FIBERPREP

125 John Hancock Road, Unit 15, Taunton, MA 02780
(508) 823-3358 FAX (508) 823-4155

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

CONTINUOUS SCAVENGER

8/22/91

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GENERAL INFORMATION

INTRODUCTION

The Fiberprep/Lamort Continuous-Type Scavenger is an auxiliary combination Pulper and Junker, which continuously removes both light and heavy contaminants and trash, when installed with most Continuous Pulpers. The Scavenger improves over-all defibering efficiency, furnishes cleaner stock, and reduces the work required in downstream processing steps. A Scavenger may be used to clean a single Pulper, or in some cases, a single unit may be used to clean two Pulpers. (In this case, the Scavenger would be fitted with two inlet connections and designated as a Dual Scavenger.) Figure 1 shows a typical installation of a Scavenger and a Pulper.

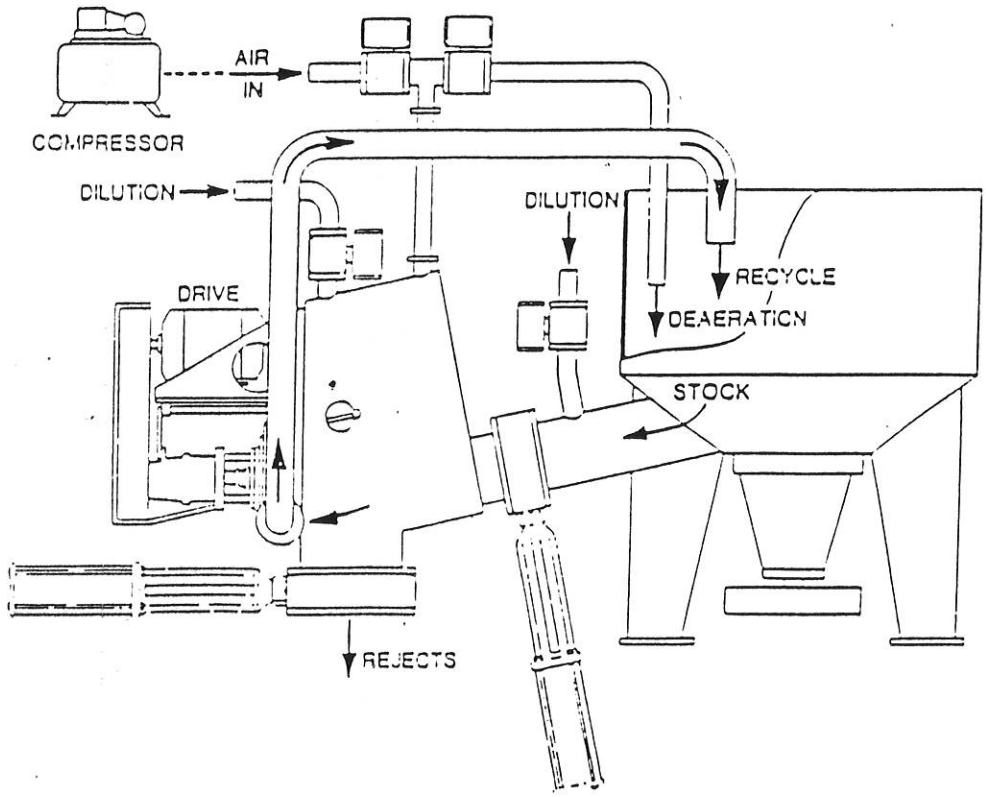

Figure 1. Typical Installation

GENERAL INFORMATION

SCOPE OF THIS HANDBOOK

This handbook provides installation, operation, and maintenance instructions for the Scavenger. It also includes a schedule of recommended maintenance procedures, which, if adhered to, will prevent or significantly reduce the incidence of breakdowns or failures, minimizing production interruptions. A parts list lists all parts of maintenance significance and identifies those parts recommended for spares. For the user's convenience, all foldout drawings are included at the end of the handbook rather than being interspersed within the text at the point of first reference.

PHYSICAL DESCRIPTION

The Scavenger is available in three (3) sizes, which are designated as Models I, II, and III.

The Scavenger consists of a tub, rotor assembly with drive belts and pulleys, an air blower, six pneumatically operated valves, and may come equipped with a control panel and/or a conveyor for reject transport. For a Dual Scavenger four additional pneumatically operated valves are required.

The tub is a cylindrical stainless steel weldment mounted with its axis twelve (12) degrees to the horizontal to match the reject outlet of the main Pulper with which the Scavenger is used. On a

PHYSICAL DESCRIPTION (CONTINUED)

Scavenger used to clean a single Pulper, there are six openings into the tub. They are the stock inlet, the reject discharge, rotor assembly installation, dilution washing inlet, air inlet/deaeration outlet, and inspection hatch. For a Dual Scavenger, serving to clean two Pulpers, an additional stock inlet connection is added.

The rotor assembly consists of a rotor which rotates inside a housing secured to the tub. Cutters on the outer face of the rotor, which projects into the tub, serve to provide stock deflaking; Vanes, on its inner face, draw the good fiber through a small annular passage formed by the rotor shroud and the rotor, and pump this fiber out of the rotor housing and back to the main Pulper through piping provided by the customer.

The blower, if provided, is a conventional blower which supplies air to the tub to evacuate liquid from the Scavenger prior to dumping rejects.

Motors required to operate the Scavenger are a Scavenger drive motor and a blower motor. A third motor, the conveyor (or other reject handling device) drive motor, is required if a conveyor is employed to transport rejects away from the unit.

PHYSICAL DESCRIPTION (CONTINUED)

For a Scavenger used to clean a single Pulper, six (6) pneumatically operated valves are used to operate the Scavenger. They are:

(V1) Stock Flow - Isolate Scavenger & Pulper

(V2) Reject - Dump Scavenger Reject

(V3) Fill/Wash - Fill Scavenger Tub & Wash Rejects to recover good fiber

(V4) Blower Air - Supply air to Scavenger to evacuate water before dumpings reject

(V5) Vent - Allow air to vent from Scavenger

(V6) V1 Flush - Supply dilution to prevent plugging of the feed pipe between the Pulper and (V1)

For a Dual Scavenger, there are two (V1) Valves (V1A & V1B), and two (V6) Valves (V6A & V6B) for each respective Pulper. Also, two additional Valves to direct Scavenger accepts to either Pulper, V8A & V8B, are required. If Valves for your Scavenger were purchased from Fiberprep, the valve descriptions, drawings, maintenance instructions, and parts lists are included in this manual.

There are four limit switches which are operated by the stock and reject valves to provide feedback for control of the Scavenger, and to prevent accidental opening of the Reject Valve (V2), and the Stock Flow Valve (V1) at the same time. These switches are as follows:

PHYSICAL DESCRIPTION (CONTINUED)

LS1 - TRIPS WHEN STOCK VALVE (V1) CLOSES

LS2 - TRIPS WHEN STOCK VALVE (V1) OPENS

LS3 - TRIPS WHEN REJECT VALVE (V2) CLOSES

LS4 - TRIPS WHEN REJECT VALVE (V2) IS NOT CLOSED (PNEUMATIC)

Valve schematics are included in drawings DSJC - 1102 for a Scavenger operating on a single Pulper, or if you have a Dual Scavenger for operation on two (2) Pulpers DSJC - 1103.

