Airedale
APPLIED THERMAL INNOVATION

LogiCool InRak™

- Direct Expansion
- Chilled Water
- Dual Circuit Chilled Water

Technical Manual

bsi. ISO 9001 Quality Management FM00542
ISO 14001 Environmental Management EMS52086

Customer Services

Warranty, Commissioning & Maintenance

As standard, Airedale guarantees all non consumable parts only for a period of 12 months, variations tailored to suit product and application are also available; please contact Airedale for full terms and details.

To further protect your investment in Airedale products, Airedale can provide full commissioning services, comprehensive maintenance packages and service cover 24 hours a day, 365 days a year (UK mainland). For a free quotation contact Airedale or your local Sales Engineer.

All Airedale products are designed in accordance with EU Directives regarding prevention of build up of water, associated with the risk of contaminants such as Legionella.

For effective prevention of such risk it is necessary that the equipment is maintained in accordance with Airedale recommendations.

SafeCool

In addition to commissioning, a 24 hour, 7 days a week on-call service is available throughout the year to UK mainland sites. This service will enable customers to contact a duty engineer outside normal working hours and receive assistance over the telephone. The duty engineer can, if necessary, attend site, usually within 24 hours or less. Full details will be forwarded on acceptance of the maintenance agreement.

CAUTION
Warranty cover is not a substitute for maintenance. Warranty cover is conditional to maintenance being carried out in accordance with the recommendations provided during the warranty period. Failure to have the maintenance procedures carried out will invalidate the warranty and any liabilities by Airedale International Air Conditioning Ltd.

Spares

A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

Training

As well as our comprehensive range of products, Airedale offers a modular range of Refrigeration and Air Conditioning Training courses, for further information please contact Airedale.

Customer Services

For further assistance, please e-mail: enquiries@airedale.com or telephone:

UK Sales Enquiries	+ 44 (0) 113 239 1000	enquiries@airedale.com
International Enquiries	+ 44 (0) 113 239 1000	enquiries@airedale.com
Spares Hot Line	+ 44 (0) 113 238 7878	spares@airedale.com
Airedale Service	+ 44 (0) 113 239 1000	service@airedale.com
Technical Support	+ 44 (0) 113 239 1000	tech.support@airedale.com
Training Enquiries	+ 44 (0) 113 239 1000	marketing@airedale.com

For information, visit us at our web site: www.airedale.com

Health and Safety

IMPORTANT
The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, commissioning and maintenance of this Airedale unit.

Safety
The equipment has been designed and manufactured to meet international safety standards but, like any mechanical/ electrical equipment, care must be taken if you are to obtain the best results.

CAUTION
When working with any air conditioning units ensure that the electrical isolator is switched off prior to servicing or repair work and that there is no power to any part of the equipment.

Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc.

Electrical installation commissioning and maintenance work on this equipment should be undertaken by competent and trained personnel in accordance with local relevant standards and codes of practice.

The refrigerant used in this range of products is classified under the COSHH regulations as an irritant, with set Workplace Exposure Levels (WEL) for consideration if this plant is installed in confined or poorly ventilated areas.

A full hazard data sheet in accordance with COSHH regulations is available should this be required.

Personal Protective Equipment
Airedale recommends that personal protective equipment is used whilst installing, maintaining and commissioning equipment.

Refrigerant Warning
The Airedale LogiCool InRak unit uses R410A refrigerant which requires careful attention to proper storage and handling procedures.

Use only manifold gauge sets designed for use with R410A refrigerant. Use only refrigerant recovery units and cylinders designed for high pressure refrigerants.

R410A must only be charged in the liquid state to ensure correct blend makeup.

The refrigerant must be stored in a clean, dry area away from sunlight. The refrigerant must never be stored above 50°C.

Global Warming Potential

R410A = 1900

EN378-1 :2008 (100 year life)

Manual Handling
Some operations when servicing or maintaining the unit may require additional assistance with regard to manual handling. This requirement is down to the discretion of the engineer.

Remember do not perform a lift that exceeds your ability.

Environmental Considerations

Freeze Protection
Airedale recommends the following actions to help protect the unit during low temperature operation. This also includes the units subject to low ambient temperatures. The Logicool InRak must have a minimum of 20% glycol as standard.

Units with supply water temperatures below +5°C
Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

Units subject to ambient temperatures lower than 0°C
Glycol of an appropriate concentration (1) must be used within the system to ensure adequate freeze protection. Please ensure that the concentration is capable of protection to at least 3°C lower than ambient.

