



Cross-Connect Products

Add-on 400 Product Cross-Connect Cabinet (Annex Series)

Description and Installation Manual (363-640-127), Revision C

Specification Numbers: F1009843, F1009845, F1009842, and F1009844

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ADMONISHMENTS USED IN THIS DOCUMENT



DANGER! Warns of a hazard the reader ***will*** be exposed to that will ***likely*** result in death or serious injury if not avoided. (ANSI, OSHA)



WARNING! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)



CAUTION! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)



ALERT! Alerts the reader to an action that ***must be avoided*** in order to protect equipment, software, data, or service. (ISO)



ALERT! Alerts the reader to an action that ***must be performed*** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)



FIRE SAFETY! Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)



SAFETY! Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

IMPORTANT SAFETY INSTRUCTIONS

Safety Precautions Definition

Definitions of the safety admonishments used in this document are listed under “Admonishments Used in this Document” on page 4.

General Safety Precautions

The following precautions shall be observed at all time when handling and installing the enclosure:

- Observe the general safety precautions against personal injury and equipment damage.
- The procedures outlined in this manual are only recommended guidelines. Ensure that all NEC (National Electric Code) and local codes for safety and wiring are followed.
 - Use listed two-hole compression connectors (lugs) to terminate all ground connections. Selected lug shall match wire and type, and crimped applied as specified by the lug manufacturer.
 - Apply NO-OX-ID-A to all ground connections.
 - Insulation of field-wire conductors should be rated no less than 105 °C, and gauge in a manner that is consistent with the NEC and local codes.
- Always use a non-contact voltage detector, when approaching an enclosure, to verify no leaks or shorts are presents on the external body.
- A minimum of two persons are required to safely install the enclosure.
- Hard hats and steel-toed boots should be worn while maneuvering the enclosure.
- Safety glasses should always be on while on-site.
- Safety gloves should be on when working in temperature extremes, with batteries, or with sharp objects.
- All electricians, operators, and technicians have been trained for the task at hand.
- Keep bystanders away.
- Ensure that all personnel on site are familiar with the first-aid kit location and emergency procedures in the event of an injury.
- Never leave the enclosure unattended. If leaving the site, close and secure the enclosure.

You Must Follow Approved Safety Procedures



DANGER! Performing the following procedures may expose you to hazards. These procedures should be performed by qualified technicians familiar with the hazards associated with this type of equipment. These hazards may include shock, energy, and/or burns. To avoid these hazards:

- a) The tasks should be performed in the order indicated.
- b) Remove watches, rings, and other metal objects.
- c) Prior to contacting any uninsulated surface or termination, use a voltmeter to verify that no voltage or the expected voltage is present. Check for voltage with both AC and DC voltmeters prior to making contact.
- d) Wear eye protection.
- e) Use certified and well maintained insulated tools. Use double insulated tools appropriately rated for the work to be performed.

Specific Safety Precautions



DANGER! RISK OF ELECTRICAL SHOCK, GENERAL

All ground connections must be installed and verified prior to connecting any power cables (AC or DC) and turning-up of enclosure.

When connecting any discrete power connection, make the connection first with the ground/return and break last with ground/return.

Do not install equipment showing any physical damage.



DANGER! RISK OF ELECTRICAL SHOCK, AC

Proper actions, include, but not limited to:

- a) Verify before contacting the enclosure that no current leakage or ground fault condition is present.
- b) Verify a proper ground is in place.
- c) Verify for AC hook-up, all enclosure circuit breakers are OFF and the utility incoming feed is OFF.

Use a trained licensed electrician.



DANGER! RISK OF ELECTRIC SHOCK

The DC bus is powered by DUAL power sources – Rectifiers and DC Batteries.

To properly work on the system, de-energize by disconnecting BOTH power sources. Even with the batteries turned off by using a local battery (circuit breaker) disconnect, batteries are still “LIVE” and hazardous, including a voltage >50 VDC, and a source of high short circuit current.

