TRICO POLY SYSTEMS LLC.

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SLINGER DEGASSER MANUAL

Rev. L

SEPTEMBER 2023

W/ HMI Screen

TRICO POLY SYSTEMS, LLC.
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Table of Contents

WARNING – HAZARD OF ELECTRIC SHOCK

SAFETY

Any installation involving electrical components such as electric heaters, motors, etc., must be grounded in accordance with the NEC (National Electrical Code) to eliminate shock hazard. All electrical wiring to electrical equipment must be installed in accordance with the NEC, or local electrical codes by a qualified person. For maximum equipment protection, the NEC recommends ground fault protection be provided for the branch circuit supplying electrical equipment.

NOTE: It is required that the end-user must provide and a fused disconnect in close proximity to each piece of electrical equipment provided by TPS (TRICO POLY SYSTEMS, LLC).

WARNING – MECHANICAL / CHEMICAL HAZARD

Equipment involving heaters, motors, gears, pumps, hoses, and or fluids, in or on equipment, provided by TRICO POLY SYSTEMS, LLC must be operated or serviced by authorized personal only. Proper personal safety equipment, energy lockouts, and proper tools must be used at all times.

If toxic chemicals are used in the manufacture of products from TPS equipment, proper handling, ventilation, and breathing apparatus may be required.

Caution: Any person operating this equipment should be aware of the potential hazards that exist with the total chemical system your company has selected and the mechanical environment that your company has selected to operate the equipment in. Check with your Chemical Supplier and Safety Department prior to operating this equipment. Under no condition should this equipment be used at elevated temperatures approaching or exceeding the autoignition temperature of the material stored or contained in or being processed in the area selected by your company.

MATERIAL SAFETY DATA SHEETS ARE TO BE MONITORED AT ALL TIMES.

In this manual, the Slinger Degasser will be referred to simply as the Degasser.

INSTALLATION

NOTE: Due to vibration during shipping, check that all bolts and screws on the top and bottom plate assemblies (including the discharge ball valve, suction block assembly and liquid level probe) are properly tightened down.

Slinger Degassers are delivered in a wooden crate. The unit is bolted to the base of the crate. Unbolt the legs and move into a production position. NOTE: IT IS REQUIRED THAT THE

DEGASSER BE LEVEL AND SECURELY BOLTED TO THE FLOOR.
The Degasser must be raised approximately 30” off the floor by using an overhead hoist. All six-leg clamps must be loosened to do this and retightened after lifting. For lifting the Degasser; the flange area of the gear reducer is a good location.

Figure 1. Hoisting Degasser

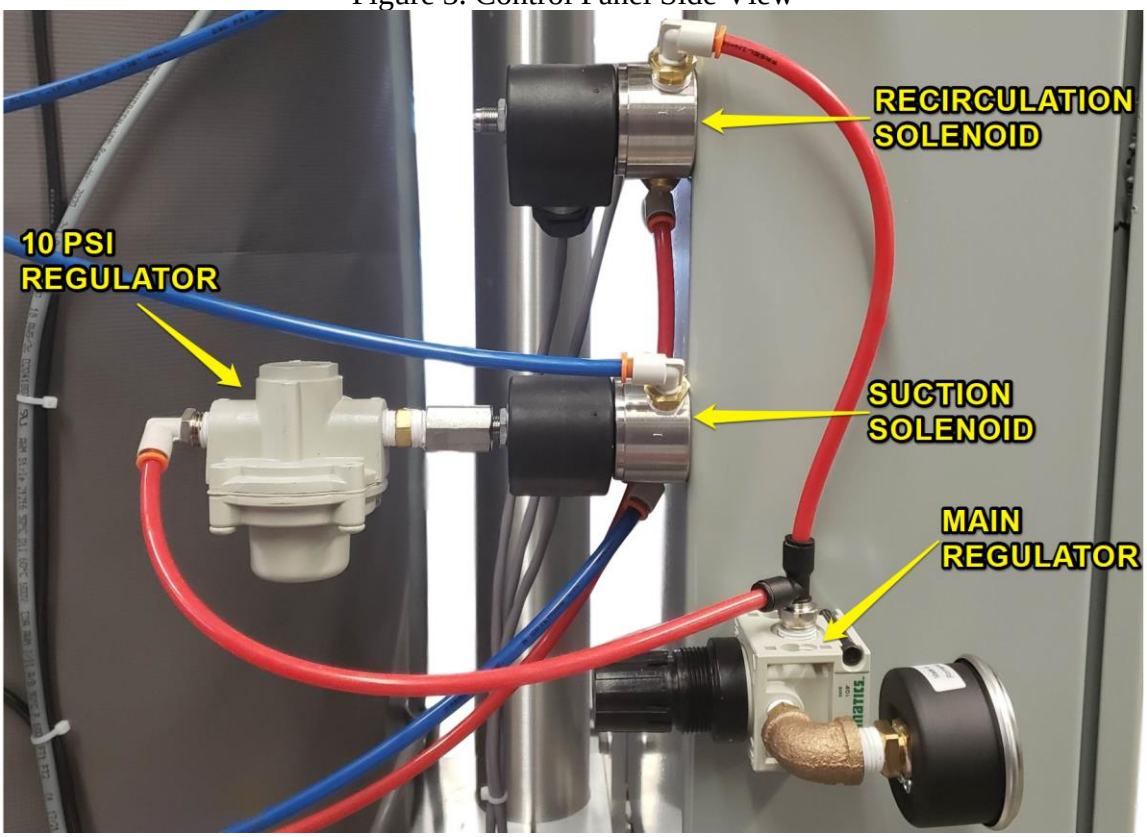
The Degasser should be placed next to the Metering Machine with the discharge material transfer hose connected from the Degasser ball valve to the pre-polymer metering pump. The dip tube assembly should be installed into the 55-gallon supply drum.

Figure 2. Dip Tube Assembly

Attached to the top of the Degasser is a 1” diameter vacuum hose that requires attachment to the vacuum source.

Located on the lower left of the Control Box panel is the main air regulator for the Degasser (see figure 3 below). Air supply from the Metering Machine or independent source is connected into this regulator at 60-100 PSI. The regulator should be set at 40-60 PSI (depending on material viscosity).

Figure 3. Control Panel Side View



POWER REQUIREMENTS

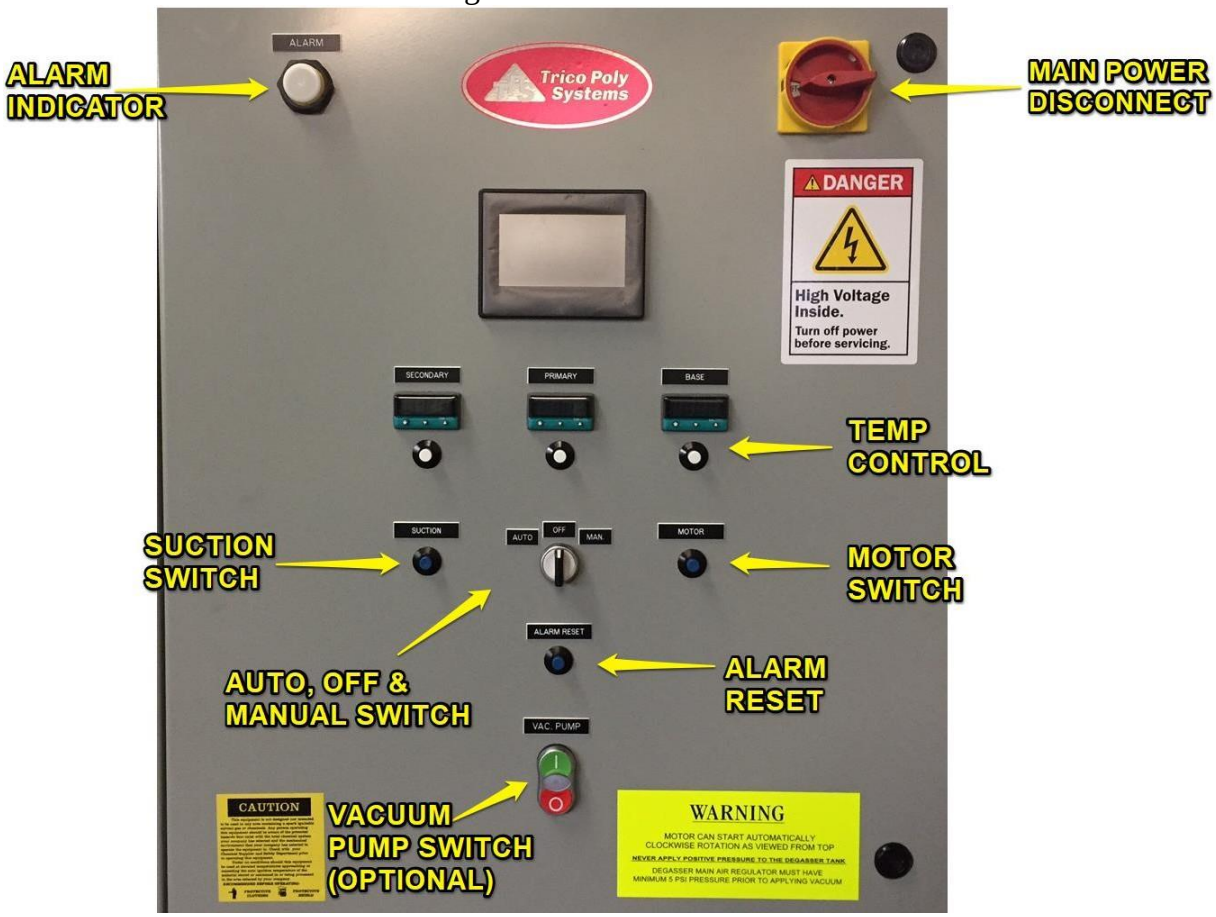
Electrical power for the control box is brought in through the opening on the upper right side of the enclosure. Voltage supply for standard TPS equipment is 3 Phase 208 or 240 VAC, however, please refer to the TPS nameplate (located on the left side panel of the control box) on each respective Degasser for voltage and amperage requirements. Voltage supply may be Delta or Wye (although no neutral is required); again, refer to the TPS nameplate. Electrical connections should be performed by a licensed electrician.

