



TA Instruments Installation Requirements for Thermal Diffusivity Systems

Notice

Thank you for ordering a thermal diffusivity system from TA Instruments. To ensure that installation of your system goes as smoothly as possible and has you ready to start evaluating your sample materials as quickly as possible, we are providing the attached installation information. It includes details regarding laboratory space, power, and auxiliary requirements, as well as configuration requirements for the controller (computer). Please review this information carefully and take any appropriate actions prior to the installation date. To avoid unnecessary delays, and/or additional charges, please ensure that the requirements specified in this document are met before your TA Instruments Service Representative arrives. Contact your local TA Instruments Representative if you have any questions.



To arrange for installation of your system, contact our U.S. Service Department (302-427-4050) or your local TA Instruments Service Representative.

Important: TA Instruments Manual Supplement

Please refer to the *TA Manual Supplement* to access the following important information supplemental to this document:

- TA Instruments Trademarks
- TA Instruments Patents
- Other Trademarks
- TA Instruments End-User License Agreement
- TA Instruments Offices

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Requirements for the Controller (Computer)

A working thermal diffusivity system consists of one or more measurement instruments (e.g., DLF-1600, DLF-2800, etc.) and a computer configured with appropriate TA Instruments software (this latter combination is subsequently referred to as a controller). The controller is included with the instrument and requires the following:

Hardware Considerations

- The computer should not be attached to other analytical instruments or any LAN.
- The PC requires an unused RS232 serial port and an unused USB for connection to the instrument.
- The PC is not permitted to run other programs or any power saving features while a test is running.
- Network cards and/or certain network operation frequently interfere with the operation of the instrument control programs.
- The PC requires a Windows 32-bit operating system.

Software Considerations

- Peripherals (e.g., printer) must be from the known Windows compatible list. (See Microsoft's web site at <http://www.microsoft.com/hwtest> for the most current list.)
- TA Instruments is not responsible for resolving issues associated with connections to your corporate network. [See further information in the next section.]
- TA Instruments is not responsible for resolving hardware/software conflicts created by the addition of third party hardware or software to the computer.

Requirements for the Thermal Diffusivity System Instrument

A Thermal Diffusivity system consists of an instrument and a computer for instrument control. To obtain installation requirements for the instrument and controller, refer to the appropriate sections of this document.

Instrument & Accessory Placement

Select a location for the instrument with adequate floor space and a rigid laboratory bench that is level. Unless otherwise specified in the instrument requirements, the work space must allow 0.6 m (24 in) in front of the instrument, 0.3 m (12 in) on each side, and 0.3 m (12 in) behind the instrument. The PC must be located within 1.5 m (60 in) of the instrument, and the vacuum pump must be located within 1.2 m (48 in) of the Environmental Module.

DXF and DLF-1 Pulse Source

Dimensions:	Depth 102 cm (40 in), Width 61 cm (24 in), Height 46 cm (18 in)
Weight:	69 kg (155 lbs)
Power requirements:	Pulse Source supply voltage: 208–240 VAC ¹ (rated for 10 A), 50/60 Hz ^{2, 3} PC and peripherals: 208–240 VAC outlet (separate). Surge protection suggested.
Laboratory conditions:	Temperature: 15–35°C Relative Humidity: 5–80% (non-condensing at 15°C) The instrument should be located in a dust-free, vibration-free environment, away from exposure to direct sunlight and direct air drafts. Locate the instrument in a ventilated space (hood, etc.) if noxious gases or vapors are generated during the heating of samples. The PC must be located no more than 150 cm (60 in) from the right side of the instrument (as viewed from the front); Required space surrounding the instrument: 30 cm (12 in.) on all sides of equipment

1. Supply voltages lower than indicated limit may result in a degradation of performance.
2. This instrument is supplied with a power cord ~2 meters long. Ensure that the mains assigned do not also supply power to noise generating equipment nearby, such as motors, welders, transformers, etc.
3. An independent heavy GROUND wire must be provided through the power hook up. 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.