Use extreme caution around the batteries and terminals.

Do not smoke.



DANGER! RISK OF ELECTRICAL SHOCK, OSP CABLES

If joint buried cables are used, check the cable sheath for voltage in accordance with local standards. If voltage is detected, do not proceed with the installation. Contact the supervisor and do not proceed until the voltage hazard is eliminated.



DANGER! RISK OF CHEMICAL EXPOSURE

A battery can present harmful chemicals. Refer to the Battery Installation Manuals and MSDS supplied with the batteries. Work in a ventilated area and follow all safety procedures.

At a minimum, wear safety glasses and gloves when working with batteries.



WARNING! PREVENT INJURIES, FROM LIFTING THE ENCLOSURE

Follow all local safety practices while lifting the enclosure. Wear all locally approved safety gear. All persons working with lifting equipment must wear standard safety headgear, eye protection, and (when required) gloves.

Keep bystanders away from work operations at all times.

Do not lift the enclosure over people. Do not let anyone work, stand, or pass under a lifted enclosure.

Use all four points (eyebolts) to lift the enclosure.

Do not move or lift the enclosure with the front door open.

Never lift or move the enclosure with batteries or rectifiers installed.

Do not allow the lifting equipment or enclosure to touch any electrical wiring or equipment.

Operate all lifting equipment within safety constraints, as defined by the manufacturer and local practices; for example, do not exceed the capacity of reach.

Do not use slings, clevises or shackles of insufficient capacity.

Crane Operation:

Only properly trained operators shall operate the crane.

Do not operate the crane until all stabilizers are extended. The stabilizers must be in firm contact with the ground or other adequate support structure. Do not retract or extend the stabilizers when the enclosure is suspended from the crane.

Do not lift the enclosure over people. Do not let anyone work, stand, or pass under a lifted enclosure.

Only the crane rigging crew should set up the crane and rigging.

Do not exceed the lifting capacity of the crane.

Forklift Operation:

The forklift must be rated for a lifting capacity of 4,000 lbs (1814 kg), or greater.

Required Equipment:

One hoist, crane, or forklift capable of lifting 4,000 lbs (1814 kg).

Four wire-rope slings, 8-ft. (2.44 m) long (minimum). Each sling should have 1,500 lb. (700 kg) capacity.

Four connecting links (clevises) (rated for a minimum of 1500 lb), to attach the wire-rope slings to the enclosure lifting eyes.

A 75-ft (20 m) rope, 5/8" (1.5 cm) in diameter, to use as a tagline. A tagline is used to guide the enclosure into position while it is lifted and lowered.



CAUTION! PREVENT EQUIPMENT DAMAGE, PROPER HANDLING

Do not stack nor lay the enclosure on its side.

Similarly, do not stack batteries or lay them on their side. Do not tip batteries -- keep in upright position at all times.

To avoid possible personnel injury or damage to the enclosure, do not remove it from the pallet until at the installation site, at the point of transfer onto the pad.



DANGER! PREVENT EQUIPMENT DAMAGE, MAINTAIN VENTILATION

To optimize the service life of this equipment, make sure there are no obstructions in front of the ventilation openings.



WARNING! RISK OF INJURY, FROM UNSECURED ENCLOSURE

Do not push or lean against an unsecured (unbolted) enclosure as it may tip over causing bodily injury.

Do not pull cables, terminate cables, install or place any batteries or rectifiers until enclosure has been secured onto a pad.

Use caution when opening and closing doors to an enclosure not secured onto a pad.



WARNING! RISK OF INJURY TO EYES AND SKIN, FROM OPTIC DEVICES

Do not look into a fiber cable or device, nor hold such cable or device against body, fabric or other material.



WARNING! RISK OF HAZARDOUS SUBSTANCES

After handling of the enclosure or any such component, such as batteries, cables, busbars, etc., always wash hands immediately after.



