THERMO BLACK CLAWSON INC.

A Thermo Fibertek company

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FLOATPURGER™ MANUAL

Installation, Operation, Maintenance, and Service Parts
October 15, 1997

Deliver manuals to:

US Gypsum Company
6825 Evergreen Avenue
Jacksonville, FL 32208

Attention: Kevin Turk

Prepared for: US Gypsum Company

Mill: Jacksonville, FL

Customer order number: 22522619 Number of manuals: (4)

Shop order number	Serial number
4871891	97-FP-0144

Read this manual carefully to learn how to operate and service your equipment correctly; failure to do so could result in personal injury or equipment damage. Keep this manual readily accessible and legible to anyone doing maintenance on or operating this equipment.

Thank you for purchasing a Thermo Black Clawson product.

780MNA-0

FLOAT PURGER™

Contents

This manual is for General Information and Guidance

For specific information concerning parts or items refer to the certified print of the equipment.

The instructions contained in this manual are recommended procedures for installing, operating and maintaining your unit.

This unit was designed to meet a definite set of specifications. It will provide many years of dependable service when installed, operated, and maintained according to our recommended procedures.

Correct installation of the unit is critical.
Reasonable operation and maintenance will not compensate for poor installation.

All information, illustrations, and specifications in this manual are based on the latest information available at the time of publication.
WE RESERVE THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE.

BLACK CLAWSON COMPANY
Shartle Division
605 Clark St., Middletown, OH 45042-0160
Phone: (513) 424-7400
TOLL FREE 24 HOUR EMERGENCY SERVICE
1-800-448-5422

This manual provides information to install, operate, and maintain your BLACK CLAWSON Unit.

Use this information as a guide in the care and operation of your Black Clawson equipment. The contents of this manual are not to be considered the only way to perform an operation; it is to be used as a guide for safe and trouble-free production.

The customer is responsible for ensuring that personnel are trained in the safe operation and maintenance of this unit. Refresher sessions covering safety, operation, and maintenance procedures are recommended periodically throughout the life of your Black Clawson equipment.

Note: Black Clawson offers qualified field service instructors to help train your operators and maintenance personnel.

FOLLOW THE SAFETY INFORMATION CONTAINED IN THIS MANUAL.

RECOGNIZE SAFETY INFORMATION This is the international SAFETY ALERT SYMBOL. When you see this symbol on your equipment or in this manual, be alert to the potential for personal injury. Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS:

DANGER - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. The signal word is to be limited to the most extreme situations.

WARNING - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION - Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: - Contains important information about the care of your unit.

FOLLOW SAFETY INSTRUCTIONS

- Carefully read all safety messages in this manual and on your machine safety signs.
- Do not operate equipment until it has been fully integrated into the system.
- Do not perform service or maintenance work on this equipment until all sources of energy have been locked out and any stored energy has been relieved. (Unit is at Zero Mechanical State.)
- Keep safety signs in good condition.
- Replace missing or damaged safety signs.
- Learn how to operate the machine and how to use controls properly.
- Do not let anyone operate the machine without instruction.
- Keep your machine in proper working condition.
- Do not modify the equipment without authorization from Black Clawson. Unauthorized modifications may impair the function, shorten the machine life, and/or render built-in safety features useless.
- Inspect unit before starting.
  - ♦ All guards and covers are in good condition and fastened in place.
  - ♦ No parts are loose, worn, damaged, or missing.
  - ♦ All personnel are clear of the equipment.

PRACTICE SAFE MAINTENANCE

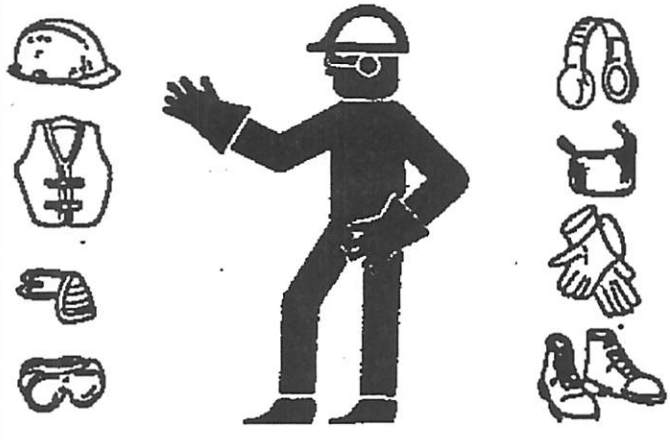
Keep equipment area clean and dry.

Keep all equipment parts in good condition and properly installed.

Understand service procedures before you do the work.

Replace worn, broken or missing parts.

Do not operate damaged equipment - fix damage immediately.



PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Consult applicable Federal, State and Local codes for proper installation and guarding.

IMPORTANT SAFETY GUIDELINES

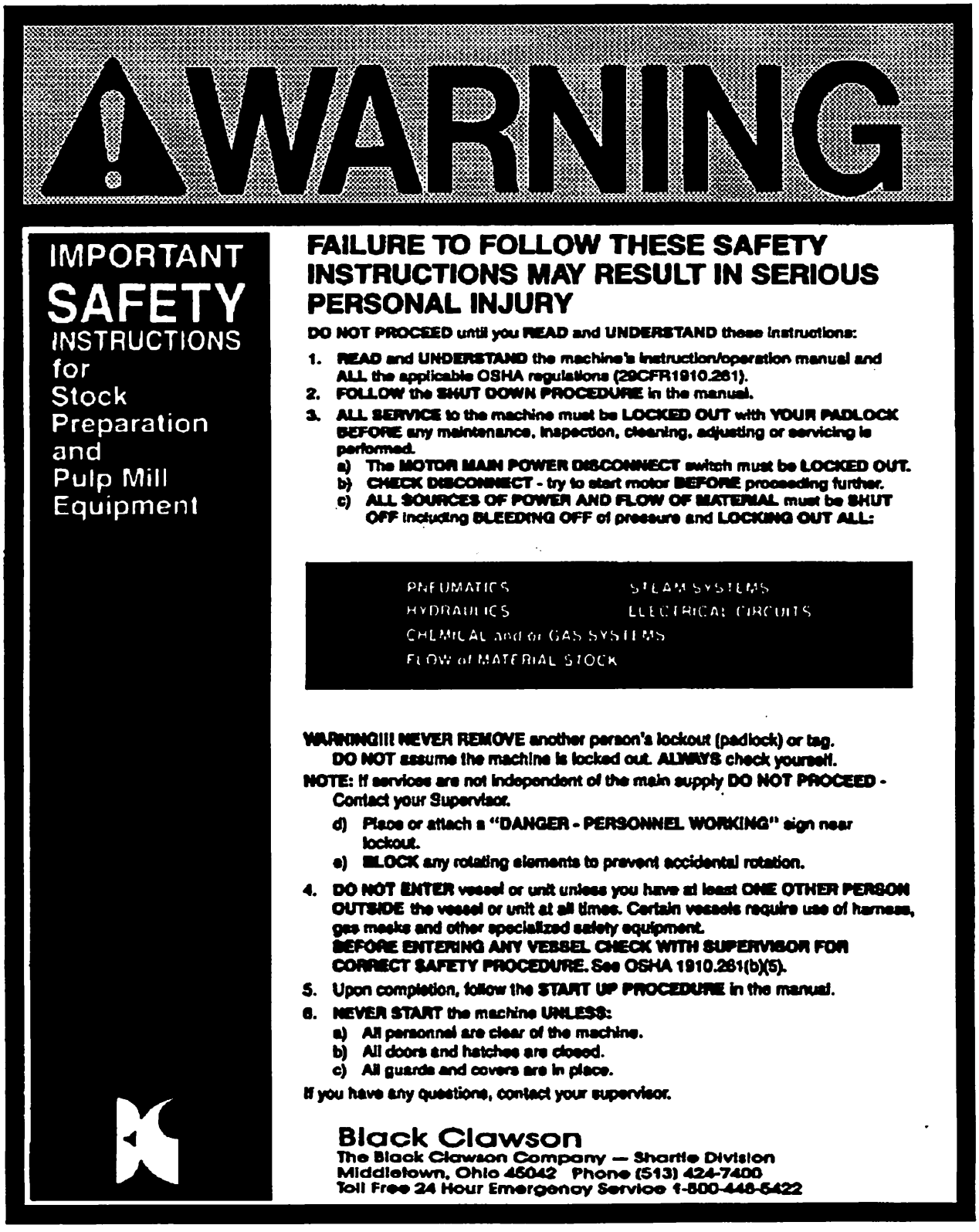
Preventing equipment problems improves user safety.

