

COOL Portable Air Conditioning®

cp cases 

COOL




PORTABLE
AIR CONDITIONING®

Introducing COOL Portable Air Conditioning®

COOL products provide the temperature control required to protect sensitive components from extreme climates where excessive high or low temperatures will prevent electronics from functioning and potential failure in critical conditions.

Thermoelectric (TEU) and Vapour Compression Cycle (VCC) technologies are available

Organisations around the world are often working in remote and hostile locations, engaged in essential work using COTS (Commercial Off The Shelf) electronic equipment in typical temperatures ranging from +55°C to -20°C. COTS equipment is often the preferred choice because of price and up to date technology – however, COTS equipment is designed for commercial applications, where optimal working temperatures may vary between +5°C to +35°C. When outside this typical temperature range, the equipment will thermally trip out in higher temperatures and often fail to work in temperatures lower than freezing. For many commercial and military applications, temperature extremes are often met – and keeping critical electronics working is paramount.

CP Cases' range of COOL Portable Air Conditioning units has been designed to provide a simple, effective solution to the above issues and to deliver a climatically controlled environment for COTS electronics – and within the manufacturers operating guidelines.

COOL products are designed to fit within the confines of 19" transit enclosures including both CP Cases' Amazon Racks and ERack ruggedised transit racks, COOL products can either be installed in a detachable 'COOL Collar' which is a clip on fit to the rear of the 19" transit rack body, or can be mounted directly onto a bulkhead panel within the rack body. Either way – the electronic equipment is then climatically controlled.

The advantage of mounting the AC into a detachable COOL Collar is twofold:-

- 1) The AC installed in a COOL Collar can be rapidly detached for applications in benign environments where AC is not required – allowing the COTS equipment to work in non-extreme ambient temperatures.
- 2) The ease of handling and transporting 19" transit enclosures loaded with electronics without the additional weight of the AC unit. When applications demanding AC are required, the COOL Collar with AC installed travels separately from the electronics enclosure, and is only attached (with quick action latches) when operating conditions require.

CP Cases and COOL provide a one-stop-shop for 19" rack mount ruggedised transit cases complete with air conditioning to maintain equipment's optimal operating conditions. All transit rack enclosures can be fitted with accessories including stowage pouches, wheel kits, pressure relief valves and humidity indicators.

COOL's portable climate control systems, operating from AC or DC power, are designed to provide a convenient and reliable method of delivering cooling and heating in extreme environments and remote locations. Standard and customisable systems are available, in both Thermoelectric and Vapour Compression Cycle air conditioning formats.

CP Cases' Amazon Racks and ERack systems do an excellent job of protecting essential electronics and other equipment from harsh weather conditions as well as contamination from dirt, dust and sand. Racks are rated IP65 and accredited to MIL STD 810G.



Thermoelectric Unit (TEU)

COOL Thermoelectric Unit (TEU) is a dependable, solid state climate control system designed specifically to provide a convenient method of delivering cooling and heating in remote locations.

TEUs operate on the thermoelectric or Peltier principle where DC voltage is applied to a solid state electronic assembly; one side of the junction cools and the other side becomes hot. Cooled air from the TEU is forcibly directed onto the electronic equipment via a distribution plate and axial fans, and warm air returning from the equipment is ducted back through the plate into the TEUs and a closed circuit is maintained. The return-air temperature is measured and when the temperature cools down sufficiently to reach the user

determined set point on the thermostat, the TEU switches off, while the circulation fans remain on.

Other than fans, there are no moving parts, and a drain vent on the hot side, allows any condensate that collects during the operation of TEU to drain away. The drain vent is set up with a short length of flexible plastic hose to 'run to ground' via a one way duck bill valve.

