

DEH-41474 Installation and Maintenance Manual

# AKD-20 AR / Entellisys AR Exhaust Plenum System





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
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
# General Information


## Hazard Classifications

The following important highlighted information appears throughout this document to warn of potential hazards or to call attention to information that clarifies a procedure.

Carefully read all instructions and become familiar with the devices before trying to install, operate, service or maintain this equipment.

 **DANGER:** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING:** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **CAUTION:** Indicates that if the hazard is not avoided could result in minor or moderate injury.

**NOTICE:** Is used to notify of practices not related to personal injury.

## Trademarks

Entellisys\*

EntelliGuard\* G

EntelliGuard\* E

EntelliGuard\* TU

Arc Vault\* Protection System

## Warranty

This document is based on information available at the time of its publication. While efforts have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance. Features may be described herein that are not present in all hardware and software systems. GE Industrial Solutions assumes no obligation of notice to holders of this document with respect to changes subsequently made. GE Industrial Solutions makes no representation or warranty, expressed, implied, or statutory, with respect to, and assumes no responsibility for the accuracy, completeness, sufficiency, or usefulness of the information contained herein. No warranties of merchantability or fitness for purpose shall apply.

Contact your local sales office if further information is required concerning any aspect of AKD-20 AR or Entellisys AR switchgear and EntelliGuard G or EntelliGuard E breaker operation or maintenance.

# Section 1. Introduction

## General Information

**NOTICE:** These instructions convey information that pertain to both AKD-20 AR and Entellisys AR low-voltage switchgear products. Information that is applicable only to AKD-20 AR will be marked as (AKD-20 AR Only) and information that is applicable to Entellisys AR will be marked as (Entellisys AR Only). Unless marked otherwise, information provided in this document is applicable to both products.

**NOTICE:** These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with the installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purposes, the matter should be referred to the General Electric Company. These instructions are intended for use by qualified personnel only.

This manual contains procedures for receiving, handling, storage and installation, of the exhaust plenum system for AKD-20 AR and Entellisys AR low-voltage switchgear.

**NOTICE:** The personnel responsible for installing, operating, and servicing this equipment should be thoroughly familiar with the contents of this manual.

Before any installation work is performed, thoroughly read and understand the material in this instruction manual and the drawings furnished with the equipment. The documentation shipped with the equipment includes the Summary, Front View, Elementary Diagram, Connection Diagram and Instruction Books. This material is located in a forward compartment tagged "INSTRUCTIONS IN THIS COMPARTMENT." The documentation provides all of the information necessary for installation of the switchgear. When requesting information from the General Electric Company, include the complete data appearing on the equipment nameplate, requisition number, summary number, and elementary diagram number. The nameplate is located in the lower left, front corner of the lineup.

When requesting information concerning any specific item furnished with the switchgear, refer to that item by description, part number, its location within this manual, and any applicable drawing number. Any material external to the equipment, which may be required to meet local codes (such as mats, screens, railings, etc.), is not furnished by the General Electric Company.

If there are any questions or requirements not covered in this manual or in the accompanying drawings, please contact the local sales office of the General Electric Company.

## Instruction Manual Arrangement

Information and procedures in this instruction manual are divided into sections as follows:

### Section 1, Introduction

Gives a brief account of the equipment's function and provides for general information, and applicable data for the equipment and its components.

### Section 2, Receiving, Handling, and Storage

Describes procedures required for receiving the exhaust plenum components and how to prepare it for short- or long-term storage.

### Section 3, Switchgear Description

Describes the AKD-20 AR and Entellisys AR low-voltage switchgear and its various components. Detailed information of the equipment internal components and their function can be found in manual DEH-41473. This section highlights the location of the exhaust plenum system as it relates to the equipment and its location on top of the equipment.

### Section 4, Exhaust Plenum Installation

Describes the procedure for installing the exhaust plenum across the top of the switchgear and provides details for assembly of the end of the plenum exhaust system.

### Section 5, Exhaust Plenum Accessories and Kits

Outlines a listing of common accessory and kit items available from the factory.

### Appendix A, Torque Values

Contains information concerning screw and bolt torque values, and details of the exhaust plenum system components.

### Appendix B, Exhaust Plenum Details

Describes the exhaust plenum system components available and provides dimensional summary of these components.

### Appendix C, Notes

An area of open space reserved for taking notes.

## Related Publications

Addendum's to this instruction manual are the available service and maintenance publications supplied separately for circuit breakers, relays and other devices not described in this instruction manual.

In addition to instruction manuals, the following drawings will be supplied as required for each order of AKD-20 AR and Entellisys AR switchgear equipment.

These are all the documents necessary to install, operate, and maintain the equipment. One complete set of drawings and instruction manuals is shipped with the equipment.

### General Arrangement Drawings

Drawings which Include front view and floor plan details.

### Elementary and Connection Drawings

Drawings (or wiring routing tables) which indicate and identify test and connection points including terminal blocks, device studs, switch contact developments, and remote connections.

### Summary of Switchgear Equipment

Documents which list of all the components furnished with the switchgear, including the breakers, identified by catalog number.

**Figure 1.1 AKD-20 AR low-voltage switchgear**



## Section 2. Receiving and Storage

### Receiving

#### Equipment Packaging

Every package leaving the factory is plainly marked with the case number, requisition number, and customer's order number. If the equipment has been split for shipment, the section numbers of the equipment enclosed in each shipping package are identified.

**NOTICE:** To avoid the loss of any parts when unpacking, the contents of each container should be carefully checked against the packing list before discarding the packing material.

The contents of each shipping package are listed on the Master Packing List. In addition, this list includes the number of the shipping crate in which miscellaneous parts needed to install and operate the equipment (such as hardware, contact lubricant, touch-up paint, breaker closing devices, etc.) are located. Normally, such devices are packed in a cardboard carton and the carton secured in an empty switchgear compartment (Figure 2.1). If such items are packed in a switchgear section instead of a separate crate, the list will indicate the appropriate section number in which they are stored. Large items (such as breaker lifting devices and dollies used with indoor equipment) will always be shipped in separate crates or cartons (Figure 2.2).

#### Inspecting for Damage

All equipment leaving the factory is carefully inspected and packed by personnel experienced in the proper handling and packing of electrical equipment. Upon receipt of any equipment, immediately perform a visual inspection to ascertain if any damage has been sustained in shipping or if there are any loose parts.

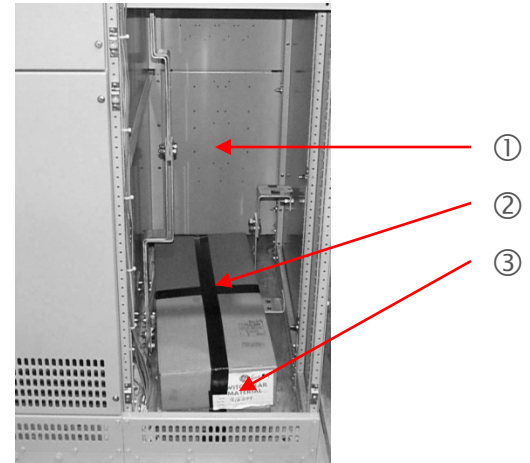
Circuit breakers may be shipped separately in individual containers with the breaker in the open position. Circuit breakers should be unpacked and visually inspected for damage or loose parts as soon as possible after they have been received.

Be sure to inspect all devices mounted or packed inside compartments of each section to see if any have been dislodged or damaged.

#### Filing a Claim

If any damage is evident, or indication of rough handling is visible, file a claim for damage at once with the transportation company and notify the nearest General Electric Company Sales Office immediately. Information on damaged parts, part number, case number, requisition number, etc., should accompany the claim.

Figure 2.1 Packaging of loose material for shipment



- (1) Spare Compartment
- (2) Carton Containing Loose Material
- (3) Shipping Label Listing Contents of Carton

Figure 2.2 Carton containing exhaust plenum components



## Storage

### Exhaust Plenum Components

If it is necessary to store the exhaust plenum system for any length of time, the following precautions should be taken to prevent corrosion or deterioration.

1. Remove protective covering. Check thoroughly for damage.
2. Store in a clean, dry, rodent-free location with moderate temperature and provide coverings to prevent dirt, water, or other foreign substances from entering the individual components.

## Section 3. Switchgear Description

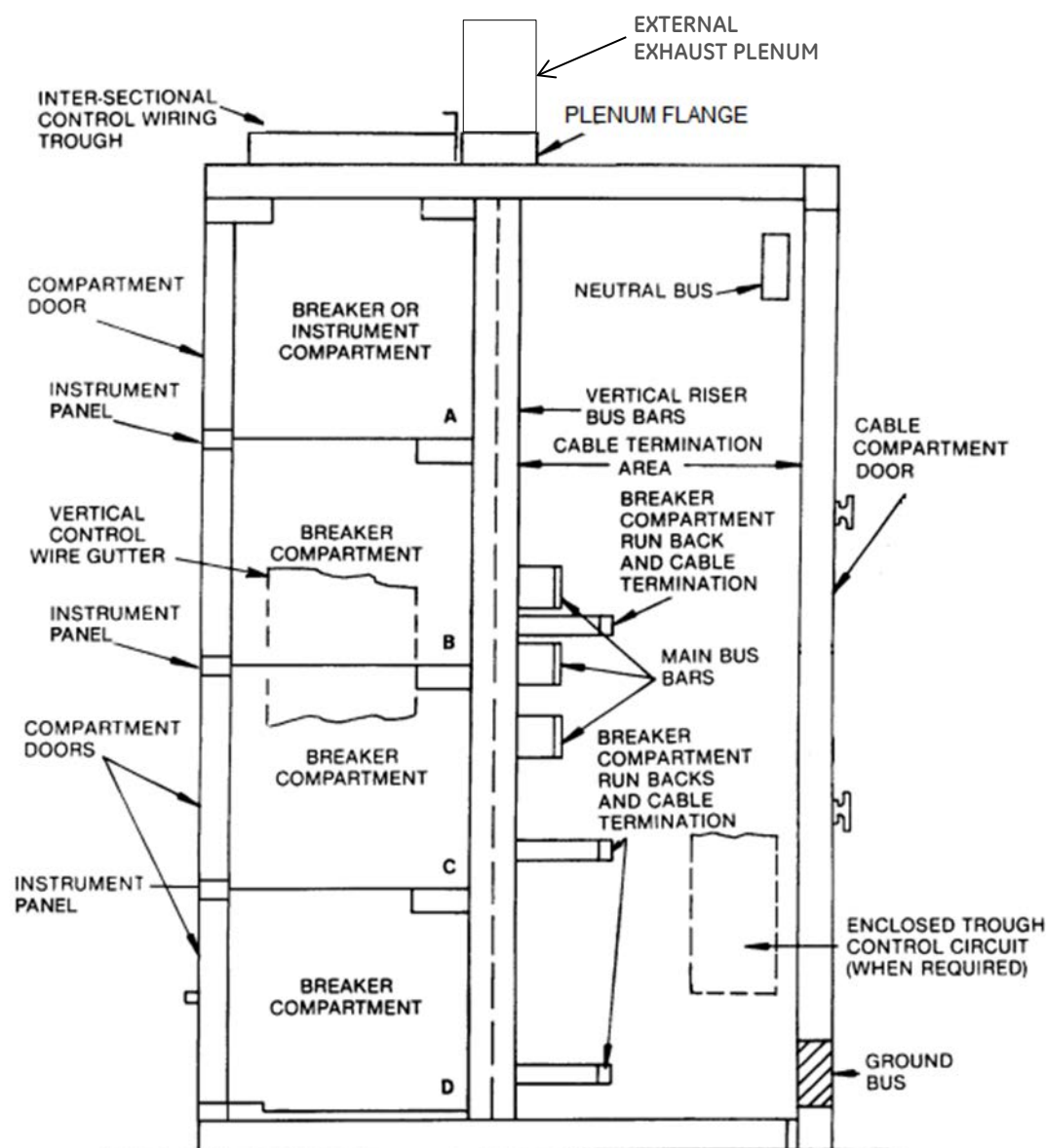
### General

This section contains a description of the General Electric low-voltage switchgear. It also describes the functions of the electrical and mechanical systems.

