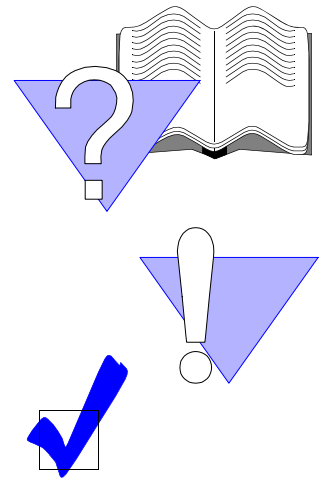


Denester Operation and Parts Manual

Purpose

This documentation provides an overview of information and procedures required to use your AMF equipment. Topics included are:

- ▼ Installation
- ▼ Operation,
- ▼ Sanitation
- ▼ Maintenance
- ▼ Replacement Parts



Quick reference check lists are provided along with information required to operate this equipment. With assistance from a AMF representative, determine the best control settings for each product, then save and record these parameters for future reference.

A parts section is provided at the end of this document to reference original AMF replacement parts designed to help you maintain the equipment through years of service.

Note: A variety of options can be available for this equipment and your equipment may be customer-specific. The Bill of Material and the Assembly Drawings should be your final reference.

Denester Operations and Parts Manual

Denester Operation and Parts Manual - - - - - 1-1

Purpose.....	1-1
Revision List	1-7

Safety Information - - - - - 2-1

Introduction.....	2-1
Purpose.....	2-1
Scope.....	2-1
Important Information Identification and Conventions	2-2
Symbols, Notations, and Message Conventions	2-2
Safety Information	2-4
Prior to Working With Equipment	2-5
General Safety Precautions	2-6
Safety Labels.....	2-7
Danger Label Symbol	2-7
Warning Label Symbol	2-8
Caution Label Symbol	2-8
AMF General Operating Precautions	2-9
General Precautions	2-10
Safety Requirements	2-11
Zero Energy State Procedure	2-12
OSHA Standard 1910.147	2-12
Special Cleaning & Safety Instructions	2-14
Pinch and Shear Points	2-14
Disconnect Main Power Supply	2-14
Lockout/Tagout Procedures ANSI Z-244.1	2-15
Scope.....	2-15
Purpose.....	2-15
Responsibility	2-15
Preparation	2-16
Procedure Involving More than One Person.....	2-16
Lockout/Tagout ANSI Z-244.1 Sample Lockout/Tagout	2-17
Sequence of Lockout Procedure	2-17
Restoring Equipment to Service	2-17
Interlocks Electrical	2-18
Electrical Interlock Description	2-18
Interlocks Electrical	2-19
NOTES.....	2-20

Denester Operations and Parts Manual

Installation Notes - - - - -3-1

Scope.....	3-1
Setting of the Equipment	3-2
General.....	3-2
Unpacking the Equipment	3-3
Locating and Lifting the Equipment	3-3
Electrical Connections	3-4
General Facility Pneumatic Plumbing Layout.....	3-5
Purchased Options and Kit Installation	3-6
Prior to Operation	3-7
Equipment Layout Insert	3-8
NOTES.....	3-9

Operation - - - - -4-1

Scope.....	4-1
Denester Layout.....	4-2
Denester Component Area Identification	4-2
How the Equipment Works	4-3
How the Equipment Works	4-4
Sequence of Operation.....	4-4
Typical Daily Operation.....	4-6
General Daily Operation Steps	4-6
Restarting After an E-stop is Pushed	4-7
Shutdown Procedure	4-8
Standard Operator Interface Control Panel.....	4-9
Operator Control Panel	4-9
Allen Bradley Panel View Operator Interface Control (OIC)	4-9
Allen Bradley Panel View Navigation.....	4-10
MCR Button.....	4-10
Emergency Stop Button	4-11
Other Miscellaneous Operator Devices and Features	4-12
Visual Alarms	4-12
Electrical Disconnects.....	4-13
Electrical Interlock Devices.....	4-14
Pneumatic Filter, Regulator, and Lubricator Assemblies	4-15
NOTES.....	4-16

Sanitation - - - - - 5-1

Scope.....	5-1
Washdown Environment Ratings.....	5-2
NEMA Enclosure Rating Reference.....	5-2
NEMA 4X Washdown.....	5-4
NEMA 12.....	5-4
Daily Sanitation	5-5
Sanitation Setup	5-5
Weekly Sanitation	5-6
NOTES.....	5-7

Maintenance - - - - - 6-1

Scope.....	6-1
General Maintenance and Lubrication Tips.....	6-2
Lubrication.....	6-2
General Component Maintenance Tips.....	6-4
General Maintenance Guide for Chain Drives (As Applicable).....	6-4
General Maintenance Guide for Couplings (As Applicable).....	6-6
General Maintenance Guide for Gear Drives (As Applicable).....	6-6
General Maintenance Guide for Belt Drives (As Applicable).....	6-7
General Maintenance Guide for Gear Boxes (As Applicable)	6-8
General Maintenance Guide for Bearings (As Applicable).....	6-8
General Maintenance Guide for Electric Motors--AC, DC and Servo (As Applicable)	6-10
General Maintenance Guide for SCR, Inverter Drives and Servo Amplifiers (As Applicable)	6-12
Daily Lubrication (As Applicable)	6-13
Gearbox Oil Levels (As Applicable)	6-13
Sealed Bearings (As Applicable)	6-13
Denester Layout.....	6-14
Denester Component Area Identification	6-14
Belt Adjustment	6-15
Belt Tensioning.....	6-15
End Effector Options	6-16
End Effector Assembly	6-16
Alternate Effector Assembly 1	6-17
Alternate Effector Assembly 2	6-18
NOTES.....	6-19

Denester Operations and Parts Manual

Parts and Service - - - - -7-1

Parts and Service Overview	7-1
Standard Information Needed Prior to Ordering	7-2
Note This Information First	7-2
Customer	7-2
Originating AMF Sales Order.....	7-2
Equipment and Serial Number List	7-2
AMF Technical Support.....	7-3
AMF Parts and Service	7-3
Standard Business Hours	7-3
Contact Information	7-4
United States	7-4
Fax	7-4
International Customers	7-5
Website Address	7-5
AMF Canada.....	7-5
AMF Western Europe	7-5
AMF Pacific Rim Service Center	7-5
Recommended Spare Parts Reference Key Components	7-6
Recommended Spare Parts	7-7
NOTES.....	7-8
Equipment Bill Of Material	7-9
NOTES.....	7-10
Equipment-Specific Drawing Inserts.....	7-11
NOTES.....	7-12

Appendix - - - - -8-1

Scope.....	8-1
Updates	8-3
Bulletins	8-5
Equipment Layout.....	8-7
Training Aids	8-9

Revision List

Revision List

Date	Chapter and Revision level	Description
July, 2009	Book	Document Creation.
September, 2010	Title Page	Notation for proper parts identification.
March, 2011	Book	Book Updated. JMM
April, 2012	Book	Book Updated. JMM
December, 2013	Book	Mechanical Updates from MN. JMM

Denester Operations and Parts Manual

Safety Information

This chapter conveys information of greatest importance, ***Safety***. It is required reading for anyone who performs any type of work on the equipment.

Introduction

Purpose

To provide information essential to the safe operation of your AMF equipment is the purpose of this manual.

A thorough understanding of the hazards involved is essential ***prior to*** working with, on, or in the vicinity of automated manufacturing equipment. AMF provides two sources through which safe methods of operation and use can be obtained:

1. The contents of this chapter, in its entirety, and safety-related entries found throughout the entire equipment manual.
2. Training sessions that are provided by AMF service personnel.

Scope

Subjects addressed in this chapter:

- ▼ Safety standards and responsibility
- ▼ Operational prerequisites and precautions
- ▼ Important information, symbol identification, and conventions
- ▼ Safety interlocks

Denester Operations and Parts Manual

Important Information Identification and Conventions

Employee safety is important. Throughout this manual you may see various methods of alerting you to important information. These symbols and message styles identify potential hazards, areas of safety or other notes of interest that should be brought to the attention to the reader.

Symbols, Notations, and Message Conventions

Symbol	Message	Content
	<i>Note:</i>	General comments regarding clarification for process discussed.
	<i>Notice:</i>	Actions that could potentially lead to damage to the product, equipment or facilities, if instructions are not followed properly.
	Warning, Caution, and Danger	The Attention / Safety Alert symbol used throughout this manual alerts you to immediate or potential hazardous conditions resulting in possible injury or death.
	Electrical Hazard	The Electrical Hazard caution symbol alerts you to possible situations where risk of electrical shock may exist.
	Movie	The movie symbol is placed in conjunction with a picture that represents a small video clip that can be played in the Adobe Acrobat PDF file.
	Consult Equipment Manual	This symbol will typically be used in separate equipment documentation, such as operator reference guides, where additional information is available on a particular subject discussed in the primary equipment documentation

Symbol	Message	Content
	Lockout / Tagout	This symbol is used primarily in quick reference guides and other procedures where Lock Out / Tag Out can be advised.
	Helpful Hints and Notes	This symbol reflects general tips, shortcuts, and other information that might be helpful to the user in using the equipment or performing and particular process.
	Frequently Asked Questions	This symbol reflects general tips, shortcuts, and other information that reflect common questions asked on process or procedure.

Denester Operations and Parts Manual

Safety Information



Safety features have been designed into the machine and hazards as marked. Refer to the Safety chapter of this manual and OEM documentation.



Make sure that all personnel read and understand this manual prior to operating, maintaining, or servicing this machine.



Misuse of or contact with **internal electrical components** or **pneumatically controlled devices** could result in severe injury or death. To prevent such occurrence, follow all lockout/tagout procedures as described in the Safety chapter of this manual and/or in accordance with your company policy. Refer to the table *Potential Energy Source and Lock-Out Procedure* under *Zero Energy State Procedure* in the Safety chapter of this manual for lockout/tagout instructions for electrical and pneumatic devices.



Before servicing, read and understand all documentation. Only qualified trained and authorized personnel should access electrical control enclosure cabinets and components.

Prior to Working With Equipment



General Safety Precautions



SAFETY FIRST! AMF strives to promote safety in the operation and maintenance of our equipment. Along with any local codes, company procedural policy governing safety, we also recommend you include the following practice and guidelines prior to any operation, maintenance, and servicing procedure.



1. Read the manual completely before attempting installation, operation or maintenance procedure.



2. Disconnect all power and release stored energy to the equipment before removing any guards or covers. Replace all safety components and verify proper operation prior to resuming equipment operation.



3. Observe Lockout/Tagout procedures where applicable.

4. Incoming electrical power must have proper shielding and grounding in accordance with all governing codes. Study and comprehend all wiring and electrical component information prior to installation or servicing.

5. Never bypass safety switches.
6. Clothing, hair, jewelry and other loose articles should be considered a safety hazard around all equipment. Please take corrective action to ensure against entangling.
7. Never attempt repairs while equipment is operating.
8. Use only original AMF equipment parts, which are designed for safe operation in the equipment.
9. Only authorized and trained personnel should operate and maintain the equipment.

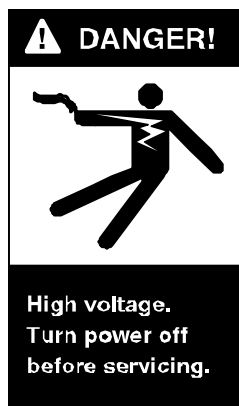
Note: This equipment should be used only for the purpose for which it was intended and sold. It should in no way be modified without prior notification and consultation of the original manufacturer.

Safety Labels

Three primary styles of labels are incorporated in the equipment in the United States and other countries. Be sure to familiarize yourself with these labels, which are designed to conform to *ANSI Z535* standards for products sold in the United States as well as having recognition in other countries. These same labels are also based on recommendations from AIB and BEMA, which are associations based within the baking industry. The messages used in conjunction with the warning symbols will identify the situations that could be hazardous.

Danger Label Symbol

Figure 0-1 . Danger Label Symbol



Color Red

The danger symbol, Figure 0-2, indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Use of the designation “DANGER” is limited to the most extreme situations. The danger symbol is identified by the color red.

Denester Operations and Parts Manual

Warning Label Symbol



Color Orange

Figure 0-2 . Warning Label Symbol

The warning symbol identifies areas or practices which, if not avoided, could result in death or serious injury. The warning symbol is identified by the color orange.

Caution Label Symbol

Figure 0-3 . Caution Label Symbol

The caution symbol 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. The caution symbol is identified by the color yellow.



Color Yellow



Many accidents can be prevented by knowing about and practicing safety. Prevent hazards by reading the safety warnings in this manual and alert others.

AMF General Operating Precautions

- ▼ Maintain your machine according to this manual's guidelines.
- ▼ Lock off and tag the main power electrical disconnect switch before maintenance or service
- ▼ Keep fingers, feet, hair and loose clothing away from moving parts.
- ▼ Keep electric power panel closed and locked at all times.
- ▼ Only authorized maintenance personnel are allowed to access the power panel.
- ▼ Do not remove, tamper with or modify the safety interlocks.
- ▼ Do not reach into, lean against, climb on or get under the machine. Always follow the lock off/tagout procedures.
- ▼ Never allow anyone to remove product from machine while it is in operation.

