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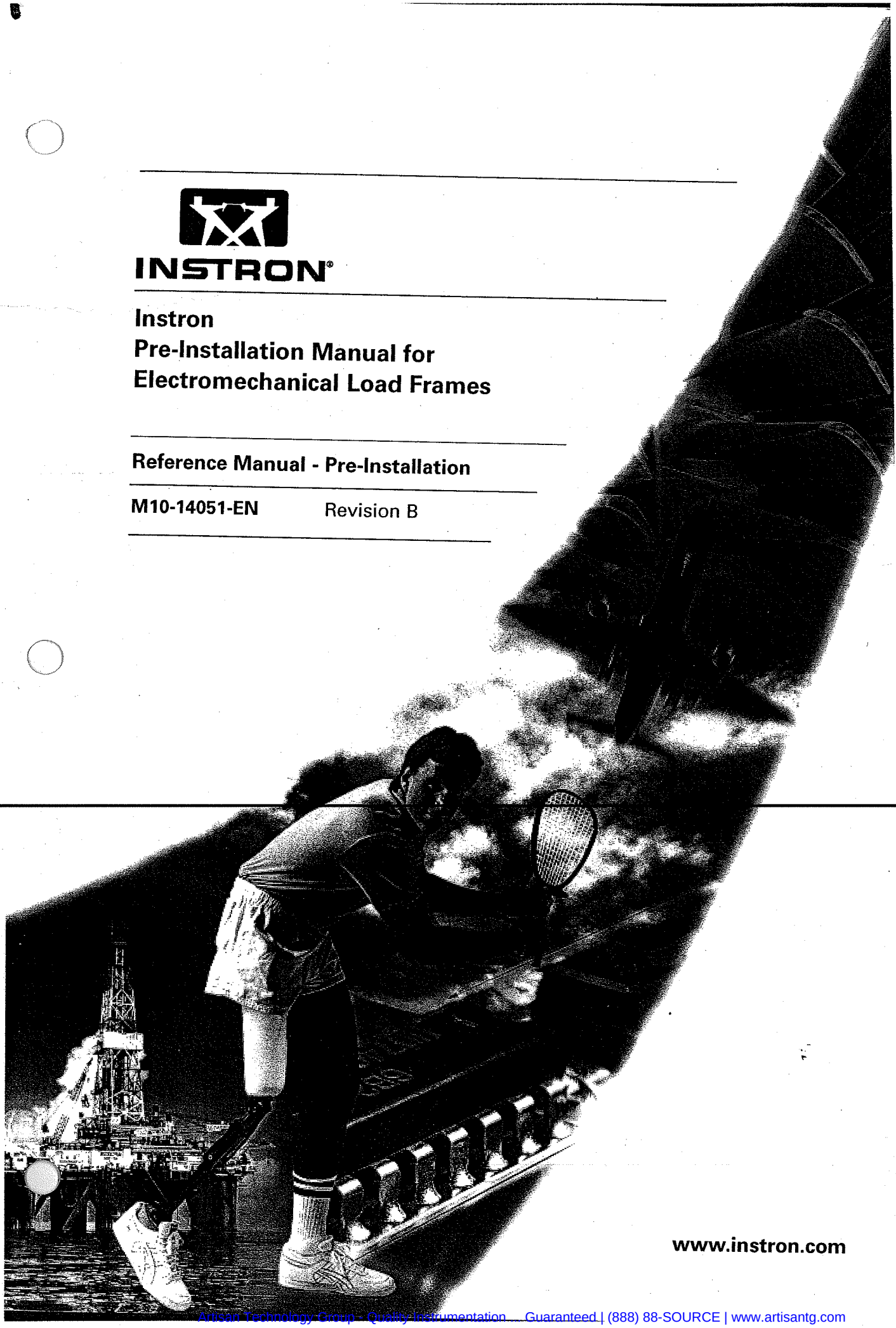
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INSTRON®

Instron Pre-Installation Manual for Electromechanical Load Frames

Reference Manual - Pre-Installation

M10-14051-EN Revision B



www.instron.com

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Electromagnetic Compatibility

Where applicable, this equipment is designed to comply with International Electromagnetic Compatibility (EMC) standards.

To ensure reproduction of this EMC performance, connect this equipment to a low impedance ground connection. Typical suitable connections are a ground spike or the steel frame of a building

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General Safety Precautions



Materials testing systems are potentially hazardous.

Materials testing involves inherent hazards from high forces, rapid motions, and stored energy. You must be aware of all moving and operating components that are potentially hazardous, particularly the actuator in a servohydraulic testing system or the moving crosshead in an electromechanical testing system.

Whenever you consider that safety is compromised, press the Emergency Stop button to stop the test and isolate the testing system from hydraulic or electrical power.

Carefully read all relevant manuals and observe all Warnings and Cautions. The term Warning is used where a hazard may lead to injury or death. The term Caution is used where a hazard may lead to damage to equipment or to loss of data.

Ensure that the test setup and the actual test you will be using on materials, assemblies, or structures constitute no hazard to yourself or others. Make full use of all mechanical and electronic limits features. These are supplied to enable you to prevent movement of the actuator piston or the moving crosshead beyond desired regions of operation.

The following pages detail various general warnings that you must heed at all times while using materials testing equipment. You will find more specific Warnings and Cautions in the text whenever a potential hazard exists.

Your best safety precautions are to gain a thorough understanding of the equipment by reading your instruction manuals and to always use good judgement.

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Warnings



Hazard - Protect electrical cables from damage and inadvertent disconnection.

The loss of controlling and feedback signals that can result from a disconnected or damaged cable causes an open loop condition which may drive the actuator or crosshead rapidly to its extremes of motion. Protect all electrical cables, particularly transducer cables, from damage. Never route cables across the floor without protection, nor suspend cables overhead under excessive strain. Use padding to avoid chafing where cables are routed around corners or through wall openings.



High/Low Temperature Hazard - Wear protective clothing when handling equipment at extremes of temperature.

Materials testing is often carried out at non-ambient temperatures using ovens, furnaces, or cryogenic chambers. Extreme temperature means an operating temperature exceeding 60°C (140°F) or below 0°C (32°F). You must use protective clothing, such as gloves, when handling equipment at these temperatures. Display a warning notice concerning low or high temperature operation whenever temperature control equipment is in use. You should note that the hazard from extreme temperature can extend beyond the immediate area of the test.



Crush Hazard - Take care when installing or removing a specimen, assembly or structure.

Installation or removal of a specimen, assembly, or structure involves working inside the hazard area between the grips or fixtures. Keep clear of the jaws of a grip or fixture at all times. Keep clear of the hazard area between the grips or fixtures during actuator or crosshead movement. Ensure that all actuator or crosshead movements necessary for installation or removal are slow and, where possible, at a low force setting.



Hazard - Do not place a testing system off-line from computer control without first ensuring that no actuator or crosshead movement will occur upon transfer to manual control.

The actuator or crosshead will immediately respond to manual control settings when the system is placed off-line from computer control. Before transferring to manual control, make sure that the control settings are such that unexpected actuator or crosshead movement cannot occur.



Robotic Motion Hazard - Keep clear of the operating envelope of a robotic device unless the device is de-activated.

The robot in an automated testing system presents a hazard because its movements are hard to predict. The robot can go instantly from a waiting state to high speed operation in several axes of motion. During system operation, keep away from the operating envelope of the robot. De-activate the robot before entering the envelope for any purpose, such as reloading the specimen magazine.

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Warnings



Hazard - Set the appropriate limits before performing loop tuning or running waveforms or test.

Limits are included in your testing system to provide a safe way of limiting actuator or crosshead movement. Failure to set these limits appropriately could result in injury to personnel or damage to equipment.



Electrical Hazard - Disconnect the electrical power supply before removing the covers to electrical equipment.

Disconnect equipment from the electrical power supply before removing any electrical safety covers or replacing fuses. Do not reconnect the power source while the covers are removed. Refit covers as soon as possible.



Rotating Machinery Hazard - Disconnect power supplies before removing the covers to rotating machinery.

Disconnect equipment from all power supplies before removing any cover which gives access to rotating machinery. Do not reconnect any power supply while the covers are removed unless you are specifically instructed to do so in the manual. If the equipment needs to be operated to perform maintenance tasks with the covers removed, ensure that all loose clothing, long hair, etc. it tied back. Refit covers as soon as possible.



Hazard - Shut down the hydraulic power supply and discharge hydraulic pressure before disconnecting any hydraulic fluid coupling.

Do not disconnect any hydraulic coupling without first shutting down the hydraulic power supply and discharging stored pressure to zero. Tie down or otherwise secure all pressurized hoses to prevent movement during system operation and to prevent the hose from whipping about in the event of a rupture.

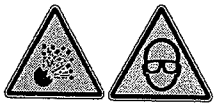


Hazard - Shut off the supply of compressed gas and discharge residual gas pressure before you disconnect any compressed gas coupling.

Do not release gas connections without first disconnecting the gas supply and discharging any residual gas pressure to zero.

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Warnings



Explosion Hazard - Wear eye protection and use protective shields or screens whenever any possibility exists of a hazard from the failure of a specimen, assembly, or structure under test.

Wear eye protection and use protective shields or screens whenever a risk of injury to operators and observers exists from the failure of a test specimen, assembly, or structure, particularly where explosive disintegration may occur. Due to the wide range of specimen materials, assemblies, or structures that may be tested, any hazard resulting from the failure of a test specimen, assembly, or structure is entirely the responsibility of the owner and user of the equipment.



Hazard - Ensure components of the load string are correctly preloaded to minimize the risk of fatigue failure.

