SST-250S SERIES STEAM TUNNEL

OPERATIONS MANUAL

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1 Safety

WARNING

Do not attempt to operate until you have thoroughly read and understand completely all instructions, rules, etc. contained herein. Failure to comply can result in accidents involving fire, electric shock, or serious personal injury. Keep owners manual and review frequently for continuous safe operation.

1.1 KNOW YOUR MACHINE.

For your own safety, read the owner's manual carefully. Learn the intended application and limitations as well as potential hazards pertinent to this machine.

1.2 KEEP GUARDS IN PLACE AND IN WORKING ORDER.

1.3 REMOVE ADJUSTING KEYS AND WRENCHES.

Confirm that keys and adjusting wrenches are removed from the machine before turning it on.

1.4 KEEP WORK AREA CLEAN.

Cluttered areas tend to lead to potential accidents.

1.5 DO NOT USE IN DANGEROUS ENVIRONMENTS.

Do not use this machine in damp locations or exposure to external elements. Keeps work area well illuminated.

1.6 KEEP NON-TRAINED PERSONNEL AWAY.

All visitors should be kept at a safe distance from work area.

1.7 DO NOT USE THE MACHINE FOR UNINTENDED PURPOSES.

Only do the job for which it was designed.

1.8 USE PROPER TOOLS.

Do not force the machine or attachments to do a job for which they were not designed.

1.9 WEAR PROPER APPAREL.

Avoid loose clothing, gloves, neckties, rings, bracelets, or jewelry, that could be caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.

1.10 DO NOT OVERREACH.

Keep proper footing and balance at all times.

1.11 MAINTAIN MACHINE IN TOP CONDITION.

Keep machine clean for best and safest results. Follow instructions for lubricating and changing accessories.

(Continued...)

WARNING

1.12 DISCONNECT MACHINE FROM POWER SOURCE.
- a. Before servicing.
- b. When changing accessories.
- c. When mounting and remounting motors.

1.13 USE RECOMMENDED ACCESSORIES.
Consult the owner's manual for recommended accessories.
1.14 NEVER LEAVE MACHINE RUNNING UNATTENDED. TURN POWER OFF. 1.15
Never clean or remove debris while the machine is running.
1.16 Do not remove or alter warning labels. Replace any that become illegible.
1.17 Do not access the unit at any time without first isolating the relevant power supply and ensure that moving parts of the machine that can be accessed are at rest.
1.18 Do not to attempt to carry out any repairs, e.g. electrical or mechanical, unless properly authorized.
1.19 Do not to remove guards from the machine unless properly authorized.
1.20 Do not interfere with safeties on the machine.
1.21 Do not use unauthorized or improvised means of gaining access to parts of the machine that are not normally accessible.
1.22 Carry out regular inspections to verify that all guards and covers are secure and properly in position. Ensure that all safety devices are functioning correctly.
1.23 Do Not open the door (guards) when the steam tunnel running.

Steam Tunnel - Installation

1.1 Requirements*

1.3.1 Mechanical
The conveyor chain, guiderail and wear strips need to be constructed of high temperature resistant materials or material growth and melting may occure

