Installation Instructions

PowerFlex 6000 Medium Voltage Variable Frequency Drive
Shipping and Handling Manual

Publication 6000-IN008C-EN-P
Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

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**WARNING**: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**ATTENTION**: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attendements help you identify a hazard, avoid a hazard, and recognize the consequence.

**IMPORTANT**: Identifies information that is critical for successful application and understanding of the product.

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Labels may also be on or inside the equipment to provide specific precautions.

**SHOCK HAZARD**: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

**BURN HAZARD**: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

**ARC FLASH HAZARD**: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).
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Introduction

This document provides procedural information for physically unloading, moving, and installing PowerFlex® 6000 medium voltage drives.

Who Should Use This Manual

This manual is intended for use by professional riggers, general contractors, electrical contractors, or plant operations personnel familiar with moving and siting heavy equipment. Specific experience with solid-state variable speed drive equipment is NOT required for this part of the installation process, but is mandatory for subsequent processes.

What Is Not in this Manual

This manual provides information specific for physically unloading and situating a PowerFlex 6000 drive. It does not include project-specific, or drive-specific topics such as:

- Dimensional Drawings and Electrical Drawings generated for each customer’s order.
- Spare parts lists compiled for each customer’s order.
- Drive-specific technical specifications.

Refer to the following documents for additional product detail or instruction relating to PowerFlex 6000 drives:

- PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006: instructions for installing the drive, dimensions, requirements, and wiring information.
- PowerFlex 6000 Medium Voltage Variable Frequency Drive User Manual, publication 6000-UM002: instructions for daily recurring drive usage, HMI interface and maintenance tasks for the product’s end-user.
- PowerFlex 6000 Medium Voltage Variable Frequency Drive Parameter Manual, publication 6000-TD004: detailed information on drive features, parameters, and troubleshooting faults.

Required Supplemental Information

This manual includes generic information about the drive cabinet layout orientation and generic electrical connection information.

Review the project-specific Dimensional Drawings (DDs) and Electrical Drawings (EDs) to better understand the specific drive system cabinet orientation and wiring requirements before performing any mechanical or electrical work. Paper copies of the DDs and EDs are placed in the document/hardware box in the Isolation Transformer Cabinet before shipment. Contact the local Rockwell Automation office to obtain digital copies, if required.
General Precautions

**ATTENTION:** This drive contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing or repairing this assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference Allen-Bradley publication 8000-4.5.2, “Guarding Against Electrostatic Damage” or any other applicable ESD protection handbook.

**ATTENTION:** An incorrectly applied or installed drive can result in component damage or a reduction in product life. Wiring or application errors, such as, undersizing the motor, incorrect or inadequate AC supply, or excessive ambient temperatures may result in malfunction of the system.

**ATTENTION:** Only personnel familiar with the PowerFlex 6000 Adjustable Speed Drive (ASD) and associated machinery should plan or implement the installation, start-up and subsequent maintenance of the system. Failure to comply may result in personal injury and/or equipment damage.

Commissioning Support

After installation, Rockwell Automation is responsible for commissioning activities for the PowerFlex 6000 product line. Contact your local Rockwell Automation sales representative to arrange commissioning.

Rockwell Automation support includes, but is not limited to:

- quoting and managing product on-site start-ups
- quoting and managing field modification projects
- quoting and managing product training at Rockwell Automation facilities and on-site

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006</td>
<td>Provides instructions for installing the drive, dimensions, requirements, and wiring information.</td>
</tr>
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<td>PowerFlex 6000 Medium Voltage Variable Frequency Drive User Manual, publication 6000-UM002</td>
<td>Provides instructions for daily recurring drive usage, HMI interface and maintenance tasks for the product’s end-user.</td>
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<tr>
<td>PowerFlex 6000 Medium Voltage Variable Frequency Drive Parameter Manual, publication 6000-TD004</td>
<td>Provides detailed information on drive features, parameters, and troubleshooting faults.</td>
</tr>
<tr>
<td>Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1</td>
<td>Provides general guidelines for installing a Rockwell Automation industrial system.</td>
</tr>
<tr>
<td>Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a></td>
<td>Provides declarations of conformity, certificates, and other certification details.</td>
</tr>
</tbody>
</table>
Preface