DLF-2 Pulse Source

Dimensions:	Depth 25 cm (10 in), Width 30 cm (12 in), Height 114 cm (45 in)
Weight:	45 kg (100 lbs)
Power requirements:	Laser supply voltage: 208–240 VAC ¹ (rated for 5 A), 50/60 Hz ^{2, 3} PC and peripherals: 208–240 VAC outlet (separate). Surge protection suggested.
Laboratory conditions:	Temperature: 15–35°C Relative Humidity: 5–80% (non-condensing at 15°C) The instrument should be located in a dust-free, vibration-free environment, away from exposure to direct sunlight and direct air drafts. Locate the instrument in a ventilated space (hood, etc.) if noxious gases or vapors are generated during the heating of samples. The PC must be located no more than 150 cm (60 in) from the right side of the instrument (as viewed from the front); Required space surrounded the instrument: 30 cm (12 in.) on all sides of equipment

1. Supply voltages lower than indicated limit may result in a degradation of performance.
2. This instrument is supplied with a power cord ~2 meters long. Ensure that the mains assigned do not also supply power to noise generating equipment nearby, such as motors, welders, transformers, etc.
3. An independent heavy GROUND wire must be provided through the power hook up. 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.

EM-200

Dimensions:	Depth 102 cm (40 in), Width 61 cm (24 in), Height 46 cm (18 in)
Weight:	10 kg (20 lbs)
Laboratory requirements:	Liquid Nitrogen: Maximum 22 psi (1.5 bar) supply pressure. Pressure exceeding 22 psi will damage the instrument. Purge gas ¹ : Nitrogen or argon (supplied by customer); preferred source: gas cylinder. Minimum inlet pressure: 0.5 psi (0.03 bar); Maximum inlet pressure: 1 psi (0.06 bar). Do NOT pressurize the furnace cavity.

1. Improperly regulated, pulsating, or poor quality purge gas may cause irregular or erratic equipment 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.

EM-500

Dimensions:	Depth 102 cm (40 in), Width 61 cm (24 in), Height 77 cm (30 in)
Weight:	34 kg (75 lbs)
Additional power requirements:	Vacuum: 208–240 VAC outlet (rated for 10 A) (separate).
Laboratory requirements:	Liquid Nitrogen: 1 L/day in a small hand-held dewar flask, manually poured into the LN ₂ receptacle. Purge gas ¹ : Nitrogen or argon (supplied by customer); preferred source: gas cylinder. Purge gas inlet must be filtered and dry. Minimum inlet pressure: 40 psi; Maximum inlet pressure 50 psi. Do NOT pressurize the furnace cavity.
Cooling water and drain:	Minimum inlet pressure to the instrument: 40 psi ² ; Maximum inlet pressure 80 psi ³ Nominal flow rate: 1–2 L/min. Varies with inlet pressure Permissible water temperature 15°C to 30°C, optimum 20°C ^{4, 5} Air temperature/relative humidity: non-condensing at 15°C. The instrument is supplied with two hoses to connect to the Coolant Inlet and Outlet ports on the back of the furnace. The other end of each hose has a 1/4" male fitting. The coolant source must be connected to the 1/4" male fittings of each hose. The customer is required to make all hose connections. If plant-wide recirculation is used, a minimum inlet/outlet differential pressure of 50 psi is required.

1. Improperly regulated, pulsating, or poor quality purge gas may cause irregular or erratic equipment 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.
2. Operating close to or below minimum pressure will result in erratic operation.
3. A chiller/circulator may be supplied. Consult the chiller/circulator manual for specifications concerning appropriate fluid types. The instrument is supplied with a hose to be connected between the instrument and the chiller/circulator. The customer is required to make all hose connections.
4. Excessively cold water will result in "sweating" and corrosion of cooled metal surfaces. Warm water may not allow starting a test from below 25°C.
5. Wall mounted supply shutoff, open drain, and city water are required if no chiller/circulator was ordered.

