center/run switch – selects servo center function in the AUTO mode. (If ordered with this option).
- D.) Power Lite – shows AC is present, will NOT come on if AC fuse is blown.
- E.) Direction LED's – show direction of guider frame movement.

CONTROLS AND SWITCHES – ULTRASONIC SENSOR AND PLUG-IN CARD

1.) **GAIN Control**

This is a 10 turn control which sets the proper operating point for the edge guide.

2.) **SPAN Control**

Adjusts the proportional deadband. CW rotation widens the deadband for stability...CCW rotation decreases deadband for ultraprecise (+ or - .002") guiding.

3.) **CORRECTION or RATE Control**

This control adjusts the speed of the servo actuator. Maximum speed is when this control is set fully clockwise.

4.) **DAMPING Control**

This control is used to prevent overshoot or "hunting". Maximum damping occurs when this control is set fully clockwise.

5.) **GAIN SET LED**

This indicator is used during SET UP to determine the operating point.

SET-UP INSTRUCTIONS – ULTRASONIC ELECTRIC SYSTEM

- 1.) Initial setting of controls (plug-in card)
 - A.) Set GAIN fully CCW.
 - B.) Set SPAN CCW.
 - C.) Set RATE CW.
 - D.) Set DAMPING CCW.

- 2.) Initial setting of Main controls (if ordered with enclosure).
 - A.) Auto/off/manual set to AUTO.
 - B.) Servo Center/Run SW set to RUN (if ordered with this option).

- 3.) Turn power ON.

- 4.) Without any web in sensor slowly turn GAIN control clockwise until GAIN SET LED illuminates.

- 5.) Check for correct direction of the actuator. (While blocking the edge sensor, the guider frame should move away from the sensor). If the direction of the actuator is incorrect, reverse the two wires at TB4 terminals 1 and 2.

- 6.) Place web in machine and further adjust GAIN control until the edge of the web lines up with the line inscribed on the sensor body.

- 7.) Run machine and adjust CORRECTION/RATE, DAMPING, and SPAN controls as needed. (Refer to explanation of controls).

CONTROLS AND SWITCHES – PHOTO ELECTRIC SENSOR AND PLUG-IN CARD

1.) **CLEAR/OPAQUE switch**

This switch is set for the proper web opacity, it selects the CLEAR or OPAQUE GAIN controls.

2.) **CLEAR GAIN control**

This 10 turn control is used to set the proper operating point for a (semi) transparent web, when the CLEAR/OPAQUE switch is set to the opaque position.

3.) **OPAQUE GAIN control**

This control is used to set the proper operating point for an opaque web, when the CLEAR/OPAQUE switch is set to the opaque position.

4.) **GAIN SET LED indicator**

This LED is primarily used during set up, to tell the operator that the proper operating point has been set.

5.) **CORRECTION or RATE control**

This control adjusts the speed of the servo actuator. Maximum speed is when this control is fully clockwise.

6.) **DAMPING control**

This control is used to prevent overshoot or “hunting”. Maximum damping occurs when this control is set fully clockwise.

SET UP INSTRUCTIONS – PHOTO ELECTRIC SYSTEM

- 1.) Initial settings of controls (plug-in card).
 - A.) CLEAR GAIN fully CCW.
 - B.) OPAQUE GAIN fully CCW.
 - C.) DAMPING fully CCW.
 - D.) RATE fully CW.
- 2.) Initial setting of Main controls.
 - A.) AUTO/MANUAL switch to AUTO.
 - B.) SERVO CENTER/RUN switch (optional item) to RUN.
- 3.) Set CLEAR/OPAQUE switch for proper material.
- 4.) Turn power ON.
- 5.) WITHOUT any web in the edge sensor, slowly rotate the selected GAIN control clockwise until the GAIN SET LED is JUST FULLY ILLUMINATED. This is the proper operating point. DO NOT advance this control further, as improper operation can result.
- 6.) Check for correct direction of the actuator. (While blocking the sensor, the guider frame should move away from the sensor). If the action of the actuator is incorrect, reverse the two wires at TB-4 terminals 1 and 2.
- 7.) With a web in the sensor, run the machine. Adjust CORRECTION or RATE control and DAMPING control as needed.
- 8.) Check for correct action of the servo center unit. If the action is incorrect then reverse red and black wires at TB-4 terminals 3 and 5.

CONTROLS AND SWITCHES – NARROW WIDTH SENSOR AND PLUG-IN CARD

1.) **CORRECTION or RATE control**

This control adjusts the speed of the servo actuator. Maximum speed is when this control is fully clockwise.

2.) **DAMPING control**

This control is used to prevent overshoot or “hunting”. Maximum damping occurs when this control is set fully clockwise.

3.) **HIGH and LOW GAIN switch**

This switch is used to compensate for various width materials. LOW SETTING is to be used on wide webs. HIGH SETTING is to be used on narrow webs – less than 1/16” wide.

4.) **BALANCE control**

This control sets balance for zero actuator movement or correction when material is not present.

SET UP INSTRUCTIONS – NARROW WIDTH SYSTEM

- 1.) Initial settings of controls (plug-in card).
 - A.) HIGH/LOW GAIN setting to LOW.
 - B.) DAMPING fully CCW.
 - C.) RATE fully CW.

- 2.) Initial setting of Main controls.
 - A.) AUTO/MANUAL to AUTO.
 - B.) SERVO CENTER/RUN switch (optional item) to RUN.

- 3.) Turn power ON.

- 4.) With sensor unobstructed set actuator to zero movement using the BALANCE control.

- 5.) Check for correct direction of the actuator. If the action of the actuator is incorrect, reverse the two wires at TB-4 terminals 1 and 2.

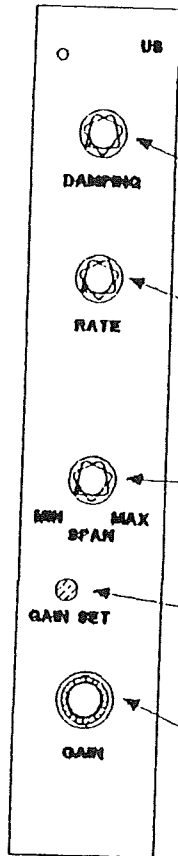
- 6.) With a web in the sensor, run the machine. Adjust CORRECTION or RATE control and DAMPING control and HIGH/LOW GAIN as needed.

OPERATOR PANEL

INSIDE ENCLOSURE-

ULTRASONIC SENSING VERSION ONLY

DESCRIPTION



VIEW OF OPERATOR PANEL LOCATED INSIDE ELECTRICAL ENCLOSURE.


DAMPING CONTROL SETS STABLE OPERATION OF GUIDER FRAME.