Dynamic systems, especially where load reversals through zero are occurring, are at risk of fatigue cracks developing if components of the load string are not correctly preloaded to one another. Apply the specified torque to all load string fasteners and the correct setting to wedge washers or spiral washers. Visually inspect highly stressed components such as grips and threaded adapters prior to every fatigue test for signs of wear or fatigue damage.

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Chapter 1
Introduction

Outline

This chapter describes the purpose of this manual and other services provided by Instron.

- Purpose of this Manual 1-2
- Product Support 1-3
- Calibration and Verification 1-4
- Training 1-5
- Delivery Time 1-6

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Purpose of this Manual

The purpose of this manual is to provide the necessary information required to appropriately prepare your site for the installation of your Instron electromechanical frame. It is important that the site be adequately prepared in order to avoid unnecessary delays in the installation process and to ensure that the frame operates without interference from various environmental conditions (i.e. excess building vibrations or extreme temperature and humidity levels).

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Product Support

Contact Instron's service department for any of the following:

- Questions regarding your site preparation.
- Questions regarding the installation process.
- Scheduling an installation appointment.

You can contact Instron's Professional Services department as follows:

In the United States & Canada: **1-800-473-7838**

Outside the U.S. & Canada: **Contact your nearest Instron office.**

A list of Instron offices is included on our web site at www.instron.com.

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Calibration and Verification

Before shipment from the factory, your machine is calibrated according to system specifications, which in most cases exceed ISO/EN or ASTM requirements. These standards recommend that verification of this calibration be repeated annually or whenever the system is moved.

Service Agreements/Contracts

In many countries and territories Instron Service offers a variety of service agreements and contracts to cover such things as annual verification, maintenance, repair coverage, and hotline support for your system. Contact your local Instron office for details on a service agreement or contract that best matches your needs. A listing of Instron offices can be found on the Instron web site at www.instron.com.

Calibration Upon Installation

ASTM standards require the system be calibrated when it is installed or whenever it is moved or relocated. Although Instron calibrates the system at the factory, Instron recommends that your load cell receive an on-site verification after installation is complete or when your system is moved or relocated. Instron can verify your load cell as an additional service to the basic installation of your system, which does not include this service. Contact your local Instron office for more information about our on-site verification services. Refer to "Product Support" on page 1-3 for Instron's contact information.

Instron recommends verifying your load cell so that your system complies with the ASTM standards.

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Training

Instron offers specialized training classes for many of its products. During installation, the service technician provides a brief overview and demonstration of your system. However, attending a training class specifically designed for your system helps you to realize the full potential and flexibility of Instron's testing systems. It is recommended that anyone who will regularly use the testing system attend a training class. This may include daily operators of the system, lab supervisors or product engineers.

Detailed training on the operation of your testing system is available through Instron's training center. Classes are offered at several Instron locations and can also be scheduled on site at your location. For a detailed description of available classes, refer to Instron's web site at www.instron.com or contact your local Instron office.

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Delivery Time

The estimated delivery time for an Instron testing system varies from system to system. No models are kept in inventory, so every testing system is custom configured to the specifications outlined in your order. In addition to building your system, it must also be thoroughly tested and inspected to ensure that it meets various national and international testing standards. This process can range from a few days to several months, depending upon the type of system purchased and the level of customizing involved.

This time period provides you adequate time to prepare your testing location for the installation.

Contact your local Instron sales representative to obtain information on the status of your system and an estimated delivery date.

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Chapter 2
Responsibilities

Outline

This chapter details the responsibilities of both the customer and Instron to ensure that the proposed testing area is suitable for the installation and operation of the testing system.

- Customer's Responsibilities 2-2
- Instron's Responsibilities 2-4

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Customer's Responsibilities

It is the customer's responsibility to ensure that all required support services are available, and that all necessary checks are made prior to installing the testing system. These services and checks are described below.

Site Preparation

Proper site preparation is imperative so that the testing system operates in accordance with its specifications and provides accurate test results. The customer must ensure that the site requirements are satisfied prior to scheduling the installation appointment. The site requirements are described in this manual under the Site Requirements section for the frame series you purchased.

Handling and Transporting

Unless specifically arranged otherwise, it is the customer's responsibility to arrange the off-loading, unpacking and moving of the testing system to the final site location. Refer to the chapter "Lifting and Handling" for details on handling and transporting your system to its final location.

Upon special arrangements, an Instron service engineer can supervise the off-loading and transportation of the load frame to its final site. Contact Instron's service department or your local Instron office for additional information on this service. Refer to "Product Support" on page 1-3 for Instron's contact information.

Insurance and Safety

Under Instron's standard contract, the shipping terms are Ex-Works (or FOB Factory), meaning ownership and liability for the testing system transfers to the customer at Instron's loading dock. Unless other shipping terms are specified in a purchase order, which Instron does not dispute, the Ex-Works shipping terms apply. Under these terms, the customer is responsible for securing the applicable transit insurance on the shipment and arranging safe transport to the final destination. Arrangements can be made through Instron to secure insurance cover and shipping, at the customer's expense.

When transporting a load frame within your own premises, you are responsible for its safe transport. Upon special arrangements, an Instron service engineer can supervise the transportation to the load frame's final site. Contact Instron's Professional Services department or your local Instron office for additional information on this service. Refer to "Product Support" on page 1-3 for Instron's contact information.

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Instron's Responsibilities

Instron's standard contract requires Instron to provide the necessary services to ensure that your testing system operates accurately. These services are described below.

Additional services and equipment may be negotiated with Instron, but these additional services must be mutually agreed upon and specifically described in your purchase order.

Insurance

Under Instron's standard contract, the shipping terms are Ex-Works (or FOB Factory), meaning ownership and liability for the testing system transfers to the customer at Instron's loading dock. Unless other shipping terms are specified in a purchase order, which Instron does not dispute, the Ex-Works shipping terms apply. Under these terms, Instron is responsible for insurance cover while the testing system is in the factory up until it reaches the loading dock for shipping.

Installation

When the site location is prepared and all the components are on site, Instron is responsible for the complete installation* of the load frame, its components and any additional accessories that may have been purchased.

The customer must not make any attempt to install the load frame without an Instron service representative present.

* For 4411, 4442, 4443, 4444 models, installation is not included in the basic purchase price of the system. Installation services are available at an additional cost. Contact your local Instron sales office for additional information on these services.

Initial Operation

Once the installation is complete, Instron performs an initial operation of the load frame and a calibration check to ensure that it is working properly and measuring accurately. Instron also performs a customer demonstration that briefly describes how to operate the system.

For customers having no previous experience with Instron systems, the service representative also performs a required on-site training program for new 5500 and 5800 systems. The required on-site training takes approximately one and a half days to complete, includes training manuals, and is designed to accommodate up

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to three individuals. This training service is only required on 5500 or 5800 systems, if your employees have no experience using Instron systems.The additional cost for this training is included in the overall costs of the system since it is required training.

Contact Instron's Professional Services department for more information on this training. Refer to "Product Support" on page 1-3 for Instron's contact information.

Additional training is available through Instron's training center. Refer to the section "Training" on page 1-5 for further details.

Documentation

Instron provides all the documentation required to operate the system, including manuals for the load frame and any required software applications.

Additional copies are available and can be ordered through Instron's sales department.

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Chapter 3
Lifting and Handling

Outline

This chapter is intended to provide general guidelines for moving electromechanical frames. Instron's electromechanical frames include the Series 3300 models, Series 4400 models, Series 5500 models (including the AsphaltPro Direct Tension Testing system) and Series 5800 models. Since our electromechanical frames vary in size and configuration (floor models vs. tabletop models, single column vs. dual column), the instructions within this chapter are not specific to any one load frame. Rather, the instructions describe how to unpack and transport your system in general terms. Detailed instructions are included with your system when it is shipped.

- General Handling Precautions 3-2
- Unpacking 3-3
- Righting the Frame from a Prone Position. 3-4
- Packaging Dimensions. 3-8
- Transporting Dual Column Frames 3-10
- Handling Single Column Frames. 3-16
- Handling MicroTesters. 3-18

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General Handling Precautions

Only individuals experienced with the operation of lifting equipment and rigging techniques should attempt to lift or move a load frame. Equipment operators must have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).

Always follow the instructions provided with the shipping package. Contact Instron if you require any additional information. Refer to "Product Support" on page 1-3 for Instron's contact information.

Warnings



Hazard - Do not use a lifting device or straps rated for less than twice the weight of the load frame. All lifting devices and straps must be rated for a capacity at least twice the weight of the load frame.

Hazard - Do not lift the frame by the top plate. This plate does not support the weight of the frame. The plate could break and cause personal injury and equipment damage. See Figure 3-1 to identify the top plate.

Hazard - Do not tilt an unsupported load frame more than 10° when it is in the upright position. Doing so may topple the load frame and cause personal injury and damage.

