Read This First – Safety Section

Steritort

Machine Order Number: EMACH037875
Campbell Soup Supply Co. – Toronto, Canada
Top Spec. No.: 3608.0927
Serial No.: 3608-94-11

Please READ FIRST before connecting Power

Important

NOTICE

JBT FoodTech is not responsible for shipping damage. The customer must check the shipment for damage when it is received. Any claims for damage must be filed with the carrier.

This service manual has been prepared for assistance in the operation and maintenance of your JBT FoodTech equipment.

There will be a charge for manuals requested after the original issue with purchased or leased equipment. Requests for additional manuals or replacement parts should be directed to:

JBT FoodTech
John Bean Technologies Corporation
2300 Industrial Avenue
Madera, California 93637
Phone: 559-661-3200

Be sure that orders for replacement parts include the following information:

1. Name of Machine: _____
2. Machine Order: _____
3. Machine Top Spec: _____
4. Machine Serial Number:_____
5. Quantity of parts required_____
6. JBT FoodTech part number_____
7. Description of part _____
8. Shipping instructions _____

⚠WARNING

FAILURE TO REPLACE BROKEN OR WORN PARTS WITH FACTORY REPLACEMENT PARTS OR PARTS OF EQUAL QUALITY COULD CAUSE SERIOUS DAMAGE TO THE EQUIPMENT OR INJURY TO PERSONNEL.

JBT FoodTech, whose policy it is to continuously improve its products, reserves the right to discontinue or change specifications, models or design without notice and without incurring obligation.

0. Safety

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0.1 General Safety Instructions

What Safety Messages Mean

The safety alert symbol signals important safety messages in this manual. Information that follows this symbol tells you the correct procedure to follow to prevent personal injury or damage to the equipment. It also tells you what could happen if you don't follow the directions. **Whenever you see this symbol, be very sure you understand the message that follows it.**

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

When the word **DANGER** follows the alert symbol, this always signifies an immediate hazard, which will cause severe personal injury or death if instructions (including recommended precautions) are not followed.

When the word **WARNING** follows the alert symbol, this signifies hazards or unsafe practices, which could cause severe personal injury or death if instructions (including recommended precautions) are not followed.

When the word **CAUTION** follows the alert symbol, this signifies hazards or unsafe practices, which could result in minor injury, product or property damage if instructions (including recommended precautions) are not followed.

The word **NOTICE** indicates a property damage message.

Symbols

Safety alert symbol, which indicates danger, warning, or caution

Health hazard, general

Fire risk

Oxidizing Agent

Low temperature

Burn Hazard

Electrical voltage

Risk of slipping

Safety First

JBT FoodTech equipment is designed and manufactured with due consideration and care for generally accepted safety standards. However, like any mechanical device, the proper and safe performance of this equipment depends upon using sound and prudent operating, maintenance, and servicing procedures under properly trained supervision.

For your protection, and the protection of others, learn and always follow the safety rules outlined in the following paragraphs and this manual. Observe warning signs on machines and exercise safe practices. Form safe working habits by reading the rules and abiding by them. Keep this manual handy and review it from time to time to refresh your understanding of the rules.

Do not take chances. The odds are stacked against you!

Always follow the safety regulations and instructions established by all state and federal regulating agencies, the safety program established by you place of work and the instructions provided in this manual.

0.2 Definitions

Cleaning or Sanitation personnel: An individual who is responsible for the physical, chemical and microbiological cleaning of the equipment.

Maintenance or Service personnel: An individual who inspects and maintains the equipment.

Operator: An individual who performs production work on the machine and who controls the movements of the machine.

0.3 Operating Zone

Only the operator or other authorized personnel should be within the operating zone when machine control circuits are energized or the machine is running.

No tools or other equipment should be kept within the operating zone.

JBT FoodTech recommends working illuminations of approx. 200 lumens around operating zone. Good lighting makes inspection easier and reduces the risk of accidents.

Information signs (for fire-fighting equipment, flow directions in piping, cut-off valves, emergency stops), warning signs (for gas or hot water) and signs that show a suitable evacuation route, should be placed in the operating zone. Follow all local, state and federal regulations and instructions for proper use of signs.

0.4 Safety Inspection

Before starting the machine:

1. Be absolutely positive all guards and safety devices are installed and operative.
2. Be sure all personnel are clear of machine.
3. Be sure to remove from the operating zone any materials, tools or other foreign objects that could cause injury to personnel or damage the machine.
4. Make certain the machine is in operating condition.
5. Make certain all indicating lights, horns, pressure gauges or other safety devices or indicators are in working order.

After shut down:

Make certain all air and electrical power is turned off.

0.5 Operating Safely

Operator is defined as "An individual who performs production work on the machine and who controls the movements of the machine" *ANSI B11.19-2003*

1. Do not operate this machine until you read and understand the operating instructions and become thoroughly familiar with the machine and its controls.

2. Never operate a machine while a safety device or guard is removed or disconnected.

3. Always wear safety glasses, safety hats or any other required safety equipment.

4. Never remove "Warnings" that are displayed on the machine. Torn or worn labels should be replaced.

5. Do not start the machine until all other personnel in the area have been warned and have moved outside the operating zone.

6. Removed any tools or other foreign objects from the operating zone before starting.

7. Absolutely do not have loose clothing or unrestrained long hair near operating machinery.

8. Keep operating zone free of obstacles that could cause a person to trip or fall towards an operating machine.

9. Never sit or stand on anything that might cause you to fall against the machine.

10. "Horseplay" around machine at any time is dangerous and prohibited.

11. Know the **EMERGENCY STOP** procedure for the machine or know how to stop the machine quickly.

12. Air and electrical power must be off when machine is not in use.

CAUTION

For maximum protection the power source should be locked out using a padlock for which only you have the key. This prevents anyone from accidentally turning on the power while you are servicing the machine.

13. Never operate machine above specified speeds, pressures, or temperatures.

14. Never manually operate limit switches with power on.

15. Keep alert and observe indicator lights and warnings that are displayed on the machine.

16. Never leave the machine unattended while in operation

17. Do not operate faulty or damaged equipment. Make certain proper service and maintenance procedures have been performed.

18. Never place fingers, hands, or any part of your body into the machine near moving parts when control circuits are energized.

0.6 Service and Maintenance Safety

1. Do not service a machine until you are thoroughly qualified and familiar with the tasks to be performed

2. Always wear protective shoes, hats, hearing protection and safety glasses during maintenance and/or repair activities.

3. Always clean up spills around machine as soon as possible

4. Exercise caution when moving machines on casters.

5. When handling heavy components, make sure to use a lifting device of adequate type and capacity for the weight involved.

6. Never operate any controls while other persons are performing maintenance on the machine.

7. Do not bypass a safety device.

8. Always use the proper tool for the job.

9. Always check the fixation of all nuts, bolts and screws after installation, repair or periodic maintenance.

10. Never open covers that house electrical components with power on.

11. When directed to make adjustments on machines in motion, extreme care must be taken.

12. Relieve all energy sources before performing maintenance. Energy sources may include, but not limited to: air, hydraulic, steam, water, and elevated weight.

13. Air and electrical power are to be turned off unless they are absolutely required for the specific service being performed.

For maximum protection the power source should be locked out using a pad lock for which only you have the key. This prevents anyone from accidentally turning on the power while you are servicing the machine.

14. Replace fuses only when electrical power is off (locked out).

0.7 Electrical Safety

1. **All electrical/electronic maintenance and service should be performed by trained and authorized electricians only.**

2. Assume at all times the **POWER** is **"ON"** and treat all conditions live. This practice assures a cautious approach, which may prevent an accident or injury.

3. To remove the power from circuit or equipment, open disconnect or breaker and lock in open position.

4. Make certain that the circuit is **OPEN** by using the proper test equipment. Test equipment must be checked at regular intervals.

5. Capacitors must be given time to discharge, otherwise it should be done manually with care.

6. There may be circumstances where "trouble-shooting" on live equipment may be required. Under such conditions special precautions must be taken as follows:

a. Make certain your tools and body are clear of power sources.
b. Extra safety measure should be taken in damp areas.
c. Be alert and avoid any outside distractions.

7. Before applying power to any equipment, make certain that all personnel are clear of the machine.

8. Control panels doors should be open only when checking out the electrical equipment wiring. After closing the panel door, make certain that (on those panels where applicable) the disconnect handle mechanism is operating properly.

9. All covers on junction panels should be closed before leaving any job.

0.8 Cleaning Safety

1. Be careful when using toxic and/or flammable solvents to clean a machine.

2. Keep electrical panel covers closed and power off when washing a machine.

3. Always clean up spills around machine as soon as possible.

0.9 Safety Aspects

The following examines some of the safety issues involved with the control system of the retort. These instructions should be read and understood thoroughly before attempting to operate the retort. All safety aspects should be maintained in good working order at all times.

0.10 Process Variable Transmitters

There are two (2) very important process variable transmitters on the Steritort.

One is used by the chart recorder to determine the temperature.

The other transmitter is the Steritort pressure transmitter.

The calibration of these transmitters must be adjusted by trained personnel only. The calibration range must not be changed. The calibration should be checked often by accepted methods.

NOTICE

Failure to follow the above recommendations could result in improper or insufficient processing of the product.

0.11 Utility Supply

The machine will be (supplied by JBT) equipped with pressure transmitters to assure adequate utility supply (flow capacity) for steam, air and water.

0.12 Safety Interlocks

The control system utilizes an Adam and Eva safety switch which determines the position of the door lock lever. The door lock lever must be in its closed position for the pressure power locking pin to seat and retain the locking lever in the door closed position.

The safety pin is actuated by vessel pressure. No position sensor is incorporated.

NOTICE

The door lock level will not open if the vessel is pressurized.

A second Adam and Eva style switch is used in the control safety interlock system to determine the position of the door and door locking ring. Until the door has been fully closed and the locking ring rotated to the closed position, all fluid supply valves, steam, air, water and vent are prevented from operating.

In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented through this exhaust valve. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN, AND THE SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

0.13 Door Safety Interlocks

The system alarms in the event that an attempt is made to open the door while the vessel is under pressure.

⚠WARNING

THE DOOR CAN ONLY BE OPENED WHEN THERE IS NO PRESSURE WITHIN THE VESSEL. IN ORDER TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN AND THE WATER LEVEL SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

DO NOT DISABLE THE MECHANICAL INTERLOCK, SERIOUS INJURY OR DEATH MAY RESULT IF THE MECHANICAL INTERLOCK IS DISABLED.

Until the door lock lever has been put in the locked position, all fluid supply valves, steam, air, water and vent are prevented from operating.

The door lever safety switch is connected to a vent valve. In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

0.14 Vent Valve and Safety Relief Valve

The actuated vent valve is used for venting pressurized vapor (steam/air) from the Laboratory Pressure Sterilizer during processing. This vent line and the pressure safety relief valve located at the rear of the vessel must be exhausted properly to a safe location outside the working environment. The vessel safety relief valve connection has been combined with a vacuum breaker (check valve). This check valve prevents unwanted vacuum from developing during rapid cooling.

0.15 Emergency Stop

The emergency stop pushbutton interrupts the control power supply. The emergency stop may be pressed at any time; however, if it is pressed during processing, a process deviation will occur because the control valves will close.

Always practice safety, if in doubt, check it out first.

0.16 Signs

Pay strict attention to all caution, warning and danger signs on the machine and within the manual.

Do not remove any warning labels from the machine. Replace warning labels if they are no longer legible or missing.

0.17 Safety Label Application Instructions

1. Thoroughly clean metal surface using **absolutely clean, lint free cloth**, saturated with isopropyl (rubbing) alcohol.

NOTICE

Do not use lacquer thinner or other thinner solvent to clean the metal surface

2. Allow alcohol to evaporate.
3. Remove the backing paper.
4. Position Decal where indicated on the Safety Decal Drawing.
5. Lightly press the decal down through the vertical center.
6. Starting at the center, smooth the decal in place.
7. Avoid touching the adhesive with cloth or hands to prevent contamination, which will reduce adhesives' effectiveness.
8. Make sure all corners and edges are fully sealed.
9. If decal is wrinkled or damaged, peel off, wash metal with alcohol again and apply new decal. Additional safety decals can be ordered from;

JBT FoodTech
John Bean Technologies Corporation
2300 Industrial Avenue
Madera, California 93637
Phone: 559-661-3200

0.18 MSDS Documentation

NOTICE

Please refer to enclosed CD for all MSDS documentation.

0.19 Safety Label Re-Order

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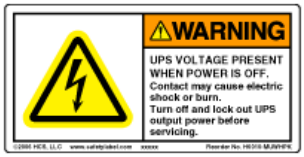

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Notes:

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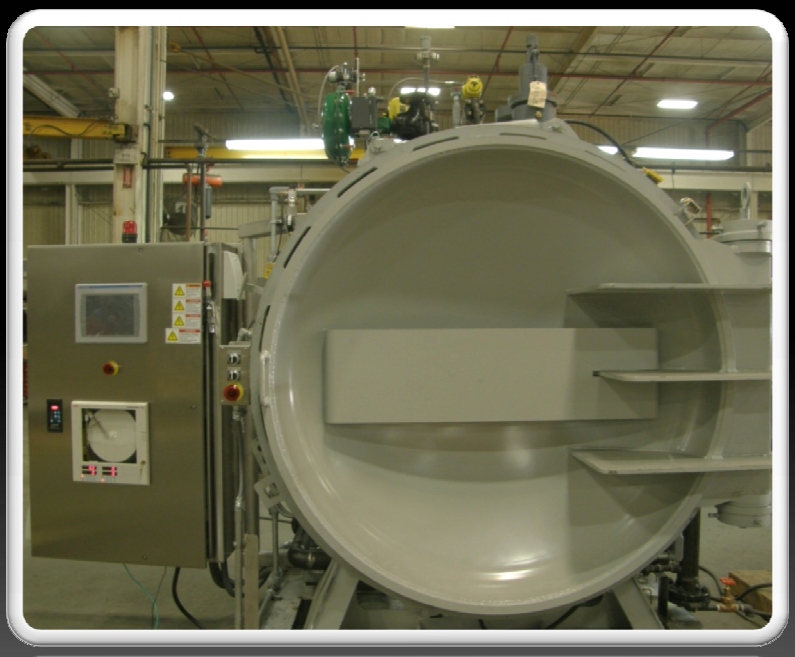
Service Manual

Steritort

Machine Order Number: EMACH03875
Campbell Soup Supply Co. – Toronto, Canada
Top Spec. No.: 3608.0927
Serial No.: 3608-94-11



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3. Machine Top Spec: _____
4. Machine Serial Number:_____
5. Quantity of parts required_____
6. JBT FoodTech part number _____
7. Description of part _____
8. Shipping instructions _____

⚠WARNING

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When the word **DANGER** follows the alert symbol, this always signifies an immediate hazard, which will cause severe personal injury or death if instructions (including recommended precautions) are not followed.

When the word **WARNING** follows the alert symbol, this signifies hazards or unsafe practices, which could cause severe personal injury or death if instructions (including recommended precautions) are not followed.

When the word **CAUTION** follows the alert symbol, this signifies hazards or unsafe practices, which could result in minor injury, product or property damage if instructions (including recommended precautions) are not followed.

The word **NOTICE** indicates a property damage message.

Symbols

Safety alert symbol, which indicates danger, warning, or caution

Health hazard, general

Fire risk

Oxidizing Agent

Low temperature

Burn Hazard

Electrical voltage

Risk of slipping

Safety First

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For your protection, and the protection of others, learn and always follow the safety rules outlined in the following paragraphs and this manual. Observe warning signs on machines and exercise safe practices. Form safe working habits by reading the rules and abiding by them. Keep this manual handy and review it from time to time to refresh your understanding of the rules.

Do not take chances. The odds are stacked against you!

Always follow the safety regulations and instructions established by all state and federal regulating agencies, the safety program established by you place of work and the instructions provided in this manual.

0.2 Definitions

Cleaning or Sanitation personnel: An individual who is responsible for the physical, chemical and microbiological cleaning of the equipment.

Maintenance or Service personnel: An individual who inspects and maintains the equipment.

Operator: An individual who performs production work on the machine and who controls the movements of the machine.

0.3 Operating Zone

Only the operator or other authorized personnel should be within the operating zone when machine control circuits are energized or the machine is running.

No tools or other equipment should be kept within the operating zone.

JBT FoodTech recommends working illuminations of approx. 200 lumens around operating zone. Good lighting makes inspection easier and reduces the risk of accidents.

Information signs (for fire-fighting equipment, flow directions in piping, cut-off valves, emergency stops), warning signs (for gas or hot water) and signs that show a suitable evacuation route, should be placed in the operating zone. Follow all local, state and federal regulations and instructions for proper use of signs.

0.4 Safety Inspection

Before starting the machine:

1. Be absolutely positive all guards and safety devices are installed and operative.
2. Be sure all personnel are clear of machine.
3. Be sure to remove from the operating zone any materials, tools or other foreign objects that could cause injury to personnel or damage the machine.
4. Make certain the machine is in operating condition.
5. Make certain all indicating lights, horns, pressure gauges or other safety devices or indicators are in working order.

After shut down:

Make certain all air and electrical power is turned off.

0.5 Operating Safely

Operator is defined as "An individual who performs production work on the machine and who controls the movements of the machine" *ANSI B11.19-2003*

1. Do not operate this machine until you read and understand the operating instructions and become thoroughly familiar with the machine and its controls.

2. Never operate a machine while a safety device or guard is removed or disconnected.

3. Always wear safety glasses, safety hats or any other required safety equipment.

4. Never remove "Warnings" that are displayed on the machine. Torn or worn labels should be replaced.

5. Do not start the machine until all other personnel in the area have been warned and have moved outside the operating zone.

6. Removed any tools or other foreign objects from the operating zone before starting.

7. Absolutely do not have loose clothing or unrestrained long hair near operating machinery.

8. Keep operating zone free of obstacles that could cause a person to trip or fall towards an operating machine.

9. Never sit or stand on anything that might cause you to fall against the machine.

10. "Horseplay" around machine at any time is dangerous and prohibited.

11. Know the **EMERGENCY STOP** procedure for the machine or know how to stop the machine quickly.

12. Air and electrical power must be off when machine is not in use.

⚠ CAUTION

For maximum protection the power source should be locked out using a padlock for which only you have the key. This prevents anyone from accidentally turning on the power while you are servicing the machine.

13. Never operate machine above specified speeds, pressures, or temperatures.

14. Never manually operate limit switches with power on.

15. Keep alert and observe indicator lights and warnings that are displayed on the machine.

16. Never leave the machine unattended while in operation

17. Do not operate faulty or damaged equipment. Make certain proper service and maintenance procedures have been performed.

18. Never place fingers, hands, or any part of your body into the machine near moving parts when control circuits are energized.

0.6 Service and Maintenance Safety

1. Do not service a machine until you are thoroughly qualified and familiar with the tasks to be performed

2. Always wear protective shoes, hats, hearing protection and safety glasses during maintenance and/or repair activities.

3. Always clean up spills around machine as soon as possible

4. Exercise caution when moving machines on casters.

5. When handling heavy components, make sure to use a lifting device of adequate type and capacity for the weight involved.

6. Never operate any controls while other persons are performing maintenance on the machine.

7. Do not bypass a safety device.

8. Always use the proper tool for the job.

9. Always check the fixation of all nuts, bolts and screws after installation, repair or periodic maintenance.

10. Never open covers that house electrical components with power on.

11. When directed to make adjustments on machines in motion, extreme care must be taken.

12. Relieve all energy sources before performing maintenance. Energy sources may include, but not limited to: air, hydraulic, steam, water, and elevated weight.

13. Air and electrical power are to be turned off unless they are absolutely required for the specific service being performed.

⚠ CAUTION

For maximum protection the power source should be locked out using a pad lock for which only you have the key. This prevents anyone from accidentally turning on the power while you are servicing the machine.

14. Replace fuses only when electrical power is off (locked out).

0.7 Electrical Safety

1. **All electrical/electronic maintenance and service should be performed by trained and authorized electricians only.**

2. Assume at all times the **POWER** is **"ON"** and treat all conditions live. This practice assures a cautious approach, which may prevent an accident or injury.

3. To remove the power from circuit or equipment, open disconnect or breaker and lock in open position.

4. Make certain that the circuit is **OPEN** by using the proper test equipment. Test equipment must be checked at regular intervals.

5. Capacitors must be given time to discharge, otherwise it should be done manually with care.

6. There may be circumstances where "trouble-shooting" on live equipment may be required. Under such conditions special precautions must be taken as follows:

a. Make certain your tools and body are clear of power sources.
b. Extra safety measure should be taken in damp areas.
c. Be alert and avoid any outside distractions.

7. Before applying power to any equipment, make certain that all personnel are clear of the machine.

8. Control panels doors should be open only when checking out the electrical equipment wiring. After closing the panel door, make certain that (on those panels where applicable) the disconnect handle mechanism is operating properly.

9. All covers on junction panels should be closed before leaving any job.

0.8 Cleaning Safety

1. Be careful when using toxic and/or flammable solvents to clean a machine.

2. Keep electrical panel covers closed and power off when washing a machine.

3. Always clean up spills around machine as soon as possible.

0.9 Safety Aspects

The following examines some of the safety issues involved with the control system of the retort. These instructions should be read and understood thoroughly before attempting to operate the retort. All safety aspects should be maintained in good working order at all times.

0.10 Process Variable Transmitters

There are two (2) very important process variable transmitters on the Steritort.

One is used by the chart recorder to determine the temperature.

The other transmitter is the Steritort pressure transmitter.

The calibration of these transmitters must be adjusted by trained personnel only. The calibration range must not be changed. The calibration should be checked often by accepted methods.

NOTICE

Failure to follow the above recommendations could result in improper or insufficient processing of the product.

0.11 Utility Supply

The machine will be (supplied by JBT) equipped with pressure transmitters to assure adequate utility supply (flow capacity) for steam, air and water.

0.12 Safety Interlocks

The control system utilizes an Adam and Eva safety switch which determines the position of the door lock lever. The door lock lever must be in its closed position for the pressure power locking pin to seat and retain the locking lever in the door closed position.

The safety pin is actuated by vessel pressure. No position sensor is incorporated.

NOTICE

The door lock level will not open if the vessel is pressurized.

A second Adam and Eva style switch is used in the control safety interlock system to determine the position of the door and door locking ring. Until the door has been fully closed and the locking ring rotated to the closed position, all fluid supply valves, steam, air, water and vent are prevented from operating.

In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented through this exhaust valve. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN, AND THE SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

0.13 Door Safety Interlocks

The system alarms in the event that an attempt is made to open the door while the vessel is under pressure.

⚠WARNING

THE DOOR CAN ONLY BE OPENED WHEN THERE IS NO PRESSURE WITHIN THE VESSEL. IN ORDER TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN AND THE WATER LEVEL SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

DO NOT DISABLE THE MECHANICAL INTERLOCK, SERIOUS INJURY OR DEATH MAY RESULT IF THE MECHANICAL INTERLOCK IS DISABLED.

Until the door lock lever has been put in the locked position, all fluid supply valves, steam, air, water and vent are prevented from operating.

The door lever safety switch is connected to a vent valve. In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

0.14 Vent Valve and Safety Relief Valve

The actuated vent valve is used for venting pressurized vapor (steam/air) from the Laboratory Pressure Sterilizer during processing. This vent line and the pressure safety relief valve located at the rear of the vessel must be exhausted properly to a safe location outside the working environment. The vessel safety relief valve connection has been combined with a vacuum breaker (check valve). This check valve prevents unwanted vacuum from developing during rapid cooling.

0.15 Emergency Stop

The emergency stop pushbutton interrupts the control power supply. The emergency stop may be pressed at any time; however, if it is pressed during processing, a process deviation will occur because the control valves will close.

Always practice safety, if in doubt, check it out first.

0.16 Signs

Pay strict attention to all caution, warning and danger signs on the machine and within the manual.

Do not remove any warning labels from the machine. Replace warning labels if they are no longer legible or missing.

0.17 Safety Label Application Instructions

1. Thoroughly clean metal surface using **absolutely clean, lint free cloth**, saturated with isopropyl (rubbing) alcohol.

NOTICE

Do not use lacquer thinner or other thinner solvent to clean the metal surface

2. Allow alcohol to evaporate.
3. Remove the backing paper.
4. Position Decal where indicated on the Safety Decal Drawing.
5. Lightly press the decal down through the vertical center.
6. Starting at the center, smooth the decal in place.
7. Avoid touching the adhesive with cloth or hands to prevent contamination, which will reduce adhesives' effectiveness.
8. Make sure all corners and edges are fully sealed.
9. If decal is wrinkled or damaged, peel off, wash metal with alcohol again and apply new decal. Additional safety decals can be ordered from;

JBT FoodTech
John Bean Technologies Corporation
2300 Industrial Avenue
Madera, California 93637
Phone: 559-661-3200

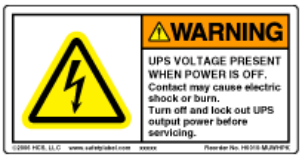
0.18 MSDS Documentation

NOTICE

Please refer to enclosed CD for all MSDS documentation.

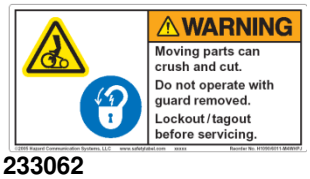
0.19 Safety Label Re-Order

233061



233102

233077



233062

233080

233088

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233119

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233107

1 General

Notes:

1.1 Introduction

NOTICE

JBT FoodTech is not responsible for shipping damage. The customer must check the shipment for damage when it is received. Any claims for damage must be filed with the carrier.

The Model 610-10 Laboratory Pressure Sterilizer (Steritort) is a pilot sterilizer used experimentally to study the effects of temperature and time variables on canned food products. Depending on the installed features, the Laboratory Pressure Sterilizer is used to simulate JBT FoodTech's Sterilmatic processes, orbital agitation processes, and standard steam cook still retorts. When these methods are simulated, the test results will accurately indicate how a product will behave in production machines.

In addition to heat penetration and cooling rate studies, the Laboratory Pressure Sterilizer may be used on inoculated packs, check product quality, study container behavior and glass closure seal strength under a variety of conditions.

NOTICE

When used for process calculations by the Ball or General method of process calculations, the temperature measurements taken within the Laboratory Pressure Sterilizer are not sufficient for the complete determination of the process. The process calculated from thermocouple measurements must be regarded only as a guide to further bacteriological process development for confirmation of the final process to be chosen.

In using a thermocouple, potential sources of error may result in a selection of process by calculation. This calculated process may be less severe than the process required for the prevention of spoilage.

Heat penetration data is extremely useful in providing guidelines for conduct of subsequent inoculated pack work. Following the establishment of heat penetration parameters, taking into consideration headspace variations and possible variation in formulation due to thickening agents, inoculated pack methods and count reduction techniques are recommended as reliable means of establishing the correct process. Refer to the Operators Section within this manual for details of inoculated pack methods.

The Laboratory Pressure Sterilizer has a 60" inside diameter pressure shell, which is approximately 3 ft in length. The system is designed for a maximum operating pressure of MAWP 55 PSI at 303°F with a reel hub speed range from 1 to 20 RPM, simulating all types of Rotary Sterilizer Lines.

1.2 Steritort

The Steritort is a horizontal processing vessel. Cans may be loaded and unloaded by opening the front door. The door is equipped with a mechanical latching system and safety interlock to prevent pressure build-up if the door is not properly locked or opened when pressure exists in the vessel.

1.3 Control System

The temperature and pressure operating parameters are determined and controlled by the Process Management System (optional feature) and recorded on the ABB Circular Chart Recorder. Temperature is controlled to +/- .5°F, while pressure is controlled to +/- .5 PSIG.

1.4 Construction

The machine is designed and manufactured to ASME Code, Section VIII, Div. 1. The Steritort pressure vessel design is limited to 45 psig.

To ensure a safe operating system, individual system components used to control the Steritort, equal or exceed the rated vessel pressure requirements.

⚠ CAUTION

TO INSURE FUTURE SAFE OPERATION OF THE STERITORT, ONLY USE MANUFACTURER AUTHORIZED PARTS WHEN REPLACING COMPONENTS.

Safety valve venting for the Steritort vessel is designed for full upstream utility pressure.

These design criteria pressure ratings are limited to:

- Steam upstream pressure maximum 120 psig.
- Air upstream pressure maximum 100 psig.

The Steritort vessel has an approximate volume of 48 cubic feet.

1.5 Installation Instructions

The unit will be shipped with as much piping and controls in place that is practical for damage free shipment. Extra parts, piping and controls that must be removed will be shipped in a separate container or containers.

A floor plan installation drawing has been provided and must be referred to for the exact placement of the unit.

NOTICE

The floor slab or piers must be strong enough to support the operating weight of the machine shown on the floor and foundation drawing. Consult a local engineering firm for foundation load conditions.

The actual weight of the unit must be confirmed by checking the bill of lading. With the weight established, the customer must select an appropriate lift truck or other lifting device with a lifting capacity safe enough to move the unit. If slings are used to lift the unit, ensure that the slings do not damage any parts as the unit is lifted.

Move the unit to the installation location.

When moving/lifting the machine, use the two (2) hoist eyes provided on the machine plus (1) sling around rear skid beam. A suitable forklift may also be used. Forklift pockets are provided on the skid.

Connect the utility piping (air, water, steam and drain) as shown on the JBT FoodTech installation drawings. The user must furnish piping to hook up service to a 1-1/2" steam inlet and a 1" air inlet.

The user must also hook up suitable piping to the 2" water inlet, and a 3" drain outlet.

Control valves are noise sources such as machine fluid control valves, steam and air inlet valves, steam vent valves, and safety relief valves. JBT FoodTech recommends extending all vent lines to the outside of the operation area.

Adequate drains should be provided to take away the overflow from these pipes. Adequate drainage should be furnished to receive the water from these pipes when flushing is required.

Connect the electrical power and other supply utilities to the unit.

After all piping and wiring has been connected, the unit must be securely fastened to the floor. Be sure to check the horizontal and vertical level before the unit is secured. The type of fastener to be used will be determined by the customer. Four (4) mounting bolt holes have been provided for this purpose; one bolt hole at each corner of the machine base. This is a very short machine; removal of machine components will change the center of gravity and might render the equipment unstable.

1.6 Specifications

(Approximate)

Model
Universal 610-10

Control System
Allen Bradley PLC Process Management System

Recorder
ABB Circular Chart Recorder

Drive Motor
SEW 2 HP (575VAC, 60HZ)

Variable Frequency Drive
Powerflex 70 (575VAC, 60HZ)

Max. Operating Pressure
45 PSIG (3.0 bar)

Reel speed
0 - 14 RPM (Approx.)

Shipping weight
Steritort Assembly Approx: 7,500 lbs

Additional Reels Approx: 250 lbs each

Thermocouples
Supplied by the customer

1.7 Utilities Recommended

(Contact factory for peak demands)

Service	Inlet size	Supply pressure (gauge)
Steam	1-1/2"	100-120 PSIG (620-862 kPa)
Water	2"	40-80 PSIG (276-414 kPa)
Air	1"	80-100 PSIG (414-620 kPa)
Electricity		575VAC, 60 HZ

1. Pipe down from larger size header
2. 175-boiler horse power (1715 kW) minimum

1.8 Inoculated Experimental Packs

NOTICE

For inoculated packs refer to:

Laboratory Manual for Food Canners and Processors, Complied by National Canners Association Research Laboratories, Volume 1, The AVI Publishing Company, Westport, Connecticut (1968), Chapter 10, pp 252-63. Other chapters are referred to in this section.

For count reductions refer to:

Yawger, E.S., 1967. The count reduction system of process lethality evaluation. Apurtes de Information Conserva (Spain). No. 55, February.

1.8.1 Introduction

The preparations of an inoculated experimental pack or count reduction are the final steps in checking a process developed by heat penetration and thermal death time studies. Inoculated packs are especially desirable in checking processes calculated for vacuum packed products containing little or no free liquid, agitating cookers, pre-sterilizers, etc. Sometimes it is necessary to make an experimental pack without prior heat penetration measurements, however in this case; it is harder to estimate the range of processes to be used. Under such circumstances, it may be advisable to make a small "sighting" pack, if time permits, and to use the result in determining process times for the larger pack.

Inoculated experimental packs are used also in comparing processing methods. In such a case, the object is to obtain comparable spoilage data, sterility end points are not so important.

1.8.2 Planning and making experimental packs

The following are some of the factors to be considered in planning an experimental inoculated pack and the techniques used in carrying it out.

Number of process levels: Still Retorts

If possible, five process levels should be included, selected to give almost 100% spoilage at the shortest process time, no spoilage at the shortest process time, and no spoilage at the longest process time. The intervals should preferably be five minutes, except where the process extends 100 minutes or are less than 30 minutes. More than five lots would permit closer spacing of time intervals, however the larger number would not be practical from an operating standpoint because it would be difficult to pack and process so many within a time limit of several hours.

A satisfactory pack may be made with four lots. Three are not advised except in an emergency, such as lack of retort capacity, interference with regular plant operations, or shortage of time. It is difficult to obtain significant data with only three lots; however three lots can be used for a small sighting pack.

1.8.3 Number of process levels: Agitating Rotary Cookers

In establishing a process for an agitating, continuous rotary cooker, it is the usual procedure to select a speed in cans per minute somewhat in excess of the maximum production of the canning line or lines feeding the cooker. However, in some cases a higher rate of speed may be chosen because with certain products it materially increases the rate of heat penetration and results in better quality. With the speed in can per minute constant, the process levels are varied by adjusting the retort temperature. For batch type agitating cookers the procedure may be to vary the process time, rather than the temperature, as is customary for still retorts.

Four temperatures are usually adequate, selected to give almost 100% spoilage at the lowest temperature to no spoilage at the highest temperature. Since processing with agitation frequently increases the rate of heating of the can contents, small changes in retort temperature may result in significant changes in lethality.

If variations both of can speed (degree of agitation) and retort temperature is to be included, a complicated pack may result, which may take several days to complete. In such instances every effort should be made to have a uniform raw product.

Careful records should be kept of fill, headspace, and viscosity (where significant), which have a pronounced effect on the heating rates of cans processed with agitation. Adequate numbers of uninoculated control cans should be included.

1.8.4 Number of process levels: Heat Exchangers

Heat exchangers have a maximum capacity in terms of gallons per minute of product, which can be pumped through them. A process is usually established at close within this level of production. Four temperatures are usually adequate for a test. The lots should be run in descending order of temperature. An uninoculated control lot should be put through at the highest temperature and ahead of the inoculated product.

1.8.5 Time necessary for making a pack

The whole pack should be completed within one day, eliminating variations in the food material as far as possible. With a large experiment, it is sometimes necessary to extend the pack over several days. Under these conditions, it might be advisable to repeat each day as a control one lot, calculated to give considerable spoilage. A fresh spore suspension for inoculation should be prepared each day from the stock suspension, which is held in the refrigerator.

1.8.6 Uninoculated controls

It is desirable to have uninoculated controls with each lot of inoculated cans; however this may make the pack too expensive. For a pack consisting of batches heated for four of five different times, a minimum of three uninoculated control lots should be included. Controls are necessary for the following reasons.

To check double seams. On occasion, cans with poorly made double seams are included within the pack, with consequent spoilage. Such spoilage shows up in the controls as well as in the inoculated lots, the proportion may be estimated readily.

To check natural contamination with heat resistant organisms. On occasion, the product under investigation is contaminated with heat resistant spoilage organisms, which are more heat resistant than the inoculum. In this case, an examination of spoiled control cans soon indicates the cause of the irregularity in results.

It is often necessary to check net and drained weights, headspace, or condition of product. Control cans are valuable for these purposes.

1.8.7 Number of containers

One hundred or more inoculated containers for each process are desirable if spoilage results are to be significant. Smaller numbers may be necessary for economic or other reasons, with containers of large size, such as No. 10 or 404 x 700 cans, but in no case should there be less than 50 containers in each lot. With 50 container lots, one swell represents 2% spoilage, which is considerable.

Where uninoculated controls are included for a given condition, there should be the same number of controls as the inoculated containers. In no case should there be less than half as many controls as there are inoculated containers.

1.8.8 Sighting packs

It may be advisable to prepare a small-inoculated pack as a preliminary to the larger pack. Results obtained may help in setting a closer schedule of process levels and reduce the number of lots within the final pack. Three or four processes should be used; however the number of inoculated containers can be reduced to 20 or 30 per lot. The same number of uninoculated control containers should be included in the shortest process.

1.8.9 Inoculum

Spore suspensions of C. botulinum should NOT be used for inoculating factory experimental packs because it is very undesirable to bringing this organism into a commercial cannery. Consequently a non-toxic mesophilic spore forming putrefactive anaerobe, having similar characteristics and identified as NCA No. 3679 (or P.A. No. 3679), is commonly used. This organism produces spores, which, in large numbers, are considerably more heat resistant than C. botulinum spores. It is necessary to determine the destruction rate (D) of spores in natural phosphate buffer, so that a number may be selected which have a thermal resistance slightly greater than the maximum for C. botulinum. The temperature selected for this determination is usually 240° or 250°F. At 240°F the maximum recorded thermal death time of 6 x 101°C. botulinum spores in phosphate is 10 minutes. A spore concentration of 3679 should be selected to give a thermal death time at 240°F between 12 and 16 minutes. A spore crop fraction of the desired resistance obtained by centrifuging may also be used (See Chapter 7).

Thermophiles are valuable for experimental packs of various products. The thermophilic flat sour type of inoculum has the advantage because only a short incubation period is necessary, 10 to 15 days, results can be obtained quickly. It has the disadvantage because spoilage cannot be detected by the appearance of the can and it is necessary to open every can at the end of the incubation period to determine the pH. Thermophilic anaerobes are useful under certain circumstances, particularly for foods in the intermediate pH range 4.7 to 5.2, which may inhibit the growth of putrefactive anaerobes, however have the disadvantage because when the spore count is reduced by heat to only a very small number, growth may be erratic.

Any significant spoilage organism may be used to inoculate an experimental pack provided its heat resistance characteristics and the number of organisms in the suspension are known. For example: C. pasteurianum has been used for tomatoes, pears, figs and other fruits with a pH above 4.0; B. coagulans (B. thermoacidurans) for tomato juice; various lactobacilli for tomato and other fruit products; various yeasts for citrus juices, pickles, etc., and various molds for acid fruits, preserves and syrups.

If no spoilage organism is available for a particular product, the best way to obtain one is to under process containers of the food to the point where spoilage occurs and study the spoilage types. It is sometimes helpful to inoculate such cans with soil from the area where the food is grown before sealing and processing.

1.8.10 Preparation of inoculums (See Chap.7)

In preparing organisms for inoculation, a stock suspension is used in spore forming bacteria. With non-spore formers, yeasts and molds, the organisms are grown on agar immediately prior to making the pack.

The cells are washed off with sterile tap water, saline solution (0.85% NaC1), or peptone water (0.1%) and diluted to the required extent. With this procedure, it is not possible to know the number of organisms used until after the pack is made, except that it may be approximated by a direct microscopic count.

Molds are sometimes used dry, the spores being dusted onto the product. A peppershaker may be employed for this purpose.

When stock suspensions of spore forming bacteria are used, the required dilution should be made with tap water or saline. The stock suspension should be kept in the refrigerator but the diluted suspension may be held at room temperature without harm. It is advisable to keep part of it in the refrigerator if the pack is to require the whole day. If the pack extends to a second day, a fresh dilution should be prepared on the second day.

1.8.11 Size of inoculums (Number of cells)

The number of spores or vegetative cells should be sufficient to give as nearly as possible the heat resistance desired. This number is determined on a container basis, the same inoculum being used for a large container as for a small container. However, it is sometimes necessary to study the effect of can size, on the assumption that the greater the can size the greater the total number of spoilage organisms which would be present. In this case, the inoculum is calculated on a per milliliter basis. A larger container of product should require a process having a greater than F value than a smaller container, because heat resistance is related to the number of organisms present. Experimental tests have shown that approximately 20 to 40% greater lethality is required for No. 10 cans than for No. 2 cans to destroy the same, per unit volume concentration of spores.

Where putrefactive anaerobe No. 3679 is selected as the test organism, the number of spores inoculated per container is usually between 10,000 and 100,000, having a thermal death time in neutral phosphate buffer of 12 to 16 minutes at 240°F.

Numbers of spores of any test organism below 10,000 per container tend to give erratic results because "skips' are more likely to occur. The greater the number of spores which can be used within the limits of the thermal death time desired, the more consistent the results are likely to be.

1.8.12 Volume of inoculums

The usual volume of inoculum is 1 ml per can. This is sufficiently small to cause no appreciable dilution of the product and sufficiently large to be measured rapidly with reasonable accuracy. For some products, such as solid packs of fish and meat, or for inoculation into a raw vegetable, 1 ml or 0.5 ml may be too much. The inoculum in such cases is usually 0.1 or 0.2 ml. Regardless of the volume of inoculum, it should contain the number of spores or vegetative cells desired.

1.8.13 Methods of inoculation

In convection heating products, it is assumed that all spores in a container receive the same heat treatment due to the rapid circulation of the product within the container. With products heating by conduction and processed in still retorts, spores receive progressively less heat in relation to their distance from the container walls. With a uniform distribution of spores within the product, it has been calculated that only about 10% receive the minimum heat treatment, indicated by a thermocouple placed at the geometric center of the product. A method has been developed by Stumbo (1953), which integrates heat effects throughout the container and describes the sum of these effects in terms of lethality with respect to a specific organism. With a uniform distribution of spores, the effects of the lethalities integrated throughout the container, on the total number of spores present can be determined. In products within agitating cookers and continuous heat exchangers, convection is augmented by mechanically induced turbulence. In agitating cookers certain factors, such as insufficient headspace and high viscosity, may limit or prevent product movement within the container, while in continuous heat exchangers the viscosity of flow and the product viscosity are critical factors affecting the uniformity of heating.

Products packed in brine or syrup are best inoculated by means of a manual or automatic pipette. For this purpose, 5 or 10 ml serological pipettes graduated to the tip in 0.1 ml divisions are satisfactory. The food is inoculated after packing in the containers and before the brine or syrup is added.

Fluid products, such as juices and purees, may be batch inoculated. Thorough mixing is necessary for uniformity of distribution, which can be accomplished in a kettle or tank equipped with a mechanical stirrer, or by pouring back and forth five times in five or ten gallon milk cans or stock pots. To obtain the amount of inoculum to add, divide the volume of product by the capacity of the can to be used, then multiply this figure by the number of spores or other cells desired per container.

Where spoilage results are to be related to heat penetration and thermal rate data in products and uniform mixing is not possible, such as fish or spinach, the inoculum should be placed as near as possible at the position of slowest heat penetration, which is the geometric center of the container for heavy products heating by conduction and between the geometric center and the bottom of products having a "broken-rate' of heating. For inoculation at the center of the container, or below, two methods may be used. Fill the container to the desired height, inoculate then complete the fill. This involves handling the containers twice which may result in considerable displacement of the inoculum. A more desirable method is to use a hypodermic syringe with a needle of suitable length to inoculate containers at the desired point after filling.

A refinement of this procedure is to use a disk of aluminum or other metal, grooved to fit over the flanges of various sizes of cans, or over the mouths of jars. Located at the center of the disk, is a hold large enough to permit the passage of a large bore hypodermic needle (a 15 gauge, 4-1/2" spinal puncture needle is useful for this purpose). A stop can be made to fit onto the needle at any point, which may be set to allow the needle to descend into the container a predetermined distance. With this device, the inoculum can be introduced into each container at exactly the same position.

In some cases it is desired to determine the process necessary to destroy the inoculum within pieces of the food product. To accomplish this, a piece of the food may be inoculated by syringe and the inoculated piece placed in the container at the slowest heating position. If sub culturing is necessary following the process, the inoculated piece may be identified by tying it with thread, string or some other device.

For a product consisting of food particles, such as diced vegetables, in a fluid medium to be given a short time high temperature process in a heat exchanger, it has not yet been possible to measure the rate of heat penetration into the particles. Also it is not possible to inoculate particles of raw vegetables with known numbers of bacterial spores. Consequently, high Fo values have been used in calculating processes for such particulate products in order to provide a good safety factor. An experimental approach to the problem has been to prepare synthetic particles, by mixing a puree of the vegetable under consideration with egg white, inoculating with the desired number of spores and then giving a nonlethal heat treatment which is sufficient to coagulate the egg white. The solidified mass can then be cut into pieces of the desired size. The time-temperature requirements for a heat exchanger process can be approximately determined for the significant spoilage organism in this manner.

With sliced products, the slowest heating position is generally considered to be between slices. In this instance, the surface of a slice may be inoculated with a small quantity of suspension containing the desired number of spores and the inoculated surface held against another surface by joining two or more slices with toothpicks. These slices are then placed at the slowest heating position within the container and may be subcultured conveniently if necessary.

In foods which are pre-sterilized before filling, it is necessary to batch inoculate before the product is put through the heat exchanger. Where pre-sterilization is employed for acid products, such as tomato and other juices, fruit nectars etc., the juice is filled into the cans hot enough to sterilize the containers after sealing, if the cans are held for a short time before cooling. To check on the degree of heat necessary to sterilize the container, it has been found that inoculation of the lid is the best procedure. Sufficient lids are selected and a measured amount of suspension in water (usually 0.1 - 0.2 ml) is placed in the curl, also in the center of the lid then allowed to dry. For the experimental pack, cans sealed with the inoculated lids can be held for various times under the desired conditions before cooling. Controls with uninoculated lids should be included. In tests with inoculated cans, the suspension should be flowed around the junction of the bottom and body of the can by tilting and rotating the can after inoculation then allowed to dry.

Two inexpensive products for filling inoculated cans to be tested for presterilization in connection with the aseptic canning of low acid products are skim milk 1.3 oz. of corn syrup per gallon, or a pea puree made with 1 lb. dried peas per gallon. Both of these products are excellent media for the growth of flat sour bacteria and P.A. No. 3679 (See Townsend and collier 1955).

1.8.14 Coding

It is most important that an easily intelligible coding system be worked out for an experimental pack and that each container be carefully marked, either before sealing, with water and steam-fast ink, or with copper sulfate solution (for plain cans), or at the sealer, with suitable die embossed codes. Any confusion in codes, even though slight, may invalidate the whole experiment.

1.8.15 Heat penetration measurements (See Chapters 8 and 9)

In work with still retorts, heat penetration measurements should be made during the processing of at least one lot within the series. Thermocouples should be inserted at the lowest heating position in 6 to 12 containers. Both heating and cooling curves should be obtained during one of the longer processes.

1.8.16 Thermal death time determinations (See Chapter 7)

Thermal death time determinations should be made on food material from the same batches used in the experimental pack. If the material can be pipetted, thermal death time tubes can be used, but if not, it is advisable to use thermal death time cans. Since both F and Z values should be obtained, tubes or cans should be heated at four or preferably five temperatures, at least 10 of the containers

should be heated at each time interval. It is advisable to include a suspension in neutral phosphate buffer as a check on the heat resistance of the organisms within a standard reference medium.

From the results of the heat penetration measurements and thermal death time determinations, F values may be calculated for each process used in the experimental pack.

1.8.17 Data to be obtained

To aid in interpreting results, the data obtained during the preparation of the pack should be as complete as possible. Significant factors vary according to the type of produce and method of handling. The following are suggested data to be obtained:

Times for various operations to be performed:
(For example: time required to prepare the food for canning, time filled containers are held before exhausting, time containers are held after sealing and before processing).

1. Batch time and temperature
2. Filling temperature
3. Fill weights
4. Type of filler
5. Viscosity, if important
6. Headspace
7. Strength of syrup or brine
8. Temperature of syrup or brine
9. Exhaust time and temperature
10. Steam flow closure
11. Vacuum, if containers are
12. Vacuum sealed
13. Closing temperature
14. Initial temperature
15. Coming up time in retort
16. (For still retorts)
17. Cooling time in retort
18. (For still retorts)
19. Agreement between retort
20. Instruments
21. Retort temperatures, check several times during the process

For continuous rotary cookers, the capacity of the cooker and of the cooler should be known; the speed in cans per minute for each process time should be determined. For batch, agitating cookers record the loading pattern and rotational speed (RPM).

In the case of products sterilized before filling, significant temperatures should be noted, the total heating time and the holding time at maximum temperature recorded. The filling temperature is most important for acid products, as in the loss of temperature resulting from contact of the product with the container. The holding time for acid products before cooling should be carefully checked, as well as the position of the containers during this period, whether they are rolled or carried upright and the composition of the conveyor on which they are carried. Whether or not the cans are washed after closure, the temperature of the wash water, are most important for such hot filled, acid products, as well as whether there is much movement of air around the cans during the holding period. For aseptic canning tests the details of product, equipment and container sterilization should be recorded.

1.8.18 Incubation

The pack should be incubated at the optimum temperature for maximum spoilage. For mesophilic bacteria and yeasts, this is between 80°F and 90°F, for molds between 70°F and 80°F and for thermophiles between 122°F and 135°F. B. coagulans (B. thermoacidurans) grows best in products incubated at between 95°F and 110°F.

When the test organism is a mesophilic putrefactive anaerobe, such as P.A. No. 3679, containers should be incubated for a minimum of three months, and should not be removed from the incubator until at least one month after the last swell has developed. This may involve incubation of the pack for a year or more.

Fruits inoculated with butryic anaerobes, yeasts, or lactobilli should be incubated at least one month, with about a week elapsing between the development of the last swell and the time incubation is discontinued.

Molds are slow growing, particularly in syrups, jellies and preserves, long storage periods may be necessary to demonstrate the presence or absence of viable cells. Growth can seldom be expected in less than two or three weeks and may be destroyed for three months or longer.

For thermophiles, an incubation period of 10 days to three weeks is sufficient. Longer periods are not advisable, owing to rapid changes in the chemical composition of products stored at high temperatures. This is particularly manifest by a reduction in the pH.

It has been demonstrated (Pearce and Wheaton 1952) that spores of NCA No. 1518 (B. stearothermophilus) which have survived a process gradually die off, if the cans are stored at a temperature below the growth range of the organism, or within the growth range if the food product is not a favorable medium. For this reason, cans inoculated with these spores should be incubated or sub cultured as soon as possible after processing.

For "sighting' packs inoculated with thermophilic bacteria, particularly where spores of a flat sour organism are used, five to seven days incubation may be sufficient.

1.8.19 Study of spoilage

All spoiled cans should be saved for possible study, unless they swell to the point of bursting before they can be placed under refrigeration. The cause of spoilage should be determined for a reasonable number of cans given the more

severe processes where only very few spoiled cans develop in a given lot, all should be checked for cause of spoilage. In general, the microscopic examination of a stained smear is sufficient, however where results are doubtful diagnostic culturing may be necessary (See Chapter 6).

All swells occurring in control cans should be studied. If such spoilage represents more than a very few cans, it may be necessary to examine all spoiled cans in the inoculated series so that an estimate can be made of the amount of spoilage due to leakage, or to some natural contaminant more heat resistant than the inoculum.

The date should be recorded when each swell develops and is removed from the incubator.

1.8.20 Sub culturing

With putrefactive anaerobes, such as P.A. No. 3679 and C. botulinum, the suitability of the food being tested as a growth medium for the test organism is sometimes in question. Most foods having pH above 5.5 are satisfactory for supporting growth during direct incubation. In this category are peas, corn, meat, fish etc. However, germination and growth of viable spores of putrefactive anaerobes and thermophilic flat sours after processing cannot be relied upon in products having a pH below 5.5. Because of this, sub culturing of the processed inoculated cans is sometimes necessary. For some packs, half the inoculated cans are sub cultured and the other half incubated without sub culturing. Again, part or all of the cans within certain key lots may be sub cultured.