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Contractor Scope of Work

Typical scope of work by the freight company, third-party contractor and/or customer (based on ex-works INCO terms)\(^{(1)}\):

- Load equipment on truck at a Rockwell Automation manufacturing facility and transport equipment to site
- Offload equipment from truck on-site
- Perform initial inspection\(^{(2)}\)
- Move equipment to the final installation location
- Position the cabinet sections together as shown in Dimensional Drawing and level the cabinet lineup
- Mechanically join cabinets together
- Affix the cabinets to the floor
- Install assemblies shipped loose (fan assemblies).
- Install external ductwork to exhaust heated air from control room (if required)
- Install power and control cabling and terminate cable connections to drive system:
  - Connect system ground cable
  - Insulation Resistance (IR) testing of incoming line and outgoing motor power cables
  - Connect incoming line and outgoing motor power cables
  - Connect control power wiring
  - Connect all external customer required control signal wiring
  - Connect electrical safety interlock control signal wiring circuit to input circuit breaker
  - Connecting the power cables and control wiring between cabinets that are shipped separately\(^{(3)}\)
- Complete Pre-commissioning Checklist

\(^{(1)}\) All or part of these activities could be provided by Rockwell Automation or its representatives, based on contract INCO terms and negotiated scope of supply/services agreement. Contact the local Rockwell Automation office for further information.

\(^{(2)}\) Customer should lead the initial inspection process.

\(^{(3)}\) Interconnection of power cables and low voltage control wiring bundles, between separately shipped cabinets, can be done by the contractor or Rockwell Automation. The commissioning quote from Rockwell Automation reflects this and will contain two options:
  a) the base quote, reflecting the power cable and control wiring interconnection work being done by the contractor
  b) the optional quote adder, reflecting the additional time and cost for Rockwell Automation to perform the power cable and control wiring interconnection work immediately prior to the commissioning process.
Chapter 1

Shipping and Handling Procedures

This document pertains to PowerFlex 6000 medium voltage drives and also mentions the optional bypass cabinets. Additional procedures may apply for specific equipment. Refer to other documentation provided with the equipment.

IMPORTANT

This chapter contains important information about offloading the drive crates and handling the drive cabinets. Review this chapter before attempting to offload the crates from the delivery truck and move the drive cabinets. The instructions help you safely offload and transport your Rockwell Automation Medium Voltage product to the installation site.

WARNING:

Never attempt to lift or move the drive by any means other than the handling methods listed in this publication. Failure to do so may result in personal injury or death, damage to the drive, and potential economic loss.

Overview

The PowerFlex 6000 drive cabinets are bolted to wooden skids and placed into wooden shipping crates. After the crating is removed, the cabinets must remain bolted to the wooden skids until moved to its final installation area. Lifting angles are affixed to the shipping skid on either side of the cabinetry, where applicable. The cabinets must remain in an upright position during handling.

ATTENTION:

The load carrying capacity of the lifting device and rigging must be sufficient to safely raise the drive. Check the shipping weights by referring to the container's commercial invoice.

Round rollers can be used to assist in moving the cabinets to the installation site. Once at the final site, the pipe rolling technique can be used to place the cabinet in the desired location.

WARNING:

Exercise extreme caution when moving the drive to ensure the equipment is not scratched, dented or damaged in any manner. Stabilize the drive during handling to prevent tipping and injury to personnel.

Any error in transporting or installing the drive will delay the drive commissioning progress.
General Handling Information

- Rockwell Automation strongly recommends using professional riggers with suitable rated lifting equipment to move the drive to the final installation site.
- Qualified professionals must inspect all lifting equipment prior to moving the cabinets.
- Keep the cabinets in an upright position. Some units are top-heavy and may fall over if tilted.
- The cabinets are not rigid structures. Do not torque or twist the cabinets while siting the drives or joining the shipping splits.
- Use fasteners with a minimum metric Grade 10.9 (SAE Grade 8) strength. Rockwell Automation recommends using Crosby bolt-type shackles.
- All lifting cables must meet lifting capacity requirements.
- Close and secure all drive doors before moving the equipment.
- Keep the cabinets bolted to the wooden shipping skids to minimize the possibility of it tipping. Do not remove the wooden skid until the cabinets are at the final installation area. Depending on the type of drive cabinet, the crate may include a pair of lifting angles. Install both lifting angles on top of the cabinet.

