

**Model KPX Static Hydraulic
Universal Testing System**

Pre-Installation Manual
M47-17034-EN Revision A

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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Original Instructions

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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 in the testing system that are potentially hazardous, particularly force actuators or a moving crosshead.

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.

Instron products, to the best of its knowledge, comply with various national and international safety standards, in as much as they apply to materials and structural testing. We certify that our products comply with all relevant EU directives (CE mark).

Because of the wide range of applications with which our instruments are used, and over which we have no control, additional protection devices and operating procedures may be necessary due to specific accident prevention regulations, safety regulations, further EEA directives or locally valid regulations. The extent of our delivery regarding protective devices is defined in your initial sales quotation. We are thus free of liability in this respect.

At your request, we will gladly provide advice and quotations for additional safety devices such as protective shielding, warning signs or methods of restricting access to the equipment.

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 judgment.

It is our strong recommendation that you should carry out your own product safety risk assessment.

Warnings



Hazard - Press the Emergency Stop button whenever you consider that an unsafe condition exists.

The Emergency Stop button removes hydraulic power or electrical drive from the testing system and brings the hazardous elements of the system to a stop as quickly as possible. It does not isolate the system from electrical power, other means are provided to disconnect the electrical supply. Whenever you consider that safety may be compromised, stop the test using the Emergency Stop button. Investigate and resolve the situation that caused the use of the Emergency Stop button before you reset it.



Flying Debris Hazard - Make sure that test specimens are installed correctly in grips or fixtures in order to eliminate stresses that can cause breakage of grip jaws or fixture components.

Incorrect installation of test specimens creates stresses in grip jaws or fixture components that can result in breakage of these components. The high energies involved can cause the broken parts to be projected forcefully some distance from the test area. Install specimens in the center of the grip jaws in line with the load path. Insert specimens into the jaws by at least the amount recommended in your grip documentation. This amount can vary between 66% to 100% insertion depth; refer to supplied instructions for your specific grips. Use any centering and alignment devices provided.



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 that 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.

Warnings



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

Installation or removal of a specimen, assembly, structure, or load string component involves working inside the hazard area between the grips or fixtures. When working in this area, ensure that other personnel cannot operate any of the system controls. 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.



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

Operational limits are included within your testing system to suspend motion or shut off the system when upper and/or lower bounds of actuator or crosshead travel, or force or strain, are reached during testing. Correct setting of operational limits by the operator, prior to testing, will reduce the risk of damage to test article and system and associated hazard to the operator.



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.

Warnings



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. is tied back. Refit covers as soon as possible.



Hazard - Shut down the hydraulic power supply and discharge hydraulic pressure before disconnection of 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 pressure to zero.



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 the user of the equipment.



Hazard - Ensure components of the load string are correctly pre-loaded 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 pre-loaded 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

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About these instructions

The information in this document is intended to aid customers in the site preparation, unpacking, lifting, and installation of the Instron Model KPX Static Hydraulic Universal Testing Systems.

These instructions assume the following:

- Your system consists of a frame, a hydraulic power supply, a control unit, a computer system with an Instron materials testing software package, and any testing accessories necessary to secure the specimen in the test space.

It is important that the site be adequately prepared in order to avoid unnecessary delays in the installation process and to ensure that the testing system operates without interference from various environmental conditions (i.e. excess building vibrations or extreme temperature and humidity levels).

Throughout your documentation are NOTE, CAUTION and WARNING statements that alert your attention to important information. They appear as follows:



Notes provide further clarification on particular issues.

Caution

Cautions alert the user to situations that may cause equipment damage.

Warning



Warnings alert the user to situations that may cause serious personal injury or death.

Please read these instructions, and any other documents provided, thoroughly and carefully. Be sure to understand all Warnings and Cautions before attempting to lift or install this equipment.

System overview

Purpose

Warning



If the equipment is used in a manner not specified by Instron, the protection provided by the equipment may be impaired. Injury to personnel or damage to the system may result. Be sure to read and understand the material presented in these instructions and in any other accompanying instructions.

The Instron Model KPX Static Hydraulic Universal Testing Systems are available in a variety of capacities. They are ideally suited for tension, compression, bend, shear, flexure and static cyclic testing on high strength materials. These frames feature a single, large test space and long test stroke that, together, provide users with great flexibility in the specimen size that can be tested and in the grips, fixtures and extensometry that can be used for the test.

System components

Model KPX systems consist of:

- Frame
- Hydraulic Power Supply (HPS)
- 59 Series control unit and other system controls and electronics
- Instron approved computer system with Instron materials testing software

[Figure 1](#) identifies the system components and various frame configurations (see “[Frame configuration options](#)” on page [12](#)).

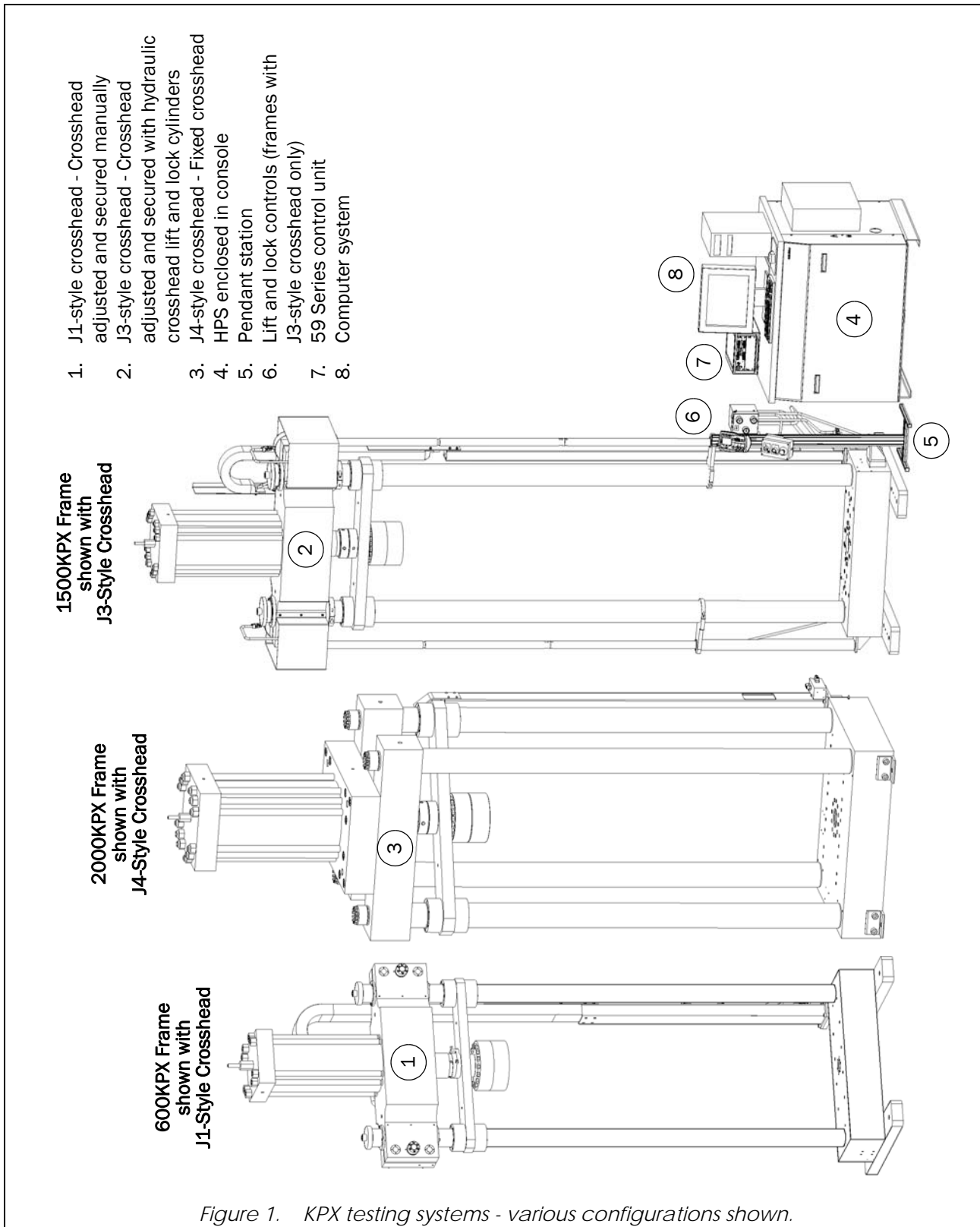


Figure 1. KPX testing systems - various configurations shown.

Frame configuration options

Frames can be configured with a variety of options. These options include:

- Crosshead variations:
 - J1-style crosshead - Crosshead adjusted and secured manually
 - J3-style crosshead - Crosshead adjusted and secured with hydraulic crosshead lift and lock cylinders
 - J4-style crosshead - Fixed crosshead
- Test opening variations:
 - A - Basic test opening
 - B - Increase vertical test space by 305 mm (12 in)
 - C - Increase vertical test space by 610 mm (24 in)
 - D - Increase vertical test space by 915 mm (36 in)
- Load cell options for 600KPX:
 - L1 - Tension/compression load cell with capacity of 300 kN (67,500 lbf)
 - L2 - Tension/compression load cell with capacity of 400 kN (90,000 lbf)
 - L3 - Tension/compression load cell with capacity of 600 kN (135,000 lbf)

The configuration options selected for your frame are identified in the complete model number of the frame. The complete model number is defined as:

{Capacity (in kN)}{Model family}-{Crosshead style option}{Test opening option}-{Load cell option}

Some examples would be:

600KPX-J1D-L2, 600KPX-J3B-L3, 1000KPX-J3D, 1500KPX-J1D, 2000KPX-J3D

It is very important to be aware of and understand the configuration of your frame as you perform various operations and procedures so that they can be performed correctly - the complete model number (in whole or in part) is used throughout this manual to identify specifications and procedures appropriate for your frame configuration. Knowing the complete model number of your frame is critical. To determine the complete model number (and thus configuration) of your frame, refer to one of the following:

- The frame serial tag (see “[System identification](#)” on page 13)
- The Instron quote

Testing accessories

Testing accessories are purchased separately from the frame. Testing accessories either provide a means to secure the specimen in the test space or provide additional functionality to the frame. Instructions on the installation, use and maintenance of Instron testing accessories are provided separately with each testing accessory. A variety of testing accessories are available. Contact your Instron Sales Representative for more information.

System identification

Your system has been given a unique serial number for system identification. This serial number can be found on the serial tag located on the rear of the frame (i.e. the frame serial tag). A duplicate serial tag can also be found on the rear of the HPS console.

In addition, the following components have also been given a unique serial number:











- **59 Series control unit** - This serial number can be found on the rear of the control unit.
- **HPS** - This serial number can be found on the rear of the HPS (rear cover of console must be removed).

The frame serial tag includes other important system information, including information on your frame's configuration. Frame configuration information can also be found on your Instron quote. Refer to "[Frame configuration options](#)" on page [12](#) for explanation of frame configuration.

System safety and information labels

Table 1 explains the meanings of any safety and information labels that may be attached to any part of the testing system.

Table 1. Descriptions of safety and information labeling.

Label	Meaning and Purpose
 <p>Crush hazard. Keep clear of feet and adjust machine in its motion. Read and understand operator's manual before using this machine.</p>	<p>Crush hazard - Indicates that a pinching or crush hazard exists from two objects coming together and instructs the user to read and understand the operator's manual before using the machine.</p>
	<p>Electrical hazard - Indicates that a hazard exists from high voltage or electrical current.</p>
	<p>High pressure hazard - Indicates that a hazard exists from high pressure. Do not adjust or reset any pressure settings until you have read and understood the operator's manual. Personal injury or damage to equipment may result. Most pressure settings should only be adjusted by an Instron service engineer.</p>
	<p>Eye protection - Indicates that a flying debris hazard exists either from specimen failure or improper use of system components. Wear eye protection or use protective shields or screens. Be sure to read and understand the operator's manual before using the system.</p>
	<p>Read the manual - Read and understand the operator's manual before using the system.</p>
	<p>Guard removal hazard - Indicates that a hazard exists - do not operate the system with covers removed. Be sure to read and understand the operator's manual before using the system. Only authorized personnel should service the equipment.</p>
	<p>General hazard - Indicates a general hazard. Be sure to read and understand the operator's manual before using or servicing the system. Only authorized personnel should service the equipment.</p>
	<p>Ground stud - Indicates a ground stud. Connect to an appropriate ground/earth system.</p>
	<p>Protective earth - Indicates the protective earth terminal for the main power supply.</p>
	<p>Three-phase power supply - Indicates that the equipment requires a three-phase power supply.</p>

Product support

Instron provides documentation, including manuals and online help, that can answer many of the questions you may have. It is recommended that you review the documentation sent with the system you purchased for possible solutions to your questions.