The usual procedure is to prepare enrichment medium and partly fill cans of a size larger than the ones being studied, leaving enough room for contents of the smaller can. For example: the contents of 211 x 400 cans may be transferred to 307 x 409 cans, 300 x 407 cans may be sub cultured in 401 x 411 cans, 307 x 409 cans in 404 x 414 cans, and 401 x 411 in 404 x 700 or 603 x 700 cans.

After the required amount of medium has been introduced into each can, a lid is inverted over the can top and covered with paper, which is tied around the body of the can an inch or so below the lid. The cans of media are then autoclaved for 30 minutes at 250°F.

For sub culturing, the processed cans are opened aseptically, and the contents transferred to the cans of enrichment medium, which has been previously exhausted by steaming in an autoclave or retort. The medium should still be hot, in order to provide some vacuum in the cans after sealing. The sterile lids are transferred to the can from the paper wrapping and the cans sealed. When dealing with heat resistant bacteria, it is advisable to heat the sealed cans in boiling water for 10 to 15 minutes, to destroy contamination, which may have entered the cans during the culturing procedure. The cans are then cooled and incubated.

It has been found that a greater number of positive cultures are obtained if the containers are sub cultured immediately after processing, rather than after a considerable period of incubation. If sub culturing is planned, it is better to do it at the beginning rather than at the end of the incubation period. Additional cans should be included within the pack to give results of incubation without sub culturing.

Experimental packs are sometimes made with the inoculum placed within one or more pieces of the food in each container. In such cases, only the inoculated pieces need be removed aseptically for sub culturing.

1.8.21 Interpretation of results

Results of experimental packs are often erratic, and must be interpreted with caution, with proper consideration of all factors involved. It is for this reason that it is essential to obtain as complete and accurate a record as possible of all details of the pack during its preparation. Sometimes spoilage results are so discordant that they cannot be used, the pack must be repeated.

It must be remembered that spores of the flat sour thermophiles tend to die off more or less rapidly during storage before incubation at temperatures below their growth range. If the cans are not incubated very soon after processing, the spoilage results may not be a true indication of the lethality of the process.

1.9 Count reduction method

Spore count reduction tests may be used to verify processes developed by heat penetration studies. This procedure integrates the lethality of the entire can volume, thus yielding an integrated sterilization value.

In performing count reduction studies many of the steps previously outlined for inoculated packs are applicable. A series of at least three different runs, varying either process time or temperature are run for each count reduction test. Normally the retort temperature is varied three degrees on each side of the targeted process temperature.

For each test condition a series of cans (usually 12) are inoculated with approximately 5 x 107 Bacillus stearothermophilus (NCA F.S. 1503) spores, then processed. Inoculated, unprocessed cans are also obtained for establishing the initial F.S. 1503 spore count for each run. After processing all cans are frozen and shipped to the JBT Santa Clara Laboratory for analysis.

Spores surviving the process are enumerated by inoculating aliquot samples of product from each can into Yeast Extract Dextrose agar with Starch (YDTAS) medium and incubating for 72 hours at 55°C (130°F). Following incubation the colonies are counted and the number of surviving F.S. 1503 spores per can calculated. The initial count and the heat resistance (D250) of the spores must be determined.

The above data is then used to calculate the Integrated Sterilization Value (ISV) by the formula:

ISV = D250 (log I - log S)

Where: D250 = time in minutes at 250° to kill 90% of the spores
I = initial number of F.S. 1503 spores per container
S = number of surviving spores per container

1.9.1 Advantages of using the count reduction method over the inoculated pack.

1. Results can be obtained within one week, while the inoculated pack takes a minimum of three months.
2. Count reduction tests use only 12 cans per run, where the inoculated pack requires 100 cans per run.
3. Inoculated packs require vast amounts of incubator space when compared to count reduction test.

1.9.2 Installation of Thermo Couples

Thermo couple wires can be fed through the reel angles. It is recommended to secure the thermo couple wire to the individual reel angle using a wire strap.

Notes:

2. Operator

Notes:

2.1 Introduction and Warnings

The operator must be familiar with the operating principle, controls and safety aspects before attempting to operate this system. Read all **WARNINGS** and **CAUTIONS** in the front of this manual before attempting to operate this machine.

DO NOT ATTEMPT TO OPERATE THIS SYSTEM UNTIL YOU HAVE BEEN TRAINED AND AUTHORIZED TO DO SO, PERSONNEL INJURY OR EQUIPMENT DAMAGE MAY OCCUR.

DO NOT PLACE ANY PART OF YOUR BODY INTO ANY PART OF AN OPERATING MACHINE.

NEVER REACH INTO MOVING PARTS TO CLEAR A JAM OF ANY TYPE.

ALWAYS SHUT DOWN AND LOCK OUT THE MAIN CONTROL POWER BEFORE ATTEMPTING TO CLEAR A JAM.

ONLY QUALIFIED PERSONS ARE ALLOWED TO SERVICE ELECTRICAL SYSTEM. ELECTRIC SHOCK AND ARC FLASH HAZZARDS EXIST. ELECTRICAL PANEL HAS MORE THAN ONE POWER SOURCE. EVEN IF POWER DISCONNECT IS TURNED OFF, POWER FROM INTERNAL UPS MAY BE PRESENT.

The reel may be jogged into position by using the two hand jog station on the left side of the door. The jog function allows reel rotation when the vessel door is open. Jog speed can be adjusted on the setup screen up to 10 RPM.

2.2 Control Panel

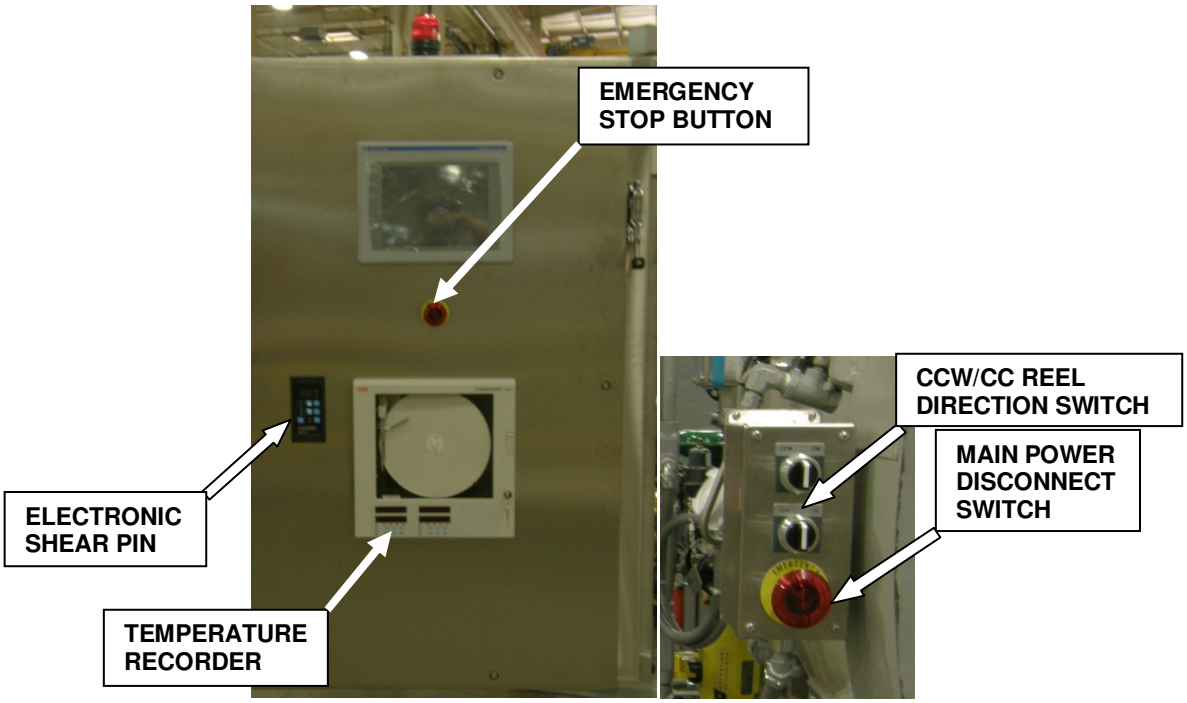

FIGURE 2-1 CONTROL PANEL WITH TOUCH SCREEN

The control panel houses the control instruments and electrical components necessary to produce conditions in the Laboratory Pressure Sterilizer which simulate the processing methods of production machines. The function of each unit in the control panel is described below.

2.2.1 Emergency Stop Pushbutton

This red pushbutton maintains a closed circuit position. It is used to STOP both the reel drive and door operating pump in the event of an emergency. This button will illuminate RED when it is pushed in to the STOP position. It is also used for resetting the Variable Frequency Drive in the unlikely event of a drive fault. This button must be pulled to the outward position to resume operation.

2.2.2 Electronic Shear pin

Please refer to enclosed CD for load control instruction PDF.

2.2.3 CCW / CC Reel Direction Switch

This switch is used to set the reel direction in the clock-wise or counter-clock-wise direction.

The drive motor speed is adjustable from 1 to 14 reel rpm, controlled by the process management system. The reel may be jogged into position by using the jog switches or the process management system. The jog function allows reel rotation when the vessel door is open. Jog speed for can loading is approximately 2 rpm.

⚠ CAUTION

THE MOVING PARTS OF THE DRIVE ASSEMBLY ARE COVERED BY A CAGE GUARD. NEVER OPERATE THE MACHINE WITH THIS GUARD REMOVED.

2.2.4 Main Power Disconnect Switch

The red main power disconnect switch is used by maintenance personnel to lock out and tag out the power supply when safety is of the utmost consideration.

2.2.5 Circular Chart Recorder

The circular chart recorder is used to record the process temperatures in real time (refer to the ABB manual for details). Temperature recorder circular charts should be replaced with a new blank chart prior to startup.

2.2.6 Operator Interface

All Screens

- Screens to have similar named KEYS on a common “footer” display
- All screens to have Current Date, Time, and show currently loaded Recipe name if included.

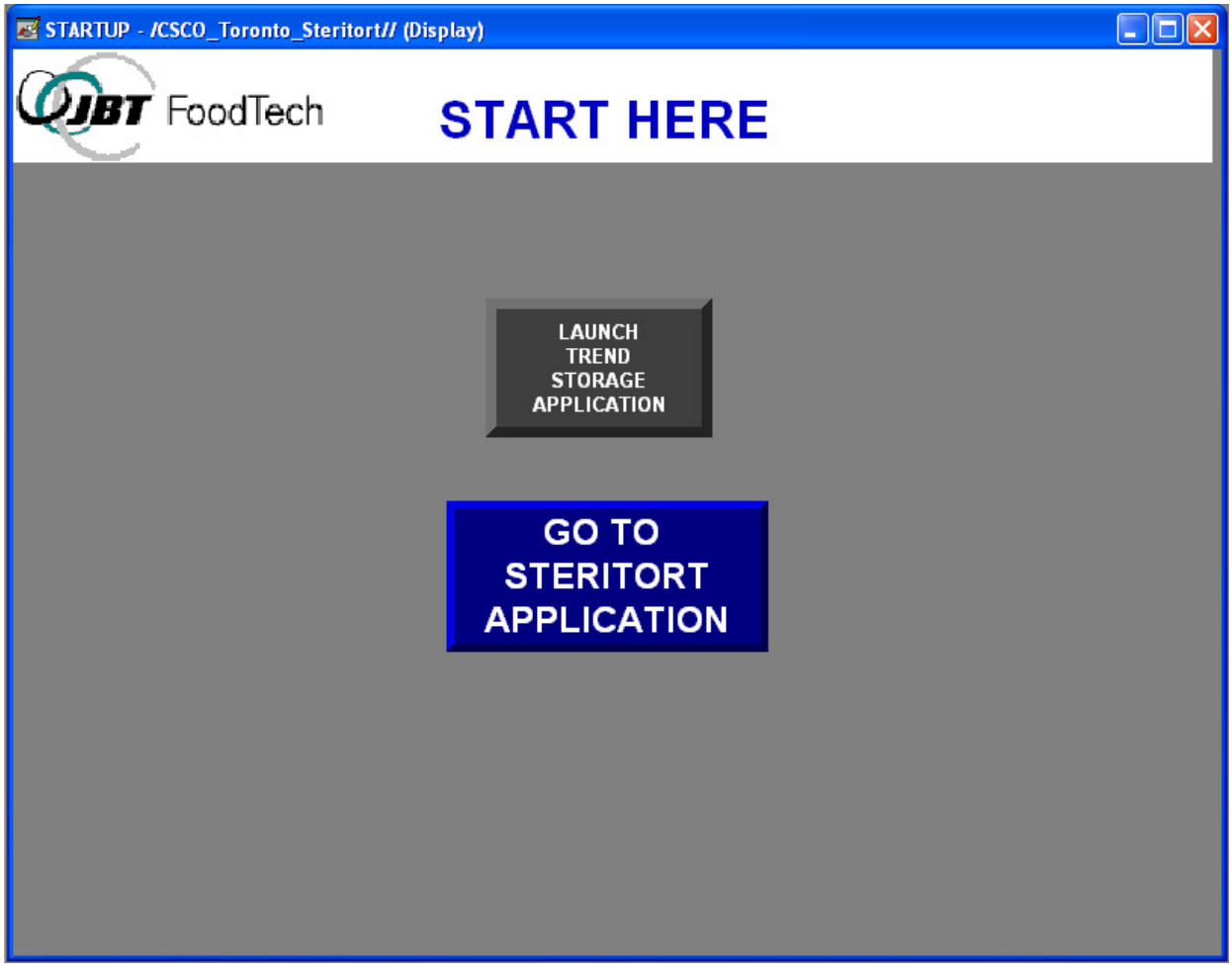

FIGURE 2-2

2.2.6.1 Start Up Screen

- The Start Up Screen provides the opportunity to launch an application that will log historical process data to a thumb drive plugged into the USB port on the control panel door.

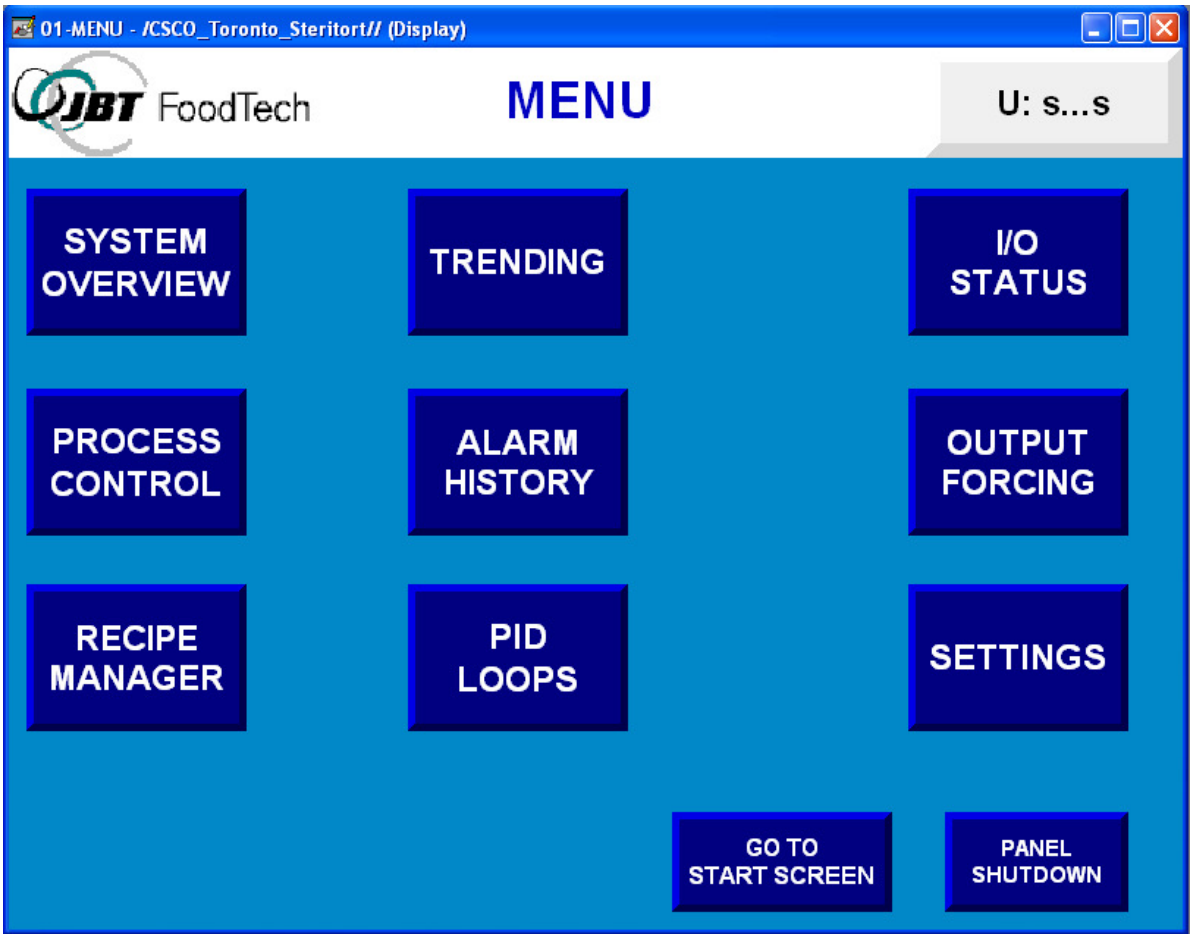

FIGURE 2-3

2.2.6.2 Main Menu

- Shows a menu of available screens with quick touch links to them.

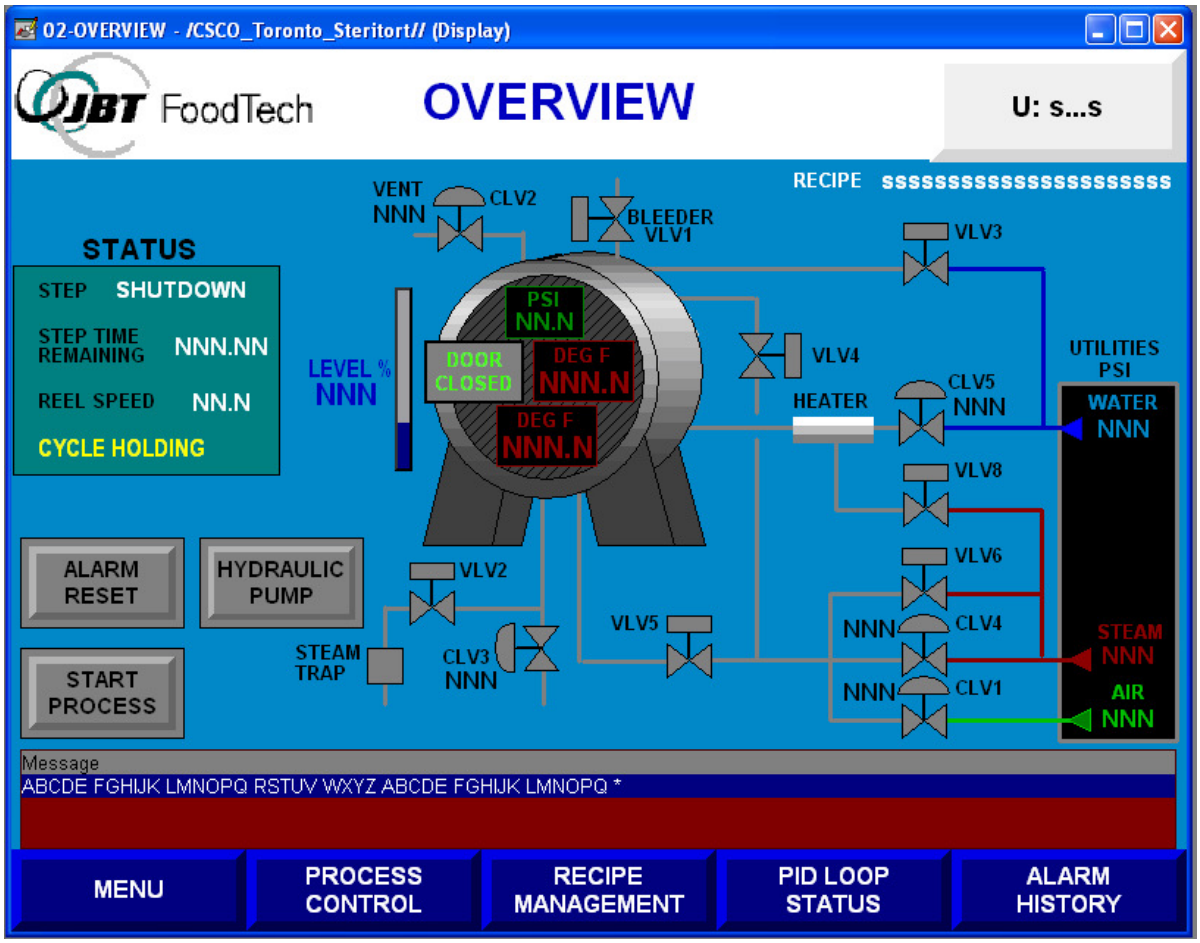

FIGURE 2-4

2.2.6.3 Process Overview

- Shows graphic of machine process, including:
  - Status of all control valves
  - Status of all analog inputs
  - Current operating step (Come Up, Cook, Pressure Cool…)
  - Currently loaded Recipe name
  - Current alarm status (window of up to 4 current alarms)

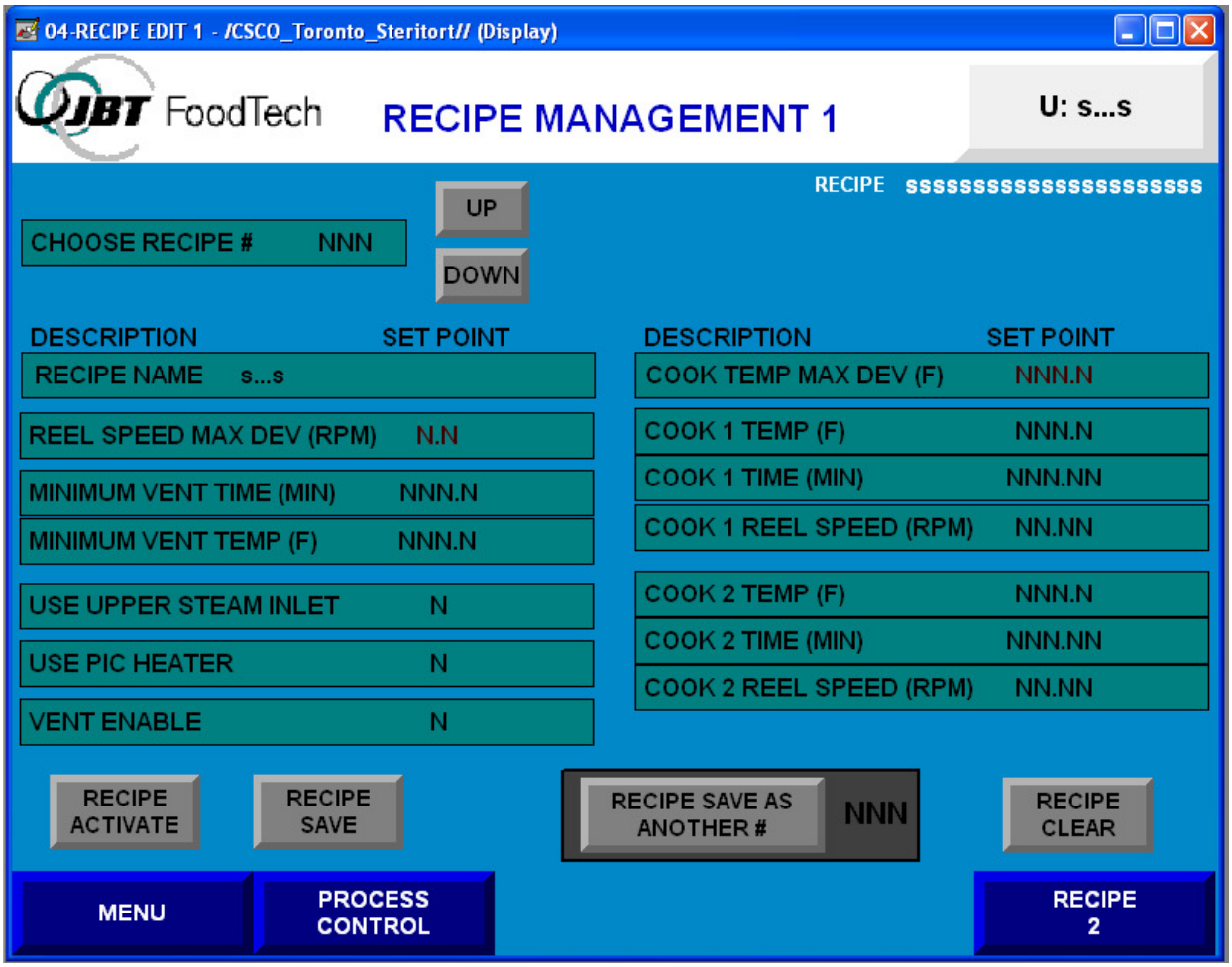

FIGURE 2-5

2.2.6.4 Recipes

- Displays Primary Recipe edit and selection Screen. User May:
  - Select a recipe by entering a number
  - Edit any Parameter of the recipe including an alphanumeric description
  - Save the recipe
  - Clear the recipe to create a new one
  - Activate a recipe to use to run a process

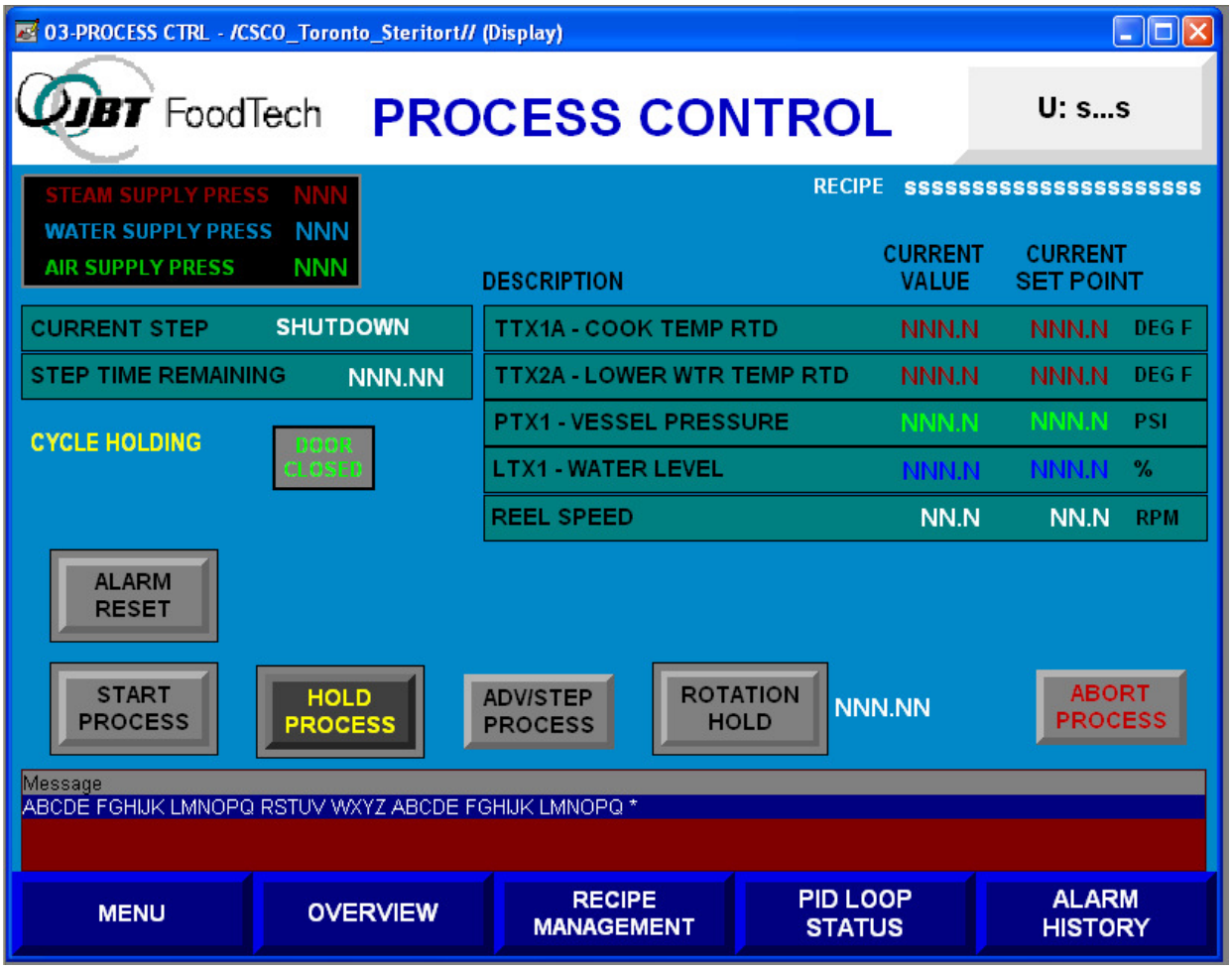

FIGURE 2-6

2.2.6.5 Process Cycle

- Displays screen for general observation & control of a process cycle. User May:
  - START the Process Cycle
  - HOLD the Process Cycle Timer
  - HOLD ROTATION to stop agitation
  - RESUME the process Cycle Timer
  - ABORT the Process Cycle
  - ADVANCE (or STEP) the Process Cycle
  - Monitoring of the Process Cycle

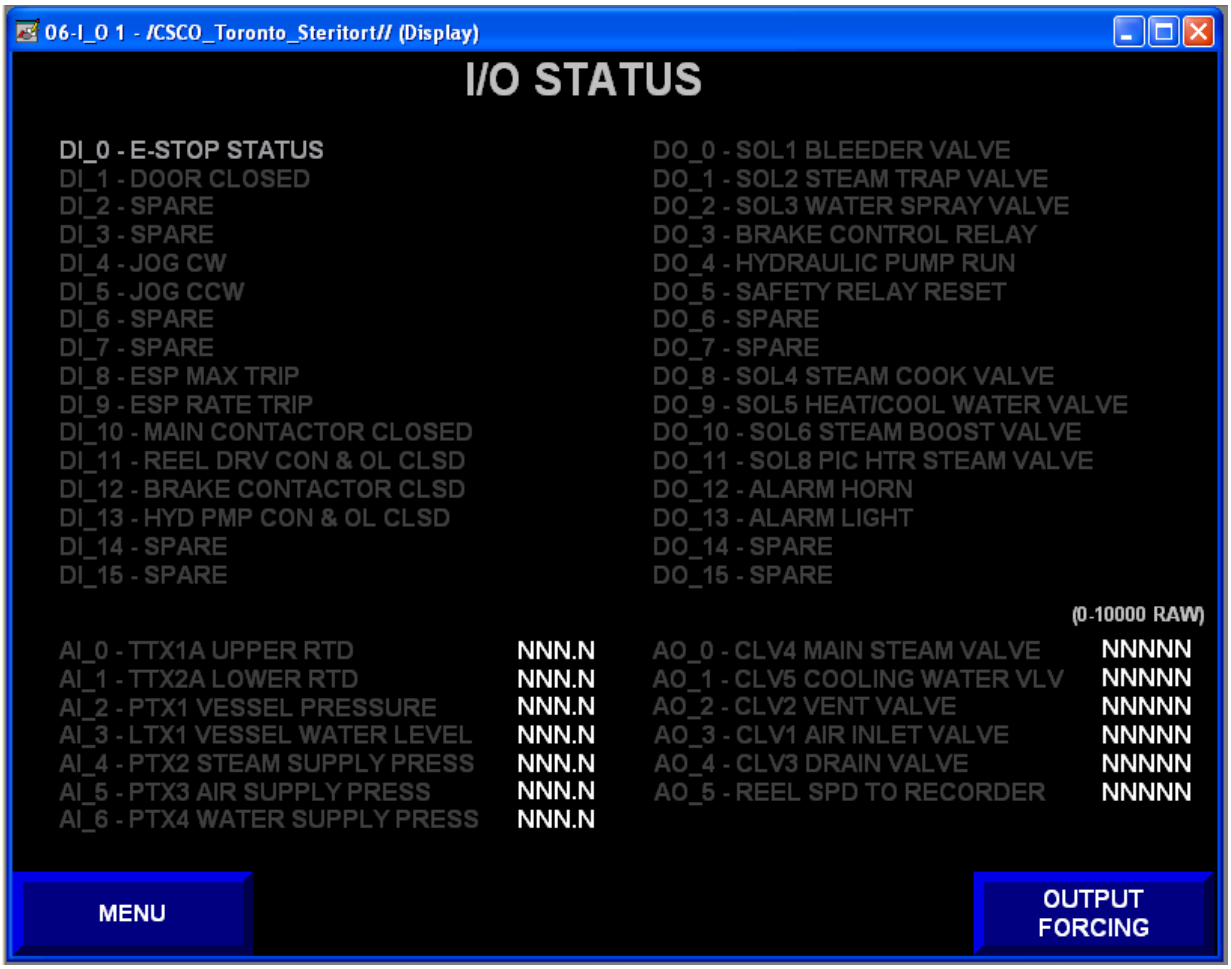

FIGURE 2-7

2.2.6.6 Machine Inputs & Outputs

- Single screen of all PLC Input and Output current status

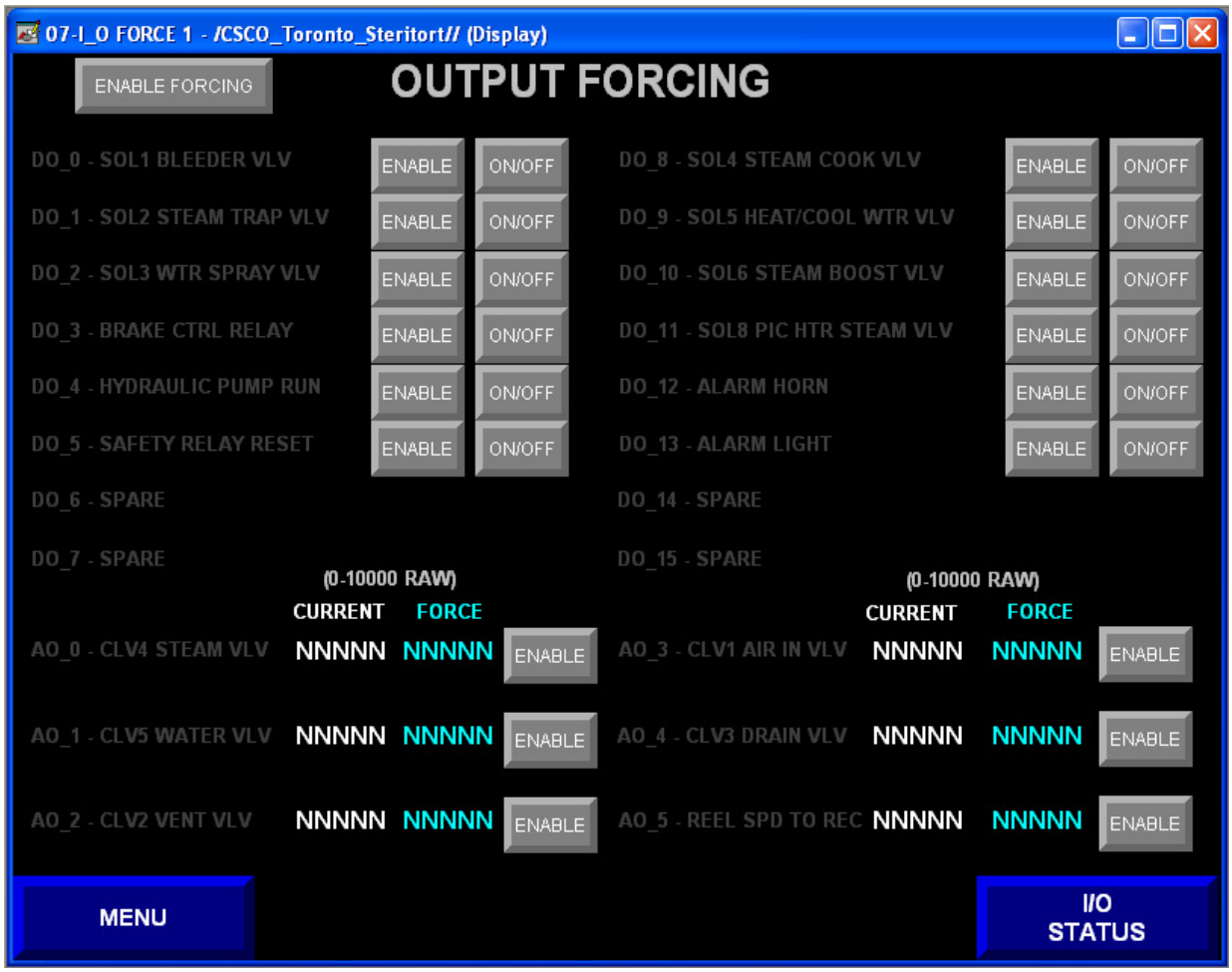

FIGURE 2-8

2.2.6.7 Machine Output Forcing / Testing

- Single screen of all PLC Outputs that can be forced with status
- Forcing Enable/Disable button for all Outputs
- Individual Digital Outputs select to force with On or Off control
- Individual Analog Outputs select to force with User provided output value

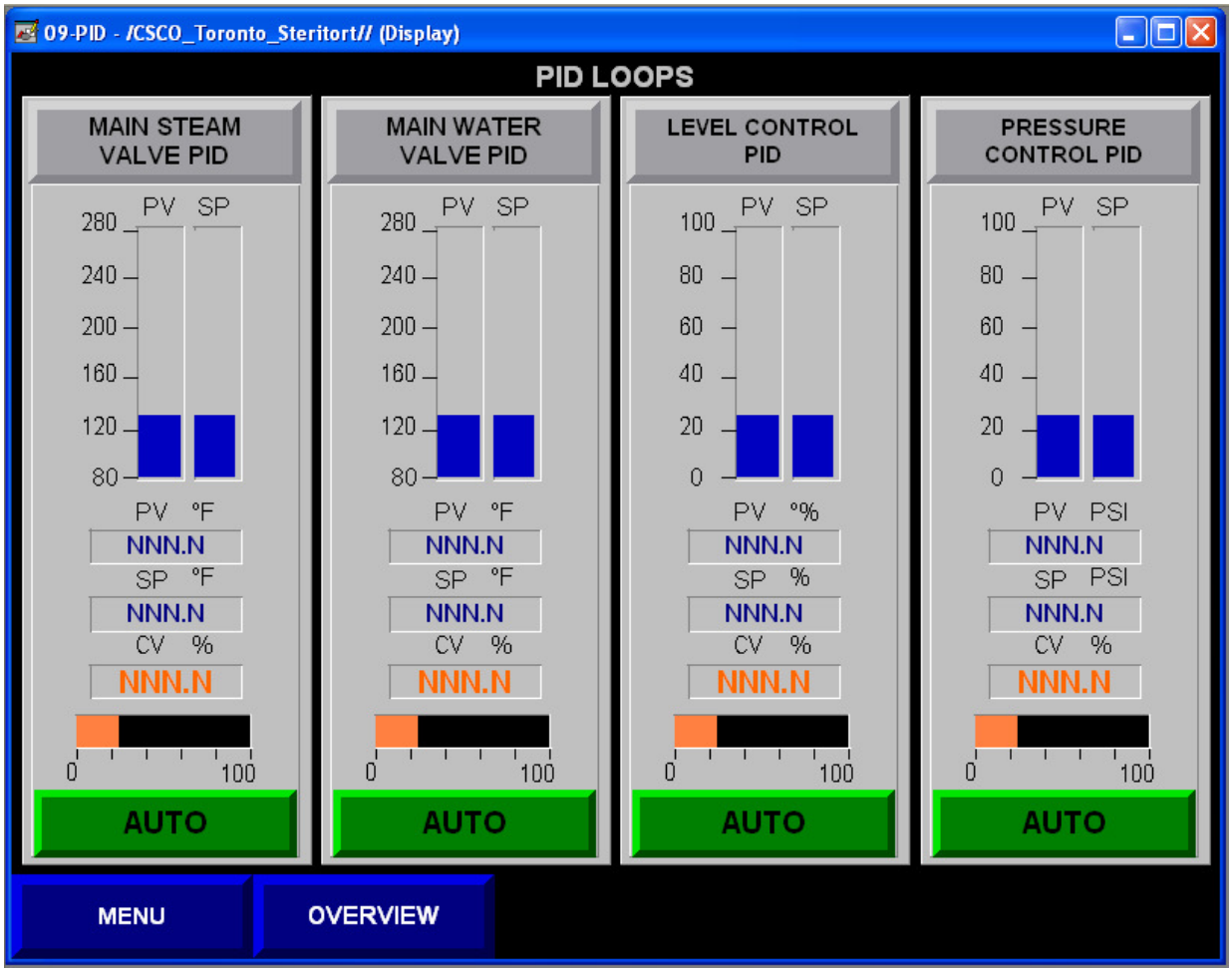

FIGURE 2-9

2.2.6.8 Process Control Loops

- P.I.D. Control Loop faceplates for Loops:
  - Steam Temp control
  - Water Temp control
  - Level control drain valve
  - Vessel Split-Range (Vent/Air) Pressure control
- Bar-Graph Displays for Process Variable (PV), Set Point (SP), and Output %
- Numeric Settings for SP, and Output %
- Auto / Manual Mode Selection
- Loop Description panel is also a push button Link to the PID Loop Tuning

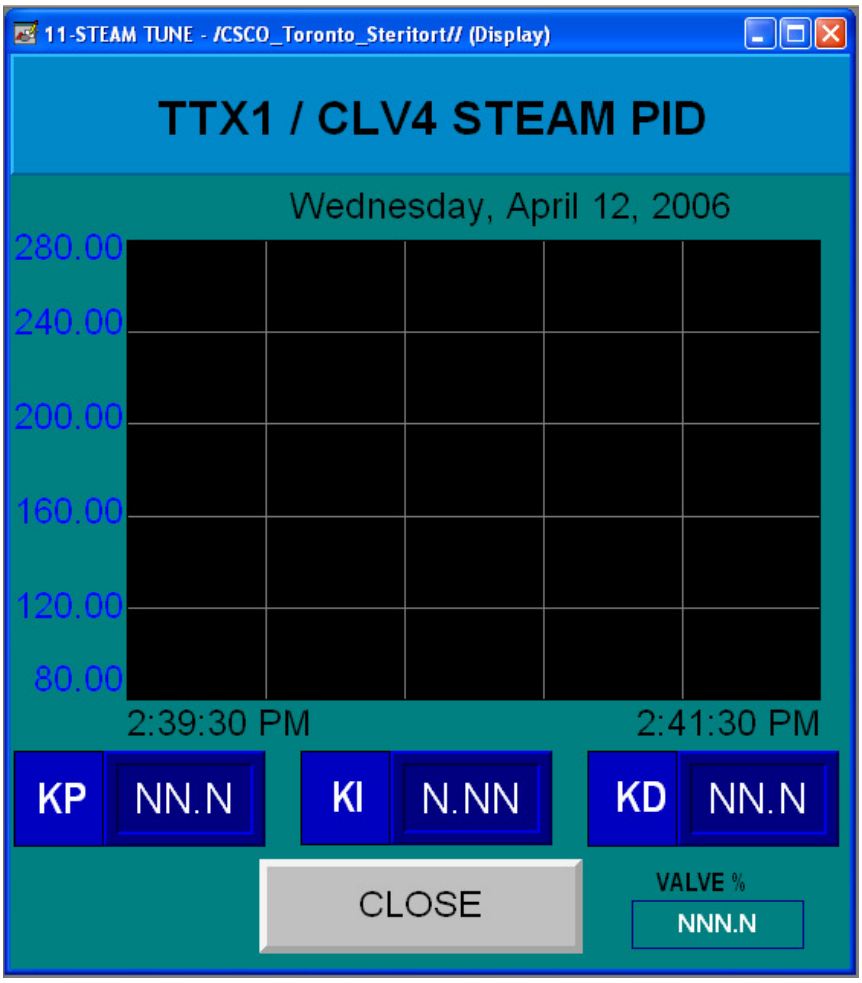

FIGURE 2-10

2.2.6.9 Process Control Loops Tuning

- P.I.D. Loop Tuning Page Example With Real Time Trend.
- The tuning screens for all control loops are similar.
  - Steam Temp Control (TTX1A)
  - Water Temp Control (TTX2A)
  - Water Level Control (LTX1)
  - Vessel Pressure Control (PTX1)

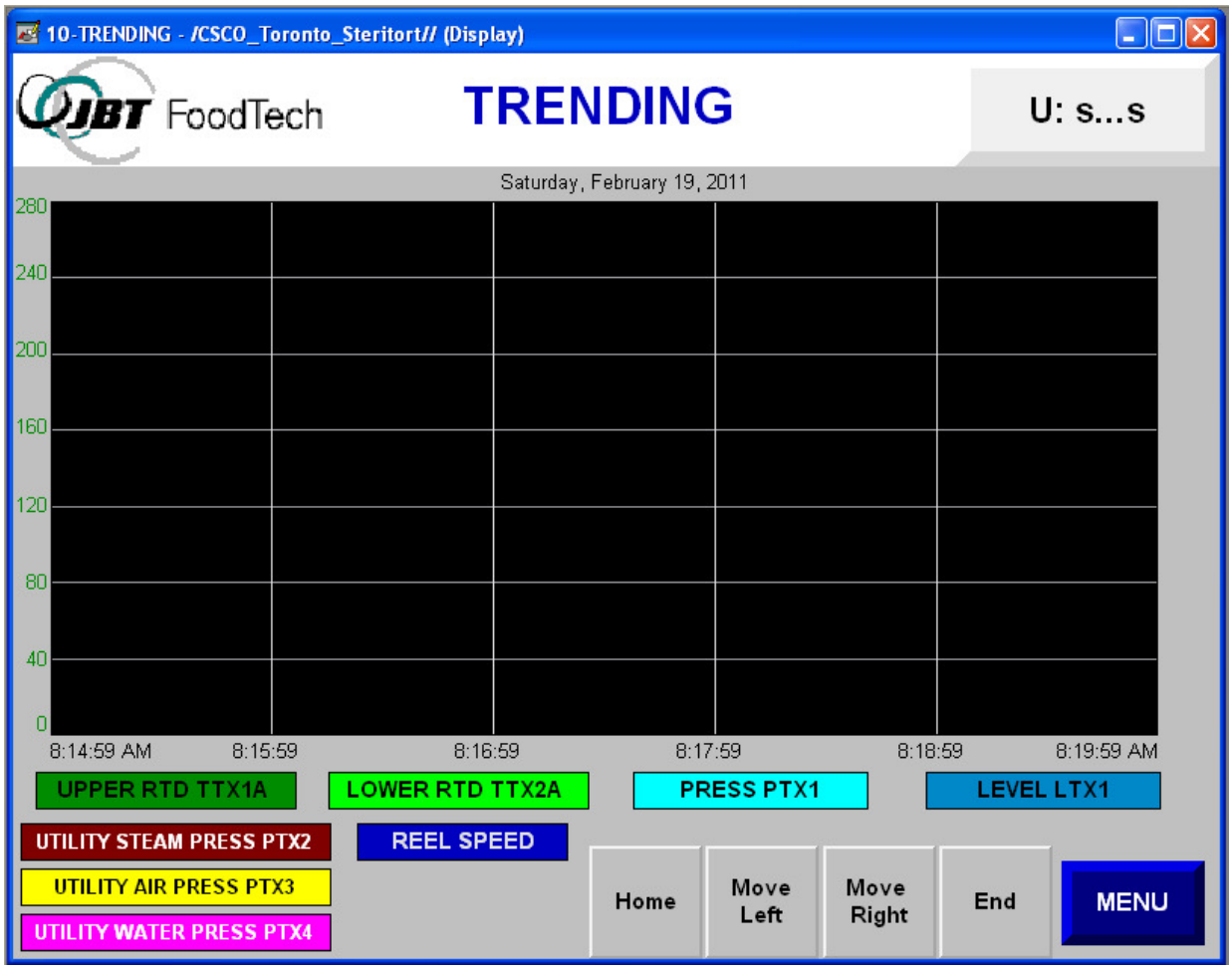

FIGURE 2-11

2.2.6.10 Historical Trends

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- Shows Historical Trend Values For Critical Process Parameters.

