IBIS INTERNATIONAL
VOLUMETRIC FEEDER MANUAL

INTRODUCTION

This manual was designed and written for the IBIS Volumetric Feeder and is applicable to all installations of Volumetric Feeders. Because of the many different applications of the IBIS Volumetric Feeder, this manual gives a general description of the volumetric feeder that will include application specifications not required in your plant. Drawings in this manual will be general to all volumetric feeders, although any auxiliary air handling systems may be different.

This manual is divided into four sections:

Operation
Maintenance
Sanitation
Trouble-Shooting

These sections are further divided into sub-sections with applicable information discussed in each. Find the major section and then the sub-section titles for the information you want and turn to paragraph(s) in this manual.

Safety information and special notes are included throughout the manual. The safety and notes are indented to call attention to the reader.

--WARNING-- This is an example of the format of the safety and information paragraphs included in the text of the manual.

Safety information is listed in one of two ways.

A **–WARNING--** paragraph is used to is give information to prevent personnel injury.
A **–CAUTION--** paragraph is used to give information to prevent machine damage.

Informational paragraphs are listed in one of the following ways.

-NOTE- paragraph is used to give information of special interest.
-IMPORTANT- paragraph is used for information that must be adhered to during installation or operation.

GENERAL DESCRIPTION

This Ibis Volumetric Feeder is designed to reintroduce reclaimed cellulose fluff into the production process at a controlled rate. Also, the volumetric feeder may be used to feed virgin material into the production process. The volumetric feeder provides precise measurement and weight control. This precise measurement is the same for either virgin or reclaimed cellulose. The volumetric feeder operates on the principle of a moving forming screen with carefully controlled air flow. This dry air forming process gives consistent pad formation and pad integrity.

As the fibers enter the forming chamber, the flow of air through the moving screen causes the fibers to be deposited on the screen in a consistent fashion. As the screen moves forward, the formed pad is exposed to a pair of high speed profiling rolls. These rolls ensure that the pad is uniform in both density and weight. The final control of uniformity is controlled by the saw tooth roll. The action of the saw tooth roll causes the fibers to be evenly dispersed into the air stream.

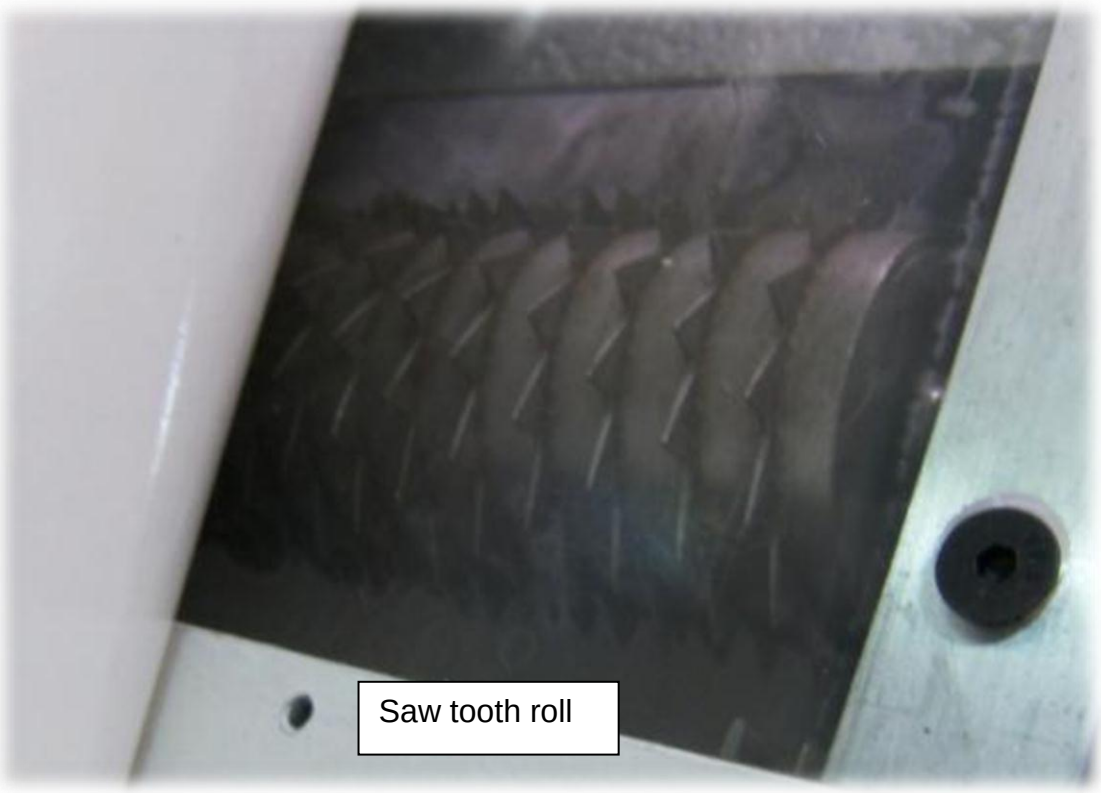

Figure 1

The volume of fibers and speed of the moving screen are controlled through internal electronic circuitry, which follows the production line speed. In the event the production line stops, the material is re-circulated until the line is again started, provided that a line recycle diverter valve is installed in the system. The screen is started or stopped by an external production line signal contact the normally will close on a timed basis, or at a certain line speed, after the line is running, to begin the metering of fiber to the line.