Denester Operations and Parts Manual

General Precautions

All AMF equipment has been designed and manufactured to conform to or exceed the design requirements of ANSI Z50.1-1988, "Safety Requirements for Bakery Equipment." It is incumbent the owner and operator of this equipment, to operate and maintain equipment in accordance with good safety practices and the requirements of ANSI Z50.1-1988 and later versions thereof



Notice: Electrical interlocks can be and frequently have been observed to be "over-ridden" by mechanically holding the interlocks in the closed position or by alterations in the electrical circuit to by-pass the interlock. The practice of "over-riding" or "by-passing" an electrical interlock renders ineffective the extra hazard protection intended.

Equipment described in this manual has been carefully designed and manufactured to our high quality standards. Special attention has been devoted to convenience of operation while simultaneously providing effective hazard protection for operating personnel.

Any piece of machinery can become dangerous to personnel when improperly operated or poorly maintained. Our service personnel are highly skilled and competent in operation and maintenance of our equipment which is installed under their supervision. A major portion of installation supervision time is devoted to instruction and training of your personnel in the operation and maintenance of this equipment. It is incumbent upon you that all personnel who will be expected to operate or maintain this equipment participate in these training and instruction sessions.

Many pieces of industrial equipment, including AMF equipment, utilize electrical interlocks on certain guards and access doors. The use of such interlocks is intended to provide increased hazard protection for your employees and particularly for careless operators. Your special attention is directed toward the need for rigid enforcement of safe operating methods and the need for proper maintenance of all safety devices.

Electrical interlocks are located on machines so that the machine will not operate when interlocked guards or panels are removed or opened. In fact, an inoperable interlock can be more hazardous than no interlock because operators become dependent upon interlocks stopping a machine when guards or access doors so equipped are opened or removed. Subsequent immobilization of such interlocks can thus increase—rather than decrease—hazardous exposure.

The most effective hazard protection for your employees is a rigidly enforced safety program which includes effective training in safe operating methods. Supplementary methods of improved hazard protection, such as electrical interlocks, are useful to the extent that they are rigidly maintained in an operable condition. Only periodic, regular inspection, and validation of the safety circuit insures detection of failed safety devices, which can lead to dangerous situations. Our service department can assist you with your training and maintenance programs.



Note: ANSI Z50.1-1988 “Safety Requirements of this standard apply to the design, construction, installation, safe operation and maintenance of bakery machinery and equipment.”

Safety Requirements

- ▼ Contact with moving machinery can cause serious injury.
- ▼ Keep guards closed. All duties required of an operator (while machine is operating) can and should be performed with all guards closed and in their intended location on the machine.
- ▼ Clean or adjust machine with main power electrical disconnect switch in the “off” position. Correction of any malfunction, cleaning or adjustments should only be accomplished while machine is stopped and with main power electrical disconnect switch in the “off” position. Before turning main power electrical disconnect switch to the “on” position, make sure all guards are returned to their proper location and are closed.
- ▼ Do not allow operators or anyone to remove products from the machine while it is in operation. It is hazardous to try to pull the product from the machine—if caught in the drive belt, sprockets or any other moving mechanisms, you may lose fingers, hands or arms.
- ▼ Do not remove products while machine is running. Do not operate machine unless all guards and covers are in place and doors are closed.
- ▼ Only authorized electricians should be allowed access to interior power panel. Electric power panel enclosures must be kept closed and fastened at all times to protect operator from dangerous circuits within.
- ▼ Keep hands out of the machine while machine is running.

Denester Operations and Parts Manual

Zero Energy State Procedure

OSHA Standard 1910.147

In addition to the safety requirements of ANSI Z50.1-1988 described earlier in this chapter, OSHA has rules and guidelines that are applicable to companies in the United States. OSHA, (Occupational Safety and Health Administration), Standard 1910.147, **The Control of Hazardous Energy**, requires that all companies have enforce a written Lockout/Tagout program and procedure.

Zero Energy State basically means ridding objects of any and all potential power which could allow movement and possibly create situations resulting in injury.

An example of typical energy sources and Lockout procedures are as listed in the following table for reference only. This listing is a general guideline and is not intended to be used as a fully comprehensive listing. It is your companies responsibility to establish, implement, maintain and enforce appropriate safety rules and guidelines applicable for the local location and laws in your vicinity.

Table 1: Potential Energy Source and Lockout Procedure

Potential Energy Source ^a	Possible locations	General Procedures
Electrical	Electrical enclosure and building incoming electrical disconnect	Switch disconnect to OFF state and attach lock to opening to prevent accidental re-connection of energy source. Wear appropriate protective clothing
Pneumatic (Air)	Equipment Shut Off air valve on filter / regulator assembly and building incoming air supply disconnect or air valve.	Switch valve to off state and place lock to valve to prevent accidental re-connection to energy source. Allow all pressurized air to be drained or bleed from system lines and components. Block items where gravitational movement may exist. Wear appropriate protective clothing

Potential Energy Source ^a	Possible locations	General Procedures
Hydraulic	Refer to electrical procedure.	Once pump disengaged from power source, loosen cylinder line connections to relieve pressure. Block items where gravitational movement may exist. Wear appropriate protective clothing
Gravity	There maybe times when working on equipment that components can fall or move due to gravity when being assembled or disassembled.	Be sure to tie off or block items when working in or around equipment as required.
Thermal	10. Refer to electrical procedure for Heating elements. 11. Refrigerants	1. Once power is removed allow adequate time for cooling of these components prior to working with these items. Wear appropriate protective clothing 2. See refrigerations manufactures recommendation where applicable. Wear appropriate protective clothing
Chemical	Refrigerants or other chemicals	Reference all applicable chemical or refrigeration manufactures guidelines. Wear appropriate protective clothing

a. Table designed and intended as a general reference. Not all listed potential energy sources maybe incorporated into this equipment.

Denester Operations and Parts Manual

Special Cleaning & Safety Instructions

Pinch and Shear Points



When installing AMF equipment for production purposes, caution should be taken not to create pinch and shear points at the infeed and discharge parts of the machine. Proper clearances should be allowed when matching up AMF equipment with conveyors, feeding, and take-away equipment.

Disconnect Main Power Supply



Never begin cleaning the machine until the main power electrical disconnect switch has been deactivated. Move the switch lever to the “off” position. Some equipment AMF produces will have automatic cleaning cycles incorporated into the design which of course power must be maintained. Please reference the “Sanitation”, and “Operation” chapters of this manual, for more information regarding sanitation and operation of this equipment.

Scope

Lockout/Tagout is a procedure, developed for industrial settings, to allow personnel a safe means working in or around equipment, especially where more than one person is involved. Generally companies have a procedure already in place. In light of safety, AMF strongly recommends for all personnel to be knowledgeable with this procedure prior to servicing or other similar situations where guarding and other safety devices maybe removed, bypassed, or circumvented. Furthermore all should be knowledgeable with local rules and regulations governing this procedure.

Lockout/Tagout Procedures ANSI Z-244.1



Note: The following is only a topical overview of a typical Lockout/tagout procedure, please consult with your companies safety department prior to any implementation for compliance to your companies rules.

Figure 1-Example Lockout / Tagout Label Decal Number 00550-009



Purpose

This procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. Responsibility

Responsibility

The responsibility for seeing that this procedure is followed is binding upon all employees. All employees will be instructed in the importance of safety in the lockout procedure by (designate individual). Each new or transferred affected employee will be taught the purpose and use of the lockout procedure by (designate individuals).

Denester Operations and Parts Manual

Preparation

Employees authorized to perform lockout will be certain as to which switch, valve or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical or others) maybe involved. Any questionable identification of sources will be cleared by the employees with their supervisors. Before lockout starts, job authorization should be obtained.

Procedure Involving More than One Person

In the preceding steps, if more than one individual is required to lock out equipment, each person will place his own personal lock on the energy isolating device(s). One designated individual of a work crew or a supervisor, with the knowledge of the crew, can lock out equipment for the whole crew. In such cases, it will be the responsibility of the individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. The designated individual will not remove a crew lock until it has been verified that all individuals are clear. Safety decals identify specific hazards and general safety. Keep them clean and legible. Never remove a warning decal from the machine. When replacing a part that has a warning decal, be sure to replace its safety decal. For replacement decals, call your AMF parts representative.

Note: All equipment will be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve or other energy isolating device bearing a lock.

The following sample lockout procedure will help you develop a specific lockout procedure if one is not currently in place.

Lockout/Tagout ANSI Z-244.1 Sample Lockout/ Tagout



Sequence of Lockout Procedure

- ▼ Notify all affected employees of lockout.
- ▼ Shut down operating equipment using the normal stopping procedure (depress stop button, open toggle switch, etc.).
- ▼ Operate the switch, valve or other energy isolating device so that the energy source(s) (electrical, mechanical, hydraulic, pneumatic, etc.) is disconnected or isolated from the equipment. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure, etc., must also be dissipated or restrained by methods such as grounding, repositioning, blocking, etc.
- ▼ Lockout the energy isolating devices with an assigned identifiable, individual lock for all personnel working in or around the equipment.
- ▼ After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.
- ▼ The equipment is now locked out.

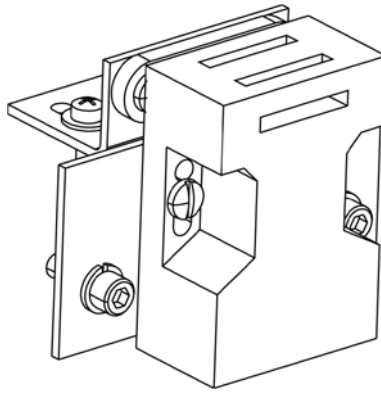
Restoring Equipment to Service

- ▼ When finished and equipment is ready for testing or service, make sure no one in equipment area is exposed.
- ▼ When equipment is clear, remove all locks. You may restore energy to equipment.

Interlocks Electrical

Electrical Interlock Description

Figure 2-Standard Interlock Safety Switch

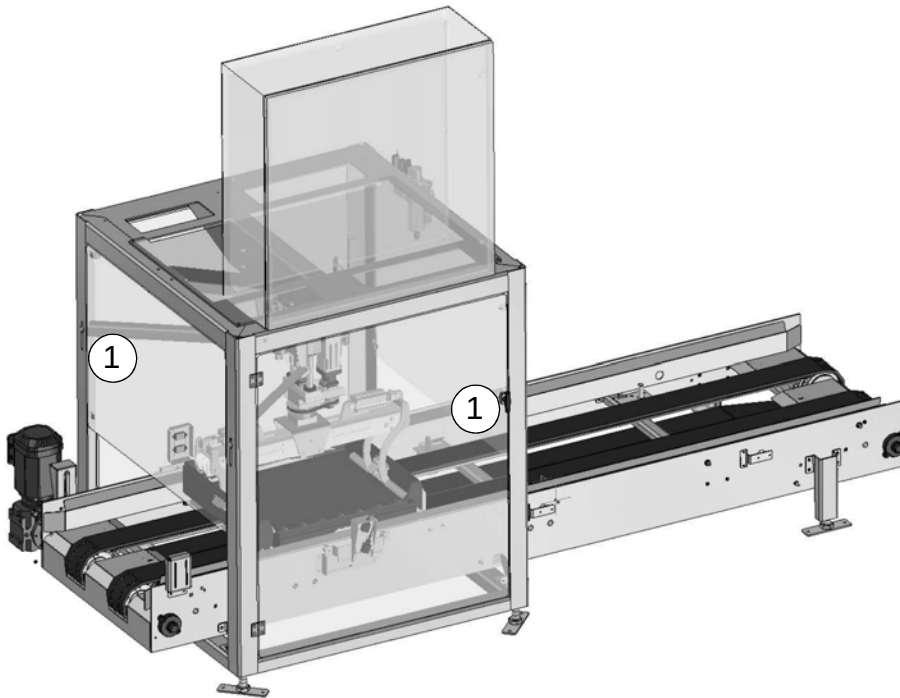


Electrical interlocks are another means of safe-guarding the equipment. These electrical devices are basically switches that are attached to doors and other guarding covers. Once a door is opened or a cover equipped with a interlock device is removed it disconnects the control voltage. The control voltage being disabled generally to the entire machine or possibly to a specific section of the equipment when part of a system package, will render it inoperable electrically. However there maybe stored energy with in the system taking

other forms. As with all safety devices failure is possible and continued caution is always advisable. When working in an area of moving parts it is always advisable for consideration given to procedure guidelines set forth in the Lockout / Tag out section of this manual. Refer also to the Operation information for possible additional information on electrical interlocks and other control components.

Figure -1 . Interlock type and location

Interlocks Electrical



1. Side door Interlocks

Denester Operations and Parts Manual

NOTES

A large grid of 20 columns and 30 rows for taking notes. The grid is composed of thin blue lines forming a series of small squares. The grid is empty and occupies the majority of the page below the 'NOTES' header.

