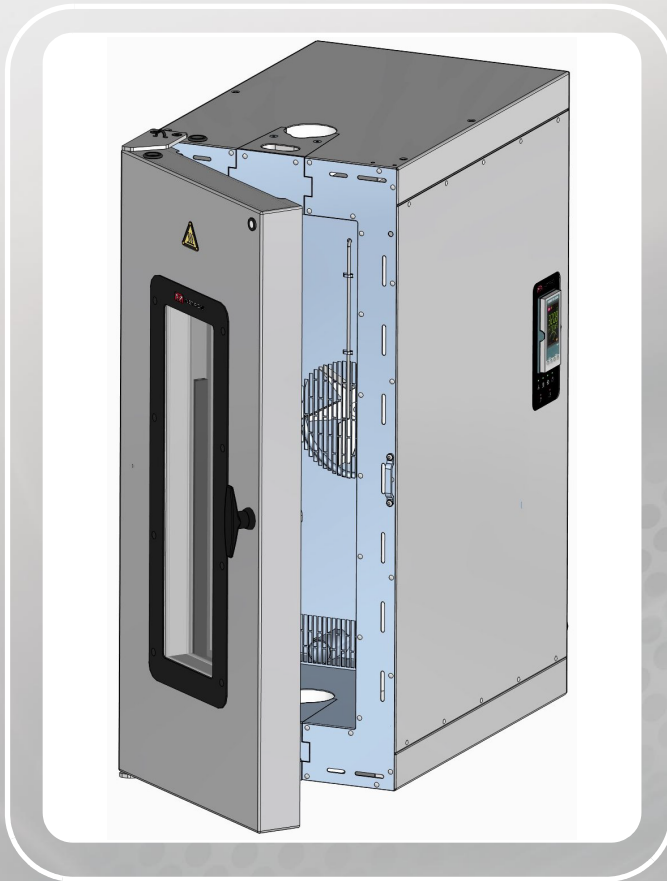


3119-600 Series Temperature Controlled Chambers



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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Table of Contents

Chapter 1	Introduction	5
	Purpose of Manual	5
	Overview of Installation	5
	Responsibilities	5
	System Footprint	5
	Additional Chamber Documentation	6
Chapter 2	Safety	7
	General Safety Precautions	7
	Warning Signs Used	8
	Thermal Contact	9
	Specimens	10
	Electrical	10
	Cryogenic Gases: Asphyxiation and Toxicity	11
	Glass Fibre Insulation	12
	High Pressure Gases	12
	Rotating Parts	13
	Physical Testing Machine	13
	Material Safety Data Sheets	14
Chapter 3	Preparing for Installation	17
	How to Use this Chapter	17
	Site Services	17
	Handling	18
	Installation	18
Chapter 4	Unpacking and Transporting	19
	Important Handling Information	19
	Unpacking	20
	Transporting the Chamber	21
	Guidelines for Final Positioning of the Chamber Test System	23
	Chamber Mounting Kit Compatibility	27

Load Frame Test Space	27
Commissioning	27
Information for Customer Installation Only	28
Chapter 5 Specifications	29
Physical Data	30
Operating Performance	35
Electrical Supply	38
Port Plugs	39
Cryogenic Storage and Supply (Option)	39

Chapter 1

Introduction

• Purpose of Manual	5
• Overview of Installation.....	5
• Additional Chamber Documentation	6

Purpose of Manual

The purpose of this manual is to provide you with information that will assist you in creating the conditions for a trouble free installation of your Instron® 3119-600 series chamber. The chamber models covered and their options are discussed in the different sections of this manual.

Please study the manual and refer any queries to your local Instron representative.

Overview of Installation

Responsibilities

This manual is intended to be used where the installation and commissioning of the chamber is carried out by an Instron engineer. [Chapter 3](#) defines your responsibilities and the responsibilities of Instron for this type of installation. Instron recommends that you do not undertake your own installation, however, if you do, [Chapter 3](#) provides the basis for a checklist of activities needed to complete your installation process.

System Footprint

Depending on your test system you may have a roller mount for your chamber and/or a Dewar flask. [Chapter 4](#) provides outline drawings for you to allow sufficient floor space to accommodate your system.

Additional Chamber Documentation



For further important Health and Safety information specifically regarding handling, installation, operation, maintenance and decommissioning of Instron furnaces and environmental chambers, refer to the Supplement M55-17038-MU “Using Instron Furnaces and Environmental Chambers”.

If you do not have a copy of this supplement, contact your local Instron representative.

Operating instructions for the chamber are supplied with the chamber and contain safety information, a description of the controls, detailed procedures for operation, preventative maintenance requirements and tips on how to get the best from your chamber.

Refer to other documentation supplied with your testing system for load frame, pullrod, grips and software operating instructions.

Chapter 2

Safety

This chapter gives information on product safety labelling and operational hazards. It contains the following sections:

- General Safety Precautions 7
- Warning Signs Used 8
- Thermal Contact 9
- Specimens 10
- Electrical 10
- Cryogenic Gases: Asphyxiation and Toxicity 11
- Glass Fibre Insulation 12
- High Pressure Gases 12
- Rotating Parts 13
- Physical Testing Machine 13
- Material Safety Data Sheets 14

General Safety Precautions

Warning



Hazard - Chambers have inherent critical risks. You are strongly advised to carry out your own safety risk assessment taking into account all the information provided in this chapter.

Chambers involve inherent hazards from high temperature and sub-zero temperature surfaces and components. It is important to be aware of all parts which are potentially hazardous, particularly the insides of chambers and items which are removed from them.

Wherever it is considered that safety is compromised, press the fan button OFF on the touch panel controller or press the mains circuit breaker OFF (O) on the rear panel.



Carefully read the operating instructions 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 the equipment or to loss of data.

Ensure that the system set-up and the test being performed constitute no hazard to operators or others (refer to the operating instructions for guidelines).

The following pages detail various general warnings that must be heeded at all times. There are more specific Warnings and Cautions in the text whenever a potential hazard exists.