A Variable Frequency Drive (VFD) motor controls the forming screen speed. This allows the control necessary for the proper amount of material at the production line. The profiling rolls and the saw toothed rolls are belt driven by a separate AC motor.

Sensors in the forming chamber control the feed of material into the volumetric feeder. These sense the amount of material in the chamber and signal the need for material. A second pair of sensors observes the discharge pad and automatically shifts production to 100% virgin material if a loss of pad is sensed.

The volumetric feeder control panel contains a PLC series processor with necessary inputs and outputs for the feeder, along with spare I/O, and space for future modifications. Any/all feeder operational status and alarm messages are displayed on the display monitor mounted on the door of the control panel.

An adjustable frequency AC drive controller, linked to Human Module Interface (HMI) on the control panel door will provide operator interface, programming, set up, control, and monitoring of voltage, amperage, and frequency (speed) of the forming screen.

An emergency stop (E-STOP) push button is provided to stop the volumetric feeder in the event of an emergency condition. A pilot light will illuminate to indicate that the emergency stop push button is actuated. An alarm horn mounted on the side of the control panel will provide an audible alarm indication of alarm conditions that occur during feeder operation. The alarm horn can be silenced by pressing the alarm reset button on the door of the control panel.

The main disconnect handle will apply power to the feeder when placed in the ON position. The disconnect handle is mechanically interlocked with the door of the control panel to prevent the door from opening when power is in the on position inside the panel.

SAFETY

--WARNING—Be aware that when the control panel is open, power is ALWAYS ON at the top of the breakers, where power is coming into the panel. SEE FIGURE 1

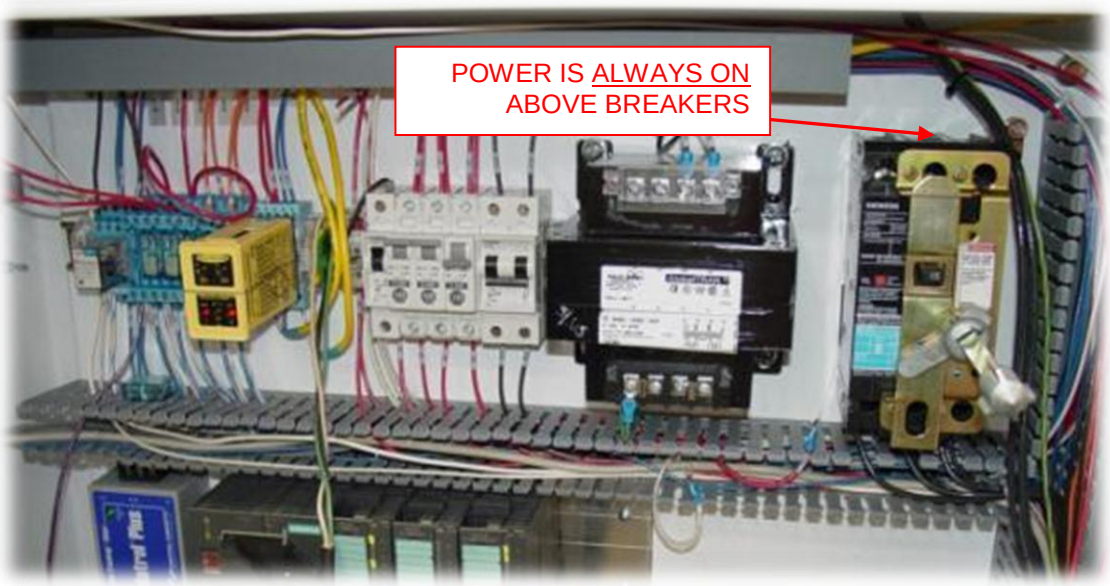

FIGURE 1

-WARNING- The bottom screen roll has a pinch point area that must be avoided. The rubber coated roll is capable of grabbing hands and fingers. DO NOT place your hands near this area while machine is in operation! SEE FIGURE 2