RATE SETS CORRECTION SPEED OF GUIDER FRAME.

SPAN IS ADJUSTED FOR TIGHTER WEB CONTROL AS NEEDED

GAIN SET IS USED TO INDICATE PROPER SETTING OF GAIN CONTROLS. ROTATE GAIN POT UNTIL THIS INDICATOR JUST COMES ON.

GAIN POTENTIOMETER IS USED TO SET PROPER OPERATING POINTS AND IS SET BY USING GAIN SET INDICATOR.

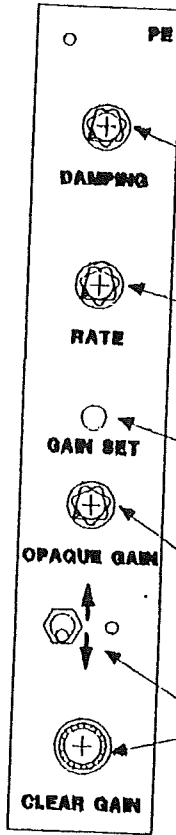
TOLERANCES (EXCEPT AS NOTED)	REVISIONS			 51 SPARTA ROAD STANHOPE, NJ 07874 TEL: (973) 347-0800 FAX: (973) 347-0885					
	No.	DATE	BY						
DECIMAL +/-	1			<h2>OPERATORS PANEL</h2> <p>EDGE GUIDE CONTROL ENCLOSURE-US.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE: NA</td> <td>DRAWN BY MDM</td> <td rowspan="2">ENGINEERING DRAWING No. EGPANL2</td> </tr> <tr> <td>DATE: 7-5-94</td> <td>CHK'D RPG</td> </tr> </table>	SCALE: NA	DRAWN BY MDM	ENGINEERING DRAWING No. EGPANL2	DATE: 7-5-94	CHK'D RPG
	SCALE: NA	DRAWN BY MDM	ENGINEERING DRAWING No. EGPANL2						
	DATE: 7-5-94	CHK'D RPG							
2									
3									
FRACTIONAL +/-	4								
	5								
	6								
ANGULAR +/-	7								
	8								

OPERATOR PANEL

INSIDE ENCLOSURE-

PHOTOELECTRIC SENSING VERSION ONLY

DESCRIPTION



VIEW OF OPERATOR PANEL LOCATED INSIDE ELECTRICAL ENCLOSURE.

DAMPING CONTROL SETS STABLE OPERATION OF GUIDER FRAME.

RATE SETS CORRECTION SPEED OF GUIDER FRAME.

GAIN SET IS USED TO INDICATE PROPER SETTING OF GAIN CONTROLS. ROTATE GAIN POT UNTIL THIS INDICATOR JUST COMES ON.

OPAQUE & CLEAR GAIN POTS ARE USED TO SET PROPER OPERATING POINTS AND IS SET BY USING GAIN SET INDICATOR.

CLEAR/OPAQUE GAIN SELECT SWITCH SETS WEB TYPE BEING GUIDED.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS		
	No.	DATE	BY
DECIMAL +/-	1		
	2		
	3		
FRACTIONAL +/-	4		
	5		
	6		
ANGULAR +/-	7		
	8		