The best safety precautions are a thorough understanding of the equipment by reading the instruction manuals and always using good judgement.

It is our strong recommendation that you carry out your own product safety risk assessment and use this to determine suitable personal protective equipment.

Warning Signs Used

When a symbol is enclosed in a triangle, it becomes a warning sign. A symbol on its own may be a warning, e.g. the “dangerous voltage” symbol, or may indicate the use of a control e.g. “Transfer of heat, general” symbol means that the control switches heating on and off. Chamber controls are shown in the operating instructions.

Sign	Meaning	Standard
	Warning - dangerous voltage	Symbol derived from BS6217:1981 (417-IEC-5036-a) “Dangerous voltage”
	Warning - hot surface	Symbol derived from ISO7000-0535 “Transfer of heat, general” Warning sign derived from BS 6217:1981 (417-IEC-5041)
	Warning - cold surface	Symbol derived from ISO 7000:1989 022 - graphical symbol for use on equipment cooling
	Warning - keep fingers away from rotating machinery	Symbol designed to ISO 3864 - international design standard for safety symbols.

Thermal Contact

Warning



Hazard - The operator MUST consult their supplier's Material Safety Data Sheet on the particular cryogenic gas being used before using this equipment at sub-ambient temperatures. Instron advise that you receive training in the handling of cryogenic gases from your supplier.

Warning



High/Low Temperature Hazard - Wear adequate personal protective equipment when using equipment at extremes of temperature. This hazard applies to the physical parts of the chamber, items in or removed from the chamber and the hot air/cold cryogenic gases from inside the chamber.



Temperatures above 60°C and below 0°C can cause burns and serious injury. The chamber has been designed to eliminate possible hazards, but it is inevitable that the points where specimens or processed items leave the chamber can be at temperatures outside these limits.

Take particular care with items that are removed from chambers whilst still hot or cold. Provide receptacles for such items as they can maintain their temperature for long periods. When removing items from the chamber use the door as a shield from hot air or cold cryogenic gases. Cold vapours can cause burns similar to heat burns and provoke respiratory problems. Depending on the chamber mounting and any attached accessories, the door may open or close under its own weight (when unlatched).

Specimens

Warning



Hazard - Certain materials may become flammable, explosive or toxic when exposed to extreme temperatures.

The 600 series environmental chambers are not intended for use with unstable materials that may be flammable, explosive or toxic under extreme conditions. 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.

Electrical

Warnings



Electrical Hazard – Ensure that the electrical socket used by the chamber power cable is connected to a suitably grounded point. Disconnect the unit from the power supply before removing any panel/cover or changing any fuse.

Repairs should only be carried out by an Instron Service Engineer, contact your local Instron representative if you suspect an electrical fault. 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 the covers as soon as possible.

Cryogenic Gases: Asphyxiation and Toxicity

Warning



Asphyxiation Hazard - Cryogenic gases can reduce the amount of oxygen in the working environment to dangerous levels.

Refer to your supplier's Material Safety Data Sheet for limits and monitoring information.

Routing the exhaust hose to a well ventilated area will reduce, but not eliminate, leakage of cryogenic gas around the chamber. Ensure that the area around the system is suitably ventilated to avoid asphyxiation/toxicity hazards.



Extraction systems may need to meet legislative requirements. Refer to pertinent government publications for details. For limits and monitoring information, refer to the Material Safety Data Sheets for LN2 or CO2 (available from your supplier).

Warning



Toxicity Hazard - Carbon dioxide is toxic.

In certain concentrations carbon dioxide can be dangerous. Refer to your supplier's Material Safety Data Sheet for limits and monitoring information.

When cryogenic gases are used with the chamber reduce all spaces around the pullrods as much as possible, or seal them. Routing the exhaust hose to a well ventilated area will reduce, but not eliminate, leakage of cryogenic gas around the chamber. Ensure that the area around the system is suitably ventilated to avoid asphyxiation / toxicity hazards.



Extraction systems may need to meet legislative requirements. Refer to pertinent government publications for details.

Glass Fibre Insulation

Warning



Hazard - Do not disassemble the chamber. Glass fibre insulation can cause skin, eye or upper respiratory tract irritation in some individuals. Refer to the “Material Safety Data Sheets” on page 14.

Repairs should only be carried out by an Instron Service Engineer. The glass fibre insulation used in the chamber is retained within its panels and does not represent a hazard in normal use. Contact your local Instron representative if any glass fibre insulation is exposed.

High Pressure Gases

Warning



High Pressure Gas Hazard - Shutting off a gas cylinder may leave high pressure gas in pipe work. Always de-pressurise pipe work before disconnection.

Instron advise that you receive training in the handling of high pressure gases from your gas supplier. Never disconnect high pressure pipe work until you are sure that it is safe to do so.

Rotating Parts

Warning



Rotating Machinery Hazard - Disconnect power supply before removing the covers.

Repairs should only be carried out by an Instron Service Engineer; contact your local Instron representative if you suspect a fault with the chamber. There are exposed rotating parts of the fan in the rear electrical compartment of the chamber. In normal operation access to the rear compartment is not required. Do not access the rear electrical compartment without first disconnecting the chamber from the power supply. Do not reconnect any power supply while the covers are removed.

Physical Testing Machine

Warning



Moving Parts Hazard - The moving parts of physical testing machines on which chambers are fitted can give rise to severe moving part hazards.

When using environmental chambers on testing machines the operator must be aware of all of the moving part hazards and use the environmental chamber taking all necessary precautions. Consult the safety section of the physical-testing machine operating instructions.

Material Safety Data Sheets

This section contains information to allow you to obtain current Material Safety Data Sheets (MSDS) directly from the manufacturers. Instron is not responsible for the content or accuracy of these MSDSs.

