Thermoelectric Air Conditioner CLT110~240-0700

700W, TEU Type, 12U Size

- 700W cooling
- Heating provides climate control
- 110-240V AC and 24V DC power options
- Variable mounting orientation
- For 12U racks only

Description

Designed to cool 19-inch rack mounted electronic and electrical equipment, COOL Portable Air Conditioning units deliver a robust solution to keeping computer servers, telecom and satcom equipment, recording instrumentation and other systems working at their optimum, providing a convenient method of delivering cooling and heating in extreme environments and remote locations.

The Thermoelectric Unit (TEU) design utilises solid-state Peltier-effect cooling and heating and provide a complete air conditioned and heated transit solution that is both efficient and highly reliable.

CP Cases COOL units deliver air conditioning and climate control for use in 19-inch racks and can be applied either as a COOL-COLLAR™ or as an integrated unit, providing a one-stop-shop for rack mount cases to maintain equipment's optimal operating conditions. All offerings can be fitted with accessories including stowage pouches, wheel kits, pressure relief valves and humidity indicators.

COOL-COLLAR™

COOL-COLLAR™ is an air conditioning capability for 19-inch racks that utilises patented sealing systems to create an airtight and waterproof fit to allow the unit to function in extreme conditions. The unit is attached to an existing rack to maintain an optimum operation temperature for equipment.

Where a greater cooling requirement is needed, two COOL-COLLARs™ with AC units can be fitted to both the front and rear of the rack. Units are available up to 340W that can be fitted to 6U, 8U, 10U or 12U racks and collars.

Integrated Units

Built directly into the rack system, these climate control units provide cooling and heating, when required, automatically when temperature perimeters are met. Normally end-mounted, CP Cases offer the capability to integrate in a range of orientations to fit client requirements.

CP Cases Limited, Unit 11 Worton Hall Industrial Estate, Worton Road, Isleworth, Middlesex TW7 6ER, United Kingdom
Tel +44 (0)20 8568 1881 | Fax +44 (0)20 8568 1141 | Email info@cpcases.com | www.cpcases.com

COOL Portable Air Conditioning TEU Units CLT110~240-0700

Specifications

Cooling Capacity	700W	
Type	Through-mount thermoelectric climate control unit	
Power	110V to 240V AC at 50Hz to 60Hz; 22V to 24V optional	
Power Requirements	7.2A (initial) 5.6A (after 8 mins) AC 60A (initial) 46A (after 8 mins) DC	
Power Cable	AC; IEC C14 connector socket. DC; 1m flying lead, no plug. Fitted cold side. Customer option to fit to hot side.	
Operating Range	-10°C to +45°C	
Housing	Aluminium with powdercoat finish.	
Colours	Desert sand as standard; other colours are available on request.	
Size	593mm H X 508mm W x 250.5mm D	
Weight	38kg	
Warranty	1 year, return to factory UK.	

Performance Graph

Thermoelectric Air Conditioning units are generally rated in watts and is a measure of the energy that is removed by the system.

However, this rating is particular to the performance of the unit under a specific set of conditions:

- Ambient temperature: The temperature of the air external to the enclosure.
- Delta temperature (delta T): The maintained difference in temperature between ambient air and the return air in the cooled enclosure.

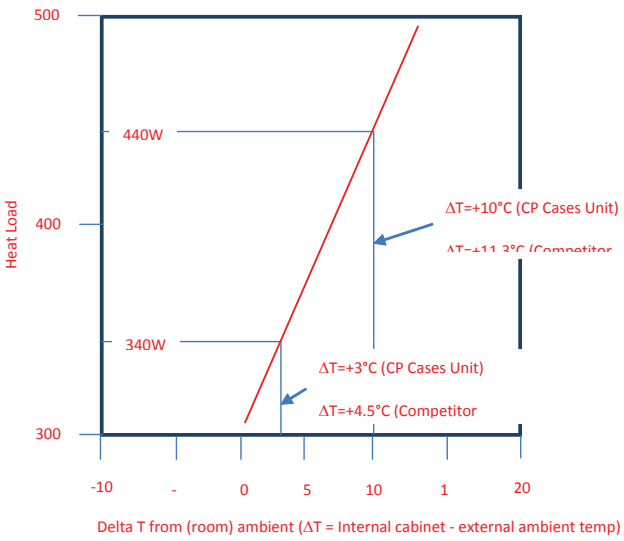
For example, COOL Portable Air Conditioning unit has a rating of 340W. This has been measured in a controlled ambient temperature of 30oC, with a delta T of +3oC.