WARNING! RISK OF EXPLOSION

For safety reasons, never restrict or block the airflow through the door or entry panel ventilation openings.



CAUTION! PREVENT EQUIPMENT DAMAGE, FROM CONDENSATION

Until the enclosure is turned up for service, the bags of desiccant shipped with the enclosure must remain in the enclosure to prevent condensation.

Once service is in-place, remove the desiccant.

**CAUTION!** PREVENT EQUIPMENT DAMAGE, BUILD A GOOD PAD

The pad should be level to within 1/4 in (6.4 mm) over the entire length and width, with a crown in the middle to prevent any pooling of water and twist to the enclosure frame.

When mounting the enclosure on a pad, the compression strength of the concrete pad used must be a minimum of 4000 psi as determined by ASTM C39 test of compression strength of concrete cylinders.

Always use a barrier pad between the concrete and the pad to prevent corrosion.

**CAUTION!** PREVENT EQUIPMENT DAMAGE, OPERATING TEMPERATURE

The enclosure is approved for operation in an environment with an expected temperature range of -40°F to +115°F (-40° C to +46°C) and 5% to 95% relative humidity range, condensing. Do not use at temperatures or humidity exceeding these ranges.

The enclosure is not for indoor use.

**CAUTION!** PREVENT DAMAGES CAUSED BY ELECTROSTATIC DISCHARGES (ESD)

When handling the ECU unit, wear an appropriate antistatic device (a wrist strap for example) that is properly connected to a designated antistatic grounding point (on a framework, on an anti-static floor mat, etc.). ESD-protective packaging material shall also be used when carrying/shipping the ECU unit.

Personal Protective Equipment (PPE)

**DANGER!** ARC FLASH AND SHOCK HAZARD.

Appropriate PPE and tools required when working on this equipment. An appropriate flash protection boundary analysis should be done determine the “hazard/risk” category, and to select proper PPE.



Only authorized and properly trained personnel should be allowed to install, inspect, operate, or maintain the equipment.

Do not work on LIVE parts. If required to work or operate live parts, obtain appropriate Energized Work Permits as required by the local authority, per NFPA 70E “Standard for Electrical Safety in the Workplace”.

**DANGER!** HAZARD OF ELECTRICAL SHOCK.

More than one disconnect may be required to de-energize the system before servicing.

Handling Equipment Containing Static Sensitive Components



ALERT! Installation or removal of equipment containing static sensitive components requires careful handling. Before handling any equipment containing static sensitive components, read and follow the instructions contained on the Static Warning Page.

Maintenance and Replacement Procedures



CAUTION! When performing any step in procedures that requires removal or installation of hardware, use caution to ensure no hardware is dropped and left inside the unit; otherwise service interruption or



NOTE! When performing any step in procedures that requires removal of existing hardware, retain all hardware for use in subsequent steps, unless otherwise directed.

STATIC WARNING



This equipment contains static sensitive components. The warnings listed below must be observed to prevent damage to these components. Disregarding any of these warnings may result in personal injury or damage to the equipment.

1. Strictly adhere to the procedures provided in this document.
2. Before touching any equipment containing static sensitive components, discharge all static electricity from yourself by wearing a wrist strap grounded through a one megohm resistor. Some wrist straps have a built-in one megohm resistor; no external resistor is necessary. Read and follow wrist strap manufacturer's instructions outlining use of a specific wrist strap.
3. Do not touch traces or components on equipment containing static sensitive components. Handle equipment containing static sensitive components only by the edges that do not have connector pads.
4. After removing equipment containing static sensitive components, place the equipment only on conductive or anti-static material such as conductive foam, conductive plastic, or aluminum foil. Do not use ordinary Styrofoam™ or ordinary plastic.
5. Store and ship equipment containing static sensitive components only in static shielding containers.
6. If necessary to repair equipment containing static sensitive components, wear an appropriately grounded wrist strap, work on a conductive surface, use a grounded soldering iron, and use grounded test equipment.