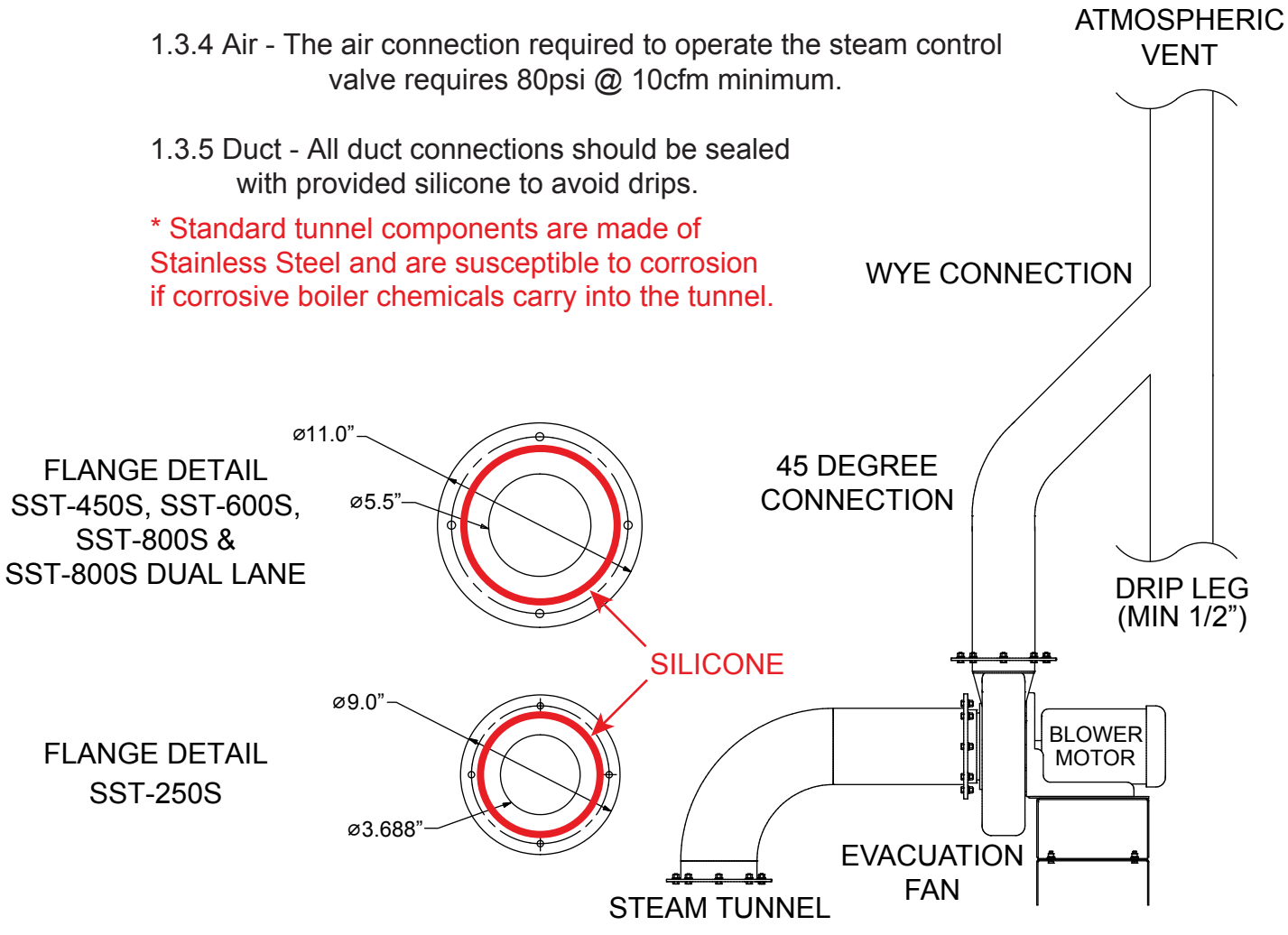
1.3.2 Consumption *(see below)* -
SST-250S 50PSI operating pressure, 550-800lbs/hr
SST-450S 50PSI operating pressure, 800-1100lbs/hr
SST-600S 50PSI operating pressure, 800-1100lbs/hr
SST-800S 50PSI operating pressure, 1000-1200lbs/hr