Wagner Industries, Inc.
51 Sparta Road
Tel: (973) 347-0800
Stanhope, NJ 07874

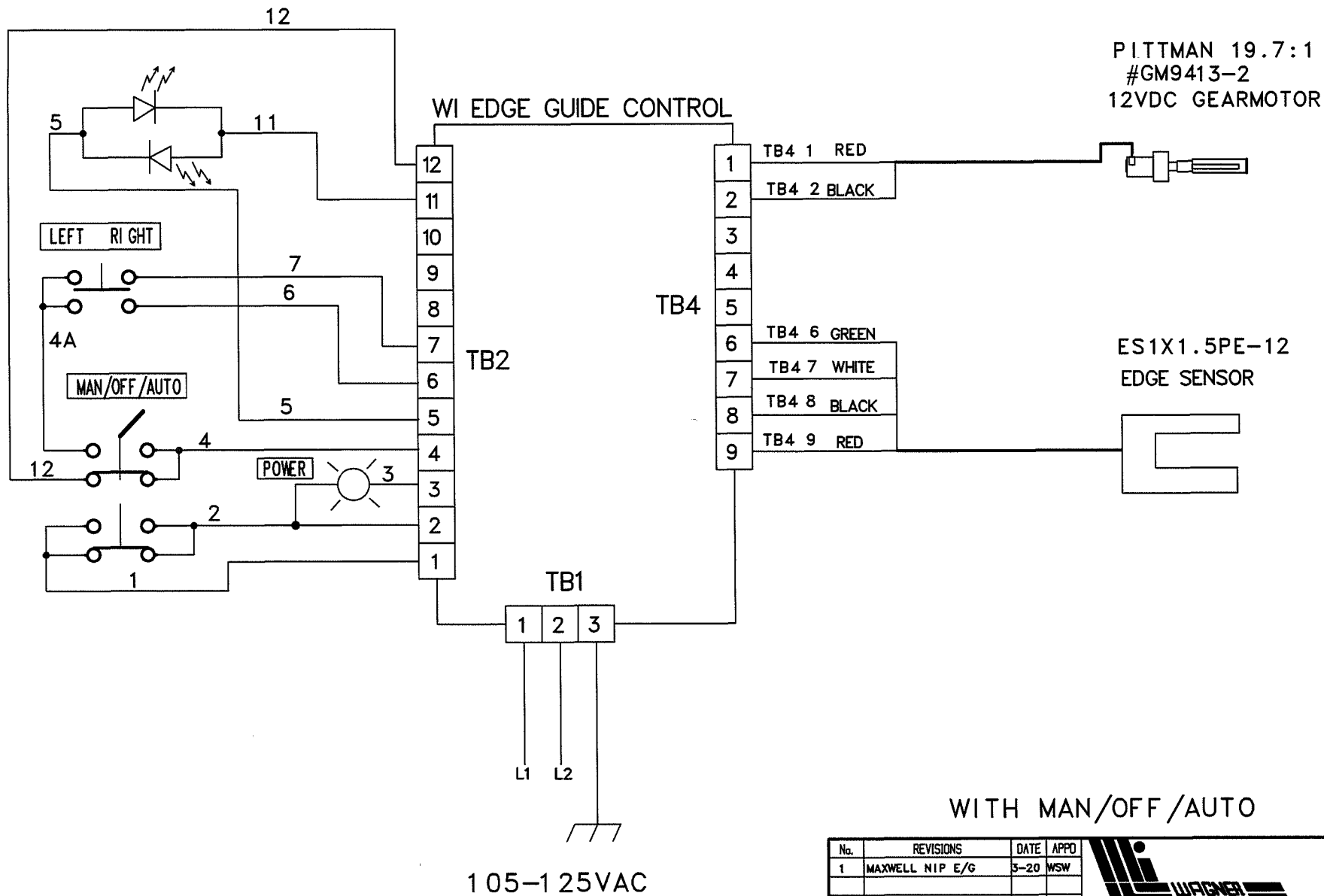
TEL: (973) 347-0800

FAX: (973) 347-0885

OPERATORS PANEL

EDGE GUIDE CONTROL ENCLOSURE- P/E & U/S

SCALE: NA	DRAWN BY WSW	ENGINEERING DRAWING No. EGPANL1
DATE: 7-3-90	CHK'D RPK	

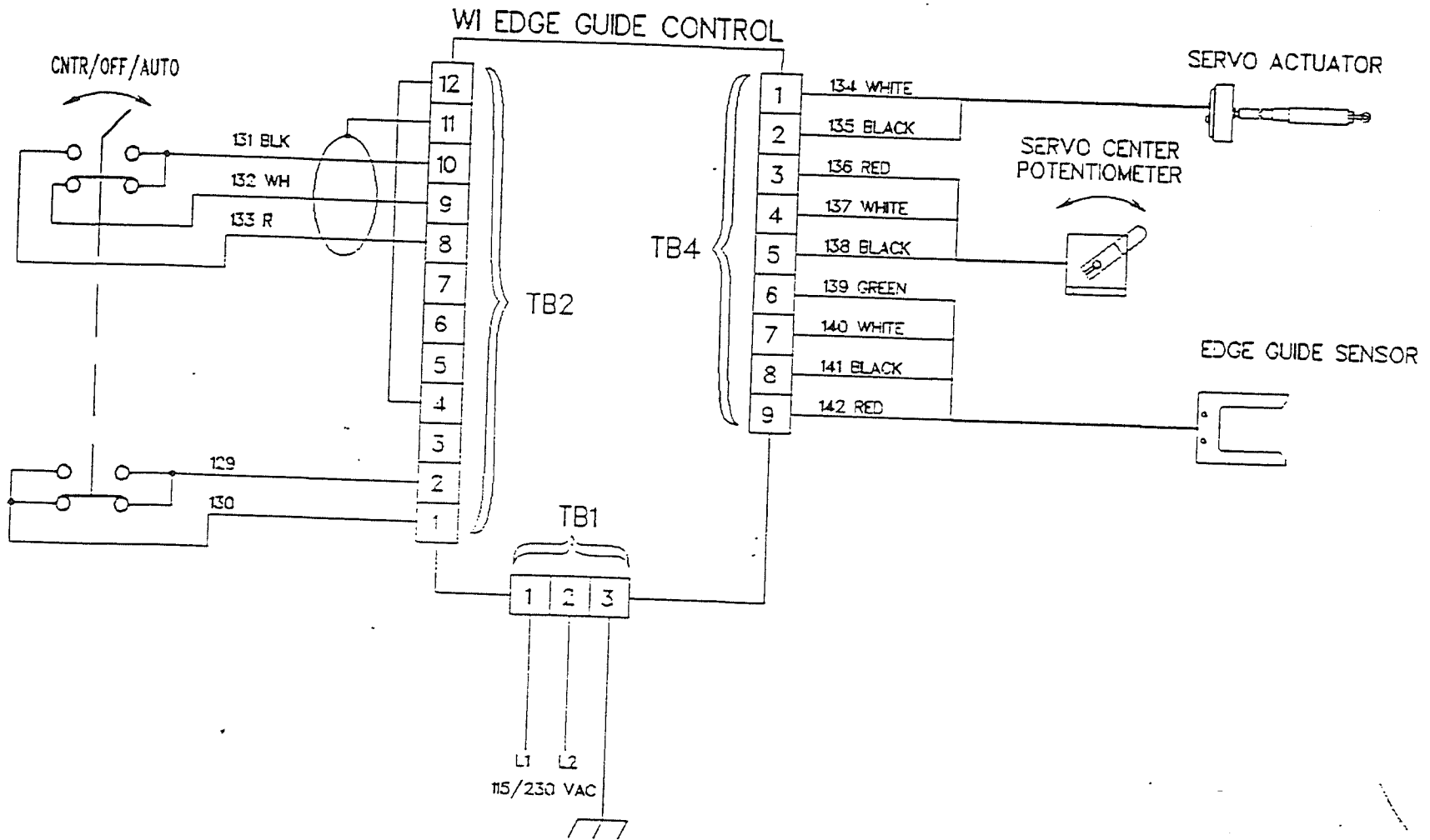


WITH MAN/OFF/AUTO

No.	REVISIONS	DATE	APPO
1	MAXWELL NIP E/G	3-20	WSW
C:\EDGEGUID\ PURDUNIP			DATE: 3-10-20
			DRWN BY: WSW
			CHKD: WSW
			SCALE: N/A



WIRING DIAGRAM
PURDUE MAXWELL R/W
NIP EDGE GUIDE



No.	REVISIONS	DATE	APPD.

51 Sparta Road
 Stanhope, NJ 07874
 973 347-0800
 Fax 347-0885

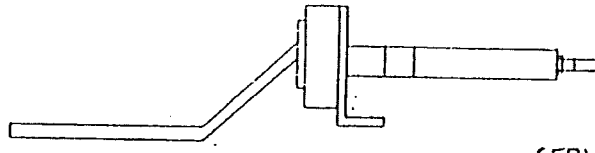
WAGNER INDUSTRIES

**EDGEGUIDE
WITH AUTO/CENTER
FUNCTIONS**

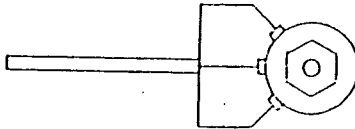
LOCATION/DRAWING NAME C:\KIM\CLK\IEG	DATE: 2/12/96	DRWN BY: UZ	CHKD:	SCALE: 1/A
TOLERANCES: (EXCEPT AS NOTED)	XXX - ±0.0025	XX - ±0.01	XXI - ±0.04	ANGULARS ±0.25 degrees

TB4

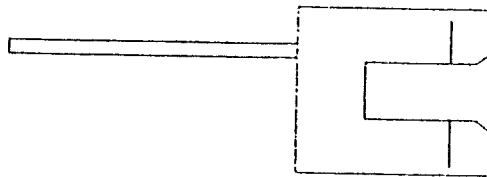
1	MOTOR	WHT
2	GND	BLK
3	+15	RED
4	SERVO CNTR	WHT
5	-15	BLK
6	RCVR ↓	GREEN
7	SIGNAL N	WHT
8	XMTR ↓	BLK
9	SIGNAL OUT	RED



SERVO ACTUATOR




SERVO CENTER POT.