Do not use or service this equipment until you **read and understand** these guidelines and instructions.

If you have any questions, contact your supervisor.

HAZARD AREAS	WHAT COULD HAPPEN	HOW TO PREVENT IT
Stock leaks from pipe connections, blind flanges, body joints, open access doors, etc. Water leaks from shower water, inlet dilution water, or other water sources.	Skin irritation or scalding. Skin contact with stock might result in chemical or thermal skin reaction	**Lockout unit** - follow shut down and start up guidelines. Be sure you have locked out all energy sources. Tighten or replace loose, leaking connections.
Valves - air and electrical operated.	Amputation or severe injury to fingers, hands, or arms.	**Lockout** valves and their energy sources and ensure that equipment is at Zero Mechanical State. **NOTE: Controls may not be independent.** Extreme care must be used when isolating power sources. Be sure of what will shut down when energy sources are locked out. Other automatic equipment connected to source will also shut down. **Do not** insert fingers, hands, arms, head or any appendage into such devices.
Motor/drive units, V-Belt/sheaves, drive shaft, rotor, reject view port	Electrical shock, amputation, or severe personal injury	**Do not** expose electrical units to water. **Shut down and lockout unit** before cleaning or servicing. **Do not** operate the unit with covers, hoods, or guards removed. Note: Manual rotation of rotating elements may be required with enclosures removed. Be sure all personnel are clear of unit before manually rotating rotor.
Exceeding design pressure of unit	Severe personal injury - seals, gaskets, or vessel might fail	**Know the correct operating pressure** of the equipment, provided in the manual and on the certified drawings. Adhere to proper operating procedures
Discharge debris, reject outlet	Cuts, abrasions, skin irritation, scalding. Reject debris contains chemicals, glass, plastic, wire, etc.	**Wear eye protection** and protective clothing. **Guard outlet** of dump valve to keep personnel from reaching into dump port or from being hit by discharged debris.

Black Clawson provides a laminated safety sign, pictured below, for this equipment. It is shipped with the unit and should be posted on or near the equipment after installation.



⚠WARNING

IMPORTANT
SAFETY
INSTRUCTIONS
for
Stock
Preparation
and
Pulp Mill
Equipment

FAILURE TO FOLLOW THESE SAFETY INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY

DO NOT PROCEED until you READ and UNDERSTAND these instructions:

1. **READ and UNDERSTAND the machine's instruction/operation manual and ALL the applicable OSHA regulations (29CFR1910.261).**
2. **FOLLOW the SHUT DOWN PROCEDURE in the manual.**
3. **ALL SERVICE to the machine must be LOCKED OUT with YOUR PADLOCK BEFORE any maintenance, inspection, cleaning, adjusting or servicing is performed.**
   a) **The MOTOR MAIN POWER DISCONNECT switch must be LOCKED OUT.**
   b) **CHECK DISCONNECT - try to start motor BEFORE proceeding further.**
   c) **ALL SOURCES OF POWER AND FLOW OF MATERIAL must be SHUT OFF including BLEEDING OFF of pressure and LOCKING OUT ALL:**

PNEUMATICS — STEAM SYSTEMS
HYDRAULICS — ELECTRICAL CIRCUITS
CHEMICAL and or GAS SYSTEMS
FLOW of MATERIAL STOCK

WARNING!!! NEVER REMOVE another person's lockout (padlock) or tag. DO NOT assume the machine is locked out. ALWAYS check yourself.

NOTE: If services are not independent of the main supply DO NOT PROCEED - Contact your Supervisor.

   d) **Place or attach a "DANGER - PERSONNEL WORKING" sign near lockout.**
   e) **BLOCK any rotating elements to prevent accidental rotation.**

4. **DO NOT ENTER vessel or unit unless you have at least ONE OTHER PERSON OUTSIDE the vessel or unit at all times. Certain vessels require use of harness, gas masks and other specialized safety equipment. BEFORE ENTERING ANY VESSEL CHECK WITH SUPERVISOR FOR CORRECT SAFETY PROCEDURE. See OSHA 1910.261(b)(5).**
5. **Upon completion, follow the START UP PROCEDURE in the manual.**
6. **NEVER START the machine UNLESS:**
   a) **All personnel are clear of the machine.**
   b) **All doors and hatches are closed.**
   c) **All guards and covers are in place.**

If you have any questions, contact your supervisor.

Black Clawson
The Black Clawson Company — Shartle Division
Middletown, Ohio 45042 Phone (513) 424-7400
Toll Free 24 Hour Emergency Service 1-800-448-5422

The development, implementation and enforcement of safe operating/maintenance procedures has been, and continues to be, the best method of accident prevention. Hazardous procedures should be identified and eliminated through ongoing safety training programs.

Stock preparation equipment requires periodic inspection, maintenance and repairs. Operating areas should be open enough to safely perform such work.