If you cannot find answers in these sources, contact Instron's Services department directly. A list of Instron offices is available on our website at www.instron.com. You may email your questions to service_support@instron.com (if your system is still in warranty, please include "IPG Warranty" in the subject line). In the US and Canada, you can call directly at 1-800-473-7838.

Product documentation

Instron offers a comprehensive range of documentation to help you get the most out of your Instron products. Depending on what you have purchased, your documentation may include some or all of the following:

Pre-Installation Manual	Information about preparing your site for installation of the system, receiving the system, and lifting and handling of the system.
Operating Instructions	How to use your system components and controls, and other frequently performed operating tasks.
System Concepts	Additional information about your system.
Online Help	Software products come complete with context sensitive help, which provides detailed information on how to use all software features.
Accessory Equipment Reference	How to set up and use any accessories you have purchased, for example grips, fixtures, extensometers, transducers, hydraulic power units, non-standard actuators, and environmental chambers.

We welcome your feedback on any aspect of the product documentation. Please email info_dev@instron.com with your comments.

Calibration upon installation

ASTM, ISO, and EN standards require the system be calibrated when it is installed or when it is moved or relocated. Instron calibrates the system at the factory, and provides a record of readings for the load cell. This machine may be verified on-site to ASTM E-4, BS 1610, DIN 51221, ISO 7500/1, EN 10002-2, JIS B7721, JIS B773 or AFNOR A03-501 standards. The factory calibration is not a complete verification to any current version of any of the above standards. Installation and Basic Software training are included with the purchase of your system. Verification services are available at a reduced rate if performed as part of the installation, but must be purchased separately. Contact your local Instron office for more information about our on-site verification services. Refer to “[Product support](#)” on page 15 for Instron’s contact information.

Training

During installation, the service engineer provides basic familiarization training on your testing 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.

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.

Customer's responsibilities

It is the customer's responsibility to ensure that all required support services (i.e. power, air, and/or water supplies, telephone line, etc.) 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 an installation appointment with Instron Service. These site requirements are described in this manual under [Chapter 3](#) and [Chapter 4](#). Always verify your equipment's specific model when referencing any information in this manual; refer to your copy of the Instron quote, or the serial number tag located on the equipment.

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 installation location. Refer to "[Move system components to installation area](#)" on page [43](#) 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 frame to its final installation location. Contact Instron's service department or your local Instron office for additional information on this service. Refer to "[Product support](#)" on page [15](#) 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 frame within your own premises, you are responsible for its safe transport. As stated under "[Handling and transporting](#)" above, you can arrange for an Instron service engineer to supervise the off-loading and transportation of the frame to its final installation location.

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

Installation is included with the purchase of the system. After the site is prepared, the frame is in place on its foundation, and all components are on site, installation by Instron will cover complete setup of the frame, hydraulic power supply, controller and computer interface, including all electrical and hydraulic hookups.

Initial operation

Once installation is complete, as part of the installation, Instron provides development of one test method to the user's requirement and basic familiarization training on the testing system.

Documentation

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

Additional copies are available and can be ordered through any Instron sales office.

Chapter 2

Specifications

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Environmental conditions

Table 2 lists the recommended environmental conditions in which the system should be operated and stored.

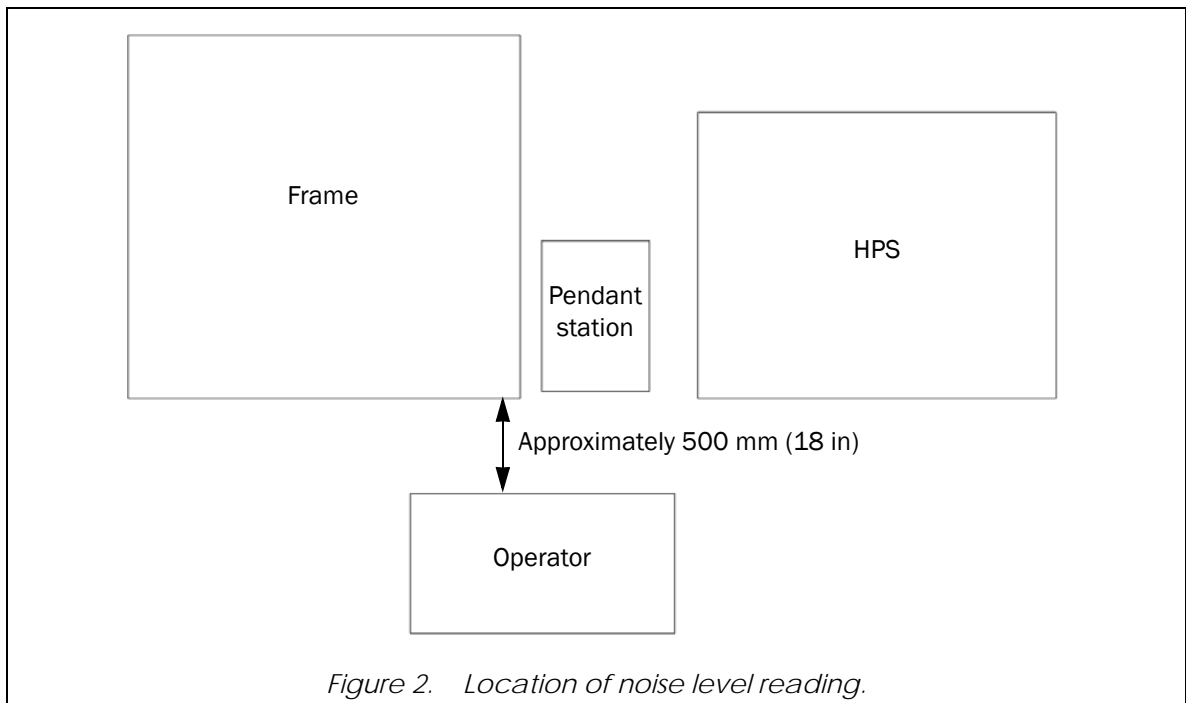
Table 2. Recommended environmental conditions.

Operating Temperature:	+10 to +38 deg C (+50 to +100 deg F)
Storage Temperature:	-40 to +66 deg C (-40 to +150 deg 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.

Noise level

The A-weighted emission sound pressure level generated by the testing system under normal operating conditions does not exceed 70 dBA. The peak C-weighted instantaneous sound pressure value does not exceed 63 Pa.

Since many variables (such as room layout) affect noise levels, it can not be assumed that these readings will be equal to those in the field. The noise level readings were taken at a location in front of the system as shown in [Figure 2](#). This is the typical location for an operator to stand when operating the system.



Heat load

The HPS generates a certain amount of heat during operation. Refer to [Table 3](#) for the approximate heat output of the HPS operating at both a 10% duty cycle and 50% duty cycle. The duty cycle is defined as the amount of time that the HPS operates under full load conditions. For example, operating at a 10% duty cycle would mean performing approximately one 6-minute test at full load per hour.

Table 3. Approximate heat output of various HPS models.

HPS Catalog Number	HPS Model	Approximate Heat Output at 10% Duty Cycle	Approximate Heat Output at 50% Duty Cycle
600KPX-D17	V22h	0.84 kW (2856 BTU/hour)	1.79 kW (6120 BTU/hour)
1000KPX-D18, 1500KPX-D18	V22e	0.12 kW (392 BTU/hour)	0.38 kW (1279 BTU/hour)
2000KPX-D19	V22f	0.12 kW (392 BTU/hour)	0.38 kW (1279 BTU/hour)

Frame ground bearing pressure

[Table 4](#) lists the various KPX frame configurations and their ground bearing pressures.

Table 4. Ground bearing pressure of standard KPX frame configurations.

Frame Model	Ground Bearing Pressure
600KPX-J1B	0.85 kg/cm ² (12.0 psi)
600KPX-J1D	0.88 kg/cm ² (12.5 psi)
600KPX-J3B	0.92 kg/cm ² (13.1 psi)
600KPX-J3D	0.96 kg/cm ² (13.7 psi)
1000KPX-J1C	0.67 kg/cm ² (9.49 psi)
1000KPX-J1D	0.68 kg/cm ² (9.67 psi)
1000KPX-J3C	0.72 kg/cm ² (10.29 psi)
1000KPX-J3D	0.74 kg/cm ² (10.49 psi)
1500KPX-J1C	0.97 kg/cm ² (13.9 psi)
1500KPX-J1D	0.99 kg/cm ² (14.1 psi)
1500KPX-J3C	1.04 kg/cm ² (14.8 psi)
1500KPX-J3D	1.06 kg/cm ² (15.1 psi)
2000KPX-J3A	0.77 kg/cm ² (11.0 psi)
2000KPX-J3D	0.82 kg/cm ² (11.7 psi)
2000KPX-J4A	0.63 kg/cm ² (9.0 psi)

Physical dimensions of components

Frame

Table 5 lists the various standard configurations of KPX frame models and their physical dimensions.

Table 5. Dimensions of standard KPX frames.

Frame Model ^{1, 2}	Height	Overall Area ³ (W x D)	Approx. Weight ⁴
600KPX-J1B	3795 mm (149 in)	1162 x 864 mm (45.75 x 34 in)	2,230 kgs (4,915 lbs)
600KPX-J1D	4405 mm (173 in)	1162 x 864 mm (45.75 x 34 in)	2,315 kgs (5,100 lbs)
600KPX-J3B	3795 mm (149 in)	1568 x 864 mm (61.75 x 34 in)	2,435 kgs (5,365 lbs)
600KPX-J3D	4405 mm (173 in)	1568 x 864 mm (61.75 x 34 in)	2,535 kgs (5,585 lbs)
1000KPX-J1C	4995 mm (197 in)	1283 x 1219 mm (50.5 x 48 in)	3,310 kgs (7,290 lbs)
1000KPX-J1D	5300 mm (209 in)	1283 x 1219 mm (50.5 x 48 in)	3,375 kgs (7,430 lbs)
1000KPX-J3C	4995 mm (197 in)	1687 x 1219 mm (66.438 x 48 in)	3,585 kgs (7,900 lbs)
1000KPX-J3D	5300 mm (209 in)	1687 x 1219 mm (66.438 x 48 in)	3,660 kgs (8,060 lbs)
1500KPX-J1C	5135 mm (202 in)	1473 x 1219 mm (58 x 48 in)	4,830 kgs (10,640 lbs)
1500KPX-J1D	5440 mm (214 in)	1473 x 1219 mm (58 x 48 in)	4,925 kgs (10,850 lbs)
1500KPX-J3C	5135 mm (202 in)	1878 x 1219 mm (73.938 x 48 in)	5,160 kgs (11,370 lbs)
1500KPX-J3D	5440 mm (214 in)	1878 x 1219 mm (73.938 x 48 in)	5,265 kgs (11,600 lbs)
2000KPX-J3A	4675 mm (184 in)	1816 x 1410 mm (71.5 x 55.5 in)	9,040 kgs (19,930 lbs)
2000KPX-J3D	5590 mm (220 in)	1816 x 1410 mm (71.5 x 55.5 in)	9,635 kgs (21,240 lbs)
2000KPX-J4A	4485 mm (176.5 in)	1331 x 1241 mm (52.375 x 48.875 in)	7,440 kgs (16,400 lbs)

- As designated on frame serial number tag
- J1 = Manually adjustable crosshead with manual crosshead locks
J3 = Hydraulically adjustable crosshead with hydraulic crosshead locks
J4 = Fixed crosshead
A = Basic test opening
B = Increase vertical test space by 305 mm (12 in)
C = Increase vertical test space by 610 mm (24 in)
D = Increase vertical test space by 915 mm (36 in)
- Dimensions are of the widest and deepest portion(s) of the frame.
- Use of permanent accessories (hydraulic or pneumatic wedge grips, side-acting grips, tee-slot tables, etc.) will significantly increase the weight of the frame. Be sure to consult instructions provided with the accessory.