EDGE SENSOR

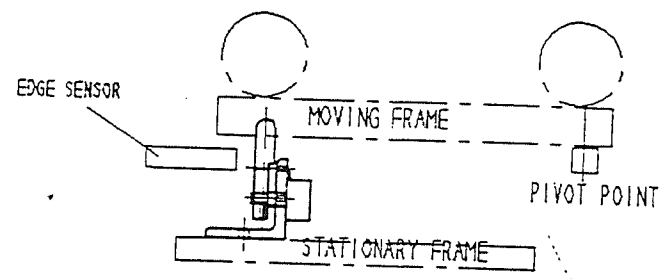
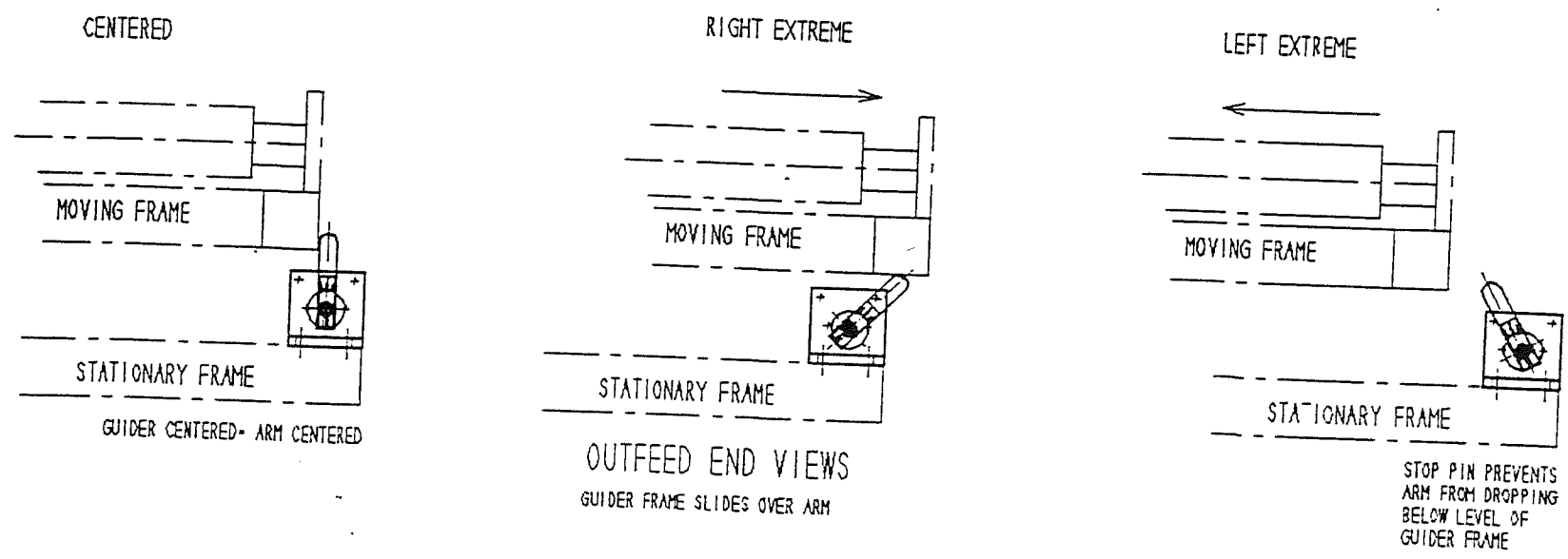
NOTES

- 1) RED AND BLK WIRES OF SERVO CENTER POT MAY BE REVERSED IN SOME APPLICATIONS.
- 2) BLK AND WHT WIRES OF SERVO ACTUATOR MAY BE REVERSED IN SOME APPLICATIONS.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS			 Wagner Industries, Inc. 51 Sparta Road Tel: (973) 347-0800 Stanhope, NJ 07874
	No.	DATE	BY	
DECIMAL +/-	1			TEL: (973) 347-0800 FAX: (973) 347-0885
	2			
	FRACTIONAL +/-	3		
4				
5				
ANGULAR +/-	6			SCALE: NTS DRAWN BY RPG ENGINEERING DRAWING No.
	7			
	8			DATE: 2/7/92 CHK'D

TB4

QUANTITY REQUIRED:
MATERIAL:



SIDE VIEW
SERVO CENTER UNIT SHOULD BE NEAR MOVING END OF GUIDER FRAME FOR MAXIMUM RESOLUTION OF GUIDER POSITION SENSING

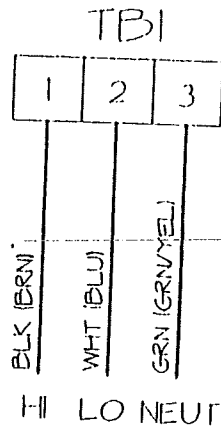
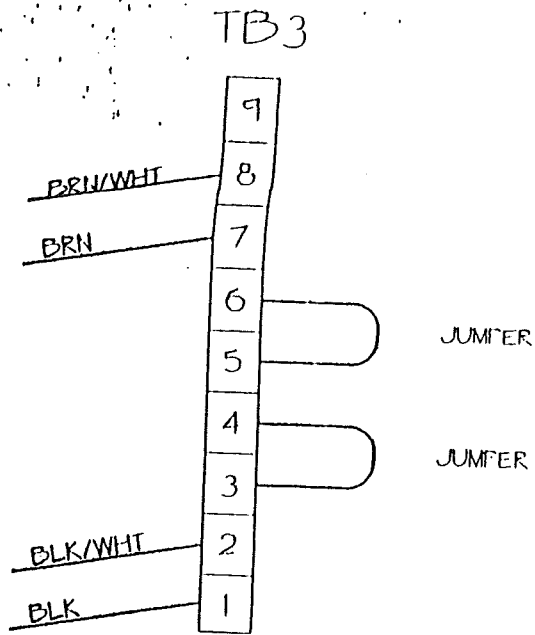
No.	REVISIONS	DATE	APPD