Safety considerations should include:

- Lockouts for zero mechanical state during repairs.
- Stock flow meters to detect plugged stock lines.
- Stock piping systems which permit unit lockout and are equipped with lines for by-pass of stock.
- Adequate lifting devices available to perform maintenance functions.
- Proper guarding and protective clothing in areas of hot stock or steam lines.
- Company procedures for entering confined spaces.
- Use of mechanical assists during internal inspections and maintenance.
- Check for damage and wear each time a unit is opened.
  NOTE: Damage or wear should be corrected immediately to assure safe, reliable, continuous operation.
- Start-up procedures should be followed carefully.

Before servicing any unit, the following procedures are required:

- Shut down stock pumps or divert stock flow.
- Make sure pressure is relieved.
- Activate and post lock out devices.
- De-activate remote control systems.
- Ensure that unit is at Zero Mechanical State.
- Follow company's procedures for entering confined spaces, if applicable.

⚠WARNING

The Float Purger is a confined space.
Carefully follow your company's procedures for entering and working in confined spaces.

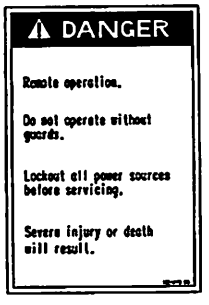
Black Clawson accepts no responsibility for use of its products other than the specific application for which it was designed. Any usage other than the product's intended application will render Black Clawson free and harmless from any safety and/or liability claims that may result from the application or deviation from the product's intended usage.

READ AND FOLLOW SAFETY SIGNS

The Black Clawson Company furnishes safety signs with each piece of equipment. These signs are factory installed and should remain on the unit for the life of the machine.

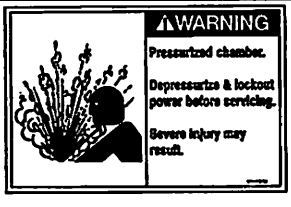
Do not remove the signs unless replacement signs are in hand and installed immediately after old signs are removed. Replacement part numbers for each sign are supplied below.

The following safety signs are attached to the unit



PART NUMBER 1504668

PART NUMBER 1504669



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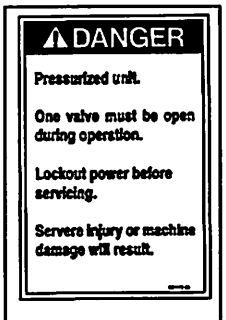
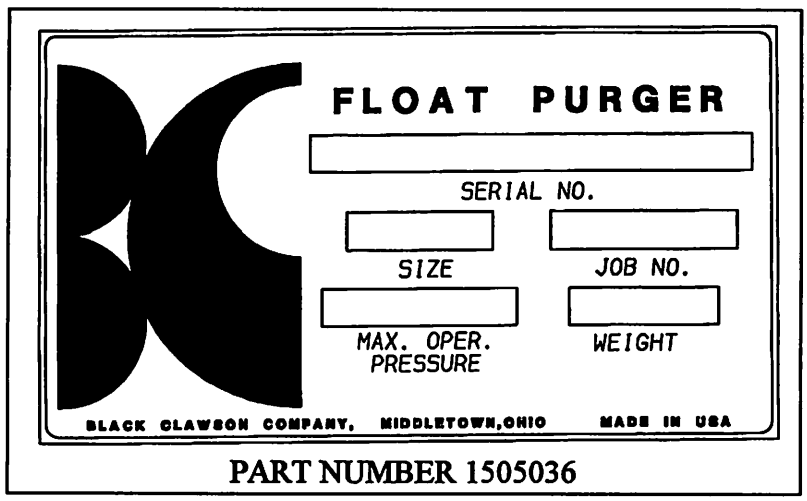


PART NUMBER 1504673

PRODUCT IDENTIFICATION NUMBERS include the serial number, job or shop order number, and model number. They are provided to help identify this unit if it needs service.

Black Clawson needs these numbers when you order parts.



PART NUMBER 1505036

Your Black Clawson unit is designed to give trouble free operation with minimum maintenance. However, certain precautions and procedures must be observed in handling, installing, operating, and servicing the unit in order to obtain optimum performance.

The information in this manual should cover most situations. Should questions arise that are not covered in this manual, additional information can be obtained by contacting:

Customer Service
The Black Clawson Company
Shartle Division
605 Clark Street
Middletown, OH 45042
Phone: (513) 424-7400
Fax: (513) 424-1168

Serial Numbers

Serial numbers are assigned at the Shartle Division. This identifying number will be found on the nameplate. It will also appear on the certified drawings. When inquiring about service or maintenance problems, always provide the serial number, size, and type of unit.

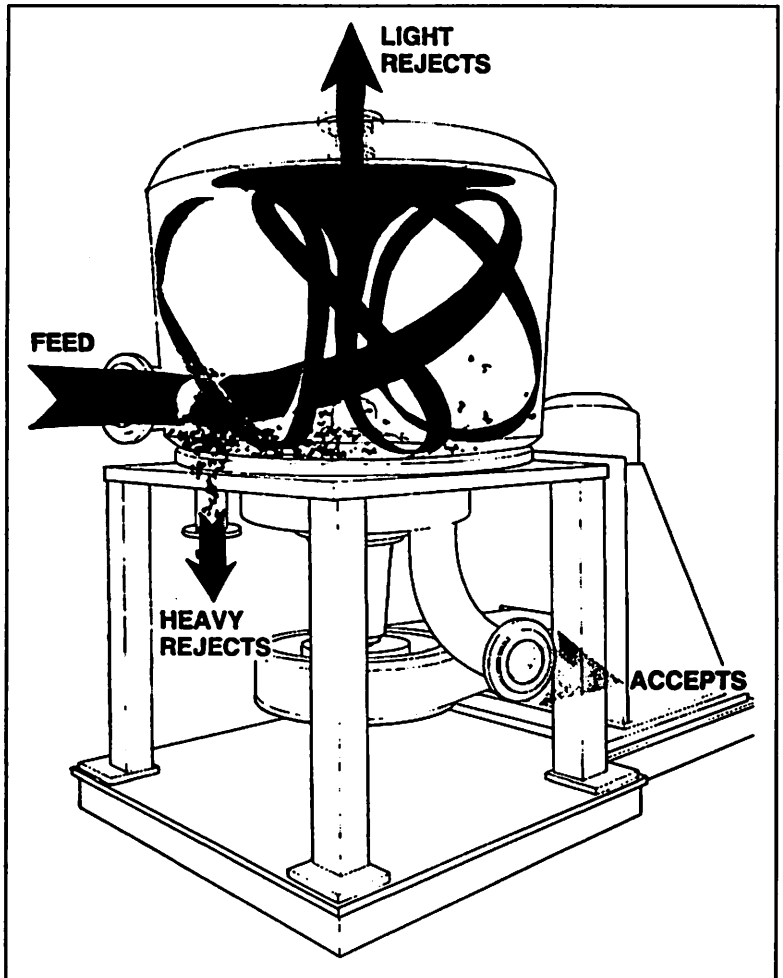
Renewal Parts

Orders for renewal parts should state the serial number(s) and include the item number, description, and part number shown on the parts list of the certified drawings. **Part numbers are not specified in this manual.** Refer to your certified drawings for part numbers.