Hydraulic power supply

Table 6. Dimensions of standard HPS models.

Height:	1038 mm (40.9 in)
Required Floor Space (W x D)¹:	1365 x 959 mm (53.75 x 37.75 in)
Weight:	680 kgs (1,500 lbs)

1. Width does not include clearance to open the electrical box door. Clearance needed to open the door is 355 mm (14 in).

59 Series control unit

Table 7. Dimensions of 59 Series control unit.

Size (W x D x H):	312 x 392 x 183 mm (12.3 x 15.4 x 7.2 in)
Weight:	13 kgs (28.6 lbs)

Crate dimensions

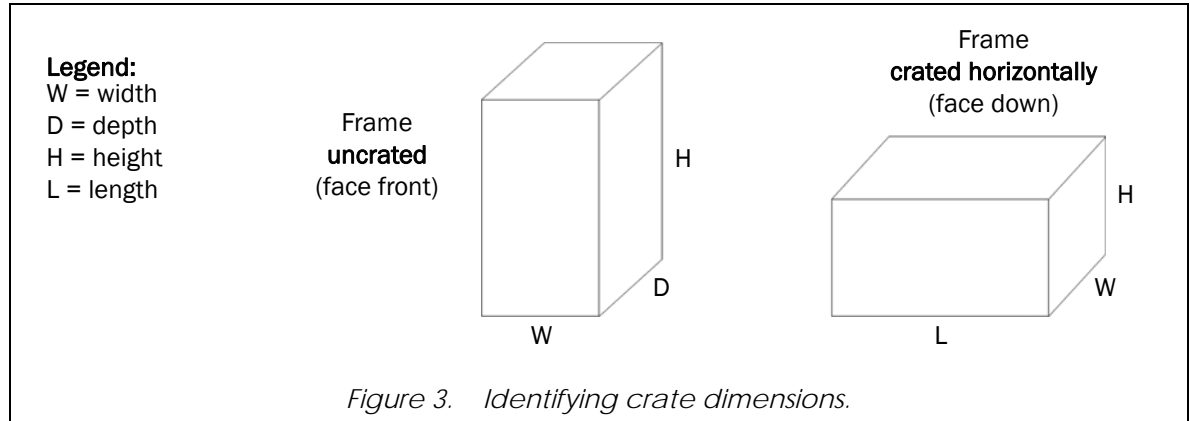
Frame

Refer to [Figure 3](#) and [Table 8](#) for typical crate dimensions of your specific frame model.

Table 8. Typical crate dimensions of standard KPX frame models.

Frame Model ^{1, 2}	Shipped Condition	Approximate Crate Dimensions (L x W x H)	Approx. Weight of Crated Frame ^{3, 4}
600KPX-J1B	Horizontal	3430 x 1473 x 1245 mm (135 x 58 x 49 in)	3,250 kgs (7,165 lbs)
600KPX-J1D	Horizontal	4040 x 1473 x 1245 mm (159 x 58 x 49 in)	3,333 kgs (7,350 lbs)
600KPX-J3B	Horizontal	3430 x 1830 x 1245 mm (135 x 72 x 49 in)	3,454 kgs (7,615 lbs)
600KPX-J3D	Horizontal	4040 x 1830 x 1245 mm (159 x 72 x 49 in)	3,554 kgs (7,835 lbs)
1000KPX-J1C	Horizontal	4470 x 1550 x 1600 mm (176 x 61 x 63 in)	3,987 kgs (8,790 lbs)
1000KPX-J1D	Horizontal	4775 x 1550 x 1600 mm (188 x 61 x 63 in)	4,051 kgs (8,930 lbs)
1000KPX-J3C	Horizontal	4470 x 1955 x 1600 mm (176 x 77 x 63 in)	4,264 kgs (9,400 lbs)
1000KPX-J3D	Horizontal	4775 x 1955 x 1600 mm (188 x 77 x 63 in)	4,336 kgs (9,560 lbs)
1500KPX-J1C	Horizontal	4625 x 1735 x 1600 mm (182 x 68 x 63 in)	6,187 kgs (13,640 lbs)
1500KPX-J1D	Horizontal	4930 x 1735 x 1600 mm (194 x 68 x 63 in)	6,282 kgs (13,850 lbs)
1500KPX-J3C	Horizontal	4625 x 2135 x 1600 mm (182 x 84 x 63 in)	6,518 kgs (14,370 lbs)
1500KPX-J3D	Horizontal	4930 x 2135 x 1600 mm (194 x 84 x 63 in)	6,623 kgs (14,600 lbs)
2000KPX-J3A	Horizontal	3940 x 2085 x 1730 mm (155 x 82 x 68 in)	10,660 kgs (23,500 lbs)
2000KPX-J3D	Horizontal	4850 x 2085 x 1730 mm (191 x 82 x 68 in)	11,340 kgs (25,000 lbs)
2000KPX-J4A	Horizontal	4875 x 1600 x 1625 mm (192 x 63 x 64 in)	9,075 kgs (20,000 lbs)

- As designated on frame serial number tag
- J1 = Manually adjustable crosshead with manual crosshead locks
 - J3 = Hydraulically adjustable crosshead with hydraulic crosshead locks
 - J4 = Fixed crosshead
 - A = Basic test opening
 - B = Increase vertical test space by 305 mm (12 in)
 - C = Increase vertical test space by 610 mm (24 in)
 - D = Increase vertical test space by 915 mm (36 in)
- This weight includes 680 kgs (1,500 lbs) for accessories that may be packed with the frame. This is only an estimation; the actual weight for accessories could be higher or lower depending on accessories purchased.
- Use of permanent accessories (hydraulic or pneumatic wedge grips, side-acting grips, tee-slot tables, etc.) will significantly increase the weight of the frame. Be sure to consult instructions provided with the accessory.



Hydraulic power supply

Refer to [Table 9](#) for typical crate dimensions of your HPS model.

Table 9. Typical crate dimensions of standard HPS models.

Approximate Crate Dimensions (L x W x H):	1855 x 1830 x 1550 mm (73 x 72 x 61 in)
Weight:	1,000 kgs (2,200 lbs)

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Chapter 3

Site Preparation

• Requirement checklist	27
• Determine system placement	28
• Prepare foundation	31
• Prepare electrical power supply	35
• Provide telephone line and network connection	37
• Provide additional utilities	37
• Prepare for shipment arrival	37

Requirement checklist

Before the KPX system arrives at your facility, it is important that the site be adequately prepared. This will avoid unnecessary delays in frame placement and installation and will ensure that the system operates without interference from various environmental conditions (i.e. excess building vibrations or extreme temperature and humidity levels).

Below is a reference checklist designed to aid the customer in preparing the testing system(s) installation site. Each item of the checklist is discussed in more detail in the following sections. Please use and refer to this checklist to complete each item.

- Determine system placement; see page 28.
- Prepare foundation; see page 31.*
- Prepare electrical power supply; see page 35.
- Provide telephone line and network connection; see page 37.
- Provide additional utilities; see page 37.
- Prepare for shipment arrival; see page 37.

* Instron is not responsible for foundation recommendations. This should be reviewed with a certified civil engineer.

Determine system placement

The location where the system will be put into service must meet certain requirements:

- Ensure that the location meets the standards described under “[Environmental conditions](#)” on page [35](#).
- The system should not be near any equipment that emits an extreme static discharge.
- The location must be large enough to house all system components and allow clearance on all sides of the system for use and maintenance. Refer to “[Physical dimensions of components](#)” on page [40](#) for dimensions of system components. Refer to [Figure 4](#) for the recommended system layout and minimum clearance requirements. Note that the standard layout of components is with the HPS located to the right of the frame, and the pendant station between the frame and HPS. This allows the operator easy access to the controls on the pendant station when standing at either the frame or the HPS.

The distance between system components is limited by the length of the supplied interconnecting hydraulic hoses and electrical cables. The standard length for supplied hoses and cables is 3 m (10 ft).

Alternate configurations of the system layout are possible (such as greater distances between components, the HPS located to the left of the frame instead of to the right, or the HPS located remotely from the frame). Typically, alternate configurations are discussed with Instron at the time of purchase so that appropriate lengths of hoses and cables can be supplied. If an alternate configuration is desired but was not discussed with Instron at the time of purchase, contact your Instron sales representative for assistance. Any configuration is limited to a total distance between HPS and 59 Series control unit of 36.5 m (120 ft). In most cases, additional costs will apply for longer hoses and cables.

- If your system includes a test space enclosure (i.e. a guard), additional space around the frame is required. Refer to [Figure 5](#).
- The system must be within a certain distance of appropriate mains power supplies. Refer to “[Prepare electrical power supply](#)” on page [35](#) for information on lengths of power cables supplied with system components.

In addition to the above requirements, the installation location may also need to meet these criteria:

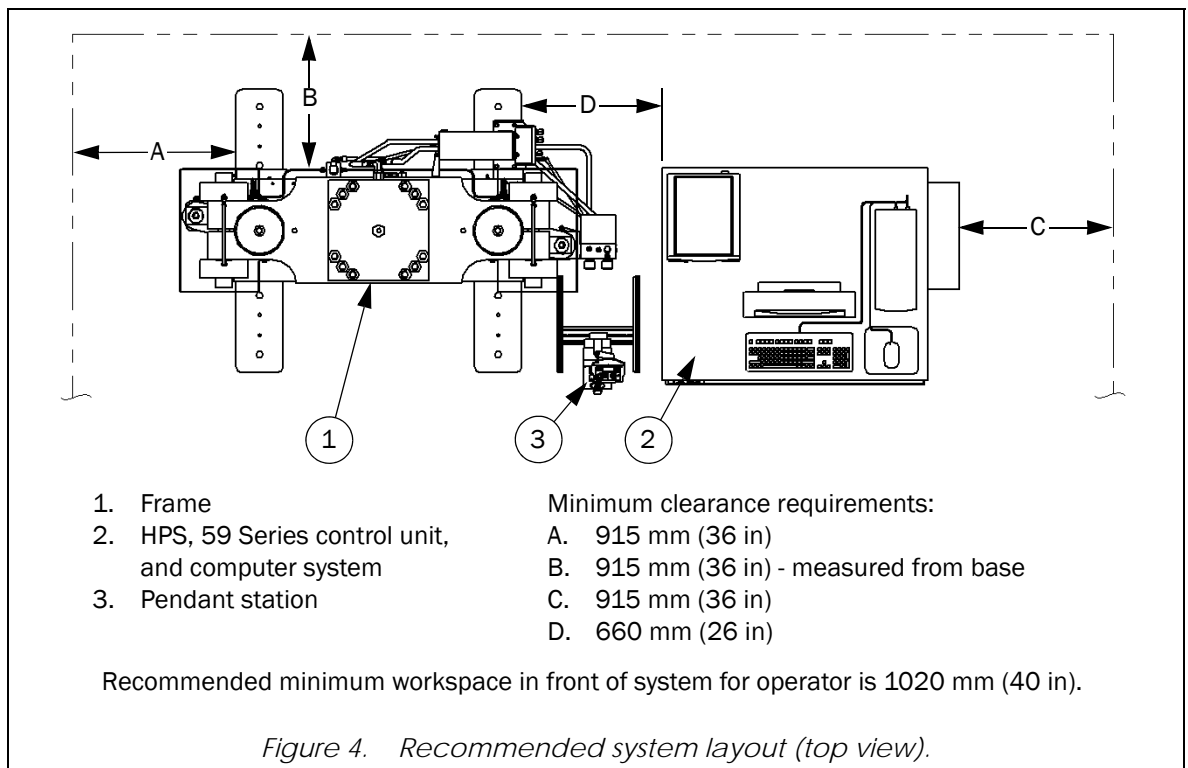
- Consider the availability of lifting equipment that may be needed for daily operation of the system. In most cases, daily operation of the system includes installation and removal of various testing accessories. Many testing accessories weigh in excess of 15 kg (30 lb) and may be difficult for operators to install and remove from the frame without the aid of lifting equipment. The lifting equipment could be an overhead crane, hoist, fork truck, etc. **All of these considerations are the responsibility of the customer.** If you need specific weight/size information for any testing accessory that you have ordered, contact your local Instron Sales Representative as directed on page [31](#).
- Check the ceiling height. Ensure that there is adequate ceiling clearance so that the frame can be easily put 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.