Figure 3.1 is a side view of a typical section showing compartmentation.

Compartmentation is identical for Entellisys AR equipment with the exception that an Entellisys Messenger is provided in lieu of an Instrument Panel for each breaker compartment.

Figure 3.1 Side view section of AKD-20 AR low-voltage switchgear





## Summary Description

General Electric low-voltage switchgear is a freestanding assembly of metal-enclosed sections containing low-voltage power circuit breakers, bus bars, cable termination provisions, auxiliary power circuit protective devices, controls, and instrumentation.

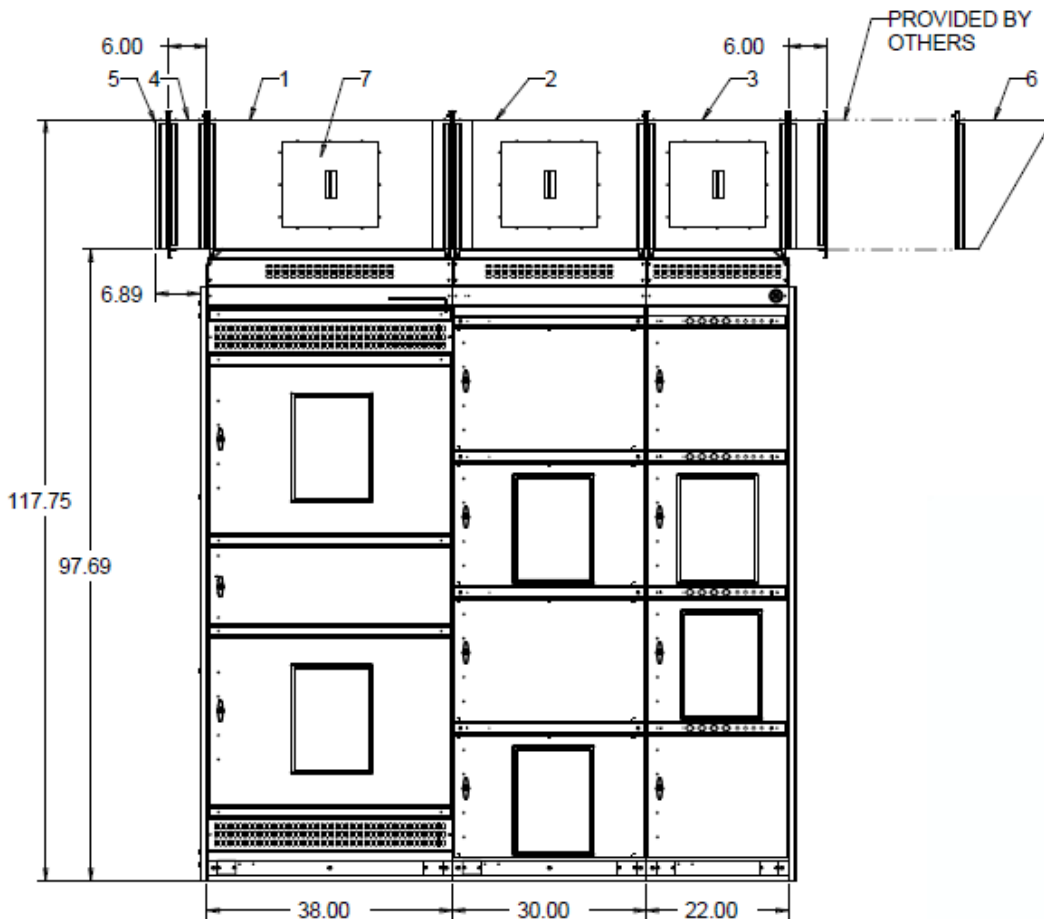
All of the primary circuit switching and protective devices, secondary control and metering devices, control fuses, instrument transformers, and instrumentation are mounted in the enclosure.

The minimum ceiling space required for an assembly of arc resistant low-voltage switchgear is 10 feet from the base of the assembly.

The breaker compartments include draw-out rails, stationary breaker contacts, interlocks, and necessary control and indicating devices. The breakers are provided with self-aligning primary and secondary disconnecting contacts, breaker locking mechanism, and integral trip unit. The individual sections, compartments, and devices are described in the following paragraphs. Figure 3.2 and Figure 3.3 provide an outline of a typical single-ended load center illustrating the nomenclature used for all equipment.

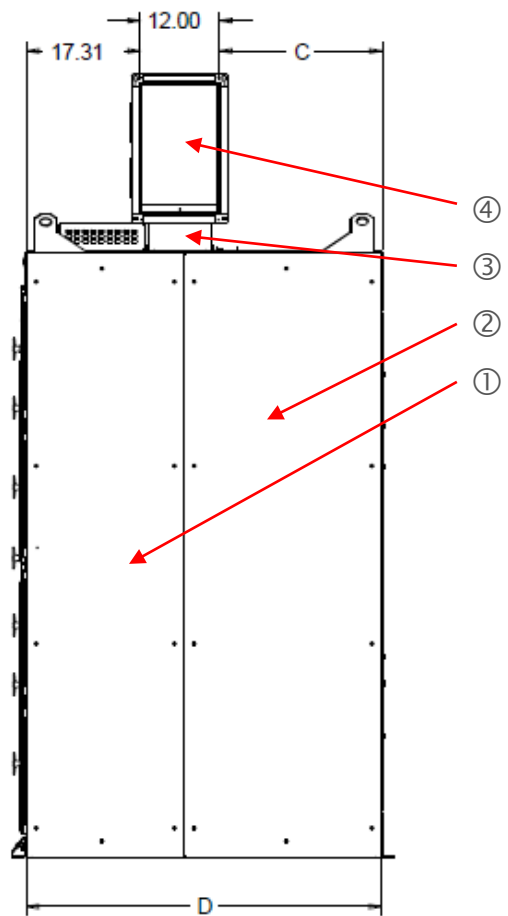
Refer to manual DEH-41473 for additional information.

**Figure 3.2 Outline of typical arc resistant low-voltage switchgear (front view)**



- (1) Exhaust Plenum Section, 38" Stack
- (2) Exhaust Plenum Section, 30" Stack
- (3) Exhaust Plenum Section, 22" Stack
- (4) Transition Adaptor Section (Typical)
- (5) End Cap
- (6) Exhaust Plenum End Portal
- (7) Exhaust Plenum Access Cover (Typical)

**Figure 3.3 Outline of typical arc resistant low-voltage switchgear (side view)**



- (1) Front Compartments & Breaker Compartments
- (2) Bus and Cable Compartment
- (3) Plenum Flange
- (4) Exhaust Plenum System

**Table 3.1 Arc resistant low-voltage switchgear assembly depths**

Dimension	Depth (inches)			
C	24.74	30.74	37.74	44.74
D	54	60	67	74

## Section 4. Exhaust Plenum Installation

### General

The exhaust plenum system (Figure 4.1) is a metallic duct that is attached to the plenum flange located on the top of the switchgear. The exhaust plenum will run across the entire length of the equipment and is attached to a plenum flange for each individual section (Figure 4.2).

**NOTICE:** The minimum unobstructed ceiling height from the base of the switchgear is 10 feet to install the exhaust plenum system.

The exhaust plenum duct is shipped separately for installation at the customer's site.

The instructions here pertain to how the exhaust plenum system is installed on top of the switchgear and requirements for the end duct installation. Refer to the customer's specification/construction drawings for routing, installation and requirements for the exhaust plenum system between the end flange on the equipment and the end exhaust portal.

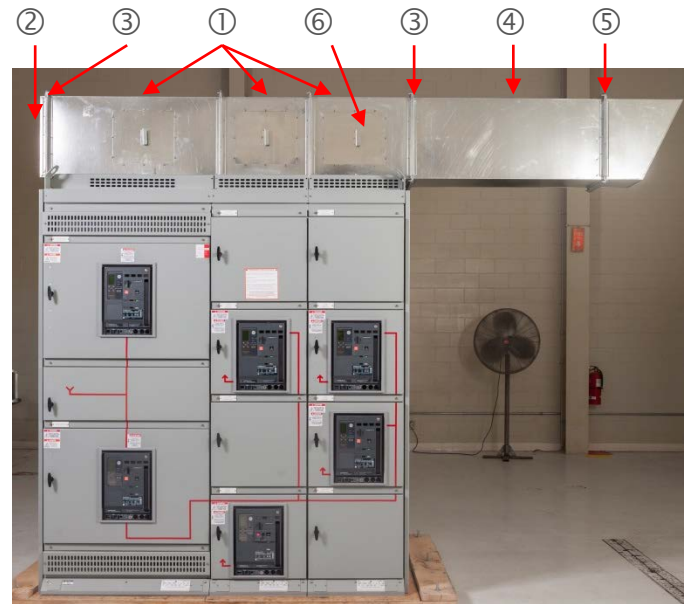
The portion of exhaust plenum system between the transition adapter and the end exhaust portal (Figure 4.1) may or may not be provided by the General Electric Company. Adherence to the design requirements in this manual is required when constructing this area of the exhaust plenum system.

**⚠ WARNING:** The exhaust plenum system is an integral component of the arc resistant rating of the equipment. Energizing and operating the equipment without a properly installed exhaust plenum system will negate the arc resistant rating.

The exhaust plenum above each section of equipment will match the width of that specific section. An access cover (Figure 4.1) is provided in each exhaust plenum above the switchgear to facilitate the installation.

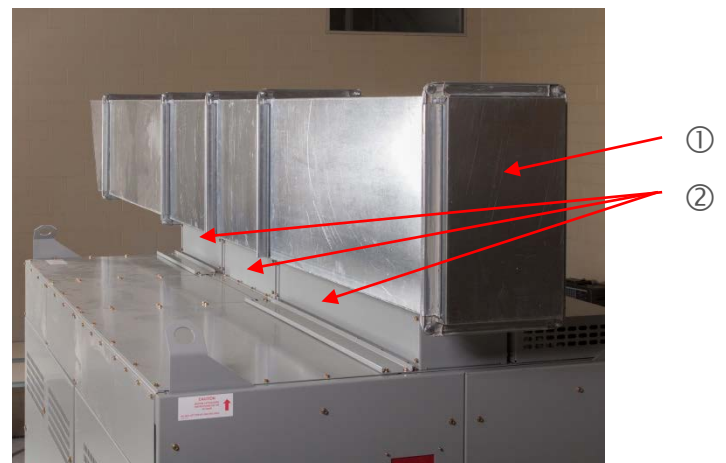
**NOTICE:** Prior to installing the exhaust plenum system, the switchgear shipping splits must be assembled and anchored to its foundation. Failure to follow this sequence may result in a misalignment of the exhaust plenum system.