51 Sparta Road
Stanhope, NJ 07874
(973) 347-0800
Fax 347-0885

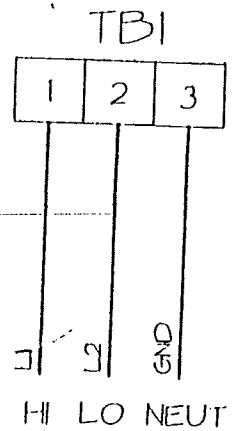
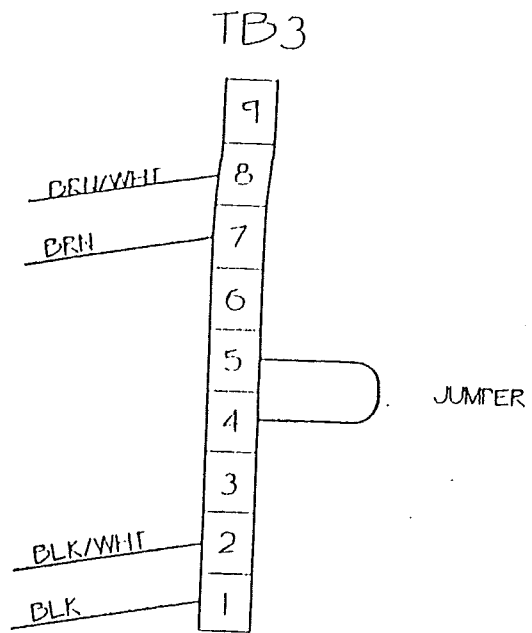
WILFINGER INDUSTRIES

OPTIONAL SERVO CENTER
INSTALLATION NOTES

LOCATION/DRAWING NAME C:\EDGEGUID\SERCTR4	DATE: 1-31-94	DRWN BY: WSW	CHKD: WSW	SCALE: 1/A
TOLERANCES- (EXCEPT AS NOTED)	XXX - ±0.0025	XX - ±0.01	X X/2 - ±1/64	ANGULAR ±0.5 degrees



120V 50-60HZ
SINGLE PHASE CONNECTION



240V 50-60HZ
SINGLE PHASE CONNECTION

TOLERANCES
(EXCEPT AS NOTED)

REVISIONS

DECIMAL
+/-

FRACTIONAL
+/-

ANGULAR
+/-

No.	DATE	BY
1		
2		
3		
4		
5		
6		
7		
8		



Wagner Industries, Inc.
51 Sprula Road
Tel: (973) 347-0800
Stanhope, NJ 07874

POWER CONNECTIONS
FOR EDGE GUIDE

SCALE: NTS

DRAWN BY RPG

ENGINEERING DRAWING No.

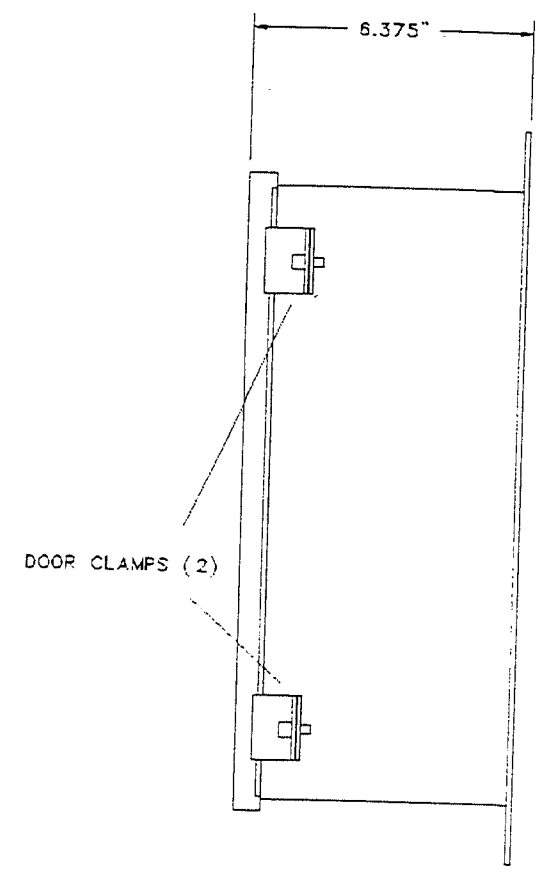
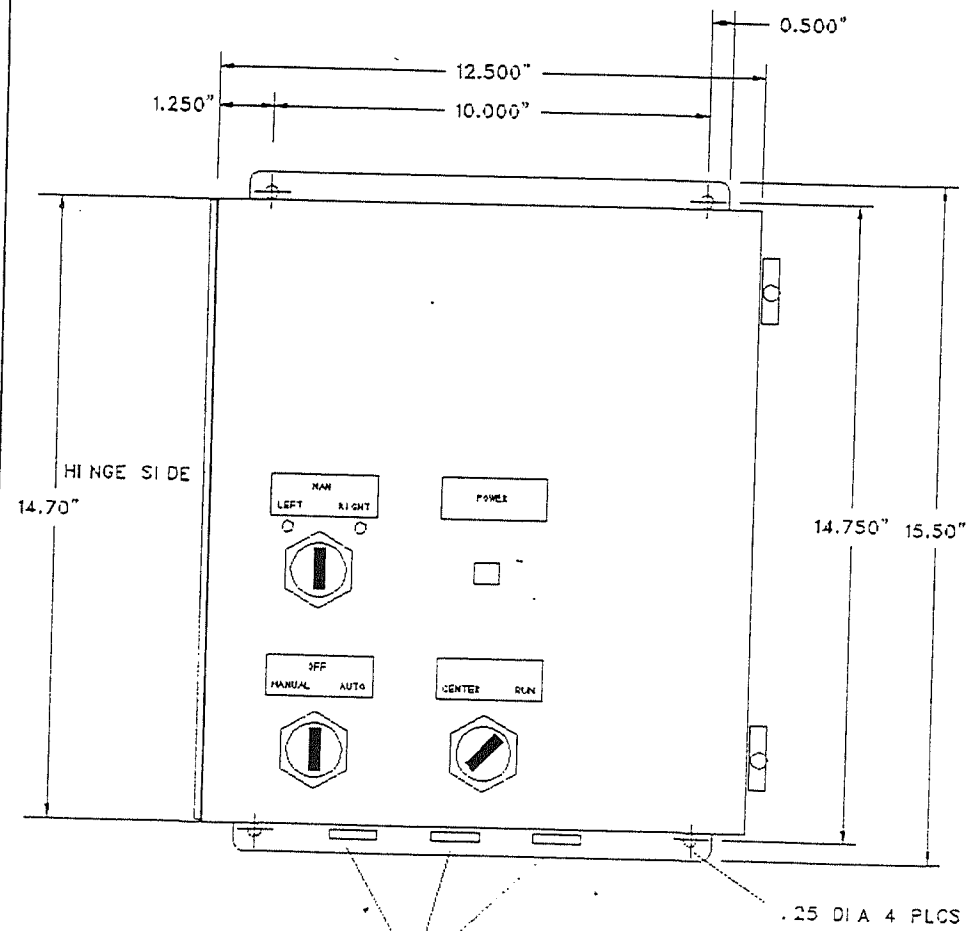
DATE: 2/7/92

