Boxer™ BXM05V19-2HE3
Outdoor Cabinet with 24VDC/-48VDC Heat Exchanger & Vertical 5-RU Rack

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1. GENERAL

1.1 Document Purpose

This document provides general, installation and specification information for the Westell® Boxer™ BXM05V19-2HE3 Outdoor Cabinet with a built-in, vertically-oriented, 5-RU by 19" relay rack and a 200 Watt heat exchanger (shown in Figure 1 and Figure 2). This product is designed to provide Network equipment protection in outdoor environments. The intended audience for this document is engineering, operations, and installation personnel of MSO, Telco, and utility companies. See Table 4 for product ordering information and available options to use with the BXM05V19-2HE3.

- NOTE -
Hereafter, the BXM05V19-2HE3 Boxer cabinet also may be commonly referred to as the “Boxer 5” or “cabinet.”

1.2 Document Status

Whenever this practice is updated, the reason will be stated in this paragraph.

1.3 Product Purpose and Description

Boxer is a compact, NEMA 4 weather-tight, heat exchanger-cooled outdoor cabinet that houses and protects a wide range of electronic equipment. Up to 5 RUs (8.75”) of unobstructed full-access rack space (19” racks) is available to mount Network equipment inside the cabinet, such as:

- Ethernet switches
- Multiplexers
- Fiber terminating equipment
- Copper bonding solutions
- Radio equipment
- Smart Grid equipment
- Media converters
- xDSL boxes
- DS3 hand-offs, and
- Virtually any equipment than can be mounted on the internal mesh backboard or in a 19” rack
Adjustable rack channels are mounted inside the cabinet at the top and bottom walls, for a rotated-rack effect, allowing equipment to be mounted vertically in the cabinet and minimizing or streamlining the cabinet width. Boxer supports rapid equipment installation and wiring through the use of adjustable and removable 19” rack channels. To ensure easy access for input and out cabling, Boxer includes multiple cable access hole knock-outs of various sizes on the cabinet floor. A door switch facilitates optional alarm functionality.

1.4 Product Mounting

The Boxer cabinet is typically mounted outdoors, above ground, on a pole, wall, or an H-frame. The streamlined 14” width (approx.) of this rugged weather-tight cabinet both creates and adapts to numerous mounting configurations. An optional battery box can be mounted under and attached to the Boxer 5 cabinet. All mounting hardware must be capable of supporting the weight of the Boxer cabinet (approximately 22 pounds) plus the weight of any equipment mounted in it. The Boxer cabinet is typically located at the customer premises but can be located anywhere a compact, weather-tight, outdoor cabinet is required.

1.5 Product Features

Each Boxer 5 cabinet comes fully assembled and ready for field-provided customer equipment installation, and includes the following features and capabilities.

- NEMA 4 compliant
- Actively-cooled with heat exchanger
  - Dissipates up to 200 watts
  - -48VDC or +24VDC powered
  - Low noise level
  - Vented heat exchanger compartment
- Temperature-controlled heat exchanger fans
- Fan test button
- Door open alarm switch & door open fan cut-off switch
- Compact size, approx. 14” W x 23” H x 20.2” D (without mounting ears and heat exchanger compartment)
- Weather-tight cabinet
- Full-size locking front door (opens with can wrench)
- Door security via a locking, hex, cup-washer bolt which also accepts a padlock
- Provides 5 RU’s (full front access) of 19” interior vertical rack space (plus 2 RU’s limited-access rack space)
- Removable/adjustable rack channels (4 positions)
- Full-size mesh backboard at interior rear wall for versatile cable management and equipment mounting options
- Knock-outs at cabinet bottom accept a variety of cable, conduit, and connector sizes/types (eleven 1”, three 2”)
- Included mounting ears allow pole, H-frame, wall or square post mounting
- Optional battery backup box available

Figure 3. Upper Interior View

Figure 4. Lower Interior View
Figure 5. Door Lock

- Light-weight aluminum construction (0.125” thick wall, 22 pounds) with powder-coat finish
- Operating temperature: -40° to 149°F (-40° to 65°C)

2. FEATURES

This section describes the exterior and interior features of the Westell® Boxer™ outdoor cabinet in more detail. Refer to Figure 5 through Figure 11 as needed while reading this section.

2.1 Exterior Features

The features visible on the outside of the cabinet are described hereunder. See Paragraph 2.2 for the interior features.

2.1.1 Construction and Materials

The NEMA 4 compliant Boxer 5 cabinet is designed to be weather-tight for above-ground applications. As such, the powder-coat painted aluminum cabinet withstands many harsh weather conditions such as rain, snow, and sleet.

2.1.2 Cabinet

The cabinet utilizes an “in-the-door” heat exchanger design. Cabinet cooling is accomplished through the front-door-mounted heat exchanger, fans, and vents. Security is provided via a lock that can be locked/opened with a can wrench or 216 tool and an optional padlock. Mounting brackets (Paragraph 2.1.2.3) are attached at the top and bottom near the back wall for permanent mounting. The bottom floor of the main cabinet contains numerous, differently-sized, intact knock-outs (Paragraph 2.1.2.4) to accommodate a variety of cable, fitting, or conduit sizes and types.

2.1.2.1 Front Door

A full-size locking door provides maximum technician and equipment access to the interior of the cabinet and also helps protect the cabinet from tampering and vandalism. The cabinet’s cooling system is a door-mounted heat exchanger (see Figure 6). When the cabinet is mounted and the door is open, the distance from the back of the mounting ears to the outer edge of the door’s flange is approximately 32” (as shown in Figure 6). With the door open, the dimensions of the internal cabinet opening is approximately 11.4” by 20.5” (as shown in Figure 22). The door opens to approximately 120 degrees. In the closed position, a gasket installed around the inside perimeter of the door abuts the front cabinet flange. When the door lock is tightened, the cabinet’s door flanges and gasket provide a weather-tight seal to protect all equipment installed inside the cabinet. The internal door switch/sensor is described in Paragraph 2.2.4.

2.1.2.2 Door Lock

To lock the door, a tamper-proof hex cup-washer bolt is provided within the lock mechanism in the door. This bolt (Figure 5) is loosened and tightened with a standard telco can wrench or 216 tool. Additional security is available when a padlock is inserted through the two opposing holes in the protruding cylindrical lock wall of the lock mechanism: a padlock hasp installed through the holes denies door tool access (tool will not reach the hex bolt).

2.1.2.3 Mounting Ears

Two mounting ears are provided at the back of the Boxer cabinet, one at the top and one at the bottom. Each ear has three mounting holes or slots. The center hole of the top ear is a key-hole, for easy one-person, cabinet-self-leveling mounting. Use mounting fasteners with a diameter of up to 3/8”). The vertical distance between the top and bottom mounting ear hole centers is 26.4” (see Figure 7). Before mounting the cabinet, remove the ears from their space-saving “shipping” position, rotate them 180 degrees, and re-install them in the “mounting” position. The top ear is taller than the bottom ear.

