ESPEC CORP.

# Air-to-Air Thermal Shock Chambers

*Innovative direct-drive lift system for reliable transfer between hot and cold zones*

# ESPEC Thermal Shock chambers are standardized products specially designed for component-level testing.

*Standard TS-CON is easy to understand and program. No confusing indicators, no special knowledge needed to operate. Artificial Intelligence (AI) function can automatically select the optimum preheat/precool for each test load.*

## High-tech TS-CON controller for time-saving operation

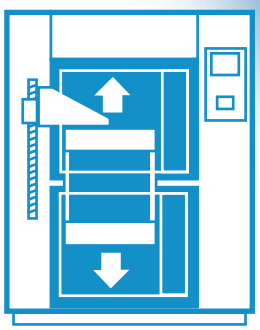
The dedicated artificial intelligence (AI) controller gives you flexible selection of the best preheat/precool temperatures for optimum performance. This feature will save you many hours of trial testing to find the proper settings for each load size.

A thermal shock chamber must reach the desired temperatures in each zone prior to the start of testing, but the time required for this preparation varies according to the conditions and load, making it almost impossible to automate. Our AI controller automatically calculates the test preparation time. All you need to do is select a test and press the test start key. The AI controller automatically completes the test preparation and then starts the test.

Programmability includes four tests already in ROM, with up to 30 more storable in RAM memory. Each test can be given a ten character name for easy reference. Programs can choose proper sensor thermocouple. Explanation key provides help with functions and alarms. You can also preselect restart modes after a power failure.

## Worry-free mechanism for zone-to-zone transfer

An electric screw drive transfers the basket carrier between hot and cold zones. The lift system moves on guide rails with carrier arms extended through slots in the side wall of the hot zone, ensuring the integrity of the cold zone. The basket carrier is supported from the carrier arms. This lift system provides a heavy duty mechanism for transfer without the associated problems of cables, pneumatic cylinders, or complicated guides.



- **The latest ozone-friendly non-CFC refrigerants are used. No phase-out dates.**
- **Zone-to-zone transfer mechanism requires no compressed air utilities.**
- **Thermal break on cold zone door and door frame deters external frosting.**
- **Reliable refrigeration design with extremely durable Copeland Discus compressors.**


## HIGH LOAD CAPACITIES AND FAST RECOVERY TO MEET STRINGENT TEST REQUIREMENTS

A range of refrigeration systems are offered to match your test requirements. Performance of each system is optimized by precooling the chamber below the desired condition, allowing a faster recovery. An additional thermal mass is built into the cold zone to store cold energy, maximizing the precooling cycle while the test carrier is in the hot zone.

The hot zone has a similar preheat mode while the carrier is in the cold zone. The preheat/precool temperature amount can be set manually or selected automatically by the AI function. The net result is a system that optimizes the thermal shock effect on your test samples.

All ESPEC thermal shock chambers are tested to meet MIL-STD 883C 1010.7, the most difficult test because it specifies the recovery of the worst case sample. Using IC chips with embedded thermocouples, ESPEC thermal shock chambers are tested for the temperature recovery of samples in multiple locations.

| Capabilities | ETS4-1SW | ETS4-2SW | ETS4-3SW | ETS13-3SW | ETS13-5SW |
|---|---|---|---|---|---|
| Hot zone testing range | 60° to 200°C (140° to 392°F) | | | | |
| Cold zone testing range | -75° to 0°C (-103° to 32°F) | | | | |
| Temperature constancy | ±1°C (±1.8°F) after recovery | | | | |
| Refrigeration system | 5 hp x 2 | 7.5 hp x 2 | 15 hp x 2 | 15 hp x 2 | 30 hp x 2 |

**Performance (MIL-STD 883C 1010.7)**

| | | | | | |
|---|---|---|---|---|---|
| Test range | -55°C to 125°C | -65°C to 150°C | | | |
| Recovery time | 15 min. load recovery | | | | |
| Test load | 30 lbs. ICs | 20 lbs. ICs | 40 lbs. ICs | 20 lbs. ICs | 40 lbs. ICs |

**Dimensions**

| | | |
|---|---|---|
| Capacity | 105L (4 cu. ft.) | 365L (13 cu. ft.) |
| Carrier (WxDxH) | 508mm x 508mm x 457mm (20"x20"x18") | 711mm x 838mm x 610mm (28"x33"x24") |
| Basket (WxDxH) | 482mm x 482mm x 25mm (19"x19"x1") | 711mm x 813mm x 25mm (28"x32"x1") |
| Exterior (WxDxH) | 1.7m x 2.4m x 2.1m (68"x96"x84") | 1.9m x 2.7m x 2.4m (76"x107"x93") |

**Site Requirements**

| | | | | | |
|---|---|---|---|---|---|
| Power supply | 460V 3Ø 60 Hz | | | | |
| | 60A | 80A | 110A | 110A | 200A |
| Cooling Water (24°C/75°F) | 7 GPM | 9 GPM | 18 GPM | 18 GPM | 32 GPM |
| Condensate drain | Two 0.5" FPT connections to open drain | | | | |
| Compressed air | 6 SCFM, 80 to 120 psi | | | | |

## OPTIONS

Six dot strip chart recorder - 100mm or 180mm
Four pen circular chart recorder - 12" diameter
IEEE-488 or RS-232 interface - allows computer operation
Traveling cable port - to run cables to samples
Additional baskets - adjustable
Heavy duty shelves - for large samples
Nitrogen purge - in lieu of dry air purge
$LN_2$ boost/back-up - for added performance
Special voltage - 200/380/415/575
Remote air cooled - in lieu of water cooling

## STANDARD ACCESSORIES

Electrical power disconnect
One sample basket (adjustable)
Dry air purge - extends time between defrost cycles
Overheat/overcool protectors
Run time meter
Controller and operation/maintenance manuals
Silencer package (except ETS4-1SW)

**Contact ESPEC for details or a quotation on any of the above at 800-537-7320.**

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