Material	Location	Manufacturer MSDS information
Promat panel	<p>Promat panel is used in the chamber's removable wedges on the 3119-607, 3119-608 3119-610, 3119-616, 3119-617 and 3119-618 models only.</p> <p>Promat Inc. block is contained between the 3119-608 chamber's outer panels and inner case.</p>	<p>United Kingdom Promat UK Limited B1 The Innovation Centre Heywood Distribution Park Heywood, Lancashire, OL10 2TS Phone : +44 (0)800 588 4444 e-mail: industryuk@promat.co.uk</p> <p>For the most up to date MSDS for the product visit the web page [https://www.promat.com/en-gb/industry/].</p>
Sindanyo H91	Sindanyo H91 is used in the chamber's removable wedges on the 3119-605, 3119-606, 3119-609 and 3119-615 models only.	<p>Tenmat Limited Ashburton Road West Trafford Park, Manchester M17 1RU United Kingdom Phone: +44 (0)161 872 2181 Fax: +44 (0)161 872 7596 e-mail: info@tenmat.com</p> <p>For the most up to date MSDS Information for the product visit the web page [www.tenmat.com].</p>

Material	Location	Manufacturer MSDS information
SUPERWOOL 607 Blanket	SUPERWOOL 607 Blanket is contained between all chamber outer panels and inner case.	THERMAL CERAMICS LIMITED Tebay Road, Bromborough Wirral, Merseyside CH62 3PH United Kingdom Phone: +44 (0) 151 334 4030 Fax: +44 (0) 151 334 1684
SUPERWOOL Paper 332-E	SUPERWOOL Paper 332-E is contained within all the chambers doors.	THERMAL CERAMICS HSE DEPARTMENT Route de Lauterbourg - BP 148 67163 WISSEMBOURG Cedex France Phone: +33 (0)3 88 54 95 50 Fax: +33 (0)3 88 54 29 20 Blanket MSDS No: 105 Paper MSDS No: 357 To confirm this is the most up to date MSDS for the product, visit the web page [www.morganthermalceramics.com]
CO ₂ /LN ₂	Where option is fitted to your chamber.	Contact your local supplier for information on material safety.

Chapter 3

Preparing for Installation

• How to Use this Chapter	17
• Site Services	17
• Handling	18
• Installation	18

How to Use this Chapter

Use this chapter where the installation and commissioning of the chamber is carried out by an Instron engineer. This chapter defines your responsibilities and the responsibilities of Instron for this type of installation. Instron recommends that you do not undertake your own installation.

Site Services

Task	Responsibility
Provision of a suitable mounting system for the chamber.	As defined in contract
Provision of a single phase mains electrical connection, installed in accordance with local, national and international wiring standards by a qualified electrician (see page 38).	Customer
Cryogen Storage System and supply hoses - (System Option) see page 39 (unless otherwise defined in contract).	Customer
Provision of suitable environmental conditions i.e. temperature/ ventilation to maintain the system in a proper working order.	Customer

Handling



See [Chapter 4](#) for handling methods and system footprint. See page [34](#) for equipment weights.

Task	Responsibility
Off-loading from delivery truck to site.	Customer
Unpacking.	Customer
Moving to final operating location.	Customer
Safety when handling and moving the system components.	Customer

Installation

Task	Responsibility
Mounting standalone chamber.	Customer
Mounting chamber to a new Instron test system, where Instron provide the brackets.	Instron
Making all electrical connections from mains to chamber.	Instron
Making cryogenic supply connections to chamber, where Instron provide Dewar flask/gas bottles/hose *.	Instron
Installation checks.	Instron
Calibration as defined in contract.	Instron
Selecting personnel for training and making them available in a timely manner.	Customer
Providing personal protective equipment for operators.	Customer
Customer training as defined in contract.	Instron
Further customer training.	Contact Instron

* System Option

Chapter 4

Unpacking and Transporting

- Important Handling Information 19
- Unpacking 20
- Transporting the Chamber 21
- Guidelines for Final Positioning of the Chamber Test System 23
- Commissioning 27
- Information for Customer Installation Only 28

Important Handling Information

Warnings



Crush Hazard - Ensure that cranes, hoists or fork-lift trucks used to move the equipment have adequate load capacity (1.5 x gross weight).

See “[Physical Data](#)” on page 30.



Crush Hazard - Ensure that slings are serviceable and are of the correct length and proof loading.



Crush Hazard - Employ suitably trained persons to operate lifting equipment.



Crush Hazard - Use good practice when lifting by crane, hoist or fork-lift truck.

Keep loads as low to the ground as possible. Any crane, hoist or fork-lift truck used to transport the equipment must have an adequate load capacity.

Unpacking

You are advised to transport the packed chamber as close to the final operating position as possible before unpacking.

The chamber is packed in a heavy duty corrugated cardboard carton. Depending on your location and the method of transport, the carton may be inside a plywood packing case with other parts of your delivery. Unpack the chamber carefully. Do not use sharp instruments to open the corrugated carton.

To protect the underside of the chamber, it is supplied mounted on four screws. Leave these screws in place. The Instron engineer will remove the screws at the point when the chamber is mounted on its load frame brackets or roller frame wheels.

The chamber is also supplied with a protective foam cover (fitted to the side of the chamber) to protect the controller during installation. Leave this foam in place until installation is complete.

Transporting the Chamber

Transport the chamber using a crane, hoist or forklift truck according to good working practice. If lifting the chamber from above, [Figure 1](#) (and [Table 1](#)) illustrates the lifting points.