Figure 4.1 Exhaust plenum system (front view)



- (1) Exhaust Plenum Section (above equipment)
- (2) End Cap
- (3) Exhaust Plenum Transition Adapter
- (4) Exhaust Plenum Duct (provided by others)
- (5) Exhaust Plenum End Portal
- (6) Access Cover (typical)

Figure 4.2 Exhaust plenum system (rear view)



- (1) End Cap
- (2) Plenum Flange (typical for each section)

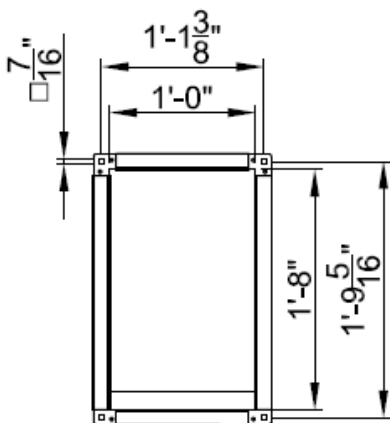
## Installation

### Exhaust Plenum above Switchgear

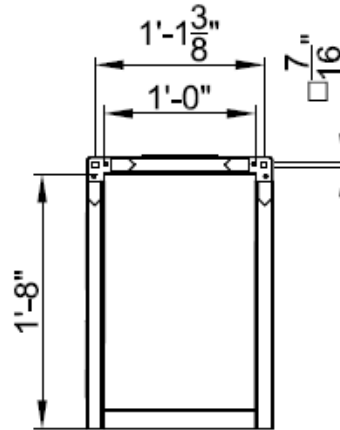
The recommend procedure to install the exhaust plenum above the switchgear is as follows:

1. Prior to installing the individual sections of the exhaust plenum system, it is important to identify the different sections for each stack width and transition adapters to be installed on the very left end section and the very right end section of the equipment lineup (Figure 3.2). The exhaust plenum sections above each section of the switchgear will have an external flange on three sides (Figure 4.4). The left and right end sections of the transition adapters will have an end flange as shown in Figure 4.3.
2. Remove the #10-32 x ¼ inch hardware attaching the access cover to the exhaust plenum section (Figure 4.6). Be sure to retain the hardware and the access cover for re-installation later in this instruction manual.
3. Remove and discard the temporary cover that is attached to the top of the plenum flange at the top of the switchgear section (Figure 4.5). Be sure to retain the mounting hardware for in step 4.
4. Raise the exhaust plenum section to the top of the switchgear and align the opening and hole pattern in the bottom of the exhaust plenum with the opening and hole pattern on the plenum flange (Figure 4.7). Attach the exhaust plenum section to the plenum flange using the hardware retained in Step 3. Torque the hardware to 7-9 ft.-lbs. Be sure that the access cover opening is facing toward the front of the switchgear.

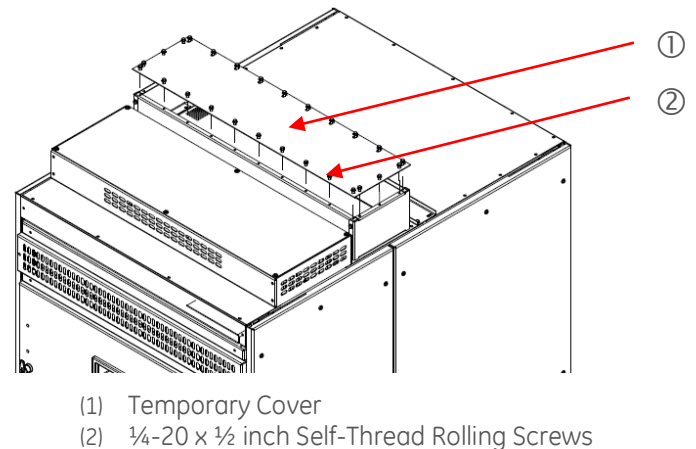
**Figure 4.3 Left and right end flange detail of transition adapter**



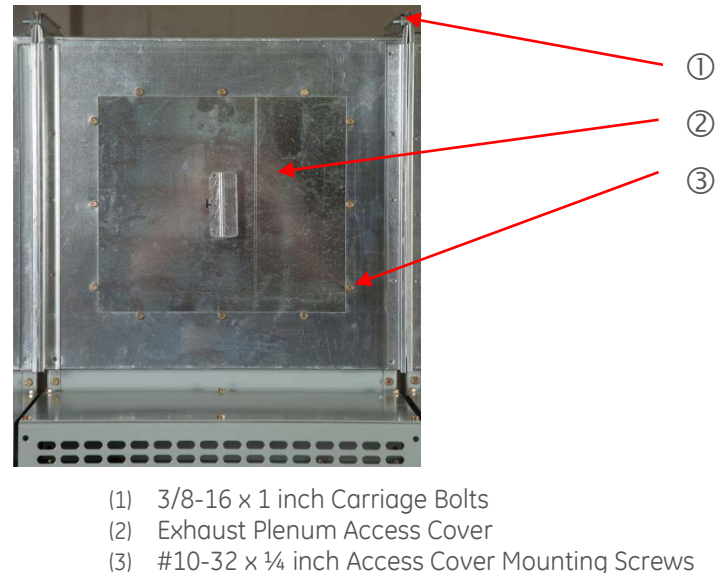
**Figure 4.4 Flange detail above switchgear**



**Figure 4.5 Plenum flange temporary cover**



**Figure 4.6 Access cover hardware**



5. Repeat steps 3 and 4 for the adjacent exhaust plenum section on the adjoining section of equipment
6. Using the 3/8-16 x 1 inch carriage bolts, lock washers and hex nuts provided, attach the upper two corners of the middle flanges together and torque to 25-30 ft.-lbs. (Figure 4.6).
7. Using the #12-24 x 7/8 inch self-thread forming screws (Figure 4.8), complete attaching the two middle flanges together. Torque the screws to 4-5 ft.-lbs. Optional flange clips may be used in lieu of the #12-24 x 7/8 inch hardware.

**CAUTION:** If properly aligned, there should be no air gap between the exhaust plenum and the plenum flange on top of the switchgear. There should be no air gap between the individual exhaust plenum sections.

**NOTICE:** As an option, a fire rated 440 butyl sealing compound may be applied between exhaust plenum flanges.

8. Repeat steps 2 through 7 until all exhaust plenum sections are installed above each section of the switchgear lineup.
9. After all exhaust plenum sections are installed above each section of the switchgear. The left and right side transition adapters can be installed at each end of the plenum system. Using the 3/8-16 x 1 inch carriage bolts, lock washers and hex nuts provided, attach the upper two corners of the transition adapters to the plenum flange and torque to 25-30 ft.-lbs. (Figure 4.6).
10. Using the #12-24 x 7/8 inch self-thread forming screws (Figure 4.8), complete attaching the transition adapter to the exhaust plenum flange. Torque the screws to 4-5 ft.-lbs. Optional flange clips may be used in lieu of the #12-24 x 7/8 inch hardware.

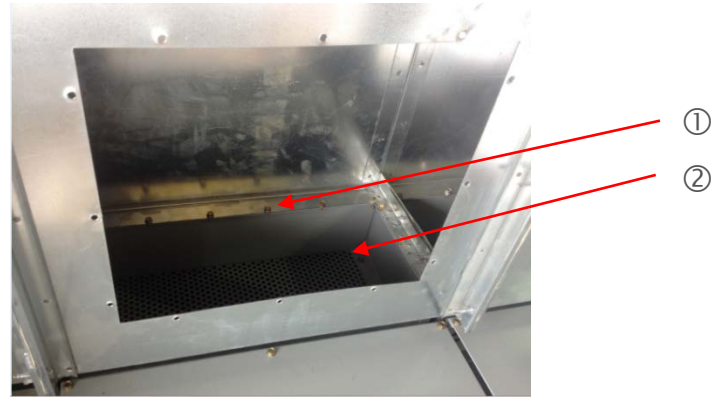
**CAUTION:** If properly aligned, there should be no air gap between the transition adapter and the exhaust plenum flange.

**NOTICE:** As an option, a fire rated 440 butyl sealing compound may be applied between exhaust plenum flanges.

11. Using the hardware and access cover retained from step 2, re-install the access cover to each exhaust plenum section. Be sure that the access cover is located internally to the exhaust plenum (Figure 4.6) and torque the hardware to 4-5 ft.-lbs.

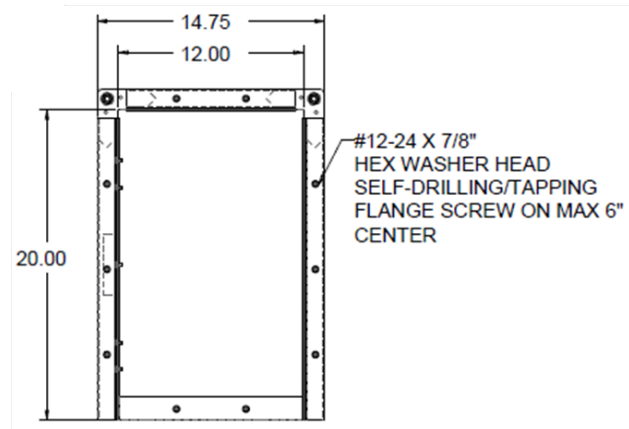
**CAUTION:** Over-tightening of the access cover mounting screws could damage the exhaust plenum itself. Care should be taken while performing this task.

Figure 4.7 Plenum flange mounting hardware



- (1) Plenum Flange Mounting Hardware
- (2) Plenum Flange Opening

Figure 4.8 Attaching exhaust plenum flange (hardware)



## Exhaust Plenum End Cap

If one end of the exhaust plenum system above the switchgear is required to be closed, an end cap (Figure 4.9) can be installed as follows:

1. Using the 3/8-16 x 1 inch carriage bolts, lock washers and hex nuts provided, attach the upper and lower two corners of the flanges together and torque to 25-30 ft.-lbs. (Figure 4.9).
2. Using the #12-24 x 7/8 inch self-thread forming screws (Figure 4.10), complete attaching the end cap to the end flange. Torque the screws to 4-5 ft.-lbs.

**⚠ CAUTION:** If properly aligned, there should be no air gap between the transition adapter and the exhaust plenum flange.

**NOTICE:** As an option, a fire rated 440 butyl sealing compound may be applied between exhaust plenum flanges.

## Exhaust Plenum End Portal

The exhaust plenum end portal should be located on an exit wall (Figure 4.11) from the equipment room and secured to this structure.

If the exit point of the equipment room is an exterior wall, the securing of the exhaust end portal must include methods to prevent water ingress between the exhaust end portal and the structure wall.

Care and consideration should be taken when selecting the exhaust end portal location. An area of at least 10 feet in all directions from the exhaust end portal needs to be clear of obstruction and access to this area should be restricted to ensure the safety of personnel.

