Thermal Diffusivity Instruments

DLF-2 with EM-2800 and Power Cart

Site Preparation Guide

Revision C Issued August 2026

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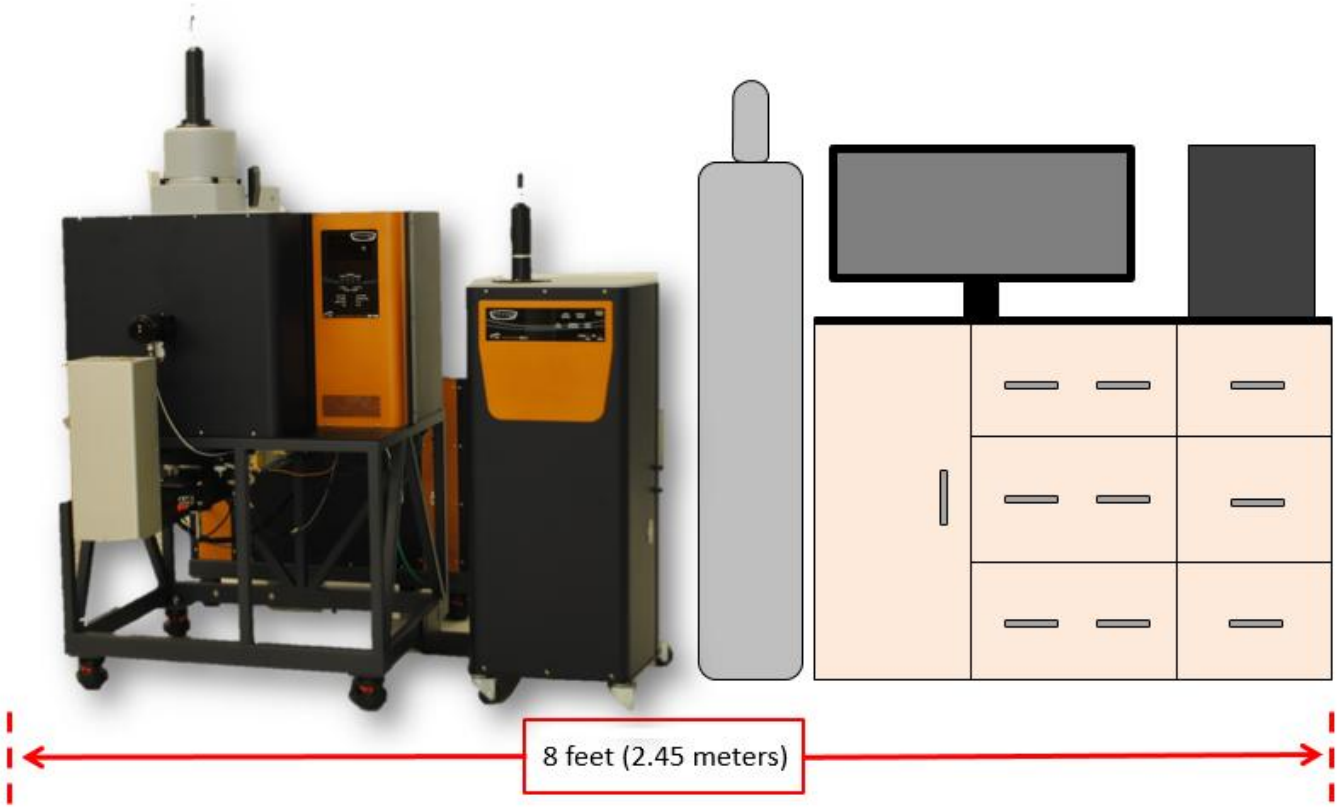
Ideal Setup

