

SCREENS

SURGE BINS

Disc Screen

Rotary Disc Screen

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Overview and General Safety

1A.1. Preface

This manual is provided as a guide to personnel involved with the installation, operation, and maintenance of the Baum Disc Screen. Operators, Inspectors, and Maintenance personnel of Baum supplied equipment should read and become familiar with the general procedures and Information contained within this manual. In addition we recommend that this manual be kept readily available for reference before beginning any operation or work associated with this equipment.

Safety precautions and instructions for awareness and information on potential hazards are found throughout this manual. Due to the complexities of the systems in which this equipment is used and the environments in which it operates, situations may arise which are not directly discussed in detail in this manual. When such a situation arises, past experience, availability of equipment, and common sense play a large part in what steps are to be taken. In addition, a Baum service representative is available to answer your questions, perform inspections and safety reviews, provide operator training, and supervise maintenance crews upon request.

Please feel free to contact a Baum Pneumatics representative at the following office:

Baum Pneumatics Inc.
16 – 1780 McLean Avenue
Port Coquitlam, B. C. Canada V3C 4K9
PH (604) 945-4507
FAX (604) 945-9925
Cell (604) 803-4618 Hank Baum
Email Info@baumpneumatics.com

1A.2. General Safety

All parts of the equipment and the system into which it's installed must be used in keeping with Sound safety practices. This manual contains safety information designed to be used in two ways: first as a primary reference for operators and plant maintenance personnel, providing them with details and explanations of operational and maintenance safety procedures; and second as a training tool within your plant's safety program.

Safety begins with properly designed and manufactured equipment. To that end, Baum has designed this equipment with safety in mind. However, the use of the equipment is subject to certain hazards that cannot be met by mechanical means alone, but only by the exercise of intelligence, care and common sense. Once the equipment enters service, Baum has no direct control over its inspection, maintenance, or operation. For this reason, safety in the field is the responsibility of the user.

CUSTOMERS ARE CAUTIONED to provide adequate Protection, Warning and Safety Equipment necessary to protect personnel against hazards involved in installation and operation of this equipment in the system or facility.

Any maintenance other than inspection, cleaning or obvious repair due to damage should be discussed with your Baum representative. Certain design parameters are utilized in the

construction of this equipment. Wear for example, can render the equipment hazardous to operate and should be discussed with your Baum representative. The following notes provide basic safety guidelines that should be incorporated into a comprehensive safety program at your plant.

- Do not remove warning signs from the equipment. If warning signs become damaged, contact Baum Pneumatics Inc. for replacements.
- Make certain that all barriers, covers, and guards are in place before starting the equipment.
- Keep aisles around equipment clear of unnecessary or hazardous articles.
- Wipe up spilled oil, grease, or water to minimize the risk of slips and falls.
- Keep clothing and all parts of the body away from moving machinery parts.
- Keep hands away from belt and chain drives.
- Wear appropriate safety equipment as required by the job and environment, including hard hats, safety shoes, hearing, eye, and breathing protection.
- Read and understand all safety information in this manual.

1A.3 Warning Signs and Colors

Signs of various types are posted throughout this manual and on the equipment to warn the end user of potential hazards associated with the operation of this machinery. These signs aid in the safe and efficient operation of this equipment, and it is recommended that periodic inspection of all signs be included in the machine's inspection program. If signs are missing, damaged or illegible, they must be cleaned or replaced to maintain the safe operation of the equipment. Replacement warning signs are available for a nominal charge by contacting the Baum Pneumatics Inc. representative at the address listed in Section A.1. Refer to Section B.5. for a complete list of warning signs.

Signs used in this manual and on the Screen use the following signal words to emphasize important and critical instructions.

DANGER

Danger is used to indicate an imminently hazardous situation which, if Not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING

Warning is used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Caution is used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

NOTICE

Notice is used for special instructions, which are important, but not hazard related.

1A.3. (cont.)

Paint Colors used to warn of potential hazards:

Safety Yellow –Physical hazards that could cause stumbling,
(Hi Visibility Yellow) falling, tripping, striking against and being caught between. i.e.
Handrail, Ladders, Guards

Safety Orange -Moving parts that may cut, crush, or strike i.e. levers, rotors

1A.4. Lockout/Tag out Procedures

When performing inspection or maintenance on Baum equipment, always follow Lockout/Tag out procedures as required by OSHA 29 CFR part 1910.147 and outlined in ANSI Z244.1. Refer to the maintenance section of your owner's manual prior to performing any maintenance. If the specific topic is not covered; contact Baum for advice before proceeding.

Lockout/Tag out procedures are to protect personnel working on or around the equipment by preventing accidental start up and exposure to hazardous energy release such as electrical shocks and stored energy. The procedure requires that individual locks and tags be placed on controls, shutoff switches, valves, or other devices to prevent usage until the person who installed the lock removes it. Never attempt to operate any control device when it is locked and tagged out.

OSHA Lockout/Tag out Procedures includes:

1. A documented and established site policy on the steps to follow for lockout and tag out
Such as:
 - a. Notify all affected people including supervisors before lockout or tag out is used.
 - b. Shut off the affected machine, equipment, system or function in a manner consistent with proper shut down procedures.
 - c. Disengage, isolate or release energy supply or source.
 - d. Apply individual locks and tags on controls, or other devices to prevent usage.
 - e. Try or test the equipment to check that the energy has been removed before service or maintenance.
2. Employee training about the facilities Lockout/Tag out Procedures at the facility.
3. Identification and location of shutoff switches and controls that isolate hazardous energy are predetermined at the site facility.
4. After maintenance is complete and each Lockout/Tag out is removed by the appropriate individual, all affected people are notified, and the energy or power is restored.

1A.5. Confined Spaces Procedures

Certain areas of this equipment may be considered a Confined Space, or a Permit Required Confined Space, per OSHA 29 CFR Part 1910.146 and outlined in ANSI Z117.1. If the Equipment is so designated, a warning sign will be posted, and a documented and established site policy must be referred to detailing the steps to follow before any entry is allowed. These procedures, along with Lockout/Tag out, must be followed before any entry is attempted into a confined space or permit required confined space.

