Established 1981
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SECTION 1
INTRODUCTION AND SPECIFICATIONS

1-1 MANUAL INTRODUCTION

The information provided in this manual is intended to assist in the installation and normal operation of the TP0412A ThermoStream® System. It is essential to follow the precautions and procedures presented here for maximum system performance and reliability.

Throughout this manual, the terms "gas" and "air" will be interchanged when the discussion pertains to the flow of the stream medium. The term "gas" in this instance should not be confused with the refrigerant used in the refrigeration system, but should be understood to be either dry nitrogen or dry air.

A four part reply card is provided in Appendix D. Please take the time now to complete and return one for our records. Thank you in advance for your cooperation in this matter.

1-2 SYSTEM DESCRIPTION

The TP0412A ThermoStream® System is a high capacity, microprocessor-based, modular, thermal inducing system designed to provide a controlled thermal environment for testing electronic components, modules, and small circuit boards at temperatures between -70°C and +200°C.

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+ WARNING +
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The test fixture may require special considerations to accommodate the temperature range of this system.

This system is comprised of four basic components, See Figure 1-1. A microprocessor-based temperature controller (1) which may be positioned away from the other components, allows the desired test temperature to be input and gives a digital readout of the gas stream temperature. A secondary heat exchanger (2), a cascade refrigeration system, to cool the gas stream on its way to the primary heat exchanger. A power controller unit (3) distributes all ac and dc power to the other assemblies and accessories as well as provides gas flow indication and control. The primary heat exchanger (4) houses the heater and directs the stream of temperature controlled dry gas at the device under test (DUT). It also supports the optional ThermoCaps which interfaces to the tester and the enclosures used to encapsulate the DUT.