If you have purchased valves from Fiberprep, these limit switches will come pre-mounted to V1 and V2.

If you have purchased a control panel to control sequencing of the Scavenger from Fiberprep, you will have a complete Scavenger Control Panel Operating Manual. Please refer to this manual for details of control panel operation.

INSTALLATION

SYSTEM CONSIDERATIONS

The Scavenger is available in sizes suitable for all pulpers of up to 2650 cubic feet capacity; it requires relatively little floor space and is easily adaptable to installation on virtually all existing pulpers - vertical and horizontal, continuous and batch.

UTILITY REQUIREMENTS

Electrical power of 440 volts, 60 cycles, 3 phases, is required for the rotor drive motor and the compressor motor.

A supply of white water at 10 psi maximum is required for diluting and washing the stock. Volume requirements vary with size of Scavenger as follows: Size I - 200-300 GPM

Size II - 300-400 GPM

Size III - 400-500 GPM

Clear water at 25 psi for lubricating the packing in the stuffing box gland is also required.

If control valves are supplied by Fiberprep, they will require an 80 psi instrument air supply for operation.

PIPING

Piping between the outlet of the main pulper and the stock valve of the Scavenger should be as short as possible and with downward slope to insure "heavies" do not settle out. (12 degrees slope is suggested.)

PIPING (CONTINUED)

Piping from the rotor housing outlet to the main pulper (recycle line), from the air inlet/deaeration outlet connection at the top of the Scavenger to the blower and pulper (deaeration line), and from the dilution washing inlet at the top of the Scavenger and the auxiliary dilution connection in the feed pipe to the white water source is to be made in accordance with the installation drawing. Note that the deaeration line must be located at least 24 inches above the recycle line. A check valve must be installed in the piping from the blower to prevent water from entering blower.

Pneumatic piping to the valves is to be made in accordance with good standard practice for such piping. A suitable filter-regulator/lubricator and a shut-off valve should be installed ahead of the valves.

MOUNTING

The Scavenger can be mounted with the motor mount supported from the floor and/or suspended from the ceiling (See Installation Drawing). In either case, the floor or the ceiling should be so constructed that no vibration will occur when the Scavenger is

MOUNTING (CONTINUED)

operating. The mounting dimensions of the Scavenger are shown on the Installation drawing. A free space (See **INSTALLATION DRAWING)** must be provided at the drive end of the Scavenger so that the rotor assembly can be removed. (See **Corrective Maintenance** chapter).

The blower must be installed in an area that is free of water and stock. It should be mounted to a firm foundation so that it does not vibrate during operation. Use of shop compressed air is not recommended. The system must be designed so pressure never exceeds 15 psi.

CAUTION: CARE MUST BE TAKEN IN DESIGN OF THE SYSTEM TO PREVENT OVER PRESSURIZING OF THE SCAVENGER. OVER PRESSURIZATION MAY VOID YOUR WARRANTY. Maximum Allowable Case Pressure = 15 PSIG.

The control panel can be mounted on any suitable vertical structure near the Scavenger.

The **minimum clearance** recommended for underneath the Scavenger is **48 inches** as measured from the flow to the bottom side of the reject valve. This typically provides sufficient space for any of the methods for reject handling - hopper, belt conveyor, bucket conveyor or compactor, (ram press). Figure 2 shows a typical bucket conveyor arrangement.

TYPICAL AUXILIARY APPLICATIONS

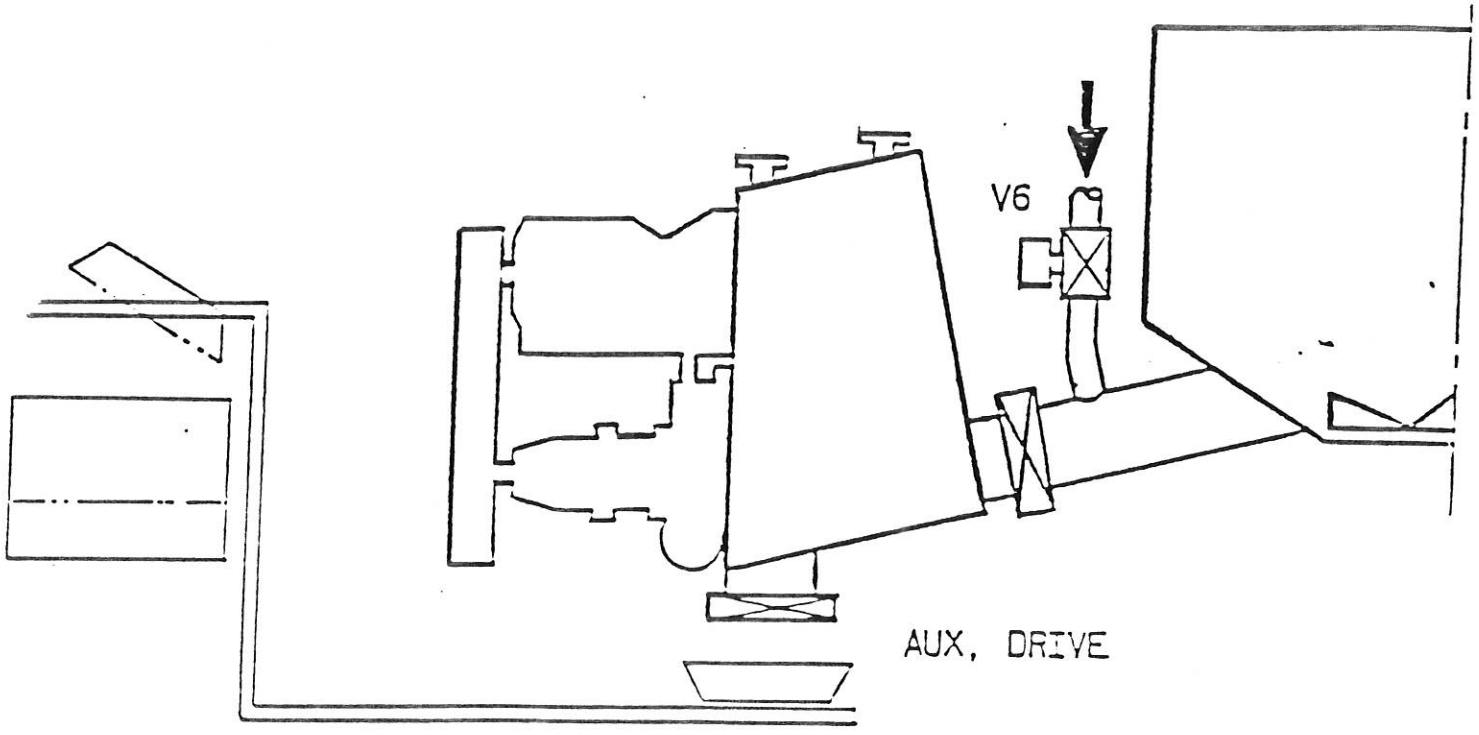

Figure 2. Typical Auxiliary Application, contact Fiberprep for bucket conveyor system.