Water / glycol solution should be constantly circulated through all waterside pipework and coils to avoid static water from freezing.

Ensure that pumps are started and running even during shut down periods, when the ambient is within 3°C of the solution freeze point (1) (i.e. if the solution freezes at 0°C, the pump must be operating at 3°C ambient).

Additional trace heating is provided for interconnecting pipework.

(1) Refer to your glycol supplier for details.

Environmental Policy
It is our policy to:
- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

CE Directive
Airedale certify that the equipment detailed in this manual conforms with the following EC Directives:

Electromagnetic Compatibility Directive (EMC)	2004/108/EC
Low Voltage Directive (LVD)	2006/95/EC
Machinery Directive (MD)	89/392/EEC version 2006/42/EC
Pressure Equipment Directive (PED)	97/23/EC

To comply with these directives appropriate national & harmonised standards have been applied. These are listed on the Declaration of Conformity, supplied with each product.

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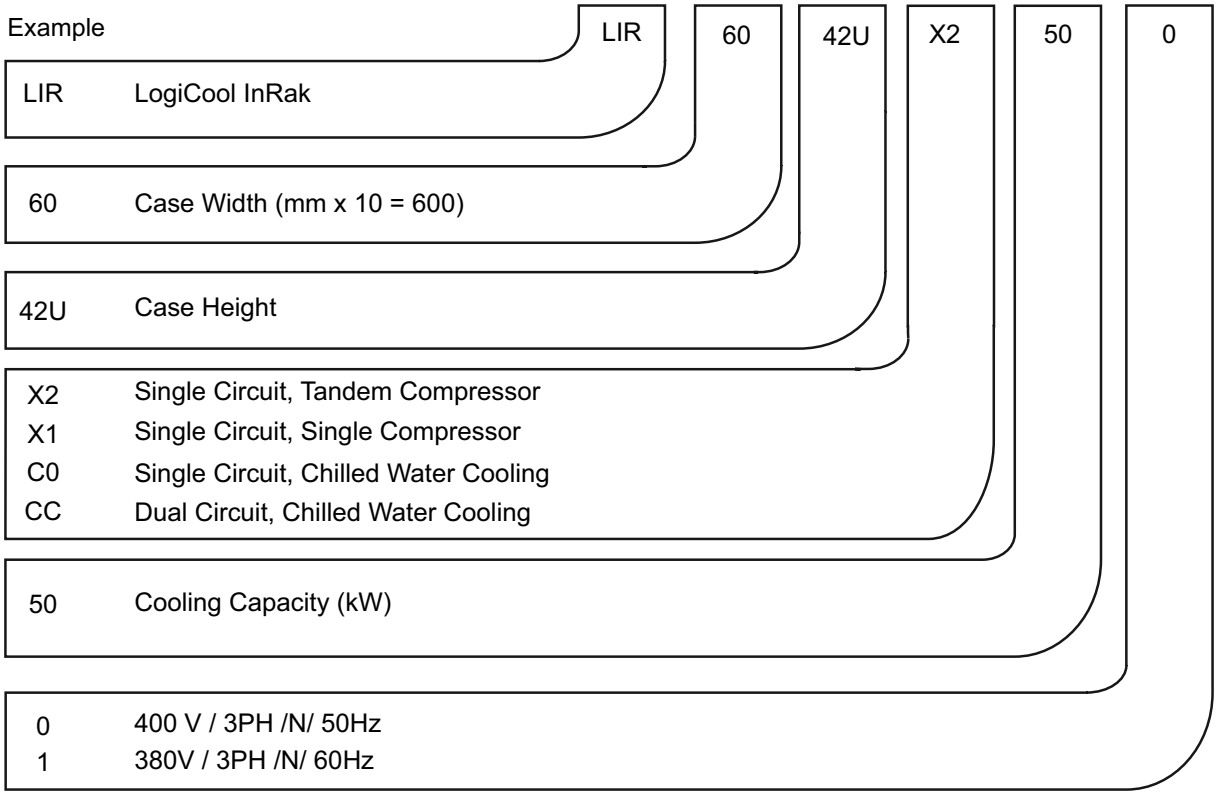
Specifiers Guide

Nomenclature



Introduction

The LogiCool InRak is an efficient in-row IT cooling solution for data centre applications.
The InRak delivers complete confidence, with redundancy features such as hot swappable fans and dual power supplies. It is extremely efficient, offering the latest fan technology coupled with sophisticated controls logic designed to optimise operation.