1.3.3 Electrical - varies by model of tunnel and options, see included electrical schematics

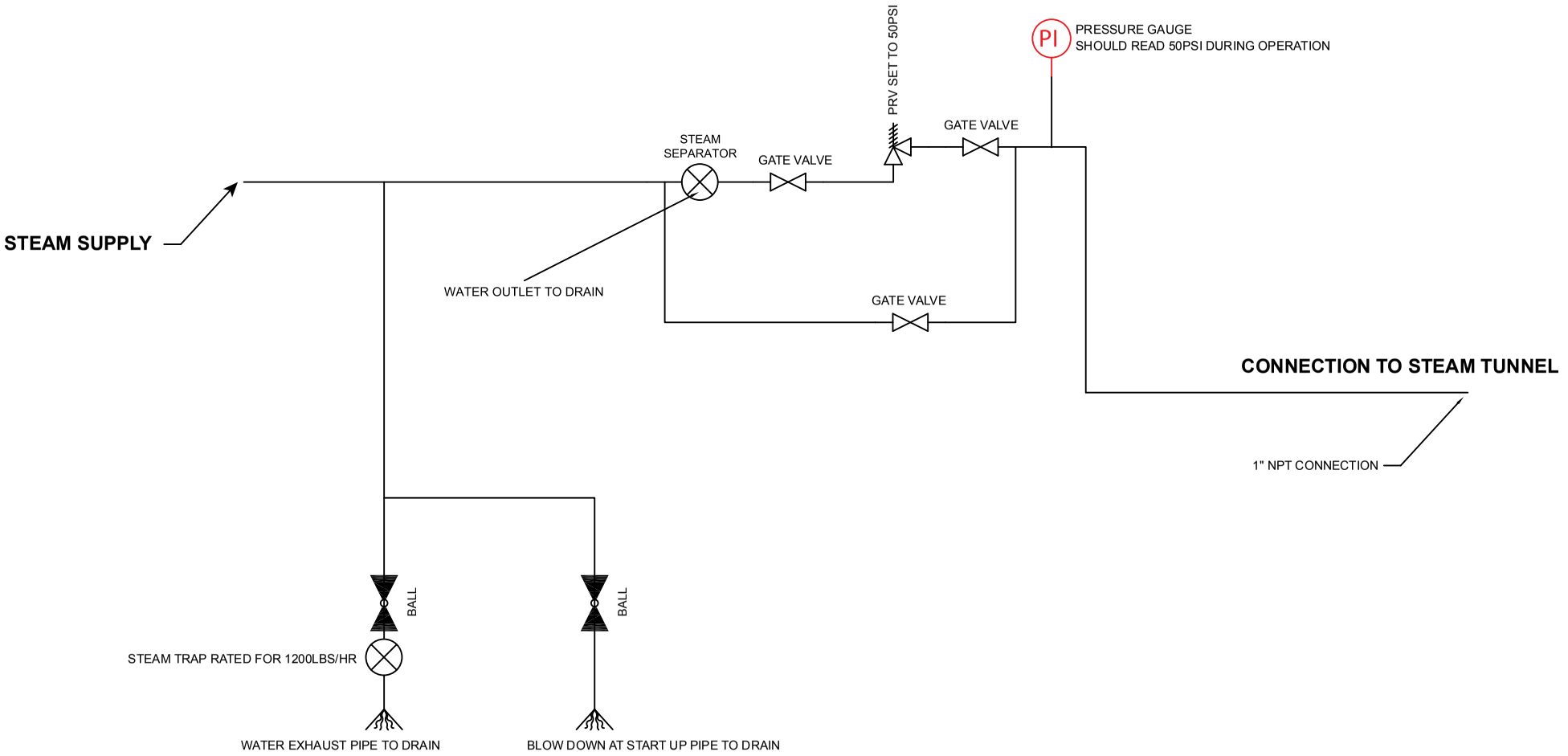
1.3.4 Air - The air connection required to operate the steam control valve requires 80psi @ 10cfm minimum.