2.1.2.4 Bottom Floor Knock-outs

Multiple knock-outs are provided on the floor of the cabinet. The knock-out sizes and quantities are shown in Table 1 and Figure 21. Do not remove a knock-out unless it is absolutely necessary to do so for cable ingress and egress, and use either tight-fitting rubber grommets or liquid-tight fittings, or other proper and approved knock-out hole sealants, to assure the best internal air quality and weather-resistance. Always use proper and company-approved tools to remove knock-outs. There are four, small, 0.300” diameter knock-outs in the floor of the Boxer cabinet where an optional battery box attaches to the cabinet (hole patterns of both units match).
Figure 8. Heat Exchanger Compartment, Exploded View

2.1.2.5 External Ground Lug

An external ground lug is provided at the bottom of the cabinet (see Figure 3) for chassis/earth ground connections. Connect an earth ground (#6 AWG recommended) to this lug per company practice. The interior ground plate (see Figure 4, explained in Paragraph 2.2.6) is bonded to this external ground lug via the lug’s mounting posts which protrude through the floor of the cabinet, and via the all-metallic cabinet construction.

2.2 Interior Features

The features located inside the Boxer 5 are described hereunder.

2.2.1 Cooling System (Heat Exchanger)

The Boxer cabinet features an active heat-exchange system that compensates for the effects of internal equipment heat and external solar and temperature loading inside the cabinet. The two heat exchanger fans (see location in Figure 8) are temperature activated. The fans turn on when the interior of the cabinet reaches 35°C (95°F) and turn off when the internal cabinet temperature cools to 25°C (77°F). At the core of the heat exchange system are numerous aluminum fins (visible through the compartment’s vent holes) on each “side” of a sealed divider wall within the heat exchanger. The dual air-path exchanger uses the lower-mounted fan to blow cool outside air past the “exterior air side” fins of the heat exchanger and to direct the heated air out the vent holes on the sides of the fan cover. Conversely, the upper-mounted fan circulates warm inside air down past the “interior air side” fins of the heat exchanger and blows cooled air into/through the main cabinet compartment. The heat exchanger unit is field-replaceable (see Table 4 for part number).

2.2.2 Heat Exchanger Fans (“FAN A” Connector)

Two, factory-installed, temperature-controlled fans (shown in Figure 8) circulate air through the heat exchanger. One fan is used for the external circuit, and one fan is used for the internal circuit. Both of these fans are factory-wired to the “FAN-A” connector on the controller card mounted on the left side wall of the cabinet, and are powered from either a field-provided +24VDC power source or a -48VDC power source. The fans are not field-replaceable, and the heat exchanger housing the fans must be replaced in the event of a unit failure (see Table 4).

2.2.3 Controller Card

This paragraph and Table 2 describes the features of the included controller card located on the inside left wall of the cabinet (Figure 9). Internal wiring at the controller card has been factory-wired. See Paragraph 3.8 to perform external connections (installer power, temperature, and alarm wiring and connections) to the controller card.

The controller card includes connections for power and for the fans, temperature alarm, door alarm, the fan test button and a 5A fan fuse. External wiring to the power source and alarm monitoring equipment is done using “Euro-connector” snap-in terminal blocks which can be pulled off of the controller card, and later re-inserted for quick and easy connections. Table 2 lists all of the connectors and positions on the controller card. The only installer connections needed are the TEMP ALARM, DOOR ALARM, and power connections (-V and +V). To make these connections to the Euro-connectors, pull-off the Euro-connector, loosen the screws inside the set-screw holes, strip approximately 3/8” off the end of each wire, insert wire(s) into hole(s), tighten screws, and push-on the Euro-connector (see Paragraph 3.8 for more installation details).
Connectors and Features on the Controller Card

- **TEMP ALARM Euro-Connector.** A Normally Open (NO) Temperature Alarm thermostat contact closes when the internal cabinet temperature exceeds 65°C and will remain on until the temperature drops below 55°C. For temperature alarm connections, connect alarm wiring from the field-provided alarm equipment to the 2-position Euro-connector at the top left of the controller card.

- **DOOR ALARM Euro-Connector.** A Normally Open (NO) Door Alarm contact closes when the door is opened. For door alarm connections, connect wiring from the field-provided alarm equipment to the 2-position Euro-connector labelled DOOR ALARM at the top left of the controller card.

- **Fan A Head Exchanger Euro-Connector.** The internal temperature-controlled heat-exchanger fans are factory wired to the controller card at the FAN-A Euro-connector (FAN-A = heat exchanger fans). The fans require a -48VDC, 1.75A (2 Heat Exchanger Fans) power source to be wired to the power Euro-connector of the controller card.

- **5A Fan Fuse.** A field-replaceable 5A fuse for proper fan operation is provided and accessible near the left bottom corner of the controller card. Remove this fuse whenever performing fan maintenance or replacing the fans.

- **-V and +V Power Euro-Connector.** The Euro connector labelled -V and +V is prewired to a 48” red and black cable wire stub. For +24V power applications, connect the red wire to the +24V source and connect the black wire to ground. For -48V power applications, connect the black wire to the -48V source and the red wire to ground.

- **Fan Test Button.** A momentary fan test button is provided in the lower left corner of the controller card. Use this button for fan testing purposes.

- **Door Switch 1 Euro-Connector.** A connector labelled DOOR SWITCH - 1 on the right side of the card is factory-prewired to the door open fan cut-off switch (upper door switch) for fan shut-off purposes when the door is opened. The door switch is field-replaceable.

- **Door Switch 2 Euro-Connector.** A connector labelled DOOR SWITCH - 2 on the right side of the controller card is factory-prewired to the door open alarm switch (lower door switch) for door open alarming purposes. The door switch is field-replaceable.

