

SECTION 2 INSTALLATION

I. UNLOADING/UNPACKING

Your Middleby Marshall Ovens are shipped partially assembled. Each oven section will arrive in its own crate of the following size and weight:

	PS360U/PS360L	PS360WB-U/PS360WB-L
Length:	72" (183cm)	66" (167cm)
Width:	48" (122cm)	57" (144cm)
Height:	60" (152cm)	50" (127cm)
Weight:	1675 lbs. (760kg)	1750 lbs. (780kg)

If you ordered stands for your ovens, they are shipped in separate crates.

When your common carrier or truck line notifies you of delivery, you must have a forklift at the facility to unload the crate(s).

If you have a door that is wider than the ovens, simply move the ovens into your facility and set up an appointment with your Middleby Marshall Authorized Installer.

NOTE: *The width of each oven can be reduced by about 1" (25mm) by removing the window from the oven. Window disassembly instructions are in the **Cleaning** section of this Owners Manual.*

If the ovens are wider than your door opening, the oven will have to be dismantled according to the directions in the Pre-Installation Procedures Manual.

NOTE

There must be adequate clearance between the oven and combustible construction. Clearance must also be provided for servicing and for operation.

WARNING

Do not obstruct the flow of combustion and ventilation air to and from your oven. There must be no obstructions around or underneath the oven.

WARNING

This oven must be installed in accordance with the rules in force. Use only in a well ventilated area. Read the instructions before use.

II. INSTALLATION, PREPARATION, AND SUPPLY

When preparing the oven for installation at a location, the latest International, National or Local Requirements should be adhered to.

The ovens must be installed on an even (level) non-flammable flooring and any adjacent walls must be non-flammable. The minimum allowed distance from the rear of the oven to the wall is 12" (30cm).

The ovens can be supported only by legs. No casters are allowed. It should be made certain that there are no obstructions located around or underneath the oven that interfere with air circulation.

The ovens must be installed under a ventilating hood with electrical exhaust air sensing control.

The gas supply connection should be according to applicable ISO-228-1 or ISO-7-1 recommendations.

Normally, the oven is prepared and adjusted to the specific gas type used by the customer. Before operating the oven, check the label on the oven and also on the packaging that the gas type indicated matches the local supply at the installation. If not, refer to Section VI, **PREPARATION FOR VARIOUS GASES**, in this chapter and convert as directed.

All installations, conversions and service work must be performed by an Authorized Service Agent according to the instructions supplied by the manufacturer.

When converting from one gas type to a different type, the orifices supplied with the conversion kit must be checked for proper size as specified in this manual to assure that the oven is operating at the nominal rated input.

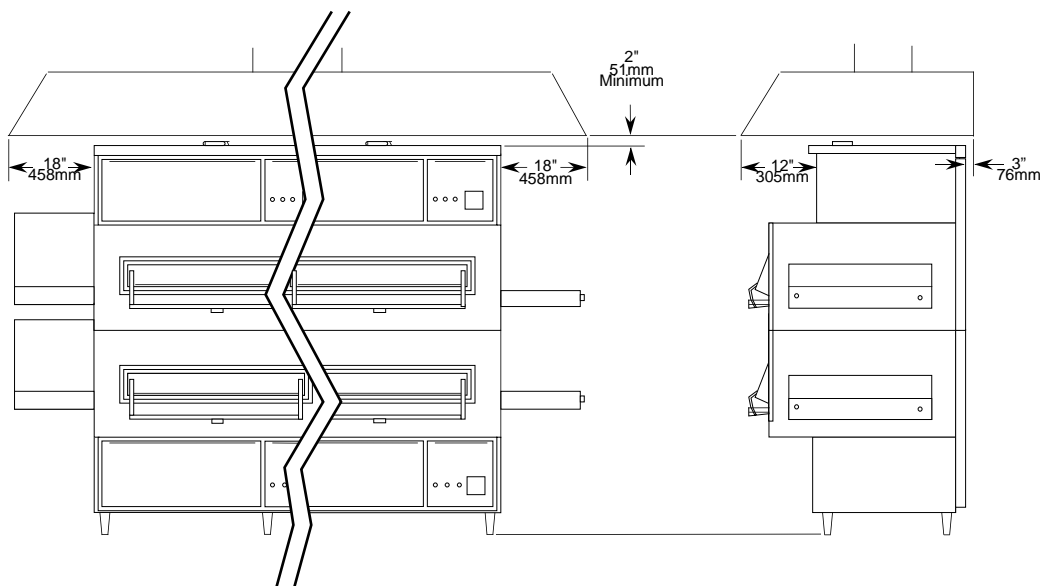


Figure 2-1 - Ventilation Hood Dimensions (RECOMMENDATIONS ONLY)

III. VENTILATION SYSTEM

IMPORTANT

Where international, national, or local codes require the installation of fire suppression equipment or other supplementary equipment, DO NOT mount the equipment directly to the oven.

MOUNTING SUCH EQUIPMENT ON THE OVEN MAY:

- ***VOID AGENCY CERTIFICATIONS***
- ***RESTRICT SERVICE ACCESS***
- ***LEAD TO INCREASED SERVICE EXPENSES FOR THE OWNER***

REQUIREMENTS

A mechanically driven ventilation system is required for the oven.

PROPER VENTILATION OF THE OVEN IS THE RESPONSIBILITY OF THE OWNER.

RECOMMENDATIONS

NOTE THAT THE HOOD DIMENSIONS SHOWN IN FIGURE 2-1 (PREVIOUS PAGE) ARE RECOMMENDATIONS ONLY. INTERNATIONAL, NATIONAL, AND LOCAL CODES WILL VARY, AND MUST BE FOLLOWED WHEN INSTALLING THE VENTILATION SYSTEM. ANY APPLICABLE INTERNATIONAL, NATIONAL, AND LOCAL CODES SUPERSEDE THE RECOMMENDATIONS SHOWN IN THIS MANUAL.

The rate of air flow exhausted through the ventilation system may vary depending on the oven configuration and hood design. Consult the hood manufacturer or ventilation engineer for these specifications.

To avoid a negative pressure condition in the kitchen area, return air must be brought back to replenish the air that was exhausted. A negative pressure in the kitchen can cause heat-related problems to the oven components as if there were no ventilation at all. The best method of supplying return air is through the heating, ventilation and air conditioning (HVAC) system. Through the HVAC system, the air can be temperature-controlled for summer and winter. Return air can also be brought in directly from outside the building, but detrimental affects can result from extreme seasonal hot and cold temperatures from the outdoors.

NOTE: Return air from the mechanically driven system must not blow at opening of bake chamber. Poor oven baking performance will result.

OTHER VENTILATION CONCERNS

- Special locations, conditions, or problems may require the services of a ventilation engineer or specialist.
- Inadequate ventilation can inhibit oven performance.
- It is recommended that the ventilation system and duct work be checked at prevailing intervals as specified by the hood manufacturer and/or HVAC engineer or specialist.

**SECTION 2
INSTALLATION**

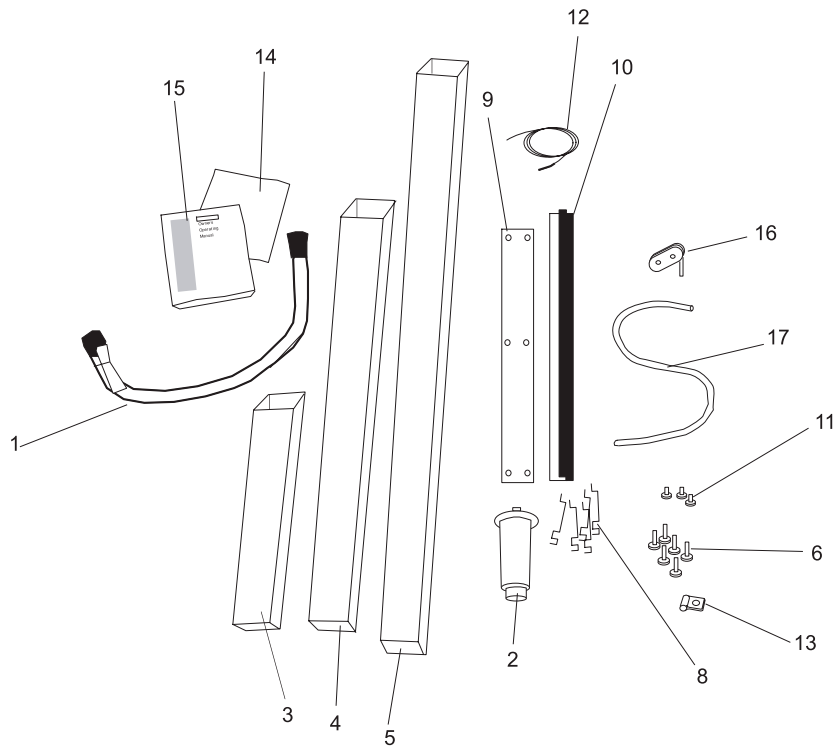


Figure 2-2 - INSTALLATION KIT

PS360L/WB-L Tandem

PS360/WB Double Tandem

PS360U/WB-U Tri Tandem

Item	Part #	Description	<i>PS360L/WB-L Tandem</i>	<i>PS360/WB Double Tandem</i>	<i>PS360U/WB-U Tri Tandem</i>	<i>PS360U/WB-U Quad Tandem</i>
1	22361-0001	Flexible Gas Hose	2	4	3	4
2	22450-0028	Adjustable Legs	8	8	12	16
3	30773	Flue Vent, 14"Lg.	2	-	-	-
4	30759	Flue Vent, 29-1/2"Lg.	-	2	3	4
5	30758	Flue Vent, 50" Lg.	-	2	-	-
6	21256-0008	Screw, 10-32 x 3/8	A/R	A/R	A/R	A/R
8	42400-0089	Master Link Kit, PS360	2	4	3	4
8	42400-0598	Master Link Kit, PS360WB	-	-	-	-
9	35122-0049	Attachment Strip	-	4	-	-
10	35000-1103	Stop, End Conv., PS360	1	2	-	-
10	35000-1899	Stop, End Conv., PS360WB	-	-	-	-
11	21292-0001	Scr, #2PT 10-16 x 3/4 Hx Wsh	A/R	A/R	A/R	A/R
12	33984	Thermocouple	2	4	3	4
13	27276-0001	Cable Clamp	2	4	3	4
14	1002040	Warranty,Parts & Serv. Dist.List	1	1	1	1
15	38615	Owners Manual,English	1	1	1	1
16	27126-0238	11 Piece Hex Key Set	1	1	1	1
17	31389	Silicone Tubing, 36" (914mm) L x 5/16" (8mm) ID x 7/16" (11mm) OD	2	4	3	4
-	35000-1454	Machinery Compartment Trim Strip	1	2	2	2
-	35000-1456	Front Gasket Spacer	2	4	4	4
-	35000-1457	Rear Gasket Spacer	2	4	4	4
-	37200-0013	Baking Chamber Gasket and Frame	1	2	2	2
-	37000-0696	Transition Floor Panel	-	-	-	1
-	48009-0024	Transition Top Panel	-	-	-	1
-	48009-0025	Transition Side Wall	-	-	-	2
-	35000-1748	Transition Rear Support	-	-	-	1
-	35000-1749	Transition Front Support	-	-	-	2
-	37000-0697	Transition Top Support Channel	-	-	-	2