CHK'D

TBI

QUANTITY REQUIRED:
MATERIAL:

EDGE GUIDE
CONTROL ENCLOSURE NEMA 12 OILTIGHT



1/2" CONDUIT ENTRY 3 PLACES

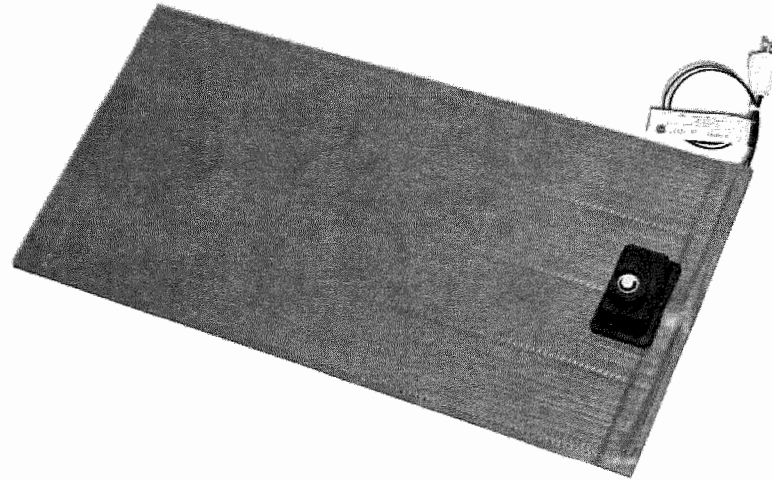
No.	REVISIONS	DATE	APPD

51 Sparta Road
Starhope, NJ 07874
(973) 347-0800
Fax: 347-0885

ENCLOSURE. EDGEGUIDE
NEMA 12
STANDARD

LOCATION/DRAWING NAME C:\EDGEGUIDE\ENCL2	DATE: 3-1-98	DRAWN BY: W8W	CHK'D: W8W	SCALE: 1/1A
TOLERANCES: (EXCEPT AS NOTED)	XXX - ±0.0025	XX - ±0.01	XX/XX - ±1/64	ANGULAR: ±0.5 degrees

English



Silicone Rubber Heating Blanket with Control

SRMU-ADJ Series Instruction Manual



You must read and understand this manual before installing, operating, or servicing this product. Failure to understand these instructions could result in an accident causing serious injury or death.

Keep these instructions for future reference.

Language	Page
English.....	1
Spanish (Español).....	12
French (Français).....	23
German (Deutsch).....	34
Italian (Italiano).....	45

TABLE OF CONTENTS

Introduction2
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 Connecting Heater to Power Source6
 Operation7
 Emergency Procedures8
 Maintenance Instructions9
 Troubleshooting Guide10
 Warranty Information11

INTRODUCTION

Thank you for purchasing a BriskHeat[®] Silicone Rubber Heating Blanket with Control. Your heater is designed to provide a long and efficient service life with function, reliability, and safety in mind. For additional information concerning this, or other BriskHeat[®] products, please contact your local BriskHeat[®] distributor or contact us toll free (U.S. / Canada only) at 1-800-848-7673 or 614-294-3376.

APPLICATIONS

Intended Applications:

- General purpose surface heating

Prohibited Applications:

- Immersion
- Exposed to weather

APPROVALS



2014 / 35 / EU (Low voltage directive)
 IEC 60519-1:2015, 60519-2:2006
 2011 / 65 / EU (RoHS 2 directive)

Approvals valid only when installed in accordance with all applicable instructions, codes, and regulations.

IMPORTANT SAFETY INSTRUCTIONS



SAFETY ALERT SYMBOL

The symbol above is used to call your attention to instructions concerning your personal safety. It points out important safety precautions. It means "ATTENTION! Become Alert! Your Personal Safety is involved!" Read the message that follows and be alert to the possibility of personal injury or death.



Immediate hazards which WILL result in severe personal injury or death.



Hazards or unsafe practices that COULD result in severe personal injury or death.



Hazards or unsafe practices that COULD result in minor personal injury or property damage.



A person who has not read and understood all operating Instructions is not qualified to operate this product.



- Do not immerse or spray any component of the control system with liquid.
- Keep volatile or combustible material away from control and heating system when in use.
- Keep sharp metal objects away from control and heating system.
- Use control and heating system only in approved locations.
- Do not modify this product. Modification will void warranty.

Failure to observe these warnings may result in electric shock, risk of fire, and personal injury.



End-User Must Comply to the Following:

- Only qualified personnel are allowed to connect electrical wiring.
- All electrical wiring must follow local electrical codes.
- The person who performs the final installation / wiring must be qualified for this work.
- The end-user is responsible for providing a suitable disconnect device.
- The end-user is responsible for providing a suitable over-current protection device. It is highly recommended that a ground-fault circuit breaker be used.

Failure to observe these warnings may result in personal injury or damage to the heater.



- Inspect all components before use (see page 9).
- Never handle the heater while it is in operation; always disconnect the heater from the power source and allow cooling prior to handling.
- Do not wrap the heater over itself.
- If spillage of foreign matter onto heater occurs, disconnect from power source and clean after heater is allowed to cool.
- Never operate a heater without an appropriate heat sink (device being heated is considered a heat sink).
- Do not operate heater above rated temperature value.
- Fasten heater to device using approved methods only.
- Do not use control and heating system if any component is damaged.
- Do not repair damaged or faulty control and heating systems.
- Do not crush or apply severe physical stress on any component of system, including cord assembly.
- Unplug control and heating system when not in use.

Failure to observe these warnings may result in personal injury or damage to the heater.

HEATER CHARACTERISTICS / SPECIFICATIONS

Part Series	SRMU-ADJ
Operating Temperature Range	Up to 425°F (218°C)
Max Power Density	10W/in ² (1.6W/cm ²)
Minimum Bend Radius	2 in (51 mm) *
Min Exposure Temperature	-60°F (-51°C)
Max Exposure Temperature	450°F (232°C)
Max Humidity	95%
Ingress Protection	IP54
Grounded Heating Element	
Moisture and Chemical Resistant	✓
Suitable for Metal Surfaces	✓
Suitable for Plastic Surfaces	✓ **
Suitable for Hazardous Locations	

* See installation instructions

** Limited applications, consult factory for additional details

INSTALLATION INSTRUCTIONS

⚠ Failure to follow these instructions could result in property damage, personal injury, or death.