### Table 2. Controller Card Connectors

<table>
<thead>
<tr>
<th>Connector Name</th>
<th># of Positions</th>
<th>Position Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left Side of Controller Card</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEMP ALARM</td>
<td>2</td>
<td>NO</td>
<td>Normally Open. (Installer connects to field-provided equipment.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COM</td>
<td>Common. (Installer connects to field-provided equipment.)</td>
</tr>
<tr>
<td>DOOR ALARM</td>
<td>2</td>
<td>NO</td>
<td>Normally open. (Installer connects to field-provided equipment.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COM</td>
<td>Common. (Installer connects to field-provided equipment.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED</td>
<td>+ voltage. Factory connected to Fan A (black wire).</td>
</tr>
<tr>
<td>FAN – B (Connector provided but not used)</td>
<td></td>
<td>BLK</td>
<td>– voltage. Factory connected to Fan B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED</td>
<td>+ voltage. Factory connected to Fan B.</td>
</tr>
<tr>
<td>FAN TEST button</td>
<td></td>
<td>FAN TEST</td>
<td>Momentary push-button to test fan operation</td>
</tr>
<tr>
<td><strong>+24V Power Operation Only Power Connections</strong></td>
<td>2</td>
<td>BLK</td>
<td>System Ground (Installer connects to field-provided DC power)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED</td>
<td>Apply +24V (Installer connects to field-provided DC power)</td>
</tr>
<tr>
<td><strong>-48V Power Operation Only Power Connections</strong></td>
<td>2</td>
<td>BLK</td>
<td>System Ground (Installer connects to field-provided DC power)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED</td>
<td>Apply -48V (Installer connects to field-provided DC power)</td>
</tr>
<tr>
<td><strong>Right Side of Controller Card</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOOR FAN CUT-OFF SWITCH 2</td>
<td>2</td>
<td>DOOR SWITCH-2 (Upper)</td>
<td>Door open fan off switch. Factory wired.</td>
</tr>
<tr>
<td>DOOR ALARM SWITCH 1</td>
<td>2</td>
<td>DOOR SWITCH-1 (Lower)</td>
<td>Door open alarm switch. Factory wired.</td>
</tr>
</tbody>
</table>
2.2.5 Internal 19" Rack Channels

Two removable/adjustable rack channel brackets (see Figure 10, Figure 11 or Figure 18) inside the cabinet provide 19" relay rack mounting for equipment that is to be mounted in the cabinet. With each rack channel in the forward-most position, the distance between the inside of the closed front door and the channel’s front face is approximately 3.75" (equipment projection), and the distance from the channel’s rear face to the cabinet’s interior mesh backboard is approximately 12.5". Four rack channel positions are available (see Figure 16), each 1" apart, if a few additional inches of equipment depth is needed at either the front or back of the channel. Each rack channel also contains predrilled holes, with standard hole spacings (either 1", 1.75", or 2" rack hole patterns), to mount customer-supplied equipment in the cabinet. Network equipment up to 5 Rack Units (5 RUs: 5 x 1.75 = 8.75") high can be mounted vertically on the internal rack inside the cabinet, either as a single piece or multiple pieces of equipment.

Extra RU Note
Two extra rack units of equipment mounting space is available at the left side of the cabinet; however, these RUs have limited rear access (partially obstructed by the door switch).

2.2.6 Grounding and Bonding Center

Boxer’s grounding and bonding center is located on the bottom interior surface of the cabinet, close to the front door. A ground plate is provided that contains five sets of ground posts and one copper ground lug, for cable and chassis/earth ground. Bond equipment/cables to the ground posts per company practice, and connect a #6 AWG chassis or earth ground wire to the ground lug. An Electro-Static Discharge (ESD) wrist-strap jack is also located on the ground plate.

3. INSTALLATION

Use and follow local codes and company practices to install the Westell® Boxer™ cabinet. If none exist, use the instructions contained herein. Installation consists of:

- inspecting the unit for possible shipping damages,
- following proper safety precautions,
- reviewing pre-mounting considerations, such as selecting the mounting type and location, and preparing the mounting site,

- INSPECTION NOTE -
Visually inspect the unit for damages prior to installation. If the equipment has been damaged in transit, immediately report the extent of the damage to the transportation company and to Westell (see Part 6 for telephone number).

- DESICCANT NOTE -
To prevent condensation during shipment and storage, Westell includes a desiccant pack within the Boxer cabinet. Once the electronic equipment is installed and turned-up, the internal power dissipation reduces the likelihood of condensation within the cabinet. However, follow company practices for desiccant maintenance procedures to prevent internal condensation.
3.2 Following Proper Safety Precautions

The cabinet should be installed only by authorized and trained personnel. Always exercise caution and follow all safety precautions.

Important Safety Instructions (Please Save)

When using your telephone/telecommunications equipment, follow basic safety instructions to reduce the risk of fire, electric shock, and injury to person(s), including the following:

A. Read and understand all instructions.
B. Follow all warnings and instructions marked on product.
C. Do not place this product on an unstable cart, stand or table; the product may fall, causing serious damage to product.
D. Slots and openings in the cabinet are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
E. This product should be operated only from the type of power source indicated on the marking label.
F. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in the risk of fire or electrical shock. Never spill liquids of any kind on the product.

- CAUTION - STATIC-SENSITIVE -
This product contains static-sensitive components! Proper electrostatic discharge procedures must be followed to maintain personal and equipment safety. Do not store units near magnetic, electromagnetic or electrostatic fields. Always store or ship units in the original static-protective packaging from Westell. Use anti-static mats when working on units.

- PRECAUTIONARY STATEMENT -
Never install telephone wiring during a lightning storm.
Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
Use caution when installing or modifying telephone lines.

3.3 Selecting and Preparing the Mounting Type and Site (Pre-Mounting Considerations)

Mount the cabinet in a location with an adequate earth ground and power access, with unobstructed cabinet access, and which insures the best lighting, ventilation, heat dissipation, and equipment access. Verify sufficient space exists to allow the opening of the left-hinged door, to access and mount the cabinet, to mount and access the optional battery box if it will be mounted below it, and to adequately access, prepare, and dress all cables. Adequate horizontal and vertical space should be left between any multiple installations to allow for cabinet opening, equipment access, and cable routings and preparations. Follow company practice for the proper distance from the cable entry point or from upstream/downstream equipment.

3.4 Gathering all Tools and Equipment

The following tools and supplies (not provided) are required to mount the Boxer cabinet.

Door Opening/Locking Tools
- 7/16” can wrench or 216 tool
- Padlock (optional)

Knock-Out Removal Tools
- Hammer
- Punch
- Pliers

Cabinet Mounting Tools, Equipment, and Hardware
- Tape measure
- Marking utensil (to mark mounting hole locations)
- Level (optional)
- Power or hand drill with assorted bits, plus long bits or drill bit extensions if pole mounting
- Socket driver and sockets, or wrenches
- Wall- or pole-mounting hardware, such as 3/8” diameter wood-type lag screws or bolts
- H-frame mounting hardware (for H-frame mounting)
- Outdoor site preparation tools
- Safety gloves and glasses (optional)
- Power hoist or lifting equipment and cables (optional)
- Assorted screwdrivers
- Appropriate ground wire and equipment

Cable Preparation Tools and Equipment
- Cable opening and preparation tools
- Proper lengths and types of communications cables
- Proper lengths and types of power cables and fittings
- Power installation tools and testing equipment
- Wire strippers (for controller card or alarm connections)
- Cable management supplies (ties, clips, markers, etc.)
- ESD protection

- KNOCK-OUT REMOVAL NOTE -
Always remove knock-outs where holes are desired before mounting the battery box or cabinet, regardless of the type of knock-out and regardless of the order of the mounting steps.