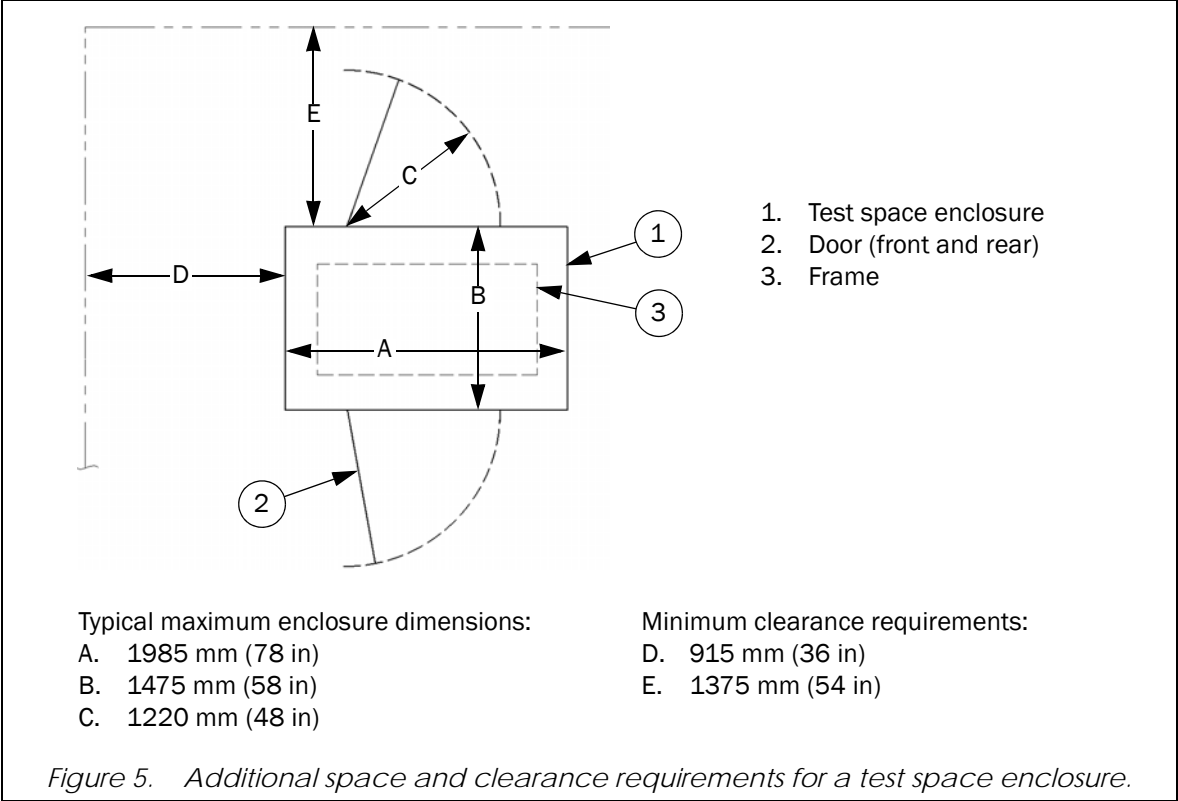
Frames are shipped horizontally and it will be necessary to stand the frame upright before it can be placed on its foundation. This may require extra ceiling height that is not necessary for normal frame operation. Refer to [Table 10](#) for the height required to stand your frame upright; this is referred to as the ‘tip-up height’. This height does not include clearance for the shipping skid or any lifting equipment.

Table 10. Ceiling height required to stand frame upright.

Frame Model ¹	Approximate Tip-Up Height
600KPX-J1B, 600KPX-J3B	3075 mm (121 in)
600KPX-J1D, 600KPX-J3D	3685 mm (145 in)
1000KPX-J1C, 1000KPX-J3C	4115 mm (162 in)
1000KPX-J1D, 1000KPX-J3D	4420 mm (174 in)
1500KPX-J1C, 1500KPX-J3C	4270 mm (168 in)
1500KPX-J1D, 1500KPX-J3D	4575 mm (180 in)
2000KPX-J3A	3660 mm (144 in)
2000KPX-J3D	4575 mm (180 in)
2000KPX-J4A	4520 mm (178 in)

1. As designated on frame serial number tag





Prepare foundation

Warning



The KPX frames, with the exception of the 2000KPX-J3D frame, will exceed a 10-degree tilt angle (will not topple when tilted through an angle of 10-degrees from its normal floor standing position). Bolting these frames to their foundation is highly recommended, but is not required.

The 2000KPX-J3D frame will meet but not exceed a 10-degree tilt angle. This frame must be bolted to its foundation using appropriately sized foundation bolts. Refer to [Table 12](#) on page [34](#) for mounting hole size and recommended bolt diameter.

The frame must be placed on a proper foundation. The foundation must be substantial enough to maintain permanent placement of the frame, and be able to withstand the shock and recoil that is generated by the frame during testing. Foundation bolts, when used, must be incorporated into the foundation. Instron cannot know the exact soil conditions in your area. Instron highly recommends that the exact design of the foundation be determined by a certified civil engineer. In general however, the following guidelines can be observed:



The foundation can be an existing floor if the floor can maintain permanent placement of the frame and can withstand the shock and recoil that is generated by the frame during testing. In general, it should meet the guidelines listed below. Contact a certified civil engineer.

- **Foundation type and area required:** The frame is designed to be floor mounted. Refer to [Figure 6](#) and [Table 11](#) on page [34](#) for dimensions of the frame's footprint and mounting hole locations.
- **Foundation thickness:** For 600KPX frames, a concrete pad that is 125 mm (5 in) thick is typically adequate. 1000KPX, 1500KPX and 2000KPX frames should have a concrete pad that is 300 mm (12 in) thick.
- **Foundation composition:** In general, the foundation should be an isolated reinforced concrete pad. The concrete used must be a 280 kgs/cm² (4000 psi) quality and be properly cured prior to the installation of the frame. The cross sectional area of the steel reinforcement should be in the range of 0.2% of cross sectional area of the cement (i.e., 185 mm² (0.288 in²) of steel for every 92,900 mm² (144 in²) of concrete). The reinforcement should be installed uniformly through the total area of the foundation.
- **Foundation shock load:** The shock load is estimated at two times the frame weight when the frame is mounted on an appropriate isolation material. Fabreeka and similar manufacturers produce various isolation materials that are appropriate for this type of application (Fabreeka's Fabcel 300 Nitrile pads can be purchased from Instron, part number 300-8899-9419). An isolation pad is especially recommended if shock transmitted through the floor can affect other equipment in the laboratory/facility.
- **Foundation mounting hardware:** 2000KPX-J3D frames must be bolted to the foundation. For all other frame models, Instron highly recommends that the frame be bolted to the foundation, although this is not required. The frame is equipped with four mounting holes in the feet to accept foundation bolts. Refer to [Figure 6](#) and [Table 11](#) on page [34](#) for the location of the mounting holes in the feet. Foundation mounting hardware is not supplied by Instron. [Figure 7](#) on page [34](#) shows the recommended components and configuration of the mounting hardware. The foundation bolts must be a medium carbon steel with a minimum tensile strength of 413.7 MPa (60,000 psi). The bolts are to have a coarse thread. Expandable anchor bolts are not recommended for this application. Refer to [Table 12](#) for mounting hole size, the recommended bolt diameter, and the thickness of the feet. The length of the foundation bolts should be determined by the civil engineer that is designing the foundation.

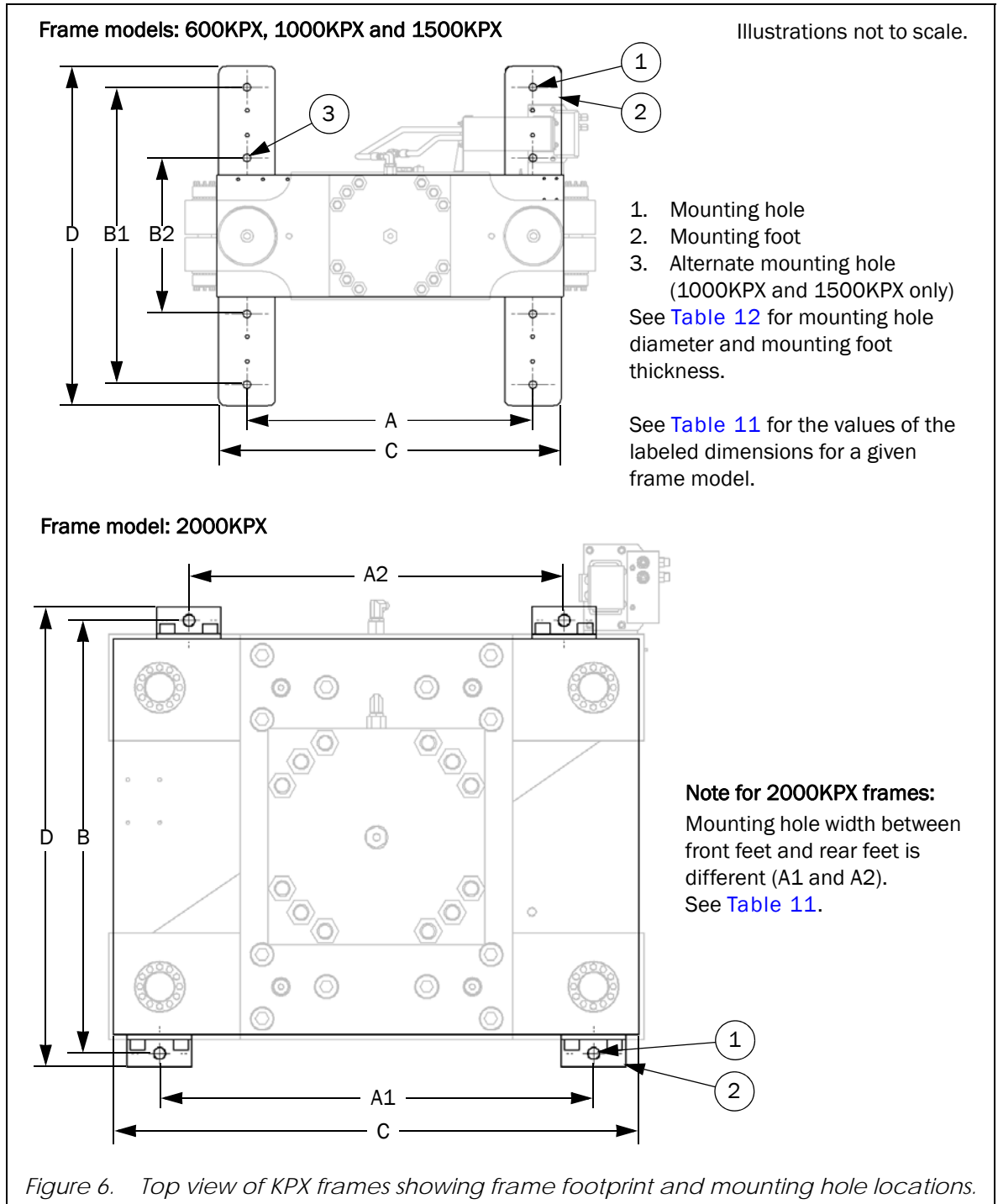
Isolation pads as discussed in bullet point “Foundation shock load” must be used between the frame and foundation. In addition, isolation washers and flat metal washers must be used between the nut and the frame. The isolation washers can be rubber or a similar material. If proper isolation pads and washers are not used, the frame can be adversely affected by the shock generated when a specimen breaks. Grout should be used to level the frame.

The nuts should be lock nuts, or double nuts to lock in place. When tightening the nut, tighten it until it contacts the upper metal washer to make sure that all components are seated properly, and then back the nut off slightly so that the isolation washer can sufficiently absorb shock. You should be able to just move the upper metal washer side to side.

- **Frame ground bearing pressure:** Refer to [Table 5](#) on page [38](#) for your frame’s ground bearing pressure. This table lists the minimum ground bearing pressure for a given frame configuration and does not take into account additional ground bearing pressure created by any accessories or fixtures mounted to the frame. Some accessories or fixtures could be heavy enough to affect the ground bearing pressure.