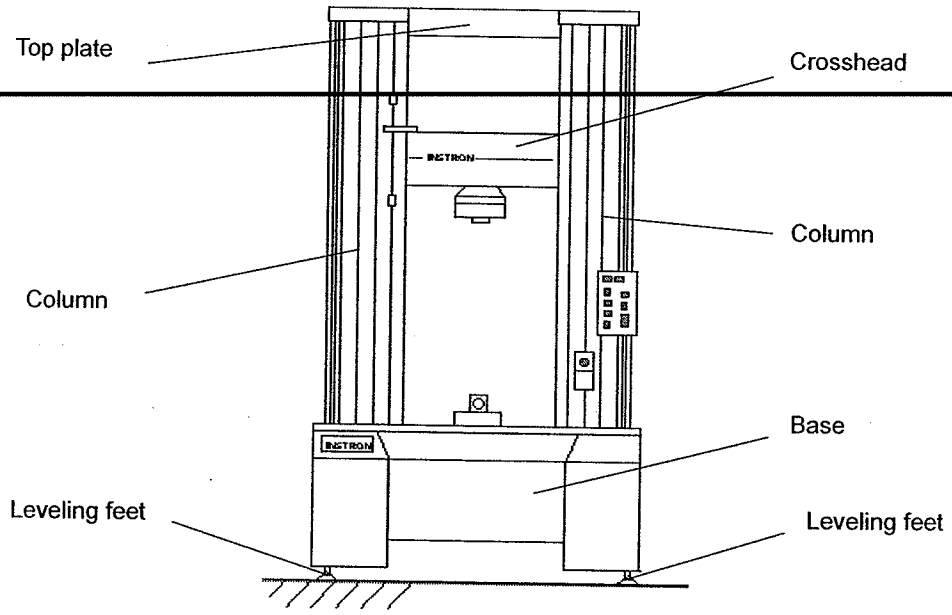


Figure 3-1. Load Frame Components

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Unpacking

Load frames are shipped fully assembled on a wooden skid in an upright position (export shipments are crated in a horizontal position) and are protected by a shrink-wrap vapor barrier.

Note: It is recommended that you do not unpack the load frame until the Instron service engineer arrives for installation. Unpacking the frame prior to installation may result in lost parts that are critical to assembly and may delay the installation.

Before moving the load frame, review the following sections:

- "Site Requirements" for the load frame series applicable to your testing system. Refer to the section included in the chapter pertaining to your testing system.
- The Transporting or Handling section for your model type, found later in this chapter.

Unpack the load frame in the following sequence:

1. Move the load frame, still in the shipping material, to its final location within your building. Use a forklift to transport the frame from the shipping dock to the final location. Unpack the load frame after it has been moved to its final location.

Note: After unpacking the load frame, it may be necessary to position the frame into its operating location. Do not remove the wooden skid until you have decided what method will be used to move the frame to its operating location. The skid is required if you choose to lift the frame from under the base. Refer to "Transporting Procedures" on page 3-11 for the possible transporting methods.

2. Remove the shipping material, leaving the load frame fastened to the shipping skid.
3. Remove the shrink wrap vapor barrier encasing the load frame.
4. Use the packing list to inventory all the items. Some accessories may be in the container with the load frame or may be packaged separately.

   Do not open any of the packing boxes. The packing list indicates the total number of boxes that are included in the shipment. Count the number of boxes you received to make sure you have the correct number of boxes. Do not open these boxes until the Instron service representative arrives to install your testing system. This ensures that no parts are lost prior to installation.
5. Retain all packing materials until the system is satisfactorily installed and all parts, assemblies and accessories have been located.

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Righting the Frame from a Prone Position

This section provides the recommended procedure for righting a load frame from a prone position. Your new frame may have been shipped in a horizontal position, and it must be moved into an upright, standing position before placing it in its operating location.

Using a Crane

If you elect to use a crane to move the load frame, Instron recommends using professional riggers experienced in moving heavy equipment.

Before You Begin

Before moving the load frame ensure that:

- The load frame is not bolted to the shipping skid.
- There are no loose accessories on the shipping skid.
- There is adequate ceiling clearance to allow the load frame to be lifted into a vertical position, including clearance for the crane.
- Your equipment operators have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).

Equipment

The following items are required:

- A crane with a load rating that is double the load frame's gross weight.
- Two lifting slings, each with a load rating that is double the load frame's gross weight.

Procedure

To lift the load frame into a vertical position:

1. Remove all packaging material from the frame and ensure that the frame is not attached to the shipping skid. This includes the L brackets securing the base to the shipping skid, and the 4x4 brace and rods protecting the crosshead.
2. Attach the two lifting slings to the crosshead and secure them to the crane hook as shown in Figure 3-2. If you use chains in lieu of lifting slings, wrap

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protective material around the crosshead to protect the crosshead from scratching and marring.

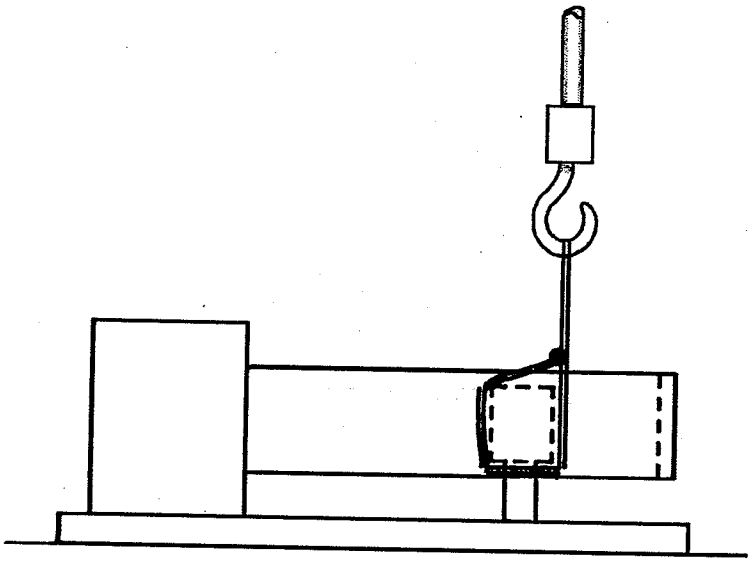


Figure 3-2. Righting a Load Frame Using a Crane

3. Slowly lift the frame until it is in an upright position and is lifted off the floor.

Note: Do not lift the frame more than 8 cm (3 in) off the floor.

4. Slowly move the load frame away from the shipping skid and remaining packaging materials.

5. When the frame is clear of the packaging material, slowly lower the load frame to the floor so that it is standing on its base in an upright position.

6. Remove the slings from the crosshead.

The frame can now be positioned into its operating location and then installed by an Instron service representative. To position the frame into its operating location, use the crosshead method to lift the frame. Refer to the section "Crosshead Method" on page 3-12 for details.

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Using a Forklift

Before You Begin

Before moving the load frame ensure that:

- The load frame is not bolted to the shipping skid.
- There are no loose accessories on the shipping skid.
- There is adequate ceiling clearance to allow the load frame to be lifted into a vertical position, including clearance for the forklift's arms, which will be above the load frame.
- Your equipment operators have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).

Equipment

The following items are required:

- A forklift with a load rating that is double the load frame's gross weight.
- Forklift extenders to extend the forklift arms.
- Two lifting slings, each with a load rating that is double the load frame's gross weight.
- Come-along to stabilize the base of the frame while moving the frame into an upright position.

Procedure

Prior to moving the frame, it is recommended that you contact Instron service for additional guidance when righting the frame.

To lift the load frame into a vertical position:

1. Remove all packaging material from the frame and ensure that the frame is not attached to the shipping skid. This includes the L brackets securing the base to the shipping skid, and the 4x4 brace and rods protecting the crosshead.
2. Attach the forklift extenders to the forklift arms.
3. Raise the forklift's arms high enough so that they can pass over the base of the load frame. Angle the arms back toward the mast so that the lifting slings cannot slip off the ends.

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4. Using the forklift, approach the frame from the base end of the load frame. Position the forklift so that the arms are directly over the load frame's base. Leave at least 36 inches of space between the forklift and the base of the frame.

5. Tie each lifting sling around the crosshead and then around each forklift arm extender. Ensure that both are taut and secure.

6. Attach the come-along to the base of the frame. The come-along provides stability to the frame while it is moving into the upright position.

7. Slowly and carefully raise the forklift arms upward to lift the crosshead and the top of the frame. The forklift arms should be high enough to allow enough clearance for the load frame to rotate into an upright position. Continue lifting the forklift arms until the load frame is in an upright position and is lifted off the floor.

Note: *Do not lift the frame more than 8 cm (3 in) off the floor.*

8. Slowly reverse the forklift to back away from the shipping skid and remaining packaging materials.

9. Once the frame is clear of the packaging material, slowly lower the load frame to the floor so that it is standing on its base in an upright position.

10. Remove the slings from the crosshead.

The frame can now be positioned into its operating location and then installed by an Instron service representative. To position the frame into its operating location, use the crosshead method to lift the frame. Refer to the section "Crosshead Method" on page 3-12 for details.

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Packaging Dimensions

The following provides the dimensions of various load frame types when packaged for shipping. If you transfer the load frame from the shipping dock to its final site location before unpacking the system, then use these dimensions to ensure that the frame fits through all doorways and hallways.