OPERATION

INTRODUCTION

The Scavenger requires little or no operator action during operation other than startup, monitoring, and shutdown. During the run and following large variations in system stock feed, it may be necessary to readjust the timers. Figure 3 is a table of operation for the Scavenger, which shows the positions of the valves and operating conditions of the motors for the various phases of the cycle.

PRESTART CHECK

Before starting the Scavenger for the first time, make the following checks to be sure that the installation is complete and that the unit is ready for operation.

1. Check that bearings are properly lubricated.
2. Check that pulleys rotate counterclockwise when facing drive end of Scavenger.
3. Check belt tension. (See **PREVENTIVE MAINTENANCE** chapter).
4. Turn on clear water supply to stuffing box and check tightness of packing gland. There must be some leakage from gland to assure proper lubrication of packing. After Scavenger has run for several hours, it will be necessary to adjust gland to allow for initial wear-in and seating of packing.

OPERATION

FUNCTIONAL DESCRIPTION

Contaminants, (plastic, polyethylene, heavyweights, etc.) are always present in varying quantities in the main Pulper tub. The extraction plate becomes obstructed with these contaminants, resulting in a reduction of flow and Pulper capacity.

To eliminate this problem, the Scavenger operates on an entirely automatic cycle to continuously unload the Pulper of these contaminants. This automatic cycle is described below.

NORMAL SCAVENGER OPERATION

The Continuous Scavenger is controlled by a PLC, which is programmed to recognize inputs from limit switches on the on/off valves and the operation of several timers to control the outputs and the control logic sequence. The PLC is programmed in a sequence (or step-like) logic which organizes the sequence of events which are to occur during a specific step. The specific details of the PLC operation, as well as the design of the control panel, are provided in the section entitled **CONTROL PANEL DESCRIPTION** which is included at the end of this manual if a control panel is being supplied with the Scavenger.

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TABLE OF OPEATION

STEP	DESCRIPTION	V1	V2	V3	V4	V5	V6	M1	M2
0	STANDBY	C	O	C	C	O	C	OFF	OFF
1	CYCLE START	C	C	C	C	O	C	OFF	OFF
2	SCAVENGER FILL	C	C	O	C	O	C	OFF	OFF
3	STOCK FLOW	O	C	C	C	O	O*	ON	OFF
4	SCAVENGER WASH	C	C	O	C	O	C	ON	OFF
5	AIR DRY REJECTS	C	C	C	O	C	C	ON	ON
6	REJECT	C	O	C	C	O	C	OFF	OFF

* – V6 IS OPENED ONLY DURING THE OPENING AND CLOSING OF V1.

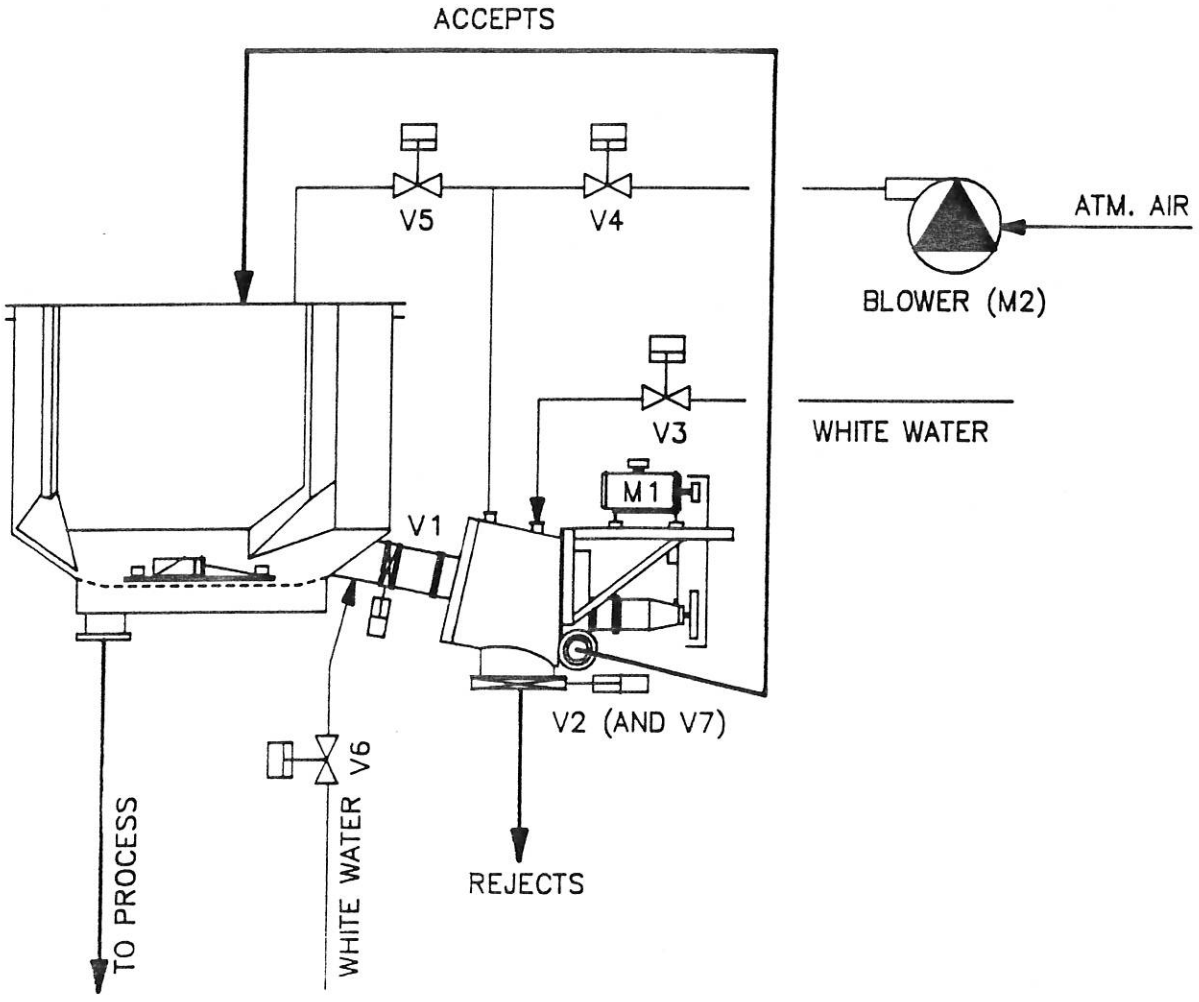

FIGURE 3 AFDE–SJC–0002

NORMAL SCAVENGER OPERATION (continued)

The following is a description of the Scavenger operation. The following valve designations will be used in the description:

V1	-	Stock Flow Valve
V2	-	Scavenger Reject Valve
V3	-	Scavenger Fill/Wash Valve
V4	-	Air/Drying Valve
V5	-	Vent Valve
V6	-	V1 Flush Valve
V7	-	V2 Air Supply-Pneumatic Safety Switch
V8	-	(A or B) Scavenger Accepts Valve (dual pulper system only)

Step 0 - Standby

The Scavenger is not operating. The following valves are closed: V1, V3, V4, V6, V7. The following valves are open: V2, V5, V8 (A or B - dual system only).