Installation Notes

The information contained in this chapter provides a brief discussion of the procedure for installing your new equipment. It is highly recommended that qualified factory-trained personnel be involved for supervision and completion of these procedures.

Scope

Note: Our company takes great care in preparing your new equipment for shipping to avoid damage to it during transit. However, prior to uncrating your equipment, inspect for external damage to the shipping container(s) that may have occurred during shipment. In the unlikely event that damage to the container is found, contact both the shipping company and your representative immediately before taking further action.

Electrical interlocks, guards and other safety devices have been incorporated into the design of the machine. The interlocks shut down machine operation when certain guards and doors are opened while the machine is running. Do not remove, modify, or tamper with these interlocks at any time! Inoperable interlocks could cause accidents that may result in death, personal injury, or damage to the machine.

Notice: Some equipment may not use interlocks. It is recommended that you review, or are instructed in, the electrical safety device details prior to working in or around the equipment.

Denester Operations and Parts Manual

Setting of the Equipment

General

All equipment should be placed on a level reinforced concrete structural floor capable of holding the weight of the system. Once the equipment is set, leveled and tested for proper operation, as applicable, the individual system components should be anchored in place. Equipment that is mounted on casters, obviously will not have to be lagged into location however there are Floor stops that will need to be set and lagged for the rollers to be positioned against.



Note: Refer to system component documentation, where applicable, for any information regarding the proper installation of the equipment. Care should be given to position the equipment away from daily fork-lift traffic to avoid collision damage to the equipment.

Note: Refer to signed layout drawing documentation only. Layouts enclosed are for general reference only as system configuration vary.

When removing from the shipping skid, generally the forklift should enter the side, centering the forks approximately at the hopper.



Note: Caution is advised to pre-test lifting the unit and adjust pick point location due to off center loading.

Note: During use of forklift, care should be taken to avoid components hanging below frame, such as the vacuum trap assembly.

Note: Verify Drawer Slide for Knife / Manifold Assembly, is in the back or non-extended position prior to lifting.

Note: It is advisable to allow an AMF Field Representative or other experienced equipment movers to be at the location prior to removing equipment from shipping container.

Unpacking the Equipment

- ▼ Carefully remove the outer packing supplies and inspect for any noticeable damage to the equipment.

Notice: Should any damage to the equipment become evident, immediately contact your shipping and factory representative for further instruction.

- ▼ Confirm that the machine is equipped as ordered according to your purchase order. In the unlikely event that there is any discrepancy with the order, contact your factory representative immediately.

Locating and Lifting the Equipment

Following this general positioning procedure will avoid excess unsupported motion, undo strain to the equipment frame, and general potential damage from improperly supported transportation.

- ▼ It is typically desirable to first locate the equipment close to the approximate operation location as possible within the plant, prior to removal from shipping skid.

Notice: Prior to moving equipment verify forks clear all electrical and pneumatic lines and connection.



Notice: Use straps or chains to secure unit frame to the lift prior to attempt of movement.

Notice: Place forks as wide as possible under frame. Load mass should be centered however always raise load slightly first to test conditions after verifying all personnel clear. Once lift conditions have been fully verified the unit may be raised from the pallet. As with any load, during travel, maintain minimal distance to the floor until at installation point.

- ▼ Once the unit is placed into position, as applicable, place and secure mounting bolts to the frame.
- ▼ After locating the equipment to the operation location, the equipment can then be removed from the shipping skid.



Notice: It is advised that you pre-test lift the unit and adjust pick point location, which could be off due to possible off center loading. Adequate frame support should be given to the equipment when lifting from the skid to avoid damage.

Denester Operations and Parts Manual

Notice: During use of the forklift, care should be taken to avoid components that may be hanging below frame, such as conduit for wiring.

Notice: It is strongly advised to allow a Field Representative and other experienced equipment movers to be at the location prior to removing equipment from shipping container. Only qualified and trained individuals should be involved in the installation and setting of the equipment.

Electrical Connections

Make appropriate incoming electrical connections with in main electrical cabinets disconnect.

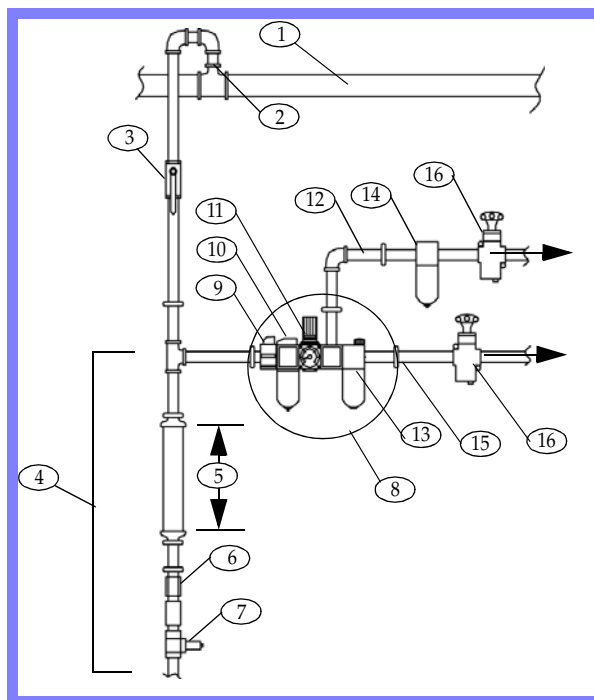


Note: (Refer to the corresponding electrical diagrams sent with the equipment for proper connection point at equipment electrical disconnect. Observe all national and local electrical codes when routing incoming electrical lines. This connection should be performed by only trained and qualified personnel.)

This equipment has been tested prior to leaving the AMF manufacturing facility. Unless the motors have been individually disconnected from the equipment for shipment, all motors have been operated and tested for proper rotation. For proper electrical phasing verification identification, after the main incoming electrical connection to the machine has been completed, a quick reference to the augers can be made. The Auger flow should be moving the product towards the metering pump. It would then be generally safe to assume that the metering pump drive and knife drive are rotating in the correct direction.

This drawing is intended for reference only and is a general example of typical pneumatic layouts that are often incorporated in manufacturing facilities. Proper investment in preparation and conditioning, regarding appropriate dryers, filtering, and water discharge, will reflect in long term operation of pneumatic equipment.

Note: It is always advisable to follow accepted pneumatic plumbing guidelines and practices that are in accordance with local codes for your area.



General Facility Pneumatic Plumbing Layout

Item	Description
1.	Header (<i>Note: 1/4" drop every 10' is typical.</i>)
2.	Air drop tap from top of header typical.
3.	Disconnect Valve
4.	Water Leg Assembly
5.	12" Drop Minimum Typical
6.	Strainer
7.	Drain Valve (Manual or Electronic)
8.	Filter, Regulator, Lubricator (FRL) Assembly
9.	Shutoff Valve
10.	5 Micron Particulate Filter (<i>Typically recommended for most applications</i>)
11.	Regulator
12.	Non-Lubricated Line to equipment
13.	Lubricator (<i>As required. depending on pneumatic component specifications</i>)
14.	.3 Micron Coalescing Filter (<i>Typically recommended for most applications</i>)
15.	Lubricated Line to equipment. (<i>As required</i>)
16.	Lock Out Valve

Denester Operations and Parts Manual

Purchased Options and Kit Installation

A variety of options can be available for this equipment. Packaged features and kits included with your equipment may be customer-specific and, consequently, may not be covered. Where applicable, these items should be reviewed with the field representative during installation and training.

Verify all guards are in place and safety switches are functional

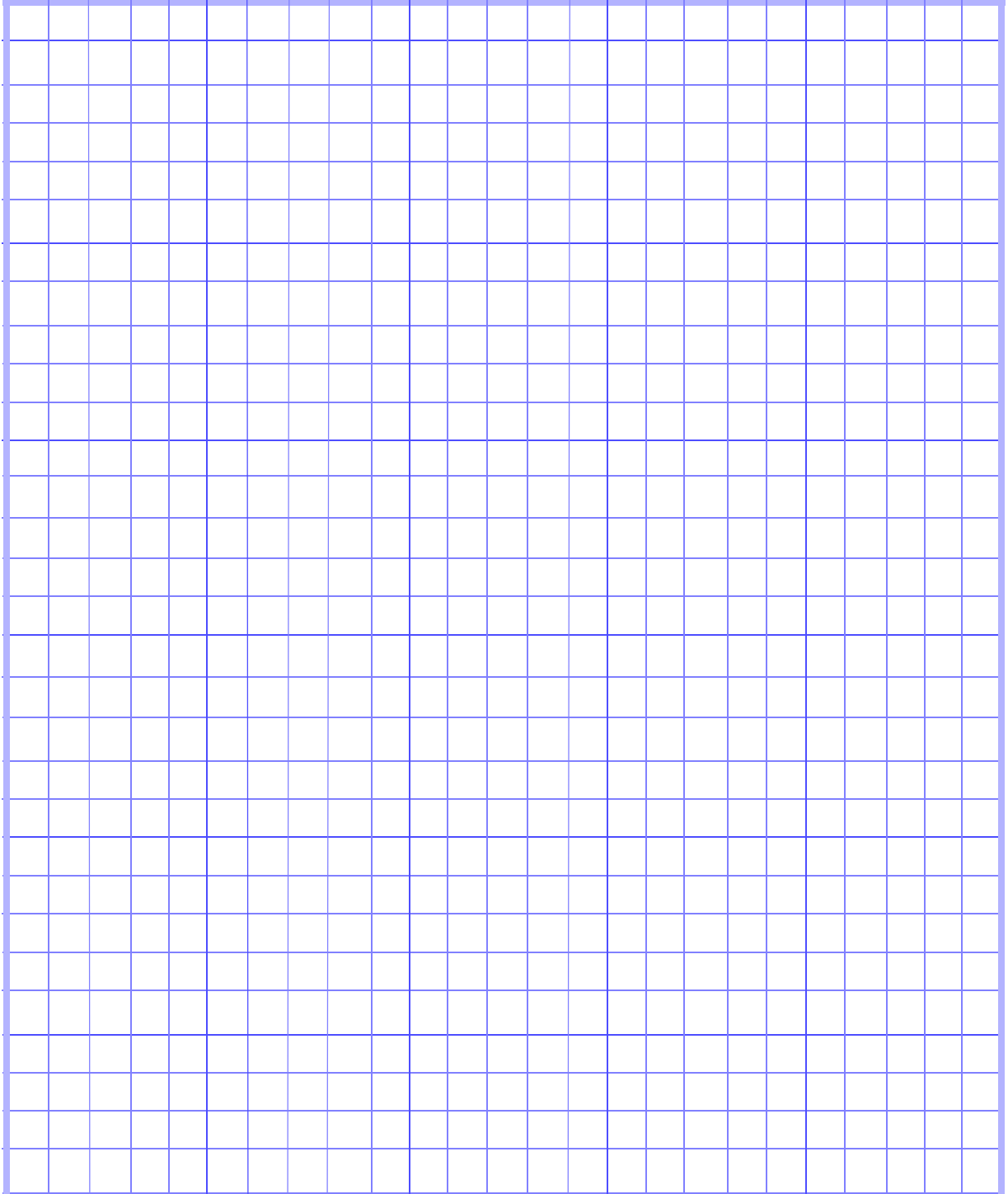
Prior to Operation

Denester Operations and Parts Manual

Equipment Layout Insert

*Where available, a system layout drawing insert will be included at this location.
If not available here, please refer to system documentation or the bakeries engineering group for signed layout copies provided prior to delivery of the equipment.*

NOTES

A large grid of 20 columns and 30 rows, intended for taking notes. The grid is composed of light blue lines on a white background.

Denester Operations and Parts Manual

Operation

This chapter covers basic operation information for the equipment. Minimal operator involvement is required. Take time to familiarize yourself with all the control information provided. To achieve the best operational results, read the entire chapter prior to operating this equipment.