Table 11. Foundation dimensions. Refer to [Figure 6](#).

Frame Model	A	B	C	D
600KPX	864 mm (34 in)	686 mm (27 in)	1016 mm (40 in)	864 mm (34 in)
1000KPX	876 mm (34.5 in)	B1 - 1067 mm (42 in) B2 - 559 mm (22 in)	1080 mm (42.5 in)	1219 mm (48 in)
1500KPX	1029 mm (40.5 in)	B1 - 1067 mm (42 in) B2 - 559 mm (22 in)	1232 mm (48.5 in)	1219 mm (48 in)
2000KPX	A1 - 1029 mm (40.5 in) A2 - 889 mm (35 in)	1029 mm (40.5 in)	1245 mm (49 in)	1092 mm (43 in)



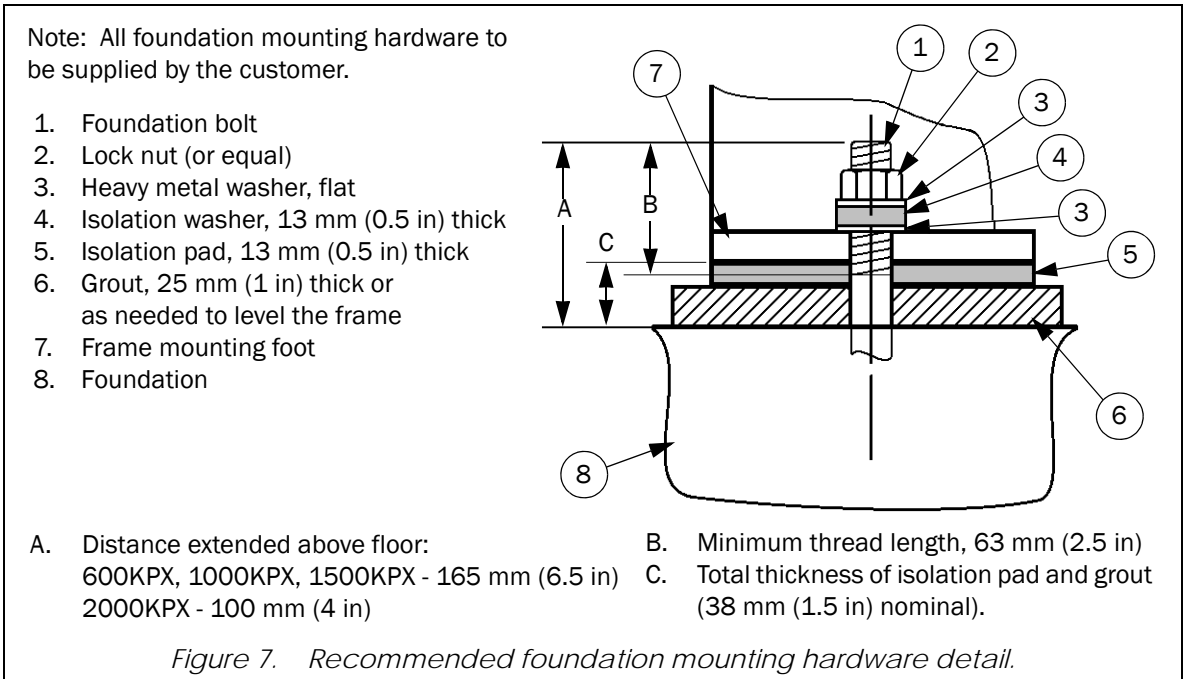


Table 12. Foundation bolt information.

Frame Model	Mounting Hole Diameter	Recommended Bolt Diameter	Mounting Foot Thickness
600KPX	25 mm (1 in)	M20 (0.75 in)	64 mm (2.5 in)
1000KPX, 1500KPX	29 mm (1.125 in)	M24 (1 in)	64 mm (2.5 in)
2000KPX	29 mm (1.125 in)	M24 (1 in)	13 mm (0.5 in)

Prepare electrical power supply

The customer must supply all electrical power to operate all components of the KPX testing system. Refer to the following sections for information on the power requirements of the various components.

Caution

It is always best to verify the power requirements for any piece of equipment before connecting it to a power supply.

Caution

Be sure all power supplies are properly grounded.

Hydraulic power supply

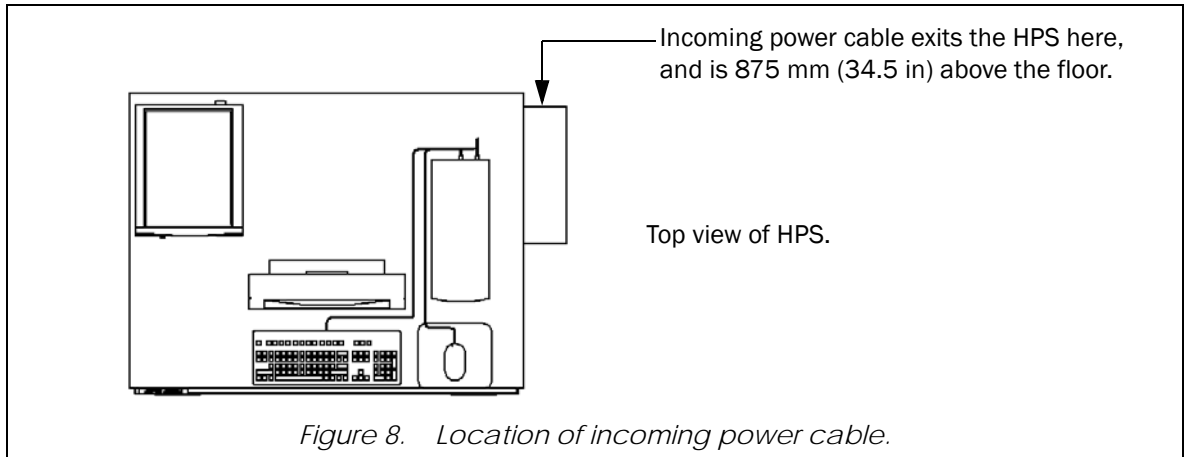
The three phase electrical requirements for the HPS vary from one system to another depending on individual customer requirements. Your specific electrical requirements can be found on your copy of the Instron quote. The standard power options and the associated power requirements are listed in [Table 13](#).

Table 13. Power options and power requirements.

Power Option	Power Requirements
600KPX-D17A	208/230 VAC, 3 Phase, 50/60 Hz, 30 Amp
600KPX-D17B	380/400/415 VAC, 3 Phase, 50/60 Hz, 20 Amp
600KPX-D17C	460 VAC, 3 Phase, 50/60 Hz, 15 Amp
1000KPX-D18A, 1500KPX-D18A	208/230 VAC, 3 Phase, 50/60 Hz, 30 Amp
1000KPX-D18B, 1500KPX-D18B	380/400/415 VAC, 3 Phase, 50/60 Hz, 20 Amp
1000KPX-D18C, 1500KPX-D18C	460 VAC, 3 Phase, 50/60 Hz, 15 Amp
2000KPX-D19A	208/230 VAC, 3 Phase, 50/60 Hz, 40 Amp
2000KPX-D19B	380/400/415 VAC, 3 Phase, 50/60 Hz, 30 Amp
2000KPX-D19C	460 VAC, 3 Phase, 50/60 Hz, 25 Amp

In addition to providing the incoming power, the following items must be supplied and considered:

- The customer's power supply should be fused, properly grounded, and equipped with a disconnect switch.
- The HPS is supplied with a power cable that is of the appropriate gauge size for the power required.
- The supplied power cable is 3 m (10 ft) long. Keep this in mind when determining the relative location of the customer's power connection to the system's installation location. The location of where the power cable connects to the HPS is shown in [Figure 8](#).
- The supplied power cable is provided without a plug. The power cable can be hardwired to an appropriately sized electrical circuit during installation, or the customer must provide an appropriate plug to be added to the power cable.
- Do not connect the HPS to its power supply at this time.



59 Series control unit

The 59 Series control unit requires a separate, single phase power source. Power requirements are 100-240 VAC, 1 Phase, 50/60 Hz. The control unit has an on/off switch on the rear of the unit. The necessary power cable is supplied.

If local codes require a residual current device (i.e. GCFI, GFI, RCCB, RCD, etc.), then it should be rated for less than 1 mA of current leakage.

Computer system

The computer system requires a separate, single phase power source. The power source requirements are typically:

- Computer tower (CPU):
 - Either a low supply voltage of 100-120 VAC or a high supply voltage of 220-240 VAC.



The incoming power supply setting on the tower must match the supply voltage or damage will occur.

- Supply frequency of 50/60 Hz (no adjustment required).
- Monitor:
 - Supply voltage of 100-240 VAC (no adjustment required).
 - Supply frequency of 50/60 Hz (no adjustment required).
- Printer: Printers must be purchased for a specific supply voltage and frequency and must be run on that voltage and frequency, no adjustment is possible. Check your printer for exact power requirements.

Provide telephone line and network connection

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. Do not connect the computer to the network until instructed to do so by Instron Service personnel.

Provide additional utilities

Depending on the system purchased and the customer's requirements, the customer may need to provide other utilities to the installation site; in addition to the main electrical power supply.

These additional utilities may include: an air supply for optional pneumatic grips/fixtures; cables for network connections; and/or direct phone line for modem connection (Internet access and phone support).

If any grips or fixtures being used with the system are pneumatically operated, the customer must supply an appropriate air supply to the installation site (unless the air supply is part of the customer order).

Prepare for shipment arrival

Before your shipment arrives, be sure that you review the requirements outlined in [Chapter 4, "Shipment Arrival"](#) so that you are prepared to handle the system and can successfully have everything in place before the arrival of the service engineer. Especially be sure to review the information provided in ["Move system components to installation area"](#) on page 90 and that you have appropriate lifting equipment or have made arrangements with a rigger. Be sure all personnel involved understand what is required to move a frame of this size.

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Chapter 4

Shipment Arrival

• Requirement checklist	39
• Review as-shipped condition	39
• Receive the system	42
• Uncrate the system	42
• Move system components to installation area	43
• Prepare the system	51
• Prepare for installation service visit	55

Requirement checklist

Once the testing system arrives at the customer's site, the customer must also complete the following before arrival of the Instron service engineer:

- [Review as-shipped condition; see page 39.](#)
- [Receive the system; see page 42.](#)
- [Uncrate the system; see page 42.](#)
- [Move system components to installation area; see page 43.](#)
- [Prepare the system; see page 51.](#)
- [Prepare for installation service visit; see page 55.](#)