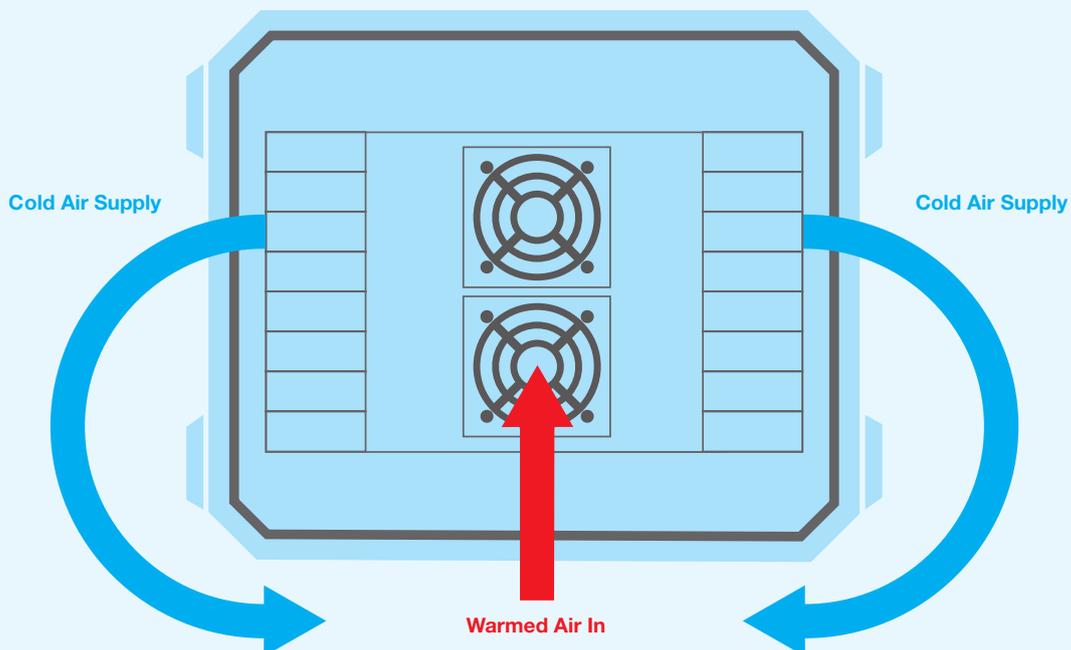
Climate Control

By controlling the polarity of the input, TEU acts as a 'Climate Control' system and delivers hot or cold air as required, relevant to the ambient air temperature. A digital controller can be set to customer specific hot/cold requirements and a digital read out displays the operating temperature within the climate controlled enclosure.

-  **Solid state**
-  **Not sensitive to orientation**
-  **Compact and robust construction**
-  **Long lifetime**
-  **Low maintenance**
-  **Climate control**
-  **No liquid refrigerant**
-  **No brownout during voltage fluctuations**
-  **Closed loop system where climate controlled AC does not mix with ambient air**

Thermoelectric Air Conditioning

View from equipment side within 19" enclosure looking towards air conditioning unit indicating airflow



Vapour Compression Cycle System (VCC)

The Vapour Compression Cycle (VCC) system is a compressor based portable air conditioning device engineered to provide high level, efficient air conditioning in remote locations, while meeting the demands of defence and civil operations in extreme environments.

The VCC system consists of an evaporator section that provides cold air into the 19" ruggedised enclosure - a vapour compression unit and a condenser section where the heat from the enclosure is expelled from the unit into the ambient. The closed loop system is supplied with an external drain system to allow for extraction of any condensate from the cooling process. The heart of VCC is the digital controller that drives the entire system. The controller operates and manages the evaporator fan system and controls the compressor.

Tetrafluoroethane, an environmentally friendly refrigerant commonly known as R134a, is circulated around the cooling circuit and heat is transferred to the refrigerant and is then, in turn, expelled at the condenser section. Fans extract the heated air out of, and away from, the condenser section. Initially, both fans will operate at low speed; however, if the temperature, and therefore, system pressure, rises to a sufficient level, the fans will automatically step up into their higher gear to operate at optimum speed. This feature enables reduced power consumption and a reduction in external noise when full power is not required.

The drain vent enables a short length of hose to be fitted to the system so that any water that collects during the operation of the VCC unit can be extracted from the system and be piped away into a suitable container.