PURPOSE OF THIS DOCUMENT

This practice provides installation instructions for installing a Vertiv Add-On 400 Pr. Annex NetReach™ Expander® as illustrated in **Figure 1**.

PRODUCT OVERVIEW

Perspective Views

Refer to **Figure 1** for perspective views of the product.

Part Numbers

Refer to **Table 1** for applicable product part numbers.

Table 1: Enclosure Part Number and Description

Part Number	Description	Typical Applications
F1009843	Color: White; Dimension: 48 x 10 x 9.5 in; PID#: 269 100 111	- pad-mounted host Cross-Connect cabinet; either double sided with less than 15 inches of space between the hinges on the side of the host cabinet or single sided with less than 14 inches of space between the hinges on the side of the host cabinet; - all pole mounted cabinets.
F1009845	Color: Green; Dimension: 48 x 10 x 9.5 in; PID#: 271 100 118	
F1009842	Color: White; Dimension: 32 x 15 x 9.5 in; PID#: 268 100 112	pad-mounted host cabinet; either double sided with minimum of 15 inches of space between the hinges on the side of the host cabinet or single sided with minimum of 14 inches of space between the hinges on the side of the host cabinet.
F1009844	Color: Green; Dimension: 32 x 15 x 9.5 in; PID#: 270 100 117	

Figure 1: Completed Add-On 400 Pr. Annex NetReach™ Expander® Cabinet Installation (left-hand installation shown for left: 1x8 Expander® cabinet and right: 2x4 Expander® cabinet).



Reason for Reissue

Whenever this practice is reissued, the reason for reissue will be stated in this paragraph.

Additional Information

Refer to other local practices or building codes as applicable for the correct methods, tools and materials to be used in performing procedures not specifically described in this document. The information contained in this practice is subject to change without notice and may not be suitable for all applications.

ANNEX CABINET INSTALLATION



CAUTION! Wear safety glasses for eye protection when drilling.



NOTE! Repositioning of the drop-down grill for the 1x8 Vertiv Add-On Pr. Annex NetReach™ Expander® cabinet:

- If the Expander® cabinet is to be installed on the left side of the host cabinet, the drop-down grill needs to remain on the left side;
- If the Expander® cabinet is to be installed on the right side of the host cabinet, the drop-down grill needs to be moved to the right side of the Expander® cabinet together with the ground bar, telephone plug cable and the plug bolts.



NOTE! The installation steps and illustrations described within this Installation Practice are for a left-hand installation. The 1-3/4" hole needs to be punched in the lower right corner of the Expander® cabinet to allow the passing of jumpers into the host cabinet's jumper looms. If the Expander® cabinet is to be installed on the right-hand side of a host cabinet, the holes and mounting location must be adjusted accordingly.