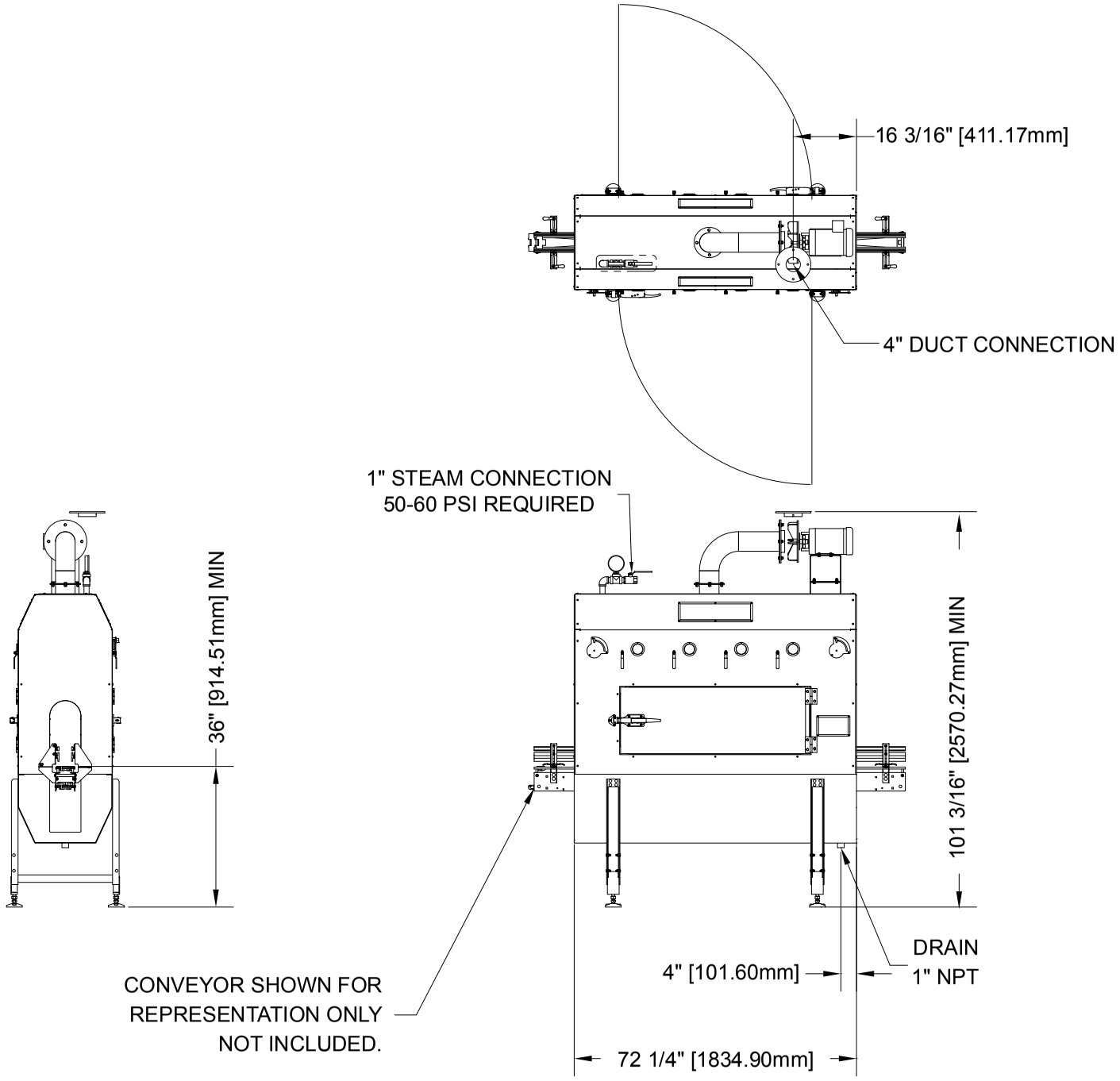
1.3.5 Duct - All duct connections should be sealed with provided silicone to avoid drips.

* Standard tunnel components are made of Stainless Steel and are susceptible to corrosion if corrosive boiler chemicals carry into the tunnel.



Steam Tunnel - Connection Details




16 3/16" [411.17mm]
4" DUCT CONNECTION
1" STEAM CONNECTION
50-60 PSI REQUIRED
36" [914.51mm] MIN
101 3/16" [2570.27mm] MIN
DRAIN
1" NPT
4" [101.60mm]
72 1/4" [1834.90mm]
CONVEYOR SHOWN FOR
REPRESENTATION ONLY
NOT INCLUDED.

3 Initial Setup

When beginning the initial setup of steam based shrink tunnel it is important to start with all the nozzle arrays closed completely after heating up the tunnel and the belt that is running through the tunnel set to full production speed. We also recommend that the exhaust blower(s) be set to 60hertz with the dampers opened half way on each end they can be adjusted later to aid in shrink and prevent escape of steam into the plant.

Important notes when setting up the steam tunnel.

1. Always ensure that the nozzle arrays are set the same on both sides in regards to pressure and position to eliminate uneven shrink.
2. Never set the pressure of any nozzle array to level that is high enough to move the container on the belt as it passes through.
3. Start at the entrance of the tunnel and work towards the discharge end for nozzle adjustment.
4. Be aware that changing the pressure on 1 nozzle array could reduce or increase the overall volume and pressure of steam being delivered to the rest of the tunnel thus changing the pressure of other nozzle arrays already configured. This means it is important to document pressure of each nozzle array once the intended effect is established.
5. Nozzles too close to the label can damage the film in some instances.
6. Wrinkles in the labels after shrinking are typically a result of too much heat in one location.
7. It is important to keep the container from touching the guide rails running through the tunnel as this can often cause issues with label shrink and orientation.