Scope

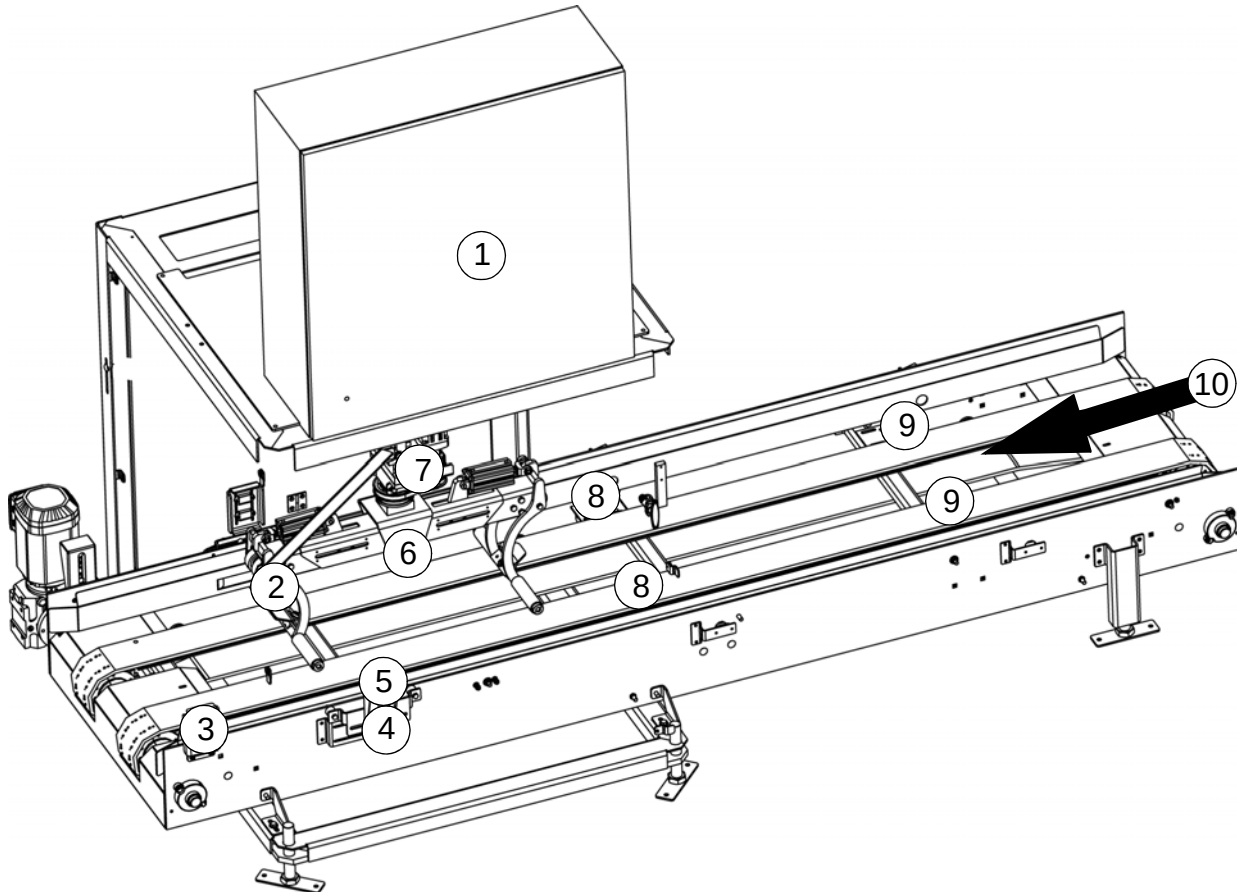
Electrical interlocks, guards and other safety devices have been incorporated into the design of the machine. The interlocks shut down machine operation when certain guards and doors are opened while the machine is running. Do not remove, modify, or tamper with these interlocks at any time! Inoperable interlocks could cause accidents that may result in death, personal injury, or damage to the machine.

Note: This information may not pertain to all equipment lines.

Denester Operations and Parts Manual

Denester Layout

Denester Component Area Identification



- | | |
|-------------------------------------|--------------------------------|
| 1. Operator Control Panel/Interface | 2. Basket at Lift |
| 3. Double Basket at End of Conveyor | 4. Top Basket at Lift |
| 5. High Basket Detect | 6. End Effector/Basket Gripper |
| 7. Basket Lift Up | 8. Standby Basket Stops |
| 9. Basket Stops | 10. Basket Travel Direction |

Note: Please note that all listed specifications are subject to change and are intended for general reference only.

Note: The customers application determines the specific Denester design. Design variations will occur.

The AMF Denester is an automated, basket recycling system that prepares baskets for re-use.

How the Equipment Works

An in-feed conveyor supplies the Denester with a flow of cross-nested baskets (stacked at 90 degrees to each other).

Baskets are then conveyed to the denester infeed basket stops. When the Denester is empty, the infeed stops retract down to allow the cross nested pair into the Denester. The photoeye sees the baskets and The head starts in the down position, when the basket is sensed, the clamps extend out, grabbing the basket. It is then raised up and rotated.

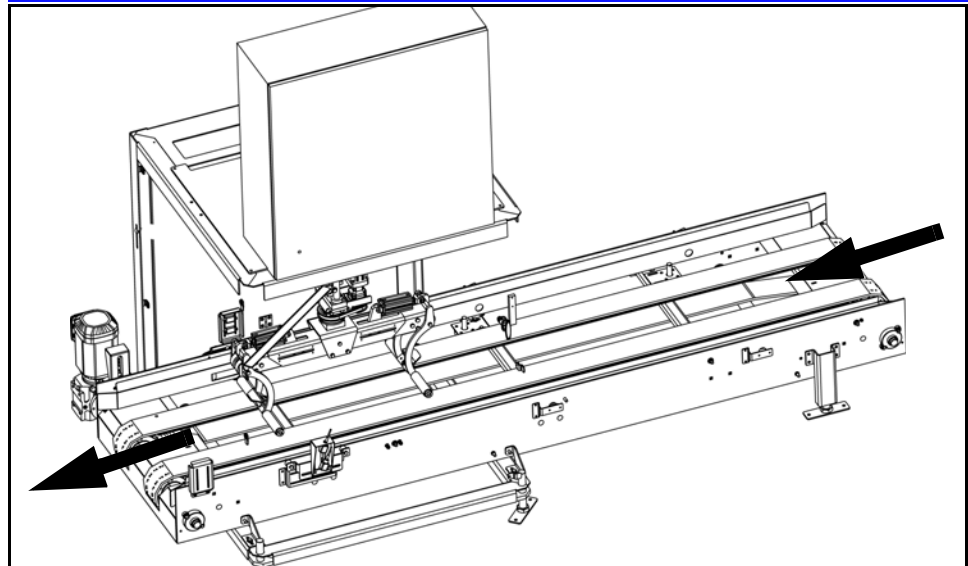
The basket clamp cylinders retract to grab the top basket. The lift cylinder moves up, lifting the top basket. When the lift cylinder is up and the clamps are holding a basket, the servo rotates the basket 90 degrees. The bottom basket moves out of the machine on the conveyor.

When the bottom basket is out and clears the photoeyes, the lift cylinder moves down and the clamps open to release the second (top) basket. The second basket exits the machine. This cycle then repeats.

Denester Operations and Parts Manual

How the Equipment Works

Sequence of Operation



Note: The customers application determines the specific Denester design. Design variations will occur. Some assemblies have been deleted from this illustration.

1. Cross-nested baskets are conveyed into the Denester to the Denester In-feed basket stops.
2. When the Denester is empty, the In-feed stops retract down to allow the cross-nested pair of baskets into the Denester. The side indexing clamp extends when the stops drop, holding back any accumulation, creating a gap if baskets are backed up.
3. The top eye in the pick area sees the top basket and tells the machine it needs to pick.
4. The lower eye sees the bottom basket and starts the timer on when to pick.
5. The basket clamp cylinders retract and grab the top basket as the pair is moving on the conveyor.
6. The lift cylinder retracts and raises the cross-nested basket off of the lower basket, which continues out of the machine.
7. When the lift cylinder is up and the clamps are extended on a basket, the servo rotates the basket 90 degrees.

8. When the bottom basket is out, and clears the photo-eyes, the lift cylinder moves down and the clamps retract to release the second (top) basket.
9. The second basket exits the machine as the head returns to its home state.
10. When the second basket clears the pick zone photoeyes, the cycle repeats.

Denester Operations and Parts Manual

Typical Daily Operation

General Daily Operation Steps

Follow these procedures for daily operation:

- ▼ Check for foreign objects, such as wrenches or other similar items that may have been left in the equipment.

Note: Prior to operation, make sure that the main panel switch is on.

- ▼ Prepare the line for production.
- ▼ Select the desired product or recipe number from the operator interface. (You may want to check the setting values that are saved for this product with the recorded values in the operation data sheet.)

Note: If you have not yet determined the initial dough settings, record settings to your Operations Data Sheet after recipe settings have proved operational.

- ▼ Verify that all personnel are clear of the machine and know that it is going to be started.
- ▼ Monitor the operation of the machine from the operator interface and the pressure gauges located on the side of the machine.
- ▼ Adjustments may be made to the machine settings as required.
- ▼ To stop the Equipment press the “Stop” button once to let the system complete its cycle.

Note: Where programmed, pressing the “Stop” button twice will stop both the Equipment and the integrated system.

Notice: The normal method of stopping the Equipment is to press the “Stop” button not the “Emergency Stop” button. The Equipment has a series of steps it performs during shut down. Pressing the “Emergency Stop” button bypasses these shut down steps and if used as the normal method of shut down may cause the machine to require increased maintenance. The “Emergency Stop” is to be used for emergencies only.

Restarting After an E-stop is Pushed

- ▲ Pull the E-stop button out.
- ▲ Follow the “Restart Procedure”.
- ▲ Press the MCR button on the operator panel.
- ▲ Press the Start button on the operator panel.
- ▲ Proceed with the normal start-up procedures.

Shutdown Procedure



Note: There are several ways to shut the system off. When safety devices are used to stop the machine, we call it 'Halt' and when button is used to stop the machine, we call it 'Controlled Stop'. It is usually recommended and is generally a preferred method to use the Stop button for normal stopping procedure. Using other device methods, such as a guard door or pressing a emergency stop may cause undesirable results or additional steps to restart the equipment. The emergency stop or opening a guard door should be only used in emergency situations only.

1. **Pressing the "Stop" button** - The machine will stop when a given cycle is completed. For example, when the "Stop" button is pressed and the Robot is moving towards the drive, it will finish its movement until it returns to the pallet load station
2. **Opening the guard door** - This halts the machine instantly. All motion on system will halt.
3. **Pressing the "Emergency Stop" Button** - This halts the machine instantly. All motion on system will halt.
4. **Push the system panel's "Disconnect Switch" to off** - The Conveyor loses power and the robot will perform a cycle stop if not already in the 'wait' position. Not recommended unless there is a personal injury or immediate drastic need to stop the machine.

Note: Disconnecting power to the system panel does NOT turn off power to the robot. The robot is powered by its own power supply in its own cabinet. The disconnect for the robot controller must be in the off position to halt power to the robot.

Operator Control Panel

The Operator Control Panel is the primary point on the machine to access status information, start and stop functions, program alteration and machine operation. These functions are made by either momentary push button, rotating selector or, like the Emergency Stop, maintained switches, or the Operator Interface Control Terminal. The function keys are used in conjunction with requirements from the display. Refer to the Electrical chapter section of this manual or OEM documentation sent for additional information regarding these individual components and usage. Refer also to the Appendix for customer-specific information for equipment features that are not standard or included in standard option packages.

Standard Operator Interface Control Panel

Allen Bradley Panel View Operator Interface Control (OIC)

The Operator Interface Control terminal is the component that allows the operator to control the various functions and features incorporated in the equipment. Typically, AMF will use Allen Bradley control. However, customer-specific alternatives are possible. Within the operator interface, the program settings are altered, saved and installed from input keys. This replaces the familiar push buttons, digital readouts, message displays and other traditional hardware devices. The programs are saved in memory and generally have battery backup, which can store the information for up to forty years without external power. This operator interface generally has four basic areas within which the operator must become familiar. The four areas are the Display Screen, 10-Digit Keypad, Function Keys, and Arrow Keys. Throughout the manual and training, these keys may also be referred to as “buttons.” You will notice that keys are very touch-sensitive.

Note: Avoid applying undue pressure on these keys or buttons, as they are sensitive to pressure. Their integrity will degrade from constant over-pressure.

The display screen will be either color or mono-chrome format. The screen, if so equipped with the order, can have touch screen control features in which the screen has buttons imbedded on the display. Touching these buttons controls motors or other features on the equipment.

Denester Operations and Parts Manual

Allen Bradley Panel View Navigation

There are several screens or pages that can be accessed within the controller. Like pages in a book, you can open areas directly from others and move back and forth.

There are areas on the page that contain shortcuts or jumps with the use of function key, also known as F-keys, or buttons, as previously described. Typically, information on page access is noted at the bottom of every screen or page. Depending on the information within a given page, you may be able to directly access another screen without moving back through several screens or pages.

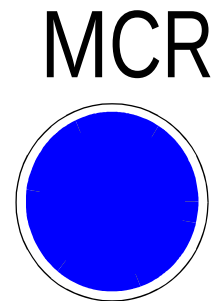
Some screens or pages are password-protected. Other areas can be directly accessed by anyone. These screens are generally described on another page within the Electrical chapter or System Electrical Control section when the unit is integrated into a system package.

Note: Due to variations in orders and updates, the Operator Interface control and operator displays, as depicted, may vary. Some features or items described may be altered or not present in your operator control.

MCR Button

Figure HS-1 . MCR Button

The Master Control Reset, more commonly known as the MCR, is used to clear fault conditions displayed from the Operator Control Interface Display and reset an internal “Master Control” relay. This allows continued motion within the equipment. Once correction to the fault is made, to resume operation, first press the MCR button. This clears the fault. Then press the Start buttons. Examples of safety-oriented conditions would be a guard door being open or an emergency stop button depressed. This situation forces the operator to recognize that a fault of this type has occurred and that the equipment must be restarted using the Start buttons, using “Safe Start” routine. Using this redundant method helps safe guard against accidental equipment start-ups.



