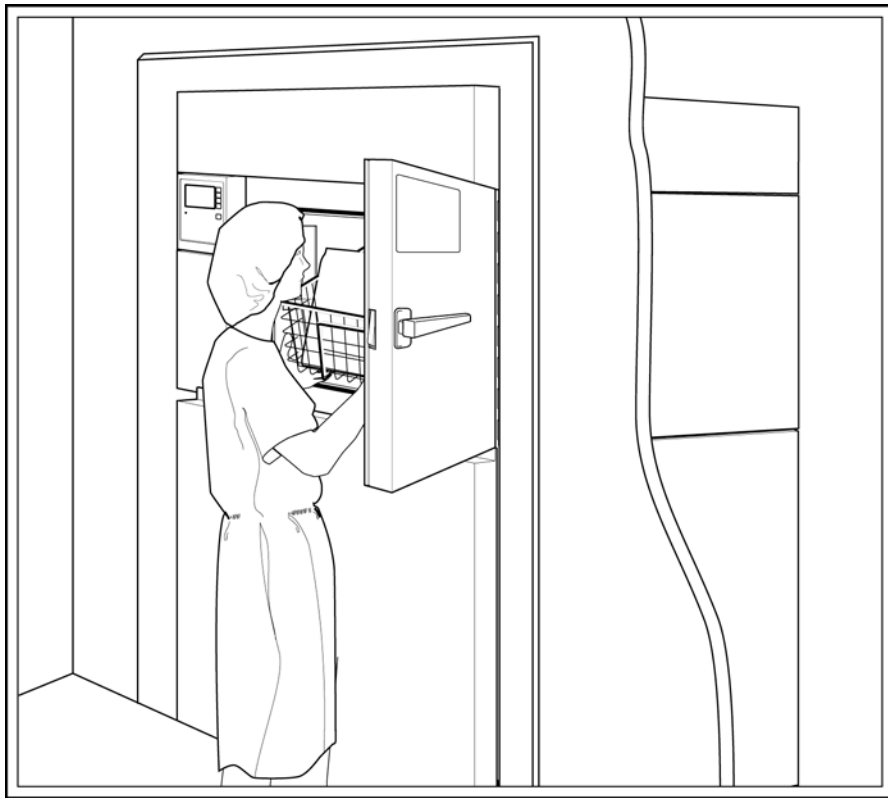


3M™ Steri-Vac™

XL Series Gas Sterilizer/Aerators

Site Planning and Installation Manual



3M Health Care

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INTRODUCTION

3M Steri-Vac™ Sterilizer Safety Information

DANGER

- **Toxic Gas**
Hazardous Voltage
Only qualified service personnel should install and service this equipment. Do not plug the cord into an outlet and operate the sterilizer until a 3M service representative has checked out the installation and provided in-service training for the operators. Costly damage and hazard could result.
- **Ethylene oxide is flammable and toxic**
Place the sterilizer in an area that is greater than 30 m³ (1,000 ft³) and that has a minimum of 10 air changes per hour. Do not place the sterilizer or ethylene oxide (EO) cartridges in an area of possible ignition sources.
- The vent line contains significant amounts of EO during the final purge phase. Do not terminate the vent line within 7.6 m (25 ft) of any possible source of ignition or any opening to the building interior such as fresh air inlets, unsealed windows, or pedestrian traffic areas.

WARNING

The customer is solely responsible for providing an oil-free and dry air supply (to a dew point of 50°F). Filters are provided for precautionary purposes only, and not as a replacement for a clean air supply. A contaminated air supply can quickly reduce the effectiveness of the filter element, resulting in early machine failure and possible ethylene oxide exposure to the operator.

CAUTION

Connect the hood to a dedicated exhaust system. Do not connect the hood to an exhaust system that recirculates air into the building.

Notice

Only health care professionals or other appropriately trained personnel in health care and industrial use areas should use this equipment. It is a violation of federal law (USA) to use this product in a manner inconsistent with its labeling. Injury to persons or property can result unless the operating instructions are followed carefully.

The purchaser is responsible for providing the necessary machine service requirements to the area where the sterilizer will be installed. These services consist of electricity, compressed air, and vent line. A dedicated exhaust system is required for installation with the local exhaust hood option.

Because of varying local codes and labor policies, it is also the responsibility of the purchaser to install the machine in its permanent location and to connect the services to the machine. For example, the state of California requires that seismic bracing be provided on the sterilizer. It is the purchaser's responsibility to ensure that state and local code requirements are met.

INTRODUCTION

Introduction to Site Planning

Site planning is an important part of the installation process. When planning an installation, consider the location, the machine service requirements, 3M Steri-Gas™ Cartridge storage, any accessories, and local code requirements. Obtain all state and local regulations affecting the use of ethylene oxide (EO). A carefully planned and prepared site allows for a smooth, trouble-free installation. A prepared site also helps ensure that the sterilizer and related equipment operate correctly. Please take time to carefully plan and prepare the site before the installation date.

Several critical planning and coordinating tasks must be performed to plan, prepare for, and coordinate a successful installation. While each installation site is unique, the following critical tasks are common to all situations.

Step 1 - Select the equipment

Step 2 - Select a location

Step 3 - Prepare the area

Step 4 - Install the equipment

The objective of this guide is to provide increasingly detailed information as planning progresses to installation.

Site Layout and Equipment Location Worksheet

Step 2 of the Site Planning and Installation process provides the recommended process for analyzing a site and selecting a suitable location where the system can be installed. This step also contains samples showing how to sketch the architectural details of a proposed site and how to sketch the proposed location of the equipment within the site. Site Layout and Equipment Location Worksheets are provided at the back of this manual to make this process easier.

Service Requirements

Several critical service requirements must be met before the 3M system checkout can be performed. These requirements include room ventilation and connections to electrical power, vent lines, and compressed air lines. Service requirements are explained in greater detail in Step 3 - Prepare the Area.

Typically, the customer is responsible for securing and scheduling these contracted services, and for supplying copies of the service requirements to the contractors. However, 3M does offer complete turn-key installations as an optional service. The equipment checkout cannot be scheduled until all equipment installation requirements have been met by the customer and verified by 3M personnel during the final pre-installation visit.

Services Specification Sheets

The summary pages for service requirements and the Site Layout and Equipment Location Worksheets can be reproduced to provide service contractors with the information necessary for completing the pre-installation work.

Deviations from the Site Plan

The customer should document any deviations from the site plan, and communicate the information to the 3M Health Care service representative.

SELECT THE EQUIPMENT**List of System Components**

Fill in the information below for each equipment item that will be installed. This list will be useful in summarizing installation needs.

Equipment	Service Requirements
	Electrical Requirements _____ _____ _____ _____ Plumbing Requirements _____ _____ _____ _____ Ventilation Requirements _____ _____ _____ _____
	Electrical Requirements _____ _____ _____ _____ Plumbing Requirements _____ _____ _____ _____ Ventilation Requirements _____ _____ _____ _____

SELECT THE EQUIPMENT

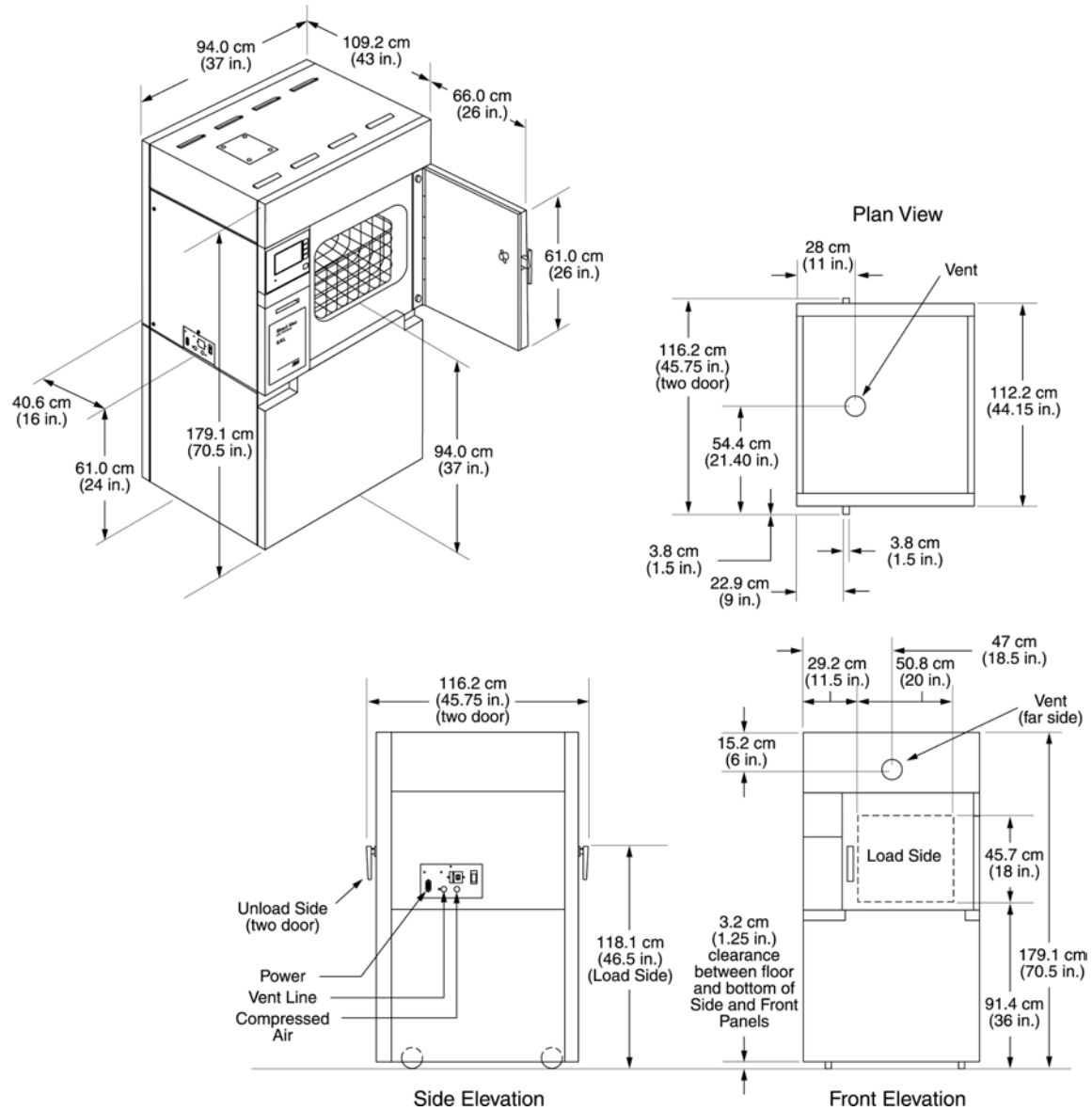


Figure 1a. Steri-Vac 8XL Sterilizer Dimensions.

SELECT THE EQUIPMENT

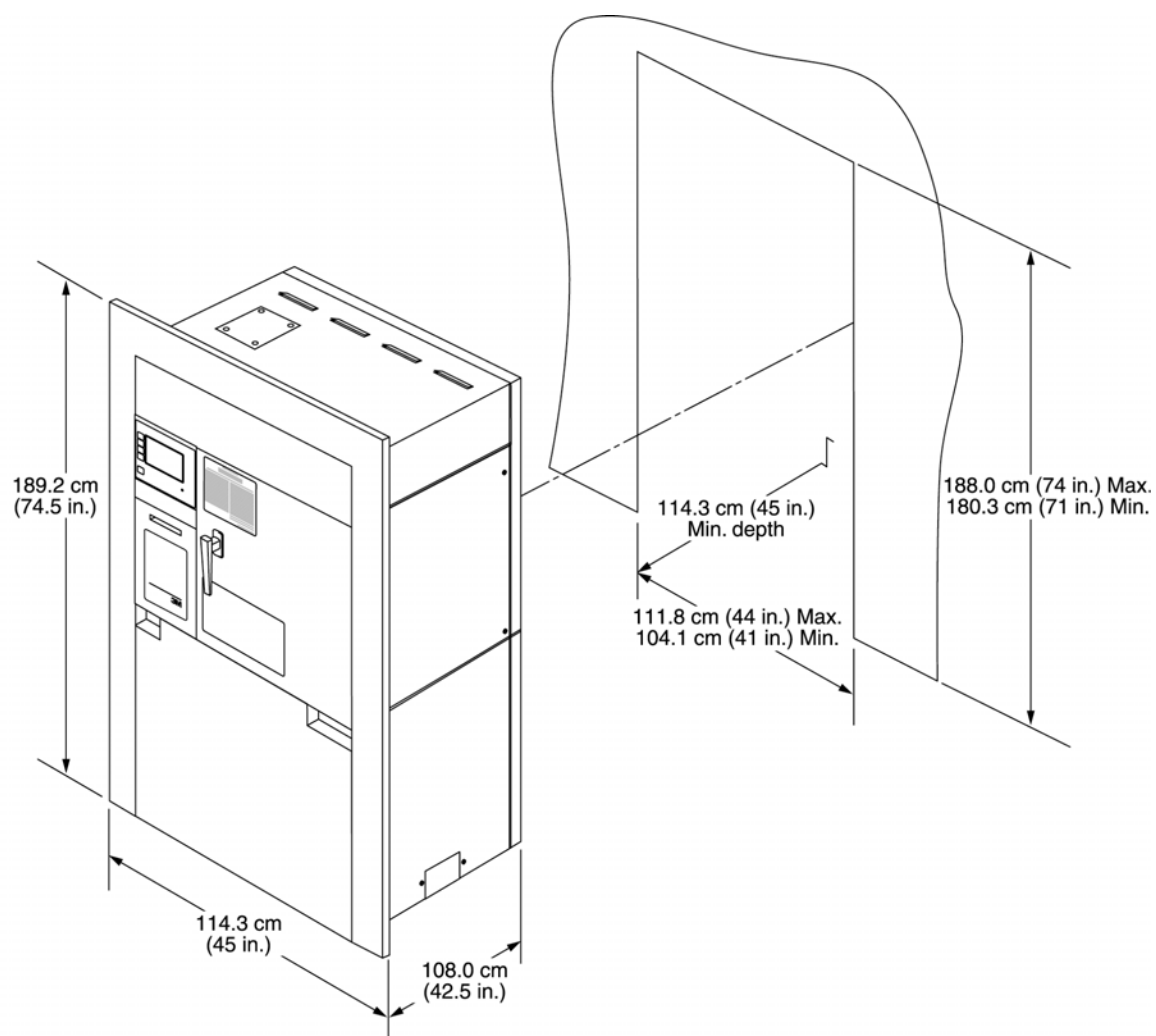


Figure 1b. Typical In-wall Opening Requirements for the Steri-Vac 8XL Sterilizer.

SELECT THE EQUIPMENT

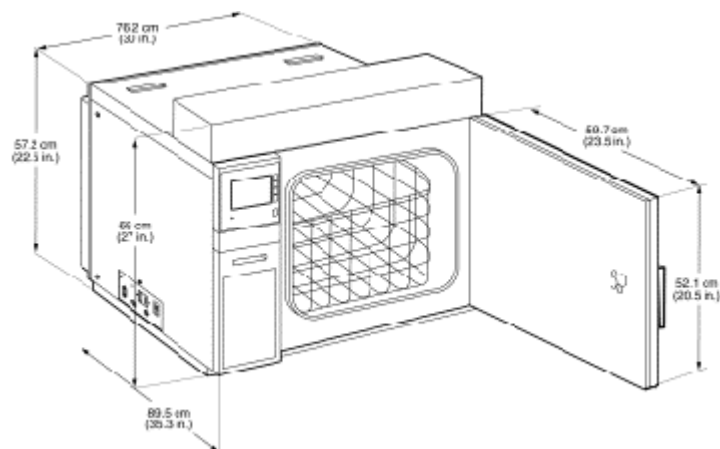


Figure 2a. Steri-Vac 5XL Sterilizer Dimensions.