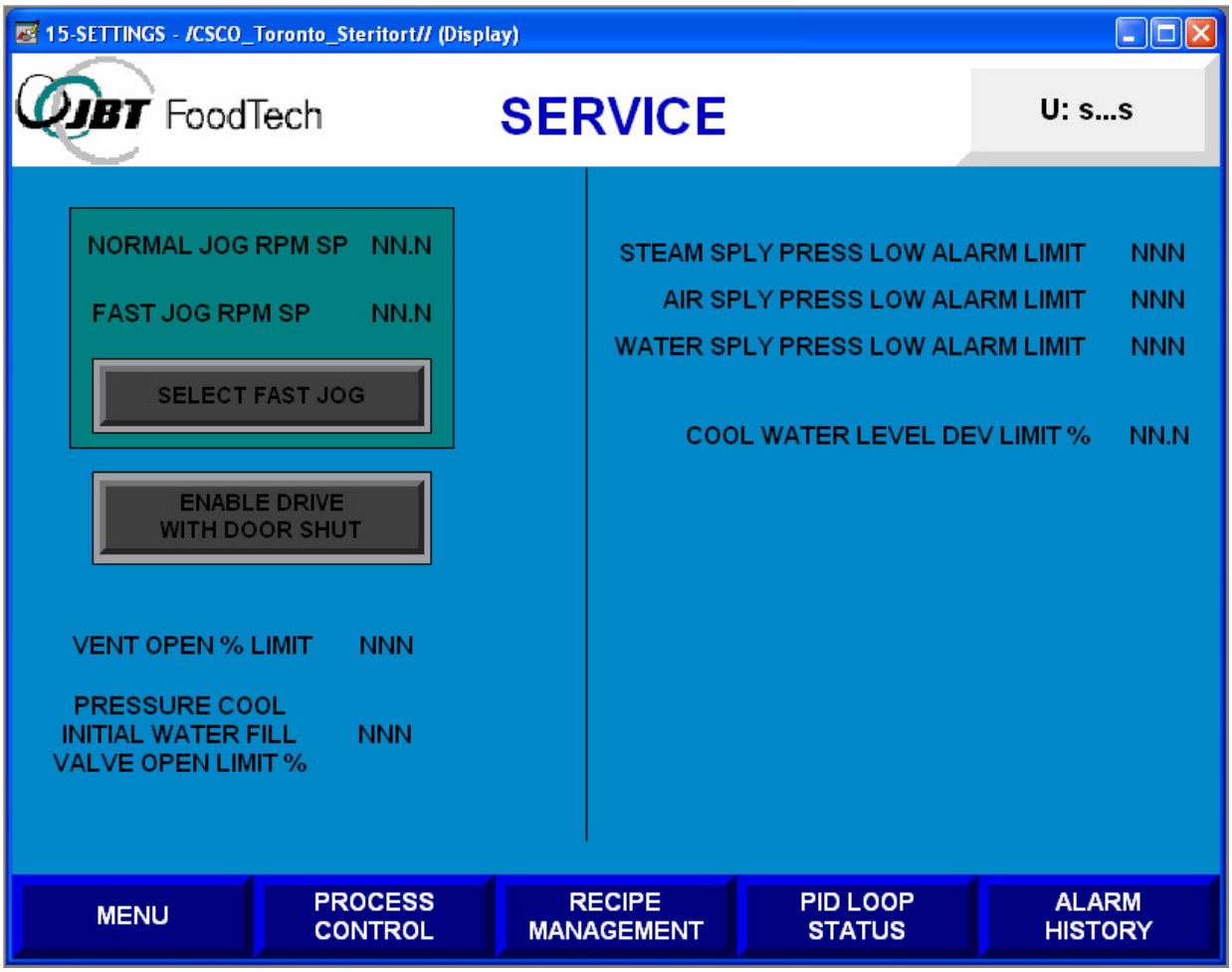


FIGURE 2-12

2.2.6.11 System Settings

- Provides System setup for certain parameters that are Recipe Independent:
  - Normal & Fast Jog Speed Set points (Fast Jog Requires Log In To Enable)
  - Drive Enable With Door Shut, Runs Drive To Check Speed
  - Vent Open Limit, Limits How Far Vent Valve Opens During Vent
  - Water Valve Initial Open Limit When Pressure Cool Starts
  - Utility Supply Pressure Alarm Deviation Limits
  - Cooling Water Level Deviation Alarm Limit

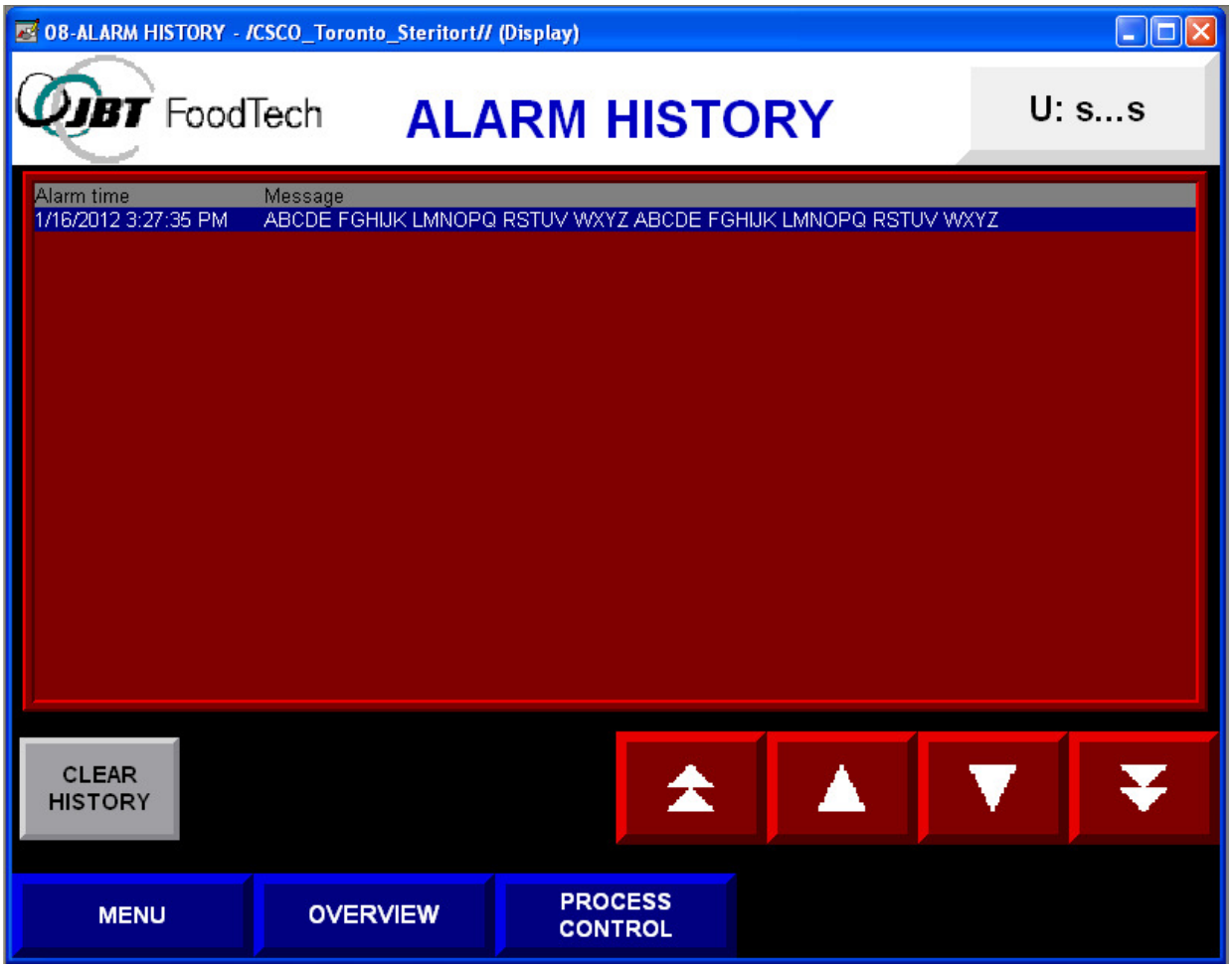


FIGURE 2-13

2.2.6.12 Alarm History

- Displays a full-screen History of system alarms with time & date

2.3 Rotary Segment Sequence: (Preheat vessel cycle first if required)

PRESSURE COOKER

COOK 1:

1. Load containers.
2. Open Vent, bleeders, Steam Trap
3. Use Steam Dome (SOL4) in Cook if selected
4. Begin Steam + boost. Cook Temp ASAP, close boost as temp approaches SP
5. Start Drive and run at Drive Speed. Stop if Deviation if “Process Stop” Enabled
6. Close Vent at Min Vent Time AND Min Vent Temp satisfied
7. End Cook at Set Point Time

COOK 2: (and so on)

8. New Temp Set Point
9. End Cook at Set Point Time

PRESSURE COOLER:

10. Bleeders closed (SOL1)
11. Air control on and stabilized briefly (10 sec.)
12. Steam off
13. Begin cooling water and fill to level, then begin control of temp.
14. Add water on temperature and drain on level
15. Limit water add on high level (Operate level + 10%)

ATMOSPHERIC COOLER:

16. Air control off
17. Top Spray (SOL4) on if selected, else use bottom (Sov-5)
18. Open vent
19. Add water on temperature and drain on level
20. Limit water add on high level (Operate level + 10%)

DRAIN:

21. All control loops off
22. Stop Reel Drive
23. Drain full Open
24. Vent full Open
25. Completed when Vessel Drained
26. Enable door open

2.4 Alarm System

2.4.1 Alarm Horn & Light

Alarm horn sounds warning if there is an alarm condition. Pressing Alarm Acknowledge will silence the horn after an alarm is triggered. The alarm light will stay on until the alarm condition is cleared.

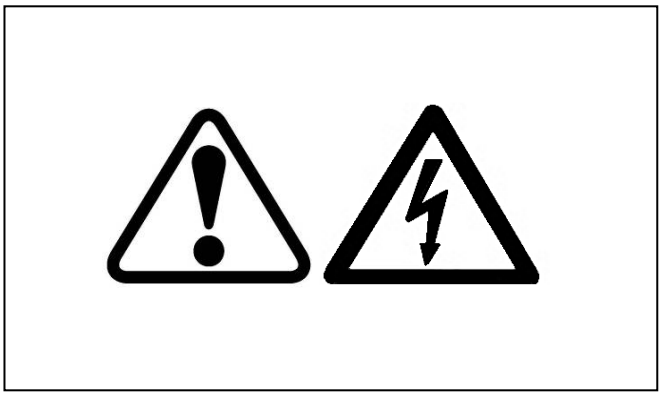
2.4.2 Alarms / Messages

PROCESS ALARMS

0. **Door Not Closed**
1. **No Valid Recipe Loaded**
2. **Spare**
3. **E-Stop Pushed**
4. **VFD Fault**
5. **VFD Alarm**
6. **Jog Error**
7. **Electronic Shear Pin - Max Load Exceeded**
8. **Electronic Shear Pin – Sudden Load Change**
9. **Drive Supply Overload**
10. **Hydraulic Pump Overload**
11. **Spare**
12. **I/O Forcing Enabled**
13. **Pressure Deviation In Cool**
14. **Low Water Level**
15. **High Water Level**
16. **Reel Speed Deviation**
17. **Cook 1 Temperature Deviation**
18. **Cook 2 Temperature Deviation**
19. **Cook 3 Temperature Deviation**
20. **Cook 4 Temperature Deviation**
21. **Spare**
22. **Spare**
23. **Spare**
24. **Condensate Level High**
25. **Hydraulic Pump Not Allowed**
26. **Spare**
27. **Abort Cycle Executed**
28. **Steam Pressure / Temperature Mismatch**
29. **Low Utility Air Supply Pressure**
30. **Low Utility Steam Supply Pressure**
31. **Low Utility Water Supply Pressure**
32. **Spare**

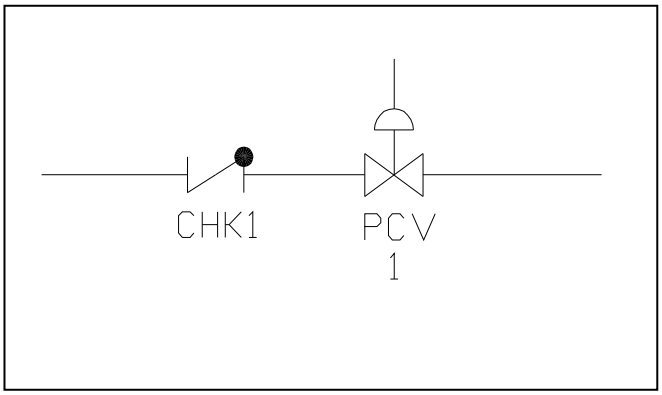
3 Mechanic

Notes:



⚠WARNING

WHEN PERFORMING MAINTENANCE OR REPAIR WORK, BE SURE POWER IS TURNED OFF AT THE STERILIZER CONTROL PANEL AND LOCKED OFF UNTIL WORK IS COMPLETED.



3.1 Piping & Instrumentation Diagram (PID)

The PID diagram, located in the parts list and drawing section, provides an overview of the control system components location within the system. Actual location on the machine may be different. The PID is mainly concerned with the functional integration. All components have been labeled for easy identification.

FIGURE 3-1 DOOR

3.2 Door Locking Controls

The vessel is equipped with a pressure activated door locking system. The door is locked and unlocked by using the door interlock handle, located on the left front side of the door. The door lever shaft is connected to a two (2)-way vent valve. In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented through this exhaust valve. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

⚠CAUTION

TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN, AND THE SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

FIGURE 3-2 DOOR INTERLOCK HANDLE

FIGURE 3-3 ADAM & EVA SAFETY SWITCH

FIGURE 3-4 HYDRAULIC CONTROL LEVER

NOTICE

The door lock lever will not open if the vessel is pressurized.

The door lock lever safety pin is actuated by vessel pressure. Once the safety pin is pushed in place, the lever cannot be rotated.

The control system utilizes an Adam and Eva safety switch which determines the position of the door lock lever and door locking ring. Until the door has been fully closed and the locking ring rotated to the closed position, all fluid supply valves, steam, air, water and vent are prevented from operating.

The control system utilizes a Adam & Eva switch, which determines the position of the door lock lever. The locking lever must be in the door open position to start the hydraulic door actuator. The door lock lever must be in its closed position for the pressure power-locking pin to seat and retain the locking lever in the door-closed position. The lock lever cannot be turned unless the locking ring for the door has been rotated to the closed position. This mechanical motion restriction of the lever prevents inadvertent damage to this lever.

The hydraulic control valve, (Figure 3-4) is used to operate the oil flow to the cylinders (Figure 3-5) which rotate the door locking ring.

FIGURE 3-5 UPPER HYDRAULIC CYLINDER

The two hydraulic cylinders lock and unlock the vessel door, by rotating the door locking ring.

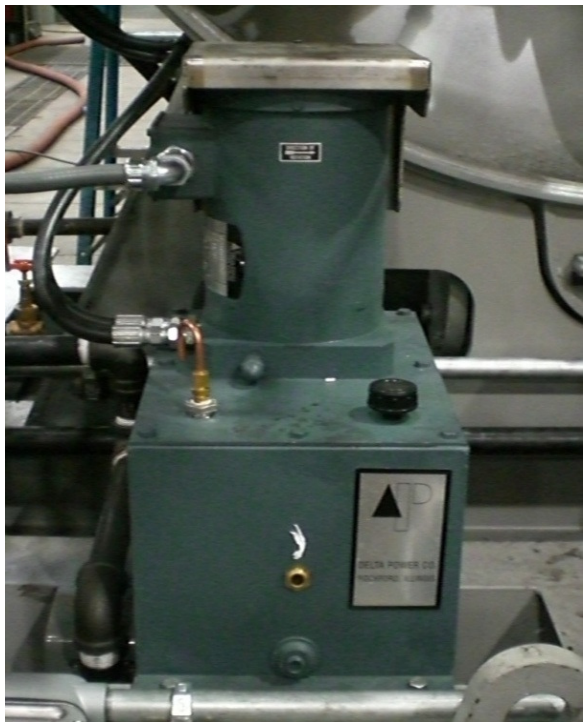


FIGURE 3-6 HYDRAULIC DOOR POWER UNIT

Hydraulic fluid pressure is supplied by the motor and reservoir shown in Figure 3-6. The fluid level within the hydraulic reservoir must be checked every (6) months.

3.3 Drive Belt Replacement

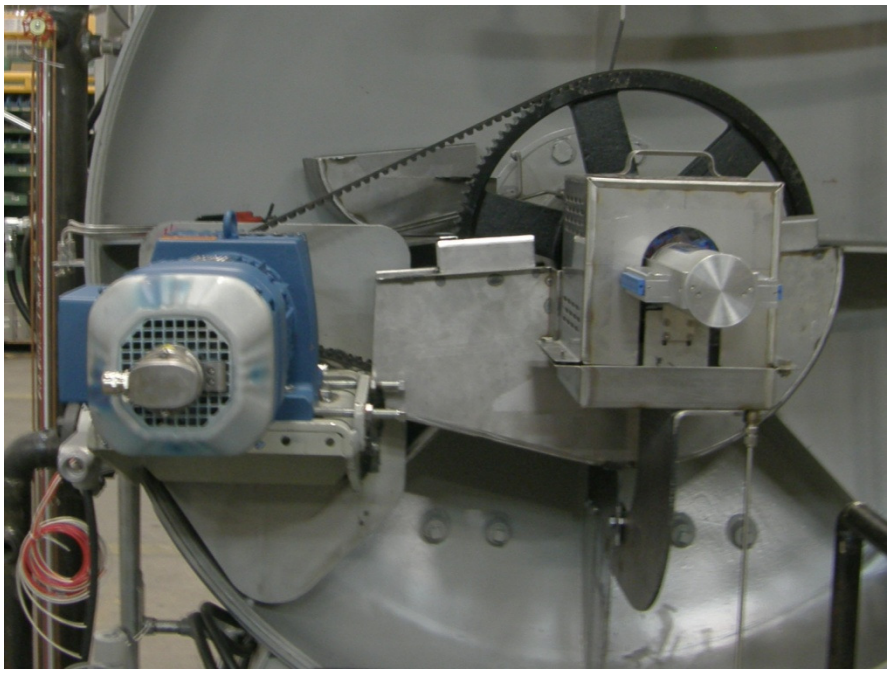


FIGURE 3-7 DRIVE SYSTEM

The drive motor shown in figure 3-7 turns the reel. The reel speed is adjustable from 1 to approximately 14 rpm. The rpm is indicated on the control panel. Jog reel speed for can loading is adjustable 0-10 rpm on setup screen.

⚠ CAUTION

A GUARD COVERS THE MOVING PARTS OF THE DRIVE ASSEMBLY.

NEVER OPERATE THE MACHINE WITH THIS GUARD REMOVED.

BEFORE WORKING ON THE DRIVE ASSEMBLY, TURN THE MAIN POWER

DISCONNECT LOCATED WITHIN THE CONTROL PANEL TO THE OFF POSITION.

To replace the drive belt perform the following steps:

1. Initiate "Lockout - Tag out" procedure for the drive motor.
2. Remove the upper section of the belt guard.
3. Loosen all 4 mounting bolts at the base of the drive motor gearbox (3/8" hex. head bolts).
4. Loosen the belt adjusting screws at the base of the drive motor gearbox to allow slack until the belt slips over the pulleys.
5. Remove the belt. In some cases the lower section of the belt guard must be removed to remove the belt.
6. To install the new belt, reverse the procedures in steps 1 thru 5.
7. Check for proper belt tension.
8. Jog the drive and check for proper alignment and tension.

3.4 Drive Belt Tension

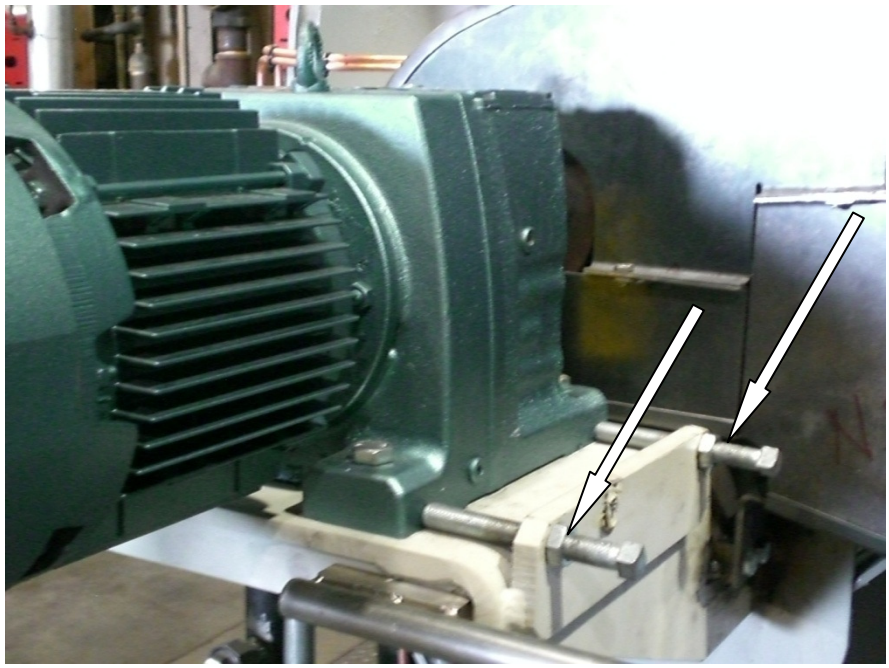


FIGURE 3-8 GEARBOX

⚠ CAUTION

A GUARD COVERS THE MOVING PARTS OF THE DRIVE ASSEMBLY.

NEVER OPERATE THE MACHINE WITH THIS GUARD REMOVED.

BEFORE WORKING ON THE DRIVE ASSEMBLY, TURN THE MAIN POWER

DISCONNECT LOCATED WITHIN THE CONTROL PANEL TO THE OFF POSITION.

To adjust the drive belt tension, loosen the mounting bolts located at the bottom of the gearbox. Turn the adjusting screws located on the side of the mounting plate until proper belt tension is achieved. Re-tighten the mounting bolts at the base of the gearbox.

NOTICE

Do not over-tighten the drive belt. Belt tension should allow between 1/2 to 3/4 inch movement (deflection) in the center section between the pulleys. This will compensate for thermal expansion during operation.

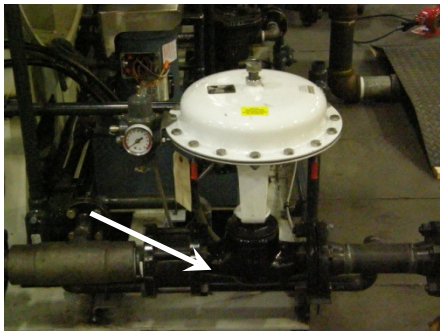


FIGURE 3-9 WATER VALVE (TCV-2)

FIGURE 3-10 SAFETY RELIEF VALVE

FIGURE 3-11 VACUUM BREAKER (VB1)

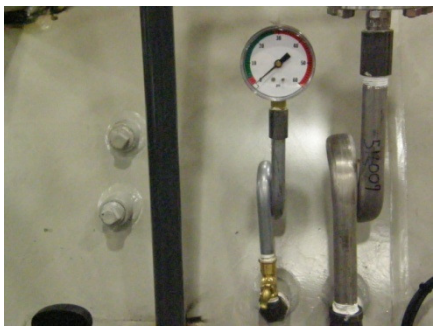


FIGURE 3-12 Press Gauge

3.5 Water

The water valve (CLV5) is shown in Figure 3-9.

3.6 Safety Relief Valve

The unit is supplied with one (1) safety relief valve. To test the safety relief valve, the National Boiler Inspection Code (NBIC) states the following:

U-111 Pressure Relief Valve;
When practical, the pressure relief valve(s) should be tested by raising the working pressure to the valve setting to check for operation at the set pressure.

NOTICE

No frequency or removal requirements have been indicated, although JBT FoodTech recommends testing the safety valve once a year.

It is recommended that safety valves be periodically blown down by operating the hand lever located on the safety relief valve. This is to ensure that they are kept in good working order and no deposits build up inside them.

3.7 Vacuum Breaker

The Steritort is equipped with a vacuum breaker (Figure 3-11), in the event of a steam collapse due to cooling beyond the vapor pressure level.

3.8 Vessel Pressure Indicator

This gauge (Figure 3-12) indicates the pressure within the Steritort vessel.

3.9 Thermometer

FIGURE 3-13

The Code of Federal Regulations states:

> Each retort shall be equipped with at least one temperature-indicating device that accurately indicates the temperature during processing. Each temperature-indicating device shall have a sensor and a display. Each temperature-indicating device and each reference device that is maintained by the processor shall be tested for accuracy against a reference device for which the accuracy is traceable to a National Institute of Standards and Technology (NIST), or other national metrology institute, standard reference device by appropriate standard procedures, upon installation and at least once a year thereafter, or more frequently if necessary, to ensure accuracy during processing. Each temperature-indicating device and each reference device that is maintained by the processor shall have a tag, seal, or other means of identity.

Therefore, JBT FoodTech recommends that at least once a year, or whenever accuracy is in question, the Temperature indicating device must be tested for accuracy against a known standard like a Certified Precision ASTM thermometer.

3.10 Checking the Accuracy of Thermal Processing Thermometers

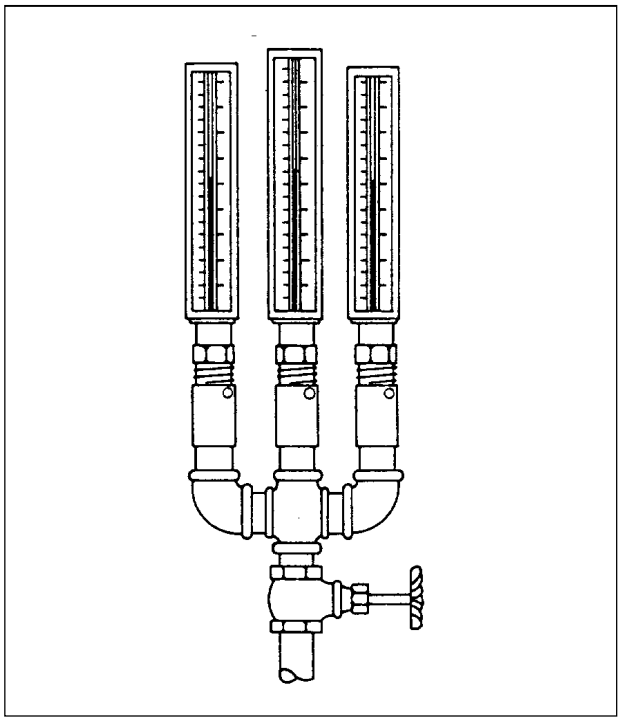


FIGURE 3-14

The mercury-in-glass thermometer is not a foolproof instrument. It must be calibrated and maintained in good operating condition.

One system for checking the accuracy of mercury-in-glass thermometers is illustrated above.

This system employs the following equipment:

1. A mercury-in-glass thermometer of known accuracy that has been standardized against a certified thermometer at the appropriate thermal process temperatures.

2. A cross of 3/4-inch pipe fittings for holding thermometers, with l/16-inch holes for bleeders drilled in the couplings holding the thermometers.

Install the testing equipment in any convenient 3/4-inch hole in a retort or in the steam manifold. Remove the cover glasses from the thermometers to be tested and check for loose stems by gently attempting to move the stem up and down. Thermometers with loose stems should not be used; they should be repaired or replaced.

Place the thermometers in the test equipment with the known accurate standard thermometer between them.

Bring the retort or steam manifold to the appropriate thermal processing temperature, making certain that it is vented sufficiently to eliminate all air.

Open the steam valve on the test equipment and allow the thermometers to come to equilibrium, which will require 10 to 15 minutes. If adjustment is required, loosen the screws on the temperature scale and adjust it up or down so that it reads the same as the standard thermometer.

Tighten the scale adjustment screws and take another reading to make certain the thermometers are properly standardized. For identification purposes, mark each thermometer and keep a record of the date on which each thermometer was standardized. Mark broken thermometers in such a way that they will not be used. Clean the cover glasses and replace them on the thermometers.

FIGURE 3-15 WATER LEVEL SIGHT GLASS

3.11 Water Level Sight Glass

The water level within the vessel is visually indicated by the water level in the sight glass (Figure 3-15).

3.12 Reels

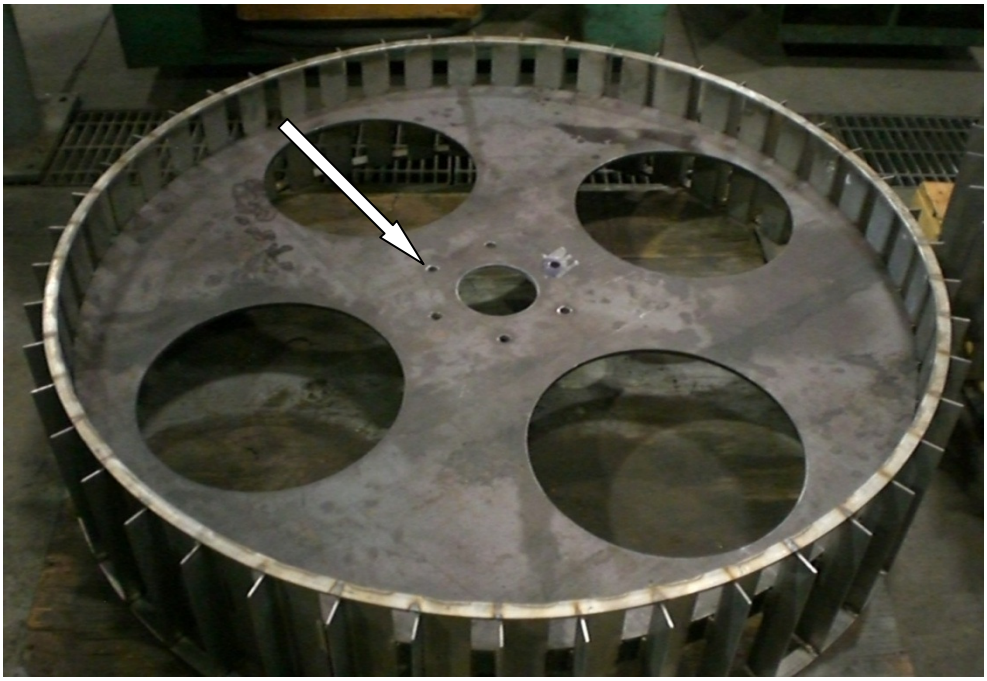


FIGURE 3-16

Laboratory Pressure Sterilizer reels are similar in construction to Sterilmatic reels. The function of the Laboratory Pressure Sterilizer reels varies with the process to be simulated. For still retort simulation, no product agitation is necessary, so the reel remains stationary. Sterilmatic products are agitated and require a revolving reel. In Sterilmatic processing the product is agitated because the reel allows the cans to roll along the bottom of the shell for about ¼ turn of reel movement.

Interchangeable reels permit the processing of a wide range of can sizes. The can capacity of each reel depends on the length of the can. The reels are 10-1/4" long, so if the cans are under 502 in length, two cans will fit on each step. Changing from one reel to another may be accomplished efficiently with a hand-operated forklift.

3.12.1 Can size and capacity for each removable reel:

401 or 404 diameter cans:

- 35 step, 70-can capacity

Combo Reel

211, 300 or 303 diameter cans:

- 48 can capacity

307 diameter cans:

- 40 can capacity

3.12.2 Changing reels

Loosen the 6 lug nuts (Figure 3-16) holding the reel to the reel shaft hub. Reels may be changed efficiently by using a hand-operated forklift. Hold the reel with the two forks on the lift about six inches through two of the four circular cutouts. Carefully lift the reel weight off the hub studs. Remove the 6 lug nuts and back away slowly from the main shaft hub.

Reverse the above steps to install the new reel.

3.13 Condensate removal system

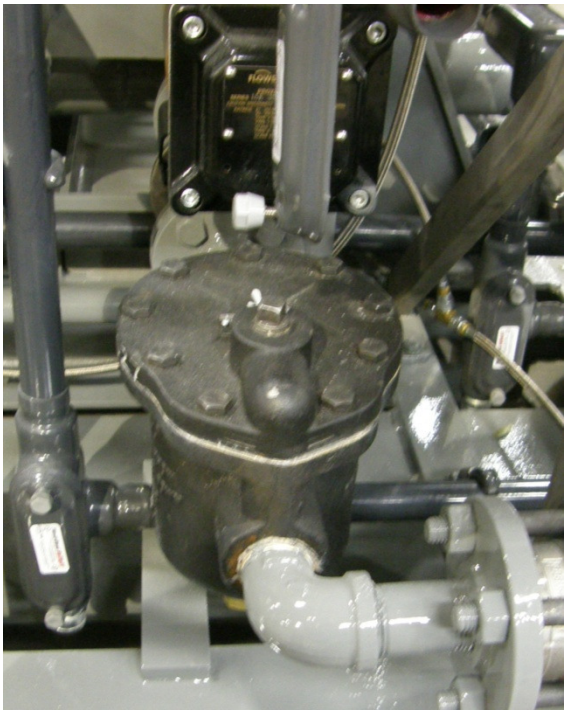


FIGURE 3-17

The Steritort vessel is equipped with a trough, which provides for low condensate return. The trough has been equipped with a low position inverted bucket condensate trap. The trap is isolated by a 90-degree turn ball valve for pressure or atmospheric cool operation.

The low end of the trough is connected to the vessel sight glass. This allows the operator to see any remaining condensate in the trough.

3.13.1 Steam Traps

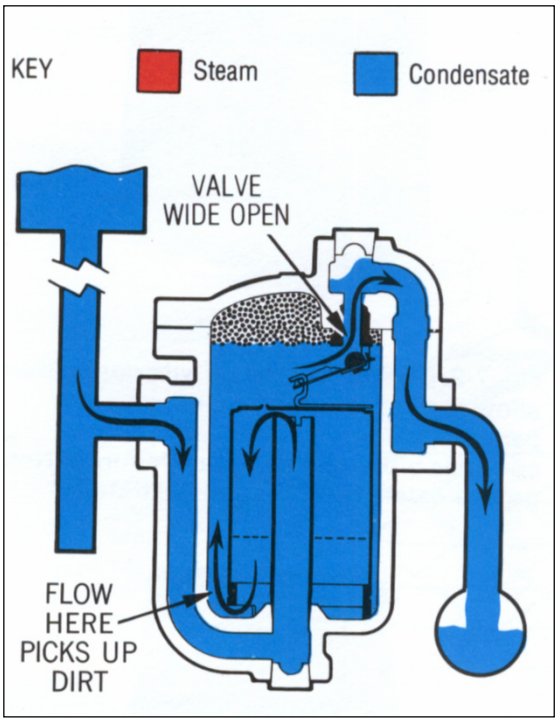


FIGURE 3-18

The steam trap (Figure 3-18) automatically discharges condensate that collects within the trough. The following inspection and repair information is very important.

3.13.1.1 Hourly inspection

Once every hour of operation, check to ensure that the trap is intermittently discharging condensate.

3.13.1.2 Steam Trap Operation

Steam Trap Operation at Pressure Closed To Maximum

The steam trap is installed in the drain line, between the sterilizer and condensate return header.

At this point, the bucket is down and the valve is wide open (Figure 3-20). As initial flood of condensate enters the trap and flows under the bottom edge of the bucket, it fills the trap body and completely submerges the bucket. Condensate then discharges through the valve (which is now wide OPEN) to the return header.

Steam also enters the trap under the bottom edge of the bucket, where it rises and collects at the top, imparting buoyancy.

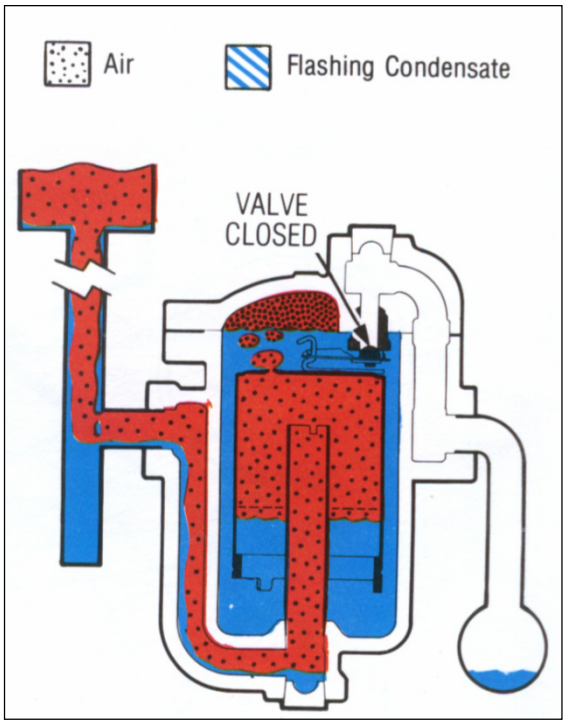


FIGURE 3-19

The bucket then rises lifting the valve towards its seat until the valve is tightly CLOSED (Figure 3-19).

Air and carbon dioxide continually pass through the bucket vent and collect at the top of the trap. Any steam passing through the vent is condensed by radiation from the trap.

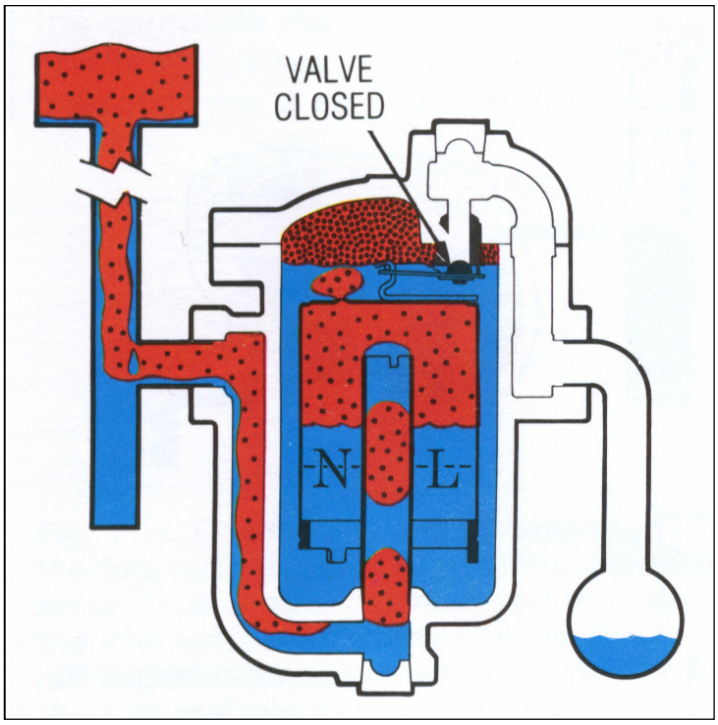


FIGURE 3-20

When condensate enters, it brings the condensate level slightly above the neutral line and the bucket exerts a slight pull on the lever (Figure 3-20). The valve does NOT open however, until the condensate level rises to the opening line for the existing pressure differential between the steam and the condensate return header.

When the condensate level reaches the opening line, the weight of the bucket, times leverage, exceeds the pressure holding valve to its seat.

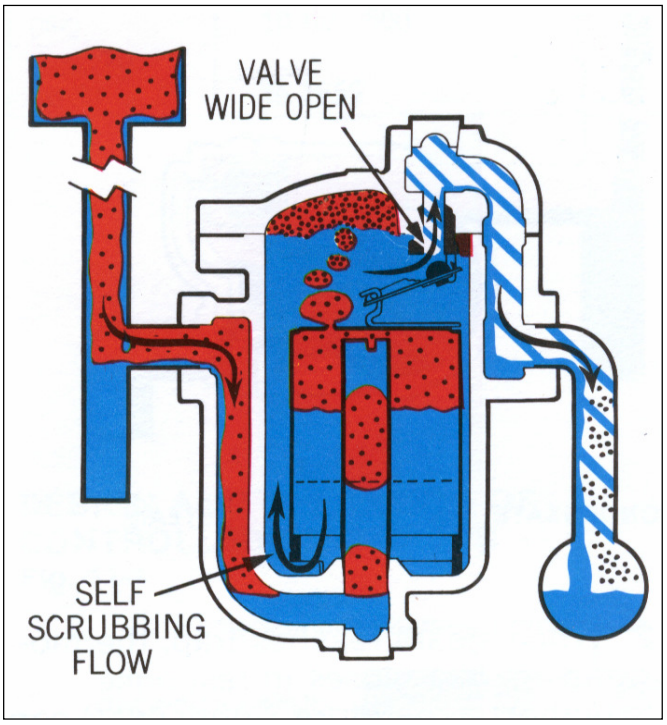


FIGURE 3-21

The bucket then sinks, opening the trap (Figure 3-21). Any accumulated air is discharged first followed by condensate. Discharge continues until more steam floats the bucket at which time the cycle begins to repeat.

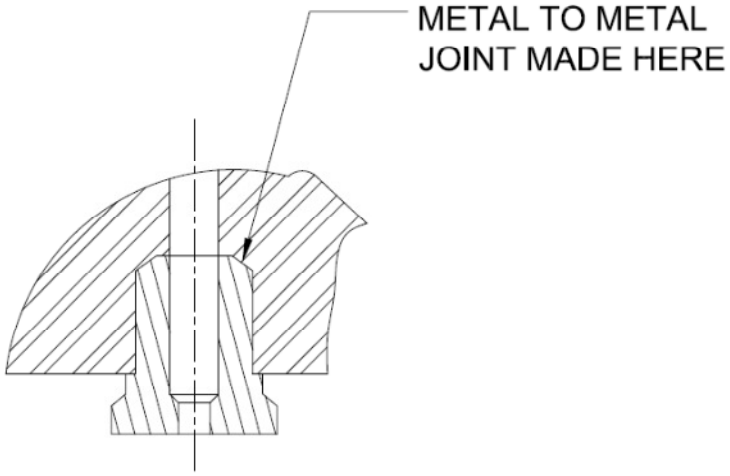


FIGURE 3-22

3.13.1.3 Troubleshooting

If the trap blows steam continuously, the trap valve is not seating due to foreign material within the orifice, or the valve parts are worn or defective.

If there is no condensate discharge from the trap and the trap is cold to the touch, the trap may be filled with foreign material or the trap parts are worn or defective.

NOTICE

Be sure the valve between the shell and the trap is open before judging the trap to be faulty.

3.13.1.4 Repair

Valves and Seats

If the valve seat has a sharp smooth edge and a narrow bright ring around the ball valve, the valve is too tight. Valves and seats that have become wire drawn or badly grooved should be replaced. Do not use a new seat with an old valve or vice versa. Valves and seats are factory lapped together in matched sets for perfect fits.

When valves and seats have worn enough to require renewal, a new lever and guide pin assembly should also be installed.

Valve Seat Installation

When installing valve seats, do not use pipe dope or lubricant on the seat threads. The joint is made by contact between the ground end of the valve seat and the beveled seating area at the bottom of the tapped hole (Figure 3-22). Make sure this seating area is perfectly clean.

NOTICE

Valve seat is made at point of contact indicated, not by threads.

Replace lever and guide pin assembly.

When new valve parts are used with an older lever, bucket travel, valve opening and trap capacity are reduced. With used and worn guide pins, the valve is not guided as closely to its seat. Poor guidance develops leaks quickly because the valve can strike to the side of the seat, instead of center.

When you install a new mechanism, less bucket or a pressure change assembly, you make the trap as good as new.

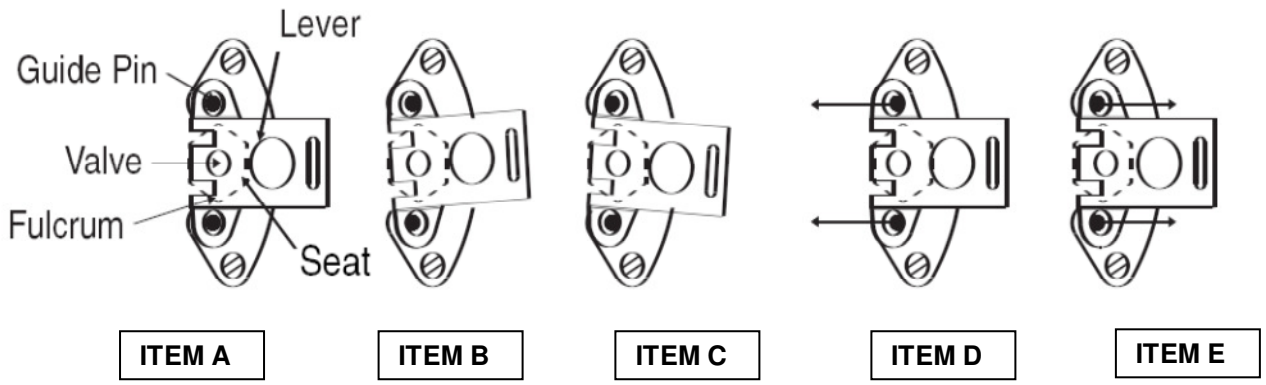


FIGURE 3-23

Alignment of Guide Pins

To check the alignment of the guide pins, hold the lever against the valve seat with the valve contacting its seat, with the two fulcrum points resting on the face of the seat. When the lever is held in this position, the guide pins should be in the center of the guide pin holes (Figure 3-23-A).

There should be equal side to side movement of the lever (See Figure 3-23-B and 3-23-C). Bend the pins until they are centrally located. Use care to ensure that the pins remain perpendicular to the guide pin plate so the lever can drop until it rests on the guide pin hooks.

Figure 3-23-A shows CORRECT ALIGNMENT of guide pins. When correctly aligned, lever can be moved sideways the same distance to the right (Figure 3-23-B) as to the left (Figure 3-23-C).

Figures 3-23-D and 3-23-E are two examples of INCORRECT ALIGNMENT. Guide pins should be bent in direction of arrows until they center in holes as shown in Figure 3-23-A.

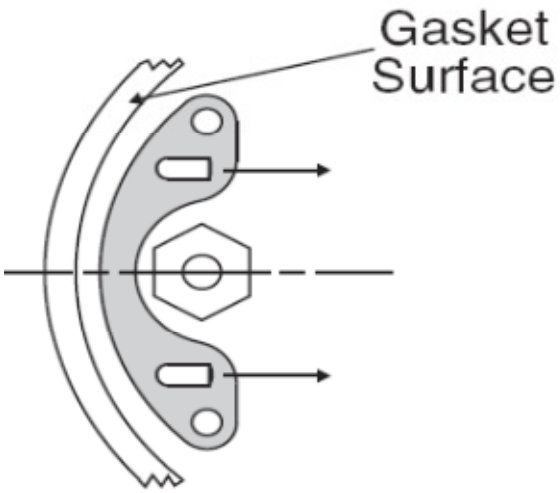


FIGURE 3-24

Guide Pin Assembly *I*nstallation

Install with hooks pointing away from adjoining gasket surfaces as shown in Figure 3-24

Lever Assembly

The lever assembly is hooked over the guide pins. In a few sizes of traps, particularly at low pressures, the valve lever assembly must be slipped on the guide pins before the guide pin assembly is fastened into position.

Guide pin plate locations (Figure 3-23).

Pins always point away from adjoining gasket surfaces.

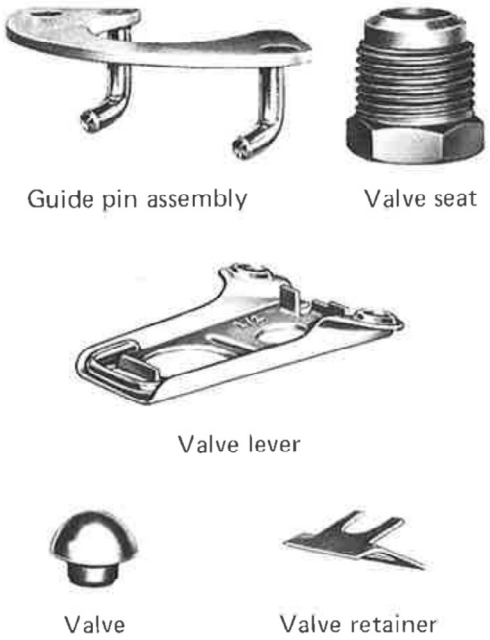


FIGURE 3-25

Spare Parts for Steam Trap

Keep one (1) set of the parts as listed in Figure 3-25 for each steam trap. In addition, keep one (1) trap gasket for each trap. For the nearest supplier, contact Spirax Sarco 1150 Northpoint Blvd. Blythewood, SC 29016, U.S.A., and Telephone: (800) 575-0394.

How to Order Repair Parts

For operating machines, specify trap number and maximum operating pressure or orifice size. For gaskets, specify trap number.

A mechanism, less bucket or pressure change assembly includes:

- Valve seat
- Valve
- Valve retainer
- Lever
- Guide pin assembly with screws

These plates come in matched sets, with orifice size stamped on the lever and guide pin assembly, as well as on the orifice itself.

3.14 Control Valves

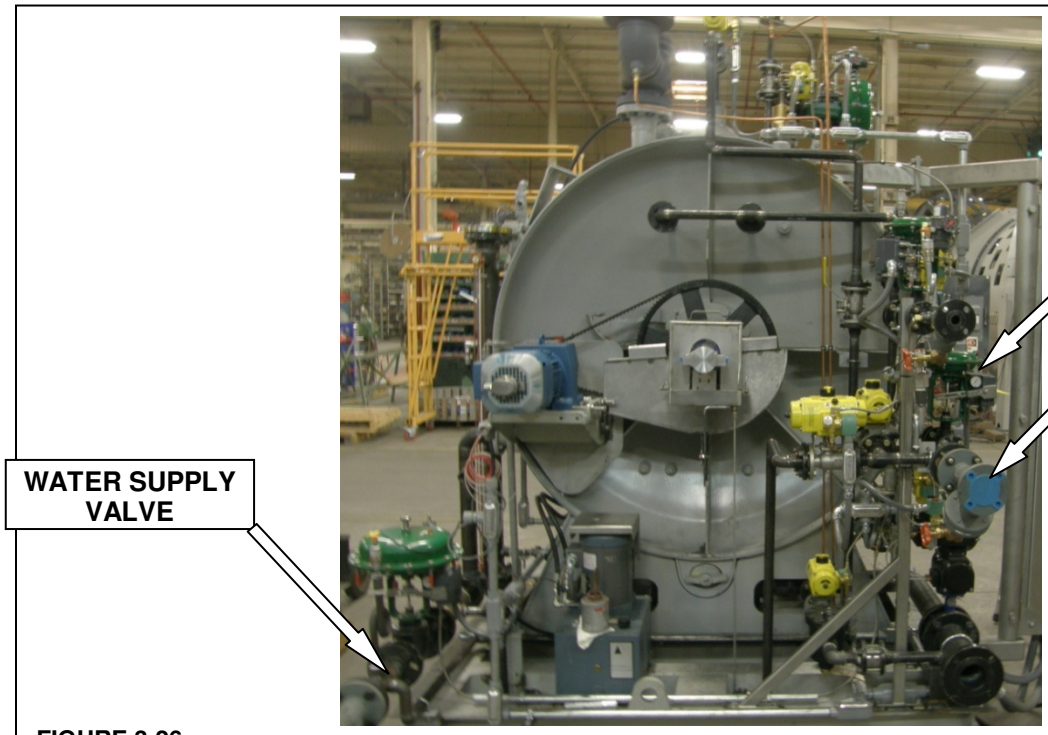


FIGURE 3-26

3.14.1 Function Description

The Laboratory Sterilizer has been equipped with a series of drain and supply control valves.

Valve movement and position can be determined by observation of the valve stem. Each globe control valve is equipped with a series 3661 I/P positioner and a pressure regulator.

Maximum air supply pressure to actuator is 45 psig.

NOTICE

All globe control valves are equipped with air to open actuator. These valves will fail closed in the event of air pressure or failure.

FIGURE 3-27 BLEEDER VALVE

3.14.2 Bleeder Valves

Bleeder valves are required to bleed a minimum volume of steam to prevent any potential air from accumulating in the sterilizer vessel.

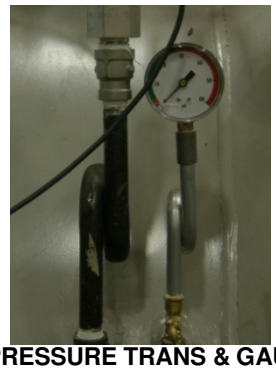


FIGURE 3-28 PRESSURE TRANS & GAUGE

3.14.3 Transmitters

The pressure transmitter (Figure 3-28) is used to sense pressure within the Steritort shell.

FIGURE 3-29 RTD

The temperature transmitter (Figure 3-29) is used to sense temperature within the Steritort shell. An RTD is connected to this transmitter and 4-20 ma. is outputted to the control system & chart recorder.

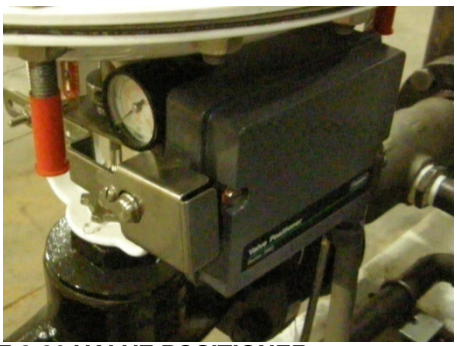


FIGURE 3-30 VALVE POSITIONER

3.14.4 I/P Valve Positioners

Each control valve comes equipped with an I/P positioner (Figure 3-30). These valve mounted positioners assure an exact relationship between actuator valve stem position and controller input signal. The gauges should indicate approximately 20 psi for proper operation of the control valve.

The control valves are equipped with a series 3661 I/P positioner. The positioner provides gain adjustment and stroking speed control. These adjustments provide an unusual capability of matching valve performance with process loop system dynamics. For adjustment details, see series 3661 I/P positioner document.

3.14.5 Steam Control Valve

The Steritort has been equipped with one (1) steam inlet.

This valve (Figure 3-31) allows the steam to flow to the trough via the steam log and/or to the rear head nozzles.