Step 1 - Cycle Start, Close V2

1.1 The reject valve, V2, closes and must close the contacts on the V2 closed limit switch, LS3. Positive feedback from LS3 will permit the cycle to continue. In order to close V2, it is necessary to energize both V7 to supply air to V2 and the V2 close solenoid to supply air to close V2.

1.2 Should the limit switch on V2, LS3, not be met, the cycle should freeze at that position and an alarm should indicate to the operator that V2 has not closed. Typically, a timer is used to provide the alarm contact should sufficient time pass without LS3 being met. Normally, it takes 20-30 seconds for V2 to move to the closed position.

NORMAL SCAVENGER OPERATION (continued)

Step 2 - Scavenger Fill

2.1 With feedback from LS3, the Scavenger fill/wash valve, V3, opens and the fill timer starts. The fill timer runs long enough to insure that the Scavenger is full of water. This is important to minimize operating problems when the stock valve opens. It is not recommended to start stock flow to the Scavenger without filling the Scavenger first.

2.2 When the fill timer times out, V3 is closed and the cycle advances.

Step 3 - Stock Flow

3.1 Following the fill step, the stock flow valve, V1, is told to open. As V1 leaves its seat and the V1 close limit switch, LS1, is no longer met, the Scavenger drive starts. Since the Scavenger rotating assembly has a pumping effect, it is preferred not to start the Scavenger until V1 has moved to avoid pumping the water out of the Scavenger before stock is introduced.

NORMAL SCAVENGER OPERATION (continued)

3.2 As V1 is told to open, the V1 flush valve, V6, opens to help wash any debris away from the inlet side of V1. Typically, V6 is open for 10-15 seconds or until V1 reaches its open position (whichever is less).

3.3 When V1 reaches its open position, and limit switch LS2 is met, the stock flow timer starts.

3.4 When the stock flow timer times out, V1 is told to close. As V1 is closing, the V1 flush valve, V6, opens to flush debris away from the seat of V1. When the V1 closed limit switch, LS1, is met, the cycle is allowed to continue. If LS1 has not been met after a period of time, V1 is opened and closed again with V6 dilution assisting in the valve closing. If V1 fails to close a second time, V1 will open and close one more time, and should V1 fail to close the third time, a V1 alarm will occur, and the cycle will not advance.

NORMAL SCAVENGER OPERATION (continued)

3.5 At any time during the stock flow step should the Scavenger drive stop for any reason, V1 will close, a drive alarm will appear, and the system will remain in standby with the exception that V2 will remain closed.

Step 4 - Scavenger Wash

4.1 When V1 has closed, the program advances to the washing step. The Scavenger fill/wash water valve, V3, opens, and the wash timer starts. After the wash timer has timed out, V3 closes, and the cycle advances.

4.2 Should the Scavenger drive fail at any time during the wash step, V3 closes, a drive alarm will appear, and the system will remain in standby with the exception that V2 will remain closed.

Step 5 - Air Dry Rejects

5.1 After the wash step, the blower is told to start, V5 closes, and V4 opens. With feedback from the blower auxiliary contacts, the reject drying timer starts. When the timer times out, V5 opens, V4 closes, the blower stops, and the cycle advances.

NORMAL SCAVENGER OPERATION (continued)

5.2 Should the blower drive fail for any reason, the cycle freezes, V4 closes, V5 opens, a blower alarm appears, and the system remains in standby with the exception that V2 is closed. Likewise, the same is true should the Scavenger drive fail for any reason during the drying step.

Step 6 - Reject

6.1 At the end of the drying step, the reject valve is told to open. The reject valve can be told to open partially to allow, first, draining of some of the residual water from the rejects, and then opening to the full position to discharge the remaining reject material.

6.2 Before the reject valve is told to open, there must be feedback that the reject handling device is ready. If a standard, belt-type conveyor is used, then the conveyor should be running prior to opening V2. If a bucket conveyor is used, the bucket must be in the down position prior to opening the reject valve.

6.3 The Scavenger drive should stop when V2 leaves its seat (LS3).

6.4 The reject timer runs when V2 is told to open to the full position.

NORMAL SCAVENGER OPERATION (continued)

Step 0 - Standby

After the reject step, the cycle can automatically repeat immediately, can repeat after a brief pause, or can stop and remain in standby until the operator initiates the next cycle. If the cycle is to repeat without a pause, then the cycle should step to Step 1. Should a pause be required between cycles, the pause timer will time out prior to the cycle automatically repeating. If operator intervention is required to start the next cycle, then the start button must be pressed.

TIMERS

The process timers are set at start-up and vary with specific applications and conditions. Typical timer settings are as follows:

1.	Fill Timer	60 -120 sec.
2.	Stock Flow Timer	90 -180 sec.
3.	Wash Timer	120-240 sec.
4.	Reject Drying Timer	120-180 sec.
5.	Reject Timer	10 - 20 sec.

ABNORMAL SCAVENGER OPERATION

STOCK VALVE NOT COMPLETELY CLOSED

In automatic operation, if the stock valve is prevented from closing completely because of plugging by contaminants, it will open and attempt to close again after a delay in the open position of 3 seconds. This will continue for three attempts, then the V1

ABNORMAL OPERATION (CONTINUED)

ALARM will appear on the control panel, and the automatic cycle freezes. When this occurs, the following steps should be taken:

1. Pump out pulper
2. Pump out Scavenger
3. Dump debris from Scavenger

WARNING: Before entering pulper to clean stock valve, ensure that power to pulper and to Scavenger has been shut off and circuit breakers tagged to guard against accidental pulper or Scavenger startup. (As an added precaution, it is also recommended that electrical leads be disconnected at Pulper and Scavenger drive motors). Also make sure that air supply to Scavenger is shut off and locked/tagged.

Close and secure manual isolation valves in all stock, water, chemical, steam, etc., lines feeding into pulper and Scavenger.

4. Inspect stock valve through reject valve.
5. Disconnect air supply to "close" side of air cylinder. Open stock valve, and from inside Pulper, thoroughly clean all material from valve.
6. Reconnect disconnected air lines. Turn on power and air supply.
7. Check that stock valve closes and opens completely.