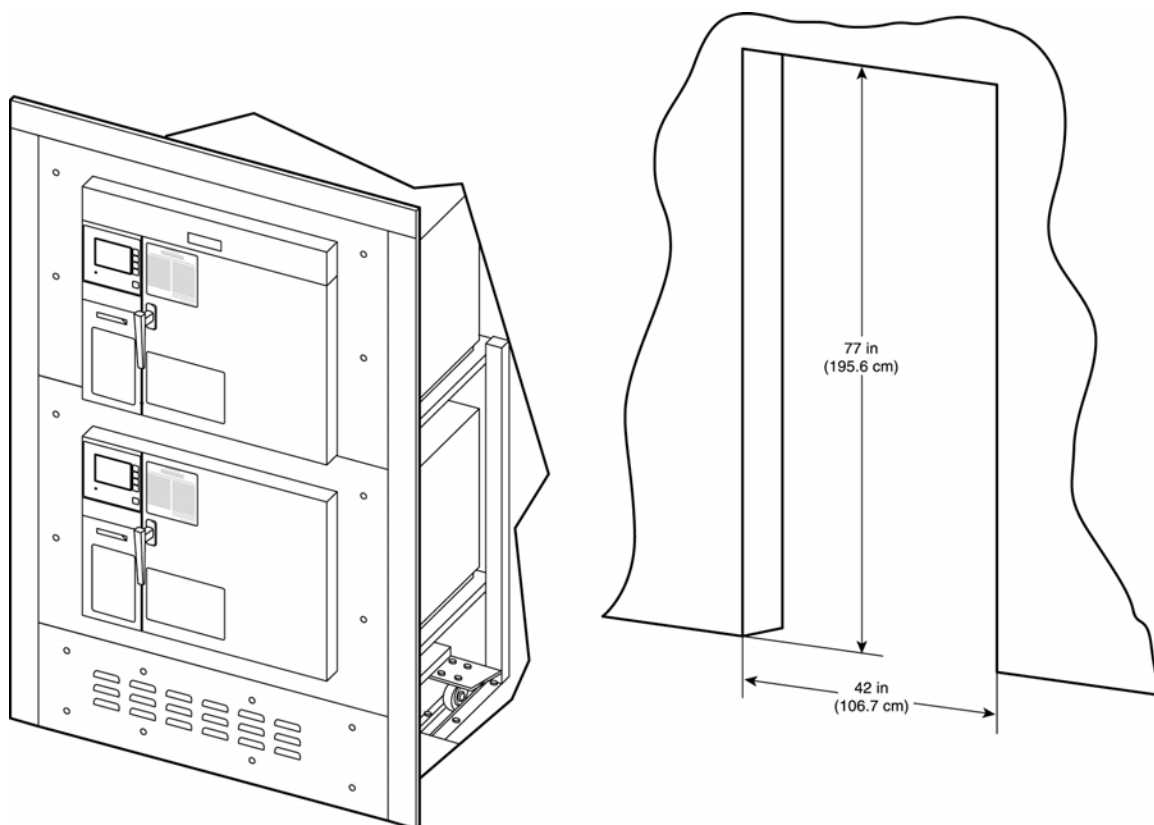



Figure 2b. Typical In-wall Opening Requirements for the 4XL, 5XL, XL Steri-Vac Sterilizer/Aerators.

SELECT A LOCATION

Selecting a Suitable Location


DANGER

Ethylene oxide is flammable and toxic

Place the sterilizer in an area that is greater than 30 m³ (1,000 ft³) and that has a minimum of 10 air changes per hour. Do not place the sterilizer or ethylene oxide (EO) cartridges in an area of possible ignition sources.

The selected location must meet all of the following requirements:

- ☐ No flammable gases (other than ethylene oxide) are present at the location.
- ☐ The location is not a high traffic area.

- ☐ The location is well-ventilated with at least 10 air changes per hour. The flow of air is away from the equipment operator (see Figure 3). Recommended room size is 30 m³ (1,000 ft³).
- ☐ The location has a nonrecirculating ventilation system. If a local exhaust hood is used, it must be connected to an exhaust system that is dedicated to the sterilizer area.
- ☐ The location allows 51 cm (20 inches) of clearance space at the top and sides of the sterilizer for maintenance and service (see Figure 5).

Notice

At the time of installation your 3M service representative will request that you certify, in writing, that the requirements for the general room ventilation rate and the non-recirculating ventilation system are met.

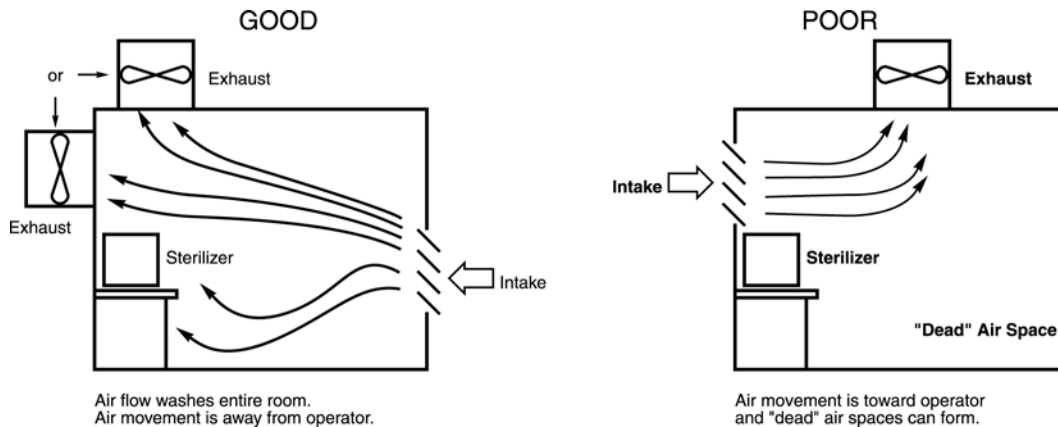


Figure 3. Ventilation Requirements.

SELECT A LOCATION

Site Layout Worksheet

Using a Site Layout Worksheet, sketch the architectural details of the location where the equipment will be installed. Include all details, such as walls, doorways, structural supports,

ventilation ducts (intake and exhaust), and electrical outlets (see Figure 4). Indicate any equipment that will be removed. A blank worksheet is provided at the back of this manual.

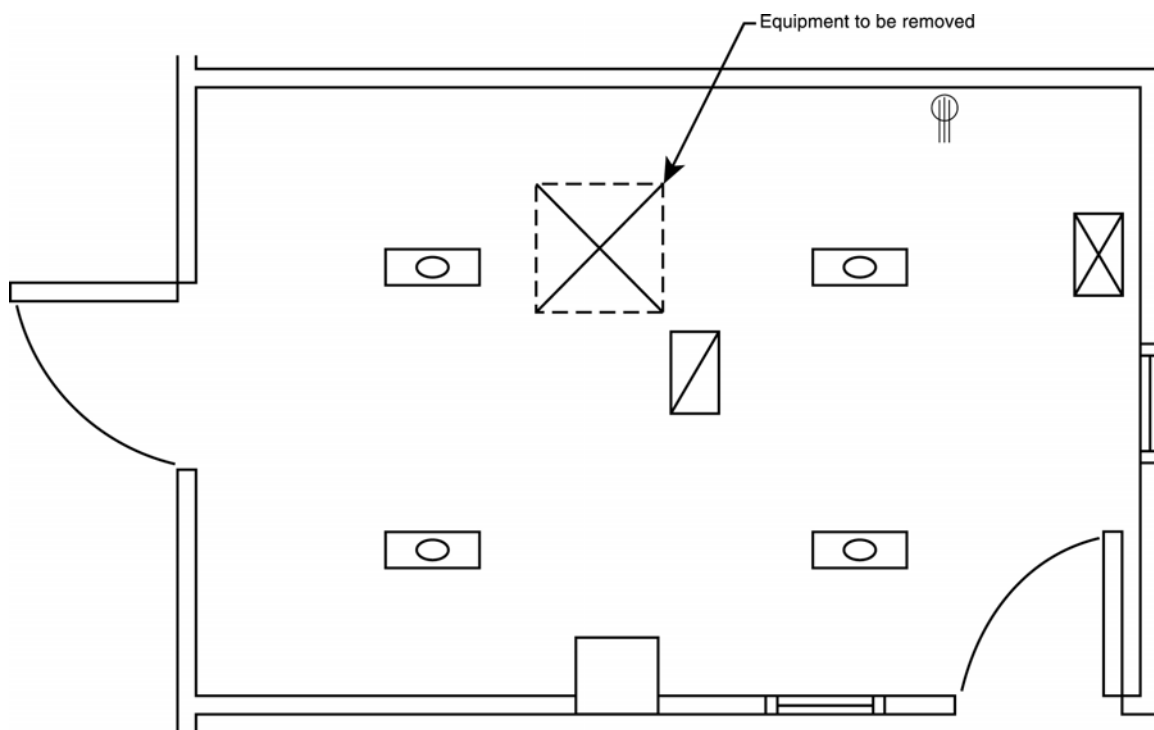


Figure 4. Site Layout Worksheet (Example).

SELECT A LOCATION

Proposed Location of Equipment

Based on the sketch of the site layout, complete an Equipment Location Worksheet to show each piece of equipment in the work area (see Figure 5). A blank worksheet is provided at the back of this manual.

If desired, the worksheet and equipment templates can be photocopied and cut out for use in planning the equipment placement. After placing the equipment, indicate on the layout any additional services required for the new equipment.

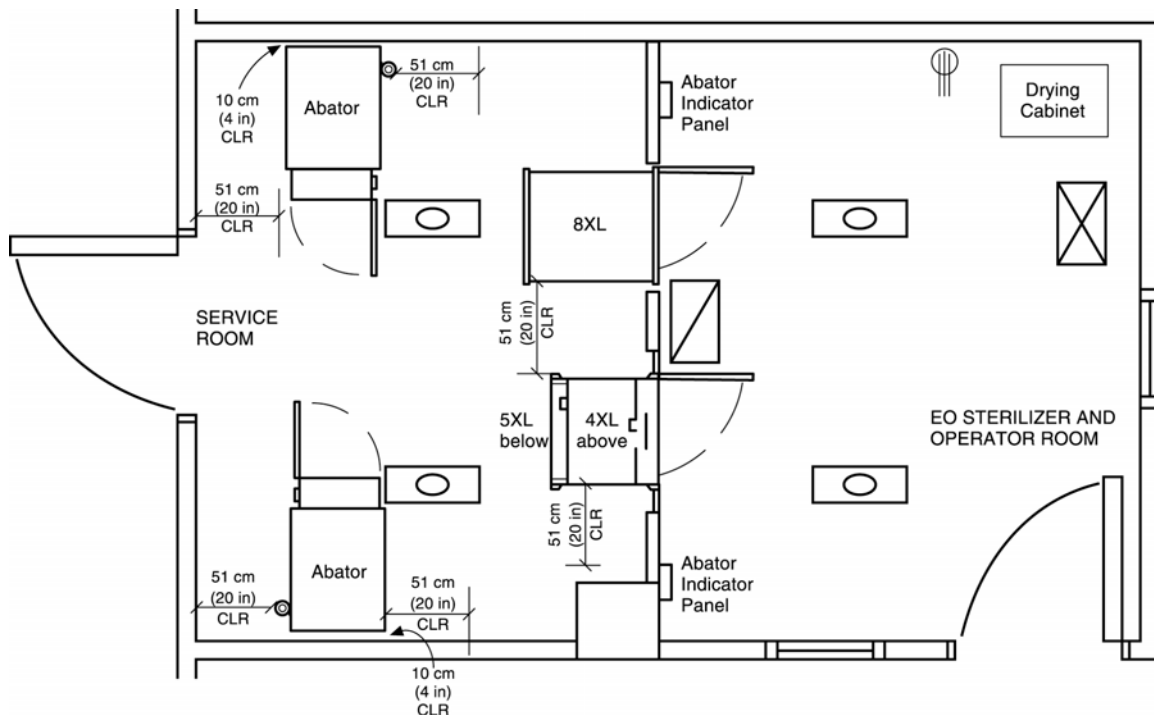


Figure 5. Equipment Location Worksheet (Example).

SELECT A LOCATION

Pre-Installation Visit

Prior to the installation of the Steri-Vac sterilizer, the 3M sales and service representatives will visit the facility where the equipment will be installed. The proposed location and planning sketches will be reviewed with the customer and the customers' engineers to discuss the required services, equipment spacing, and other considerations.

Service and Renovation Requirements

Send copies of the site layout sketches and service requirements to each of the contractors (electrical, ventilation, plumbing, and structural).

PREPARE THE AREA

Preparing the Selected Location

This step provides details of the basic service connections required for 3M Steri-Vac equipment. Additional services may be needed for other equipment installed to support the sterilizer equipment.

Consider whether the following equipment will also be needed:

- ☐ air compressor to supply clean, dry, oil-free air for the sterilizer vacuum system
- ☐ ethylene oxide emission control systems to comply with local regulations
- ☐ ventilation system connection to optional local exhaust hoods to allow quicker access to the load

Notice

Without a local exhaust hood, the sterilizer will remain locked for three hours of mandatory aeration.

The placement of any utility services required for any additional equipment must also be considered. Contact the supplier of the additional equipment for the installation and service requirements.

The following pages provide detailed information for contractors installing the services required to run the 3M Steri-Vac equipment. The pages are laid out so that they can be easily photocopied and sent to contractors. These pages, along with the worksheets you made to show the area before and after installation of the equipment, should give the contractor a good understanding of the job. Figure 13 (page 21) shows typical service connections at the sterilizer.

PREPARE THE AREA**Electrical Service Requirements**

The electrical requirements for the 3M equipment being installed are shown in the following table.

Additionally, when planning the electrical service consider support equipment such as; compressors, air dryers, and emission control systems.

Requirement	8XL Sterilizer/ Aerator	5XL Sterilizer/ Aerator	4XL Sterilizer/ Aerator	XL Aerator
Voltage	230 Vac (~) \pm 10% ¹			
Frequency	50/60 Hz			
Phase	Single			
Current	15 amp dedicated circuit			
Heat Load	6150 Btu/h	5500 Btu/h	5500 Btu/h	5120 Btu/h
Internal Circuit Breaker	15 amp	10 amp	10 amp	10 amp
Power Cord	220 volt, 15 amp, NEMA 6-15 plug ²			
Marks³	UL FCC cUL C-tick CE	UL CE cUL FCC C-tick	UL FCC GS CSA	UL FCC GS CSA
Code and Building Regulation Compliance	Due to variation in local regulations, the owner is responsible for complying with applicable codes and regulations as they pertain to locating the equipment and providing services to the equipment.			

¹ Sterilizers and aerators can operate on 208 Vac single phase if voltage does not drop below 198 Vac. If voltage drops below this level, a step up transformer is required. No starting surge is required for the sterilizers.

² Power cords furnished with equipment to be used outside the USA will meet electrical requirements of that location.

UL standard requires the 4XL, 5XL, 8XL to have a hospital grade power cord plug so it will plug into a hospital grade receptacle.

Install conductors, conduit, boxes, receptacles, connectors and accessories required for each circuit. Install receptacles within 3 feet of connections on equipment and in a location accessible to service personnel.

³ Canadian Standard Association (CSA), Underwriters Laboratory (UL & cUL - Canadian requirements). GS Geprüfte Sicherheit (German Device Safety Compliance). C-Tick-Australian EMC compliance mark.

PREPARE THE AREA

Compressed Air Requirements

Compressed air is used to operate a venturi type vacuum system and to operate air-controlled pistons that both lock and unlock the sterilizer door. The vacuum operates during the sterilization cycle to remove air and ethylene oxide from the sterilizer chamber. The vacuum also operates during the aeration phase which may last in excess of 12 hours.

Compressed Air Supply Specifications	
Pressure	3.5 kg/cm ² (50 psig) minimum 10.5 kg/cm ² (150 psig) maximum
Flow Rate	1.7 liters per second at 3.5 kg/cm ² (3.5 cubic feet per minute at 50 psig) per sterilizer based on 100% duty cycle compressor
Quality	Clean air supply with a maximum allowable dirt particle size of 0.5 microns and free of oil
Moisture Content	Less than 10°C (50°F) dewpoint

Notice

A compressed air source that does not meet the specifications can cause early machine failures. 3M's warranty and preventive maintenance agreements do not cover machine failures caused by an improper compressed air source.

Compressor System

The following recommended compressor manufacturers can provide additional information:

Powerex 1-800-544-0350
Champion 1-815-875-3321

Air Dryer

Moisture in the compressed air line will not be removed by the filter supplied. A refrigerated air dryer may be needed to meet the dewpoint requirement. It should be a non-cycling hermetic

type compatible with the flow and pressure of the compressor selected. It should be capable of accepting saturated air and drying it to 10°C (50°F) dew point at 38°C (100°F) ambient. It would typically have an automatic drain trap and be wired from the compressor controller. The following air dryers are examples that may be used: Norgren D-10 Series or Arrow A-10.

Filters

3M supplies an air filter assembly with each sterilizer to remove dirt particles from the incoming air. This filter must be installed on the compressed air line at the time of installation. This filter must be drained periodically to remove excess water.

