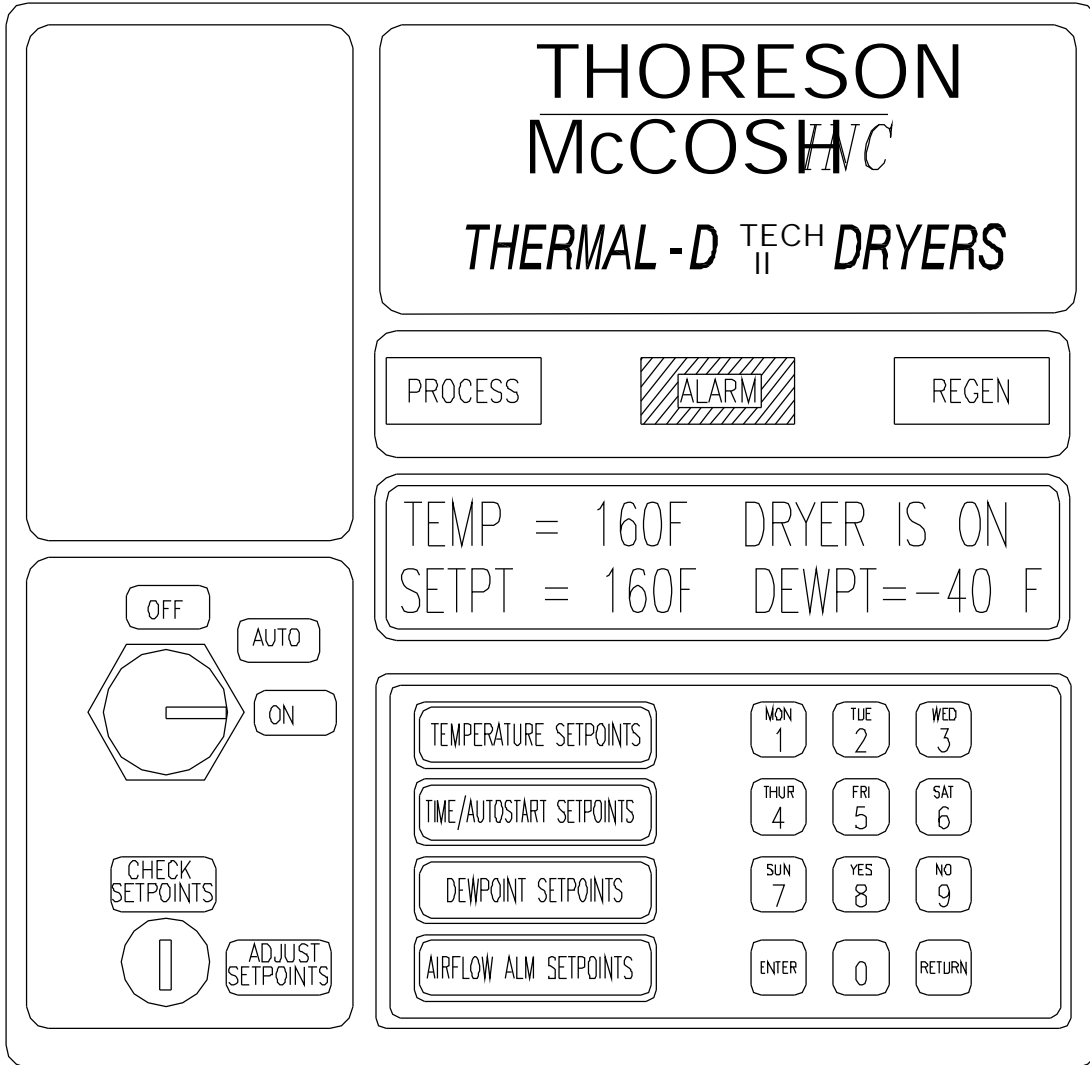


Thoreson-McCosh Inc

TECH II DRYER



INSTRUCTION MANUAL

IB200301

THORESON-McCOSH INC
1885 Thunderbird St. Troy MI. 48084
Phone 1-248-362-0960
Fax 1-248-362-5270
sales@thoresonmccosh

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FORWARD

The information contained in this Instruction Manual is provided to you for the maintenance of your Thoreson-McCosh equipment.

Also included in this manual are operating instructions, a service parts list, and wiring diagrams. Please file this manual for future use.

For additional information, please contact:

THORESON-McCOSH Inc. 1885 Thunderbird Street Troy, MI 48084 Phone: (248) 362-0960 Facsimile: (248) 362-5270 sales@thoresonmccosh.com

CUSTOMER RECORDS

Upon receipt of your Thoreson-McCosh equipment, it is very important that you complete the table below. The information will be needed to best serve you when you call the Thoreson-McCosh Service Department with questions or to order replacement parts. The information is located on the Serial Tag on the unit and inside the door of the control box.

Model Name _____

Serial No. _____

Wiring Diagram No. _____

Insert No. _____

Program No. _____

Layout No. _____

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SECTION 1 THORESON-MCCOSH PRODUCT WARRANTY

Thoreson-McCosh warrants each product of its manufacture to be free from defects in material and workmanship for a period of 30 months (2-1\2 years) with a 5 year warranty for the desiccant bed seals from the date of delivery to the original purchaser .from the date of delivery to the original purchaser. Thoreson-McCosh's obligation under this warranty is limited to repairing or replacing any part returned to the Thoreson-McCosh factory with transportation charges prepaid, and which, on examination by Thoreson-McCosh, shall disclose to Thoreson-McCosh's satisfaction to have been defective. Regularly scheduled maintenance items (desiccant, filters and dew point sensors) are excluded from this warranty coverage.

The purchaser must notify Thoreson-McCosh of such defects and promptly deliver the defective part(s) in accordance with Thoreson-McCosh's shipping instructions, delivery prepaid. Parts will be replaced F.O.B. Thoreson-McCosh factory, by Thoreson-McCosh, and will be invoiced to the purchaser with "credit on return of defective part", if the part is returned within fifteen (15) days after shipment of replacement part. Thoreson-McCosh is not liable for installation or cost to install the replacement part or removal of the defective part.

Thoreson-McCosh is not responsible for any failure of its product due to improper use, installation, or operation. Thoreson-McCosh shall not assume any expense or liability for repairs made to any Thoreson-McCosh unit or equipment outside Thoreson-McCosh's own factory unless specifically agreed to in writing by Thoreson-McCosh.

Equipment and accessories furnished by us, but manufactured by others, are guaranteed to the extent of the original manufacturer's guarantee to Thoreson-McCosh, if that guarantee exceeds 30 months (2-1/2 years).

It is expressly understood that Thoreson-McCosh is not responsible for damage and/or injury caused to buildings, contents, products, or persons by reason of installation or use of any of our products. Thoreson-McCosh shall not be liable for loss, damage or expenses arising directly or indirectly from, or being consequential or incidental to, the use of its products or from any other cause.

The above warranty supersedes, and is in lieu of all other warranties expressed or implied; and no person, agent, representative or dealer is authorized to give any warranties on behalf of Thoreson-McCosh, not to assume for Thoreson-McCosh any other liability in connection with Thoreson-McCosh products.

SECTION 2 INSTALLATION

SECTION 2.1 INTRODUCTION

Your Thoreson-McCosh dryer was run prior to shipment and checked to insure that its performance is up to specifications. Upon arrival in your plant, the unit should be carefully inspected for physical damage which might have occurred in transportation. Should any damage be observed, it should be reported to the carrier at the earliest possible time.

The dryer should be located as close as possible to the machine hopper it will serve in order to minimize thermal and air flow losses. The unit can be placed on any reasonable level area or platform. The unit should be connected to the power source indicated on the model name plate.

SECTION 2.2: Three Phase – 3 Wire Units

The power line terminals are identified as L1, L2, and L3. All heater and blower circuits are individually fused. It is highly recommended, and required by many local codes, that a fusible disconnect of adequate capacity be provided. The unit is ready to operate after connecting the power lines to their respective terminals and properly grounding the machine.

Blower motor rotation on three phase units must be checked when the unit is first started after any reconnection of the unit.

To check for correct phase:

- 1: Turn the Off/Auto/On switch to on.
- 2: Place your hand over the smaller of the two outlets on top of the dryer.
- 3: Air should be blowing out this opening.
- 4: If suction is felt, remove power and interchange any two of the three power leads L1, L2, or L3.
- 5: The unit is now ready for operation

CAUTION: The correct phase is extremely important, Incorrect phase can damage this machine.