EM-900

Dimensions:	Depth 102 cm (40 in), Width 61 cm (24 in), Height 77 cm (30 in)
Weight:	31 kg (75 lbs)
Additional power requirements:	Vacuum: 208–240 VAC outlet (rated for 10 A) (separate).
Laboratory requirements:	Liquid Nitrogen: 1 L/day in a small hand-held dewar flask, manually poured into the LN ₂ receptacle. Purge gas ¹ : Nitrogen or argon (supplied by customer); preferred source: gas cylinder. Purge gas inlet must be filtered and dry. Minimum inlet pressure: 40 psi; Maximum inlet pressure 50 psi. Do NOT pressurize the furnace cavity.
Cooling water and drain:	Minimum inlet pressure to the instrument: 40 psi ² ; Maximum inlet pressure 80 psi ³ Nominal flow rate: 1–2 L/min. Varies with inlet pressure Permissible water temperature 15°C to 30°C, optimum 20°C ^{4, 5} Air temperature/relative humidity: non-condensing at 15°C. The instrument is supplied with two hoses to connect to the Coolant Inlet and Outlet ports on the back of the furnace. The other end of each hose has a 1/4" male fitting. The coolant source must be connected to the 1/4" male fittings of each hose. The customer is required to make all hose connections. If plant-wide recirculation is used, a minimum inlet/outlet differential pressure of 50 psi is required.

1. Improperly regulated, pulsating, or poor quality purge gas may cause irregular or erratic equipment 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.
2. Operating close to or below minimum pressure will result in erratic operation.
3. A chiller/circulator may be supplied. Consult the chiller/circulator manual for specifications concerning appropriate fluid types. The instrument is supplied with a hose to be connected between the instrument and the chiller/circulator. The customer is required to make all hose connections.
4. Excessively cold water will result in "sweating" and corrosion of cooled metal surfaces. Warm water may not allow starting a test from below 25°C.
5. Wall mounted supply shutoff, open drain, and city water required if no chiller/circulator was ordered.

EM-1200

Dimensions:	Depth 102 cm (40 in), Width 61 cm (24 in), Height 77 cm (30 in)
Weight:	34 kg (75 lbs)
Laboratory requirements:	<p>Liquid Nitrogen cooling (static): 1 L/day; use a small hand held dewar flask and manually pour into the LN₂ receptacle.</p> <p>Purge gas¹: Nitrogen or argon (supplied by the customer); preferred source: gas cylinder. Purge gas inlet must be filtered and dry. Minimum inlet pressure: 40 psi; Maximum inlet pressure 50 psi. Do NOT pressurize the furnace cavity.</p> <p>The instrument is supplied with hose barbs to be connected to rubber or Tygon tubing, minimum inside tubing diameter of 3.175 mm (or equivalent), minimum pressure rating of 100 psi (7 bar). The customer is required to make all hose connections.</p>
Cooling water and drain:	<p>Minimum inlet pressure to the instrument: 40 psi²; Maximum inlet pressure 80 psi³</p> <p>Nominal flow rate: 1–2 L/min. Varies with inlet pressure</p> <p>Permissible water temperature 15°C to 30°C, optimum 20°C^{4, 5}</p> <p>Air temperature/relative humidity: non-condensing at 15°C.</p> <p>The instrument is supplied with two hoses to connect to the Coolant Inlet and Outlet ports on the back of the furnace. The other end of each hose has a 1/4" male fitting. The coolant source must be connected to the 1/4" male fittings of each hose. The customer is required to make all hose connections.</p> <p>If plant-wide recirculation is used, a minimum inlet/outlet differential pressure of 50 psi is required.</p>

1. 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.
2. Operating close to or below minimum pressure will result in erratic operation.
3. A chiller/circulator may be supplied. Consult the chiller/circulator manual for specifications concerning appropriate fluid types. The instrument is supplied with a hose to be connected between the instrument and the chiller/circulator. The customer is required to make all hose connections.
4. Excessively cold water will result in "sweating" and corrosion of cooled metal surfaces. Warm water may not allow starting a test from below 25°C.
5. Wall mounted supply shutoff, open drain, and city water required if no chiller/circulator was ordered.