FLOAT PURGER™

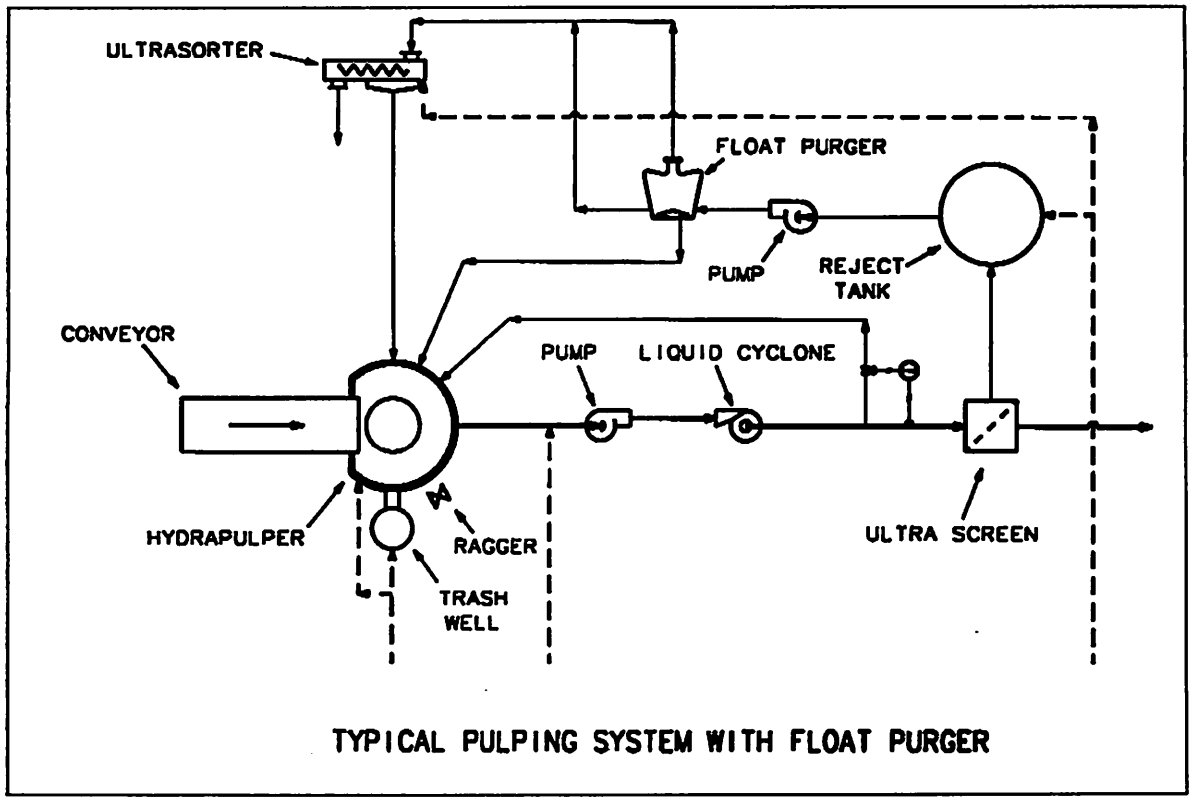
The Black Clawson Float Purger is a vertical pressurized machine which performs three main functions to treat coarse screen rejects in a large hole (3/8" - 5/8" diameter) pulping system.

1. This machine defibers, under pressure, un-deflaked stock, which is then accepted and returned to the Hydrapulper or fed forward to a secondary coarse screen.
2. It concentrates light contaminants such as plastic, styrofoam, textiles, etc., at its center. These contaminants are then rejected and fed to a screening device such as a vibrating screen or a Black Clawson UltraSorter.
3. It rejects heavy particles contained in the slurry by periodically purging them out of the system to a separator such as a Black Clawson UltraSorter. An optional double valve junk chamber is available for heavies collection.



PRINCIPLE OF OPERATION - FLOAT PURGER

A typical pulping system utilizing a Float Purger is shown in the sketch below.



TYPICAL PULPING SYSTEM WITH FLOAT PURGER

SIZES

The Float Purger is manufactured in four sizes:

- Model 300-48
- Model 150-34
- Model 75-25
- Model 40-18

COMPONENTS OF FLOAT PURGER

Discharge section

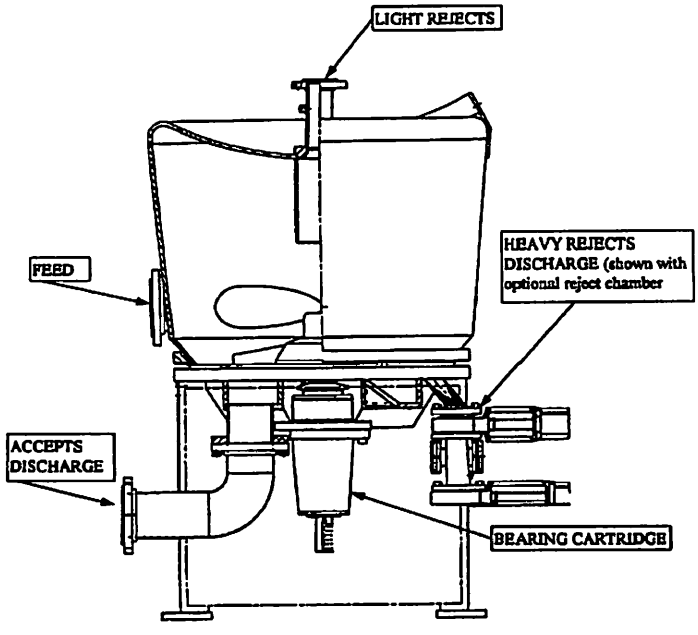
The discharge section is the main support structure of the Float Purger. It contains the extraction chamber, support legs, heavy reject connection, and provision to mount the bearing cartridge assembly.

Inlet section

The inlet section forms the shell or tank of the Float Purger. It contains the stock inlet and light reject connections.

Reject chamber (optional)
The reject chamber is a cylindrical tapered body. It is provided with two sight glasses to observe build-up of heavy contaminants. The chamber is isolated by two through-gate valves.

Bearing cartridge assembly
The bearing cartridge assembly consists of a bearing housing containing a shaft, bearings, seals, bearing retaining caps, and flinger. This assembly is mounted underneath the bottom flange of the discharge section.