3.5 Removing the Knock-outs

Knock-outs should be removed wherever holes for cable access are needed prior to mounting the cabinet. See Figure 21 or Table 1 for knock-out sizes, quantities, and locations, and follow the steps below to remove the knock-outs.

1. Open the cabinet door. If knock-outs will need to be removed, using a 216 tool or can wrench, open the large front door of the Boxer cabinet to access the knock-outs.

2. Remove knock-out(s). Prior to mounting the cabinet, per company practice, remove as many appropriately-sized knock-outs at the bottom of the cabinet as needed for the specific application (consider ground, power, and communication cable access needs, venting, and whether optionally mounting a battery box with the cabinet).

3. Install rubber grommets or conduit fittings. Install either a heavy-duty rubber grommet or the conduit fitting of
choice (liquid-tight recommended) in each selected knock-out hole. If an optional vent is desired, the provided vent cap can be installed in one of the smaller knock-outs.

4. **Close the cabinet door.** Once the knock-outs are removed, lock the door using the 216 tool or can wrench, to minimize possible product damage and personal injury.

- NOTE -
To improve the integrity of the cable entries seal when rubber grommets are used, a water-proof foam or silicone sealant should be used on the interior side of the cabinet, around the exposed grommet and cable entry.

### 3.6 Mounting the Cabinet

The Boxer cabinet is typically mounted outdoors, above ground, on an H-frame, wall, or a square pedestal or post (minimum 8” wide). All mounting hardware (not provided) must be capable of supporting the weight of the Boxer cabinet (approximately 22 pounds) plus the weight of any equipment mounted in it. Run all cables to the mounting location, perform any trenching, trench cable placements, and backfilling prior to the cabinet mounting, and clear the installation area of any debris, vegetation, and unneeded equipment or obstacles.

- MOUNTING EAR ADJUSTMENT NOTE -
The Boxer cabinet is shipped with the ears rotated such that the ears’ inside right-angle corner abuts the cabinet’s top-rear wall corner (left drawing below), to protect the ears during transport. Prior to mounting the cabinet, unscrew the bolts that secure the ears to the cabinet, rotate the ears 180 degrees so the flange with the oblong holes faces away from the cabinet (right drawing below), then re-attach and tighten the ear mounting bolts.

- WEIGHT NOTE -
The Boxer cabinet weighs approximately 22 pounds. The weight of the internal equipment installed in the Boxer should not exceed 25 pounds. The mounting surface, structure, and hardware must be able to support the combined weight (47 pounds).

#### 3.6.1 Mounting on an H-Frame

Follow the steps below to mount the Boxer cabinet on an H-frame. See Figure 12 for an H-frame mounting drawing. If the installation includes the battery box, attach the battery box to the cabinet prior to mounting to the H-Frame.

1. **Determine exact mounting location in H-frame.** Select and mark the exact horizontal and vertical final mounting location within the H-frame. The spacing between the top and bottom horizontal rail mounting holes should be 26.4” (on centers, see Figure 7, Figure 12, or Figure 22). Westell recommends a height of 30” from the ground. In addition to allowing for a comfortable installer working height, leave adequate space under Boxer for cable access (or an optional battery box), as stated in Paragraph 3.3, as well as in front of the mounting to allow the door to open (see Figure 6), and at the sides in the event of any multiple installations.

2. **Remove knock-outs.** See Paragraph 3.5 (Removing the Knock-outs) to remove the knock-outs where any cable access holes (or holes to attach an optional battery box) are desired.

3. **Prepare the mounting hardware.** Bring the appropriate mounting hardware to the installation site. The hardware must be capable of supporting the weight of the cabinet plus the weight of the added internal equipment. Insert all rail nuts into the channel (compress the spring on the nuts as needed) and slide them over to the marked mounting location.

4. **Lift cabinet.** Lift the cabinet to the mounting height.

5. **Attach cabinet to H-frame rails.** Align the holes in the cabinet’s top mounting ear with the holes in the inserted rail nuts in the H-frame, then insert and install an appropriate bolt through each set of aligned holes. Tighten appropriately. Repeat for the bottom mounting ear and H-frame rail. Verify the cabinet is in the proper horizontal position, make any needed adjustments, then securely tighten all mounting hardware.

6. **Test installation firmness.** Test the installation by attempting to move the cabinet. Correct any looseness, if detected.

7. **Determine next step.** If ground, power, and communications cables and internal equipment will not be connected and mounted at this time, proceed to the next step to finalize the cabinet installation. If ground, power, and communications cables and internal equipment will be connected, mounted, and powered-up at this time, skip the next step and proceed to Paragraphs 3.7 through Paragraph 3.13 for those procedures.

8. **Close up cabinet and clean the site.** If not already closed, close the Boxer door, and lock it using a can wrench or 216 tool and an optional padlock. Pick up any tools and materials at the installation site, and clean the site of any trash or debris.

#### 3.6.2 Mounting on a Wall or Square Post

Follow the steps below to mount the Boxer cabinet to an approved wall (Figure 13) or square post. The approved wall or post must be capable of supporting the combined weight of the cabinet, the equipment mounted inside the cabinet, plus the
optional battery box (and batteries), if installed. Westell recommends a minimum installation height of 30” from the ground. See Figure 7 and Figure 22 for cabinet and mounting hole dimensions.

1. **Remove knock-outs.** See Paragraph 3.5 (Removing the Knock-outs) to remove the knock-outs where any cable access holes are desired.

2. **Find best wall or post position.** Locate the best mounting position for the cabinet on the wall or post. Verify this location meets all cabinet spacing requirements.

3. **Prepare the mounting hardware.** Bring the appropriate mounting hardware to the installation site. The hardware must be capable of supporting the weight of the cabinet plus the weight of the added internal equipment.

4. **Determine mounting height and mark top hole locations.** Measure and mark the top mounting hole locations on the wall or post. Westell recommends a height of 30” from the ground. In addition to allowing for a comfortable installer working height, leave adequate space under Boxer for cable access (or an optional battery box), as stated in Paragraph 3.3, as well as in front of the mounting to allow the door to open and at the sides in the event of any multiple installations. With a marking utensil, mark the top mounting holes to be drilled, in a level horizontal line, at the desired wall or post height.

5. **Drill top mounting holes.** Drill appropriately-sized pilot holes, slightly smaller than the width and depth of the mounting bolts, screws or fasteners, at the marked location. **Do not drill the holes too large.**

6. **Partially install bolts.** Partially install the bolts until only 1/2” remains.