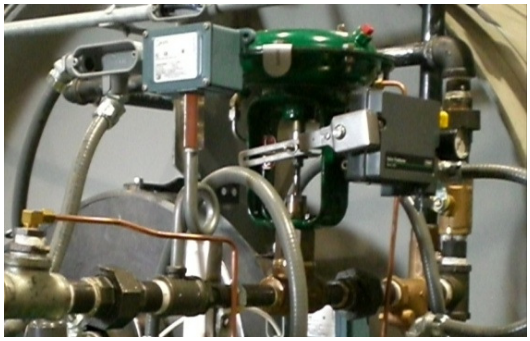


FIGURE 3-31 STEAM CONTROL VALVE

3.14.6 Drain Control Valve

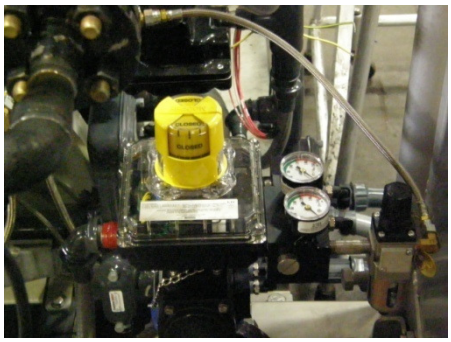
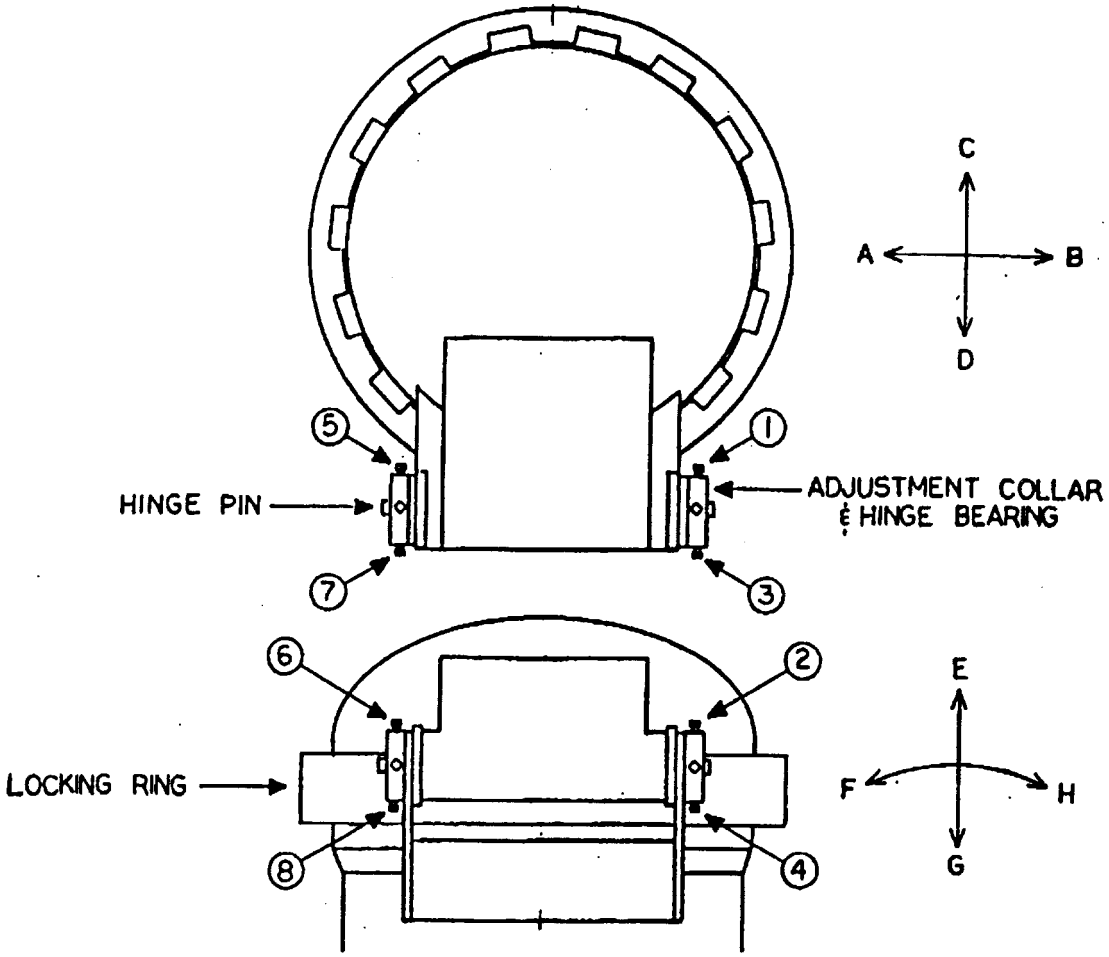


FIGURE 3-32 DRAIN CONTROL VALVE

3.14.7 Steam Condensate On/Off Valve & Trap

FIGURE 3-33 STEAM CONDENSATE CONTROL

3.15 Door Hinges



DOOR ADJUSTMENT								
MOVEMENT DIRECTION	ADJUSTMENT BOLT							
	①	②	③	④	⑤	⑥	⑦	⑧
"A"	L		T		T		L	
"B"	T		L		L		T	
"C"	L		T		L		T	
"D"	T		L		T		L	
"E"		L		T		L		T
"F"		L		T		T		L
"G"		T		L		T		L
"H"		T		L		L		T

L - LOOSEN

T - TIGHTEN

FIGURE 3-34 DOOR HINGE ADJUSTMENT CHART

3.16 Maintenance Chart

Component	Operation	Frequency	Procedure
Door			
O-ring and sealing faces	Clean	After each cycle	Wiping is usually adequate
O-ring gasket	Replace	First indication of leakage	Insert the gasket at four spaced points to insure uniform gasket distribution. Use pressure of the door closing to seat the gasket into the groove.
NOTICE **DO NOT STRETCH THE GASKET WHEN INSTALLING IT IN THE GROOVE. DO NOT USE PETROLEUM BASED LUBRICANTS ON ETHYLENE PROPYLENE GASKETS.**			
General alignment and tightness	As required	Check weekly	See door hinge adjustment chart at F
Control Cabinet			
Cooling	Cooling check	Bi-monthly	Check control panel cooling fan filter

Refer to vendor's literature for more specific parts and service information on all mechanical components.

Notes:

4 Electrical

Notes:

The electrician should read and understand all information within this manual before attempting any maintenance or adjustments to the equipment.

The electrical installation (see General Section) should be performed in accordance with instructions in this manual and local/national codes. It should only be done by a licensed/qualified electrician. Waterproof fittings should be used for all electrical work on this machine. All electrical connections should be inspected for defects such as loose connections and corrected as necessary before the machine is energized (JBT FoodTech recommends this be done yearly).

NOTICE

It is the responsibility of the operator to ensure that all personnel are clear of the machine and that no start-ups are attempted unless there has been a clearance of all personnel out of the area. Any maintenance activities that actually involve working on the machine should only be implemented after the power has been shut down and locked out. If possible, it is strongly recommended that the power be shut down to the whole machine and the EMERGENCY STOP be pushed IN to ensure that the machine is not inadvertently started.

⚠WARNING

PERSONNEL UTILIZING THE MAINTENANCE MODE OF OPERATION SHOULD BE AWARE THAT SOME SYSTEM SAFETY FEATURES MIGHT BE BYPASSED. USE CAUTION AT ALL TIMES WHILE IN THIS MODE. IF A MALFUNCTION OCCURS, USE AN EMERGENCY STOP PUSHBUTTON.

⚠WARNING

DUE TO HIGH VOLTAGE, ONLY QUALIFIED ELECTRICIANS MAY BE ALLOWED TO ENTER THE CONTROL PANELS AND/OR JUNCTION BOXES.

⚠WARNING

USE CAUTION WHEN WORKING WITHIN THE CONTROL CABINET OR JUNCTION BOXES. TURN OFF THE MAIN POWER DISCONNECT SWITCH BEFORE OPENING THE CONTROL CABINET OR JUNCTION BOXES. FAILURE TO OBSERVE THIS MAY RESULT IN PERSONALL INJURY DUE TO HIGH VOLTAGE.

⚠WARNING

FOLLOW ALL REQUIRED LOCK OUT AND TAG OUT PROCEDURES PRIOR TO STARTING MAINTENANCE CHECKS.

4.1 Electrical Maintenance Checks

4.1.1 Semi-Annual Checks

Check Junction Boxes Control panels are clean, free of debris and not damaged.

Check if splices are mechanically secure and insulated. Repair minor problems.

Check if conductors and cables are grouped, bundled and clearly labeled.

Check if wiring is free of damage, wear, deterioration and corrosion.

Check for evidence of overheating (overloading)

Check for loose or disconnected wiring.

Check instrument panel light bulbs, knobs, and switches are in good working order.

FIGURE 4-1 CONTROL PANEL WITH TOUCH SCREEN

4.2 Electrical System Overview

The electrical control system is located in a control cabinet. The control cabinet is pre wired as much as possible to reduce the number of connections and time required for installation.

Refer to the ABB Commander manual for detailed instructions on the circular chart recorder.

4.3 Power Distribution

(Refer to the Electrical Schematic)

The control panel has an interlocked disconnect for removing all power from the Steritort. The power required is 575VAC, 60 HZ by customer. A step down transformer provides all 120 VAC power for the control system.

FIGURE 4-2 DOOR INTERLOCK SAFETY SWITCH

FIGURE 4-3 ADAM & EVA SAFETY SWITCH

4.4 Door Locking Controls

NOTICE

The door lock lever will not open if the vessel is pressurized.

The control system utilizes an Adam and Eva safety switch which determines the position of the door lock lever and door locking ring. Until the door has been fully closed and the locking ring rotated to the closed position, all fluid supply valves, steam, air, water and vent are prevented from operating.

In the event that pressure remains in the vessel and the lever is moved to the open position, the vessel will be vented through the exhaust valve. This creates a visible and audible exhaust warning.

⚠WARNING

MAKE SURE THE VENT OPENING IS POINTED AWAY FROM THE OPERATOR AND ANY OTHER PERSONNEL. THE GASSES CAN BE HOT AND MAY CAUSE PERSONAL INJURY.

⚠WARNING

TO PREVENT STEAM AND HOT WATER INJURIES, NEVER OPEN THE DOOR UNLESS THE VENT VALVE AND THE WATER OUTLET VALVE ARE OPEN, AND THE LOWER SIGHT GLASS INDICATES THAT THE VESSEL IS COMPLETELY DRAINED.

4.5 Control Panel

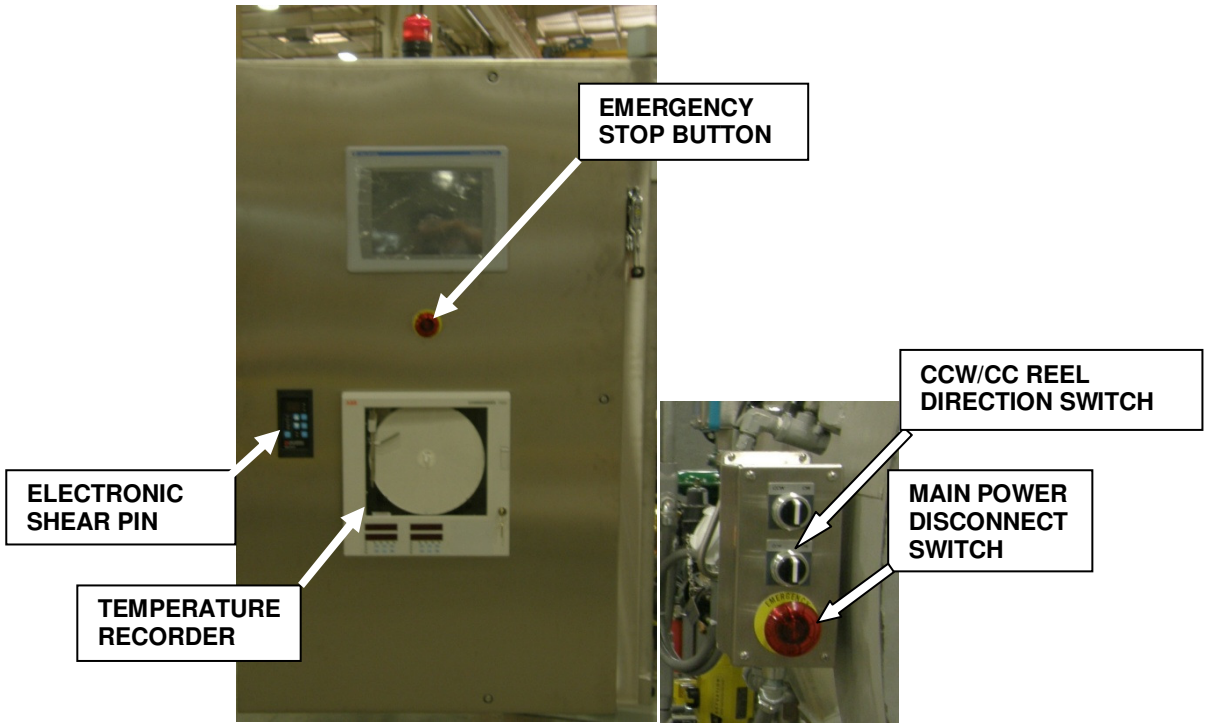


FIGURE 4-4 CONTROL PANEL WITH TOUCH SCREEN

The control panel houses the control instruments and electrical components necessary to produce conditions in the Laboratory Pressure Sterilizer which simulate the processing methods of production machines. The function of each unit in the control panel is described below.

4.5.1 Emergency Stop Pushbutton

This red pushbutton maintains a closed circuit position. It is used to STOP both the reel drive and door operating pump in the event of an emergency. This button will illuminate RED when it is pushed in to the STOP position. It is also used for resetting the Variable Frequency Drive in the unlikely event of a drive fault. This button must be pulled to the outward position to resume operation.

4.5.2 Main Power Disconnect Switch

The red main power disconnect switch located on the control panel is used by maintenance personnel to lock out and tag out the power supply when safety is of the utmost consideration.

4.5.3 Electronic Shear Pin

Please refer to enclosed CD for load control instruction PDF.

4.5.4 CCW/CC Reel Direction Switch

The switch is used to set the reel direction in the clock-wise or counter-clock –wise direction

4.5.5 Drive Assembly

The drive motor speed is adjustable from 0 to 14 reel rpm. The reel may be jogged into position by using the jog cord. The jog function allows reel rotation when the vessel door is open. Jog speed for can loading is approximately 2 rpms.

⚠ CAUTION

A GUARD COVERS THE MOVING PARTS OF THE DRIVE ASSEMBLY. NEVER OPERATE THE MACHINE WITH THIS GUARD REMOVED.

4.5.6 Circular Chart Recorder

The circular chart recorder is used to record the process temperatures in real time (refer to the ABB manual for details). Temperature recorder circular charts should be replaced with a new blank chart prior to startup.

4.6 Electrical Drawings

4.6.1 Steritort

Serial No.: 3608-94-11
Shell Top Spec: 3608.0927

DRAWING LIST

PART NO.	DESCRIPTION
0283.4932	Schematic ~ Electrical

Notes:

5 Troubleshooting

Notes:

5.1 General

This section lists some of the problems that may be encountered in the field and some of the likely solutions to the problems. This does not imply that these problems will be encountered or that the solutions listed are the only answers. This part provides information for use in diagnosing and correcting certain problems that may occur in the operation of the cooker/cooler line.

Before starting the troubleshooting procedure, perform a thorough inspection of the installation to determine if the problem is caused by obvious defects, such as loose connections, oil leaks, damaged or broken parts etc.

NOTICE

Immediately push the Emergency Stop button if the machine operates in an unexpected or unusual manner.

Before locating or solving any problem, make sure that all safety precautions, outlined within the front of this manual and specific safety instructions for maintenance and/or repair activities, have been observed.

Recommendations to be followed in case of problems:

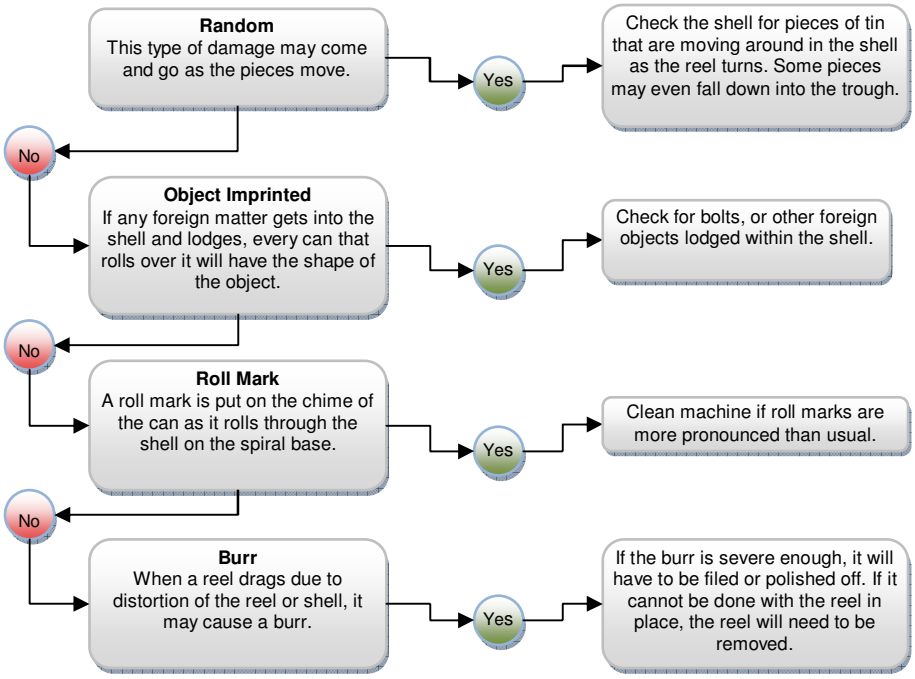
Check if an alarm message is shown on the monitor.

Most of the problems will be detected by the vessel and a corresponding alarm message will be displayed. However, in case a problem is detected by the operator (e.g. unusual noise, or obvious problems, such as water leaks), the operator must immediately stop the machine by pressing the emergency stop button, in order to avoid any further damage to the equipment.

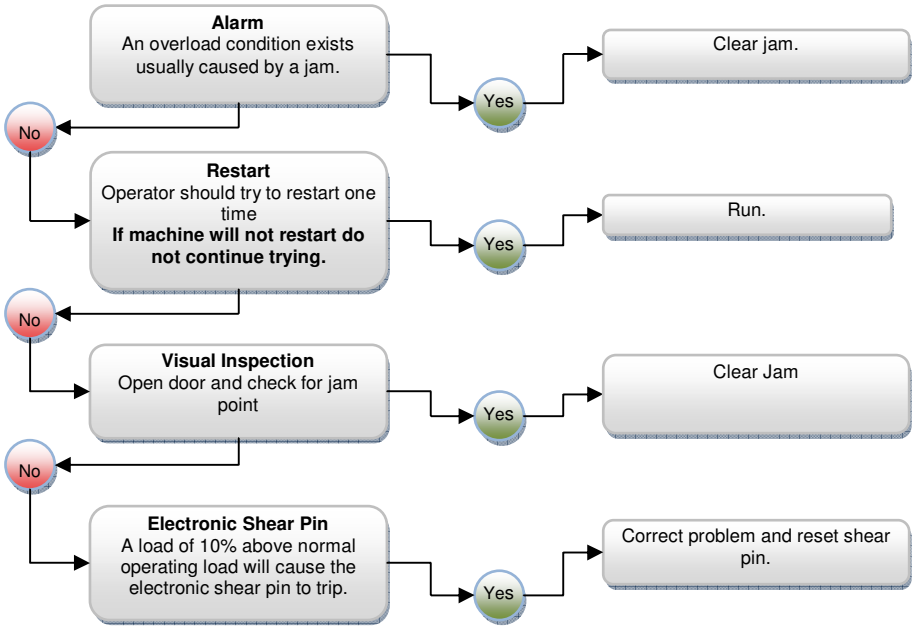
If the problem is detected and no alarm is indicated on the monitor, or the problem cannot be solved by the following corrective actions, contact the JBT FoodTech Service Department for technical assistance.

5.2 Decision Tree

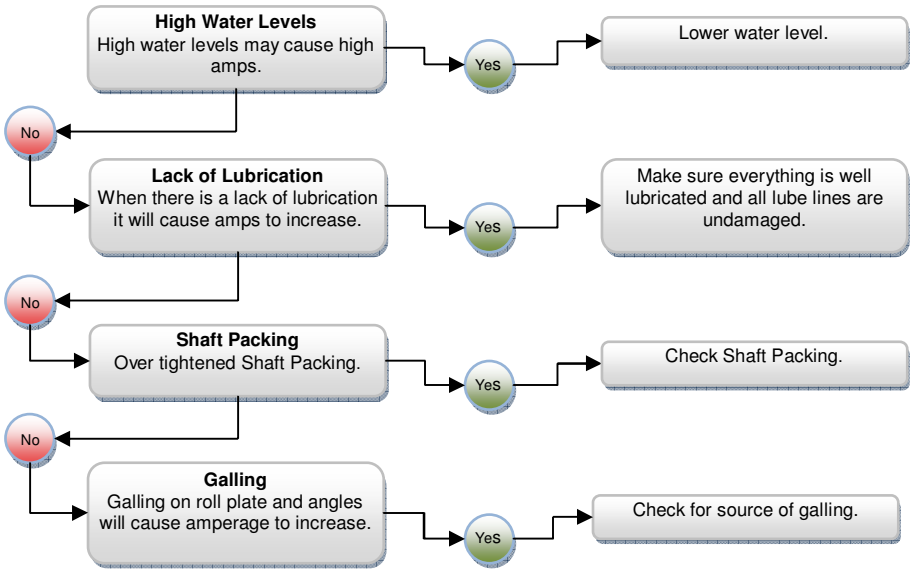
5.2.1 Container Damage



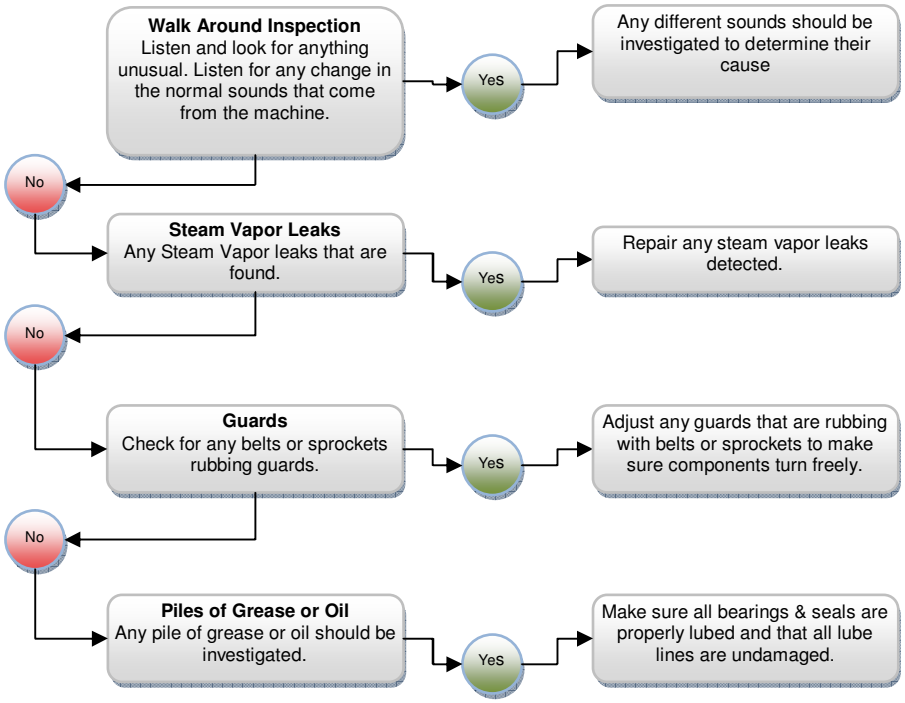
5.2.2 Jams


Alarm
An overload condition exists usually caused by a jam.
Yes
Clear jam.
No
Restart
Operator should try to restart one time
If machine will not restart do not continue trying.
Yes
Run.
No
Visual Inspection
Open door and check for jam point
Yes
Clear Jam
No
Electronic Shear Pin
A load of 10% above normal operating load will cause the electronic shear pin to trip.
Yes
Correct problem and reset shear pin.

5.2.3 High Amps



5.2.4 Loss of Steam or Air Pressure



5.3 Corrective Actions

Problem: **The process does not start when the process start button is activated.**

Cause: Door not properly sealed. Or door safety switch malfunction. Or controller tripped out.
Remedy: Check to be sure that the door is shut, locked and the safety pin is extended. If the system still will not start, check the door safety switches for malfunction. Check the power disconnect and main switch.

Problem: **Temperature does not come up.**

Cause: No steam or air input.
Remedy: Check steam and air inlet lines.

Problem: **Temperature stops rising after 100° C.**

Cause: Pressure relief valve open or drain valve not closed.
Remedy: Check to make sure that the pressure setting is not below the equivalent steam pressure. Or, fully close drain valve.

Problem: **Alarm sounds - temperature alarm.**

Cause: During temperature rise, the temperature fails to reach the temperature setting. Insufficient heating.
Remedy: Check steam valve and supply line.

Cause: During cooling, the temperature exceeds the preset range.
Remedy: Check water valve seal.

Cause: During cooling, the temperature fails to reach the temperature setting.
Remedy: Check water valve and water supply line.

Cause: Possible fault in supply lines and faulty adjustment of control parameters to new conditions.
Remedy: Contact JBT Services Department.

Problem: **Large oscillations on the temperature and pressure recorder graph during heating or when temperature is being held.**

Cause: Drain valve fails to seal properly.
Remedy: Close and open the drain valve to eject possible foreign matter from the valve seat. If this happens during cooling, operate with manual valve.

Problem: **Water level does not drop from maximum level.**

Cause: Drain valve does not open. Or blockage or backpressure in piping.
Remedy: Check for cause.

Cause: Inside pressure slightly above atmospheric pressure.
Remedy: Check opening of pressure relief valve.

Problem: **Safety valves blow.**

Cause: Possible blockage in pressure sensor tubing.
Remedy: Clean and check sensor tubing.

Problem: **Valve does not travel full stroke.**

Cause: Insufficient pressure at plunger, air leak, membrane failure or insufficient air supply.
Remedy: Tighten all joints, replace membrane, and adjust air pressure with pressure control valve.

Cause: Foreign body inside valve.
Remedy: Remove valve from piping and remove foreign body.

Cause: Spindle seized.
Remedy: Check and replace if necessary.

Cause: Faulty spring.
Remedy: Check and replace if necessary.

Problem: **Valve travels in jerks.**

Cause: Packing gland too tight.
Remedy: Loosen with a spanner wrench and re-tighten by hand.

Cause: Spindle seized or rusty.
Remedy: Check and replace if necessary.

Cause: Faulty spring.
Remedy: Check and replace if necessary.

Problem: **Valve leaks.**

Cause: Valve seat leaks.
Remedy: Check and re-grind valve seat.

Problem: **Packing gland leaks.**

Cause: Poor seal.
Remedy: Tighten gland.

Cause: Packing too dry.
Remedy: Apply silicone oil to spindle.

6 Lubrication

Notes:

To maintain the efficiency and reliability of the lab sterilizer, lubricate as recommended by the following charts. Use a selection of lubricants from the chart below.

6.1 Door Seal Gasket

To keep the door seal gasket in good condition, it must be kept clean and regularly lubricated with silicon oil to prevent foreign matter or dirt from adhering to it. If the gasket is not maintained properly, it could cause problems when opening and closing the door, or affect the tightness of the Steritort.

6.2 Control Valves

Apply lubricant regularly between spindle and packing gland to maintain the seal in good condition. A silicone grease or oil should be used.

6.3 Recommended lubricants or equivalents:

Oil

JBT FoodTech High Temperature H2 Non-zinc Rotary Cooker Oil
It is available in the following container sizes:
Part Number 575015 - 55 gallon drum.
Part Number 575016 - 110 gallon disposable tote.
Part Number 575017 - 275 gallon disposable tote.

Hydraulic Oil

JBT FoodTech H1 Food Grade JAX FGH-AW-46 Viscosity Hydraulic Oil
It is available in the following container sizes:
Part Number 575078 - 55 gallon drum.
Part Number 575079 - 110 gallon disposable tote.
Part Number 575080 - 275 gallon disposable tote.

Grease

JBT FoodTech Cooker Bearing Grease ~ New Generation High Temperature H2 Water Resistant Grease for Cooker Bearings
Available container sizes:
Part Number 575037 - 14 Ounce Tubes
Part Number 575031 - 35# Pail
Part Number 575035 - 120# Keg

For on-line ordering

www.myJBTFoodTech.com

6.4 Important Policy Statement

If, for any reason you choose to buy from another company, contact a lubricant engineer at that company and ask for a written recommendation of the companies' oils and greases suitable for use with the pressure cooker line. In the event that a product from another company must be applied to a component such as a chain or gearbox, remove the old oil and clear the component at least once with an oil remover. After lubrication, remove the new product without using an oil remover then lubricate for the second time.

6.5 Lubrication Chart

⚠ CAUTION

NEVER LUBRICATE THE MACHINE WHEN IT IS MOVING. BE SURE TO WIPE OFF EXCESS LUBRICANT. KEEP THE FLOOR CLEAN.

- **Door hinges** (Grease fittings)
  - Grease as often as necessary (approx. every 100 hours) to permit easy door movement.
- **Door locking hub** (Grease fitting)
  - Grease as often as necessary to permit easy locking and unlocking of the door.
- **Main drive**
  - Check monthly to see that oil is up to plug level. Every six months flush and refill.
- **Reel shaft bearings** (Two grease fittings)
  - Grease once a day before shift startup.

NOTICE

Please refer to enclosed CD for all MSDS Documentation.

Notes:

7 Cleanup

Notes:

⚠WARNING

IT IS IMPORTANT TO WEAR PROTECTIVE CLOTHING SUCH AS APRON, GLOVES, EYE PROTECTION AND RUBBER BOOTS FOR ALL CLEANING PROCEDURES.

⚠WARNING

DO NOT ATTEMPT TO CLEAN OR REMOVE ANY PORTION OF THE SYSTEM WHILE THE SHELL IS UNDER PRESSURE. SERIOUS INJURY CAN OCCUR.

7.1 Boiling Out and Cleaning the Retort

Before a new retort is initially put into operation the shell should be boiled out to remove all grease, oil and dirt that may have accumulated inside.

It is also recommended that a retort returning to or presently in production be cleaned out according to a schedule set by the user. This schedule is determined by the amount of use and type of product processed within the retort.

⚠ CAUTION

WHEN BOILING OUT, THERMOMETERS WITH A MAXIMUM READING BELOW 212° F (100° C) SHOULD BE DISCONNECTED.

To boil out the retort shell, proceed as follows:

1. Make a soap solution in a separate container of hot water and any good soap powder, e.g., Tide.
2. Mix this until no lumps or granules of soap remain.
3. Pour the solution into the shell.
4. Remove the thermo-couple from the port.
5. Fill the shell with clean water until it flows from the thermo-couple port.
6. Replace the thermo-couple back into the port.
7. Bring the temperature to 210° to 212° F (99° to 100° C) while the pump is running.
8. Allow it to continue to run for about two hours while maintaining the 210° to 212° F (99° to 100° C) temperature.
9. Drain the solution off. Then fill to same level as before with clean water. Allow the pump to run for about ten minutes, then drain again.

It is usually necessary to wash and rinse two or three times.

NOTICE

If it becomes necessary to use alkali, be sure to remove all traces of alkali before the machine is returned to production. Under heat, the alkali will spangle the tin on the cans. Also, if alkali is used it should not be heated over 180° F. as it loses some of its effectiveness.

Figure 7-1 SIGHT GLASS DRAIN VALVE

7.2 Sight Glass Stand Pipe Drain

When the stand pipe becomes dirty inside, perform the following procedure:

1. Open the valve located at the bottom of the standpipe 1/4 turn and hold until all pressure has relieved from the stand pipe.

8 Recommended Spare Parts

8.1 How to Order

NOTICE

JBT FoodTech is not responsible for shipping damage. The customer must check the shipment for damage when it is received. Any claims for damage must be filed with the carrier.

⚠WARNING

FAILURE TO REPLACE BROKEN OR WORN PARTS WITH FACTORY REPLACEMENT PARTS OR PARTS OF EQUAL QUALITY COULD CAUSE SERIOUS DAMAGE TO THE EQUIPMENT OR INJURY TO PERSONNEL.

JBT FoodTech, whose policy it is to continuously improve its products, reserves the right to discontinue or change specifications, models or design without notice and without incurring obligation.

Requests for replacement parts should be directed to:

JBT FoodTech
JBT Corporation
2300 Industrial Avenue
Madera, California 93637
Phone: 559-661-3200

Be sure that orders for replacement parts include the following information:

1. Name of Machine: _____
2. Machine Order: _____
3. Machine Top Spec: _____
4. Machine Serial Number:_____
5. Quantity of parts required: _____
6. JBT FoodTech part number: _____
7. Description of part:_____
8. Shipping instructions:_____

8.2 Spare Parts List

Part	No. Qty.	Description
268183	1	*Gasket-Door
259022	1	Gear Motor - Drive, 2HP
0138.6350	2	Bearing - Assy 2-5/16
135439	1	Belt- Drive
457575	2	Seal- Shaft 2-5/16
457617	1	Seal-O/Ring, Drive Shaft
3608.7391	1	Gasket- Shaft Seal Cap
3608.8691	1	Gasket- Hub, Drive
3608.8701	1	Gasket- Hub, Drive
268217	2	Gasket - Flange, flat ring, 3/4" pipe
268145	2	Gasket - Flange, flat ring, 1" pipe
268146	2	Gasket - Flange, flat ring, 1-1/2" pipe
268154	2	Gasket - Flange, flat ring, 2" pipe
268141	2	Gasket - Flange, flat ring, 3" pipe, 150#
268108	1	Gasket - Flange, flat ring, 3" pipe, 300#
543663	1	Valve-Control, 3/4" NPT, globe
543627	1	Valve-Control, 2" NPT, globe
543994	1	Valve-Control, 3" FLGD (flangeless), butterfly
544054	1	Valve-Ball, 3/4" NPT, actuated
544052	1	Valve-Ball, 1" NPT, actuated
543705	1	Valve-Solenoid, 3-way, namur mount
543658	1	Valve-Solenoid, 3-way (pneumatic dump)
273271	1	Sight Glass, 46.06" LG
311264	1	Drive -AC, 2 HP
531356	1	Level Transmitter
521081	1	RTD
464070	1	Switch - Safety (Jokab)
531350	1	Pressure Transmitter (high temp)
531286	1	Pressure Transmitter (low temp)
406403	1	Safety Relay
266220	2	Fuse - Glass Tube, 1/2 amp
378235	1	PLC - I/O Module, Digital Input, 16 Pt
378095	1	PLC - I/O Module, Digital Output
378163	1	PLC - I/O Module, Analog Input, 8 Channel
378164	1	PLC - I/O Module, Analog Output, 8 Channel

*Spare provided with machine

Notes:

9 Parts Lists and Drawings

Notes:

SEQ	Level	Item Number	Item Description	Qty	UM
1	0	3400.1597	TOP SPEC FOR (3) SHELL LINE TO RUN 300x4	1.00	EA
2	1	3400.1597-MECH	TOP SPEC FOR (3) SHELL LINE TO RUN 300x4	1.00	EA
3	2	3903.3860	PARTS - LOOSE, PRESS. CKR #1,	1.00	EA
4	3	143849	BOLT - HEX HD FIN, 1-1/4-7NC X	6.00	EA
5	3	269190	GAUGE - PRESSURE,6"DIA.DIAL	1.00	EA
6	3	3602.2021	PLATE-FOOT	6.00	EA
7	3	3602.2052	WRENCH-SPANNER, REEL BEARING	1.00	EA
8	3	3602.6972	WRENCH-SOCKET, MANHOLE COVER	1.00	EA
9	4	479005	SOCKET - WRENCH, 6-PT 1-5/8	1.00	EA
10	3	3806.6391	PIPE-LEG SUPPORT, CKR./CLR.,	1.00	EA
11	3	538002	TOOL - 3/4 DRIVE RATCHET, CRAFTSMAN	1.00	EA
12	3	479037	SOCKET - 2 3/8, 12 PT. CRAFSTMAN, 3/4 DR	1.00	EA

9.1 How to Read Indented Parts Lists

The parts lists are indented starting from the Top Spec. to the sub-assemblies then to the sub-parts of each sub-assembly. The number in the column labeled “Level” is the indentation position.

EXAMPLE:
The Top Spec number is located next to the assembly description. In this example, the Top Assembly for a Cooker/Cooler Line is Part Number 3400.1597.

In the left column, the number one (1) appears for the Mechanical Assembly. The number three (3) indicates that these items are sub -assemblies to the Mechanical Assembly.

All the items below the number 1 are part of these sub-assemblies.

NOTICE

JBT FoodTech is not responsible for shipping damage. The customer must check the shipment for damage when it is received. Any claims for damage must be filed with the carrier.

⚠WARNING

FAILURE TO REPLACE BROKEN OR WORN PARTS WITH FACTORY REPLACEMENT PARTS OR PARTS OF EQUAL QUALITY COULD CAUSE SERIOUS DAMAGE TO THE EQUIPMENT OR INJURY TO PERSONNEL.

9.2 Parts Identification

Parts identification in this manual is based on Engineering Spec. Number **3608.0907**. Requests for replacement parts should be directed to:

JBT FoodTech
JBT Corporation
2300 Industrial Avenue
Madera, California 93637
Phone: 559-661-3200

Be sure that orders for replacement parts include the following information:

1. Name of Machine: _____
2. Machine Order: _____
3. Machine Top Spec: _____
4. Machine Serial Number:_____
5. Quantity of parts required: _____
6. JBT FoodTech part number: _____
7. Description of part:_____
8. Shipping instructions:_____

JBT FoodTech, whose policy it is to continuously improve its products, reserves the right to discontinue or change specifications, models or design without notice and without incurring obligation.

Notes:

9.3 Bill of Material

Serial No.: 3608-94-11
Shell Top Spec: 3608.0927

Notes:

9.4 Mechanical Drawings

9.4.1 Steritort

Serial No.: 3608-94-11
Shell Top Spec: 3608.0927

DRAWING LIST

PART NO.	DESCRIPTION
0998.3334	Floor Plan – Steritort
3708.0674	Steritort Assembly
3708.0685	Shell – Steritort
3708.0724	Piping – Steritort
3708.0704	Drive – Steritort, 2 HP, SEW
3708.0714	Slip Ring Assembly
3708.0462	Layout – Lubrication
3608.7583	Cover – Motor, Hydraulic Pump
3708.0483	Layout – Pneumatic System
3708.0454	Bracket Control Panel
3608.9903	Layout - Hydraulic
3708.0904	Decals
3708.0693	P&ID – Steritort
3608.9854	Reel, Combo
3708.0864	Reel
3708.0533	Vent Valve Prox. Addition

Notes:

10 Vendor Literature

Notes:

10.1 Mechanical

Top Spec. No. 3608.0927

ITEM NUMBER	ITEM DESCRIPTION
239696	SAFETY VALVE, 3" FLANGED
253090	FILTER/REGULATOR - AIR, 1/4 NPT, 5-125 PSI
259022	REDUCER – GEARMOTOR, 2HP, 32.27:1
502063	STRAINER-PIPELINE, 2", FLANGED
464070	SENSOR – SAFETY, NON-CONTACT
502066	STRAINER-PIPELINE, 1-1/2", FLNGD
502068	STRAINER-PIPELINE, 1.0" NPT
523156	THERMOMETER - DIGITAL RTD, DIGI-STEM,
532027	TRAP - STEAM, 1 IPS
542123	VALVE - GLOBE, 1/2 NPT, 150#
540052	VALVE GLOBE, ¾ NPT, 150#
542208	VALVE – SHUT-OFF, ¼ TUBE X
542292	VALVE - GLOBE, 3/8 NPT, 150#
543479	VALVE - CHECK WAFER, TYPE, 3/4
531327	TRANSMITTER – POWER, LOAD CONTROLS
543494	VALVE - CHECK, WAFER TYPE, 1"
543515	VALVE - CHECK, WAFER, TYPE 2"
543627	VALVE – CONTROL, 2" FLGD, CARBON STEEL
543705	TRANSMITTER - POWER, LOAD CONTROLS
543994	VALVE – BUTTERFLY -3", CONTROL
544053	VALVE - BALL, 1" FLGD, SST
544052	VALVE - BALL, 1" FLGD, ACTUATED SST
543897	VALVE - CHECK, WAFER TYPE, 1-1/2"
543663	VALVE - CONTROL, 3/4" NPT
544054	VALVE - BALL, 3/4" FLGD, ACTUATED SST
543705	VALVE - SOLENOID, 3-WAY

10.2 Electrical

Top Spec. No. 3608.0927

ITEM NUMBER	ITEM DESCRIPTION
215103	CONTACTOR – 3 POLE, IEC, 9AMPS
500166	STARTER – MANUAL MOTOR W/PROTECTOR
215125	CONTACTOR – IEC, AUX CONTACT
206035	COMPUTER – ETHERNET NETWORK SWITCH, 5
507459	SWITCH – JUMBO MUSHROOM HEAD
215145	CONTACT – BLOCK, 1 N.O., 1 N.C.
378092	PLC – PROCESSOR COMPACTLOGIX
378095	I/O MODULE – DIGITAL OUTPUT
378163	I/O MODULE – ANALOG INPUT, 8 CHANNEL
378164	I/O MODULE – ANALOG OUTPUT, 8 CHANNEL
406413	RELAY – MISC. 2 OUTPUTS SAFETY MODULE
406403	RELAY – SAFETY, STOP CAT 0, UP TO CAT 3
378093	PLC – POWER SUPPLY, CMPCTLGX
507460	SWITCH – SELECTOR, 3 POSITION
531286	TRANSMITTER – PRESSURE 0-145

10.3 Reports

	ITEM DESCRIPTION
	ASME REPORT
	ULC REPORT

NOTICE

Vendor literature pdf files located on CD

Notes:

www.jbtfoodtech.com

North America

John Bean Technologies Corporation
2300 Industrial Avenue
Madera, CA 93637
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Fax: +1-559/661.3156
madera.fpsd@jbtc.com

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fpsd.info@jbtc.com

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sales.parma@jbtc.com

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Phase 1, 8 Sunning Road
Causeway Bay, Hong Kong
Phone: +852 2808 4624
Fax: +852 2537 8100
infoasia-jbtfoodtech@jbtc.com