Motor base assembly
The motor base assembly is a mild steel angle plate arrangement. The motor is mounted to this assembly in a vertical position. It is provided with a slide arrangement and adjusting screws for belt adjustment.

End face seal assembly
The drive shaft, as it enters the Float Purger discharge section, is sealed by a mechanical seal. It consists of a rotating sealing element working against a stationary sealing element. The end face seal housing is provided with a connection for a continuous water supply under the rotor hub to flush contaminants which might collect in this area. **NOTE:** Since the seal is lubricated by the stock, it is important that the Float Purger is not operated dry. As an additional precaution, we recommend adding water to the seal at all times. Seal water supply must be set at 10 psi above the inlet pressure, flow 1.0 - 1.5 gpm. A ¼" NPT connection is mounted in a manifold on the side of the Float Purger for easy access.

Extraction plate
The extraction plate is mounted to the extraction chamber directly under the rotor. Accepted stock must pass through perforated holes in the extraction plate. Standard hole size is 3/16" diameter.

Rotor hub
The rotor hub is mounted directly to the Float Purger shaft. The rotor hub is the mounting platform for the rotor vane and contains two drive pins which align and drive the rotor. The inside counterbore (second step) fits onto the seal sleeve and seals with an o-ring.

Rotor vane
The rotor vane ring is a solid one-piece casting. The rotor works in conjunction with the extraction plate to efficiently defiber flakes of stock. The design of the rotor vane creates a vortex to concentrate light contaminants. The rotor is positioned directly above the extraction plate, with the clearance set to a recommended gap dimension (see certified drawings).

Drive
The rotating element is driven through a V-belt and sheave arrangement. A mechanical seal is used where the drive shaft enters the lower section of the discharge section.

Pressure monitoring
The feed, accept, and light reject nozzles are equipped with nipples to accomodate PMC type pressure transmitters.

Float Purger control system (Optional to purchase from Black Clawson)
This system performs the following functions:
1. Starts/Stops the Float Purger main drive motor.
2. Provides remote manual positioning of the accepts and rejects valve.
3. Indicates inlet, accepts, and light rejects pressures.

A separate wall-mounted control panel can be furnished with start/stop pushbuttons, pressure gauges, manual air loading station for accepts valve, ammeter for main drive motor, optional heavy rejects timer, optional light rejects flow controller, etc., as required.

Three paper machine component pressure transmitters are included with the panel for field mounting.

Black Clawson strongly recommends installation of a flow meter on the light rejects line. The Black Clawson control panel is available with or without a flow controller.

SPECIFICATION	300-48	150-34	75-25	40-18
Inlet flange size	12″	8″	6″	4″
Accept flange size	12″	8″	6″	4″
Light rejects flange size	6″	6″	2.5″	2″
Heavy rejects flange size	4″	3″	3″	2″
Seal water connection	(2) 1/4″ NPT	(2) 1/4″ NPT	(1) 1/4″ NPT	(1) 1/4″ NPT
Maximum connected horsepower	300 hp	150 hp	75 hp	40 hp
Seal water*	3-4 gpm	3-4 gpm	3-4 gpm	3-4 gpm
Flush water	3-4 gpm	3-4 gpm	NA	NA
Dry weight of unit	Will Advise	8400 lb.	4200 lb.	3500 lb.
Operating weight	Will Advise	13,900 lb.	7000 lb.	4600 lb.
Overhead lifting capacity requirements	Will Advise	2100 lb.	1500 lb.	1000 lb.
Dynamic load (per pier)	Will Advise	4350 lb.	2200 lb.	1500 lb.
Maximum inlet pressure	75 psi	75 psi	75 psi	75 psi
Minimum inlet pressure	35 psi	35 psi	35 psi	35 psi
WK^2 of unit	Will Advise	450	160	50
Overhead clearance required	Will Advise	30″	24″	20″

* See certified drawings for seal water quality requirements.

FLOAT PURGER™

The Black Clawson Float Purger offers many advantages in a system that requires any of the main functions this unit performs; concentration of light contaminants, defibering of undeflaked stock, and collection and removal of heavy grit. Among the features of the Float Purger are:

- Energy efficient
- Continuous and reliable operation
- High rejects removal efficiency
- High accepts quality
- Low maintenance
- Reduces contaminant buildup in pulper
- Increases production rate from pulping system
- Reduces pulper downtime
- No special operator attention
- 75 psi pressure rating
- Available in 4 sizes

FLOAT PURGER™

The design and operating characteristics of the Float Purger separate three distinctive streams from the coarse screen reject flow of a secondary fiber system; paper fiber, light rejects, and heavy rejects. Each stream need further processing, requiring accessory equipment.

Paper fiber

While the quality of the accepted stock from the Float Purger is good, after passing through 3/16" diameter holes, it does not compare to the accepts from the coarse screen. It is necessary to either send the Float Purger accepts back to the pulper (or dump tank) for another pass through the coarse screen, or send them forward to a secondary coarse screen that has accepts that join the flow with the primary coarse screen accepts.

Light rejects

While the majority of this stream is lightweight contaminants such as styrofoam and plastics, there is a small amount of fiber. It is recommended that this reject stream be sent to a tailing device such as a vibrating screen or Black Clawson UltraSorter.

Heavy rejects

Fiber and water can be recovered through further processing in a Black Clawson UltraSorter.

Carrier
Black Clawson units and accessory equipment are shipped by truck.

Shipping Papers
One set of shipping papers is attached to the shipment in a place where it is easily seen by those who unload it. A copy of these papers was mailed to your receiving department.

⚠WARNING

Check weights shown on shipping papers and determine if your crane or hoist can lift the heaviest item safely.

Check-Off
As each part is unloaded, check it off shipping papers. Report shortages to Black Clawson within twenty-four hours. File damage claims against transportation company within twenty-four hours.

Unloading Pattern
Trucks are generally unloaded from back to front. Crane operator must be sure of a clear lift or the piece being lifted may swing against other parts and cause damage.

Wooden Boxes (Crates)
Clamps, bolts, nuts, cap screws, eyebolts, and other small parts are shipped in one or more wooden boxes. **NOTE:** Do not store these boxes outdoors.

Bracing Material
Leave wood blocks, steel strapping, and other bracing materials in place until hoisting sling is in place and piece is ready to be lifted.

Lifting
- Check to be sure that eyebolts and hooks are attached securely and have appropriate lift rating.

- Straighten the sling as slack is removed and make a test lift by allowing the weight of the piece to be supported by the crane while the piece itself is not more than an inch or two above the truck bed.

- Lift pieces carefully and smoothly; with cast parts, the flanges will break next to the cored holes if pieces are jerked suddenly by the crane.