SECTION 2.3 UNITS WITH COMPLETE DRYING HOPPER

Clean the inside of your hopper thoroughly to avoid contamination of plastics. Your drying hopper is made in two sections for ease of cleaning and installation. To remove barrel of hopper, lift it out of its “seat” in the hopper cone. Install the hopper cone of the feed section of your molding machine, being sure that is well secured. Refit the hopper barrel into its “seat” on the hopper cone, being sure that is seated properly.

SECTION 2.4: UNITS WITH HOPPER EXTENSION

Clean the inside of your extension thoroughly to avoid contamination of plastics. Install the “balanced flow” air diffuser with the mounting plate and bolts supplied. The loose plate serves as an escutcheon on the outside of the extension through which the bolts are inserted. Place the extension on your machine hopper, being sure that the extension is centrally located on the machine hopper.

SECTION 2.5: HOSE INSULATION INSTRUCTIONS

Install hose insulation on hose from dryer outlet to the drying hopper inlet. Cutting insulation into approximately 12” sections will give more flexibility in the hose. Remove the plastic strip from adhesive after placing insulation over hose.

SECTION 3 TECH II INSTRUCTIONS

SECTION 3.1 INTRODUCTION

This dryer is a triple desiccant bed unit which continuously removes moisture from the process air stream by adsorption. While two of the beds are adsorbing moisture from the process air, the third is being automatically regenerated.

This unit is a re-circulating dryer, recycling the drying air from the material hopper back through the desiccant beds. The only atmospheric air that enters the process air system is a small quantity, which may leak in via the material loading system, if present, on the hopper. A process air filter and regeneration air filter provided to prevent contaminants from reaching the desiccant material

SECTION 3.2 OPERATOR INTERFACE PANEL

The operator interface panel includes:

- 1: Key switch to lock out access to process setpoints
- 2: On/Auto/Off switch
- 3: 16 key keypad
- 4: Two line by 40 character Vacuum Fluorescent Display

SECTION 3.2.1: ON/AUTO/OFF SWITCH

This three position switch turns the dryer on (in the On and auto position) and off (in the Off and Auto position). When the switch is placed in the Auto position, the dryer is controlled by the Auto Setpoints for the current day. Setting the Auto Setpoints is covered in Section 3.4.2

SECTION 3.2.2: KEY ACCESS SWITCH

The Key access switch provides a security function, locking out the set point adjust, while still providing all monitoring capabilities.

SECTION 3.3 DESCRIPTION OF KEYPAD

The key pad consists of twelve regular function keys, similar to a pocket calculator, and four special keys, that allow checking and adjusting the setpoints

SECTION 3.3.1: KEY FUNCTION

NOTE: Pressing the “RETURN” key at any time it is allowed, returns you to the first screen (see figure 3.1)

NOTE: All the following screens are shown wit the key switch in the “ADJUST SETPOINTS” position

PROCESS TEMP= 221°F	DRYER IS ON
PROCESS SET POINT = 221°F	DEWPOINT = -40°F

Figure 3.1 – First Screen

SECTION 3.4: TEMPERATURE SETPOINTS

SECTION 3.4.1: MODIFYING THE PROCESS TEMPERATURE SET POINT

When the “TEMPERATURE SETPOINTS” key is pressed, displays the current process set point, and if the key switch is turned to “ADJUST SETPOINTS” allows the modification of the process set point by punching in the new set point and pressing the “ENTER” key

PROCESS SET POINT = 222°F
NEW = 180°F PRESS ENTER

Figure 3.2 – Process Set point Screen

SECTION 3.4.2: MODIFYING THE AUTO TEMPERATURE SET POINT

When the ‘TEMPERATURE SETPOINTS” key is pressed, displays the current process set point, and if the key switch is turned to “ADJUST SETPOINTS” allows the modification of the process set point by punching in the new set point and pressing the ‘ENTER” key. At this point the Auto Temperature Set point is displayed.

This set point controls the process Temperature when the On/Auto/Off switch is in the Auto position, and the current time is within the band specified by the Start2 range but not the Start1 range (see section 8 for example)

AUTO SET POINT = 150°F
NEW = 195°F PRESS ENTER

Figure 3.3 – Auto Temperature Set Point Screen

SECTION 3.4.3 REGENERATION TEMPERATURE DISPLAY

Alternatively, two consecutive presses of the Temperature Set Points key displays the regeneration temperature and set point.

REGENERATION TEMP = 540°F SET POINT = 550°F
REGEN EXHAUST = 300°F PUSH RETURN

Figure 3.4 –Regeneration Temperature Display Screen

NOTE: Regeneration exhaust temperature is displayed only if the regeneration power saver option is purchased

This allows you to monitor the regeneration temperature for trouble-shooting. You can return to the first screen by pressing the “RETURN” key. The regeneration temperature set point cannot be modified.

SECTION 3.5: TIME/AUTOSTART SETPOINTS

SECTION 3.5.1: MODIFYING THE AUTO START AND STOP TIMES

The first press of the Time/Autostart Set Points key displays:
“PRESS THE DAY TO BE VIEWED OR PRESS TIME/AUTOSTART KEY AGAIN”.
The second key press can be any of the keys labeled MON through SUN. Pressing any one of the Mon through Sun keys causes that day’s start and stop set points to be displayed. These are ‘START’, “STOP1”, “START2”, “STOP2”, which are displayed in turn by subsequent presses of the “ENTER” key

MONDAY START1 = 08:00
NEW = 0800 QUIT = RETURN

Figure 3.5 Monday Start 1 screen

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At this point, two start times and two stop times can be programmed. Stop1 goes with Start1, Stop2 goes with Start2. It is important to note that the clock is a 24-hour clock with one day represented by 00:00 to 24.00. Also, each start time should have its corresponding stop time entered with a time greater than the start time. Otherwise the dryer will not turn on while the Off/Auto/On switch is in the Auto position. See also Section 8, Seven Day Timer Setup

SECTION 3.5.2: DISPLAYING CURRENT, PST AND STANDARD CYCLE TIMES

Two consecutive presses of the Time/Autostart Set points key causes the standard cycle and regeneration times to be displayed.

STD. CYCLE = 60 MIN. REGEN. CYCLE = 32 MIN
PUSH ENTER TO CONTINUE OR PUSH RETURN

Figure 3.6 Standard Cycle Time Screen

If the next key press is the “ENTER” key, the display will show how far into the cycle the dryer currently is, and how long the last cycle lasted

CURRENT = 25 LAST = 60 MIN
PUSH ENTER TO CONTINUE OR PUSH RETURN

Figure 3.7 Current and Last Cycle Time Screen

Pressing the “ENTER” key again will access the editing or viewing the current day and time. At this point the day and time can be edited by first entering the current day. Press one of the keys labeled MON through SUN. Then the current time can be entered; this dryer operates on the 24-hour clock with one day represented by 00:00 to 24:00. Finally, press the ENTER key to enter the new time

MONDAY 09:15
NEW = MONDAY 10:15

Figure 3.8 Current Day and Time Screen

SECTION 3.6 DEW POINT SET POINTS

This key displays the dew point shift set point, dew point shift condition (on or off) and dew point alarm set point. The dew point shift option keeps the beds from shifting until its set point is reached; that is, the beds do not shift until the dew point of the process stream reaches the set point value. This can be selected when key access is allowed by pressing the “YES” key, or deselected by pressing the “NO” key, and can be monitored when key access is not allowed.

DEW POINT SET POINT = 20° SHIFT OFF
DEW POINT SHIFT ON ? (YES/NO)

Figure 3.9 Dew point Set Points Screen

Pressing the “YES” key displays the following screen

DEW POINT SET POINT = 20°F
NEW = 35°F PRESS ENTER

Figure 3.10 Dew Point Shift On Screen

At this point, you can enter a new dew point shift set point. When you press enter, the following screen appears

ALARM SET POINT = 25° **SHIFT ON**
NEW = 25°F **PRESS ENTER**

Figure 3.11 Dew Point Alarm Screen

At this point, you can enter a new dew point alarm set point. When you press enter, you are returned to the First Screen (figure 3.1). **NOTE: Make sure the dew point alarm is a larger number than the dew point set point when dew point shift is enabled.**

SECTION 3.7: AIR FLOW ALARM SET POINT

This key displays the actual air speed. No modification of alarms is allowed. To leave this screen – press the “RETURN” key.