Requirements:

- Electrical terminations must be completed by qualified persons.
- No special tools or protective equipment is needed to handle this product (specific applications or surfaces may require protective equipment).
- Installation temperature range: -60°F (-51°C) to 131°F (55°C).
- Clearance of 3" (7.5cm) required around the surface during installation.
- Voltage and frequency must be within +/- 10% of the value specified on the product label.
- The heater must be mounted to a grounded surface or a conductive grounding screen must be placed between the heater and the surface.

Surface Preparation:

Always install your heater on a clean even surface for optimum performance and extended service life. Debris and residue on the surface can not only damage your heater but may also reduce the effectiveness of the heater by reducing the heat transfer between the surface and the heater.

- Remove or avoid contact with sharp edges including rough corners, weld spatter, exposed bolts, etc.
- Remove or avoid contact with rust, stickers, or other coverings.
- Remove oil, moisture, gel and other liquids.

Heater Bend Radius:

Ensure that there is an appropriate bend radius allowance for the installation of your heater. The minimum bend radius for this heater is 2 in (51 mm). The minimum bend radius applies to the heater element direction of the heater only (See Figure 1). Do not bend the heater in the opposite direction of the heater element. If the heater width is less than 4 in (102 mm), the heater cannot bend along the controller box of the heater.

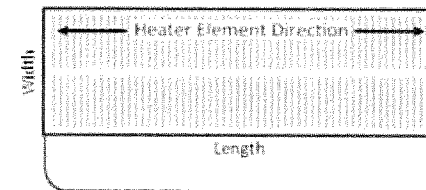


Figure 1

Instructions:

1. If your heater is equipped with PSA Pressure Sensitive Adhesive, verify the date of manufacture is within 6 months of heater installation. The date of manufacturer is marked on the outside of the packaging. If the date is beyond 6 months, please contact your local distributor/representative or us at 1-800-848-7673, 614-294-3376, or bhtsales1@briskheat.com for reapplication of PSA adhesive.
2. Inspect heater prior to each installation (see inspection procedure).
3. Inspect vessel to be heated for any sharp edges, rust, oil, etc.
4. Ensure that there is no combustible material within 12" (30cm) of the surface to be heated.
5. Mounting

Heaters supplied with PSA (Pressure sensitive adhesive):

For PSA Models Only - Installation of heater using factory supplied Pressure Sensitive Adhesive (PSA):

Peel off the release film (Figure 2) and then press the heater onto the surface of the item being heated using a medium to hard rubber roller (Figure 3). Ensure heating blanket is making intimate contact with the surface to be heated.

- The pressure sensitive adhesive will cure when the heating blanket is energized and heat is generated. PSA generally cures in twenty minutes at 200°F (93°C) in a 68°F (20°C) ambient environment. The cure time will vary with temperature of the heating blanket and surrounding ambient conditions. The higher the ambient temperature and set-point of the heating blanket, the faster the cure time.
- The heating blanket may require a temporary method of attachment to secure the heater until the PSA cures. Use a high-temperature adhesive tape (BriskHeat® Part # AAT2180) to secure the heater.
- For larger heaters, press the heater onto the surface as the film is removed.

NOTE: BriskHeat® does not recommend allowing pressure sensitive adhesive to cure at temperatures below 40°F (4°C).

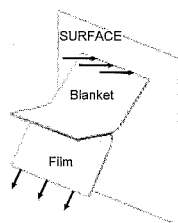


Figure 2:
Removing Film

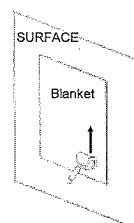


Figure 3:
Rolling the
Blanket

Heater without PSA may be mounted with:

- Factory supplied mechanical fasteners
 - High temperature adhesive tape
 - Thin layer (<1/8" (3mm)) of RTV
6. Check for any air-gaps between the heater and surface. Air-gaps can reduce heat transfer from the heater causing excess heat.

CONNECTING HEATER TO POWER SOURCE



All electrical wiring must be completed by qualified persons and must be in compliance with local codes and regulations.

Before connecting the heater to an electrical source, turn the adjustable dial on the heater's control box in the counter clockwise direction until it stops (this is the off position).

Heaters provided with a plug:

Connect the provided plug to a power supply receptacle.

Heaters provided with wire leads:

The power leads consist of two non-polarized black conductors which should be connected to line 1 and line 2. The power connections must be adequately rated to electrically support the voltage and amperage of the heater. The identification label located on the power cord displays voltage and amperage requirements.

OPERATION

This product is equipped with a dial adjustable thermostat temperature controller. A maximum temperature is identified on the label: 425°F (218°C) or 160°F (71°C). Adjust dial to desired heat output. To increase temperature output of the heater, turn the adjustable dial in the clockwise direction. To decrease temperature output of the heater, turn the adjustable dial in the counter clockwise direction.

Note: Ambient conditions will affect the dial's position in which the heater begins to heat. In cooler temperature conditions the heater will begin to heat at a lower temperature position on the dial and in warmer temperature conditions the heater will begin to heat at a higher temperature position on the dial.

It is recommended that a thermometer is attached to the vessel being heated. Adjust the dial until you achieve the desired temperature.

Note: Changes in ambient conditions or in the temperature of the contents may cause the temperature to shift over time.

For heating temperature sensitive materials that require a specific set-point or have a tight tolerance temperature range Use of an external temperature controlling device is required. Select a temperature controller with the accuracy necessary for the application and is approved for the location and conditions where the heater is to be used. For lower temperature applications up to 212°F (100°C) BriskHeat recommends the use of a TC4X Digital Temperature Controller. For higher temperature applications BriskHeat recommends the use of a TTD Digital Temperature Controller.

Note: If assistance determining a proper temperature controlling device is required for your application, please contact BriskHeat or your local distributor for application assistance and product solutions.

Install and connect the external temperature controlling device between the heater and the electrical source as shown in Figure 4. Install the temperature controlling device in accordance with manufacturer's installation instructions.

Mount the temperature sensor on the surface being heated near the heater. Secure the sensor using appropriately rated aluminum or fiberglass adhesive tape.

Set the heater's temperature controlling dial to the maximum temperature setting. Adjust heater output using the external temperature controlling device.

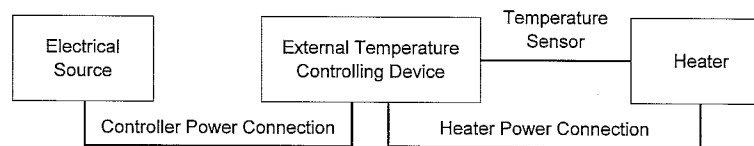


Figure 4

EMERGENCY PROCEDURES

Read and understand these procedures prior to using this heater.
Disconnect power to the heater in the event of an emergency.