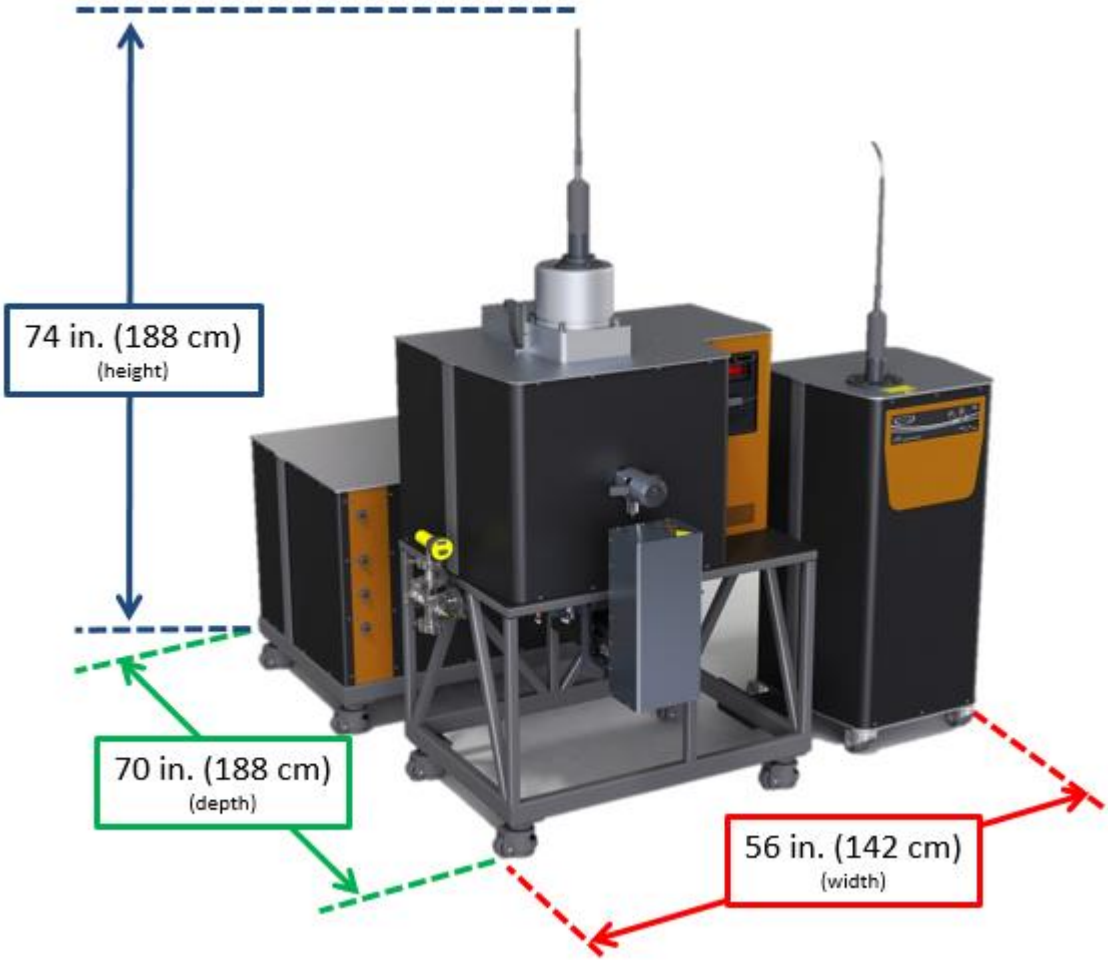
IDEAL PLACEMENT

Select a location with adequate floor space and in a vibration-free environment.