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
1	0	3608.0927	STERITORT - JBT MODEL 610-10, HAND LOAD	1	EA
2	1	3608.0927-MECH	STERITORT - MECHANICAL TOP SPEC,	1	EA
3	2	3708.0674	STERITORT - ASSEMBLY, JBT MODEL 610-10,	1	EA
4	3	3708.0685	SHELL - STERITORT, 45 PSI, STD ROTARY	1	EA
5	4	176015	DOOR - QUICK OPENING, HORIZ.,	1	EA
6	4	3608.9834	TROUGH - STERITORT,	1	EA
7	5	0305.0041	GASKET - HANDHOLE, TROUGH	2	EA
8	5	1558.2461	CROWFOOT	2	EA
9	5	1558.2472	COVER - HANDHOLE, TROUGH	2	EA
10	6	143401	BOLT - HEX HD HVY, 5/8-11NC X	1	EA
11	5	222067	COUPLING - PIPE, HALF,	2	EA
12	5	222075	COUPLING - PIPE, 1/2 IPS, 3000#, FGD,	6	EA
13	5	3602.2921	SECTION - TROUGH	2	LF
14	5	3602.8432	PLATE-END, TROUGH	2	EA
15	5	3608.9841	DRAIN - TROUGH, 3", FLANGED	1	EA
16	6	262009	FLANGE - PIPE, WELDING NECK, 3	2	EA
17	4	3608.8164	SADDLE - STERITORT	1	EA
18	5	3608.8193	LEG - SUPPORT, STERITORT	1	EA
19	4	3608.9413	MOUNTING-PLATE,DRIVE SYS,STERI	1	EA
20	4	3608.8173	BLISTER - INSTRUMENT,STERITORT	1	EA
21	5	171003	CAP - HEMI WELD, 10" I.D.,	1	EA
22	5	222024	COUPLING - PIPE, 3/4 IPS,	2	EA
23	5	222231	COUPLING - PIPE, 2 IPS, 3000#	1	EA
24	4	3608.8664	FLANGE - DRIVE, STERITORT	1	EA
25	4	3608.8204	ROLLPLATE - STERITORT, ARS-30,	1	EA
26	4	222231	COUPLING - PIPE, 2 IPS, 3000#	1	EA
27	4	222024	COUPLING - PIPE, 3/4 IPS,	16	EA
28	4	303025	HEAD - FLANGED & DISHED,	1	EA
29	4	3802.6102	PLATE-MOUNTING,ASME & S/N.	1	EA
30	4	0409.3171	PLATE - NAME, ASME PRESSURE,	1	EA
31	4	222064	COUPLING - PIPE, HALF,	4	EA
32	4	437008	SCREW - DRIVE, TYPE U, #14 X	8	EA
33	4	3608.6083	BRACKET - MOUNT BI-DIRECTIONAL	1	EA
34	4	3807.3931	BRACKET - SENSOR MOUNT, JOKAB	1	EA
35	5	356023	NUT - HEX FULL FIN, 1/4-20NC,	2	EA
36	4	3608.9643	PANEL - DECAL,1/8 X 12 X 45	1	EA
37	4	222076	COUPLING - PIPE, 1 IPS,	1	EA
38	4	4020.6102	PLATE - LIFTING LUG	2	EA
39	4	222074	COUPLING - PIPE, 1/4 IPS,	1	EA
40	4	3608.6161	MOUNT - GREASE ZERK	1	EA
41	4	143271	BOLT - HEX HD HVY, 3/4-10NC X	8	EA
42	4	3608.8683	HUB - DRIVE, BOLT-IN,STERITORT	1	EA
43	4	3608.8701	GASKET - HUB, DRIVE, STERITORT	1	EA
44	4	3608.8691	GASKET - HUB, DRIVE, STERITORT	1	EA
45	4	143243	BOLT - HEX HD HVY, 5/8-11NC X	3	EA
46	4	3807.3921	BRACKET - SENSOR MOUNT, JOKAB	1	EA
47	5	208011	COLLAR - SET, 7/8 X 1-1/2 X	1	EA
48	5	356023	NUT - HEX FULL FIN, 1/4-20NC,	2	EA
49	4	3608.9662	BRACKET-JOG STATION, FOR (3)	1	EA
50	4	3807.3911	BRACKET - SENSOR MOUNT, JOKAB	1	EA
51	5	356023	NUT - HEX FULL FIN, 1/4-20NC,	2	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
52	4	3807.3861	BRACKET - SENSOR MOUNT, EDEN	1	EA
53	5	356023	NUT - HEX FULL FIN, 1/4-20NC,	2	EA
54	4	464070	SENSOR - SAFETY, NON-CONTACT, EDEN	2	EA
55	4	143025	BOLT - HEX HD FIN, 1/4-20NC X	8	EA
56	4	3807.3791	CLIP - SENSOR, EDEN SAFETY SENSORS	4	EA
57	5	577532	PIN - DOWEL, 5/32 X 3/4 LG, 18-8 SST	2	EA
58	4	3907.5742	PIPE-STUB,2" FLGD, VENT VALVE,	2	EA
59	5	262236	FLANGE - PIPE, WELD NECK	1	EA
60	4	3907.7842	PIPE-STUB, 3", 300# FLANGED,	1	EA
61	5	262242	FLANGE - PIPE, WELD NECK	1	EA
62	3	3708.0714	ASSEMBLY - SLIP RING, STERITORT, 24 CIRC	1	EA
63	4	3708.0813	GUARD - SLIP RING, STERITORT, SST	1	EA
64	5	6390.667500	HANDLE - SST.	1	EA
65	4	3708.0803	PAN - SLIP RING, STERITORT	1	EA
66	5	222247	COUPLING - PIPE, HALF, 1/4 IPS	1	EA
67	5	143115	BOLT - HEX HD FIN, 3/8-16NC X	2	EA
68	5	577532	PIN - DOWEL, 5/32 X 3/4 LG, 18-8 SST	2	EA
69	4	3708.0792	BRACKET - MOUNTING, GUARD, STERITORT	1	EA
70	4	3708.0762	HUB - SHAFT, SLIP RING, STERITORT	1	EA
71	4	3708.0771	PIN - DRIVING, SLIP RING, STERITORT, SST	1	EA
72	5	144031	BOLT - HEX HD FIN, 1/4-20 NC	1	EA
73	4	4002.7041	PAD - WELD, SST, RECTANGLE, (2) 3/8-16NC	1	EA
74	4	356031	NUT - HEX FULL FIN, 3/8-16NC,	2	EA
75	4	304075	HUB-SLIP RING, 24 CIRCUIT, FOR EXTERNAL	1	EA
76	4	211589	Connector-locking,thermocouple	18	EA
77	4	304039	HUB - THERMOCOUPLE, SLIP RING	1	EA
78	4	356072	NUT - HEX JAM FIN, 1/4-20NC,	2	EA
79	4	433062	SCREW - CAP, FLAT SOC HD,	4	EA
80	4	356657	NUT - HEX FULL FIN, 10-24 NC, 18-8 SST,	4	EA
81	4	448045	SCREW - SET, HEX SOC, CUP PT,	1	EA
82	4	143115	BOLT - HEX HD FIN, 3/8-16NC X	1	EA
83	4	556171	WASHER - FLAT, 18-8 SST, 3/8,	1	EA
84	4	211334	CONNECTOR - TUBE, 1/4 TUBE X	1	EA
85	3	3708.0704	DRIVE - STERITORT, 2 HP, SEW-EURODRIVE	1	EA
86	4	259022	REDUCER - GEARMOTOR, 2 HP, 32.27:1 GEAR	1	EA
87	4	199025	FITTING - LUBRIC, 1/8 PTF, 65	1	EA
88	4	495267	SPROCKET - HTD TIMING BELT,	1	EA
89	4	495329	SPROCKET - HTD, TIMING BELT, 14mm PITCH,	1	EA
90	4	135439	BELT - HTD, 14MM PITCH, 40MM	1	EA
91	4	163558	BUSHING - QD, 2-15/16 BORE,	1	EA
92	4	163169	BUSHING - TAPERLOCK, 1-3/8 BORE, 5/16 KW	1	EA
93	4	3708.0384	GUARD - DRIVE, 2 HP STERITORT	1	EA
94	5	143016	BOLT - HEX HD FIN, 1/4-20NC X	8	EA
95	5	356402	NUT - SPOTWELD, STL, 1/4-20	8	EA
96	5	143916	BOLT - HEX HD FIN, 3/8-16NC X	4	EA
97	5	3001.0021	HANDLE - COVER	2	EA
98	4	3608.9733	DRIVE BASE, STERITORT	1	EA
99	5	356085	NUT - HEX JAM FIN, 1/2-13NC,	2	EA
100	5	450087	SCREW - SET, SQ HD, CUP PT,	2	EA
101	4	0138.6350	BEARING - 2 15/16 BORE,	2	EA
102	5	3806.9991	BEARING - ROLLER, RADIAL, INNER RACE,	1	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
103	5	129009	BEARING - ROLLER, RADIAL,	1	EA
104	5	3807.0001	BEARING - ROLLER, RADIAL, OUTER RACE,	1	EA
105	4	3635.0151	COLLAR - BEARING LOCK, MAIN	1	EA
106	5	448224	SCREW - SET, HEX SOC, 1/2 DOG PT,	2	EA
107	4	3608.8673	SHAFT - DRIVE, STERITORT W/	1	EA
108	4	3608.6964	COLLAR-LOCKING, BRG SLEEVE	1	EA
109	4	3608.6972	SPACER-BEARING,STERI SHAFT	1	EA
110	4	3608.6983	GLAND-PACKING, SHAFT,STERI	1	EA
111	4	3608.6993	CAP-RETAINER, SHAFT BEARING	1	EA
112	4	3608.7003	CAP - RETAINER, SHAFT PACKING	1	EA
113	4	457575	SEAL-SHAFT, 2.937 DIA SHAFT	2	EA
114	4	1563.1083	HUB - REEL	1	EA
115	4	143919	BOLT - HEX HD FIN, 5/8-11NC X	6	EA
116	4	316162	KEY - MACHINE, SQUARE,	1	EA
117	4	448109	SCREW - SET, HEX SOC, CUP PT,	2	EA
118	4	435149	SCREW - CAP, SOC HD, 1/2-13NC	8	EA
119	4	143242	BOLT - HEX HD FIN, 5/8-11NC X	3	EA
120	4	199023	FITTING - LUBRIC, 1/8 PTF,	3	EA
121	4	448089	SCREW - SET, HEX SOC, CUP PT,	3	EA
122	4	143907	BOLT - HEX HD FIN, 1/2-13NC X	4	EA
123	4	356040	NUT - HEX FULL FIN, 1/2-13NC,	4	EA
124	4	316389	KEY - MACHINE,SQUARE,MODIFIED	1	EA
125	4	3608.7382	CAP - SEAL, STERITORT SHAFT	1	EA
126	4	3608.7391	GASKET - CAP, SEAL	1	EA
127	4	211061	CONNECTOR - TUBE, 1/4 TUBE X	1	EA
128	4	211062	CONNECTOR - TUBE, 1/4 TUBE X	1	EA
129	4	542208	VALVE - SHUT-OFF, 1/4 TUBE X	1	EA
130	4	3608.8701	GASKET - HUB, DRIVE, STERITORT	1	EA
131	4	3608.8691	GASKET - HUB, DRIVE, STERITORT	1	EA
132	4	143273	BOLT - HEX HD HVY, 3/4-10NC X 2-1/2 LG	8	EA
133	4	316135	KEY - MACHINE, SQUARE,	2	EA
134	4	457617	SEAL - O-RING,5-1/8X4-7/8X1/8,	1	EA
135	4	556094	WASHER - FLAT, STL, 1/2 STD,	4	EA
136	4	556041	WASHER - LOCK, SPRING REG 1/2	4	EA
137	3	3608.8044	SKID - STANDARD STERITORT	1	EA
138	4	4020.6102	PLATE - LIFTING LUG	1	EA
139	3	268183	GASKET - DOOR, STERITORT,	1	EA
140	3	3708.0462	LUBRICATION LAYOUT - STERITORT, SST	1	EA
141	4	199132	FITTING - LUBRIC, 1/8 PTF, 67	2	EA
142	4	239432	ELBOW - TUBE, 1/4 TUBE X 1/8	2	EA
143	4	211487	CONNECTOR - TUBE, 1/4 TUBE X	2	EA
144	3	3608.9903	LAYOUT- HYDRAULIC	1	EA
145	4	101031	ADAPTER - HOSE, 90 DEG, 1/2	6	EA
146	4	163031	BUSHING - PIPE, HEX, 1/2 X 3/8	2	EA
147	4	101201	ADAPTER - PIPE, TEE, 3/8 NPT	2	EA
148	4	101054	ADAPTER - HOSE, STRAIGHT, 1/4	2	EA
149	4	2367710	HOSE ASSEMBLY 3/8 X 54	2	EA
150	4	2369516	HOSE ASSEMBLY 3/8 X 72	4	EA
151	4	101120	ADAPTER - PIPE, STRAIGHT,	2	EA
152	4	196094	CLAMP - HOSE, 1.5 ID CLOSED,	1	EA
153	4	196140	CLAMP - HOSE, 11/16 ID,	7	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
154	4	350040	NIPPLE - PIPE, 1/4 IPS X 2 LG,	1	EA
155	4	350046	NIPPLE - PIPE, 1/4 IPS X 3 LG,	1	EA
156	4	239049	ELBOW - PIPE, 90 DEG, 1/4 IPS,	2	EA
157	3	3708.0483	PNEUMATIC LAYOUT - STERITORT	1	EA
158	4	199311	FITTING - HOSE, ELBOW, 1/4 MNPT X 1/4 SA	12	EA
159	4	350046	NIPPLE - PIPE, 1/4 IPS X 3 LG,	1	EA
160	4	253090	FILTER/REGULATOR - AIR,	1	EA
161	4	101476	ADAPTER - PIPE, STRAIGHT,	13	EA
162	4	199224	FITTING - HOSE END, NIP ASSY,	46	EA
163	4	299212	HOSE - FITTING, CRIMP SOCKET	46	EA
164	4	299201	HOSE - BRAIDED, TEFLON SST 1/4	50	LF
165	4	101494	ADAPTER - HOSE, TEE, 1/4 HOSE	11	EA
166	3	3708.0724	PIPING-CONTROL, ASSEMBLY, FOR ROTARY	1	EA
167	4	3601.0081	SUPPORT-PIPE, LOG-STM	2	EA
168	4	3602.4651	NIPPLE - SPECIAL	1	EA
169	5	350269	NIPPLE - PIPE, SHORT, 2 IPS X	1	EA
170	4	3608.8262	SUPPORT - PIPE, 1"	3	EA
171	5	144001	BOLT - U, 1/4 DIA X 1 PIPE	1	EA
172	5	3608.8252	BRACKET - PIPE SUPPORT, 1"	1	EA
173	5	556259	WASHER - FLAT, STL, 3/8 STD,	2	EA
174	4	3608.8792	PAN - DRIP, STERITORT,	1	EA
175	5	222134	COUPLING - PIPE, 1/2 IPS,	1	EA
176	5	222247	COUPLING - PIPE, HALF, 1/4 IPS	1	EA
177	4	3702.1171	BRACKET-SUPPORT, 2" PIPE	2	EA
178	4	3708.0292	BRACKET - SUPPORT - PIPING	1	EA
179	4	3708.0754	PIPING - WATER IN, STERITORT, FLANGED	1	EA
180	5	143204	BOLT - HEX HD FIN, 1/2-13NC X	12	EA
181	5	143253	BOLT - HEX HD HVY, 5/8-11NC X	12	EA
182	5	143563	BOLT - HEX HD HVY, 5/8-11NC X	4	EA
183	5	144324	BOLT - HEX HD FIN,1/2-13 NC X	4	EA
184	5	222392	COUPLING - PIPE, THREAD-O-LET 3/4	2	EA
185	5	239603	ELBOW - WELDING, PIPE, 90 DEG,	1	EA
186	5	239652	ELBOW - WELDING, PIPE, 2 IPS,	2	EA
187	5	239659	ELBOW-PIPE,BUTT WELD,1",90 DEG	7	EA
188	5	258443	REDUCER-PIPE,WELD,ECCENTRIC,	1	EA
189	5	262160	FLANGE - PIPE, SCREWED, 2 IPS	2	EA
190	5	262236	FLANGE - PIPE, WELD NECK	4	EA
191	5	262340	FLANGE-PIPE,WELD NECK,1",RF,	2	EA
192	5	262384	FLANGE - PIPE, WELD NECK	2	EA
193	5	268217	GASKET - FLANGE, 150#, 3/4"	5	EA
194	5	268154	GASKET - FLANGE, FLAT RING,	5	EA
195	5	294137	HEATER - WATER, 125 GPM,	1	EA
196	5	350328	NIPPLE - PIPE, 1/2 IPS X 2-1/2	1	EA
197	5	350392	NIPPLE - PIPE, CLOSE, 2 IPS X	2	EA
198	5	356020	NUT - HEX HVY, 1/2-13NC, STL,	16	EA
199	5	356319	NUT - HEX FULL FIN, 5/8-11NC,	16	EA
200	5	502063	STRAINER-PIPELINE,2",FLANGED,	1	EA
201	5	515418	TEE-PIPE,BUTTWELD,REDUC,2X2X1	1	EA
202	5	542123	VALVE - GLOBE, 1/2 NPT, 150#	1	EA
203	5	543479	VALVE - CHECK WAFER, TYPE, 3/4	1	EA
204	5	543515	VALVE - CHECK, WAFER, TYPE 2"	1	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
205	5	543627	VALVE - CONTROL, 2" FLGD, CARBON STEEL	1	EA
206	5	544054	VALVE - BALL, 3/4" FLGD, CAST SST BODY,	1	EA
207	5	544053	VALVE - BALL, 1" FLGD, CAST SST BODY,	1	EA
208	4	3708.0734	PIPING - DRAIN, STERITORT, FLANGED, 3"	1	EA
209	5	143204	BOLT - HEX HD FIN, 1/2-13NC X	12	EA
210	5	143563	BOLT - HEX HD HVY, 5/8-11NC X	4	EA
211	5	144324	BOLT - HEX HD FIN,1/2-13 NC X	4	EA
212	5	239033	ELBOW - PIPE, 90 DEG, 1 IPS, 150#,	1	EA
213	5	239532	ELBOW - WELDING, PIPE, 90 DEG,	1	EA
214	5	262009	FLANGE - PIPE, WELDING NECK, 3	4	EA
215	5	262317	FLANGE-PIPE,SCREWED,1"IPS	2	EA
216	5	262340	FLANGE-PIPE,WELD NECK,1",RF,	4	EA
217	5	268141	GASKET - FLANGE, FLAT RING,	2	EA
218	5	268145	GASKET - FLANGE, FLAT RING,	5	EA
219	5	350406	NIPPLE - PIPE, 1 IN IPS X 3, SCH 80, A53	3	EA
220	5	356020	NUT - HEX HVY, 1/2-13NC, STL,	16	EA
221	5	356319	NUT - HEX FULL FIN, 5/8-11NC,	4	EA
222	5	515437	TEE-PIPE, BUTTWELD, REDUCING,	2	EA
223	5	532027	TRAP - STEAM, 1 IPS, THREADED PORTS	1	EA
224	5	543494	VALVE - CHECK, WAFER TYPE, 1"	1	EA
225	5	543994	VALVE - BUTTERFLY -3", CONTROL	1	EA
226	5	544052	VALVE - BALL, 1" FLGD, CAST SST BODY,	1	EA
227	4	3708.0744	PIPING - STEAM/AIR IN, STERITORT, FLANGE	1	EA
228	5	143204	BOLT - HEX HD FIN, 1/2-13NC X	60	EA
229	5	143229	BOLT - HEX HD FIN, 1/2-13NC X	4	EA
230	5	144324	BOLT - HEX HD FIN,1/2-13 NC X	12	EA
231	5	222067	COUPLING - PIPE, HALF,	3	EA
232	5	239659	ELBOW-PIPE,BUTT WELD,1",90 DEG	11	EA
233	5	239716	ELBOW-WELDING,PIPE,90DEG,REDUC	1	EA
234	5	258442	REDUCER-PIPE,WELD,ECCENTRIC,	1	EA
235	5	258443	REDUCER-PIPE,WELD,ECCENTRIC,	6	EA
236	5	262236	FLANGE - PIPE, WELD NECK	1	EA
237	5	262238	FLANGE - PIPE, WELD NECK	1	EA
238	5	262317	FLANGE-PIPE,SCREWED,1"IPS	1	EA
239	5	262340	FLANGE-PIPE,WELD NECK,1",RF,	20	EA
240	5	262384	FLANGE - PIPE, WELD NECK	4	EA
241	5	268145	GASKET - FLANGE, FLAT RING,	16	EA
242	5	268146	GASKET - FLANGE, FLAT RING,	2	EA
243	5	268217	GASKET - FLANGE, 150#, 3/4"	5	EA
244	5	350328	NIPPLE - PIPE, 1/2 IPS X 2-1/2	1	EA
245	5	350388	NIPPLE - PIPE, 1 IN IPS X 2	1	EA
246	5	350490	NIPPLE - PIPE, SHORT, 3/8 IPS	1	EA
247	5	356020	NUT - HEX HVY, 1/2-13NC, STL,	76	EA
248	5	502066	STRAINER-PIPELINE,1-1/2",FLNGD	1	EA
249	5	502068	STRAINER-PIPELINE, 1.0" NPT,	1	EA
250	5	515390	TEE-PIPE,WELD,1",SCH80,A106	6	EA
251	5	542123	VALVE - GLOBE, 1/2 NPT, 150#	1	EA
252	5	542292	VALVE - GLOBE, 3/8 NPT, 150#	1	EA
253	5	543479	VALVE - CHECK WAFER, TYPE, 3/4	1	EA
254	5	543494	VALVE - CHECK, WAFER TYPE, 1"	2	EA
255	5	543663	VALVE - CONTROL, 3/4" FLANGED,	2	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
256	5	543897	VALVE - CHECK, 1-1/2" WLC MODEL 9034-1	1	EA
257	5	544052	VALVE - BALL, 1" FLGD, CAST SST BODY,	4	EA
258	4	3708.0492	LOG - STEAM, STERITORT, FLANGED, 2"	1	EA
259	5	171113	CAP - PIPE, BUTT WELD, 2" NOM,	1	EA
260	5	222397	COUPLING - PIPE, THREAD-O-LET 1/2	3	EA
261	5	262236	FLANGE - PIPE, WELD NECK	1	EA
262	4	3708.0502	TUBE - CONNECTOR, LOG, STEAM, 5/8	3	EA
263	4	3802.1131	PAD - WELD	4	EA
264	4	4009.3452	SUPPORT - PIPE 3 IN	1	EA
265	5	143558	BOLT - U, 1/2 DIA X 3 PIPE,	1	EA
266	5	4009.3432	BRACKET - PIPE SUPPORT 3 & 4	1	EA
267	5	556094	WASHER - FLAT, STL, 1/2 STD,	2	EA
268	4	269233	GAUGE - PRESSURE, 2-1/2" DIAL, 0-60 PSI	1	EA
269	4	348008	MUFFLER - STEAM EXHAUST,	1	EA
270	4	354120	NOZZLE - SPRAY, 150 DEG,	1	EA
271	4	523156	THERMOMETER - DIGITAL RTD, DIGI-STEM,	1	EA
272	4	199264	FITTING - BRASS, TAYLOR	1	EA
273	4	543705	VALVE - SOLENOID, 3-WAY, 24VDC	7	EA
274	4	544054	VALVE - BALL, 3/4" FLGD, CAST SST BODY,	1	EA
275	4	542208	VALVE - SHUT-OFF, 1/4 TUBE X	1	EA
276	4	543134	VALVE - COCK, 1/4"NPT, MALE &	1	EA
277	4	543627	VALVE - CONTROL, 2" FLGD, CARBON STEEL	1	EA
278	4	543565	VALVE - SAFETY, STEAM, 3",250#	1	EA
279	4	239696	ELBOW-DRIP PAN, SAFETY VALVE,	1	EA
280	4	3708.0874	PIPING - LEVEL CONTROL, STERITORT, 3"	1	EA
281	5	143257	BOLT - HEX HD HVY, 5/8-11NC X	8	EA
282	5	163036	BUSHING - PIPE, HEX, 3/4 X 1/2	2	EA
283	5	163071	BUSHING - PIPE, HEX, 2 X	1	EA
284	5	222483	COUPLING - PIPE, THREAD-O-LET 3/4	4	EA
285	5	239129	ELBOW - PIPE, 90 DEG, 3/4 IPS,	2	EA
286	5	262009	FLANGE - PIPE, WELDING NECK, 3	2	EA
287	5	262337	FLANGE-PIPE,SCREWED,REDUCING,	1	EA
288	5	262343	FLANGE-PIPE, SCREWED, REDUCING	1	EA
289	5	268141	GASKET - FLANGE, FLAT RING,	2	EA
290	5	269181	GAUGE / VALVE - WATER LEVEL, 1/2" NPT	1	EA
291	5	273271	GLASS - SIGHT, WATER LEVEL, 5/8 OD X	1	EA
292	5	350234	NIPPLE - PIPE, CLOSE, 3/4 IPS	2	EA
293	5	350266	NIPPLE - PIPE, SHORT, 3/4 IPS	2	EA
294	5	350526	NIPPLE - PIPE, 3/4 IPS X 3 LG,	1	EA
295	5	350580	NIPPLE - PIPE, 3/4 IPS X 5 LG,	1	EA
296	5	356319	NUT - HEX FULL FIN, 5/8-11NC,	8	EA
297	5	540052	UNION - PIPE, FEMALE, 3/4 IPS,	2	EA
298	5	542293	VALVE - GLOBE, 3/4 NPT, 150#	1	EA
299	4	143204	BOLT - HEX HD FIN, 1/2-13NC X	8	EA
300	4	143253	BOLT - HEX HD HVY, 5/8-11NC X	12	EA
301	4	143257	BOLT - HEX HD HVY, 5/8-11NC X	8	EA
302	4	143426	BOLT - HEX HD HVY, 3/4-10NC X	8	EA
303	4	143529	BOLT - HEX HD FIN, 1/2-13NC X	4	EA
304	4	143913	BOLT - HEX HD FIN, 1/2-13NC X	4	EA
305	4	160002	BREAKER - VACUUM, 2 IPS,	1	EA
306	4	163067	BUSHING - PIPE, HEX, 2 X 3/4 ,	1	EA

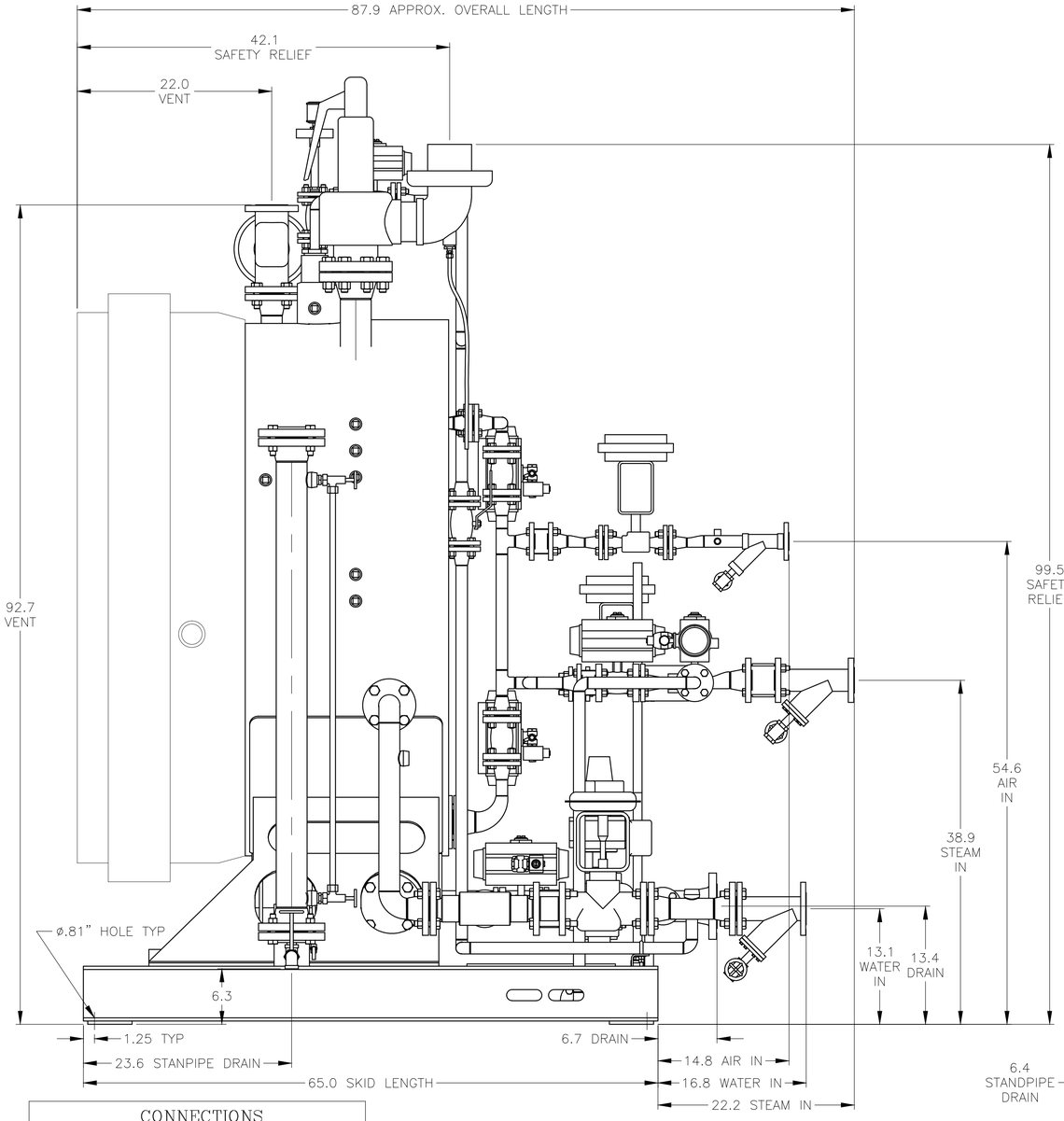
SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
307	4	163136	BUSHING - PIPE, HEX, 2 X 1 ,	1	EA
308	4	163183	BUSHING - PIPE, HEX, 1/2 X	1	EA
309	4	163190	BUSHING - PIPE, HEX, 1-1/4 X 1	1	EA
310	4	163211	BUSHING - PIPE, HEX, 3/4 X 1/2	1	EA
311	4	163278	BUSHING - PIPE, HEX, 3/4 X 1/4, STD,	2	EA
312	4	171031	CAP - PIPE, 3/4 IPS, 150#, SST, T-304	1	EA
313	4	211062	CONNECTOR - TUBE, 1/4 TUBE X	2	EA
314	4	211065	CONNECTOR - TUBE, 3/8 TUBE X	2	EA
315	4	211070	CONNECTOR - TUBE, 5/8 TUBE X 1/2 MPT	6	EA
316	4	222012	COUPLING - PIPE, 1/4 IPS, STL,	1	EA
317	4	222024	COUPLING - PIPE, 3/4 IPS,	1	EA
318	4	222074	COUPLING - PIPE, 1/4 IPS,	1	EA
319	4	239064	ELBOW - PIPE, STREET, 90 DEG,	1	EA
320	4	239129	ELBOW - PIPE, 90 DEG, 3/4 IPS,	1	EA
321	4	262186	FLANGE - PIPE, BLIND, 3 NOM	1	EA
322	4	262376	FLANGE-PIPE,SCREWED,3/4 IPS X	2	EA
323	4	268108	GASKET - FLANGE, FLAT RING,	1	EA
324	4	268141	GASKET - FLANGE, FLAT RING,	2	EA
325	4	268154	GASKET - FLANGE, FLAT RING,	3	EA
326	4	268217	GASKET - FLANGE, 150#, 3/4"	2	EA
327	4	350132	NIPPLE - PIPE, 3/4 IPS X 7 LG,	1	EA
328	4	350234	NIPPLE - PIPE, CLOSE, 3/4 IPS	1	EA
329	4	350272	NIPPLE - PIPE, SHORT, 4 IPS X	1	EA
330	4	350426	NIPPLE - PIPE, 1/2 IPS X 6 LG,	1	EA
331	4	356020	NUT - HEX HVY, 1/2-13NC, STL,	8	EA
332	4	356040	NUT - HEX FULL FIN, 1/2-13NC,	4	EA
333	4	356067	NUT - HEX HVY, 3/4-10NC, STL,	8	EA
334	4	356319	NUT - HEX FULL FIN, 5/8-11NC,	20	EA
335	4	393051	PLUG - PIPE, SQ HD, 1 IPS,	1	EA
336	4	393056	PLUG - PIPE, SQ HD, 1/2 IPS,	3	EA
337	4	393080	PLUG - PIPE, SQ HD, 3/4 IPS,	18	EA
338	4	393202	PLUG - PIPE, SQ HD, 1/4"IPS	1	EA
339	4	512003	SYPHON - PIGTAIL, 1/4 MPT,	1	EA
340	4	556038	WASHER - LOCK, SPRING REG 3/8	4	EA
341	4	556041	WASHER - LOCK, SPRING REG 1/2	4	EA
342	3	3608.7583	COVER - MOTOR, HYDRAULIC PUMP	1	EA
343	3	3708.0454	BRACKET - MOUNT, HINGED, CONTROL PANEL	1	EA
344	4	356045	NUT - HEX FULL FIN, 5/8-11NC,	3	EA
345	4	356091	NUT - HEX JAM FIN, 5/8-11NC,	3	EA
346	4	143443	BOLT - HEX HD FIN, 5/8-11NC X	3	EA
347	4	143187	BOLT - HEX HD FIN, 1/2-13NC X	4	EA
348	4	356041	NUT - HEX FULL FIN, 1/2-13NC,	4	EA
349	4	556286	WASHER - FLAT, 18-8 SST, 1/2,	4	EA
350	4	556042	WASHER - LOCK, SPRING REG 1/2	4	EA
351	4	143528	BOLT - HEX HD FIN, 3/4-10NC X	4	EA
352	4	356048	NUT - HEX FULL FIN, 3/4-10NC,	4	EA
353	4	556200	WASHER - FLAT, 18-8 SST, 3/4,	4	EA
354	4	556046	WASHER - LOCK, SPRING REG 3/4	4	EA
355	4	143425	BOLT - HEX HD FIN, 7/16-14NC X	4	EA
356	4	356038	NUT - HEX FULL FIN, 7/16-14NC,	4	EA
357	4	556117	WASHER - FLAT, 18-8 SST, 7/16,	4	EA

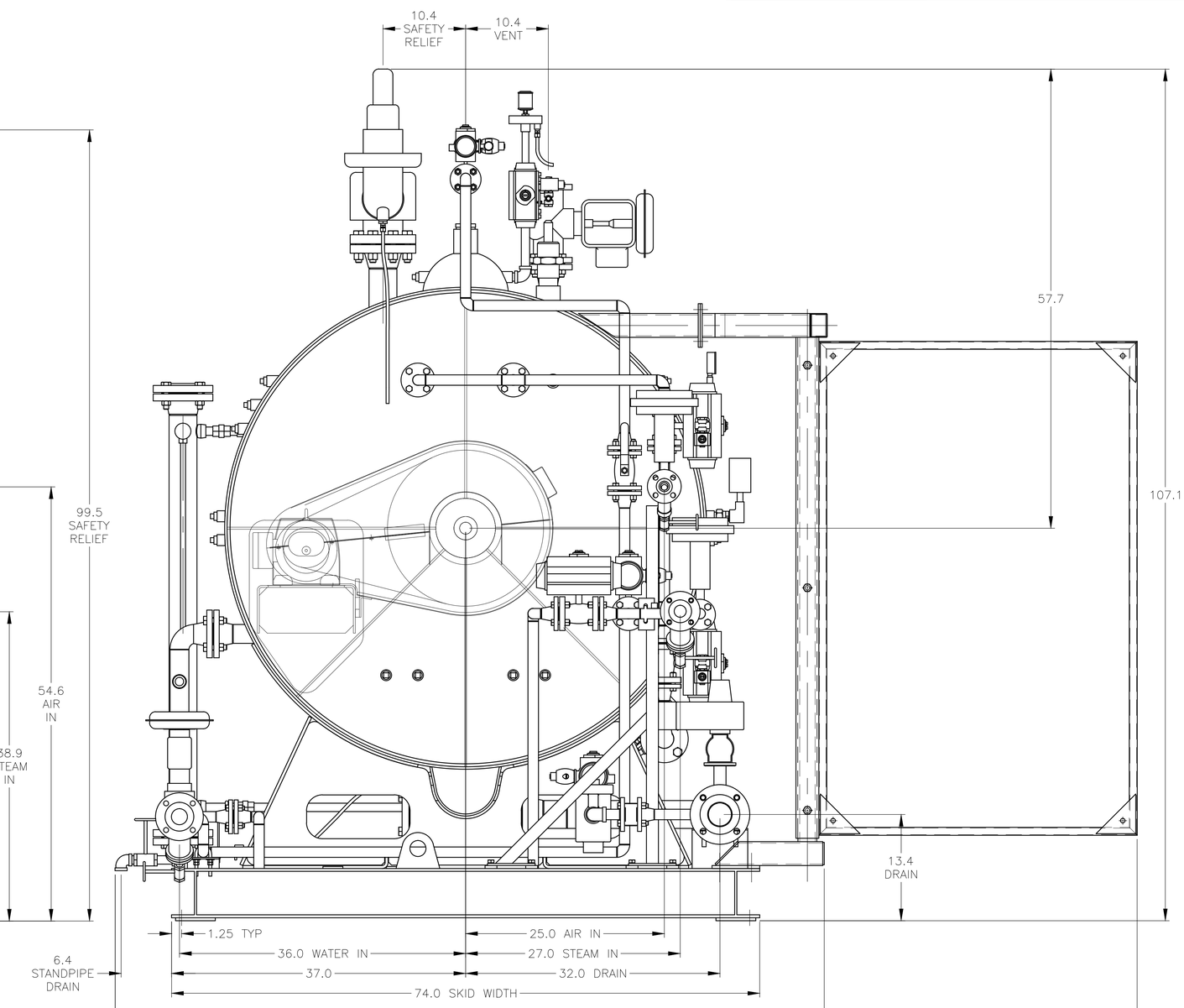
SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
358	4	556116	WASHER - LOCK, SPRING REG 7/16	4	EA
359	3	3708.0904	DECALS LOCATION - SAFETY, STERITORT	1	EA
360	4	0263.0092-5	DECAL - DIE CUT, JBT FOODTECH	1	EA
361	4	0263.0092-3	DECAL - DIE CUT, JBT FOODTECH	2	EA
362	4	233061	DECAL - WARNING, GUARD REMOVED	1	EA
363	4	233062	DECAL - WARNING, TIMING BELT	2	EA
364	4	233065	DECAL - WARNING, HOT SURFACE	10	EA
365	4	233087	DECAL - WARNING, BURN HAZARD	2	EA
366	4	233092	DECAL - WARNING, ROTATING SHAFT	1	EA
367	4	233102	DECAL - UPS VOLTAGE PRESENT	2	EA
368	4	233080	DECAL - DANGER, HAZARDOUS VOLTAGE	1	EA
369	4	233081	DECAL - WARNING, ACCESS RESTRICTED	1	EA
370	4	233118	DECAL - CAUTION, PRESSURIZED DEVICE,	1	EA
371	4	233107	DECAL - WARNING, PRESSURIZED STEAM	2	EA
372	4	3407.0761	BRACKET - DECAL, PIPE	3	EA
373	4	3608.9922	BRACKET - DECAL, 2" PIPE	1	EA
374	5	144306	BOLT - U, 5/16-18NC X 2" PIPE	1	EA
375	4	233088	DECAL - WARNING, BURN HAZARD	1	EA
376	4	233119	DECAL - WARNING ARC FLASH, SHOCK HAZARD	1	EA
377	4	233087	DECAL - WARNING, BURN HAZARD	1	EA
378	4	144175	BOLT - U, 3/8 DIA X 1" PIPE,	3	EA
379	4	556086	WASHER - FLAT, 18-8 SST, 3/8,	6	EA
380	4	3608.6651	BRACKET - DECAL, VALVE	1	EA
381	2	268183	GASKET - DOOR, STERITORT,	1	EA
382	2	3708.0864	REEL - STERITORT, 35 STEP, 401 & 404	1	EA
383	3	3708.0854	HEAD - REEL, 35 STEP, STERITORT, FOR 31"	1	EA
384	3	3708.0842	ANGLE - REEL, 35 STEP, STERITORT, 2-7/8	35	EA
385	2	3708.0533	BRACKET - SENSOR, VENT OPEN, STERITORT	1	EA
386	3	507920	SWITCH - PROXIMITY, 18MM BARREL, 3 WIRE	1	EA
387	3	143979	BOLT - HEX HD FIN, 5/16-18NC X 3/4 LG,	2	EA
388	3	556037	WASHER - LOCK, SPRING REG 5/16	2	EA
389	3	356026	NUT - HEX FULL FIN, 5/16-18NC,	2	EA
390	2	3608.9854	REEL - STERITORT, AGITATING, COMBO	1	EA
391	3	3708.0882	ANGLE - REEL, STERITORT, 211-303 DIA CAN	24	EA
392	3	3708.0892	ANGLE - REEL, STERITORT, 307 DIA CANS,	20	EA
393	3	3608.3163	REEL HEAD - 42 STEP	1	EA
394	2	3708.0920	PARTS - LOOSE, VALVE TAGS W/ UTILITY	1	EA
395	3	580003	TAG - METAL, ROUNDED RECTANGULAR	1	EA
396	2	3708.0930	PARTS - LOOSE, PRESSURE TRANSMITTER	1	EA
397	3	258191	REDUCER - PIPE, 3/4 X 1/2 IPS,	1	EA
398	3	163380	BUSHING - PIPE, HEX, 3/4 X 1/2, 18-8 SST	3	EA
399	3	239029	ELBOW - PIPE, 90 DEG, 3/4 IPS,	1	EA
400	3	222015	COUPLING - PIPE, 1/4 IPS, 150#, SST	2	EA
401	3	163353	BUSHING - PIPE, HEX, 3/4 X 1/4	2	EA
402	1	3608.0927-ELEC	STERITORT - ELECTRICAL TOP SPEC,	1	EA
403	2	0283.4940	ASSEMBLY - CONTROL PANEL, STERITORT,	1	EA
404	3	160229	BREAKER - CIRCUIT, 6A, 2 POLE, DIN RAIL	1	EA
405	3	160238	BREAKER - CIRCUIT, OPERATING MECHANISM	1	EA
406	3	378098	PLC - RACK, COMPACTLOGIX END R	1	EA
407	3	160234	BREAKER-CIRCUIT, 3 POLE, THERMAL-MAG	1	EA
408	3	507911	SWITCH - DISCONNECT, FLANGE MOUNT OPER	1	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
409	3	215111	CONTACTOR - IEC 25 AMP	1	EA
410	3	215103	CONTACTOR - 3 POLE, IEC, 9AMPS	3	EA
411	3	500166	STARTER-MANUAL MOTOR W/ PROTECTOR,	2	EA
412	3	215125	CONTACTOR - IEC, AUX CONTACT	2	EA
413	3	160222	BREAKER - CIRCUIT, 2A, 2 POLE, DIN RAIL	2	EA
414	3	531327	TRANSMITTER - POWER, LOAD CONTROLS	1	EA
415	3	406414	RELAY - OVERLOAD, RATE OF CHANGE	1	EA
416	3	529137	TRANSFORMER - .75 KVA, CONTROL, 575-600V	1	EA
417	3	541006	UPS - 850VA, 510 WATT, 115VAC, 2 MIN	1	EA
418	3	160220	BREAKER - CIRCUIT, 5A, 2 POLE, DIN RAIL	1	EA
419	3	160223	BREAKER - CIRCUIT, 1A, 1 POLE, DIN RAIL	5	EA
420	3	160221	BREAKER - CIRCUIT, 2A, 1 POLE, DIN RAIL	6	EA
421	3	401076	RECEPTACLE - EM-DUO-120/20,20A	1	EA
422	3	404107	RECORDER - ELEC CIRCULAR CHART 4 PEN	1	EA
423	3	522001	THERMOSTAT - ENCLOSURE TEMP CTRL	1	EA
424	3	409976	POWER SUPPLY - 24VDC, 5 AMP OUTPUT	3	EA
425	3	206035	COMPUTER - ETHERNET NETWORK SWITCH, 5	1	EA
426	3	298003	HORN - AUDIBLE, 120V 50/60HZ	1	EA
427	3	ALM-HN-MNT	GRILL,FLUSH,FOR FEDERAL 350	1	EA
428	3	156031	BOX - HORN, OUTLET, FEDERAL	1	EA
429	3	507459	SWITCH - JUMBO MUSHROOM HEAD,	1	EA
430	3	215145	CONTACT - BLOCK, 1 N.O., 1 N.C.	1	EA
431	3	318525	PLATE - NAME, ENGRAVED "EMERGENCY STOP"	1	EA
432	3	ALM-VI-LHT	ALARM LIGHT	1	EA
433	3	333037	LIGHT - BULB FOR TELEMECANIQUE	1	EA
434	3	266220	FUSE - GLASS TUBE, 1/2-AMP BUSS	20	EA
435	3	520151	TERMINAL - GROUNDING BAR	1	EA
436	3	378092	PLC - PROCESSOR COMPACTLOGIX	1	EA
437	3	378235	I/O MODULE - DIGITAL INPUT, 16 POINT	2	EA
438	3	378095	I/O MODULE - DIGITAL OUTPUT	1	EA
439	3	378163	I/O MODULE - ANALOG INPUT, 8 CHANNEL	1	EA
440	3	378164	I/O MODULE - ANALOG OUTPUT, 8 CHANNEL	1	EA
441	3	376199	PC ETHERNET PATCH CABLE, 10'	2	EA
442	3	406239	RELAY - CONTROL, 4PDT, 8A CONTACTS	10	EA
443	3	406241	RELAY - BASE, FOR 4 POLE SQUARE D ZELIO	10	EA
444	3	406413	RELAY - MISC. 2 OUTPUTS SAFETY MODULE	1	EA
445	3	406403	RELAY - SAFETY, STOP CAT 0, UP TO CAT 3	1	EA
446	3	0409.3392	PLATE - NAME, ELECTRICAL	1	EA
447	3	0263.0092-1	DECAL - DIE CUT, JBT FOODTECH	2	EA
448	3	233080	DECAL - DANGER, HAZARDOUS VOLTAGE	2	EA
449	3	233119	DECAL - WARNING ARC FLASH, SHOCK HAZARD	2	EA
450	3	233077	DECAL - DANGER, TWO SOURCES OF POWER	2	EA
451	3	318525	PLATE - NAME, ENGRAVED "EMERGENCY STOP"	1	EA
452	3	198579	ENCLOSURE - MOUNTING BRACKET FOR	1	EA
453	3	198584	ENCLOSURE - LIGHT FIXTURE, 18" FLUOR	1	EA
454	3	326079	LAMP - FLUORESCENT, 15W, TYPE F15T8	1	EA
455	3	0283.4982	PLATES - LEGENDS, STERITORT,	1	EA
456	3	198566	ENCLOSURE - BACK PLATE FOR HOFFMAN	1	EA
457	3	198592	ENCLOSURE - COOLER, OUTDOOR FAN & EXH	1	EA
458	3	160225	BREAKER - CIRCUIT, 1A, 2 POLE,	1	EA
459	3	378093	PLC - POWER SUPPLY, CMPCTLGX	1	EA

SEQ	LEVEL	ITEM	DESCRIPTION	QTY	UM
460	3	0283.4954	ENCLOSURE - LAYOUT/CUTOUT, STERITORT,	1	EA
461	3	378251	PLC - I/O OPERATOR INTERFACE, 10",	1	EA
462	3	311264	DRIVE - VFD 2HP, 600VAC, POWERFLEX 70	1	EA
463	3	376869	MEMORY CARD - SD	1	EA
464	3	0283.4932	SCHEMATICS - ELECTRICAL, STERITORT,	1	EA
465	3	531351	TRANSMITTER - RTD, 3 WIRE, LOOP POWERED,	3	EA
466	3	160129	BREAKER - CIRCUIT, RAIL MOUNT,1AMP	4	EA
467	3	160119	BREAKER - CIRCUIT, RAIL MOUNT,	3	EA
468	3	160128	BREAKER - CIRCUIT, RAIL MOUNT,2A	2	EA
469	3	376199	PC ETHERNET PATCH CABLE, 10'	4	EA
470	2	0283.4960	ASSEMBLY - SHELL MOUNTED ELEC, STERITORT	1	EA
471	3	531356	TRANSMITTER - LEVEL, GUIDED RADAR	1	EA
472	3	198272	ENCLOSURE-ELECT PUSH BUTTON,	1	EA
473	3	507460	SWITCH - SELECTOR, 3 POSITION,	2	EA
474	3	507459	SWITCH - JUMBO MUSHROOM HEAD,	1	EA
475	3	215145	CONTACT - BLOCK, 1 N.O., 1 N.C.	1	EA
476	3	318525	PLATE - NAME, ENGRAVED "EMERGENCY STOP"	1	EA
477	3	CCW-CW-PLT	PLATE-NAME, ENGRAVED ROTATION	2	EA
478	3	512003	SYPHON - PIGTAIL, 1/4 MPT,	2	EA
479	3	512004	SYPHON - PIGTAIL, 1/2 MPT,	2	EA
480	3	543658	VALVE - SOLENOID, 1/4 NPT, 3	1	EA
481	3	531350	TRANSMITTER - PRESSURE, WITH DISPLAY	2	EA
482	3	531286	TRANSMITTER - PRESSURE 0-145	2	EA
483	3	521081	PROBE-RTD, 3 WIRE DUAL ELEMENT,	2	EA
484	3	169149	CABLE - ELECTRICAL, 10M, 4 WIRE, 90 DEG,	4	EA

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION





CONNECTIONS	
STEAM IN	1-1/2" 150# FLGD
WATER IN	2" 150# FLGD
AIR IN	1" 150# FLGD
VENT	2" 150# FLGD
DRAIN	3" 150# FLGD
SAFETY RELIEF	6" PIPE
STANDPIPE DRAIN	3/4" NPT

UTILITY SUPPLY REQUIREMENTS		
STEAM	80-120 PSIG	8,900.0 LBS/HR *
COOLING WATER	40-80 PSIG	354.0 GPM *
COMPRESSED AIR	80-120 PSIG	670.0 SCFM *

* = INLET VALVE(S) WIDE OPEN

APPROXIMATE MACHINE WEIGHT

	NET WEIGHT	MAX. WEIGHT *
60.0"ø STERITORT	7,500 LBS	10,500 LBS

* = FULL OF WATER

CSSC – TORONTO, CANADA
S/N 3608-94-11

REV.	ECO	REVISIONS	BY	DATE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

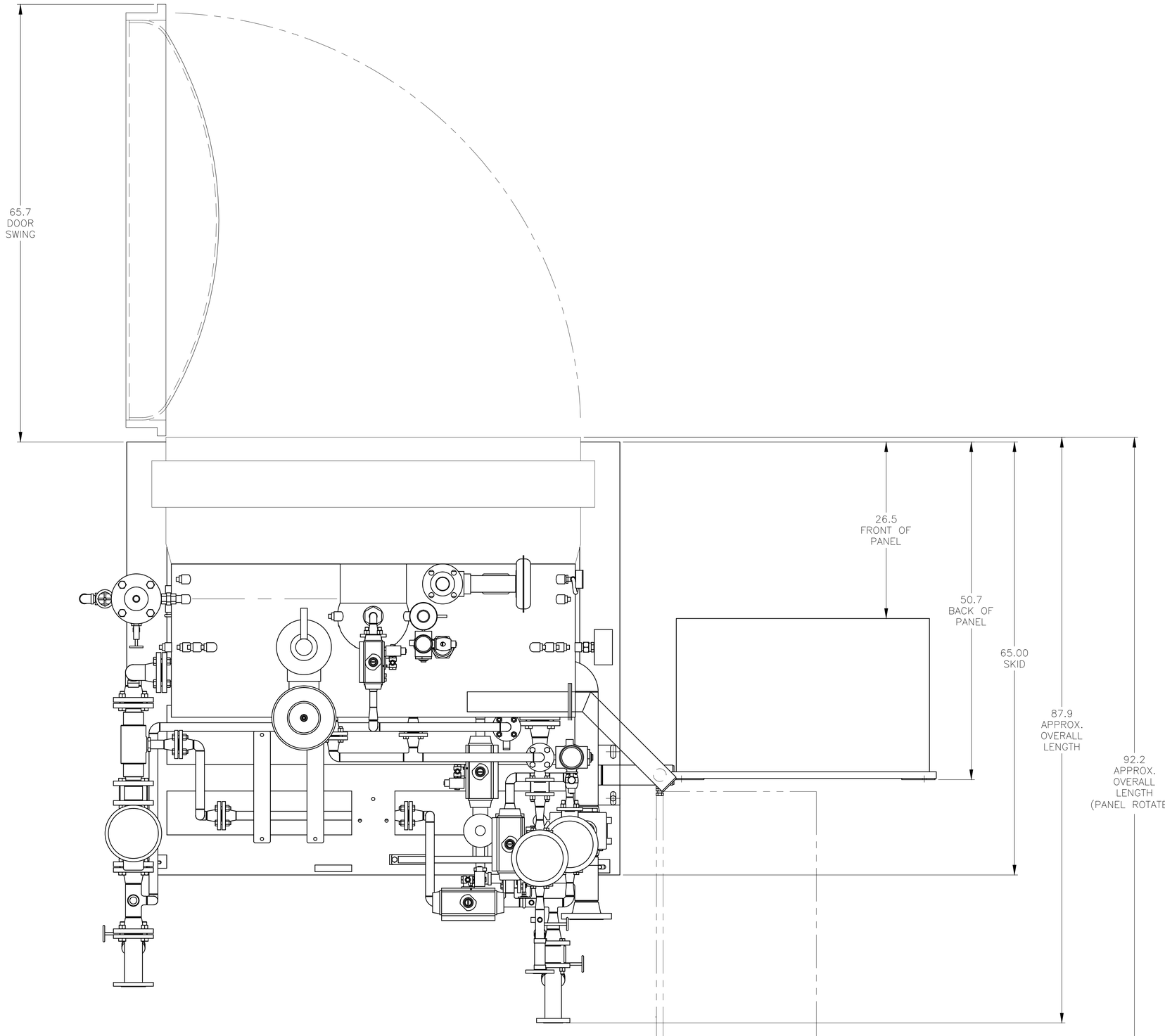
FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:
S.O. 1st Used: EMACH03875
SIMILAR TO: 0998.3194
NEXT ASS'Y: 3608.0927

TITLE
FLOOR PLAN – STERITORT
FOR ROTARY SIMULATION

DRAWN: A PRINS | SCALE: 1/8 | SIZE D | DWG NO 0998.3334 | REV 0 | SH 1 OF 2
DATE: 100311 | APPROVED:

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION



CSSC – TORONTO, CANADA
S/N 3608–94–11

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03875

SIMILAR TO: 0998.3194

NEXT ASS'Y: 3608.0927

TITLE
FLOOR PLAN – STERITORT
FOR ROTARY SIMULATION

DRAWN: A PRINS

SCALE: 1/8

DATE: 100311

APPROVED:

SIZE D

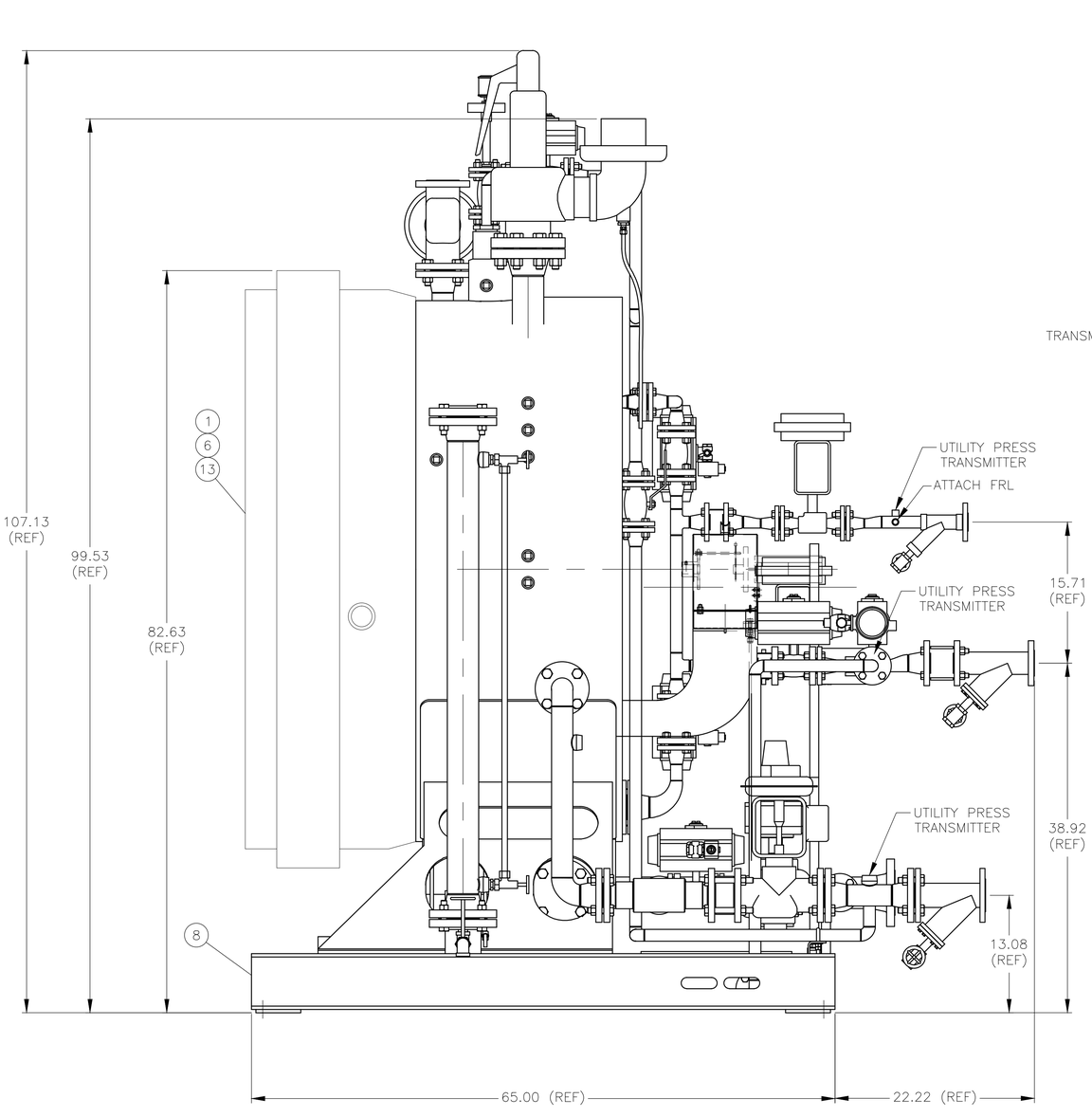
DWG NO 0998.3334

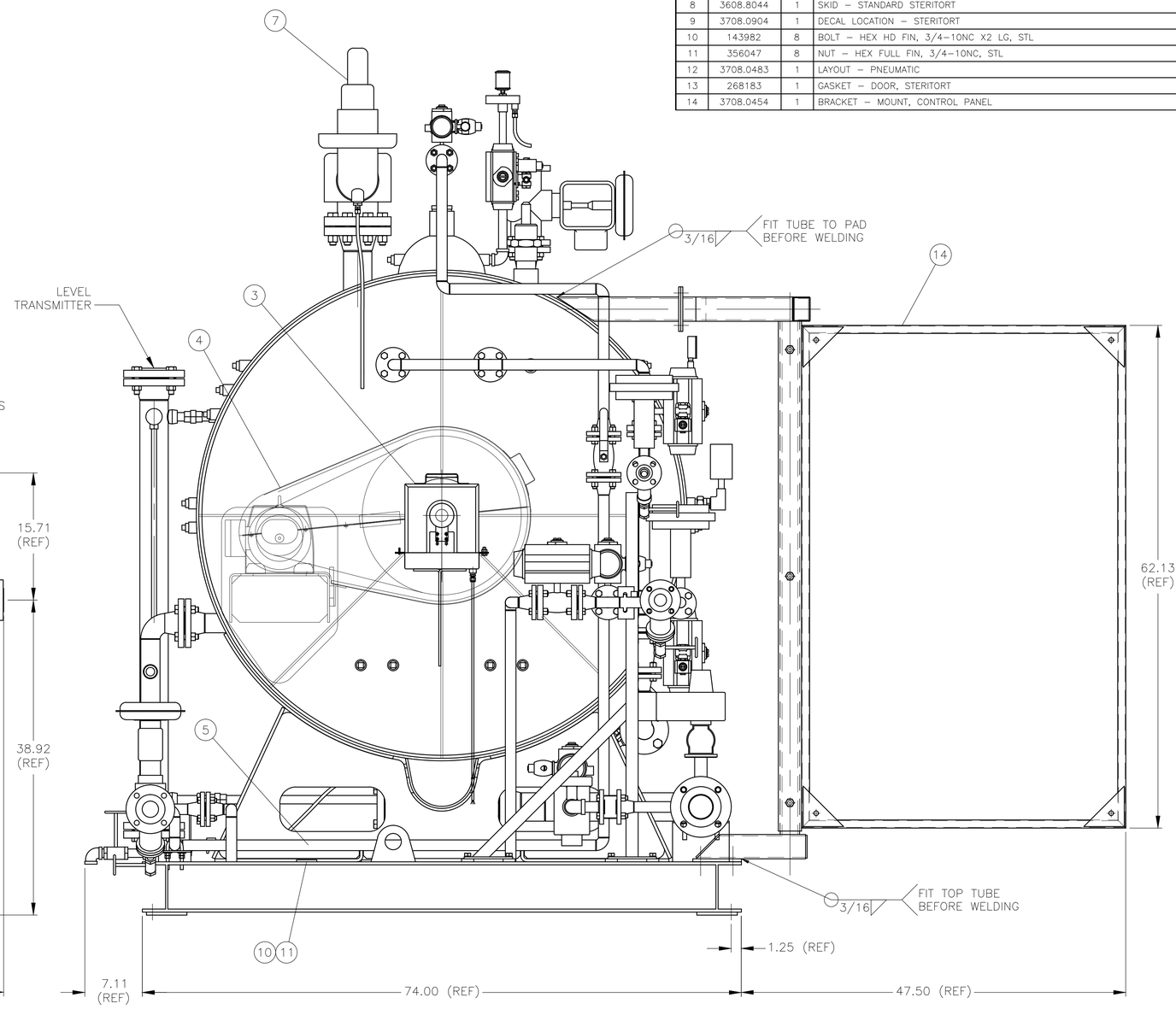
REV 0

SH 2 OF 2

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	3608.9903	1	LAYOUT – HYDRAULIC
2	3708.0462	1	LAYOUT – LUBRICATION, STERITORT
3	3708.0714	1	SLIP RING ASSY (24 CIRCUIT)
4	3708.0704	1	DRIVE – STERITORT, 2 HP SEW
5	3608.7583	1	COVER – MOTOR, HYDRAULIC PUMPSTERITORT
6	3708.0685	1	SHELL – STERITORT, 55 PSI, STD
7	3708.0724	1	PIPING – STERITORT
8	3608.8044	1	SKID – STANDARD STERITORT
9	3708.0904	1	DECAL LOCATION – STERITORT
10	143982	8	BOLT – HEX HD FIN, 3/4–10NC X2 LG, STL
11	356047	8	NUT – HEX FULL FIN, 3/4–10NC, STL
12	3708.0483	1	LAYOUT – PNEUMATIC
13	268183	1	GASKET – DOOR, STERITORT
14	3708.0454	1	BRACKET – MOUNT, CONTROL PANEL