Required Equipment

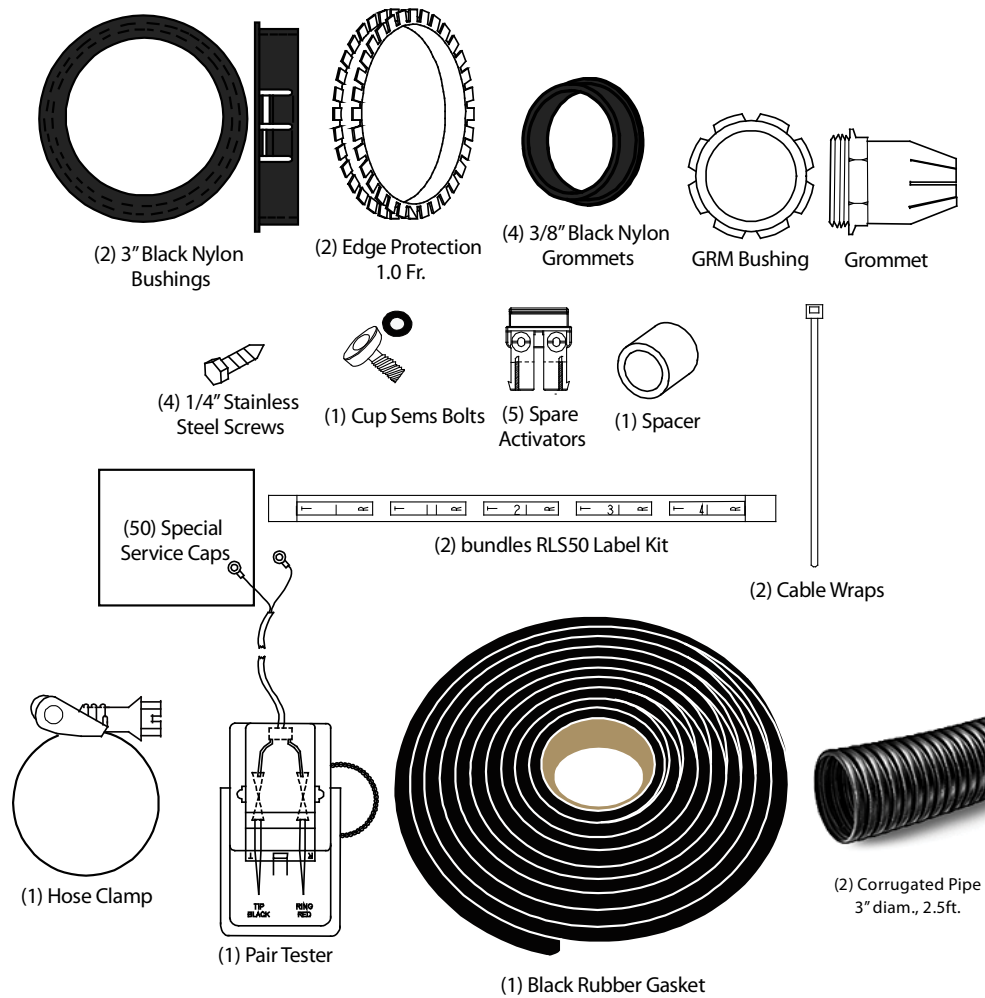
To mount the Vertiv Add-On 400 Pr. Annex NetReach™ Expander® cabinet kit, you will need to supply the following tools:

- A pair of safety glasses
- A pair of protective gloves
- A ladder
- One (1) power drill
- 3/8" drill bits, appropriate for drilling in metal
- 1-3/4" and 3" hole saw or punch capable of drilling through aluminum
- A metal file for deburring
- One (1) 216-type tool.

Kit Contents

Remove the kit components of the Expander® cabinet kit from the packaging. Verify that the kit contains all of the required components and hardware illustrated in **Figure 2**, and dispose of the packaging per local practices.

Figure 2: Add-On 400 Pr. Annex NetReach™ Expander® Cabinet Kit Contents



Kit Installation

Host Cross-Connect Cabinet

Procedure

1. Unlock host cabinet doors using the appropriate security tool. See **Figure 3**.
2. Secure the doors in their open position using the wind latches.
3. Ensure that any wires are pulled away from the side of the host cabinet in preparation for drilling.

Figure 3: Sample of a host Cross-Connect cabinet



Add-On 400 Pr. Annex NetReach™ Expander® Cabinet

Procedure

1. Remove the Expander® cabinet cover by sliding it upward and removing it from the Expander® cabinet base. Set safely aside for re-use.

Figure 4: Unhook safety chain from the metal hook.