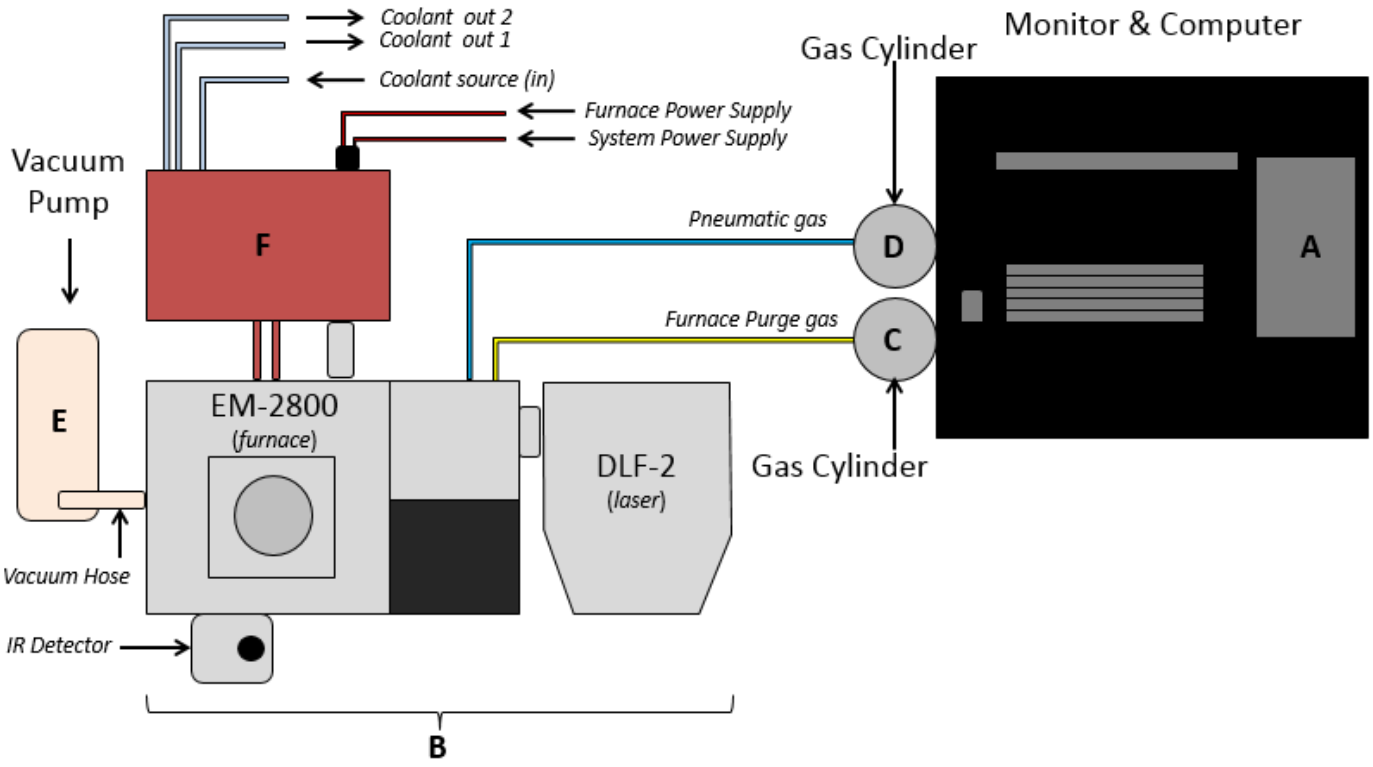
Ideal Setup

SPACE MEASUREMENTS



Ideal Setup

IDEAL PLACEMENT–TOP VIEW



Components:

A. Computer

B. EM-2800 & DLF-2

C. Gas Cylinder (Argon)

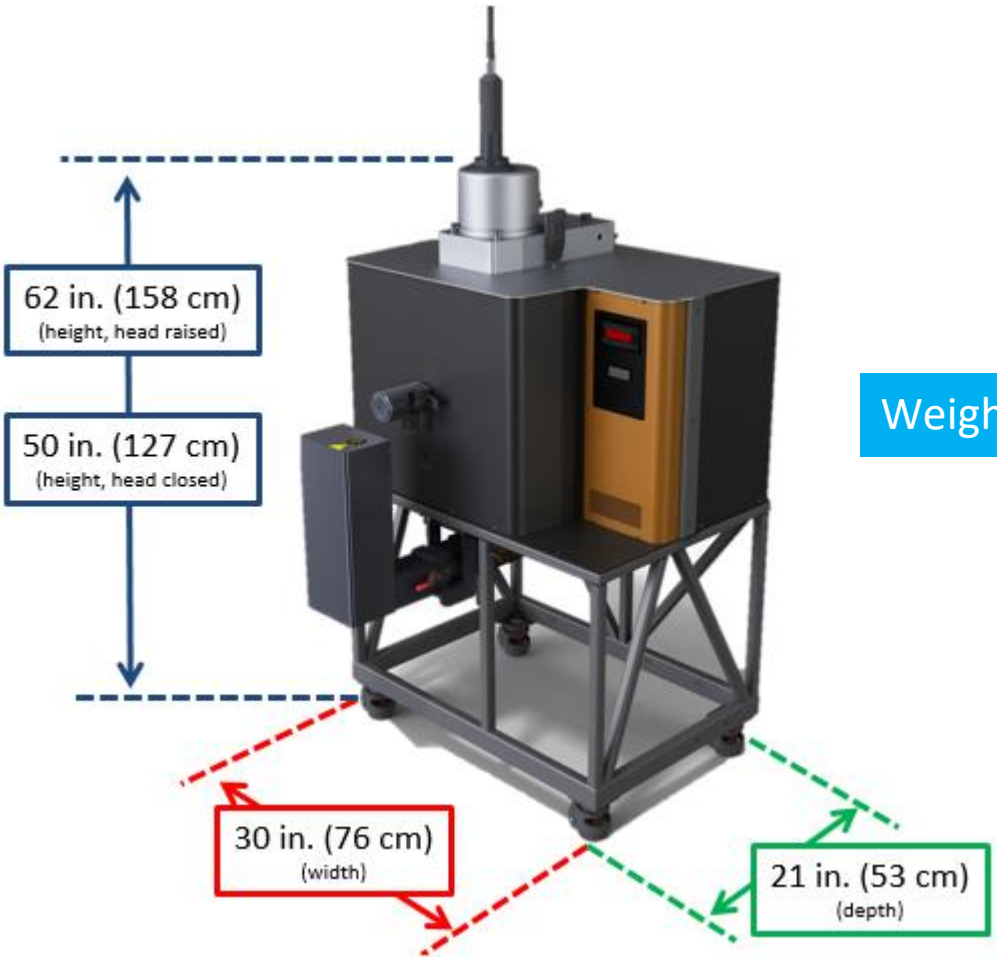
D. Gas Cylinder (Air or nitrogen)