ATTENTION: Do not stand near or underneath equipment being lifted overhead.

ATTENTION: Restrict access to areas where equipment will be lifted overhead to prevent access from unauthorized personnel.

Offloading and Moving Crates

Fork Lifts

The terms fork lift, lift truck, and fork lift truck are all commonly used and refer to the same thing. A single fork lift may be used for offloading and moving cabinets up to 4 m (157 in.) wide, if the fork lift has sufficient lifting capacity. Cabinets exceeding 4 m should be offloaded and moved with two fork lifts operating in tandem.

- Insert the forks into the openings of the wooden shipping skid.
- Balance the crates on the forks. The crates can be heavier on one side.
- Use safety straps when handling to steady the crate while moving.
Unpack and Inspect the Drive

Before leaving the factory, all drives have undergone both performance and quality tests. However, damage may occur during the shipping or handling process.

Immediately upon receiving the drive, inspect the crates for signs of damage. After the crates are offloaded, disassemble the crating and check for possible shipping damage. Use a crowbar or other suitable tool to carefully remove the packaging. Do not insert the tool too far into the packaging or damage to the drive cabinet may occur. Inspect the drive cabinets for physical damage according to the Rockwell Automation Conditions of Sale. Open the doors and inspect the major components for signs of damage (Table 2).

Figure 1 - Crated Cabinet

Access to the medium voltage cabinets of the drive is restricted by the use of lockable handles. The cabinet keys are located in the same document/hardware box as the EDs and DDs (see Required Supplemental Information on page 5). The box is accessible through the opening in the cabinet side sheet (without opening a door).

IMPORTANT Any claims for visible breakage or damage must be made to the freight company by the user as soon as possible after receipt of shipment. Rockwell Automation will provide the user with reasonable assistance in the securing of adjustment for such damage claims.
Drive Configurations

All PowerFlex 6000 power modules are designed as front connection. For a drive amperage rating ≤350 A (304 A for heavy duty), a fixed-mounted power module design is supplied. Fixed-mounted modules are shipped installed in the drive.

For a drive amperage rating of >350 A (304 A for heavy duty), power module are shipped separately, therefore site installation and cable connection is needed. In this case, a lifting cart is supplied for power cell replacement.

The cabinets may appear slightly different than shown in the illustrations, based on voltage class. See the diagrams in the PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006e for more information.
Shipment List

The complete shipment will consist of a number of crates, as shown below:

Table 1 - Shipment Configurations

<table>
<thead>
<tr>
<th>Amp Rating(1)</th>
<th>Starting Cabinet (optional)</th>
<th>Filter Cabinet (optional)</th>
<th>Fan</th>
<th>Isolation Transformer Cabinet</th>
<th>Power Module/LV Control Cabinet</th>
<th>Power Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤350 A</td>
<td>1 crate</td>
<td>1 crate</td>
<td>Depends on fan quantity</td>
<td>1 crate</td>
<td>1 crate</td>
<td>Delivery with PC</td>
</tr>
<tr>
<td>&gt;350 A</td>
<td>1 crate</td>
<td>1 crate</td>
<td>Depends on fan quantity</td>
<td>1 crate</td>
<td>1 crate</td>
<td>Delivery separately</td>
</tr>
</tbody>
</table>

(1) The document/hardware box contains:
- Testing Reports
- Electrical Drawings (EDs) and Dimensional Drawings (DDs)
- Certifications
- All necessary hardware for mounting lifting angles and fan assemblies, and securing the cabinets together.
- Keys for the lockable cabinet handles