1A.6. Material Safety Data Sheets (MSDS)

In order to transfer MSDS information from our suppliers to our customers, Baum Pneumatics Inc. will provide this service on customer request. All customer requests need to be specific because of the volume and complexity of the MSDS system. To correctly identify the appropriate MSDS, the Baum Pneumatics job number must be known. Inquiries concerning the MSDS information can be addressed to the Baum Pneumatics Inc.

Rotary Disc Screen

Introduction

One Model, many Options; Three disc designs, three housing widths, and many IFO spacing combinations.

1A.7 Introduction

The Baum Rotary Disc Screen is a simple and rugged machine capable of continuous separation of oversize material from incoming flows. Screens are designed to align with a chain or belt conveyor of the same width.

The principle design of these screens is a series of profiled discs, all rotating in the same direction. The spacing between discs IFO (interface opening) allows acceptable material to pass between the disc and slot length (between shafts) while oversize material is carried to the end and rejected. By using different length spacers between the discs, the size of accepted material can be changed.

The Rotary Disc Screen is self-cleaning, non-binding, compact and energy-efficient. The high efficiencies and low maintenance costs makes this screen ideal for many types of bulk material recovery.

1A.7 General Information

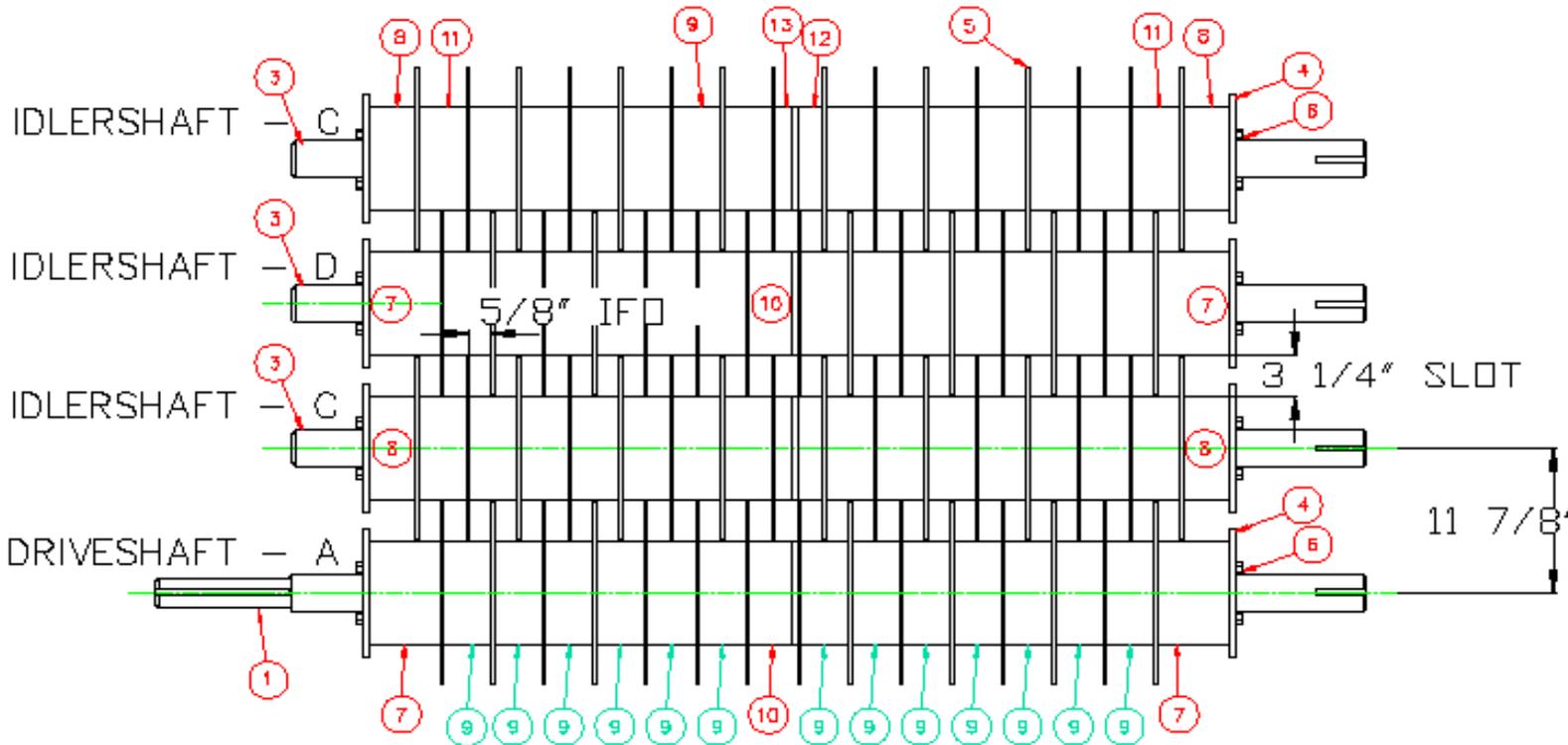
Baum Pneumatics Rotary Disc Screens are manufactured of high quality components, machined, fabricated and assembled with great care. All units are carefully checked by hand at the manufacturing shop and test run for proper operation before shipment.

All units will have attached to the housing a Baum Pneumatics Inc. nameplate. On this nameplate is Baum Pneumatics Job Number, Model Number, and Serial Number for each screen. This information should be referred to whenever the screen requires service or spare parts.

The following features are standard on Rotary Disc Screens.