INITIAL DEGASSER SETUP (HMI SCREEN)

There is one crucial setting that is required for initial setup. This setting is the unit of temperature measurement. The Degasser’s HMI (Human Machine Interface) screen needs to know what temperature unit the Base temperature controller is set to. **CAUTION: THIS MUST BE SET TO MATCH THE TEMPERATURE UNIT OF THE BASE CONTROLLER. IF THIS SETTING DIFFERS FROM THE BASE CONTROLLER, THE PLC PROGRAM WILL NOT INTERPRET THE BASE’S TEMPERATURE CORRECTLY AND AN**

OVERHEATING CONDITION MAY OCCUR. See page 15 for HMI password entry and page 16 for instructions on setting this temperature unit.

Figure 4. Control Panel



GENERAL OPERATION

The Degasser has two main functions:

1. To remove any air and entrained gases from the material
2. To bring the temperature of the material up to some optimum point (usually the processing temperature).

The Degasser has two operating modes: manual and auto. Manual mode is for initially filling and emptying the Degasser. In manual mode degassing can take place (so long as the tank is under vacuum). Auto mode is where the degassing process is very efficient and is, therefore, the normal production mode. The Degasser is equipped with a motor (commonly referred to as the agitator motor) and gear reducer which turns a central shaft in the tank. This shaft turns a pump (known as the gerotor pump) located at the bottom of the tank. The supply drum or container is connected to the Degasser's suction block via the dip tube assembly and a 1.5" suction hose. With the Degasser under vacuum, the material is forced into the tank by atmospheric pressure on the supply container. Note: for moisture-sensitive materials, it is recommended to use an air drier or low pressure (1-2 PSI) nitrogen source on the supply drum and Degasser vent (needle

valve). **CAUTION: DO NOT APPLY POSITIVE PRESSURE EXCEEDING 5 PSI** (a relief valve is present should the tank be mistakenly pressurized, see page 33).

In automatic mode (with vacuum present and agitator motor running), material enters the Degasser through a suction valve and rises to the top of the tank via a hollow drive shaft (agitator shaft). At the top of the shaft, there are two rotating disks that sling the material against the heated wall. This creates a thin film of material that slides down the tank wall. Heaters on the sidewall and base quickly bring the material to operating temperature. However, incoming material must be pre-heated and should not be less than 15°C below the processing temperature. The combination of a thin film of material, heat, and vacuum causes the trapped air bubbles in the material to be easily removed. This is the degassing process.

Once the material reaches the bottom of the tank; it will form a liquid reservoir. A pump at the bottom of the tank forces the material into the suction block where it is directed towards the discharge ball valve and the hollow agitator shaft. If the ball valve is closed, all the material travels back up the shaft to be degassed again. This is referred to as recirculation. If the ball valve is open, the material will flow out of the ball valve and into the hose of the process equipment.

The design of the suction block is such that incoming material from the drum does not mix with degassed outgoing (to ball valve) material from the reservoir.

NOTE: Depending on material viscosity, standard flow Degassers utilize a 1.5HP agitator motor and can discharge approximately 30-32 lb/min (600-800cps) with 5/1 gear reduction. High flow Degassers use a 2HP motor and larger gerotor pump and can discharge approximately 45 lb/min.

As an option, some Degassers ship with a heated discharge hose and ball valve on a 3’ stand. This setup is typically used for hand batching. Caution should be used when opening the discharge valve as the material is under pressure and will flow with considerable force. The material discharge pressure can be reduced by lowering the pressure of the main regulator.

The Degasser’s control panel contains an HMI (Human Machine Interface) screen and temperature controllers. A status light located at the upper left switches to various colors and states (maintained or blinking) to indicate the status of the Degasser.

LIQUID LEVEL PROBE

A liquid level probe is used to measure the amount of material in the tank. The probe is mounted on the bottom plate and rises into the tank approximately 24 inches. This probe gives a continuous liquid level readout. The probe’s electronics connects to the HMI screen. The screen displays the level in percent (0-100). 100% refers to liquid at the tip of the probe (approximately 24” from the bottom plate. The Degasser’s tank is 36” in height. The logic functions with three levels: low, control and flood.

Note: High capacity Degassers are double the height of the standard tank and thus contain a 48-inch probe.

A secondary probe is mounted on the tank wall and located near the top (several inches below the Primary Heater Junction Box). This probe is at a fixed position on the tank and is a redundant flood probe (see page 27). It will trigger a flood condition should the continuous probe malfunction.

In auto mode, when the PLC measures the "control" level, it automatically turns on the suction valve solenoid and the suction valve opens to allow incoming material from the supply drum. Once liquid level rises and the control is satisfied, the PLC turns off the suction valve solenoid and the suction valve closes.

For the continuous probe, all three points (flood, control and low) are programmable via the HMI. It is shipped with the standard setting of 50% for the control level, but this can be changed by the customer. See pages 16-18.

TEMPERATURE CONTROLLERS

There are three heaters on the Degasser, each with its own temperature controller. Each controller commands a solid-state power relay for its respective heater.

The Base temperature controller maintains temperature on the liquid reservoir. Its temperature sensor is located on the base plate and protrudes into the reservoir several inches. The Base controller communicates with the PLC. To prevent damage to the temperature sensor and to prevent the pump from running when the material is cold and very viscous, the PLC does not allow the pump to run until the Base has reached set point.

The Primary and Secondary controllers maintain temperature for the tank wall. The Primary sensor is located approximately 1/3rd up the tank wall. The Secondary sensor (see note below) is located on the upper tank wall (a few inches from the top plate). It is shaped like a hook and thus referred to as the hook sensor. The Secondary heater is seldom used. It is enabled only when in Auto mode and the suction valve is enabled. Typical operation requires only the Primary heater.

Located under each temperature controller is an on/off switch. This is used to cycle power to the controller when an alarm condition exists or to simply switch off the controller when the heat is not needed.

Note: On Degassers with serial numbers 181220 and beyond, the following changes were made:

1. The secondary temperature sensor is no longer on the tank wall. It is located on the top plate near the short sight-port. It is no longer hooked shaped, but straight.
2. All RTD temperature sensors were changed to standard curve 100Ω sensors.

CONTROL SWITCHES

Motor

The Motor switch is a momentary switch used to run the motor in Manual mode. Vacuum in the tank must be vented to run the motor in Manual mode.

Suction
The Suction switch is also a momentary switch. It is used to transfer material into the Degasser in Manual mode. It is also used to initiate suction in Auto mode and when the Degasser is ready for more material after a vacuum break alarm (page 12).

Alarm Reset
The Alarm Reset switch is used to silence the audible alarm. When the alarm sounds, depress the reset switch momentarily to silence the audible alarm. This action simply disables the audible alarm; the operator must investigate the cause for the alarm.

Temperature Controller Switches
Each controller has its own power switch, located directly under each controller. The switch also functions as an "Alarm Reset" when there is an under/over temperature alarm condition.

Vacuum Pump Control – Optional
On some Degassers, a vacuum start/stop switch is located under the Alarm reset switch. The vacuum switch controls a contactor located in the control box. This contactor is used to control an external vacuum pump.

DETAILED OPERATION

MANUAL MODE (Start-up / Manual Fill)

1. Turn on main power to the Slinger Degasser by turning the main power disconnect switch to “ON”. This switch is in the upper right corner of the control panel. This allows power to all the internal circuit breakers. Once powered on, a one-minute timer is activated to initialize the Degasser.

Note: The control panel cannot be opened unless the power switch is in the “OFF” position, otherwise the switch mechanism will be damaged.

Note: Air pressure (40-60 PSI) <u>MUST</u> be on the main air regulator before operating the Slinger Degasser. The main air regulator is supplying a secondary air regulator, which is set for 10 PSI. This 10 PSI maintains the suction diaphragm closed (when the suction solenoid is off). If vacuum is applied to the Degasser without main air and the suction diaphragm is not closed, the material in the supply drum can flow into the degasser uncontrolled.

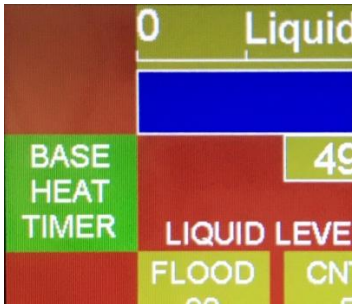
2. At power up, the operate switch (Auto/Off/Manual) should be in the Off position. If it is not, a display message will appear on the screen.

3. Set the operate switch to Manual. This will enable the Base and Primary heaters. The Degasser will begin the warm-up phase. Verify the correct setpoints for both temperature controllers. To verify, press the star button on each controller; the setpoint and temperature unit will display. A blinking LED light at the upper right of each controller indicates the controller is calling for heat. If the tank is completely empty, it is

recommended to switch off the Primary heater, otherwise, with no liquid touching the Primary sensor, an over-temp condition may result. The Secondary controller may also be calling for heat, but its power relay is not enabled unless in Auto mode and the suction valve is enabled.

4. Turn on the vacuum source. A vacuum gauge displays the vacuum in the tank. The gauge is located on the upper left of the control box (at the needle valve). Vacuum should be between 25 to 30 inches of mercury.

5. Once the Base reaches setpoint, a timer is enabled to ensure that the entire Base has reached a uniform temperature. When the timer is on, a text message displaying "Base Heat Timer" is shown on the main screen (see below). This timer can be changed, refer to page 16-18. Once the timer text disappears, the HMI screen displays "READY". At this point you can switch to Auto mode (if under vacuum and there is material in the tank) or continue in Manual mode.



6. To introduce material into the Degasser, the operator must depress the Suction button (energizing the suction solenoid). This is a momentary switch. The suction solenoid routes vacuum from the tank (tall sight port) to the suction valve (diaphragm). This creates a pathway for material to flow into the Degasser. An adjustable stop deflector can be adjusted for material flow. The stop deflector is located on the bottom of the suction block assembly and has a knurled knob (thumbscrew). Turning it clockwise will press the deflector against the suction diaphragm and therefore reduces or totally stops the flow of incoming material. Turning it counterclockwise, allows the vacuum to pull on the diaphragm and thus opens the path from the inlet to the agitator shaft, allowing material to flow. Adjustment is dependent on viscosity and desired inlet flow. **NOTE: In Manual mode, so long as vacuum is present, material may be transferred into the Degasser after the one minute power on initialization timer. You do not have to wait until the Base reaches processing temperature to transfer in material. However, it is advisable to have the supply drum and Degasser near processing temperature when it is being filled. Otherwise, the cold and viscous material will take a considerable amount of time to be transferred to the Degasser**.