Note: It is always good suggested practice when working on the equipment to use good judgment and be familiar with the proper use of Lockout/Tagout procedures outlined in this manual. Please also comply with any company safety policies and procedures incorporated within your facility.

It is not necessary to use the MCR button to clear a warning or fault that is not deemed safety oriented, such as a “Warning Film is Low”. During these events, depending on the advisement or fault message, it may be possible to correct the situation without stopping the machine. Once corrections have been made, the error or fault advisement message will cease to display. In some circumstances, however, to correct a non-safety oriented fault, it may be necessary to open a guard door. In such cases, it will be necessary to resume operation utilizing the MCR button.

Emergency Stop Button

Figure HS-2 . Emergency Stop Button

The Emergency Stop Button is recognizable by its color (red) and its mushroom shape (large and circular). This is a maintained contact, meaning once moved in or out it will stay in position until it is physically moved again. To stop the equipment, push the button in. To reset and resume equipment operation, simply turn the button clockwise and allow it to move back to its outer position. Some buttons may require the operator to pull them back to the outer position. This button is used when immediate halting of movement is required, due to possible injury or damage to the equipment. It is not good practice to use this button as a normal method of stopping the equipment. Under normal situations after the Stop button is used, it is also good practice to use the Emergency Stop Button prior to working in or around the equipment as an extra measure of safety!



Note: In non-emergency situations, it is advisable to use the Stop button rather than the Emergency Stop to avoid possible uncharacteristic situations. Such situations may result in unpredictable faults due to mechanical or program stopping location. Emergency situations constitute risk of bodily danger or injury to personnel in the vicinity of the equipment or risk of damage to the equipment if an immediate action to halt or stop the equipment isn't taken. It is always good practice when working on the equipment to use good judgment and be familiar with the proper use of Lockout/Tagout procedures outlined in this manual. Please also comply with any company safety policies and procedures incorporated within your facility.

Denester Operations and Parts Manual

Other Miscellaneous Operator Devices and Features

Following are some features that may be included with your particular operator control console. These features may or may not be available, while others may be substituted.

Visual Alarms

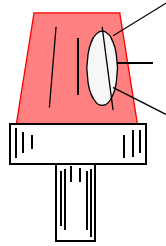


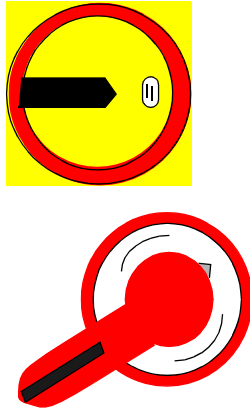
Figure HS-3 . Visual Alarm Indication

The visual Alarm indicators shown for reference, depicts the standard red Rotary Style Beacon. This will activate when either a Start, Fault or Cleaning condition event is in occurrence.

Depending on order specifications, some machines may be equipped with a similar unit that has only a single light, typically yellow, with an audible alarm mounted at the top. When this system is used, a flashing or pulsating light will indicate a fault presence or start-up initiation and the audible alarm will sound. During normal operation, the light will remain on or off, depending on system configuration.

Electrical Disconnects

Figure HS-4 . Electrical Disconnects



Two common styles of electrical panel disconnects are employed, as depicted. The purpose of these devices is to electrically isolate or disconnect voltage to an area of the machine or in its entirety. Special caution is advised prior to turning these switches. It is recommended that, prior to operating these switches, you contact the Facility Maintenance department.

Electrical Interlock Devices

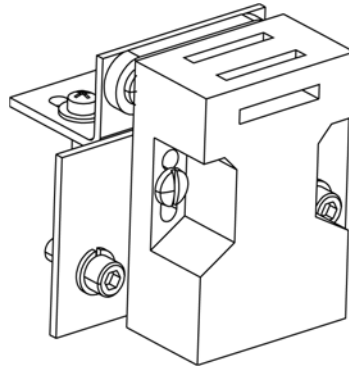


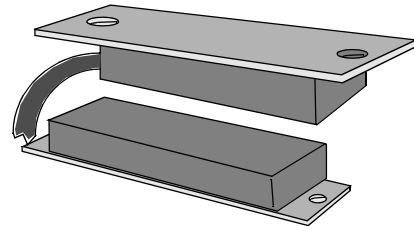
Figure HS-5 . Interlock Safety Switch

The electrical interlocks, shown in Fig. 4-14, are located throughout the equipment on guard doors. The primary purpose for these devices is to disconnect a circuit that is maintaining the Master Control Relay (MCR). This will then drop control power to the equipment, thus inhibiting any movement while the interlock is disconnected. Refer to the “MCR Button” for additional information. Interlock switches

function similarly to the Emergency Stop Button, where once the interlock becomes disconnected from its mating component the machine will stop immediately. Refer also to “Emergency Stop Button” section of the chapter. It is good practice not to use this as a common procedure for stopping.

Figure HS-6 . Magnetic Interlock

Depicted in this figure is a magnetic style interlock that may be used. This type of switch is maintained in the state position by means of a magnetic field. Once the element with the magnet has been moved away from the proximity of the mating switch, the switch changes state.

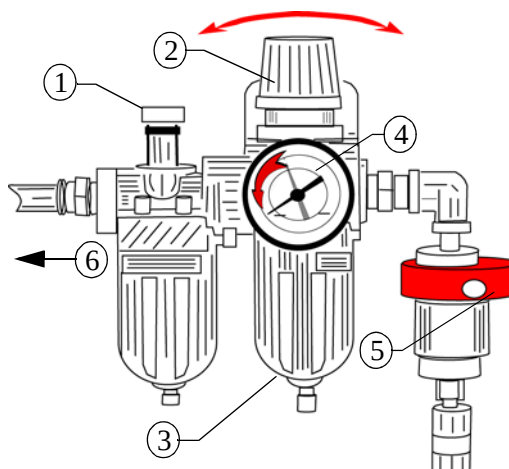


Note: In non-emergency situations it is advisable to use the Stop button rather than the Interlock safety switch, to avoid possible uncharacteristic situations. Such situations may result in unpredictable faults due to mechanical or program stopping location. Emergency situations constitute risk of bodily danger or injury to personnel in the vicinity of the equipment or risk of damage to the equipment if an immediate action to halt or stop the equipment isn't taken. It is always good suggested practice when working on the equipment to use good judgment and be familiar with the proper use of Lockout/Tagout procedures outlined in this manual. Please also comply with any company safety policies and procedures incorporated within your facility.

Pneumatic Filter, Regulator, and Lubricator Assemblies

Figure 2-7 . FRL with Lock-Out Assembly

1. Lubricator assembly,
2. Regulator
3. Filter
4. Regulator Gauge
5. Pneumatic Lock-Out, Air Dump and Air Disconnect
6. Air Flow Direction



Where a FRL, (Filter, Regulator, Lubricator), has been incorporated it is typically because of the type of pneumatic components that have been incorporated into the equipment require a specific amount of oil for trouble free operation. Generally a setting of 1 drop every 30 seconds to 1 minute is adequate, however, it is recommended that the OEM, (Originating Equipment Manufacture), of the pneumatic devices documentation be reviewed for recommendations prior to adjusting.



Note: It is extremely important to maintain the air in a dry state when using a in-line pneumatic oiler or contamination to the pneumatic devices will occur. Inspect the air filter on a daily bases for water accumulation and drain as required. Always wear appropriate safety articles, such as safety goggles, when draining the air filter bowl.

Note: Not all pneumatic devises require external oilers as shown. The addition of a oiler to a pneumatic devise not requiring one may deteriorate its longevity and cause additional maintenance to be required to the pneumatic system.

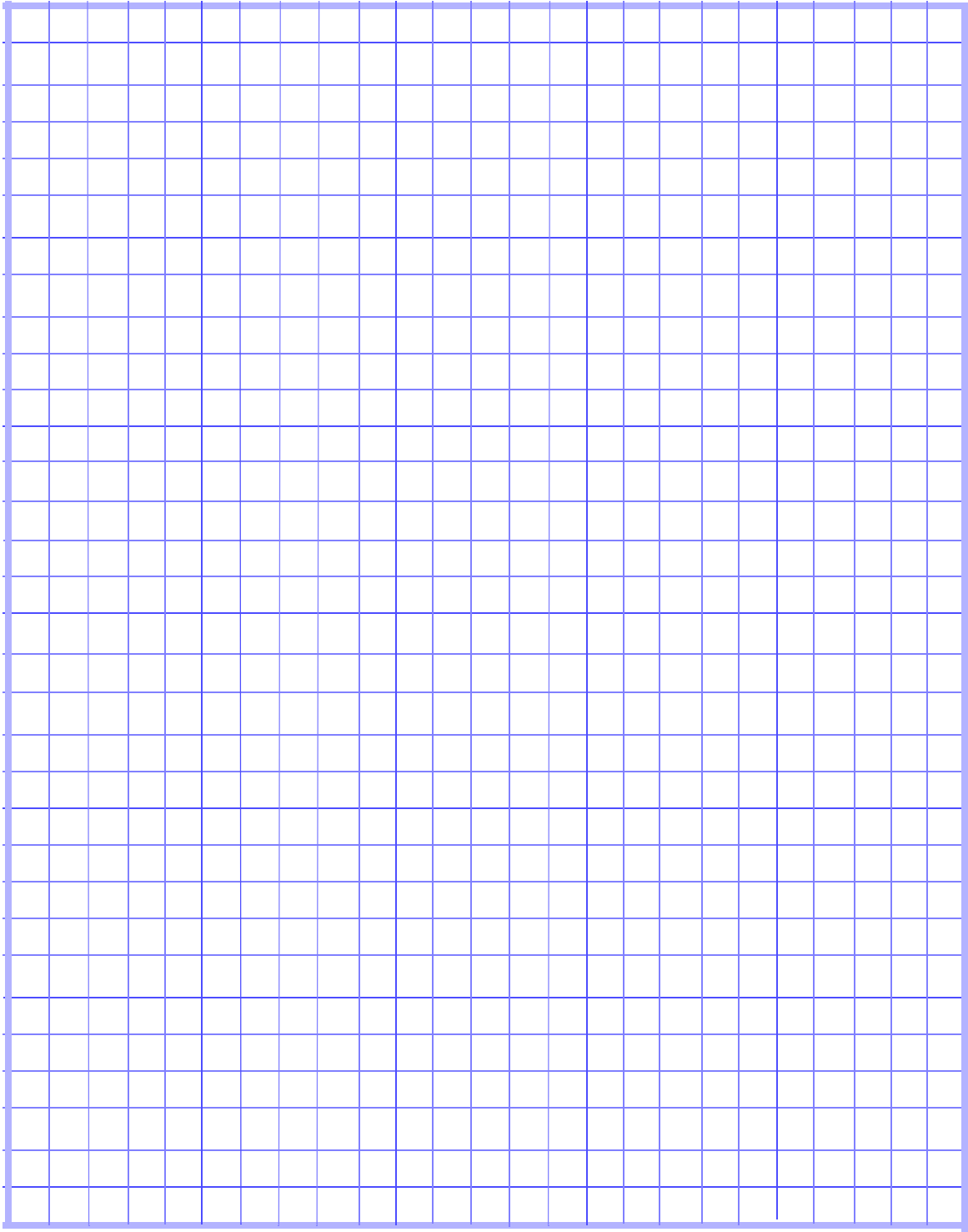
The lock-out disconnect devise works as a air dump in the down position which can be locked in place. A air dump is a devise which quickly bleeds or drains the air lines of pressure so additional movement of pneumatic devises will not occur. The actual air dump may be manual as depicted or electrical, where it is controlled by the system. With the electronically controlled type generally if a guard, door or emergency stop has been activated, the air dump will be activated allowing all pneumatic devices associated with that section of the equipment to de-pressurize.



Note: It is still recommended to manually lock-out the electronically controlled air dump devices) when working in and around the equipment to assure all stored energy remains released.

Denester Operations and Parts Manual

NOTES



Sanitation

This section describes general daily, weekly, and down day sanitation procedures on the equipment. Due to variation in industry standards and locations, the end user is responsible for development of their own specific sanitation guidelines which can be unique between installation sites. Make sure that anyone performing sanitation on the machine receives thorough training. In addition to cleaning the machine, sanitation personnel should be able to identify obvious machine problems. These problems should be reported to the maintenance department.

Scope

Notice: Do not use sodium hypochlorite (bleach) compounds or ammonia to sanitize the machine. Sodium hypochlorite and ammonia detergents damage seals and metal components and will void all warranties provided by AMF. Unless otherwise specified, do not expose this equipment to a pressure wash or other washdown environment.

Note: For additional information regarding lubrication procedures also refer to the Maintenance section of this manual.

Washdown Environment Ratings

NEMA Enclosure Rating Reference

Various enclosure ratings exist for indicating environment conditions to which the equipment is designed to be safely exposed. These ratings are often referred to as NEMA ratings.

NEMA is a acronym that stands for National Electrical Manufacturers Association. NEMA, created in the fall of 1926 by the merger of the Electric Power Club and the Associated Manufacturers of Electrical Supplies, provides a forum for the standardization of electrical equipment, enabling consumers to select from a range of safe, effective, and compatible electrical products.

