

# INSTALLATION SECTION

## CFS 2100



401 N. Lincoln ☎ P.O. Box 72 ☎ Colville, WA 99114-0072 ☎ U.S.A.  
Tel: (509) 684-4505 ☎ Fax: (509) 684-4500  
E-mail: [sales@colmacind.com](mailto:sales@colmacind.com) ☎ Website: [www.colmacind.com](http://www.colmacind.com)



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## INSTALLATION

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Installation, operation and maintenance of the gas piping, valves, burner and control circuits are covered by the following American Standards:

1. Uniform Mechanical Code.
2. National Fire Protection Association No. 54.
3. Installation of Gas Appliances and Gas Piping (ANSI Z21.30).
4. Installation of Domestic Gas Conversion Burners (ANSI Z21.8).
5. Requirements for Installation of Gas Equipment in Large Boilers (Z21.3).

Installation and replacement of gas piping or gas appliances and repair of gas pipeline components shall be performed only by a **qualified installing agency**. A "**qualified installing agency**" is defined as any individual, firm, company or corporation which either in person or through a representative is engaged in and is responsible for the installation or replacement of gas piping on the outlet side of the meter, or of the service regulator when a meter is not provided, or the connection, installation or repair of gas appliances, who is experienced in such work, familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction.

It is the responsibility of the distributor and/or purchaser to know the local "**authority having jurisdiction**" (normally the local utility company); and, for contracting with a **qualified installing agency** to perform the installation, start-up and any maintenance of the gas system for this machine.

✓ **NOTE: Improper Installation done by non-qualified or non-licensed personnel may void the warranty on the machine.**

COLMAC INDUSTRIES, INC

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## UNCRATING AND SHIPMENT INSPECTION

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*Your Colmac finishing tunnel should be uncrated and carefully checked for shipping damage.*

Upon delivery, visually inspect the crate and visible parts for shipping damage. If the crate or cover is damaged or signs of possible damage are evident, have the carrier note the condition on the shipping paper before the shipping receipt is signed. **Carrier must** have signed for damage before any damage claims can be processed.

Check for internal damage or unsecured parts.

### **Recommended Moving Procedure**

**Use spreader bars to lift and move tunnel (Figure 1). Using only a sling could bend the panels.**

Remove all of the quick release panels and main lint screens. Keep them in order so they can be replaced in position after installation. Check again for internal damage or unsecured parts.

Some conveyor, loader and assembly components will be stored behind these panels in the finishing chamber or in the control box. Remove these and set aside for later assembly. Open the additional parts crates and check contents.

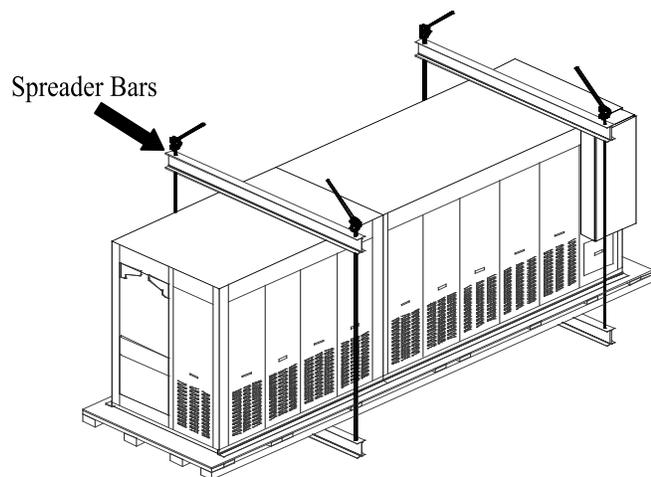


Figure 1 – CFS 2100 shown

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## PLACEMENT

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The tunnel finisher should be set on a smooth, level floor. Make sure the machine is level. It is not necessary to bolt or lag this machine to the floor. Careful consideration should be given to the placement of the machine so that the best productive flow is possible through the plant.