The next step is to establish what basic shape for the bottle being used. This is important for determining where to focus the first set of nozzle arrays in order to lock in the label. The typical configuration is to try to lock the label in on the bottom edge of the container. However if there is not a large enough area for the label to lock in under the bottom in some cases it is possible to lock the label in on the top but this is not recommended for shapes where the top is smaller than the bottom. If it is not possible to lock the label in on the top or the bottom it is still possible to get a smooth even result but it will require more setup and finer adjustment of the array pressures and in some cases requires a heat activated adhesive be added to the labels. The term “locking the label in” is referring to shrinking a portion of the label to size where it can no longer move up and down vertically on the bottle because it is contoured to ledge on the container. One common mistake is to set the steam to high when pointing the nozzle arrays on the bottom of the container thus lifting the label up off the belt and causing the label to lock in to high.

(Continued...)

The ideal configuration of a steam tunnel is to have the label look as though it is starting from the locked in location on the container and then move in a wave like motion towards the other end of the container in a constant and even flow. It is important that the shrink start on one end and then move to the other end careful not to shrink the other end before the middle trapping air and causing bubbles. This is why it is important to start with all the nozzle arrays closed and work back towards the discharge end of the tunnel.

4 Operation and Maintenance

4.1 Pre Start Checks

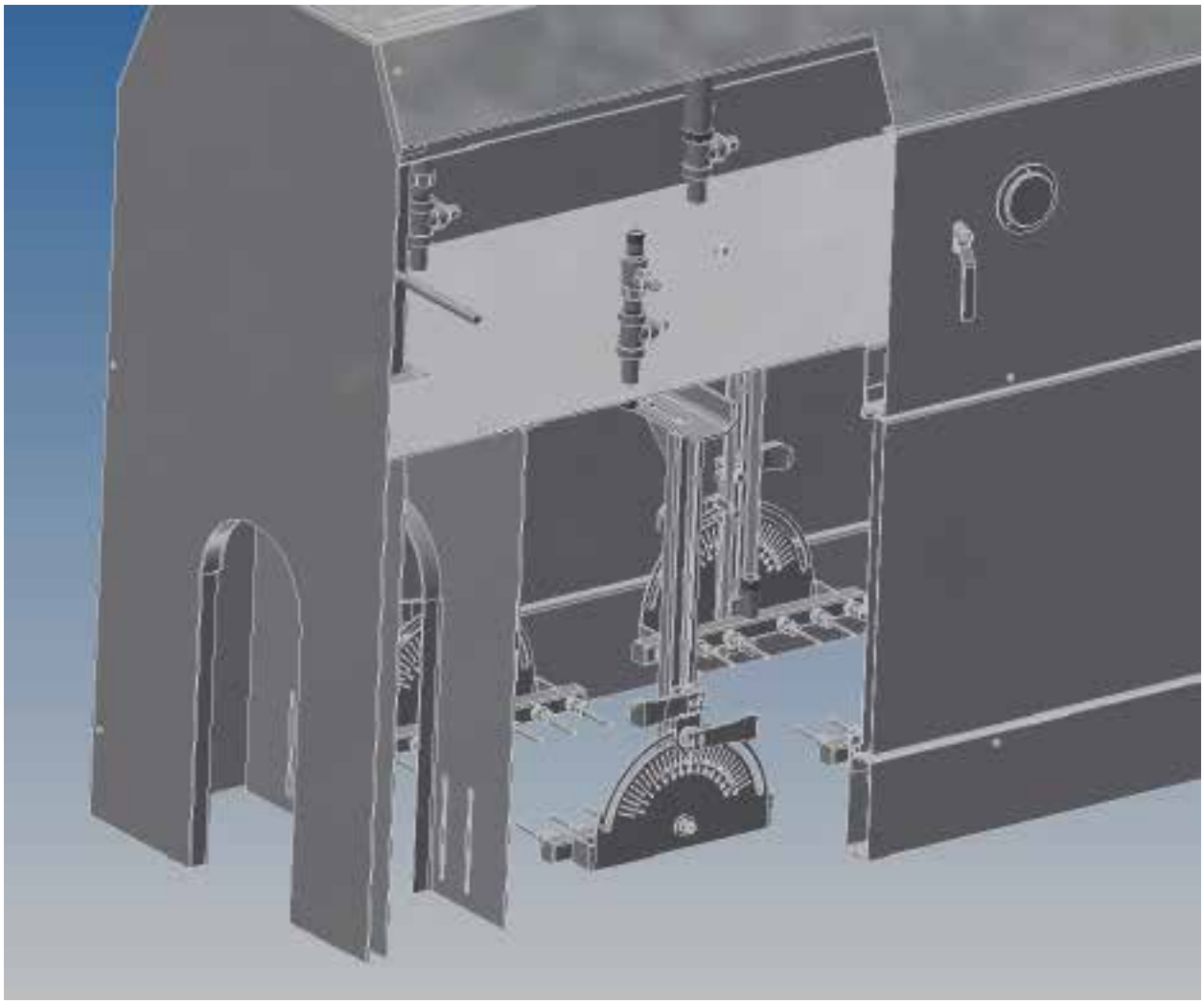
4.1.1. Check incoming steam pressure. Pressure should be a minimum of 50 psi with the nozzles open and should be constant.