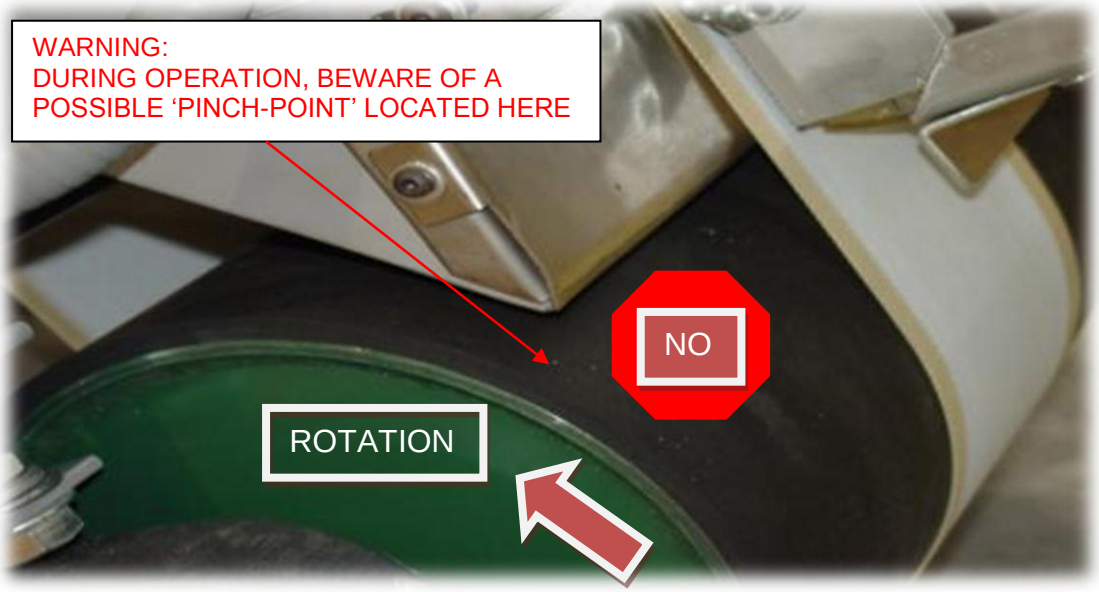

FIGURE 2

-WARNING-
DO NOT REACH INTO ANY AREA WHERE MARKED AS A POTENTIAL PINCH-POINT. SERIOUS HARM CAN RESULT. ALWAYS DISCONNECT POWER FROM MACHINE BEFORE DOING ANY MAINTENANCE OR INTERNAL ADJUSTMENTS.

VOLUMETRIC FEEDER OPERATION

The volumetric feeder operator controls located on the door of the control panel will provide operator control of the volumetric feeder and consists of an illuminated start push button, a stop push button, reverse push button, jog push button, alarm reset push button, scarfing rolls of/on switch, auto/manual select switch, auto trim adjust, run/jog select switch, a Human Interface Module (H.I.M.) for the programming, setup, monitoring and manual adjustment of the forming screen speed and an alarm pilot light to indicate alarm conditions.

The start and stop push buttons are used to start and stop the forming screen and the scarfing rolls in the auto, or manual control mode, as well as during maintenance operations, such as reverse and jog of the forming screen.

The reverse push button is used to operate the forming screen in the reverse direction for use during maintenance operations, or clearing jams.

-WARNING-
Operation of the screen in the reverse direction may adversely affect the automatic tracking of the forming screen, which can possibly cause severe damage to the screen.

The run/jog switch allows the operator to select normal operation of the unit in run position, and the ability to jog the forming screen in the jog position. In the jog position the forming screen will only run when the start push button is pressed. The jog function is generally used during alignment or maintenance operations, and clearing jams.

The scarfing rolls off/on switch can be used to turn the rolls off when the screen is operated independently, in the manual mode, for maintenance operations, etc., by placing the switch in the off position. The switch should be in the on position, during normal automatic operation of the feeder. The forming screen is interlocked with the scarfing rolls, during auto operation of the feeder, and will have to be running in order for the forming screen to operate.

The auto/manual switch is used to select the speed reference source that is controlling the speed of the forming screen. In the auto position, a production line speed reference signal, normally a tach generator,, or analog signal, will control the speed of the screen. The auto trim adjust control, is used to adjust the speed of the forming screen, in reference to the incoming signal. In the manual position the dial on the H.I.M. module controls the speed of the forming screen.

The manual speed control also determines the speed of the screen when the production line signals a line stoppage, due to the feeder controls automatically switching to the manual speed control (H.I.M. module). This speed should be adjusted to a speed setting that will keep product moving slowly though the feeder, when a recycle diverter valve is installed in the system. The message VF Recycling will be displayed on the operator interface during this time.

Note: If a recycle diverter valve isn't installed in the system, the manual speed control should be set at 0% speed.

The quantity of the material in the forming chamber is sensed and controlled by a photoswitch pair (light source ad receiver) located at the forming chamber. The photoswitch control module, located inside the control panel, has sensitivity and time on/off adjustments to control the on/off activation of an output signal. This turn controls the supply of the fluff material to the feeder from a supply source such as a vertical hopper, by starting and stopping of the feed rolls in vertical hopper, or other similar feed devices.

A second photoswitch pair located at the discharge nozzle, will sense a 'NO-MAT' condition, or absence of material on the forming screen. This photoswitch will activate the alarm horn and the alarm light, to alert the operator during operation of the feeder. The message No Mat will be displayed on the operator interface, to indicate this condition. **See Figure 6, Page 10.**

Note: The operation of the no mat alarm is interlocked with the operation of the scarfing rolls. The no mat alarm is enabled when the scarfing rolls are in operation and disabled when the rolls are not operating.

Screen tracking limit switches, located on the left and right side of the forming screen, will control the screen tracking mechanism, to keep the screen tracking properly during operation. The left or right switch will activate the left or right tracking solenoids, when actuated by screen movement from side to side, to keep the screen centered.

Screen misalignment limit switches, located on the left and right side of the screen, will sound the alarm horn, turn on the alarm light, and stop the screen in the event of a severe screen misalignment, to prevent damage to the screen. A message will display on the operator interface, if this condition occurs.