Initial Inspection Checklist

Table 2 - Shipping Damage Assessment

<table>
<thead>
<tr>
<th>Isolation Transformer Cabinet</th>
<th>Power Module Cabinet</th>
<th>Low Voltage Control Cabinet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage Door:</td>
<td>Fixed-mounted:</td>
<td>Low Voltage Door:</td>
</tr>
<tr>
<td>❑ Transformer Temperature monitor relay</td>
<td>❑ Power Module mounting bolts</td>
<td>❑ Pilot lights</td>
</tr>
<tr>
<td>Cabinet:</td>
<td>❑ Power Module incoming cable loose</td>
<td>❑ Push buttons</td>
</tr>
<tr>
<td>❑ Incoming Line Power Cable Terminal Insulators</td>
<td>❑ Voltage Sensing Board</td>
<td>❑ HMI Interface</td>
</tr>
<tr>
<td>❑ Outgoing Load Power Cable Terminal Insulators</td>
<td>❑ Quick connector</td>
<td>❑ Panel:</td>
</tr>
<tr>
<td>❑ Transformer Secondary Windings</td>
<td></td>
<td>❑ DIN rail mounted components</td>
</tr>
<tr>
<td>– Inspect nomex wrap</td>
<td></td>
<td>❑ UPS</td>
</tr>
<tr>
<td>– Verify windings from core are undamaged</td>
<td></td>
<td>❑ Fiber optic cables</td>
</tr>
<tr>
<td>– Check for debris in top of core</td>
<td></td>
<td>❑ PLC</td>
</tr>
</tbody>
</table>

Storage

Store the drive in a dry, clean and cool area.

The storage temperature must be maintained between -25...55 °C (-13...131 °F).
This temperature rating applies only to the drive, it does not include the UPS (uninterruptible power supply). If the storage temperature fluctuates significantly or if the relative humidity exceeds 90%, use heating and moisture protection devices to prevent condensation.

Store the drive in a conditioned building with adequate air circulation. Do not store the drive outdoors.
Environmental Conditions

- Elevation above sea level must be less than 1000 m (3250 ft)\(^{(1)}\).
- Ambient air temperature must be between 0...40 °C (32...104 °F)\(^{(2)}\).
- Relative humidity must be less than 95%, non-condensing.
- The drive must be installed indoors; there must be no dripping water or other fluids in the room.
- Operation Vibration limited to 3M3(a) per IEC60721-3-3.
- Cooling air must be clean without significant concentrations of sand, corrosive or conductive dust, or explosive gas.
- Free from significant vibration.
- The drive must be anchored on a level floor. Please refer to the dimension drawing for the anchor point sizes and locations.

For the equipment to operate in conditions other than those specified, consult the local Rockwell Automation Sales Office.

Mounting Clearance Distance

Install the drive with appropriate clearance distances on all sides to ensure proper operation and allow maintenance of the drive.

Table 3 - Minimum Mounting Clearance Distances

<table>
<thead>
<tr>
<th>Location</th>
<th>Minimum Distance Required, approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Front</td>
<td>• 1500 mm (60 in.)</td>
</tr>
<tr>
<td>Behind</td>
<td>• 1000 mm (40 in.)(^{(2)})</td>
</tr>
</tbody>
</table>
| Above\(^{(1)}\) | • 1000 mm (40 in.) without ducting requirements  
                  • 1500 mm (60 in.) with ducting requirements |

\(^{(1)}\) Distance above is measured from the top plate of the drive cabinet (excludes height of fan housing).

\(^{(2)}\) Rear access is not required unless air-ducting is needed, in which case contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

**ATTENTION:** An incorrectly applied or installed drive can result in component damage or reduction in product life. Ambient conditions not within the specified ranges may result in malfunction of the drive.

\(^{(1)}\) Options are available for operation up to 5000 m a.s.l. However, these must be stated at the time of order and cannot be retrofitted in the field.

\(^{(2)}\) Options are available for ambient temperatures up to 50 °C (122 °F). However, these must be stated at the time of order and cannot be retrofitted in the field.
Mounting Requirements

Embed the channel steel base profile (Figure 5, Figure 6) in the base with its top surface flush with ground level, or protruding slightly above ground level.