- Housing are formed to reduce the amount of welding in the fabrication process.
- Heavy-duty shaft assemblies, with rotor mounted with removable 4 bolt flange bearings.
- Shafts are dimpled; setscrews are loctited at bearing collars for shock loads.
- Discs are 3/8" mild steel scalloped (wave) for hog, (star) pattern for chips.
- Removable infeed section
- Removable lower rear panel for access under shafts
- Removable upper side panels for access to shafts.
- A large hinged access door for inspection, adjustment, and access to chains, sprockets, & bearings.
- Adjustable gravity feed oiler piped to each chain.
- Four bolt flange ball bearings located with a full length angle iron support.
- Shafts are interlaced, every second shaft to be offset spaced, and discs are staggered.
- Shaft mount reducers and torque arm mount are standard.

- Drive shafts are supplied not turned down.
- AISI 1045 material is used for strength and weldability.
- Rotors are painted and safety decals are affixed.
- 4 Lifting lugs are welded to the upper side panels.



1A.10 Optional Features

Below is a partial listing of optional features which may be selected at the time of order. In many cases, features may be added to existing units, contact Baum Pneumatics for more information on in-field modifications.

Orientation rolls to reduce material plunging thru at infeed.

Electric Motor(s) by Baum Pneumatics Inc.

Optional drive arrangements (standard is right hand when facing discharge end)

Speed sensing at last shaft to detect loss of RPM.

Safety switch for chain cover door and infeed hopper door(s).

Foot mount reducer and chain drive.

Infeed AR 400 impact plate to reduce wear (bolt in liner).

Oil drip gravity feed for chains.

Drip tray and drain inside guard

Bearing grease lube manifold each side of machine, Automatic Greasers

1/2" plate discs, welded on to shafts

Various special materials and/or coatings to meet specific operating conditions.

Special preparation, primer and paint as required.

Baum Pneumatics Screens are manufactured of high quality components, and machined, fabricated and assembled with great care. All units are carefully checked by hand at the manufacturing shop for proper operation before shipment.

1A.11 Screen Safety Warning Signs/Decals

The following safety warning signs are used on screens



Should any of the signs on the screen be missing, damaged, or illegible, they should be cleaned or replaced to ensure the safe operation and maintenance of the Screen. Replacement warning signs are available for a nominal charge by contacting a Baum Pneumatics representative at the address listed in Section A.1.

A-101271		Rotation Arrow
C-101275	"WARNING"	Equipment starts and stops automatically...."
C-101299	"WARNING"	Rotating Shafts and moving drive components...(with pictorial)
C-101272	"WARNING"	Equipment Starts and Stops Automatically..."(with pictorial)
C-101275	"NOTICE"	Do Not Spring this base...

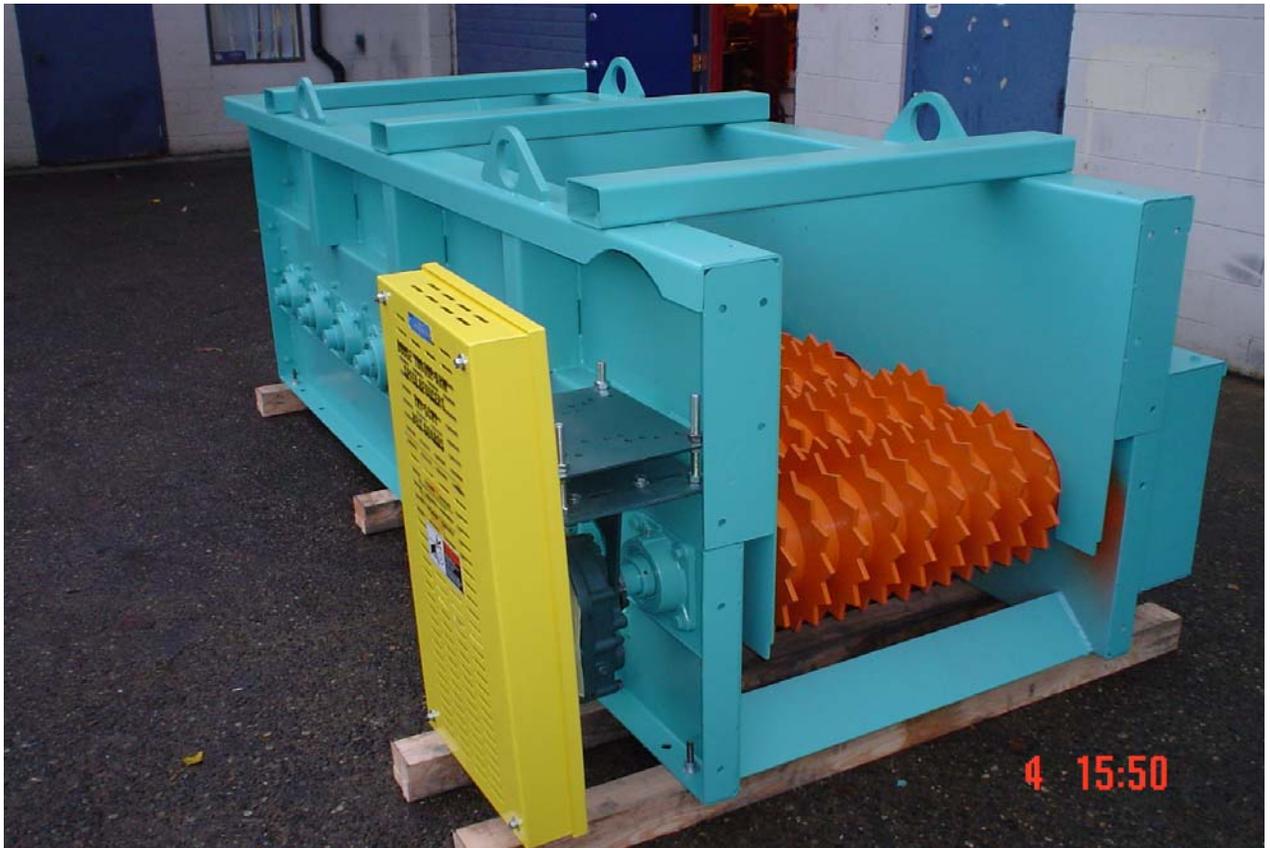


FIGURE 12 25x7 shafts screen assembly.