Figure 2-3
Dimensions and Data: PS360L Tandem

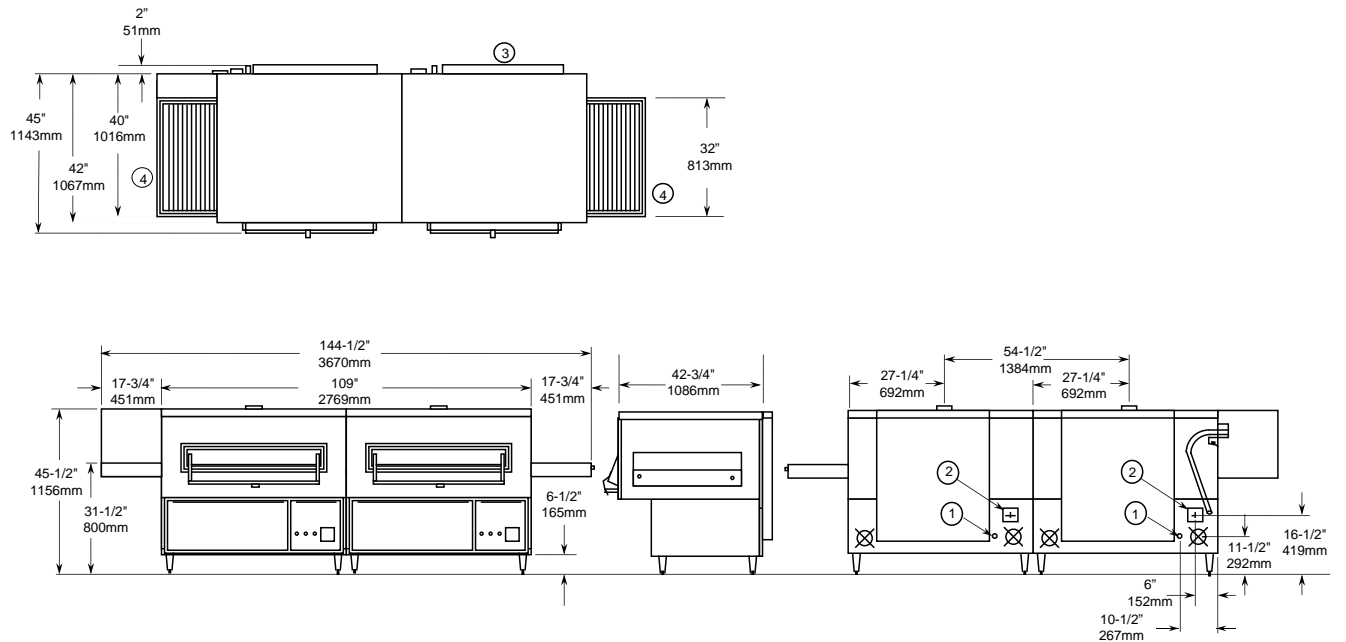
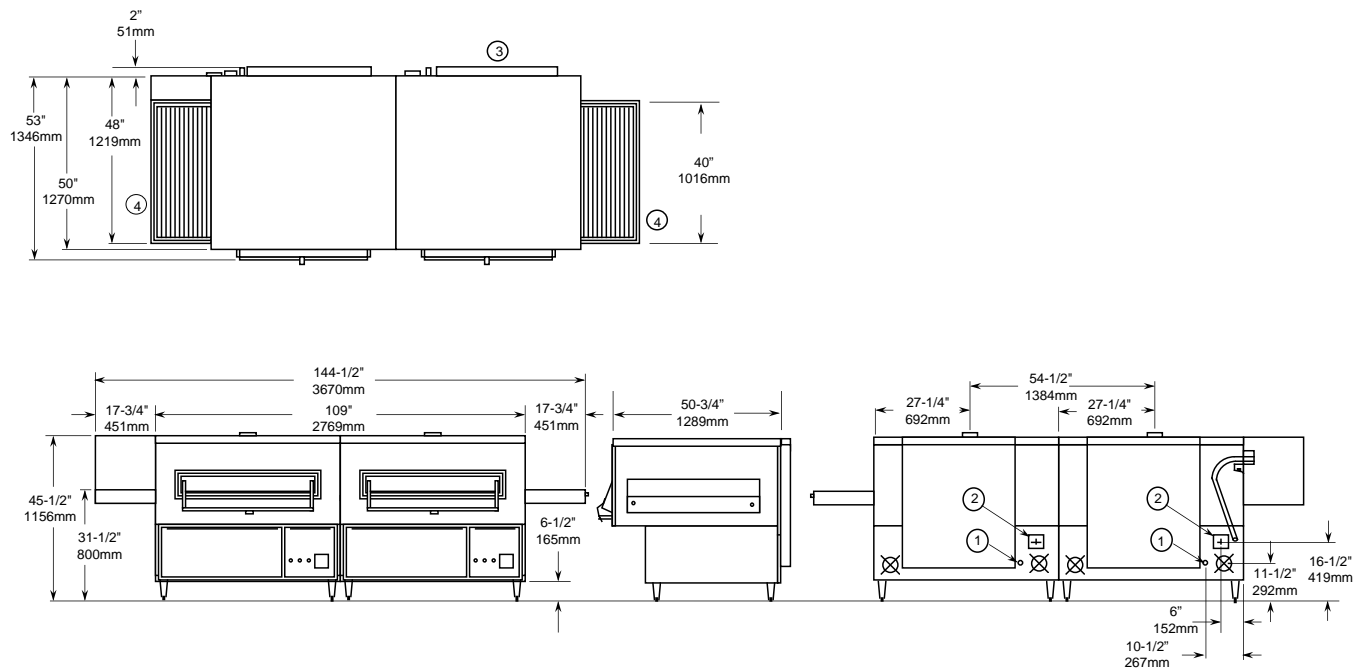


Figure 2-4
Dimensions and Data: PS360WB-L Tandem



SECTION 2
INSTALLATION

Figure 2-5
Dimensions and Data: PS360 Double Tandem

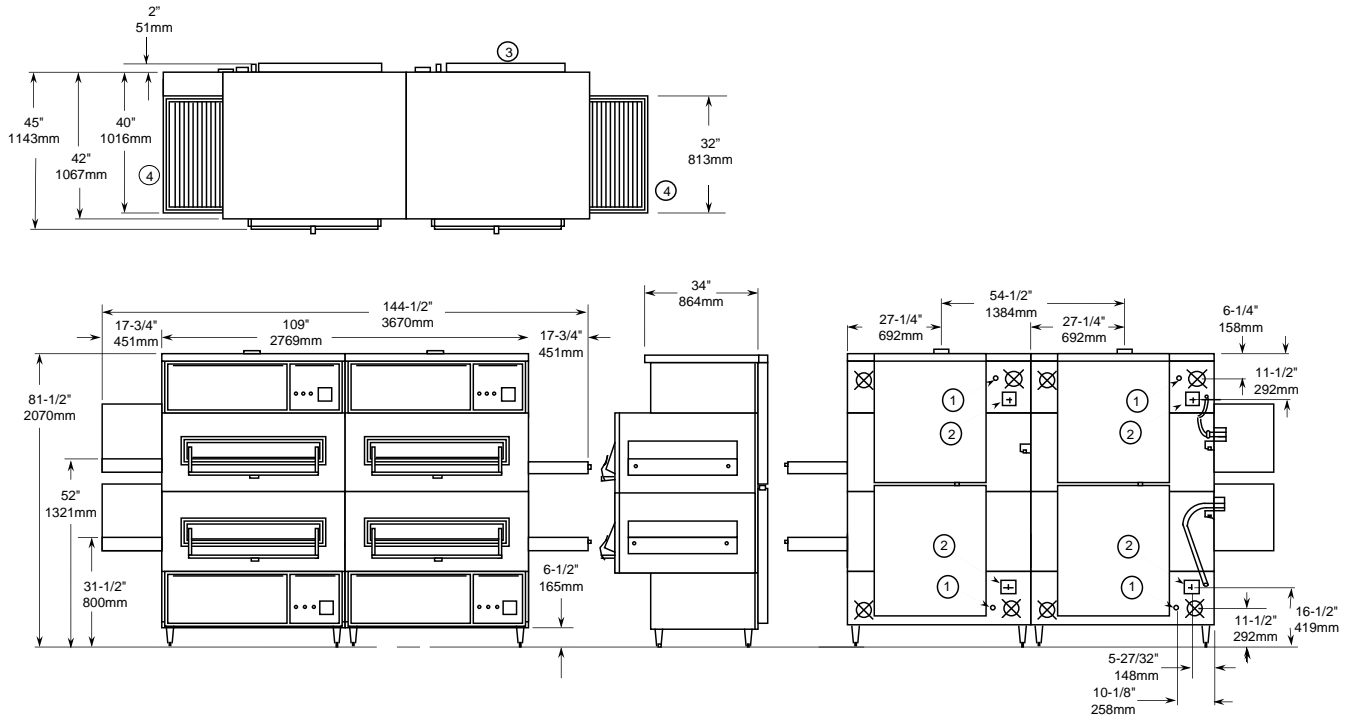


Figure 2-6
Dimensions and Data: PS360WB Double Tandem

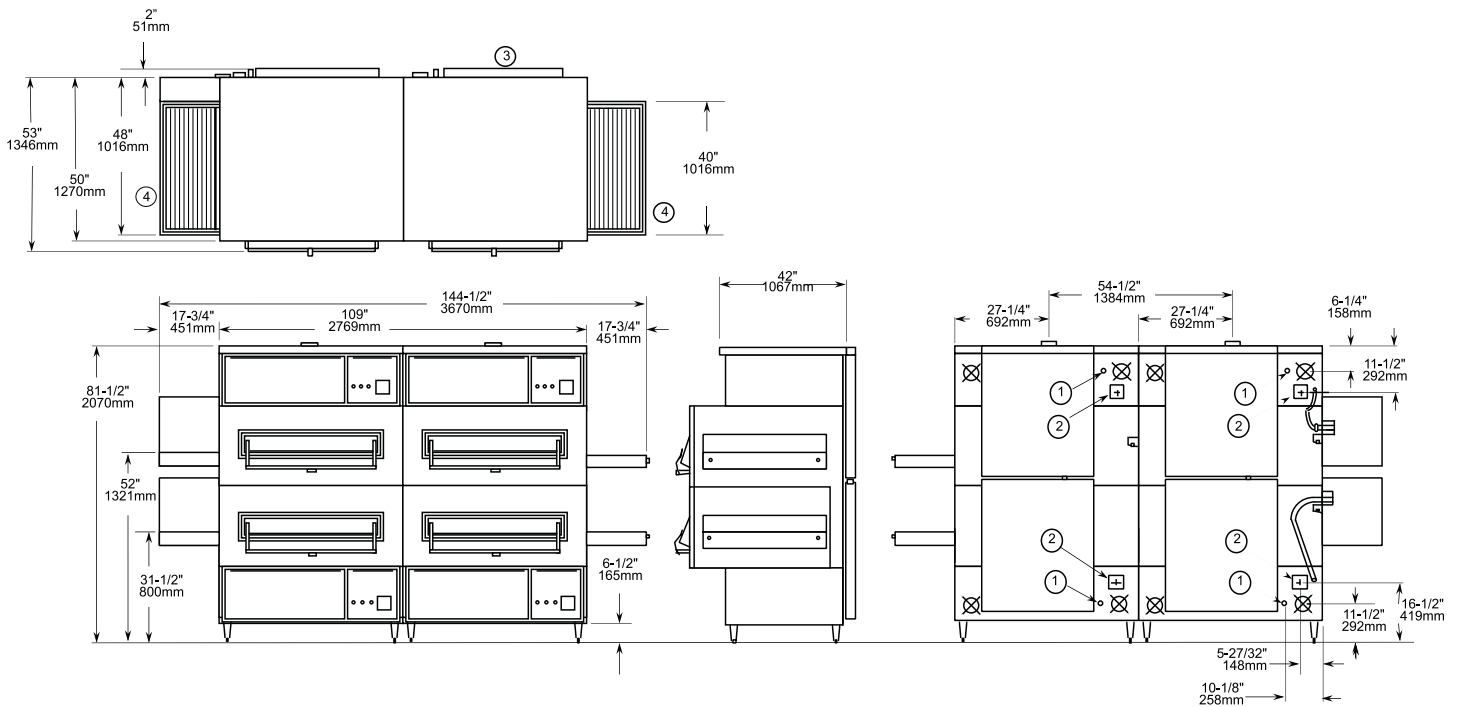
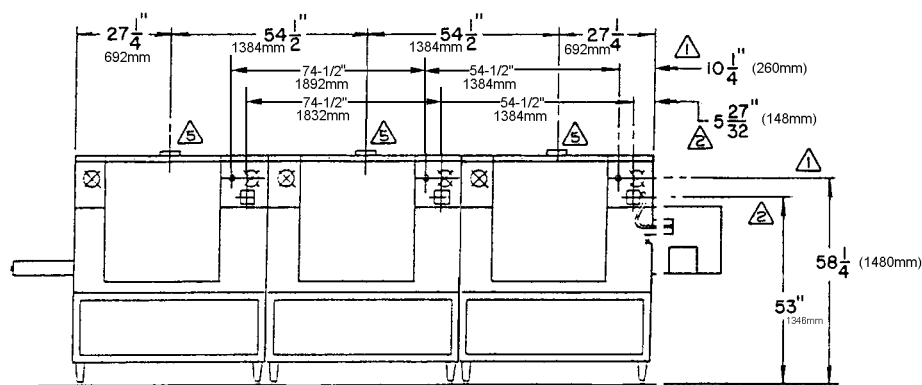
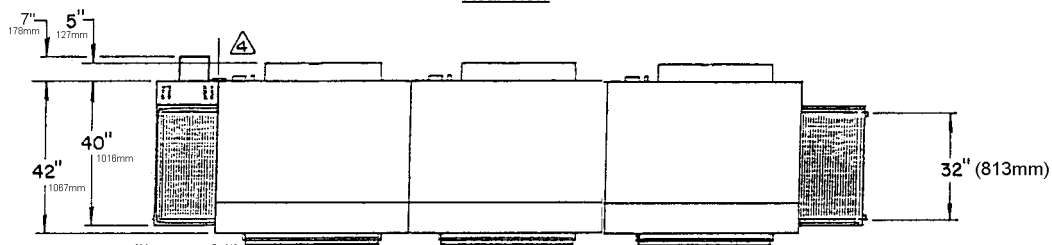


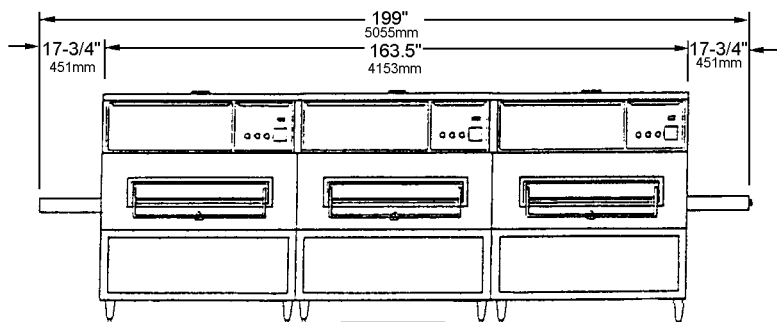
Figure 2-7
Dimensions and Data: PS360U Tri Tandem



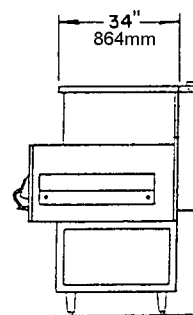
Rear View



Top View



Front View



Side View

DIRECT GAS FIRED:

Gas rating - 135,000 BTU/HR (40KW) each oven.
 Total 405,000 BTU/HR (120KW)

Required gas pressure - Natural: 20 - 30 mbar
 L.P.G.: 50 mbar

Recommended supply pipe size -

Natural: 2-1/2" (64MM) N.P.T.