To safely remove the unit from the skid and move it into position in the system, the following instructions must be followed:

- Remove the guard plates that are attached to the four legs of the unit.
- Put chains or slings around all four legs of the unit and connect them to an overhead lifting device which has sufficient lifting capacity to lift the unit.
- Protect contact points between the slings and the Float Purger to prevent damage to the unit.
- Lift the unit carefully and maintain the unit in a level position.
- Move unit into position on the foundation.
- Install unit on foundation, per instructions in this manual.
- Replace all guards before starting the unit

⚠WARNING

Do not use the lifting lugs on the top of the unit to move the unit into position. These lugs are to be used only for removing the inlet section of unit from the discharge section.

Take the following precautions to minimize potential damage to the unit if outside storage is planned:

- Cover equipment with waterproof covering.

- Do not allow water to accumulate in or on the unit, especially if the weather conditions approach freezing (32° F) or below.

- Do not store items such as valves, cylinders, switches, etc., outside.

- Coat drive shaft with a non-oxidizing protective agent.

Black Clawson assumes no liability as to specific storage requirements for equipment or components.

BLACK CLAWSON UNITS ARE DESIGNED FOR SAFE OPERATION. ALL OPERATORS AND MAINTENANCE PERSONNEL SHOULD READ AND UNDERSTAND ALL SAFETY INFORMATION BEFORE USING OR SERVICING THE EQUIPMENT; AND SHOULD HAVE ACCESS TO THIS INFORMATION AT ALL TIMES.

Do not modify the machine without authorization. Modifications could affect the function of the machine, shorten machine life or render built-in safety features useless.

Never start the machine unless:

- All personnel are clear of the machine.
- All doors and/or hatches are closed.
- All guards and covers are in place.

Do not exceed the maximum operating pressure. Maximum safe pressure of this unit is stated on the Certified Drawings.

Lock-out machine before servicing. All energy sources and stock supply must be shut-off and locked-out with your padlock before and during installation, maintenance, inspection, cleaning, or adjusting this unit. Unit must be at Zero Mechanical State (ZMS) before any service work is performed.

⚠WARNING

Never remove another person's lock-out (padlock) or tag.

Check disconnect. Try to start motor before servicing unit.

Bleed off pressure and lock-out all pneumatic, hydraulic and steam systems, electrical circuits, chemical and gas systems, water, and stock flow.

Do not proceed if services are not independent of the main supply. Contact your supervisor.

Follow installation and maintenance procedures in this manual, along with your company's safety guidelines.

Use valves designed for lock-out and tagging. All valves used on this equipment should be designed to be locked-out and tagged.

Never operate unit without guards in place.

Tighten sheave bushings to manufacturer's specification. All factory installed attachments are tightened to industry standard torque specifications.

Check torque prior to start up. Tack welding of bolt heads is an accepted industry practice.

⚠CAUTION

Do not exceed maximum torque specifications. Over tightening fasteners can result in failure of bolts and other attachments.

PRE-INSTALLATION

The following information shows what tools, equipment, and materials must be available for installation, and it explains the use of information supplied with the unit. It will save time if all pre-installation work is completed before the unit is received. This section can be used as a check-list for preparation and installation.

Black Clawson prepares the following documents for every piece of equipment. They provide critical information for equipment installation.

- **Certified Drawings** - prepared by Black Clawson upon receipt of your purchase order and your returned approval drawings.
- **Owner's Manual** - sent with Certified Drawings.
- **Shipping List** - one is sent with the shipment and one is mailed to the mill the day shipment is made.

FOUNDATION

Refer to the Certified Drawings for foundation information.

EQUIPMENT PLACEMENT

Certified Drawings show space requirements for equipment operation and the anchor bolt plan. Adequate equipment clearances must be considered in your equipment layout. Consideration should be given to maintenance and installation requirements.

When equipment has to be lowered through an opening in the floor above, be sure that it is in correct foundation position before the unit is erected.

NOTE: Check the Certified Drawings to determine if any unusual clearance problems will arise while moving the unit through the mill.

LIFTING EQUIPMENT

We have attempted to ensure that the unit weights are on the Certified General Assembly Drawings for each piece of equipment. If the weight is not on the drawing, contact Black Clawson. Verify that the hoist or crane at the mill has adequate load capacity to lift the unit safely. If it does not, it will be necessary to lease lifting equipment or contract for the services of a rigger.

ELECTRICAL REQUIREMENTS

Be sure that power cables and controls are properly sized, and can be routed to the unit with a minimum of bends and turns. Verify that the available electricity is correct for the equipment it is to operate.

PIPING

Check Certified Drawings for pipe sizes. Be sure that correct sizes of pipe, fittings, and adapters will be available when the piping is installed. It is essential that all piping be well supported. Also, expansion loops or joints should be properly installed in the connecting pipes to allow for linear expansion. Piping must not be connected to the unit until the grout has hardened and the foundation bolts have been tightened.

LEVELING INSTRUMENTS

Use a sensitive, graduated tube spirit level, reading to 10 seconds per graduation (0.006 inch per foot), with a screw adjustment. The level in an ordinary machinist's square is not accurate enough for the installation of this equipment.

Black Clawson assumes no responsibility for the site preparation and/or construction required for the installation of this equipment. An adequate foundation, determined from the machine weight and floor loading conditions, must be provided.

The general guidelines suggested in this manual are for those individuals involved in installing the unit. It is the responsibility of the customer's erection crew or agents to maintain "As Built" specifications during the installation of the unit. If you have any problems or questions concerning the installation of this equipment, please contact the Black Clawson Field Service Department.

CUSTOMER SUPPLY

The customer is to furnish all foundations, anchor bolts, steel shims, piping, etc. Refer to quotations and Certified Drawings for a complete listing of parts and hardware furnished by Black Clawson.

FOUNDATION SURFACES

Clean all loose concrete chips and dust from foundation.

ANCHOR BOLT POCKETS

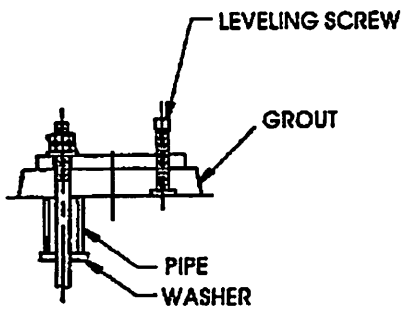
Remove all debris and dust from anchor bolt pockets before installing sleeves.

SHIM PACKS

Steel shims will be required to level the unit before it is grouted in place. Mill supply must include 3″ x 3″ shims in various thicknesses.

ANCHOR BOLTS

Bolts must be sufficient length to project at least ¼″ through the nut when the unit is bolted down. Allow for grout, thickness of soleplate/footpads, and thickness of nut when determining proper bolt length. See sketch below for typical anchor bolt arrangement.