The InRak delivers even greater efficiency when combined with Airedale's latest free cooling chillers.
Providing industry-leading cooling for its footprint, the InRak offers the ultimate in scalable solutions for the modern data centre. The InRak is designed to fit in between industry standard server racks and offer "plug and play" connectivity.

The InRak is available for 50 Hz and 60 Hz power supplies as follows:-

	X1	X2	C0	CC
400 V / 3PH / 50 Hz Supply	●	●	●	●
380 V / 3PH / 60 Hz Supply	●	–	●	●

Construction

The cabinet shall be manufactured with galvanised sheet steel to provide a smooth aesthetically pleasing finish. The galvanised sheet steel panels shall be coated with an epoxy baked powder paint to provide a durable finish.
Standard unit colours shall be Black Grey (RAL 7021) or Light Grey (RAL 7035).

Standard and Optional Features

		C0	CC	X1	X2
Door	Hot Swappable Fan Assembly	●	●	●	●
	Independent Fan Isolation	●	●	●	●
	Discharge Grille	●	●	●	●
	Removable Access Panel	●	●	●	●
	Secure Door Locks	●	●	●	●
	Return Air Grille	●	●	●	●
	Mains Isolator	●	●	●	●
	G4 Return Door Air Filter	○	○	○	○
	Levelling Feet	●	●	●	●
	Castors	●	●	●	●
	Anti-Recirculation Brush Seal	●	●	●	●
Electrical	Electrical Switch Gear	●	●	●	●
	Door Electric Isolator	●	●	●	●
	Controller Capacitive Backup	●	●	●	●
	Energy Manager	○	○	○	○
	Phase Rotation Monitoring	○	○	○	○
	Thyristor Controlled Electric Heat	○	○	○	○
	IEC 60309 Plug and Socket	○	○	○	○
	Dual Power Change Over Switch	○	○	○	○

● Standard Feature ○ Optional Feature — Not Avaliable

Standard and Optional Features

		C0	CC	X1	X2
Controls	Microprocessor Control	●	●	●	●
	Graphical Display	●	●	●	●
	Unit Status LED	●	●	●	●
	Dew Point Control	●	●	●	●
	Filter Change Monitoring	○	○	○	○
	Touch Screen Display	○	○	○	○
	Rack Pressure Management	○	○	○	○
	Dynamic Air Volume Control	○	○	○	○
	Water Detection	○	○	○	○
	Fire / Smoke Detection	○	○	○	○
	Refrigerant Leak Detection	—	—	○	○
Chilled Water	Efficient Chilled Water Coil	●	●	—	—
	Bleed / Drain Valves	●	●	—	—
	Modulating Control Valves	●	●	—	—
	3 Way Chilled Water Valve	○	○	—	—
	2 Way Chilled Water Valve	○	○	—	—
	Chilled Water Isolation	○	○	—	—
	Chilled Water Solenoid Valve	○	○	—	—
Refrigeration	Efficient Fixed Speed Scroll Compressor	—	—	—	●
	Efficient EC Inverter Scroll Compressor	—	—	●	●
	Electronic Expansion Valve	—	—	●	●
	Refrigeration Sight Glass	—	—	●	●
	Oil Separator	—	—	●	●
	Liquid Line Solenoid Valve	—	—	●	●
	Refrigerant Pump down	—	—	○	○

● Standard Feature ○ Optional Feature — Not Avaliable

Unit Overview

Standard Front Door Features

- Hot Swappable Fan Assembly
- Independant Fan Isolation
- Discharge Grille
- Removable Access Panel
- Secure Door Lock

Standard Construction Features

- Levelling Feet
- Castors
- Anti-Recirculation Brush Seal
- Side Access Panels

Standard Control Features

- Microprocessor Control
- Graphical Display
- Unit Status LED
- Dew Point Control

Optional Control Features

- Touch Screen Colour Display
- Filter Change Monitoring
- Rack Pressure Management
- Dynamic Air Volume Control
- Water Detection
- Fire / Smoke Detection
- Refrigerant Leak Detection

Unit Overview

Standard Rear Door Features
- Secure Door Lock
- Return Air Grille
- Mains Isolator

Optional Rear Door Features
- G4 Return Door Air Filter

Standard Electrical Components
- Electrical Switch Gear
- Door Electric Isolator
- Controller UPS Backup

Optional Electrical Components
- Condensate Pump
- Energy Manager
- Phase Rotation Monitoring
- Thyristor Controlled Electric Heat
- IEC 60309 Plug and Socket