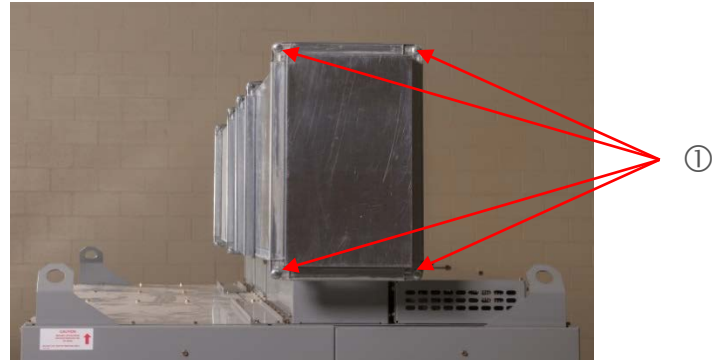
Recommended attachment means are identical to those shown in Figure 4.10.

The exhaust end portal hinged flap is secured in place with a self-thread forming screw. Behind the hinged flap, a standard rodent screen is provided. An optional moisture absorbent foam material may be located between the rodent screen and hinged flap.

Care should be taken to ensure the flap is secured, closed and flat against the exhaust portal assembly.

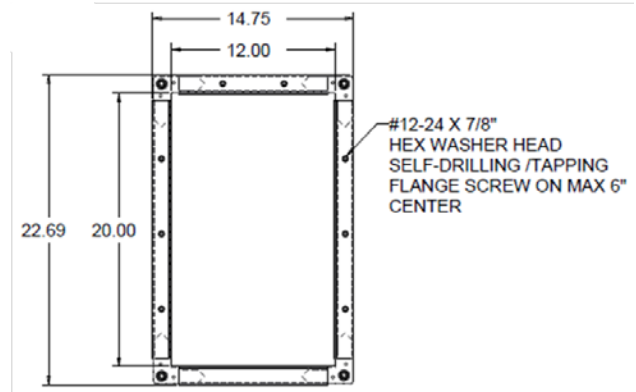
**⚠ WARNING:** An area of at least 10 feet in all directions from the exhaust end portal should be free and clear of personnel and obstructions to allow safe passage of exhaust gases during an internal arcing fault within the equipment. Failure to do so may result in serious injury or death.

**Figure 4.9 Exhaust plenum end cap**

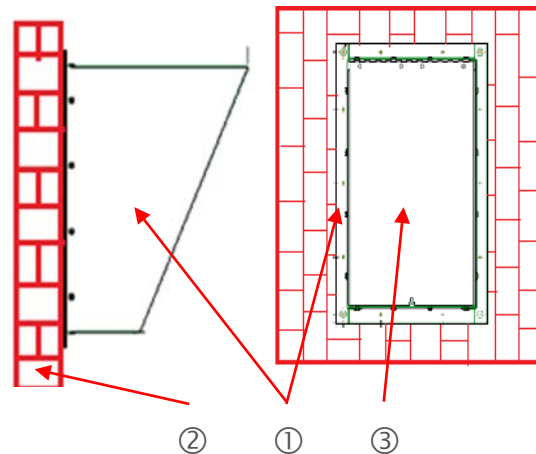


(1) 3/8-16 x 1 inch Carriage Bolts

**Figure 4.10 Attaching end flange (hardware)**



**Figure 4.11 Typical exhaust portal assembly**



- (1) Exhaust Plenum End Portal Assembly
- (2) Structural Wall
- (3) Exhaust Plenum End Portal Hinged Flap

## **Plenum System between Equipment and End Portal**

Construction of the exhaust plenum between the end flange on the switchgear and the exhaust end portal can vary upon the customer's construction requirements.

Care should be taken to ensure that minimum cross-sectional area of the exhaust plenum interior volume measure no less than 12 inches by 20 inches.

The exhaust plenum should be constructed of a corrosion resistant metal with a material thickness of no less than 23 gauge.

Attaching the exhaust plenum should adhere to the details shown in Figure 4.10.

Total length of the plenum has no restriction. Elevation changes and turns of no greater than 90 degrees are acceptable but should be kept to a minimum.

The exhaust plenum should be anchored in such a method that it will support the weight of the system itself and adhere to the customer's construction/specification requirements.



## Section 5. Exhaust Plenum Accessories and Kits

The following tables list common accessories and kits available for ordering for the AKD-20 AR or Entellisys AR equipment.

**Table 11.1 Exhaust plenum accessories and kits**

Description	Catalog Number
440 Butyl Sealing Compound, Exhaust Plenum Flange	440BUTYL
Exhaust Plenum Section, 22" Wide	GM2AR22EPS
Exhaust Plenum Section, 30" Wide	GM2AR30EPS
Exhaust Plenum Section, 38" Wide	GM2AR38EPS
Exhaust Plenum Section, T-Section, 22" Wide	GM2AR22EPTS
Exhaust Plenum Section, T-Section, 30" Wide	GM2AR30EPTS
Exhaust Plenum Section, T-Section, 38" Wide	GM2AR38EPTS
Exhaust Plenum Section, V-Section, 30" Wide	GM2AR30EPVS
Exhaust Plenum Section, V-Section, 38" Wide	GM2AR38EPVS
Exhaust Plenum, Access Cover	GM2ARAC
Exhaust Plenum, End Cap	GM2AREC
Exhaust Plenum, Exhaust End Portal	GM2AREP
Exhaust Plenum, Exhaust End Portal w/ Moisture Absorbent Foam	GM2AREPMAF
Exhaust Plenum, Flange Clip	GM2ARTFC
Exhaust Plenum, Transition Adapter	GM2ARTAS
Exhaust Plenum Section, Extension (36")	GM2AREP3
Exhaust Plenum Section, 90 Degree Elbow – Vertical	GM2AREP90V
Exhaust Plenum Section, 90 Degree Elbow – Horizontal	GM2AREP90H



## Appendix A. Torque Values

**Table A.1 Torque values for electrical hardware other than cable terminals (Copper, Tin or Silver Plated)**

Hardware Size	Torque (1)(2) (ft.-lbs.)
#10-32	4-5
#12-24	4-5
¼-20	7-10
3/8-16	25-30
½-13	35-40
5/8-11	45-55

- (1) These torque values are for non-lubricating threads  
 (2) Standard nut with conical spring washer or lock washer

**NOTICE:** When installing parts or components to the compartment molded base, torque ¼ inch screws slowly and do not exceed nine ft.-lbs.

**Table A.2 Torque values for cable terminals**

Wire Size	Torque (1)(2) (in.-lbs.)
6	100
5	
4	
3	
3	125
2	
1	
0	
00	150
000	
0000	
200,000	
250,000	200
300,000	
350,000	
400,000	
500,000	250
600,000	
700,000	
750,000	
800,000	300
900,000	
1,000,000	
1,250,000	
1,500,000	400
1,750,000	
2,000,000	

- (1) These torque values are for non-lubricating threads  
 (2) Torque values provided for reference only. Follow cable terminal manufacturer's recommended torque values.

## Appendix B. Exhaust Plenum System Details

### General

The exhaust plenum system will be attached to the top of the switchgear assembly (Figure 3.2 and Figure 3.3). The exhaust plenum section above each stack of the equipment will match the stack width of the equipment and be supplied with three external flanges and one internal flange (Figure B.1).

An optional T-Section exhaust plenum (Figure B.2) may be provided per the customer's requirements. The rear facing flange of the exhaust plenum t-section is provided with four external flanges.

**NOTICE:** Use of the exhaust t-section plenum will require routing the exhaust plenum system over the top rear section of the equipment stack which will limit the entrance of power cables and/or busway from above.

An optional V-Section exhaust plenum (Figure B.3) may be provided per the customer's requirements. The vertical facing flange of the exhaust plenum v-section is provided with four external flanges. The V-Section exhaust plenum is not available for 22 inch wide stack widths.

The very left and right end of the exhaust plenum system is provided with an exhaust plenum transition adapter which has four external flanges (Figure B.4). The four sided external flange pattern are used for all exhaust plenum connections not directly above the equipment plenum flange.

Figure B.1 Exhaust plenum section

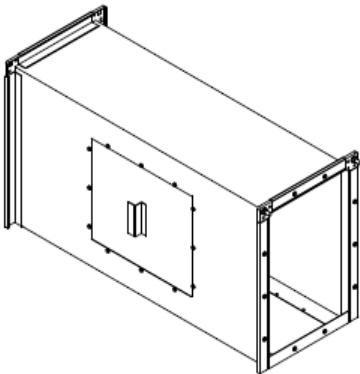


Figure B.2 Exhaust plenum t-section

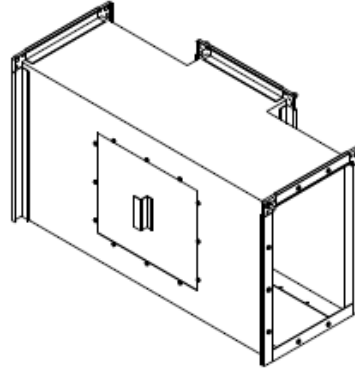


Figure B.3 Exhaust plenum v-section

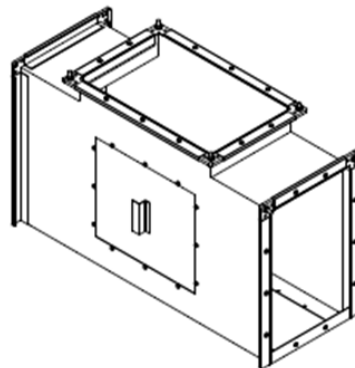
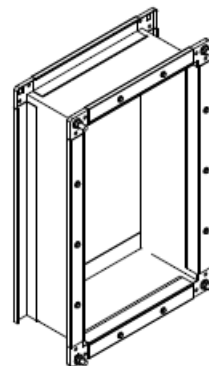


Figure B.4 Exhaust plenum transition adapter



If one end of the exhaust plenum system is required to be closed, an exhaust plenum end cap can be provided (Figure B.5). The exhaust plenum end cap is attached to the exhaust plenum transition adapter.

An exhaust plenum end portal is provided as an egress point for the exhaust plenum system (Figure B.6).

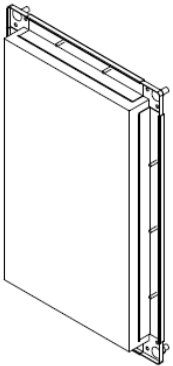
An optional exhaust plenum extension (Figure B.7) may be provided per the customer requirements. The exhaust plenum extension is 36 inches in length and is provided with four external flanges on each side.

An optional exhaust plenum 90 degree vertical elbow (Figure B.8) may be provided per the customer requirements. The exhaust plenum vertical elbow is provided with four external flanges on each side and enables the exhaust plenum to be directed in a vertical orientation.

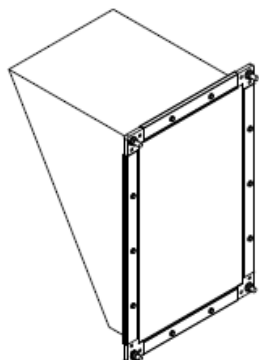
An optional exhaust plenum 90 degree horizontal elbow (Figure B.9) may be provided per the customer requirements. The exhaust plenum horizontal elbow is provided with four external flanges on each side and enables the exhaust plenum to be directed in a horizontal orientation.