**Figure 4 - A typical cross-sectional view of the trench system**

For Type A Design

The base must be smooth, flat and level. The base structure of the drive cabinet may be constructed with #10 channel steel, approximately 100 x 48 x 5.3 mm (3.9 x 1.9 x 0.2 in.). Dimension pairs reflect the 1300 mm deep cabinet configuration and the corresponding Drive Cable Trench depth (Figure 4). See the PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006 for more information.
For Type B Design

The base must be smooth, flat, and level. The base structure of the drive cabinet may be constructed with #12 channel steel, approximately 120 x 53 x 5.5 mm (4.7 x 2.1 x 0.2 in.). Dimension pairs reflect the 1400 mm deep cabinet configuration and the corresponding Drive Cable Trench depth (Figure 4). See the PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006 for more information.
Bolt or weld the drive cabinet on the profile steel base (See the PowerFlex 6000 Medium Voltage Variable Frequency Drive Installation Manual, publication 6000-IN006 for more information). A reliable connection must be made between the steel base and the cabinet. The steel base profile shall be reliably grounded.

**Moving with Rod or Pipe Rollers**

This method is only suitable when there are no inclines and the drive is moved on the same floor.

Boards with cross section of about $51 \times 152$ mm ($2 \times 6$ in.) and length of at least 300 mm (12 in.) longer than the drive must be placed under the wooden skid.

Lift the cabinet and carefully and slowly lower the drive cabinet onto the roller pipes until the drive weight is borne on the roller pipes. Do not remove the shipping skid; the skid is required for this process (See Attach the Overhead Lifting Cables on page 21).

Roll the drive to its destination location. Steady the cabinet to prevent tipping.
Remove the Wooden Skids

Remove the wooden shipping skids when the drive is in its final installation location. Steel angle brackets bolt the cabinet to the wooden shipping skid. Remove this hardware, lift the cabinets off the skids, and remove the skids from underneath.

Refer to Lift the Power Module/LV Control Cabinet on page 19 and Lift the Isolation Transformer Cabinet on page 24.

Figure 9 - Angle Brackets

Overhead Lifting Methods

The preferred method of lifting the cabinets is an overhead crane. If overhead lifting with a crane is not available, use a fork lift with a capacity greater than the cabinet weight. Lift the cabinet using the overhead lifting angles or isolation transformer lifting provisions and suitable spreader bars and rigging attached to the fork lift.

IMPORTANT Close and lock the cabinet doors before moving any cabinets.
Lift the Power Module/LV Control Cabinet

Two lifting angles are used for the Power Module/LV Control Cabinet and are affixed to either side of the shipping skid.

The length of the lifting angles depends on the length of the Power Module/LV Control Cabinet.

### Table 4 - Lifting Angles (for cabinets with power modules 200 A and below)

<table>
<thead>
<tr>
<th>Length, approx.</th>
<th>Dimensions, approx.</th>
<th>Weight per Angle, approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.55 m (5.08 ft)</td>
<td>100 x 80 x 8 mm (3.9 x 3.1 x 0.32 in.)</td>
<td>17.0 kg (37 lb)</td>
</tr>
<tr>
<td>1.79 m (5.87 ft)</td>
<td>100 x 80 x 8 mm (3.9 x 3.1 x 0.32 in.)</td>
<td>19.6 kg (43 lb)</td>
</tr>
<tr>
<td>2.18 m (7.15 ft)</td>
<td>100 x 80 x 8 mm (3.9 x 3.1 x 0.32 in.)</td>
<td>23.9 kg (53 lb)</td>
</tr>
<tr>
<td>2.32 m (7.61 ft)</td>
<td>100 x 80 x 8 mm (3.9 x 3.1 x 0.32 in.)</td>
<td>25.4 kg (56 lb)</td>
</tr>
<tr>
<td>2.80 m (9.19 ft)</td>
<td>100 x 80 x 8 mm (3.9 x 3.1 x 0.32 in.)</td>
<td>30.6 kg (67 lb)</td>
</tr>
</tbody>
</table>