Note: The following general list of NEMA enclosure definitions is intended only as a general brief fundamental guide and not guaranteed for exact definition accuracy. For a complete report with detailed explanation for all exact NEMA definitions, contact the National Electrical Manufacturers Association and request a formal report.

▼ Type 1

- ▲ Intended for indoor use primarily to provide a degree of protection against (hand) contact with enclosed equipment. Usually, a low-cost enclosure, but suitable for clean and dry environments.

▼ Type 2

- ▲ Intended for indoor use primarily to provide a degree of protection against limited amounts of falling dirt and water.

▼ Type 3

- ▲ Intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; undamaged by ice that forms on the enclosure.

▼ Type 3R

- ▲ Intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by ice that forms on the enclosure.

▼ Type 4

- ▲ Intended for indoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water; undamaged by ice that forms on the enclosure.

▼ Type 4X

- ▲ Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water; undamaged by ice that forms on the enclosure.

▼ Type 6

- ▲ Intended for indoor or outdoors that occasional temporary submersion is encountered.

▼ Type 6P

- ▲ Intended for indoor or outdoors that occasional prolonged submersion is encountered. Corrosion protection.

▼ Type 12

- ▲ Intended for indoor use to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids.

▼ Type 13

- ▲ Intended for indoor use primarily to provide a degree of protection dust, spraying of water, oil, and noncorrosive coolant.

Denester Operations and Parts Manual

NEMA 4X Washdown

Where applicable, per specifications at point of order, the equipment may be optionally designed for NEMA 4X washdown environment. Where the equipment is designed for this environment, the equipment will withstand direct washdown conditions as follows.

Washdown conditions for a NEMA 4X environment typically constitute direct contact of water with a 1" diameter hose at 65 gallons per minute for a 5-minute period at 42 pounds per square inch. The components also should have corrosion resistant properties.



Note: Various washdown ratings exist for equipment. Prior to performing a washdown procedure on any equipment, first verify that the equipment is appropriately rated for a washdown environment that matches your procedure. Potential damage and dangerous conditions can result, should equipment, not properly rated for washdown surroundings, be exposed to this potentially extreme sanitation environment.

NEMA 12

Some AMF equipment comes standard with NEMA 12 rated components. As previously stated, a NEMA 12 rating is intended for indoor use to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids. This rating will provide an adequate degree of protection and is suitable for most environments requiring general wipedown procedure.



Note: Equipment with an NEMA 12 rating is not suited for a washdown environment and, therefore, should not be subjected to that degree of sanitation.

Sanitation Setup

Daily Sanitation



Note: Lock Out / Tag Out all power at the main power panel when directly contacting the divider especially moving parts and during dis-assembly procedures.



Note: Never work in or around equipment with power applied to the machinery as injury and / or damage to the equipment may occur. Always perform Lockout and Tagout procedure prior to working in around equipment.

▼ Daily Sanitation.

- ▲ Remove all trash and debris from machine.
- ▲ Clean photo-eyes and reflectors.
- ▲ Clean under all conveyors.

Denester Operations and Parts Manual

Weekly Sanitation

It is recommended on a weekly sanitation to remove and sanitize the pumps impellers. For weekly sanitation:

▼ **Weekly Sanitation**

- ▲ Wipe down or blow down (air) the machine.
- ▲ Clean all debris collection catch pans as applicable.

NOTES

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light blue lines. The paper is otherwise white and contains no other markings or text.

Denester Operations and Parts Manual

Maintenance

Scope

This chapter offers recommended preventative maintenance schedules for maintaining your AMF equipment. For best results, incorporate the outlined recommended schedules into your preventative maintenance program. Review all OEM information included. Train all operation, sanitation, and maintenance personnel in appropriate departmental maintenance and lubrication schedules.

This equipment is designed for long life and heavy use. With implementation of a proper and regular maintenance schedule, this equipment will provide many years of service. Additional information regarding component replacement procedures can be found in the Sanitation or Operation chapters.



Note: Before performing maintenance, lock out and tag out power to the machinery at the main power panel. Never allow anyone access to the interior of the main power panel unless that person is a trained licensed, qualified electrician.

Denester Operations and Parts Manual

General Maintenance and Lubrication Tips

Lubrication

The following tables provide quick reference lubrication and maintenance tips for typical items associated with routine maintenance cycles. These tables are intended for general reference and should be referenced as applicable to your system's requirements. Additional lubrication information may be located in the OEM manuals. Refer to both the Sanitation and the Maintenance chapters of the primary manual.

Note: These are typical daily maintenance items to be performed on a routine basis. Your specific equipment may not be applicable to all items listed in the following general charts.

Table 1: General Maintenance and Lubrication

Section	Maintenance or Lubrication Required	Daily	Weekly	Monthly	Semi-Annual
Pneumatic Components	Inspect and add lubrication to pneumatic lubricator where applicable. <i>Note: As applicable, where dry, non-lube, air devices are incorporated, this should be disregarded.</i>		✓		
	Check incoming air filter/regulator for contamination build-up, as pneumatic devices require clean and dry air.	✓			
	Inspect air cylinders seals for leakage. Repair or replace as required. <i>Note: Refer to appropriate OEM information before attempting to rebuild defective air components.</i>		✓		
	Check air lines and fittings for leaks.	✓			

Maintenance

Section	Maintenance or Lubrication Required	Daily	Weekly	Monthly	Semi-Annual
Equipment Overall	Verify all guards and safety switches are in proper position and proper operating condition	✓			
	Inspect bearings and bushing components for wear. Grease as applicable, using FDA-approved food-grade grease. ^a (Refer to the <i>General Maintenance For Bearings</i> of this document.)			✓	✓
	Inspect Gear Box lubrication level. (Refer to OEM recommendation and the <i>General Maintenance for Gear Boxes</i> section of this document.)				✓
	Inspect chain drives, sprockets and general drive components for wear and proper alignment. Replace and/or repair as required. (Refer also to the <i>General Maintenance for Chain Drives</i> section in this document.)		✓		
	Inspect fasteners, hinge and hinge pins for fatigue and repair or replace as required and as applicable to the equipment.		✓	✓	
	Inspect for broken or cracked drive and guide belts as relevant and replace as required.		✓	✓	

a. Lubriplate (Food Grade Machinery Lubricant) - LO145-098 or equivalent typical. Refer also to applicable OEM information that pertains to your equipment components.

Denester Operations and Parts Manual

General Component Maintenance Tips

General Maintenance Guide for Chain Drives *(As Applicable)*

Type of Maintenance	When To Do	What To Do
Setscrew and Bushing Capscrew check.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check setscrews or capscrews for looseness. Retighten to manufacturer's recommended torque's where necessary.
Chain Sag	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter. New chain will elongate considerably at first.	Typically, adjust chain sag on slack side until it is equivalent to approximately 2% of center distance.
Chain Elongation	Chains should generally be replaced after stretching in excess of 2.5%. Check overall length after first 100 hours of operation and periodically thereafter.	Remove chain and measure. If actual length is 2.5% longer than calculated length it should be replaced.
Check for sprocket wear	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	If sprocket teeth have a hooked appearance, replace with new sprocket.

Type of Maintenance	When To Do	What To Do
Check for alignment	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	If wear is apparent on either side of sprocket there is misalignment. Align Sprockets to correct. If over worn replace sprocket.

Denester Operations and Parts Manual

General Maintenance Guide for Couplings (As Applicable)

Type of Maintenance	When To Do	What To Do
Setscrew and bushing capcrew check.	Initial inspection - 100 hours and once a year thereafter.	Check setscrews or cap-screws for looseness. Retighten to manufacturer's recommended torque's where necessary.
Lubrication	Initial inspection - 100 hours and once a year thereafter.	Check for leakage initially and lubricate once a year thereafter.
Alignment	Initial inspection - 100 hours and once a year thereafter.	Disassemble and check for uneven wear patterns. Realign shafts as required. Replace defective coupling components

General Maintenance Guide for Gear Drives (As Applicable)

Type of Maintenance	When To Do	What To Do
Setscrew and bushing capcrew check.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check setscrews or cap-screws for looseness. Retighten to manufacturer's recommended torques where necessary.
Lubrication	Initial inspection - 80 - 100 hours after initial operation and once a year thereafter.	Gear lubrication as recommended by OEM.

Type of Maintenance	When To Do	What To Do
Alignment	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Disassemble and check for uneven wear patterns. Realign as required. Replace defective components

General Maintenance Guide for Belt Drives (As Applicable)

Type of Maintenance	When To Do	What To Do
Setscrew and bushing capscrew check.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check setscrews or capscrews for looseness. Retighten to manufacturer's recommended torques where necessary.
Check Pulley Alignment	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	If there is evidence of severe wear on pulley flanges and / or belt edges, the drive is misaligned. Correct alignment to prevent premature failure.
Check Belt Tension	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Adjust belt centers and / or tensioners, to take up accumulated slack. When the drive is operational, the belt typically should track in a straight line between pulleys. <i>Note- Over-tension can cause damage to belt and drive components.</i>

Denester Operations and Parts Manual

General Maintenance Guide for Gear Boxes (As Applicable)

Type of Maintenance	When To Do	What To Do
Lubrication	Typically, initial change after first 100 hours. Change after 2500 hours or 6 months thereafter.	Drain used oil from box. Flush box if oil has become contaminated. Refill with new lubricant to proper levels as prescribed by OEM.
Lubrication level inspection	Initial inspection - 24 hours. Second inspection - 80 - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check oil level and add as necessary as prescribed by OEM. Inspect for leakage if additional oil is required.
Check Mounting Bolts	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check mounting bolts for tightness, verify alignment and retighten as necessary.

General Maintenance Guide for Bearings (As Applicable)

Type of Maintenance	When To Do	What To Do
Setscrew and bushing capcrew check.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check setscrews or cap-screws for looseness. Retighten to manufacturer's recommended torques where necessary.

Type of Maintenance	When To Do	What To Do
Locking Collars	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check eccentric collar tightness on shaft. If loose, turn in the direction of shaft rotation until hand tight, then tighten collar setscrew to recommended torque value.
Lubrication	Initial inspection - 100 hours and once every 4 months to a year thereafter, pending environment. <i>Note: Should environment be of more extreme conditions regarding operation speed, temperature, and general cleanliness, it may be necessary to increase the frequency.</i>	Add grease slowly with drive in operation. When lubricant begins to bead and come out of seals, the bearing will contain the correct amount of grease. <i>Note: Verify with OEM information as some bearings seal damage is possible if over greased.</i>
Check Mounting Bolts	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check mounting bolts for tightness, verify alignment and retighten as necessary.
Inspect bearing alignment	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check bearing alignment should bearing shifted since installation.
Check for damaged seals.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Inspect seals to verify that they are not punctured or damaged by foreign objects.

Denester Operations and Parts Manual

Type of Maintenance	When To Do	What To Do
Check bearing temperature.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check normal operating temperature range and log these readings for future comparison. <i>Note: Typical bearing temperatures should not exceed 200° F unless special bearing and lubrication has been used.</i>
Check for bearing noise.	Initial inspection - 24 hours. Second inspection - 100 hours. Third Inspection - 500 hours and periodically thereafter.	Check bearing to have a soft smooth purring sound. If noisy, may indicate foreign matter in bearing or bearing degradation. Verify lubrication level to be correct.

General Maintenance Guide for Electric Motors--AC, DC and Servo (As

Type of Maintenance	When To Do	What To Do
Lubrication <i>See also gear box maintenance guide</i>	Initial inspection - 100 hours and once a year thereafter as required.	Check for leakage initially and lubricate once a year thereafter or per OEM recommendation.
Clean, (Not required for Servo)	Every 6 months or as required by environment.	Using moderate air pressure (25 - 30 PSI), blow out dirt from winding and wipe commutator and brushes or slip rings.

Type of Maintenance	When To Do	What To Do
Check Brushes and Commutator (DC)	Every 6 months or as required by environment.	Inspect brushes for wear, clean as necessary. Replace if more than half worn. Inspect and clean commutator. Clean with a lint-free cloth and carbon tetrachloride or as recommended by the OEM information.
Connector Inspection	Initial inspection - 100 hours and once a year thereafter.	Inspect and tighten all connections on motor and controller.
Current Check, (SCR and Inverter Drives)	Every 6 months	Check current draw and compare with normal. Record these in log for trends and future reference.
Check for vibration and mounting bolt tensioning.	Every 6 months	Retighten all mounting bolts as required. Run motor and verify it is running smoothly with little or no vibration.

Denester Operations and Parts Manual

Applicable)

General Maintenance Guide for SCR, Inverter Drives and Servo Amplifiers (As

Type of Maintenance	When To Do	What To Do
Keep Control Clean and Moisture Free	Every 6 months or as required by environment.	Keep cabinet free from dust, oil, grease and moisture. Wipe exterior of control clean with cloth. Blow interior of control clean with dry moderate air pressure (25-30 PSI), if necessary.
Connector Inspection	Initial inspection - 100 hours and once a year thereafter.	Inspect and tighten all connections on motor and controller.
Current Check, (SCR and Inverter Drives)	Every 6 months	Check line and armature current draw and compare with normal. Record these in log for trends and future reference.