An optional exhaust plenum flange clip (Figure 7.10) may be provided to attach the exterior flanges of the exhaust plenum system. Two flange clips can be used on each of the long axis and one flange clip can be used on each of the shorter axis of the exterior flange.

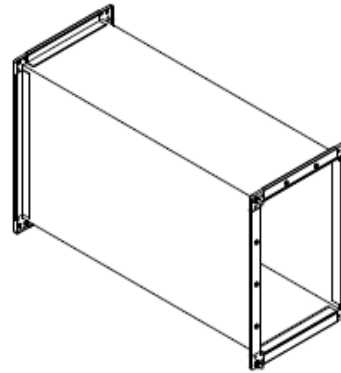
**Figure B.5 Exhaust plenum end cap**



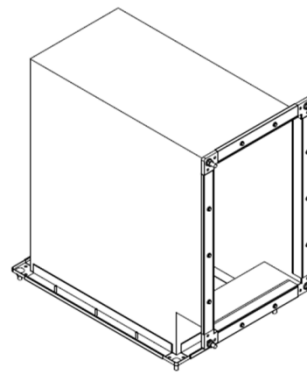
**Figure B.6 Exhaust plenum end portal**



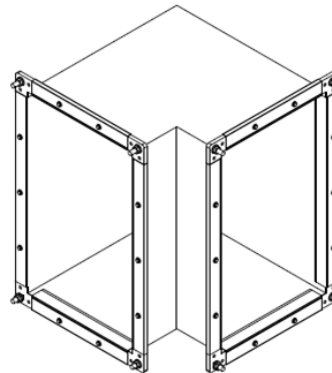
**Figure B.7 Exhaust plenum extension**



**Figure B.8 Exhaust plenum vertical elbow**



**Figure B.9 Exhaust plenum horizontal elbow**



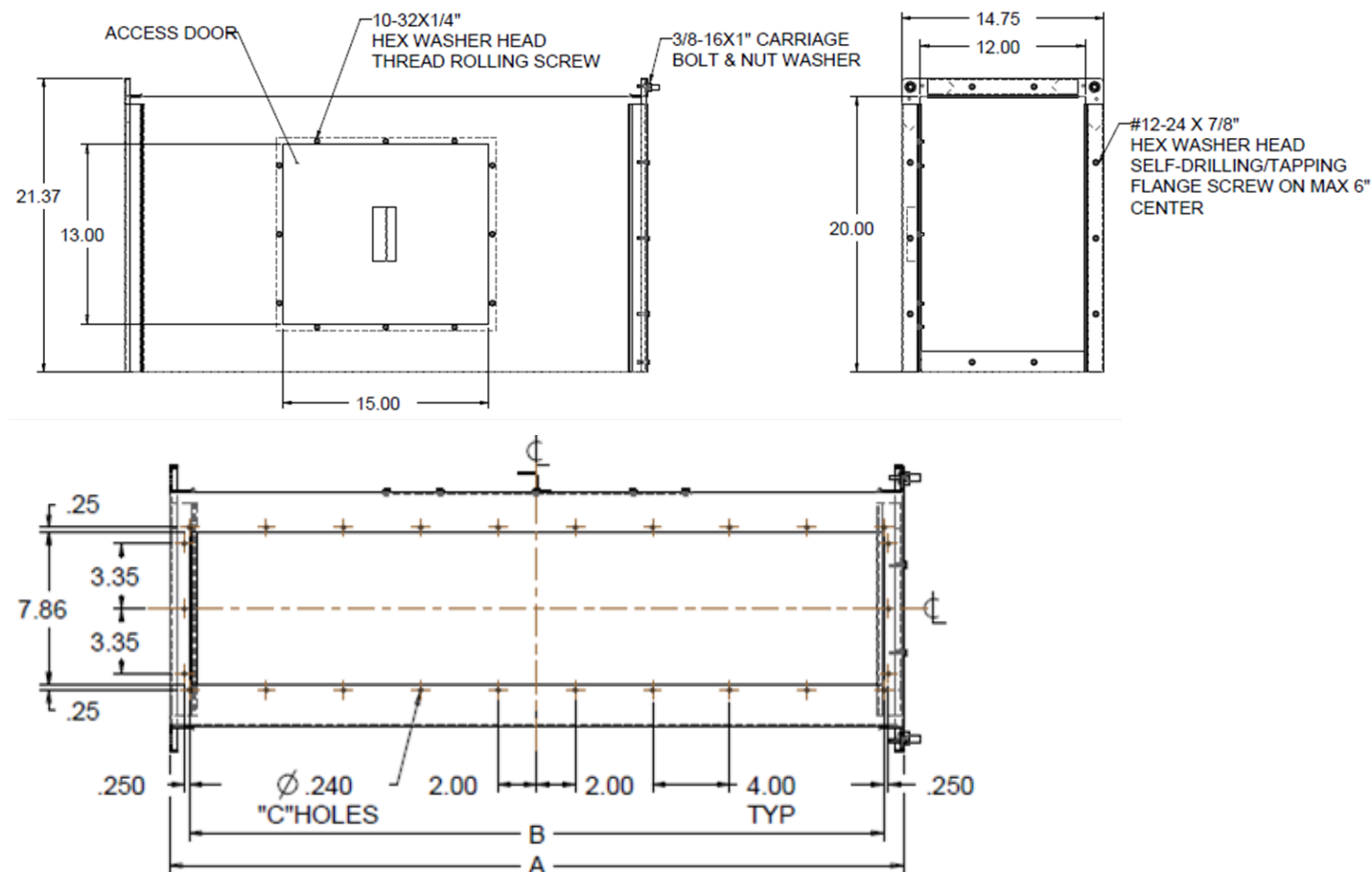
**Figure B.10 Exhaust plenum flange clip**



## Exhaust Plenum Section

The exhaust plenum sections may be provided in widths of 22, 30, and 38 inches (Figure B.10).

**Figure B.11 Exhaust plenum section details**



**Table B.1 Exhaust plenum section widths (inches)**

Stack Width	Dimension "A"	Dimension "B"	Qty. of "C" Holes
22	22	20	18
30	30	28	22
38	38	36	26

**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum T-Section

The exhaust plenum t-sections may be provided in widths of 22, 30, and 38 inches (Figure B.12).

Figure B.12 Exhaust plenum t-section details

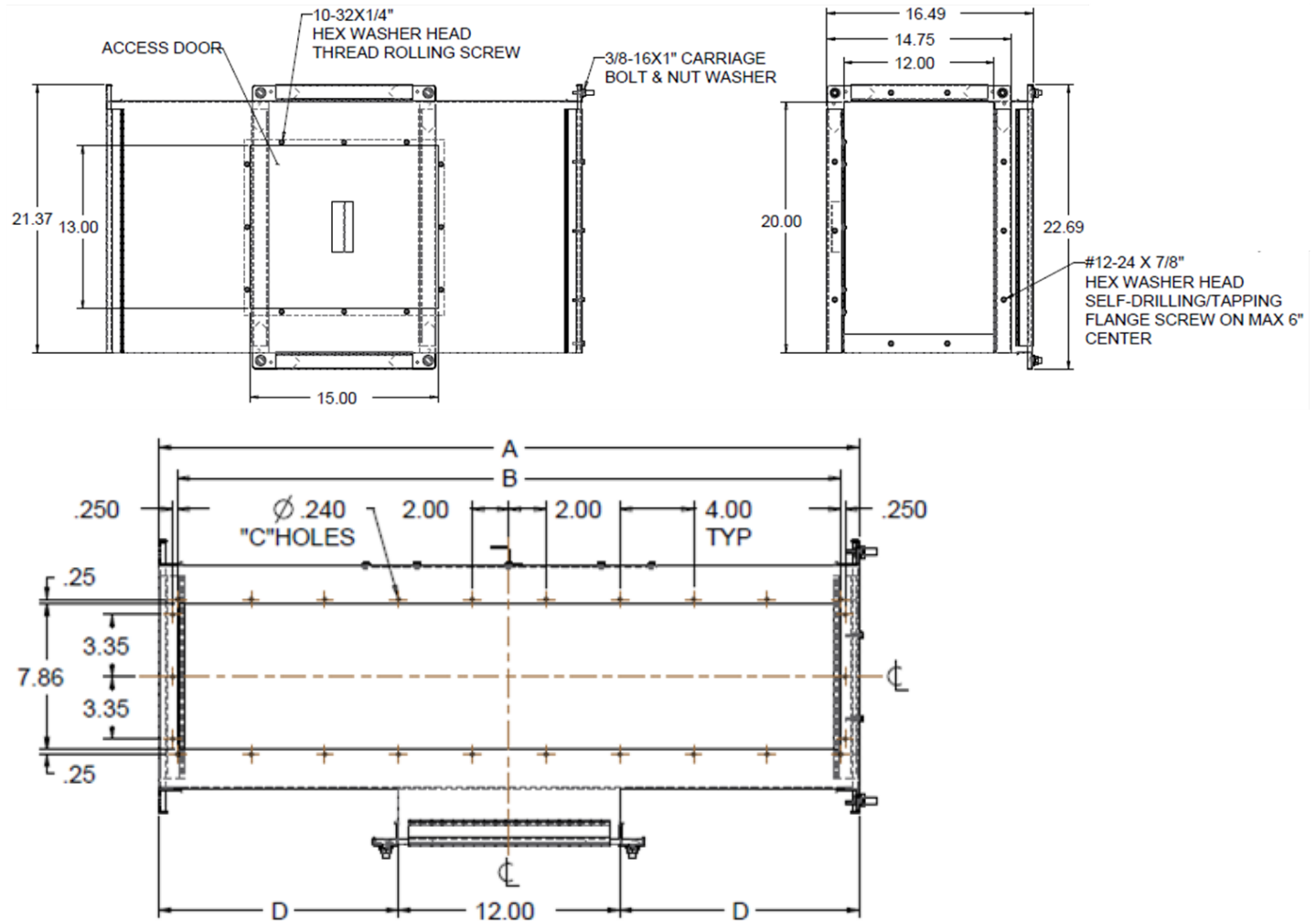


Table B.2 Exhaust plenum t-section widths (inches)