ABNORMAL OPERATION (CONTINUED)

REJECT VALVE NOT COMPLETELY CLOSED

In automatic operation, if the reject valve is prevented from closing completely because of plugging by contaminants, the V2 ALARM on the control panel lights after a delay of 20 - 30 seconds, and the automatic cycle stops. When this occurs, the following steps should be taken:

WARNING: Before attempting to clean reject valve, ensure that V1 (stock inlet valve) is closed and air supply to "open" side of air cylinder is disconnected.

1. Open reject valve.
2. Turn off and secure manual valve in Scavenger system air supply.
3. Disconnect air supply line to "close" side of reject valve air cylinder.
4. Thoroughly clean all material from valve.
5. Reconnect reject valve air line.
6. Turn on air supply.
7. Check that reject valve closes and opens completely.
8. Reconnect V1 (stock valve) air line.

SAFETY DEVICES

Along with various interlocks built into the sequential program, the Scavenger is also protected against overpressure and simultaneous opening of the stock valve V1 and the reject valve V2.

OPERATION

OVERPRESSURE

Overpressure is protected against by means of a pressure switch (located inside Fiberprep supplied control panels), which has been preset to trip at 8 psi, when activated, stops the program sequence in whatever step it is in and returns all valves to their fail-safe condition.

The pressure in the Scavenger tub is monitored by a small transducer mounted on the tub wall. If for some reason, such as excessive dilution water pressure, the tub pressure rises above 8 PSI, the transducer signals the pressure switch in the cabinet and the shutdown procedure is initiated.

CAUTION: BEFORE RESTARTING THE SYSTEM, THE CAUSE OF THE OVERPRESSURE SHOULD BE DETERMINED.

V1/V2 SAFETY INTERLOCKS

A safety device involving V1 and V2, consists of a three-way solenoid valve feeding supply pressure to these two valves. This is referred to as V7. This valve is energized during the cycle to supply air to open or close V2. In the de-energized condition, air can only be supplied to V1. Since it can only supply one valve at a time, it prevents the simultaneous opening of both of these valves should a spurious voltage spike or module failure attempt to do this.

V1/V2 SAFETY INTERLOCKS (continued)

The second safety device involving V1 and V2 is a pneumatic limit switch. This is mounted on V2 (when supplied by Fiberprep) and prevents V1 from opening when V2 is not closed.

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125 John Hancock Road, Unit 15, Taunton, MA 02780
(508) 823-3358 FAX (508) 823-4155

OPERATION MANUAL

for the

FIBERPREP INC.

CONTINUOUS SCAVENGER

CONTROL PANEL

8/23/91

CONTINUOUS SCAVENGER CONTROL PANEL

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CONTINUOUS SCAVENGER CONTROL PANEL

GENERAL DESCRIPTION

The Continuous Scavenger Control Panel (See Assembly Drawing) consists of a NEMA 4 enclosure, which houses an Allen-Bradley SLC 150 microprocessor and expander, to provide automatic control of the Continuous Scavenger operation. Should the panel lose 110v power, the PLC has a rechargeable battery backup to prevent memory loss during this power outage. Specific information on these units is included in this manual in Allen Bradley Bulletin 1745. The enclosure houses a pressure switch which takes a pneumatic signal form the PMC transmitter mounted on the Scavenger vat. This pressure switch is factory preset to activate a Scavenger Emergency Stop condition if tub pressure reaches 8 psi. A reset button is also located inside the enclosure. This button must be used to allow continuation of Scavenger operation if an Emergency Stop is triggered either by the operator or an overpressure situation.

The Continuous Scavenger panel is powered by a 110 volt, single phase, 15 amp power supply; all outputs are 110 volt, single phase, 2 amps. There is a line filter on incoming power to modulate any power swings. All panel outputs are fused with standard 2 amp quick-blow fuses. The panel wiring (See wiring drawing) is color coded as follows:

CONTINUOUS SCAVENGER CONTROL PANEL

GENERAL DESCRIPTION

NOTE: Under no circumstances substitute 2 amp quick-blow fuses with higher amp fuse.

Black - power at all times

Red - control wiring

White - common

Green - ground

The face of the panel has all buttons and switches required to provide control of the Scavenger in Manual and Automatic modes. A more detailed description of the panel buttons and switches is provided in the Operations Section of this manual, and further information is provided in Allen-Bradley Bulletin 1745-TCAT included with the controller.

The panel face has a digital amp meter which monitors the Scavenger drive motor load, and a graphic representation of the Scavenger with lights to indicate valve positions and valve and motor alarm lights.

PANEL SWITCH AND BUTTON FUNCTIONS

The Continuous Scavenger panel face is represented in Figure 1.

[Power on Light]

This is lit when 110v power supply to panel is on.

CONTINUOUS SCAVENGER CONTROL PANEL

PANEL SWITCH AND BUTTON FUNCTIONS (Continued)

[Start Button]

Push button that starts a Scavenger cycle when in the automatic mode. Used to restart the Scavenger cycle should a fault occur and is corrected.

[A-BOTH-B SWITCH] (Dual Pulper system only)

For operation of a single Continuous Scavenger to clean two (2) Pulpers, the switch allows the operator to select Scavenger Operation on each Pulper individually or operation alternately between both Pulpers.

[Pause/No Pause Switch]

Provides an option that provides either a timed period between Scavenger cycles, or no period between cycles. Time set will be in minutes.

[Manual/Off/Auto Switch]

A selector which selects Manual or Automatic Operation. In the off position, power is removed from the PLC and all panel outputs. In the manual position, the cycle is in the "stand-by" state with power removed from the outputs but the logic program remains in its last sequence step. The cycle will restart at this point if the start is pressed in the "Auto" mode. In the Automatic position the cycle proceeds normally.

PANEL SWITCH AND BUTTON FUNCTIONS (continued)

[Repeat/Single Cycle Switch]

A selector which selects a single Scavenger cycle or continuous cycling of the Scavenger.

[Freeze/Run Switch]

The switch, in the Run position, allows continuous operation of the Scavenger. In the "Freeze" position, the automatic sequence stops at that sequence step in the cycle. The timers continue to run; however, the cycle will not advance automatically unless the switch is in the "Run" position. The cycle can, however, be advanced to the next step when in the "Freeze" position by pressing the Manual Step button.

[Manual Step Button]

The manual step button permits the operator to advance the cycle to the next sequence step. There may be several sequence (logic) steps used for a specific operating step; therefore, it may be necessary to press than manual step several times to advance to the next operating step. To advance in "Automatic", place the "Freeze/Run" switch in "Freeze" and press the manual step.

PANEL SWITCH AND BUTTON FUNCTIONS (continued)

[Manual Step Button] (continued)

In "Manual", the program logic can be advanced to a specific step. Power is removed from the outputs in "Manual", output action does not occur. It is then possible to start the cycle from any step providing specific conditions are met; for example, V2 is closed.

[Auxiliary Drive Switch]

A spring loaded switch to the normally off position. This switch will allow manual operation of the Reject Conveyor when in the Manual mode. STANDARD CONVEYOR AND COMPACTOR ONLY

[Drive Switch]

This switch is spring loaded to the normally off position. This switch will allow manual operation of the Scavenger drive motor when in the Manual mode.