### Table 5 - Lifting Angles (for cabinets with power modules above 200 A)

<table>
<thead>
<tr>
<th>Length, approx.</th>
<th>Dimensions, approx.</th>
<th>Weight per Angle, approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 m (3.28 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>30.1 kg (66 lb)</td>
</tr>
<tr>
<td>1.50 m (4.92 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>45.1 kg (99 lb)</td>
</tr>
<tr>
<td>1.60 m (5.25 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>48.2 kg (106 lb)</td>
</tr>
<tr>
<td>1.75 m (5.74 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>52.7 kg (116 lb)</td>
</tr>
<tr>
<td>2.00 m (6.56 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>60.2 kg (132 lb)</td>
</tr>
<tr>
<td>2.60 m (8.57 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>78.5 kg (173 lb)</td>
</tr>
<tr>
<td>2.75 m (9.02 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>83.1 kg (183 lb)</td>
</tr>
<tr>
<td>3.00 m (9.84 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>90.7 kg (200 lb)</td>
</tr>
<tr>
<td>4.00 m (13.12 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>12.1 kg (267 lb)</td>
</tr>
<tr>
<td>4.60 m (15.09 ft)</td>
<td>160 x 100 x 16 mm (6.3 x 3.9 x 0.63 in.)</td>
<td>139.3 kg (307 lb)</td>
</tr>
</tbody>
</table>

### Install the Lifting Angles

**IMPORTANT** Label and retain all lifting-related hardware if the drive system may be moved in the future.

**ATTENTION:** Failure to install the pair of lifting angles prior to moving the drive may result in personal injury and/or equipment damage.

The lifting angles hold the Power Module/LV Control cabinets together to prevent separation and damage while riggers move the drive to the final installation area.
Chapter 1  Shipping and Handling Procedures

For Cabinets with Power Modules 200 A and Below

The lifting angles are shipped with the Power Module/LV Control Cabinet and must be secured before lifting the cabinet.

1. Remove the lifting angles from the skid.
2. Remove the attachment hardware that is pre-installed in the mounting holes in the cabinet top plate before shipment.
3. Align and secure the lifting angles in six places as shown (Figure 10) using the hardware removed in step 2.

Figure 10 - Install Fasteners from the Lifting Angles to the Drive in six places
For Cabinets with Power Modules Above 200 A

1. Remove the lifting angles from the skid.
2. Align and secure the lifting angles in four places as shown (Figure 10).

**Figure 11 - Install Fasteners from the Lifting Angles to the Drive in four places per cabinet**

---

**Attach the Overhead Lifting Cables**

1. Attach rigging assembly firmly to the lifting angles on the top of the Power Module/LV Control Cabinet (Figure 12).

---

**ATTENTION:** The load carrying capacity of the lifting device and rigging must be sufficient to safely raise the cabinet. Check the shipping weights by referring to the container’s commercial invoice.

---

**ATTENTION:** Do not pass cables through the support holes in the lifting angles. Use slings with safety hooks or shackles.

2. Adjust the rigging lengths to compensate for any unequal weight distribution of load.

   The cabinet must remain in an upright position.
To reduce the tension on the rigging and the compressive load on the lifting device, do not allow the angle between the lifting cables and vertical to exceed 45º (Figure 12).

\[ \angle \leq 45^\circ \]

**ATTENTION:** Do not tilt the drive.

3. Remove the steel angle brackets bolting the cabinet to the skid.
4. Lift the cabinet using overhead lifting angles and remove the wooden shipping skid from under the equipment.

**ATTENTION:** Only lift the cabinet high enough to remove the shipping skid at this point. Do not place any parts of the body underneath the cabinet. Remove the shipping skid from the work area before continuing.

## Remove Overhead Lifting Cables and Lifting Angles

When the cabinet is in the desired position, remove the lifting angles.