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

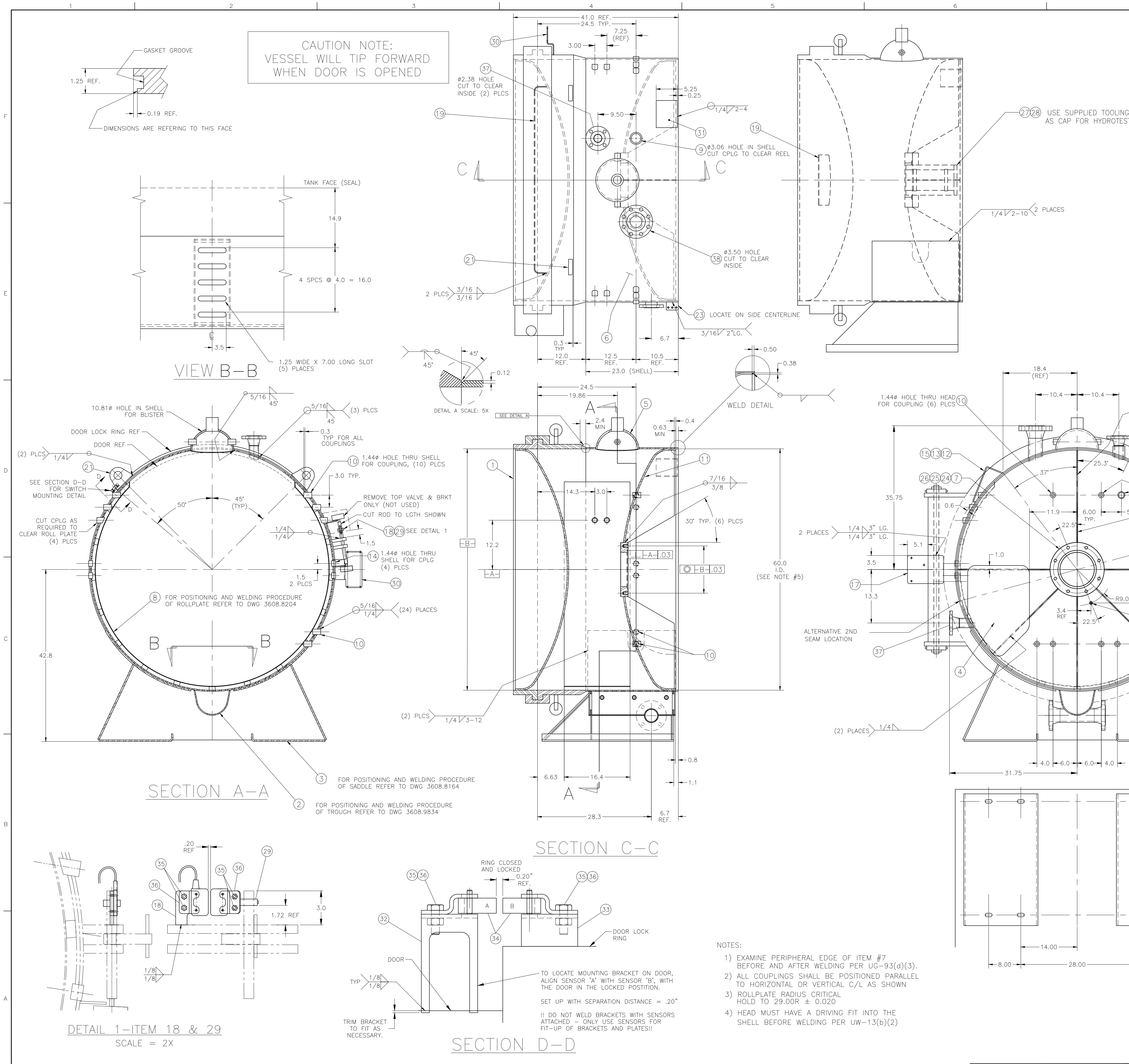
FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT: 7500 Lbs
S.O. 1st Used: EMACH03875
SIMILAR TO: 3708.0344
NEXT ASS'Y: 3608.0927–MECH

TITLE
ASSEMBLY – STERITORT
FOR ROTARY SIMULATION

DRAWN: A PRINS | SCALE: NTS | SIZE D | DWG NO 3708.0674 | REV 0 | SH 1 OF 1
DATE: 101111 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE



ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	176015	1	DOOR – RH, STEEL, 60 PSI
2	3608.9834	1	TROUGH – STERITORT, SA-285 GRC
3	3608.8164	1	SADDLE – STERITORT, HR A-36
4	3608.9413	1	MOUNTING PLATE – DRIVE MOTOR, HR A-36
5	3608.8173	1	BLISTER – INSTRUMENT, SA-516 GR 70
6		1	STL-PL-5/16, SA-516 GR 70
7	3608.8664	1	FLANGE – DRIVE, SA-516 GR 70
8	3608.8204	1	ROLLPLATE – STERITORT, ARS-30
9	222231	1	COUPLING – PIPE 3000#, 2' SA-105
10	222024	16	COUPING – PIPE 3000#, 3/4", SA-105
11	303025	1	DISHED HEAD – 60" O.D. SA-516 GR70
12	3802.6102	1	MOUNTING PLATE –ASME & S/N, STEEL
13	0409.3171	1	NAMEPLATE – ASME
14	222064	4	COUPLING – PIPE 3000# HALF, 3/4", SA-105
15	437008	8	SCREW – DRIVE, #14 X 3/4 LG, STEEL
16		6	PLATE – 1/4 THK, SA-285 GR C STEEL
17	3608.6083	1	BRACKET – HYD VALVE MTG
18	3807.3931	1	BRACKET – SAFETY SWITCH
19	3608.9643	1	PANEL – DECAL
20	222076	1	COUPLING – PIPE 3000#, 1" SA-105
21	4020.6102	2	LIFTING LUG, SA-516 GR 70
22	222074	1	COUPLING – PIPE 3000#, 1/4", SA-105
23	3608.6161	1	BRACKET – GREASE ZERK FITTINGS
24	143271	8	BOLT – HX HD, 3/4-10NC x 2" LG, SA-325 TYPE 1
25	3608.8683	1	HUB – DRIVE, STERITORT
26	3608.8701	1	GASKET – HUB, DRIVE
27	3608.8691	1	GASKET – HUB, DRIVE, SMALL END
28	143243	3	BOLT – HX HD, 5/8-11NC x 1-1/2 LG, SA-325, TYPE 1
29	3807.3921	1	BRACKET – MOUNTING, SAFETY SWITCH
30	3608.9662	1	BRACKET – JOG STATION, HR A-36
31		1	PLATE – 1/4 THK, SA-285 GR C STEEL
32	3807.3911	1	BRACKET – MOUNTING, SAFETY SWITCH, SST T-304
33	3807.3861	1	PLATE – MOUNTING, SAFETY SWITCH, SST T-304
34	464070	2	SWITCH – SAFETY, SET, NON CONTACT, JOKAB
35	143025	8	BOLT – HEX HD, 1/4-20NC X 3/4 LG, SST
36	3807.3791	4	CLIP – SENSOR, EDEN SAFETY SENSORS
37	3907.5742	2	PIPE – STUB, 2" FLANGED, 150#
38	3907.7842	1	PIPE – STUB, 3" FLANGED, 300#

NOTES:

1) EXAMINE PERIPHERAL EDGE OF ITEM #7 BEFORE AND AFTER WELDING PER UG-93(d)(3).
2) ALL COUPLINGS SHALL BE POSITIONED PARALLEL TO HORIZONTAL OR VERTICAL C/L AS SHOWN
3) ROLLPLATE RADIUS CRITICAL HOLD TO 29.00R ± 0.020
4) HEAD MUST HAVE A DRIVING FIT INTO THE SHELL BEFORE WELDING PER UW-13(b)(2)

ASME PART

MUST BE REVIEWED AND RELEASED BY PROJECT ENGINEER PRIOR TO EACH TIME USED
DESIGNED TO ASME CODE SECTION VIII DIV 1.
(ADDENDUM DATED ____),FOR:
MAWP 45 PSI AT MAX. TEMP. 292 °F
MIN. DESIGN METAL TEMP. 50 °F AT 45 PSI.
HYDROSTATIC TEST PRESSURE 59 PSIG:
ASME CODE MATERIAL REPORT REQUIRED;
MARK WITH MATERIAL HEAT NUMBERS.
REVIEWED BY: INITIALS ____ DATE ____

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

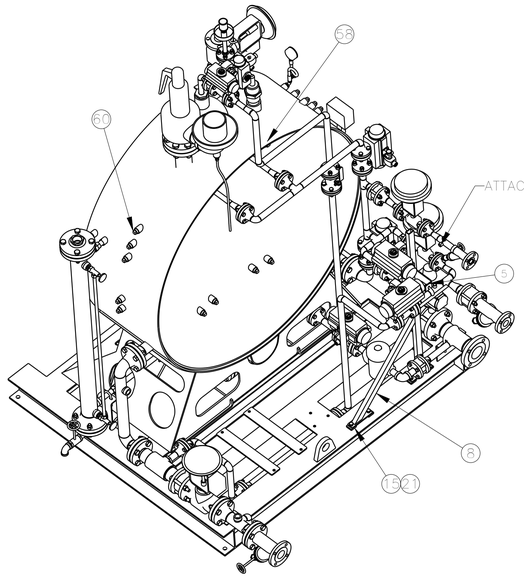
JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

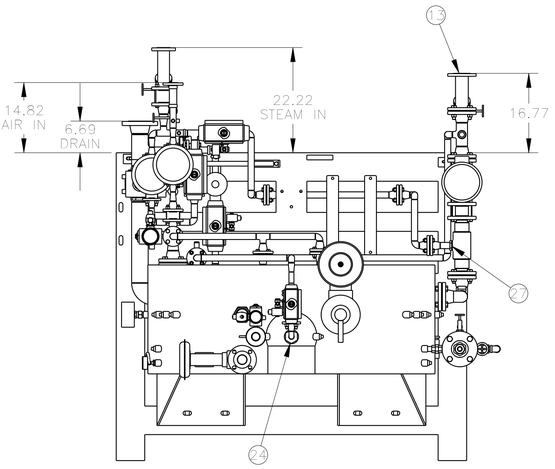
EST. WT:		TITLE: SHELL – STERITORT STD ROTARY MODE	
S.O. 1st Used:	EMACH03875		
SIMILAR TO:	3708.0355	DRAWN: A PRINS	SCALE: 1:8
NEXT ASS'Y:	3708.0674	DATE: 081211	APPROVED:

SIZE: E | DWG NO: 3708.0685 | REV: 0 | SH 1 OF 1

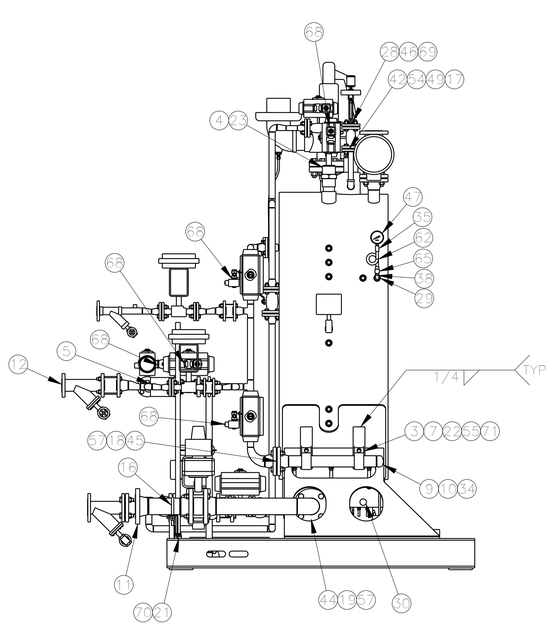
REV | ECO | REVISIONS | BY | DATE

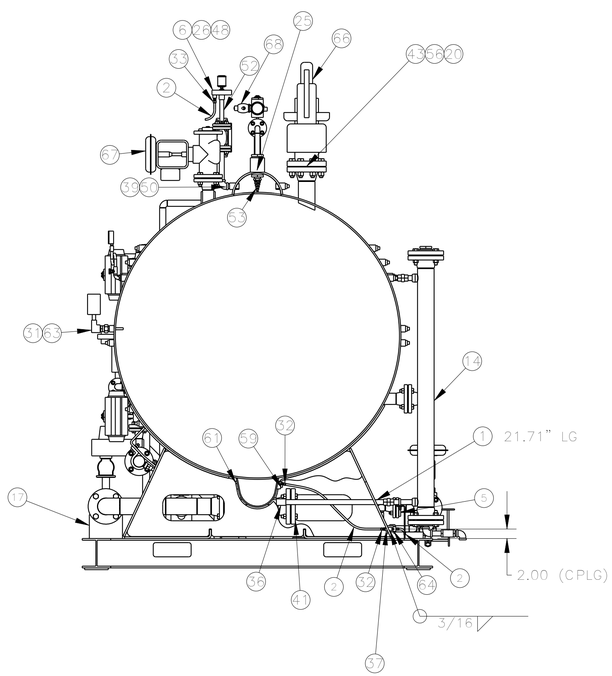
ASME PART

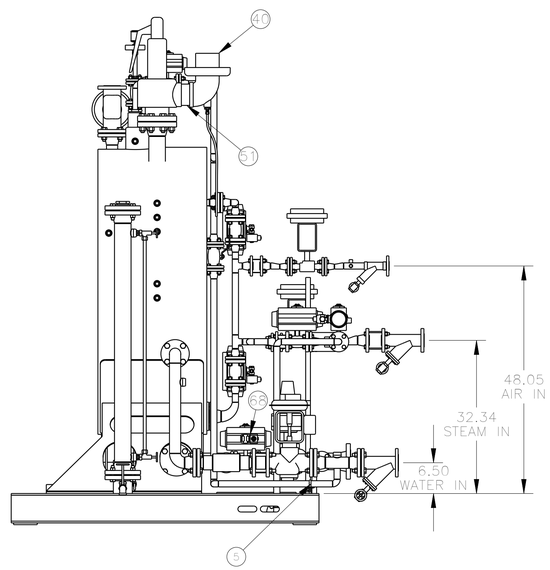




61	393202	1	PLUG – PIPE, SQ HEAD, 1/4 NPT, STL
62	512003	1	SYPHON – PIGTAIL, 1/4 NPT
63	523156	1	THERMOMETER – DIGITAL RTD, DIGI-STEM, 0-300 DEG F
64	542208	1	VALVE – SHUT-OFF, 1/4 TUBE X 1/4 MNPT, 2-WAY, BRASS
65	543134	1	VALVE – COCK, 1/4 NPT, BRASS, 250#
66	543565	1	VALVE – SAFETY, FLANGED, 3 IPS, 250# INLET, 45 PSI
67	543627	1	VALVE – CONTROL, 2 IPS, FLANGED, W/ MOUNTED I/P
68	543705	7	VALVE – SOLENOID, 3-WAY, 24VDC, 1/4" NPT
69	544054	1	VALVE – BALL, FLANGED, 3/4, SST, W/ ACTUATOR
70	556038	4	WASHER – LOCK, 3/8 REG, STL
71	556041	4	WASHER – LOCK, 1/2 REG, STL







ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1		2"	STL PIPE 3/4 SCH 80 SA-106 GR B
2		3"	CU TUB RD 3/8 X .032 WALL
3	3601.0081	2	SUPPORT – PIPE, 2"
4	3602.4651	1	NIPPLE – SPECIAL, VACUUM BREAKER
5	3608.8262	3	SUPPORT – PIPE, 1"
6	3608.8792	1	PAN – DRIP, BLEEDER, STERITORT
7	3702.1171	2	BRACKET – SUPPORT, 2" PIPE, PRESS. STERILIZER
8	3708.0292	1	BRACKET – SUPPORT – PIPE, STERITORT
9	3708.0492	1	PIPING – LOG, STERITORT
10	3708.0502	3	TUBE – CONNECTOR, LOG, STEAM, 5/8
11	3708.0734	1	PIPING – DRAIN, FLGD, STERITORT
12	3708.0744	1	PIPING – STEAM/AIR INLET, STERITORT
13	3708.0754	1	PIPING – WATER IN, STERITORT
14	3708.0874	1	PIPING – LEVEL CONTROL, STERITORT
15	3802.1131	4	PAD – WELD, SST
16	4009.3452	1	SUPPORT – PIPE, 3"
17	143204	8	BOLT – HEX HD, 1/2-13NC X 2 LG, SA-354 GR B
18	143253	12	BOLT – HEX HD HVY, 5/8-11NC X 2-1/2 LG, STL, SA-325 TYPE 1
19	143257	8	BOLT – HEX HD HVY, 5/8-11NC X 3 LG, STL, SA-325 TYPE 1
20	143426	8	BOLT – HEX HD HVY, 3/4-10NC X 3-1/2 LG, STL, SA-325 TYPE 1
21	143529	4	BOLT – HEX HD, 1/2-13NC X 5/8 LG, STL, SA-354 GR BD
22	143913	4	BOLT – HEX HD, 1/2-13NC X 1-3/4 LG, STL
23	160002	1	BREAKER – VACUUM, 2 NPT, BRASS
24	163067	1	BUSHING – PIPE, HEX, 2 X 3/4, BLACK IRON
25	163136	1	BUSHING – PIPE, HEX, 2 X 1, BLACK IRON
26	163183	1	BUSHING – PIPE, HEX, 1/2 X 1/8, BRASS
27	163190	1	BUSHING – PIPE, HEX, 1-1/4 X 1, BLACK IRON
28	163211	1	BUSHING – PIPE, HEX, 3/4 X 1/2, STL
29	163278	2	BUSHING – PIPE, HEX, 3/4 X 1/4, BLACK IRON
30	171031	1	CAP – PIPE, 3/4 IPS, 150#, SST, T-304
31	199264	1	FITTING – BRASS, UNION HUB, 3/4 NPT
32	211062	2	CONNECTOR – TUBE, 1/4 TUBE X 1/4 MNPT, BRASS, COMP
33	211065	2	CONNECTOR – TUBE, 3/8 TUBE X 1/4 MNPT, BRASS, COMP
34	211070	6	ADAPTER – TUBE, 5/8 TUBE X 1/2 MPT, STL
35	222012	1	COUPLING – PIPE, 1/4 IPS, 150#, STL
36	222024	1	COUPLING – PIPE, FULL, 3/4 IPS, 3000#, FGD STL
37	222074	1	COUPLING – PIPE, FULL, 1/4 IPS, 3000#, FGD STL
38	239064	1	ELBOW – PIPE, THREADED, STREET, 1/4 IPS, 150#, MAL IRON
39	239129	1	ELBOW – PIPE, 90 DEG, THREADED, 3/4 IPS, 150#, MAL IRON
40	239696	1	ELBOW – DRIP PAN, 4 NPT, STL
41	262186	1	FLANGE – PIPE, BLIND, 3 NOM, 150#, STL
42	262376	2	FLANGE – PIPE, THREADED, 3/4 IPS, 150#, STL
43	268108	1	GASKET – FLANGE, FLAT RING, 3 IPS, 300#
44	268141	2	GASKET – FLANGE, 3 IPS, 150#, FLAT RING
45	268154	3	GASKET – FLANGE, 2 IPS, 150#, FLAT RING
46	268217	2	GASKET – FLANGE, 3/4 IPS, 150#, FLAT RING
47	269233	1	GAUGE – PRESSURE, 2-1/2" DIAL, 0-60 PSI
48	348008	1	MUFFLER – STEAM EXHAUST, 1/8 MNPT
49	350132	1	NIPPLE – PIPE, 3/4 IPS X 7 LG, SCH 40, STL
50	350234	1	NIPPLE – PIPE, CLOSE, 3/4 IPS X 1-3/8 LG, SCH 40, STL
51	350272	1	NIPPLE – PIPE, 4 IPS X 4 LG, SCH 40, STL
52	350426	1	NIPPLE – PIPE, 1/2 IPS X 6 LG, SCH 80, STL
53	354120	1	NOZZLE – SPRAY, 150 DEG FULL CONE, BRASS, 1 MNPT
54	356020	8	NUT – HEX HVY, 1/2-13NC, STL, SA-194 GR 2H
55	356040	4	NUT – HEX, 1/2-13NC, STL
56	356067	8	NUT – HEX HVY, 3/4-10NC, STL, SA-194 GR 2H
57	356319	20	NUT – HEX, 5/8-11NC, STL, SA-194 GR 2H
58	393051	1	PLUG – PIPE, SQ HEAD, 1 NPT, 3000#, STL
59	393056	3	PLUG – PIPE, SQ HEAD, 1/2 NPT, 3000#, STL
60	393080	18	PLUG – PIPE, SQ HEAD, 3/4 NPT, 3000#, STL

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES
XX.X = ± .050
XX.XX = ± .030
XX.XXX = ± .010
ANGLE = ± .5°
3RD ANGLE PROJ.

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:	3639 LBS
S.O. 1st Used:	EMACH03875
SIMILAR TO:	37080364
NEXT ASSY:	3708.0674

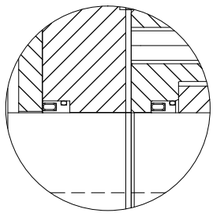
TITLE
PIPING – CONTROL, STERITORT

DRAWN:	PRINS	SCALE:	1:16	SIZE D
DATE:	100611	APPROVED:		DWG NO 3708.0724 REV 00 SH 1 OF 1

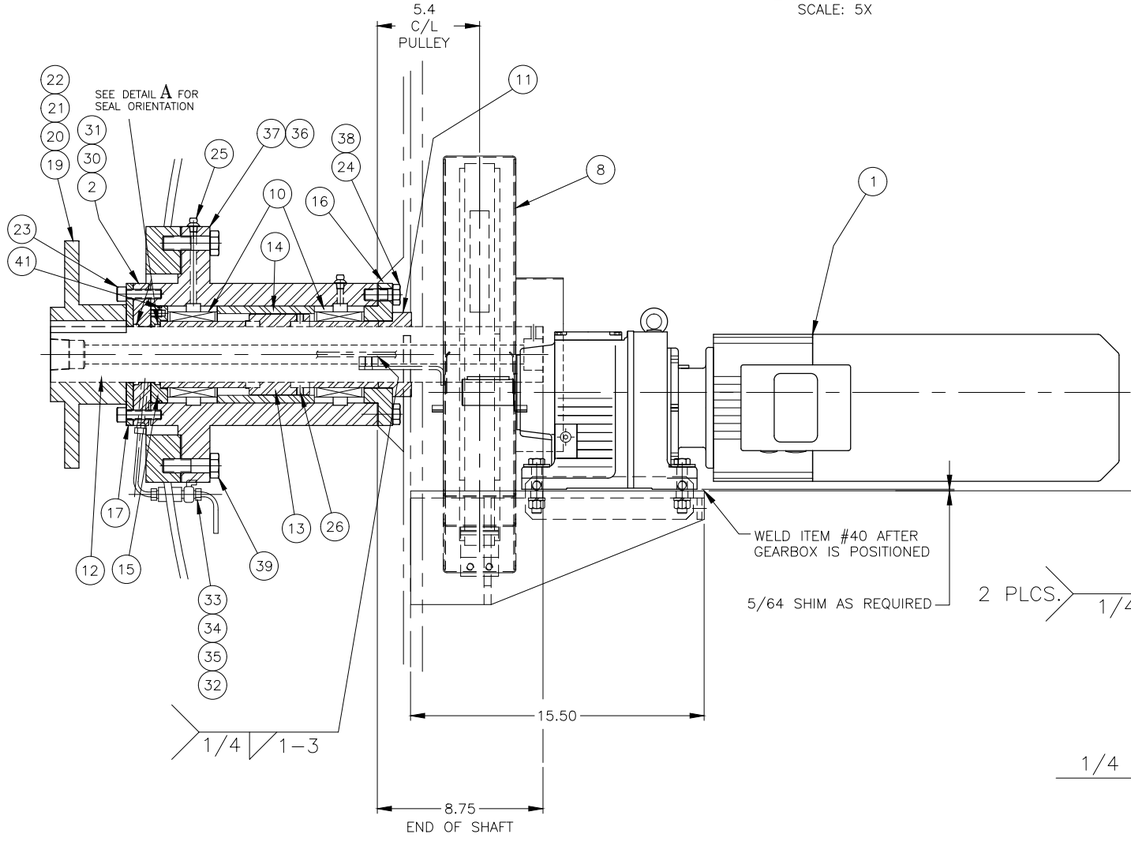
REV.	ECO	REVISIONS	BY	DATE

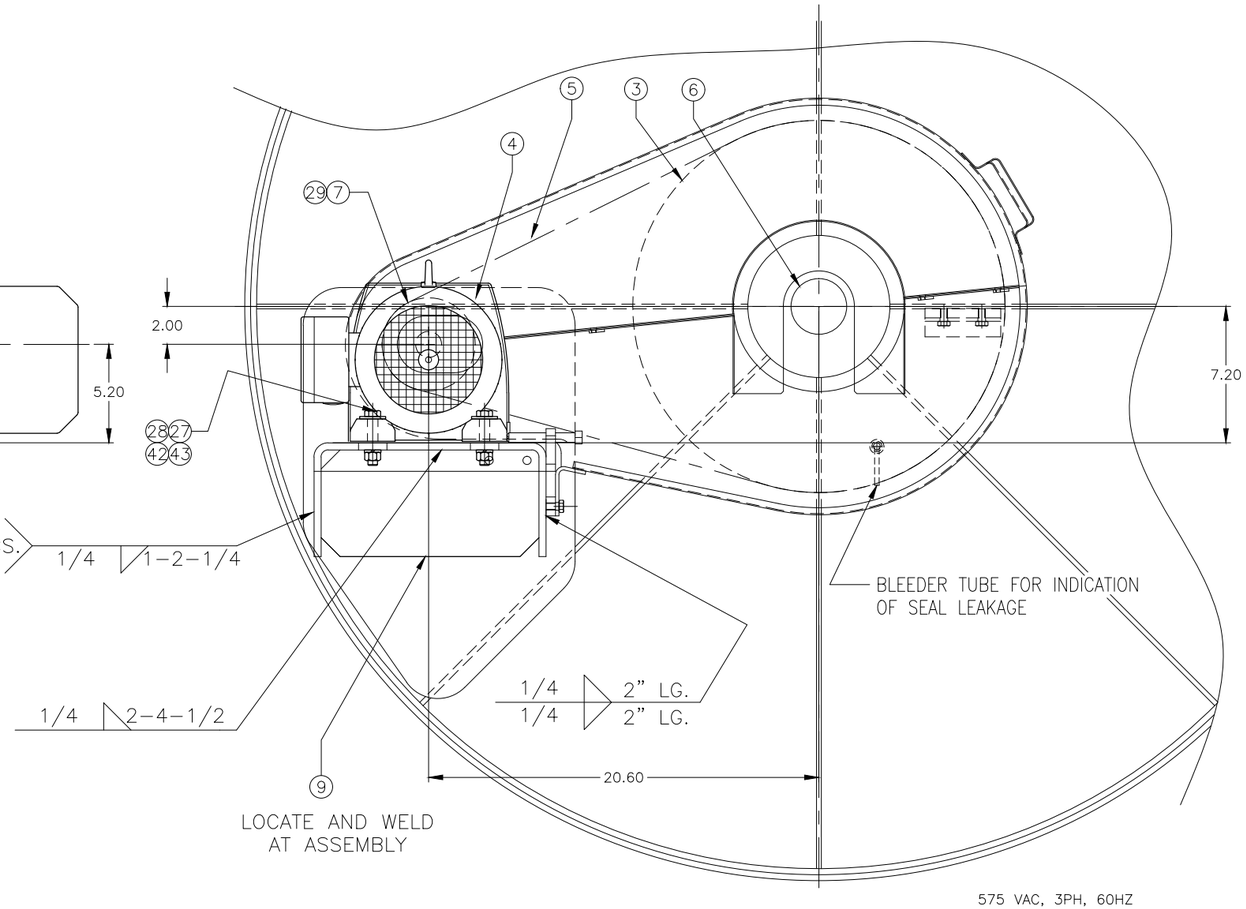
22	448109	2	SCREW – SET, HEX SOC, CUP PT, 1/2–13NC X 3/4 LG, STL
23	435149	8	SCREW – CAP, SOC HD, 1/2–13NC X 1–3/4 LG, STL
24	143242	3	BOLT – HEX HD FIN, 5/8–11NC X 1–1/2 LG, STL
25	199023	3	FITTING – LUBRIC, 1/8 PTF, BALL CHECK, STL
26	448089	3	SCREW – SET, HEX SOC, CP PT, 3/8–16NC X 3/8 LG, SST
27	143907	4	BOLT – HEX HD FIN, 1/2–13NC X 2–1/2 LG
28	356040	4	NUT – HEX FULL FIN, 1/2–13NC, STL
29	316389	1	KEY – MACHINE, SQUARE, MODIFIED .3135/.3125 X 2 3/8 LG
30	3608.7382	1	CAP – SEAL, STERITORT SHAFT
31	3608.7391	1	GASKET – CAP, SEAL
32	211061	1	CONNECTOR – TUBE, 1/4 TUBE X 1/8 MPT, BRASS
33	211062	1	CONNECTOR – TUBE, 1/4 TUBE X 1/4 FPT, BRASS
34	542208	1	VALVE – SHUT–OFF, 1/4 TUBE X 1/4 MPT, 2–WAY, BRASS
35	801410	2'	CU TUB RD 1/4 X .030 X 50' ASTM–B280 ACR (SOFT)
36	3608.8683	REF	HUB – DRIVE, BOLT–IN, STERITORT
37	3608.8701	1	GASKET – HUB, DRIVE, STERITORT
38	3608.8691	1	GASKET – HUB, DRIVE, STERITORT
39	143273	8	BOLT – HEX HD HVY, 3/4–10NC X 2–1/2 LG, STL, SA–325, T 1
40	316135	2	KEY – MACHINE, SQUARE, 1/2 X 2"
41	457617	1	SEAL – O–RING, 5–1/8 X 4–7/8 X 1/8
42	556094	4	WASHER – FLAT, STL, 1/2 STD
43	556041	4	WASHER – LOCK, SPRING REG 1/2 SIZE, STL

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	259022	1	REDUCER – GEARMOTOR, 2 HP, 32.27:1 GEAR RATIO, 54 RPM OUTPUT
2	199025	1	FITTING – LUBRIC, 1/8 PTF, 65DEG, BALL CHK, STL
3	495267	1	SPROCKET – HTD, 14MM X 112T X 19.65" P.D. 40 MM WIDE BELT
4	495329	1	SPROCKET – HTD, TIMING BELT, 14mm PITCH, 28T, 40mm BELT WIDTH
5	135439	1	BELT – HTD, 14MM PITCH, 40MM WIDE
6	163558	1	BUSHING – QD, 2–15/16 BORE, 3/4 X 1/8 KEYWAY, TYPE E
7	163169	1	BUSHING – TAPERLOCK, 1–3/8" SHAFT, 5/16 KWY, 2012 SIZE
8	3708.0384	1	GUARD – DRIVE, 2 HP STERITORT
9	3608.9733	1	BASE – DRIVE, 2 HP, STERITORT
10	0138.6350	2	BEARING – 2 15/16 BORE
11	3635.0151	1	COLLAR – BEARING LOCK
12	3608.8673	1	SHAFT–REEL, STERITORT 2–15/16 DIA X 26" LG
13	3608.6964	1	COLLAR–LOCKING, BRG SLEEVE
14	3608.6972	1	SPACER–BEARING, STERITORT SHAFT
15	3608.6983	1	GLAND–PACKING, SHAFT, STERITORT
16	3608.6993	1	CAP–RETAINER, SHAFT BEARING
17	3608.7003	1	CAP–RETAINER, SHAFT PACKING
18	457575	2	SEAL–SHAFT, 2.937 DIA SHAFT
19	1563.1083	1	HUB – REEL
20	143919	6	BOLT – HEX HD FIN, 5/8–11NC X 1–1/4 LG, STL
21	316162	1	KEY – MACHING, SQUARE, .626/.625 X 3 1/2 LG ALLOY STL



DETAIL A
SCALE: 5X





575 VAC, 3PH, 60HZ
FOR 1.0–20.0 REEL RPM (5.6–112Hz)
MOTOR/GEARBOX W/BLOWER & ENCODER

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

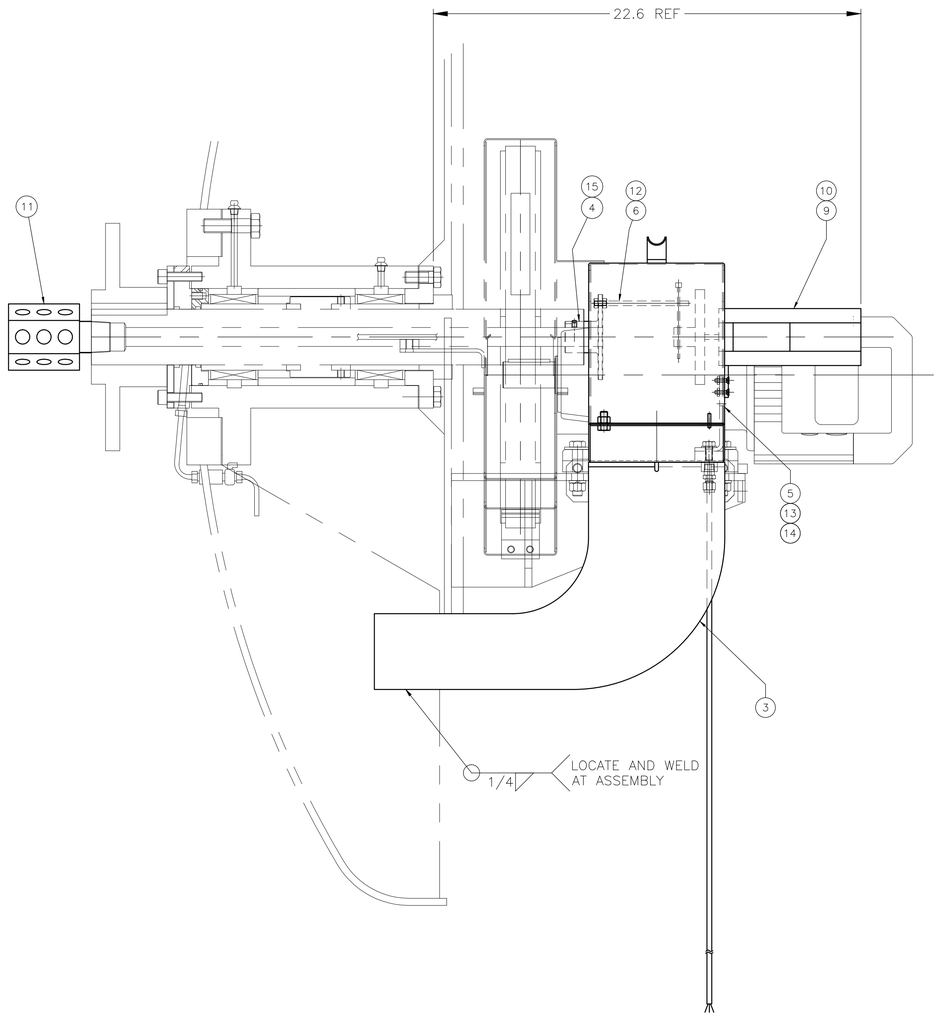
EST. WT:
S.O. 1st Used: EMACH03875
SIMILAR TO: 3708.0374
NEXT ASS'Y: 3708.0674

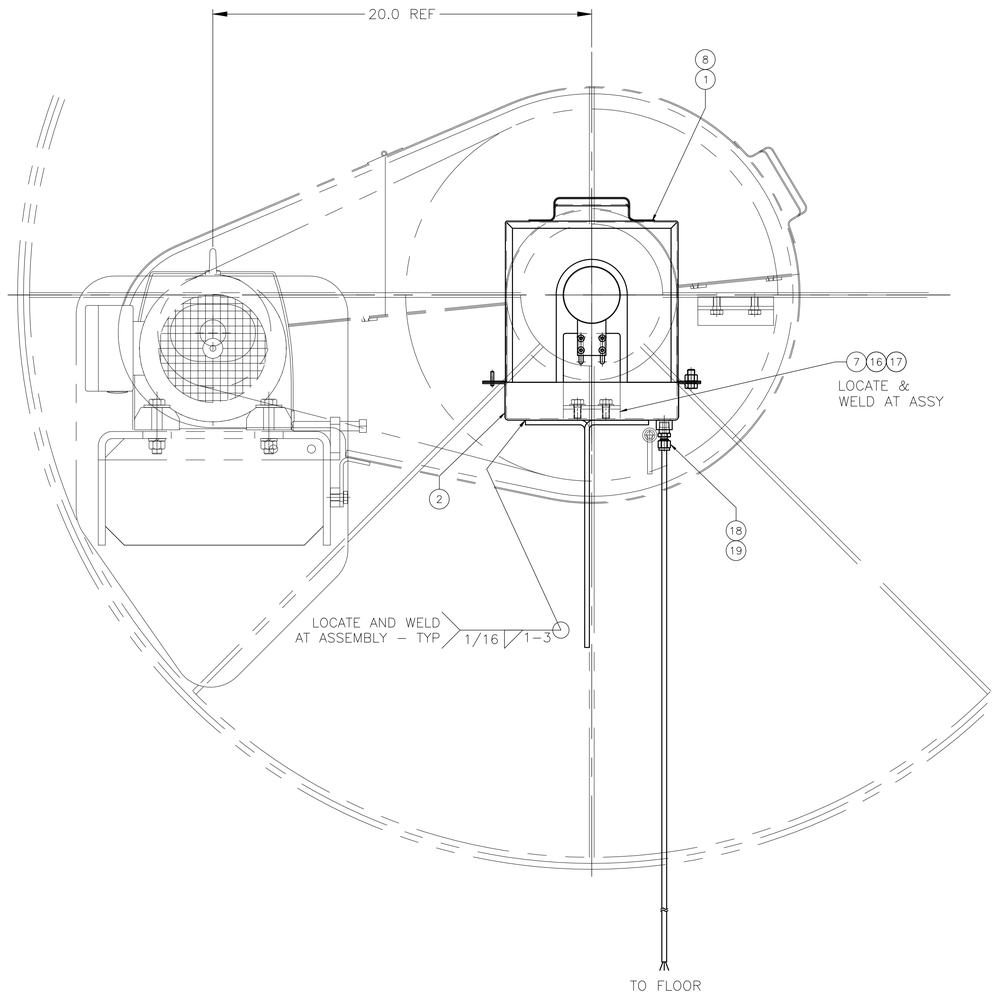
TITLE
DRIVE – STERITORT
2 HP, 575 VAC

DRAWN: CMT–RG | SCALE: 1/4 | SIZE: D | DWG NO: 3708.0704 | REV: 0 | SH 1 OF 1
DATE: 081511 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	3708.0813	1	GUARD – SLIP RING
2	3708.0803	1	PAN – SLIP RING
3	3708.0792	1	BRACKET – GUARD, SLIP RING
4	3708.0762	1	HUB – SHAFT, SLIP RING
5	3708.0781	1	BRACKET – SLIP RING
6	3708.0771	1	PIN – DRIVER, SLIP RING
7	4002.7041	1	PAD – WELD
8	356031	2	NUT – HEX FULL FIN, 3/8–16NC, 18–8 SST
9	304075	1	SLIP RING ASSEMBLY – 24 CIRCUIT
10	211589	18	CONNECTOR – THERMOCOUPLE W/8FT WIRE
11	304039	1	HUB – THERMOCOUPLE, 18 CIRCUIT HUB
12	356072	2	NUT – HEX, JAM, 1/4–20NC, 18–8 SST
13	433062	4	SCREW – CAP, FLAT SOC HD, 10–24NC X 3/4 LG, 18–8 SST
14	356657	4	NUT – HEX, 10–24NC, 18–8 SST
15	448045	1	SCREW – SET, 1/4–20NC X 1/2, 18–8 SST
16	143115	2	BOLT – HEX HD FIN, 3/8–16NC X 3/4 LG, 18–8 SST
17	556171	2	WASHER – FLAT, 3/8, 18–8 SST
18	802340	3'	SST–TUB–1/4 X .028, T–304
19	211334	1	CONNECTOR – TUBE, 1/4 TUBE X 1/4 MPT, SST





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03875

SIMILAR TO: 3608.9804

NEXT ASS'Y: 3708.0674

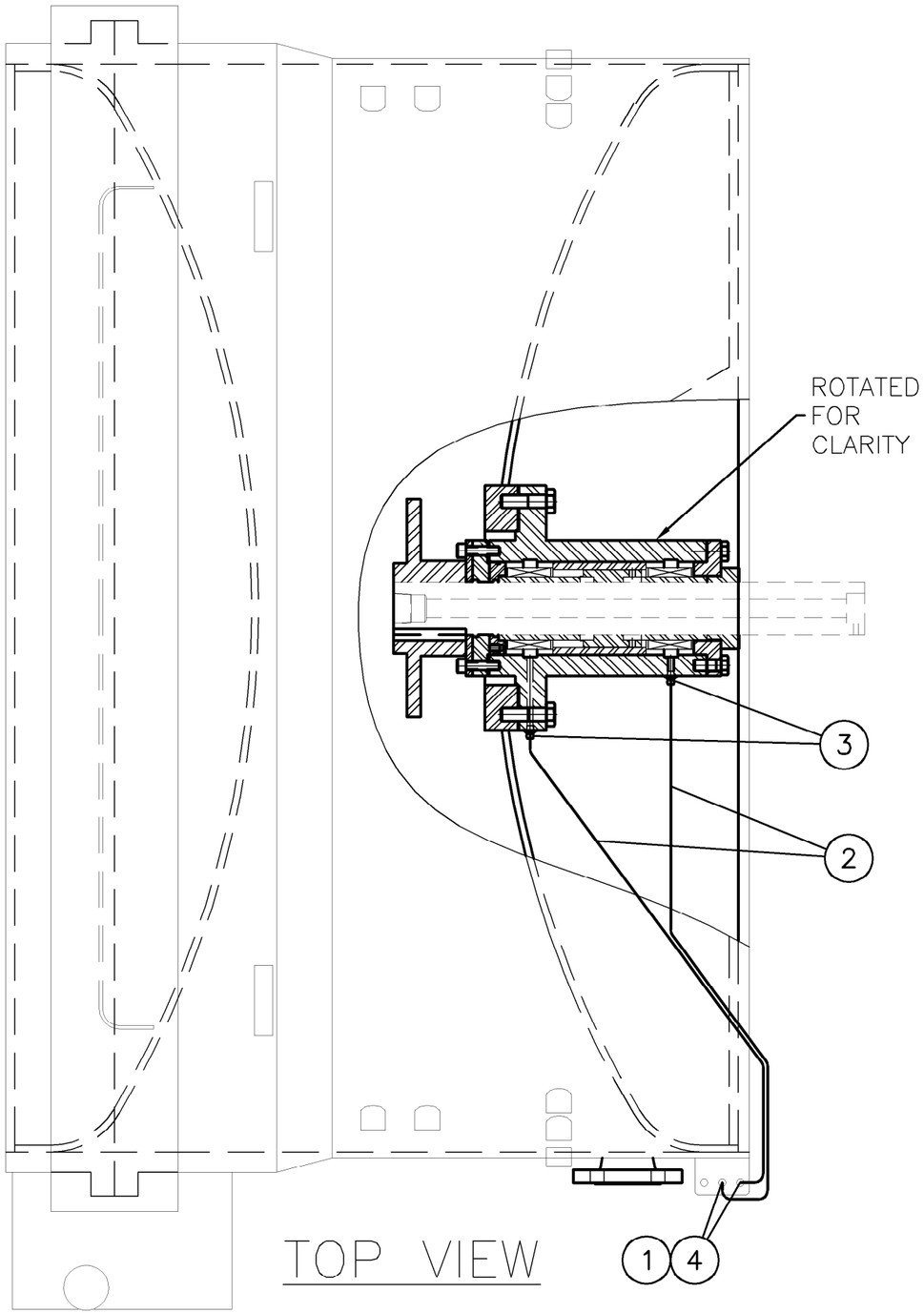
TITLE
ASSEMBLY – SLIP RING,
STERITORT

DRAWN: CMT–RG | SCALE: 1:4 | SIZE D | DWG NO 3708.0714 | REV 0 | SH 1 OF 1

DATE: 081511 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	199132	2	FITTING – LUBRIC, 1/8 FNPT, 67 DEG, BALL CHK, SST
2	802340	10'	SST–TUB–1/4 X .028, T–304
3	239432	2	ELBOW – TUBE, 1/4 TUBE X 1/8 MNPT, SST
4	211487	2	CONNECTOR – TUBE, 1/4 TUBE X 1/8 FNPT, SST



TOP VIEW

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE

TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03721

SIMILAR TO: 3608.6192

NEXT ASS'Y: 3708.0344

TITLE
LAYOUT – LUBRICATION
STERITORT

DRAWN: FENDER

DATE: 12/9/10

SCALE:

APPROVED:

SIZE B

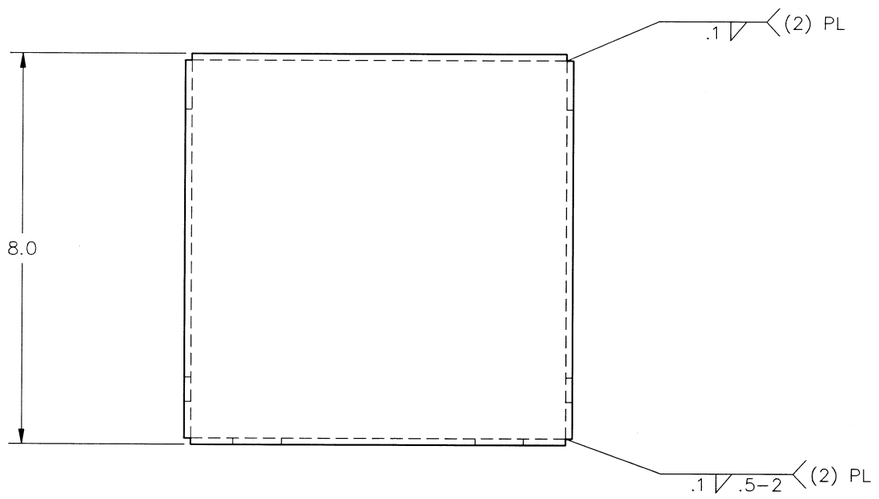
DWG NO 3708.0462

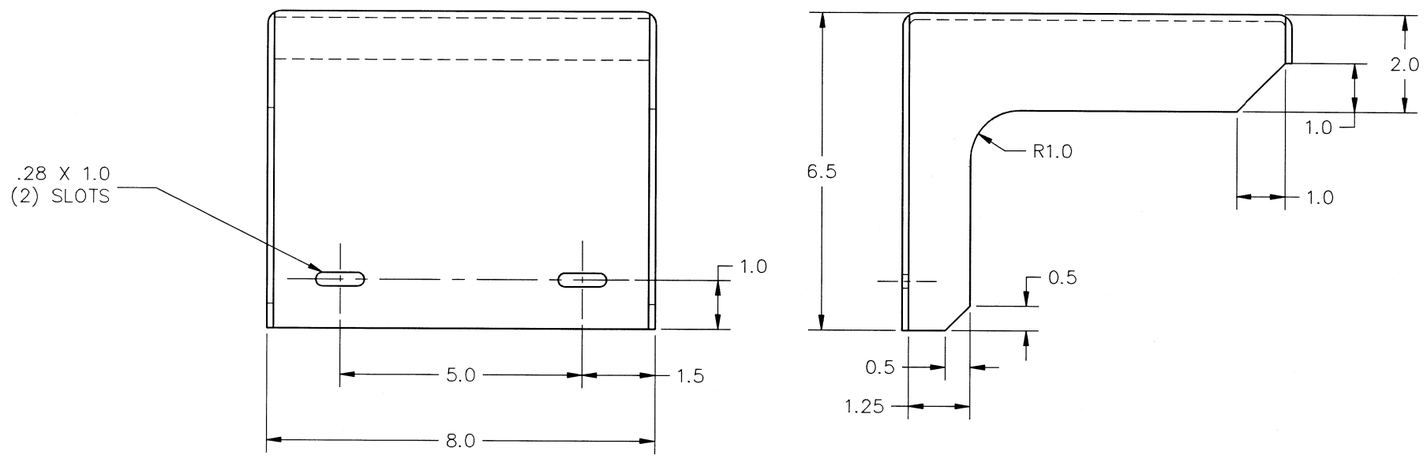
REV 0

SH 1 OF 1

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	DWG SIZE	PART NUMBER	QTY REQD	DESCRIPTION	MATERIAL – DIMENSIONS





MM

SO#

EST WT

THIRD ANGLE PROJECTION

SYM	ECO	REVISIONS	BY	DATE
1	101659	SST–SH–10GA WAS SST–SH–16 GA	TS	6–30–98

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE

TOLERANCES
XX.X = ±.060
XX.XX = ±.030
XX.XXX = ±.010
ANGLES = ± .5°

SURFACE ROUGHNESS =
PROTECTIVE FINISH =

SIMILAR TO
NEXT ASSY 3608.7074

DWN BY STAVIG
DATE 6–30–98
APPD
SCALE 1/2

FMC Corporation
Food Processing Systems Division
Madera, California 93639

TITLE COVER–MOTOR, HYD PUMP STERITORT

A2 C SIZE

C A D

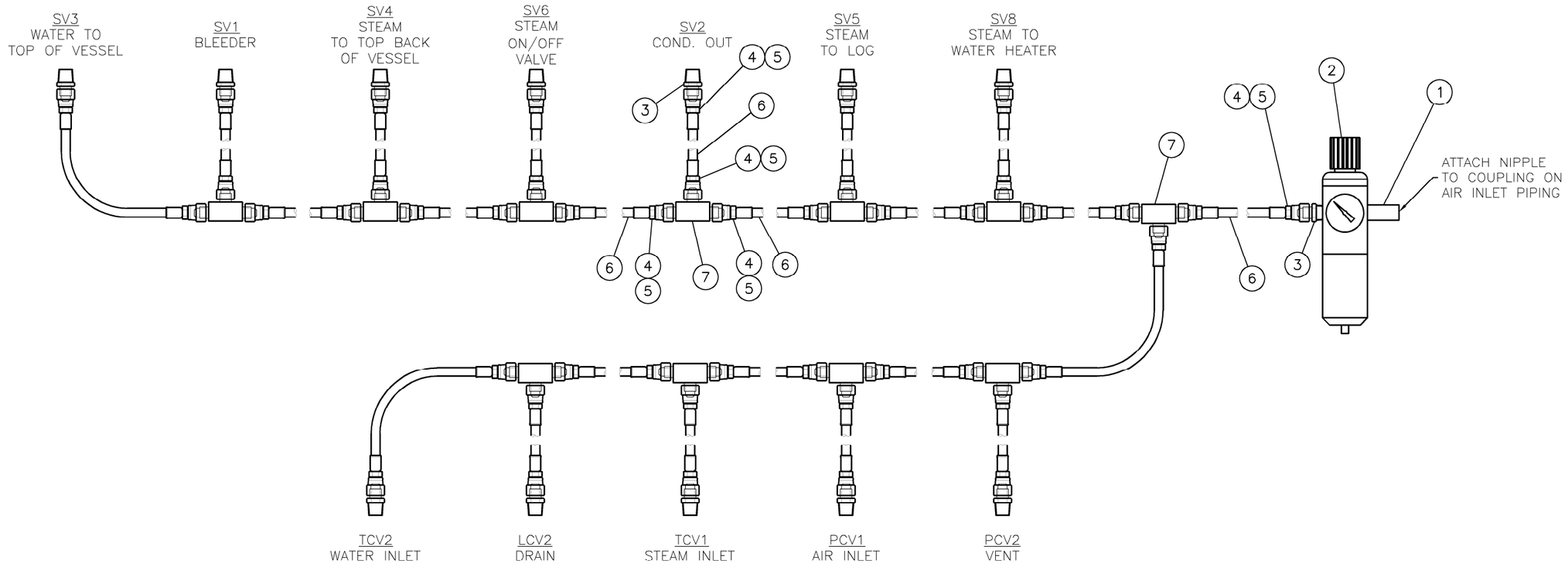
MATERIAL SST–SH–10 GA HRAP T–304

PART NO 3608.7583

SH 1 OF 1

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	350046	1	NIPPLE – PIPE, 1/4 NPT X 3 LG, STL, BLK
2	253090	1	FILTER/REGULATOR – AIR, 1/4 FNPT, 0–140 PSI
3	101476	13	ADAPTER – 1/4 MNPT X 1/4 SAE 45 DEG FLARE, BRASS
4	199224	46	FITTING – HOSE END, NIPPLE ASSY, 1/4 SAE 45 DEG FLARE, SWIVEL
5	299212	46	SOCKET – CRIMP, HOSE END, 1/4
6	299201	50	HOSE – BRAIDED, TEFLON LINED SST, 1/4
7	101494	11	ADAPTER – TEE, 1/4 SAE 45 DEG FLARE

TYPICAL HOSE CONNECTION



REF P&ID: 3708.0323

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03721

SIMILAR TO: 3608.9773

NEXT ASS'Y: 3708.0344

TITLE: PNEUMATIC LAYOUT – STERITORT

DRAWN: FENDER | SCALE: | SIZE: C | DWG NO: 3708.0483 | REV: 0 | SH 1 OF 1

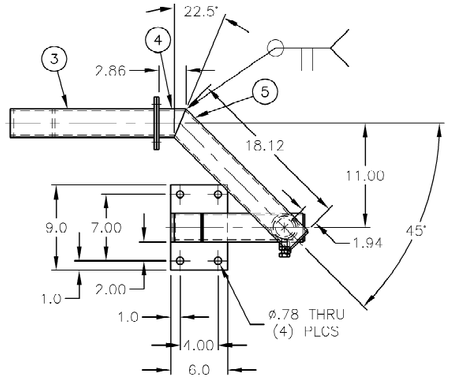
DATE: 12/10/10 | APPROVED:

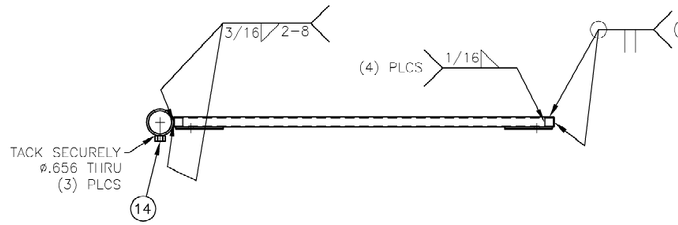
REV.	ECO	REVISIONS	BY	DATE

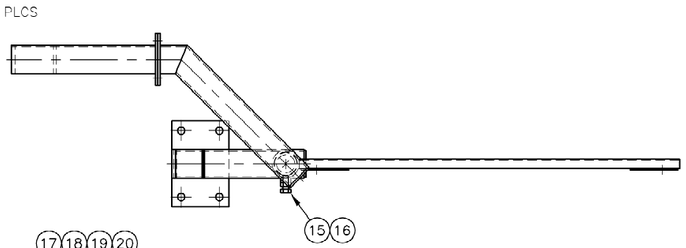
ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
21	143528	4	BOLT – HEX, 3/4–10NC X 2 LG, 18–8 SST
22	356048	4	NUT – HEX, 3/4–10NC, 18–8 SST
23	556200	4	WASHER – FLAT, 3/4, 18–8, SST
24	556046	4	WASHER – LOCK, 3/4, 18–8, SST
25	143425	4	BOLT – HEX, 7/16–14NC X 1 LG, 18–8 SST
26	356038	4	NUT – HEX, 7/16–14NC, 18–8 SST
27	556117	4	WASHER – FLAT, 7/16, 18–8, SST
28	556116	4	WASHER – LOCK, 7/16, 18–8, SST

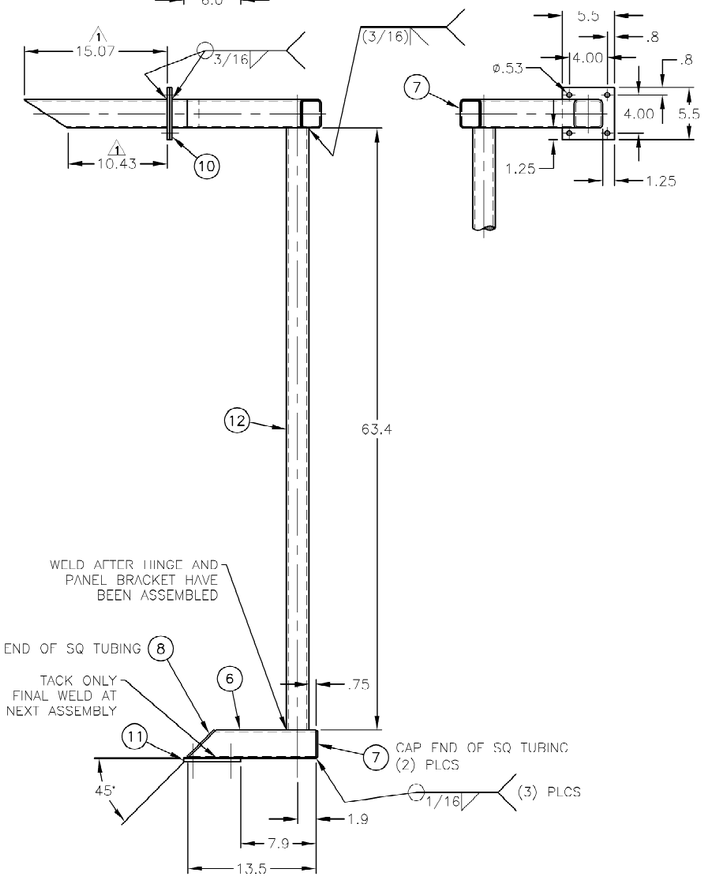
ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
11		1	SST–PL–3/8, HRAP T–304
12		1	SST–PIPE–2–80, TYPE 304–WELD
13		1	SST–PIPE–2–1/2–40, TYPE 304–WELD
14	356045	3	NUT – HEX, 5/8–11NC, 18–8 SST
15	356091	3	NUT – HEX, JAM, 5/8–11NC, 18–8 SST
16	143443	3	BOLT – HEX, 5/8–11NC X 1–1/2 LG, 18–8, SST
17	143187	4	BOLT – HEX, 1/2–13NC X 1 LG, 18–8 SST
18	356041	4	NUT – HEX, 1/2–13NC, 18–8 SST
19	556286	4	WASHER – FLAT, 1/2, 18–8, SST
20	556042	4	WASHER – LOCK, 1/2, 18–8, SST

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1		2	SST–TUB–SQ 1 X .120–W, CFAP, T–304
2		2	SST–TUB–SQ 1 X .120–W, CFAP, T–304
3		1	SST–TUB–SQ 3 X .180–W, CFAP, WELD, T–304
4		1	SST–TUB–SQ 3 X .180–W, CFAP, WELD, T–304
5		1	SST–TUB–SQ 3 X .180–W, CFAP, WELD, T–304
6		1	SST–TUB–SQ 3 X .180–W, CFAP, WELD, T–304
7		2	SST–PL–3/16, HRAP T–304
8		1	SST–PL–3/16, HRAP T–304
9		1	SST–PL–3/16, HRAP T–304
10		2	SST–PL–1/4, HRAP T–304

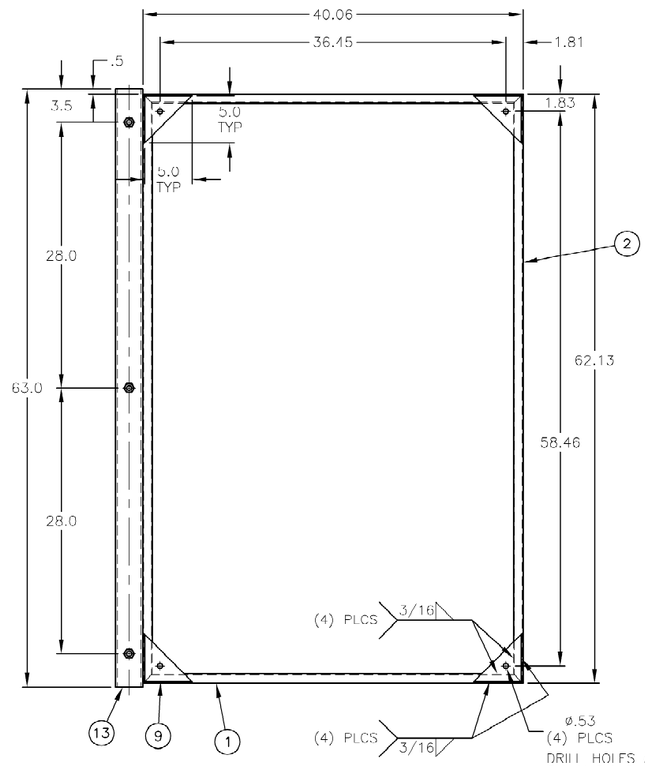




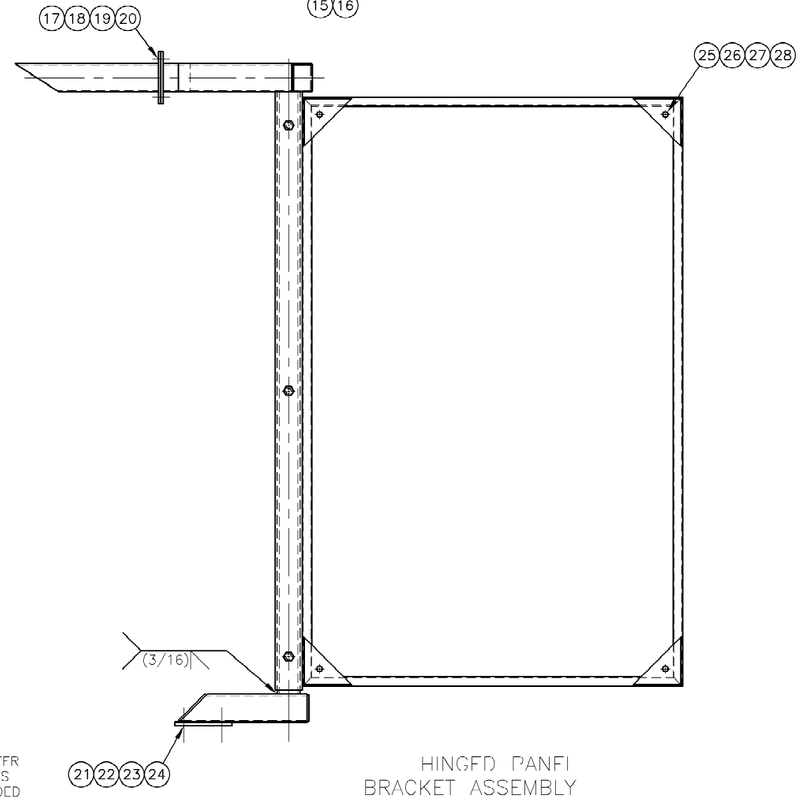




HINGE BRACKET



PANEL BRACKET



HINGED PANEL
BRACKET ASSEMBLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
DECIMAL 'SHOP' CORRECT
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES: 3RD ANGLE PROJ.
XX.X = ± .050
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03721

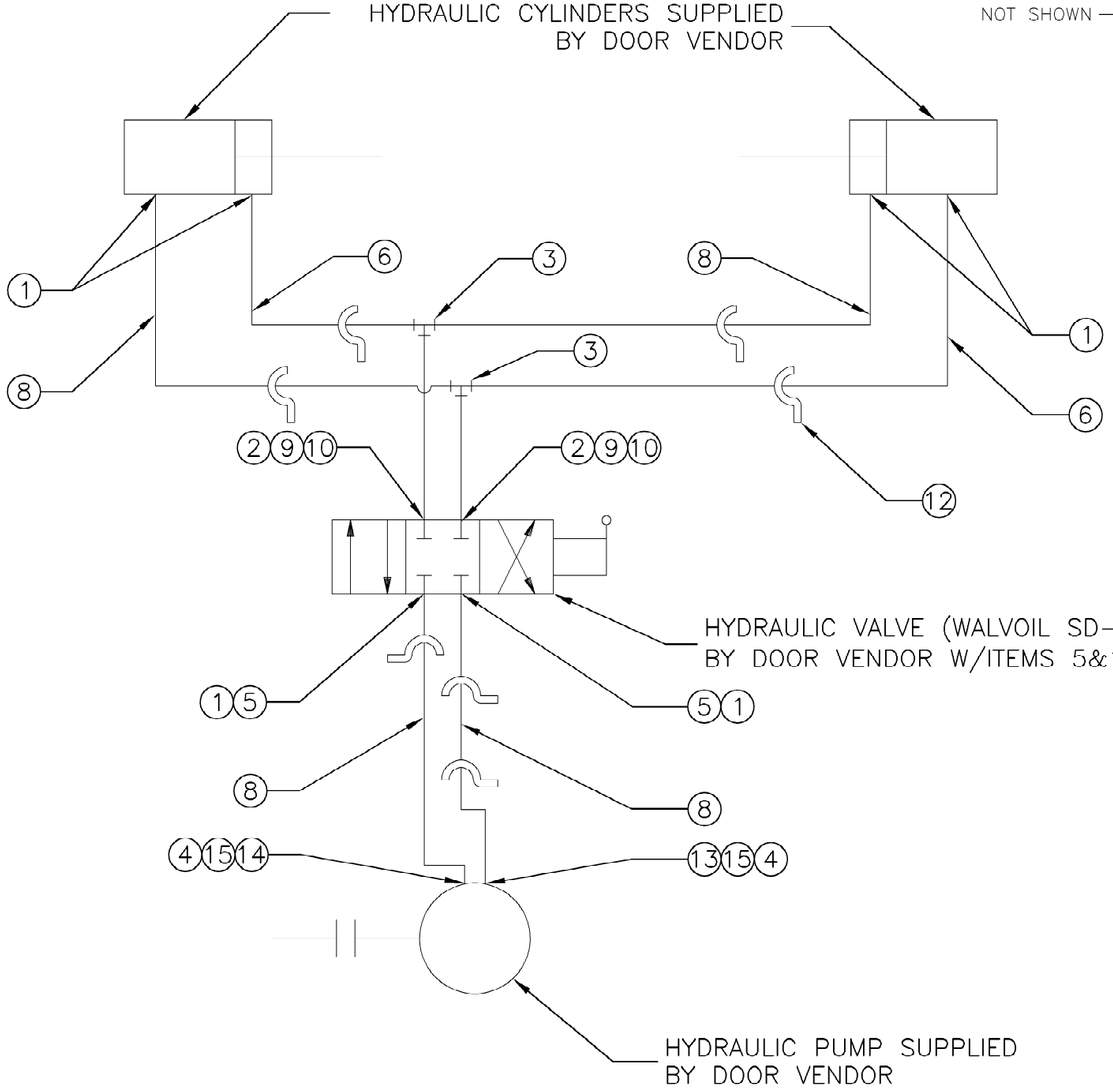
TITLE: BRACKET – MOUNT, HINGED
STERITORT CONTROL PANEL

REV.	ECO	REVISIONS	BY	DATE
1	110671	15.07 WAS 12.07, 10.43 WAS 7.43	COOK	121810

SIMILAR TO: 3608.9814
NEXT ASSY: 3708.0344
DRAWN: ADAMS
SCALE: 1/8
DATE: 12/09/10
APPROVED:
SIZE: D
DWG NO: 3708.0454
REV: 1
SH 1 OF 1

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	101031	6	ADAPTER – HOSE, 90 DEG, 1/2 NPTF MALE X 3/8 NPSM FEM SWIVEL
2	163031	2	BUSHING – PIPE, HEX, 1/2 X 3/8
3	101201	2	ADAPTER – PIPE, TEE, 3/8 NPT MALE X 3/8 X 3/8 NPT FEM
4	101054	2	ADAPTER – HOSE, STRAIGHT, 1/4 NPTF MALE X 3/8 NPSM FEM
5		REF	ADAPTER – 1/2 STR THR O–RING X 1/2 NPTF, WEATHERHEAD C3269x8x8
6	2367710	2	HOSE ASSEMBLY 3/8 X 54
7			
8	2369516	4	HOSE ASSEMBLY 3/8 X 72
9	101120	2	ADAPTER – PIPE, STRAIGHT, 1/2 MPT X 1/2 FPT FEM SWIVEL
10		REF	ADAPTER – 5/8 STR THR O–RING X 1/2 NPTF, WEATHERHEAD C3269x10x8
11	196094	1	CLAMP – HOSE, 1.5 ID CLOSED, STL–NEOPRENE COVERED
12	196140	7	CLAMP – HOSE, 11/16 ID, NEOPRENE COATED
13	350040	1	NIPPLE – PIPE, 1/4 IPS X 2 LG,STL, BLK
14	350046	1	NIPPLE – PIPE, 1/4 IPS X 3 LG,STL, BLK
15	239049	2	ELBOW – PIPE, 90 DEG, 1/4 IPS,STL

NOT SHOWN



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

FMC FoodTech
FMC Technologies, Inc.
Madera, California U.S.A.

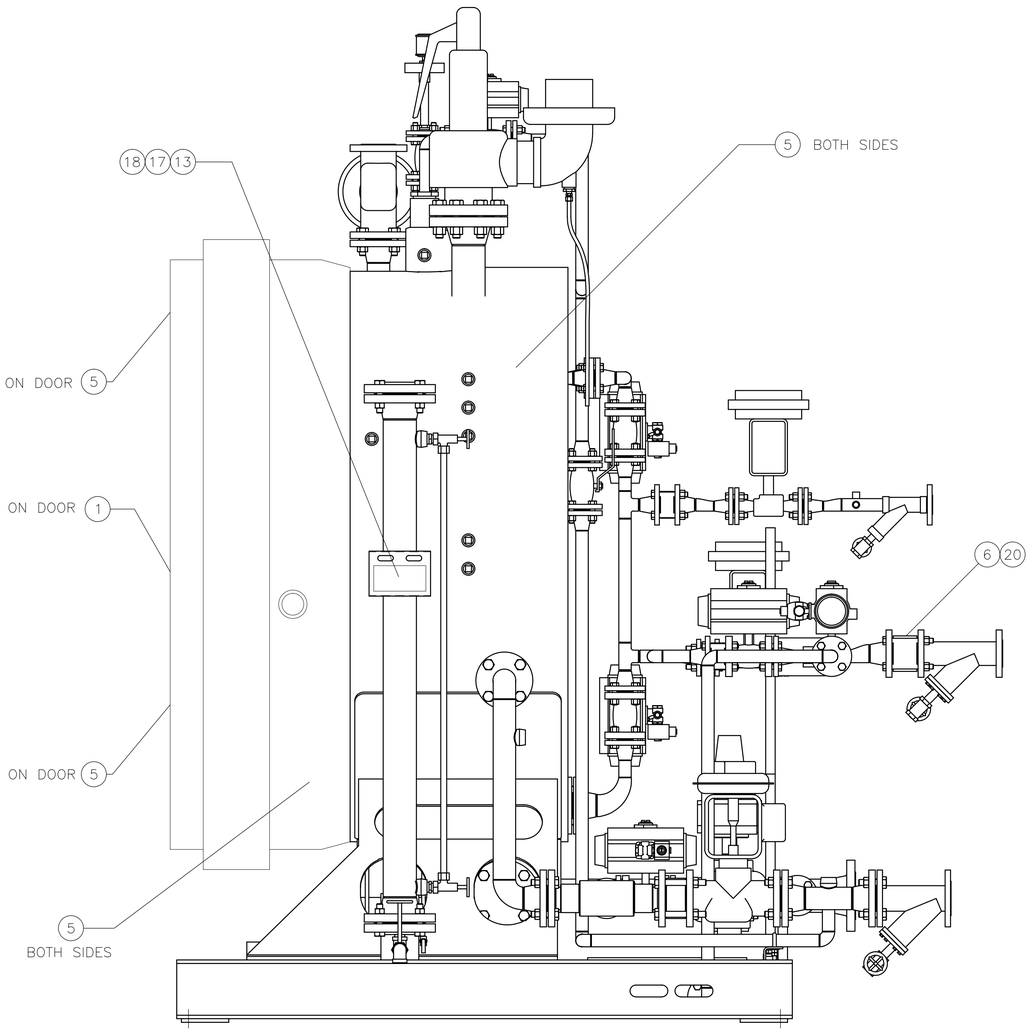
EST. WT:
S.O. 1st Used: EMACH02992
SIMILAR TO: 3608.6173
NEXT ASS'Y: 3608.9864

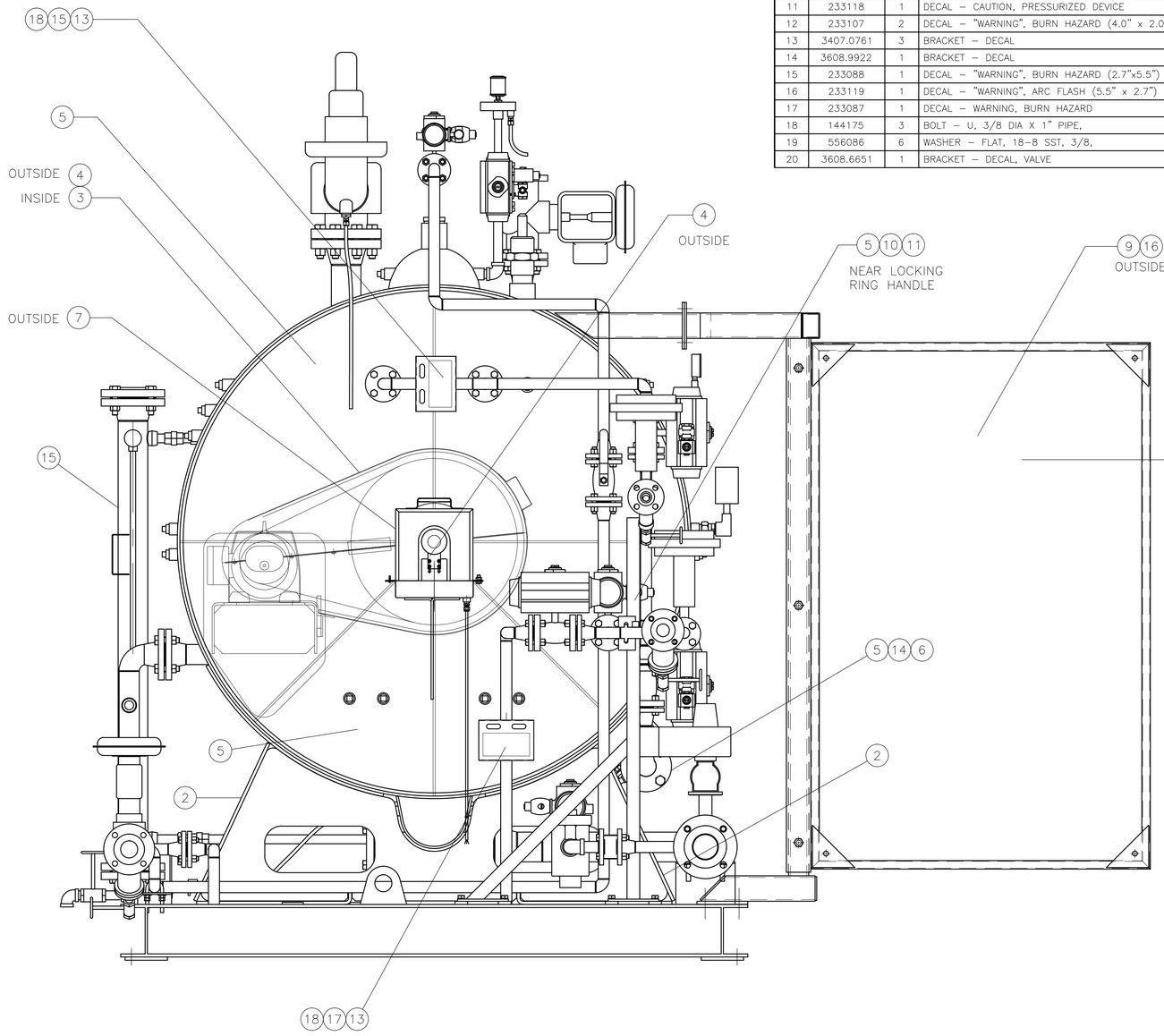
TITLE
HYDRAULIC LAYOUT
STERITORT DOOR

DRAWN: B ALLEN | SCALE: 1.5:1 | SIZE C | DWG NO 3608.9903 | REV 0 | SH 1 OF 1
DATE: 050107 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	0263.0092-5	1	DECAL "JBT FOODTECH"
2	0263.0092-3	2	DECAL "JBT FOODTECH"
3	233061	1	DECAL – "WARNING", GUARD REMOVED (5.5"x2.7")
4	233062	2	DECAL – "WARNING", TIMING BELT (5.5"x2.7")
5	233065	10	DECAL – "WARNING", HOT SURFACE (5.5"x2.7")
6	233087	2	DECAL – "WARNING", BURN HAZARD (5.5"x2.7")
7	233092	1	DECAL – "WARNING", ROTATING SHAFT (5.5"x2.7")
8	233102	2	DECAL – UPS VOLTAGE PRESENT
9	233080	1	DECAL – "DANGER", HAZARDOUS VOLTAGE (5.5"x2.7")
10	233081	1	DECAL – "WARNING", ACCESS RESTRICTED (5.5"x2.7")
11	233118	1	DECAL – CAUTION, PRESSURIZED DEVICE
12	233107	2	DECAL – "WARNING", BURN HAZARD (4.0" x 2.0")
13	3407.0761	3	BRACKET – DECAL
14	3608.9922	1	BRACKET – DECAL
15	233088	1	DECAL – "WARNING", BURN HAZARD (2.7"x5.5")
16	233119	1	DECAL – "WARNING", ARC FLASH (5.5" x 2.7")
17	233087	1	DECAL – WARNING, BURN HAZARD
18	144175	3	BOLT – U, 3/8 DIA X 1" PIPE,
19	556086	6	WASHER – FLAT, 18-8 SST, 3/8,
20	3608.6651	1	BRACKET – DECAL, VALVE





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03875

SIMILAR TO: 3708.0194

NEXT ASS'Y: 3708.0674

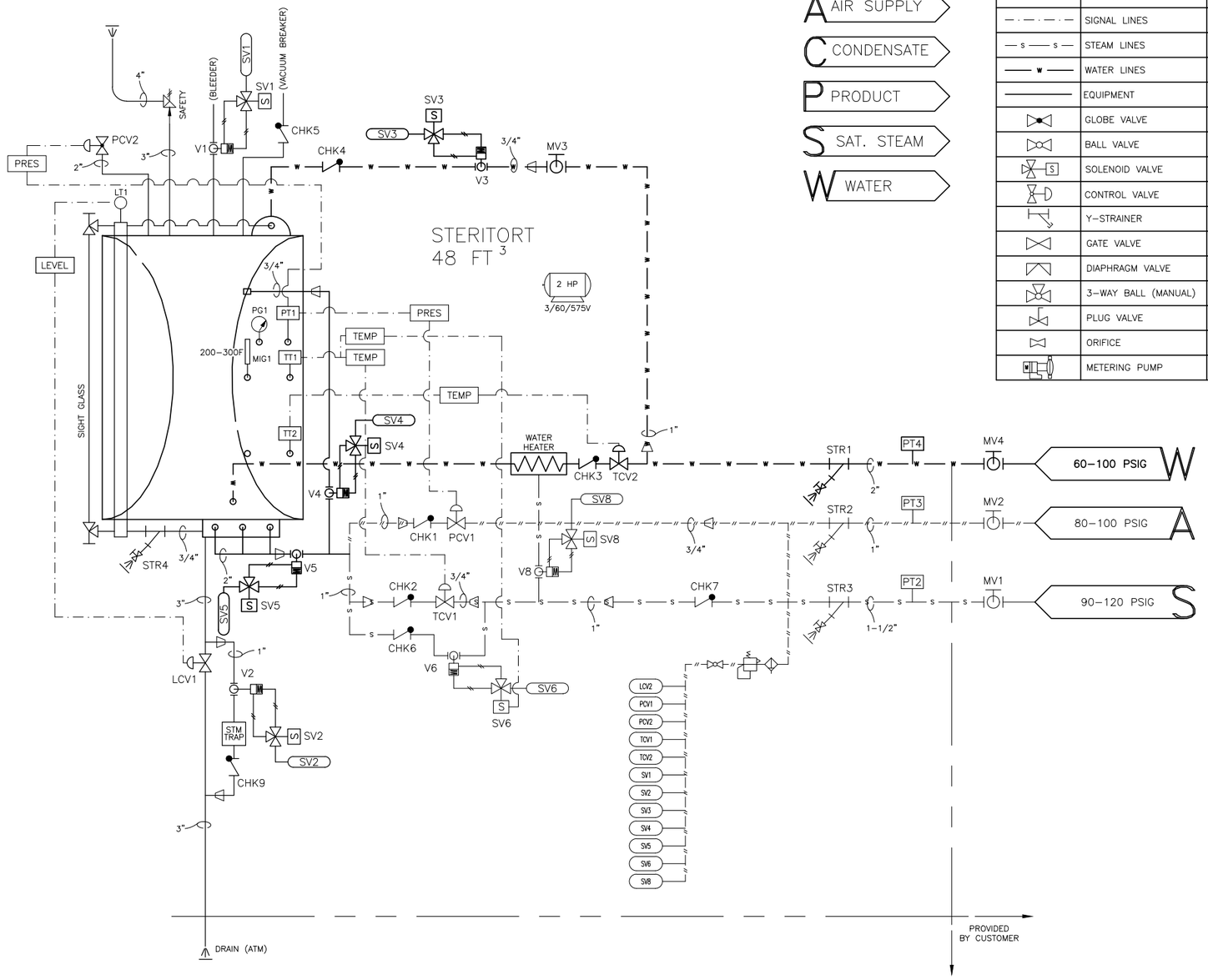
TITLE
DECALS LOCATION – SAFETY
STERITORT

DRAWN:HOWDEN | SCALE: 1/8 | SIZE D | DWG NO 3708.0904 | REV 0 | SH 1 OF 1

DATE: 101211 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION



LEGEND			
— // — // —	AIR LINES		SAFETY RELIEF VALVE
— · — · —	SIGNAL LINES		BLEEDER
— s — s —	STEAM LINES		FIELD MOUNTED DEVICE
— w —	WATER LINES		PANEL MOUNTED DEVICE
	EQUIPMENT		DISPLAY ON MAIN PANEL
	GLOBE VALVE		PROGRAM IN MAIN PANEL
	BALL VALVE		ACTUATOR AIR TO OPEN
S	SOLENOID VALVE		FLOW CONTROL W/ DIGITAL POSITIONER
	CONTROL VALVE	TAG	EQUIPMENT TAG
	Y–STRAINER		REDUCER
	GATE VALVE		LINE SIZE
	DIAPHRAGM VALVE		GAUGE (PRESSURE)
	3–WAY BALL (MANUAL)		FILTER/REGULATOR
	PLUG VALVE		AIR GAP/GRAVITY DRAIN
	ORIFICE		AIR GAP/GRAVITY DRAIN
	METERING PUMP		CHECK VALVE

CSSC – TORONTO, CANADA
S/N 3608–93–11

REV.	ECO	REVISIONS	BY	DATE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

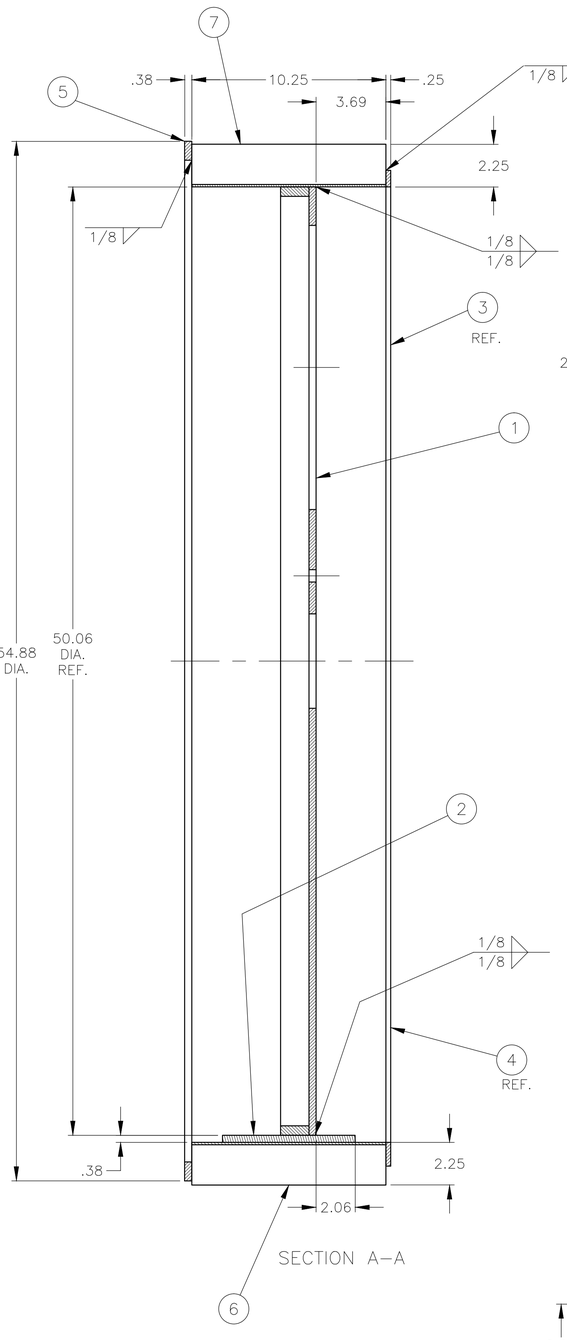
EST. WT:
S.O. 1st Used: EMACH03875
SIMILAR TO: 3608.0323
NEXT ASS'Y: 3608.0927

TITLE: P&ID – STERITORT

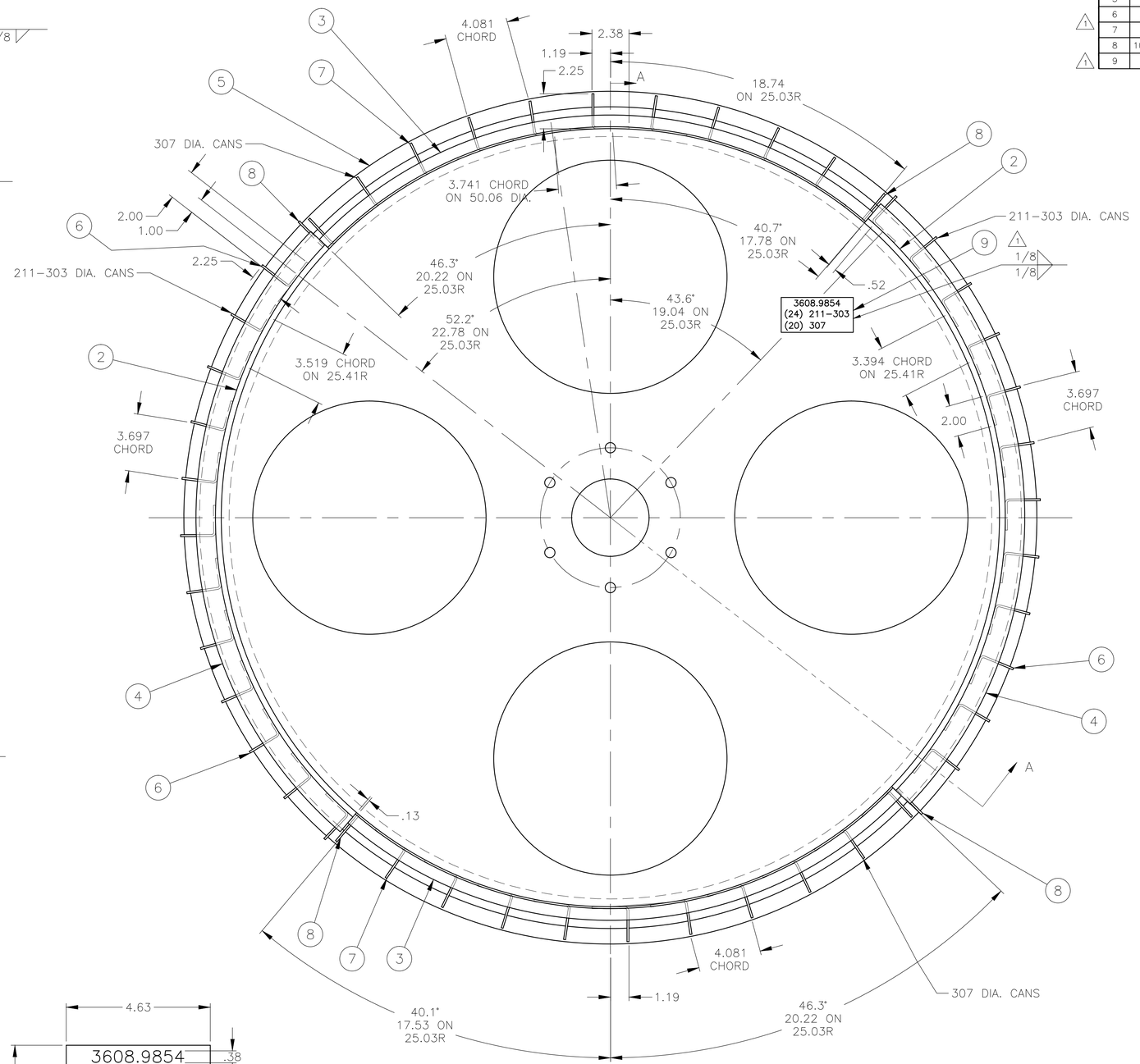
DRAWN: CMT–RG | SCALE: NONE | DATE: 081511 | APPROVED:

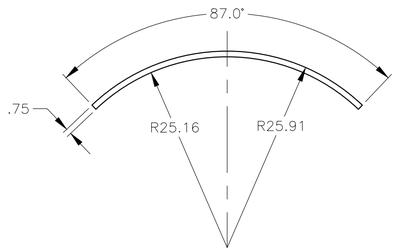
SIZE C | DWG NO 3708.0693 | REV 0 | SH 1 OF 1

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	3608.3163	1	REEL HEAD, 42 STEP
2		2	STL–F–3/8 X 5 HR A–36
3		2	SST–F–1/4 X 3/4 HRAP T–304
4		2	SST–F–1/4 X 1–1/4 HRAP T–304
5		1	SST–F–3/8 X 1 HRAP T–304
6	3708.0882	24	ANGLE – REEL, 211 – 303 DIA. CAN
7	3708.0892	20	ANGLE – REEL, 307 DIA. CAN
8	10.25 X 2.25	4	SST–SH–11 GA HRAP T–304
9		1	SST–SH–12 GA HRAP T–304

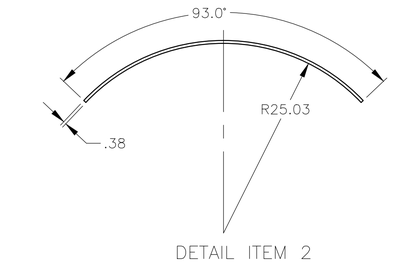


SECTION A–A

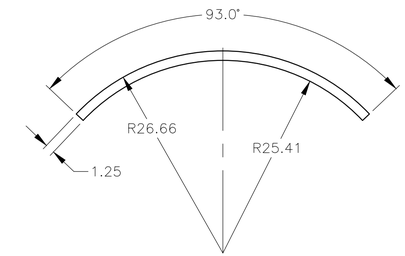




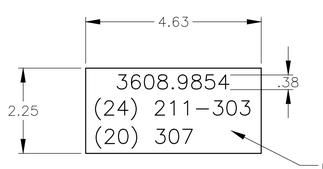
DETAIL ITEM 3



DETAIL ITEM 2



DETAIL ITEM 4



DETAIL ITEM 9
(SCALE=1/2) △1

(24) 211–303 DIA. CANS
(20) 307 DIA. CANS

REV.	ECO	REVISIONS	BY	DATE
01	111170	CHANGED ITEMS #6 & #7 FROM RAW MTRL TO 3708.0882 & 3708.0892. ADDED ITEM #9 & DETAIL	CG	09/05/11

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

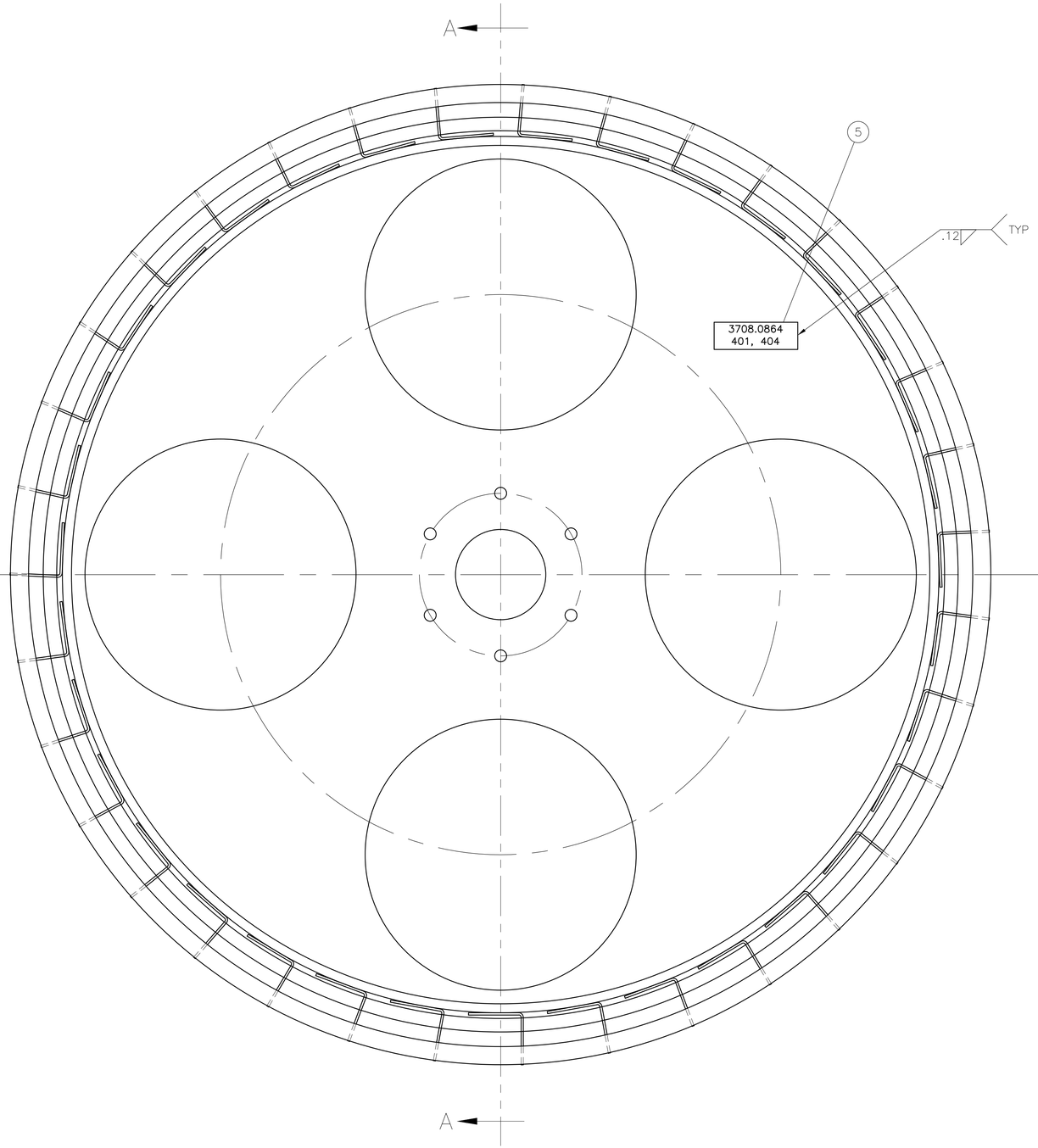
FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

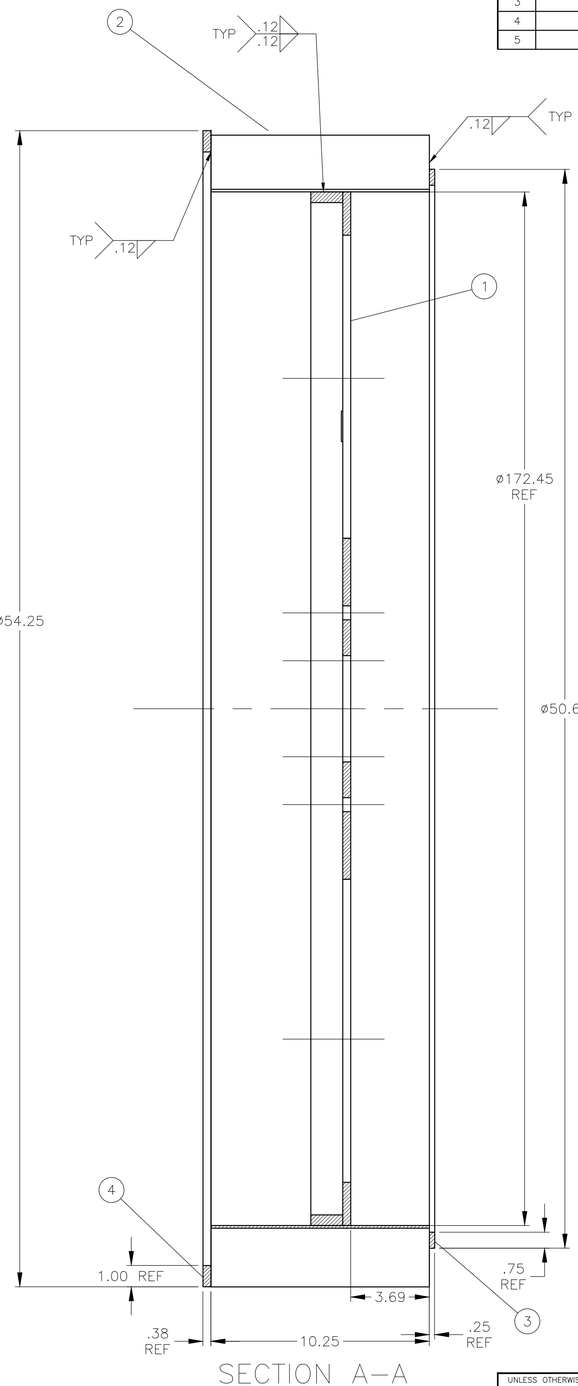
EST. WT:
S.O. 1st Used: EP02605
SIMILAR TO: 3608.0334
NEXT ASS'Y:
DRAWN: STAVIG
DATE: 010605
SCALE: 1/4
APPROVED:

TITLE
REEL – STERITORT, COMBINATION,
31.0 LENGTH SHELL, 211–303 & 307 DIA. CANS

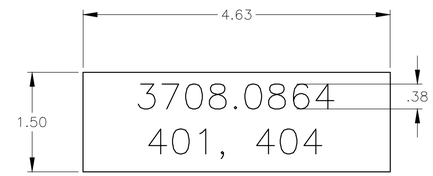
SIZE D | DWG NO 3608.9854 | REV 1 | SH 1 OF 1

ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1	3708.0854	1	REEL HEAD
2	3708.0842	35	ANGLE – REEL, 35 STEP
3		1	SST – FL – 1/4 X 3/4 – HRAP T–304
4		1	SST – FL – 3/8 X 1 – HRAP T–304
5		1	SST – SH. – 12 GA. – HRAP T–304



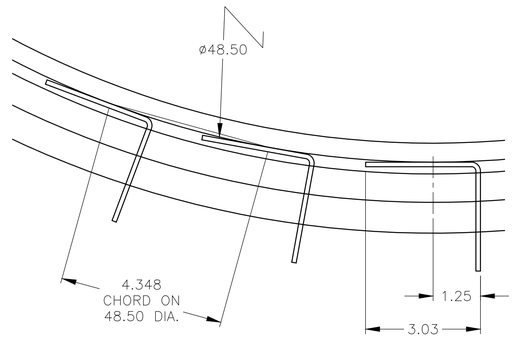


SECTION A–A



DETAIL 1 – ITEM 5
SCALE: 1" = 1"

NOTE:
ENGRAVE ITEM 5 WITH 3/8" LETTERS.
ENGRAVE PART NUMBER AND CAN SIZES AS SHOWN ABOVE.