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## LEVELING INSTRUCTIONS

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To reduce corrosion caused by moisture collecting under the deck plate, it is suggested that supports be placed under the deck to provide a space for air circulation. At least 1" (25mm) lift should be achieved for adequate ventilation.

Two types of support that may be used are: 1) channel or 2) Colmac leveling pads.

An ideal structural component for these supports is standard 1 x 2 (25mm x 51mm) channel placed with the flanges down. These should be oriented at right angles to the long dimension of the machine and be as long as the full base width of the deck (including flanges).

These supports should be spaced no more than 60" (1524mm) on the CFS 2100.

When installed under the multiple modules of the CFS 2100, these supports should be located at the junctions of the modules and should be centered under the junctions as shown in **Figure 2**.

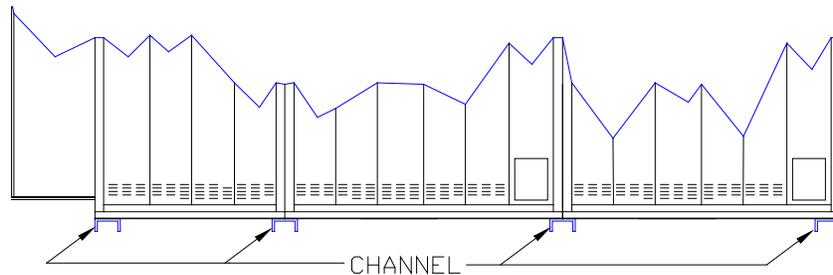


Figure 2

The leveling pads (available from the factory) should be installed in each pre-drilled, 1/2" (12.7 mm) hole on the existing angle of the CFS 2100 and the new finishing module (Figure 3).

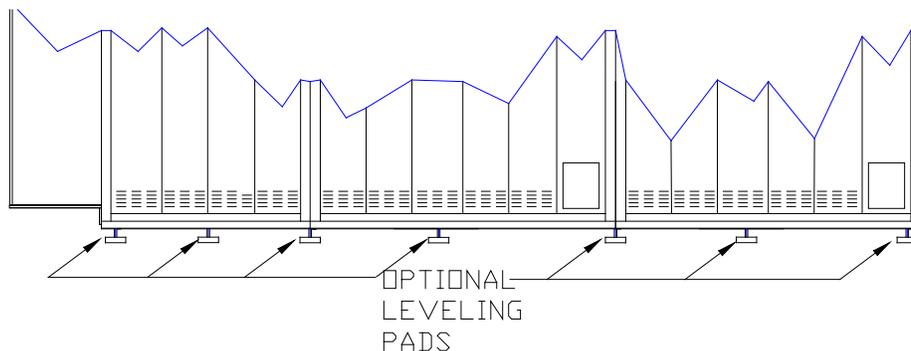


Figure 3

1. Support the tunnel with a forklift or crane.

2. Install the channel or optional leveling pads.
3. If using leveling pads, install them by first removing the top bolt, leaving the bottom bolt and washer on the pad and then inserting into the 1/2-inch holes in the channel.
4. Set the machine down and adjust the leveling pads, if used.

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## **MULTIPLE MODULE INSTALLATION**

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The following steps apply for multiple module installation:

1. Position and align each additional module making sure that the bolt holes in the back wall, center wall and front wall line up with the previous module.

✓ **NOTE:** machines having multiple modules can be assembled easier with a 5000-pound forklift truck equipped with side-shift hydraulics.