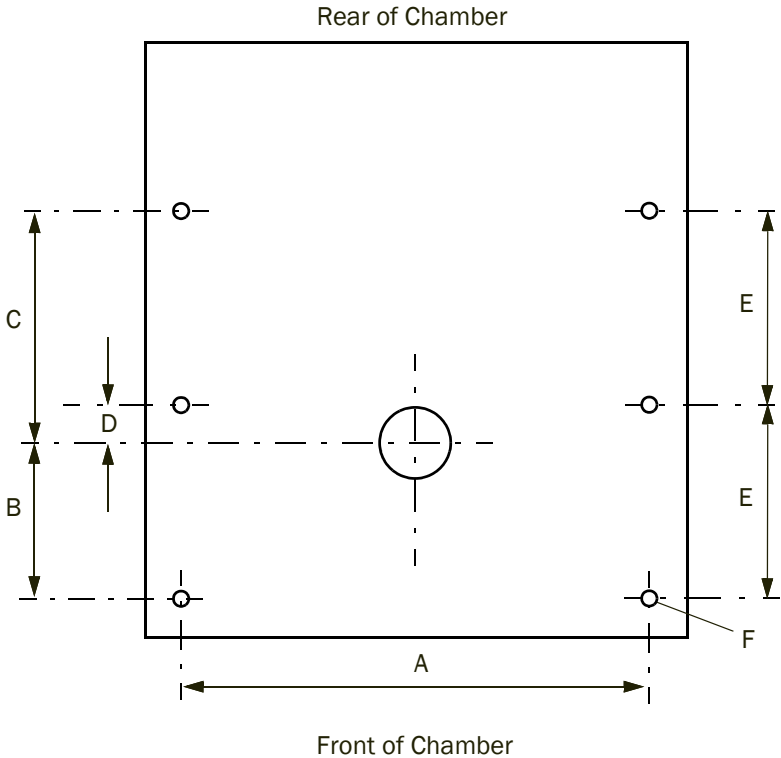


Figure 1. Chamber Fixing Holes/Lifting Points (viewed from above or below)

Table 1. Chamber Fixing Holes/Lifting Points

Chamber Number	Dimensions - mm (in)					
	A	B	C	D	E	F
3119-605	325 (12.8)	75 (2.9)	335 (13.2)	130 (5.1)	205 (8.1)	6 x M10
3119-606	325 (12.8)	75 (2.9)	335 (13.2)	130 (5.1)	205 (8.1)	6 x M10
3119-609	325 (12.8)	75 (2.9)	335 (13.2)	130 (5.1)	205 (8.1)	6 x M10
3119-615	325 (12.8)	75 (2.9)	335 (13.2)	130 (5.1)	205 (8.1)	6 x M10
3119-607	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10
3119-608	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10
3119-610	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10
3119-616	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10
3119-617	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10
3119-618	480 (8.9)	160 (6.3)	240 (9.3)	40 (1.6)	200 (7.9)	6 x M10

See “Weight” on page 34 for chamber weights.

Caution

Eyebolts are included with the chamber to enable initial positioning and installation of the chamber only.

After installation, certification and maintenance of the eyebolts as lifting equipment become the customer's responsibility. Refer to relevant local legislation.

Guidelines for Final Positioning of the Chamber Test System

This section assumes that the chamber is part of a new Instron test system. The chamber may have a fixed mount or a roller mount assembly. The chamber may also be fitted with a cooling pack option. You need to provide sufficient clearance around your system to accommodate your configuration. Ensure the working area is clean, tidy and hazard free. Leave a space on the right hand side of the test machine to access the chamber controls.

See “[Safety](#)” on page [7](#) when considering environmental conditions in the vicinity of the testing equipment. Attention should be given to siting the equipment in locations where air-borne dust and other contaminants can be kept to a minimum.

[Figure 2](#) and [Figure 3](#) illustrate different configurations based on an electromechanical load frame. The dimensions (see [Table 2](#)) are taken from the load string centre line and are therefore applicable to any Instron load frame.