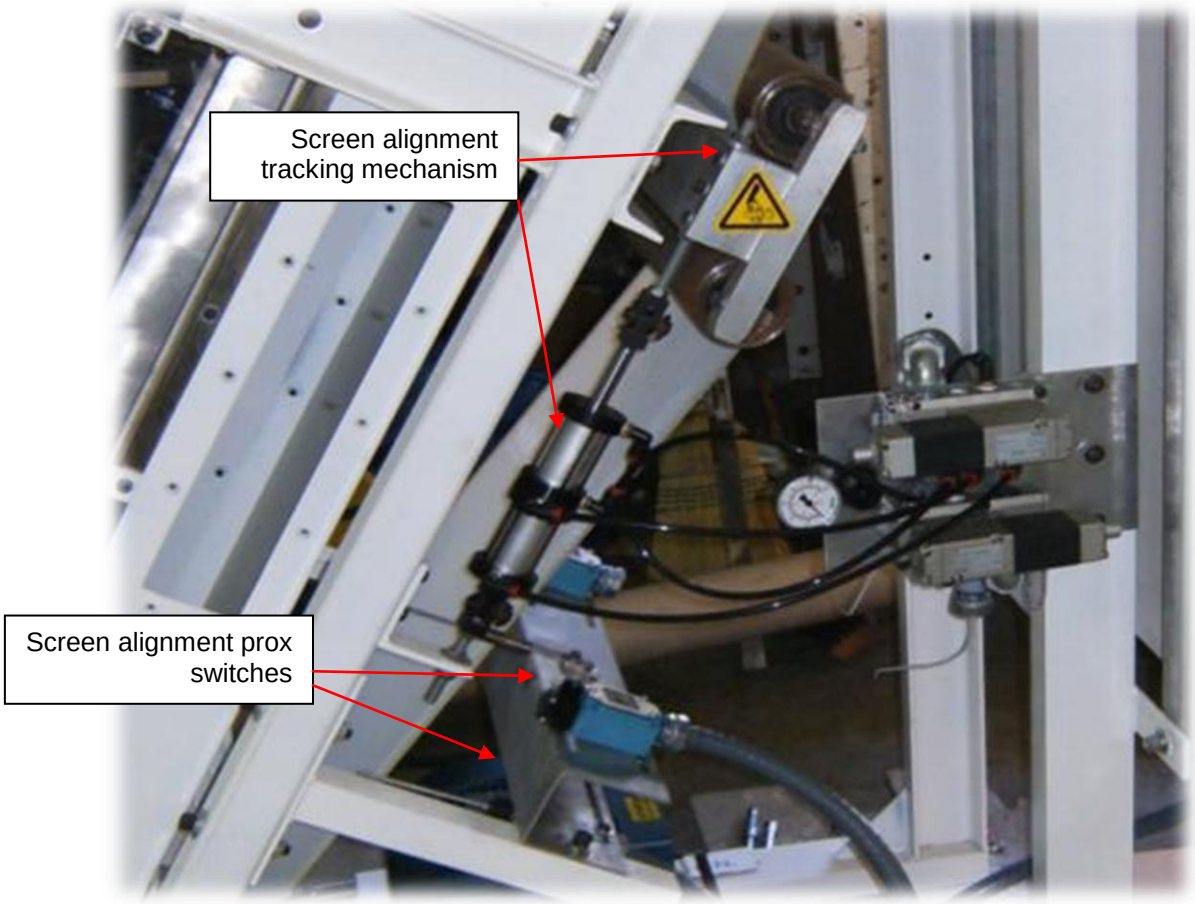

Figure 4

A nozzle position switch located at the nozzle will sense the movement of the nozzle, in the event of a material jam condition in the nozzle. This will activated the alarm horn and light, and stop the volumetric feeder. A message will be display this condition on the operator interface.

If the screen drive motor, or scarfing rolls drive motor fails to start when required, or should either of the drive motors stop during operation due to an overload trip condition, or drive controller fault condition, the alarm horn and alarm light will activate to indicate the condition. A Corresponding drive fault message, Screen Drive Fault, or Scarfing Rolls Fault will also be display on the operator interface.

Should a high temperature condition occur in the forming screen drive motor, an internal temperature switch will sense the high temperature condition, and stop the motor. The alarm horn and alarm light will activate to alert the operator on the condition, and the message Screen Motor Hi Temp will be displayed on the operator interface.

The alarm conditions associated with the volumetric feeder along with the operating mode, and operating conditions, will be displayed on the operator interface during operation of the feeder. These operating modes, operating conditions, and alarm messages are as listed below.

Operating Mode (Top Message): On Line, Stopped (Press Start), VF Recycling, Screen jog Forward, Screen Reverse and Manual Operation.

Operating Conditions (Middle Message): Screen Track Left, Screen Track Right, and Fluff Demand.

Alarm Conditions (Bottom Message – Flashing): Nozzle Off, No Mat, Screen Mis-track, Screen Drive Fault, Scarfing Rolls Fault, and Screen Motor Hi Temp.

VOLUMETRIC FEEDER MAINTENANCE

SCREEN TRACKING

The forming screen on the volumetric feeder must run as nearly centered as possible during operation. The screen is kept centered by the screen tracking assembly below the forming chamber. Initial correct tracking is necessary to prevent excessive correction by the tracking assembly and to reduce the possibility of screen damage.