Install the mist separator in front of the micro-mist separator to remove coarse air contaminants that would otherwise plug the micro-mist element. Replace the mist separator at least every 6 months and the micro-mist separator at least every 12 months. Change the elements more frequently if the air supply is highly contaminated.

WARNING

The customer is solely responsible for providing an oil-free and dry air supply (to a dew point of 50°F). Filters are provided for precautionary purposes only, and not as a replacement for a clean air supply. A contaminated air supply can quickly reduce the effectiveness of the filter element, resulting in early machine failure and possible ethylene oxide exposure to the operator.

Multiple Sterilizer Installations

Each sterilizer requires a minimum of 3.5 kg/cm² (50 psig) pressure with a minimum flow rate of 1.7 liters per second (3.5 scfm). Example: Two sterilizers would require 3.5 kg/cm² (50 psig) with a 3.4 liters per second (7 scfm) air flow.

PREPARE THE AREA

Compressed Air Line Installation Kit

The Compressed Air Line Installation Kit supplied with the sterilizer is installed between the sterilizer and the hospital compressed air services (see Figure 6).

Compressor Location

Locate the compressor away from work areas to reduce noise levels around the sterilizer. Make sure the compressor manufacturer's electrical power requirements are met.

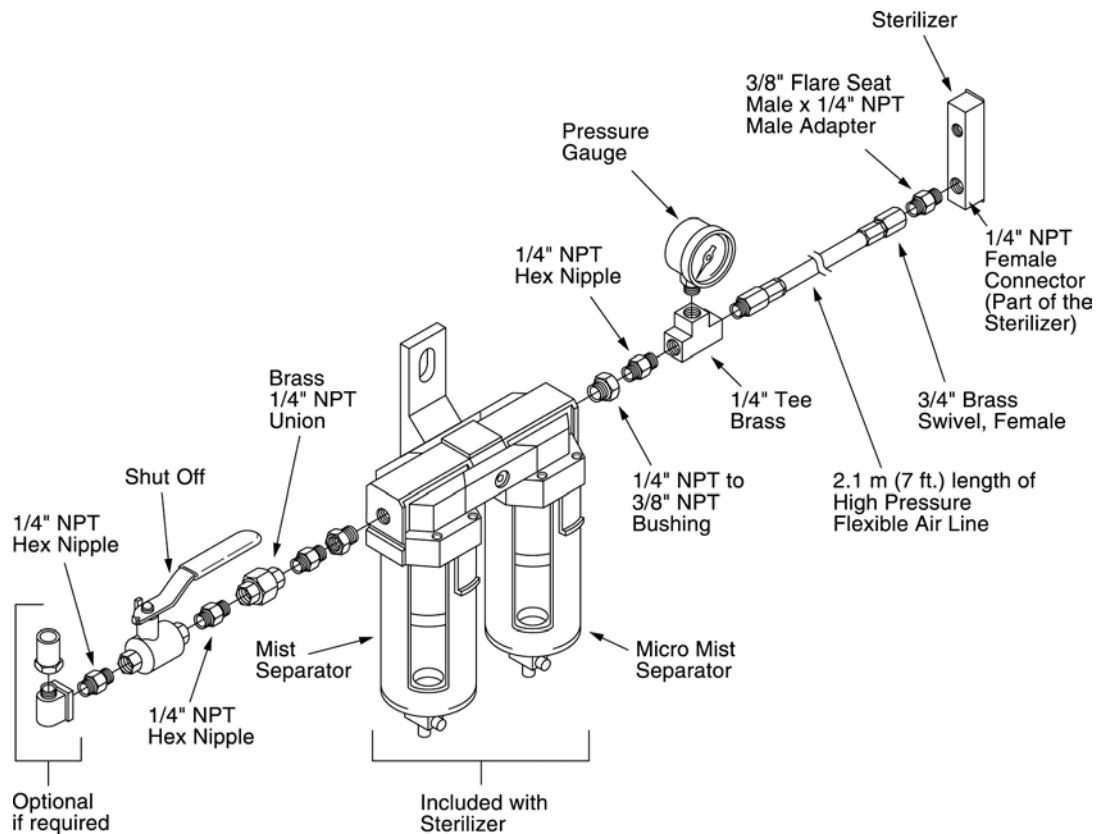


Figure 6. Compressed Air Line Connection Details (Using Installation Kit).

PREPARE THE AREA**Ethylene Oxide Vent Line Requirements**

Connect the sterilizer/aerator to a dedicated vent line to exhaust ethylene oxide to the outside atmosphere or to an emission control system (abator). The following requirements for venting the sterilizer/aerator must be met.

Multiple sterilizers can be vented through a common vent line (see the following table).

Number of sterilizers	Length of Vent Line		
	31 m (100 ft.)	61 m (200 ft.)	91.5 m (300 ft.)
1	1.9 cm (3/4 in.)	1.9 cm (3/4 in.)	1.9 cm (3/4 in.)
2	1.9 cm (3/4 in.)	2.5 cm (1 in.)	2.5 cm (1 in.)

Do not exceed 91.5 meters (300 feet) maximum from sterilizer port. Use hard drawn copper tube.

Make sure the vent system is constructed of straight lengths of copper tube using a minimum number of long radius elbows.

If two sterilizers are to be connected to a common vent system, use a Y fitting. Short radius elbows and T fittings cause an excessive amount of back pressure. Add a threaded fitting to termination of run to facilitate pressure test of system.

Avoid sags or loops in the vent line to prevent moisture buildup at other points in the line.

Ensure that the vent line is gas tight from the sterilizer to the outside atmosphere. Braze or solder vent line in accordance with local fire codes.

Keep the vent line, with the exception of a turned-down extension terminating on the roof top or exterior wall, inside the building. This is to prevent moisture from freezing in the line and blocking the vent (see Figure 8 and 9).

⚠ DANGER

The vent line contains significant amounts of EO during the final purge phase. Do not terminate the vent line within 7.6 m (25 ft) of any possible source of ignition or any opening to the building interior such as fresh air inlets, unsealed windows, or pedestrian traffic areas.¹

Vent Line Installation

Install inlet assembly from Vent Line Installation Kit within three feet of sterilizer's ethylene oxide port in a position accessible to service personnel (see Figure 7). For multiple sterilizer installations use a Y fitting to connect the two sterilizer vent lines to a single vent line. The Y fitting reduces the back pressure caused when two machines tie into one vent line. Run the single vent line directly to exterior or to an abator. Make connection at abator using appropriate fittings. When abator is installed, run vent line from vent outlet port on abator to exterior.

¹Reference AAMI/ANSIA ST-43 Good Hospital Practice: Ethylene oxide gas ventilation recommendation and safe use.

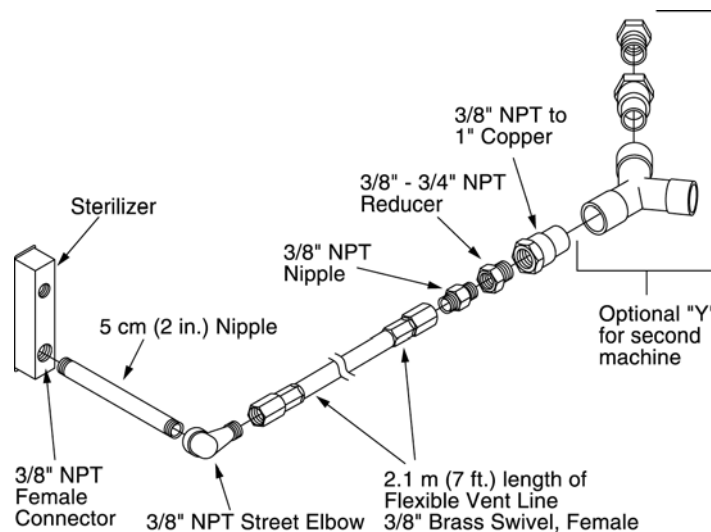


Figure 7. Ethylene Oxide Vent Line Connection Details (Using Installation Kit).

PREPARE THE AREA

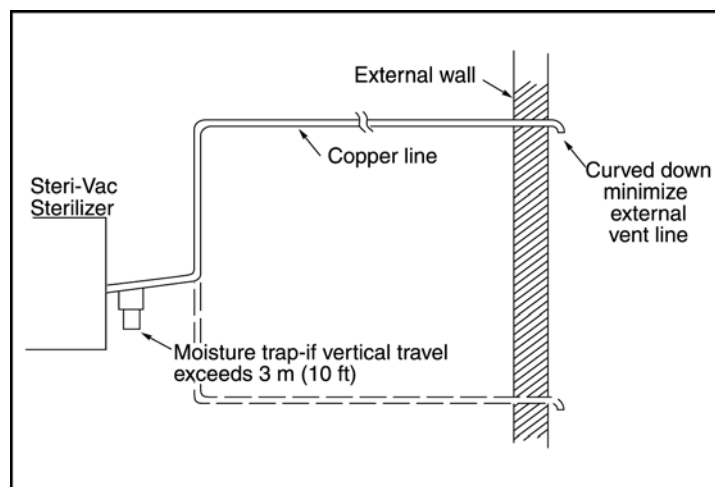


Figure 8. Ethylene Oxide Horizontal Vent Line Installation (Example).

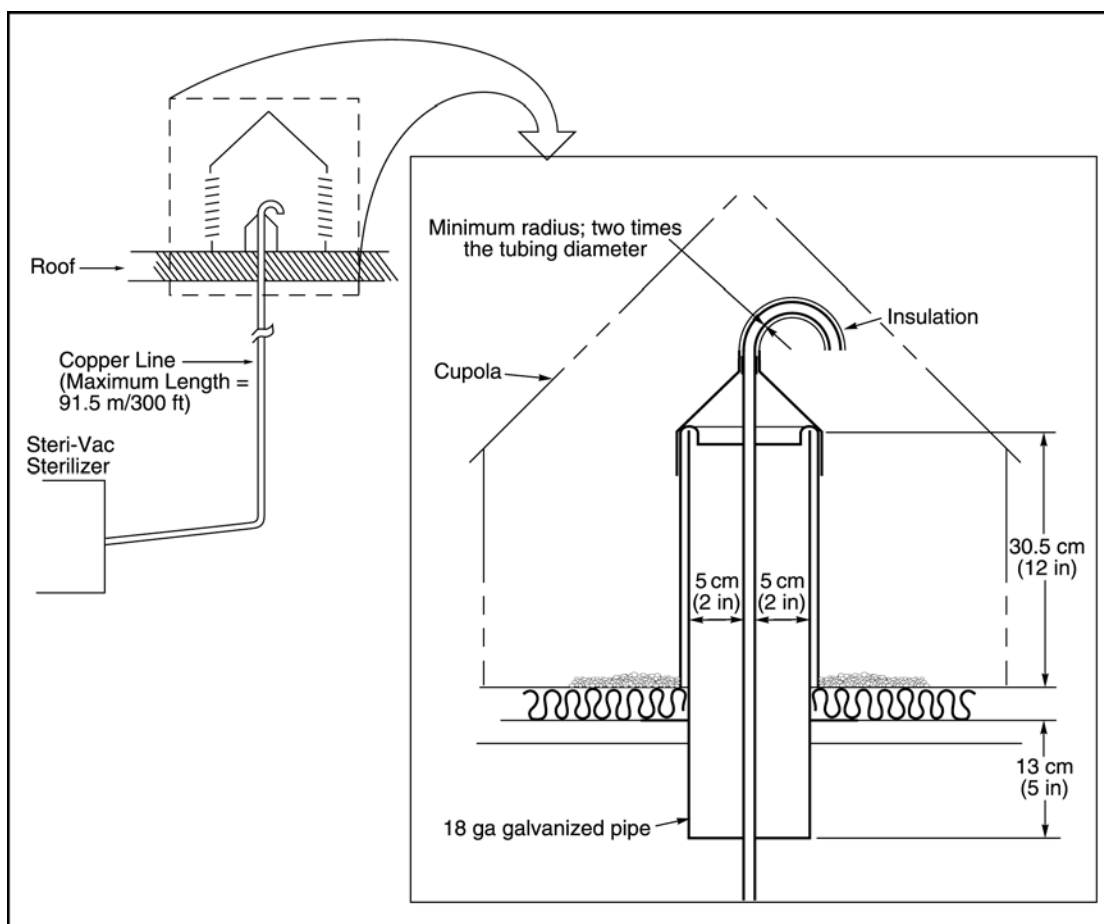


Figure 9. Ethylene Oxide Horizontal Vent Line Installation (Example).

PREPARE THE AREA**Optional Local Exhaust Hood Requirements****Notice**

Disregard this section if the sterilizer is not equipped with the optional local exhaust hood feature.

The optional local exhaust hood can be installed in the top panel of the sterilizer. This allows the operator quicker access to the materials being aerated. The hood removes residual ethylene oxide gas (EO) from the sterilizer chamber after the sterilization cycle when the door is in the latched position. The hood must be connected to a dedicated exhaust system supplied by the customer.

At the end of the sterilization cycle, the operator opens the sterilizer door to a latched position. While in this position, air is drawn upward from the bottom of the sterilizer door through the hood to the outside or to an emission control system via the exhaust duct (see Figure 10). The air stream pulls EO molecules from the front of the sterilizer chamber.

Units without the local exhaust hood have a mandatory three-hour aeration after the sterilization cycle before the door unlocks. This reduces the airborne EO level sufficiently to allow the operator to remove the baskets.

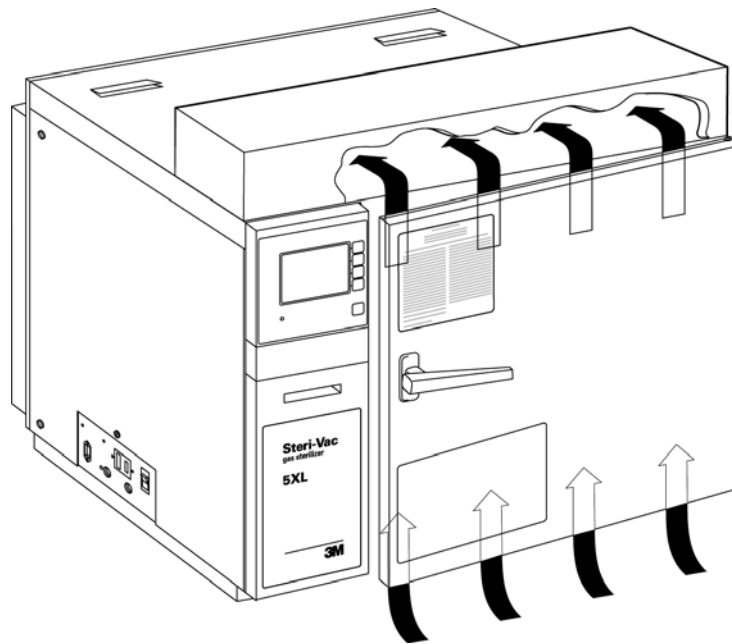


Figure 10. Air flow into Exhaust Hood.

PREPARE THE AREA**Exhaust Ventilation System Planning and Design****Notice**

Make sure the following requirements are met when planning and designing your ventilation system.

- ☐ Determine the air flow required, size, length and number of elbows needed in the ductwork. Take into consideration that each elbow introduces losses in air flow.
- ☐ Calculate the total air flow required for each branch.
- ☐ Calculate the static pressure for the entire system using standard industrial ventilation techniques, and add a 10% safety factor to the air flow and the static pressure.
- ☐ Select an exhaust fan to meet these requirements.
- ☐ Determine if a new exhaust system is needed or if an existing system can be used. If an existing system will be used, make sure the existing system meets the sterilizer equipment specifications. The diagrams in Figures 12, 13, and 14 show several installation possibilities. Consider them in planning your installation.
- ☐ Design and construct the exhaust system in accordance with state and/or local fire, health and safety codes.

CAUTION

Connect the hood to a dedicated exhaust system. Do not connect the hood to an exhaust system that recirculates air into the building.

Exhaust Ventilation System Specifications

The following ventilation system requirements should be met to ensure maximum air movement through the hood.

Air flow

Minimum of 2.8 cubic m/min (100 scfm) through the hood, or a minimum of 350 m/min (1150 ft/min) in the 102 mm (4 in) line to the hood. Maximum airflow through the hood is 7.0 cubic m/min (250 scfm).

Minimum static pressure

-0.15 cm (-0.06 in) of water at the static pressure port. Measure the static pressure when the sterilizer door is in the open latched position.

Hood connection

102 mm (4 in) outside diameter.

Ductwork

Use metallic ductwork rated to handle the highest pressure that the system delivers. Use a minimal amount of flexible, air-tight duct. Flexible duct can introduce significant air flow resistance. Use a larger diameter flexible duct to minimize frictional air drag loss. Minimize the number of elbows to reduce the static pressure loss in the system. Seal duct seams and joints with aluminum duct tape or sealant to prevent leaks.