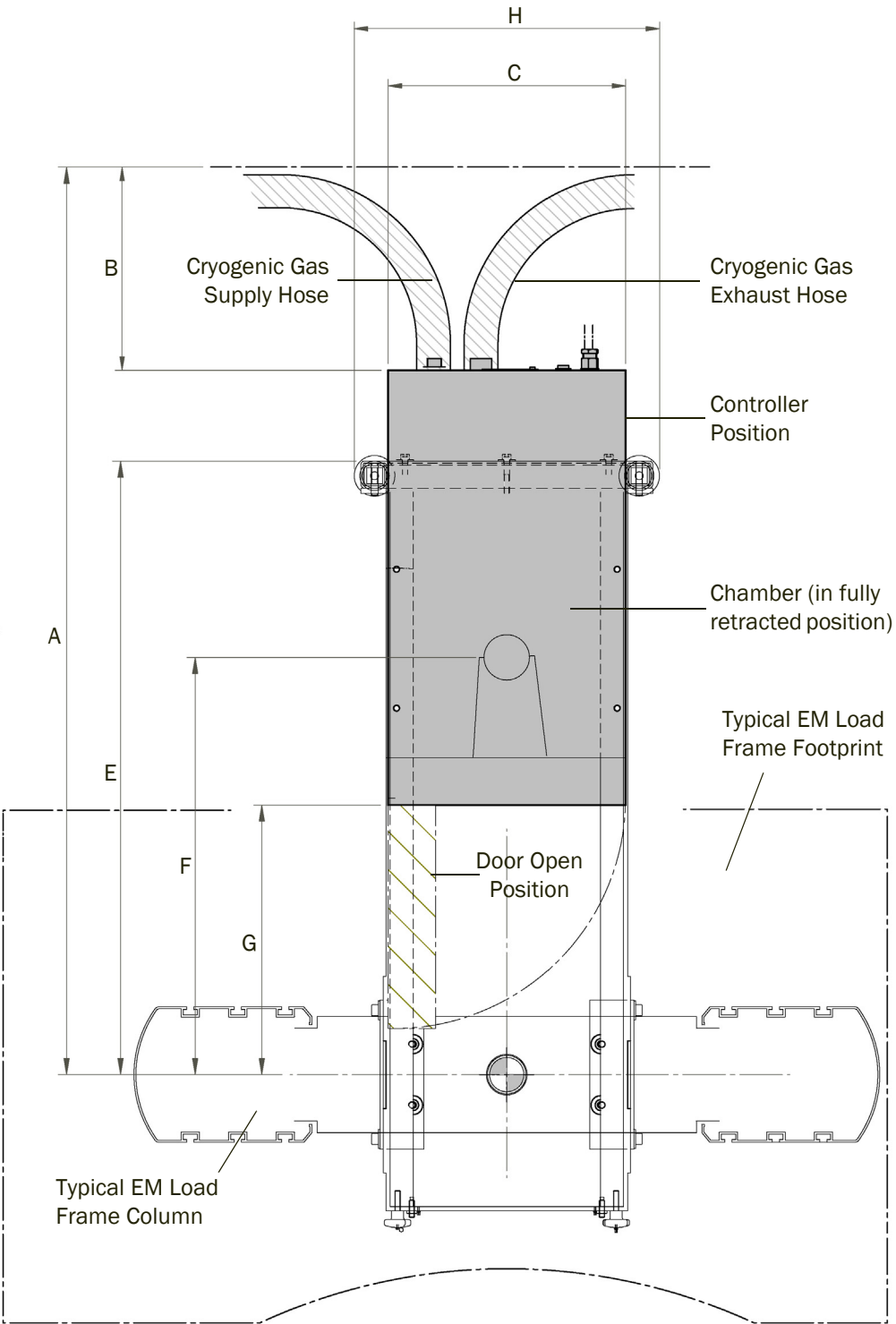


Figure 2. Plan View of Chamber with 3119-230 Roller Mount Assembly

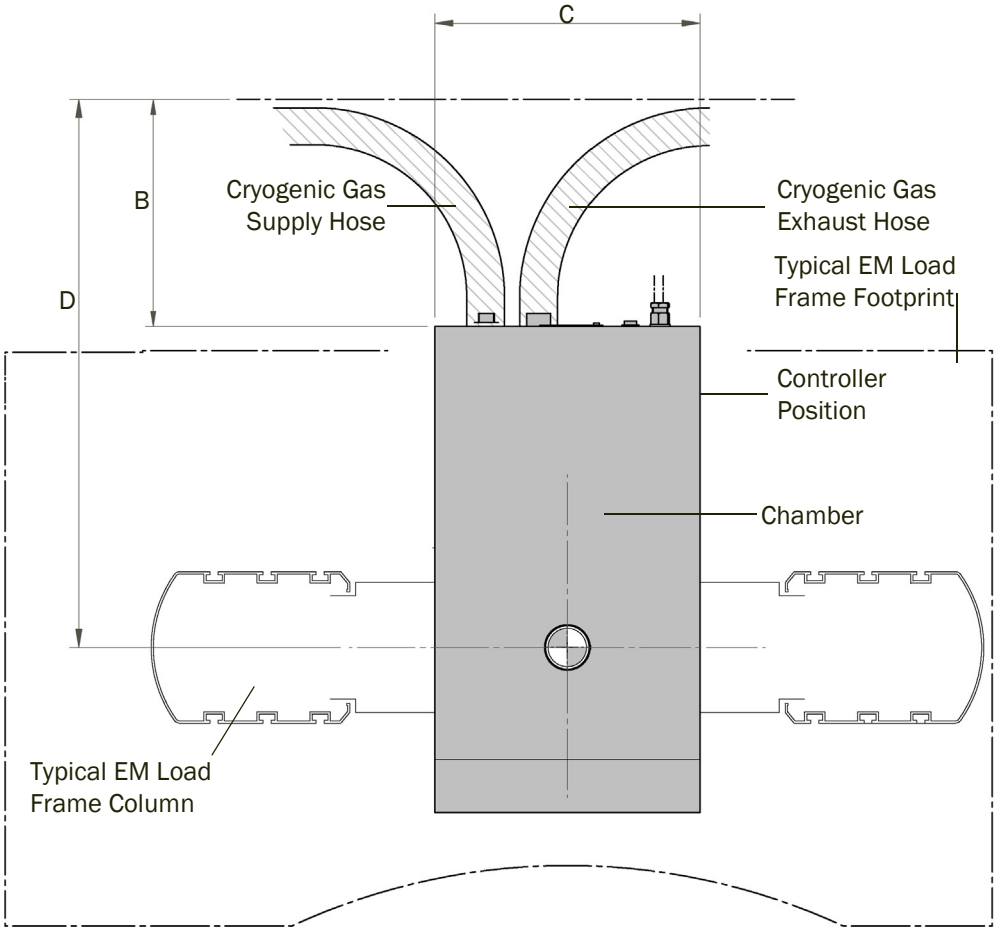


Figure 3. Plan View of Chamber with Fixed Mounting

Table 2. Chamber Footprint Dimensions

Chamber Number	Dimensions - mm (in)							
	A Minimum	B Minimum	C	D Minimum	E	F	G	H
3119-605	1317 (51.9)	300 (11.8)	350 (13.8)	701 (27.6)	906 (35.7)	616 (24.3)	427 (16.8)	450 (17.7)
3119-606	1317 (51.9)	300 (11.8)	350 (13.8)	701 (27.6)	906 (35.7)	616 (24.3)	427 (16.8)	450 (17.7)
3119-609	1317 (51.9)	300 (11.8)	350 (13.8)	701 (27.6)	906 (35.7)	616 (24.3)	427 (16.8)	450 (17.7)
3119-615	1317 (51.9)	300 (11.8)	350 (13.8)	701 (27.6)	906 (35.7)	616 (24.3)	427 (16.8)	450 (17.7)
3119-607	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)
3119-608	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)
3119-610	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)
3119-616	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)
3119-617	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)
3119-618	1841 (72.5)	300 (11.8)	550 (21.7)	930 (36.6)	1336 (52.6)	986 (38.8)	686 (27.0)	450 (17.7)

Chamber Mounting Kit Compatibility

Table 3. Chamber Mounting Kit Compatibility

Mounting Number	Mounting Type	Chamber (3119-)	Load Frame
3119-201	Rigid	605, 606 and 609	3300, 5500, 5800 and 8870
3119-203	Rigid	605, 606 and 609	8801, 8802, 8803 and 8862
3119-204	Rigid	607, 608 and 610	5500 and 5800
3119-205	Rigid	607, 608 and 610	8801, 8802, 8803 and 8862
3119-201	Rigid	615	3300, 5500, 5800 and 8870
3119-204	Rigid	616, 617 and 618	5500 and 5800
3119-230	Roller	All	All

Load Frame Test Space

Warning



Crush Hazard - Moving components can cause injury.