Standard Chilled Water Features
- Efficient Chilled Water Coil (Single or Dual Circuit)
- Bleed / Drain Valves
- Modulating Control Valve

Optional Chilled Water Features
- 3 Way Chilled Water Valve
- 2 Way Chilled Water Valve
- Isolating Solenoid Valves
- Bypass Regulating Valve

Standard Refrigeration Features
- Efficient Fixed Speed Scroll Compressor
- Efficient EC Inverter Scroll Compressor
- Electronic Expansion Valve
- Refrigeration Sight Glass
- Oil Separator
- Liquid Line Solenoid Valve

Optional Refrigeration Features
- Refrigerant Pump down

Front Door Assembly

EC Fan motor

310mm diameter backward curved centrifugal fans with EC motors mounted with inlet ring shall be provided to ensure optimum efficiency.

The fan section shall be designed as a hot swap assembly which can be changed quickly minimising downtime during replacement or maintenance. The assembly incorporates a fan isolation switch to interrupt power before removal.

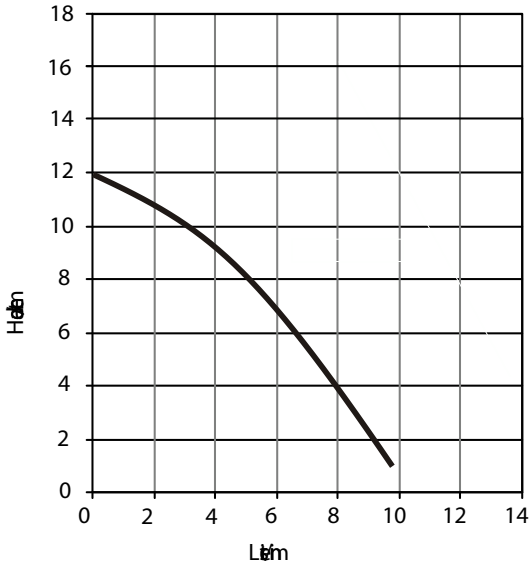
N+1 Fan Redundancy

The InRak has the option for N+1 redundancy. This runs the unit at 75% airflow under normal conditions. If a fan fails the remaining healthy fans speed up to 100% achieving the full design airflow.

Optional Features

Condensate Pump

The following graphs illustrate the TOTAL static (head) pressure available. The system horizontal pipe losses and vertical lift should be factored in when calculating the condensate pump performance.

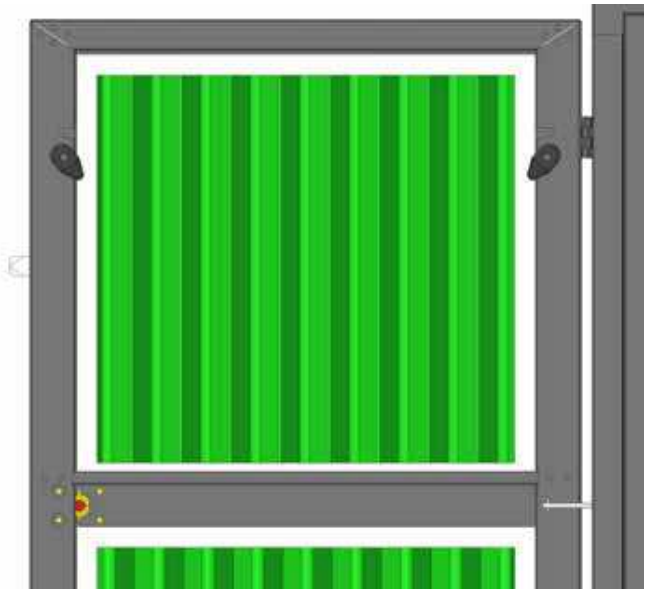


IMPORTANT
Use only 10mm (3/8”) copper tube when connecting the discharge stub to the condensate pump. The discharge line from the pump should rise no more than 6 metres vertically and no more than 8 metres in total length before being interrupted with a swan neck air break and tundish.

Rear Door Assembly

Optional Features

G4 filtration
The unit shall be fitted with G4 Filtration.



Packaging
For specific markets units shall be shipped, mounted on wooden pallet and covered with polythene. The pallet shall be mechanically fixed to the unit for transportation only.

Optional Features

Sterling Board LAT (Wooden Case) Packing
Units shall be supplied complete with additional LAT corner protection and cross braces to afford extra transit protection. Sterling board heat treated man made material shall be used (including pallet) to comply with phytosanity import regulations (please contact Airedale for this option).