**AIR SPEED = 24 CFM
PRESS RETURN**

Figure 3.12 Air Speed Display

SECTION 3.8: FORCING A BED INDEX

NOTE: The following screen is shown with the key switch in the “ADJUST SET POINTS” position

Forcing the beds to shift can be a useful diagnostic tool, and also makes removing the desiccant beds much easier. Pressing the Airflow Alm Set Points key twice

INDEX BEDS? (YES/NO)

Figure 3.13 Bed Index Display

Pressing the “NO” key returns to the First Screen (figure 3.1) and does not affect the machine. Pressing the “YES” key causes the dryer to assume that the correct cycle time has been reached. The dryer will now shift if the Off/Auto/On key is in the On position (or the Auto position and has been programmed to turn the dryer at that time)

NOTE: Units with dew point must have the dew point shift turned off in order to force a bed index.

NOTE: Shifting the beds should not be done unless it is necessary as it will cause improper drying.

SECTION 3.9: REGEN BLOWER OFF-DELAY TIMER

SECTION 3.9.1 PURPOSE

The Regen Blower Off-Delay Timer allows additional cooling of the regenerated bed

SECTION 3.9.2 METHOD:

Regeneration of the desiccant beds is accomplished by blowing extremely hot (550°F) ambient air through the desiccant for a predetermined length of time. The blower and heaters then shut off until the process cycle is complete. Normal cooling is accomplished through static (condition) heat transfer during the remainder of the process cycle, then through convection while the bed is in the cool down position during the next process cycle. This is accomplished by bleeding off a small portion of the process air through the bed, then recapturing this air in the process heater box. This cools down the bed and allows reuse of the energy used to regenerate the bed.

However, because desiccant, as it captures moisture gives off heat, this energy and the heat from the bed is cooling down can make it very difficult to attain low process temperatures (<150°F) Therefore, we have made it possible to extend the regen blower running time with the regen heaters off. This allows the convective cooling to be achieved before the bed rotates to the cool down position. The danger is that the ambient air will introduce some moisture as the bed cools down, thereby reducing the effectiveness of the desiccant to dry the process air. This is less of a danger than letting the process loop go open loop, because desiccant will not adsorb moisture until its temperature is below approximately 200°F. Thoreson-McCosh would not recommend using the off-delay unless necessary, and recommends that the dryer be monitored closely to determine the effect of the time delay, as ambient conditions change, and plastics differ in what they need to achieve acceptable dryness.

SECTION 3.9.3; SETTING THE OFF-DELAY

Put Key in the "Adjust Set Points" position

Press the "AIRFLOW ALM SETPOINTS" key three times, until the following is displayed;

"CHANGE REGEN BLOWER COOL DOWN TIME?"

"CURRENT = 00 NEW=00 MINUTES (MAX = 15)"

This display shows the current off-delay (cool down) time, the new time as you enter it, and the maximum time allowed (15 minutes)

Enter the new time up to 15, and press the enter key It is possible to enter a time up to 99. However, when the off-delay (cool down) time begins, it will revert to zero. The regen blower will now stay on for this period of time after the dryer has finished the normal regeneration cycle. For dryers with the generation power saver option, the blower will stay on for this period of time after regenerating bed has reached an exhaust temperature of 350°F

SECTION 4: TD DRYER MECHANICAL METHOD OF OPERATION

SECTION 4.1: INTRODUCTION

This dryer is a triple desiccant bed unit which continuously removes moisture from the process air stream by adsorption. While two of the beds are adsorbing moisture from the process a third is being automatically recharge.

This unit is a recirculating dryer, recycling the drying air from the material hopper through the desiccant beds. The regeneration air flow is completely independent of the process air flow. The only atmospheric air that enters the process system is a small quantity which may leak in via the material loading system, if present on the hopper. A process air filter and regeneration air filter are provided to prevent contaminants from reaching the desiccant material.

SECTION 4.2: TRIPLE BED METHOD OF OPERATION

The operation of the triple bed dryer is based on each of the three beds being indexed to one of three separate stations within the unit.

The first position is the regeneration station. Here, super-heated ambient air is blown through the bed to drive off adsorbed moisture from the desiccant material. This moisture is exhausted to the atmosphere near the bottom of the dryer.

The second position is the cool down station. Here, a small percentage of return air from the hopper passes through the bed to gradually cool down the hot desiccant material. The heat captured by this air is used to heat the process air, thus minimizing process heater energy requirements. As the bed cools, it begins to contribute to the adsorption process.

The third position is the process station. Here, the rest of the return air from the hopper passes through the bed. The dried cooled, desiccant material is now permitted to adsorb any moisture that is carried in the return air, before it is heated and sent back to the drying hopper.

Automatic indexing of the beds is performed by separating the manifold seals from the beds with an electric lineal actuator motor. The beds are then rotated with a gear motor/chain drive assembly until they are detected via the limit switch at the next sequential station. The lineal actuator motor then clamps the manifold seals against the beds for air-tight operation.

On standard units, the automatic bed indexing time cycle is controlled by the microprocessor, which is set up to guarantee very dry process air, even while operating under extremely severe drying conditions

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In the optional dew points control mode, the dew point of the process air is continuously monitored. Automatic bed indexing will occur only when the dew point is approaching an unacceptable level.

The process air heating elements are located in the heater box which is nearest the control box mounted on the upper deck. An indicating light is provided to indicate when the process heater elements are on.

The regeneration air heating elements are located in the heater box on the upper deck, furthest from the control box. On standard units the regeneration heater and blower are timed to be on during the first portion of the bed index cycle, and off during the remainder of the cycle. On units with the optional regeneration power saver, the heaters and blower will shut off early if the regeneration of the bed is sensed as being completed (regeneration exhaust temperature reaches a minimum of 350°F). An indicating light is provided to indicate when the regeneration heater elements are on.

SECTION 5: PRELIMINARY TD DRYER CHECKS

SECTION 5.1: VISUALLY CHECK DRYING SYSTEM

Check dryer hoses and hopper. Be sure that delivery and return hoses are in good condition routed with a minimum of length and sharp bends. Hopper lid should be in place and reasonably well sealed. If a hopper loader is used, it should be mounted so that drying air leakage is minimized

SECTION 5.2: CHECK DRYING HOPPER INLET TEMPERATURE

At hopper inlet, the drying temperature should be as specified by the material supplier. In general, as hot as possible without allowing thermal degradation of the material. If the hopper inlet temperature is lower than the dryer discharge the dryer temperature should be increased to compensate for the temperature drop in the hose.

SECTION 5.3: CHECK THE HOPPER TEMPERATURE DISTRIBUTION

Let dryer run for 3 – 4 hours. Air/material temperature in the hopper should be uniform around the hopper at any level, and hot (within 15°F of inlet temperature) up to 80% of the full hopper height when material is being added at the designed drying rate. Under static drying conditions (no new material added to the hopper) the discharge temperature should approach inlet temperature after approximately 4 – 5 hours of operation. Should these checks show that the heat is not progressing upward through the hopper, the dryer should be checked for low air flow. See dryer test procedures.

SECTION 5.4: CHECK DISCHARGE DEW POINT OF DRYER

For standard dryers, it should be approximately - 40°F or lower. Should dew point run higher than specified, check dryer.

SECTION 6: MAINTENANCE

SECTION 6.1: FILTERS

The process and regeneration filters should be checked weekly and cleaned with compressed air or replaced if necessary

SECTION 6.2: LUBRICATION

The regeneration blower motor bearings may be lubricated every 6 months to extend blower life. A couple drops of S.A.E. 20 motor oil at each of the two motor bearings is recommended.

SECTION 6.3: MOLECULAR SIEVE TEST

When it is suspected that the molecular sieve needs replacement, there is a simple test that can be performed. A positive test does not ensure that the molecular sieve is in good condition. If there is a large percentage of broken pellets or dust contamination from foreign matter, or most of the pellets are discolored, the desiccant should be replaced. New desiccant is light tan in color.

To test the desiccant's effectiveness, a sample should be regenerated in an oven at 600°F for about two hours. At the end of that period, place the desiccant into an air tight jar and allow it to cool down to room temperature for a minimum of 12 hours. Pour 30ml of water into a small glass. Determine and record the temperature of the water using a mercury thermometer. Into a similar dry glass, pour a quantity of desiccant that is 10% greater by volume than the water (33ml). Dry the thermometer and place it into the glass containing molecular sieve. With one quick motion, pour the water into the glass of desiccant. Observe the increase in temperature of the mixture while stirring with the thermometer and record its peak which will occur in about 20-30 seconds. Subtract the water temperature from peak temperature observed. If the temperature difference is 40°F or greater, the sieve is in satisfactory condition

SECTION 6.4” DESICCANT BED RECHARGING PROCEDURE

Read instructions through completely before attempting to remove the beds.