Exhaust Fan

Use a centrifugal fan with backward curved blades designed for continuous operation. The fan must be a high efficiency spark-proof fan with the motor sealed from the exhaust air stream. The impeller and impeller ring around the drive shaft must be nonferrous.

Ventilation Failure Detector

An air flow sensor is installed in the exhaust opening of the hood. The sensor detects low air flow in the exhaust hood and activates a caution message (C1 - Low Air Flow in Exhaust Hood), to alert personnel of ventilation system failure. This caution does not stop the sterilization cycle in progress, but will cause an automatic three hour mandatory aeration to be performed. The ventilation problem must be corrected for the sterilizer to clear the message.

PREPARE THE AREA

Outside Discharge

The ventilation system should exhaust to the outside. A roof-top discharge should be used. The discharge point should be at least 7.6 m (25 ft) away from any possible sources of ignition, openings to building, or pedestrian traffic ways. Greater distances may be needed in some locations. Use one of the types of discharge terminations illustrated in Figure 11.

Use an industrial ventilation consultant or ventilation contractor to help design and install the local exhaust system.

For further information, please consult the following:

EPA, "Sterilant Use of EO in Hospitals & Health Care Facilities," Appendix A, Table VII; OSHA EtO Standard: 29 CFR 1910 Occupational Exposure to Ethylene Oxide.

Dept. Health Education and Welfare, DHEW Publ. No. HRA-74-400. "Minimum Requirements of Construction & Equipment for Hospital & Medical Facilities," HEW, PHS, Health Resources Adm., Div. of Facilities & Utilization, Rockville, MD 20852, 1974, p. 27.

Industrial Ventilation, Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48902.

American Society of Heating, Refrigeration & Air Conditioning Engineers, ASHRAE, Applications Volume 1982, Chapter 7.

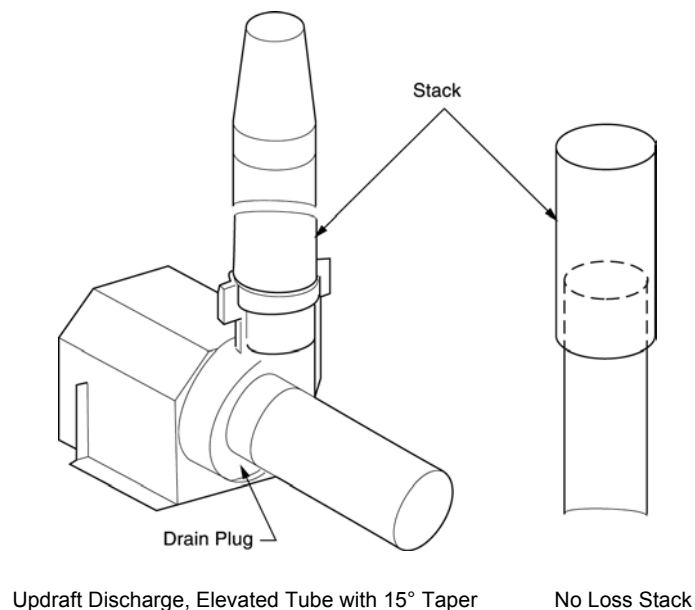


Figure 11. Outside Ventilation Stack Design Suggestions.

PREPARE THE AREA

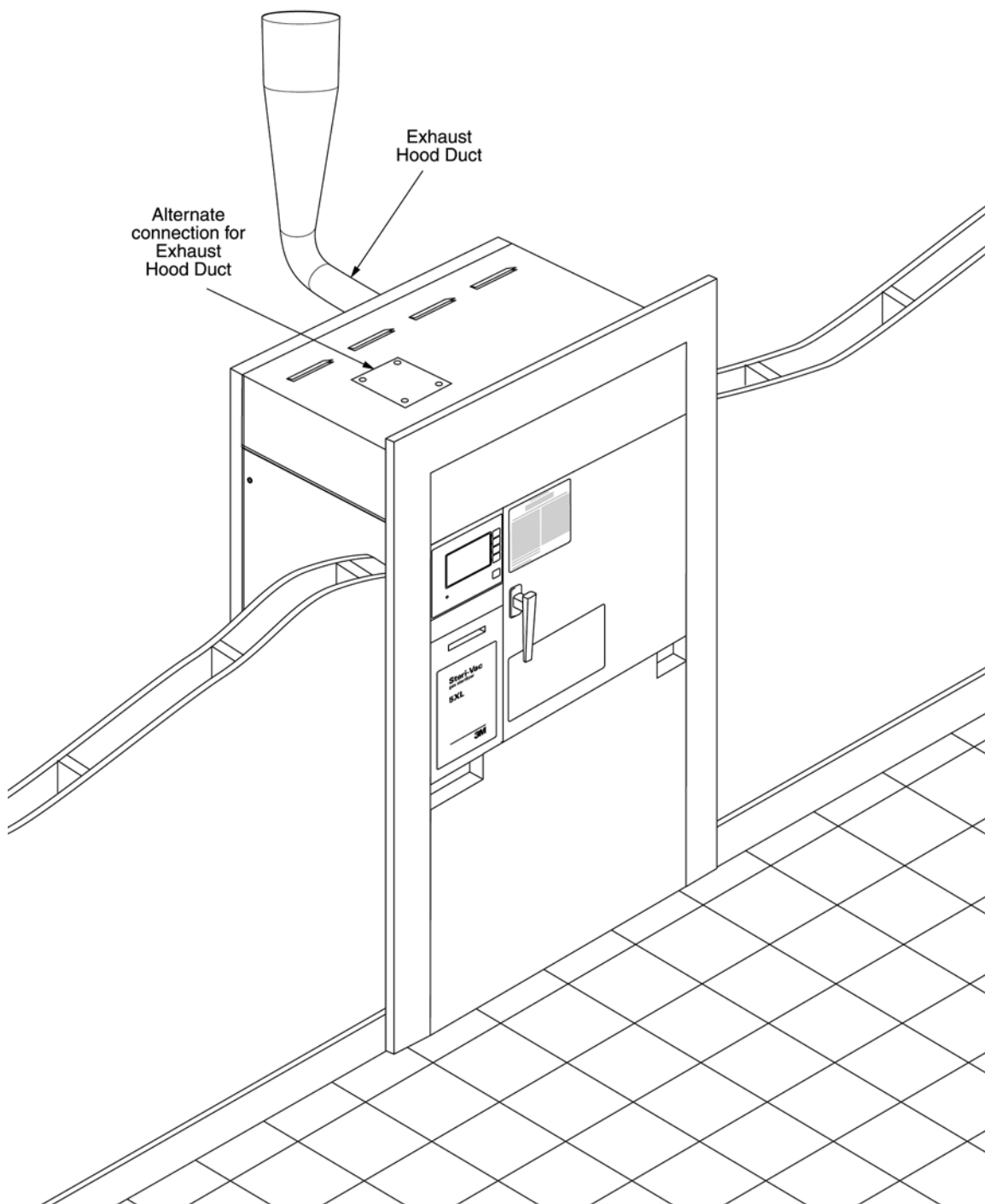


Figure 12. Typical In-wall Installation.

PREPARE THE AREA

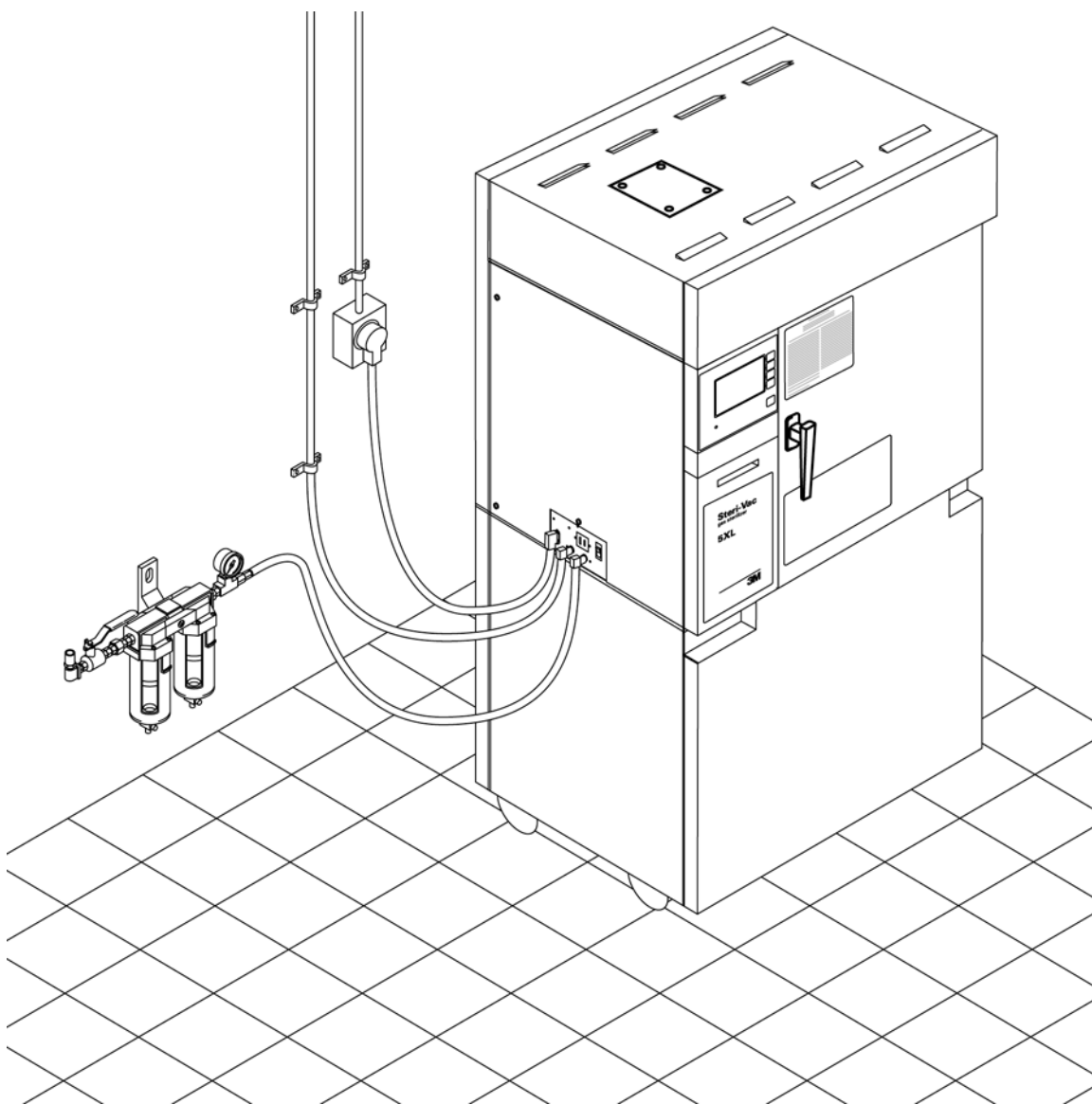


Figure 13. Typical Service Connections.

PREPARE THE AREA

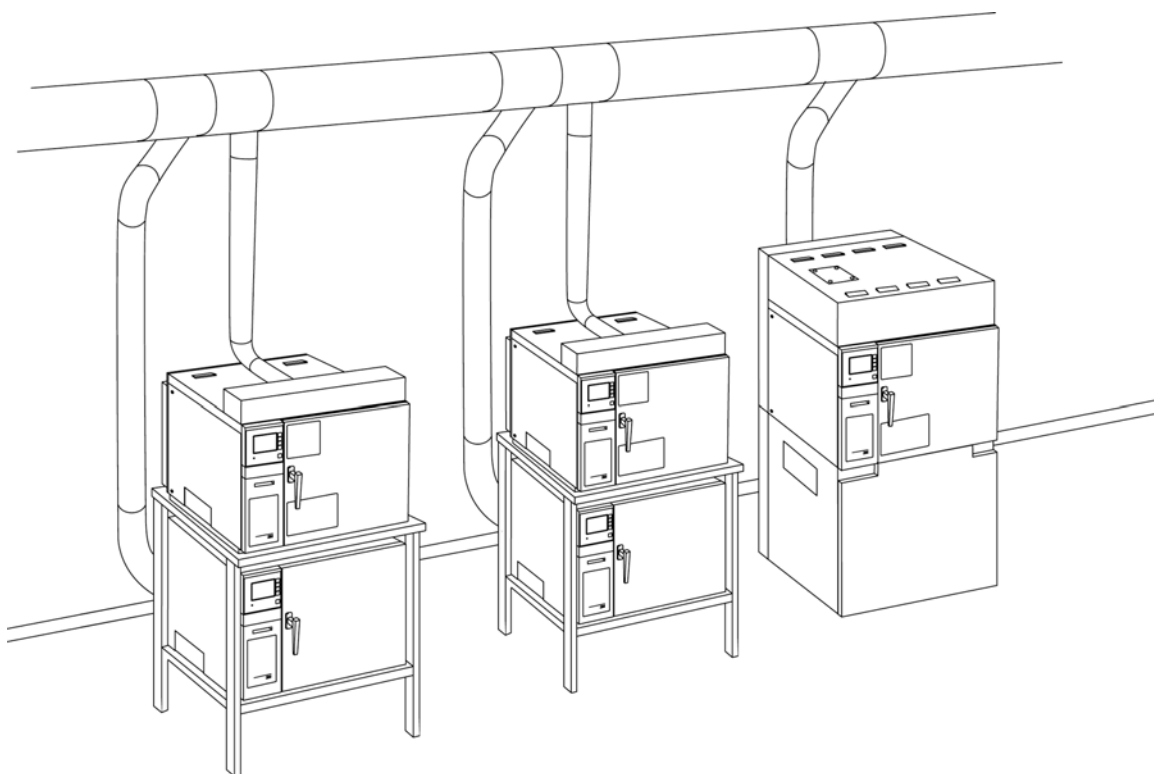


Figure 14. Multiple Hoods and Aerators Vented into a Dedicated Ventilation System.

FINAL INSTALLATION**DANGER**

**Toxic Gas
Hazardous Voltage**

Only qualified service personnel should install and service this equipment. Do not plug the cord into an outlet and operate the sterilizer until a 3M service representative has checked out the installation and provided in-service training for the operators. Costly damage and hazard could result.

Unpacking the Sterilizer

1. Unpack and inspect the sterilizer as follows:
 - a. Remove all shipping material from the sterilizer.
 - b. Examine the sterilizer for damage. If any damage is found, follow the instructions under Shipping Damage, below.
2. Position the machine in its permanent location and level the unit by adjusting the sterilizer feet.

Notice

A minimum of 51 cm (20 in) is required on each side and the top of unit for service access.

Shipping Damage

When the Steri-Vac sterilizer is delivered, inspect it for damage that may have occurred during shipping.

If any shipping damage is found when unpacking the sterilizer, immediately file a damage claim with the transportation company and notify your 3M sales or service representative. Normally, a transportation company assumes liability for shipping damage for a 10-day period starting with the day of delivery. After the 10 days, the purchaser must accept the merchandise as delivered.

System Installation

The System Installation and checkout is conducted by the 3M sterilization system representative and the customer.

Make sure you complete the Customer Checklist (located at the back of this manual) before calling your service representative to review the installation checklist. During this review with you, the service representative will discuss any changes required before the checkout visit.

Contact the service representative by phone when the sterilizer is in place and connected to the required electrical and mechanical services.

FINAL INSTALLATION

System Checkout and In-Service Training

The 3M service representative will schedule the checkout visit to assure that the sterilizer is installed and operating according to 3M specifications. After the checkout, the service representative will:

- ☐ Request the checkout form be signed by authorized personnel.
- ☐ Provide in-service training for personnel on the proper operation of the sterilizer.
- ☐ Provide information on a Steri-Vac Gas Sterilizer/Aerator Operator Certification Program.
- ☐ Provide a completed Customer Service Order that includes the date the warranty takes effect.

Additional Information

The Occupational Safety and Health Administration (OSHA) requires that you monitor your employee exposure to ethylene oxide after sterilizer installation to establish base lines for the Permissible Exposure Level (PEL) of 1 ppm/8-hour TWA and the Excursion Limit (EL) of 5 ppm averaged over a 15-minute sampling period.

Material Safety Data Sheets or additional information on installation, accessories, preventive maintenance agreements, etc., can be obtained by writing or calling the 3M Health Care Service Center.

For Seismic bracing information contact 3M Health Care Service Center.