[Blower Switch]

This switch is spring loaded to the normally off position. This switch will allow manual operation of the Blower drive motor when in the Manual mode.

CAUTION: This switch should be used in conjunction with V4 and V5, or for jogging of motor for purpose of establishing rotation.

PANEL SWITCH AND BUTTON FUNCTIONS (continued)

[V1 Close/Open Switch]

This switch is spring loaded to the normally closed position. This switch allows manual operation of the Stock Flow valve, V1, in the Manual mode. Note: Will not open in Manual if V2 is open due to pneumatic limit switch (LS4). See V1/V2 Safety Devices description.

[V2 Close/Neutral/Open Switch]

This swtch allows manual operation of the V2 valve in Manual mode

[V3 Close/Open Switch]

This switch is spring loaded to the normally closed position and allows manual operation of the fill/washing valve (V3) in the Manual mode.

[V4 Close/Open Switch]

This switch is spring loaded to the normally closed position and allows manual operation of the Blower Air Valve (V4) in the Manual mode.

[V5 Close/Open Switch]

This switch is spring loaded to the normally open position and allows manual operation of the Vent Valve (V5) in the Manual mode.

PANEL SWITCH AND BUTTON FUNCTIONS (Continued)

[V6 Close/Open Switch]

This switch is spring loaded to the normally closed position and allows manual operation of the V1 Flush Valve (V6) in the Manual mode.

[EMERGENCY STOP BUTTON]

This button will suspend all operation of the Scavenger when the button is pushed. It drops out all motors; V1, V3, V4, and V6 close; V5 opens; and V2 remains in the position occupied when Emergency Stop was pushed.

To reset the Emergency Stop condition, the E-Stop button must be pulled out, and the reset button inside the panel pushed.

When returned to the automatic mode, the cycle will resume at the point it was discontinued after the "Start" button is pressed. Note that on power-up timers are reset as is the case after an emergency stop.

NOTE: It is recommended that the program chips provided with this panel not be installed in the PLC, but stored in a safe place in the unlikely event of a loss of logic in the Microprocessor, if

PANEL SWITCH AND BUTTON FUNCTIONS (continued)

[Emergency Stop Button] (continued)

the chip is left in the Microprocessor, and power is lost to the Microprocessor, (ie, battery failure, emergency stop, etc.). Timer settings will be preferentially recovered from the program chip when power is restored. If timer settings for stock flow, fill, wash, or pause are different from the original factory preset times, the operator will have to reset his current times using the TCAT. **CAUTION: DO NOT REMOVE OR INSTALL CHIP WITH POWER APPLIED TO PANEL, AS THE CHIP WILL BE DAMAGED!**

OPERATING THE SCAVENGER

To start the Scavenger:

1. Put Off/Man/Auto switch to Auto.
2. Push Start Button.

The Scavenger operation will begin.

A. To run one cycle at a time:

1. Put Repeat/Single switch to Single.
2. Put Pause/No Pause switch to No Pause.

The Scavenger sill run one cycle at a time. At the end of a complete cycle, it will automatically stop and wait for the start button to be pushed.

OPERATING THE SCAVENGER (continued)

B. To run the operation with continuously repeating cycles (no pause between cycles):

1. Put the Repeat/Single switch to Repeat.
2. Put Pause/No Pause switch to No Pause.

The Scavenger will no run repeat cycles. A new cycle will begin immediately following the end of a cycle. This is not a requirement for operator intervention.

C. To run repeat cycles, but with a predetermined amount of time between cycles:

1. Put Repeat/Single switch to Repeat.
2. Put Pause/No Pause switch to Pause.
3. Set T-CAT 915 to desired time (minutes).

The Scavenger will now run repeat cycles; but at the end of each cycle, the pause timer will run for a preset time, and then it will restart automatically after the pause time. No operator action is required.

A list of timers and counters is included at the end of this manual. Timers which are operator adjustable are adjusted on mill site based on operating conditions.

CONTINUOUS SCAVENGER CONTROL PANEL

SCAVENGER SHUTDOWN

When the Scavenger will be shutdown for any reason, turn Repeat/Single switch to single; to finish the current cycle.

OPERATING THE T-CAT

To call up a Timer or Counter:

1. Press ADDR/IO key. [9] will display followed by _ _.
2. Press remaining two digits of timer being accessed (ie 901).
3. Press enter. 901 will appear under address, green light under TMR will be on and green light will be on next to Preset showing the preset time.

*Preset time - Time predetermined

*Accum time - The accumulated time

*TMR - Will be in seconds

*CNT - Will be in minutes or a numerical count

TO SET A TIMER (*Preset Time Only)

A. Press ADDR/IO
B. Press 2 digit timer#
C. Press enter
D. Press "Preset" twice
E. - - - will display
F. Enter new time
G. Press enter

CONTINUOUS SCAVENGER CONTROL PANEL

TO SET A COUNTER

Follow same instructions for setting timers. Green light will be on under CNT.

*Do not attempt to change accum or resets as they could have negative results on sequencing of program.

More detailed information will be included in A-B Bulletin 1745 Timer-Counter access terminal, supplied with Allen-Bradley controller.

Timers/Counters, that are operator variable, can be changed through the TCAT. Timers/Counters, that do not affect the operation of the Scavenger, are internally protected from change and can only be changed with programmer. (Optional)!

DUAL PULPER SCAVENGER SYSTEM N/A

When you wish to change the A-BOTH-B switch, put Repeat/Single switch to single, and finish the cycle. When operating a dual pulper system, it is possible to select either "A" or "B" pulper and have the Scavenger operate continuously on either pulper, or it is possible to have the Scavenger alternate between either pulper by placing the "A-BOTH-B" switch in the "both" position and the "Repeat/Single" switch in "Repeat". There are counters for "A"

DUAL PULPER SCAVENGER SYSTEM (continued) N/A

Pulper and "B" Pulper so that it is possible to run more than one cycle on a specific pulper before changing to the other pulper. Thus, it is possible to run three cycles on Pulper "A", for example, and then, running one cycle on Pulper "B". To stop the Scavenger cycle, put the "Repeat/Single" switch in "Single", and the Scavenger will stop at the end of the current cycle.

Should it be necessary to operate only one pulper after operating on both pulpers, then change the "A-BOTH-B" selector switch to the appropriate pulper (A or B) and the Scavenger cycle will switch to that appropriate pulper at the end of its current cycle and remain there until the pulper selector switch is changed.

Should it be necessary to change from operating on a specific pulper to operating on both pulpers, when the pulper selector switch is put to the "Both" position, the Scavenger cycle will begin alternating between both pulpers at the end of its current cycle and will begin will Pulper "A".

PLC PROGRAM DESCRIPTION - SCAVENGER OPERATION

On power-up, the T-CAT will display Counter 919. C919 is the logic sequence step counter and indicates which sequence step the program is currently running. The following describes the counter step number and the corresponding sequence step number.