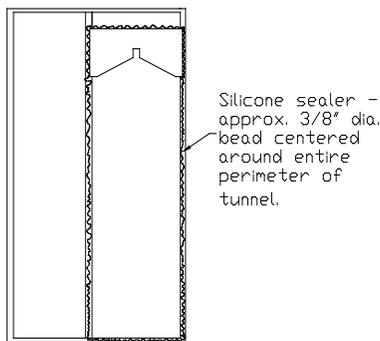


Figure 4

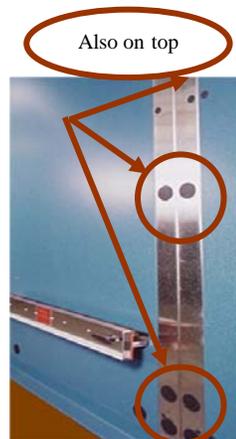


Figure 5

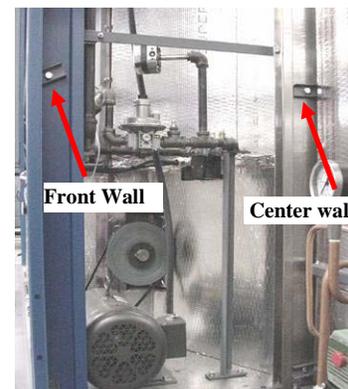


Figure 6

2. Sealer should be applied around the finishing chamber opening between the mating surfaces as show in Figure 4.
3. Install bolts and nutplates. Refer to Figures 5 and 6. Do not tighten until all bolts and nutplates are installed. After all the bolts and nutplates are installed, rotate the tightening sequence so the bolts and nutplates are tightened evenly.
4. Level the machine. Refer to the Leveling Instructions on the previous page.
5. Connect the conveyor tube, using the jig provided by Colmac. This connection should be welded.
6. Install the conveyor chain into the conveyor tube, bringing the ends together on the drive sprocket for easier connection of the connecting pin. Be sure to install the cotter key into the clevis pin.
7. Have qualified personnel connect all utilities.
8. Check all steam and gas connections for leaks.

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## **ENTRANCE ENCLOSURE INSTALLATION**

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(Reference Figure 7)

Pre-assembled and tested by Colmac.

✓ **NOTE: IMPORTANT – Coat all mating surfaces with silicone sealer prior to installation.**

Place hood assembly on top of the enclosure and secure with 3/8" (9.5mm) bolts to machine.  
Use 1/4" (6.35mm) bolts to fasten hood top to enclosure.

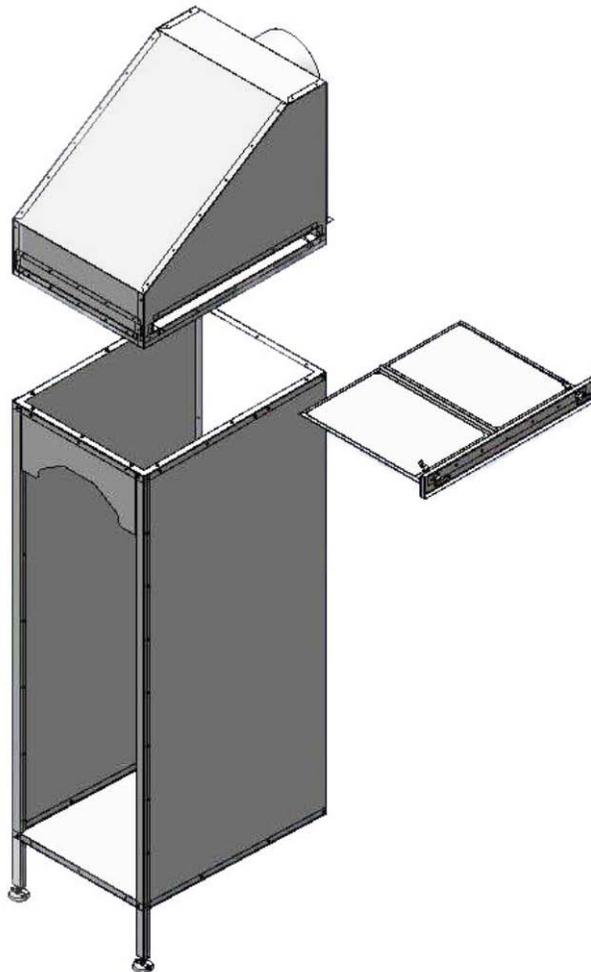


Figure 7

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## SUPPLY CONNECTIONS

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**CAUTION:** This machine uses a natural gas burner system that can be converted to propane or butane. This system should not be exposed to synthetic or petroleum dry cleaning solvents. Such exposure will be hazardous to the machine and the garments being processed. If dry cleaned garments are to be finished in the machine, be sure they have been completely dried and deodorized.