Review as-shipped condition

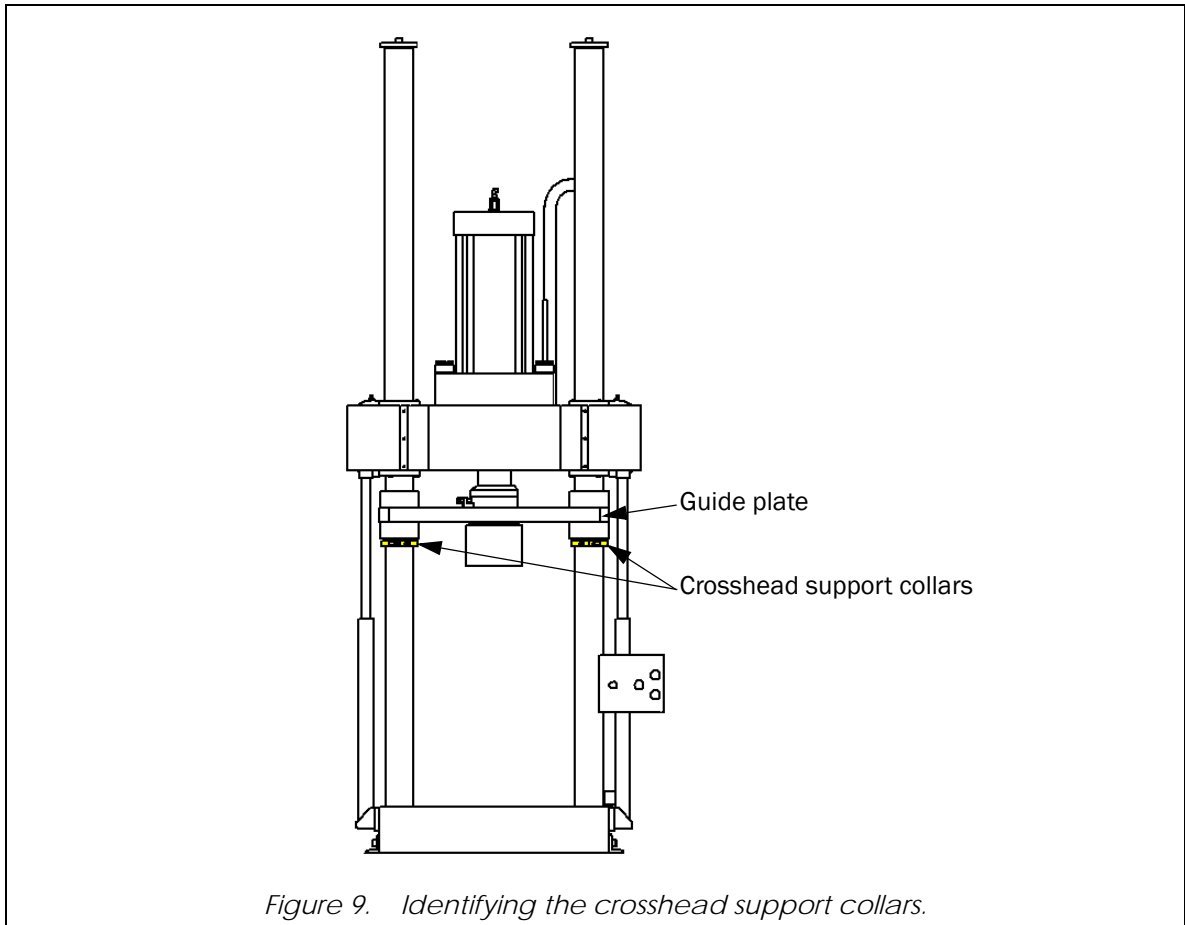
The testing systems are carefully crated at the factory to minimize the possibility of damage to the system during transportation.

Frame

Frames are crated in a horizontal position. Frames are prepared for shipment in the following manner:

- System interconnections are disconnected.
- For frames with a **J1-style or J3-style crosshead**, the crosshead is lowered and then manually secured to the columns to assure that the frame can withstand being lifted by the crosshead:
 - For frames with a **J1-style crosshead**, the manual locks are tightened as they would be for testing.
 - For frames with a **J3-style crosshead**, the clamp bolts are tightened. Do not loosen these clamp bolts until directed to do so by the procedures outlined in these instructions.
- The rod of the hydraulic cylinder is fully retracted and then the crosshead support collars (see [Figure 9](#)) are placed directly under the guide plate and tightened on the columns. This assures that the rod remains secure in the hydraulic cylinder during lifting and moving.
- For frames with a **J4-style crosshead AND high-capacity external grips**, the rod of the hydraulic cylinder is fully extended instead of retracted.

- For frames with a **J3-style crosshead**, the lifts and locks control unit, which is mounted to the right-hand lift cylinder, is either loosened and rotated on the cylinder or removed to protect it from damage during transportation. Also, the covers for the lock cylinders are removed.
- For **2000KPX** frames, some or all of the mounting feet are removed from the frame base.



- For frames that were purchased with optional high-capacity external grips, the grips are typically mounted in the frame for shipment (except for some 2000KPX frames). When the grips are mounted in the frame for shipment, the upper and lower grips are blocked together with brackets for stability and to prevent damage to grips or frame. Do not remove these grip brackets until directed to do so by the procedures outlined in these instructions. For some 2000KPX frames, one or both grips are removed from the frame and are crated separately.
- The position encoder cable may be unplugged from the position encoder on the frame.

Once the frame is prepared for shipment, it is placed on a heavy-duty wooden skid, secured to the skid with metal banding and blocked or supported to prevent the frame from shifting on the skid. Appropriate crating is then placed around it to protect the contents from damage.

Other system components

Other system components are prepared for shipment and crated or packaged as follows:

- **HPS:** A solid cap is installed on the fill hole of the reservoir to prevent against oil leakage. In some cases, the oil may be drained from the reservoir. The HPS is placed on its own wooden skid and is typically bolted and/or blocked to the skid. Other system components may be crated with the HPS.
- **59 Series control unit:** The control unit is packed in a box and crated with the HPS.
- **Pendant station:** The pendant station is crated with the HPS and is typically bolted to the skid.
- **Computer system:** When supplied by the factory, the computer system is packed into boxes and crated with other system components.
- **Optional testing accessories:** When testing accessories are purchased, they are packaged according to their size and weight. Smaller items are typically packed into boxes and crated with other system components. Larger items may be placed in their own crates if necessary. Refer to the following items for crating/packaging information for some of the larger accessories.
 - **Optional test space enclosure:** When purchased, this is crated separately.
 - **Optional furnace system:** When purchased, the furnace and its mounting bar and hinge are removed from the frame. The mounting bar is secured to the skid with the frame, and the furnace and hinge are packed into a box.
 - **Optional automatic extensometers (such as AutoX):** When purchased, an automatic extensometer and its mounting hardware are removed from the frame. The extensometer is crated in its own wooden box. The mounting hardware is typically crated with the frame.
 - **Optional tee-slot table:** When purchased, the tee-slot table is mounted to the frame before shipment from the factory.

Receive the system

The system should arrive at the customer's site in one or more crates as described in "[Review as-shipped condition](#)". Each crate is marked with a crate number relating to the total number of crates included for the shipment. A packing list is attached to one of the crates and is enclosed in an adhesive backed package labeled "Packing List Enclosed".

When the system is received visually check for damage to crating that may have occurred during shipment. If damage is visible, check the contents of the crate for damage to system parts. Notify both the common carrier and Instron immediately to report any damage. Take pictures of the system as received, if possible, to document damage.

The crate containing the frame will be the largest and the heaviest. Refer to [Table 8](#) on page 24 for typical frame crate dimensions and weights. These testing systems can be very large (depending on options purchased) and require special considerations for transportation and rigging.

Uncrate the system

Perform the following to uncrate the system. Be sure to avoid damaging the system while uncrating.

- Remove the crating and packing material from the frame and its components.
- Verify the content of your shipment against the packing list provided. **Retain all packing materials until the system is satisfactorily installed and all parts, assemblies and accessories have been located.**
- Notify Instron and the common carrier immediately if there are any discrepancies.

Move system components to installation area

Before you begin

Before moving any part of the system ensure that:

- The final operating site is properly set up. Review all information in [Chapter 3](#), in particular “[Prepare foundation](#)” on page [31](#) and “[Prepare electrical power supply](#)” on page [35](#).
- You have all the necessary lifting equipment as outlined under the “Equipment Required” section and that all equipment is appropriately rated to lift the frame and other system components.
- 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 frame, including clearance for lifting the frame via a forklift or crane.
- There are no loose accessories on any skid, crate or component that is being moved.
- The frame and forklift (or crane) can fit through all doorways, halls, elevators or stairs from the shipping dock to the final site location. Also that the floors from the shipping dock to the final site location have sufficient support for the weight of the frame and forklift (or crane) combined. If you move the frame while it is still crated, refer to the crated dimensions listed in [Table 8](#) on page [24](#). If you move the frame without its crating, refer to the frame dimensions in [Table 5](#) on page [22](#). See Note below.



If “semi-permanent” fixtures (i.e. hydraulic or pneumatic wedge grips, tee-slot tables, etc.) are mounted to the frame, it will be necessary to add the weight of the fixture(s) to the frame weight (see [Table 5](#) on page [22](#) or the frame’s serial number tag). Fixture weights can be found on their labels. Be sure to include the weight for each fixture or fixture component. Some fixtures are made of several components, and each component may have its own label that lists its specific weight. “Semi-permanent” fixtures can significantly increase the total weight of the frame.

- All factory installed shipping hardware is intact on the frame and that the frame has not been altered from its as-shipped configuration. This as-shipped configuration ensures that the crosshead is secure. The crosshead must be secure before lifting the frame. Personal injury or damage to frame could result if it is not secure. Do not remove any shipping hardware from the frame or alter the as-shipped configuration until directed to do so by the procedures outlined in these instructions. The factory installed shipping hardware should consist of:
 - Grip bracket (when optional high-capacity external grips are purchased and mounted in frame for shipment)

Frame

Following are instructions to remove the frame from its skid, stand the frame upright, move it to the installation area, and place it on its foundation. It is recommended that at least two qualified personnel be present when moving the frame.

Equipment required



All equipment must be supplied by the customer unless noted as “supplied”.

- Overhead crane
- Fork truck or second overhead crane
- Slings that are **appropriately rated for the weight of the frame:**
 - **For all frames except 2000KPX-J4 frames:** Two slings with a minimum length of 3.6 m (12 ft)
 - **For 2000KPX-J4 frames:** Four slings with a minimum length of 3.6 m (12 ft)
 - Two slings with a minimum length of 1.2 m (4 ft)
- Four hoist rings that must be able to support a side load; for sizes refer to [Table 14](#)
- A spreader bar for placement between the tops of the columns is required for some frames; for requirements refer to [Table 14](#)
- Four pieces of lumber with approximate dimensions of 100 x 150 x 700 mm (4 x 6 x 28 in) each
- **For 2000KPX-J4 frames:** Protective material (such as leather or heavy cardboard) to place between the lifting equipment and frame components

Table 14. Required size of hoist rings and spreader bar per frame model.

Frame Model	Size and quantity of hoist rings needed		Width of Spreader Bar
	for columns, column stop bar, or crosshead	for base	
600KPX	M24, qty 2	M30, qty 2	762 mm (30 in) ¹
1000KPX	M30, qty 2	M30, qty 2	762 mm (30 in) ¹
1500KPX	M30, qty 2	M30, qty 2	876 mm (34.5 in) ¹
2000KPX-J3A	M36, qty 2	M30, qty 2	Not required
2000KPX-J3D	M36, qty 2	M30, qty 2	Supplied
2000KPX-J4A	Not required	M30, qty 2	Not required

1. When these frames are purchased with the B height option AND optional high-capacity external grips, a spreader bar is **not** necessary.

Recommended procedure

Warning



Only experienced operators should run the crane or fork truck. If unfamiliar with proper placement or use of slings, contact an experienced rigger.

1. Be sure that all crating has been removed from around the frame. Cut and remove all metal banding that secures the frame to the wooden skid. If any accessories are packed with the frame, remove them. The frame will be laying face down as shown in **View A** of [Figure 10](#) on page 47, [Figure 11](#) on page 48 or [Figure 12](#) on page 49.
2. Be sure that the frame is not secured to the skid in any way.
3. Connect the position cable to the position encoder. The position encoder is located either on the top of the hydraulic cylinder or on the bottom of the crosshead.



The position cable may have been disconnected from the position encoder for shipment; however, the cable remains routed through the flexible track. Connect the cable to the position encoder. This will be easier to do before the frame is stood upright.

4. **For 600KPX, 1000KPX and 1500KPX frames:** Remove the column cap from the top of each column (see **View A** of [Figure 10](#)).
For 2000KPX frames: It is not necessary to remove anything.
5. **For 600KPX, 1000KPX and 1500KPX frames:** Place a hoist ring in the tapped hole in the top of each column. For size of hoist ring, refer to Table 14.
For 2000KPX-J3 frames: Place a hoist ring in the center hole of each column stop bar (see **View A2** of [Figure 11](#)). For size of hoist ring, refer to Table 14.
For 2000KPX-J4 frames: Place a 3.6 m (12 ft) sling around each side of the rear crosshead, between the actuator and the columns (see **View A** of [Figure 12](#)). Use a “choker” configuration for each sling, see the **Inset** of [Figure 12](#). Be careful not to damage the hydraulic hoses that attach to the hydraulic cylinder. Be sure to use protective material between the slings and crosshead. Attach both slings to the crane.
6. For frames that require a spreader bar (see Table 14), place the spreader bar between the columns; it should be placed as close to the tops of the columns as possible. For 2000KPX-J3D frames, the provided bar should be bolted between the two column stop bars as shown in **View A2** of [Figure 11](#).
7. Place a 3.6 m (12 ft) sling through each hoist ring. Attach both ends of each sling to the overhead crane.
8. Place a hoist ring in each of the two M30 holes in the rear of the base (see **View A1** of [Figure 11](#) or **View A** of [Figure 12](#)).
9. Place a 1.2 m (4 ft) sling through each hoist ring.
10. Attach the ends of each sling to their respective forks of the fork truck. Place them close to the base of the forks. The forks must be tilted up. It may be desired to take additional measures to prevent the slings from sliding off the forks. Be sure the slings are of equal length on each side so that the fork truck will pick up the frame evenly. The slings will support the majority of the frame weight; be sure the slings are **SECURE** on the forks. The frame should now appear as shown in **View B**.