E. Vacuum Pump

F. Power Cart

Instrument Measurements

EM-2800 MEASUREMENTS



Weight: 202 kg (445 lbs)

Instrument Measurements

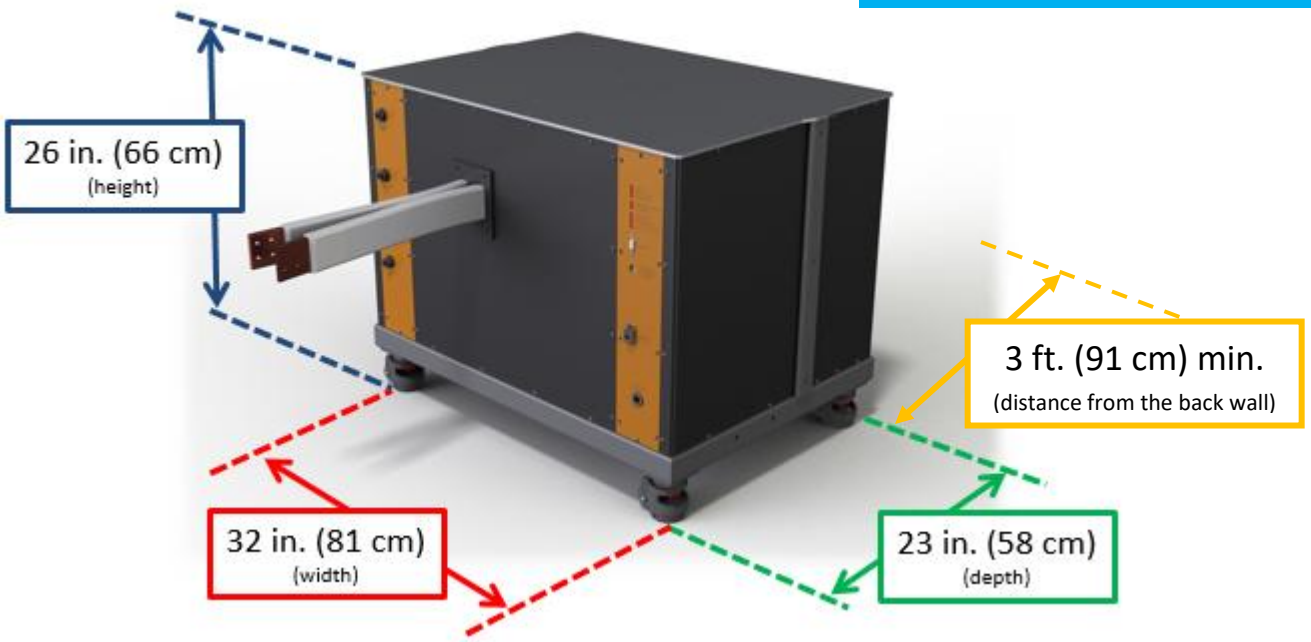
DLF-2 MEASUREMENTS

Weight: 71 kg (156 lbs)

Instrument Measurements

POWER CART MEASUREMENTS

Weight: 193 kg (426 lbs)



Utility Requirements

POWER

System supply voltage: 200–240 VAC (rated for 15 A)
50 or 60 Hz

Furnace supply voltage: 200-240 VAC (rated for 80 A)
50 or 60 Hz

Distinct voltages 200, 208, 220 & 240 VAC need to be configured on the furnace transformer during installation.