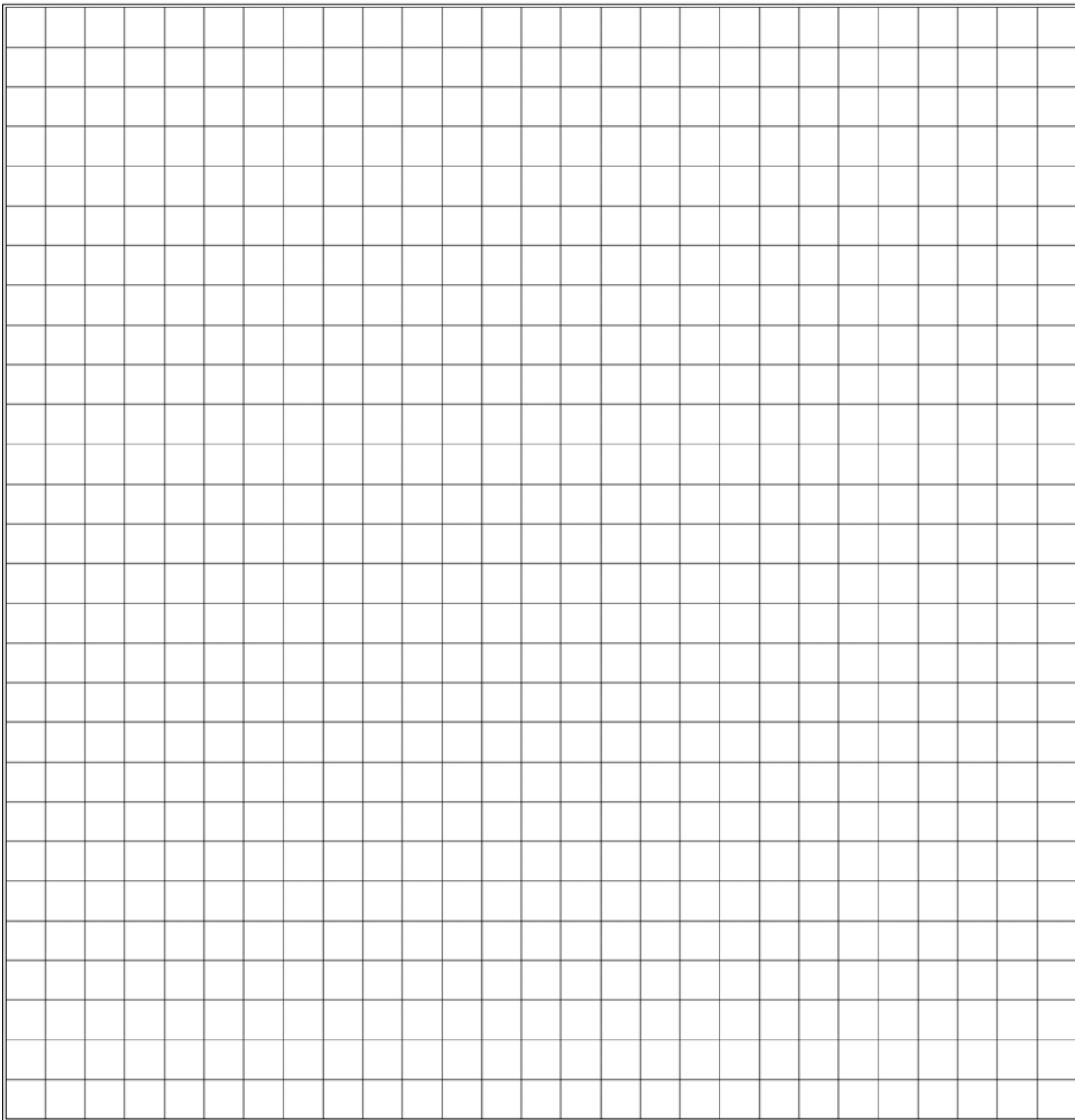
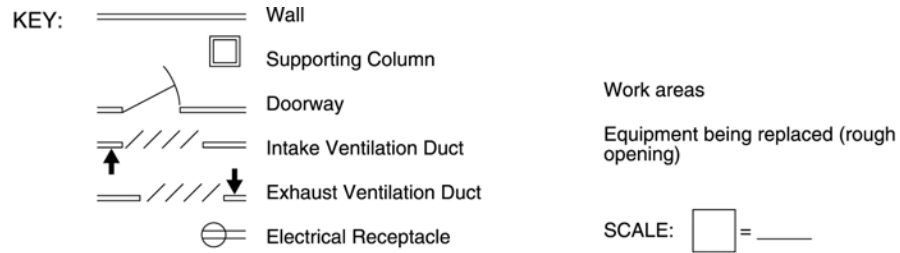
3M Health Care Service Center
Suite 200 Bldg. 502
3350 Granada Ave. N.
Oakdale, MN 55128
800-292-6298

In Canada, contact:

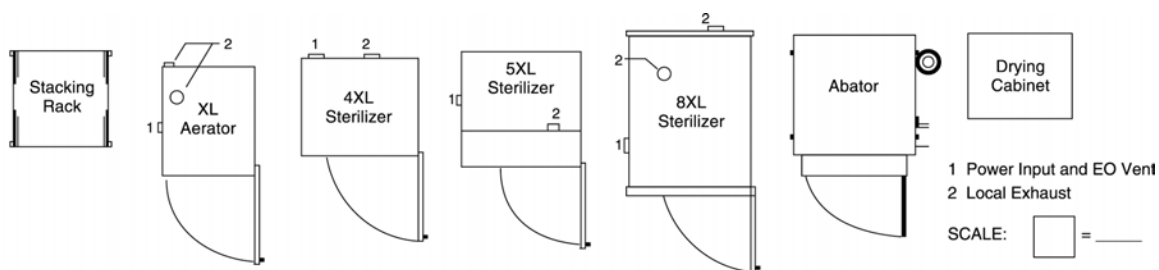
3M Canada, Inc.
P.O. Box 5757
London, Ontario, N6A 4T1
800-268-6235 (English)
800-567-3193 (French)

Outside the United States, contact the local 3M subsidiary.

SITE LAYOUT WORKSHEET



EQUIPMENT LOCATION WORKSHEET

A full-page sheet of white graph paper with a light gray grid. The grid consists of small squares, approximately 1 cm by 1 cm each. There are 20 columns and 20 rows of squares, creating a total area of 400 small squares. The grid lines are thin and evenly spaced.

CUSTOMER CHECKLIST

General

1. Did you obtain all state and local regulations affecting EO? ☐ Yes ☐ No

Electrical Supply

2. What is the supply circuit current rating?
3. Is the minimum supply voltage during peak usage greater than 198 volts? ☐ Yes ☐ No

Venting

4. Does the vent go from the sterilizer to the outside atmosphere directly without being terminated into any existing ductwork, air flow system, or ventilation system? ☐ Yes ☐ No
5. Is the vent line hard drawn copper tube? ☐ Yes ☐ No
6. What is the total length of the vent line?
7. If the answer to the above question is greater than 91 m (300 ft), was the system approved by 3M? ☐ Yes ☐ No
8. What is the outside diameter of the vent line?
9. Does the vent line have a downward bend at end of the run? ☐ Yes ☐ No
10. Is the vent outlet located greater than 7.6 m (25 ft) from any possible sources of ignition or any openings to the building (e.g., doors, fresh air, inlets, unsealed windows)? ☐ Yes ☐ No
11. Is the vent line gas tight? ☐ Yes ☐ No
12. If the vent line extends through the roof:
- a. Is the vent line insulated to protect from freezing (where required)? ☐ Yes ☐ No
- b. How far above the roof does the vent line extend?
- c. Is there a 180° downward bend at the end of the vent line? ☐ Yes ☐ No

Compressed Air Line

13. Does the compressed air source maintain 3.5 kg/cm² (50 psig) and a flow rate of 1.7 liters per second (3.5 scfm)? ☐ Yes ☐ No
14. Is the air supply clean, dry to a dewpoint of 10°C (50°F), and oil free? ☐ Yes ☐ No
15. Are supplied filters installed? ☐ Yes ☐ No
16. Does the air enter into the filter through the port marked IN? ☐ Yes ☐ No
17. Are the filters accessible for maintenance? ☐ Yes ☐ No
18. Is a shutoff installed upstream from the air filter so that air can be turned Off for machine service? ☐ Yes ☐ No

19. Is an air pressure gauge installed between the filters and the air inlet to the sterilizer? ☐ Yes ☐ No

Sterilizer Location

20. Is there 51 cm (20 in) of clearance on both sides and the top of the sterilizer? ☐ Yes ☐ No
21. If clearance is less than specified, can the sterilizer be moved? ☐ Yes ☐ No
22. If the sterilizer is movable, is a braided flexible tubing used for the vent line? ☐ Yes ☐ No
23. Is there a flexible line used on the air service so the sterilizer can be moved without disconnecting that service? ☐ Yes ☐ No
24. Has the unit been installed in an area free of flammable gases and liquids (other than EO)? ☐ Yes ☐ No
25. Does the area have at least 10 air changes per hour? ☐ Yes ☐ No
26. Is the room air flow pattern away from the equipment operator? ☐ Yes ☐ No

Local Exhaust System (only applicable when unit is equipped with local exhaust hood feature)

27. Does the local exhaust system meet the air flow requirements stated in the exhaust ventilation specifications in this document? ☐ Yes ☐ No
28. Does the minimum static pressure meet the exhaust ventilation specifications stated in this document? ☐ Yes ☐ No
29. Is the ductwork material impervious to EO? ☐ Yes ☐ No
30. Is the outside diameter of the ductwork connection for the hood correct for the installed hood? ☐ Yes ☐ No
31. Is the outside exhaust termination located greater than 7.6 m (25 ft) from any openings to the building (e.g., doors, fresh air, inlets, unsealed windows)? ☐ Yes ☐ No
32. Is the exhaust hood blower suitable for continuous operation and protected from adverse weather? ☐ Yes ☐ No

STERI-GAS CARTRIDGE DILUTION CHART

The following tables provide estimates of (1) air concentrations of ethylene oxide (EO) if a 3M Steri-Gas Cartridge empties into a room, and (2) the time needed for a room ventilation system to reduce the EO concentrations to acceptable levels. These charts are based on rooms with 10 air changes/hour (3M specification and JCAHO recommendation).

Steri-Gas Cartridge 4-100

Room volume in cubic ft	Room volume in cubic meters	Room airflow (cfm)	EO gas weight (g)	Room EO concentration (ppm) after spill	Time to reach 0.5 ppm (minutes)
600	17	100	100	3270	53
700	20	117	100	2803	52
800	23	133	100	2452	51
900	25	150	100	2180	50
1000	28	167	100	1962	50
1500	42	250	100	1308	47
2000	57	333	100	981	45
2500	71	417	100	785	44
3000	85	500	100	654	43
3500	99	583	100	561	42
4000	113	667	100	490	41
4500	127	750	100	436	41
5000	142	833	100	392	40
5500	156	917	100	357	39
6000	170	1000	100	327	39
6500	184	1083	100	302	38
7000	198	1167	100	280	38
7500	212	1250	100	262	38
8000	227	1333	100	245	37
8500	241	1417	100	231	37

Steri-Gas Cartridge 8-170

Room volume in cubic ft	Room volume in cubic meters	Room airflow (cfm)	EO gas weight (g)	Room EO concentration (ppm) after spill	Time to reach 0.5 ppm (minutes)
600	17	100	170	5559	56
700	20	117	170	4765	55
800	23	133	170	4169	54
900	25	150	170	3706	53
1000	28	167	170	3335	53
1500	42	250	170	2224	50
2000	57	333	170	1668	49
2500	71	417	170	1334	47
3000	85	500	170	1112	46
3500	99	583	170	953	45
4000	113	667	170	834	45
4500	127	750	170	741	44
5000	142	833	170	667	43
5500	156	917	170	606	43
6000	170	1000	170	556	42
6500	184	1083	170	513	42
7000	198	1167	170	476	41
7500	212	1250	170	445	41
8000	227	1333	170	417	40
8500	241	1417	170	392	40

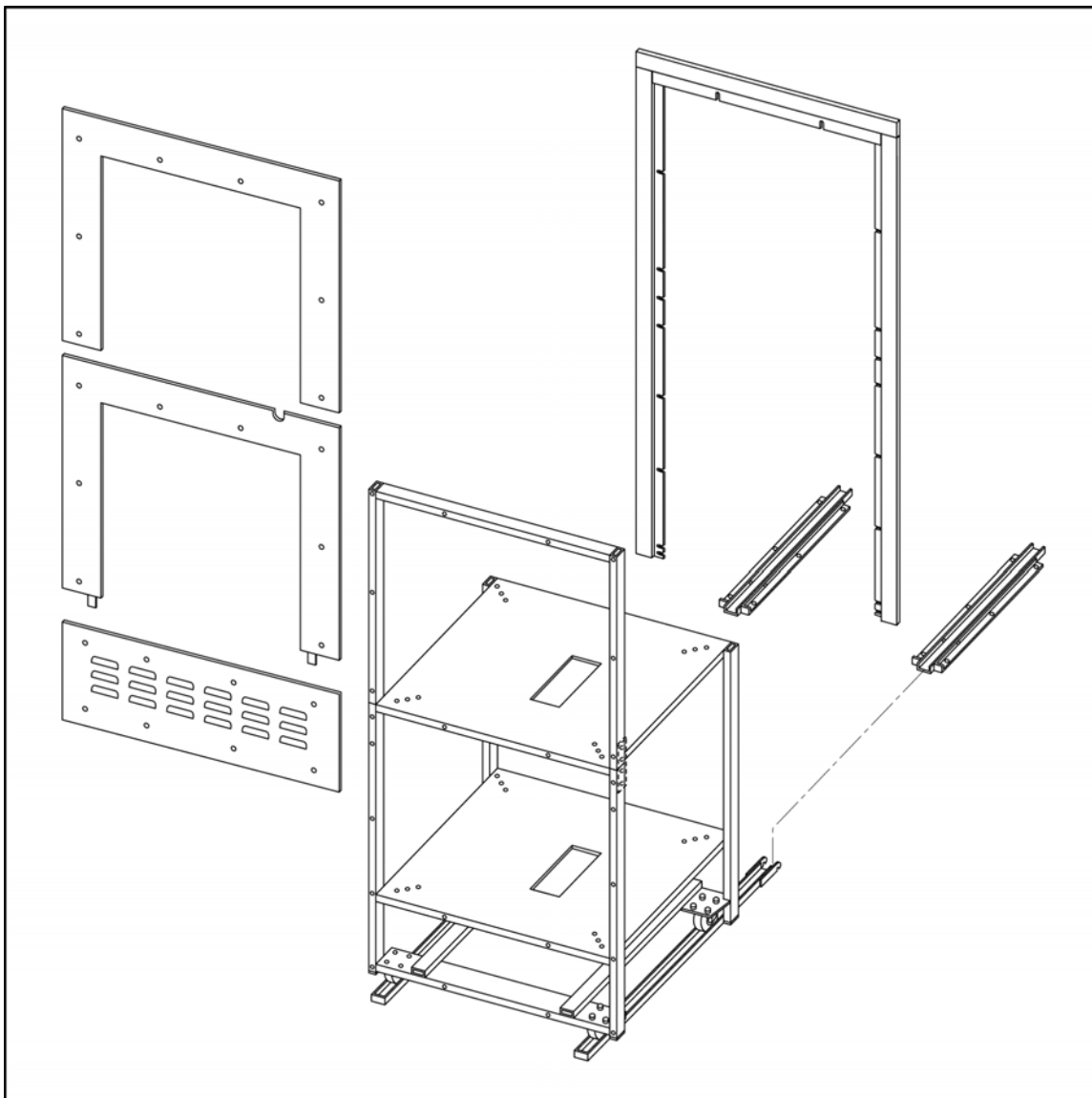
$\text{spill-ppm} = [(\text{gas weight in mg}) / (\text{room volume in cu m})] * [(1 \text{ ppm} / (1.80 \text{ mg/cu m}))]$

$\text{cfm} = (\text{room volume in cu ft}) * (10 \text{ changes/hr}) / (60 \text{ min/hr})$

$\text{time} = [\log_{10}(0.5 \text{ ppm} / \text{spill-ppm})] * [(-2.303) * (\text{room volume in cu m}) / (\text{cfm})]$

MODEL 1238 IN-WALL MOUNTING UNIT

Installation Guide



MODEL 1238 IN-WALL MOUNTING UNIT**Installation of the 3M Model 1238 In-Wall Mounting Unit****A. General Information.**

The 3M Model 1238 in-wall mounting unit accommodates two 3M Steri-Vac™ 5XL or two 4XL Ethylene Oxide Gas Sterilizers or one sterilizer and one aeration cabinet. A stainless wall bezel and front trim for flush mount installation are also included.