LPG: 1-1/2" (38MM) N.P.T.

⚠ Connections - 3/4" (19mm) N.P.T. inlet connection (4 total)

3/4" (19mm) full-flow gas shut-off valves (4 total)

⚠ Electrical Rating - 1PH 208-240V 2 Pole 3 Wires with ground 8 amps 50HZ. Separate electrical service required for each oven.

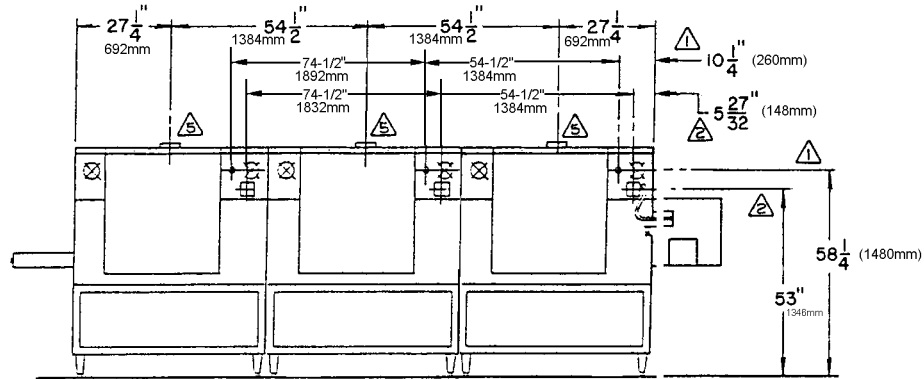
⚠ RECOMMENDED MINIMUM CLEARANCES: rear of oven to wall - 11-13/16" (300mm)

⚠ Oven Vent - Gas Oven Only

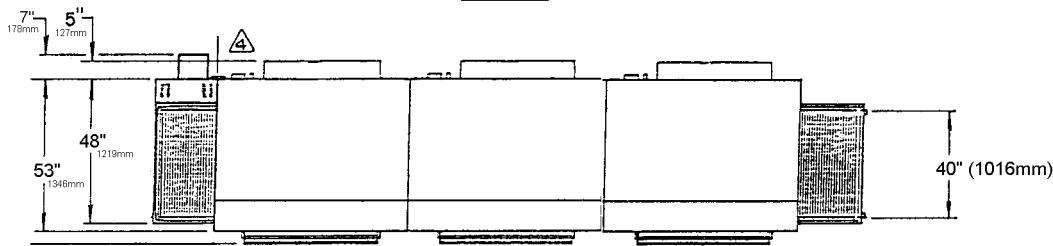
CONVEYOR SPEED expressed in bake time

25 min. 0 sec. - maximum
 2 min. 0 sec. - minimum

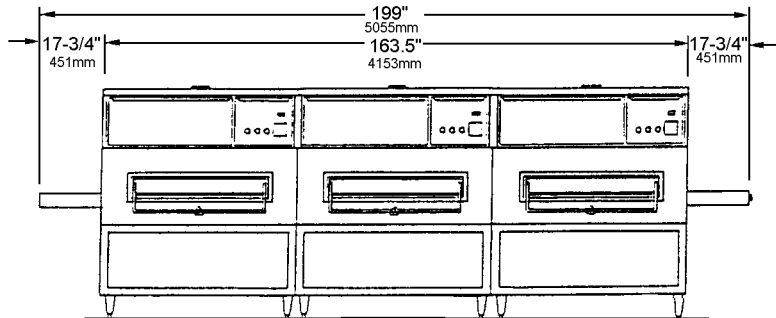
Figure 2-8
Dimensions and Data: PS360WB-U Tri Tandem



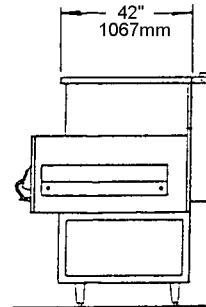
Rear View



Top View



Front View



Side View

DIRECT GAS FIRED:

Gas rating - 170,000 BTU/HR (50kW) each oven.
Total 510,000 BTU/HR (150kW)

Required gas pressure - Natural: 20 - 30 mbar
L.P.G.: 50 mbar

Recommended supply pipe size -

Natural: 2-1/2" (64MM) N.P.T.

LPG: 1-1/2" (38MM) N.P.T.

⚠ Connections - 3/4" (19mm) N.P.T. inlet connection (4 total)

3/4" (19mm) full-flow gas shut-off valves (4 total)

⚡ Electrical Rating - 1PH 208-240V 2 Pole 3 Wires with ground 8 amps 50HZ.
Separate electrical service required for each oven.

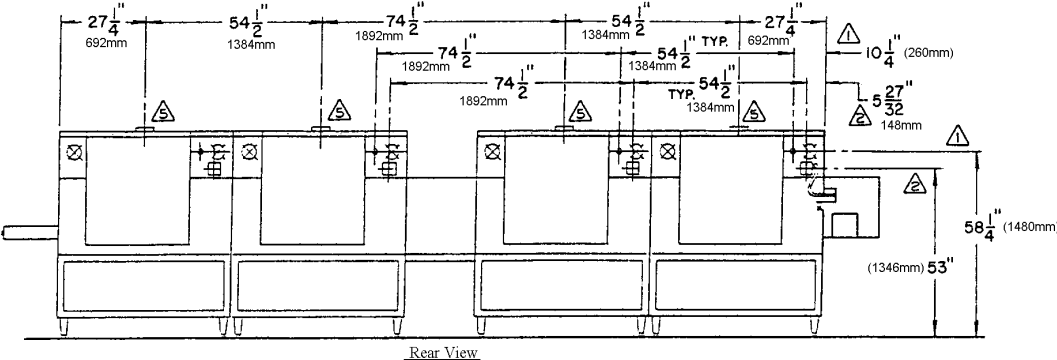
⚠ RECOMMENDED MINIMUM CLEARANCES: rear of oven to wall - 11-13/16" (300mm)

⚠ Oven Vent - Gas Oven Only

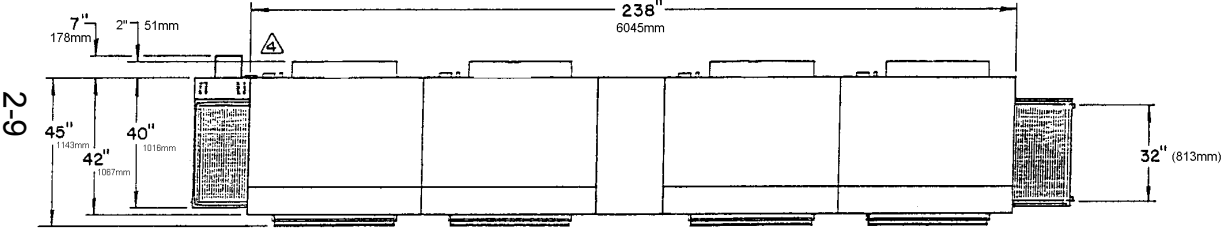
CONVEYOR SPEED expressed in bake time

25 min. 0 sec. - maximum
2 min. 0 sec. - minimum

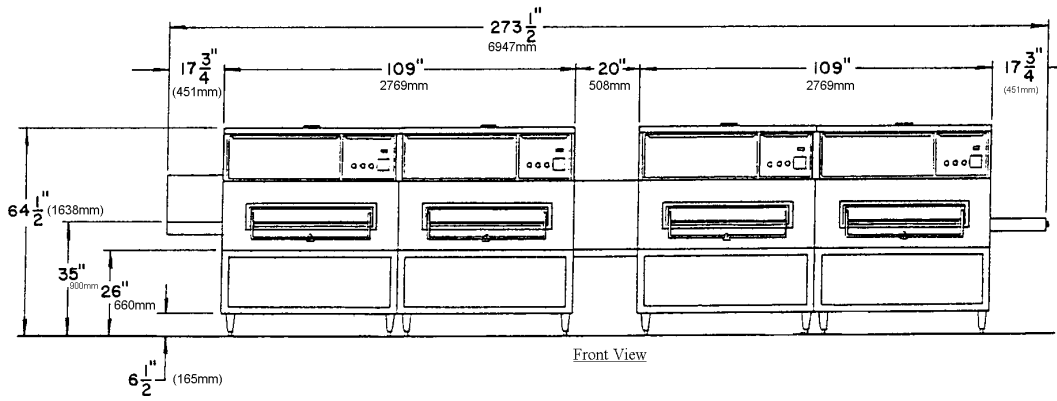
**Figure 2-9
Dimensions and Data: PS360U Quad Tandem**



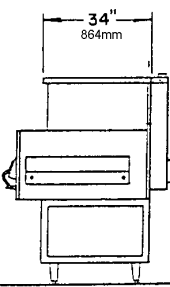
Rear View



Top View



Front View



Side View

DIRECT GAS FIRED:
Gas rating - 135,000 BTU/HR (40kW) each oven.
 Total 540,000 BTU/HR (160 kW)
Required gas pressure - **Natural:** 20 - 30 mbar
LPG: 50 mbar

Recommended supply pipe size -
Natural: 2-1/2" (64MM) N.P.T.
LPG: 1-1/2" (38MM) N.P.T.

⚠ Connections - 3/4" (19mm) N.P.T. inlet connection (4 total)
 3/4" (19mm) full-flow gas shut-off valves (4 total)

⚡ Electrical Rating - 1PH 208-240V 2 Pole 3 Wires with ground 8 amps 50HZ.
 Separate electrical service required for each oven.

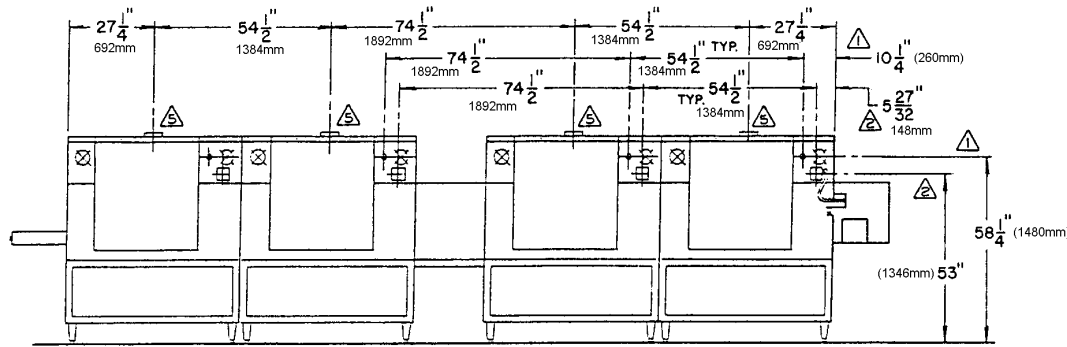
⚠ RECOMMENDED MINIMUM CLEARANCES: rear of oven to wall - 11-13/16" (300mm)