7. The material flows around the suction diaphragm and up the hollow agitator shaft. At the top of the shaft are three outlet holes. The material will flow out of these holes, onto the slinger disc and fall to the bottom of the tank. Once "LOW LEVEL" has been satisfied, the operator can let go of the Suction button. This switches off the suction solenoid and thus vacuum is no longer applied to the suction diaphragm. Instead, 10 PSI from the secondary air regulator is applied to the diaphragm and this causes it to press up against

the inlet for the hollow shaft (blocking the flow).

Note: If vacuum is present and in manual mode, DO NOT open discharge valve. This will cause material and or air to be drawn into the Degasser from the discharge valve.

AUTOMATIC MODE – Discharge valve closed

Once material low level has been satisfied, the Degasser can be set to AUTOMATIC mode.

1. Set the operate switch to AUTO mode. The motor will run if the Base has reached the setpoint temperature AND the Base timer has expired. The agitator motor must rotate in a **clockwise direction**, as viewed from the top. If it does not, set the operate switch to Off or Manual (see troubleshooting section on page 28).

2. Press the Suction button once to initialize suction. This action is only needed once unless there is a vacuum break alarm (see separate section on "vacuum break alarm", page 12). Material will flow into the Degasser. The agitator motor will turn the slinger discs, resulting in the material hitting the heated sidewall and flowing down to the reservoir. This is the degassing process. Once the control level is satisfied, the suction solenoid is automatically turned off and no new material will enter the Degasser.

The material inside the Degasser will now recirculate through the gerotor pump on the bottom of the tank and travel up the agitator shaft to be re-slung against the heated sidewall. It is most likely that the operating temperature is higher than the supply drum temperature, because of this difference; the Base and Primary temperature controllers may display an alarm condition. The display will read "AL". Reset the temperature controller by recycling power to the controller. The heaters will quickly bring the material up to setpoint temperature.

Note: To determine when the material is degassed enough for dispensing, the operator must view the material through the sight ports located on the Degasser's top plate.

AUTOMATIC MODE – Discharge valve opened

Note: The Degasser MUST be in AUTO mode for material dispensing.

Once material is ready to be dispensed, open the discharge ball valve. Material is discharged under pressure through the ball valve and into the heated material transfer line (and on towards the pre-polymer metering pump). As material is dispensed; the liquid level will go below the control point. Once this occurs, the suction diaphragm will open and allow material to flow until control liquid level is satisfied. As new material is transferred into the Degasser, an upper sidewall temperature sensor is sensing the incoming material. If the new material is below set point, all heaters including the Primary heater, can activate and quickly heat the material to achieve set point.

Material discharge pressure at the ball valve is indirectly set by the main air regulator. In Auto mode, the "recirculation" solenoid is energized. This solenoid routes air pressure from the main regulator to the recirculation diaphragm. This diaphragm is located behind a square aluminum

cap (at the suction block). The design of the suction block is such that the pump generates an equal amount of pressure at the ball valve to overcome the pressure on the recirculate valve (diaphragm).

Gerotor pump theoretical maximum output:

Gear Reduction	lbs/min
5/1	50
7.5/1	33
10/1	24

Note: Discharge output is dependent upon incoming material (viscosity 600-800 cps) being within 15°C of the processing temperature. Otherwise, discharge flow rate may decrease

AUTOMATIC MODE – Vacuum Break Alarm

When in AUTO mode, there will come a time when the supply drum becomes empty. When this happens, air from the drum will enter the Degasser. This will cause the vacuum level in the tank to drop. A vacuum switch will trigger and cause a vacuum break alarm. This action automatically commands off the suction valve. Once suction is switched off, the vacuum level will quickly return to normal. The operator has two choices:

1. Replace the supply drum and depress the Suction button to re-initialize suction. New material will automatically flow into the Degasser and fill to the liquid level control point.
2. The operator chooses not to replace the drum and utilize only the remaining material in the Degasser. The operator must **NOT** depress the Suction button; the Degasser will not automatically fill to maintain liquid level control point. As material is dispensed to the metering pump, the liquid level will continue to decrease until the "Low Level" alarm sounds, and its text message is displayed on the main screen. The motor will continue to run for two minutes after low level is triggered.

Note: Once the motor stops, the discharge valve should be immediately closed, otherwise material can be drawn back into the Degasser (via vacuum in the tank).

EMPTYING – In Manual Mode

Emptying the Degasser allows the material inside the tank to flow back into the supply drum through the suction hose. The Degasser must be vented to do this. As the material lowers in level inside the tank, the low-level alarm will enable.

Steps for Emptying Degasser

1. Verify the discharge ball valve is closed.
2. Set the operate switch to Manual mode.
3. Isolate the vacuum source/pump from the Degasser. The typical setup has a valve between the Degasser and vacuum source.
4. Vent the Degasser. This is accomplished by opening the needle valve located near the

vacuum gauge. The valve is connected to the vacuum switch. **CAUTION: NEVER APPLY POSITIVE PRESSURE TO A DEGASSER**

5. If not fully open, open the suction diaphragm by turning the adjustment knob fully counterclockwise.
6. Verify the suction hose is connected from the Degasser to the supply drum.
7. Depress the Motor push-button switch. The agitator motor will turn the gerotor pump, which will pump the material around the suction diaphragm and into the suction hose. During this operation, the suction valve is enabled. This action turns off the 10 PSI pressure to the diaphragm.
8. When the emptying process is completed, set the operate switch to Off.
9. The remaining material in the suction hose can be emptied by releasing the hose from the dip tube. Carefully lower the suction hose into a pail to catch the remaining liquid.

SHUT DOWN

Shutting down the Degasser will depend on its future use. The vacuum may be left on the Degasser as well as material. From day to day operations, a typical shutdown may only consist of:

1. Close the discharge valve.
2. Isolate the vacuum source.
3. Mechanically close off the suction valve by turning the thumbscrew (clockwise) located on the bottom of the suction cap.
4. Set the operate switch to Off.
5. Turn off power to the Degasser via the main power switch.

If the Degasser will not be used for a period of time (more than a few days), it is recommended to empty the Degasser and vent the vacuum with nitrogen (refer to page 24). **CAUTION: NEVER APPLY POSITIVE PRESSURE TO A DEGASSER**

Note: If the Degasser's suction hose is removed from the dip tube assembly and the tank contains material (with vacuum, not present), the material will slowly drip down through the pump and into the suction hose. To prevent this, use the thumbscrew to mechanically close off the suction valve.

ALARM CONDITIONS

The alarm will sound on the following alarm conditions:

1. Temperature. Any temperature controller can alarm when the temperature is outside the band for the setpoint.
2. Liquid level low. In Auto mode, once the low alarm triggers, a two-minute timer is initiated. Once the timer expires, the motor is commanded off. If the low alarm is overridden (see page 16), the alarm is not triggered, and the motor will continue to run.
3. Liquid level flood. The initial flood alarm will trigger the normal audible alarm. If the level reaches the secondary flood probe, the audible will cycle to a ½ second alternating

beep. With either flood alarm, the suction solenoid (if enabled) will be commanded off (in Auto and Manual modes). If the flood alarm is overridden (see page 16), The flood is ignored, and the Degasser will run normally.

4. Vacuum not present in Auto mode.
5. Vacuum present in Manual mode while trying to run the motor.
6. Motor not running when commanded on.

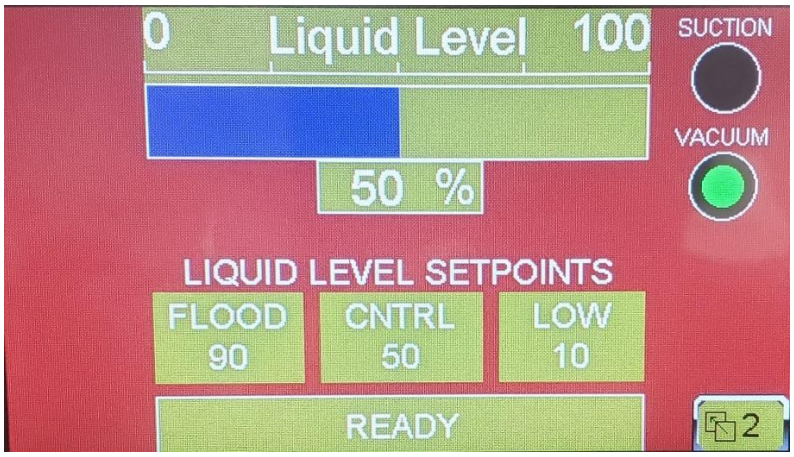
When any alarm conditions exist, the audible alarm will sound, and the status light will turn red. The alarm reset button can be pressed to turn off the audible alarm. Once the switch is pressed, the audible alarm will turn off and the status light will switch from maintained red to blinking red (indicating that the alarm condition is still present).

HMI SCREEN / PLC OPERATION

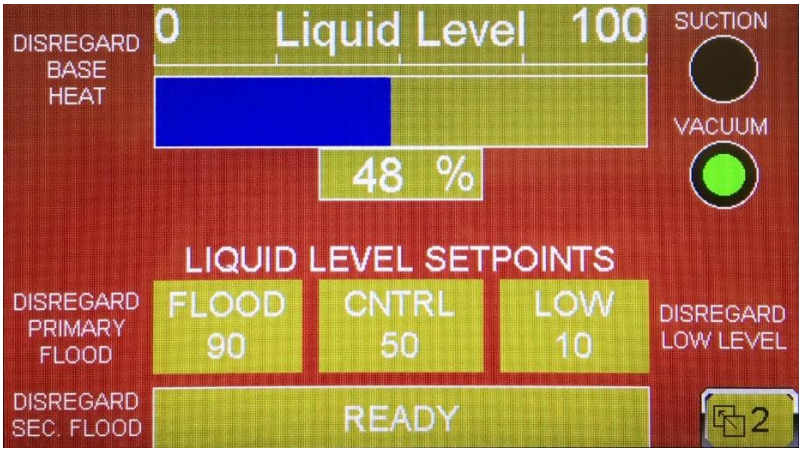
The HMI screen is both a display device for the operator and a PLC (programmable logic controller). It has several screens that display Degasser status (via indicators and text messages). It controls Degasser operation, all heaters and communicates with the Base temperature controller.