4.1.2. Ensure all guards are in place.

4.1.3. Make sure area is clean and clutter free.

4.2 General Setup

4.2.1. Using the Cam Lock handles attached to the nozzle arrays, adjust the nozzle arrays to match container size and shape. A good starting point is to gradually work the nozzles from the bottom of the container to the top. (Internal guiderail may need to altered to avoid interference.)



4.2.2 The slot on top of the spray bar mounting arm will allow the ends of the nozzles to be positioned approximately 3" from the container.
4.2.3 Close all doors and turn on the steam. (Be sure to clear all tools from inside the tunnel and make sure conveyor is running.)
4.2.4 Adjust the pressure of each nozzle to approximately 5 psi using the pressure control handle.
4.2.5 Adjust the Damper to the closed position and slowly open until steam is barely contained within the ends of the tunnel.

4.2.6 Begin testing the shrink.
4.2.7. If shrink is unacceptable, readjust nozzle aim, nozzle proximity, and pressure as needed. If adjusting nozzle location, make sure to shut off steam and wait for handles to cool.

4.3 Operation
4.3.1 Be sure to allow Tunnel ample time to warm up before running production.
4.3.2. Run production as intended, periodically checking the pressure gauges for fluctuation and inspecting the final product for defects.

4.4 Trouble Shooting

4.4.1 Product does not exit the tunnel - Check for product jam and down containers.

4.4.2. Insufficient Shrink or Defect - Check incoming steam pressure. Check pressure of individual spray bars. Check for clogged nozzles. Check for clogged Damper.

4.4.3. Containers falling - Check Belt, Guiderail, and Wearstrip for growth or damage.

6 Replacement Parts

6.1 Replacement Parts List

K58L05002IFC - Standard Latch w/ Strike Flush

6149K7 - Crank Handle w/ Set Screws, 1/2" Diameter, 2" Slop Opening

C131206 - ASCO Steam Valve Rebuild Kit

5676T264 - High Temperature Type 321SS Braided Air & Water Hose
w/ Female X Female Fittings, 24" L, 1/2" ID, 300 PSI'

5676T405 - High-Temperature Type 321SS Braided Air & Water Hose,
w/ Male X Female Fittings, 36" L, 1" ID, 300 PSI

5676T266 - High-Temperature Type 321SS Braided Air & Water Hose,
w/ Female X Female Fittings, 36" L, 1/2" ID, 300 PSI

5676T268 - High-Temperature Type 321SS Braided Air & Water Hose,
w/ Female X Female Fittings, 48" L, 1/2" ID, 300 PSI

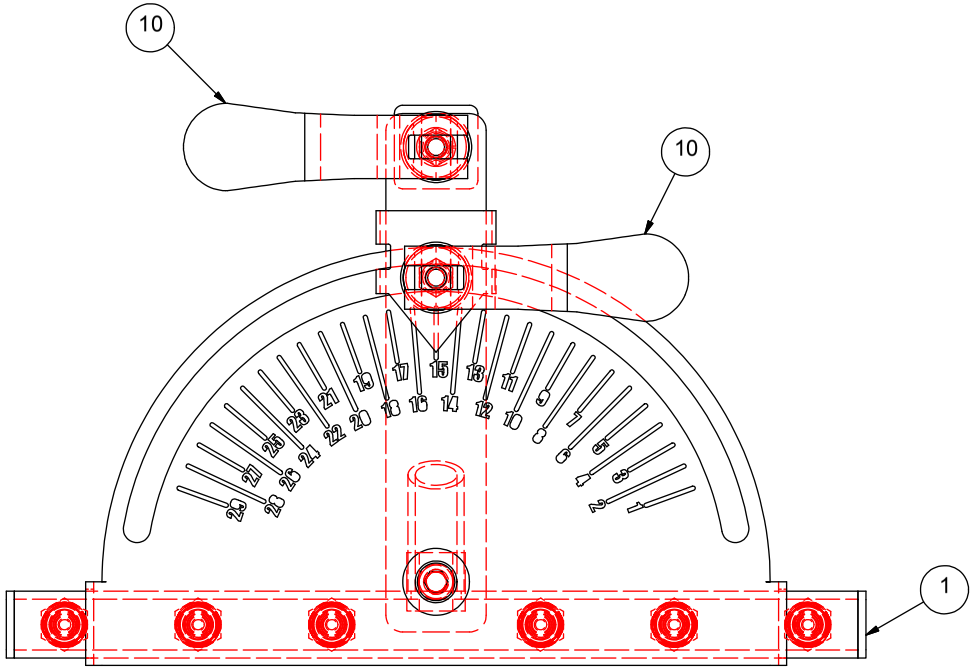
5676T271 - High-Temperature Type 321SS Braided Air & Water Hose,
w/ Female X Female Fittings, 60" L, 1/2" ID, 300 PSI