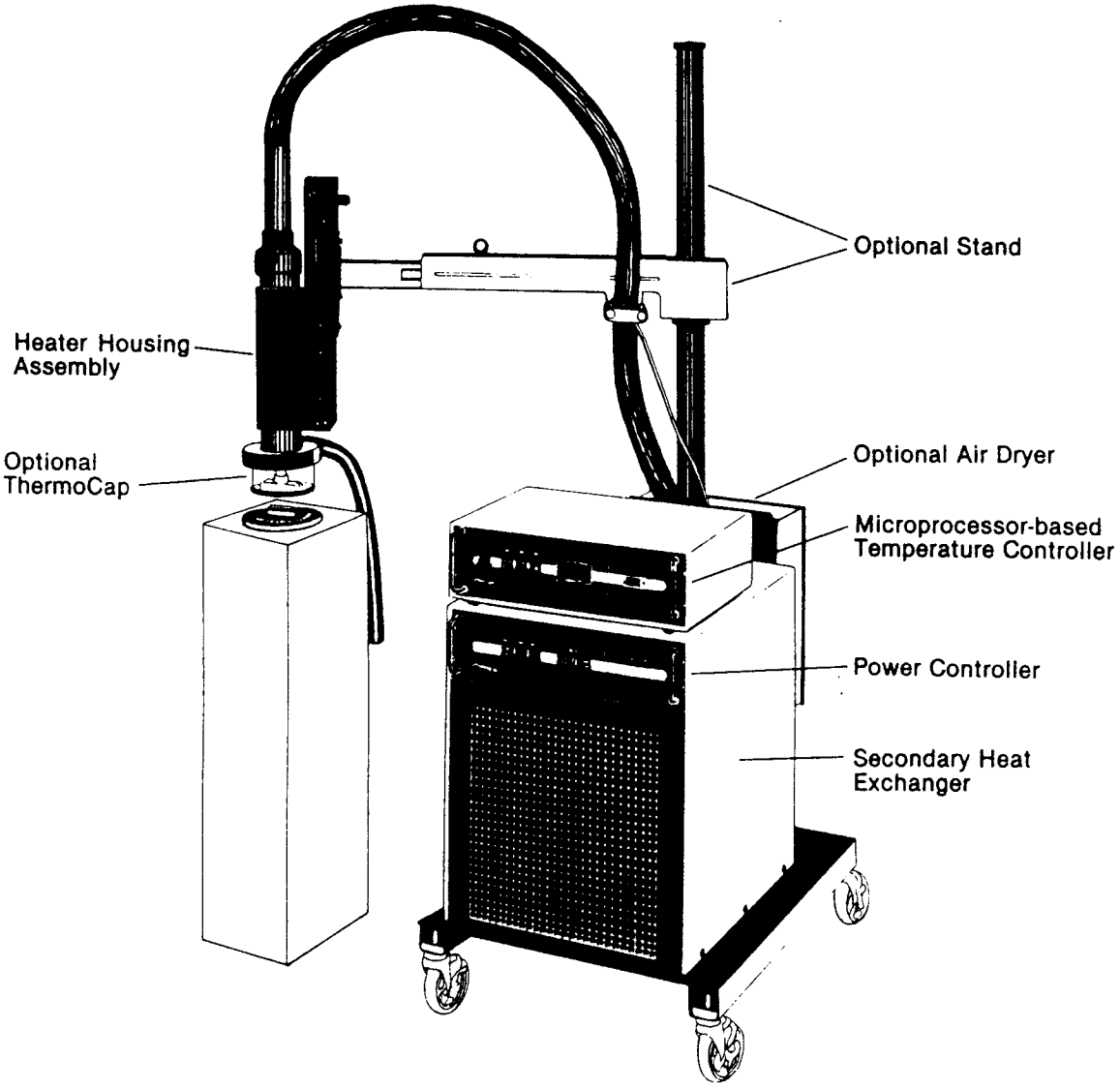

Figure 1-1. Typical TP0412A ThermoStream^{R} System

The system is self-contained; however, the user must provide necessary electrical power and a dry gas source. The gas source may be dry nitrogen (N_2). Compressed air is acceptable, however, if conditioned to -60°C dew point and prefiltered to remove any contaminates which may cause damage to either the DUT, tester, or system. If no dry gas source is available, the optional air dryer (See Appendix B-2) must be installed between the gas source and the system.

1-3 STANDARD SYSTEM FEATURES

The TP0412A ThermoStream System is equipped to provide the following:

- Wide temperature range: -70°C to +205°C at 5 liters/sec (10SCFM)
- Less than 90 seconds transition time, dry gas stream temperature only, between temperature extremes
- Unique thermal coupling to the DUT provides fastest transition times and highest accuracy for a given flow rate
- Microprocessor-based controller with internal diagnostic function and dedicated calibration mode
- "Overheat", "Out of Range" and "At Temperature" indications
- Built-in safety features such as resettable circuit breaker and independent heater case temperature sensor
- Dual air/gas flow system for both rapid temperature change and gas conservation while holding the DUT at test temperature
- Resettable overheat protection
- Adjustable (2 to 10SCFM) air flow rate with BAR-LED flow readouts in both SCFM and liters/second
- Design permits flexibility in the location of various components to best suit the user's space, operation and environmental conditions
- Self-contained refrigeration system provides all necessary cooling for dry gas medium, eliminating the need for liquid nitrogen or CO_2 to assist in cooling.

- Non-breakable, easily oriented shrouds (enclosures) available for most component package configurations as well as for small circuit boards.

- Double wall Thermal Cap enclosing the test site surfaces prevents condensation or frost under normal environmental and testing conditions.

- With the optional stand, the primary heat exchanger may be rotated ±90° from a center position allowing 180° freedom of air flow direction. With minimal effort, this center position may be re-adjusted, enabling a different quadrant to be covered.

Refer to Section 1-5 for a listing of the available standard options and accessories.

1-4 SYSTEM SPECIFICATIONS

Temperature Range:
-70°/+205°C (1 to 5 liters/sec. or 2 to 10SCFM).
[OVERHEAT pre-set at +210°C]

Temperature Accuracy:
±2°C or ±2%, whichever is greater, within the system operating range (limits)

Temperature Repeatability of Component:
±0.5°C (provided same set temperature)

Temperature Stability of Component:
±0.5°C typical (provided same set temperature)

Controller Type:
PID (Proportional, Integral, Derivative) zero-cross AC

Input Gas Requirements:
+18 to +32°C (64 - 90°F) dry nitrogen or dry air
-57°C (-70°F) dew point supplied at 65psig.

Output Gas Flow:
1-5 liters/sec (2-10SCFM)

Electrical Source: (For systems manufactured prior to System S/N 8412882: 220vac, 30 amp service with receptacle for Hubbell twist lock connector (Hubbell P/N 2620).

For systems manufactured after System S/N 8412882: 220vac ±20v, 20 amps at 50/60 hz service with receptacle for Hubbell twist lock connector (Hubbell P/N 2321).

Dimensions:

	Width		Height		Depth		Weight	
	cm	(in)	cm	(in)	cm	(in)	kg	(lbs)
Controller	48.9	(19.25)*	15.2	(6.0)**	34.3	(13.5)	7.7	(17)
Htr. Ass'y.	8.9	(3.5)	62.9	(24.75)	--		--	
Refrig.	48.9	(19.25)*	58.4	(23.0)	59.7	(23.5)	86.2	(190)
Thermal Cap	10.2	(4.0)	9.5	(3.75)	--		--	

*Diameter
**Length