To begin the installation process first remove the rack from its shipping carton. Be sure to check for any shipping damage and report any damage immediately to the shipping company.

Remove the feet from the bottom of the rack and install the casters supplied using the 5/16 x 1 inch bolts, nuts and washers.

Turn the rack over so it is sitting on its casters and locate the upper frame and joining tabs. Attach the joining tabs to the upper frame with the 5/16 x 1 inch bolts. Remove two of the plastic caps from the front of the rack and install the upper frame as shown in installation print 2.

B. Finished Installation.

1. Installation print No. 1 gives an idea of what the completed installation will look like. The Steri-Vac 5XL ethylene oxide gas sterilizer is shown on the top shelf and the Steri-Vac XL aeration cabinet is on the bottom.
2. Refer to print No. 11 for optional pass through in-wall installation.

C. General Specifications.**1. The Access Area.**

The space into which the Model 1238 in-wall mounting unit is placed is referred to as the "access area". This area will need to be well ventilated for a number of reasons.

- a. In order to maintain an ambient temperature of NOT GREATER than 37°C (99°F). Higher ambient temperatures may cause an elevation of the COOL CYCLE temperature in Steri-Vac sterilizers or cool cycle aborts.

- b. In order to prevent any build up of ethylene oxide vapor if a leak should occur.
2. A finished wall opening, meeting the following specifications, will be required.
 - a. The finished wall opening must meet the following dimensions:

Height: 77 in. + 1/2 in. -0

Width: 42 in. + 1/2 in. -0

Depth: minimum of 42 in.
 - b. Finished walls must be plumb.
 - c. If a side wall is in front of the sterilizer there must be a distance of 20 in. between such a wall and the Model 1238 mounting unit to allow for service access when the unit is rolled out of the access area.
3. Floor Preparation.
 - a. The floor finish in the area housing the unit must be the same height (i.e. on the same plane) as the work area in front of the unit. This is required for ease of movement of the unit for service and repair.
 - b. This floor finish area should be:

Width: 42 in. minimum

Depth: 42 in. minimum
 - c. If possible, the floor should be flat and level.
4. The sterilizer and aerator cabinet must be available for fitting onto the unit at the time of installation, since some adjustment may be necessary when attaching the front panels.

D. Components.

The major components of the Model 1238 mounting unit are depicted in installation print No. 2. Check the unit to make sure that all components are present, and that no damage has occurred in shipment.

MODEL 1238 IN-WALL MOUNTING UNIT

E. Installing Permanent Floor Channels (Installation print No. 5)

1. Template.
 - a. A blueprint marked "TEMPLATE, Model 1238" is included with the Model 1238 mounting unit.
 - b. Lay the TEMPLATE in the access area with the front aligned with the front wall of the DOOR FRAME. If the TEMPLATE does not fit properly, check the DOOR FRAME width for uniformity, top-to bottom, and shim as needed.
 - c. Tape the TEMPLATE down, being careful to obtain as much surface contact of the TEMPLATE to the floor as possible.
 - d. Mark and drill at least four (4) holes per FLOOR CHANNEL.
 - e. Remove the TEMPLATE.
Anchor the FLOOR CHANNELS to the floor using suitable concrete anchors. Do not over tighten the bolts at this time, as it may be necessary to adjust the FLOOR CHANNELS late in the installation.
 - f. Attach the STOP BRACKET as illustrated in Installation Print No. 10. Temporarily adjust the STOP BRACKET to its farthest rear position. It will be readjusted later in the installation.

G. Placement of Sterilizers Onto the Rack.

1. Roll the RACK onto the permanently mounted FLOOR CHANNELS.
2. Attach the EXTENSION TRACKS to the FLOOR CHANNELS.
3. Roll the RACK forward onto the EXTENSION channels as illustrated in installation print No. 6.

4. Attach the ADJUSTABLE NYLON FEET to the bottom rear of both the Sterilizer and Aerator. There should be approximately one inch (1") of the NYLON FEET protruding below the base of each unit.
5. Position the Sterilizer onto the top tray of RACK. Position the 3/4" SPACERS under the front of the sterilizer as illustrated in installation print No. 7. CAUTION: Due to the weight of the sterilizer, this procedure will normally require at least three individuals. Use caution when positioning the 3/4" SPACERS so as not to pinch hands between the Sterilizer and the top tray of the RACK.
6. Secure Sterilizer to the top tray by means of the 5/16" x 1 1/2 BOLTS provided.
7. Using the 3/4" SPACERS, follow the same procedure for mounting the aerator to the bottom tray of the RACK. Observe the same precautions.
8. Adjustments. The front plane of both Sterilizer and Aerator must be approximately parallel with the front plane of the RACK. If adjustments are needed, use the ADJUSTABLE NYLON FEET for this purpose.

H. Access Area Illustration.

Installation print No. 8 is a generalized drawing of the service connections at the rear of the installation. As indicated earlier, flexible lines will be required between the sterilizers and the stationary services. The connections need not be made until completion of the installation.

MODEL 1238 IN-WALL MOUNTING UNIT**I. Installation of Stainless Panels.
(See Installation print No. 9)**

1. Remove the protective adhesive-backed paper from the PANELS prior to installation. During installation, use care so as not to scratch the stainless steel surfaces.
2. Beginning with the TOP PANEL, attach the top and lower PANELS to the RACK by means of the Phillips-head STAINLESS SCREWS. Leave all of the screws loose at this time.
3. Do not attempt to install the LOUVERED PANEL at this time.
4. Slide the left and right door frames in behind the stainless steel panels and tighten the screws.
5. Slide the top door frame in behind the top stainless panel. Align the door frames and tighten all of the panel screws. Install the nut and washer on either end of the top door frame.
6. Locate the adhesive backed foam and place it around the back side of the door frame at the outer edge. Installation print No. 4.
7. Gently roll the RACK back into the access area until the DOOR FRAME meets the wall.

**J. STOP and HOOK Adjustment
(See Installation print No. 10)**

1. The purpose of the STOP is to keep RACK/STAINLESS PANELS from damaging the flange on the DOOR FRAME when returning the unit to the access area after service and maintenance.
2. Remove the STOP from the right FLOOR CHANNEL. Apply a liberal coating of petroleum jelly to both the bottom of the STOP and the floor area beneath the STOP.
3. Reattach the STOP loosely to the FLOOR CHANNEL, this time its forward-most position.

4. Gently roll the unit back into the access area until contact is barely made between the STAINLESS PANELS and the flange on the DOOR FRAME.
5. Carefully roll the unit forward again and tighten the STOP. Be careful not to move it forward or rearward in the process.
6. The purpose of the HOOK is to keep the unit from rolling forward as operators open and close Sterilizer doors.
7. Attach the HOOK on the bracket on the lower left corner of the RACK. Attach the shoulder bolt and three washers on the outside of the left FLOOR CHANNEL (refer to Installation print No. 2).
8. With the unit tight against the STOP, adjust the HOOK so that firm contact is made between the HOOK and SHOULDER BOLT (refer to Installation print No. 10).
9. Tighten the nut on the shaft of the HOOK to maintain the HOOK position.

K. Flexible Connections.

1. Connect all electro-mechanical services to the Sterilizers. (Compressed air, vent line, exhaust hood and electrical.)
2. Observe all flexible connections while rolling the unit back into the access area. Make sure that none of these lines fall down into the FLOOR CHANNELS where they might become damaged by the wheels on the RACK.

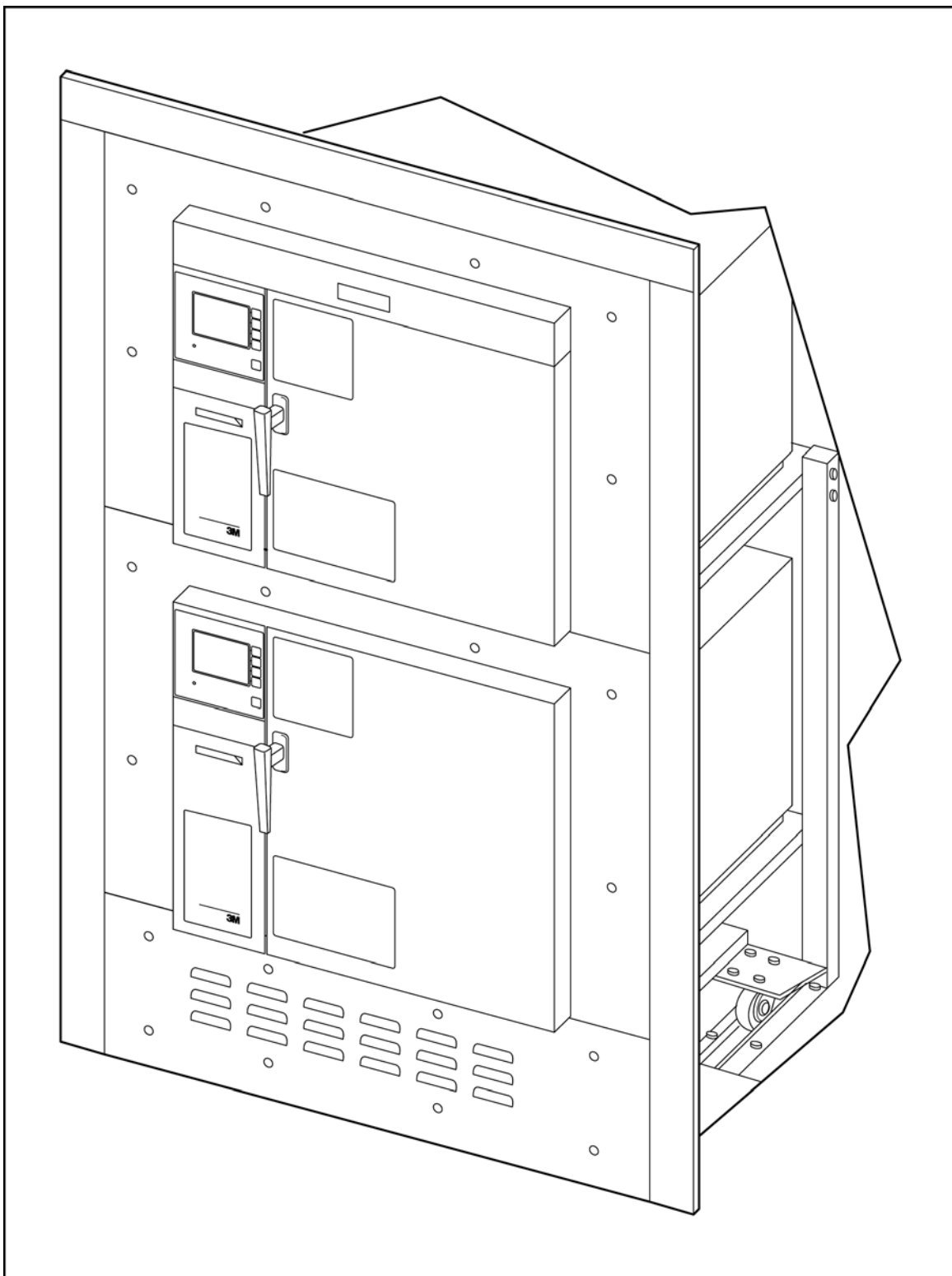
**L. Installing LOUVERED PANEL.
(See Installation print No. 12)**

1. Roll the unit back into the access area and secure the HOOK.
2. Remove the EXTENSION TRACKS and store them beneath the unit.
3. Attach the LOUVERED PANEL.
4. The installation is now complete.