KCL-12 - Aluminum Cam Lever

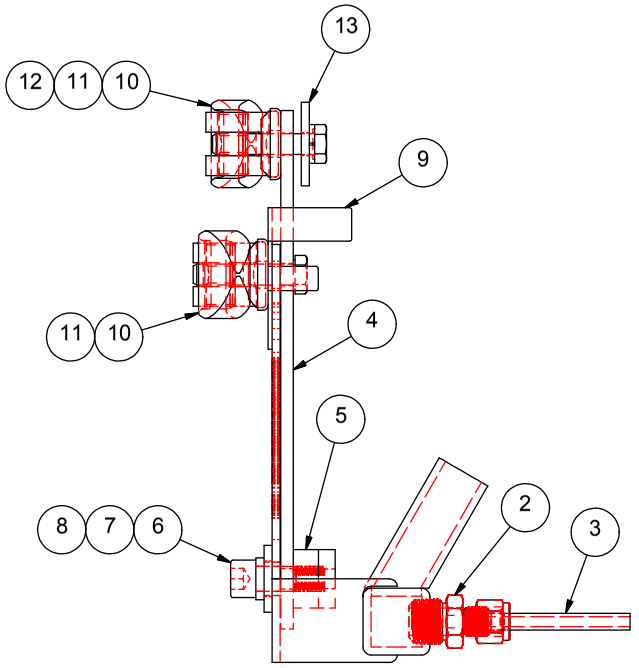
4599K43 1/2" Bronze Gate Valve

9745130-0007 - Gauge 2 1/2", 0-15PSI

6.2 Nozzle Array Details



SIDE



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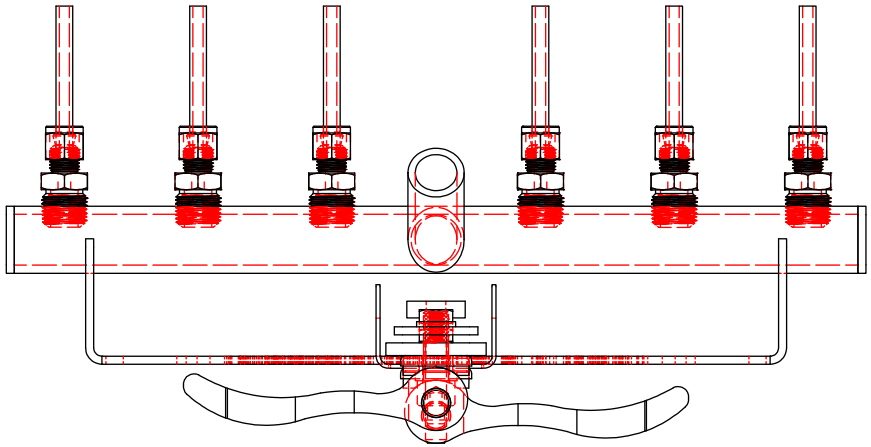
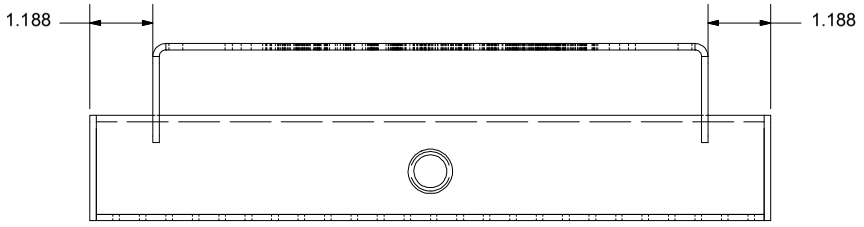