Table 3-1. Packaging Dimensions for Load Frame Types

Frame Type	Length	Width	Height
Single column models and 4411	67 cm 26 in	107 cm 42 in	163 cm 64 in
MicroTesters	67 cm 26 in	107 cm 42 in	163 cm 64 in
AsphaltPro Testing System	67 cm 26 in	107 cm 42 in	163 cm 64 in
Standard table top models	107 cm 42 in	97 cm 38 in	181 cm 71 in
Standard floor models	153 cm 60 in	112 cm 44 in	257 cm 101 in
Standard table top models with second test space	107 cm 42 in	97 cm 38 in	181 cm 71 in
Standard floor models with second test space	153 cm 60 in	112 cm 44 in	257 cm 101 in
Extra height table top models	107 cm 42 in	97 cm 38 in	224 cm 88 in
Extra height floor models	272 cm 107 in	140 cm 55 in	127 cm 50 in
Extra height table top models with second test space	107 cm 42 in	97 cm 38 in	224 cm 88 in
Extra height floor models with second test space	280 cm 110 in	153 cm 60 in	127 cm 50 in
Extra wide table top models	183 cm 72 in	107 cm 42 in	181 cm 71 in
Extra wide floor models	127 cm 50 in	183 cm 72 in	257 cm 101 in
Extra wide and extra height table top models	178 cm 70 in	112 cm 44 in	224 cm 88 in

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Table 3-1. Packaging Dimensions for Load Frame Types (Continued)

Frame Type	Length	Width	Height
Extra wide and extra height floor models	305 cm 120 in	183 cm 72 in	127 cm 50 in
Double extra height floor models	341 cm 134 in	153 cm 60 in	168 cm 66 in
Double extra height floor models with second test space	351 cm 138 in	153 cm 60 in	168 cm 66 in
Double extra height and extra wide floor models	341 cm 134 in	183 cm 72 in	168 cm 66 in

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Transporting Dual Column Frames

Before You Begin

Before moving the load frame ensure that:

- You have reviewed the section "Site Requirements" for the load frame series applicable to your testing system. Verify that all conditions are met prior to transporting the test system.
- Your equipment operators have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).
- At the final site location, there is adequate clearance between the ceiling and the top of the load frame, including clearance for lifting the frame via a forklift or crane.
- There are no loose accessories on the shipping skid.
- The frame and forklift (or crane) can fit through all doorways, halls, elevators or stairs from the shipping dock to its final site location. If you transfer the load frame while it is still in its packaging, refer to the dimensions for your frame type in Table 3-1 on page 3-8. If you move or relocate the load frame without its packaging, refer to the dimensions for your specific model number, which are shown in chapters 4, 5 or 6 (depending on your frame series) of this manual.
- The floors from the shipping dock to the final site location have sufficient support for the weight of the load frame and forklift (or crane) combined.
- You have adequate packaging materials to protect the load frame when moving or relocating it to another site. Contact Instron Professional Services to determine the appropriate packaging requirements for your model type.

Equipment

The following items are required:

- A forklift or crane with a load rating that is double the load frame's gross weight.
- Protective padding for the crosshead.
- 8 mm wrench for securing bolts for the table top machines.

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Caution

If the shipping skid has been removed, do not lift the frame with a forklift underneath the base. Lifting the frame in this manner will damage the underside of the frame.

Similarly, do not lift the load frame by the top plate. This plate is not designed to support the weight of the frame, and it might break.

If the shipping skid has been removed, then lift the frame using a forklift with padded forks inserted under the crosshead. Refer to "Crosshead Method" on page 3-12 for details.

Transporting Procedures

There are three methods for transporting the load frame to the test site:

- **Frame Base method** - Using a forklift to lift the upright load frame from underneath the base with the shipping skid still attached. Refer to Figure 3-3 on page 3-12.
- **Crosshead method** - Using a forklift with padded forks to lift the load frame from under the crosshead as shown in Figure 3-4 on page 3-13.
- **Crane method** - Using a crane to lift the upright load frame from the crosshead. If this method is used, Instron recommends using professional riggers experienced in moving heavy equipment.

Frame Base Method

This method requires that the base be firmly attached to a shipping skid. The center of the base, where the forklift arms would be placed if no shipping skid was used, cannot support the weight of the load frame.

To transport the load frame using the frame base method:

1. Ensure that the frame is bolted to the shipping skid.
2. Carefully insert the forks under the shipping skid as shown in Figure 3-3 on page 3-12.
3. The crosshead should be in its lowest position so that the frame is not top heavy.
4. Slowly and carefully lift the frame off the floor. Do not lift the frame more than 8 cm (3 in) off the floor.

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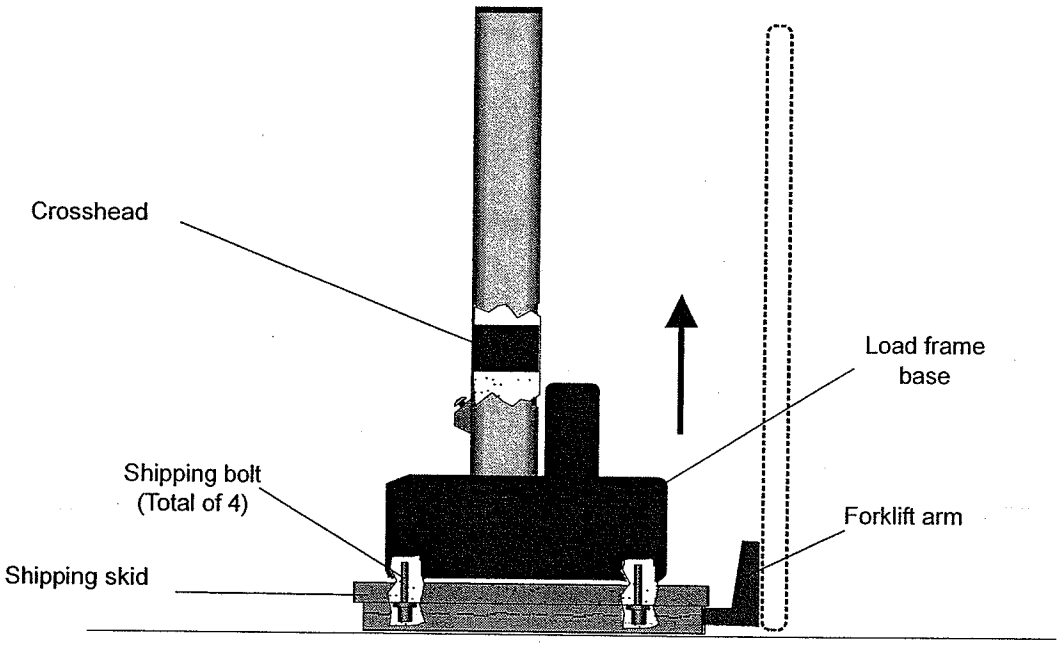


Figure 3-3. Lifting the Frame from the Base

5. Move the frame to its operating location.
6. Slowly lower the frame to the floor. Before placing the frame in its operating location, four leveling feet must be inserted into each corner of the base. The shipping skid must be removed to insert the feet and before placing the frame in its operating location.
7. Follow the instructions described under "Crosshead Method" on page 3-12 to remove the transport skid and position the frame.

When the frame is in its operating location, you can proceed with the installation process.

Crosshead Method

This method requires protective padding on either the crosshead or forklift arms to protect the crosshead from scratching or marring.

This method can be used to:

- Transport the load frame to the site location.
- Lift a tabletop load frame onto a table or workbench.
- Lift the frame to remove the transport skid from the frame's base and to insert the leveling feet.

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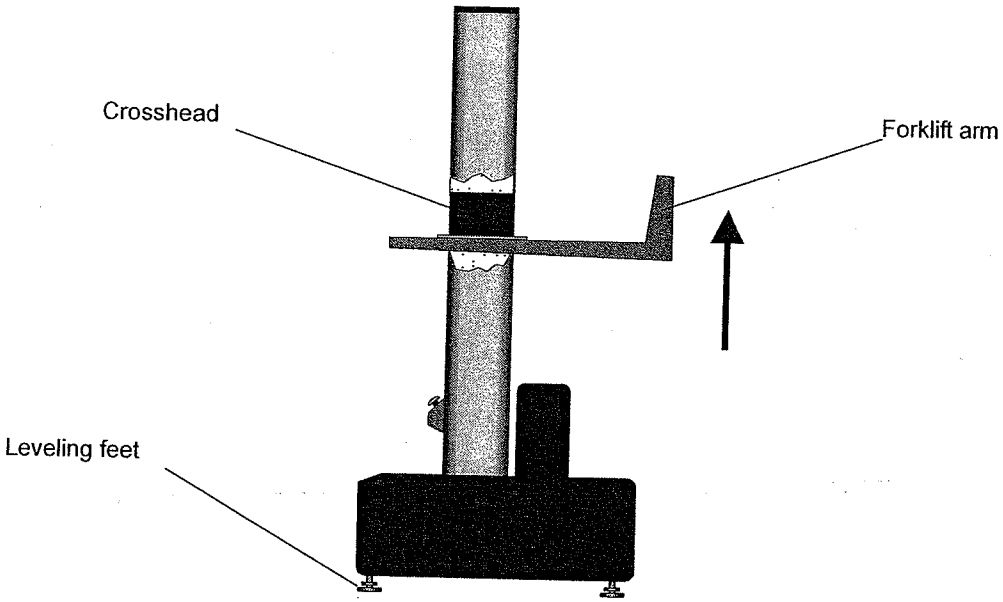


Figure 3-4. Lifting the Frame from the Crosshead

To transport the load frame using the crosshead method:

1. Ensure that there are no shipping bolts attached to the skid.
2. Using a forklift with padded forks or protective material around the crosshead, carefully insert the forks under the crosshead between the columns. Refer to Figure 3-4 on page 3-13.
3. Slowly and carefully lift the frame off the floor. Do not lift the frame more than 8 cm (3 in) off the floor.
4. Remove the shipping skid, if it has not already been removed.
5. Move the frame to its operating location.
6. Four leveling feet are supplied for the load frame. Thread one leveling foot into each corner of the base before placing the frame in its testing location.
7. Place the load frame carefully into position.
8. Remove the padded forks from under the frame's crosshead.

When the frame is in the testing location, you can proceed with the installation process.

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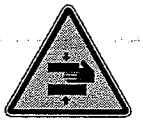
Crane Method

Instron recommends using professional riggers experienced in moving heavy equipment.

To transport the load frame using the crane method:

1. Attach the two lifting slings to the crosshead and secure them to the crane hook as shown in Figure 3-5. If you use chains in lieu of lifting slings, wrap protective material around the crosshead to protect the crosshead from scratching and marring.

Warning



Crush hazard - Do not allow anyone in the immediate area of the load frame when lifting it off the ground.