7. **Lift cabinet, and align mounting holes.** Lift the cabinet to the partially installed bolts, align the top ear keyholes with the bolts, then hang the cabinet from the bolts.

8. **Fully install the top mounting bolts.** Verify the cabinet is level. Finish driving the top mounting bolts until they are snug and the cabinet is flush and tight against the wall. Manually test the bolt tightness to verify the bolts will support the cabinet weight before the next step. Correct any level or mounting bolt discrepancies.

9. **Mark and drill bottom mounting holes.** Mark the exact locations for the bottom ear’s mounting bolts through the predrilled slotted holes in the bottom mounting ear. Drill appropriately-sized pilot holes, slightly smaller than the width and depth of the bolts, at the marked locations. **Do not drill the holes too large.**

10. **Install bottom mounting bolts.** Insert and drive all bottom bolts completely in to their final seated position. Finish the installation by verifying all bolts are firm and snug.

11. **Determine next step, or close up cabinet and clean the site.** Repeat Steps 6-8 of Paragraph 3.6.1 to determine the next step or finish the physical cabinet installation.

### 3.7 Making Ground Connections

Five sets of bond/ground posts are provided on a ground plate on the interior floor of the cabinet (see Figure 14). These posts are provided to bond network and customer equipment or communications cables. **Make all ground connections prior to any telecommunications cable connections.**

1. **Locate or establish an external earth ground.** Find or create an external and appropriate earth ground, per company practice and local codes.

2. **Connect earth ground wire.** Connect the earth ground wire to the #6 AWG ground lug provided at the exterior bottom of the cabinet (Figure 15), per company practice.

3. **Ground cables and installed equipment.** As each cable and piece of equipment is mounted inside the cabinet (in the following sections), connect it to a ground lug or post provided on the interior ground plate (see Figure 14), per company practice.

4. **Use ESD ground jack.** Whenever installing equipment or performing system testing or maintenance, use the provided ESD ground jack also provided on the cabinet’s interior ground plate.

### 3.8 Making Fan Power Connections (External DC)

To power the factory-prewired Boxer cooling fans, an external +24V (3.5A) or -48VDC (1.75A) power source must be connected to the power terminals of the Controller Card mounted on the inside of the cabinet door.
Connecting -48VDC Fan Power
Follow the steps below to connect +24V or -48VDC fan power to the Euro-connector in the Controller Card in the Boxer cabinet. Always follow local codes and company practices, and see Figure 9 and Figure 17 as necessary.

1. **Verify the power source.** Verify the power source is in good working condition.

2. **Remove or disable power.** Disable power at the power source before proceeding (power is re-applied in Paragraph 3.8).

3. **Remove knock-out for power wires.** Select the best knock-out for power cable ingress and egress, and remove the knock-out per Paragraph 3.5, and prepare any grommet placement and conduit fittings per company practice.

4. **Route wires into cabinet.** Extend and route the DC wires from the power source into the Boxer cabinet through the knock-out hole. Fish enough wire to reach the Controller Card with adequate slack.

5. **Strip power wires.** Strip off approximately 3/16” from the end of the wires for DC power.

6. **Pull out power Euro-connector.** Remove the 2-position Euro-connector at the bottom left corner of the Controller Card (pull it out, as shown in Figure 17). Loosen the small screws in the connector, to accept the wires.

7. **Connect power wires to loose Euro-connector.** Insert each stripped wire into the proper position (in the rectangular hole, see Figure 17) provided for it in the Euro-connector, holding each wire in place while tightening each screw.
   - **+24VDC operation.**
     - Connect the negative power wire: Connect the negative power wire to the -V terminal.
     - Connect the positive power wire: Connect the positive +24VDC power wire to the +V terminal.
   - **-48VDC operation.**
     - Connect the negative power wire: Connect the -48VDC power wire to the -V terminal.
     - Connect the positive power wire: Connect the positive power wire to the +V terminal.

8. **Re-install Euro-connector.** After the power wires are properly positioned and secured in the Euro-connector, re-insert the fan power 2-pin Euro-connector back into its receptacle in the lower left corner of the controller card.

9. **Perform wire management.** Perform cable management per company practice.

10. **Proceed to Paragraph 3.10.** Proceed to Paragraph 3.10 for system power-up.

### 3.9 Making TEMP/DOOR ALARM Connections

The high temperature alarm and door alarm connections are located on the Controller Card located on the inside left side wall of the cabinet. Easy pull-off/push-on Euro-connectors are provided for these installer connections. To make connections to the Euro-connectors, pull-off the Euro-connector, strip ¼” off the end of each wire to be connected, loosen the set screw in the screw hole in the connector, insert the wire into the provided wire port hole, tighten the screw to secure the wire, repeat for each wire, then push-on the Euro-connector.

1. **Temperature Alarm connections.** Connect the Temperature Alarm **Normally Open** (NO) contact terminal to the Alarm input of the field-provided alarm monitoring device.

---

![Figure 14. Ground Plate for Equipment](image1)

![Figure 15. External Ground Lug](image2)

![Figure 16. Channel Adjustment Posts](image3)
Connect the Common contact terminal to the common input of the alarm monitoring device. For reference, the Normally Open Temperature Alarm thermostat contact closes when the internal cabinet temperature exceeds 65°C.

2. **Door Alarm connections.** Connect the Door Alarm Normally Open Door Alarm contact terminal to the Alarm input of the alarm monitoring device. Connect the Common contact terminal to common input of the alarm monitoring device. For reference the Normally Open contact closes when either the Network or Customer door is opened.

---

**- DEACTIVATING THE DOOR ALARM -**

The door alarm sensor can be temporarily disabled during equipment installation or maintenance by gently pulling out the cylindrical-shaped switch actuator until it clicks. Closing the door automatically resets/enables the sensor. To manually enable the door alarm sensor, gently push the switch actuator back in.

### 3.10 Performing System Power-Up

Before mounting any field-provided communications equipment in the cabinet, verify all internal Boxer equipment and power connections are functional. Follow the steps below to perform a Boxer system power-up procedure.

1. **Verify all power and ground connections are complete.** Examine the earth ground and all power connections inside and outside the Boxer cabinet and verify they are safe, secure, and complete.

2. **Turn on the external power source.** Apply the power from the external power source.

3. **Verify fan is operational.** Verify the fan is properly working by detecting air circulation directly in front of the fan.

---

**- EXTRA RU NOTE -**

Two extra rack units of equipment mounting space is available at the left side of the cabinet; however, these RUs have limited rear access (partially obstructed by the door switches).