- 1: Remove power to dryer
- 2: Set Off/Auto/On switch to On, set key switch to “Access Set Points”
- 3: Remove side panels
- 4: Follow the procedure in Section 3.8” Forcing a Bed Index”. When the beds are clear of the manifolds, remove power from the dryer
- 5: Loosen band clamps and remove beds

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NOTE: The bed turret assembly can be manually rotated if care is taken to rotate them slowly, so damage to the drive assembly will not occur

NOTE: Never allow the bed left motor to run unless all of the beds are in place, or damage to the lift assembly could result

Inspect the center cavity at the top of the bed for any quantity of beads which indicate a damaged inner screen

Inspect the bottom part of the bed for the presence of any loose beads, which may indicate a damaged outer screen. If when the beds are refilled and there is still evidence of bead leakage, the bed must be repaired or replaced.

To replace the desiccant

- 1: Remove the cap plate to gain access to the desiccant
- 2: Dump the desiccant beads out and vacuum the remaining beads out.
- 3: Fill the beds with new desiccant – use only 8 x 12 size (0.080” diameter) desiccant beads. Fill beds as full as possible. Rock the beds to promote settling of the beads. Add more desiccant to fill the beds.
- 4: Apply high temperature sealant (G.E. silicone RTV-106n sealant is recommended) and secure cap plates to beds
- 5: Secure beds into dryer with cap plates up and positioned outward from center of dryer.
- 6: Start the dryer and let it operate for a few bed shift cycles while inspecting for leaks at the upper and lower bed seals.
- 7: Shut off dryer and install side panels.
- 8: After approximately 1-2 weeks of dryer operation add more desiccant to make up for any further settling which may have occurred.

SECTION 6.5: DEW POINT METER – SENSOR REPLACEMENT

The dew point sensor should be replaced once a year

NOTE: Never attempt to measure the resistance of the sensor. This will damage the sensor.

To replace the sensor

- 1: Remove power from the unit
- 2: Locate the sensor manifold assembly. This is a aluminum block.
- 3: Remove the socket
- 4: Unscrew the ring nut
- 5: Remove the sensor from the manifold.
- 6: Remove the cap from the sensor & place it on a new sensor.
- 7: Reverse steps 1 – 5

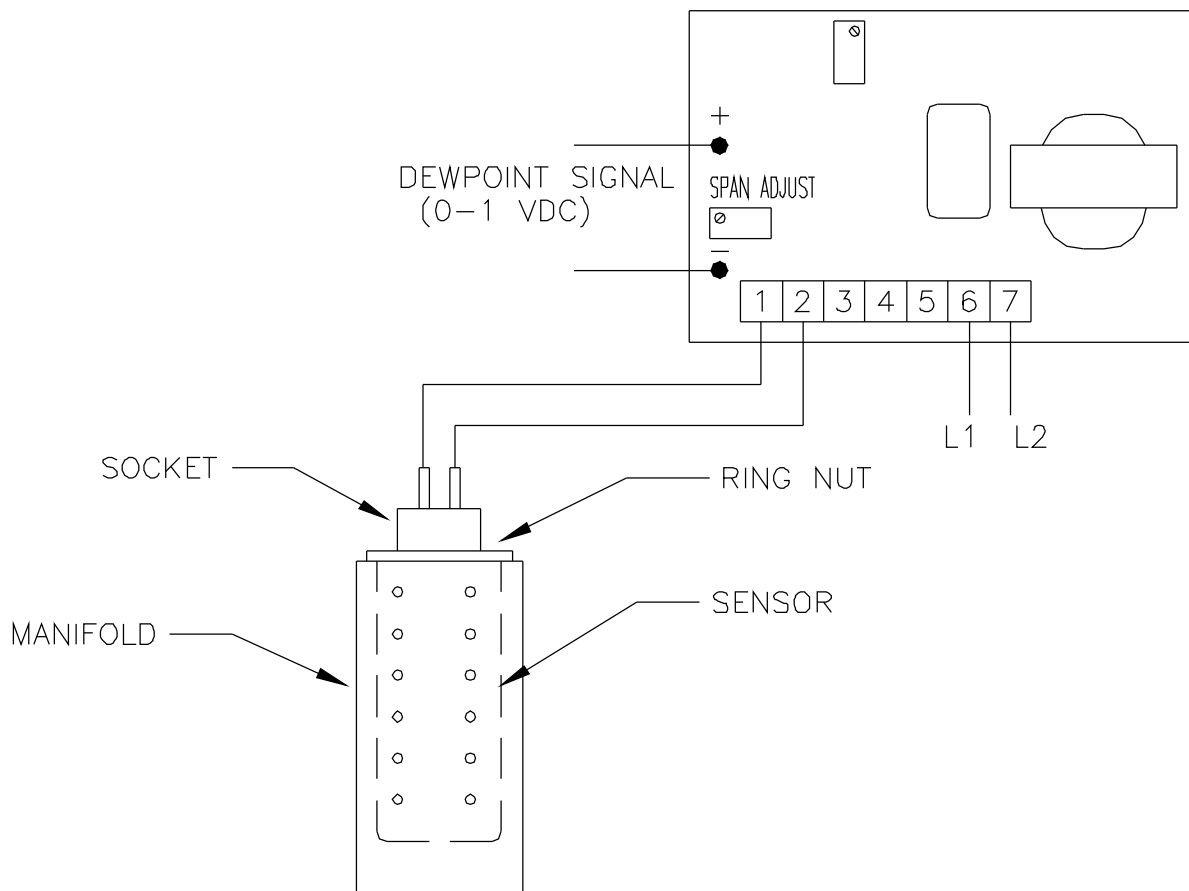


Figure 6.1: Dew point Board and Sensor Assembly

SECTION 6.6: PUSH UP MOTOR INSTALLATION FOR TD-12 & TD-24

REMOVING THE PUSH-UP MOTOR:

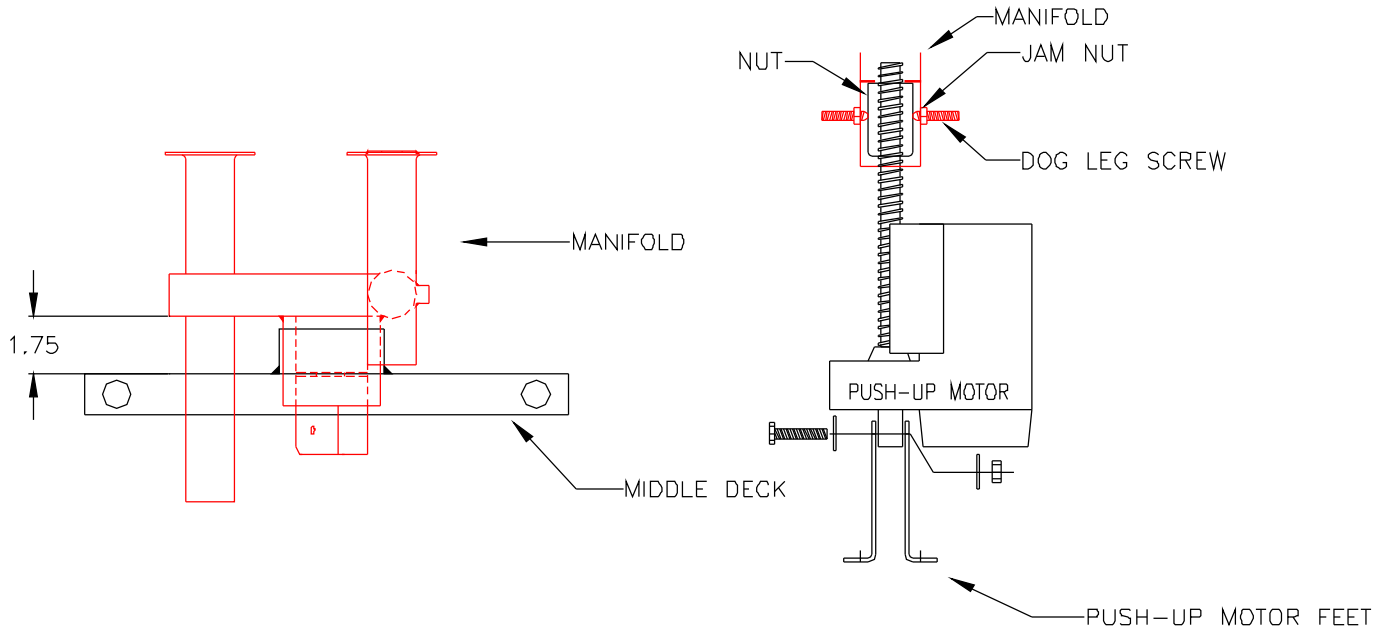
If it is possible to Force a Shift, do so. Disconnect the power from the unit after the manifold has pulled down and the beds have started to rotate. Unwire the motor wires from the terminal block inside the dryer control panel. From inside the dryer cabinet, pull the motor cord set out of the control box. Remove the dog leg screws from the tube on the bottom of the manifold. Remove the bolts from the push-up motor feet to the bottom deck. Pivot the feet under the motor and pull the shaft out of the tube on the bottom of the manifold.