⚠ Oven Vent - Gas Oven Only

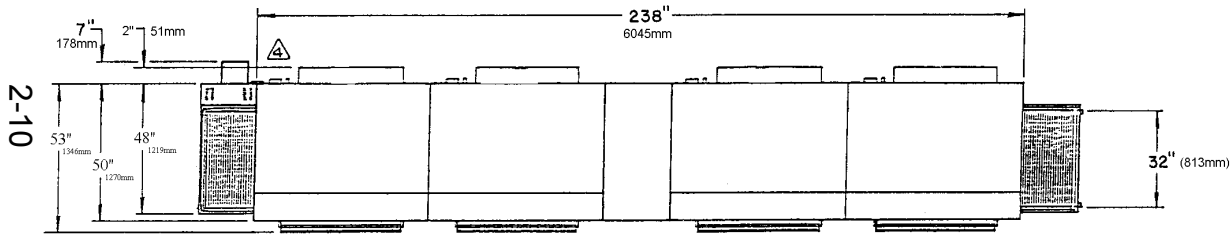
CONVEYOR SPEED expressed in bake time

25 min.	0 sec.	- maximum
2 min.	0 sec.	- minimum

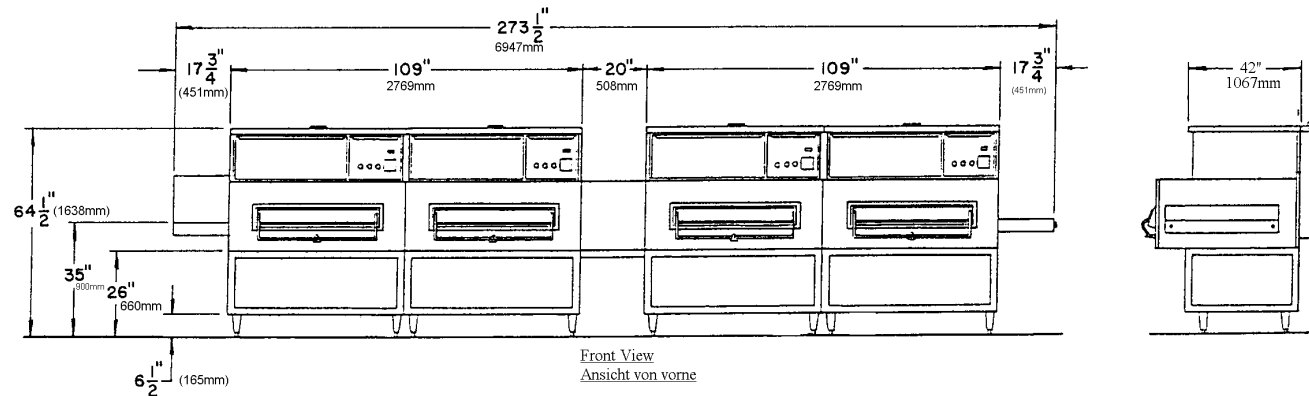
Figure 2-10
Dimensions and Data: PS360WB-U Quad Tandem



Rear View
Ansicht Von



Top View
Ansicht von oben



Front View
Ansicht von vorne

DIRECT GAS FIRED:

Gas rating - 170,000 BTU/HR (50kW) each oven.
Total 680,000 BTU/HR (200kW)
Required gas pressure - Natural: 20 - 30 mbar
LPG: 50 mbar

Recommended supply pipe size -

Natural: 2-1/2" (64MM) N.P.T.
LPG: 1-1/2" (38MM) N.P.T.
Connections - 3/4" (19mm) N.P.T. inlet connection (4 total)
3/4" (19mm) full-flow gas shut-off valves (4 total)
Electrical Rating - 1PH 208-240V 2 Pole 3 Wires with ground 8 amps 50HZ. Separate electrical service required for each oven.

RECOMMENDED MINIMUM CLEARANCES: rear of oven to wall - 11-13/16" (300mm)

Oven Vent - Gas Oven Only

CONVEYOR SPEED expressed in bake time

25 min. 0 sec. - maximum
2 min. 0 sec. - minimum

2-10

SECTION 2
INSTALLATION
IV. THERMOCOUPLE
INSTALLATION

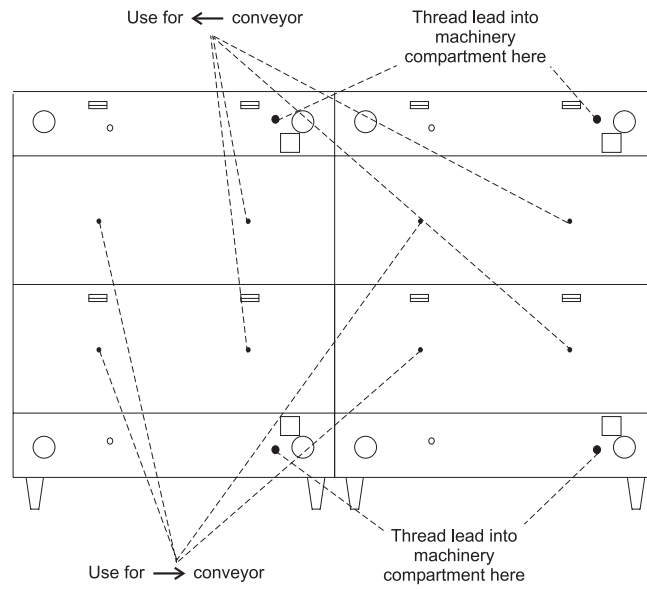


Figure 2-11
Thermocouple Installation Locations

1. Install the thermocouple sensing bulb into the correct hole in rear of bake chamber as shown in Figure 2-11.
2. Thread thermocouple lead through grommet and into the machinery compartment.

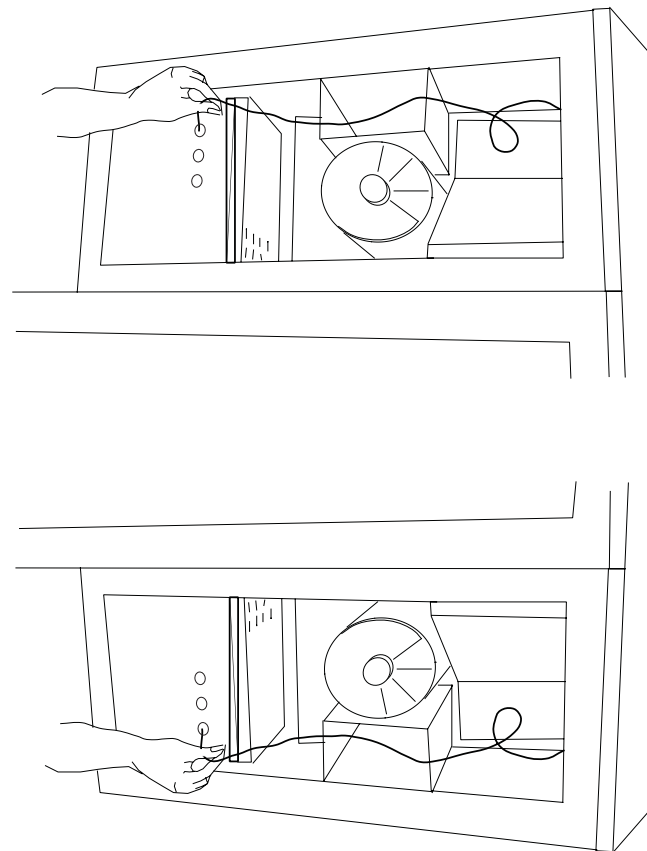


Figure 2-12
Placing the Thermocouple Leads

3. Remove the right-side access panel of the machinery compartment.

Thread the thermocouple lead through the side of the machinery compartment as shown in Figure 2-12, and into the electrical box (at the right-front of the machinery compartment).

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4. Connect the thermocouple leads to the temperature controller as shown in Figure 2-13.

5. Repeat Steps 1-4 for each of the other ovens in the installation.

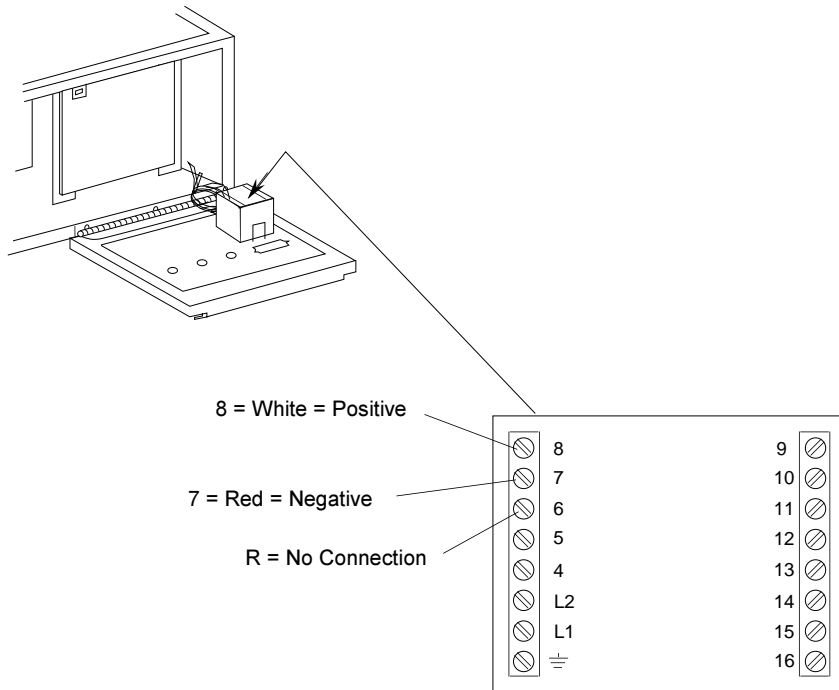


Figure 2-13
Thermocouple Lead Connections

V. ASSEMBLY

If the installation includes upper ovens mounted atop lower ovens, the ovens must be stacked before joining the tandem ovens together.

If the installation includes ovens that are to be mounted on stands, assemble the ovens to the stands before joining the ovens together. An exploded view of the stand is shown in Figure 2-14.

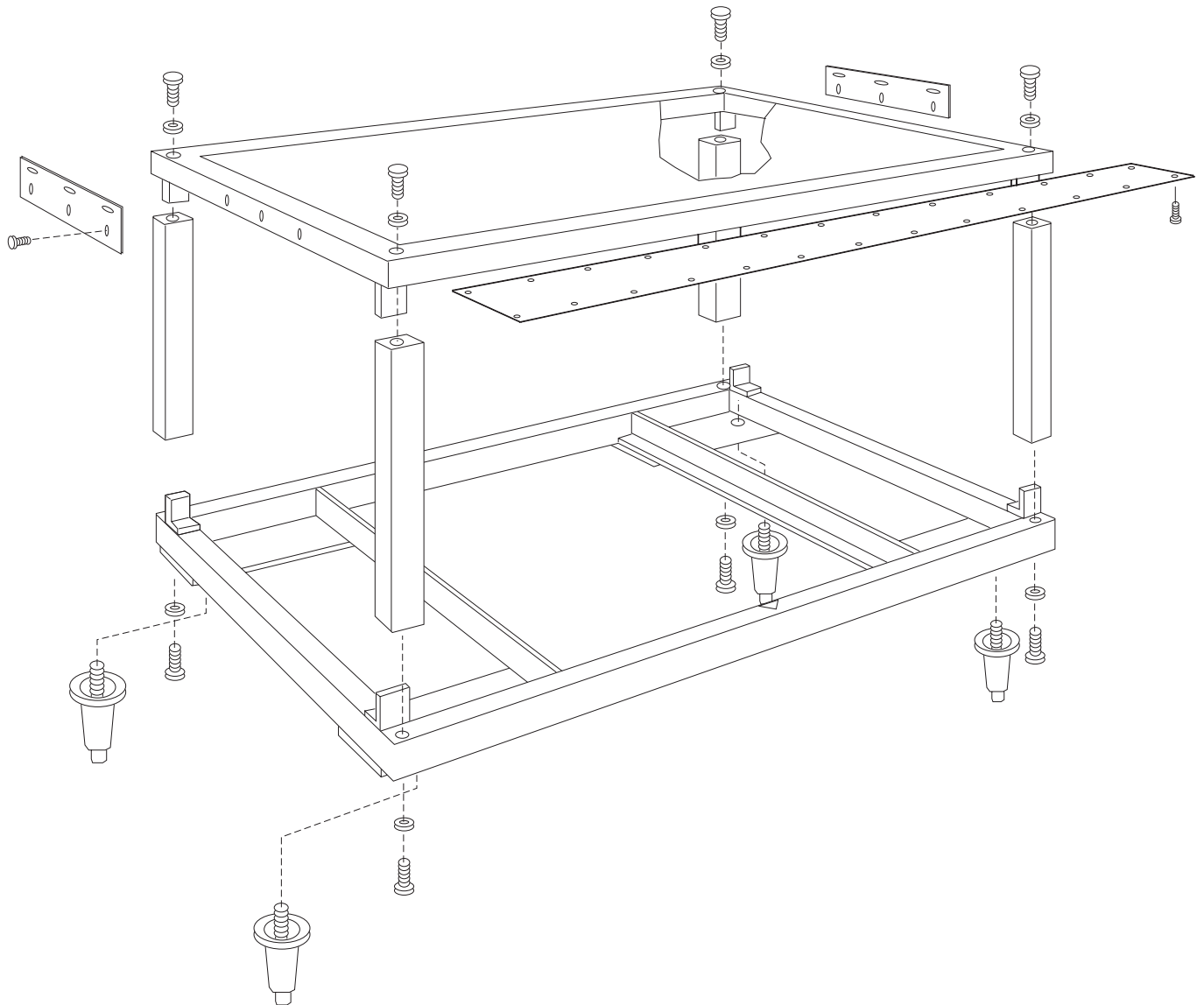


Figure 2-14
Exploded View - Upper Oven Stand

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JOINING THE OVEN BODIES

For TANDEM and DOUBLE TANDEM installations, perform Steps 1-7 to join the ovens.

For TRI TANDEM installations, perform Steps 1-7 to join two of the ovens together, and ensure that they are level; then, repeat Steps 1-7 to join the third oven to the two that are assembled.

For QUAD TANDEM installations, perform Steps 1-7 for EACH PAIR of ovens, producing two sets of two joined ovens. Do not assemble the center bridge section at this time.