### 3.11 Mounting Equipment Inside Boxer

Boxer utilizes a 5-RU by 19" rack with adjustable/removable rack channels. Four channel adjustment posts on the side walls (see Figure 16) are provided which allow the channels to be mounted in one of four different positions (can be adjusted forward or backward as needed. Boxer’s rack-hole pattern accommodates a wide variety of equipment and mounting ear hole patterns.

---

**- DESICCANT NOTE -**

To prevent condensation during shipment and storage, Westell includes a desiccant pack within the Boxer cabinet. Once the electronic equipment is installed and turned-up, the internal power dissipation reduces the likelihood of condensation within the cabinet. However, follow company practices for desiccant maintenance procedures to prevent internal condensation.
6. **Determine/adjust** the rack channel depth (optional). If the factory installed rack channels are not at the proper equipment projection depth, adjust the channels at this time. Remove the nuts that secure each channel and re-position the channels as needed, then re-install the nuts to secure each rack channel.

7. Verify the combined wattage of all equipment installed in the cabinet does not exceed 200 watts.

8. Verify all connections are made at the controller card; access to it may be limited if equipment is mounted immediately next to it.

9. Mount the equipment on the rack and/or on the rear mesh back plate, per company practice and the application.

10. Use the bond posts provided on the ground plate as needed for bonding or grounding any cables or equipment installed inside the cabinet.

### 3.12 Connecting Communication Cables

The types of communication cables used and their connector types (if any) vary per the application and the equipment installed inside the cabinet. To accommodate a variety of cable and connector sizes, the Boxer cabinet has 11 small and 3 large cable-hole knock-outs, as shown in Table 1 and Figure 21.

<table>
<thead>
<tr>
<th>- NOTE -</th>
</tr>
</thead>
<tbody>
<tr>
<td>To improve the integrity of the cable entries seal when rubber grommets are used, a water-proof foam or silicone sealant should be used on the interior side of the cabinet, around the exposed grommet and cable entry.</td>
</tr>
</tbody>
</table>

1. Run the communications cables to the Boxer cabinet.
2. Insert and route the cable through the desired grommet.
3. Attach the cable’s connector to the appropriate connector of the targeted equipment.
4. Repeat for each cable.
5. Make any desired connections between units of equipment.
6. Use the bond posts and ground lugs provided on the ground plate as needed for bonding or grounding any communications cables brought into the Boxer cabinet.

### 3.13 Optioning Installed Equipment

Make all option settings on the installed equipment per equipment manufacturer instructions and company practices.

### 3.14 Performing Cabinet Housekeeping

Verify all equipment is secure, verify all wires and cables are neatly organized and managed, verify all bonding and grounding connections are made at the ground plate, and verify no equipment, tie-downs, cables, or wires will interfere with the closing of the door. Clean up the installation site per company practice.

### 3.15 Closing and Locking the Cabinet

Upon completion, the installer should close and lock the cabinet by tightening the cup-washer bolt. The customer may optionally lock the door with a padlock (customer supplied) through the holes provided for it in the cylindrical door-lock flange.

### 4. MAINTENANCE

The Westell® Boxer™ components are maintenance-free, however, please note the following item.

- At least once every six months, periodic inspections should be performed on the Boxer cabinet to remove any debris from the door’s vent holes. This facilitates proper temperature and operation of the cabinet and allows unobstructed air flow.

### 5. SERVICE AND REPAIRS

Replacing parts is the only recommended type of field repair for the Westell® Boxer™ cabinet. The list below contains the only Boxer parts which may be ordered and field-replaced (see Part 6 for a telephone number, contact Westell for ordering information, and see Paragraph 7.2 for the return procedure). See the paragraphs below for detailed steps to remove and replace these parts.

**Field-replaceable parts:**
- Controller Card
- Door Alarm Switch
- Heat exchanger unit

<table>
<thead>
<tr>
<th>- CAUTION -</th>
</tr>
</thead>
<tbody>
<tr>
<td>To avoid electrical shock, turn off any DC or AC power feeds to the panel before removing or replacing the controller card.</td>
</tr>
</tbody>
</table>

#### 5.1 Replacing the Controller Card

The Controller Card cannot be field repaired. Should a problem be suspected with the card, it must be removed and returned to Westell for service, then re-installed or replaced. Follow the steps below to replace the controller card.

1. **Disconnect power.** Disconnect power to the card by removing the power Euro-connector block (labeled “‐V” and “+V”). Pull the connector forward.
2. **Remove all connectors.** Disconnect all other wire connections in the card by simply pulling off each Euro-connector in the controller card (on the card’s left and right edges, see Figure 9 and Figure 17) in similar fashion, and labeling each connector as it is removed, to facilitate re-connection with the replacement card. It is not necessary to remove any wires from the connectors (unless a fan is suspected of being faulty and is also being replaced).
3. **Remove card.** Remove the old card by unscrewing the nuts that secure the card to the cabinet wall, then pulling the card off the studs.

<table>
<thead>
<tr>
<th>- RETURN UNIT NOTE -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return the old/defective unit to Westell, and receive a replacement/new unit (see Paragraph 7.2 for details).</td>
</tr>
</tbody>
</table>

4. **Install new card.** Replace the old card with the new card, ordered and received from Westell. Be sure most of the connectors face left and that the card labelling is visible and not upside-down, align the mounting holes in the card with the posts on the cabinet wall, then tighten the nuts onto the studs to secure the card. Re-insert or snap-on all connectors in their proper positions in the card, connecting the power connector block last.
5. **Test.** Verify the alarms and fans work. Verify the fans are working properly by pressing the fan test button (see bottom of Figure 17 for location).

* CAUTION *
To avoid electrical shock, turn off any DC or AC power feeds to the controller before beginning this procedure.

5.2 **Replacing the Heat Exchanger**

The single-unit fans/heat exchanger cannot be field repaired. Should a problem be suspected with the heat exchanger or fan within it, the entire heat exchanger unit must be removed and returned to Westell for service, then re-installed or replaced. Follow the steps below to replace the controller card.

1. **Open the cabinet.** Open the cabinet door by loosening the door lock.
2. **Remove fuse.** Remove the 5A fan fuse from the controller card (see Figure 9 or Figure 17 for fuse location).
3. **Disconnect fan power.** Remove the FAN A Euro connector at the controller card and remove the two wires from the connector. *Important Note: Make a note (written) which colored wires were removed from which connector terminals.* Replace the Euro connector back on the card.
4. **Free the power cables.** Remove or disengage the power cord from the cable management clips/clamps on the door, and remove any cable ties.
5. **Remove heat exchanger.** Remove the heat exchanger unit’s mounting hardware located on the inside of the door, then firmly grasp and lift off the heat exchanger compartment from the door. Make a (written) note of the length of the old power cord.