This measurement has been taken back-to-back with an alternative manufacturers unit rated at 440W which could achieve a delta T of only +4.5oC under the same conditions.

A series of controlled measurements enable the delta T that the unit can maintain with a load of 440W to be accurately predicted as +10oC. The alternative manufacturers unit rated at 440W which could achieve a delta T of only +11.1oC under the same conditions.

Predicting the performance of TEUs in real-life applications is somewhat more difficult. The straight-line performance prediction is subject to a degree of error for aggressive negative delta T requirements, and requirements are often expressed over a wide range of ambient air temperatures. More importantly the airflow characteristics for a specific application make a significant contribution to cooling capacity. Rack mounted units have different sizes, and different configurations for internal cooling features, e.g. fans and heat-sync modules.

The published manufacturers rating for TEUs is a useful guide to cooling performance, but direct comparison between units is often not straight-forward. For complex mission-critical applications professional advice should be taken.



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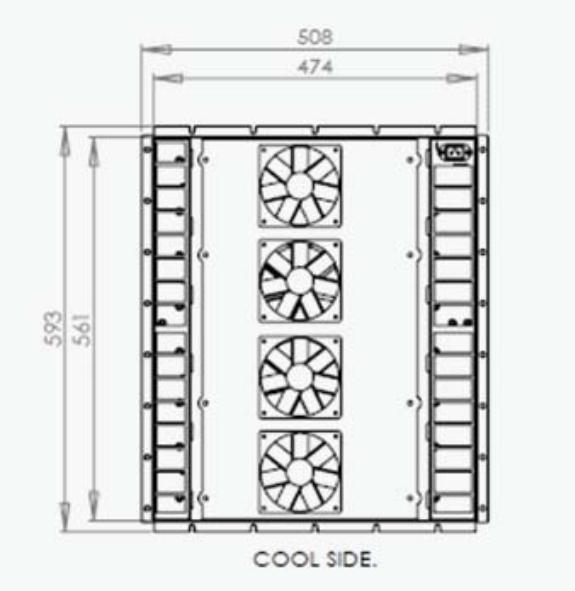
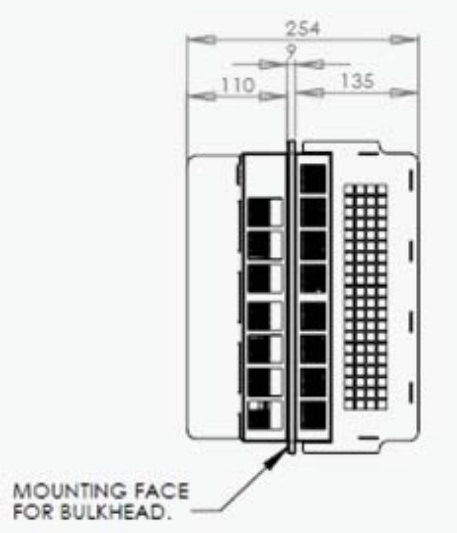
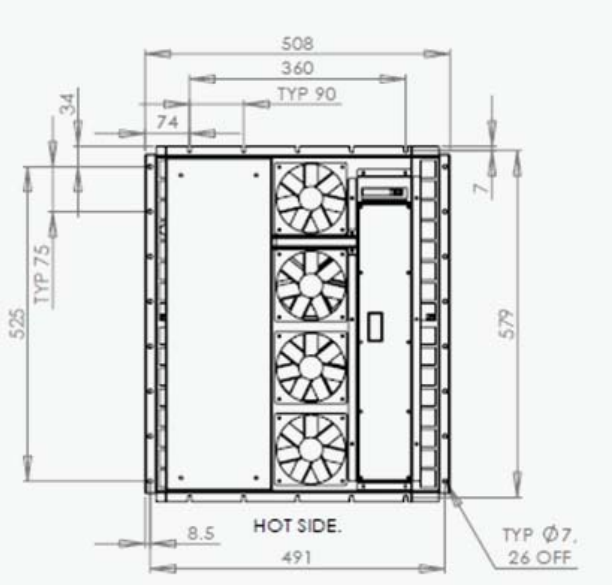
Drawings