1. Determine the proper position of the ovens by referring to Figure 2-15. Then, move the ovens to their approximate final locations.

NOTE: The Sealing Gasket Assembly is shown attached to the left oven in Figure 2-15, but may be pre-mounted to EITHER of the two ovens.

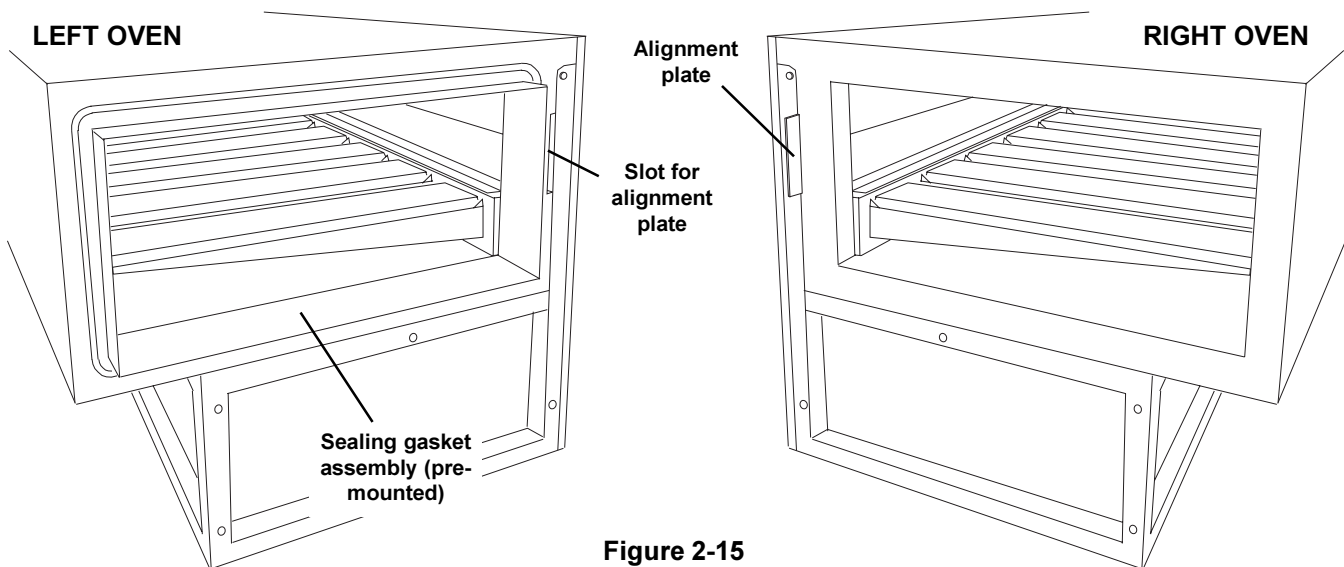


Figure 2-15
Oven Positioning and Alignment

2. Remove the rear axial cooling fans that are adjacent to the mating sides of the ovens, as shown in the diagram. Leave the fan wiring connected to the oven.

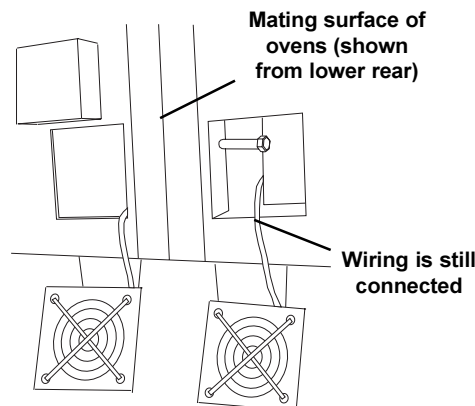


Figure 2-16
Cooling Fan Removal

3. Insert three of the supplied 1/2 x 5" bolts through the holes in the frame of the right oven, pointing outward as shown in Figure 2-17. Then, slide the spacers into place on the bolts.

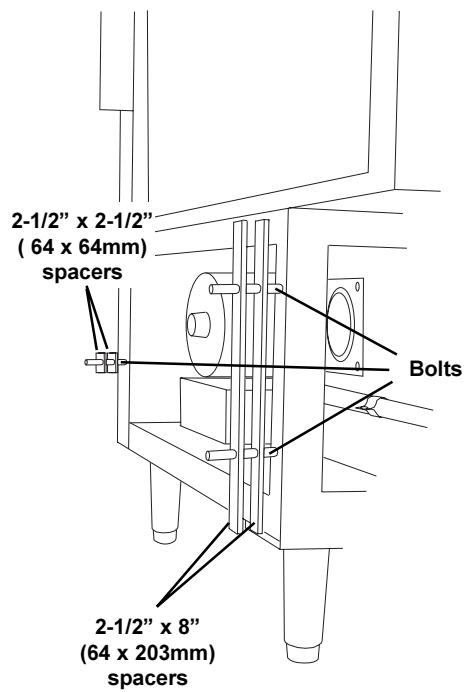


Figure 2-17
Bolts and Spacers

4. Push the ovens together. Check that the mounting bolts, alignment plate, and sealing gasket are properly aligned.

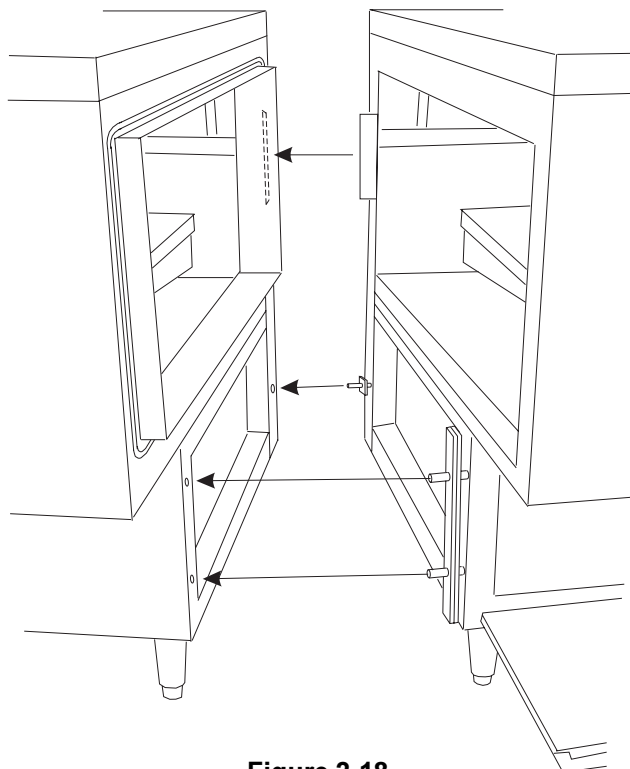


Figure 2-18
Aligning the Ovens for Assembly

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5. Check the alignment of the track rails using a straightedge. The rails **MUST BE LEVEL** across the gap between the ovens. If necessary, adjust the oven legs to align the track rails.

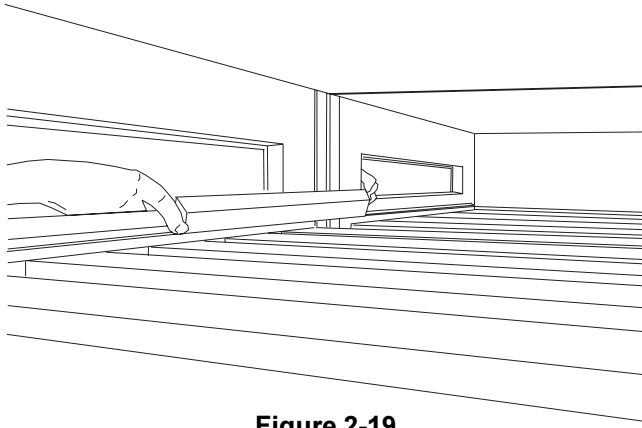


Figure 2-19
Checking Track Rail Alignment

6. Tighten all of the attaching bolts. Check that the mating edges of the ovens align properly. If gaps appear between the tops of the ovens, it will be necessary to loosen the connecting bolts and realign the ovens.

IMPORTANT: If it is necessary to realign the ovens, remember to re-check the alignment of the track rails.

7. Attach the front trim strip between the two ovens, as shown in Figure 2-20.

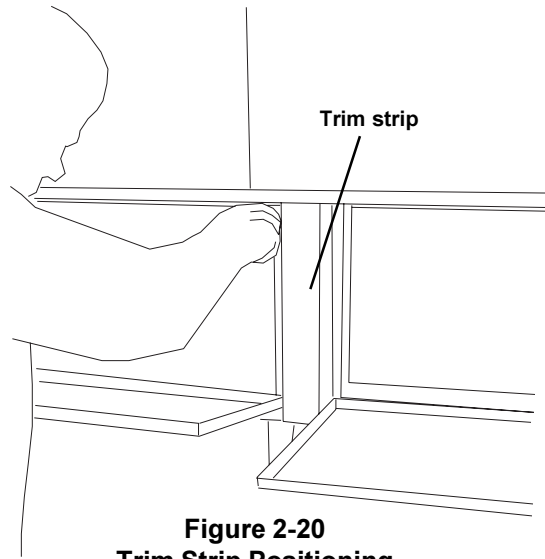
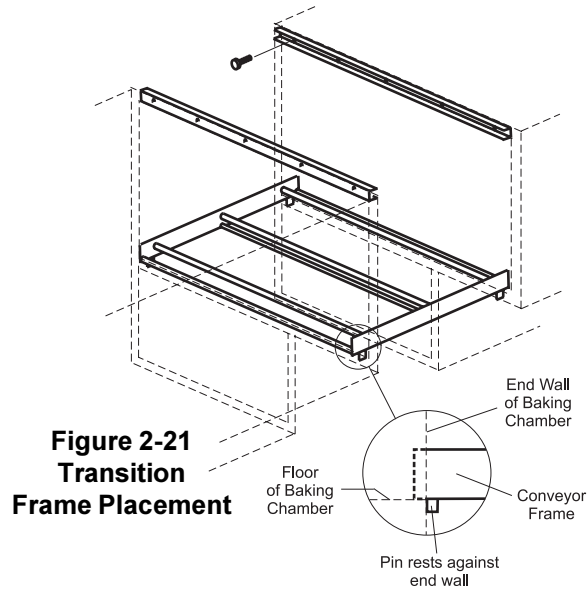


Figure 2-20
Trim Strip Positioning

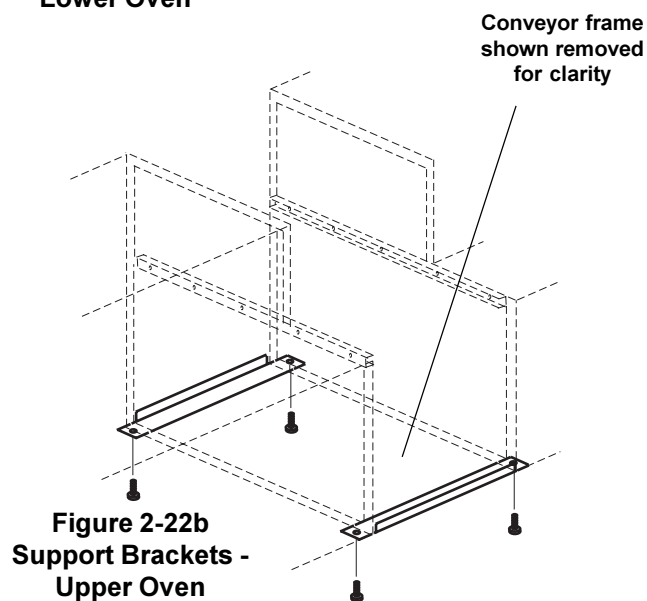
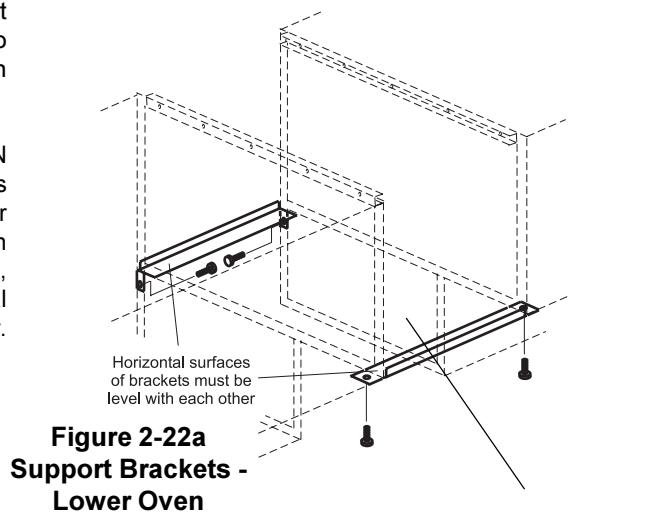
8. Perform one of the following, as appropriate:
 - For PS360/360WB Tandem and Double Tandem installations, skip ahead to the **INSTALLING THE CONVEYOR FRAME AND BELT** section (Page 2-19).
 - For PS360/360WB Tri Tandem installations, perform Steps 1-7 again to attach the third oven to the two that have just been assembled. Then, skip ahead to the **INSTALLING THE CONVEYOR FRAME AND BELT** section (Page 2-19).
 - For PS360/360WB Quad Tandem installations, perform Steps 1-7 again to attach the two remaining ovens to each other. Then, continue on to Step 9 to attach the center (transition) section.