✓ **NOTE:** During the winter season the factory will run anti-freeze through the steam system and then blow it out to prevent frozen pipes in shipment. Before operating, open traps and purge, and also, check solenoid steam valves to be sure they are not stuck.

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## ELECTRICAL

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***WARNING!!***

**Machine Must Be Electrically Grounded!**  
**Failure to attach an EARTH ground could result in damage to  
any solid state device!**

**DO NOT USE PLUMBING FOR GROUNDING!!!**

The CFS tunnel has a manual disconnect which should be connected to the facility power system in accordance with local codes. If the tunnel is a CFS 2100, each module has a manual disconnect. Consult installation drawings to determine total amperage requirements of your system. Make sure the electrical supply voltage is the same as required by this machine.

At the first trial of the electrical connection, make sure the rotation of all blowers is as marked. Be sure to check each blower for rotation.

✓ **NOTE:** *Do not wire any auxiliary equipment into the control box.*

**\* SPECIAL WARNING!! \***

All installation and adjustments must be accomplished by a qualified installing agency!

**✓ NOTE: IMPORTANT INSTALLATION INFORMATION**

To be sure of adequate gas supply, the piping that supplies the gas to the machine must be sized in accordance with the governing code. Because of the relative low operating pressure of the tunnel, the size of pipe and length of the piping run must be properly installed.

Determine plant gas pressure before connecting the gas line to the machine.

Maximum inlet pressure - 7psi (0.476atm)

Connect the incoming gas service regulator that was shipped with your tunnel as follows:

1. Locate the gas inlet pipe on top of the tunnel (see installation drawings in the "**Installation**" section).
2. Remove pipe cap.

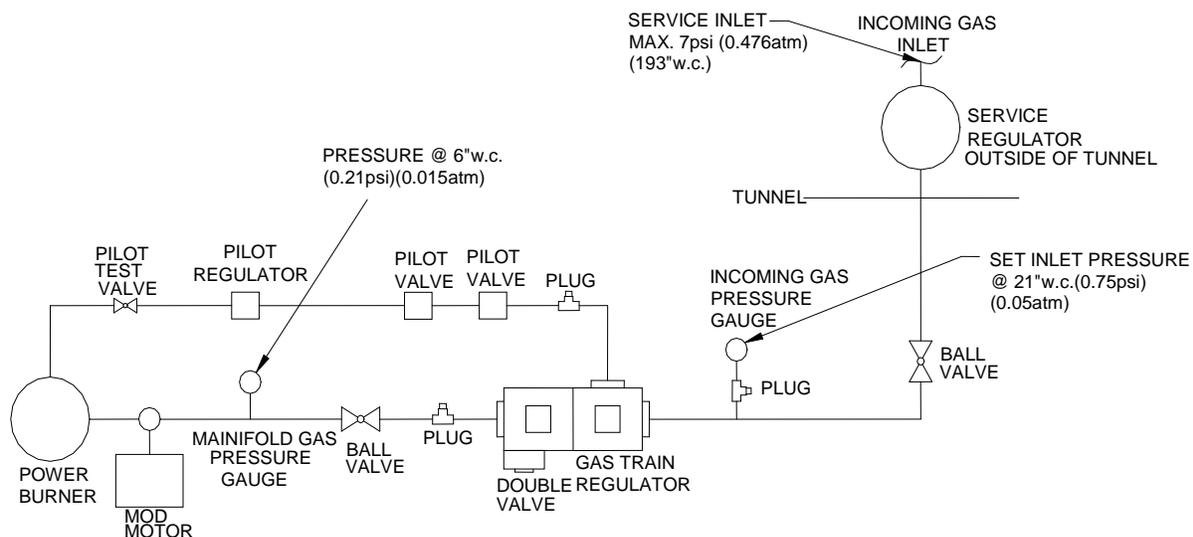


Figure 8

3. Screw regulator on with arrow on casting pointed **downward** (Figure 8).
4. Use pipe compound or thread sealant, properly threaded pipes and careful assembly procedure so that there is no cross threading, etc., which might cause damage.