INSTALLING THE PUSH-UP MOTOR:

Hold the manifold up and insert the shaft with nut of the new push-up motor, into the manifold tube. Pivot the feet under the push-up motor and bolt the feet to the bottom deck. Block or hold the manifold up at the proper distance from the middle deck. Distance should be 1.75". Adjust the nut up or down so that when the manifold tube sits on top of the nut, you still maintain the distance between the bottom of the manifold and the top of the middle deck. **DO NOT LET THE SHAFT TURN WHILE ADJUSTING THE PUSH-UP NUT.** Replace the dog leg screws and tighten the jam nuts. **Do not over screw the dog leg screws into the nut.** Feed the push-up motor cord set into the dryer control box and wire to the terminal block. (see wiring diagram).

TESTING THE PUSH-UP MOTOR:

Remove the heater fuses. Apply power to the unit. After the beds have finished rotating, watch the push-up motor to see if it turns off when the beds push on the upper bed seals. **NOTE: IF THE MOTOR IS OUT OF ADJUSTMENT, THE MOTOR MAY STALL AND BURN OUT THE WINDINGS. USE AN AMP PROBE ON THE RED WIRE OF THE PUSH-UP MOTOR TO SEE IF THE MOTOR HAS TURNED OFF.** If there is still a current draw, force a shift. When the manifold has pulled down, disconnect the power. Adjust the nut down. Replace the power and check to see that the beds seal properly, and the push-up motor turns off. If the beds don't seal and there is too much of a gap between the seals and the top of the beds, adjust the nut up the distance of the gap plus 1/8". Check that all three beds seal in each position. Disconnect the power. Replace the heater fuses.



SECTION 6.7: PUSH UP MOTOR INSTALLATION FOR TD-40 THRU TD-360

REMOVING THE PUSH-UP MOTOR:

If it is possible to Force a Shift, do so. Disconnect the power from the unit after the manifold has pulled down and the beds have started to rotate. Unwire the motor wires from the terminal block inside the dryer control panel. From inside the dryer cabinet, pull the motor cord set out of the control box. Remove the split collar from the tube on the bottom of the manifold. Remove the bolts from the push-up motor feet to the bottom deck. Pivot the feet under the motor and pull the shaft out of the tube on the bottom of the manifold.

INSTALLING THE PUSH-UP MOTOR:

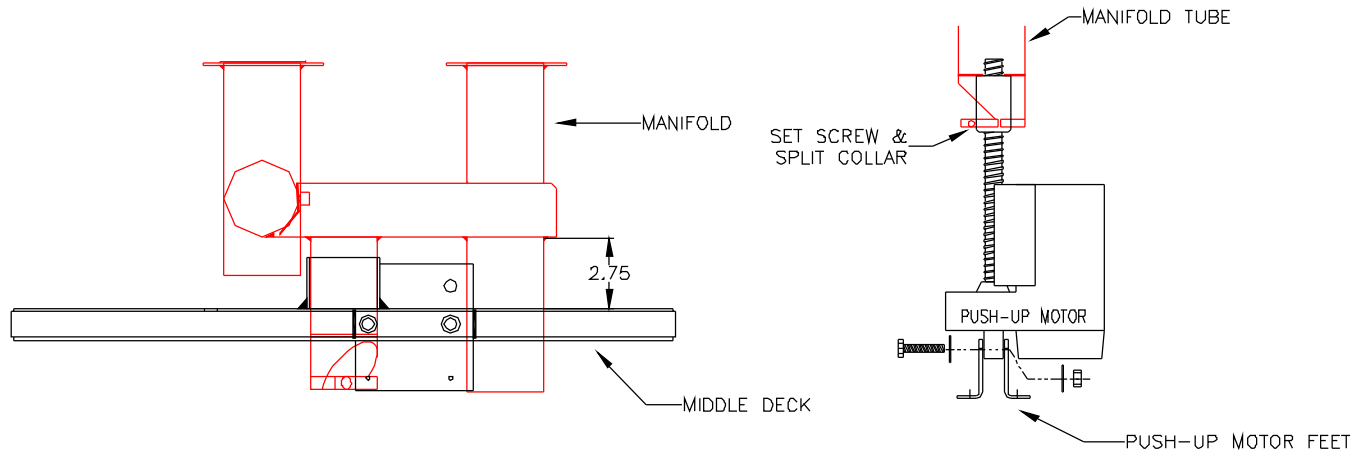
Hold the manifold up and insert the shaft with nut of the new push-up motor, into the manifold tube. Pivot the feet under the push-up motor and bolt the feet to the bottom deck. Block or hold the manifold up at the proper distance from the middle deck. Distance should be 2.75" for a TD-40 through the TD-120, 5.00" for the TD-150 through TD-360. Adjust the nut up or down so that when the manifold tube sits on top of the nut, you still maintain the proper distance between the bottom of the manifold and the top of the middle deck. **DO NOT LET THE SHAFT TURN WHILE ADJUSTING THE PUSH-UP NUT.** Replace the split collar. Feed the push-up motor cord set into the dryer control box and wire to the terminal block. (see wiring diagram).

TESTING THE PUSH-UP MOTOR:

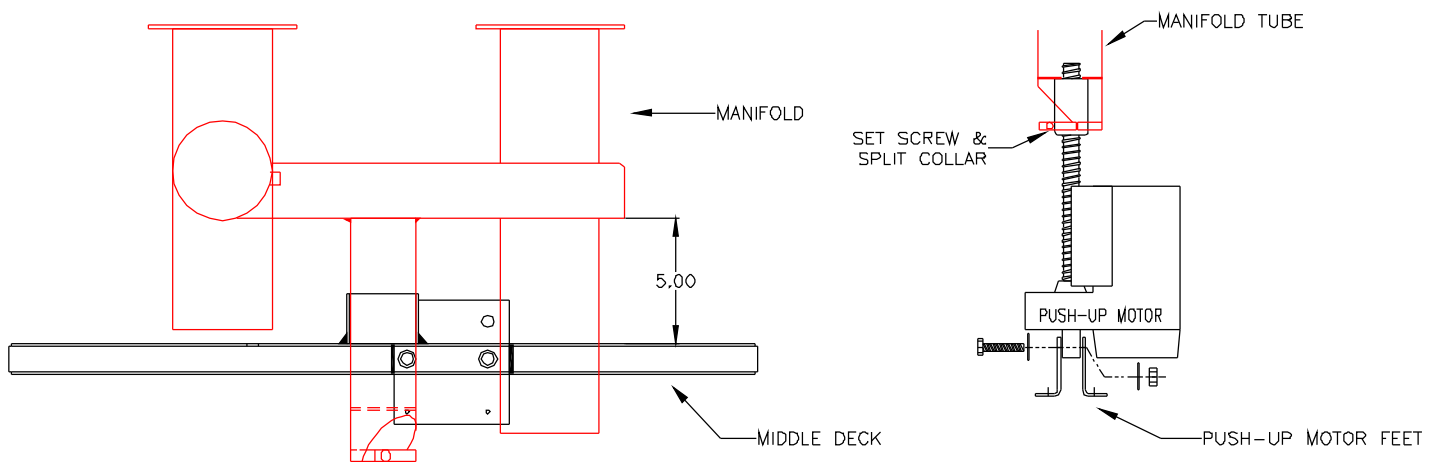
Remove the heater fuses. Apply power to the unit. After the beds have finished rotating, watch the push-up motor to see if it turns off when the beds push on the upper bed seals. **NOTE: IF THE MOTOR IS OUT OF ADJUSTMENT, THE MOTOR MAY STALL AND BURN OUT THE WINDINGS. USE AN AMP PROBE ON THE RED WIRE OF THE PUSH-UP MOTOR TO SEE IF THE MOTOR HAS TURNED OFF.** If there is still a current draw, force a shift. When the manifold has pulled down, disconnect the power. Adjust the nut down. Replace the power and check to see that the beds seal properly, and the push-up motor turns off. If the beds don't seal and there is too much of a gap between the seals and the top of the beds, adjust the nut up the distance of the gap plus 1/8". Check that all three beds seal in each position. Disconnect the power. Replace the heater fuses.