After the chamber, push/pullrods and grips/fixtures etc. have been installed, it is important to prevent any accidental crushing by the moving components.

When setting up, use the system features to:

- Prevent the grips coming together.
- Prevent the crosshead coming into contact with the chamber.
- Prevent the moving grip driving into the chamber.
- Provide a minimum clearance of 30 mm to prevent fingers from becoming trapped between moving components.

Commissioning

After installation, the Instron engineer will check the performance of the chamber and provide the contractually agreed training.

Information for Customer Installation Only

Instron recommend that customers do not undertake chamber installation and accept no responsibility for such an installation. In the event that you decide to undertake your own installation, the following watch points are offered without prejudice:

- Pay attention to the handling information provided (see [page 19](#)).
- Ensure that you provide an electrical power supply socket that meets the requirements of the chamber (see [page 38](#)) and local regulations.
- Ensure that the working environment is clean, tidy and free from trip hazards.
- Leave a space on the right hand side of the test machine to access the chamber controller.
- Ensure that the chamber is level.
- Ensure that the power cable is routed to avoid damage during chamber and test system use. Always clip or tie cables to avoid a trip hazard.
- Use the data in this manual to design mounting brackets to suit your test system. See [Table 1](#) and “[Physical Data](#)” on [page 30](#). Note that the underside and top of the chamber have identical fixing points. Ensure that your design does not cause a conflict between the chamber dimensions and your test system operation.
- Read and understand the operating instructions of the chamber and your test system.
- Route cables and hoses from other accessories to avoid contact with parts of the chamber which may become hot.

Warning

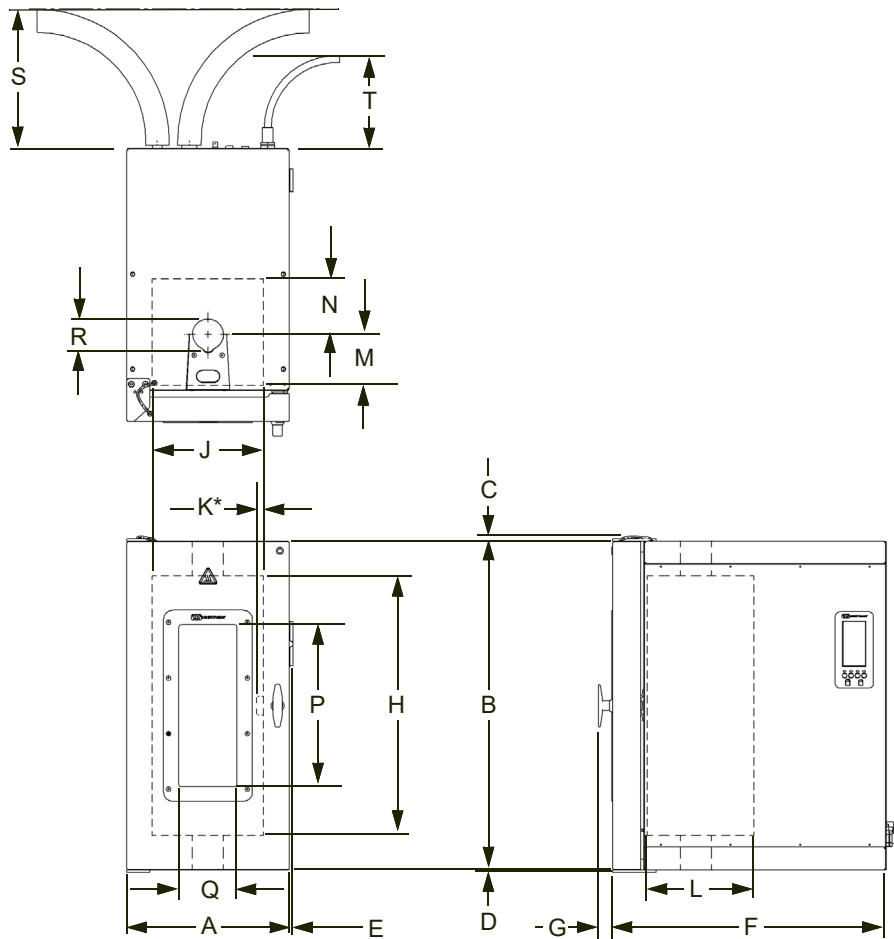


Hazard - Chambers have inherent critical risks. You are strongly advised to carry out your own safety risk assessment taking into account all the information provided in this manual before attempting to install the chamber.

Chapter 5

Specifications

- Physical Data 30
- Operating Performance..... 35
- Electrical Supply 38
- Port Plugs 39
- Cryogenic Storage and Supply (Option) 39



K* = Light as shown (right hand side) is for models 3119-605, 606 and 609 only.
 For models 3119-607, 608 and 610 light is on left hand side

Figure 4. Chamber Dimensions

Physical Data

Referring to [Figure 4](#):

Table 4. External dimensions

	A	B	C	D	E	F	G
	External Width - mm (in)	External Height - mm (in)	Top Hinge Height - mm (in)	Bottom Hinge Height - mm (in)	Control Panel Depth - mm (in)	External Depth - mm (in)	Handle Depth - mm (in)
3119-605	350 (13.8)	635 (25.0)	15 (0.6)	5 (0.2)	10 (0.4)	590 (23.2)	31 (1.2)
3119-606	350 (13.8)	710(27.9)	15 (0.6)	5 (0.2)	10 (0.4)	590 (23.2)	31 (1.2)
3119-607	550 (21.6)	710(27.9)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)
3119-608	550 (21.6)	710(27.9)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)
3119-609	350 (13.8)	810 (31.9)	15 (0.6)	5 (0.2)	10 (0.4)	590 (23.2)	31 (1.2)
3119-610	550 (21.6)	810 (31.9)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)
3119-615	350 (13.8)	1010 (39.8)	15 (0.6)	5 (0.2)	10 (0.4)	590 (23.2)	31 (1.2)
3119-616	550 (21.6)	1050 (41.3)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)
3119-617	550 (21.6)	910 (35.8)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)
3119-618	550 (21.6)	1150 (45.3)	15 (0.6)	5 (0.2)	N/A	855 (33.7)	31 (1.2)