5. Apply wrench or vise pressure only to the flat areas around the pipe tapings at the end being threaded to the pipe to avoid possible fracture of the regulator body, which could result in leakage.
  6. Hook up gas line.
  7. Adjust the incoming gas service regulator to deliver 15" w.c. at the equipment pressure gauge.
- ✓ **NOTE:** Before shipment, Colmac has adjusted the incoming gas service regulator to the closed position.

Contact the Colmac Service Department if gas supply is not sufficient to operate tunnel.

Check gas pressure downstream of the main burner regulator. Verify that it remains at the factory setting of 12" w. c. using a calibrated water column gauge. Any changes in the main burner regulator setting to compensate for differences in heating value of the natural gas should be accomplished using a calibrated water column gauge and the final pressure setting recorded.

- a. If the gas contains propane or other components which produce a heating value significantly greater than 1000 Btu/cu. ft., it will be necessary to change the gas orifice on the burner assembly. Contact the Colmac Service Department to determine the correct orifice size for the gas you are using.
- b. If the natural gas has a heating value significantly lower than 1000 Btu/cu. ft. and the operating temperature can not be maintained, it will be necessary to change the gas orifice on the burner assembly. Contact the Colmac Service Department to determine the correct orifice size for the gas you are using.

**PIPE SIZING TABLE FOR 1PSI (28"W.C.)(0.07ATM)**  
Capacity of pipes of different diameters and lengths in cubic feet per hour. For an initial pressure of 1 psig with a 10% pressure drop and a gas of 0.6 specific gravity.

Pipe Size of Schedule 40 Pipe (Inches)	Total Equiv. Length of Pipe in Feet									
	50	100	150	200	300	400	500	1000	1500	2000
1	740	520	430	370	300	260	230	170	130	120
1 1/4	1,540	1,090	890	760	630	540	490	350	280	250
1 1/2	2,330	1,650	1,350	1,160	960	830	740	530	420	380
2	4,550	3,210	2,640	2,260	1,870	1,610	1,440	1,040	830	750

Table 1

**PIPE SIZING TABLE FOR 2PSI (55"W.C.)(0.14ATM)**

Capacity of pipes of different diameters and lengths in cubic feet per hour. For an initial pressure of 2 psig with a 10% pressure drop and a gas of 0.6 specific gravity.

Pipe Size of Schedule 40 Pipe (Inches)	Total Equiv. Length of Pipe in Feet									
	50	100	150	200	300	400	500	1000	1500	2000
1	1,080	760	620	540	440	380	340	240	190	170
1 1/4	2,250	1,590	1,300	1,120	910	790	710	500	410	350
1 1/2	3,410	2,410	1,970	1,700	1,390	1,200	1,070	760	620	530
2	6,640	4,700	3,840	3,310	2,700	2,350	2,090	1,480	1,210	1,040

**Table 2**

- c. Natural gas can be considered to have 1000 Btu/cu. ft. anywhere in the country. As such, pipe capacity is very important. A 400,000 Btu/hr burner will require no less than 400 cu.ft./hr to be supplied to the burner. Likewise, an 800,000 Btu/hr burner will require 800 cu.ft./hr and a 1,100,000 Btu/hr burner will require 1100 cu.ft./hr. These tables give gas capacities in cu. ft./hr for various diameters of pipe at various lengths.

Tables 1 and 2 show the gas supplied at 1psi and 2psi respectively. These tables are for *reference only*. Be sure that you comply with your *local* code authority.