2. Slowly and carefully lift the frame off the floor. Do not lift the frame more than 8 cm (3 in) off the floor.

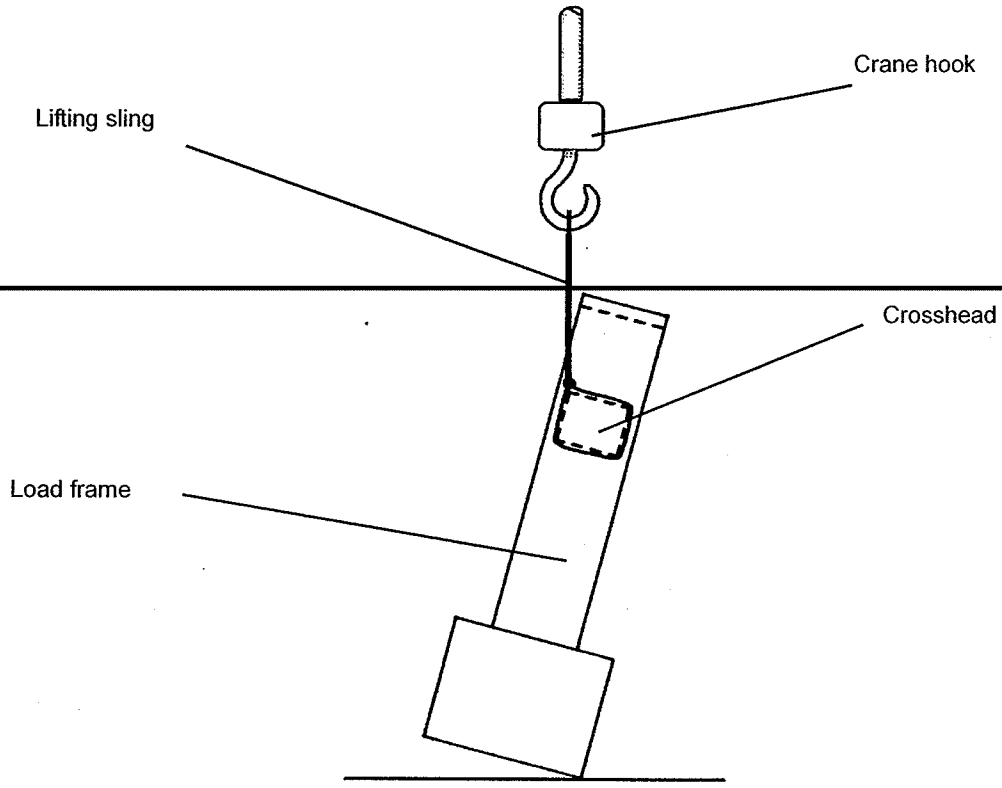


Figure 3-5. Lifting Load Frame with a Crane

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3. Remove the shipping skid, if it has not already been removed.
4. Move the frame to the operating location.
5. Four leveling feet are supplied for the load frame. Thread one leveling foot into each corner of the base before placing the frame into its testing location.
6. Place the load frame carefully into position.
7. Remove the lifting straps from the crosshead, and any protective padding, if used.

When the frame is in its testing location, you can proceed with the installation process.

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Handling Single Column Frames

The single column load frames are packed in a strong cardboard carton strapped to a wooden pallet. Accompanying components are also packed in cardboard cartons. These testing systems must be set up on a strong table or work bench at a convenient operating height and within easy reach of electrical power outlets.

Before You Begin

Before moving the load frame ensure that:

- You have reviewed the section "Site Requirements" for the load frame series applicable to your testing system. Verify that all conditions are met prior to transporting the test system.
- Your equipment operators have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).
- At the final site location, there is adequate clearance between the ceiling and the top of the load frame.
- There are no loose accessories on the shipping skid.
- The frame and forklift can fit through all doorways, halls, elevators or stairs from the shipping dock to its final site location. If you transfer the load frame while it is still in its packaging, refer to the dimensions for your frame type in Table 3-1 on page 3-8. If you move or relocate the load frame without its packaging, refer to the dimensions for your specific model number, which are shown in chapters 4, 5 or 6 (depending on your frame series) of this manual.
- You have adequate packaging materials to protect the load frame when moving or relocating it to another site. Contact Instron Professional Services to determine the appropriate packaging requirements for your model type.

Equipment

You need the following items:

- A forklift with a load rating that is double the load frame's gross weight.
- Sharp knife.
- Cutter for the steel strapping.
- Two individuals to lift the frame onto the table.

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Procedure

To unpack and position the load frame:

1. Use a forklift to carry the container to the testing area. Refer to "General Handling Precautions" on page 3-2 for guidelines and warnings.
2. Place the load frame carton near its final operating location.
3. Cut the strapping that secures the load frame carton to the wooden pallet.
4. Open the top of the load frame carton and remove the packing material.
5. Using a sharp knife, carefully cut down one corner of the carton and along the base, then fold the cut portion of the carton to one side.

Warning



Hazard - The load frame is heavy. Use two adults to lift the frame.

Caution

Do not put any strain on the Emergency Stop button, the limit stops, or the load frame grip adapters while lifting the load frame.

6. Using two individuals, firmly grasp the load frame base, lift the frame out of the carton, and place it in its operating position.
7. Use the packing list to inventory all the items. Some accessories may be in the container with the load frame or may be packaged separately.

   Do not open any of the packing boxes. The packing list will indicate the total number of boxes that are included in the shipment. Count the number of boxes you received to make sure you have the correct number of boxes. Do not open these boxes until the Instron service representative arrives to install your testing system. This ensures that no parts are lost prior to installation.
8. Retain all packing materials until the system is satisfactorily installed and all parts, assemblies and accessories have been located.

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Handling MicroTesters

Before You Begin

Before moving the load frame ensure that:

- You have reviewed the section "Site Requirements" for the load frame series applicable to your testing system. Verify that all conditions are met prior to transporting the test system.
- Your equipment operators have the appropriate licenses and have complied with your local safety standards (i.e. the appropriate training required by OSHA in the U.S.).
- At the final site location, there is adequate clearance between the ceiling and the top of the load frame, including clearance for lifting the frame via a fork-lift or crane.
- There are no loose accessories on the shipping skid.
- The frame and forklift can fit through all doorways, halls, elevators or stairs from the shipping dock to its final site location. If you transfer the MicroTester while it is still in its packaging, refer to the dimensions for your frame type in Table 3-1 on page 3-8. If you move or relocate the MicroTester without its packaging, refer to the dimensions for your specific model number, which are shown in chapters 4, 5 or 6 (depending on your frame series) of this manual.
- You have adequate packaging materials to protect the load frame when moving or relocating it to another site. Contact Instron Professional Services to determine the appropriate packaging requirements for your model type.

Equipment

You need the following items:

- A forklift or crane with a load rating that is double the load frame's gross weight.
- Two (2) web lifting slings with a minimum capacity that is double the load frame's gross weight, and are 915 mm (36 in) in length.
- Two (2) M10 eyebolts. Supplied with the MicroTester.

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Procedure

Warnings



Hazard - Do not lift the frame by the actuator cover. The cover does not support the weight of the frame. If used for lifting, the cover could break and cause personal injury and equipment damage.

Hazard - Do not tilt an unsupported load frame more than 10° when it is in the upright position. Doing so may topple the load frame and cause personal injury and equipment damage.

Hazard - Do not use lifting devices or straps rated for less than twice the weight of the load frame. Lifting devices or straps rated below this capacity may break and cause personal injury and equipment damage.

To transport the MicroTester:

1. Verify that the four crosshead clamping bolts are tightened to 40 N-m (30 ft-lbs). See Figure 3-6 on page 3-20.
2. Install the two M10 eyebolts in the ends of the crosshead as shown in Figure 3-6.
3. Attach the slings to the eyebolts.
4. Attach the upper end of each sling to a forklift or crane.
5. Carefully lift the frame by the slings. Do not let the slings touch the actuator cover or plastic track. The frame will tilt forward about 30° during lifting. See Figure 3-7 on page 3-21.
6. Lower the MicroTester carefully onto the table.
7. Release the slings from the forklift and remove them from the MicroTester.

Note: *Do not use the forklift blades to lift the frame from under the crosshead – the actuator could be damaged if the frame slips off the fork.*