TOP

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	SSLC0011	SMALL LEFT STEAM NOZZLE ARRAY HEADER,
2	6	BRFTGCMPR025X375	WELDMENT FITTING, BRASS COMPR 1/4" X 3/8"
3	6	SSLA0004	COPPER STEAM NOZZLE
4	1	SSLA0007	MOUNTING BAR, STEAM HEADER
5	1	SSNUTTSLOT375X050	T-SLOT NUT, 3/8" THREAD FOR 1/2" SLOT
6	1	SSSKTCAP0310	Bolt, 3/8 - 16 UNC - 1 Stainless Steel Socket
7	1	PLBRGFLG375X375	BEARING, PLASTIC FLANGED 3/8" X 3/8"
8	1	SSLA0006	1/2" CUSTOM WASHER FOR NOZZLE
9	1	SSLA0005	ADJUSTMENT POINTER, HEADER ANGLE
10	1	ALLEVERCAM0031	CAM LEVER, INTERNAL THREAD 5/16"
11	2	SSBLTHEX0272	Bolt, 5/16-18 UNC - 1.5 Stainless Steel Hex
12	1	SSWSHLCK0052	Washer, 0.3125" Stainless Steel Lock
13	1	SSLA0105	CAM LEVER BACKPLATE, STEAM TUNNEL

Diffuser Block



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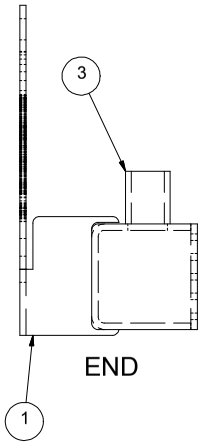

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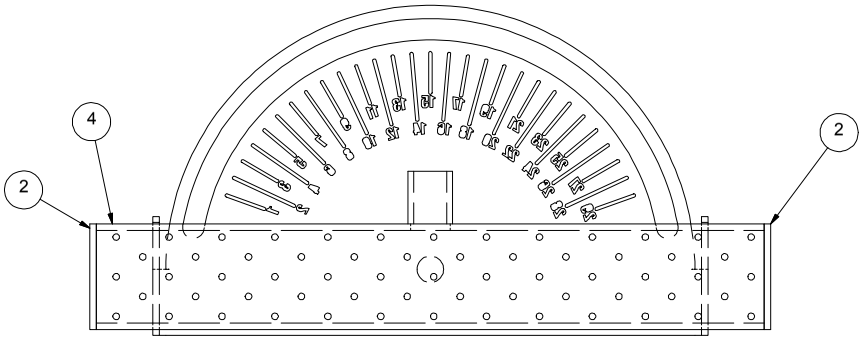

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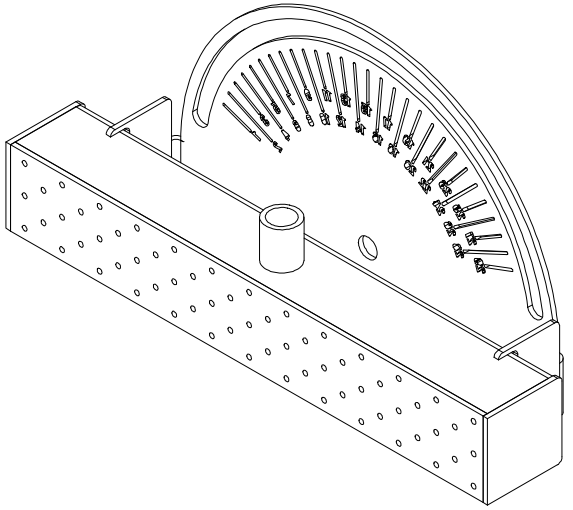

SMALL STEAM
NOZZLE ARRAY
PART NUMBER: SSLC0029

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	SSLB0028	STEAM BAR LEFT MOUNT PLATE
2	2	SSLA0030	2" X 2" SQUARE TUBE WELD CAP
3	1.000 in	SSPIPE400004THRD	1 PIPE, STNLS 1/2" SCH 40 ONE END THREADED
4	1	SSLA0033	SMALL STEAM NOZZLE ARRAY HEADER, WLDMNT