Transformer Connections Table			
Terminal	**To**	**Terminal**	**Primary Voltage**
H1	>	H5	240V
H2	>	H5	220V
H2	>	H4	208V
H2	>	H3	200V

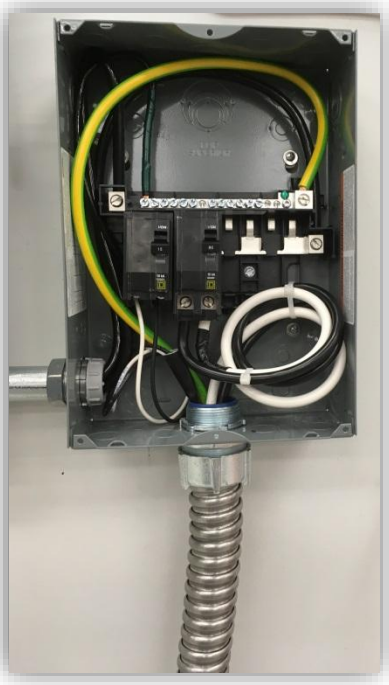
The conduit on the back of the power cart must be connected to a dedicated utility panel with a dedicated, easily accessible main power disconnect switch.

Vacuum

120V (US) or 220–240V, 6.4A max, 50/60 Hz

Power cords provided

- DLF-2, EM-2800, computer and monitor power cables are provided with the instrument and plugged into the back of the power cart.
- The vacuum pump power cable is provided with the pump.



CAUTION **Use power cords with plugs appropriate for your circuit.**

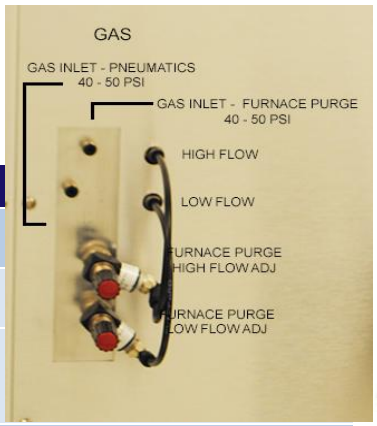
CAUTION Connect the DLF-2, EM-1600, computer, and monitor to outlets on the back of the Power Cart and make sure that the mains assigned do not also supply power to noise generating equipment nearby, such as welders, motors, transformers, etc.

CAUTION Supply voltages lower than indicated may result in a degradation of performance.

CAUTION An independent heavy GROUND wire must be provided through the power hookup. Improper grounding may cause severe damage for which the supplier will not accept responsibility. All power strips must be fully grounded and carry the ground through to the sockets into which the computer is plugged.

Utility Requirements

GAS



Furnace Purge Gas	Requirements
Conditions	Must be dry
Type	Must be **argon**
Inlet Pressure	Minimum: 45 psig (3.10 bar) Maximum: 50 psig (3.45 bar)
Source	Must be from a **gas cylinder**, **Grade 5 purity**
Port	1st port on the back with 1/8” diameter push-to-connect fitting

Pneumatic Gas	Requirements
Inert Gas	• Required • **Argon** from the gas cylinder can be used • Dry **air** or **nitrogen** from a cylinder or house supply
Ports	2nd port on the back with 1/8” diameter push-to-connect fitting

<u>1/8” Urethane tubing</u>

- Supplied with the instrument
- Rated to 100 psig (7 bar)
- 4.5 m (15 ft) length of tubing connects to the furnace by threaded barb connection (supplied).
- A push-to-connect (Legris) 1/8” to 1/8” tubing connector is provided:
- A push-to-connect (Legris) 1/8” stem to ¼” tubing adapter is provided:

<u>1L/day of Liquid Nitrogen</u>

- Use a small handheld Dewar flask to manually pour into the detector Dewar. A funnel is supplied for assistance.

CAUTION

Improperly regulated, pulsating, or poor-quality purge gas may cause irregular or erratic instrument operation. Containment of exhaust is recommended if noxious or poisonous gases are released by sample when heated. Venting inert gases into small rooms may reduce the oxygen content of the air and become hazardous to personnel.