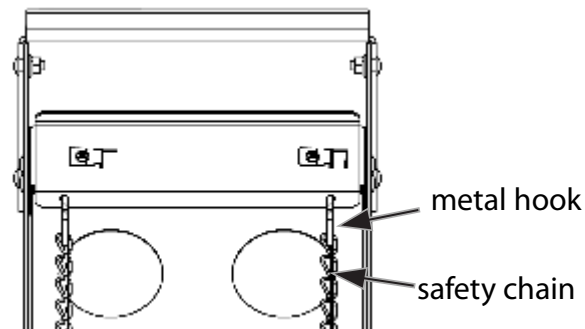
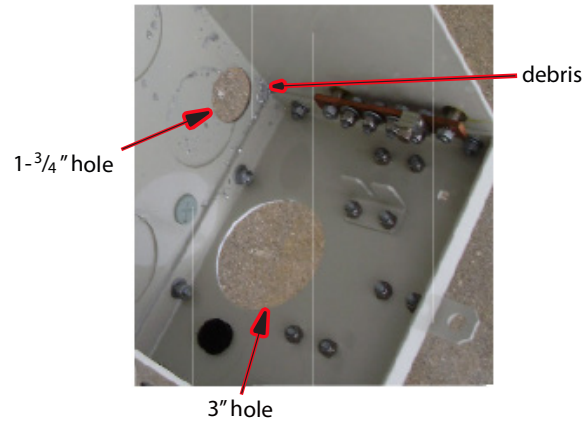


Figure 5: Marked and drilled 1-3/4" hole at the lower left-hand side of the host Cross-Connect cabinet.



2. Detach the safety chain from the Expander® cabinet and remove the drop-down grill. This will lighten the weight of the Expander® cabinet and provide easy access for marking and drilling. See **Figure 4**.
3. Determine the appropriate location in the host cabinet where the 13/4" clearance hole will pass through into the Expander® cabinet. See **Figure 5**.
4. Drill a 1-3/4" hole in the Expander® cabinet using a drill or punch tool. A 3" hole saw or punch will be needed for conduit entry as noted in **Figure 6**.

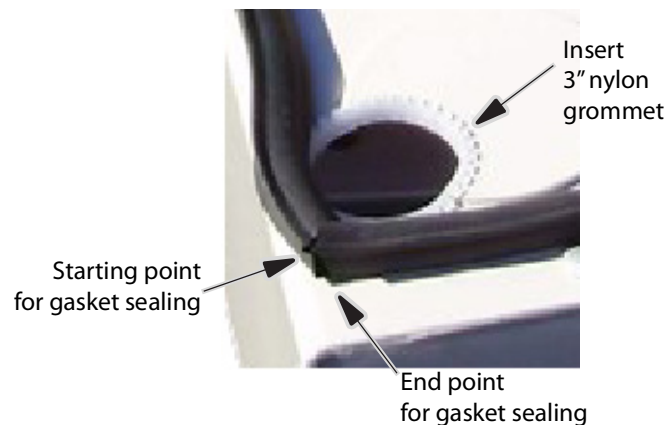
Figure 6: Drilled 1-3/4" hole at the lower right-hand side and 3" knockout at the bottom of the Add-On 400 Pr. Annex NetReach™ Expander® Cabinet.



 **NOTE!** Deburr as necessary.

5. Using the Expander® cabinet as a template, establish the proper height and horizontal placement for the Expander® cabinet onto the host cabinet.
6. Using provided grommet strip, attach securely to inside edge of the 1-3/4" hole. See **Figure 7**.
7. Attach the provided black gasket strip to the rear of the Expander® cabinet and place it approximately 1/8" from the edge of the Expander® cabinet. See **Figure 7**.

Figure 7: Insertion of plastic caterpillar grommet and proper attachment of gasket strip.



 **NOTE!** The joint must be in one of the lower corners of the Expander® cabinet to provide a weather-tight seal.

8. Using the Expander® cabinet as a template, mark mounting locations onto the side of the host cabinet and center punch in preparation for drilling.
9. Using a drill and a 3/8" drill bit, drill pilot holes in (4) locations.
10. Attach the Expander® cabinet to the side of the host cabinet using (4) 3/8" stainless steel screws and washers as shown in **Figure 8**.