**Determine plant gas pressure before connecting the gas line to the machine.**

For fittings, add equivalent of straight pipe.

**Equivalent Resistance of Bends, Fittings, and Valves, Length of Straight Pipe in Feet**

		45° Ell	90° Ell	180° Close return bends	Tee
Nominal pipe size, inches	Inside dia. <i>d</i> , in. Sch. 40	<i>L</i> = equivalent length in feet of Sched. 40 (standard weight) straight pipe			
1/2	0.622	0.73	1.55	3.47	3.10
3/4	0.824	0.96	2.06	4.60	4.12
1	1.049	1.22	2.62	5.82	6.90
1-1/4	1.380	1.61	3.45	7.66	6.90
2	2.067	2.41	5.17	11.5	10.3

**Table 3**

Incoming gas pressure *should have been* determined before placing the machine order. If this was not done, it may be necessary to use a different incoming gas regulator or change the spring that was supplied. The label on the regulator determines spring sizes. The standard service regulator is supplied with an orange spring – maximum incoming pressure: 193" w.c. (7psi) (0.476atm), output range: 12" w.c (0.43psi)(0.03atm) to 28" w.c. (1psi) (0.07atm). (Reference Table 4)

**Maximum service regulator inlet pressure: 7psi (0.476atm)(193" w.c.)**

SPRING	OUTPUT	SEAT	INPUT MAX
ORANGE	12" w.c (0.43psi)(0.03atm) to 28" w.c. (1psi)(0.07atm)	5/16	193" w.c. (7psi)(0.476atm)

Table 4

**Set tunnel inlet pressure at: 0.54psi (0.036atm)(15" w.c.)**

Before starting the machine, purge the air out of the gas line. This is accomplished by pulling the plug out of the end as shown in Figure 9. Purge the air out until there is a smell of gas. Then, put the plug back.

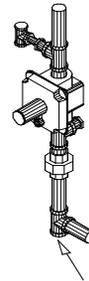


Figure 9

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## HIGH-LOW GAS PRESSURE SAFETY SWITCH

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For your protection, the gas line is equipped with high and low gas pressure safety switches that will turn the gas off if the pressure rises above or drops below the factory settings. Factory settings are: High- 28" w.c. and Low - 9" w.c. The main gas regulator's high and low pressure switches will automatically reset themselves if actuated.

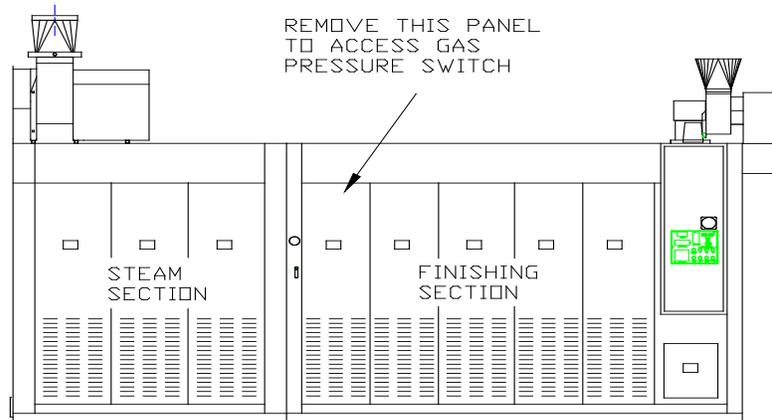


Figure 10

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## VENTING

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### EXHAUST BLOWER VENTING

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It is important the exhaust system has sufficient airflow to dispose of combustion gases and it is recommended that a professional heating and ventilating contractor designs and installs the exhaust system. It is recommended that for adequate airflow, each exhaust blower develop no more than 1.5" static pressure in its exhaust duct. Each blower must have a separate duct.

Special attention must be paid to the installation of the duct attached to the entrance exhaust blower. The air in this line is highly saturated with water vapor, which rapidly condenses on the inner walls of the duct, especially if the ambient temperature is cool. This ducting can be installed in a way, which minimizes leakage.