* RETURN UNIT NOTE *
Return the old/defective unit to Westell, and receive a replacement/new unit (see Paragraph 7.2 for details).

6. **Mount the replacement heat exchanger unit.** From the front side of the door, route the power cord of the replacement heat exchanger through the access/hole cut-out near the top of the cabinet door, then mount the new heat exchanger to the door by aligning the mounting posts with the holes in the door, and secure the heat exchanger using the retained hardware from the step above. Firmly tighten the hardware.

7. **Prepare power cord/wires.** Verify that the length of the new unit’s power cord is sufficient to easily reach the FAN A connector in the controller card on the left inside wall of the cabinet, without tension, with the door in both the open and closed positions. If needed, trim the new power cord to length, using the old heat exchanger unit’s cord length as a reference (refer to the length recorded in Step 5), or simply verify the cord can reach the controller card with sufficient slack and without undue tension. Expose the cord’s black and white wires (trim/cut off approx. 1-2” of the cord’s thicker, black, outer jacket material), then strip off approximately ½” of jacketing from the black and white wires to expose the copper wires.

8. **Connect power cord wires to FAN A Euro connector.** Remove the FAN A Euro connector from the controller card. (If not already removed, remove the old wires from the controller by loosening the set screws in the connector.) Verify the set screws in the Euro connector are loosened enough to allow the new wires to be fully inserted and connected. Insert the wires into their proper wire port holes (black wire goes to the wire port hole labelled “RED” and the white wire goes to the “BLK” wire port hole). After the correct wires are inserted into the correct holes, hold the wires in place and firmly tighten the set screws. To test the connection, attempt to pull the wire out from the hole; correct any loose connection. Re-install the connector into the card.

9. **Re-install the fuse.** Install the 5A fuse that was removed in Step 2 back into its place in the controller card.

10. **Perform cable management.** Manage any cable slack and secure the power cord by using the clamps and clips on the inside walls and door of the cabinet and using cable ties per company practice. Verify all wires are clear of the door hinges and flanges and will not be pinched.

11. **Apply power and test.** If not already installed, re-install the fuse in the controller card, and apply power to the cabinet. Verify the fan is working properly.

5.3 **Replacing the Door Alarm Switches**

The door sensor switches cannot be field repaired. Should a problem be suspected with a door sensor switch, remove the individual switch and return it to Westell for service, then replace it. To remove and replace a door alarm switch, proceed with the following instructions.

* WIRE AND BLOCK DISCONNECTION NOTE *
The Euro-connector blocks used for making DC distribution and alarm wire connections facilitate a simple group disconnection of all alarm and dc distribution wire connections; there’s no need to unscrew each wire. Simply remove the entire block by pulling the blocks away from the panel.
1. Open the cabinet. Open the large cabinet door.

2. Determine which switch is faulty. The top door switch is for fan cut-off and is known as Switch 2. The bottom door switch is the door open alarm switch and is known as Switch 1.

3. Disconnect door switch power. Pull out and remove either the “DOOR SWITCH-2” or the “DOOR SWITCH-1” Euro-connector at the right side of the controller card on the left inside wall of the cabinet, depending on which switch is faulty (see Step 2 above) and will be replaced. Also remove the 5A fan fuse from the controller card (see Figure 9 or Figure 17 for fuse location) to disconnect power.

4. Remove switch bracket mounting screws. Remove the nuts that attach the door switch bracket to the threaded posts in the top, left, inside corner of the open cabinet.

5. Access switch to disconnect switch wires. Press on the switch from the back side to gently press or snap out the switch to access the wires at the rear. Carefully disconnect each wire connector one at a time, noting which wire goes to which terminal lug and noting or labelling the color or polarity of each connector, for easy re-connection to the terminal lugs of the new switch.

6. Remove the faulty door switch. Remove the old/faulty door switch.

7. Install the new door switch. Reverse the steps above to install the replacement door switch. If attaching the wire connectors to the door switch terminal lugs prior to snapping the switch in place in the bracket, first route the wires from the rear through the cut-out hole for the switch in the bracket. When re-attaching the wire connectors to the switch’s two terminal lugs, verify the following:
   - verify the wires are properly routed so that they will easily reach the back of the installed door switch (no tension)
   - verify that the door switch cable’s black wire connects to the door switch terminal lug labelled “COM,” and that the cable’s red wire connects to the terminal lug labelled “NC”

8. Secure door switch mounting bracket to the cabinet wall. After snapping the new switch in place in the cut-out hole in the bracket, attach the switch’s mounting bracket back onto the cabinet by aligning the bracket’s mounting holes with the threaded posts in the upper left wall of the cabinet, setting the bracket down over the posts, and threading the mounting hex nuts back on to the posts until tight.

9. Apply power and test. Re-attach the previously removed door switch Euro connector(s) and/or the 5A fuse into the controller card to apply power. Verify that the switch and alarm work properly. To disable a door alarm sensor, pull out or forward on the switch’s cylindrical-shaped actuator, either press back on it or close the door to re-enable it.

6. CUSTOMER & TECHNICAL SERVICES

6.1 Customer Service & Technical Assistance

If technical or customer assistance is required, contact Westell by calling or using one of the following options:

Voice: (800) 377-8766
email: global_support@westell.com


6.2 Part Numbers

This equipment is identified by a product number (A90-BXM05V19-2HE3), which consists of three parts: the issue letter of the equipment (A), the assembly type (90), and the specific model number (BXM05V19-2HE3). Each time a change is made to the product which changes the form, fit, or function of the product, the issue letter is incremented or advanced by one. Be sure to indicate the issue level as well as the model number when making inquiries about the equipment.

7. WARRANTY & RETURNS

7.1 Warranty

Westell warrants this product to be defect-free at shipment time. Westell also warrants this product to be fully functional for the time period specified by the terms and conditions governing the sale of the product. Equipment repairs/modification attempts by an unauthorized person will void the warranty.

7.2 Return and Replacement Policy

Westell will repair or replace any defective Westell equipment without cost during the warranty period if the unit is defective for any reason other than abuse, improper use, or improper installation. Before returning the defective equipment, first request a Return Material Authorization (RMA) number from Westell. Once an RMA number is obtained, return the defective unit, freight prepaid, and a brief problem description to:

Voice: (630) 375-4457
email: rgmdept@westell.com

Replacements will be shipped in the fastest manner consistent with the urgency of the situation. Westell will continue to repair or replace faulty equipment beyond the warranty period for a nominal charge. Contact Westell for details.