Figure 8: Attachment of the Add-on Annex NetReach™ Expander® cabinet to the host cabinet.

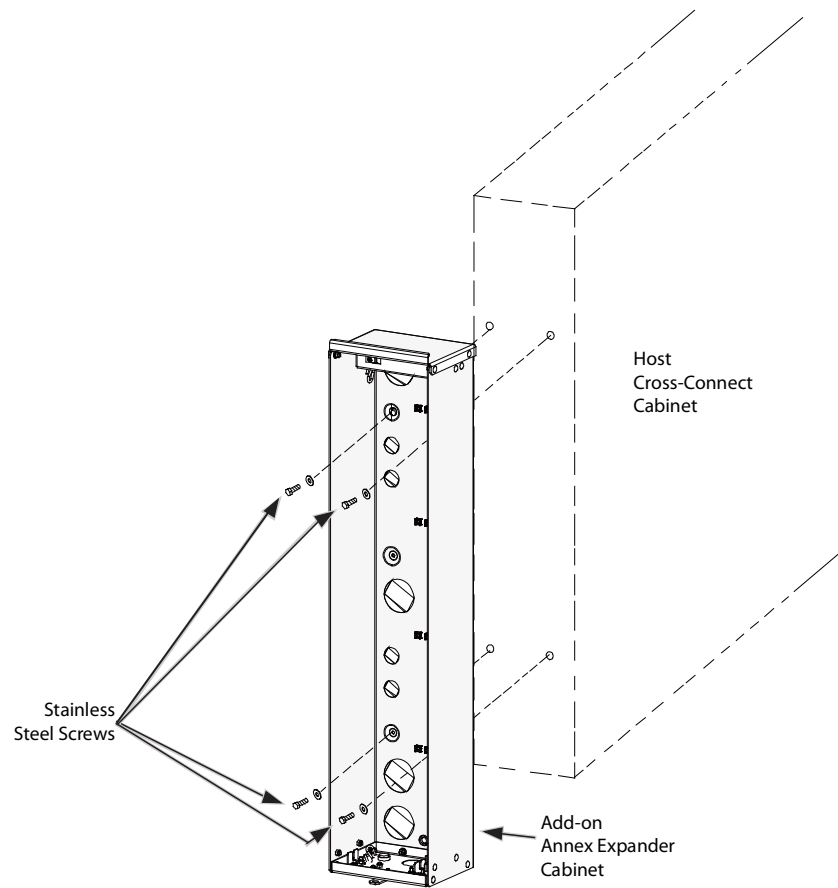
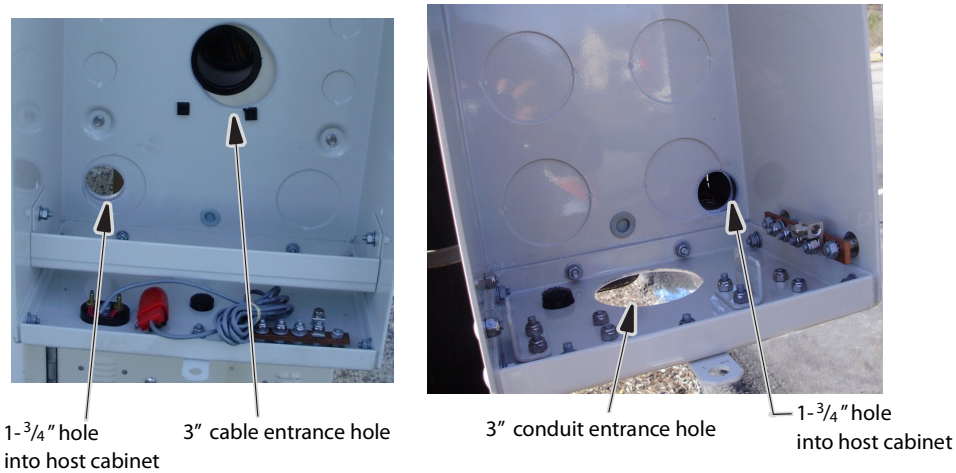
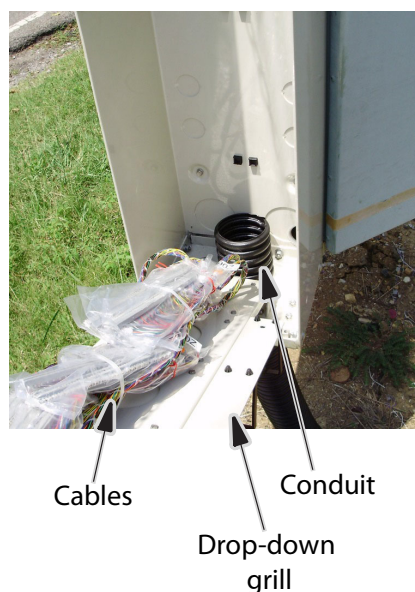