9. Test-fit the transition section of the conveyor frame, as shown in Figure 2-21. The alignment pins on the bottom of the frame ensure correct spacing of the center ovens.



10. Attach the two angled support brackets between the two center ovens, as shown in Figures 2-22a and 2-22b.

Note that a LOWER OVEN (PS360L, PS360WB-L) uses different support brackets for the front and rear, while an UPPER OVEN (PS360U, PS360WB-U) uses identical brackets on the front and rear.



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10. Remove the transition section of the conveyor frame. Place the transition floor panel into place atop the support brackets. See Figure 2-23.

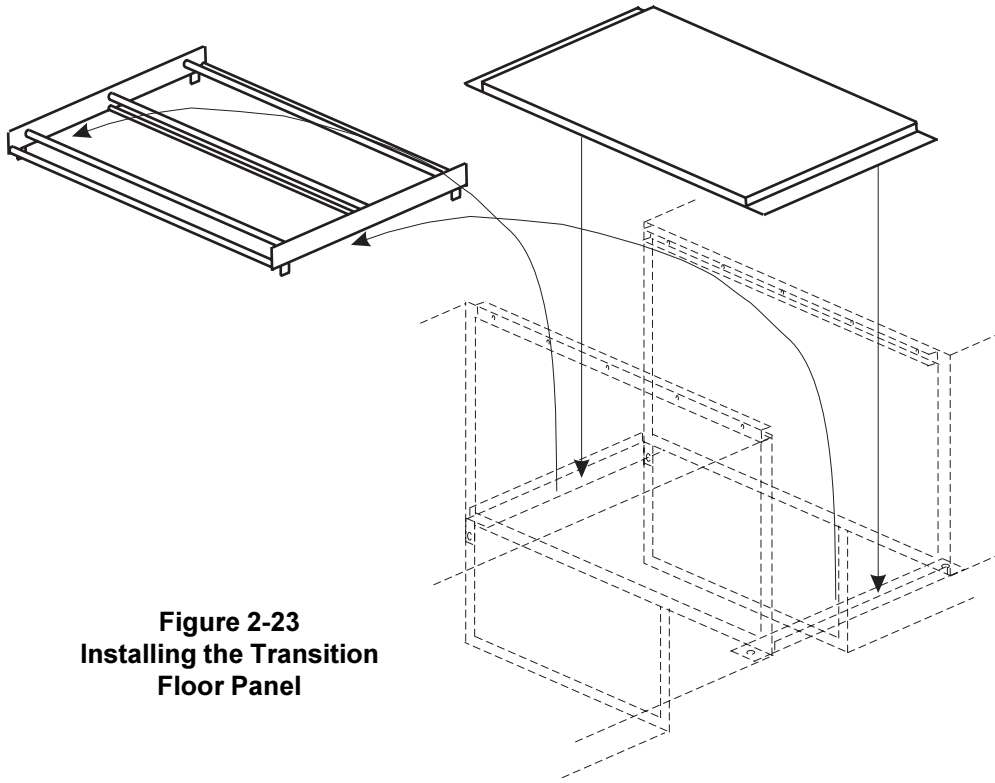


Figure 2-23
Installing the Transition
Floor Panel

11. Replace the transition (center) conveyor section, as shown in Figure 2-24.

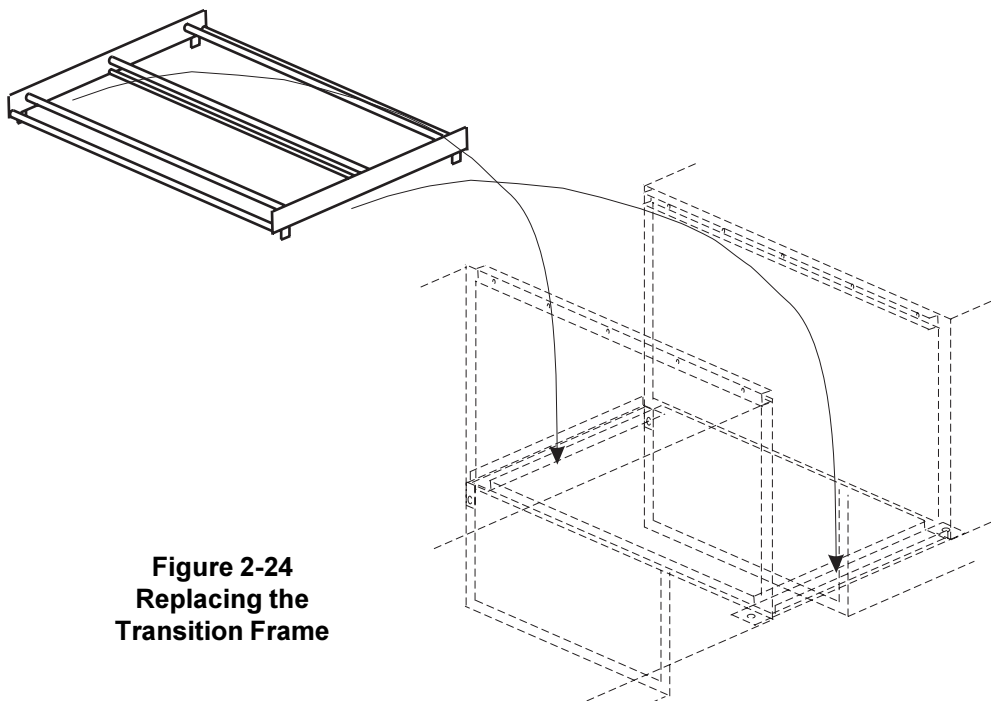


Figure 2-24
Replacing the
Transition Frame

INSTALLING THE CONVEYOR FRAME AND BELT

FOR ALL TYPES OF OVENS, ENSURE THAT THE DRIVE SECTION/END OF THE CONVEYOR FRAME IS PLACED ON THE SAME END OF THE OVEN AS THE CONVEYOR DRIVE MOTOR.

1. Insert the conveyor frame into the oven as follows:

For a TANDEM or DOUBLE TANDEM oven, slide the conveyor frame assembly into either end of the oven.

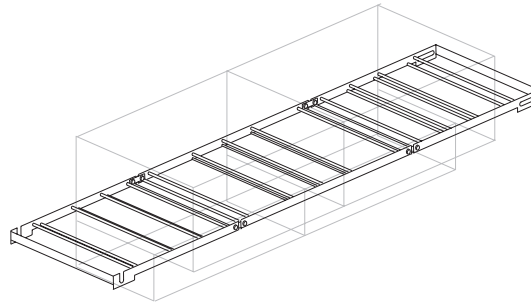


Figure 2-25a
Installing the Conveyor Frame-
Tandem and Double Tandem Ovens

For TRI TANDEM ovens, slide one center section and one end section of the frame into EACH END of the oven. The four sections should butt against each other.

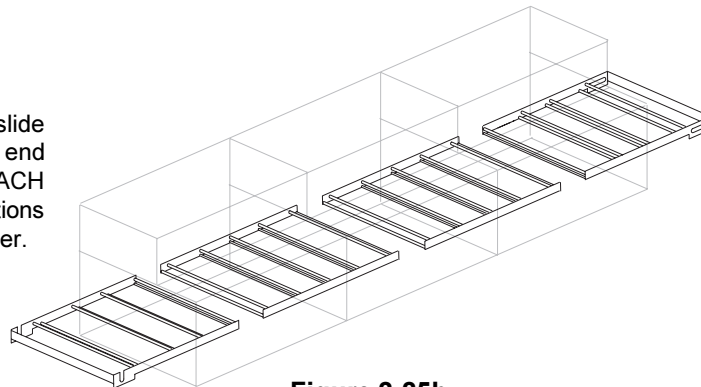


Figure 2-25b
Installing the Conveyor Frame-
Tri Tandem Ovens

For QUAD TANDEM ovens, slide two intermediate sections and one end section of the frame into EACH END of the oven. Butt the two inner intermediate sections against the transition (center) frame section. The other frame sections should butt against each other.

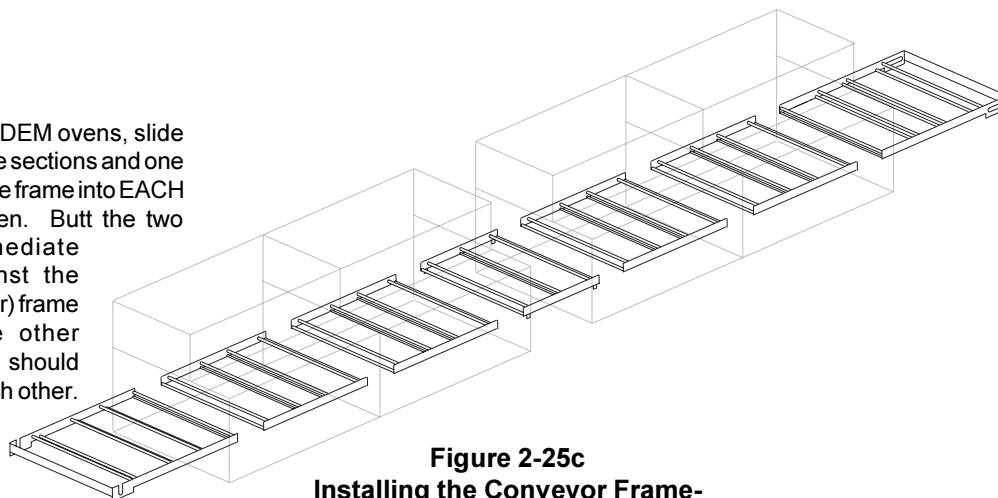
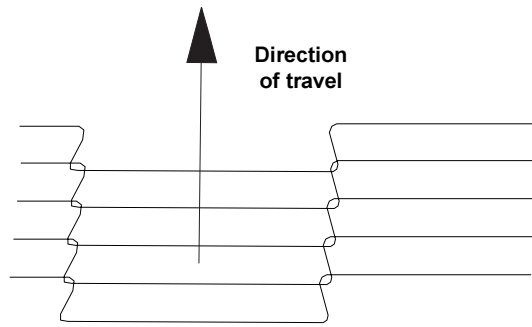


Figure 2-25c
Installing the Conveyor Frame-
Quad Tandem Ovens

SECTION 2 INSTALLATION

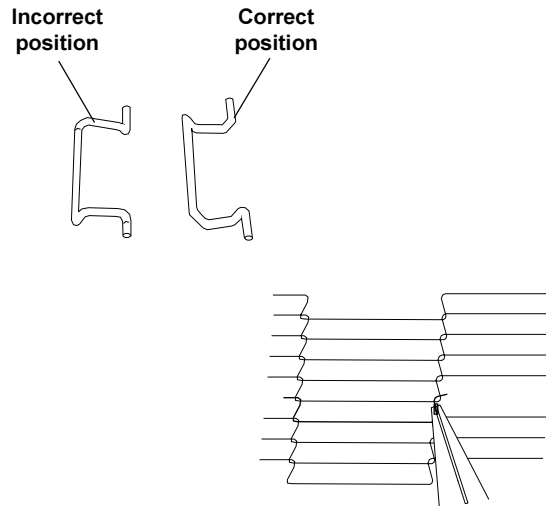
- Slide the conveyor belt through the support rods underneath the frame, and thread it through the oven. Then, reach through the oven window and pull the free end of the belt through the oven so that it lies atop the conveyor frame.

Check that the links on the conveyor are oriented as shown in Figure 2-26.



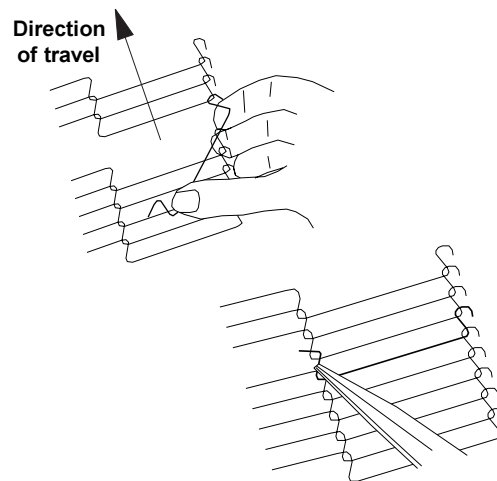
**Figure 2-26
Conveyor Link Orientation**

- Connect the inside master links. Check that the links are oriented as shown in Figure 2-27.



**Figure 2-27
Inside Master Links**

- Connect the outside master links. Note that the outside master links have right and left sides. The right-side master link has an open hook facing you, as shown in Figure 2-28.



**Figure 2-28
Outside Master Links**

- For a TANDEM, DOUBLE TANDEM, or TRI TANDEM oven installation, skip ahead to the next section. For a QUAD TANDEM oven installation, continue on to Step 6.

- Slide the top transition panel into place. Then, slide the two transition side panels into place. See Figure 2-29.
- If the four latches are not already attached to the side and top transition panels, attach them in place as shown in Figure 2-29.