8. SPECIFICATIONS

8.1 Electrical and Physical Specifications

The Boxer™ electrical and specifications are listed below, and the physical specifications are shown in Table 3.
Power Specification
A. Fan power: -48VDC @ 60 W max. (1.25A)

Controller Card Specifications
B. Provisions for +24V or -48VDC inputs to power the fans
C. 5 Amp GMT Fan fuse
D. Provisions for 65°C Temperature Sensor contacts (Normally Open)
E. Provisions for door open contacts (Normally Open)
F. Heat exchanger fans. Turn on at 35°C (95°F), turn off at 25°C (77°F)

Cooling
G. Fan: 200W heat exchanger

8.2 Regulatory/Agency Specifications
The Boxer cabinet is designed to meet the following regulatory, safety or environmental specifications or requirements:
- NEMA 4 compliant
- UL 60950 Compliant

8.3 Physical Specifications
The Boxer™ physical specifications are shown in Table 3.

<table>
<thead>
<tr>
<th>Physical Feature</th>
<th>U.S.</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (including mounting ears)</td>
<td>28.1 in.</td>
<td>71.37 cm</td>
</tr>
<tr>
<td>Height (between mounting holes)</td>
<td>26.4 in.</td>
<td>67.06 cm</td>
</tr>
<tr>
<td>Height (cabinet only, no mounting ears)</td>
<td>23.04 in.</td>
<td>58.52 cm</td>
</tr>
<tr>
<td>Width (exterior)</td>
<td>14.3 in.</td>
<td>36.32 cm</td>
</tr>
<tr>
<td>Depth (door closed, approx.)</td>
<td>20.0 in.</td>
<td>50.80 cm</td>
</tr>
<tr>
<td>Depth (door open 90°)</td>
<td>32.0 in.</td>
<td>81.28 cm</td>
</tr>
<tr>
<td>Depth (cabinet box only, approx.)</td>
<td>18.9 in.</td>
<td>48.01 cm</td>
</tr>
<tr>
<td>Operating Temperature (including solar loading)</td>
<td>-40° to 149°F</td>
<td>-40° to 65°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 95% (non-condensing)</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>H-Frame, wall, or square post</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Boxer Cabinet Physical Specifications

8.4 Ordering Specifications
To order units, call the telephone number shown in Paragraph 6.1 and specify a specific model number shown in Table 4. Battery boxes, skirts, accessories, and other orderable options are shown in Table 5.

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Cooling</th>
<th>Power</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxer 5</td>
<td>(5-RU 19&quot; tall rack) Main Cabinet</td>
<td>Passive cooling</td>
<td>N/A</td>
<td>A90-BXM05V19-NMT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200W fan-cooled, always-on</td>
<td>-48VDC</td>
<td>A90-BXM05V19-NAF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200W heat exchanger, temp-controlled</td>
<td>+24 or -48VDC</td>
<td>A90-BXM05V19-2HE3</td>
</tr>
<tr>
<td>Boxer 10</td>
<td>(10-RU 19&quot; wide rack) Main Cabinet</td>
<td>Passive cooling</td>
<td>N/A</td>
<td>A90-BXM1019-NMT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXM1019-NHE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, temp-controlled</td>
<td>+24VDC</td>
<td>A90-BXM1019-NHE2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>600W fan-cooled, always-on, customer access door</td>
<td>+24VDC</td>
<td>A90-BXM1019-CAF</td>
</tr>
<tr>
<td></td>
<td>Main Cabinet+SideCar+Battery Box</td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC1019-4H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC1019-4H2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>700W heat exchanger, temp-controlled</td>
<td>+24 or -48VDC</td>
<td>A90-BXSC1019-4HE</td>
</tr>
<tr>
<td>Boxer 16</td>
<td>(16-RU 19&quot; wide rack) Main Cabinet</td>
<td>4K BTU air conditioner, temp-controlled</td>
<td>120VAC</td>
<td>A90-BXSC1019-4KAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC1619-4H</td>
</tr>
<tr>
<td></td>
<td>Main Cabinet+SideCar+Battery Box</td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC1619-4H2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, temp-controlled</td>
<td>+24 or -48VDC</td>
<td>A90-BXSC1619-4HE3</td>
</tr>
<tr>
<td>Boxer 20</td>
<td>(20-RU 19&quot; wide rack) Main Cabinet</td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC2019-4H</td>
</tr>
<tr>
<td></td>
<td>Main Cabinet+SideCar+Battery Box</td>
<td>400W heat exchanger, always-on</td>
<td>-48VDC</td>
<td>A90-BXSC2019-4H2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400W heat exchanger, temp-controlled</td>
<td>+24 or -48VDC</td>
<td>A90-BXSC2019-4HE3</td>
</tr>
<tr>
<td>Boxer 30</td>
<td>(30-RU 19&quot; wide rack) Main Cabinet</td>
<td>1000W heat exchanger, temp-controlled</td>
<td>-48VDC</td>
<td>A90-BXSC3019-10H</td>
</tr>
<tr>
<td></td>
<td>Main Cabinet+SideCar+Battery Box</td>
<td>1000W heat exchanger, temp-controlled</td>
<td>-48VDC</td>
<td>A90-BXSC3019-10H2</td>
</tr>
</tbody>
</table>

* In the Boxer 5 cabinet, the 19" wide rack is vertical (rotated 90 degrees, with channels at top and bottom).

Table 4. Boxer Cabinet Ordering Information
### Boxer Battery Boxes, Accessories, and Options

<table>
<thead>
<tr>
<th>Type</th>
<th>Part Number</th>
<th>Description</th>
<th>Supported Models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery Boxes &amp; Skirts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXB05V-A</td>
<td>Battery box standard</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>A90-BXB19-A</td>
<td>Battery box with heater pad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXB19-B</td>
<td>Battery box wide for Boxer with SideCar</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>A90-BXS19-14</td>
<td>Skirt box for boxer, 14” high</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-HP01</td>
<td>Battery heater pad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-PM02</td>
<td>Pole mount kit: main cabinet</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>A90-BXA-PM03</td>
<td>Pole mount kit: main cabinet + standard battery box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-PM05</td>
<td>Pole mount kit: main cabinet + standard &amp; wide battery box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-WH01</td>
<td>Wall/H-frame mount kit: main cabinet + standard &amp; wide battery box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXB05V-WH1</td>
<td>Wall/H-frame mount kit: Boxer 5 cabinet + standard battery box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-PT1</td>
<td>Pad mount template: standard battery box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A90-BXA-PT2</td>
<td>Pad mount template: wide battery box</td>
<td></td>
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</tr>
<tr>
<td>A90-BXA-CK01</td>
<td>Coupler kit (2) ½”, (2) ¾”, (4) 2”</td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5. Boxer Orderable Options and Accessories

![Figure 20. Left-Side View, Door Open](image-url)
Figure 21. Bottom View, Showing Knock-out Locations and Sizes
Figure 22. Front View, Door Open