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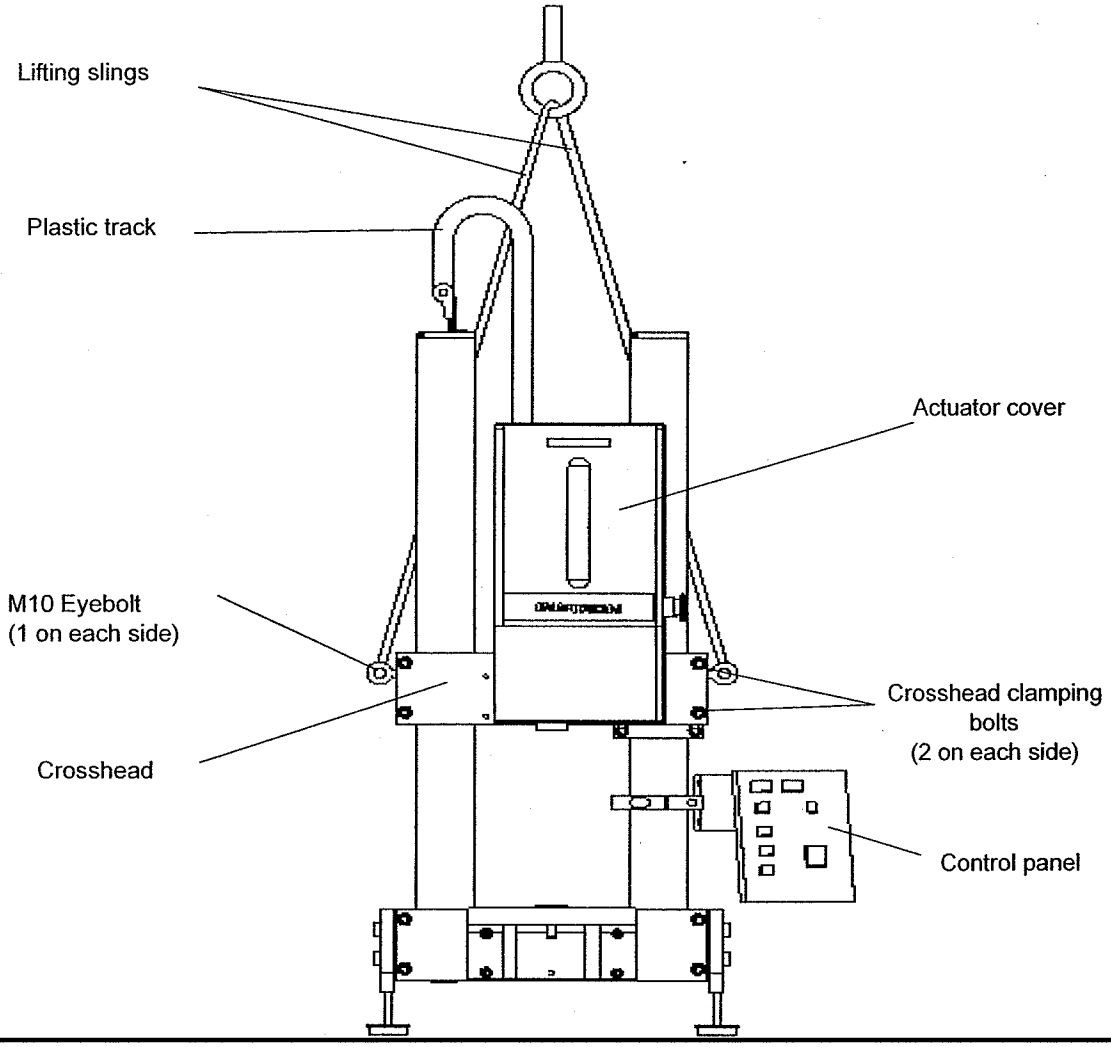


Figure 3-6. Lifting the MicroTester - Front View

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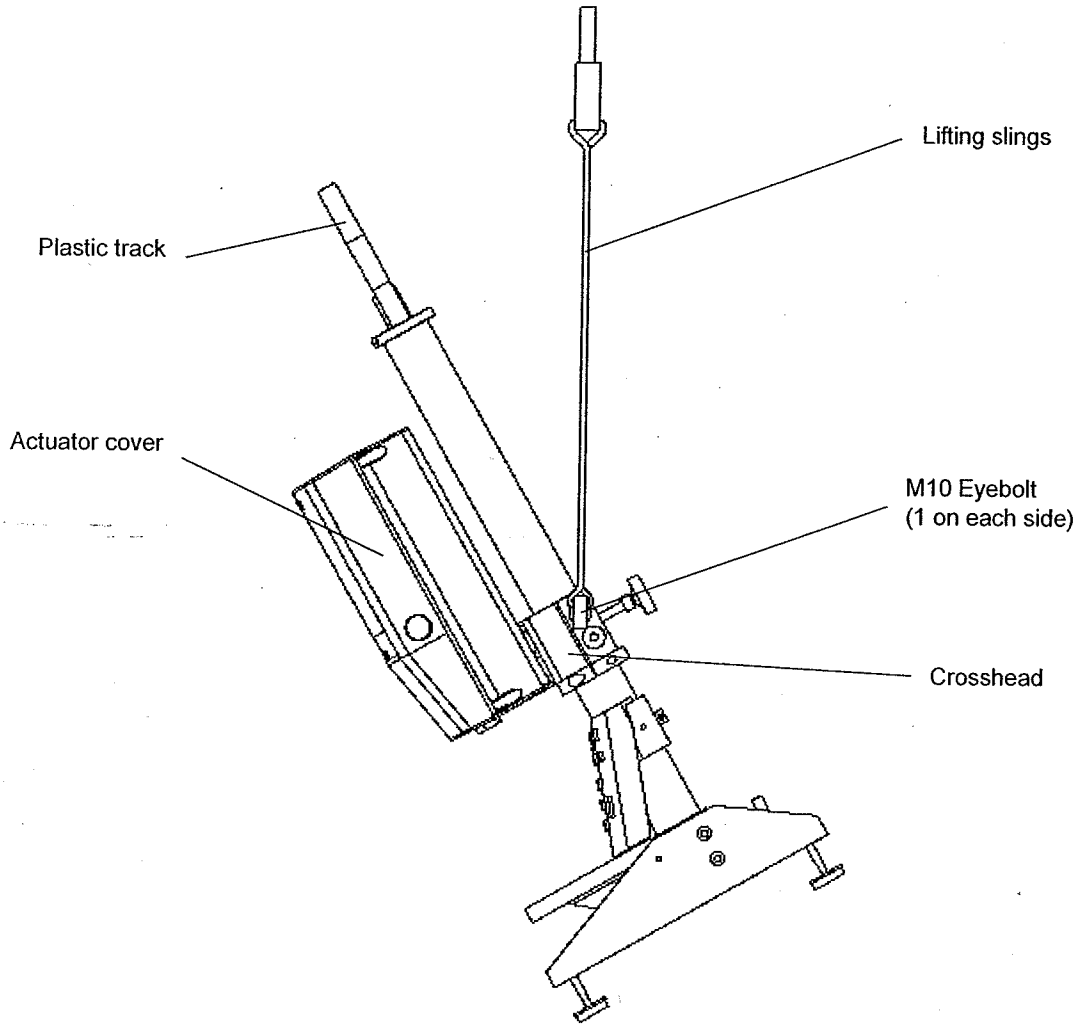


Figure 3-7. Lifting the MicroTester - Side View

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Chapter 4
Series 3300 Frames

Outline

This chapter describes the site requirements for the Series 3300 load frames and provides the general specifications common to all the 3300 frames. It also provides basic frame specifications and dimensions, for all available frame options, that are required in order to adequately prepare the testing site for installation.

- Site Requirements 4-2
- Common Specifications 4-4
- Frame Specifications 4-5
- Accessories. 4-6

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Site Requirements

Proper site preparation is imperative so that the testing system operates in accordance with its specifications and provides accurate test results.

Floor Loading

The supporting floor must be checked for its weight loading and be able to support the weight of the load frame and any other accessory parts that may have been purchased. The floor must be free of vibrations from other activities taking place in or near the building.

For larger load frames, it is recommended that you consult your facility engineer, foundation specialist, or a civil engineer to ensure that the load capacity of the floor can support at least three times the weight of the load frame and its component parts. The higher load capacity is necessary because large dynamic loads may occur when a specimen breaks and this additional load may be absorbed into the floor.

Anti-vibration mountings are available as an option in order to reduce the transfer of these large dynamic loads into the supporting floor. Contact your local Instron sales representative to discuss your needs.

Table Loading

The supporting table must be checked for its weight loading and must be able to support the weight of the load frame with all its components and accessories, if the computer and accessories are placed on the same table. There must be a sufficient margin of safety in the table's weight loading to ensure the stability of the system.

The table must be free of vibrations from other activities taking place in or near the building. A table with leveling feet is recommended.

Power Supply

Ensure that the required power supply is available and complies with the requirements detailed under "Electrical Power Requirements" on page 4-4.

Telephone and Network Access

Ensure that a telephone line is located within the general testing area. This enables the user to contact Instron's service department directly from the testing area so the user can perform the instructions provided and resolve the situation while on

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the telephone with the service representative. This facilitates resolving issues in a timely manner and reduces the number of repeated phone calls on the same problem.

It is also suggested that network drops, or digital phone lines, be within the general testing area. Instron's goal is to provide remote diagnostics in order to resolve system issues. Having a network drop or digital phone line available will enable an Instron service representative to dial into the testing system's computer to diagnose and resolve problems more efficiently. Including the network or digital lines in your initial site preparation will facilitate adding this function if it becomes necessary in the future.

Ceiling Clearance

Ensure that there is adequate ceiling clearance so that the load frame can be easily placed in its testing location. Take into consideration how you will be transporting the frame (by forklift or crane, for instance) and ensure that the ceiling height can accommodate your mode of transportation.

Environmental Conditions

Ensure that the testing site meets the standards described under "Environmental Requirements" on page 4-4.

Accessibility

The load frame must be accessible for routine maintenance. There should be approximately 915 mm (36 in) of space on all sides of the frame. This allows easy access to all components of the testing system without having to move the load frame. If the frame is moved, it may need to be re-verified.

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Common Specifications

The following information is common to all 3300 testing systems.

Electrical Power Requirements

Table 4-1. 3300 Series - Electrical Power Requirements

Model #	Voltage *	Frequency	Maximum Distance from Power Source
3342, 3343, 3344, 3345,	Single Phase Voltage 100/ 120/ 220/ 240 VAC ±10% Power cords are available for the various international standards	47 to 63 Hz	2.44 m 8 ft Measured from the rear right side of the load frame (1)
3365, 3366, 3367, 3369	Single Phase Voltage 100/ 120/ 220/ 240 VAC ±10% Power cords are available for the various international standards	47 to 63 Hz	2.44 m 8 ft Measured from the right side of the load frame (1)

* Refer to the "Frame Specifications" tables for details regarding the maximum power requirements for your specific testing system.