Fasten the latches on the side and top panels to hold the panels in place.

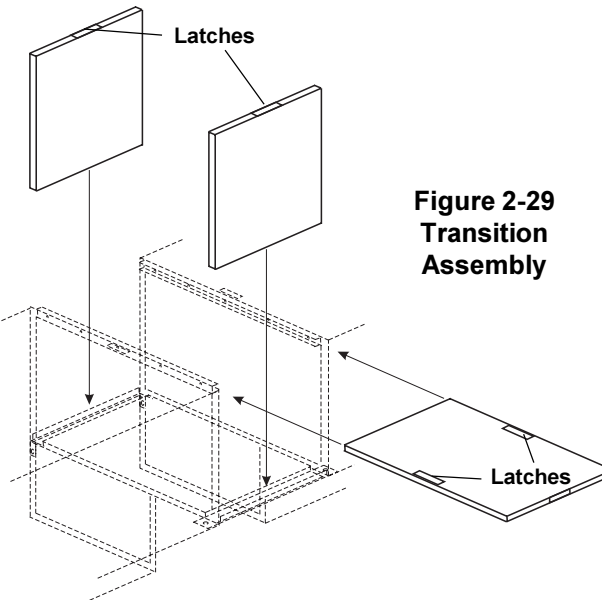


Figure 2-29
Transition
Assembly

- LOOSELY attach the conveyor drive motor to the end wall of the oven, as shown in Figure 2-30.
- Assemble the conveyor drive chain in place on the motor and conveyor drive sprockets.
- Position the motor to adjust the tension of the drive chain. The deflection of the chain should not exceed 1/4" (6mm). Then, tighten the motor in place.

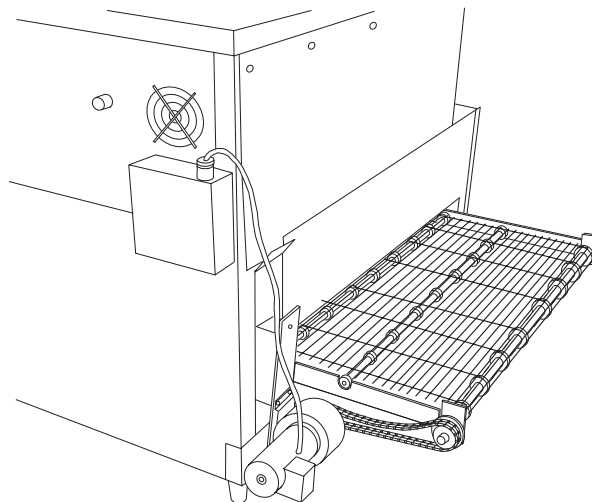


Figure 2-30
Conveyor Motor and Drive Chain Assembly

- Assemble the end plugs and motor housing onto the oven.

TANDEM AND DOUBLE TANDEM OVENS ONLY:
Assemble the conveyor crumb trays and conveyor extension covers onto the oven.

GAS OVEN ROUGH-IN

UTILITY ROUGH-IN DIMENSIONS AND POSITIONING

CAUTION

IT IS REQUIRED THAT THE OVEN BE PLACED UNDER A VENTILATION HOOD FOR ADEQUATE AIR SUPPLY AND VENTILATION.

**GAS SUPPLY
&
ELECTRICAL SUPPLY
PROVIDED BY CUSTOMER**

DO NOT USE CONDUIT FOR GROUND

CIRCUIT BREAKER

1 circuit breaker/fused disconnect switch **with lockout/tagout** is required for each oven cavity. Wire each oven cavity separately.

ELECTRICAL SPECIFICATIONS

220-230V, 1 Ph, 8 Amp draw, 50 Hz, 2 pole, 3 wire system per oven cavity (2 hot, 1 grd).

GAS RATING

Models PS360U/L: 135,000 BTU/HR, 34,020kcal/HR, 40kW/HR
Models PS360WB-U/L: 170,000 BTU/HR, 42,840kcal/HR, 50kW/HR

MINIMUM GAS METER RATING

600 Ft.³/Hour (17m³h) for 1 or 2 oven cavities.
1200 Ft.³/Hour (34m³h) for 3 or 4 oven cavities.
Minimum rating does not take other gas appliances into consideration. Gas consumption varies at each site. Total BTU/HR (kcal/hr) must be calculated on high flame off of each appliance to determine if meter needs to be larger.

MINIMUM GAS PIPE SIZE

Natural: 2" (51mm) ID for 1 or 2 oven cavities with runs up to 200 ft.(61m).

OR

2-1/2" (64mm) ID for 3 or 4 oven cavities with runs up to 200 ft.(61m)

Must be a dedicated line.

Runs over 200 ft. consult factory

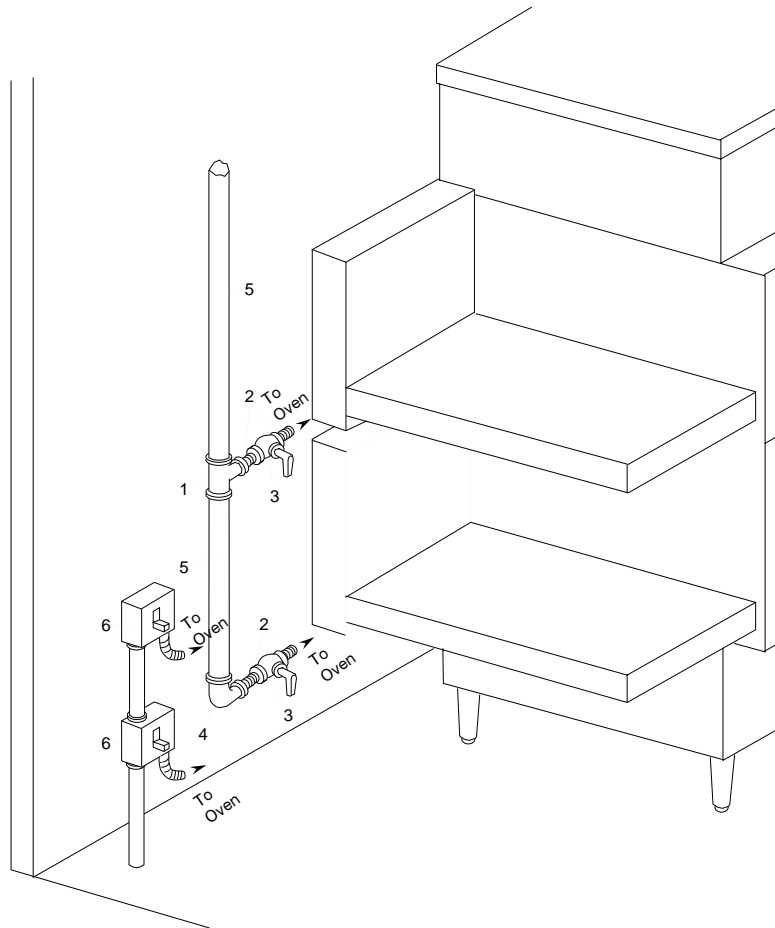
Propane: 1-1/2" (38mm) ID for 1 or 2 oven cavities with runs up to 200 ft.(61m).

OR

2" (51mm) ID for 3 or 4 oven cavities with runs up to 200 ft.(61m).

Must be a dedicated line.

Runs over 200 ft. consult factory



**Figure 2-31
Oven Rough-In**

GAS VALVES

3/4" (19mm) ID **full flow** gas shut-off valve.
A separate connection and valve must be provided for each oven.

REQUIRED SUPPLY GAS PRESSURE

Natural: 20-30mbar
Propane: 50mbar

SUGGESTED

If space permits, service should be located to the left of the ovens to allow access to switches and valves.

User Supplied Items:

ITEM	DESCRIPTION
1	2"(51mm) X 2"(51mm) X 3/4"(19mm) TEE
2	3/4"(19mm) X 3"(76mm) NIPPLE
3	3/4" (19mm) FULLFLOW GAS SHUT-OFF VALVE
4	2"(51mm) X 3/4"(19mm) 90° REDUCER ELBOW
5	2"(51mm) ID GAS SUPPLY PIPE LINE-NATURAL GAS
6	15 AMP TOGGLE SWITCH - 2 POLE for GAS

VI. ELECTRICAL CONNECTION

Check the oven data plate before making any electric supply connections. Electric supply connections must agree with data on the oven data plate. A typical oven data plate is shown in Figure 2-34 (on Page 2-24).

NOTE: When the oven is installed, it must be electrically grounded in accordance with current IEC/CEE requirements and also with local codes.

The electrical installation, including the service connection, must comply with current IEC/CEE requirements and to local codes. The installation must undergo a complete electrical check before operating the oven.

Special attention must be given to the polarity of the supply when connecting to oven input terminals.

All connections are made at one common connection at the back of each oven. Refer to Figures 2-32 and 2-33.

NOTE: At the installation location, it is required that the electrical supply for each oven incorporates a main circuit breaker (not furnished). The circuit breaker must have 3mm contact gaps breaking all poles of the supply.

WARNING: If your electrical supply has fast-acting circuit breakers, then the initial starting current of the blower motors in Model PS360WB-U and PS360WB-L may trip the breakers. It is suggested to use slow-acting circuit breakers with these models.

For further electrical information, refer to the wiring diagram.

WARNING: The connections to the exhaust system, electrical supply, and gas supply must follow the installation instructions. Initial start-up of the oven can be performed only by an authorized agent.

Figure 2-32
Junction Connection Box (Lower Oven)

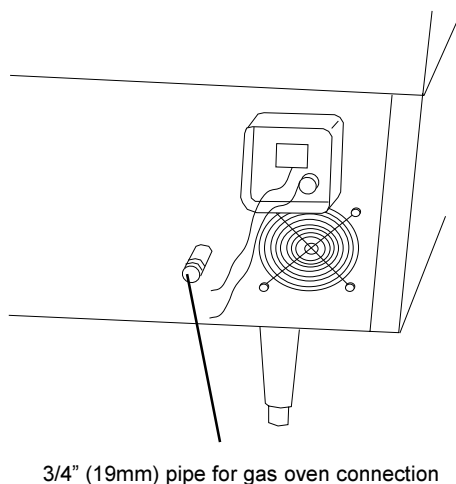
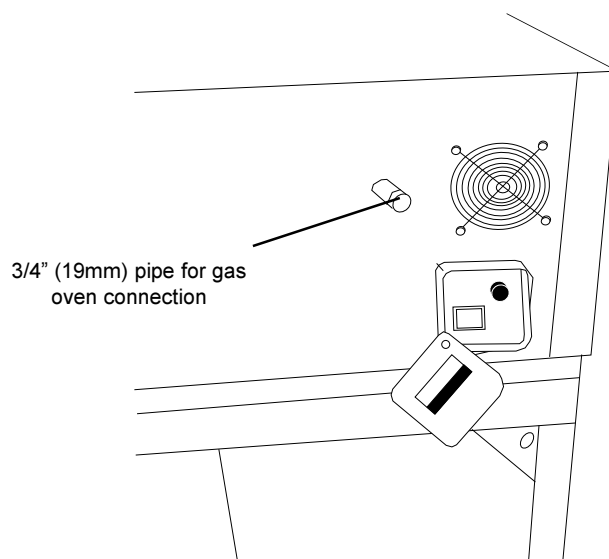


Figure 2-33
Junction Connection Box (Upper Oven)



SECTION 2
INSTALLATION


 <p>1400 TOASTMASTER DRIVE, ELGIN ILLINOIS 60120 USA</p>					
MOD., TYP <input type="text"/>		SR.-NR: <input type="text"/>		ANNO <input type="text"/>	
TYPE,-BAUART, TIPO-B 23		ID.-NR: <input type="text"/>			
	IE,IT,PT ES,GB	DE	NL	BE,FR	AT,CH
CAT	"2H3+	"2ELL3B/P	"2L3B/P	"2E+3+	"2H3B/P
P	G20 20 G30 29-37	G20 20 G25 20 G30/31 50	G25 25 G30 28-30 G31 30	G20 20-25 G30 29-37	G20 20 G30/31 50
<p>Qn = <input type="text"/> kW U 220-230 V. 50 Hz ~ Pn <input type="text"/> W</p>					

Figure 2-34
Typical Oven Data Plate - Models PS360/PS360WB

VII. GAS SUPPLY FOR GAS HEATED OVENS

Pipe sizing -- Always install a shut off valve in the gas supply line to the oven. This valve should be the same size as the supply line.

Please remember that the longer the pipe runs, the more the pressure drops. One 90° elbow equals a 1,2 m length of pipe.

Each oven section requires a nominal gas input as follows:

PS360U,L (per oven)	40 kW
PS360WB-U, -L (per oven)	50 kW

Follow the recommended pipe sizing and meter sizing as indicated in the Rough-in Drawing (Figure 2-31,Page 2-22).

The flexible hose furnished with the oven must be positioned as shown in Figure 2-35.

NOTE: *The recommended pipe sizes are larger than usually required to eliminate any operation problems. It is much less expensive to make the initial installation large enough to do the job rather than redoing the job later.*

For lighting instructions, refer to Step-by-Step Operation in the **OPERATION** Section of this manual.