Applicable)

Daily Lubrication (As Applicable)

- ▼ Typically, this is done during sanitation as outlined in the Sanitation chapter of the manual. It is important that these components be checked prior to any situations or conditions that require the equipment to be “dry” run.

Gearbox Oil Levels (As Applicable)

- ▼ Where applicable, inspect all gearboxes regularly for overheating conditions and lubrication levels. Some Gearboxes can be sealed and do not require additional lubrication through the life of the unit. Always refer to proper lubrication levels and types per recommendations set forth by the gearbox manufacturer.
- ▼ In general, do not overfill gearboxes as vent plug discharge, seal leakage and damage may occur.



Note: Refer to and follow manufacturer's recommendation of lubrication type and quantity to use. Note gear box orientation, as it can have direct impact on lubrication levels required for the gear box.

Sealed Bearings (As Applicable)

- ▼ Proper lubrication of sealed bearings vary greatly between manufacturers and application of the bearings. Always refer to the bearing manufactures recommendation of proper lubrication type, amount, and periods for the application. Variation in lubrication intervals will exist pending bearing manufacturer, bearing type, construction, RPM and other environmental issues concerning areas, such as, temperature, and general cleanliness conditions.
- ▼ Store grease in clean, dry areas protected from contamination.
- ▼ Wipe grease fittings and nozzle clean after use.
- ▼ Verify lubricant compatibility prior to usage.
- ▼ Do not over grease sealed bearings as this may cause damage to the seals due to over pressure. Add grease slowly and in controlled quantities as variation will exist pending bearing size. Generically, 1/2 to 1 pump of grease at fitting is all that is necessary for many applications, depending on gun and grease type.

Note: It is common that after lubrication, the operating temperature may increase until the bearing stabilizes and the lubricant is fully dispersed evenly throughout the bearing.

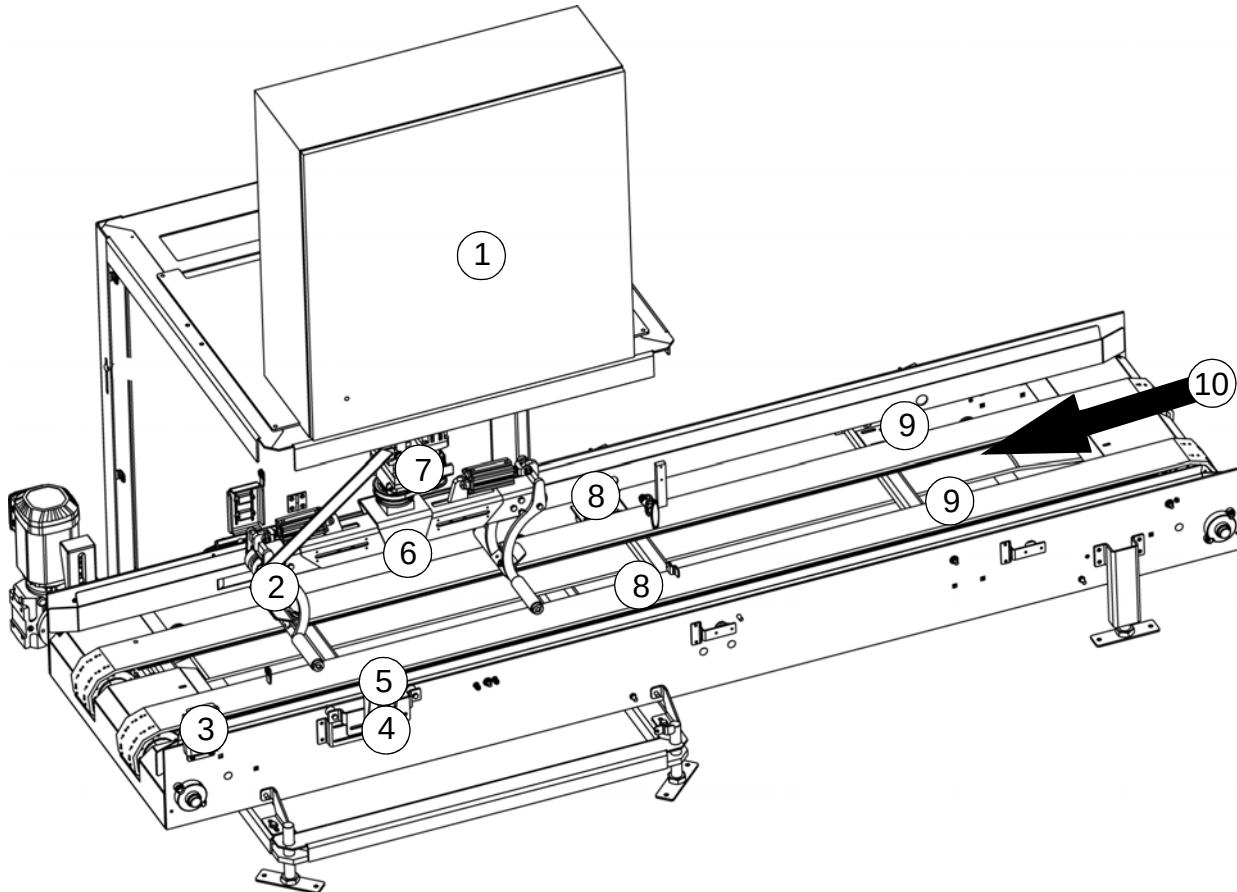


Note: Over lubrication can be detrimental to bearing life as can under lubrication. Always refer to specific OEM recommended bearing maintenance information.

Denester Operations and Parts Manual

Denester Layout

Denester Component Area Identification



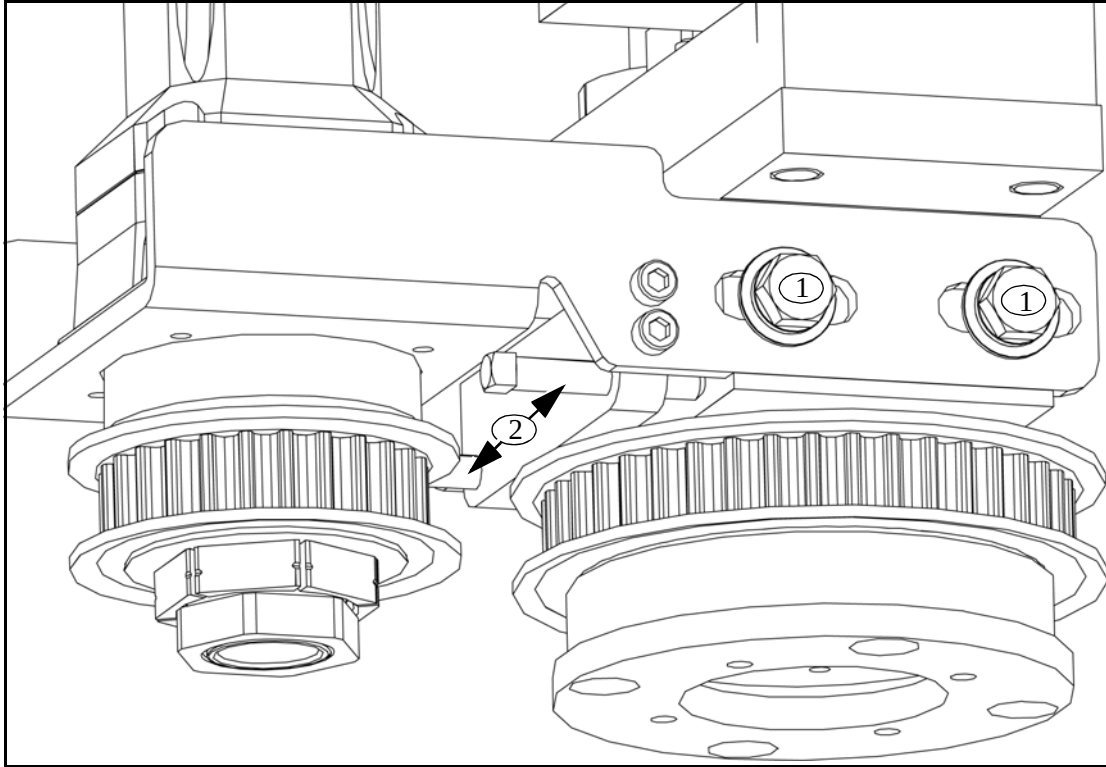
- | | |
|---|--------------------------------|
| 1. Operator Control Panel/Interface | 2. Basket at Lift |
| 3. Double Basket at End of Conveyor P.E.722 | 4. Top Basket at Lift |
| 5. High Basket Detect | 6. End Effector/Basket Gripper |
| 7. Basket Lift Up | 8. Standby Basket Stops |
| 9. Basket Stops | 10. Basket Travel Direction |

Note: Please note that all listed specifications are subject to change and are intended for general reference only.

Note: The customers application determines the specific Denester design. Design variations will occur.

Belt Tensioning

Belt Adjustment

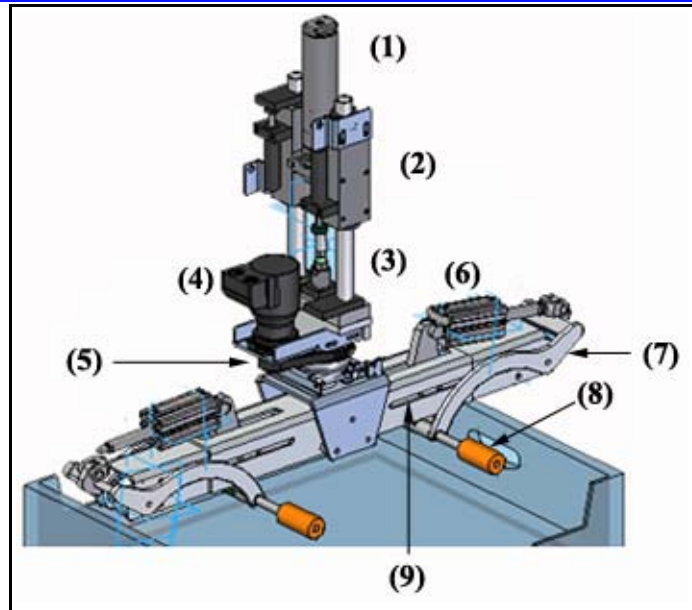


Note: The belt has been removed from the illustration for clarity purposes.

After the machine has been locked out, loosen all four gearbox mounting bolts, (1). Slowly and evenly turn each jack screw (2). When the belt is snug with 1/8" back and forth play, it has been properly tensioned. Tighten each of the four gearbox mounting bolts, (1).

End Effector Options

End Effector Assembly



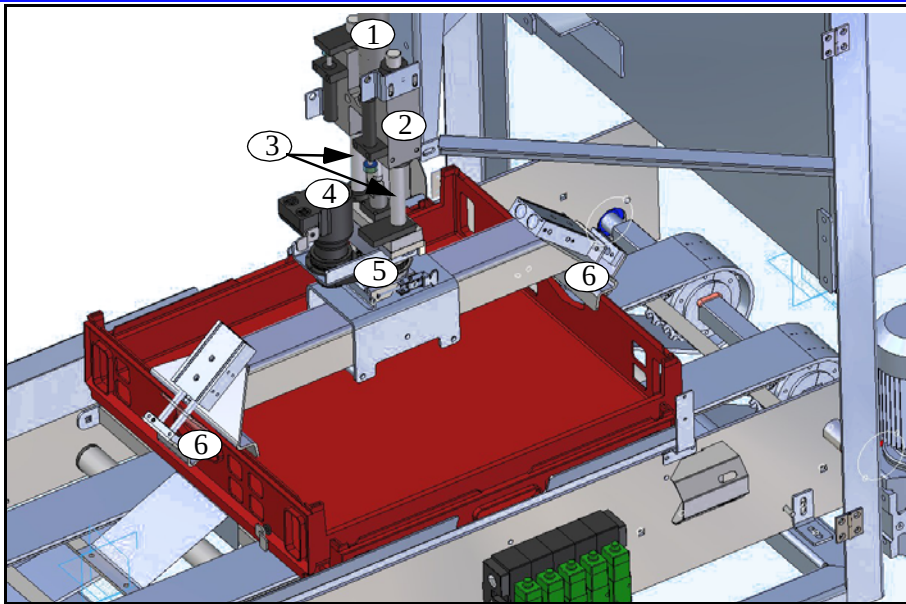
Note: The customers application determines the specific Denester design. Design variations will occur.

1. Air Cylinder, Z-Axis
2. Guide Pin Housing
3. Guide Pins
4. Servo Motor
5. Timing Belt
6. Air Cylinder, Pivot Arm, (2) places
7. Pivot Arm, (2) places
8. Basket Gripper, (2) places

Span Adjustment, Pivot Arms, (2) places

Note: The span (distance) between the left and right gripper (clamp) assemblies is determined by the width of the incoming baskets. This dimension is commonly set at the factory and rarely changed thereafter.

