



New from Cooper B-Line is i-ACE, a side mounted intelligent heat exchanger unit designed to provide closed loop 20kW cooling duty.

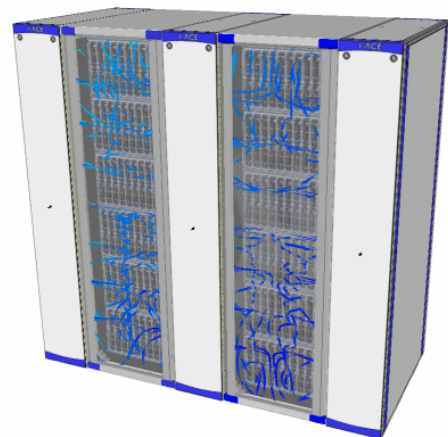
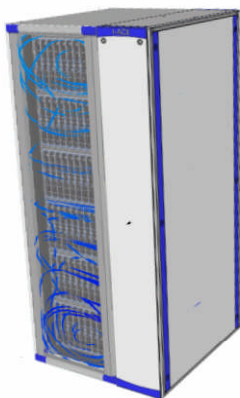
Using proven chilled water technology, i-ACE continues Cooper B-Line's philosophy of offering scalable solutions designed to grow with demand.

i-ACE has been designed as a 300mm wide module allowing two units mounted side by side to take up one 600mm wide floor tile space. The i-ACE unit cladding can be configured to provide either left hand or right hand mounted operation. This also allows users to opt to have the cladding configured to service two adjacent enclosures, providing 50% duty to each cabinet.



Features

- Modular upgrade to any 42U / 47U Access Cabinet with a depth of 1000mm or more.
- True 20kW Duty.
- 300mm wide foot print allowing two units to mount on a 600mm tile space.
- Single or dual cabinet configuration capability including N+1 redundancy.
- Option to integrate internal sensors to i-BOX to provide network configurable access and remote monitoring functionality.
- Hot swap-able fan units.
- Colour options (Black RAL 9005 with blue trim as standard)
- Aesthetic design that compliments the Access cabinet range.



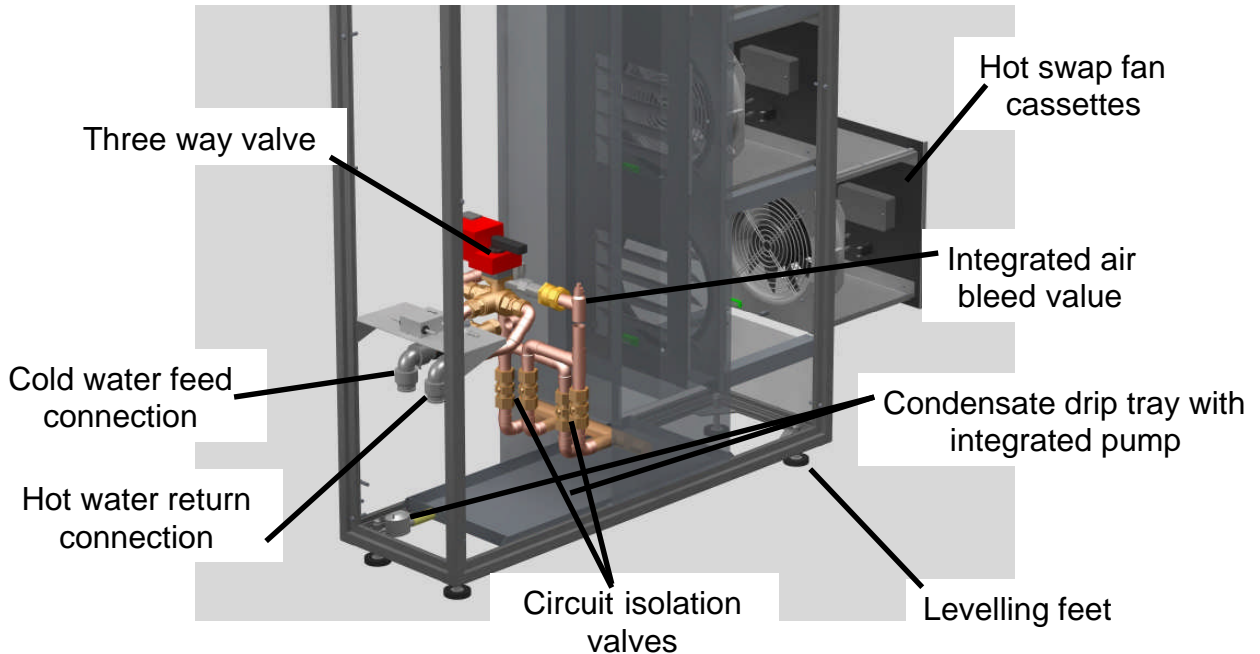
Benefits	<ul style="list-style-type: none"> ▪ Easy deployment with quick coupling connectors and flexible hoses. ▪ Optional installation and commissioning service. ▪ Fully compatible with 42U/47U height units and can be configured to suit 1000mm + depth cabinets. ▪ Efficient.
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Specification & Performance	<ul style="list-style-type: none"> ▪ Duty 20kW ▪ Airflow rate 1 m³/s ▪ Delivery air temperature 18°C ▪ Return air temperature 35°C ▪ Fluid flow rate 1.0 l/s ▪ Fluid inlet temperature 10°C ▪ Fluid outlet temperature 15°C ▪ Weight 125kg (commissioned)
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1. Unit Operation