B Installation

1B.1 Shipping, Handling, and Storage

The Baum Pneumatics Disc screen is designed with lifting lugs located at the top sides of the housing.

Personal injury or property damage may occur if equipment used to lift the Disc screen does not have a rated load capability greater than the weight listed on the general arrangement drawings. Check the approximate total weight listed on the assembly drawing. Care should always be taken to insure adequate capacity in any equipment used to lift or move the equipment. Lifting line angles must exceed 45 degrees (from horizontal).

When shipping by truck, the screen should be placed on a wood pallet and bound to the flatbed trailer using the lifting holes at the top of the frame. Chains or straps may be used to tie the screen to the flatbed trailer. Under no circumstances should the

screen be lifted or secured by the rotor shafts. Depending on the size of the screen, the unit may be shipped in several pieces, requiring some assembly. Any damage incurred from shipping should be reported to both Baum Pneumatics Inc. and the shipping carrier involved as soon as possible after receipt of the screen.

Equipment will be shipped with all bare metal surfaces primed or coated with a suitable shipping rust protector, clean any rust or dirt that may have accumulated during shipment, and recoat with a suitable protector.

If equipment is to be stored before installation, store the equipment under cover, out of direct sunlight, and kept dry. **WATERPROOF TARPING OR COVERINGS ARE NOT ADEQUATE.** Temperature should be ideally controlled to 70deg F.(21 deg.C.) And less than 60% relative humidity. Minimize all temperature variations that can cause internal condensation in bearings and gearboxes. Allow air to circulate freely around the equipment. Keep equipment away from any corrosive or hazardous environments during storage. Keep equipment away from any blowing dusts or dirt, which could damage shaft seals.

If the equipment is to be stored for extended period of time (over 4 months), it is recommended that the shafts of the equipment be turned manually every four months to redistribute grease inside the bearing housings. Gear reducers should be filled to manufacturers recommendations with a rust preventative oil to protect internal gears and bearings, and rotated every four weeks to redistribute oil inside the gear reducer housing. Seal any breather or vents if instructed by the gear reducer manufacturer. Additional instructions for extended storage can be obtained from Baum Pneumatics Inc

If equipment is to be stored longer than 9 months, and the equipment due to size or weight cannot be stored in the above parameters, it is strongly recommended that the gear reducers, motors, and bearings be removed from the equipment and stored in a controlled environment.

After any extended storage, all protective oils should be drained and flushed from the gearbox, as any internal condensation will contaminate the oil with water.

1B.2 Mounting and supports

The disc screen may be mounted to either structural steel framework or to steel imbeds in concrete floors. Screen assembly drawings give the minimum steel requirements. The mounting surface must be level and flat to within 1/8". Infeed and outfeed chute work higher than 4 feet must not be supported off the screen. Remove temporary cross brace(s) tack welded underside of screen, once it is leveled and bolted down.

Two types of drive installations are used on screens. The standard is shaft-mounted reducer, where the motor is installed on the reducer, and Baum provides a torque arm bracket off the screen housing. This arrangement is typically shop assembled (minus the motor).

The second is a foot mounted reducer, typically mounted off nearby steel work.

When installing the screen, take care to protect the internal parts from damage, particularly from welding and falling objects. Take care not to distort the screen housing during the installation process, to prevent binding and/or heat build-up.

1B.3 Service Access

To provide access for weekly inspections and maintenance, a service platform should be located at the same level or slightly below the screen support base, conforming to all OSHA safety requirements. The service platform should be a minimum of 3'-6" around the perimeter of the screen and drive. This will allow necessary clearance to open drive guards and to remove various parts for servicing. Enough clearance should be allowed on top to lift side panels and remove the internal shafts (rotors).

Should it not be possible to maintain the recommended minimum clearances, pay close attention to the general arrangement drawings. Some parts of the screen may be difficult to remove with less than the recommended minimum clearances. Contact Baum for specific recommendations in tight installations. Compressed air should be provided at the screen floor level to remove accumulated dust and foreign matter at maintenance cycles.

1B.4 Infeed Requirements

Infeed layout to the screen is critical for a long, dependable operation, with minimal wear. Infeed to the screen should be uniform in rate and free of surges, evenly distributed across the width of the screen. The infeed should also be as free as possible of rocks and tramp iron, which could damage the discs and shafts. As mentioned above, the infeed chute work should not be supported by the screen, or to any of its supports.

In a typical infeed layout, an access door is recommended above the screen in the chute work, to aid in the inspection of the discs. This door must be fitted with a safety switch. Direct infeed material to land on infeed chute and NOT DISCS. Spread material across full width of screen before material contacts discs.

The drawings on the next pages show the correct infeed requirements for Rotary Disc Screen.

1B.5 Outfeed Requirements

The outfeed chute for the screen should not be supported by the screen, or to any of its supports,

In a typical outfeed layout, an access door is typically recommended below the screen in the chute work, to aid in the inspection and maintenance. Baum recommends this door must be fitted with a safety switch of similar construction and operation to that required on the top access door.

1B.6 Electrical Requirements

1B.7 a. Electric Motors

The general arrangement drawing calls out the specific horsepower of motor required for a given screen. It is also recommended that local push button operator controls be provided as required in the infeed or discharge areas of the screen, including emergency stop, normal start and stop, and jog control.

1B.7 b.Speed Sensors

Some screens may include a speed sensor to detect proper rotational speed during operation. One sensor will typically be positioned on the last shaft opposite the drive end of the screen.

The probe senses off a flag or key seat on the shaft, with one pulse equaling one revolution. See the Speed Sensing Appendix for more information on the speed sensing probes, if used.

1B.7 c.Safety Switches

Baum strongly recommends a keyed magnetic safety switch mounted on all access doors. This particular switch should be selected to suit the mill standards as well as not easily be tampered with, whether intentional or accidental.