Electric Shock:

- Do not touch the injured person while they are still in contact with the electrical current.
- Call your local emergency service if the injured person experiences: severe burns, confusion, difficulty breathing, heart rhythm problems, cardiac arrest, muscle pain and contractions, seizures or a loss of consciousness.

Minor Burns:

- Hold the burned area under cool running water for 10-15 minutes.
- Remove rings or other tight items from burned area.

Major Burns:

- Call your local emergency service.
- Protect the person from further harm.
- Remove rings or other tight items from burned area.
- Monitor breathing and perform CPR if necessary.

Fire:

- Call your local emergency service.
- If it is safe to do so, use a fire extinguisher to fight the fire, otherwise evacuate to a safe distance and wait for help to arrive.
- This heater is built from material that will not support a flame but could ignite nearby combustible material.

MAINTENANCE INSTRUCTIONS

Anyone who reads and understands these instructions is
qualified to maintain this heater.

Maintenance:

- All maintenance should be performed after heater has cooled to room temperature and with the electricity disconnected.
- This product should be inspected prior to being installed and at least every 12 months during use.
- Dirt, oil, grease or other foreign matter can be removed with a damp rag and mild household cleaners.
- Do not attempt to repair a damaged heater.

Inspection:

- Inspection should be performed after the heater has cooled to room temperature and with the electricity disconnected.
- The heater should be free of any cuts, cracks, or punctures.
- The power leads should not have any visible breaks in their insulation
- The heater should be free of any build-up of dirt, oil, grease, or other foreign matter.

Storage:

- This product should be stored indoors.

Disposal:

- This product does not contain any hazardous substances and may be discarded with domestic waste.

TROUBLESHOOTING GUIDE

Please read this guide prior to contacting BriskHeat[®]. This guide is designed to answer the most commonly asked questions. If you are unable to identify the problem or need additional assistance, please contact your local distributor/ representative or us at 1-800-848-7673, 614-294-3376, or bhtsales1@briskheat.com.

PROBLEM	SOLUTION(S)
Heater does not warm up	Verify heater is connected to proper voltage. Check to see if there is a resistance reading (not an open circuit) in heater using an ohm meter.
Pressure sensitive adhesive is not adhering	Verify date of manufacture. PSA has a shelf life of 6 months. Ensure there are no air gaps and heater is making intimate contact with surface being heated. Confirm: <ul style="list-style-type: none"> • Medium to hard rubber roller used for install. • Surface properly cleaned and clear from oil, dirt and residue. • Installation occurred above 40°F (4°C).
Circuit breaker is tripping	Validate that the circuit breaker is capable of handling the amp requirement of heater. The identification label located on the power cord displays the heater's amperage requirement. Examine heater and cord for any damage. Check to see if there is a resistance reading between power leads and the ground lead.

WARRANTY INFORMATION

BriskHeat warrants to the original purchaser of this product for the period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever comes first. BriskHeat's obligation and the exclusive remedy under this warranty shall be limited to the repair or replacement, at BriskHeat's option, of any parts of the product which may prove defective under prescribed use and service following BriskHeat's examination, is determined by BriskHeat to be defective. The complete details of the warranty can be found online at www.briskheat.com or by contacting us at 1-800-848-7673 (toll free, U.S. / Canada) or 1-614-294-3376 (Worldwide).



Corporate Headquarters:
4800 Hilton Corporate Dr.
Columbus, OH 43232, U.S.A.

Europe:
P.O. Box 420124
44275 Dortmund, Germany

Toll Free: 800-848-7673
Phone: 614-294-3376
Fax: 614-294-3807

Email: bhtsales1@briskheat.com

GETTING STARTED WITH YOUR HEATER:

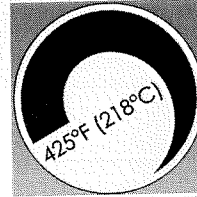
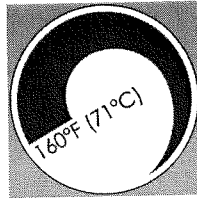
1. Before connecting the heater to an electrical source, turn the adjustable dial on the heaters control box in the counter clockwise direction until it stops (this is the off position).
2. Connect heater to an approved AC electrical source.
3. Turn the adjustable dial in the clockwise direction until the desired heat output is reached.

For heating temperature sensitive materials that require a specific set-point or have a tight tolerance temperature range, use of an external temperature controlling device is required. Please refer to "ADJUSTMENT OF TEMPERATURE SET-POINT" section of the product instruction manual.

Note: Ambient conditions will affect the dial's position in which the heater begins to heat. In cooler conditions the heater will begin to heat at a lower temperature position on the dial and in warmer conditions the heater will begin to heat at a higher temperature position on the dial.

ATTENTION: Carefully read and understand the entire operating instructions prior to using this heater.

Mid Temperature Models 160°F (71°C) High Temperature Models 425°F (218°C)



P/N: 11195-13

BriskHeat
Made in U.S.A.

CE 12/11/2020

4800 Hilton Corporate Dr
Columbus, OH 43232
1-800-848-7673

SRMU100609P - ADJ
Size _____
Type _____
RECEIVED
JAN 1 1 2021

THIS UNIT IS INTENDED FOR INDUSTRIAL OR COMMERCIAL USE ONLY.

BY:

BriskHeat

CE 12/11/2020

4800 Hilton Corporate Dr
Columbus, OH 43232
1-800-848-7673

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Type _____

THIS UNIT IS INTENDED FOR INDUSTRIAL OR COMMERCIAL USE ONLY.

RECEIVED
JAN 1 1 2021

BY:

Nip Roller Resurfacing/Replacement Vendors

From: windust300@aol.com <windust300@aol.com>

Date: Thursday, August 3, 2023 at 10:05 PM

To: Cakmak, Mukerrem <cakmak@purdue.edu>

Subject: Roller Grinding and Recovering services

---- **External Email:** Use caution with attachments, links, or sharing data ----

Miko

The 2 companies I used for over 25 years are as follows. Both are excellent quality and competitive pricing.

Miko: These are the companies as promised::

1) Passaic Rubber Co.
45 Demarast Drive
Wayne, NJ 07074
Atten: Nick

973/ 696 0500

2) Aarubco Rubber Co.
259 2nd Street
Saddle Brook, NJ 07663
Atten:Stephen Wharton

973/ 772 8177

Be sure to specify that the roller is a Blue Polyurethane with a durometer of 60 and they should grind only enough to remove any residue buildup on the face. Keep flat across entire face within +/- 0.002" tir.

Best
Bill W.
973/ 459-1297 Cell
973/ 770-1008 Office (Home)