1. Remove rigging from the lifting angles, and remove the bolts holding the lifting angles together; retain or recycle hardware.
2. Remove and retain the hardware from the base of the lifting angles and retain or recycle the lifting angles.
3. Reinstall the hardware (M20 x 60) removed in step 2 (to seal the holes) on the top of the drive (Figure 14), or retain all spacers (to seal the holes) on the top of the drive (Figure 15).

**Figure 14 - Insert Bolts**

![Figure 14 - Insert Bolts](image)

**Figure 15 - Retain Spacers**

![Figure 15 - Retain Spacers](image)
Lift the Isolation Transformer Cabinet

For cabinets with power modules 200 A and below.

1. Unfasten and remove the middle top plate on top of the cabinet, and retain middle top plate and hardware.

Figure 16 - Remove Top Middle Plate

The cabinet version with a single main cooling fan will have two support brackets. The cabinet version with two fans will have three support brackets.

Most configurations have one or two top-mounted main cooling fans in the isolation transformer cabinet. However, high power configurations can have more.

Figure 17 - Isolation Transformer with one Fan Assembly (Overhead view)
2. Attach the steel cable to the U-ring attachments (Figure 20), ensuring the cables pass freely through the center section of the cabinet and that they do not contact the middle top plate support brackets.

3. Attach the U-ring attachments to the lifting provisions on the isolation transformer.
ATTENTION: The cabinet is attached to the base of the isolation transformer. The cabinet is designed to be lifted only by the isolation transformer lifting provisions. Do not attach cables to the Isolation Transformer cabinet.

ATTENTION: Keep the weight of the isolation transformer centered when lifting. It is recommended to use the four lifting provisions at all corners of the isolation transformer. Alternatively, the two lifting provisions diagonally opposed could be used.
For cabinets with power modules 200 A and below.

1. Unfasten and remove the middle top plate on top of the cabinet, and retain middle top plate and hardware.

The configurations have two to five top-mounted main cooling fans in the isolation transformer cabinet.

Figure 21 - Isolation Transformer with three Fan Assemblies (Overhead view)

2. Attach the steel cable to the U-ring attachments (Figure 22), ensuring the cables pass freely though one or two fan openings of the cabinet and that they do not contact the edge of the fan opening.

3. Attach the U-ring attachments to the lifting provisions on the isolation transformer.
Figure 22 - Overhead Lifting (Isolation Transformer Cabinet)

ATTENTION: The cabinet is attached to the base of the isolation transformer. The cabinet is designed to be lifted only by the isolation transformer lifting provisions. Do not attach cables to the Isolation Transformer cabinet.

ATTENTION: Keep the weight of the isolation transformer centered when lifting. It is recommended to use the four lifting provisions at all corners of the isolation transformer. Alternatively, the two lifting provisions diagonally opposed could be used.
Lift the Starting/Junction Cabinet (Optional)

The lifting angles hold the starting/junction cabinet together to prevent separation and damage while riggers move the drive to the final installation area.

The lifting angles are shipped with the starting/junction cabinet and must be secured before lifting the cabinet.

1. Remove the lifting angles from the skid.
2. Remove the attachment hardware that is pre-installed in the mounting holes in the top plate of the cabinet before shipment.
3. Align and secure the lifting angles in four places as shown (Figure 23).

Figure 23 - Overhead Lifting (Starting/Junction Cabinet)

4. Reinstall the hardware (M12 x 2) and the pre-installed attachment hardware (M6) in the mounting holes (to seal the holes) on the top of the drive.
Lift the Filter/Junction Cabinet (Optional)

The lifting angles hold the filter/junction cabinet together to prevent separation and damage while riggers move the drive to the final installation area.

The lifting angles are shipped with the filter/junction cabinet and must be secured before lifting the cabinet.

1. Remove the lifting angels from the skid.
2. Remove the attachment hardware that is pre-installed in the mounting holes in the top plate of the cabinet before shipment.
3. Align and secure the lifting angles in four places as shown (Figure 24).

Figure 24 - Overhead Lifting (Filter/Junction Cabinet)

4. Retain the four spacers (to seal the hole) on the top of the drive.

Figure 25 - Retain Spacers
Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

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