Main Screen

The Main screen (screen 1) displays the liquid level reading and general status of the Degasser.



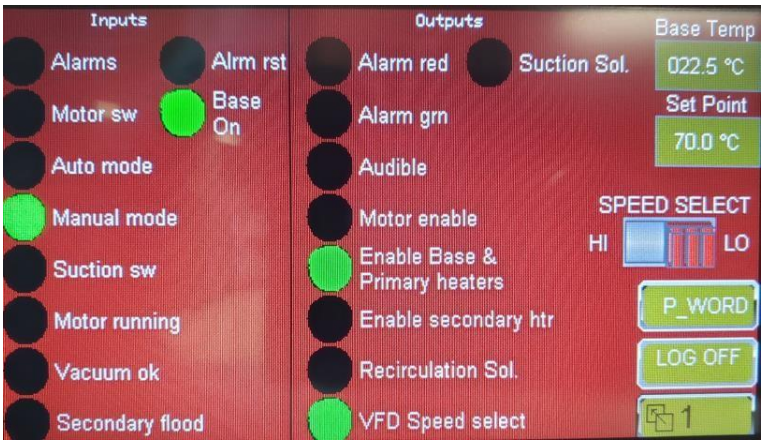
1. Liquid level is displayed numerically and as a bar graph. Setpoints are also displayed.
2. A text box at the bottom of the screen displays various messages during operation.
3. Two indicators for suction and vacuum are also displayed. When suction is enabled the indicator flashes green. When vacuum is present, the indicator maintains green.
4. Special text messages (see below) are displayed when the respective input is set to override (Base Heat, Flood and Low level). Note: from Degasser serial numbers 200819, there are two messages for flood override (primary and secondary). These override settings are only accessed from the password-protected screen, see the next page.



5. The button at the lower right labeled “2” is used to navigate to the second screen.

Status Screen (screen "2")

This screen is used primarily to troubleshoot Degasser operation. Inputs and outputs are listed. The black color indicates the off state, green indicates the on-state. The Base current temperature and setpoint is displayed on the upper left. The button at the lower right labeled "1" is used to navigate to the main screen.

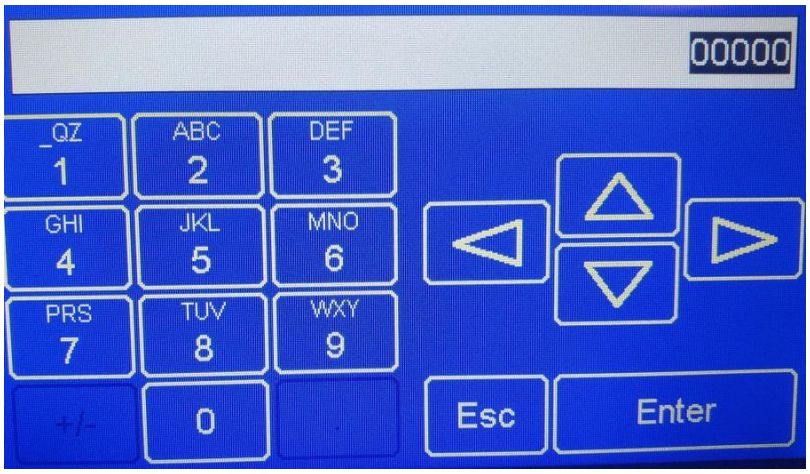


For Degassers equipped with speed control, the high/low switch is used to select the speed.

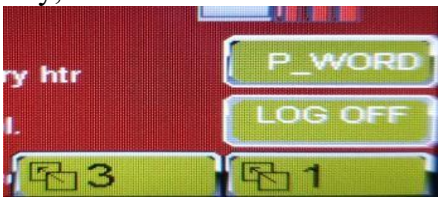
Password

There is a third screen that is only accessible via a numeric password. This screen is used to configure special settings that do not normally change. To enter the password, press the "P_WORD" button and the password screen will display:

Password Screen

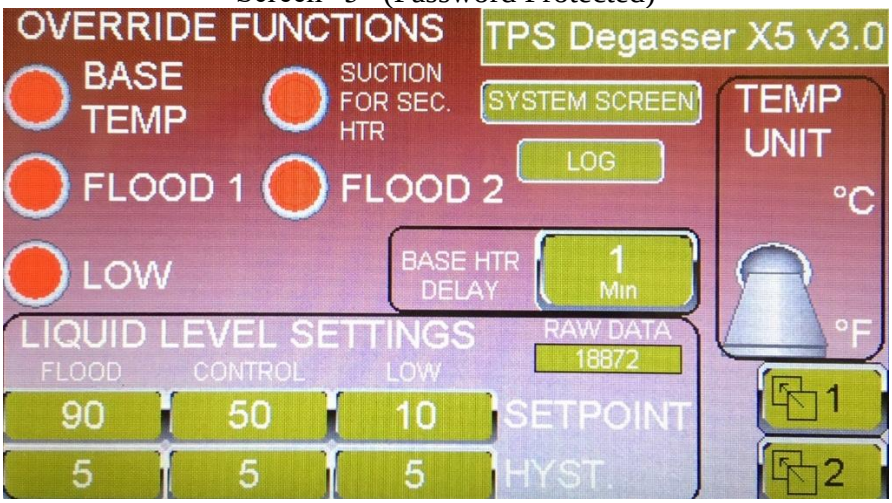


If the password is entered correctly, a button labeled "3" will be visible at the lower right.



Configuration Screen
This password-protected screen contains several settings and configurations. The text at the top of the screen displays the Degasser's software version. This is for TPS use only. Once this screen is active, an internal 5-minute timer initiates. After 5 minutes, this screen is disabled.

Screen "3" (Password Protected)



Temperature Unit
On the right side of the screen, there is a toggle switch for setting the Degasser's temperature unit: Celsius or Fahrenheit. The PLC needs to know what temperature unit the Base temperature controller is set to. **CAUTION: THIS MUST MATCH THE TEMPERATURE UNIT OF THE BASE CONTROLLER. IF THIS SETTING DIFFERS FROM THE BASE CONTROLLER, THE PLC WILL NOT INTERPRET THE BASE'S TEMPERATURE CORRECTLY AND A MATERIAL OVERTEMP DAMAGE MAY RESULT**. This setting is stored in battery-backed RAM and need only be done once.

Override Buttons
These buttons are used to change Degasser operation. Normally these settings should not be changed, but certain conditions may arise to temporarily change the Degasser's run mode. Buttons are normally off (red). If switched to ON (green) the setting is in override (ignored). When in override, a text message on the main screen is displayed. Some functions are reset upon recycling power, some are retentive. Each is listed below:

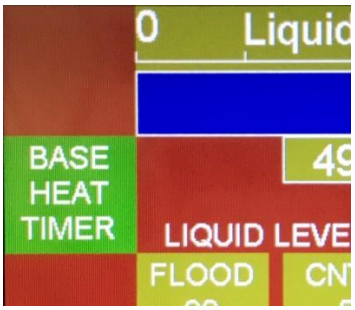
1. Base Temp: Normally, upon power-up, the PLC will not allow the motor or suction valve to energize until the Base has reached its setpoint and the Base heater timer has expired. If this button is switched to ON (green), the PLC will ignore the Base's temperature and timer, and allow the motor and or suction valve to turn on. This function resets to OFF upon recycling power. Caution: this setting should only be changed for special circumstances. Allowing the motor to run before the Base has reached temperature may cause internal damage.
2. Flood: If switched to ON, the PLC will disregard the flood condition. Note: from Degasser serial numbers 200819 and beyond, there are two override buttons. FLOOD 1

is for the primary flood from the continuous level probe. FLOOD 2 is for the secondary flood probe located on the tank wall near the top. Use caution when setting these buttons! These functions reset to OFF (Red) when recycling main power.

3. Low: If switched to ON, the PLC will disregard the low setpoint. Use caution when setting this button since there is no low alarm and the Degasser may run empty. This function is retentive.
4. Suction for Sec. Htr: If switched to ON and in Auto mode, the PLC will disregard the suction valve and allow the secondary wall heater to enable (regardless of the suction valve's state). Use caution when setting this button since too much heat will cause an over-temp condition. This function resets to OFF upon recycling power.

Base Heater Delay

This is a numeric entry button. A time between 1 and 60 minutes can be entered. This timer is enabled once the Base reaches setpoint. When the timer has expired, the Base (reservoir) is uniformly heated and the Degasser is ready; the status/alarm light will switch to green. If this setting is changed, a power cycle to the Melter is required, otherwise, the old-timer value will be used. When the timer is active, a "Base Heat Timer" text message appears on the main screen, see below.



System Screen Button

This button is used to change internal PLC settings. **DO NOT CHANGE THESE SETTINGS WITHOUT GUIDANCE FROM TPS**.

Log Off Button

This button is used to "log off" from the password-protected screen. Once pressed only the main and status screens will be accessible.

Liquid Level Settings

Numeric entry buttons are used to change the level settings in percent. A keypad will appear once the respective button is depressed. Recall that 100% is the level at the tip of the probe and not the top of the tank.

1. Setpoints: Each setting can be changed to maintain a lower or higher setpoint of each function.
2. Hyst (Hysteresis): the hysteresis can also be changed. This is the window where a setpoint is active.
    a. Flood: Flood is active when the level reaches the flood setpoint and remains active until the level falls below the setpoint minus the hysteresis. From the settings above, the flood condition will trigger when the level reaches 90% and remain active until the level falls below 85%.

b. Control: The control setting is what causes the suction valve to open and close in Auto mode. The suction valve will open and allow material in when the level falls below the control setpoint minus the hysteresis. It will close when the level rises above the control setpoint plus the hysteresis. From the above settings, this means suction will occur when the level is below 35%. The Suction will stop when the level reaches 45%.
c. Low: Low is active when the level falls below the low setpoint. It remains active until the level rises above the setpoint plus the hysteresis. From above, the low condition exists when the level is below 10% and remains active until the level rises above 15%.