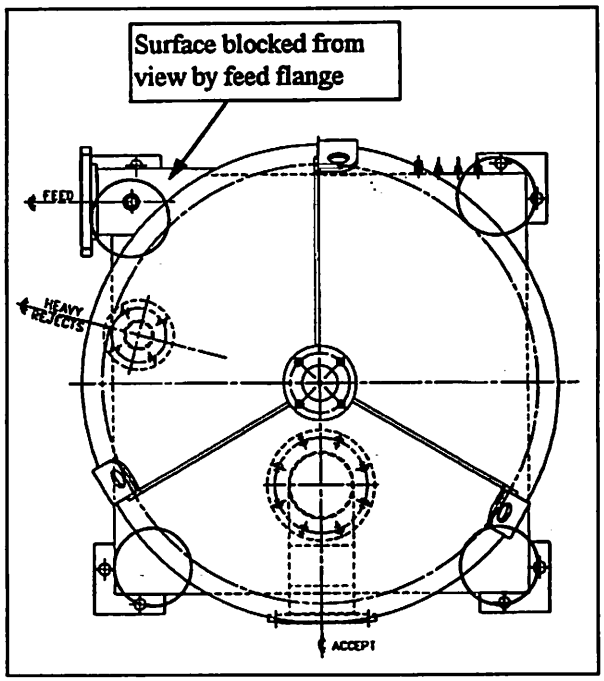


Your Certified Prints call out the anchor bolt sizes, typical spacing, and layout.

Black Clawson recommends that anchor bolts be encased by using sleeves (as shown) to make allowance for minor deviations in mounting hole location. Several sleeve types are commercially available.

LEVELING THE UNIT

Install the unit on the foundation by lowering it over the anchor bolts. Using the four surfaces indicated in the sketch below, level the unit to within 1/16" in both directions. Place steel shims next to each anchor bolt and underneath unsupported lengths of the unit base. Use care not to distort the alignment of the unit when shimming. Snug the nuts on the anchor bolts to hold the unit while the grout is poured and sets. Firmly tighten the nuts on the anchor bolts after the grout has set up.



Circles indicate the surfaces that should be used to check Float Purger for level.

GROUT

All grout design and placement of grout is the responsibility of the customer. Deviations from standard grouting practice, such as hollow, could result in structural failure. Piping must not be connected to the unit until the grout has thoroughly hardened and the foundation bolts have been tightened.

LIFTING DEVICE

Provision should be made for an overhead lifting device to dismantle the inlet section, rotor, rotor hub, extraction plate, and bearing cartridge for maintenance. Sufficient floor space should be available to accomodate these parts.

V-BELT DRIVE

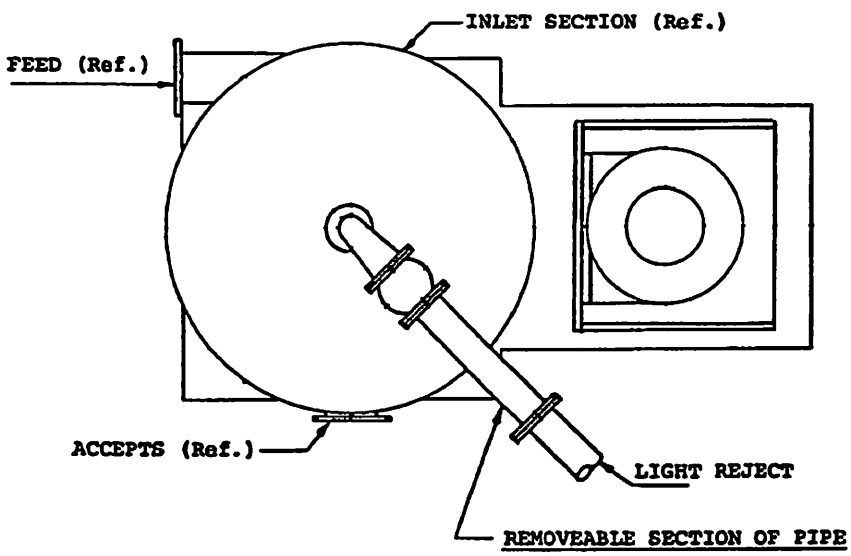
Mount the motor on the motor bracket. Install the sheave on the motor shaft and align it with the sheave on the Float Purger drive shaft. Install the V-belts and adjust for proper tension. **NOTE:** Do not overtighten belts, as this may cause premature bearing failure.

Water connection
Water is piped to the unit through ¼" NPT connections which are mounted in a manifold assembly, along with 1/8" grease fittings. The water connections are used for supplying water to the seal (on all models) and for under rotor flushout (on the Model 300 and 150 only). Water should be at 10-15 psi above stock inlet pressure, 3-4 gpm. Water quality is on the certified drawings.

Inlet connection
Piped from the pump feeding the unit.

Accepts connection
To be piped to desired location, either back to the pulper or forward to a secondary pressure screen. A single automatic valve controls the flow from this connection.

Light reject outlet piping
In order to facilitate removal of the inlet section for maintenance, the discharge piping should be provided with an additional flanged connection beyond the radius of the inlet section diameter. This section of piping, including a valve at the light reject pipe, can be removed to allow the inlet section to be lifted up to clear the rotor and hub (as illustrated below). We recommend that this line contain a flow meter. A single automatic valve controls the flow from this connection.



Heavy reject line
The standard method for heavy rejects removal is a piped connection to the unit handling the rejects (e.g. Black Clawson UltraSorter). A single automatic v-port ball valve controls the flow from this connection to minimize the chance of plugging.

Double valve junk chamber (optional)

It is possible to periodically purge the heavy rejects, without the attention of an operator, by installing an optional automatic double valve junk chamber.

Rejects through this chamber are usually purged into a collection vessel, such as a dumpster. However, since all mills handle this arrangement in the configuration that best suits their system, appropriate guarding is the responsibility of the mill. The discharge must be guarded to keep employees from reaching into the chamber, and to protect employees from discharged debris during the dump cycle.

⚠WARNING

Mill supplied guards must conform to applicable standards including, but not limited to, OSHA 1910.212, OSHA 1910.217, ASME B15.1, and EN 294.

Inspect the following before starting the unit:

- All guards and covers are in good condition and fastened in place.
- No parts are loose, worn, damaged, or missing.
- All personnel are clear of the equipment.
- All pipe connections are tight.
- Water is flowing to the mechanical seal and the under rotor flush out (on the Model 300 and Model 150 only).