The purpose of this switch is to insure that the screen **cannot start**, should personnel have physical access to the area near the discs, sprockets, or other moving parts. This switch is intended to **supplement** all normal required Lock out and Tag out procedures. **Access doors which may be present in chutes above or below the screen must also be equipped with properly mounted and wired switches.**

1B.7 d.Electrical Lock-Out

Standard plant procedures for locking out the screen must follow the OSHA Lock out/Tag out Procedures outlined in Section A.4 the screen **must** be locked out during any inspection or service. Failure to do so may result in serious or fatal injury. Also on hydraulic drives electrical power to the hydraulic pump **must** be disconnected and locked in the OFF position before any of the screen guards or covers are opened. Normal Lock out procedures for the screen includes removal of the belts as an added precaution.

In addition, equipment adjacent to the screen may require Lock out during screen inspection and maintenance. This is especially true when the screen is a part of a system. Determine all equipment in the systems that require lock out before opening any part of the screen for inspection or maintenance.

1B.7 e. System Interlocking

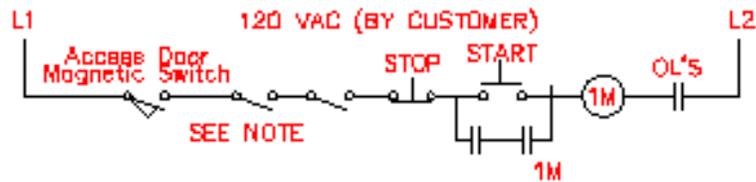
Safe operation of a screen can only be achieved by the proper interlocking of the electrical controls system, as shown in Figure #2 below. All plant standards must be also complied with in regard to proper equipment lock out procedures prior to maintenance of any kind.

Failure to follow proper lock out procedures **can cause severe personal injury or death**. Full understanding of the plant standards for equipment lock out prior to maintenance is essential for the safety of personnel. Questions regarding plant standard lock out procedures should be directed to immediate supervisors and/or plant personnel responsible for safety.

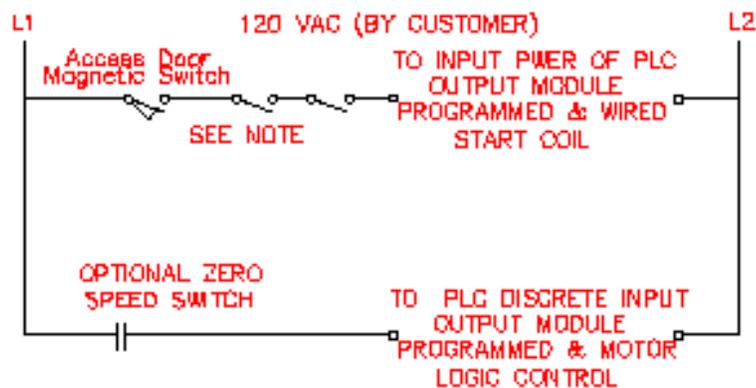
Should there be any questions regarding the requirements of safety switches due to specific aspects of screen installation or usage, or regarding the intent of the required safety interlocking shown in figure #2, contact Baum Pneumatics Inc., at the address given in Section A.1.

REQUIRED SAFETY INTERLOCKING FOR BAUM DISC SCREENS

HARDWIRED CONTROL SYSTEM



PLC CONTROL SYSTEM



NOTE

REMOVE JUMPER(S) FOR INSTALLATION OF ADDITIONAL MAGNETIC SWITCHES AS REQUIRED BY SITE SPECIFIC CONDITIONS. THIS WOULD INCLUDE THE USE OF ADDITIONAL ACCESS DOORS IN CHUTES ABOVE OR BELOW THE SCREEN OR ANY CONDITION IN WHICH PERSONNEL MAY HAVE ACCESS TO THE SCREEN SHAFTS AND / OR DRIVE(S).

1B.8 Electrics

Note

The inductive proximity sensors (used as motion sensors) must be wired and functioning correctly before powering the electric motor, otherwise there is no sensing of this drive, if something was to fall into and jam the screen, the sensor must indicate the stoppage.

1B.9 Delays

The infeed material must be held in a surge bin or surge conveyor, if screened material is to be fed into a pneumatic conveying system. The surge bin size determines how smoothly the conveying system will operate. Also this bin is required to hold material if there is a

diverter (switch gate) in the conveying system. Once a switch has been made, the surge bin must be emptied, before allowing another switch, emptying time is 4x holding time.

Start-up Check Sheet

The following is provided to assist with the check out of the Baum Pneumatics Screen. The screen must be LOCKED OUT before starting this procedure. Lock Out for screens is defined as electrically locking out the drive motor and removing the drive belts for the gear reducer.

1. Check the alignment of any V-belt drive, and L.S.S. Coupling (if used) Make sure the drive belts are removed.
2. Fill the gear reducer with oil recommended in the appendix. Grease at both ends of reducer.

WARNING

Sharp discs inside unit. Heavy mass of rotors can severely injure hands and fingers, even with drive motor disconnected. Keep all arms, fingers out of the disc pockets while rotating the screen.

Only allow the person working on the screen to rotate it.

3. Inspect the screen for any foreign material inside the disc pockets. Check for binding of the rotor assemblies in their housings, the shafts should move easily without rubbing the housing.
4. Check and record the Disc to Disc IFO (interface opening)
5. Close drive cover and any access doors used during inspection. Insure that all drive covers, coupling guards are in place and secure.
6. Replace drive belts and restore electrical power to the screen motor. Jog the screen for correct rotation. Rotation arrows are included on the end bells of the screen. Correct rotation, relative to the top of the rotor assemblies is towards the discharge end of screen.
7. Start the screen and let it run for 30 minutes. Listen for any abnormal sounds, indicating misalignment. Shut down, Lockout the electrical power, and check for any hot bearings or noticeable misalignment. Check and record Free Running Amperage.
8. Restore power to the motor, and test all related interlocking systems for proper operation to the rest of the process system (conveyors, pneumatics, etc.) (See section 1B.7) Check for proper speed sensing interlocking, if supplied.
10. Start-up system, and begin feeding material to the screen.