--NOTE—Initial tracking is done at factory and adjustment of factory setting may cause a greater possibility of erratic operation and damage. Only change the factory setting if readily apparent variation is seen.

Remove tension from the screen by loosening both take-up bearing assemblies on the bottom screen roll. When the tension is removed, be sure the tracking assembly is properly centered with the air cylinder in the neutral position. Proper air pressure must be present. If necessary, adjust the tracking assembly by adjusting the clevis on the tracking cylinder. Be sure the clevis is tightened before operating feeder.

--IMPORTANT—Check the condition of the screen and all bearings and screen rolls before continuing with the tracking adjustments. If damage is present on any of these items, screen tracking will be impossible to achieve. Replace any damaged part.

Adjust lower take-up bearing assemblies for equal tension on both sides of the screen. Operate the feeder in manual mode. Observe the tracking and the tracking assembly. If screen tracks erratically or the tracking assembly operates excessively, adjust the lower roll bearing assembly tighter on the side the screen tracks toward.

If screen tracking is difficult t achieve, check the condition of the screen. A worn or torn screen will not track properly and may cause severe damage later. Check the proximity switches. One may be loose or damaged. Repair as needed. Check the bearings on all screen rolls. If a bearing or roll is worn or damaged, screen tracking will be impossible to achieve.

SCREEN LIMIT SWITCH POSITION

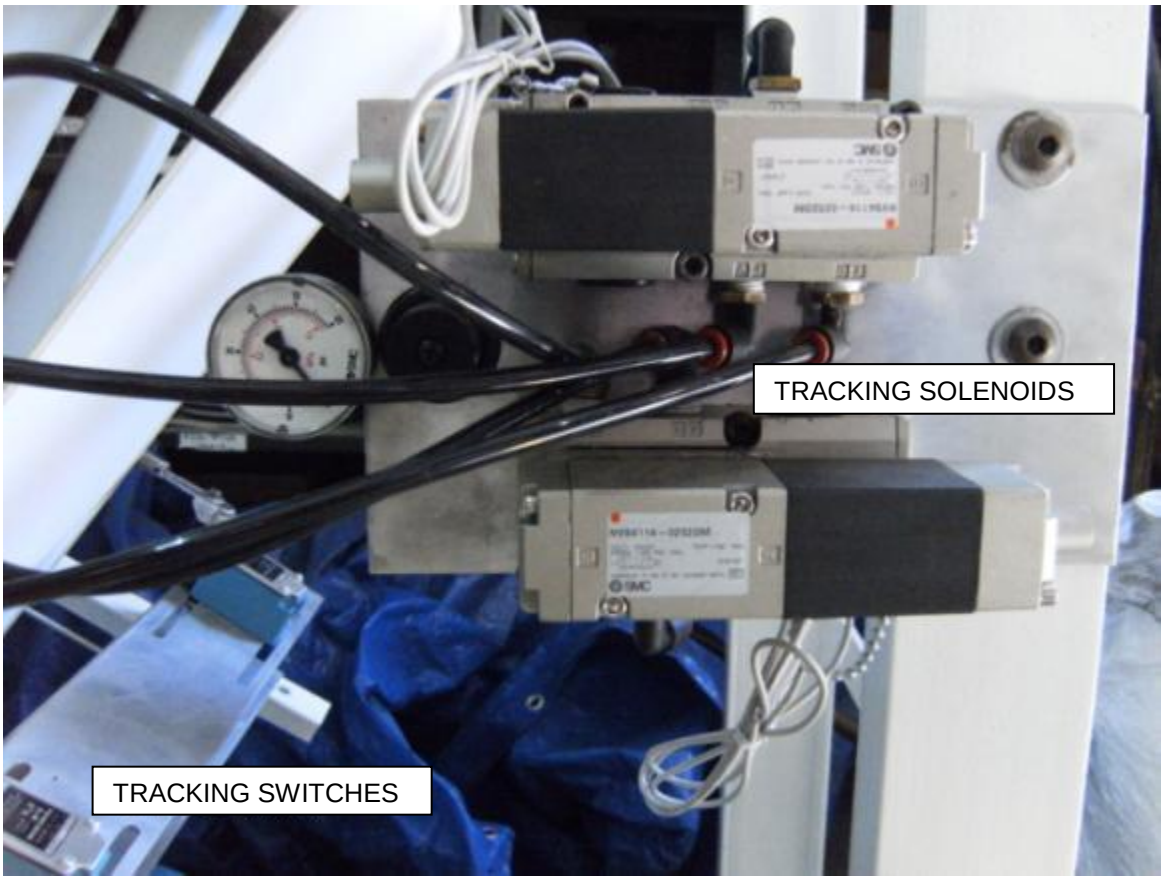

Figure 5

Four proximity limit switches provide protection and control the tracking of the screen. One set is used to stop the screen if tracking goes beyond a point that would cause screen damage. The other set of switches is used with the tracking assembly to maintain the screen in the proper location.

The proximity switches that protect the screen from damage are adjusted so that the turn off point is as far from center to the left or right as possible without damage occurring to the screen.