Figure 9: Conduit entrance and 1-3/4" hole punched or drilled into host cabinet (left: 2x4 Expander® cabinet, right: 1x8 Expander® cabinet).



11. Tighten securely to compress gasketing to one-half of its original, uncompressed thickness to ensure water-tight seal.
12. After securing the Expander® cabinet to the host cabinet, verify the alignment of the 1-3/4" hole into the host cabinet. See **Figure 9**.
13. Insert the conduit into the 3" entrance hole. This will serve as the cable entry point. See **Figure 10**.

Figure 10: Entrance of conduit into Add-On 400 Pr. Annex NetReach™ Expander® cabinet for cable entry



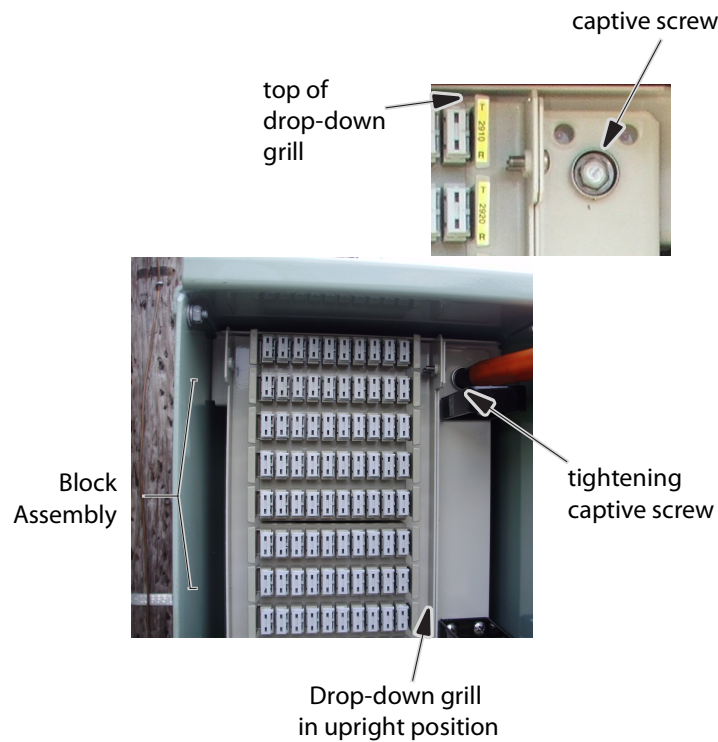
KIT COMPLETION

Add-On 400 Pr. Annex NetReach™ Expander® Cabinet

Procedure

1. Secure the grills back to their proper position by tightening the captive screw located at the top of the grill. See **Figure 11**.
2. Reinstall lift-off cover to the Expander® cabinet base.
3. Secure the lift-off cover with a padlock.

Figure 11: Drop-down grill in upright position.



Host Cross-Connect Cabinet

Procedure

1. Close the host cabinet doors and secure with lock.

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