3. Raw Data: Raw data signal for the liquid level. It is only used for troubleshooting.

INPUTS / OUTPUTS

The HMI/PLC has four inputs and four outputs. An I/O module is used for the remaining inputs and outputs. HMI screen 2 displays the I/Os. The respective indicator is green when the I/O is active. The indicator is black when the I/O is off.

HMI/PLC Inputs

No.	Input	Description (LED Green)
1 (I1)	Controller alarms	Alarm condition (daisy chained from each controller)
2 (I2)	Motor switch	Run the motor in manual mode
3 (I3)	Auto mode	Operate switch set to Auto
4 (I4)	Manual mode	Operate switch set to Man.

I/O Module Inputs

No.	Input	Description (LED Green)
1 (I17)	Suction switch	Suction switch depressed
2 (I18)	Motor running	Motor is running (feedback from VFD or contactor)
3 (I19)	Vacuum Ok	Vacuum switch triggered (vacuum present in tank)
4 (I20)	Secondary flood	Secondary flood probe triggered (flood condition)
5 (I21)	Alarm reset	Reset switch to silence audible alarm
6 (I22)	Base controller on	Base controller powered on
7		

HMI/PLC Outputs

No.	Output	Description (LED Green)
1 (Q1)	Visual alarm-red	Output to control status light – red state
2 (Q2)	Visual alarm-green	Output to control status light – green state
3 (Q3)		
4 (Q4)		

I/O Module Outputs

No.	**Output**	**Description (LED Green)**
1 (Q17)	Audible alarm	Audible alarm commanded on
2	Motor Start	Motor command on
3	Enable Base & Pri. Heaters	Enable base and primary heaters
4	Enable Secondary Heater	Enable secondary heater (hook sensor)
5	Recirculation	Recirculation solenoid commanded on
6	Speed select	VFD speed select
7	Suction	Suction solenoid commanded on

CALIBRATION - CONTINUOUS LIQUID LEVEL PROBE

For testing, the probe is calibrated at TPS' facility with Benzoflex. The probe should be re-calibrated using the actual material. Calibration must be performed at the processing temperature and vacuum level.

1. With power on and vacuum on the Degasser, set to manual mode.
2. Transfer a bit of material from the drum into the Degasser (just enough to cover the base of the probe). Use the sight port to check the level.
3. Locate the liquid level probe (it is mounted on the Degasser's bottom plate, near the base temperature sensor). Remove the bottom cover.
4. Looking into the housing, locate the span "S" and zero "Z" buttons. There are UP and DOWN buttons for span and zero.
5. To establish the zero (empty) level, first, observe the liquid level display on the HMI's main screen. If the number displayed is below zero, press and hold the Z UP button to get to zero. If the number is above zero, press and hold the Z DW button to go down to zero. In either case, pressing the button a longer time will increase the rate at which the reading changes. Once zero is displayed, the probe is calibrated for the zero level.
6. Fill the Degasser to the tip of the probe and turn on the Primary wall heater to bring the material to the process temp. Note: if the material tends to develop too much foam, then fill the Degasser in steps. Once at temperature, proceed to the next step.
7. To establish the full level, press and hold the span UP or DW buttons until the HMI displays a level of 100 (if the meter has been set up for percentage). Once this occurs, the flood alarm will turn on. The flood can be temporarily ignored (see page 16 -18).
8. This completes the calibration procedure. Too remove the flood condition, disconnect the vacuum and vent the Degasser. Then run the motor to empty the Degasser until the LL reading is below the flood hysteresis level (usually 85%).

Special precautions for Continuous Level Systems

1. When removing the probe for cleaning, do so very carefully. Only use solvent and soft tools to clean any buildup off the probe.
2. When re-installing the probe do not over tighten. Snug the probe then seal with a silicone caulk material.
3. *The probe must be calibrated at operating temperature.*
4. Do not turn on the agitator until all solid material inside the Degasser has melted.

Any solids inside the Degasser could destroy the probe if agitated.

RESET FUNCTION - CONTINUOUS LIQUID LEVEL PROBE

In a few instances, the calibration procedure above will not result in a functioning level probe and the probe's electronics must be reset. To reset, the Degasser should be fully empty:

1. Press both "DW" buttons for two seconds.
2. Wait two seconds.
3. Press both "UP" buttons for two seconds.
4. The display should show a level near zero.
5. Run the normal calibration procedure described above.

TEMPERATURE CONTROLLER SETTINGS

Degasser S/Ns starting with 181220 (all temperature zones including heated discharge hose)

CAL 3300 Program

LEVEL 1		LEVEL 2		LEVEL 3	
Tune	OFF	**SP1.P**	--	**SP1.d**	SSd
bAnd	10 (18)	**bAnd**	OFF	**SP2.d**	rLY
int.t	5	**PL.1**	100	**Burn**	uP.SC
dEr.t	25	**PL.2**	100	**rEU.d**	1r.2r
dAC	1.5	**SP2.A**	bAnd	**rEU.L**	1n.2n
CYC.t	20	**SP2.b**	Lt.ho	**SPAn**	0
oFSt	0	**diSP**	1	**Zero**	0
SP.Lk	OFF	**hi.SC**	150 (302)	**ChEK**	Off
SPrr	0	**Lo.SC**	0 (32)	**rEAD**	--
SPrn	OFF	**inPt**	RTD	**dATA**	CTA
SoAk	--	**Unit**	°C (°F)	**Ver**	(factory set)
Set.2	8 (14)			**rESET**	(see below)
Bnd.2	0.1 (0.2)				
CYC.2	ON.OFF				

Note: On Degassers with serial numbers 181220 and beyond, the following changes were made:

1. The secondary temperature sensor is no longer on the tank wall. It is located on the top plate near the short sight-port.
2. All RTD temperature sensors were changed to standard curve 100Ω sensors.

TEMPERATURE CONTROLLER SETTINGS

Degasser S/Ns prior to 181220 (Base & Wall Heaters Only)

CAL 3300 Program

LEVEL 1		LEVEL 2		LEVEL 3	
Tune	OFF	**SP1.P**	--	**SP1.d**	SSd
bAnd	10 (18)	**bAnd**	OFF	**SP2.d**	rLY
int.t	5	**PL.1**	100	**Burn**	uP.SC
dEr.t	25	**PL.2**	100	**rEU.d**	1r.2r
dAC	1.5	**SP2.A**	bAnd	**rEU.L**	1n.2n
CYC.t	5	**SP2.b**	Lt.ho	**SPAn**	-56 (-101)
oFSt	0	**diSP**	1	**Zero**	15 (27)
SP.Lk	OFF	**hi.SC**	150 (302)	**ChEK**	Off
SPrr	0	**Lo.SC**	0 (32)	**rEAD**	--
SPrn	OFF	**inPt**	RTD	**dATA**	CTA
SoAk	--	**Unit**	°C (°F)	**Ver**	(factory set)
Set.2	8 (14)			**rESET**	(see below)
Bnd.2	0.1 (0.2)				
CYC.2	ON.OFF				

Note: Degassers with serial numbers prior to 181220 have non-standard RTDs
LEVEL 4 - DO NOT ALTER: USE DEFAULT SETTINGS ONLY

GENERAL INFO:

1. These settings, when entered on all new units will configure both outputs properly and calibrate the unit for the special RTD temperature control. There should be no need to make any additional adjustments.
2. Set.2 represents the upper/lower band for alarm purposes. This input can be adjusted by the operator for individual applications. The factory hysteresis is 8°C.

3. For the rESET setting, “all” should only be used to completely reset the controller in the event that a total reprogram is needed.

4. The Base temperature controller contains a communication board and thus is not directly interchangeable with the other controllers. Default settings are for degrees Celsius. The settings above in ( ) are for a reading in degrees Fahrenheit.

5. To silence Alarm and reset, depress white button below Controller. Depress once to turn Controller OFF and depress again to turn Controller ON.

6. Temperature Controllers are capable of various programs depending on customer's application i.e. over-temperature only etc...

ENTERING ADJUSTMENTS

1. To enter a new setpoint, depress the * button. The unit of measure will appear first, then the present setpoint. While depressing the * button, depress the up or down scroll button to desired setpoint temperature.

2. To enter the program (Level 1, Level 2, Level 3), depress both scroll buttons simultaneously for three seconds. The word " tune " will appear on the display. This is the first entry on Level 1. To scroll to each input, depress either the up or down scroll button. To change an input, depress the * button and scroll up/down with the scroll buttons.

CHANGING TEMPERATRE UNIT – Default unit is °C, to change to °F:

1. Depress both scroll (up/down) buttons for four seconds. The word “tune” will appear.
2. Use the scroll down button until “Level” appears. The display will alternate between “Level” and “1”.
3. Switch to level 2 by holding down the * button and the scroll up button.
4. Once in Level 2, use the scroll up button until “unit” is displayed. The display will alternate from “unit” to “°C “.
5. Hold the * button and the scroll up button to change to °F.
6. Use the scroll up button until Level is displayed.
7. Use the scroll up button until Level is displayed.
8. Depress both scroll buttons for four seconds until the temperature is displayed.

SPEED CONTROL - Optional

Some Degassers contain an optional speed control drive. This is a variable frequency drive (VFD) that controls the speed of the agitator motor. HMI screen 2 contains a selection switch for the speed: High or Low.

High speed is the standard speed rating for the motor (1750 RPM). Low speed is programmable and varies from user to user. Note that these numbers do not take into account the gear reducer. The gear ratio will define the actual agitator and gerotor pump speed. Some notes and basic VFD settings follow:

Settings for Mitsubishi VFD

Parameter	Indication	Description	Setting
0	P0	Torque boost (%)	6%
1	P1	Maximum frequency (Hz)	60
2	P2	Minimum frequency (Hz)	30
3	P3	Base frequency (Hz)	60
7	P7	Acceleration time (sec)	5
8	P8	Deceleration time (sec)	5
9	P9	Electronic thermal overload (Amps)	6.0
14	P14	Load pattern	1
30	P30	Regeneration function	0
79	P79	Operation mode	0

Notes:

1. The maximum frequency is based on a maximum speed of 1750 RPM.

2. Minimum frequency is user-configurable. 1750*(30/60)=875 RPM. This is an example. Note that this is the motor speed and not the pump speed.