A first-time checkout should include the following:

1. Check the sheave alignment and belt tension.
2. Wipe the two grease fittings and pump 3 ounces of grease into each bearing. The bearings have been lubricated with grease at the factory; however, this may have settled during shipment. See the lubrication instructions in Section 8-1 of this manual for grease recommendations.
3. Jog the motor to check the rotation. The rotating element should turn clockwise when viewed from the top. **NOTE:** Do not operate the Float Purger dry, as excessive heat will damage the mechanical seal. Make sure that there is water flow to the seal.
4. Check that rotor clearance has been set to 0.060".
5. Verify that the accept, light reject, and heavy reject valves function properly.
6. Confirm that there is proper flow and pressure to the seal and under rotor flush water.
7. Make sure that all flange connections are tight.

The minimum inlet pressure is 35 psi and, for good defibering, the optimum consistency is 2.0%. The satisfactory operation of the Float Purger depends upon a constant reject flow of light weight contaminants out the top reject line. By monitoring the feed and accept pressure, the unit can be controlled within satisfactory operating ranges of pressure.

Normal operating pressure drops are in the 6-12 psi range, which should keep the extraction plate open. Pressure differentials in excess of 15 psi will most likely cause the extraction plate to blind over. If the extraction plate does blind, it can be cleared by closing the accept valve until the pressure drop is recovered to normal range. The light rejects line remains on flow control during this purge cycle. After purging, return to original valve setting. If the plug condition repeats, the pressure drop will need to be lowered by throttling the accept flow back. A balance of accept and reject flow will need to be determined to obtain the desired operating conditions.

Heavy rejects flow is controlled (either continuously or on periodic purge) from the Float Purger through an automatic valve on the heavy reject connection. These rejects are sent to a separator such as the Black Clawson UltraSorter. An optional double valve junk chamber can be furnished for collection and disposal of the heavy contaminants.

The light reject valve is typically flow controlled during operation to continuously purge rejects. In the event that the recommended flow control is not used, the valve is periodically fully opened to purge the build up of light contaminants behind the valve. Black Clawson recommends the use of a flow meter to the light reject line to control the flow.

For emergency shut down, controls for the drive motor and stock feed pump should be interlocked so that they shut down immediately and simultaneously upon pressing an E-Stop button.

Recommended controls:

Light rejects: Flow controller is recommended. If HIC is used, periodic purge of the reject valve is needed.

Accepts: Requires a flow controller or HIC.

Heavy rejects: Requires periodic purge.

Operational alarms recommended:

- High pressure differential between feed and rejects
- High amp load
- Low feed pressure
- Low reject flow

Interlocks

1. Unit drive motor should be interlocked so that the unit will not run with the accept and reject valves in closed positions.
2. Unit drive motor should be interlocked with feed pump so that unit starts before the feed pump.
3. Unit drive motor should be interlocked with seal water valve so that water is flowing to the mechanical seal any time that the rotor is turning.
4. The feed pump should be controlled to start within one minute of starting the Float Purger, to prevent damage to the mechanical seal.

Controls for Optional Heavy Reject Chamber

Initially the top valve is open and the bottom valve is closed. This is the collection period for the reject chamber. When the collection time has expired, the top valve closes and activates its closed limit switch which allows the bottom valve to open. When this valve opens, a limit switch is activated. The flush water valve is then opened and the dump timer is started. When the dump timer expires, the bottom valve closes but the flush water valve remains open to fill the reject chamber. The top valve will reopen only after the limit switch for the bottom valve is activated. The flush water valve closes upon the expiration of the interval timer. The cycle is now complete and will repeat upon the expiration of the collection timer.

Safety considerations are an important element of proper trouble shooting procedures. Actively thinking about safety of yourself and others, as well as the condition of your equipment is of primary importance. Several safety areas are discussed below.

Power Supplies
Before working on a power supply, always remove the AC power source at the main disconnect switch. When using more than one power supply, be sure to disconnect all of them.

Main Power Disconnect
The main power disconnect switch should be located where operators and maintenance personnel have quick and easy access to it. Ideally, the disconnect switch is mounted on the outside of the enclosure so that it can be accessed without opening the enclosure. In addition to disconnecting electrical power, all other sources of power (pneumatic and hydraulic) should be de-energized before working on a panel controlled machine or process.

Activating Devices when Troubleshooting
When troubleshooting, never reach into the machine to actuate a device. Unexpected machine motion could occur.

Stand Clear of Machine
When trouble shooting any control panel problem, have all personnel remain clear of the machine. The problem could be intermittent, and sudden unexpected motion could occur. Have someone ready to operate an emergency stop switch in case it becomes necessary to shut off power to the machine.

Program Alteration
There are several causes of alteration to the user program, including extreme environmental conditions, electromagnetic interference (EMI), improper grounding, improper wiring connections and unauthorized tampering. If you suspect the memory has been altered, check the program against an approved version such as on the EEPROM memory module.

Hardwired Circuitry
Circuits that are installed on the machine for safety reasons, including overtravel limit switches, stop push buttons, and interlocks, should always be hard-wired in series so that when any one device opens, the master control relay is de-energized, thereby removing power to the machine. Never alter these circuits to defeat their function. Serious injury or machine damage could occur.

Safety Recommendations for Maintenance Personnel
All maintenance work should be done by qualified personnel familiar with construction, operation, and hazards involved with the equipment.

The appropriate work practices of NFPA 70E should be followed.

Make-Do testing devices such as incandescent lamps have low impedance. The low impedance of these devices can effectively change a voltage level from logic "1" condition to a logic "0" condition when attempting to make a measurement. Unexpected machine motion can result if an output to a controlled device is energized as a result. Neon lamps do not respond to voltages typically used in logic circuits (e.g. 32 VDC or less.) Use of a neon lamp tester could lead to false conclusions about the voltage present in a circuit.

High input impedance meters are required to obtain accurate voltage measurements in high impedance circuits. Unless otherwise specified by the manufacturer, a meter with an input impedance of ten (10) megohms or greater is recommended for making voltage measurements. The meter must also have sufficient sensitivity to measure logic level voltages; some meters do not respond to low voltages.

Control Panels (if supplied)
The control panels are designed using all NEMA and/or U.L. approved components suited for the environment in which it is being placed. Every effort is made to adhere to the N.E.C., OSHA, ANSI and mill standards as they apply to your application.

The power feed should include an equipment grounding conductor to bond the enclosure to building earth ground.

⚠WARNING

Contact with AC line potentials may cause injury to personnel.

Power feed should have a disconnect or breaker capable of being locked in the open position.

All field devices should be wired per Certified Installation Drawings furnished with the control panel.

The field wiring should be routed in such a way as to separate the AC from the DC and/or low level signals.

All the electronic instruments were factory programmed to a fail safe state (if a component failure occurs.) The panels include a power push button that, when pushed, will power down the main processor, closing all valves.

Education and Knowledge Leads to Safety

Planning for an effective solid state circuit requires enough knowledge to make basic decisions that will render the system safe as well as effective. Everyone who works with a solid state control should be educated in its capabilities and limitations. This includes in-plant installers, operators, service personnel and system designers.