The screen is now ready for operation.

C Operation

1C.1 Material Pre conditioning Requirements

Material pre-conditioning requirements will differ depending on the specific use of the Screen. Generally, the screen infeed material should be free of large rocks and tramp steel which might damage the screen shafts and discs. Maximum operating temperature unless specified in writing is 100 degrees F. (38C.) Special bearing modifications can allow screens to be operated at higher temperatures, if known before manufacture.

Do not use the screen for material of densities other than those for which the screen was designed. If material conditions change, contact Baum. It may be possible to make changes to the screen to work for the new infeed classification.

Screens are not normally designed or manufactured to operate handling hazardous materials or in a hazardous environment. Hazardous materials are those classified as explosive, flammable, toxic, or otherwise dangerous to personnel if not completely contained inside the screen housing. If the screen is to be operated in any of the above environments or handle any form of hazardous material, contact Baum for a complete review of the application.

1C.2 Basic Screen Operation

WARNING

This Screen can cause death or severe personal injury if all guards and covers are not in place during operation. Do not walk on covers or guards during operation. Always Lockout the screen before inspecting any part of the unit.

Anti stall electrical control to automatically reverse screen when a stoppage has been detected.

Do not decrease or increase the operating speed of the screen beyond the range listed on the general arrangement drawings, unless by written instruction from Baum Pneumatics Inc. To do so may cause excessive motor amperage draw, accelerated wear, and/or permanent damage to the screen, and void all warranties. The standard rotational speeds are given below as reference, always use the speed called out on the general arrangement drawing.

Whenever possible, the screen should not be stopped with material in the unit. Housing and rotor corrosion damage may occur if moisture is allowed collect in the screen between operation cycles. Excessive amperage is also required at restart.

1C.3 Screen Troubleshooting

Use these troubleshooting procedures for the following operational problems.

WARNING

This equipment can cause death or severe personal injury if all safety precautions are not taken. Lockout/Tag out this equipment anytime inspection or maintenance is to be performed. Normal Lockout procedures for the screen include removal of the drive belts as an added precaution.

In addition, equipment adjacent to the screen may require Lockout during screen inspection and maintenance. Determine all necessary Lockout requirements before any work is performed.

Sharp knives inside unit. Heavy mass of rotor can severely injure hands and fingers, even with drive disconnected. Keep all arms, hands, even fingers out of rotor pockets while rotating the screen.

Material jammed in screen:

Stalled machine: Remove objects causing jam.
If problem persists contact Baum Pneumatics.

Reduced capacity: Check infeed to ensure proper spread of material.
If problem persists contact Baum Pneumatics

Lockout the screen, remove the drive belts, and open up the access door. Wearing goggles and face mask use a compressed air blast to remove chips from the infeed area. Try to spin the rotors to clear the plug. If chips are packed in, use a tool to dig out the plug. **Do not use your hands to clear the plug.**

Belts off drive sheaves:

Lockout the screen, and open up the belt guard. Remove the old belts and check for wear. Rotate screen using the driven sheave, checking for a jammed rotor, rotor to housing interference, or defective bearings. Check alignment of drive sheaves, and reinstall new belts, if necessary. Tension belts per manufacturers recommendations. Reinstall drive belt guard. Screen is ready for start-up.

5D.1 Maintenance

The Baum Disc Screen has been designed to be easily serviced. The screen is of a simple design allowing fast access to all serviceable components to reduce downtime to a minimum. The useful life of any piece of equipment can be extended by consistent and sound maintenance practices.

WARNING

This equipment can cause death or severe personal injury if all safety precautions are not taken. Lockout/Tag out this equipment anytime inspection or maintenance is to be performed. A Normal Lockout procedure for the screen includes removal of the drive belts as an added precaution.

In addition, equipment adjacent to the screen may require Lockout during screen inspection and maintenance. Determine all necessary Lockout requirements before any work is performed.

Rotating Discs inside unit. Heavy mass of rotors can severely injure hands and fingers, even with drive disconnected. Keep all arms, hands, even fingers out of rotors while rotating the screen.

1D.2 Preventative Maintenance

The Screen should be checked over on a regular schedule shown below to maximize operator safety and the screens' useful life. Always look the screen over for damage, signs of improper operation and malfunctions, feel for new vibrations, listen and smell for odd noises or odors that may signal the need for a more thorough investigation.

After the first week of operation on a new installation, the tightness of all bolts and screws and spacing should be checked. Also the drive chains oiler lubrication settings should be checked on a weekly basis until a re lube cycle is determined.

Lockout before any inspection or adjustment

Weekly-	Check all guards and covers are in place, and function properly. Check oil level in oiler reservoir for chains (if equipped) Otherwise lube chains manually every 300 hrs.
Monthly-	Lubricate main bearings. Check gear reducer oil levels and grease motor bearings. Check disc spacing Check fasteners for looseness Check chain and sprocket alignment Check V-Belt drive condition.
3-Month-	Grease main bearings every (1700 hrs).
6-Month	Check all attachment bolts, nuts, and bearing set screws. Check speed sensors for proper operation and interlocking with the infeed and outfeed equipment. Check V-Belt/Chain drive adjustment on Motor/Reducer drive. Change oil in gear reducer.

1D.3 Lubrication Information

The following items will require lubrication service at intervals listed in Section F.1. as specified Gear reducers: **(Lockout required)** see reducer appendix.

Shaft bearings **(Lockout required)** Shaft Bearings should be re lubricated with a high quality grease conforming to NGLI #2 (monthly) or more often in dusty environments. Grease fittings are located on each bearing.

Chain oil to be directed between link plate edges of roller chain.

Ambient Temperature	Lubricant	Rating
Celsius	SAE	BS4231
-5 to +5	20	100
5 to 40	30	150 to 220

For disc screen applications multi grade SAE 20/50 oil would be suitable.