3. Parameter 14 defines the type of load for the drive. 0 – for constant torque loads (high torque at low speeds. 1 – for variable torque loads (low torque at low speeds). If the parameter is changed to 0, be aware that at low speeds the drive will supply more current to the motor and an overload condition may exist.
4. To change a setting:
    a. Press “PU/EXT” button to light the “PU” LED.
    b. Press “MODE” button to choose the parameter setting mode.
    c. Rotate knob until the required parameter is shown.
    d. Press “SET” and use the knob to change the setting.
    e. Press “SET” to save the setting.
    f. Press “MODE” twice to go back to the monitor mode.
    g. Press “PU/EXT” twice to light the “EXT” LED.

5. To view output current, press “MODE” to get to frequency display and then press “SET” to display current. If P52 is set to “1”, the output current is displayed in monitor mode; the frequency appears while “SET” is pressed.

6. If the motor current draw exceeds the overload setting (P9) for approximately one minute, the drive will disable the motor and error code "Γ H Π" will appear. Current exceeding 150% of the rated output current will disable the motor immediately and error code "Γ H Γ" will appear. To reset the drive, either cycle power or press the "STOP/RESET" button.

Settings for Yaskawa VFD (p/n 45529-3)

Item	Parameter	Setting	Description
1	b1-01	0	Frequency source – digital inputs
2	B1-02	1	Run command from digital inputs
3	B1-03	1	Stop method – deceleration, coast
4	C1-01	3	Acceleration time (sec)
5	C1-02	6	Deceleration time (sec)
6	C6-01	1	Duty mode - normal
7	C6-02	4	Carrier frequency – 10KHz
8	D1-03	60	Frequency reference, input S4
9	D1-05	30	Freq ref, input S5
10	E1-01	230	Input voltage
11	E1-04	60	Max output frequency
12	E1-05	220	Max output voltage
13	E1-06	60	Base frequency
14	E1-07	30	Mid output frequency
15	E1-08	110	Voltage at Mid output frequency
16	E1-09	4.0	Min output frequency
17	E1-10	4.0	Voltage at Min output frequency
18	E2-01	6.0	Motor rated current
19	E2-03	3.0	Motor no load current
20	H1-04	4	Digital input selection – S4
21	H1-05	5	Digital input selection – S5
22	H2-01	0	Digital output function – during run
23	L1-01	1	Motor protection – on
24			

Notes:

1. To change a setting:
    a. Use the up/down arrows to scroll until "PAR" appears.
    b. Press enter and press up/down arrows to find the parameter.
    c. Press enter and use the ">" button and or up/down arrows to change the setting.
    d. Press "ESC" (escape) button. This saves the setting.
    e. Go to the next parameter and repeat steps b-d.
    f. Press "ESC" again to return to the normal display.

2. Refer to the Yaskawa AC Drive J1000 manual for more information.

NITROGEN BACKFILL

The setup shown below can be used to backfill the Degasser with nitrogen. A nitrogen supply with a 1-2 PSI regulator connected with a tee is needed. Follow the steps for backfilling:

1. Close the vacuum source to the Degasser.
2. Open the N2 supply.
3. Slowly open the Degasser's needle valve. Because the Degasser is under vacuum, the nitrogen will be pulled into the tank. Adjust the needle valve accordingly (so no air is pulled in the tee during backfill).
4. Once nitrogen begins to "leak" from the bottom of the tee, the Degasser is full.
5. Close the needle valve and the N2 supply. The Degasser is now backfilled with nitrogen.

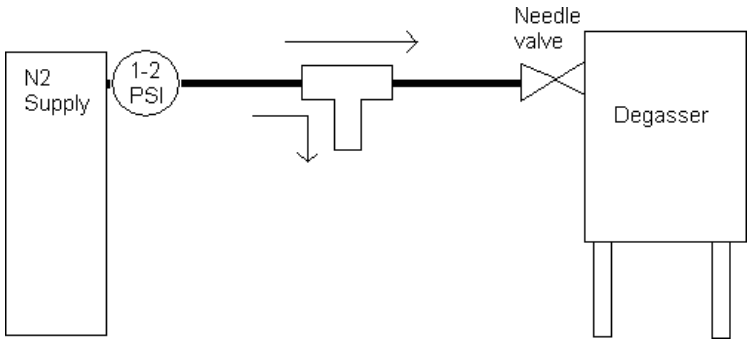


Figure 5. Vacuum Components & Secondary Flood Probe

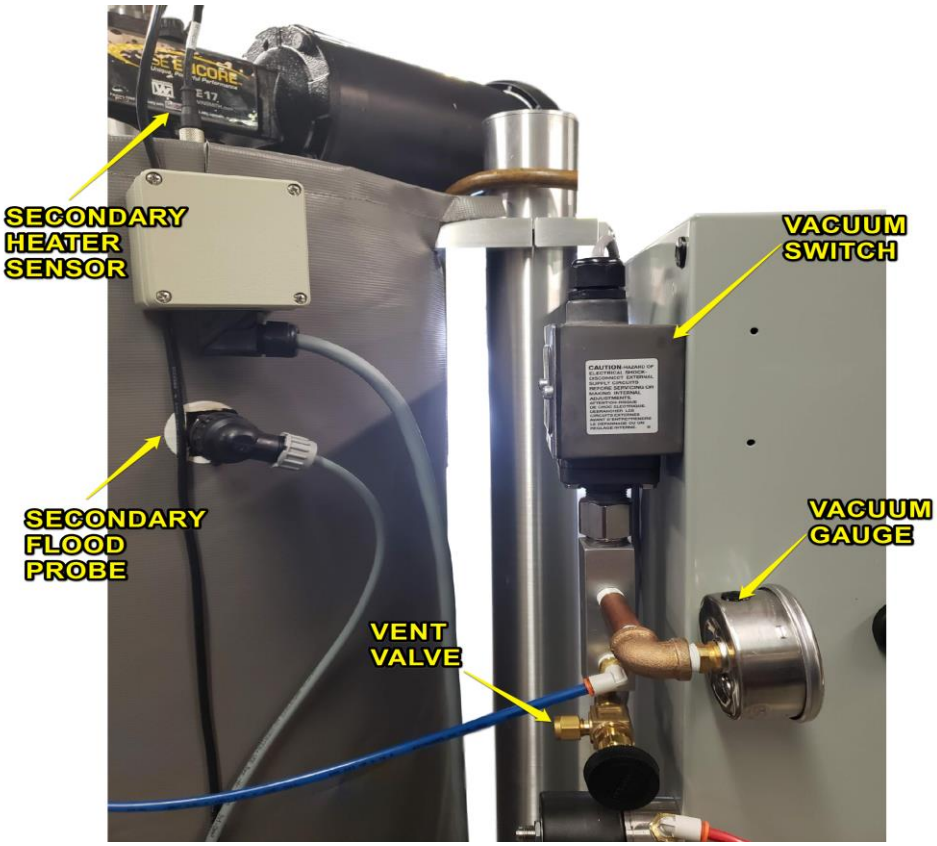
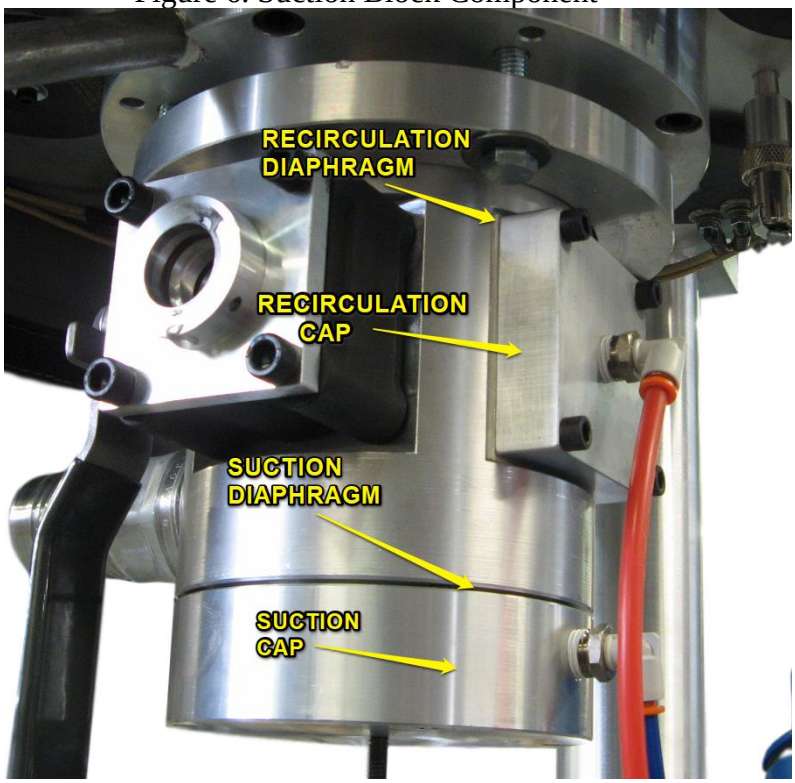


Figure 6. Suction Block Component



TROUBLESHOOTING

Temperature

Most temperature issues are caused by poor electrical connections. Therefore, before replacing a temperature controller or sensor, verify that the wiring is good from the controller's sensor inputs to the sensor itself. This includes the connector as well. Review the electrical schematic and use an ohmmeter to verify continuity of the wiring. The resistance of wiring from the controller's inputs to the sensor connector should be less than 1 ohm. If a reading greater than 1 ohm or if an "O.L." for over-limit is measured, then a poor connection exists in the wiring.

The table below describes some error codes displayed on the temperature controller.

Error Code	Possible Cause	Solution
Input fail or incorrect temperature displayed	Sensor not connected	Check connection
	Poor wire connection	Same as above
	Controller defective	Replace
	Controller not programmed	Enter settings
	Faulty sensor	Replace
No display	No power	Push-button switch faulty
		Replace controller
		Power Supply faulty (check if LED is on)

One common temperature issue that causes the alarm to switch on is when the controller senses that the temperature has fallen outside the setpoint band (after reaching the setpoint). For example, the base setpoint is 70°C. The Degasser is powered on and put in manual mode. The base heater turns on and after a while reaches the setpoint. Cold material is introduced into the Degasser and the base temperature falls to 60°C and the alarm is switched on. The default setting for the band is 8°C, thus if the temperature decreases below 62°C, the alarm will sound. Re- cycling power to the base temperature controller will reset the alarm.