Cooling Mode - Chilled Water Cooling (C0)

Chilled Water Coil

3/8” plain tube cooling coil with 1.8 mm fin pitch and hydrophilic fins.

Dependant on model the coil shall be single (C0) or dual circuit (CC).

Bleed and Drain Valves
Valves shall be factory fitted to easily bleed the system of any air and drain water for maintenance.

Optional Features

0-10 Volts DC Chilled Water 3 Way Valve
A 0-10 VDC chilled water 3 way regulating valve shall be fitted. This shall be used to govern the chilled water flow to the coil when there is a demand for cooling.

0-10 Volts DC Chilled Water 2 Way Valve
A 0-10 VDC chilled water 2 way regulating valve shall be fitted. This shall be used to govern the chilled water flow to the coil when there is a demand for cooling.

Isolating Solenoid Valves (C0 Only)
Isolating solenoid valves shall be fitted to the inlet and outlet connections. This shall control the water flow to and from the cooling module in the event of fault or power failure. The valves have a low pressure drop and are fast acting. The valves shall be Normally Closed (NC) operation.

Leak Isolation Valve (CC Only)
A combination of the chilled water valve and a non return valve shall be fitted to ensure water isolation in the event of fault or power failure. The valve has a low pressure drop and fast acting.

Bypass Regulating Valve
A bypass regulating valve shall be fitted in the bypass leg of the system to enable constant flow when there is no cooling demand. This simulates the coil pressure drop ensuring that the water flow rate does not change irrespective of the flow through the chilled water coil.

This enables flow through each cooling module without the need for a Cooling Distribution unit (CDU).

Cooling Mode - Direct Expansion Cooling (DX)

Single EC Inverter Driven Compressor

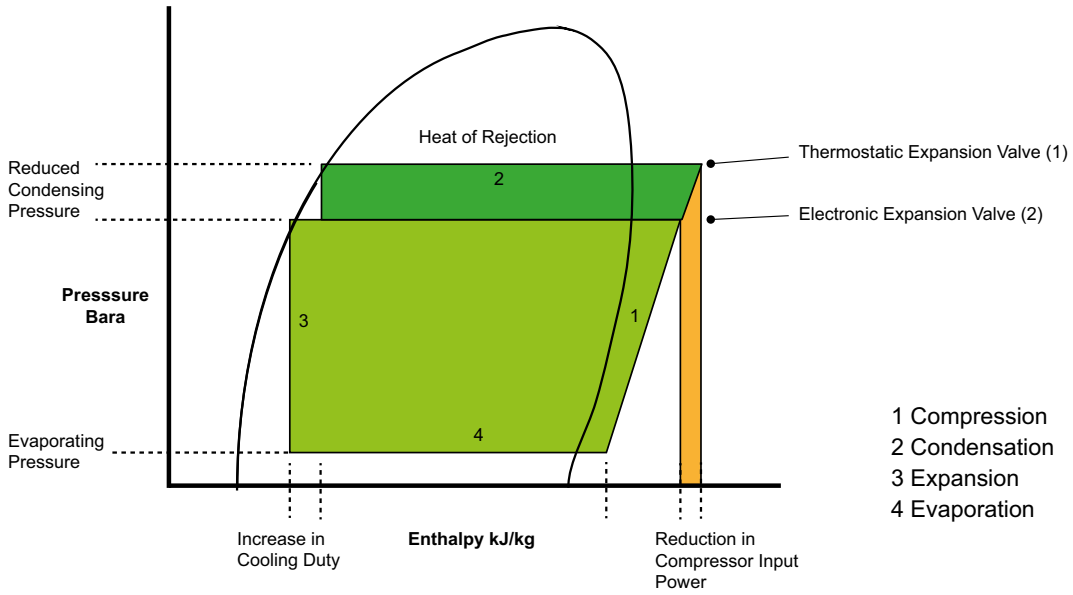
Comprising of an EC inverter driven scroll compressor which provides variable control of the system performance, by adjusting its speed. This output allows external load demands to be met with greater precision, eliminating unnecessary temperature and humidity variations. Consequently, system efficiency and reliability are much improved by extending major component working hours.

Tandem EC Inverter and Fixed Speed Compressors

Combining a fixed speed compressor and EC inverter driven scroll compressor provides a more flexible variable control of the system performance, by adjusting one compressors speed.
This output allows greater external load demands to be met than with the single inverter option with greater precision, eliminating unnecessary temperature and humidity variations.
Consequently, system efficiency and reliability are much improved by extending major component working hours.