Stacking Rack

Model 1238

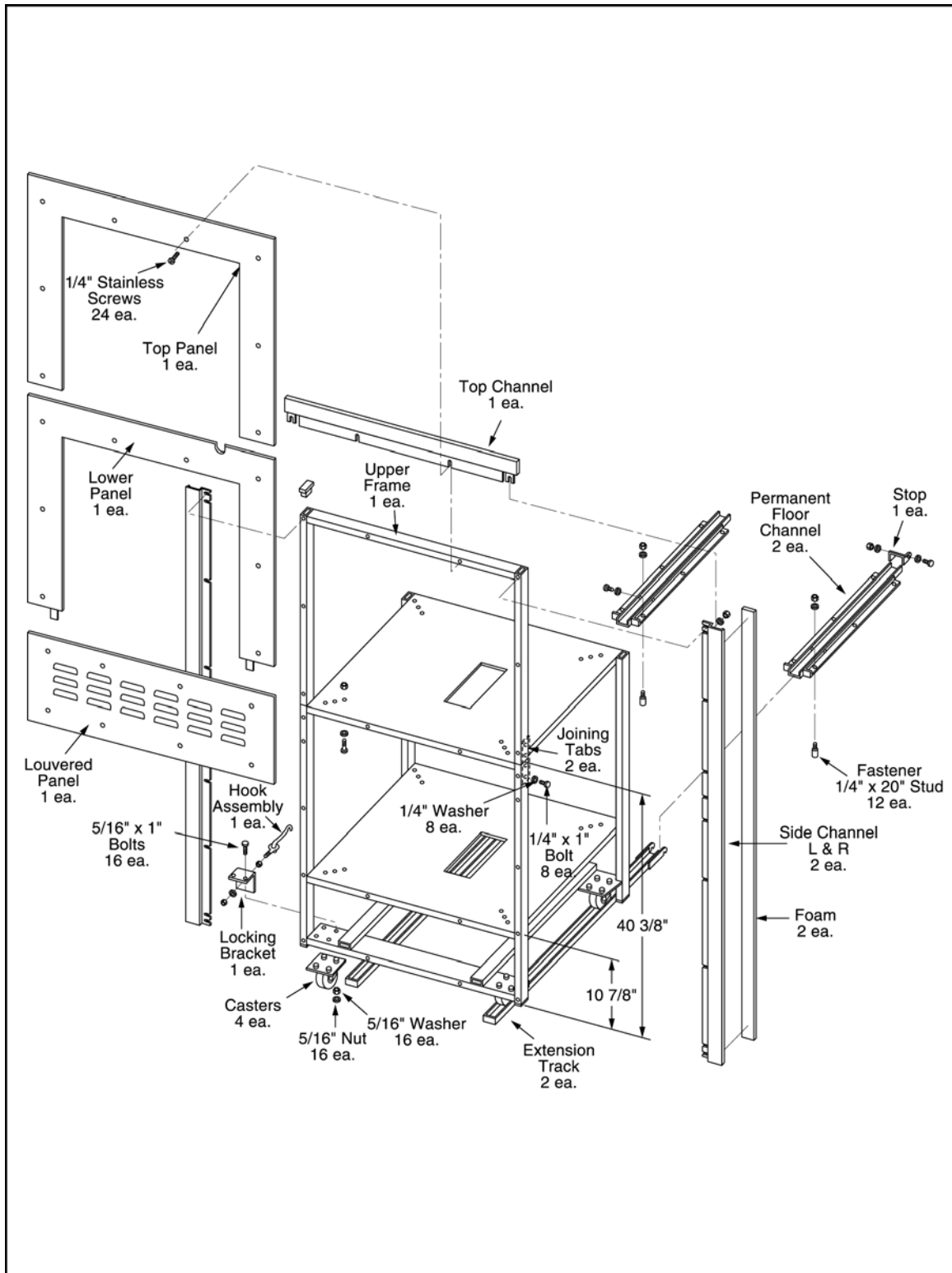
Installation print No. 1



Illustrated Parts List

Model 1238

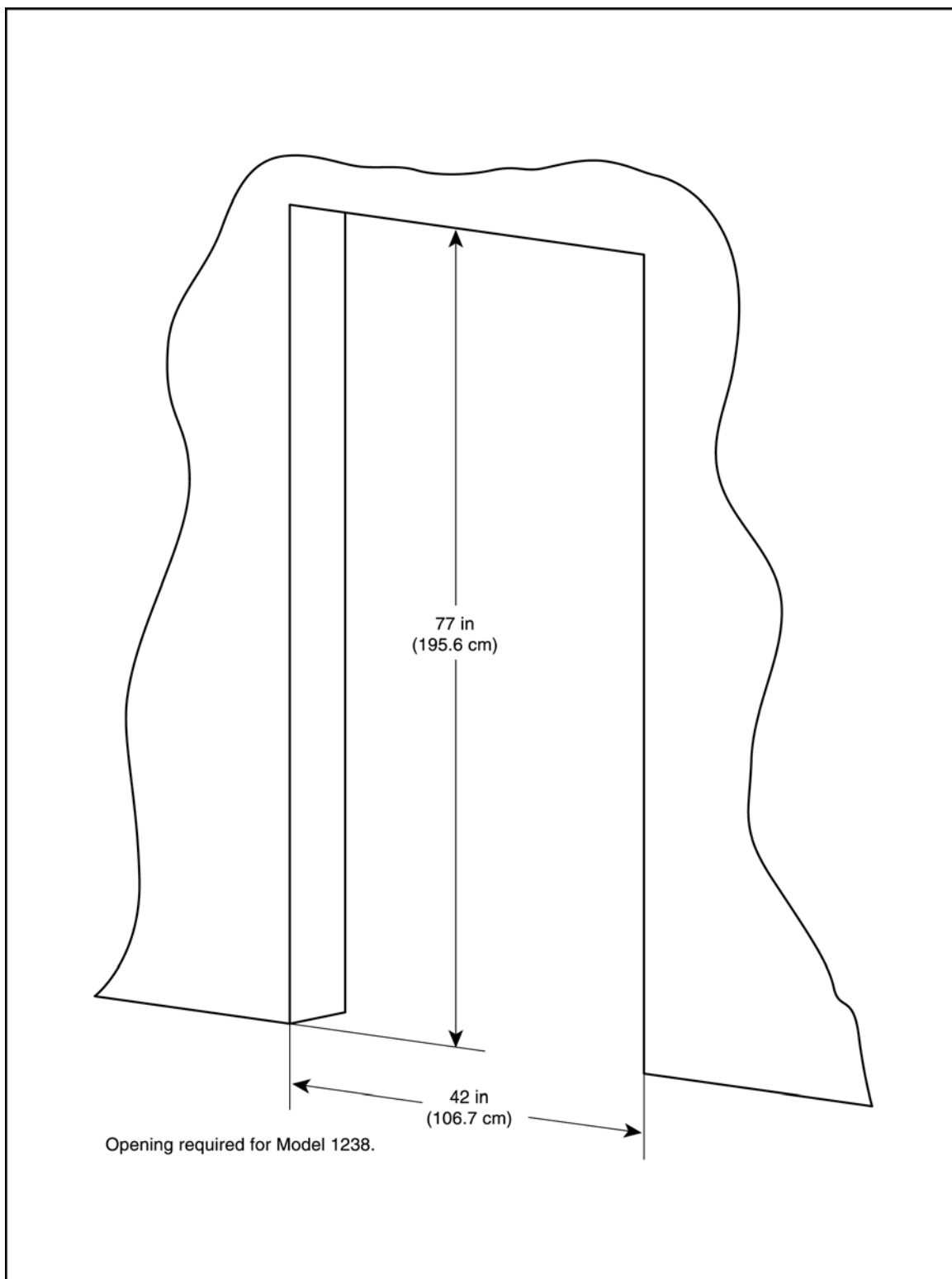
Installation print No. 2



Door Frame Opening

Model 1238

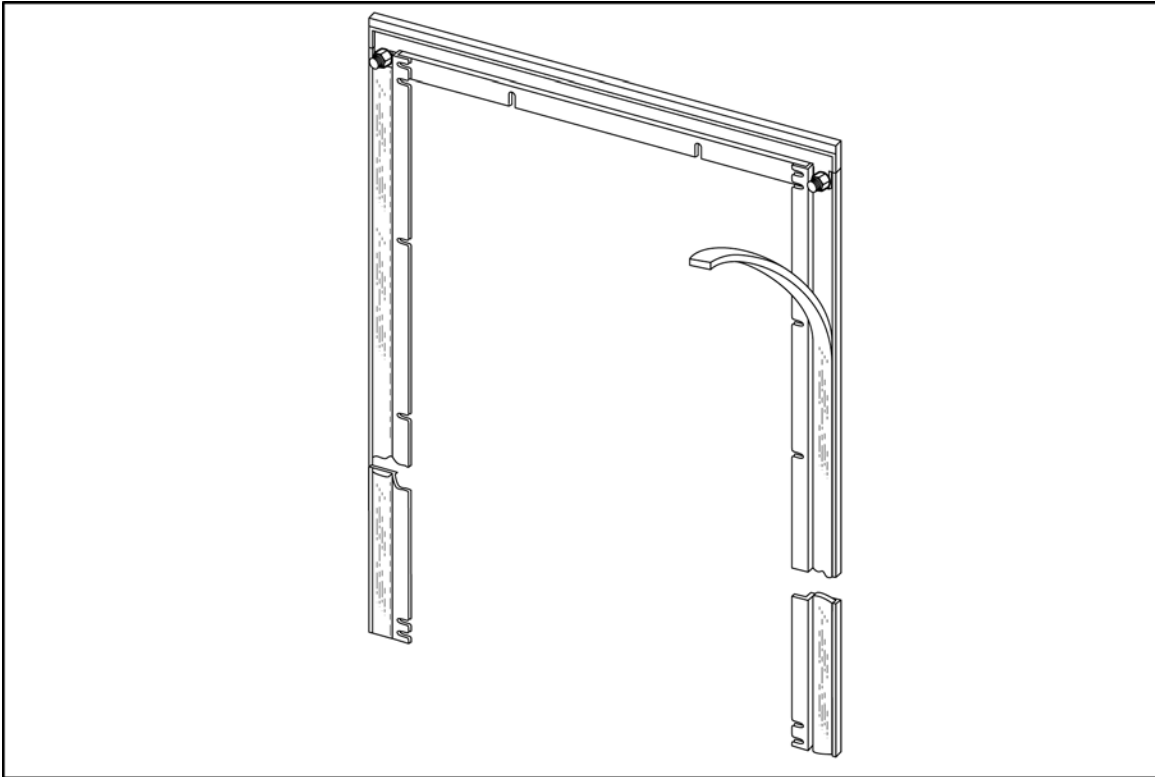
Installation print No. 3



Mounting Door Frame In-Wall

Model 1238

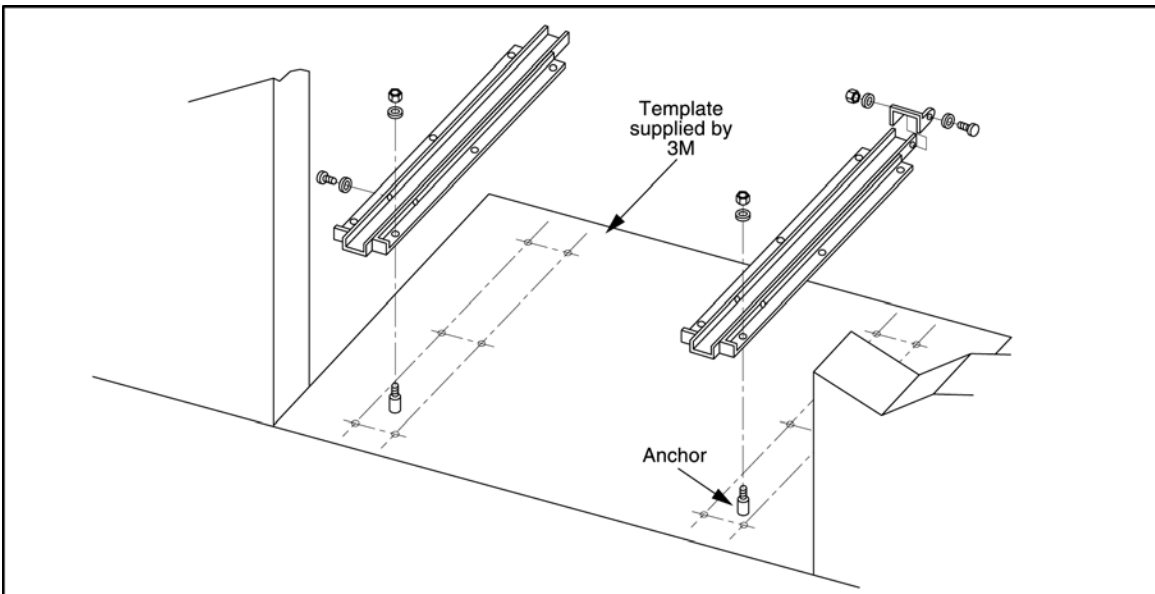
Installation print No. 4



Fastening Permanent Tracks

Model 1238

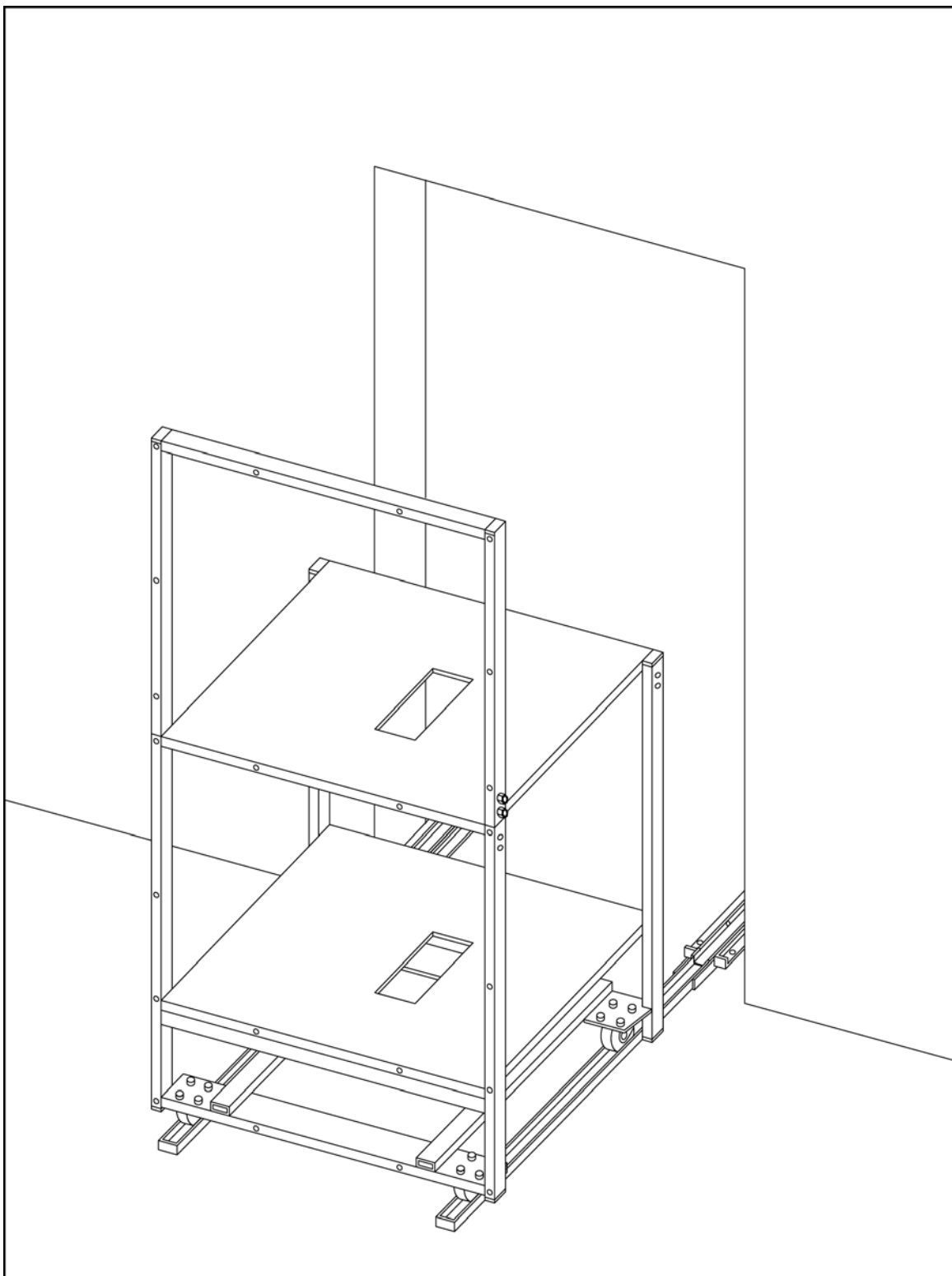
Installation print No. 5



Mounting Extension Tracks and Cart

Model 1238

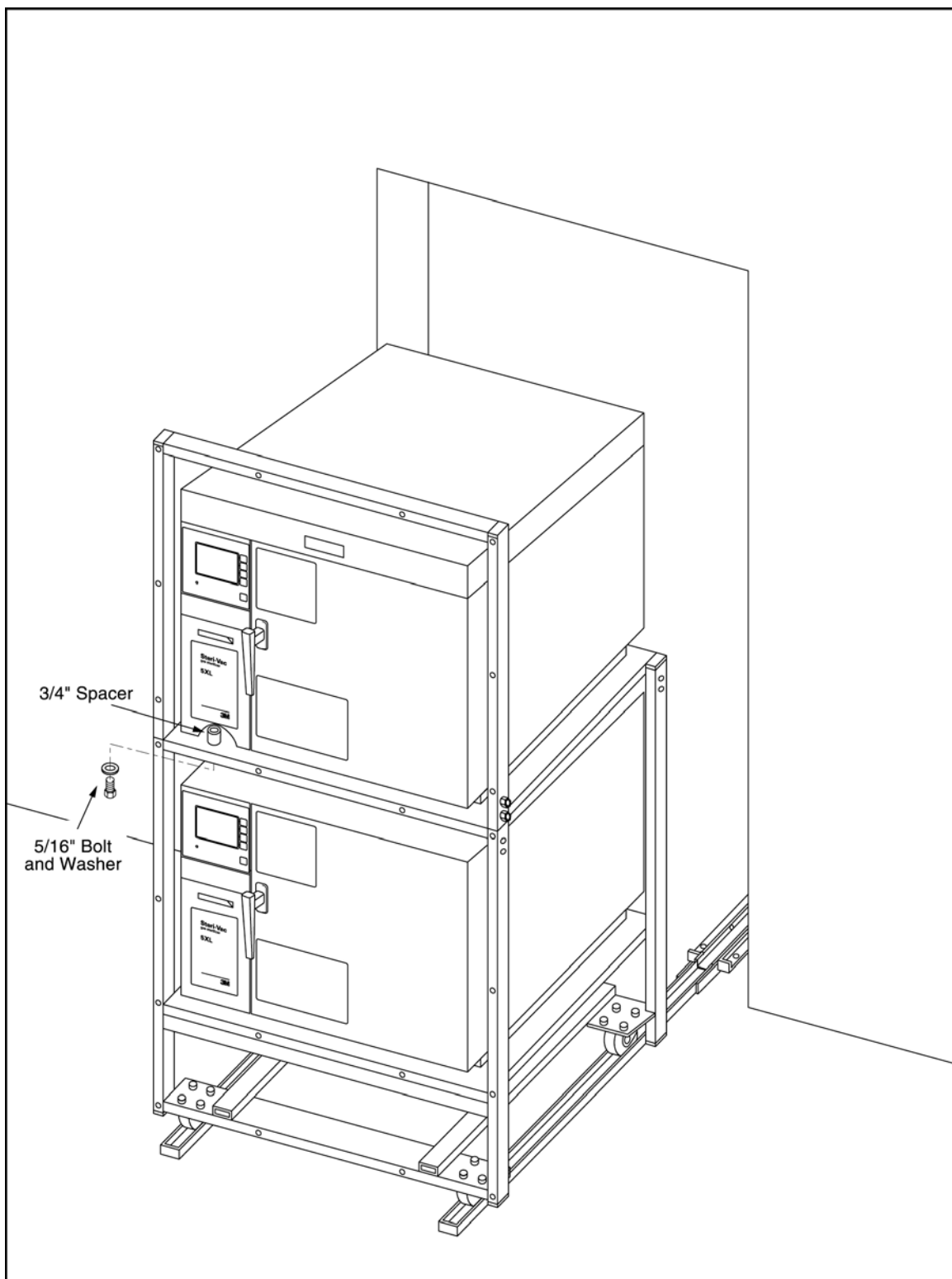
Installation print No. 6



Mounting Units to Cart

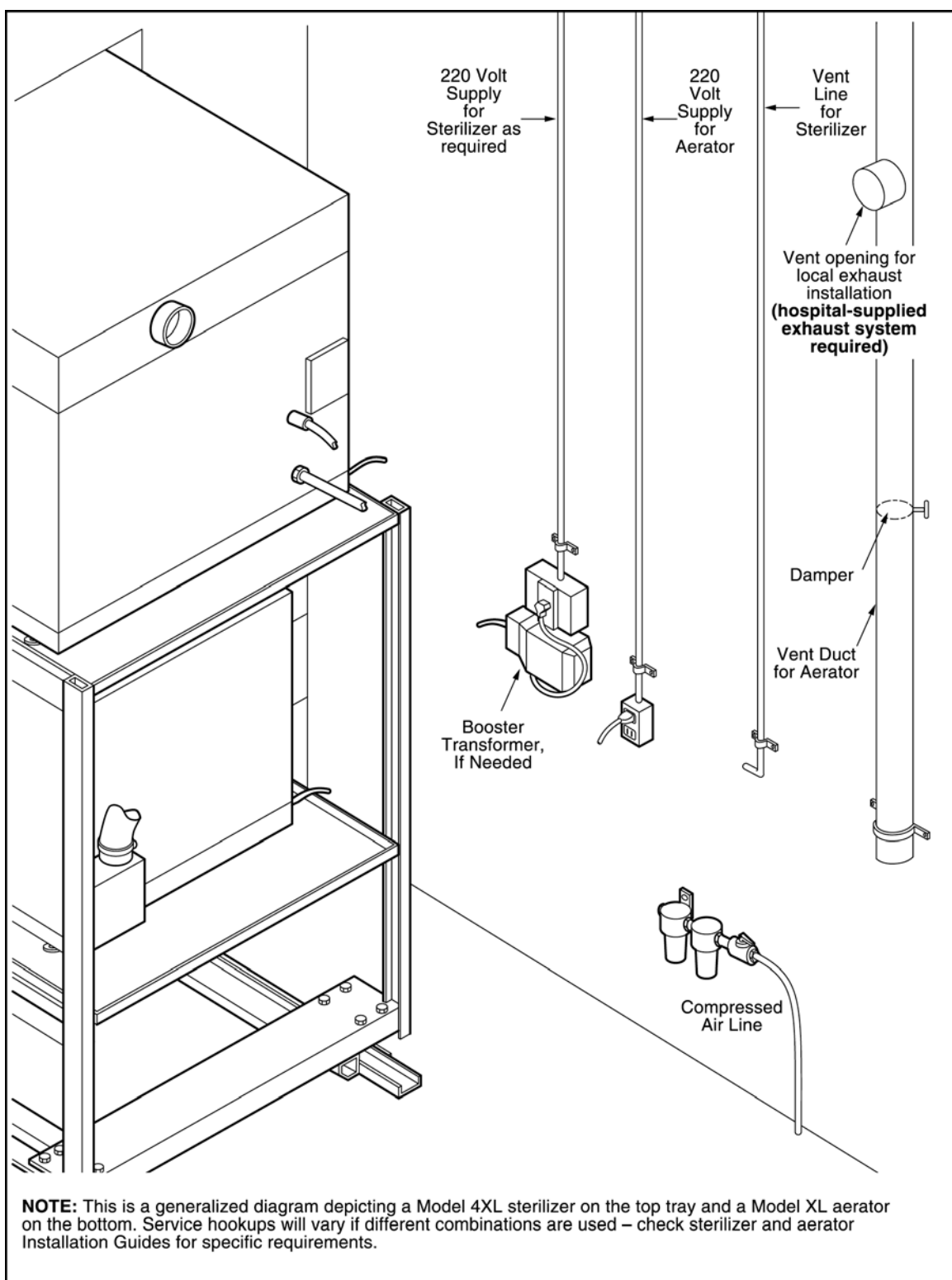
Model 1238

Installation print No. 7