The same example above can be applied to a temperature that exceeds the setpoint. If the setpoint has been reached and the temperature rises beyond the band (+8°C); the alarm will sound.

This band can be increased to avoid nuisance alarms. The setting is "set.2" in level 1 menu. A band beyond 20°C is not recommended.

Motor / Pump

<u>Incorrect Rotation</u>

The shaft must turn clockwise as viewed from the top. If not, two motor phase wires must be exchanged in the control box. Refer to the electrical schematic. Only a qualified person should perform this change-over.

General Issues

Since the motor runs the slinging shaft which turns the gerotor pump, troubleshooting a motor problem may be caused by a pump problem and vice versa. A motor overload is installed in the control panel to protect the motor. If the overload trips, this is an indication of the motor drawing more current than what it is rated for. There are five conditions for this, with the third through fifth being the most probable causes.

1. Defective motor
2. Gear reducer problem
3. Gerotor pump problem. Problems with the gerotor usually occur because of: improper assembly, metal/foreign particles, or cured urethane that locks up the pump. If the overload trips, trying to turn the shaft by hand clockwise (using a vice grip on the external portion of the shaft protruding from the gear reducer.). It should turn without too much force required. If it does not turn, then the problem is most likely a locked-up pump.
4. Material too viscous. Although not a problem for the pump, very viscous materials require more power to run the pump and therefore the motor may need to be increased in power rating.
5. Material blockage. If a large enough blockage exists in the suction block, the pump may develop enough pressure to cause the motor to overload.

Material Pumped Back into Supply Drum

One common problem that occurs is when the Degasser is put in Auto mode and material is pumped back through the suction hose into the supply drum.

The primary cause for this is a blockage in the shaft or at the hub where the slinger disks are mounted. A full or partial blockage will cause the pressure in the shaft to build up and eventually it exceeds the pressure on the suction diaphragm. When this happens, the material has no place to go, other than through the passageway that takes it back to the suction hose. This condition is easily noticed when the discharge ball valve is closed. If the valve is open, then there exists another passageway for the material (discharge from the Degasser) to go and thus the problem is somewhat hidden.

A secondary cause for this issue is if there is no pressure on the suction diaphragm. With no pressure keeping the diaphragm closed, the material can make its way back to the suction hose. The suction diaphragm must always have either have vacuum on it (suction solenoid on) or a slight pressure of 10 PSI (suction solenoid off). The 10 PSI comes from the secondary regulator mounted above the main air regulator.

Vacuum Leaks

Since the Degasser's main function is to remove air bubbles from resin, a vacuum leak is the one problem which cannot be tolerated. Attention to the proper time intervals for parts replacement is crucial.

If the source of the leak cannot be determined, the best starting point is at the bottom. Before continuing though, you should have a good view of the inside of the tank from both sight ports. If

they are dirty, remove vacuum from the tank and disassemble both ports being careful not to drop any parts into the tank. Be mindful of which o-rings and gaskets are removed so that they can be replaced in the same order. The sight port itself is made of glass, be careful when cleaning it. When re-assembling the sight ports, use vacuum grease on the o-rings. With vacuum back on, bring a little material into the degasser so that the bottom plate is covered by an inch or two. Allow 10 or 15 minutes to degas the material. Look down through one of the sight ports so see if you see a train of bubbles. Use a flashlight on the other sight port for a better view. A leak in the lower plate or suction block assembly will be visible by bubbles. If there are no bubbles, then the leak is higher up in the tank. Bring in some more material and recheck for bubbles and repeat.

Keep in mind that any of the fittings for the vacuum lines (blue hoses) may not be tight and thus could cause a leak.

See below for some additional checks:

1. Suction diaphragm. A defective diaphragm will not only cause problems with transferring material from the drum to the Degasser but if any pinhole is present, the 10 PSI applied to the backside of the diaphragm will introduce air into the incoming material stream.
2. Recirculate diaphragm. Any pinhole or defect in this diaphragm will also introduce air into the Degasser tank.
3. O-Rings. Any o-ring that separates the Degasser tank from the outside environment should be reviewed. Don't overlook the small o-ring used on the bottom thumbscrew.

Although not a cause of a vacuum leak, the vacuum gauge may (over prolonged Degasser use) provide a false reading. Over time, the vacuum hose from the sight port to the vacuum gauge may become clogged with material and this could result in a false vacuum reading.

Some vacuum leaks near the gerotor pump will actually cause an inconsistent discharge flow of material, causing one to believe the problem is the pump. See section on discharge pressure issues.

When the mechanical shaft seal is replaced (in top plate and under gear reducer), it must be installed properly. If improperly installed, a vacuum leak can occur. This leak will be evident by placing a finger in the gear reducer's oil cup. You will feel suction and possible hear air flow in the cup. See page 35 for the mechanical seal.

Suction Issues

Since transferring material from the drum to Degasser involves vacuum, the first things to check would be the vacuum source and suction valve. Prior to this, however, would be to check that the stop deflector at the bottom of the suction block is preventing the suction valve to open. Back the thumbscrew out if this is the case. The suction valve is composed of the suction diaphragm and cap. Proper suction is achieved with a flexible diaphragm. Over time, the diaphragm reacts with the resin and this causes the diaphragm to become stiff and inflexible. When replacing, verify the new diaphragm is flexible and there are no pinholes or other damage.

If the diaphragm is found to be in good shape, then the ¼" tube that connects to the cap should be checked. Loosen the fitting and remove the tube to the cap. With vacuum in the Degasser and

in manual mode, press the suction button. Hold the end of the tube and verify there is vacuum/suction present. If no vacuum is present, the tube or suction solenoid may be clogged. Follow the tube back to the suction solenoid and inspect solenoid for resin buildup.

Problems with transferring material usually involve some type of clog or blockage. A blockage in the suction block, shaft, or slinging disk assembly will give similar results; namely no suction or very slow suction of material.

If using materials that are sensitive to moisture-curing; material build-up and possible blockages will result. It is important to either have constant vacuum on the Degasser or if the Degasser will not be used for a considerable amount of time, it is recommended to vent the Degasser with nitrogen. Contact TPS for this. **CAUTION: DO NOT APPLY POSITIVE PRESSURE EXCEEDING 5 PSI.**

Discharge Pressure & Inconsistent Material Flow Issues

If the discharge pressure is not correct, check the main air regulator, recirculation solenoid, recirculation diaphragm, and associated tubing. Material blockages and partial blockages in the suction block assembly could create this problem. The recirculation diaphragm must be installed properly – the "shiny" side must be towards the material side.

Do not overlook possible problems with the heated transfer line as there could be a partial blockage there as well. Also, verify that the ball valve is open!

If there is no pressure or material from the ball valve, and the motor seems to be running properly and the recirculate diaphragm has pressure; the problem is most likely that the pump is not turning. This issue usually arises after an overhaul on the Degasser; whereupon the pump is not installed properly, or the agitator shaft is either itself not turning or not properly engaged in the pump's sleeve.

A faulty recirculation solenoid will cause the material to discharge at no or very little pressure. If the discharge valve is open and vacuum is on; it can also cause a peculiar situation where the material is sucked from an external metering pump through the discharge valve and into the Degasser. If the discharge of the metering pump is not closed off, then air can be sucked into the Degasser. This can then give way to foaming problems and or excessive air bubbles, making it appear that the degassing process is insufficient.

A large vacuum leak in the vicinity of the gerotor pump will also lead to inconsistent material discharge flow. Depending on the size of the leak, the flow can be anywhere from a pulsating flow to a material flow with air bubbles. This can occur at a few locations:

- The 45° drainage pipe (located near the discharge ball valve). Pipe or cap is loose.
- The o-ring (p/n 42150) between the pump housing and bottom plate.
- The o-ring (p/n 43775) between the pump housing and suction block.

TANK CLEANING

This section describes a basic procedure to clean a Degasser for transferring over from an ether to ester resin or vice-versa. After emptying the pre-polymer from the Degasser, Benzoflex can be used as flushing material.

1. A quantity of 2-3 gallons is needed to satisfy the low-level probe.
2. Set a process temperature of 50-60°C.
3. After transferring the material into the tank, manually inhibit suction by adjusting the bottom thumbscrew fully clockwise.
4. Verify that the discharge ball valve is closed.
5. Run in auto mode for approximately 30 minutes.
6. After emptying the tank, there will be some residual material in the lower portion of the suction block, pump housing, and discharge ball valve. Remove the cap from the lower 45° angle pipe to completely empty the tank.
7. Inspect/clean the recirculate and suction diaphragms and the discharge valve.

HEATED LINES

Some Degassers may contain a heated suction and or heated discharge hose.

Suction Line

Normally, the suction line is not controlled from a temperature controller. The design is such that a continuous current is passed through the line to maintain a minimum temperature of 40-50°C. A toroidal transformer is used to power the suction line.

Discharge Line

A discharge line contains a temperature sensor and the line's heat is controlled via a temperature controller. The length is customer-specific. A toroidal transformer is used to power the discharge line.

When troubleshooting heated line problems, verify continuity of the connectors and check all fuses and circuit breakers.

VACUUM SWITCH ADJUSTMENT

The vacuum switch may be adjusted to trigger at different vacuum levels. The switch assembly is located on the rear of the control box (upper left corner as viewed from the front of the control box). It is mounted above the vacuum gauge. Using a Philips screwdriver, remove the two cover screws.

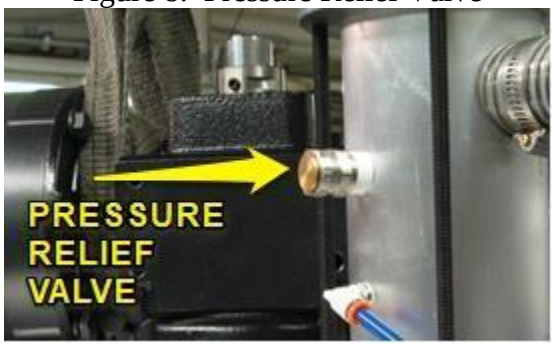
Figure 7. Vacuum Switch

To adjust the vacuum level at which the switch triggers, rotate the knob as follows: Rotate CW (clockwise) to lower the trigger point (less vacuum). Rotate CCW to increase. To ease adjustment, use the needle valve to bleed vacuum while observing the gauge and HMI screen 2, vacuum OK input on (green).