STEP COUNTER DISPLAY - C919

	CNTR. DISP.	SEQ. STEP	STEP SUMMARY
	0	717	Standby
	1	701	Close V2
	2	702	Fill, open V3
	3	703	Open V1, Start Drive
	4	704	Stock Flow
	5	705	Close V1, Open V6
(1)	6	706	Open V1, Close V6
(1)	7	707	Retry Close V1, Open V6
(1)	8	708	Open V1, Close V6
(1)	9	709	Retry Close V1, Open V6
	10	710	V6 Open (flush stock line)
	11	711	Wash, Open V3
	12	712	Start Blower, Open V4, Close V5
	13	713	Dewater Rejects
(2)	14	714	Partially Open V2, Drain Rejects
	15	715	Reject Open V2 (full open)
	16	716	Pause, No Pause (or single)
	0	717	Repeat or Single

NOTES:

1. Counter Steps 6-9 call to try to close V1 again if V1 fails to close. If V1 closes successfully, then the counter display will move to 10.

2. At Step 14, the cycle also looks for specific reject device requirements.

3. Standby - Defined as follows:

   a. Drives not running
   b. Closed Valves - V1, V3, V4, V6 and V7
   c. Open Valves - V5
   d. Valves in last state - V2, V8 (dual)

PLC PROGRAM DESCRIPTION - SCAVENGER OPERATION (Continued)

Seq. Step 701 - (Step 1) Closes V2 to start a new cycle. When the closed limit switch, LS3, is met, then the cycle advances to 702.

Seq. Step 702 - (Step 2) Opens V3 and starts the fill timer (T902). When T902 times out, the cycle advances to 703.

Seq. Step 703 - (Step 3) Tells V1 to open. When V1 leaves its seat and the closed limit switch, LS1, is not met, then the Scavenger drive is started. If feedback from the drive auxiliary contacts i not received within 5 seconds (T918) of when the drive is told to start, then the cycle is aborted, a drive alarm appears, and the Scavenger remains in standby (V2 in last state). When valve V1 reaches the open limit switch, LS2, (and the drive is running), the cycle advances to 704.

Seq. Step 704 - The stock flow timer (T903) is started. When T903 times out, the cycle advances to 705. If the Scavenger drive fails, the cycle is aborted, a drive alarm appears, and the Scavenger remains in standby (V2 in last state).

Seq. Step 705 - Tells V1 to close. When V1 closes and the closed limit switch, LS1, is met the cycle advances to 710. As V1 is closing, the V1 flush water valve, V6, is open. If V1 does not close and LS1 is not met within a set period of time (T910) then the cycle runs through sequence steps 706-709.

Seq. Step 706 - If LS1 is not met and T910 has timed out, then V1 is opened and V6 is closed. When V1 reaches the open position, LS2 is met, a delay timer (T909) runs for 3 seconds, and the cycle advances to 707.

Seq. Step 707 - V1 is told to close and the V1 flush water valve, V6, is opened. If V1 does not close and LS1 is not met within a set period of time (T910) then the cycle advances to 708. If V1 does close and LS1 is met, then the cycle advances to 710.

PLC PROGRAM DESCRIPTION - SCAVENGER OPERATION (Continued)

Seq. Step 708 - Same as 706, except the next sequence step is 709.

Seq. Step 709 - Same as 707, except if LS1 is not met after T910 has timed out, then the cycle freezes, and a V1 alarm appears. V6 closes with the V1 alarm; however, the Scavenger drive continues to run. The cycle will not advance until the problem is corrected.

Seq. Step 710 - If V1 closes successfully, then V6 remains open for 10 seconds (T907) to flush the stock line between the Pulper and V1. When T907 times out, the cycle advances to 711. A Scavenger drive failure will abort the cycle.

Seq. Step 711 (Step 4) - The wash water valve, V3, opens and timer T904 starts. When T904 times out, the cycle advances to 712. A Scavenger drive failure will abort the cycle.

Seq. Step 712 (Step 5) - The blower drive is started, V4 is opened, and V5 is closed. With feedback from blower auxiliary contacts, the cycle advances to 713. On blower failure or Scavenger failure, the cycle is aborted, and the appropriate alarm appears.

Seq. Step 713 (Step 6) - The reject drying/dewatering timer (T905) is started. When T905 times out, V4 closes, V5 opens and the blower stops. The cycle advances to 714. A blower failure or Scavenger failure will abort the cycle.

Seq. Step 714 - The program checks for the appropriate reject device (see following description for the different reject devices). V2 is partially opened (T911) to allow residual water to drain. After a period of time (T920) to drain water, the cycle advances to 715. The Scavenger drive stops when V2 leaves its seat and LS3 is not met.

Seq. Step 715 - V2 is opened to its full position, and the rejects are discharged. The reject timer (T906) starts, and when T906 times out, the cycle advances to 716.

PLC PROGRAM DESCRIPTION - SCAVENGER OPERATION (Continued)

Seq. Step 716 - The program checks for pause/no pause (or single). If a cycle pause is called for, the pause timer (C915) runs and times out before advancing to 717. Otherwise, the cycle will advance immediately to 717.

Seq. Step 717 - The program check for a repeat or single cycle. If a repeat is called for, the cycle automatically advances to the beginning step, 701. If cycle is set to single, the Scavenger will remain in standby until the operator initiates the next cycle by pressing the start button or putting the Repeat/Single switch in Repeat.

For dual pulper operation with "Both" pulpers selected, the specific pulper operation evaluated; that is, the number of cycles selected for a pulper must be complete, then the pulper selection is switched.

NOTE: Step number shown in parentheses ( ) indicates operating step as discussed on Normal Operation Section of Scavenger Manual.

CONTINUOUS SCAVENGER CONTROL PANEL

PLC PROGRAM DESCRIPTION - REJECT HANDLING

The Fiberprep Scavenger control panel is designed to except 4 types of reject devices. It recognizes these devices by a jumper which creates a PLC input. These devices and jumpers locations are as follows:

Reject Device	Terminal
Standard Belt Conveyor	- no jumper
Bucket Conveyors	- 305
RAM Press/Compactor	- 303
Hopper (no conveyor)	- 301

Standard Belt Conveyor

The PLC recognizes a standard belt-type conveyor if there is not an input (jumper) to terminal 301, 303, or 305. When this condition is met, the sequence logic requires that the conveyor is running before V2 is opened. A timer, T917, is started with feedback from the conveyor drive and governs the length of time the conveyor runs to ensure the rejects are carried away. Should the conveyor trip out, an alarm will appear, and should this occur before the reject valve is told to open full (during seq. step 714) the cycle will freeze. Once the problem is corrected, the cycle will resume. Should the conveyor trip out after the reject step (715), it is not possible to start the conveyor in the Automatic Mode.