If adjustment is necessary, adjust these switches so the screen cannot over travel to the point of damage in either direction. Do not adjust these switches unless necessary. Unnecessary adjustment increases the possibility of damage to the screen.

Tracking adjustment during operation is accomplished by the tracking assembly through control of the tracking proximity switches. These work in a similar way as the safety switches. One switch causes the tracking assembly to move the screen to the left and the other causes movement to the right. These switches must be set so that excessive adjustment is not created. Also, these must be set close enough to prevent erratic tracking. Proper initial screen tracking as described in the screen tracking section is necessary.

If excessive automatic adjustment of the tracking assembly is occurring, inspect the screen rolls on the top and bottom and the tracking assembly rolls for a material build-up. Also, check the screen fabric for tears or other damage. When damage is detected, the screen must be replaced immediately.

SCREEN SUCTION AIR BALANCE

Proper operation of the volumetric feeder requires the air balance set to give optimum performance. Initial set-up from the factory is with all ports and damper doors closed. The exhaust manifold slide dampers are locked fully open.

Because of the type of material some adjustment may be necessary to achieve optimum results. The slide dampers in the exhaust ports may be closed to adjust the suction on the forming screen. Also, the upper plenum damper may be adjusted. There is an indicator/pointer, attached to the damper shaft, on the side of the plenum, for use in making the adjustment. A setscrew is provided for securing the position of the damper after the adjustment is made.

Consult the factory if desired results are not achieved. Additional assistance is available for particular application. Make any adjustments in small increments so as not to disturb the operation too much. Also, adjust only one port or door at a time. Normally, the screen suction fan will have a duty of 1,800 – 2,500 CFM @ -8" to –12" w.c. (50-70 Cubic Meters/min @ -200 to –300 mm w.c.).
Note: These are general requirements, consult ibis for specific requirements.

FLUFF SUCTION NOZZLE

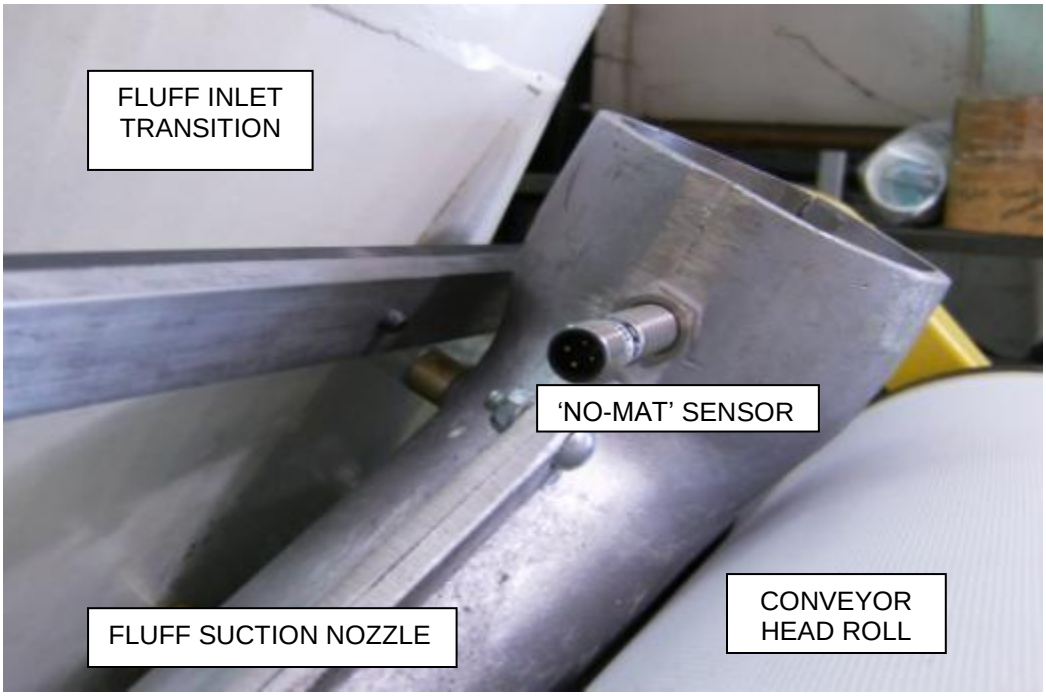

Figure 6

The fluff suction nozzle at the saw tooth roll should be supplied by a fan that is in operation, when the volumetric feeder is operating. The fan should be capable of supplying a minimum of 500 CFM @ -2" to –4" w.c. (14 Cubic Meters/min @ -50 to –100 mm w.c.).

LUBRICATION SCHEDULE

Figure 7

Lubrication of the ibis Volumetric Feeder must be carried out as a part of the total manufacturing plant lubrication schedule, and incorporated on a daily and weekly etc. basis. The feeder lubrication will include checking and maintenance of oil level in the reducer and lubrication of the idle and roll shaft bearings.

The bearings on the forming screen rolls and scarfing and saw rolls shafts should be greased with a high-grade gun grease on a semi-annual basis. The bearings will not require a large amount of grease. Just two or three shots from the grease gun will be sufficient. The scarfing roll tensioning pulleys should be greased each month.

