

Kinergetics Chamber Conditioning Unit

(CCU-06)



Introduction

The Divex Chamber Conditioning Unit CCU-06 has been designed for use in hyperbaric environments, both air and heliox, for temperature and humidity control. It is rated to depths of 500msw and form part of the extensive range of Divex hyperbaric environment conditioning equipment. The CCU-06 has been specifically designed for heating, cooling and dehumidification.

The unit may be mounted in any convenient space within the chamber where an even flow of circulating gas can be ensured, usually below chamber bunks. Flexible ducting may be added to the blower outlet to ensure adequate circulation or to direct circulation into the required areas. Interconnecting fluid supply pipework, shell stop valves, chamber temperature/humidity monitoring equipment and fluid temperature control systems are not specified as these will tend to be unique for each application. The end-user should ensure these items are provided and installed to acceptable standards.

Required Services and Consumables

Inputs to the Chamber Conditioning Unit, CCU-06 are heated fluid, cooled fluid and electrical power for the Blower Motor.

Main Components

Components contained in the Chamber Conditioning Units include:

Coil Assembly

Heating and cooling coils fitted to common end plates forming a single coil assembly, mounted inside the heat exchanger box. Chamber atmosphere first passes through the cooling coil and then through the heating coil.

Heat Exchanger Box

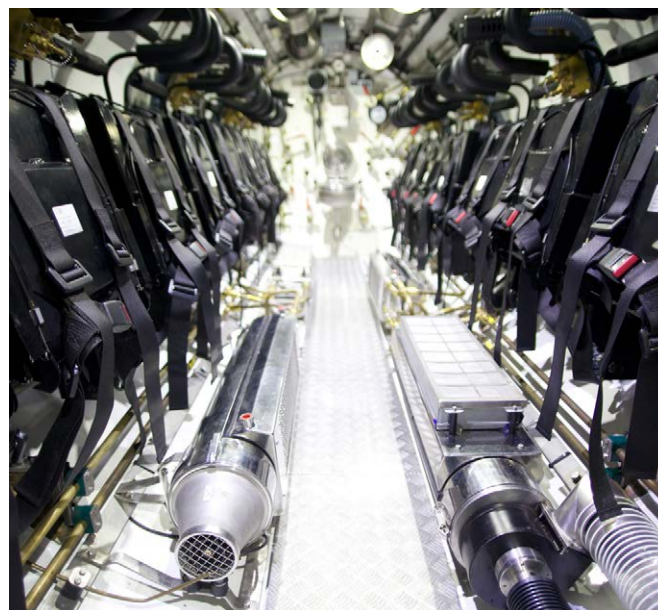
Encloses Heat Exchanger Assembly and includes hot and cold water connection ports and condensation drain ports for the CCU-06. Mounted onto Plenum or Duct Assembly.

Plenum or Air Duct Assembly

Positioned between the Heat Exchanger Assembly and the Blower Assembly and includes mounting brackets.

Blower Assembly

Produces the flow of breathing gas and includes electric motor.





Environmental Control for CCU-06 Cooling and Dehumidification

When cooling or dehumidification is required, fluid, usually cooled to $\pm 2^{\circ}\text{C}$, is directed through the CCU Chiller Coil.

The volume of fluid flow will determine the amount of cooling or dehumidification achieved (Note: the fluid flow control system is not included in this scope of work). Heat is transferred to the cooled fluid from the breathing gas as it flows through the heat exchanger. Moisture in the breathing gas will condense on the cooling coil fins and drain from the Coil Housing Assembly. When no dehumidification is required, the temperature of the fluid must be controlled to a point where condensation on the coil will no longer occur.

To ensure adequate drainage of condensate off the heat exchanger fin plates, the CCU-06 unit must be mounted in the horizontal plane. In this position, the fin plates are vertical and condensate will flow down, drip off the fins and can then be removed through any of the 4 condensate drain ports.

Heating

When heating is required, fluid, usually heated to $\pm 60^{\circ}\text{C}$, is directed through the CCU Heater Coil. When heated fluid passes through the heater coil, heat is transferred to the breathing gas as it flows through the Heat Exchanger. Additionally, breathing gas that has been cooled to remove humidity can be re-heated to the required temperature as it passes through the heater coil. Again, hot and cold fluid flow rates must be controlled to achieve this and this control may be automatic or manual.

Breathing Gas Flow

Breathing gas enters the CCU-06 through the wire mesh, moves across the cooling coil, then over the heating coil, through the blower and then is circulated back into the chamber.

Specification

General	
Electrical Requirements	24 VDC, $\pm 2\text{A}$
Air Volume Moved	Up to $2\text{m}^3/\text{min}$
Chilling/Heating Capacity*	500 W @ 0msw 4000 W @ 100msw 8000 W @ 300msw Heliox
Condensation Removal Rate*	Up to 0.2 ltrs/min
Cooling/Heating Liquid	25 ltrs/min
Requirements	Cold @ 2°C , Hot @ 60°C
Coil Construction	Copper fins, Stainless Steel tubes and end plates
Housing & Blower Assembly	Gr. 316 Stainless Steel
Heating/Chilling Fluid Ports	$1/2"$ NPT (F)
Condensate Drain Ports	$1/2"$ NPT (F) x 4 off
Coil External Pressure Test	65 bar (Hydro)
Assembly Leak Test	50 bar (Helium)
Mounting Orientation	Radiator fin plates in vertical plane for condensate drainage

* These are calculated values that need to be verified by testing in hyperbaric environments and are gas and depth dependant.



Order Codes

Kinergetics Chamber Conditioning Unit
(CCU-06)
KI40053

KI-MDS-570 R1