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TD-40 THROUGH TD-120



TD-150 THROUGH TD-360



SECTION 6.8: PULL-DOWN MOTOR REPLACEMENT INSTRUCTIONS: TD-12 THROUGH TD-360

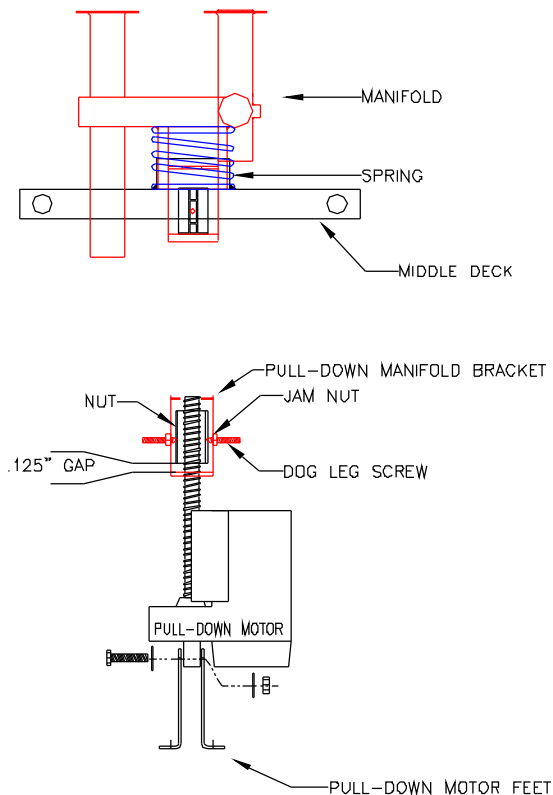
The manifold must be in the up position before starting this procedure.

- 1) Disconnect the power from the unit.
- 2) Unwire the motor from the terminal block of the dryer control panel. (see the wiring diagram). From inside the dryer cabinet, pull the motor cord set out of the pulling elbow.
- 3) Loosen the jam nuts on the dog leg screws and remove the dog leg screws from the pull-down manifold bracket.
- 4) Turn the drive nut up as far as possible inside the manifolds pull-down bracket.
- 5) Remove the bolts holding the pull-down motor feet to the bottom deck. Pivot the feet out from under the pull-down motor.
- 6) Lower the motor and turn the drive nut upward until the nut comes off the end of the pull-down motor shaft.

Reverse the procedure to replace the pull-down motor.

NOTE: When putting the dog leg screws into the groove in the drive nut, the nose of the screws should be in the groove, but not touching the drive nut. The drive nut should slide smoothly up and down on the screws.

NOTE: Maintain a .125" gap between the bottom of the drive nut and the bottom of the manifold pull-down bracket.



SECTION 6.9: DISPOSAL OF MERCURY CONTACTORS

When a mercury contactor needs to be replaced, care must be taken to properly dispose of the defective unit. Remove the contactor and place it in a plastic baggy and seal the bag. Then place the unit or units in a sealable 5 gallon steel drum. If the unit is under Thoreson-McCosh's factory warranty, ship to Thoreson-McCosh for warranty replacement credit. If the unit is no longer under warranty, please contact:

Bethlehem Apparatus
P.O. Box 890
Front St.
Hellertown. PA 18055
Ph: (215) 838-7034

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SECTION 6.10: MAINTENANCE SCHEDULE

TO BE USED IN CONJUNCTION WITH DRYER INSTRUCTION MANUAL

DRYER#:

DATE:

SPECIAL INSTRUCTIONS:

WEEKLY

CHECK AND CLEAN OR REPLACE FILTERS

CHECK BLOWER DIRECTION

CHECK FOR UNUSUAL NOISE

CHECK SYSTEM FOR AIR LEAKS (HOSES, HOPPER)

SEMI-ANNUALLY

OIL REGENERATION BLOWER MOTOR BEARINGS

CHECK BED INDEXING

CHECK LIGHTS

CHECK CONTACTS

CHECK AMP DRAW OF HEATERS AND BLOWER MOTORS

(SEE WIRING DIAGRAM , INSERT AND INDIVIDUAL MOTORS NAME PLATE)

ANNUALLY

REPLACE DEW POINT SENSOR

TEST MOLECULAR SIEVE

GREASE SHAFT BEARINGS AT TOP AND BOTTOM OF BEDS

(SUGGESTED GREASE: DOW CORNING #41 EXTREME HIGH TEMP. BEARING
GREASE OR EQUIVALENT

SECTION 7 ALARM MESSAGE CHART

ALARMS

MESSAGE

Index Switch timed out,
beds fail to index

BEDS NOT INDEXED

Process Temperature too high
(30 degrees above set point for 3 minutes)

TEMP TOO HIGH

Process Temperature too low
(20 degrees below set point for 3 minutes)

TEMP TOO LOW

Pull down motor failed to actuate the
rotate motor

PULL DOWN MOTOR
FAILURE

Thermistor temperature probe
Failed. The failed probe's
Temperature will read 999°F

PROBE FAILED

Process filter dirty

FILTER DIRTY ¹

Process air flow too low

AIR FLOW LOW ²

Regeneration heater failure

HEATER FAULT ³

Incorrect phasing of three phase
Power supply (see Section 2.1)

WRONG PHASE ⁴

Process Dewpoint exceeds the alarm set point

HIGH DEWPOINT ⁵

¹ Only displayed if dryer comes with dirty filter

² Only displayed if dryer comes with air flow monitoring and alarm option

³ Only displayed if dryer comes with regeneration heater fault option

⁴ Only displayed if dryer comes with blower direction alarm option

⁵ Only displayed if dryer comes with Dewpoint option

SECTION 8: SEVEN DAY TIMER SET UP

To set up the 7 day timer to turn on Monday morning and shut off Friday, program as follows: Example uses start at 6 A.M. Monday morning, auto set point, change to process set point each morning to 8 A.M., change to auto set point each evening to 5 P.M., shut off each evening at 7 P.M., Monday through Thursday, shut off Friday evening at 5 P.M.

MONDAY

START1 08:00 PROCESS SET POINT
STOP1 17:00 AUTO SET POINT
START2 06:00 AUTO SET POINT
STOP2 19:00 OFF

TUESDAY

START1 08:00 PROCESS SET POINT
STOP1 17:00 AUTO SET POINT
START2 06:00 AUTO SET POINT
STOP2 19:00 OFF

WEDNESDAY

START1 08:00 PROCESS SET POINT
STOP1 17:00 AUTO SET POINT
START2 06:00 AUTO SET POINT
STOP2 19:00 OFF

THURSDAY

START1 08:00 PROCESS SET POINT
STOP1 17:00 AUTO SET POINT
START2 06:00 AUTO SET POINT
STOP2 19:00 OFF

FRIDAY

START1 8:00 PROCESS SET POINT
STOP1 17:00 OFF
START2 6:00 AUTO SET POINT
STOP2 08:00

SATURDAY

START1 24:00 OFF
STOP1 24:00OFF
START2 24:00 OFF
STOP2 24:00 OFF

SUNDAY

START1 24:00 OFF
STOP1 24:00 OFF
START2 24:00 OFF
STOP2 24:00 OFF

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SECTION 9: SPI PROTOCOL

The **SPI protocol** allows the user to set the baud rate and unit I.D. To change the values, there is a DIP switch on the lower right hand corner of the Main control Board. Each switch, when pushed to the right of off, when pushed to the left is on. The bottom 4 switches are for setting the unit I.D., the base unit I.D. is 32. If the bottom switch is considered switch one, then to set the unit I.D.: (for the following switch 5 should always be in the Off position