If too much grease is injected into the bearings, excess heat will result that may cause breakdown of the grease and the bearing seals. Do not pump enough grease into the bearing to force the grease out of the seals. This causes seal failure. Either of these will result in premature failure of the bearing.

Be sure to wipe away any excess grease from the bearing after greasing. Grease left on the bearing will collect dust and fiber from the air. This grease and dust on fiber materials will combine to form an abrasive compound that will wear bearings very quickly.

The bearings in the volumetric feeder motors require grease, depending on the type and use. Greasable bearings must be flood greased.

To grease a greasable motor bearing, the top and bottom fill plugs must be removed and a grease fitting installed in the top hole. Grease should then be pumped through the bearing to flush out all the old grease until the grease being pumped through the bearing is no longer contaminated with old grease.

When the bearing is flushed, the motor should be run for five minutes to allow any excess grease in the bearing to be forced out. This will prevent later bearing failure because of excess grease in the bearing. Reinstall the filler plugs in the motor bearing access holes.

The gearboxes on the volumetric feeder must be serviced regularly to give dependable long life. Failure to check the level of grease or to replenish the grease or change the grease at the recommended intervals may cause premature failure of the reducer.

The level of oil in the reducer must be checked each month of operation. Check the level by removing the check plug on the side of the reducer. If the oil is not at a level that just allows the oil to start to run out of the hole, the reducer must be filled with the proper type of oil until the oil just start to run out of the reducer.

The oil in the reducer should be drained and replaced after the first week of operation and every six months thereafter. Each year the reducer cover should be removed and the condition of the gears and bearings and seals checked. If any excessive gear wear is observed, the gear should be replaced. It may be necessary to replace all gears in the reducer to prevent premature wear of the new gear.

Any time the oil is grained from the reducer it should be inspected for signs of gear wear and outside contamination. If any signs of abnormal wear are seen, the reducer should be opened and inspected.

VOLUMETRIC FEEDER SANITATION

Proper sanitation is necessary to provide a safe and effective work area for operating and maintaining personnel. Cleaning the volumetric feeder and the area around the feeder will decrease the possibility accidents and machine failure.

--WARNING—All sanitation procedures should be performed only when the main electrical disconnect is off and locked out. **DO NOT clean any part of the machine when the machine is running.**

The area around the feeder should be swept with enough frequency to prevent an accumulation of material that could cause hazards to operating personnel. The floor will become slick when a build-up of material occurs. Control of any equipment will be hindered by a build-up of foreign material.

The feeder and motor bearing should be inspected and cleaned as needed to prevent a build-up of material that would cause erratic action of the drives and motor. Be sure to clean any fluff or dirt from the ends of the shafts where the bearings are located to prevent the bearings sizing.

--NOTE—Normally, the only times the bearings would be contaminated would be from excess material escaping from the forming chamber. However, these items should be check regularly.

Any bearing that is greased must have the excess grease wiped from the grease fitting and bearing outer surface. Grease and any dust or particulate will combine to form a very abrasive compound that can wear a bearing very quickly. Clean all fluff and dirt from the inside surfaces of the bearing enclosures with a vacuum or by wiping with clean lint-free wipes

--IMPORTANT—DO NOT use compressed air for general sanitation purposes. This will only relocate the dust and fluff to others areas of the plant and will create health and safety hazards there. Use vacuum cleaners or wipe the surfaces.

All the sensors on the feeder must be cleaned each day as part of the routine maintenance. The high and low mat sensors are located on each side of the forming chamber. The tracking proximity sensors are located below the forming chamber. Remove any build-up of material from these sensors.

Be sure the light emitting and receiving surfaces on the photoswitches are not blocked by dust particles.

Clean any residue from the forming chamber of the feeder. Inspect and clean the screen rolls and the scarfing and saw rolls of any material built-up. This is best done with a vacuum cleaner. Use of compressed air will cause the possibility of injury to personnel. Compressed air will simply relocated the material to other parts of the plant.

Inspect the forming chamber for breaks in the enclosure and the forming screen for tears and remove any build-up of material. Inspect also for excessive wear of the forming screen. If necessary, repair or replace the screen or seals.

TROUBLE-SHOOTING PROCEDURE

All trouble-shooting should be done in an orderly and logical step-by-step manner with only one procedure followed at a time. Trying more than one corrective measure at a time may in some instances mask the real cause of the trouble. This trouble-shooting guide for the ibis Volumetric Feeder is designed to give assistance to plant maintenance personnel in the event of a failure of the volumetric feeder.

--WARNING—Be sure all electrical disconnects have been turned off and the panel(s) locked out before any trouble-shooting, repair or service is performed.

The first step in determining the cause of a failure is to isolate the effects of the failure. The trouble-shooting guide will be helpful by giving some ideal of abnormal conditions.

The operators of the volumetric feeder or the personnel that normally work around the volumetric feeder will be a good source of information. This is because they will be able to recognize that the volumetric feeder does not “sound right” or “look right”. They may not know why but they will be able to describe unusual operation.

The next step would be to go to the trouble-shooting guide and find the problem you are encountering listed in the **PROBLEM** column. Common problems are listed in this column. The problem you have may not be listed exactly, but a closely related problem may be.