Rear Hookups of Model 1238 Units

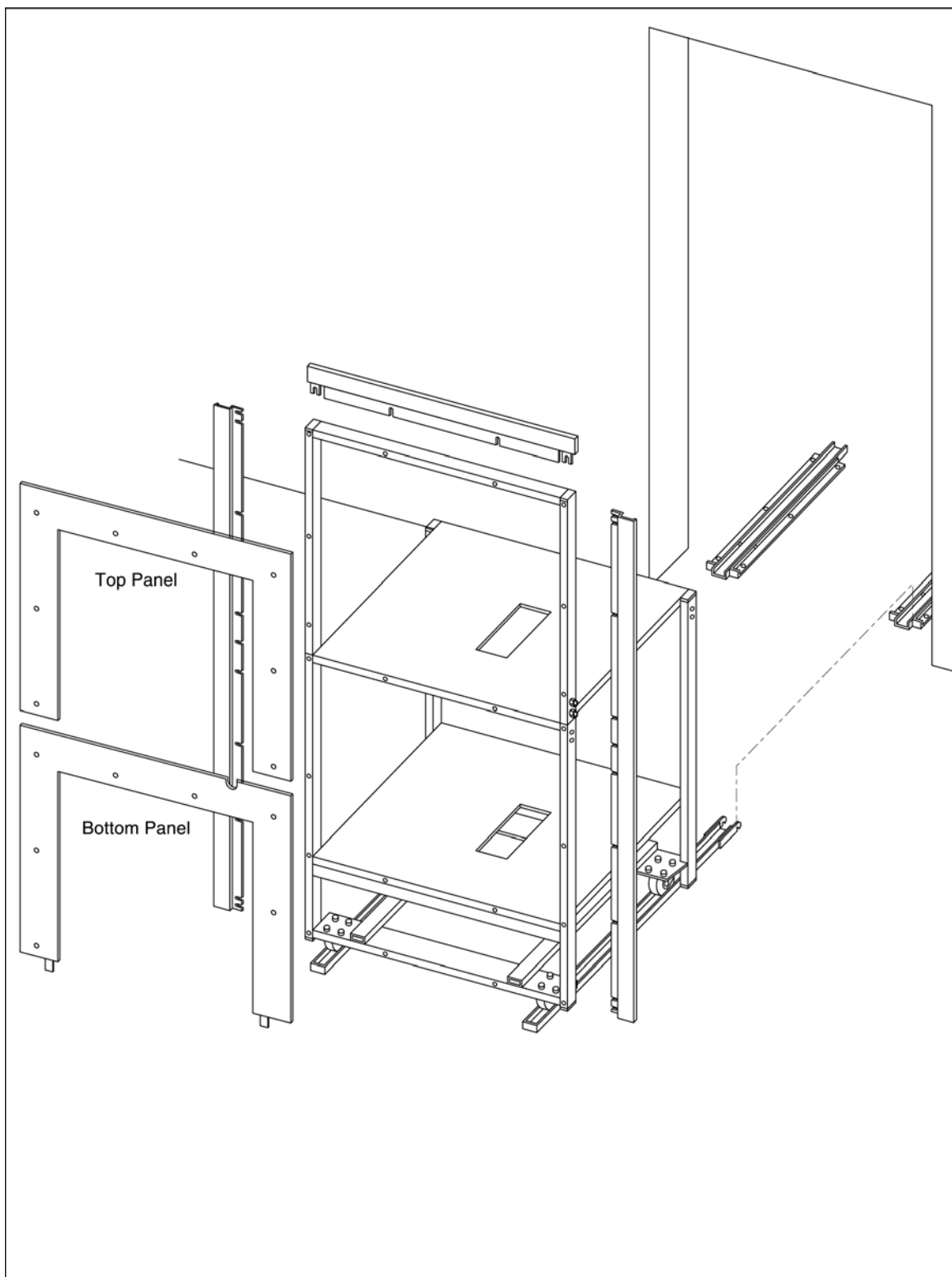
Installation print No. 8



Mounting Top Two Panels

Model 1238

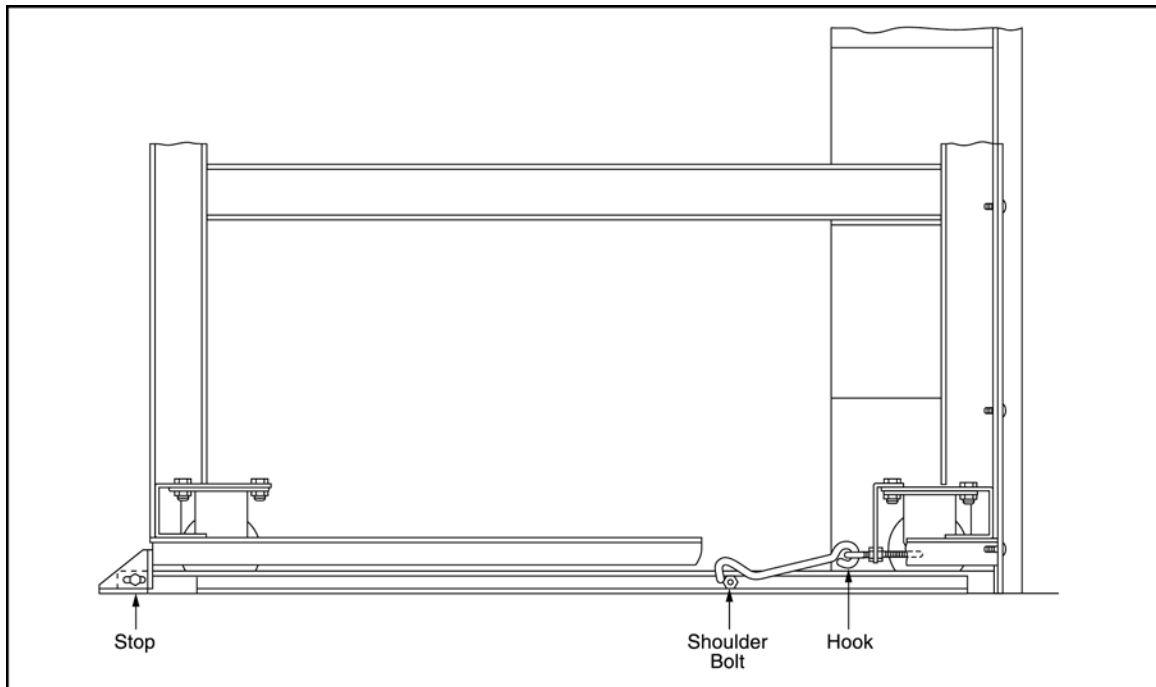
Installation print No. 9



Stop and Hook Adjustment

Model 1238

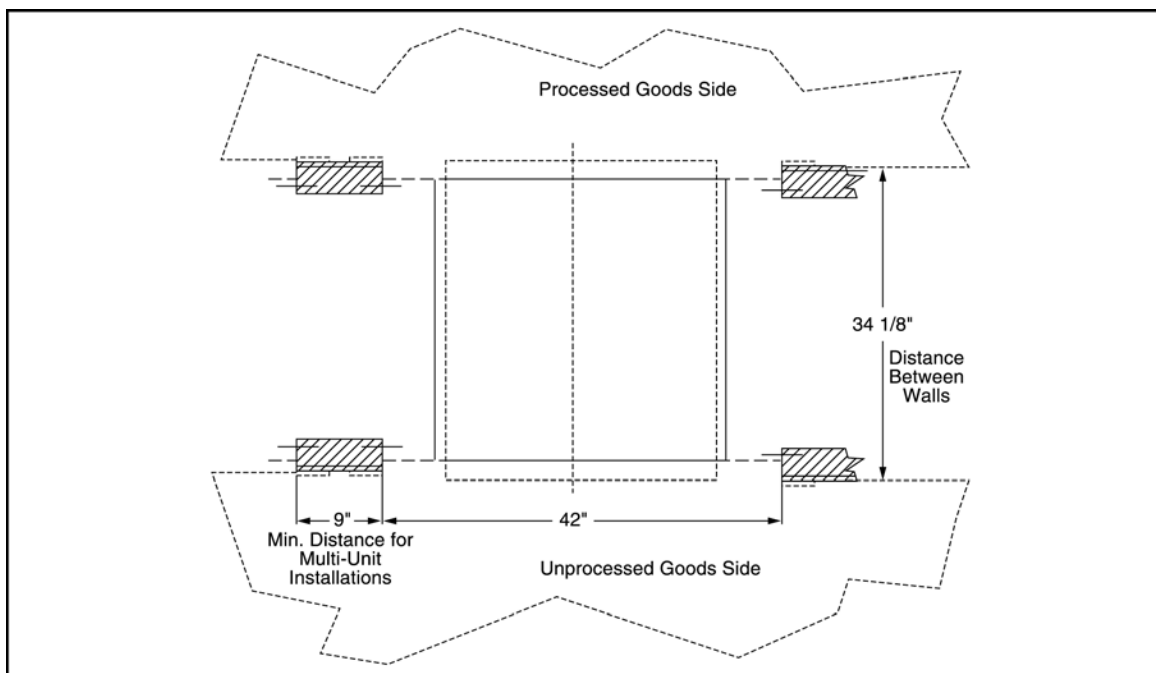
Installation print No. 10



Pass Through Sterilizer Installation

Model 1238 5XL

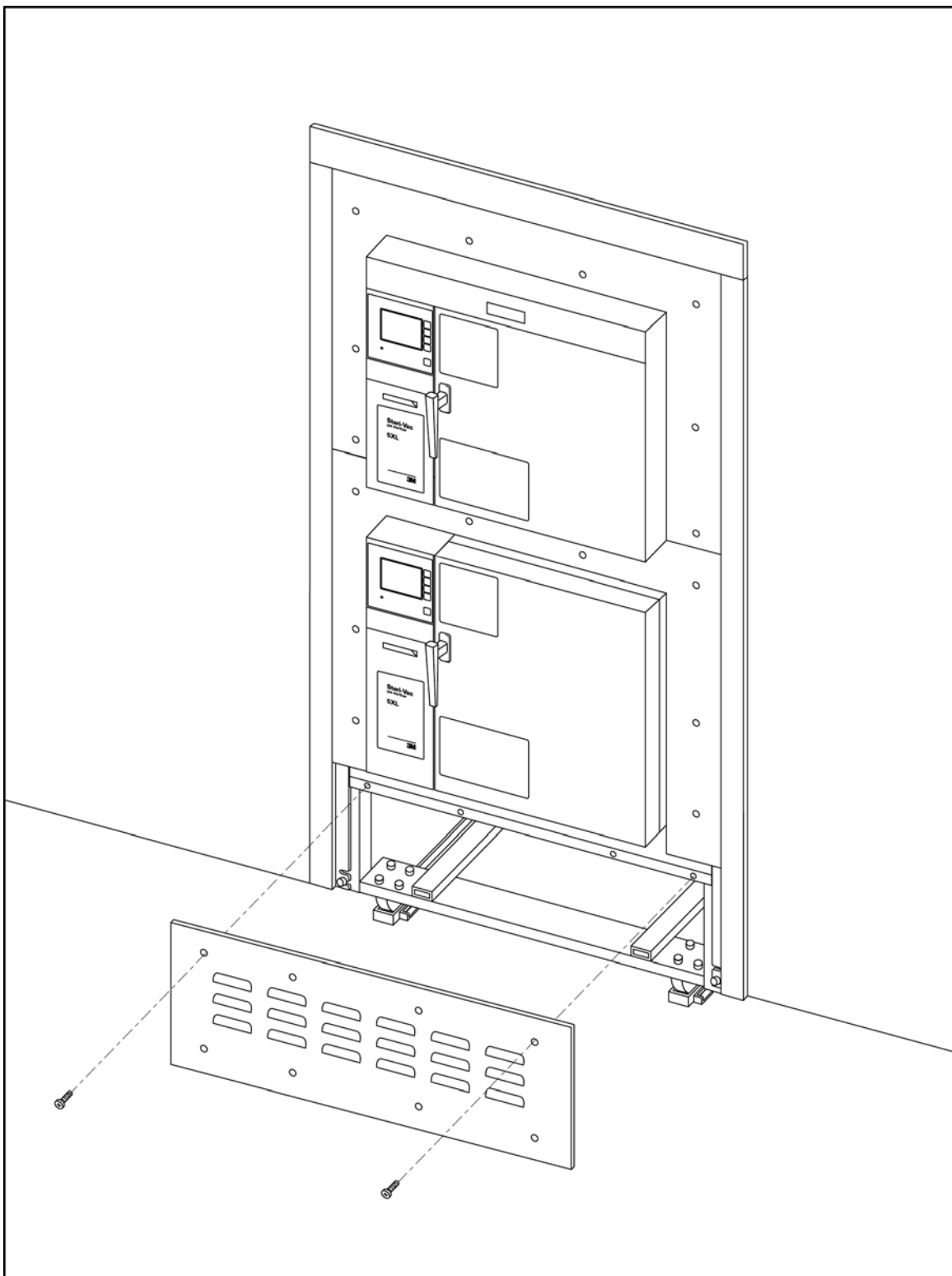
Installation print No. 11



Remove Extensions Mount Bottom Panel

Model 1238

Installation print No. 12



NOTES



Health Care
3M Center,
Building 275-4E-01
St. Paul, MN 55144-1000
1-800-228-3957

3M Canada Inc.
P.O. Box 5757
London, Ontario,
Canada, N6A4T1
1-800-563-2921

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