

Thermal Chucks—H1000 Series

Specifications

Introduction

Micromanipulator's H1000 Series Thermal Chuck System is an integrated system to maximize your options. Choose a Thermal Chuck *and* a Temperature Control System (operate either an AC or DC Heat Controller). Next choose desired heat exchanger (cooling to ambient or rapid cooling of the thermal chuck below the cool setpoint). Then choose the Cooling Unit (either above ambient with user-supplied cooling water or rapid cool down to 0° C). This specification sheet features the Thermal Chucks used with this system.

The H1000 and HC1000 Thermal Chuck Systems consist of a Thermal Chuck and Temperature Control Equipment. The thermal chuck is the device under test (DUT) interface for temperature control and electrical signal connections.

Features

- The H1000 series of Thermal Chucks are all capable of -65° C to + 400° C operation. Upgrading temperature control equipment may be accomplished without replacing the Thermal Chuck.
- The H1000 Thermal Chuck is available in three different configurations to provide the correct electrical interface between the DUT and the measurement equipment.
 - Coaxial
 - Advanced Coaxial
 - Triaxial
- The H1000 Thermal Chuck design includes a fluid-cooled heat shield that surrounds the sides and bottom of the thermal chuck.
- Protects personnel from accidental burns.
- Shields probe station hardware from heat radiation that can cause thermal stress of positioning components.
- The thermal chuck cooling hoses have quick connect fittings for easy installation and removal. The

hose fittings on ambient and 0° C systems have fittings with internal seals that prevent coolant leakage.

- The H1000 Thermal Chuck system design employs our advanced kinematic mount that minimizes vertical temperature expansion of the chuck assembly.
- The H1000 Thermal Chuck contains a cast-in heating element and cooling duct for very efficient heating and cooling.
- The H1000 Thermal Chuck is available with lift pins that raise the wafer for loading and unloading.

Specifications

Performance

Temperature uniformity:

- 65° C to +15° C: ± 2.5%
- +15° C to +50° C: ± 0.5%
- +50° C to +150° C: ± 1.25%
- +150° C to +350° C: ± 1.5%
- +350° C to +400° C: ± 2.0%

Vertical expansion:

Less than 10µm /100°C

Electrical isolation:

- Coaxial surface to ground:
 - > 100 Gohm @ 25°C
 - > 1 Gohm @ 400°C
- Advanced coaxial surface to ground:
 - > 5 Tohm @ 25°C
 - > 5 Gohm @ 400°C
- Advanced coaxial surface to guard (see note 1):
 - > 5 Tohm @ 25°C
 - > 5 Gohm @ 400°C

- Triaxial surface to ground (see note 1):
 - > 10 Tohm @ 25°C
 - > 10 Gohm @ 400°C
- Triaxial surface to guard:
 - > 5 Tohm @ 25°C
 - > 5 Gohm @ 400°C

Note 1: The Advanced Coaxial configuration may be wired triaxially with a Model 101 adapter.

Capacitance:^[1]

- Coaxial surface to ground:
 - 4" ≤ 100 pF 6" ≤ 150 pF
 - 8" ≤ 200 pF 12" ≤ 500 pF
- Triaxial surface to ground:
 - 4" ≤ 75 pF 6" ≤ 100 pF
 - 8" ≤ 150 pF 12" ≤ 500 pF

^[1] In a proper probing environment

Electrical noise floor:^[2]

- Advanced coaxial:
 - < 12 fAp-p @ 25° C
 - < 250 fAp-p @ 200° C
 - < 3 pAp-p @ 400° C
- Triaxial:
 - < 10 fAp-p @ 25° C
 - < 140 fAp-p @ 200° C
 - < 2 pAp-p @ 400° C

^[2] In a properly shielded environment

Physical data

- Flatness: ± 25µm over the entire temperature range
- Size:

	Diameter	Thickness
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12"	13.25" (33.6cm)	2.36" (6cm)
8"	8.75" (22cm)	2" (5cm)
6"	6.50" (16.5cm)	2" (5cm)
4"	4.50" (11.4cm)	2" (5cm)

- Weight:

	Coax	Triax
12"	8.75 lb (4 kg)	10.25 lb (4.6 kg)
8"	8.75 lb (4 kg)	10.25 lb (4.6 kg)
6"	5.25 lb (2.3 kg)	6.25 lb (2.8 kg)
4"	4.25 lb (2 kg)	4.75 lb (2 kg)



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Specifications subject to change without notice.