--IMPORTANT—Do not correct more than one item at a time since this could mask problems and only create a temporary repair that may lead to further and more serious damage.

The last step would be to use the POSSIBLE CAUSE column and further isolate the problem. In all but one case, several possible causes are listed for the problems listed. Check again with the operators and maintenance personnel for cause closest to what they suspect the problem to be.

Lastly, check the possible solution column and determine if the solution listed with the cause you suspect to be the reason for the fault is the appropriate repair procedure. Proceed with repairs when the appropriate repairs are determined.

--NOTE—It may be necessary to check and recheck the trouble-shooting guide to determine the exact repair procedure. Do not make any hasty and unconfirmed decisions about the repair procedure. This could lead to more serious damage and personnel injury.

Finally, if you followed the steps for determining and repairing the damage or fault and cannot isolate the cause satisfactorily, call ibis for assistance. Most repairs can be made successfully by you after following the outline above. Be sure to exhaust all possibilities before calling ibis to save you time and money.

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Trouble alarm sounds-severe screen mistracking.	Tracking assembly cylinder mounting loose or broken. Tracking assembly cylinder air connections loose or broken. Absence of compressed air. Tracking assembly limit proximity switches out of adjustment. Tracking assembly limit proximity switches covered with foreign material.	Repair or replace mounting assembly parts. Repair or replace air connections. Establish air pressure. Re-adjust tracking assembly proximity switches. Clean all proximity switches.
Material blowout from around plenum damper doors.	Inadequate screen suction. Excessive inlet transport air. Side of top damper doors open. Clogged forming screen (in stopped position).	Open balancing gates on exhaust manifold. Adjust inlet transport air. Close upper plenum damper doors to allow inlet transport air to be better directed. Turn off volumetric feeder and clean screen.
Discharge mat not removed by suction nozzle.	No suction at nozzle. Saw and/or scarfing rolls not operating. Excess discharge mat thickness for screen speed.	Check for clogs in ducts and check vacuum source. Check rolls and rolls drive motor and drive belts. Adjust for thinner mat and/or adjust nozzle.
Erratic discharge feed rate.	Inadequate screen speed. Inadequate suction at discharge nozzle. Non-uniform discharge mat.	Set screen speed. Minimum screen speed must fiberize mat into discharge nozzle. Too slow of a screen speed causes mat to chunk off. Increase nozzle suction. Factory test indicate 500 CFM at –2 to –4” w.c. in 4” duct is ideal. Adjust scarfing rolls for proper mat profile.
Trouble alarm sounds – thin mat	Loss of air flow in material feed duct. Inadequate material in feed device. Obstruction of feed sensors in forming chamber.	Correct loss of air flow and adjust feed. Supply material to feed device. Clean sensors. Sensors must see each other to call for material.
Excessive movement of the tracking assembly.	Tracking assembly not centered in neutral. Severely worn or stretched or damaged forming screen. Bottom roll take-up bearings not even. Improperly adjusted tracking sensor limit proximity switch.	Follow tracking procedure to properly align assembly. Replace forming screen. Follow tracking procedure to properly adjust bearings. Adjust tracking sensor limit switch.
Volumetric Feeder will not start in automatic mode.	Scarfing rolls not running. Emergency stop button pushed in. Panel not in automatic mode.	Start scarfing rolls. Emergency stop button must be pulled out. Turn panel controls to automatic

	Remote switches not set in proper mode. Trouble alarm was energized and causes not corrected. Screen Limit bypass control not set properly.	mode. Set Remote switches in proper mode. Correct problem and restart volumetric feeder. Set screen limit bypass control properly.
Volumetric Feeder will not start in manual mode.	Panel not in manual mode. Manual speed control not turned fast enough. No material in chamber or screen limit proximity switches violated.	Turn panel controls to manual mode. Turn manual speed control up. Correct as necessary.

SPARE PARTS INFORMATION

Due to the myriad of component combinations, not all components listed are standard to the VF-12 and some parts are not listed. When inquiring about spares, please include the machine serial number to ensure correct part replacement.

Part Description	Part Number
Roll Drive Belt idler bearing	VF-001
PhotoLight, Level sensor	VF-101
PhotoLight, RECEIVER LEVEL SENSOR	VF-102
SENSOR CABLE	CD12M-0B-070-C1
Set Collar	VF-002
TRACKING Limit Switch	VF-003
Clip, C1	41408
MAIN DRIVE V-Belt, Double	VF-005
Motor2 HP, 460/3/60 OR 380/3/50HZ (VERIFY NAMEPLATE DATA)	WEGM1450
TRACKING FAILURE Limit Switch	VF-004
TRACKING ROLLER BEARING	VF-006
Latch	41252
Air Regulator	32105-2
Bearing - PIN ROLL & SCARFING ROLL	VF-007
Solenoid valve 24vdc (VERIFY CONTROL VOLTAGE)	32223
Solenoid valve 110vac (VERIFY CONTROL VOLTAGE)	32225
Chain, #40	44019
Sprocket Idler	VF-008
VF-12 Gearbox	42104
VF-12 SCREEN BELT	27165
Piggy back cylinder assembly	SPUSR

***** = SPECIFIED BY NAMEPLATE DATA

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