UNIT I.D. = 32

Switch One Off
Switch Two Off
Switch Three Off
Switch Four Off

UNIT I.D. = 33

Switch One On
Switch Two Off
Switch Three Off
Switch Four Off

UNIT I.D. = 34

Switch One Off
Switch Two On
Switch Three Off
Switch Four Off

UNIT I.D. = 35

Switch One On
Switch Two On
Switch Three Off
Switch Four Off

UNIT I.D. = 36

Switch One Off
Switch Two Off
Switch Three On
Switch Four Off

UNIT I.D. = 37

Switch One On
Switch Two Off
Switch Three On
Switch Four Off

UNIT I.D. = 38

Switch One Off
Switch Two On
Switch Three On
Switch Four Off

UNIT I.D. = 39

Switch One On
Switch Two On
Switch Three On
Switch Four Off

UNIT I.D. = 40

Switch One Off
Switch Two Off
Switch Three Off
Switch Four On

UNIT I.D. = 41

Switch One On
Switch Two Off
Switch Three Off
Switch Four On

UNIT I.D. = 42

Switch One Off
Switch Two On
Switch Three Off
Switch Four On

UNIT I.D. = 43

Switch One On
Switch Two On
Switch Three Off
Switch Four On

UNIT I.D. = 44

Switch One Off
Switch Two Off
Switch Three On
Switch Four On

UNIT I.D. = 45

Switch One On
Switch Two Off
Switch Three On
Switch Four On

UNIT I.D. = 46

Switch One Off
Switch Two On
Switch Three On
Switch Four On

UNIT I.D. = 37

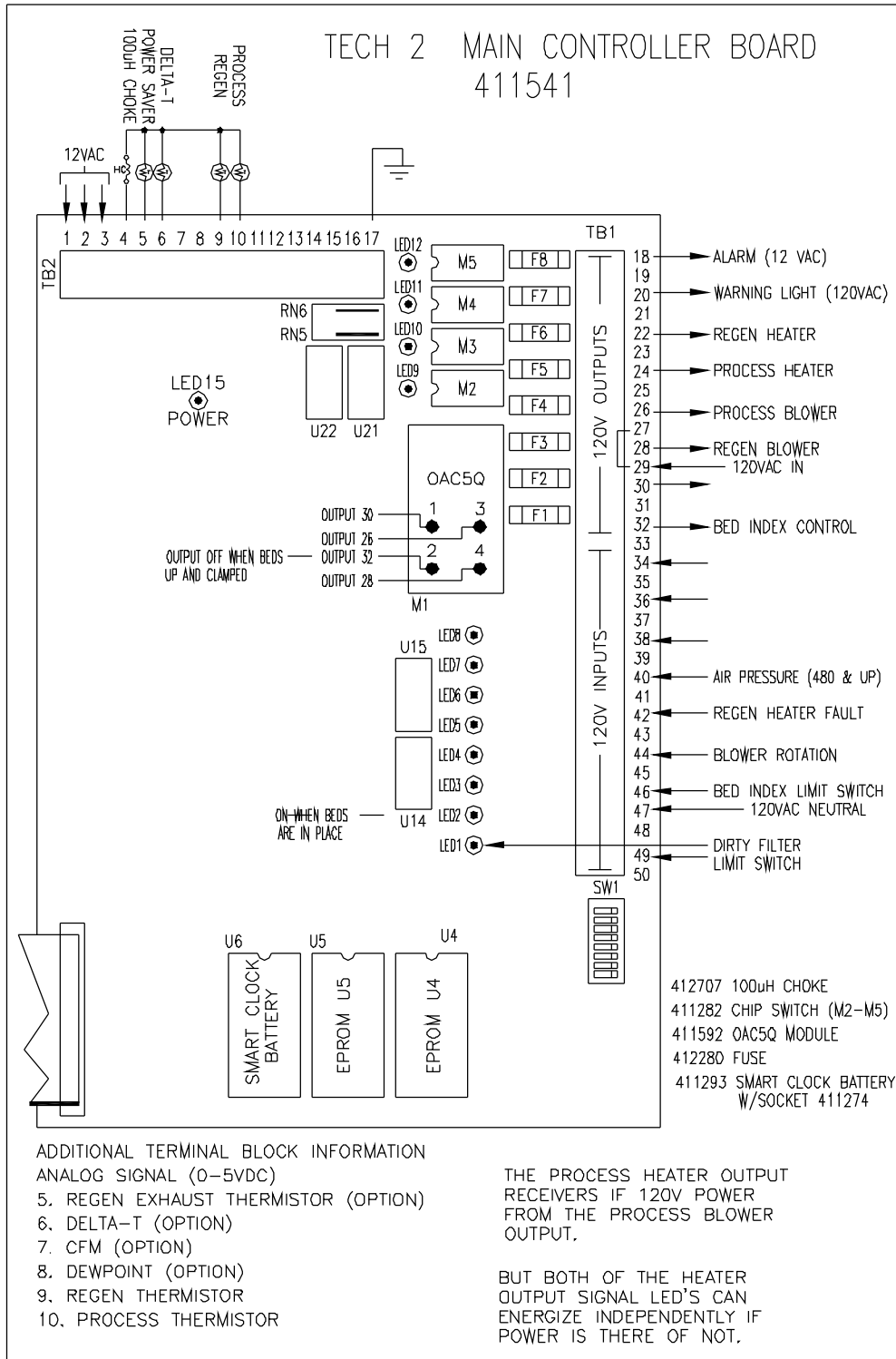
Switch One On
Switch Two On
Switch Three On
Switch Four On

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For higher unit I.D. numbers, repeat the above with switch 5 in the On position
To set the Baud Rate:

<u>Baud</u>	<u>Switch 6</u>	<u>Switch 7</u>	<u>Switch 8</u>
1200	On	Off	Off
2400	Off	Off	Off
4800	Off	On	Off
9600	Off	Off	On
19200	Off	On	On

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XX

A

TO CALIBRATE THE REGEN HEATER THERMISTOR, REMOVE THE SAMPLE SCREW AND INSERT A EXTERNAL TEMPERATURE PROBE. FIND THE HOTTEST TEMPERATURE IN THE TUBE. LOOSEN THE BRASS FITTING AND MOVE THE THERMISTOR IN AND OUT UNTIL THE TEMPERATURE READ-OUT IS THE SAME AS THE EXTERNAL PROBE. SNUG THE FITTING ONTO THE PROBE.DO NOT OVER TIGHTEN THE FITTING.

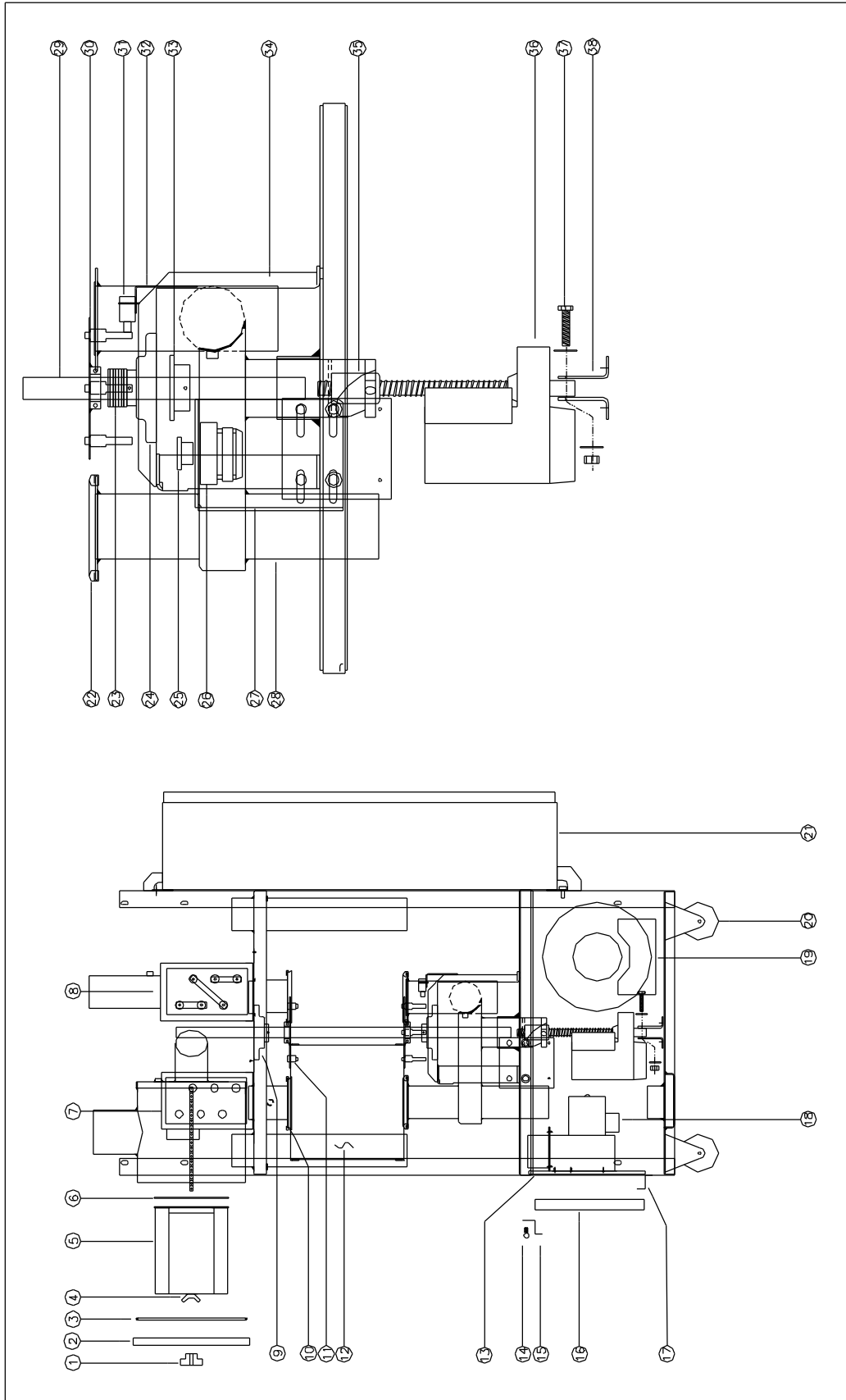
TO CALIBRATE THE PROCESS, POKE A HOLE IN THE HOSE CONNECTED TO THE PROCESS BOX TO CHECK THE TEMPERATURE WITH AN EXTERNAL PROBE.