Warning



Be sure the forks are tilted up. If the forks are tilted down (beyond level), this may allow the load to shift and the slings to slide off the forks. This will result in dropping the frame and may cause injury to personnel or damage to frame.

11. Using both the crane and the fork truck, slowly lift the entire frame off the wooden skid approximately 150 mm (6 in) while maintaining the horizontal orientation of the frame. Be sure to lift the frame as close to completely horizontal as possible; this allows the mounting feet to clear the timbers of the skid easily (when they are between timbers).
12. Remove the wooden skid from under the frame.
13. Place two of the pieces of lumber on the floor under the base, one near each front corner.
14. Carefully lower the frame base with the fork truck and let it rest securely on the lumber. The top of the frame is still supported by the crane. Remove all lifting equipment from the frame base.
15. Place the remaining two pieces of lumber on the floor and position them so that they will be under the rear of the base, one near each corner, when the frame is upright. The frame should now appear as shown in **View C**.
16. Using the crane, **SLOWLY** lift the frame upright. It will be necessary to move the position of the crane as the frame comes upright. Move the crane slowly so as to remain **in control** of the frame. **Be sure to maintain tension in the sling**. Carefully let the frame rest on the four pieces of lumber. See **View C**.

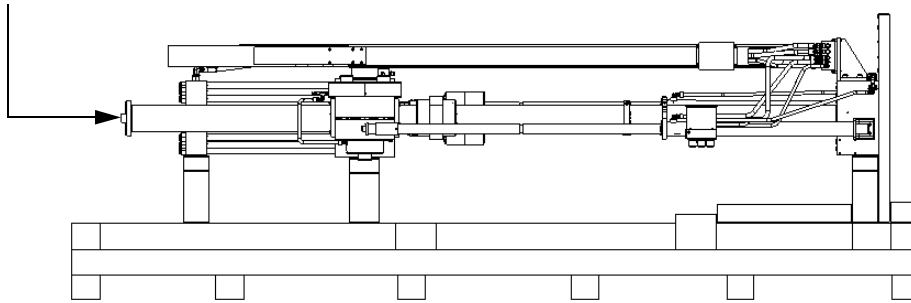
Warning



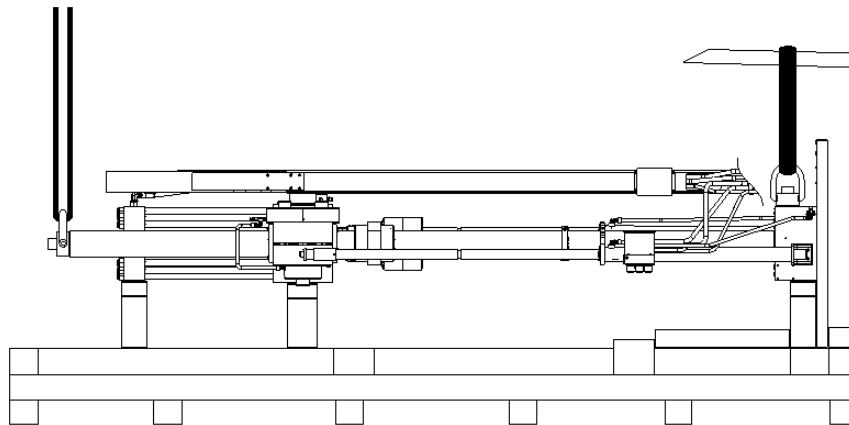
Exercise extreme caution! Raise the frame slowly and carefully. If the frame is brought upright too quickly, it may rock too far forward. This could produce a potentially dangerous situation!

17. **For 2000KPX-J4 frames:** Place the two remaining 3.6 m (12 ft) slings around each side of the front crosshead, similar to the placement of the slings around the rear crosshead (see **View D** of [Figure 12](#) on page 49). Use a “choker” configuration for each sling and be sure to use protective material between the slings and crosshead. If necessary, reposition the two slings that are on the rear crosshead (for lifting the frame straight up). Attach all four slings to the crane.
18. Carefully lift the frame.
19. Carefully move the frame to the foundation location.
20. Place the frame over the foundation bolts. Secure the frame to the foundation bolts.
21. Remove all lifting equipment from the frame, including the spreader bar (when used). For frames where the column caps were removed, replace the column caps.

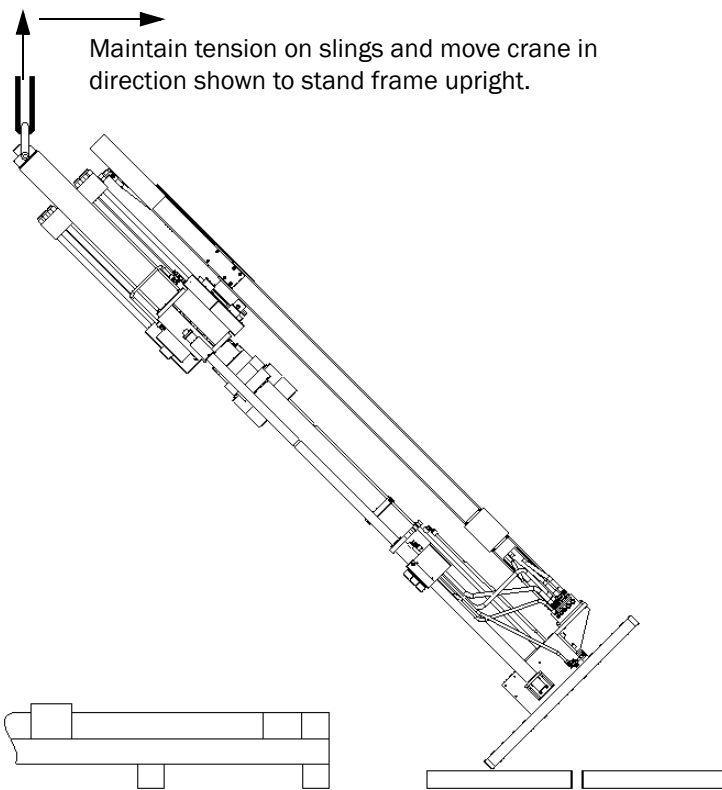
Remove the column cap from the top of each column. Place a hoist ring in the top of each column.



View A



View B



Maintain tension on slings and move crane in direction shown to stand frame upright.

View C

Figure 10. Standing a KPX frame upright (all models except 2000KPX).

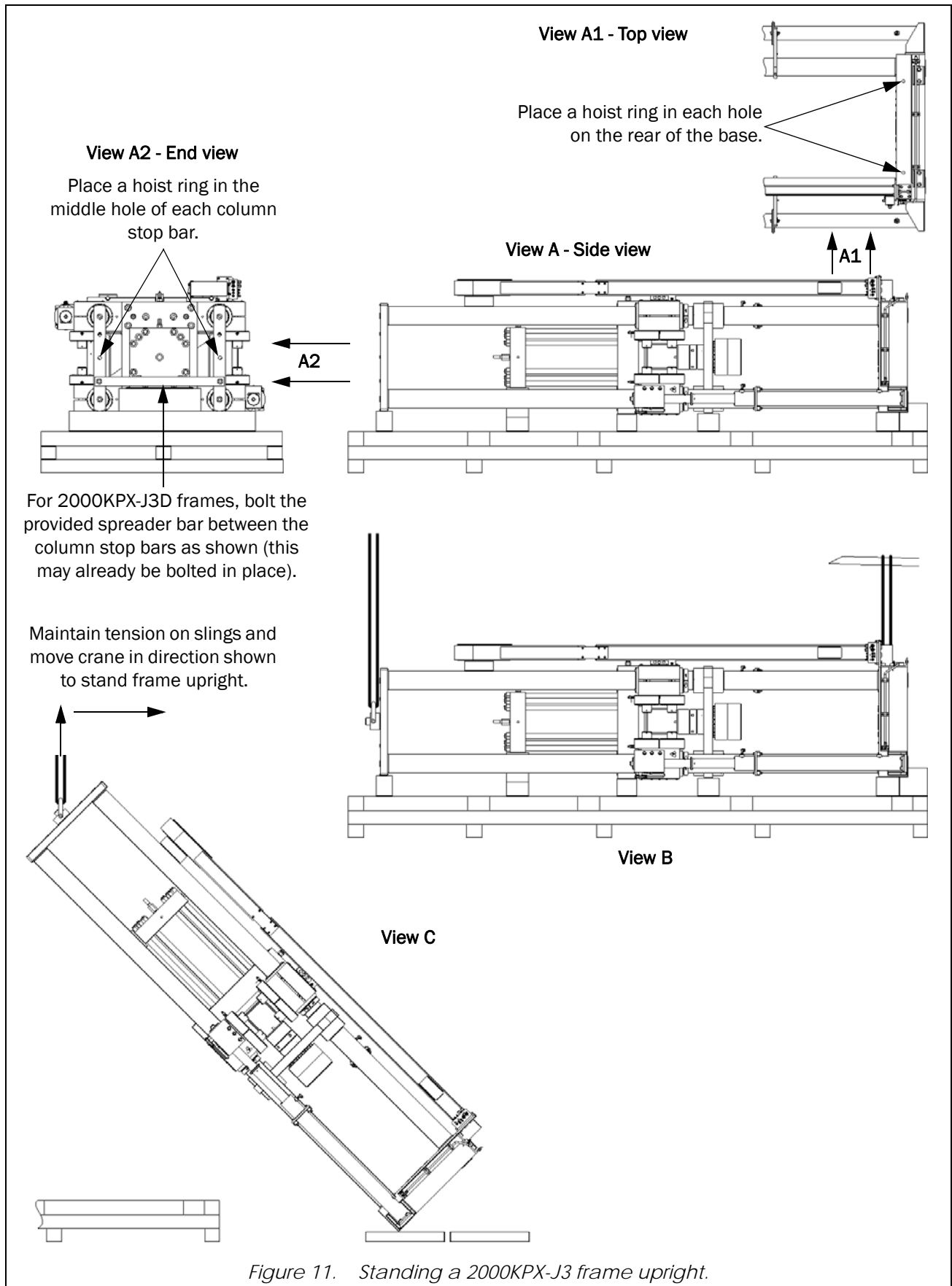
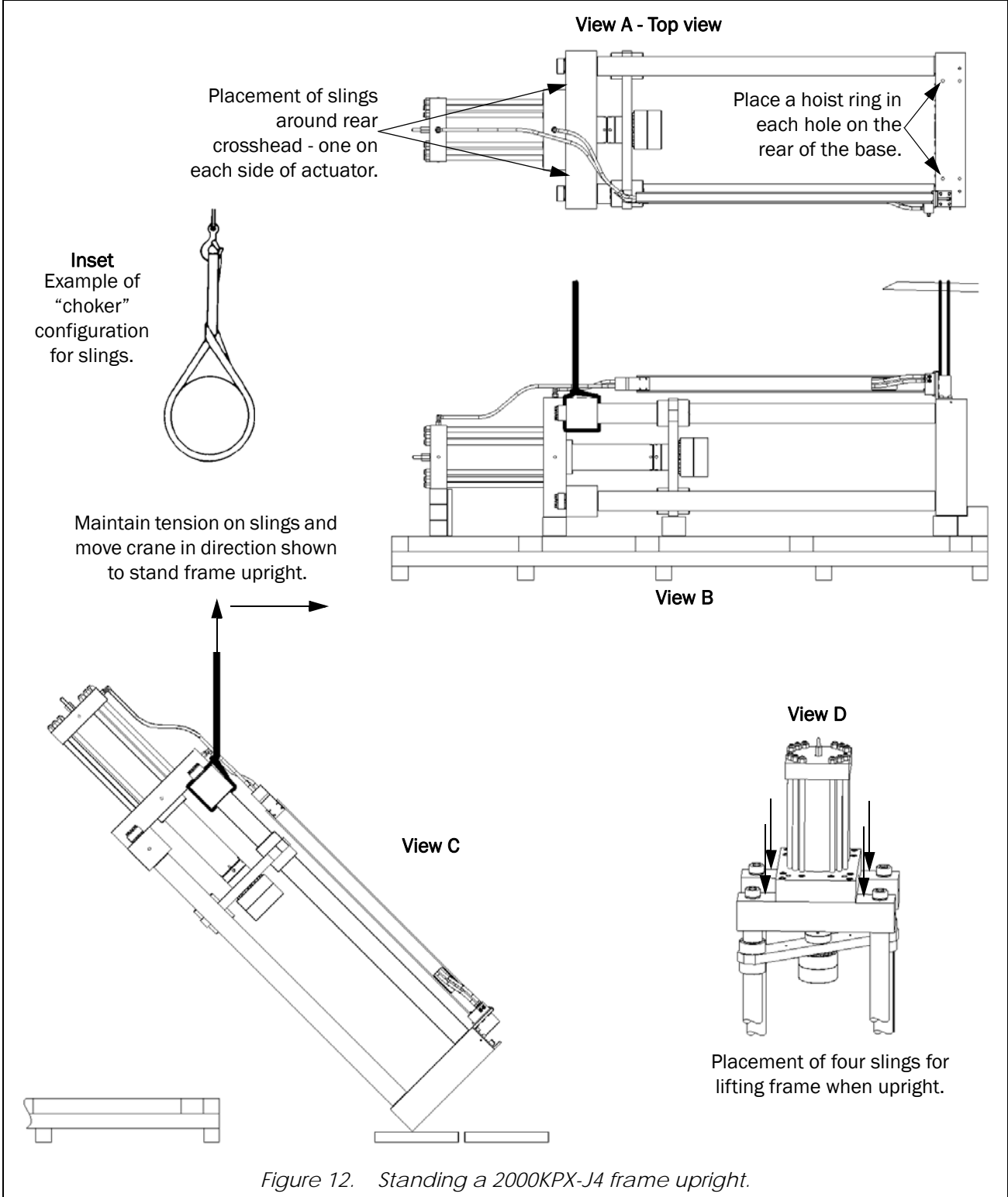