1D.4 Screen Disc Maintenance

When the screen is assembled, the Interface Opening I.F.O. between discs is recorded and filed for that serial number. The screen as manufactured provides enough clearance for operation, with minimum variance. Wear will increase the clearances, as well as round off the profile of the disc, which drives the material forward

1D.5 Proximity Sensing Components

A speed sensor may be provided as part of the screen to sense low shaft speed, warn operators, and shut down the screen and related equipment. The sensor is typically located on the end of the screen opposite the drive, positioned such that if any of the drive components fail a sensor will pick up a loss of speed. The sensor must be interlocked into the system, and be operating properly to prevent unnecessary down time.

Every 4500 hours (6 months) the sensor should be individually checked to insure proper operation, and proper interlocking into the process system. See Speed Sensing Appendix for more information on this unit, if used.

1D.6 Mechanical Components

The following mechanical components should also be checked on a routine basis, as follows. Always Lock out / Tag out before performing any of the following functions:

-Check all attachment bolts and nuts, and bearing set screws for proper tightness every 2000 hours (3 months). See Section F.7. for bolt torque specifications.

-All drive guards and covers must be in place and functional at all times, and checked every week. Also clean any grease slung from the bearings, grease tends to attract dust.

1D.7 Periodic Maintenance

With its inherently simple design, the Baum screen has few wear parts that require replacement at specified intervals. These parts include the discs, spacers, (infeed chute liner if equipped). This section is provided to give detailed instruction on these items.

Disc Spacing Adjustment

1. LOCK OUT MOTOR.
2. Loosen set screws / locking collars or lock nuts on each bearing at both ends of shaft.
3. Move shaft to achieve equal spacing on both sides of discs and inside upper panels of screen.
4. Re-tighten sets screws / locking collars or lock nuts.
5. Check for sprocket alignment.

Disc Replacement

LOCK OUT MOTOR.

1. Remove upper side panels and lift off the base frame.
2. Remove drive chain on shaft requiring disc replacement.
3. Remove 4 bolts from each bearing and lift out shaft. (bearing mounting nuts are welded on inside of lower side panels)
4. A disc spacer is welded at the center of the shaft. Therefore, to replace a disc on the sprocket half will require the removal of the sprocket and bearing on that side. If the disc is on the other side, then only the bearing on that side needs removal.
5. Remove the clamping plate on the required side and slide out the discs and spacers.
6. Replace the damaged disk.
7. Install the clamping plate using thread locking compound on the 4 bolts.
8. Replace bearings and sprockets and install shaft ensuring that discs are timed (either with points aligned or staggered) as per original installation.
9. Rotate shafts and check that the discs do not contact spacers.
10. Replace panels.

1D.13 Bolt Torque Specifications

During the course of Maintenance on the Baum Screen, it is very important to torque all bolted fasteners to the proper levels to avoid loosening in service. All replacement bolts must be of the same grade as the original bolt. All specifications below are for lubricated threads.

Bolt Size (inches)	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20 UNC	4 ft-lb	6 ft-lb	9 ft-lb
5/16-18 UNC	8 ft-lb	13 ft-lb	18 ft-lb
3/8-16 UNC	15 ft-lb	23 ft-lb	35 ft-lb
7/16-14 UNC	24 ft-lb	35 ft-lb	55 ft-lb
1/2-13 UNC	35 ft-lb	55 ft-lb	80 ft-lb
5/8-11 UNC	75 ft-lb	110 ft-lb	170 ft-lb
3/4-10 UNC	130 ft-lb	200 ft-lb	280 ft-lb
7/8-9 UNC	160 ft-lb	320 ft-lb	460 ft-lb
1-8 UNC	190 ft-lb	480 ft-lb	680 ft-lb

The following fasteners should be coated with an loctite compound before assembly, per the manufacturer's instructions.

- Shaft end clamp plate, (use GR. 8 bolts)..
- Bearing mounting bolts.

1D.14 Special Tools

No special tools are required in working on the Baum Screen.

1D.15 Recommended Spare Parts

The following items are recommended spare parts that should be kept on hand at all times. The complete callout for items can be found in the General Arrangement and Repair Parts Sheets for this job, and are included as part of this manual. This includes necessary ordering information, including Baum drawing numbers (part numbers) that are required to fill orders. When ordering spares, it is helpful to have the original Baum Job Number and Screen Model Number from the nameplate located on the screen housing.

Some parts of the screen are industry standard; although shafts, discs, use special tolerances. Contact your Baum representative for these replacement parts.

5D.15 (cont.) Rotary Disc Sceen – SPARE PARTS

Quantity	Description
1	Electric Motor
1	Gear Reducer
1 set	V-Belts
2	Bearings: QM BLUE BRUTE -TAPER ADAPTER SLEEVE
u.n.o.	
	Size 25 QM DVF-2 7/16
	Size 40 QM DVF-2 15/16
	Size 55 QM DVF-3 7/16
41 links (one section)	RC 100 chain

5D.16 Appendix Manufacturers Manuals

- QM bearings
- Rexnord Planet Gear Reducer Mars

5D.17 Drawings

Drawing no. MEB-237, Assembly Baum Disc Screen Model 60/66

Drawing no. MEA-550, Replaceable disc details

DRAWINGS HERE 1D.16assy 1D.17 exploded 1D.18 maint section 3D



BAUM PNEUMATICS INC.