SYM.	AMT	PART NO.	DESCRIPTION
XX			
XXX			

REVISION

THORESON McCOSH			
1885 THUNDERBIRD ST. TROY, MICHIGAN	PH. 248-362-0960 FAX 248-362-5270		
SCALE	DATE	DR. BY	DRAWING NO.
NOT TO SCALE	00-00-00	GLK	XX

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20	4	CASTERS, 2 SWIVEL, 2 RIDGID	
19	1	PROCESS BLOWER	
18	1	REGEN BLOWER	
17	1	LOWER REGEN FILTER BRACKET	
16	1	REGEN FILTER BRACKET	
15	1	UPPER REGEN FILTER BRACKET	
14	1	THUMB SCREW	
13	1	REGEN FILTER GASKET	
12	3	DESICCANT BED	
11	1	UPPER TURRET PLATE	
10	3	UPPER BED SEAL	
9	1	UPPER BEARING	
8	1	PROCESS HEATER BOX	
7	1	REGEN HEATER BOX	
6	1	PROCESS FILTER GASKET	
5	1	PROCESS FILTER	
4	1	WING NUT WITH FLAT WASHER	
3	1	PROCESS FILTER COVER GASKET	
2	1	PROCESS FILTER COVER	
1	1	KNOB	
SYM.	AM'T	DESCRIPTION	

40	X	---	
39	X	---	
38	2	PUSH-UP MOTOR BRACKETS	
37	1	SHOULDER BOLT, LOCK-NUT, 2 WASHERS	
36	1	PUSH-UP MOTOR	
35	1	PUSH-UP MOTOR NUT	
34	1	LOWER BEARING SUPPORT ASSEMBLY	
33	1	SHAFT GEAR	
32	1	BED INDEX LIMIT SWITCH BRACKET	
31	1	BED INDEX LIMIT SWITCH	
30	1	LOWER TURRET PLATE	
29	1	BED SHAFT	
28	1	MANIFOLD	
27	1	ROTATE MOTOR BRACKET	
26	1	ROTATE MOTOR	
25	1	ROTATE MOTOR GEAR	
24	1	LOWER BEARING	
23	X	SHIMMS, AM'T VARIES TO MAINTAIN MAX 3/8" GAP	
22	3	LOWER BED SEAL	
21	1	ELECTRICAL CONTROL ENCLOSURE	
SYM.	AM'T	DESCRIPTION	

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TD DRYERS COMMON SPARE PARTS LIST

MODEL	MANIFOLD UPPER SEAL	MANIFOLD LOWER SEAL	PROCESS FILTER	REGEN FILTER	DEW POINT SENSOR	MANIFOLD SEPARATION DEVICE	BED INDEX MOTOR
TD-6	413987 (3PCS)	413987 (3PCS)	404663	404663	-----	413989	409650
TD-12	413987 (3PCS)	413987 (3PCS)	410086	404663	411335	410213	409650
TD-24	413987 (3PCS)	413987 (3PCS)	410086	404663	411335	410213	409650
TD-40	413860 (3PCS)	413861 (3PCS)	409951	404654	411335	410213	409650
TD-60	413860 (3PCS)	413861 (3PCS)	409951	404654	411335	410213	409650
TD-90	413860 (3PCS)	413861 (3PCS)	409951	404654	411335	410213	409650
TD-120	413860 (3PCS)	413861 (3PCS)	409951	404654	411335	410213	409650
TD-150	413985 (3PCS)	413986 (3PCS)	410598	404648	411335	410213	410713
TD-180	413985 (3PCS)	413986 (3PCS)	410598	404648	411335	410213	410713
TD-240	413985 (3PCS)	413986 (3PCS)	410598	404648	411335	410213	410713
TD-360	413985 (3PCS)	413986 (3PCS)	410598	404648	411335	410213	410713
TD-480	411204 (3PCS)	411204 (3PCS)	(404656 PRE 1997) 404658	409951	411335	Call factory	410713
TD-600	411204 (3PCS)	411204 (3PCS)	(404656 PRE 1997) 404658	409951	411335	Call factory	410713
TD-800	411204 (3PCS)	411204 (3PCS)	404658	409951	411335	Call factory	410713
TD-1000	410865 (3PCS)	410865 (3PCS)	404658 (2PCS)	409951	411335	Call factory	413663
TD-1500	410865 (3PCS)	410865 (3PCS)	404658 (2PCS)	404656	411335	Call factory	413663
TD-2000	411792 (3PCS)	411792 (3PCS)	404658 (3PCS)	404656	411335	Call factory	413663

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MSDS

Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MERCURY

MSDS NUMBER: M1599 --- **EFFECTIVE DATE: 07/09/2001**

1. PRODUCT IDENTIFICATION

Synonyms: Quicksilver; hydrargyrum; Liquid Silver

CAS No.: 7439-97-6

Molecular Weight: 200.59

Chemical Formula: Hg

Product Codes:

J.T. Baker: 2564, 2567, 2569, 2572

Mallinckrodt: 1278, 1280, 1288

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS No	Percent	Hazardous
Mercury	7439-97-6	90 - 100%	Yes

3. HAZARDS IDENTIFICATION

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)

Flammability Rating: 0 - None

Thoreson-McCosh Inc

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:

May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointestinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:

Causes irritation and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion.

Eye Contact:

Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:

Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:

Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor. Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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J. T. Baker CINNASORB(R) and RESISORB(R) are recommended for spills of this product.

7. HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Limits:

- OSHA Acceptable Ceiling Concentration:

mercury and mercury compounds: 0.1 mg/m³ (TWA), skin

- ACGIH Threshold Limit Value (TLV):

inorganic and metallic mercury, as Hg: 0.025 mg/m³ (TWA) skin, A4 Not classifiable as a human carcinogen.

- ACGIH Biological Exposure Indices:

total inorganic mercury in urine (preshift): 35 ug/g creatinine;

total inorganic mercury in blood (end of shift): 15 ug/l.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face respirator with a mercury vapor or chlorine gas cartridge may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with a mercury vapor or chlorine gas cartridge may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Silver-white, heavy, mobile, liquid metal.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

13.55

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

356.7C (675F)

Melting Point:

-38.87C (-38F)

Vapor Density (Air=1):

7.0

Vapor Pressure (mm Hg):

0.0018 @ 25C (77F)

Evaporation Rate (BuAc=1):

4

10. STABILITY AND REACTIVITY

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

At high temperatures, vaporizes to form extremely toxic fumes.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.

Conditions to Avoid:

Heat, flames, ignition sources, metal surfaces and incompatibles.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

All forms of mercury can cross the placenta to the fetus, but most of what is known has been learned from experimental animals. See Chronic Health Hazards.

Carcinogenicity:

EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Mercury (7439-97-6)	No	No	3

12. ECOLOGICAL INFORMATION

Environmental Fate:

This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.

Environmental Toxicity:

This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY

Hazard Class: 8

UN/NA: UN2809

Packing Group: III

Information reported for product/size: 2.5KG

Thoreson-McCosh Inc

International (Water, I.M.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

International (Air, I.C.A.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 2.5KG

15. REGULATORY INFORMATION

-----\Chemical Inventory Status - Part 1\-----
Ingredient TSCA EC Japan Australia

Mercury (7439-97-6) Yes Yes No Yes

-----\Chemical Inventory Status - Part 2\-----
Ingredient Korea DSL NDSL Phil.

Mercury (7439-97-6) Yes Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----
-SARA 302- -SARA 313-----
Ingredient RQ TPQ List Chemical Catg.

Mercury (7439-97-6) No No Yes No

-----\Federal, State & International Regulations - Part 2\-----
Ingredient CERCLA -RCRA- -TSCA-

Mercury (7439-97-6) 1 U151 No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 2Z

Thoreson-McCosh Inc

Poison Schedule: S7

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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Thoreson-McCosh Inc

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