EM-1600

Dimensions:	Depth 72 cm (28 in), Width 107 cm (42 in), Height 153 cm (60 in)
Weight:	137 kg (300 lbs)
Additional Power requirements:	Main furnace supply voltage: 208–240 VAC outlet (rated for 25A), 50/60 Hz Pump: 220–240 VAC outlet (rated for 15A) (separate)
Laboratory requirements:	Liquid Nitrogen cooling (static): 1 L/day; use a small hand held dewar flask and manually pour into the LN ₂ receptacle. Purge gas ¹ : Dry nitrogen or dry argon (supplied by the customer); preferred source: gas cylinder. Purge gas inlet must be filtered and dry. Minimum inlet pressure: 40 psi; Maximum inlet pressure 50 psi. Do NOT pressurize the furnace cavity. The instrument is supplied with hose barbs to be connected to rubber or Tygon tubing, minimum inside tubing diameter of 3.175 mm (or equivalent), minimum pressure rating of 100 psi (7 bar). The customer is required to make all hose connections.
Cooling water and drain:	Minimum inlet pressure: 40 psi ^{2, 3} ; Maximum inlet pressure: 80 psi Nominal flow rate: 1–2 L/min (varies with inlet pressure) Minimum inlet/outlet differential pressure (if plant-wide recirculation is used): 50 psi Water temperature: 15°C–30°C ⁴ , optimum 20°C Air temperature/relative humidity: non-condensing at 15°C The instrument is supplied with two hoses to connect to the Coolant Inlet and Outlet ports on the back of the furnace. The other end of each hose has a 1/4" male fitting. The coolant source must be connected to the 1/4" male fittings of each hose. The customer is required to make all hose connections.

1. 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.
2. Operating close to or below minimum pressure will result in erratic operation
3. Wall mounted supply shutoff, open drain, and city water required; 2 meters feed and drain hose supplied that may be used in place of hose barbs, if applicable.
4. Excessively cold water may result in “sweating” and possible corrosion of cooled metal surfaces. Warm water may not permit beginning a test at 25°C or lower.

EM-2800

Dimensions:	Depth 183 cm (60 in), Width 76 cm (30 in), Height 153 cm (60 in)
Weight:	160 kg (350 lbs)
Additional Power requirements:	Main Furnace power supply voltage: 208-240 VAC (rated for 100A), 50/60 Hz Voltage taps may be changed to 208V or 240V, if necessary Pump: 220–240 VAC outlet (rated for 15A) (separate)
Laboratory requirements:	Liquid Nitrogen: 1 L/day in a small hand-held dewar flask, manually poured into the LN ₂ receptacle. Purge gas ^{1, 2} : Argon is required (supplied by customer); preferred source: gas cylinder. Two stage regulator with second stage: 40–50 psi maximum rating required. Maximum delivery pressure: 45 psi. Operation in air or moisture bearing atmosphere is not permitted. Hose (supplied by customer): Rubber/Tygon tubing, minimum inside tubing diameter of 6 mm (or equivalent), minimum pressure rating of 100 psi (7 bar). The customer is required to make all hose connections.
Cooling water and drain:	Minimum inlet pressure to the instrument: 40 psi; Maximum inlet pressure 80 psi Nominal flow rate: 4–5 L/min. Varies with inlet pressure Permissible water temperature 15°C to 30°C, optimum 20°C. Air temperature/relative humidity: non-condensing at 15°C.
Vacuum (supplied by customer; required)	Mechanical vacuum pump: Minimum 100 lpm, 10 ⁻³ torr (port blanked off)

1. The instrument has provision for the collection of the effluent purge gas, which may be collected and piped away at the customer's option. Containment of the exhaust is recommended if noxious or poisonous gases are released by the specimen when heated.
2. Improperly regulated, pulsating, or poor quality purge gas may cause irregular or erratic equipment 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.

TA Instruments Offices

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