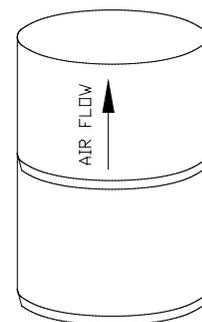


Figure 11

This is accomplished by installing the duct sections exactly opposite to the way a normal stovepipe is joined, as shown in the illustration below. With this method of joining the duct, any liquid condensing on the inside walls of the duct will remain inside and flow back to the blower housing where a drain system will carry it away.

Horizontal runs should be installed in the same manner but with a slight slope to promote drainage toward the blower.

In addition, sealing the duct joints with a silicone or similar compound will further reduce leakage. The steam module vent should use jacketed pipe when venting through the roof, especially when the run is short.

✓ **NOTE:** Both vents should use a back draft damper in cold climates to prevent freezing in the steaming section when the machine is not operating.

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## MAIN INCOMING SERVICE REGULATOR VENTING

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On the main incoming service regulator, beside the connection for incoming gas service there is a connection for a vent line. (See Figure 12)

Colmac suggests, and your local gas authority may *require*, that you to install a vent line to disperse gas outside of your building in the event of regulator failure. In the event of total regulator failure the regulator will stop gas from going through the tunnel; it is important that this excess gas be vented out of the building to eliminate the possibility of an explosive condition.

Whether the regulator is vented through the roof, or through a wall it is important to protect the vent outlet from incoming elements (rain, and snow) that *will* damage the regulator. If your regulator is vented through the roof install a 180° elbow so the vent opening faces the roof; if your regulator is vented through a wall install a 90° elbow so the vent opening faces the ground.

Connect your vent line using 1 inch NPT piping; connection is accessible upon removing the protective screen.

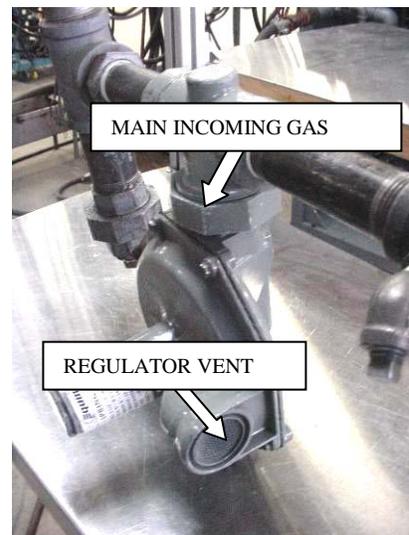


Figure 12 – Main Incoming Service Regulator

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## PROPER STEAM HOOK-UP

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The steam and return system connections are very important. Poor steam quality or incorrect connections directly affect its performance. (Reference Figure 13)

- 1 To insure adequate steam supply, the steam line should be 1-1/4" (32mm) or larger and the return line should be 3/4" (19mm). The factory recommends the larger supply sizes to compensate for line loss. Since the tunnel is equipped with steam traps, no additional traps are required. Never put one (1) trap in line with another, as the traps will no longer function. Be sure to check all steam connections for leaks. A strainer should be put into the steam line. All steam lines should be insulated to prevent loss of heat and possible injury to personnel.