The delivery air temperature is monitored and this information is used to modulate a three way valve on the fluid supply which in turn varies the cooling capacity of the heat exchanger. In the event of low cooling demand the three way value isolates the i-ACE heat exchanger from the chiller circuit. This has the effect of reducing cooling demands on the chiller which in turn improves the chiller efficiency and reduces power consumption.

Fig 1.1 – i-ACE Internal Configuration



At low cooling levels the fan speed is reduced, reducing power consumption. Some air flow within the system is advantageous as this helps to avoid condensation build up.

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2. Unit Design

The i-ACE unit incorporates a finned heat exchanger to cool a re-circulating airflow from an adjacent server cabinet. The i-ACE unit may be mounted on either side of a server cabinet, or when sandwiched between two cabinets can serve both at 50% cooling capacity each.

The chilled water flows through the heat exchanger which comprises two coil sections, each piped independently and fitted with separate isolation valves enabling the unit to continue to run at 50% capacity in the unlikely event of a circuit failure. The exchanger construction is copper tube with aluminium fin, and galvanised steel casework.

The air movement is provided by up to five separate fans which can be hot swapped in service. On smaller cooling duties fewer fans can be installed. Air return baffles are positioned at the rear of every fan aperture to stop leakage in the event of a fan cassette being removed. The fans are inserted and removed at the front of the unit with access only available via a lockable access panel.

The removable carriage containing the fan includes overload protection for each individual fan. There are handles to aid the removal of individual fan cassettes.

Power supply

The equipment within the i-ACE unit operates on 24V dc. A switch mode power supply is installed in the top section of the unit. This has an input supply range of 85 – 270V (0-66Hz) (or 120 – 400V dc). At full load the i-ACE unit consumes 300W of power.

Monitoring

An independent monitoring system is provided based on the i-BOX technology. Each mode has up to two sensors as follows:

- | | |
|---|----------------------------------|
| 1. Fan 1 Speed | Return air temperature at Fan 1 |
| 2. Fan 2 Speed | Return air temperature at Fan 2 |
| 3. Fan 3 Speed | Return air temperature at Fan 3 |
| 4. Fan 4 Speed | Return air temperature at Fan 4 |
| 5. Fan 5 Speed | Return air temperature at Fan 5 |
| 6. Water Leakage | Integrated flood sensor |
| 7. Outlet Water Temperature | Water Flow Rate |
| 8. Inlet Water Temperature | Integrated temperature sensor |
| 9. Outlet Air Temperature | Integrated temperature sensor |
| 10. Front and Rear Panel Access Monitor | Integrated panel contact sensor. |