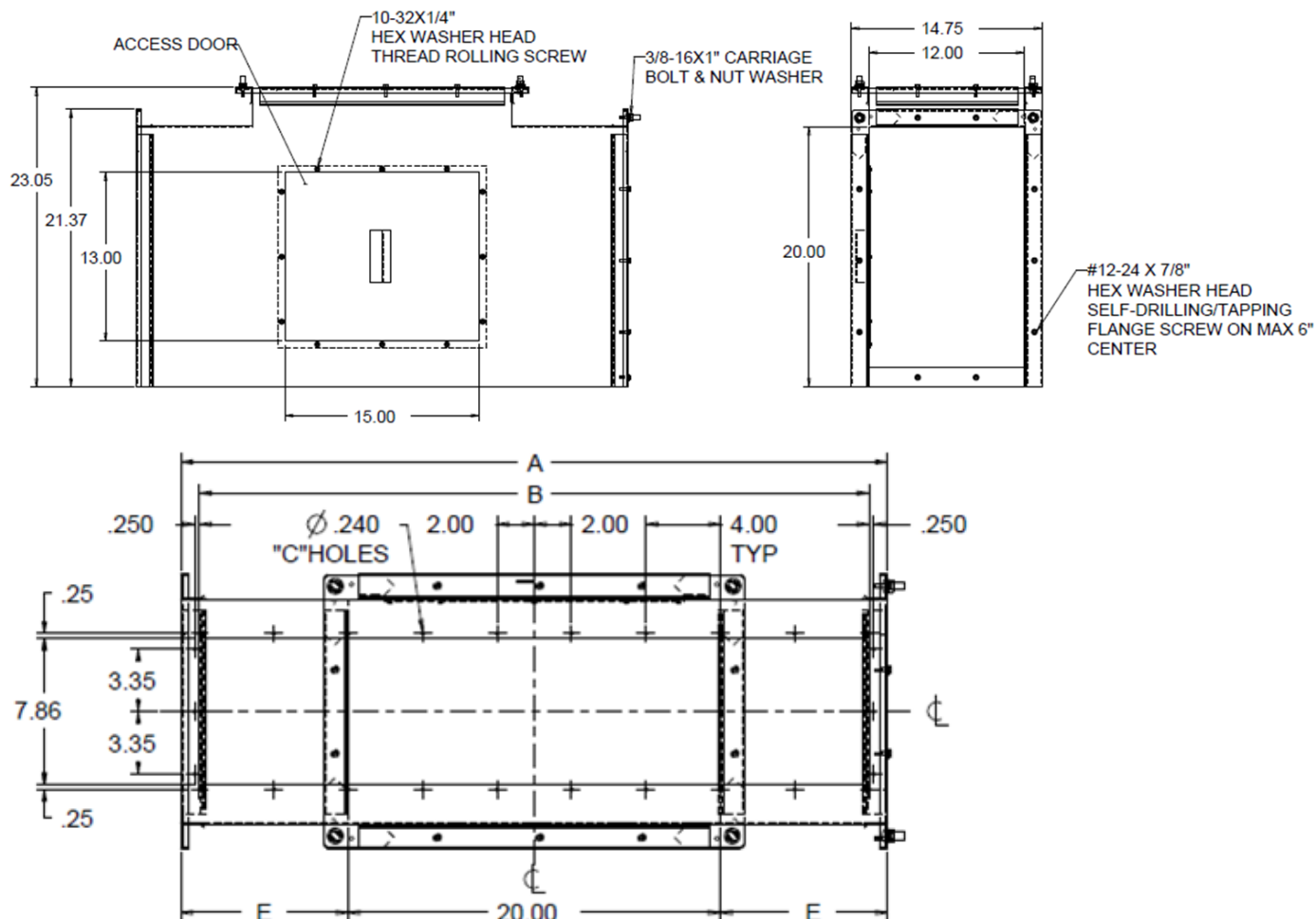
Stack Width	Dimension "A"	Dimension "B"	Qty. of "C" Holes	Dimension "D"
22	22	20	18	5
30	30	28	22	9
38	38	36	26	13

**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum V-Section

The exhaust plenum t-sections may be provided in widths of 30 and 38 inches (Figure B.13).

**Figure B.13 Exhaust plenum v-section details**



**Table B.3 Exhaust plenum v-section widths (inches)**

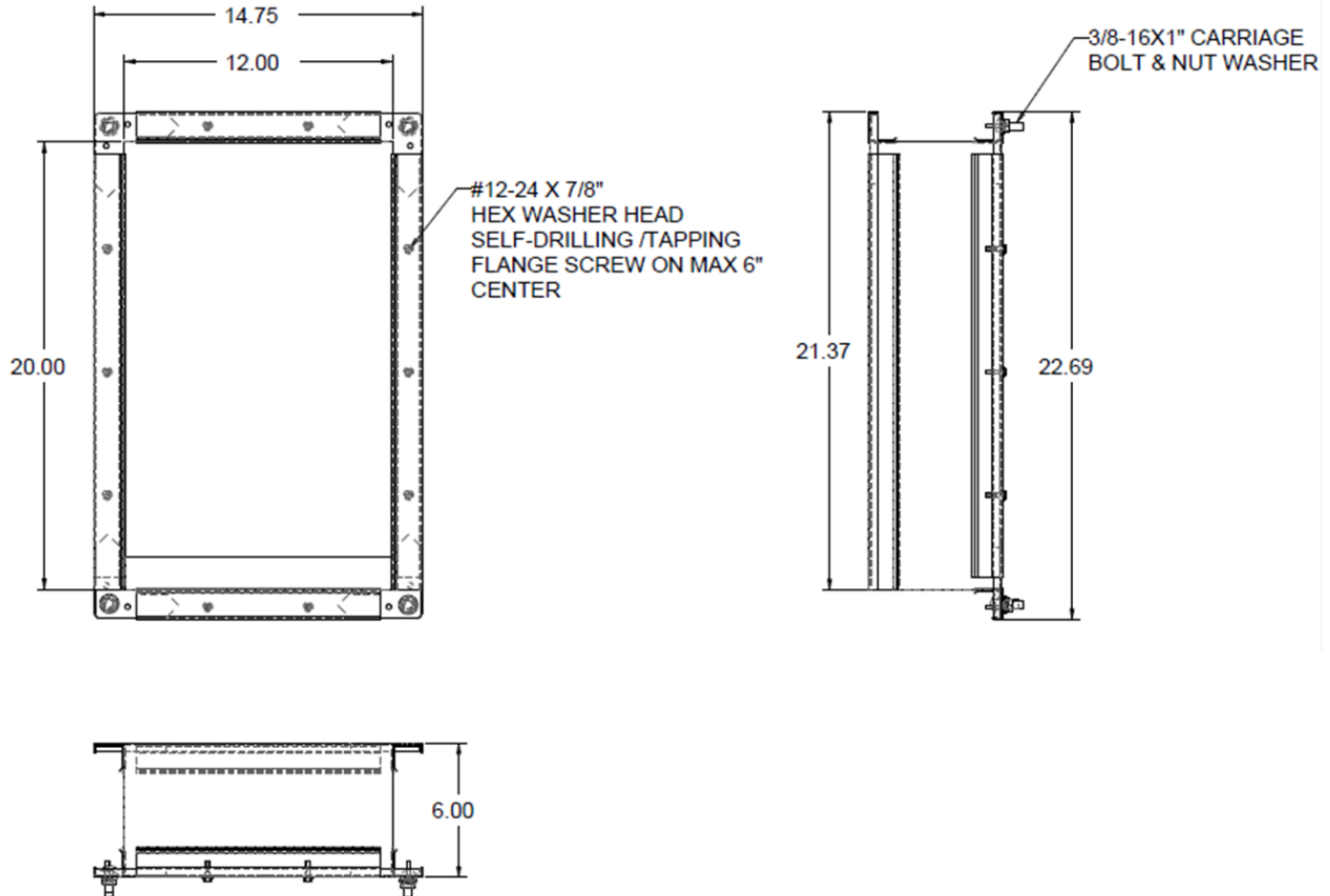
Stack Width	Dimension "A"	Dimension "B"	Qty. of "C" Holes	Dimension "E"
30	30	28	22	5
38	38	36	26	9

**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum Transition Adapter

The exhaust plenum transition adapter is attached to the left and right most plenum sections at the end of the equipment assembly (Figure B.14).

Figure B.14 Exhaust plenum transition adapter details

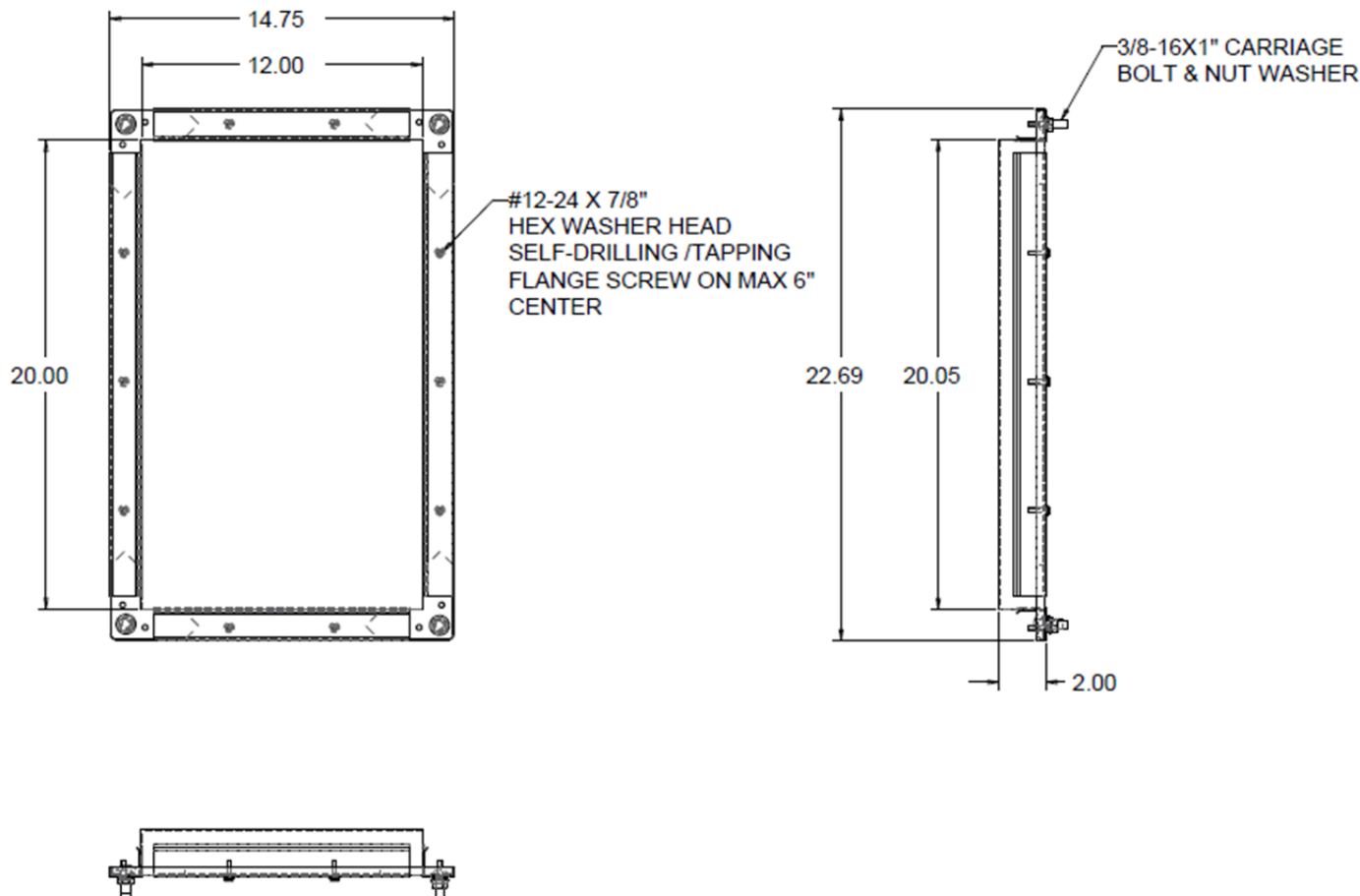


**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum End Cap

The exhaust plenum end cap is attached to the left or right most plenum sections at the end of the equipment assembly (Figure B.15). The exhaust plenum end cap must be installed on the exhaust plenum transition adapter (Figure B.14).