(1) If the power source is located to the left of the load frame, then the distance must also include the width of the load frame.

Environmental Requirements

Operating Temperature:	+10° to +38° C (+50° to +100° F)
Storage Temperature:	-40° to +66° C (-40° to +150° F)
Humidity:	10% to 90% (non-condensing)
Atmosphere:	Designed for use under normal laboratory conditions. Protective measures may be required if excessive dust, corrosive fumes, electromagnetic fields, or hazardous conditions are encountered.

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Frame Specifications

Table 4-2. 3300 Series - Standard Frame Specifications

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Single Column Table Top Models	3342	900 mm 35.4 in	382 mm 15.0 in	500 mm 19.7 in	38 kg 83 lb	500 N 112 lbf	170 VA
	3343	1300 mm 51.2 in	382 mm 15.0 in	500 mm 19.7 in	42.5 kg 94 lb	1 kN 225 lbf	200 VA
	3344	1300 mm 51.2 in	382 mm 15.0 in	500 mm 19.7 in	42.5 kg 94 lb	2 kN 450 lbf	240 VA
	3345	1358 mm 53.5 in	382 mm 15.0 in	500 mm 19.7 in	51 kg 112 lb	5 kN 1125 lbf	300 VA
	3345 Extra Height	1628 mm 64.1 in	382 mm 15.0 in	500 mm 19.7 in	57 kg 126 lb	5 kN 1125 lbf	300 VA
Twin Column Table Top Models	3365	1,582 mm 62.3 in	756 mm 29.8 in	707 mm 27.8 in	110 kg 242 lb	5 kN 1,125 lbf	300 VA
	3366	1,582 mm 62.3 in	756 mm 29.8 in	707 mm 27.8 in	110 kg 242 lb	10 kN 2,250 lbf	300 VA
	3367	1,582 mm 62.3 in	756 mm 29.8 in	707 mm 27.8 in	121kg 266 lb	30 kN 6,750 lbf	600 VA
	3369	1,582 mm 62.3 in	756 mm 29.8 in	707 mm 27.8 in	141 kg 312 lb	50 kN 11,240 lbf	700 VA

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Accessories

There are many accessories available with our 3300 series electromechanical frames. Some accessories may change the frame's dimensions and require more space than the measurements shown in this manual. Special electrical requirements may also be necessary. Some accessories may require additional services, such as pneumatic grips requiring an air supply with filtered air and an air regulator.

If you purchased accessories with your testing system, contact Instron's service department for additional information you may need to properly prepare your test site. Refer to “Product Support” on page 1-3 for Instron’s contact information.

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Chapter 5
Series 4400 Frames

Outline

This chapter describes the site requirements for the Series 4400 load frames and provides the general specifications common to all the 4400 frames. It also provides basic frame specifications and dimensions, for all available frame options, that are required in order to adequately prepare the testing site for installation.

- Site Requirements 5-2
- Common Specifications 5-4
- Frame Specifications 5-6
- Accessories. 5-12

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Site Requirements

Proper site preparation is imperative so that the testing system operates in accordance with its specifications and provides accurate test results.

Note: Models 4487 and 4489 require specialized site preparation that cannot be generalized for the purposes of this manual. Refer to the specific Installation manual for these models.

Floor Loading

The supporting floor must be checked for its weight loading and be able to support the weight of the load frame and any other accessory parts that may have been purchased. The floor must be free of vibrations from other activities taking place in or near the building.

For larger load frames, it is recommended that you consult your facility engineer, foundation specialist, or a civil engineer to ensure that the load capacity of the floor can support at least three times the weight of the load frame and its component parts. The higher load capacity is necessary because large dynamic loads may occur when a specimen breaks and this additional load may be absorbed into the floor.

Anti-vibration mountings are available as an option in order to reduce the transfer of these large dynamic loads into the supporting floor. Contact your local Instron sales representative to discuss your needs.

Table Loading

The supporting table must be checked for its weight loading and must be able to support the weight of the load frame with all its components and accessories, if the computer and accessories are placed on the same table. There must be a sufficient margin of safety in the table's weight loading to ensure the stability of the system.

The table must be free of vibrations from other activities taking place in or near the building. A table with leveling feet is recommended.

Power Supply

Ensure that the required power supply is available and complies with the requirements detailed under "Electrical Power Requirements" on page 5-4.

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Telephone and Network Access

Ensure that a telephone line is located within the general testing area. This enables the user to contact Instron's service department directly from the testing area so the user can perform the instructions provided and resolve the situation while on the telephone with the service representative. This facilitates resolving issues in a timely manner and reduces the number of repeated phone calls on the same problem.

It is also suggested that network drops, or digital phone lines, be within the general testing area. Instron's goal is to provide remote diagnostics in order to resolve system issues. Having a network drop or digital phone line available will enable an Instron service representative to dial into the testing system's computer to diagnose and resolve problems more efficiently. Including the network or digital lines in your initial site preparation will facilitate adding this function if it becomes necessary in the future.

Ceiling Clearance

Ensure that there is adequate ceiling clearance so that the load frame can be easily placed in its testing location. Take into consideration how you will be transporting the frame (by forklift or crane, for instance) and ensure that the ceiling height can accommodate your mode of transportation.

Environmental Conditions

Ensure that the testing site meets the standards described under "Environmental Requirements" on page 5-5.

Accessibility

The load frame must be accessible for routine maintenance. There should be approximately 915 mm (36 in) of space on all sides of the frame. This allows easy access to all components of the testing system without having to move the load frame. If the frame is moved, it may need to be re-verified.

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Common Specifications

The following information is common to all 4400 testing systems.

Electrical Power Requirements

Table 5-1. 4400 Series - Electrical Power Requirements

Model #	Voltage *	Frequency	Maximum Distance from Power Source
4411, 4442, 4443, 4444, 4465, 4466, 4467, 4469	Single Phase Voltage 100/ 120/ 220/ 240 VAC ±10% Power cords are available for the various international standards	47 to 63 Hz	2.44 m 8 ft Measured from the right side of the load frame (1)
4464	Single Phase Voltage 100/ 120/ 220/ 240 VAC +10/-5% Power cords are available for the various international standards	47 to 63 Hz	2.44 m 8 ft Measured from the right side of the load frame (1)
4481, 4482, 4484, 4485	Single Phase Voltage 100/ 120/ 220/ 240 VAC ±10% The voltage setting for the frame determines the type of plug you receive: 100 and 120 V includes NEMA L5-30P 30A plug 220 and 240 V includes IEC309 16A plug.	47 to 63 Hz	2.44 m 8 ft Measured from the right side of the load frame (1)
4487, 4489	Three Phase Voltage 200-240, 360-440, or 440-480 VAC ±10%	50 to 60 Hz	Refer to the Installation manual for these frames

* Refer to the "Frame Specifications" tables for details regarding the maximum power requirements for your specific testing system.

(1)If the power source is located to the left of the load frame, then the distance must also include the width of the load frame.

For model #4464, the power supply must not be greater than 10% nor less than 5% of the specified voltage.

For models #4481, 4482, 4484, 4485: Although these frames operate at the indicated voltages, high speed turn-around times will be affected if voltage is near the extreme of tolerance. For 230 V operation, the frame is normally set to 220 V.

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Environmental Requirements

Operating Temperature:	+10° to +38° C (+50° to +100° F)
Storage Temperature:	-40° to +66° C (-40° to +150° F)
Humidity:	10% to 90% (non-condensing)
Atmosphere:	Designed for use under normal laboratory conditions. Protective measures may be required if excessive dust, corrosive fumes, electromagnetic fields, or hazardous conditions are encountered.

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Frame Specifications

Table 5-2. 4400 Series - Standard Frame Specifications

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Single Column Table Top Models	4411	1,500 mm 46.0 in	830 mm 33 in	420 mm 17 in	70 kg 154 lb	5 kN 1,125 lbf	300 VA
	4442	875 mm 34.4 in	375 mm 14.75 in	500 mm 19.7 in	39 kg 85 lb (1)	500 N 112 lbf	225 VA
	4443	1,275 mm 50.2 in	375 mm 14.75 in	500 mm 19.7 in	44 kg 96 lb (1)	1 kN 225 lbf	225 VA
	4444	1,275 mm 50.2 in	375 mm 14.75 in	500 mm 19.7 in	45 kg 98 lb (1)	2 kN 450 lbf	360 VA
Twin Columns Table Top Models	4464	1,597 mm 62.9 in	909 mm 35.8 in	700 mm 27.5 in	136 kg 300 lb	2 kN 450 lbf	300 VA
	4465	1,597 mm 62.9 in	909 mm 35.8 in	700 mm 27.5 in	136 kg 300 lb	5 kN 1,125 lbf	300 VA
	4466	1,597 mm 62.9 in	909 mm 35.8 in	700 mm 27.5 in	136 kg 300 lb	10 kN 2,250 lbf	300 VA
	4467	1,597 mm 62.9 in	909 mm 35.8 in	700 mm 27.5 in	182 kg 400 lb	30 kN 6,750 lbf	600 VA
	4469	1,597 mm 62.9 in	909 mm 35.8 in	700 mm 27.5 in	240 kg 530 lb	50 kN 11,240 lbf	700 VA
Floor Standing Models	4481 (2)	2,092 mm 82.4 in	1,130 mm 44.5 in	757 mm 29.8 in	862 kg 1,900 lb	50 kN 11,240 lbf	1,400 VA
	~~4482~~ (2)	~~2,092 mm~~ 82.4 in	~~1,130 mm~~ 44.5 in	~~757 mm~~ 29.8 in	~~862 kg~~ 1,900 lb	~~100 kN~~ 22,500 lbf	~~1,400 VA~~
	4484 (2)	2,092 mm 82.4 in	1,130 mm 44.5 in	757 mm 29.8 in	952 kg 2,100 lb	150 kN 33,750 lbf	2,800 VA
	4485 (2)	2,092 mm 82.4 in	1,130 mm 44.5 in	757 mm 29.8 in	952 kg 2,100 lb	200 kN 45,000 lbf	2,800 VA
	4487	2,553 mm 100.5 in (3)	1,617 mm 63.7 in	762 mm 30.0 in	2,214 kg 4,880 lb	300 kN 67,500 lbf	3,000 VA
	4489	2,972 mm 117.0 in (3)	1,604 mm 63.2 in	762 mm 30.0 in	3,629 kg 8,000 lb	600 kN 135,000 lbf	5,000 VA

(1) Weight includes the load frame and control panel.