Table 5. Internal dimensions

	H	J	K	L
	Internal Height mm (in)	Internal Width mm (in)	Internal Light Width mm (in)	Internal Depth mm (in)
3119-605	485 (19.1)	240 (9.4)	20 (0.8) ^a	230 (9.0)
3119-606	560 (22.0)	240 (9.4)	20 (0.8) ^a	230 (9.0)
3119-609	660 (26.0)	240 (9.4)	20 (0.8) ^a	230 (9.0)
3119-615	860 (33.9)	240 (9.4)	20 (0.8) ^b	230 (9.0)
3119-607	560 (22.0)	400 (15.7)	20 (0.8) ^b	400 (15.7)
3119-608	560 (22.0)	400 (15.7)	20 (0.8) ^b	400 (15.7)
3119-610	660 (26.0)	400 (15.7)	20 (0.8) ^b	400 (15.7)
3119-616	900 (35.4)	400 (15.7)	20 (0.8) ^b	400 (15.7)
3119-617	760 (29.9)	400 (15.7)	20 (0.8) ^b	400 (15.7)
3119-618	1000 (39.3)	400 (15.7)	20 (0.8) ^b	400 (15.7)

a. As shown in Figure 4, light is on right hand side of chamber.

b. Light is on left hand side of chamber. Not shown in Figure 4.

Table 6. Pullrod dimensions

	M Centre of Pullrod Port to Front of Chamber Space mm (in)	N Centre of Pullrod Port to Rear of Chamber Space mm (in)	R Pullrod Port Diameter mm (in)
3119-605	110 (4.3)	120 (4.7)	67 (2.6)
3119-606	110 (4.3)	120 (4.7)	67 (2.6)
3119-609	110 (4.3)	120 (4.7)	67 (2.6)
3119-615	110 (4.3)	120 (4.7)	67 (2.6)
3119-607	200 (7.8)	200 (7.8)	90 (3.5)
3119-608	200 (7.8)	200 (7.8)	90 (3.5)
3119-610	200 (7.8)	200 (7.8)	90 (3.5)
3119-616	200 (7.8)	200 (7.8)	90 (3.5)
3119-617	200 (7.8)	200 (7.8)	135 (5.3)
3119-618	200 (7.8)	200 (7.8)	135 (5.3)

Table 7. Window dimensions

	P Window Height mm (in)	Q Window Width mm (in)
3119-605	350 (13.8)	125 (4.9)
3119-606	350 (13.8)	125 (4.9)
3119-609	460 (18.1)	125 (4.9)
3119-615	640 (25.2)	125 (4.9)
3119-607	350 (13.8)	125 (4.9)
3119-608	350 (13.8)	125 (4.9)
3119-610	460 (18.1)	125 (4.9)
3119-616	460 (18.1)	125 (4.9)
3119-617	460 (18.1)	125 (4.9)
3119-618	460 (18.1)	125 (4.9)

Table 8. Cable and hose clearances

	S Cable Clearance mm (in)	T Hose Clearance mm (in)
All variants	Minimum 200 (7.9)	Minimum 300 (11.8)

Table 9. Weight

	Weight kg (lb)
3119-605	65 (143)
3119-606	65 (143)
3119-609	75 (165)
3119-615	85 (187)
3119-607	135 (297)
3119-608	165 (363)
3119-610	165 (363)
3119-616	165 (320)
3119-617	150 (309)
3119-618	173 (382)

Operating Performance

Table 10. Temperature specifications

	Maximum Temperature - °C (°F)	Minimum Temperature CO ₂ - °C (°F)	Minimum Temperature LN ₂ - °C (°F)	Temperature Stability - °C (°F) ^a	Temperature Gradient ^b	Maximum Temperature Overshoot - °C (°F) ^a
3119-605	350 (660)	-70 (-95)	-100 (-150)	±2 (±3.6)	±1% of set point after 10 minutes stability time, or ±2 °C (±3.6 °F), whichever is greater	2 (3.6)
3119-606	350 (660)	-70 (-95)	-100 (-150)	±2 (±3.6)		2 (3.6)
3119-609	350 (660)	-70 (-95)	-100 (-150)	±2 (±3.6)		2 (3.6)
3119-615	350 (660)	N/A	-100 (-150)	±2 (±3.6)		2 (3.6)
3119-607	350 (660)	-70 (-95)	-150 (-238)	±2 (±3.6)		2 (3.6)
3119-608	600 (1112)	-70 (-95)	-150 (-238)	±2 (±3.6)		2 (3.6)
3119-610	350 (660)	-70 (-95)	-150 (-238)	±2 (±3.6)		2 (3.6)
3119-616	350 (660)	N/A	-80 (-112)	±2 (±3.6)		2 (3.6)
3119-617	350 (660)	N/A	-80 (-112)	±2 (±3.6)		2 (3.6)
3119-618	350 (660)	N/A	-80 (-112)	±2 (±3.6)		2 (3.6)

a. The specified performance of the chamber is not applicable within 15 °C of ambient.

b. Figures for temperature measured at the specimen (metal) over a 50 mm (2 in) gauge length. Figures are not applicable within 15 °C of ambient.