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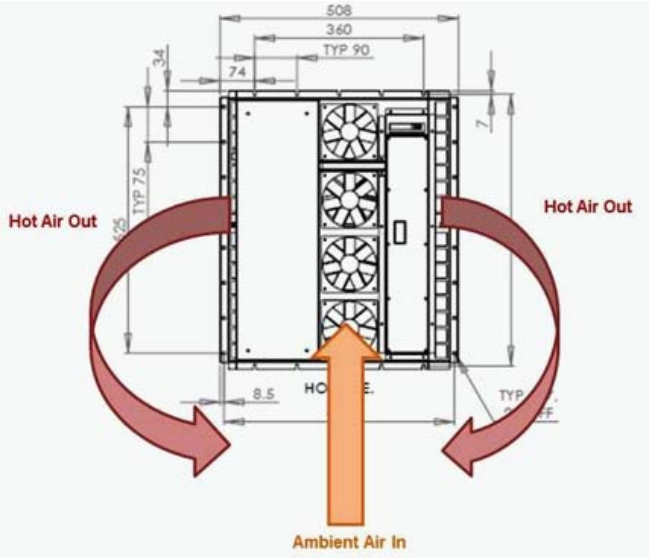
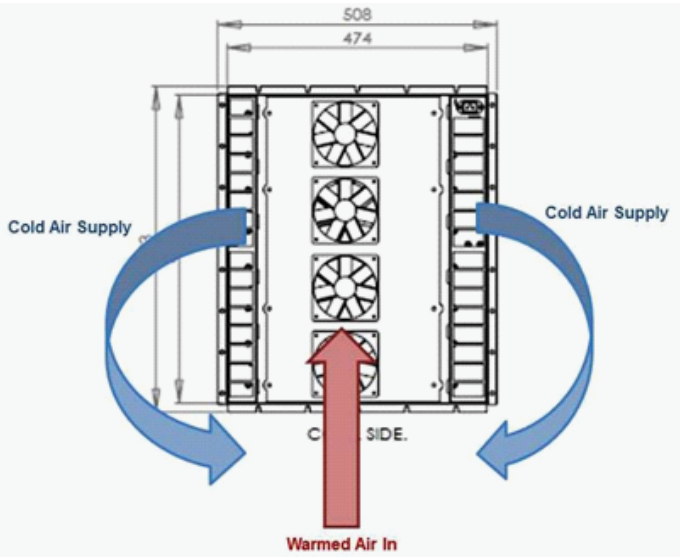
TEU Airflow

The 700W TEU does not provide a high flow rate of cold air; applications need to be assessed carefully to ensure that the cold air provided by the unit is not:

- Impeded significantly by the arrangement of the equipment;
- In conflict with the airflow created by internal fans of the equipment.

The diagrams below identify the direction of airflow on the hot (ambient) side, and the cold (inside) side.





This configuration is optimised for equipment that has air intakes at the sides, and exhausts hot air from the rear (e.g. the majority of CISCO switches).However, some applications, and in particular bespoke military electronics, have equipment with very different intake and exhaust configurations. It is extremely difficult to predict airflow interactions, and the efficacy of the TEU airflow in a complex application environment. It is recommended that if performance is in doubt, testing is conducted with the real equipment.

If testing can be conducted, and demonstrates a problem with airflow, the following solutions are available:

Fan flow reversal

The direction of the internal fans can be reversed to provide a supply of cold air from the central fans. This has an impact on the efficiency of airflow over the internal heat sink, resulting in a reduction in performance of 10 – 20%, so should be approached with caution, but may be a solution in a limited number of cases.

Air ducting:

Deflectors and ducting can be introduced into the case to enable cold air to be delivered to the required location, but due to the low airflow rate from the TEU, this should only be implemented as part of a testing and development programme with no guarantee of results.

TEU Heating Mode

The TEU automatically works in reverse to heat the inside of the case when the temperature drops below the allowable deviation (the dead band) from the target temperature within the rack (the set point). This function is enabled as standard, but can be disabled to suit a customer application.

The TEU heating mode is less efficient than cooling mode, but can provide up to 250W of heating capacity.

Test Standards

The following testing is planned for all variants:

Unit Integrity:

- IP Rating: Testing to prove the IP Rating claims made for each unit – used globally
- NEMA 4: Testing to prove the watertight integrity for each unit – US market driven.
- Military Specifications: MIL-STD 810 and DEF STAN testing, against a range of parameters.

Unit Safety:

- CE Marking (LV directive & EMC directive):

o Analysis and testing required by law for all electrical items for sale in the EU.

Unit Cooling (& Heating) Performance:

- Testing to prove the cooling and heating performance claims for the units.

EMC Shielding Performance:

- Testing to prove the efficacy of EMC output data.