Figure 11. Standing a 2000KPX-J3 frame upright.



Hydraulic power supply

The HPS can be removed from the shipping crate with a fork truck or pallet jack.

1. Remove any blocking from in front of the HPS. Be sure there are no bolts securing the HPS to the skid.
2. Place the forks under the base of the HPS. Make certain that the forks extend as far as possible to the rear of the HPS before lifting.
3. Lift the HPS from the skid and carefully move it to the desired location. The typical location is to the right of the frame as shown in [Figure 4](#) on page [29](#). Be sure to leave at least the recommended space between frame and HPS.
4. Place the HPS on the floor and remove the forks from under the HPS.

Prepare the system

Once the frame is in place on its foundation, the following preparations are necessary.

Remove shipping hardware from the frame

Remove any shipping hardware from the frame, including grip brackets (if the frame was shipped with optional high-capacity external grips).

Fill/check reservoir

Caution

Do not operate the HPS without oil in the reservoir. Damage to pump will occur.

Caution

Make sure the oil level in the reservoir is at the proper level before starting the HPS.

For systems shipped with no oil in the reservoir, it must be filled with hydraulic oil before starting the pump. Damage to pump will occur if reservoir is not filled! Refer to procedures provided in Chapter 4 of the System Operating Instructions (supplied separately) and fill the reservoir. When possible, the appropriate amount and type of oil is placed in a separate container and shipped with the system. If it was not possible to ship oil with the system (due to freight restrictions), it will be necessary for the customer to supply the appropriate amount and type of oil for the system; refer to procedures provided in Chapter 4 of the System Operating Instructions (supplied separately).

For systems shipped with oil in the reservoir, check the level of the oil in the reservoir. The oil should be to the top of the sight gauge (with the hydraulic cylinder completely retracted).

Install air breather assembly

Caution

Do not run the test system with the solid cap in place on the HPS reservoir. Pump cavitation could result.

For shipment purposes, a solid cap is installed on the fill hole of the reservoir. Once the system is installed, this solid cap must be removed and replaced with the supplied air breather assembly. If the solid cap is left on the reservoir and the HPS started, pump cavitation could occur.

Install crosshead lifts and locks control unit (J3-style crosshead only)

For frames equipped with hydraulic crosshead lift and lock cylinders (J3-style crosshead), a lifts and locks control unit is mounted to the right-hand lift cylinder. For shipment, the control unit has either been rotated on the lift cylinder or removed from the lift cylinder. The control unit must be returned to its operating position. Procedures vary depending on frame model; refer to the appropriate procedure for your model.

All frames except 2000KPX frames

Equipment required

- A 6 mm hex key (supplied)

Recommended procedure

1. Loosen two of the four M8 socket head cap screws that secure the clamp holding the control unit to the lift cylinder (use 6 mm hex key). See [Figure 13](#).
2. Rotate the control unit so that it faces to the front of the frame.
3. Once the control unit is in the desired position, tighten the two M8 socket head cap screws until fully seated plus one-quarter turn.

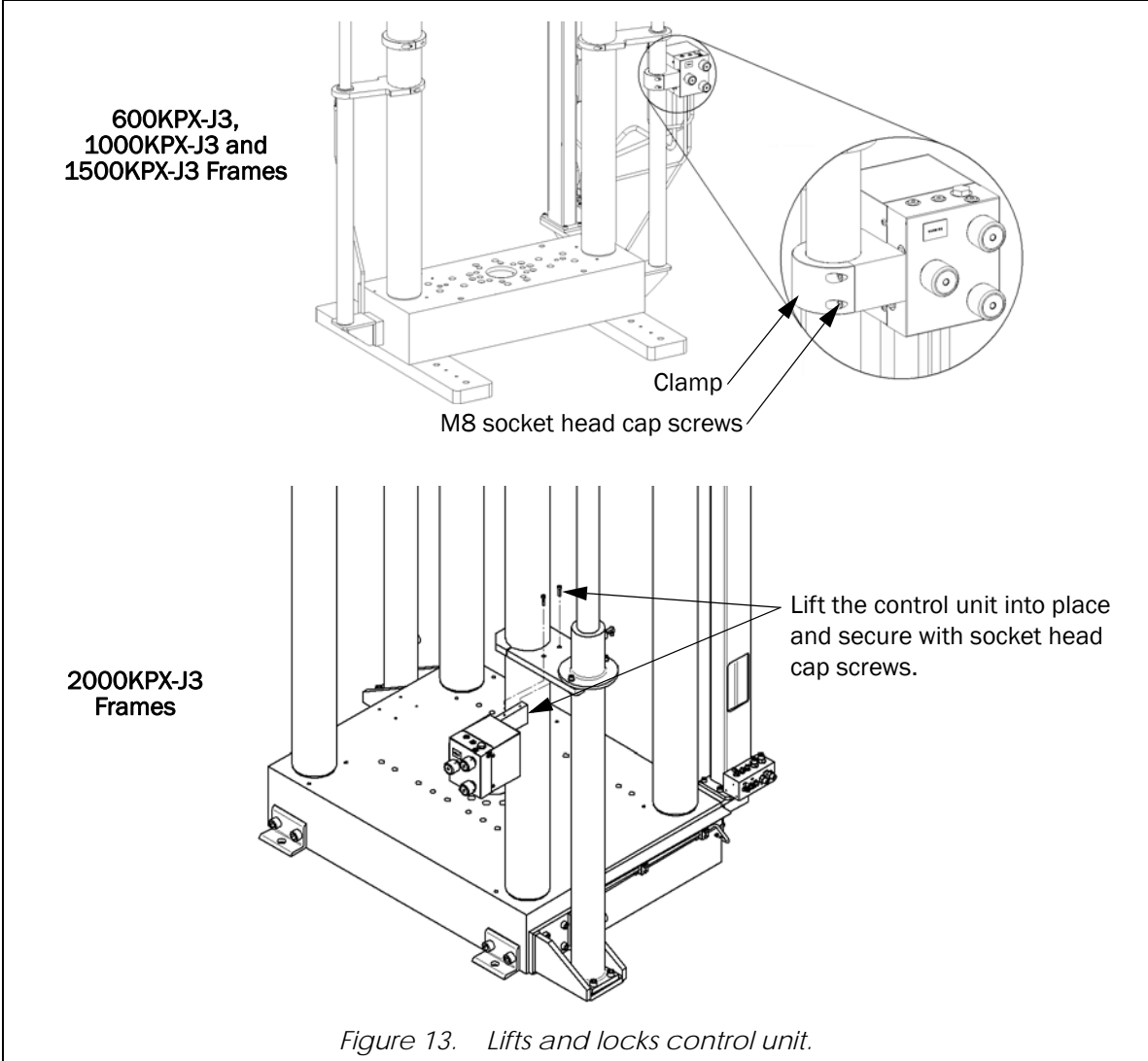
2000KPX-J3 frames

Equipment required

- A 6 mm hex key (supplied)

Recommended procedure

1. If the control unit is mounted backwards on the lift cylinder bracket, remove it from the bracket. Be sure the control unit is supported and then loosen and remove the two M8 x 30 mm socket head cap screws (use 6 mm hex key). See [Figure 13](#).
2. Orient the control unit so that it faces forward.
3. Lift the control unit into place.
4. Align the holes in the control unit bracket to the holes in the lift cylinder bracket.
5. Secure the control unit in place with the two M8 x 30 mm socket head cap screws. Tighten the cap screws until fully seated plus one-quarter turn.



Locate and provide equipment for Service Engineer (J3-style crosshead only)

For frames equipped with hydraulic crosshead lift and lock cylinders (J3-style crosshead), you must locate and provide the following equipment. This equipment will be used by the Service Engineer during installation of your system.

- A suitable **stable** platform such as a man-lift, stairs, or ladder. The platform must be of sufficient height so that the Service Engineer can reach the clamp bolts on the crosshead. The clamp bolts are typically no more than 3.1 m (10 ft) from the floor.
- A square-drive wrench. The size of the square-drive is dependent on your frame model, refer to [Table 15](#). The socket that will be used with this wrench is supplied by Instron. The wrench must have a handle length (or extension) that provides enough leverage to loosen a bolt that has been tightened up to 810 N-m (600 lbf-ft) - a handle length (or extension) of 1 m (40 in) or longer is recommended.

Table 15. Size of square-drive wrench required.

Frame Model	Size of square-drive Wrench Required
600KPX	3/4 in
1000KPX, 1500KPX, 2000KPX	1 in

Computer system - network connection

If the computer system will be connected to a corporate network, Instron highly recommends that it not be connected until after installation is complete. Most Instron software requires an Administrator level password in order to install the software correctly. Connecting the computer to the network before the arrival of the Instron service engineer usually delays the installation until the required password is obtained and may cause conflicts with the control system until it is fully operational. After installation, the computer can be connected to the network without interfering with the control system.

Prepare for installation service visit

System installation is included with the purchase of the system. Instron service will schedule an installation appointment to take place after delivery of the testing system to the customer's site. An Instron field service engineer will arrive at the customer site for connecting system components, system checkout, verification of system calibration, and customer training.

Before the service engineer arrives for installation, the customer must prepare the installation site as described under the "[Requirement checklist](#)" on page 27 and page 39. In particular, be sure that the following items have been completed:

- All system components are at or near their final location.
- Adequate power source(s) are available for the HPS, 59 Series control unit, computer system and other peripherals.
- Network and phone connections are available. Do not connect the computer system to the network.
- All preparations discussed under "[Prepare the system](#)" on page 51 have been completed.
- Adequate work area is available to allow interconnection and final installation.

If there are any questions or if more information is needed, contact Instron's Services department as directed on page 15.

The following list is an overview of what the field service engineer will complete at the time of installation:

- Review the customer's order against the goods that were actually received.
- Electrical hook-up of test system.
- Unpack and set up the computer system and interconnect system components.
- Bring test system to operational/functional state.
- Install grips/fixtures for training.
- Provide basic software training for a basic system. This may be extended depending on software options purchased.

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Product Support: www.instron.com