Rotary Disc Screen

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Disc Replacement (not applicable on welded shafts)

1. LOCK OUT MOTOR.
2. Remove upper side panels and lift panels off the base frame.
3. Remove drive chain on shaft requiring disc replacement.
4. Remove 4 bolts from each bearing and lift out shaft.(four bearing mounting nuts are welded on inside of lower side panels)
5. A disc spacer is welded at the center of each shaft. Therefore, to replace a disc on the sprocket side will require the removal of the sprocket and bearing on that side. If the disc is on the other side, then only the bearing on that side needs removal.
6. Remove the clamping plate on the required side and slide out the discs and spacers.
7. Replace the damaged disk.
8. Reassemble and install the clamping plate using thread locking compound on the four grade 8 fasteners torque to 85 ft lbs.
9. Replace bearings and sprockets and install shaft ensuring that discs are timed (either with points aligned or staggered) as per original installation.
10. Rotate shafts and check that the discs do not contact spacers.
11. Replace panels.

Chain wear (chain is worn)

1. When inside bushing and the case hardened chain pin wear causing chain to be lengthened by approx. three (3) percent (for 21 tooth sprocket disc screen drives)
2. When pin is exposed, or carrier rollers and bushings drag on the sidebar.
3. If chain operates occasionally above its fatigue strength the chain may suffer fatigue failure, prior to breakage wear may not be apparent.
4. If chain whips due to slack, pulsating loads or stiff chain joints. Whip causes rapid chain wear. Chain stiffness can indicate overloads, misalignment, poor lubrication, corrosion, excessive pulsation, or material collecting in chain joints.
5. Excessive noise results from misaligned sprockets, improper slack, lack of lubrication, or worn chain and sprockets.

Sprockets

1. Sprocket hook-shaped teeth indicate wear, evenly worn side of teeth indicate parallel misalignment of sprockets, uneven wear on sides of teeth indicate angular misalignment (bushing run out or bent shafts)
2. Use a straight edge to align machined surfaces of sprockets.
3. End float varies with each bearing manufacturer approx.050" (bearings should be fixed on sprocket side of machine.)

Drip Lubrication

1. Proper lubrication greatly extends chain life, manual drip feed is available with a reservoir, and effective lubrication reaches all areas where chain surfaces "scrub" each other.
2. Drip feed rate of 4 to 6 drops per minute is recommended
3. Drip tray inside guard has a drain connection to collect tramp oil.

Tension

Disc screen shaft center distances are designed so that chain tensioning is not required; center distances are under the maximum allowed distance with exactly 40 pitches of RC100 chain.

Chain and sprocket Hardness

1. Increased hardness of high wear chain parts increases chain life, but hardness can be detrimental to material toughness.
2. Factory hardened sprockets are selected for these reasons; drive is slow speed, sprockets have less than 25 teeth, and service is likely in an unusually abrasive environment.
3. Reynolds red leaf chain is selected to be first to fail if a severe overload exists.

Bearings

1. Lubrication: Grease bearings every 1700 hours of operation using #2 Lithium base grease.
2. Environmental Protection: Protect bearings from Excessive loads, contamination, poor storage, misalignment, handling and mounting abuse.
3. Component selection: Dodge SCM and QM DVF 4 bolt flange mount bearings are used. (DVF for higher loads)
4. Mounting: Mounting bolts are (Loctited) in place, set screws on Dodge bearings are dimpled thru to shaft and also (Loctited) in place.
5. Grease manifold is designed so mill personnel can install automatic greasers directly on to manifold 1/8" NPT conn.

5. Training / Operation

Start-Up / Commissioning is available, however these screens are simple self explanatory machines,

and this service is usually not required.

Anti stall or anti jam trip current relays with reversing starters are hardest on the chain drive, and should be used cautiously.

Keep oil in the chain lube reservoir.

Visually inspect daily for material jammed between shafts or shaft and side walls, lock out before attempting removal.

6. Troubleshooting

Stalled machine: Remove objects causing jam. If problem persists contact Baum Pneumatics.

Reduced capacity: Check infeed to ensure proper spread of material.
If problem persists contact Baum Pneumatics

Noise Check chain alignment, or twisting causing upper panel to contact shaft(s)

7. Recommended Spare Parts

1 set	V-Belts
2	Flange bearings
1	Length of drive chain w/ link
1 set	Shafts (once wear becomes a factor in performance)

8. Manuals

-	18	Bearings	Dodge	SCM 2 15/16 4 bolt flg
-	1	Reducer	Dodge	TXT 525 Torque Arm
-				TDT 2 15/16 bushing kit
-				TA5M motor mount
-	7	Sprockets	Martin	DS100R21
-	2		Martin	100R21
-	40 links	Roller Chain		Reynolds RC100
-	1	Chain Lube	Lube Devices	½ gallon reservoir 10 port manifold, vented needle valves 2" Flat brushes (B&T)

9. Drawings

- Drawing no. B555 09 AA 01, Assembly Baum Disc Screen Model 66x9
- Drawing no. MEA-550, Replaceable disc details

10. Design

A High volume classifier and conveyor
IFO 2 5/8" for 3" minus material, 9 shafts estimating 180 Units per hour capacity.
RPM 55, Tested 10 Amps at 208V no load.

Discs: 3/8" mild steel, scalloped shaped and staggered for hog fuel, with removable spacers.

Reducer: 25:1 Shaft mount drive 2.3x service factor (mechanical rating 23.5 hp),
215T 10 hp 1800 rpm motor by customer,

Chain: Reynolds capacity 12x motor hp rating (if lubricated)

Shafts: 3 1/4" turned to 2 15/16" AISI C4130 chrome-moly steel.

Bearings: Ball bearing flange mount, blue loctite on mounting bolts, dimpled shafts and loctite set

Screws, anti seize compound on shaft to bearing fits.

Clamping: cap screws on shafts Gr. 8 torque to 85 ft lbs, loctite in place.

Lube Grease: Room on grease manifold has been allowed for a set of (Electro luber) time delay
grease dispensers in the future.

Belt Drive: 1.15:1 reduction 5V 770 (2) belts (mechanical rating 29 hp)

11. Coatings / Decals

Shafts are painted safety orange, Interior side panels are coated with graphite based dry film
lubricant

(No.1 slip plate), Exterior is painted two part epoxy.

Decals and Warning signs samples as shown:

Surge Bins

5

SURGE BINS

Surge Bins