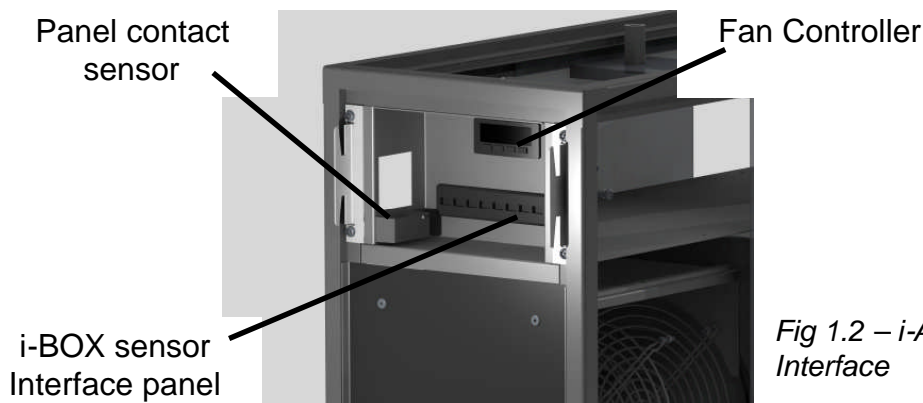


Fig 1.2 – i-ACE Sensor Interface

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Condensate

In the event of ambient conditions being such that condensate is formed on the surface of the cooling heat exchanger coil fins any moisture droplets will be contained within the drip tray mounted in the base of the unit. The drip tray includes the provision of a condensate pump which will provide the following -

		PUMPING HEAD				Condensate Pump
		1m	2m	3m	4m	
PRIMING LIFT	1m	12 l/hr	10 l/hr	9 l/hr	6 l/hr	
	2m	9 l/hr	8 l/hr	8 l/hr	5 l/hr	
	3m	X	X	X	X	
	4m	X	X	X	X	
		HORIZONTAL RUN				
		12m	5m	X	X	

i-ACE Unit Fans

The 5 fans fitted in removable carriages to the i-ACE unit are axial type speed controlled with tacho outputs.

- **Impeller material:** Sheet steel (welded to the rotor and stove enamelled in black)
- **Bearings:** Ball bearings
- **Direction of Flow:** "V", exhaust over braces
- **Operating mode:** S1
- **Protection class:** 1
- **Housing material:** Die-cast aluminium
- **Direction of rotation:** Left, looking at rotor.
- **Electrical connection:** Terminal strip
- **Insulation class:** "B"
- **Approvals:** VDE, CSA, UL

Electrical connection from the carriage is made via a type J connector to the i-ACE unit chassis. Cinch connectors 'J' connectors incorporate patented resilient finger contacts. Up to twelve fingers engage with each flat plug pin to provide low contract resistance, high current carrying capacity and minimum insertion and withdrawal forces.

These special features help to provide a thoroughly reliable connector, enhanced by Mk2 shells moulded in grey high impact thermoplastic for appearance and durability.

- **Mouldings:** High impact thermoplastic – green.
- **Plug blades:** Brass – silver plated.
- **Socket contacts:** Copper alloy – silver plated
- **Shells:** High impact thermoplastic colour - Grey

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3. Unit Temperature Control:

The i-ACE unit utilises an electronic controller with an integrated display. The system employed provides the ideal solution for refrigeration and air conditioning applications as it allows the control of chillers, heat pumps, or refrigeration systems. The software is fully programmable for both control functions and user interface in an easy and user-friendly manner thanks to the Universal Control Jet (UCJ) development environment.

The chilled water is regulated by the 3 way valve which is modulated by an actuator.

Mode of Operation: The actuator is controlled by means of a standard control signal DC 0 - 10v. It opens to the position dictated by this signal. The measuring voltage "U" allows the damper position (0 - 100%) to be electrically indicated.

High functional reliability: The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.

Measurement:

Chilled water flow and temperature is measured by a vortex flow sensor which provides a series of combined flow and temperature sensors (two in-one) based on the principle of vortex shedding behind a bluff body. These sensors are fully compatible with wet, aggressive media and utilises MEMS sensing technology in combination with a novel packaging concept using corrosion-resistant coating on the MEMS sensor element.

Chilled water pressure is measured by an integrated pressure sensor. Again this sensor is compatible with wet, aggressive media.

The RPS sensor utilises MEMS sensing technology in combination with a novel packaging concept using corrosion resistant coating on the MEMS sensor element.

4. The Enclosure

The enclosure is made up of an extruded aluminium framework with colour configurable external panels (internal panels are black RAL9005 as standard). The external cladding can be easily removed once access has been gained through the front and rear cover panels. This provides the ability to service the i-ACE heat exchanger in position in the unlikely event of a malfunction.