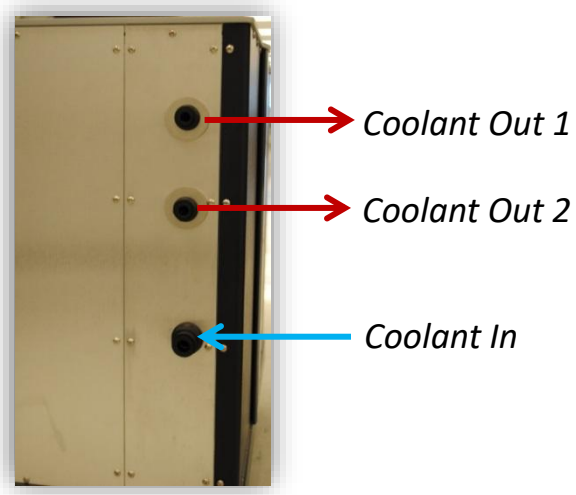
Utility Requirements

WATER

	Requirements
Cooling Capacity	• 10 kW at 25°C return to the instrument
Recirculation	• If plant-wide recirculation is used, a minimum inlet/outlet differential pressure of 50 psig (3 bar) is required.
Flow Rate	• Minimum 5.7 L/min (1.5 gal/min) • Inlet pressure: Maximum 80 psig (5.5 bar)
Water Temperature	• Optimal: **20°C** • Permissible: 15°C–30°C • Excessively cold water will result in “sweating” and corrosion of cooled metal surfaces. Warm water may not allow you to start a test from below 25°C.
Chiller/Circulator	• If a chiller/circulator is being used, it must be placed at the same level as the instrument. A connection to city water as a backup in case of lost power is required. • Wall-mounted supply shutoff, open drain, and city water are required if a chiller/circulator is not used.

The instrument is supplied with three hoses (1.8 meters/6 feet each) to connect to the Coolant Inlet and Outlet ports on the back of the Power Cart. The other end of each hose must be connected to the coolant source.

The coolant source must have a shutoff valve.



Coolant Inlet & Outlet Connections

Computer Requirements

HARDWARE REQUIREMENTS

Item	Requirement
USB Ports	3 unused USB ports
Serial Ports	Unused RS-232 port

Computers should not be connected to any other analytical instruments or LAN.

Instrument drivers and software are provided on CD.

SOFTWARE REQUIREMENTS

Item	Requirement
Operating System	• Windows 7 or 10, 32- or 64-bit, Ultimate, Enterprise & Professional • Home version not supported
Network	• *Waters is not responsible for resolving issues associated with connections to your corporate network.* • *Network cards and/or certain network operation frequently interfere with the operation of the instrument and software.*
Conflicts	*Waters is not responsible for resolving hardware/software conflicts created by the addition of third party hardware or software to the computer.*

Site Preparation Checklist

Thermal Diffusivity Instruments: DLF-2 with EM-2800 and Power Cart

	Sufficient lab space for instrument, computer, vacuum pump, and recirculator (if needed): ☐ Width: 168 cm (5.5 ft) ☐ Depth: 230 cm (7.5 ft) ☐ Height: 188 cm (6 ft)
	☐ Furnace power is 200–240 VAC, 80 A max, 50/60 Hz ☐ System power is 220–240 V, 15 A max, 50/60 Hz ☐ Vacuum power is 120 V (USA) or 220–240 V 6.4 A max, 50/60 Hz
	Purge Gas – Dry argon ☐ Grade 5 purity cylinder ☐ Regulator to allow 45–50 psig (3.10–5.50 bar) Pneumatic Gas – Dry air; Argon or nitrogen ☐ Tank ☐ House supply ☐ Regulator to allow 45–50 psig (3.10–5.50 bar) Liquid Nitrogen ☐ Handheld dewar, 1 L/day usage
	Water Circulation ☐ Nominal flow rate of 1.5 gal/min ☐ Optimal coolant temperature of 20°C ☐ Filtered or clean and debris-free
	☐ The Customer assumes responsibility for any damage that occurs when the instrument is moved by someone other than a trained Waters Service Representative.

I hereby acknowledge that all utility requirements have been met per the checklist above and that they will be ready at the agreed time of installation.

<u>If all utility requirements are not met at the agreed time of installation, additional charges may be incurred for a return Service trip.</u>

_____ / _____ / _____

Customer *DD* *MM* *YYYY*

_____ _____ _____ _____

Company *City* *State* *Country*

Please send a signed copy of the completed checklist to your local Service representative.

Waters Technologies Corporation Offices

For information on our latest products, contact information, and more, see our website at: http://www.tainstruments.com.

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