Alternate Effector Assembly 1

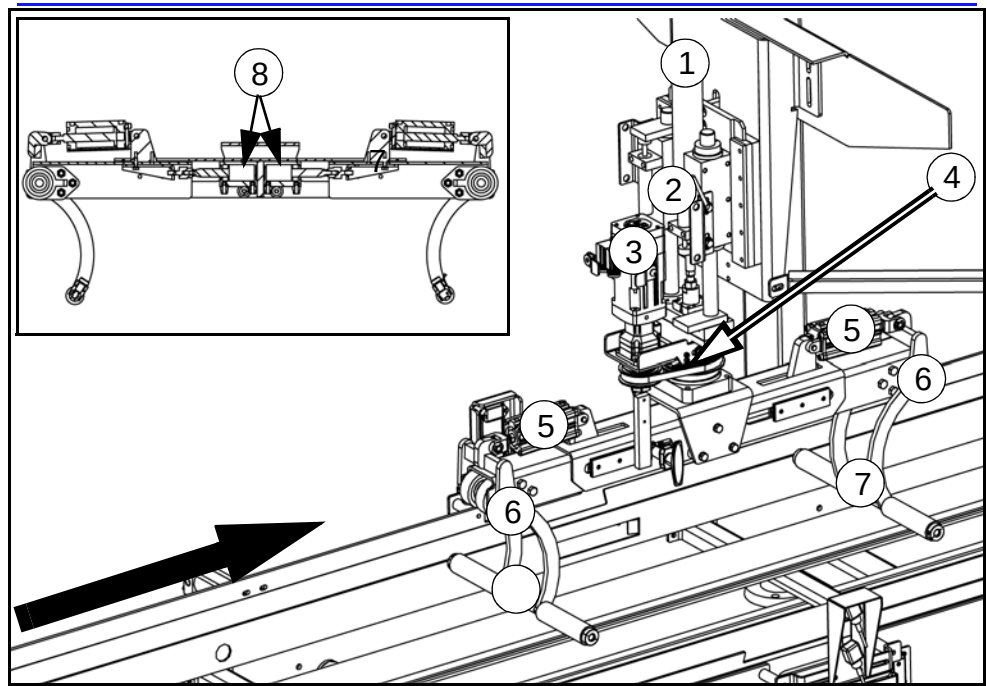


Note: The customer's application determines the specific Denester design. Design variations will occur.

1. Air Cylinder, Z-Axis
2. Guide Pin Housing
3. Guide Pins
4. Servo Motor
5. Timing Belt
6. Pneumatic Basket Gripper, (2) places

Denester Operations and Parts Manual

Alternate Effector Assembly 2



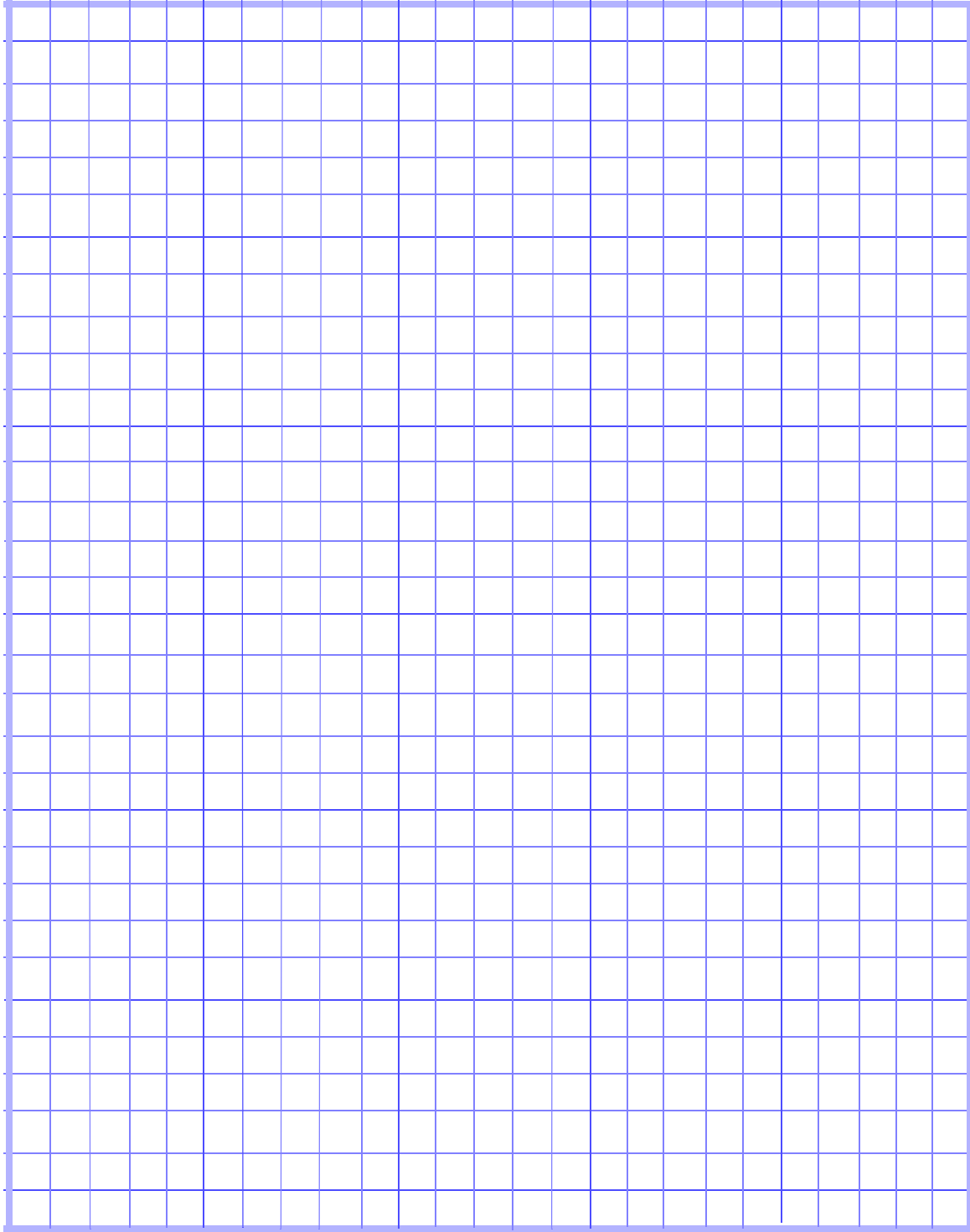
Note: The customer's application determines the specific Denester design. Design variations will occur.

1. Air Cylinder, Z-Axis
2. Guide Pins and Guide Pin Housing
3. Servo Motor
4. Timing Belt
5. Air Cylinder, Pivot Arm, (2) places
6. Pivot Arm, (2) places
7. Basket Gripper, (2) places
8. Width Adjust Cylinders

Span Adjustment, Pivot Arms, (2) places

Note: The span (distance) between the left and right gripper (clamp) assemblies is determined by the width of the incoming baskets. This dimension is commonly set at the factory and rarely changed thereafter.

NOTES

A large grid of 20 columns and 30 rows for taking notes. The grid is composed of light blue lines on a white background. The first column is slightly wider than the others, and the first row is slightly taller than the others, creating a header space for labels.

Denester Operations and Parts Manual

Parts and Service

This section includes general information, Equipment bills of materials, recommended spare parts list, illustrations and numbers to identify replacement parts sub-assembly.

Parts and Service Overview

AMF parts have been specifically designed and manufactured to withstand conditions found in a harsh bakery environment. For machine longevity and reduced “down time,” always order genuine AMF parts.

Note: This information is confidential and not to be reproduced without prior written consent from AMF.

Denester Operations and Parts Manual

**Standard
Information
Needed Prior to
Ordering¹**

Note This Information First

**Figure 1-Model and Serial
Number Plate Examples**

When ordering parts, via fax or telephone, please have available all the following information. This enables your parts representative to process your order quickly and accurately.



Customer

Originating AMF Sales Order

Equipment and Serial Number List

Serial Number	Equipment Description
---------------	-----------------------

1. Please use the space below to record required information for future reference.

AMF Parts and Service

The Parts and Services division of AMF is dedicated to meeting your requirements for spare parts, updates, modifications and service. Our sales staff has many years of machine and AMF equipment experience. Because customer service and support is a major concern, we offer extended service hours, dual distribution points in the US and Europe, a high inventory of support parts, 24-hour emergency service, same-day shipment on inventoried items ordered before 6:00 pm EST, and express shipping anywhere in the world! We take product support quite seriously. So, no matter where you are in the world, your AMF equipment can be serviced quickly.

We have service offices based in the US and Europe, with knowledgeable, experienced teams to service your equipment, train your personnel, provide routine maintenance checks, and more. For the life of your AMF equipment, strong technical support is always available and only a phone call away. Please also refer to the Parts chapter of this manual for further information on obtaining any of these services you may require. Should questions arise and technical assistance be needed, please contact the technical staff at AMF.

Standard Business Hours

AMF Parts and Services standard hours are from 8 am to 6 pm EST, Monday through Friday, with 24-hour emergency support also available after normal hours and holidays. When calling Support, please have available all identification information concerning your equipment with return phone number and extension where you can be reached.

AMF Technical Support

Denester Operations and Parts Manual

Contact Information

United States

In the United States, the AMF Parts and Services division can be contacted at:

▼ **1-800-BAKERS-1** (1-800-225-3771)

Fax

To order via fax transmissions, dial:

▼ **1-804-342-9755**

International customers can contact us direct for the nearest agent or direct orders in the United States by dialing:

International Customers

▼ 1-804-355-7961

Website Address

For international replacement parts order inquiries placed directly with the United States and other support services, please visit our website at the following internet location:

▼ www.amfbakery.com

AMF Canada

▼ 1025 Cabana Street
Sherbrooke, Quebec
Canada J1K 2m4

▲ Ph: 819-563-3111

▲ Fx: 819-821-2832

AMF Western Europe

▼ AMF
Clayton Wood Close
West Park Ring Road
Leeds
LS 16 6QQ
England

▲ Ph: (44) (0) 1132 787 110

▲ Fx: (44) (0) 1132 741 415

AMF Pacific Rim Service Center

▼ Blk. 5000 Ang Mo Kio Ave. 5 #05-07 Techplace II
Singapore, 569870

▲ Ph: 65-482-4600

▲ Fx: 65-481-8255

Denester Operations and Parts Manual

Recommended Spare Parts Reference Key Components

The recommended spare parts areas are broken down into categories. Icons\ alpha characters denote recommended spare parts priority designations for this equipment.

Note: Refer to your specific Recommended Spare Parts key for Part Designations.

Due to typical customer-specific order requirements of this Equipment, a standard recommended Spare Parts list is not available for this Equipment. Should a applicable spare parts package be available at the time of the publication of this manual, this list will be located in the Appendix.

Recommended Spare Parts

If the Spare Parts listings is not included with this manual, an AMF representative will be contacting your company shortly to provide a comprehensive itemized recommended spare parts listing with quotation, tailored specifically for your new Equipment.

NOTES

A large grid of 20 columns and 30 rows for taking notes. The grid is composed of light blue lines on a white background, forming a series of small squares. The grid is rectangular and occupies most of the page below the 'NOTES' header.

When ordering parts, reference this Bill of Material along with your Equipment Model and Serial Number as a preventive measure against incorrect component order specification.

Equipment Bill Of Material



Note: CAUTION! Some components and/or assemblies can be interchangeable. These alterations are generated from specifications produced during the order origination. Due to these alterations, it is highly suggested that these reference drawings be used together with the Bill Of Materials prior to ordering parts.

Denester Operations and Parts Manual

NOTES

A large grid of 20 columns and 30 rows for taking notes. The grid is composed of light blue lines on a white background, forming a series of small squares. The grid is intended for handwritten notes.

In reference to the Equipment specific “Bills of Material”, available assembly drawings, that are order specific to the Equipment, are inserted at this location.

Equipment-Specific Drawing Inserts



CAUTION! Some components and/or assemblies can be interchangeable. These alterations are generated from specifications produced during the order origination. If applicable, the designation Model Parts” within the above Bill of Material refers to items that are order-specific.

NOTES

A large rectangular grid of graph paper, consisting of 20 columns and 30 rows of small squares. The grid is outlined by a thicker blue border. It is intended for taking notes or drawing diagrams.

Appendix

The appendix section provides a location in this manual for placing future updates, bulletins and other various addendums concerning your Equipment. Available training aids and like documentation, as available, will also be located in this section.

Scope

Items under updates contained in this appendix are generally Equipment-related revisions or items that were created possibly after publication of this manual. Items added can also be non-optional or non-standard features that are customer-specific. These items may also be revisions made to improve general performance of the Equipment or safety concerns.

Denester Operations and Parts Manual

Updates

Denester Operations and Parts Manual

Where sent, current and future Technical bulletins, for this Equipment, can be inserted in this location.

Bulletins

Denester Operations and Parts Manual

Where available, a system layout drawing insert will be included at this location. If a layout drawing insert is not included here, refer to system documentation or your engineering group for signed layout copies provided prior to delivery of the Equipment.

Equipment Layout

Training Aids

Denester Operations and Parts Manual