Table 11. Heating and cooling specifications


	Heat-up Time 100 V (minutes)	Heat-up Time 120 V (minutes)	Heat-up Time 200 V (minutes)	Heat-up Time 240 V (minutes)	Cool-Down Time (minutes)	Heating Method
3119-605	100	50	100	50	20	Forced Convection
3119-606	100	50	100	50	20	
3119-609	100	50	100	50	20	
3119-615	100	50	100	50	20	
3119-607	N/A	N/A	35	25	40	
3119-608	N/A	N/A	N/A	60	40	
3119-610	N/A	N/A	35	25	40	
3119-616	N/A	N/A	35	25	40	
3119-617	N/A	N/A	35	25	40	
3119-618	N/A	N/A	35	25	40	
	<i>To maximum or minimum temperature from ambient including typical load string.</i>					

Table 12. Temperature Accuracy

Temperature - °C (°F)	Accuracy - °C (°F)
-150 (-240)	±5.5 (±10.0)
-100 (-150)	±5.0 (±9.0)
-40 (-40)	±4.5 (±8.1)
0 (32)	±3.5 (±6.5)
+100 (210)	±3.5 (±6.5)
+200 (390)	±3.5 (±6.5)
+300 (570)	±4.5 (±8.1)
+400 (750)	±4.5 (±8.1)
+500 (930)	±5.0 (±9.0)
+600 (1110)	±5.5 (±10.0)

Table 13. Typical LN₂ Consumption

	3119-605, 3119-606 and 3119-609 _a		3119-607, 3119-608 and 3119-610 _b	
Temperature °C(°F)	To Achieve Temperature (from ambient)	To Maintain Temperature	To Achieve Temperature (from ambient)	To Maintain Temperature
-30 (-22)	3 Litres	7 Litres/Hr	7 Litres	10 Litres/Hr
-70 (-150)	6 Litres	10 Litres/Hr	12 Litres	14 Litres/Hr
-100 (-150)	7 Litres	12 Litres/Hr	18 Litres	16 Litres/Hr
-150 (-238)	N/A	N/A	25 Litres	20 Litres/Hr

- a. Based on a 3119-609 chamber containing typical 12 kg grips and pull rods such as 2732-008. Total gas consumption will be affected by the duration and frequency of door opening. It will also vary according to the size of the load string and specimen.
- b. Based on a 3119-610 chamber containing typical 25 kg grips and pull rods such as 2716-002. Total gas consumption will be affected by the duration and frequency of door opening. It will also vary according to the size of the load string and specimen.

Electrical Supply

Single phase 50/60 Hz ac supply (see [Table 14](#)) terminating in a socket (see [Table 15](#)), protected by a circuit breaker or fused isolator of an appropriate rating.

Earth impedance = 1 Ω (tested prior to installation).

Table 14. Electrical Supply

Chamber Number	Operating Voltage V	Max Current A	Power Consumption kW	Mains Plug Type see Table 15
3119-605	100 - 120	20	2.4	C
	200 - 240	10	2.4	A/B
3119-606	100 - 120	20	2.4	C
	200 - 240	10	2.4	A/B
3119-607	200	22.4	4.5	D/E
	240	26.7	6.4	D/E
3119-608	240	26.7	6.4	D/E
3119-609	100 - 120	20	2.4	C
	200 - 240	10	2.4	A/B
3119-610	200	22.4	4.5	D/E
	240	26.7	6.4	D/E
3119-615 ^a	200 - 240	22	4.4	D/E
3119-616 ^a	240	26.7	6	D/E
3119-617 ^a	240	26.7	6	D/E
3119-618 ^a	240	26.7	6	D/E

a. B1 (Ambient) and B2 (LN₂)

Table 15. Mains Plug

Mains Plug	Description/Rating	Destination Country
A	240 V 16 A IEC 60309 (BS4343)	Non-U.S.A.
B	240 V 20 A NEMA (HUBBELL) L6-20P	U.S.A.
C	120 V 30 A NEMA (HUBBELL) L5-30P	U.S.A.
D	240 V 32 A IEC 60309 (BS4343)	Non-U.S.A.
E	240 V 30 A NEMA (HUBBELL) L6-30P	U.S.A.

Port Plugs

Port plugs reduce, but do not eliminate, heat loss and escape of cryogenic gas by reducing the annular gap between the pullrods and the chamber port. It is not possible to completely seal the annular gap as this would introduce friction and affect the load reading.

If Instron is supplying the load string, port plugs may also be supplied. Check your order to see if port plugs are included.

If you are supplying your own port plugs, you need to ensure that the material used is suitable for the full temperature range in use and that friction is not introduced.

Cryogenic Storage and Supply (Option)

The pressure required for optimum performance is:

- CO₂:50 bar (725 psi)
- LN₂:1.5bar (22 psi)



Below the specified pressure, there will be a significant reduction in performance.

Table 16. Cryogen Connectors

Coolant	Chamber Fitting	Typical Dewar Fitting		Recommended Hose	Recommended Dewar Flask
LN ₂	1/2" BSP Male	EU	1/2" BSP Male/Female	3119-104	3119-102
		USA	CGA 295 Male (0.75-16 UNF -2A RH)	3119-106	-
CO ₂	3/8" BSP Male	EU	0.860" x 1/14" Whitworth RH Male	3119-103	-
		USA	CGA 320 Male (0.825-14 NGO - RH)	3119-105	-

Table 17. Cryogen Hoses

Cat No	Description	Adapter (Chamber End)	Hose Fitting (Chamber End)	Length m (ft)	Hose Fitting (Bottle End)	Adapter (Bottle End)
3119-103	EU CO ₂ Hose	-	3/8" BSP Female	2 (6.6)	1/4" BSP Female	1/4" BSP Male to 0.860" x 1/14" Whitworth RH Female
3119-104	EU LN ₂ Hose	-	1/2" BSP Female	2 (6.6)	1/2" BSP Female	-
3119-105	USA CO ₂ Hose	3/8" BSP Female to 9/16-18 37 DEG JIC Male	9/16-18 37 DEG JIC Female	1.8 (6)	CGA 320 Female (0.825-14 NGO - RH)	-
3119-106	USA LN ₂ Hose	1/2" BSP Female to CGA 295 Male (0.75-16 UNF -2A RH)	CGA 295 Female (0.75-16 UNF -2A RH)	1.8 (6)	CGA 295 Female (0.75-16 UNF -2A RH)	-

Table 18. LN₂ exhaust specifications

Exhaust port	outside diameter (mm (in))	31.75 (1.25)
	inside diameter (mm (in))	25.4 (1)
Exhaust tubing (supplied)	outside diameter (mm (in))	39 (1.54)
	inside diameter (mm (in))	30 (1.18)
	length (mm (in))	3000 (118.11)
	material	white silicon rubber



Product Support: www.instron.com