Figure B.15 Exhaust plenum end cap details



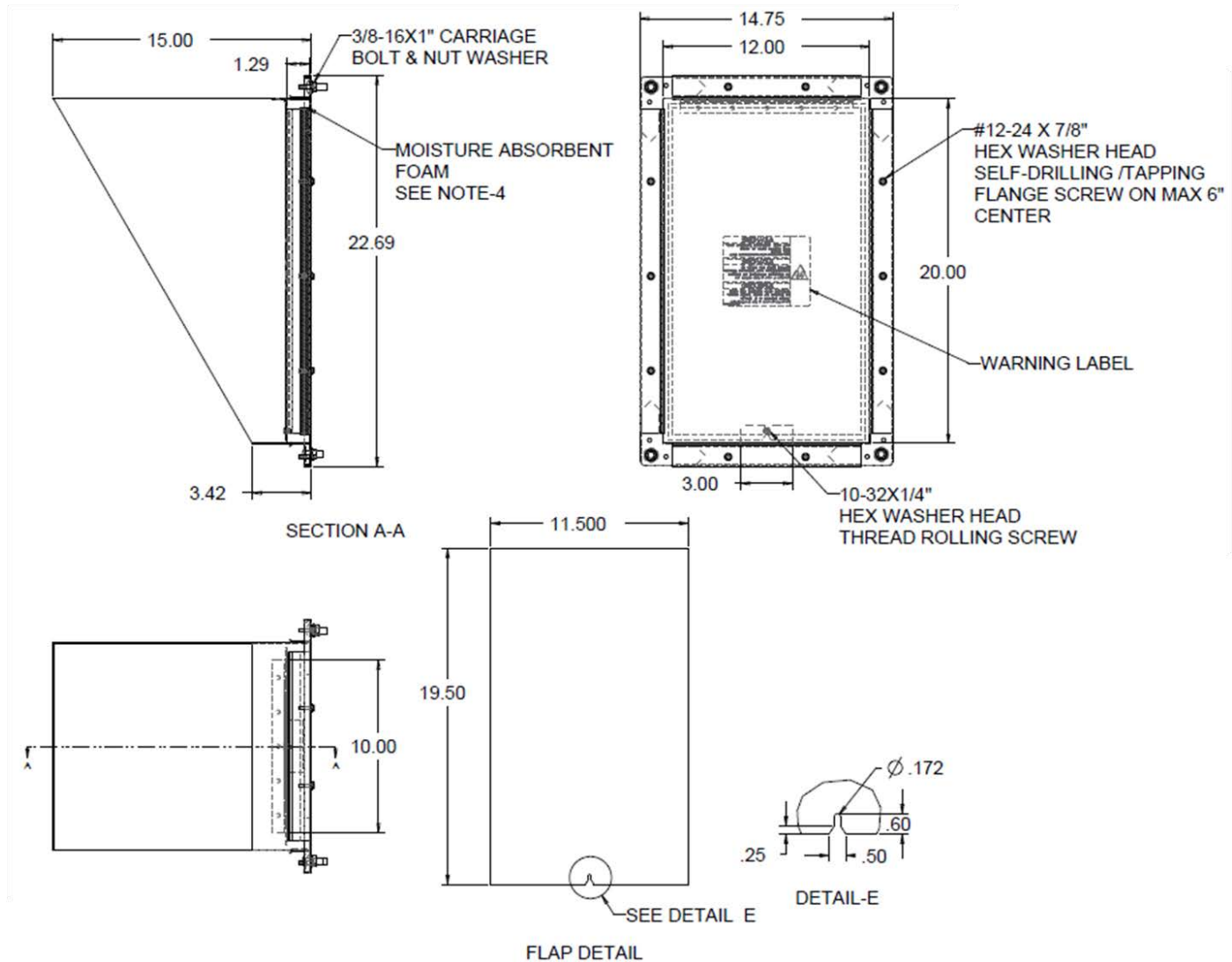
**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.



## Exhaust Plenum End Portal

The exhaust plenum end portal provides an egress point for the exhaust plenum system (Figure B.16).

**Figure B.16 Exhaust plenum end portal details**

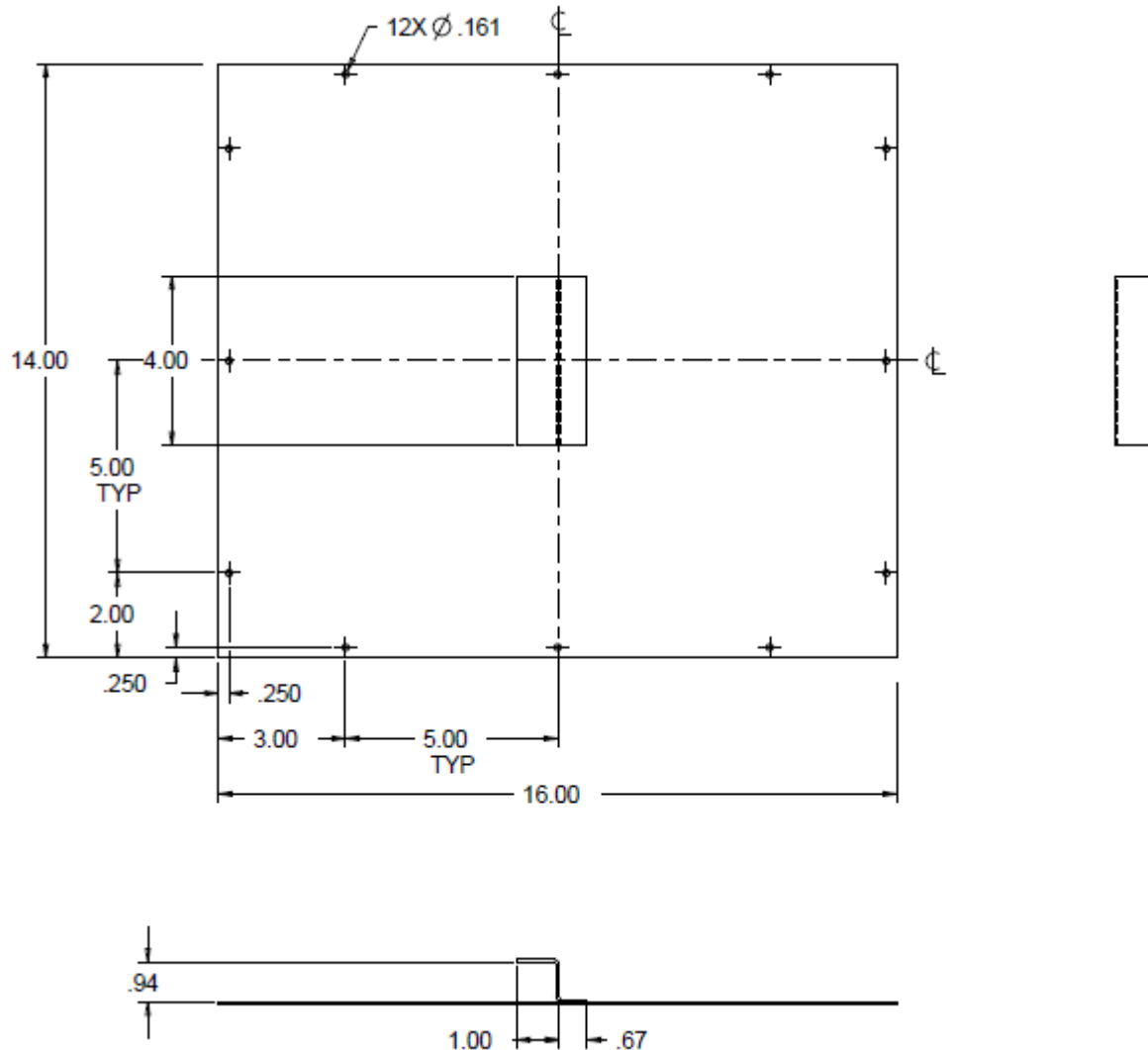


**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum Access Cover

The exhaust plenum access cover is provided on each exhaust plenum above the switchgear assembly to ease with the installation of the exhaust plenum system (Figure B.17).

**Figure B.17 Exhaust plenum access cover details**

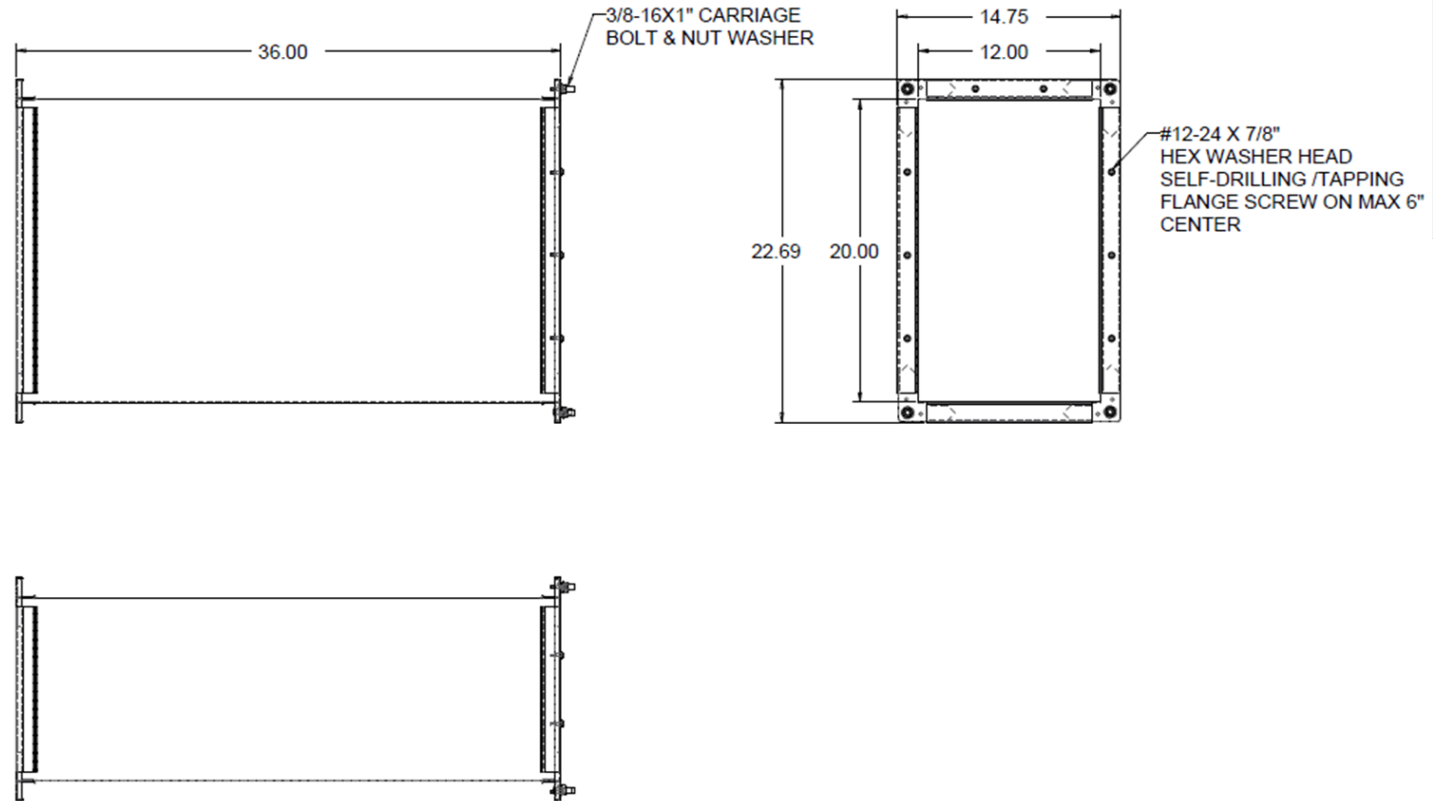


**⚠ CAUTION:** Over-tightening of the access cover mounting screws could damage the exhaust plenum itself. Care should be taken while performing this task.