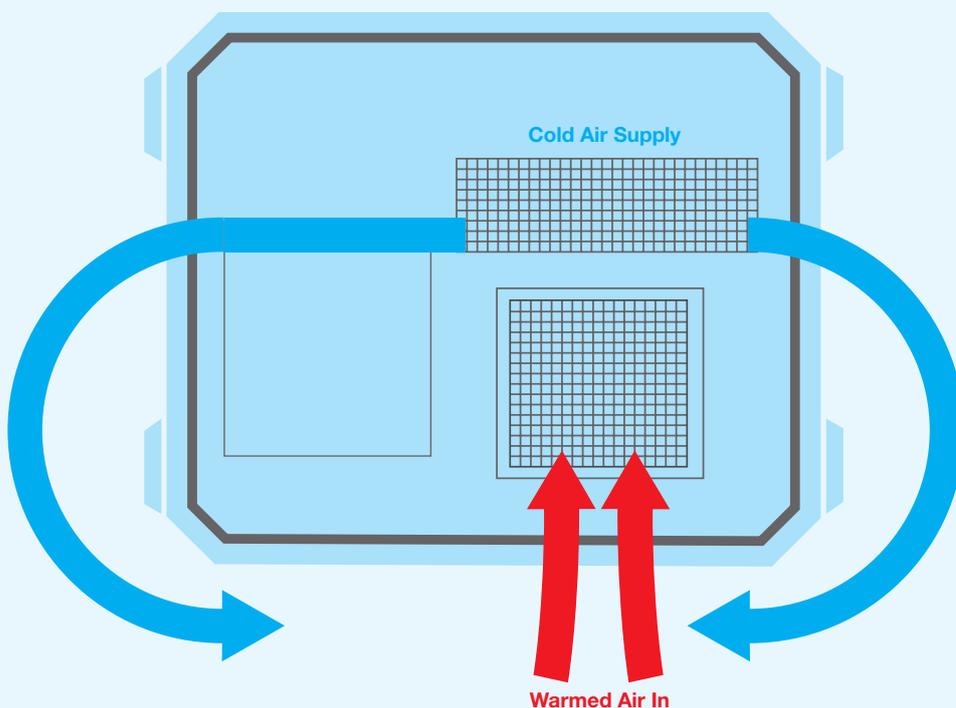
Heating option is available when specifying the VCC unit

Low profile silicone heater mats of varying outputs (200W-1000W) can be installed under the electronics. These are adhesive bonded to the thermally insulated floor of the enclosure, and controlled by the digital controller – which engages and disengages the heater when preset temperatures are reached. Temperature settings are user changeable.

-  **Highly efficient**
-  **Uses R143a – an environmentally friendly refrigerant**
-  **Closed loop system where climate controlled AC does not mix with ambient air**
-  **Robust construction**
-  **Easy to operate**
-  **Low maintenance**
-  **Automatically adjusts to high demand**

VCC Air Conditioning (installed in COOL Collar)

View from equipment side within 19" enclosure looking towards air conditioning unit indicating airflow



Chilled air from the cold output grille can be ducted to specific areas in the enclosure to maximise the effect of the air conditioner.



Amazon Features

- ◆ MIL STD 810G and IP65 accredited
- U Sizing – available from 4U to 14U with various standard 19-inch inner chassis depth options
- Stacking – all racks have positive stacking, aligning at the front face
- BS DIN Standards – internal rack chassis conforms to BS5954 / BS EN 60297 / DIN 41494
- COOL-COLLAR™ – bolt-on air conditioning unit available
- + Easily customised to meet application requirements, with many options and accessories available

ERack Features

- ◆ MIL STD 810G and IP65 accredited
- U Sizing – available in 3U to 18U with various standard 19-inch inner frame depth options
- Stacking – all racks have positive stacking, aligning at the front face
- BS DIN Standards – internal rack chassis conforms to BS5954 / BS EN 60297 / DIN 41494
- Lightweight aluminium monocoque construction – easily customised
- EMC EMC compliant options
- COOL-COLLAR™ – bolt-on air conditioning unit available
- + Easily customised to meet application requirements, with many options and accessories available

See Amazon Cases and ERack brochures for full details on additional accessories.



COOL Portable Air Conditioning™ products currently available:

COOL part #	Capacity	Voltage	Rating	Accreditation (by customer)
CLT110~240-0340	340 W	100VAC/240VAC	Std Product	
CLT110~240-0340	340 W	100VAC/240VAC	IP55	Def Stan
CLT110~240-0340	340 W	100VAC/240VAC	EMC	Def Stan
CLT24~28-0340	340 W	24VDC/28VDC	IP55	Def Stan
CLT24~28-0340	340 W	24VDC/28VDC	EMC	Def Stan
CLT110~240-700	700 W	110VAC/240VAC	Std Product	
CLV240-1600	1600 W	240VAC	Std Product	
CLV110-1600	1600 W	110VAC	On Application	
CLV240-1600	1600 W	240VAC	IP55	Def Stan
CLV240-1600	1600 W	240VAC	EMC	
CLV24~28-1600	1600 W	24VDC/28VDC	IP55	Def Stan
CLV24~28-1600	1600 W	24VDC/28VDC	EMC	Def Stan



CP Cases Ltd Unit 11 Worton Hall Industrial Estate
 Worton Road | Isleworth | Middlesex | TW7 6ER | UK
 Tel: +44 (0) 20 8568 1881 | Fax: +44 (0) 20 8568 1141
www.cpcases.com V1 Created August 2017. E&OE.