Bucket Conveyor

The PLC recognizes a Bucket Conveyor if there is an input (jumper) to terminal 305. The bucket conveyor is operated sequentially from the PLC by a logic sequencer (S925). This sequence operates in parallel to main Scavenger sequence but is independent of the Scavenger sequence; that is, the Scavenger cycle may repeat without a pause while the bucket conveyor proceeds through its operating sequence. A fault in the Scavenger operation will not affect the bucket conveyor, nor will the "Manual Step" function or the "Freeze/Run" function. However, should the operator put the operation in the Manual mode or press the Emergency Stop button, the bucket conveyor will stop. Operation will resume when the system is returned to the Auto mode. It is not necessary to press the start button.

The bucket conveyor and Scavenger are linked at the reject step (seq. steps 714 & 715). First, the bucket conveyor must be in position underneath the reject valve as acknowledged by the Bucket Down switch (BDS), then the reject valve can open. When the reject step is completed (Timer T906 has timed out), a reject counter

PLC PROGRAM DESCRIPTION - REJECT HANDLING (continued)

(C912) adds one (1). The reject counter permits multiple Scavenger dumps (if desired) prior to running the bucket conveyor. When C912 has counted out, the bucket drain timer (T913) runs. At this point, the bucket conveyor and Scavenger are completely independent. When T913 times out, the operation moves into the bucket conveyor sequence proceeds as follows:

Seq. Step 725 - The bucket conveyor is told to run (up). With feedback from the motor auxiliary contacts, the sequence advances to 726. Al,so, the conveyor run timer (T917) starts. Should the drive fail to start, a conveyor alarm will appear.

Seq. Step 726 - The bucket travels up until it meets the Bucket Up Switch (BUS) where it stops and the sequence advances to 727. Should the drive fail, an alarm will appear. Additionally, should timer T917 time out before the bucket reaches the BUS, the drive will stop and an alarm will appear. This is to alert the operator that the conveyor has malfunctioned during its travel. Thus, it is important that T917 be set longer than the time required for the bucket to travel. Finally, should the bucket travel beyond the BUS, the Up Safety Switch (USS) will stop the conveyor when met and an alarm will appear.

Seq. Step 727 - The bucket dump timer (T914) runs. When T914 times out, the sequence advances to 728.

Seq. Step 728 - The conveyor drive starts (down). With feedback that the drive has started, the sequence advances to 729. An alarm appears on drive failure. Timer T917 starts.

Seq. Step 729 - The bucket travels down until it meets the Bucket Down Switch (BDS) where it stops, and the sequence advances to 730. Should the drive fail, an alarm will appear. As in Sequence Step 726, should timer T917 time out before the bucket reaches the BDS, the drive will stop, and an alarm will appear. Also, should the bucket travel beyond BDS, the Down Safety Switch (DSS) will stop the drive, and an alarm will appear.

PLC PROGRAM DESCRIPTION - REJECT HANDLING (continued)

Seq. Step 730 - The bucket conveyor is in standby underneath the Scavenger reject valve.

NOTE: Should a bucket conveyor fault occur, it is recommended that the Scavenger System be put in Manual, power removed from the bucket conveyor and the problem corrected. When the problem is corrected, the conveyor operation will resume when the system is returned to Auto. The Scavenger will then resume operation when the Start button is pressed.

RAM Press/Compactor

The operation of a Compactor is essentially the same as a standard conveyor. The difference being when the compactor is told to run. The PLC recognizes a Compactor if there is an input (jumper) to terminal 303. When this condition is true, the sequence logic requires that the reject step be complete before the compactor runs. When T906 has timed out, the compactor is started. There is a delay time (T910) to allow the compactor to run a few cycles before the cycle advances to the Pause/No Pause Step (Seq. Step 716). This is to ensure that the level of rejects in the Compactor feed hopper does not interface with the closing of V2 at the beginning of the next cycle. Once the Compactor is told to run, it will run until its own time calls for it to stop. The compactor should stop in the retracted position.

No Conveyor/Reject Hopper

The PLC recognizes that there is not a conveyor or other device if there is an input (jumper) at terminal 301. If this condition is true, then the reject valve is opened for a specified period of time (T906). The Scavenger cycle is described in the Main sequence description.

CONTINUOUS SCAVENGER CONTROL PANEL

CONTINUOUS SCAVENGER CONTROL PANEL LIST OF TIMERS, COUNTERS & SEQUENCES

ADDRESS	FUNCTION	TIME	STATUS	COMMENTS
901S	Logic Sequence	---	P	Maintains step logic organization and sequence.
902T	Fill	60.0	A	Time V3 open to fill Scavenger with water.
903T	Stock Flow	330.0	A	Time V1 open to clean pulper.
904T	Wash	15.0	A	Time V3 open to wash good fiber to pulper.
905T	Dry Rejects	90.0	A	Time Compressor on and V4 open to dry rejects.
906T	Reject	15.0	A	Time V2 is open to dump rejects.
907T	V6 Open Delay	10.0	A	Opens V6 to flush through V1.
908T	V1 Alarm Timer	30.0	P	Times V1 to open/close prior to alarm.
909T	V1 Open Delay	3.0	P	If V1 does not close - time open before retry closing.
910T	V1 Close	25.0	P	Time allowed for V1 to close before retry.
911T	V2 Open Delay	5.0	A	Time to partially open V2 to drain residual water prior to reject (906T).
912T	Reject Counter (Bucket Conveyor)	1.0	A	Counts the number of rejects before running bucket conveyor.
913T	Bucket Drain (Bucket Conveyor)	20.0	P	Time for dewatering rejects before dumping bucket.
914T	Bucket Dump (Bucket Conveyor)	20.0	P	Time bucket stays in dump position before returning to under V2.

CONTINUOUS SCAVENGER CONTROL PANEL

CONTINUOUS SCAVENGER CONTROL PANEL LIST OF TIMERS, COUNTERS & SEQUENCES (continued)

ADDRESS	FUNCTION	TIME	STATUS	COMMENTS
915C	Pause Timer	6	A	No. of minutes off line before next cycle.
916T	Minute Timer	60.0	P	Times minutes for pause counter.
917T	Conveyor Run	40.0	P	Time for standard conveyor to run after V2 has opened.
918T	Motor(s) Alarm	5.0	P	Alarm delay for drive motors.
919C	Step Counter	---	P	Counts sequence logic steps in program. Displayed by T-CAT on power-up.
920T	V2 Drain	15.0	A	Time to allow dewatering rejects after partially opened (911T).
921T	V2 Close Alarm	30.0	P	Time allowed for V2 to close before alarm.
922C	Pulper "A" Counter (Dual Pulper System)	1	A	Counts times cycle is run on Pulper "A".
923C	Pulper "B" Counter (Dual Pulper System)	1	A	Counts time cycle is run on Pulper "B".
925S	Bucket Conveyor Sequencer	---	P	Maintaining step logic organization and sequence for Bucket Conveyor.

A - Adjustable with TCAT programmer
P - Protected - must use programmer to change.
S - Sequencer
T - Timer
C - Counter