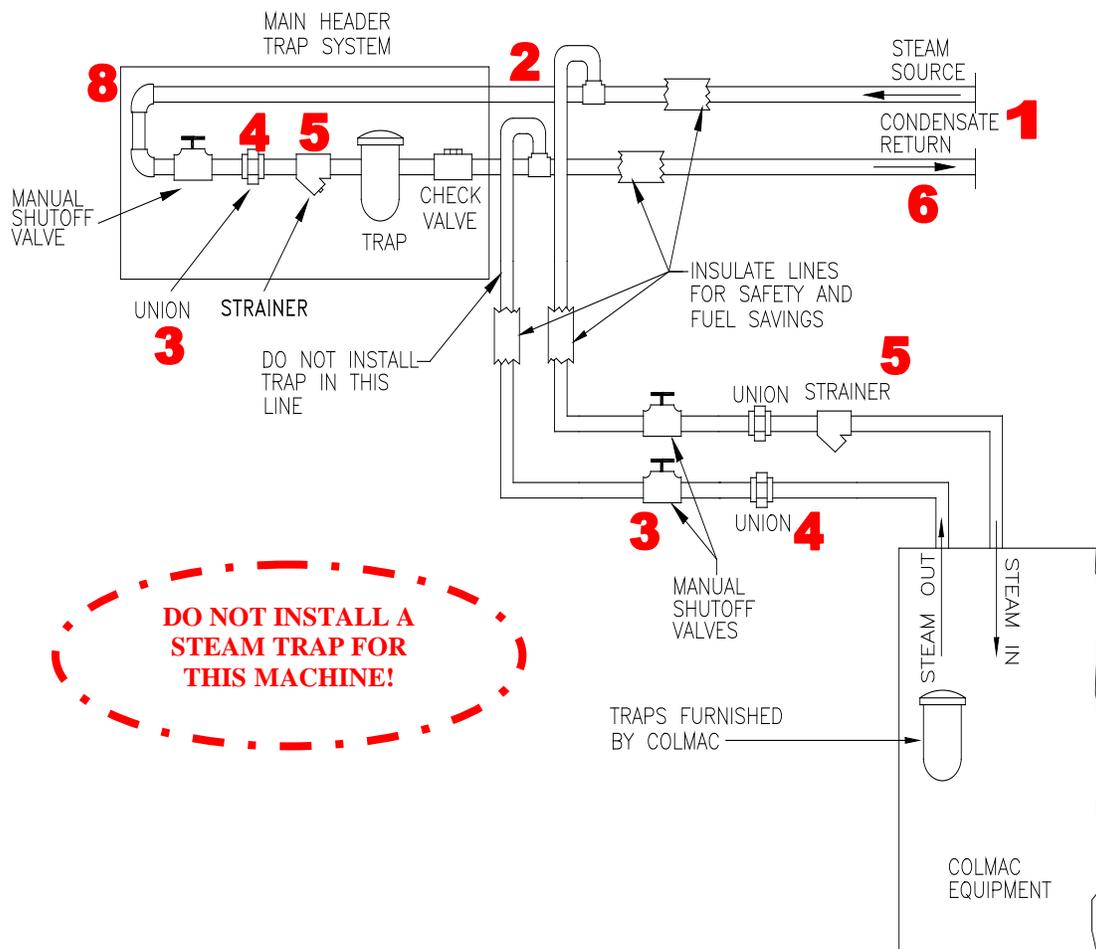


Figure 13

- 2 **Supply Line:** Connect the steam line to the top of the steam headers as shown in Figure 9 to insure a clean, dry steam supply.
- 3 **Shut-off valves** installed ahead of the union and strainer on the "steam-in" and "steam-out" lines and between the union and return header on the "Main Header Trap System" (8), will simplify shut-off for repair and maintenance. "Ball" or "Gate" type valves are recommended for maximum flow.

- 4 **Unions** placed between the shut-off valve and the machine will simplify hook-up and disconnection between the steam supply and the machine.
- 5 The **strainer** is important to insure that the steam is free of foreign materials that could foul electric valves, traps and other components in the steam system of the machine.
- 6 **Condensate Return System:** Connect the condensate, return pipe to the top of the return header to prevent foreign material from being drained back into the return system of the machine.
- 7 **Do not install a steam trap for this machine.** Your Colmac Machine has traps and a check valve already installed as part of the return system. If a trap is installed outside the machine, the steam and return systems will not function properly.
- 8 To assure clean, unsaturated steam to your equipment, the main steam header(s) should be trapped. This will help prevent condensate in the steam lines and increase the efficiency of the steam-heated equipment.