CAUTION

DURING PRESSURE TESTING NOTE ONE OF THE FOLLOWING:

1. The oven and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressure in excess of 1/2 psig (3.45 kPA).
2. The oven must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 1/2 psig (3.45 kPA).
3. If the incoming pressure is over 50 mbars, a separate regulator must be installed before the 3/4" manual gas shutoff valve located at the rear outside of the oven.

WARNING:

To prevent damage to control valve regulator during initial turn on of gas, it is **very important** to open manual shutoff valve **very slowly**.

After the initial gas turn on, the manual shutoff valve must remain open except during pressure testing as outlined in the above steps or when necessary during service maintenance.

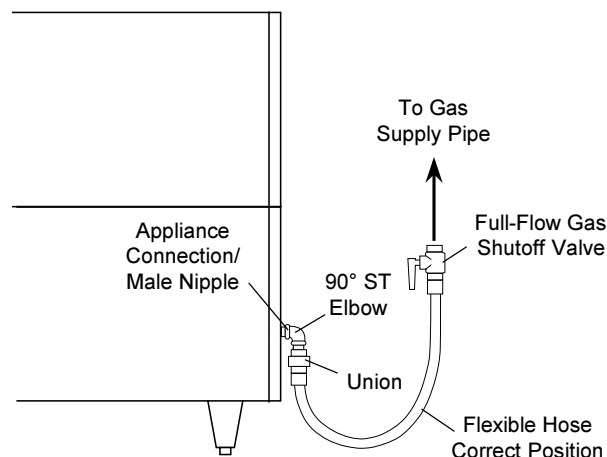


Figure 2-35
Flexible Hose Connector Installation

VIII. PREPARATION FOR VARIOUS GASES

Before proceeding to set up the oven for a specific gas, the main gas supply valve and the electrical supply circuit breaker should be turned off.

When preparing the oven for use of Group H or L Natural gases, the orifice (Manifold) pressure should be adjusted to the values shown in the chart on Page 1-1.

The main orifice and also the by-pass (low flame) orifice should be changed for the specific gas type used as shown in the following Table, also refer to Section IX, **CHANGING ORIFICES**.

FOR USE WITH NATURAL GAS

The input to the burner can be determined using the orifice (manifold) pressure data or by the volume supplied using the gas meter.

Using the orifice pressure data you must know the specific gas quality used and when using the volume method you must know the heat value (HuB) of the gas used (Obtainable from your local gas supplier).

If you used the orifice pressure method, you should double check the rated input using the volume method.

If the measured input does not correspond with the rated input, check first that correct orifices are installed. If the orifice sizes are as specified, check and correct the supply and orifice pressures to obtain the correct input based on the gas meter reading.

FOR USE WITH LIQUID (LP) GAS

When using liquid gas the converter in the multifunction gas valve has to be turned end over end - 180° (Refer to Figure 2-36). This takes the governor out of operation.

GAS TYPE AND PRESSURE LABEL			
IT	II _{2H3+}	Predisposto per gas metano	20 mbar
GB	II _{2H3+}	Adjusted for natural gas	20 mbar
FR	II _{2E+3+}	Essaye au gaz naturel (E/L)	20-25 mbar
DE	II _{2ELL3B/P}	Eingestellt auf Erdgas (E)	20 mbar
DE	II _{2ELL3B/P}	Eingestellt auf Erdgas (LL)	20 mbar
ES	II _{2H3+}	Preparado para gas natural	20 mbar
NL	II _{2L3B/P}	Aangelegd op aardgas	25 mbar
BE	I _{2E+}	Essaye au gaz naturel/aangelo op aardgas	20-25 mbar

GAS TYPE AND PRESSURE LABEL			
IT	II _{2H3+}	Predisposto per G.P.L.	28-30/37 mbar
GB	II _{2H3+}	Adjusted for L.P.G.	28-30/37 mbar
FR	II _{2E+3+}	Essaye au gaz naturel liquide	28-30/37 mbar
DE	II _{2ELL3B/P}	Eingestellt auf Flüssiggas	50 mbar
ES	II _{2H3+}	Preparado para gas liquido	28-30/37 mbar
NL	II _{2L3B/P}	Aangelegd op vloeibaar gas	30 mbar
BE	I ₃₊	Aangelegd op vloeibaar gas/essaye au gaz liquide	28-30/37 mbar

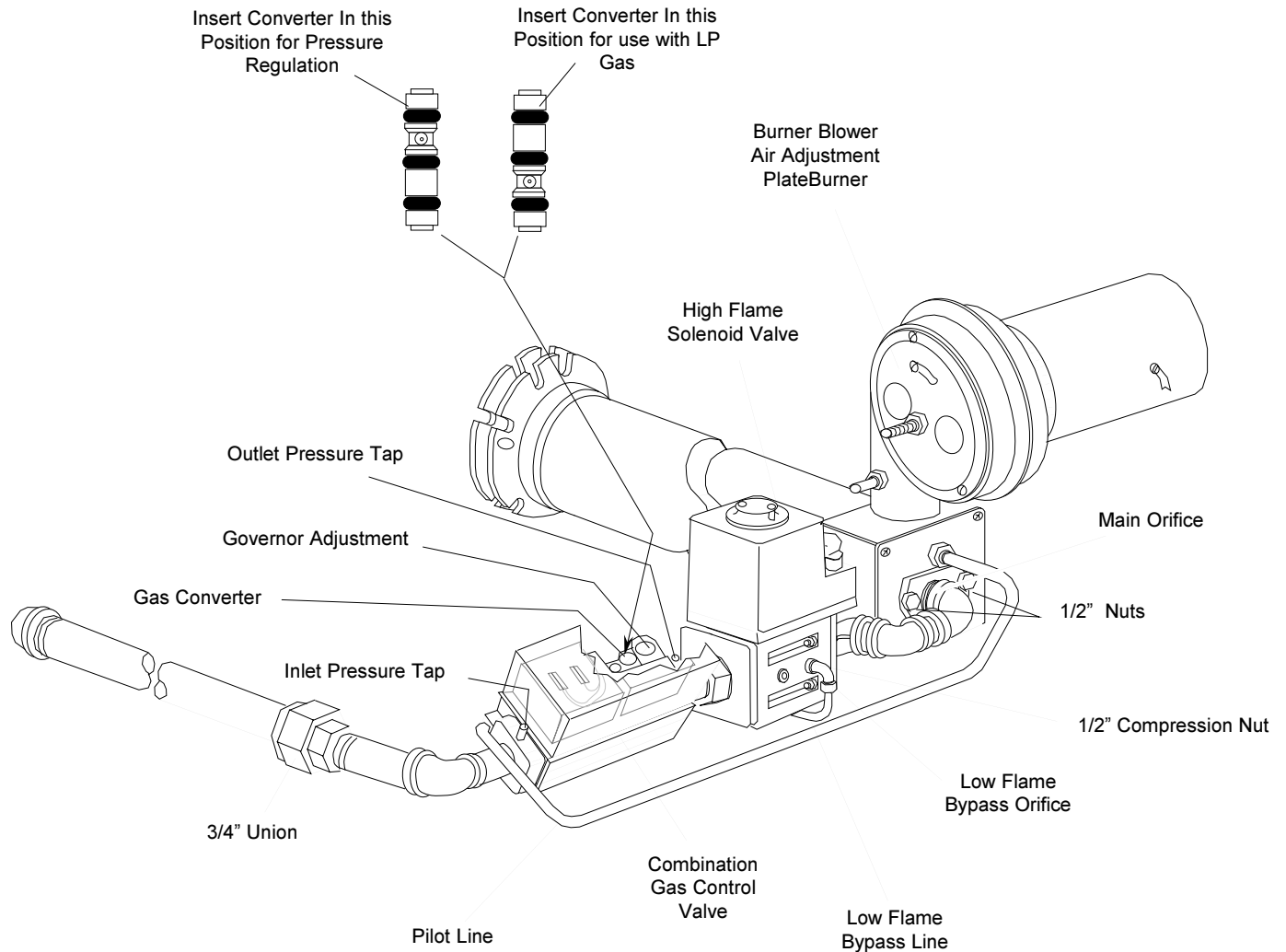


Figure 2-36
Burner/Piping Assembly

IX. CHANGING ORIFICES

TO CHANGE MAIN ORIFICE (Refer to Figure 2-36)

1. Turn off main gas supply valve.
2. Open 3/4" union in gas supply line.
3. Remove 1/2" nuts securing gas train to the burner housing.
4. Using a 11/16" wrench remove orifice from the mounting flange.
5. Install new orifice in reverse order.

WARNING

Before operating oven check for gas leaks!

TO CHANGE BYPASS (LOW FLAME) ORIFICE (Refer to Figure 2-36)

1. Turn off main gas supply valve.
2. Open 3/4" union in gas supply line.
3. With 1/2" wrench loosen compression nuts securing bypass tube to solenoid valve.
4. Remove orifice from bypass tube.
5. Install new orifice in reverse order.

X. VOLUMETRIC METHOD

WARNING

Before operating oven check for gas leaks!

IMPORTANT

During these measurements, no other gas appliance should be in operation being supplied from the same gas meter.

To determine gas flow setting value "E":

E = Liters/min.

NB = Rated input in kW

HuB = Heat (Calorific) value of gas in kW/m³

$$E = \frac{NB}{HuB}$$

To determine the time of 0.1m³ (100 liters) gas usage:

$$\text{Time in minutes} = \frac{100}{E}$$

The time of the gas flow through the meter should be taken with a stopwatch.

1. Remove cover screw from the gas valve pressure (governor) adjustment valve.
2. Open main gas supply valve and start oven according to supplied instructions with the temperature control at maximum setting.
3. Once oven is in operation, adjust pressure valve (governor) to the calculated volume using the time for 100 liters of flow through. Turning the adjustment screw clockwise will increase the flow and counter-clockwise will reduce it.

4. Replace cover screw on adjustment valve and turn off main gas supply valve.
5. Record the reading obtained from the gas meter and calculate obtained gas flow. Compare this to the indicated flow in the **CHART OF ORIFICE SIZES, GAS PRESSURES, NOMINAL INPUT RATINGS AND GAS FLOW** on Page 1.
6. Note the following comments and procedures to assure correct gas supply pressure and adjusting the gas valve to obtain proper orifice (manifold) pressure.

XI. VARIATIONS OF RATED SUPPLY PRESSURES

Special attention should be given to the supply pressure and gas flow pressure at the supply connection to the oven. The nominal supply pressure for gas family Group 2 (natural gas) should be 20 mbar.

If the supply pressure is lower or higher than the rated (nominal) pressure then the reason should be investigated and the gas supplier contacted.

If the supply pressure is lower than 17 mbar's or higher than 25 mbar's then the oven should be shut down and the gas supplier notified. No adjustment of the oven controls should be made and the oven should not be operated.

TO CHECK GAS SUPPLY PRESSURE:

1. Close main gas supply valve.
2. Remove supply (inlet) pressure measuring stud screw from gas valve and attach the manometer to the stud.
3. Open main gas supply valve and restart oven with temperature control at maximum setting.
4. Measure inlet (supply) pressure. For all natural gases this should be between 17 and 25 mbar's.
5. Turn oven off, close main gas supply valve, remove manometer from stud and tighten cover screw in to pressure measuring stud.

ORIFICE (MANIFOLD) PRESSURE METHOD:

1. Turn off main gas supply valve.
2. Remove pressure measuring stud screw located at the "out-flow" (closest to gas burner) of the gas valve and attach a manometer.
3. Remove cover screw from the gas valve pressure (governor) adjustment valve.
4. Open main gas supply valve and start oven according to supplied instructions with the temperature control at maximum setting.
5. Once oven is in operation, adjust pressure valve (governor) to the orifice pressure value as shown for the specific gas in the Gas Specifications Table.
6. Turn oven off, close main gas supply valve, remove "U" tube manometer and tighten cover screw into pressure measuring stud.

SECTION 2 INSTALLATION

SPECIAL NOTICES:

The ovens should be operated only in an area that has good air circulation.

The oven must be installed under an electrically powered ventilating hood.

Installation of replacement parts requiring access to the interior of the oven is permitted only by authorized service personnel.

The operator should be properly trained to the functioning of the oven.

This instructions manual should be supplied to the operator.

Constructional changes to the area where the oven is installed shall not affect the air supply to the oven.

The installation, start-up and changes required when changing from one gas type to another can be performed only by a certified professional.

These ovens are intended only for commercial use and are to be operated only by professionals.

It is required that the oven is regularly inspected for proper functioning. The frequency of inspections are dependent on the oven usage, however it should be performed at least once a year.

After adjustments or service work the oven has to be checked for gas leaks.

NOTE: After conversions, readjustments or service work the oven has to be tested for proper functioning. Basically the following applies:

- Testing for gas leaks,
- Testing for correct air supply, specifically to the burner blower,
- Testing of proper combustion and gas supply,
- Testing of correct gas supply controls,
- Testing the flue gas escape from the oven,
- Testing the vent system of the installation location.