PRESSURE RELIEF VALVE

A direct acting-pressure relief valve is located on the tall sight port (see figure below). Should the Degasser be mistakenly pressurized, this valve will relieve pressure. Cracking pressure is preset at 5 +/-2 PSI.

Figure 8. Pressure Relief Valve



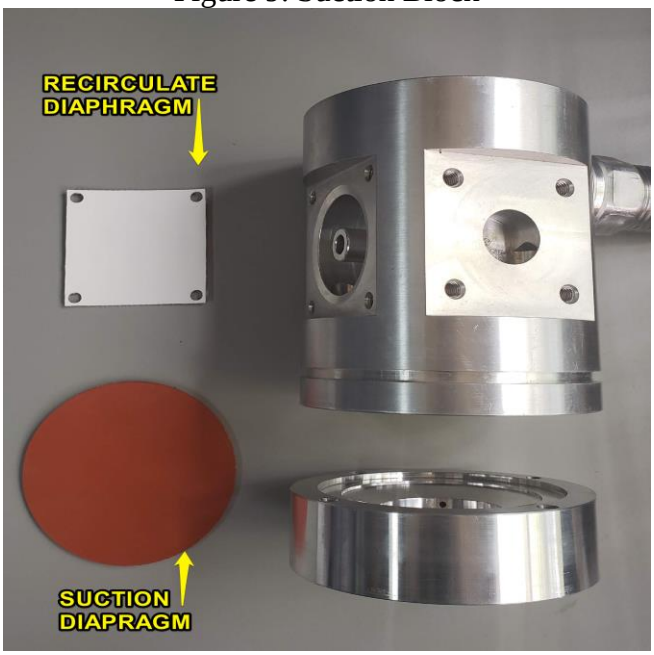
MAINTENANCE

The following parts should be replaced or checked at the specified time interval:

1. Suction Diaphragm (2 months). The suction diaphragm can be replaced with the material in the Degasser. A bucket and a few rags will be needed. Remove the bottom aluminum suction cap. There will be resin in this area. Replace the diaphragm and use a thin coating of vacuum grease around the edge of the side that faces the material.

2. Recirculate Diaphragm (2 months). The recirculation diaphragm can be replaced with the material in the Degasser. A bucket and a few rags will be needed. Disconnect main air to the Degasser and remove the aluminum recirculation cap. There will be resin in this area. Replace the diaphragm with the shiny side toward the material (use a thin coating of vacuum grease). Reconnect main air.

Figure 9. Suction Block



3. Empty port (6 months). Near the bottom of the Degasser at the gerotor pump housing, there is a 45° angled pipe with a cap. This is the empty port. It is primarily used to empty the Degasser should the pump be locked or non-working. There is resin in this pipe that normally does not get discharged. Therefore, it is recommended to periodically remove the cap and drain the Degasser from this port. Drain only with the Degasser vented.

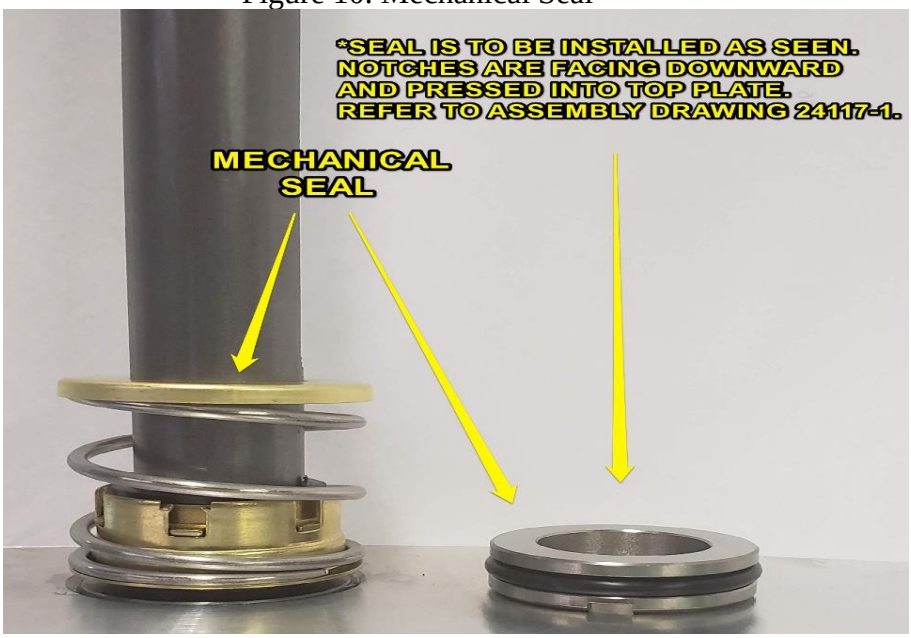
4. Secondary Flood Probe Test (6 months). Enter the password to access screen 3 and set the flood input to “ignore”. In manual mode, transfer in material until it is at the level of the secondary flood probe. In screen 2, the “secondary flood” input should be on (green). This verifies the secondary flood is working properly. To restore to normal conditions, break vacuum and run the motor in manual mode to decrease the level. Once at the nominal operating level, go back to screen 3 and remove the flood ignore setting.

5. Pressure relief valve Test (6 months). Preferably with no material in the Degasser, setup a low-pressure regulator to introduce nitrogen into the Degasser. Slowly increase pressure from zero to 5-6 PSI. The pressure relief valve should open and vent the Degasser. Do not increase pressure beyond 8-9 PSI. Should the pressure in the Degasser reach this setting without venting, replace the valve.

6. Removal of motor (6 months). Although the anti-seize compound is used on the motor's shaft, it is recommended to remove the motor from the gear reducer and re-coat the shaft with anti-seize compound.

7. Mechanical seal (2 years). The mechanical seal mounted on the top plate should be replaced every two years. To accomplish this, remove the four bolts that are securing the gear reducer to the top plate (note that there is normally 10 oz of oil on the reducer's base. Have rags in hand to catch spilled oil). Before removing the old seal, take note of the assembly, it is critical to install the new seal properly. Refer to assembly drawing 24117-1. To remove the steel section (with o-ring), use a hand held torch or heat gun to heat the seal and area around the seal. This should loosen the seal and using two small screw drivers, pry the seal up.

Figure 10. Mechanical Seal



8. Mechanical seal lubrication (6 months). Check the level in the oil cup at the reducer. See figure 10 below. Use Tereso oil 32 or 10W oil. This oil keeps the mechanical seal in the Degasser's top plate lubricated.

9. Gear reducer vent valve. The vent valve on the gear reducer should always be in the open position (CCW looking down). See figure 11 on the next page.

Figure 11. Reducer Oil Cup & Vent Valve.

10. Degasser tear down & cleaning. Although Trico Poly does not have a specific time frame for a complete tank tear down and cleaning, Trico does recommend a tear down every 2-3 years (especially if the Degasser runs multiple shifts during the day). From the nature of urethanes and experience, the internal parts will have build-up. Over time, this resin build-up can become quite hard and lead to issues with the pump locking up or discharging small bits of cured resin downstream to the dispensing machine. Obviously, a teardown is a time-consuming job, but with guidance from Trico and having replacement parts (o-rings, etc.) ready, a maintenance person can have the Degasser running again in two days.

SPARE PARTS

A spare parts list is added below. When disassembling any part, take note of the sequence of parts so that reassembly will be straightforward. Be especially careful when removing the ge-rotor pump. Mark the plates for reassembly as it is possible to install the plates backwards. O-rings should never be installed dry; use vacuum grease around the o-ring before installing.

An * indicates replacement at disassembly/reassembly

Item	Part No.	Description	Qty Req.	Replacement Interval
1	42145	O-Ring #235, extended sight port	3	*
2	34102	Gasket, flush mounted sight port	3	*
3	39346	Gasket, gear reducer	1	*
4	43879	Seal, shaft, mechanical	1	2 yrs
5	SEE NOTE 5	O-Ring for top and bottom plates	2	*
6	42153	O-Ring #330, slinger assy	1	*
7	41956	O-Ring #328, slinger assy	1	*
8	42150	O-Ring #259, adapter to gerotor pump	1	*
9	41584	O-Ring #224, suction block to adapter block	1	*
10	43775	O-Ring #244, suction block to adapter block	1	*
11	42303	O-Ring #117, stem, recirculate valve	1	*
12	39092	Diaphragm, recirculate	1	2 months
13	34096	Diaphragm, suction, 4”	1	2 months
14	41741	O-Ring #010, thumb screw	1	1 yr
15	44530	Solenoid, recirculate and suction	2	Inspect monthly
16	21498 (45670-3)	Sensor, temperature, center side wall, 1” (Deg S/N after 181220)	1	Replace at failure
17	21498-1 (45670)	Sensor, temperature, base, 2” (Deg S/N after 181220)	1	Replace at failure
18	21498-2 (45670-2)	Sensor, temperature, hook, upper side wall (Deg S/N after 181220, located on top plate)	1	Replace at failure
19		Oil, gear reducer, (Mobil SHC 634)		6 months keep full
20		Oil, shaft seal, (Teresso 23 or equivalent 10W)	10 oz.	6 months keep full
21	45793	Pressure relief valve	1	6 months - Inspect/test
22	41698-1	Seal kit, discharge ball valve	1	*

Notes:

1. Part number for the 1¼ discharge ball valve is 42924.
2. A seal kit exists containing all the o-rings and gaskets for an overhaul (p/n 21404).

3. A tube of vacuum grease is available; p/n 42857.
4. Secondary flood probe p/n 32256-3.
5. For Degassers (s/n 230905 and up) with stainless steel barrel use p/n 46008 (o-ring #459). For aluminum barrel, use p/n 42716 (o-ring #281).

Revisions:
L: 8-Sep-2023: Add note for top/bottom plate o-ring