DETAIL 2 – ANGLE
SCALE: 1/2" = 1"

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE
TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.Xx = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

TITLE: REEL – 35 STEP, 404 CANS
STERITORT 31" SHELL LENGTH

S.O. 1st Used: EMACH03875

SIMILAR TO: 3608.7934

NEXT ASS'Y: 3608.0927–MECH

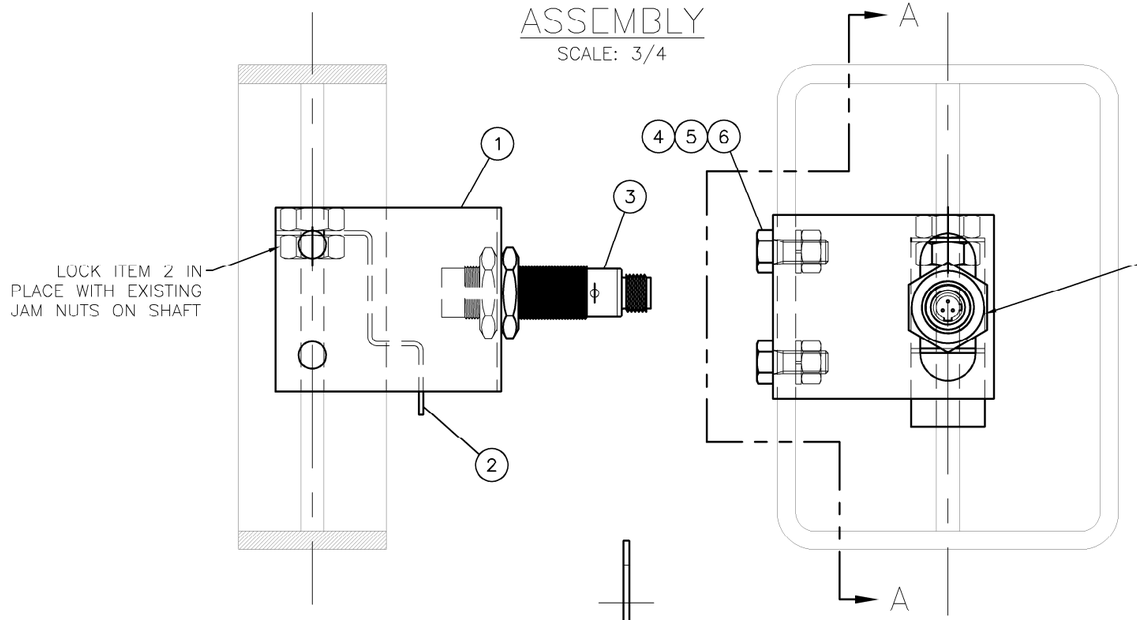
DRAWN: CMT–RG | SCALE: 9/32 | SIZE: D | DWG NO: 3708.0864 | REV: 00 | SH 1 of 1

DATE: 082911 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

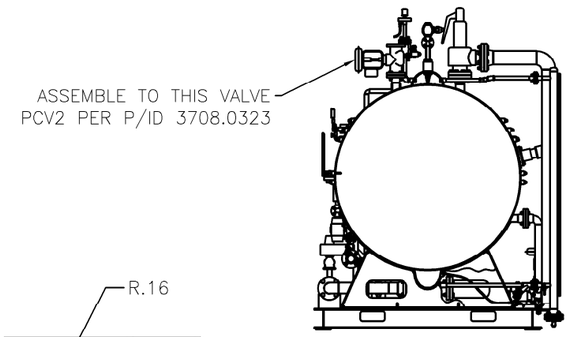
ITEM NO	PART NUMBER	QTY REQD	DESCRIPTION
1		1	SST-SH-16 GA, HRAP T-304
2		1	SST-SH-16 GA, HRAP T-304
3	507920	1	SWITCH - PROXIMITY, 18MM, 3 WIRE, 20-250 VAC/VDC
4	143979	2	BOLT - HEX HD, 5/16-18NC X 3/4 LG, CLR ZNC CHROM
5	556037	2	WASHER - LOCK, SPRING, 5/16, CLR ZNC CHROM
6	356026	2	NUT - HEX, 5/16-18NC, CLR ZNC CHROM

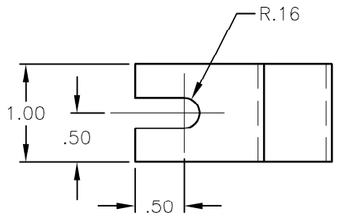
ASSEMBLY
SCALE: 3/4

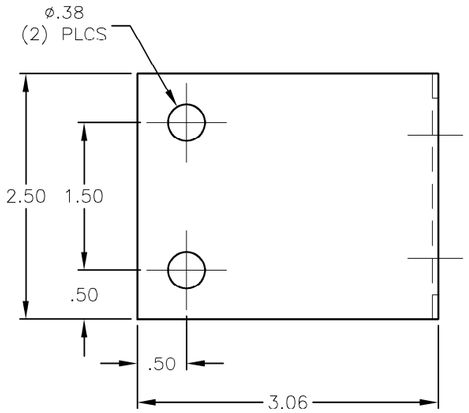


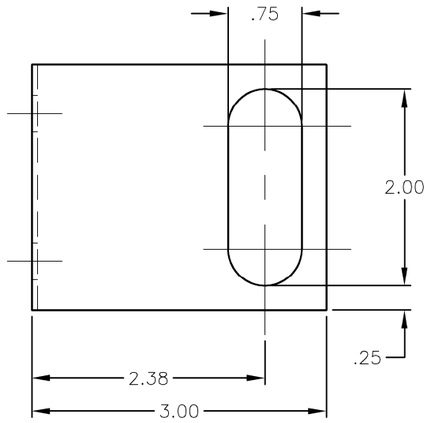
SECTION A-A

NOTE: BREAK SHARP EDGES AND CORNERS

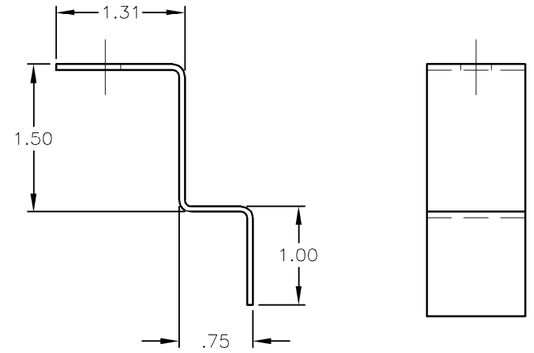








ITEM 1
SCALE: 1/1



ITEM 2
SCALE: 1/1

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
BREAK SHARP CORNERS
TOLERANCES ARE NOT CUMULATIVE

TOLERANCES 3RD ANGLE PROJ.
XX.X = ± .060
XX.XX = ± .030
XX.XXX = ± .010
ANGLES = ± .5°

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

EST. WT:

S.O. 1st Used: EMACH03721

SIMILAR TO:

TITLE
BRACKET - SENSOR, VENT OPEN
STERITORT

DRAWN: FENDER | SCALE: NOTED | SIZE C | DWG NO 3708.0533 | REV 0 | SH 1 OF 1

NEXT ASS'Y: 3608.0907-MECH | DATE: 12/17/10 | APPROVED:

REV.	ECO	REVISIONS	BY	DATE

JBT FoodTech

John Bean Technologies Corporation
Madera, California U.S.A.

CLIENT NAME AND LOCATION :	CSSC TORONTO CANADA
PROJECT NAME AND MACHINE TYPE :	EMACH03875 STERITORT
MACHINE OPTIONS :	ROTARY MODE ONLY

POWER SOURCE :	575VAC / 60Hz
CONTROL VOLTAGE :	24 VDC
CONTROLLER TYPE :	PLC
CONTROLLER DETAIL :	ALLEN BRADLEY COMPACT LOGIX

JOHN BEAN TECHNOLOGIES CORP.
2300 Industrial Ave.
Madera, CA 93639
O 559.661.3200 email Madera.fpsd@jbtc.com
F 559.661.3222

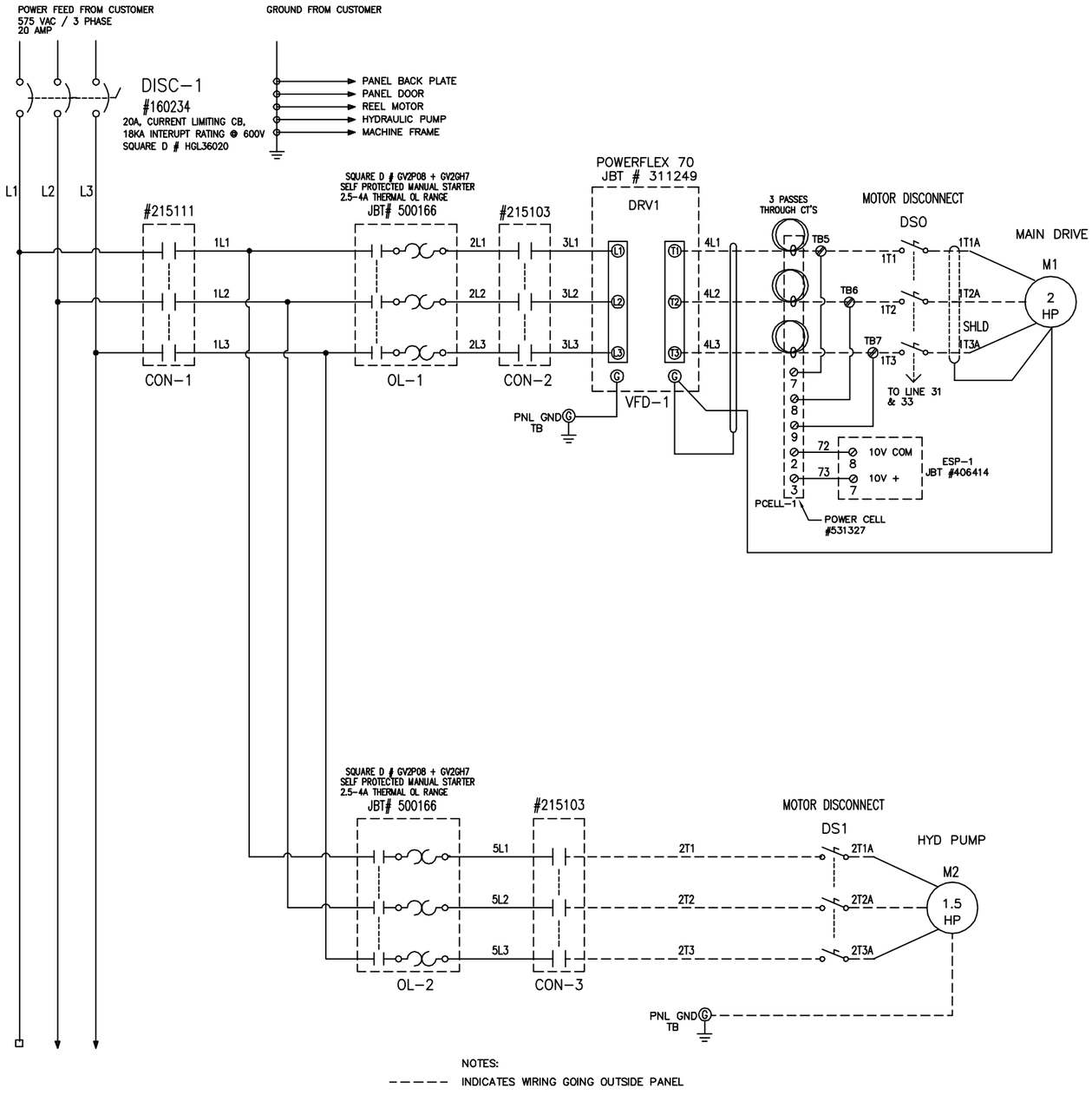
EMACH03875

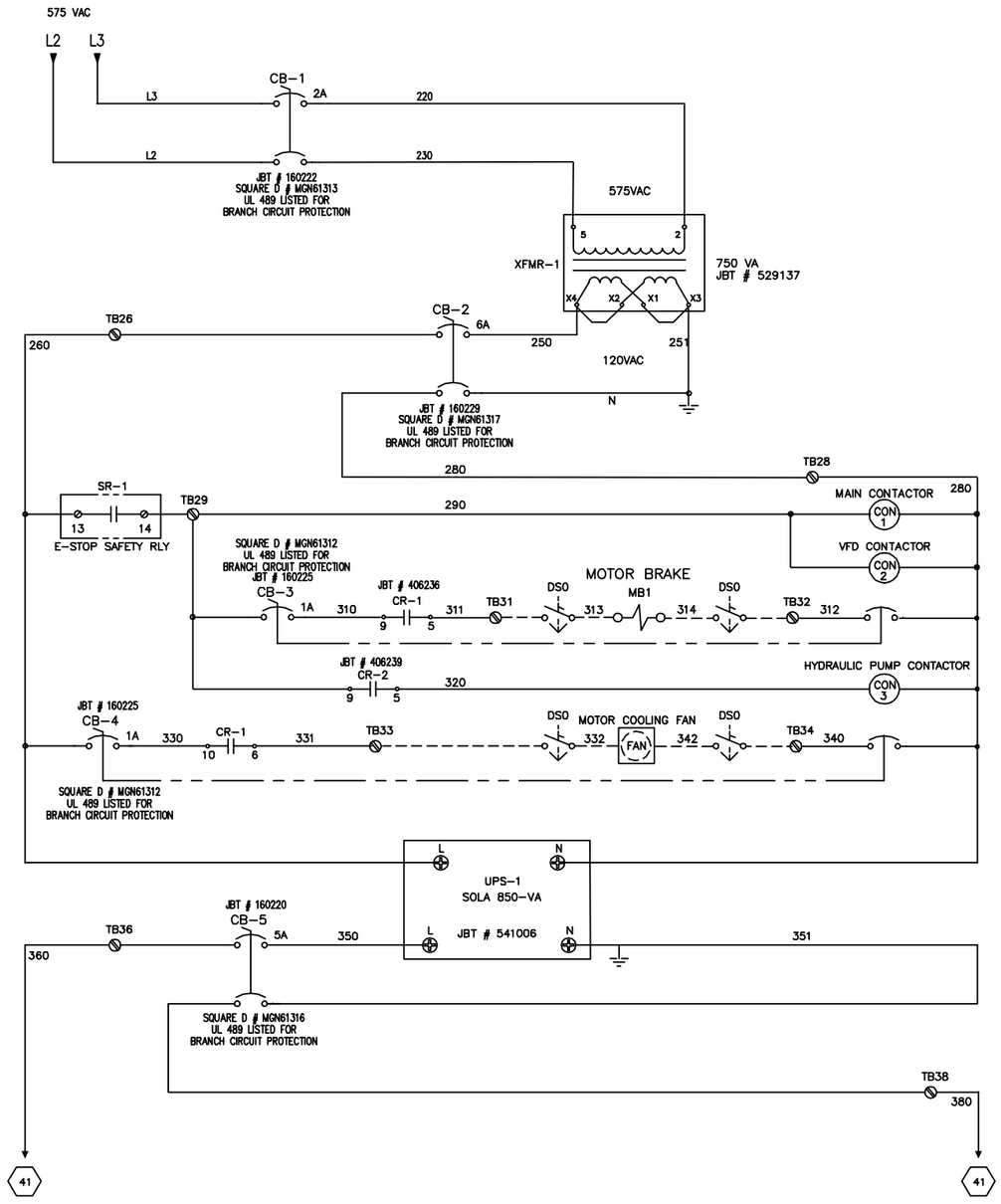
REV.	ECO	REVISIONS	BY	DATE

JBT FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

TITLE CSCO TORONTO STERITORT – 2011
COVER SHEET

DRAWN:	SIZE	DWG NO	REV	SH
BTA	B	0283.4932	00	01 OF 11
DATE: 10/3/11				



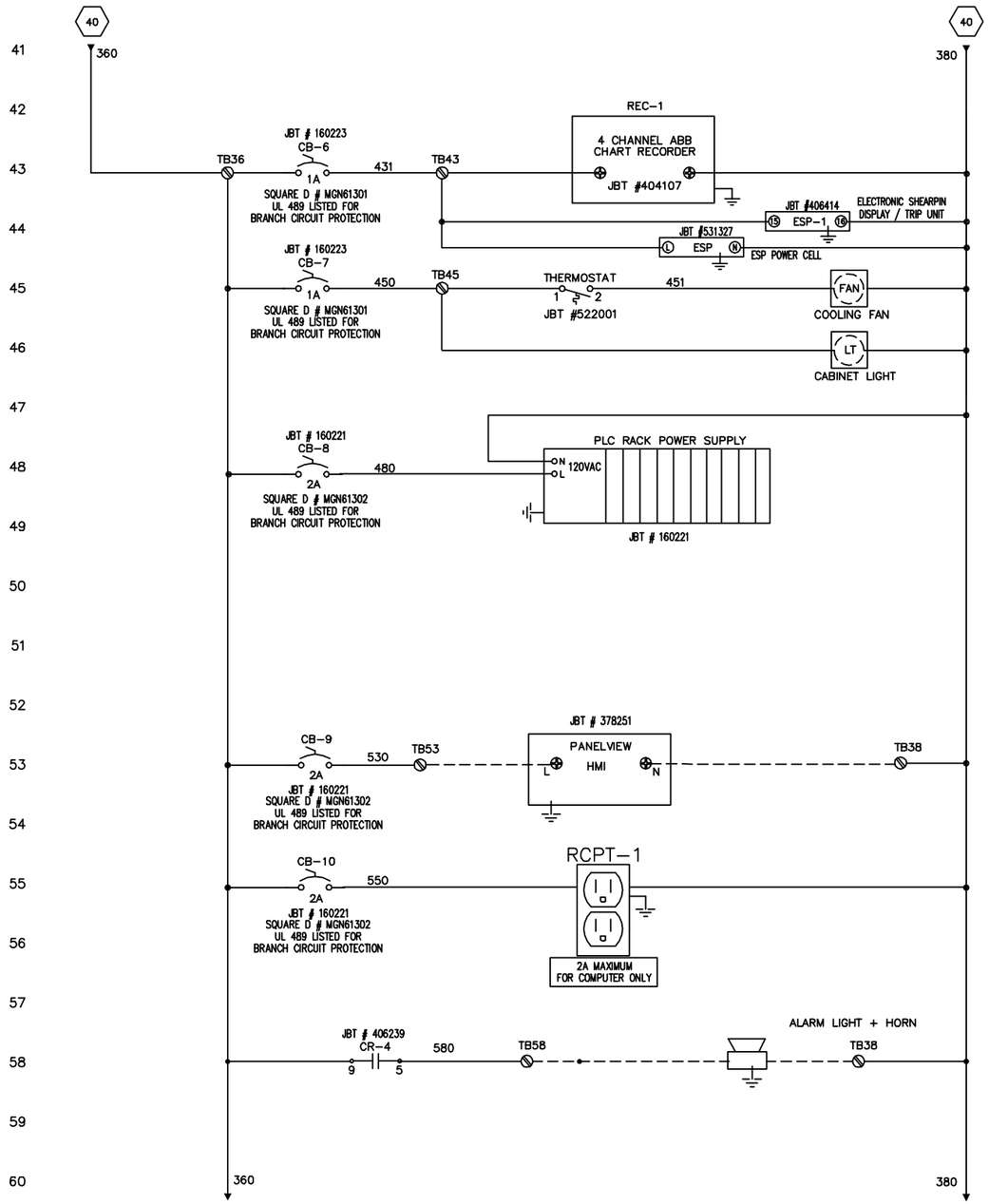


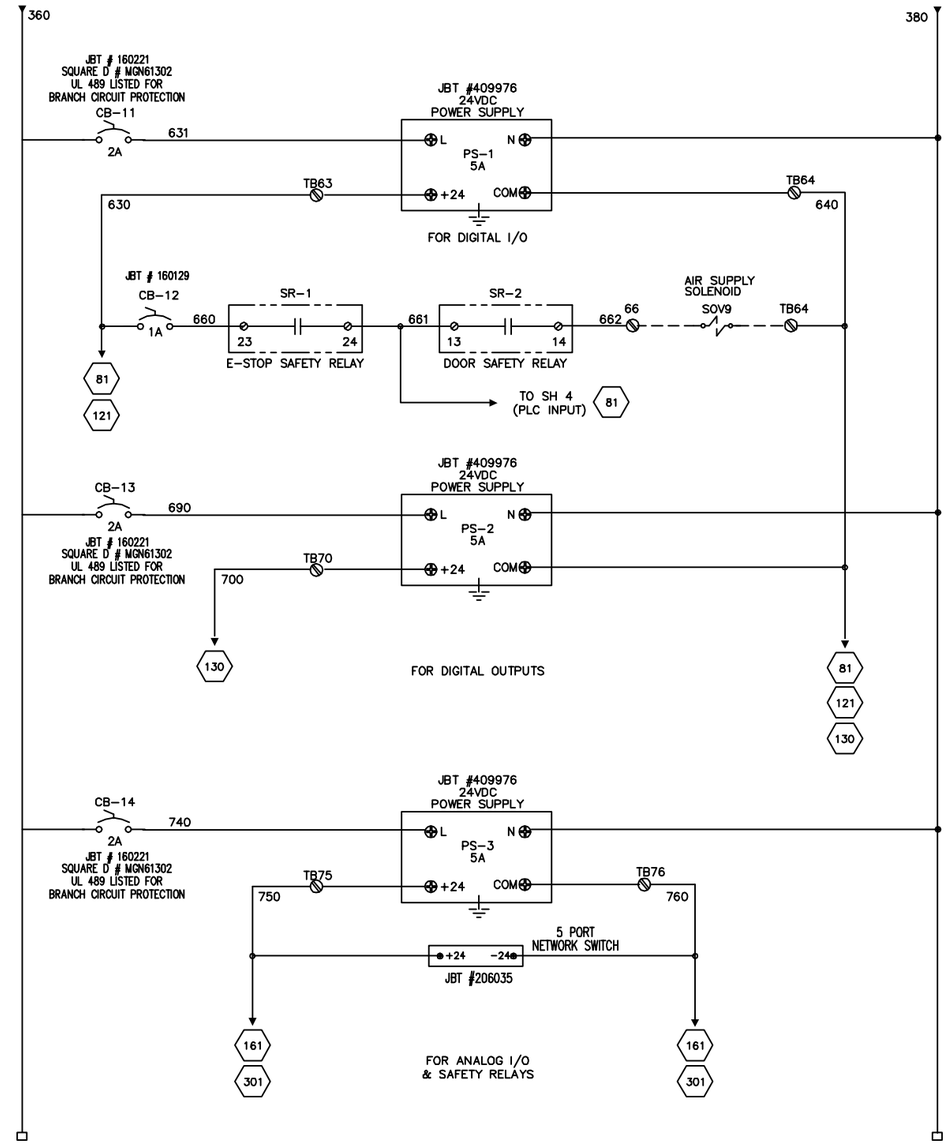
REV.	ECO	REVISIONS	BY	DATE

FoodTech
John Bean Technologies Corporation
Madera, California U.S.A.

TITLE: CSSC STERITORT

DRAWN:	SIZE	DWG NO	REV	SH
BTA	B	0283.4932	00	2 OF 11
DATE: 12/20/11				





NOTES:

- - - - - INDICATES WIRING GOING OUTSIDE PANEL

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John Bean Technologies Corporation
Madera, California U.S.A.

TITLE: CSSC STERITORT

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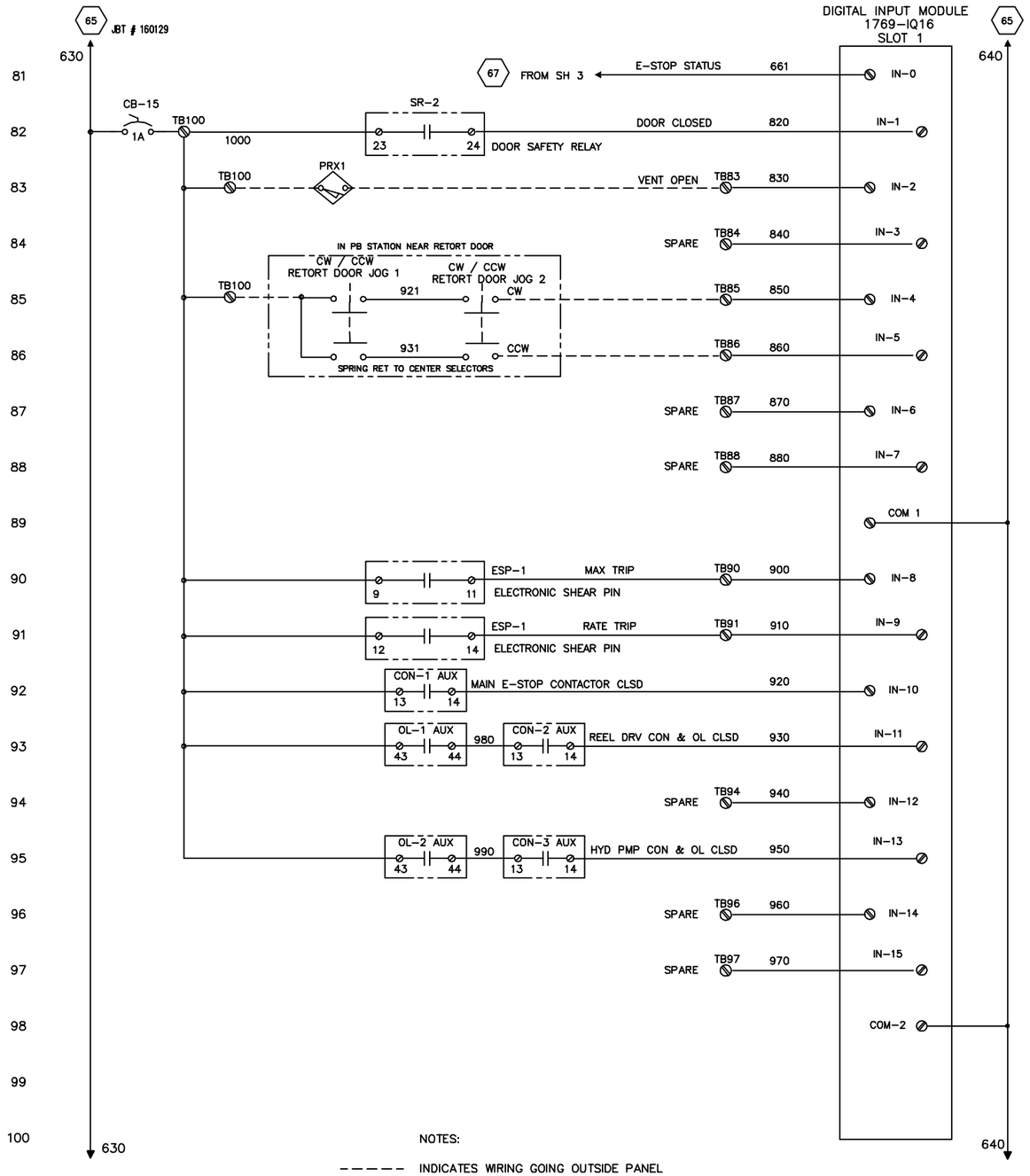
DATE: 12/20/11				



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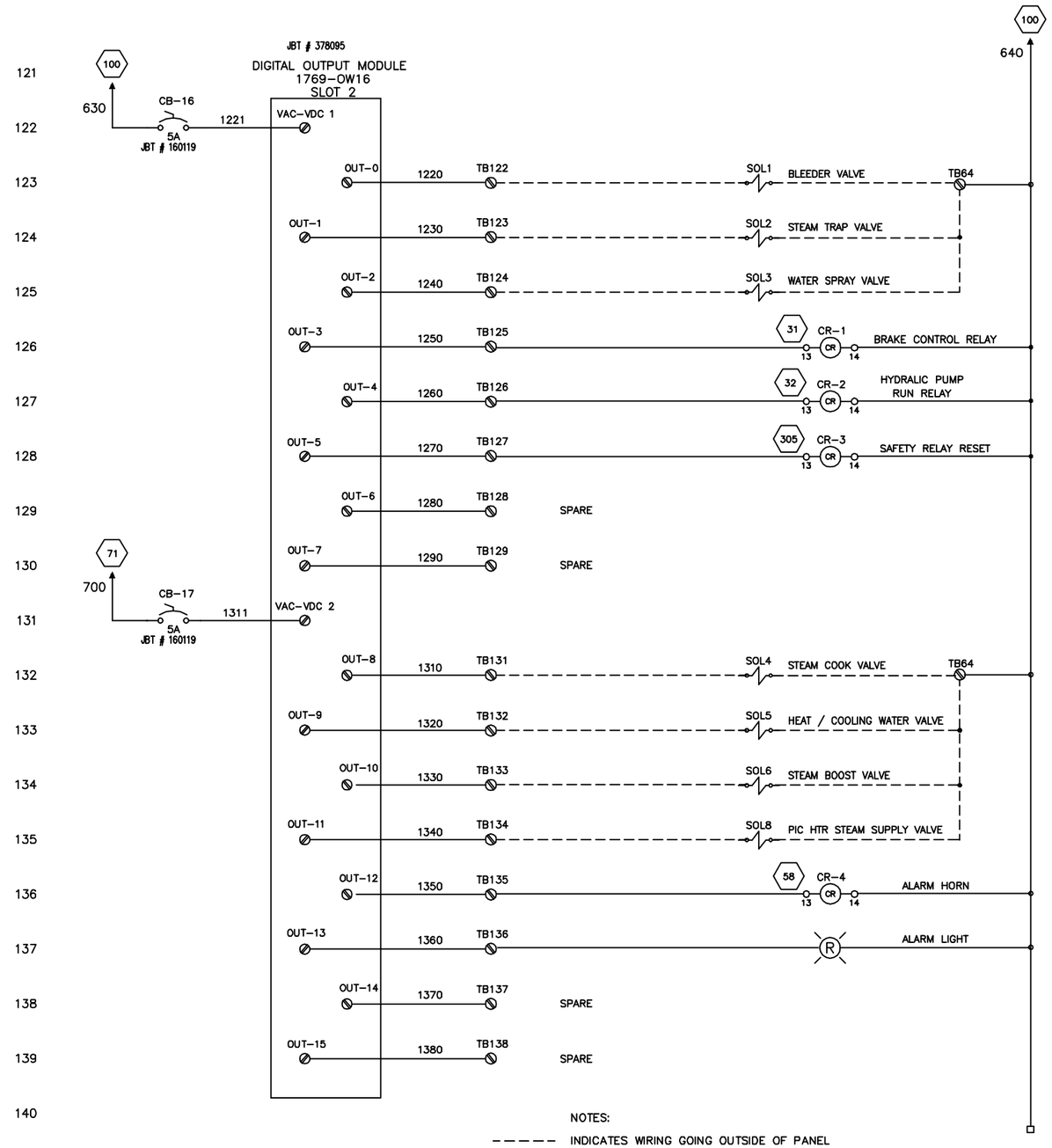
DATE: 12/20/11				



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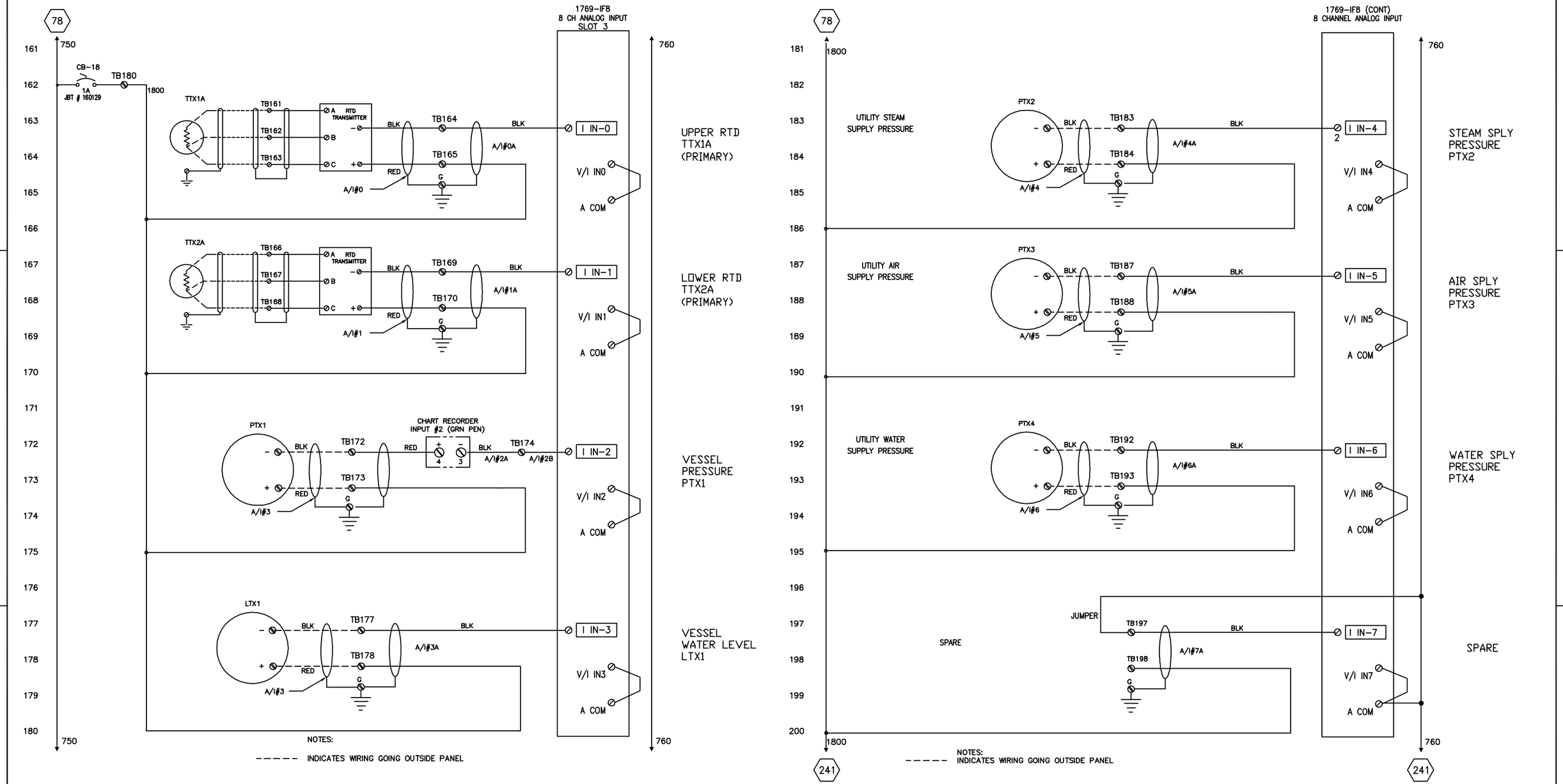

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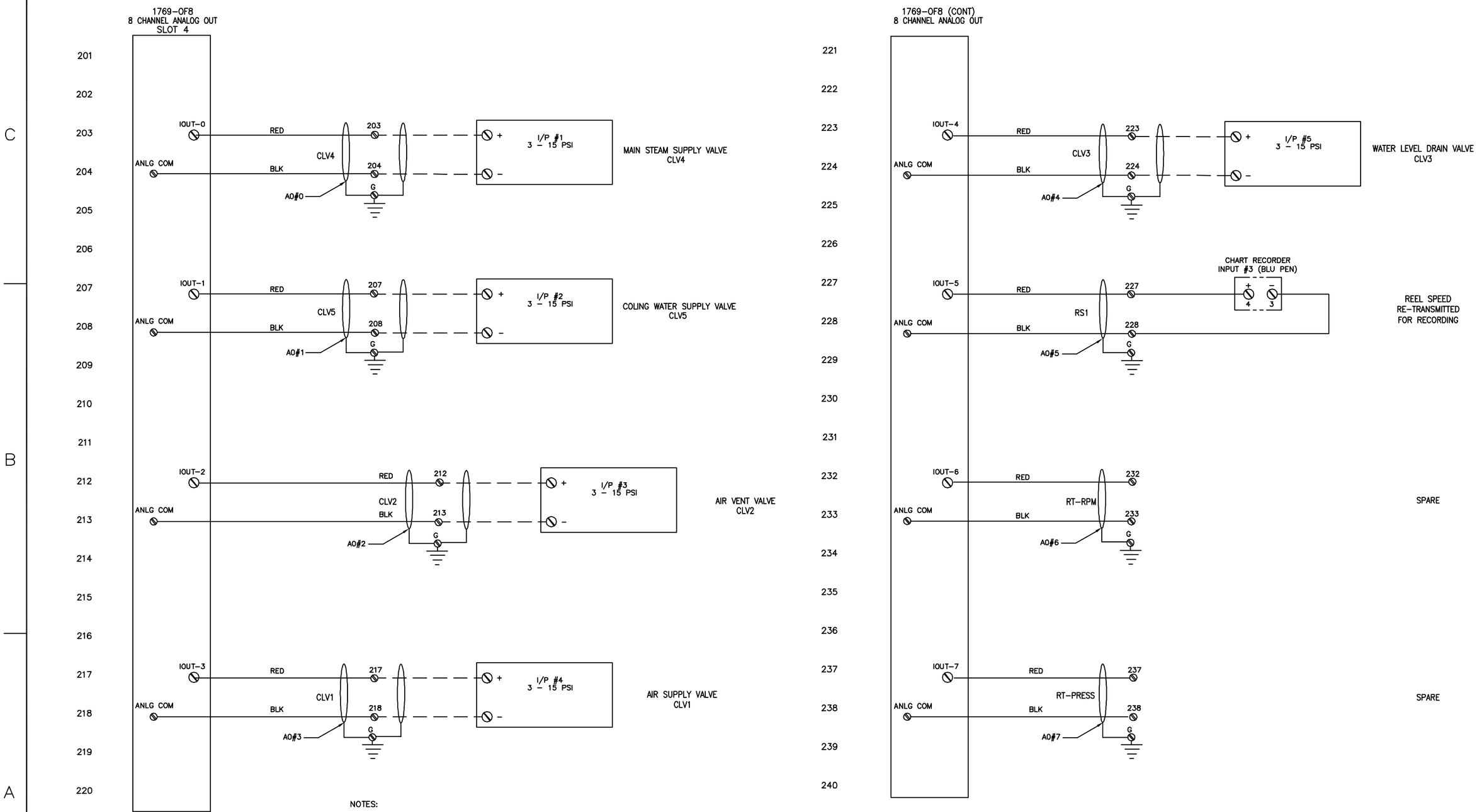

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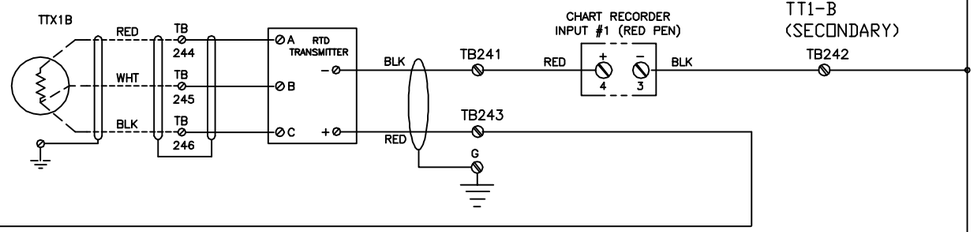
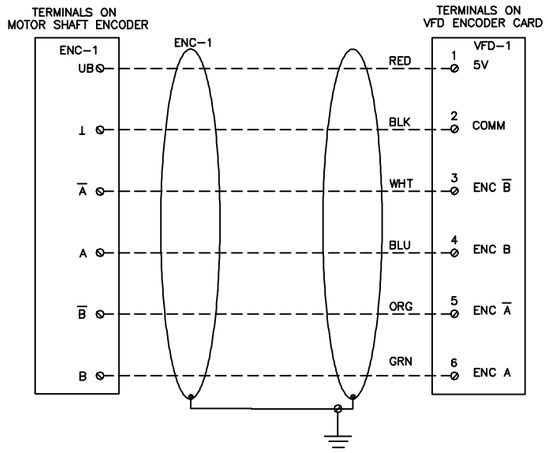
DATE: 11/05/11				

200

1800



MOTOR SHAFT ENCODER TO VFD ENCODER CARD CONNECTION DETAIL



200

760

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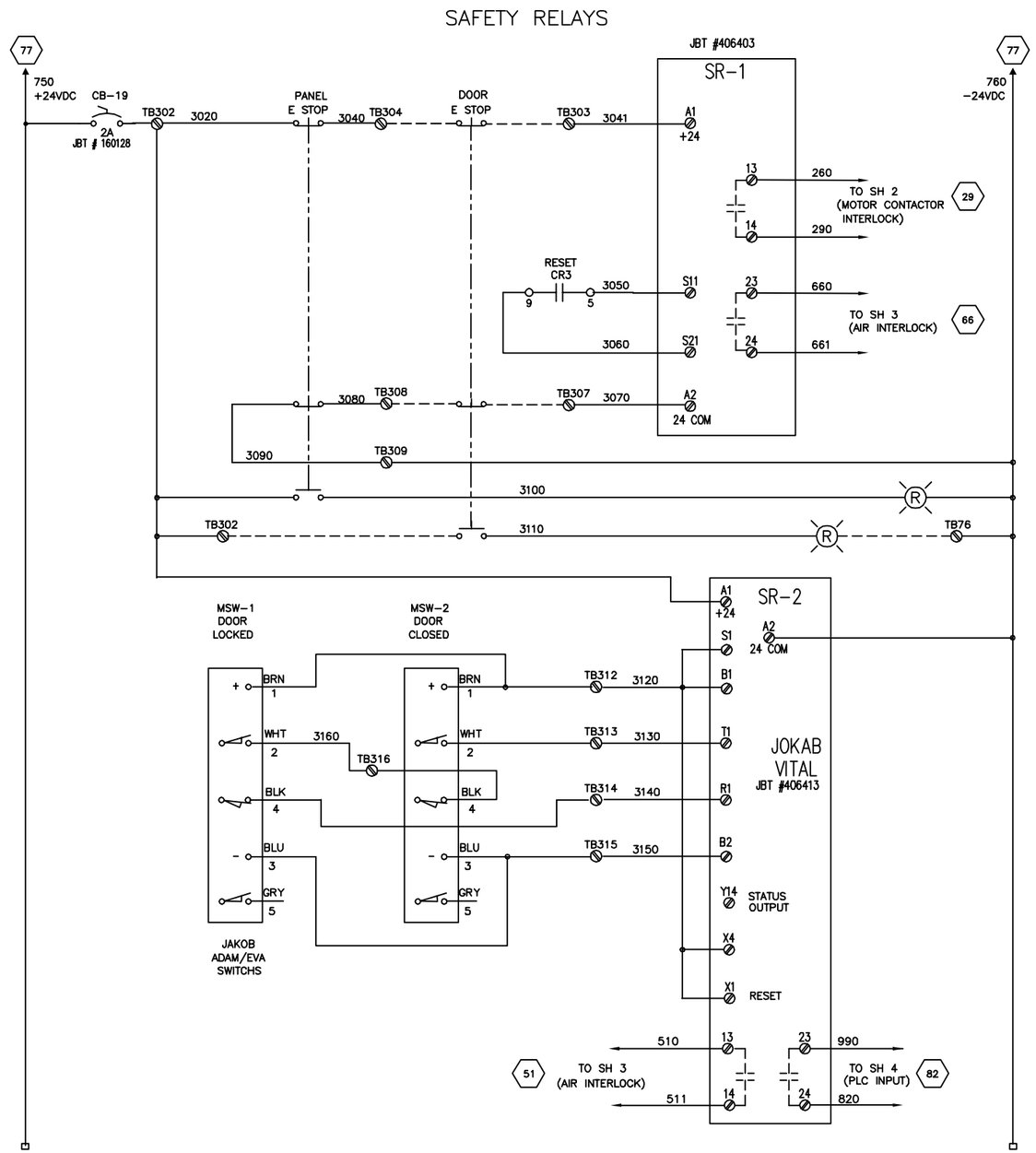
DATE: 12/20/11				



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SUGGESTED VFD SETUP PROCEDURE FOR ENCODER FROM ROCKWELL

Connect the motor to the drive uncoupled from the load. Wire the encoder to the encoder feedback PCB. Make sure that the voltage jumper is set properly for 5 or 12 V. This is the encoder signal voltage.
Set parameter 412 with the encoder type, single or quad. The "check" selections mean that the drive will check for an encoder loss. The other selections don't check for encoder loss.
Set parameter 413 with the PPR of the encoder.
Start the drive in open-loop operation and run it in the forward direction at a slow speed like 5Hz. If the motor is not rotating in what you consider the forward direction, power down the drive and swap any two motor leads. Restart the drive and then check parameter 415. If the encoder is indicating with a minus sign ahead of the speed value, then the encoder is wired backwards vs the rotation of the motor. If that happens, swap the A and A(not) wires from the encoder.
When the motor is rotating in the correct direction, and the encoder speed parameter 415 indicates forward as well (no minus sign), then the motor and encoder are setup correctly.
Then, shutdown the drive and set parameter 80 to Encoder. The drive will then use the encoder to compensate for load changes to keep the encoder speed, and thus the motor speed, constant.

FACTORY VFD SETTINGS

DISABLE DIGITAL INPUT 1
PARAMETER
361=9, (RUN REV)

SET DIGITAL INPUT 2
PARAMETER
362=8, (RUN FORWARD)

SET DIGITAL INPUT 4
PARAMETER
366=15, (SPEED SEL 1)

SET DIGITAL OUTPUT 1
PARAMETER
380=4 (RUNNING)

SET DIGITAL OUTPUT 2
PARAMETER
384=1 (FAULTED)

SET AI1 AS SPEED REF
PARAMETER
90=1

SET AI1 FOR CURRENT
PARAMETER
320, BIT 0=1
322=20 (20MA)
323=4 (4MA)

FVC VECTOR MODE
PARAMETER
53=4

ENC TYPE
PARAMETER
412=(QUAD)

ENC PULSE PER REV
PARAMETER
413=1024

FEEDBACK SELECT
PARAMETER
80=3 (ENCODER)

PI REFERENCE SELECT
PARAMETER
126=8 (ENCODER)

MAX SPEED
PARAMETER
82=60? (HZ)

PRESET SPEED 1
PARAMETER
101=10 (HZ)

CONTROL PANEL NAMEPLATE INFORMATION

JBT FoodTech

John Bean Technologies Corporation

VOLTS 575 PHASE 3 HZ 60

PANEL FULL LOAD CURRENT 20A

SCCR 5KA ENCL TYPE 1

LARGEST MOTOR/LOAD FLA 2.7

TB TORQUE RATING 4.4–7.1 LB–IN

DWG 0283.4932 YEAR 2011

SUPPLY CONDUCTOR AND MACHINE OVERCURRENT PROTECTION PROVIDED AT MACHINE SUPPLY TERMINALS.

0409.3392 Madera, CA

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CSSC STERITORT					
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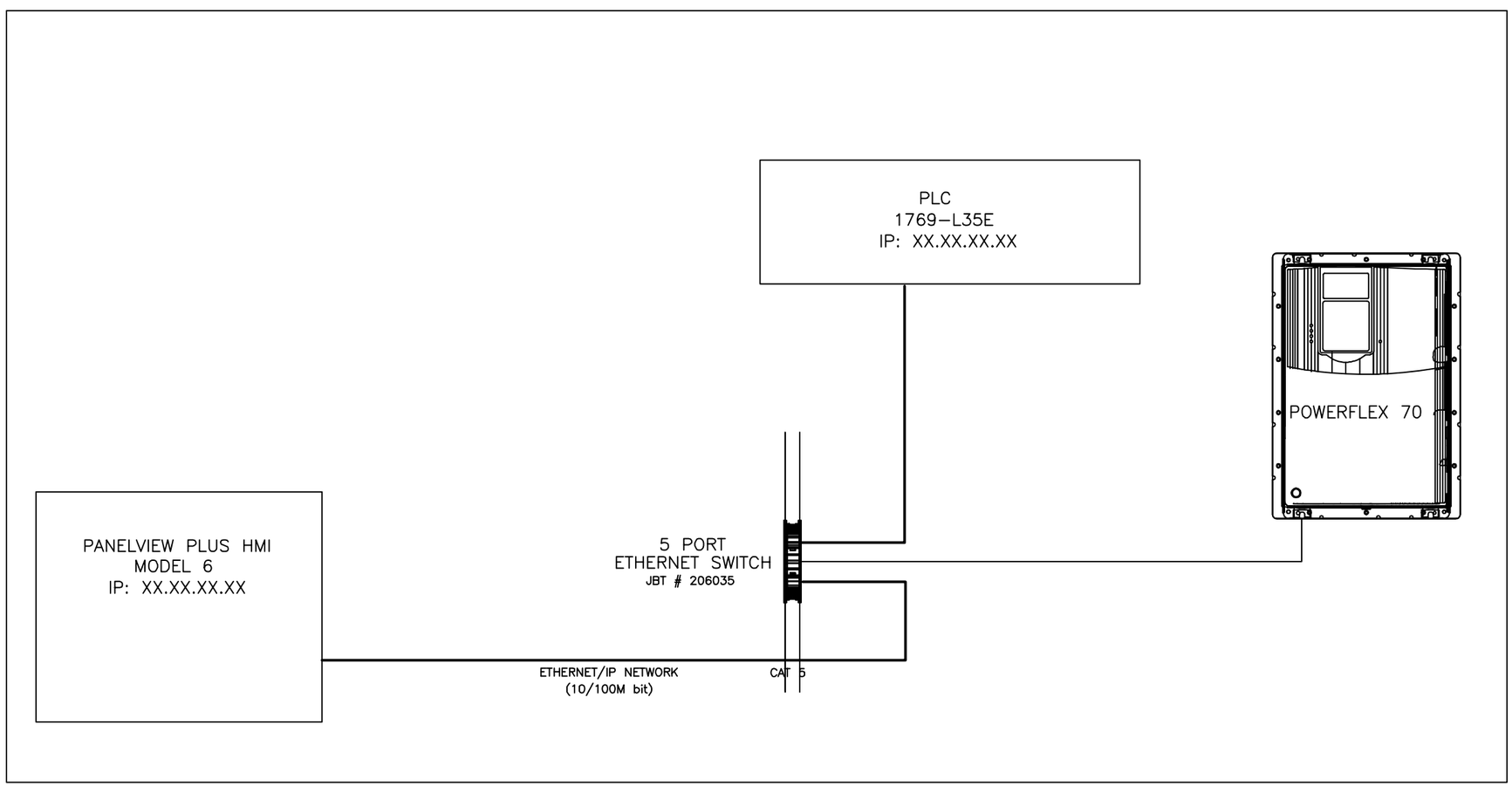
NETWORK MAP

IN CONTROL PANEL



NOTES:

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