Colour configurations include:

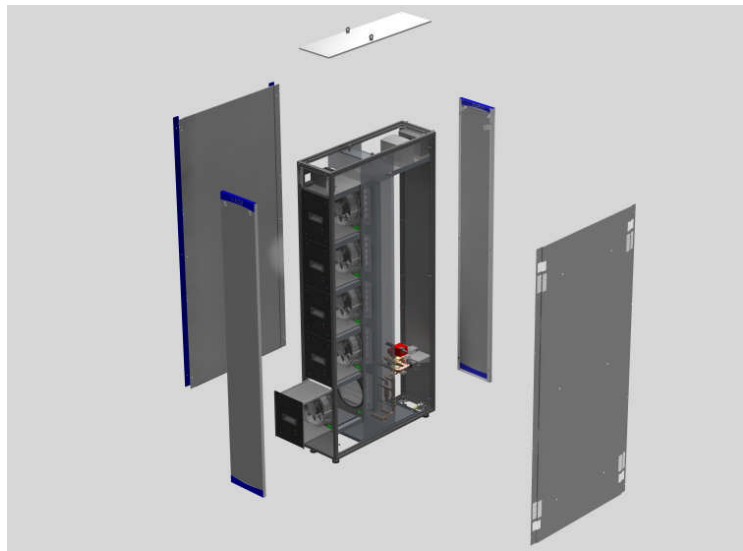
Standard

- Black RAL9005 with blue trim.

Options

- Light grey NCS 1502-Y with blue trim.
- Light grey NCS 1502-Y with mid grey trim.

*Fig 1.3 – i-ACE
Cladding Configuration*



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5. Installation

The i-ACE unit can be easily mounted to a standard Access cabinet.

- a) Remove the existing standard side panels and replace with the special i-ACE single piece side panel as shown in Fig 1.4. This panel simply bolts to the “W” sections at the top and bottom front and rear and provides a uniform surface for the i-ACE unit to mount on.
- b) It is advisable that the front and rear cladding panels are removed together with the fan cassettes prior to the mating of the i-ACE unit to the cabinet. This helps to reduce the weight of the unit making it easier to position.

Please note that great care should be taken when handling the unit as the unit is inherently unstable due to its limited foot print. Lifting eyes are provided and should be used wherever possible to stabilise the unit until it is securely mounted to the cabinet.

- c) Using the captive nuts fitted in the matting face of the i-ACE unit bolt through from the inside of the Access cabinet into the i-ACE unit. Please ensure that the sealing gasket is fitted to the side of the i-ACE unit prior to the units being bolted together.
- d) The Access cabinet and i-ACE unit can then be aligned using the jacking feet mounted to the base of each unit.
- e) The water supply and return services can now be connected. It is important that adequate provision is provided for the safe removal of any condensate build up. Failure to address this issue can lead to major issues including the threat of “Legionnaires Disease”.
- f) Connect power to the unit. The power feed can be drawn from the power distribution unit mounted inside the adjoining cabinet.

Fig 1.4 to 1.6
i-ACE Connectivity

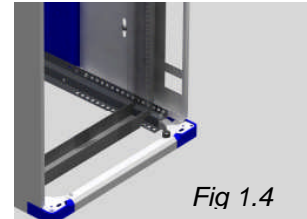


Fig 1.4



Fig 1.5



Fig 1.6

Other power connectivity options are available to meet redundancy requirements.

6. Order Codes

Order Code	Description	Standard Finish	Packaging
AC471020KWHELHB	Access Cabinet 47U x 1000mm Deep 20kW Heat Exchanger Assembly for LH Mounting Complete With Cladding Panels	Black with blue trim	Crated
AC471020KWHERHB	Access Cabinet 47U x 1000mm Deep 20kW Heat Exchanger Assembly for RH Mounting Complete With Cladding Panels	Black with blue trim	Crated
AC471020KWHEDFB	Access Cabinet 47U x 1000mm Deep 20kW Heat Exchanger Assembly for Dual Feed Mounting Complete With Cladding Panels	Black with blue trim	Crated
AC421020KWHELHB	Access Cabinet 42U x 1000mm Deep 20kW Heat Exchanger Assembly for LH Mounting Complete With Cladding Panels	Black with blue trim	Crated
AC421020KWHERHB	Access Cabinet 42U x 1000mm Deep 20kW Heat Exchanger Assembly for RH Mounting Complete With Cladding Panels	Black with blue trim	Crated
AC421020KWHEDFB	Access Cabinet 42U x 1000mm Deep 20kW Heat Exchanger Assembly for Dual Feed Mounting Complete With Cladding Panels	Black with blue trim	Crated

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