## Exhaust Plenum Extension

The exhaust plenum extension is an optional item that can be used to extend the exhaust plenum above the switchgear further in the equipment room (Figure B.18). The exhaust plenum extension is provided in 36 inch lengths.

**Figure B.18 Exhaust plenum extension details**

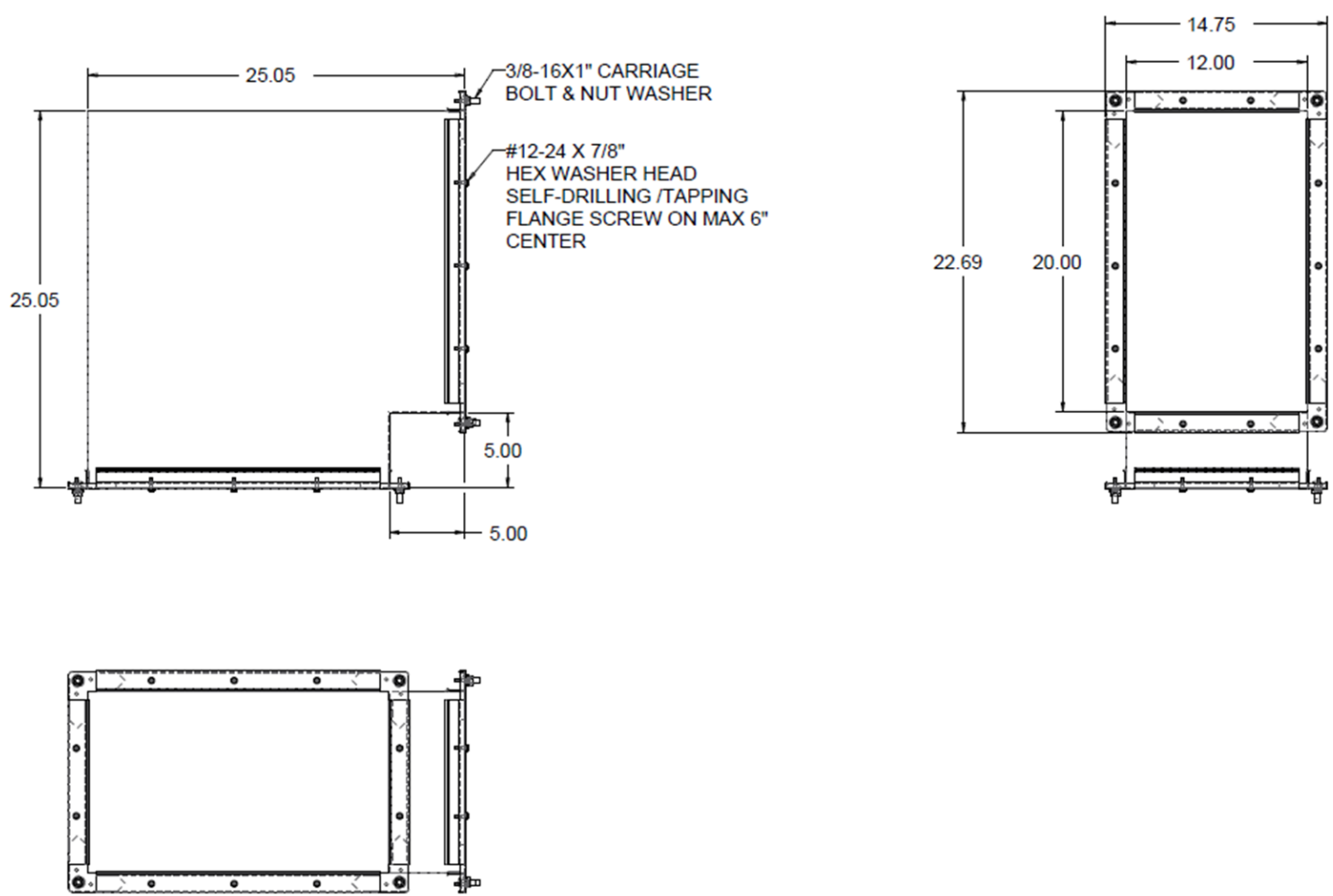


**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum 90 Degree Vertical Elbow

The exhaust plenum vertical elbow is an optional item that can be used to extend the exhaust plenum above the switchgear further in the equipment room (Figure B.19). The exhaust plenum vertical elbow can be oriented in either an upward or downward orientation.

**Figure B.19 Exhaust plenum 90 degree vertical elbow details**

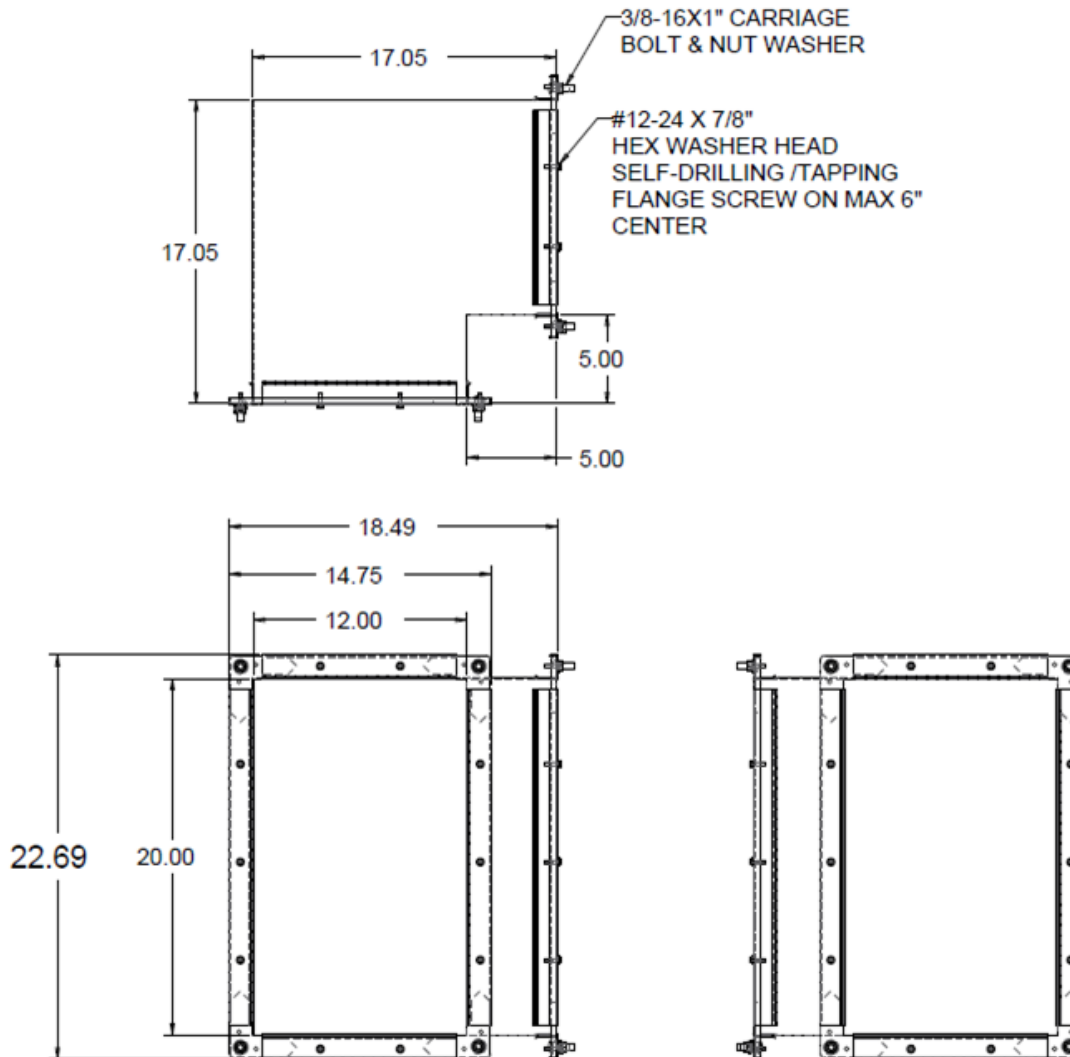


**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum 90 Degree Horizontal Elbow

The exhaust plenum horizontal elbow is an optional item that can be used to extend the exhaust plenum above the switchgear further in the equipment room (Figure B.20). The exhaust plenum horizontal elbow can be oriented in either a left or right orientation.

Figure B.20 Exhaust plenum 90 degree horizontal elbow details

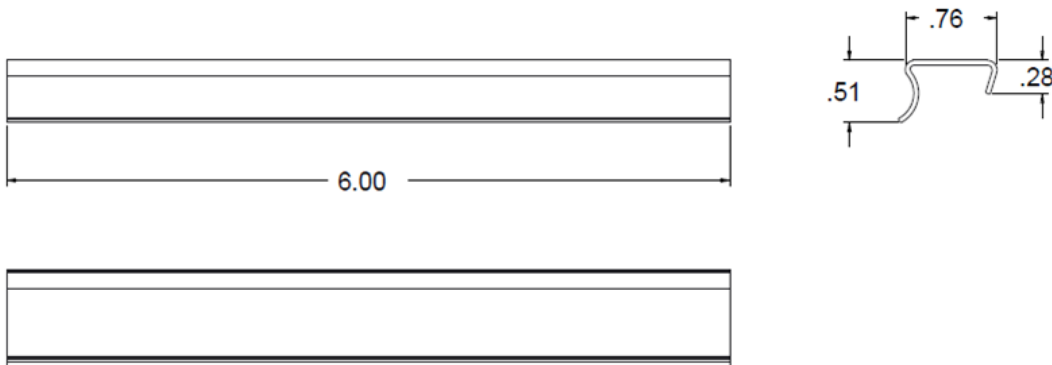


**NOTICE:** Use of optional flange clips (Figure B.10) may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips may be installed on each long exterior flange and one flange clip may be installed on each short exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

## Exhaust Plenum Flange Clip

The exhaust plenum flange clip is an optional item that can be used to attach the exterior flanges of the individual exhaust plenum components to adjacent exterior flanges (Figure B.21). The exhaust plenum flange may be used in lieu of the #12-24 x 7/8 inch hardware. Two flange clips shall be used on each long axis exterior flange and one flange clip shall be used on each short axis exterior flange. Use of the optional flange clips will still require the installation of the 3/8-16 x 1 inch carriage bolts at each exterior flange corner.

**Figure B.21 Exhaust plenum flange clip details**



## Appendix C. Notes



## Imagination at work

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