(2) The optional Support Base/Extension #2910-064 adds the following dimensions to the standard frame when fitted: Height 300 mm (11.8 in)
Weight91 kg (200 lb)

(3) Includes leveling feet. Height is decreased by 40 mm (1.625 in) if leveling feet are not used.

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Table 5-3. 4400 Series - Standard Frame w/ 2nd Test Space

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Twin Column Table Top Models	**4464** (1) (2)	1,636 mm 64.4 in	909 mm 35.8 in	700 mm 27.5 in	154 kg 340 lb	2 kN 450 lbf	300 VA
	4465 (1) (2)	1,636 mm 64.4 in	909 mm 35.8 in	700 mm 27.5 in	154 kg 340 lb	5 kN 1,125 lbf	300 VA
	4466 (1) (2)	1,636 mm 64.4 in	909 mm 35.8 in	700 mm 27.5 in	154 kg 340 lb	10 kN 2,250 lbf	300 VA
	4467 (1) (2)	1,636 mm 64.4 in	909 mm 35.8 in	700 mm 27.5 in	248 kg 547 lb	30 kN 6,750 lbf	600 VA
Floor Standing Models	**4481** (2)	2,173 mm 85.6 in	1,130 mm 44.5 in	757 mm 29.8 in	1,047 kg 2,310 lb	50 kN 11,240 lbf	1,400 VA
	4482 (2)	2,173 mm 85.6 in	1,130 mm 44.5 in	757 mm 29.8 in	1,047 kg 2,310 lb	100 kN 22,500 lbf	1,400 VA
	4484 (2)	2,223 mm 87.5 in	1,130 mm 44.5 in	757 mm 29.8 in	1,138 kg 2,510 lb	150 kN 33,750 lbf	2,800 VA
	4485 (2)	2,223 mm 87.5 in	1,130 mm 44.5 in	757 mm 29.8 in	1,138 kg 2,510 lb	200 kN 45,000 lbf	2,800 VA

(1) Add 30 mm (1.2 in) to the frame height with the load cell fitted.

(2) Allow an additional space of 200 mm (8.0 in) above the crosshead for loadcell installation and removal access.

Table 5-4. 4400 Series - Extra Height Frames

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Twin Column Table Top Models	**4464**	2,117 mm 83.3 in	909 mm 35.8 in	700 mm 27.5 in	151 kg 333 lb	2 kN 450 lbf	300 VA
	4465	2,117 mm 83.3 in	909 mm 35.8 in	700 mm 27.5 in	151 kg 333 lb	5 kN 1,125 lbf	300 VA
	4466	2,117 mm 83.3 in	909 mm 35.8 in	700 mm 27.5 in	151 kg 333 lb	10 kN 2,250 lbf	300 VA
	4467	2,117 mm 83.3 in	909 mm 35.8 in	700 mm 27.5 in	200 kg 440 lb	30 kN 6,750 lbf	600 VA
	4469	2,117 mm 83.3 in	909 mm 35.8 in	700 mm 27.5 in	263 kg 580 lb	50 kN 11,240 lbf	700 VA

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Table 5-4. 4400 Series - Extra Height Frames (Continued)

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Floor Standing Models	4481	2,592 mm 102.0 in	1,130 mm 44.5 in	757 mm 29.8 in	930 kg 2,050 lb	50 kN 11,240 lbf	1,400 VA
	4482	2,592 mm 102.0 in	1,130 mm 44.5 in	757 mm 29.8 in	930 kg 2,050 lb	100 kN 22,500 lbf	1,400 VA
	4484	2,592 mm 102.0 in	1,130 mm 44.5 in	757 mm 29.8 in	1,025 kg 2,260 lb	150 kN 33,750 lbf	2,800 VA
	4485	2,592 mm 102.0 in	1,130 mm 44.5 in	757 mm 29.8 in	1,025 kg 2,260 lb	200 kN 45,000 lbf	2,800 VA
	4487	3,162 mm 124.5 in	1,617 mm 63.7 in	762 mm 30.0 in	2,449 kg 5,400 lb	300 kN 67,500 lbf	3,000 VA
	4489	3,582 mm 141.0 in	1,604 mm 63.2 in	762 mm 30.0 in	3,719 kg 8,200 lb	600 kN 135,000 lbf	5,000 VA

Table 5-5. 4400 Series - Extra Height Frames w/ 2nd Test Space

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Twin Column Table Top Models	4464 (1) (2)	2,161 mm 85.1 in	909 mm 35.8 in	700 mm 27.5 in	169 kg 373 lb	2 kN 450 lbf	300 VA
	4465 (1) (2)	2,161 mm 85.1 in	909 mm 35.8 in	700 mm 27.5 in	169 kg 373 lb	5 kN 1,125 lbf	300 VA
	4466 (1) (2)	2,161 mm 85.1 in	909 mm 35.8 in	700 mm 27.5 in	169 kg 373 lb	10 kN 2,250 lbf	300 VA
	4467 (1) (2)	2,161 mm 85.1 in	909 mm 35.8 in	700 mm 27.5 in	266 kg 586 lb	30 kN 6,750 lbf	600 VA
Floor Standing Models	4481 (2)	2,673 mm 105.2 in	1,130 mm 44.5 in	757 mm 29.8 in	1,116 kg 2,460 lb	50 kN 11,240 lbf	1,400 VA
	4482 (2)	2,673 mm 105.2 in	1,130 mm 44.5 in	757 mm 29.8 in	1,116 kg 2,460 lb	100 kN 22,500 lbf	1,400 VA
	4484 (2)	2,723 mm 107.2 in	1,130 mm 44.5 in	757 mm 29.8 in	1,211 kg 2,670 lb	150 kN 33,750 lbf	2,800 VA
	4485 (2)	2,723 mm 107.2 in	1,130 mm 44.5 in	757 mm 29.8 in	1,211 kg 2,670 lb	200 kN 45,000 lbf	2,800 VA

(1) Add 30 mm (1.2 in) to the frame height with the load cell fitted.

(2) Allow an additional space of 200 mm (8.0 in) above the crosshead for loadcell installation and removal access.

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Table 5-6. 4400 Series - Extra Wide Frames

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Twin Column Table Top Models	4465	1,580 mm 62.2 in	1,427 mm 56.2 in	700 mm 27.5 in	330 kg 725 lb	5 kN 1,125 lbf	300 VA
	4466	1,580 mm 62.2 in	1,427 mm 56.2 in	700 mm 27.5 in	330 kg 725 lb	10 kN 2,250 lbf	300 VA
	4467	1,580 mm 62.2 in	1,427 mm 56.2 in	700 mm 27.5 in	425 kg 935 lb	30 kN 6,750 lbf	600 VA
Floor Standing Models	4481	2,092 mm 82.4 in	1,483 mm 58.4 in	757 mm 29.8 in	1,090 kg 2,400 lb	50 kN 11,240 lbf	1,400 VA
	4482	2,092 mm 82.4 in	1,483 mm 58.4 in	757 mm 29.8 in	1,090 kg 2,400 lb	100 kN 22,500 lbf	1,400 VA
	4484	2,092 mm 82.4 in	1,483 mm 58.4 in	757 mm 29.8 in	1,180 kg 2,600 lb	150 kN 33,750 lbf	2,800 VA
	4485	2,092 mm 82.4 in	1,483 mm 58.4 in	757 mm 29.8 in	1,180 kg 2,600 lb	200 kN 45,000 lbf	2,800 VA

Table 5-7. 4400 Series - Extra Wide and Extra Height Frames

	Model #	Height	Width	Depth	Weight	Load Capacity	Maximum Power Requirement
Twin Column Table Top Models	4465	2,105 mm 82.9 in	1,427 mm 56.2 in	700 mm 27.5 in	347 kg 765 lb	5 kN 1,125 lbf	300 VA
	4466	2,105 mm 82.9 in	1,427 mm 56.2 in	700 mm 27.5 in	347 kg 765 lb	10 kN 2,250 lbf	300 VA
	4467	2,105 mm 82.9 in	1,427 mm 56.2 in	700 mm 27.5 in	443 kg 975 lb	30 kN 6,750 lbf	600 VA
Floor Standing Models	4481	2,592 mm 102.0 in	1,483 mm 58.4 in	757 mm 29.8 in	1,158 kg 2,550 lb	50 kN 11,240 lbf	1,400 VA
	4482	2,592 mm 102.0 in	1,483 mm 58.4 in	757 mm 29.8 in	1,158 kg 2,550 lb	100 kN 22,500 lbf	1,400 VA
	4484	2,592 mm 102.0 in	1,483 mm 58.4 in	757 mm 29.8 in	1,253 kg 2,760 lb	150 kN 33,750 lbf	2,800 VA
	4485	2,592 mm 102.0 in	1,483 mm 58.4 in	757 mm 29.8 in	1,253 kg 2,760 lb	200 kN 45,000 lbf	2,800 VA

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