Electronic Expansion Valves (EEV)

Electronic expansion valves differ to the traditional thermostatic expansion valves in their ability to maintain control of the suction superheat at reduced head pressures. This can lead to significant energy savings particularly at reduced loading and low ambient temperatures.



(1) Cooling Cycle @ 22°C ambient with a conventional TEV fitted.
(2) Cooling cycle @ 22°C ambient, demonstrating a typical EEV condensing temperature taking full advantage of lower ambient air temperatures (below 35°C).

Refrigeration Components

Oil Separator
Fitted to ensure higher than usual levels of circulatory oil of the variable speed compressor stay within the unit, and are not lost to external pipe work causing damage to the compressor.

The component is fitted in the discharge line of the compressor and used to separate the oil from the unit's refrigerant. The separated oil is then fed back into the suction line to ensure adequate amounts return to the compressor.

Sight Glass
A liquid line sight glass is fitted to give an indication of the state of the refrigerant within the system. If the sight glass becomes yellow it is an indication that the filter drier requires changing.

Optional Features

Refrigerant Leak Detection
If the leak detector reaches the alarm set point, a leak alarm will be set and a message displayed. By default after detecting a leak, the unit will give an alarm but will continue to run normally. This can be changed to give an alarm and also shut down the unit and isolate it by closing the liquid line solenoid valve.

If pump-down features are present on the unit, it can be set to give an alarm and also pump-down when a leak is detected.

Indirect Detection
As well as optional direct leak detection the unit also has indirect refrigerant leak detection as standard. This uses intelligent monitoring in the software to establish if there is a leak.

If all the following conditions are present then a leak alarm will be generated:
- High superheat with the expansion valve fully open and superheat not reducing.
- High discharge superheat.
- Low sub cool.

Pump-down
Pump-down is used to pump all the refrigerant in the circuit into the outdoor coil and contain it there either when a leak is detected or when the unit turns off. Containing all the refrigerant in one outdoor area is good practice for safety reasons as well as being the best way of preventing liquid flood-back to the compressor on restart.

Electrical

Standard Electrical features include

- Mains Isolator
- MCB's
- Withdrawable Main Control Panel

Ultracap UPS

The Ultracap module is an external backup device for the controller. The module guarantees temporary power to the controller in the event of power failures and allows for enough time to keep the controller running with time to change power supplies.
The module is made using Ultracap storage capacitors (EDLC = Electric Double Layer Capacitor), which are recharged independently by the module.
These ensure reliability in terms of much longer component life than a module made with lead batteries: the life of the Ultracap module is at least 10 years.

Optional Features

Dual Power Switch

Dual supply for redundancy and backup in the event of mains supply failure shall be provided. The dual power supply switch ensures that the InRak always has an incoming power supply.

For the dual power supplies to operate effectively, the incoming power supplies must have the same voltage and frequency and be within 120° phase angle.
The dual power switch does not provide protection to the external condenser. Further provision must be made for this.

Energy Manager

Three-phase compressors can rotate in either direction depending upon phasing of the power.
Since there is a 50-50 chance of connecting power in such a way as to cause rotation in the reverse direction, phase rotation is monitored on a digital input to the controller to prevent start-up of the compressor upon detection of reverse phase rotation.
The power meter within the InRak products is capable of monitoring many different electrical parameters.

- Phase Voltages
- Line Voltages
- Phase Currents
- Unit Power
- Unit Power Factor

Thyristor Controlled Electric Heat

Finned electric heating elements complete with auto and manual reset overheat cut-out protection. Standard electric heating elements are phase balanced for increased efficiency. The thyristor control offers precision control between 0 to 100% via the microprocessor

IEC 60309 Plug and Socket

A IEC 60309 plug and socket shall be fitted enabling quick connection of power to the unit.

Controls

Display/Keypad

The display keypad features a simple array of keys to navigate through the in built menus.

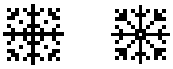
With an 8 x 22 character (132 x 64 pixel) screen size, back lit in white for improved contrast, the large screen shall provide for user friendly viewing and easy status recognition by displaying a combination of text and icons.

The default screen shall show the unit status and room condition (°C/RH %) without the need for interrogation and an easy to navigate menu structure for further interrogation and adjustment shall be provided.

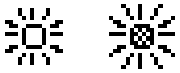
Display for illustration only.

Display Symbols

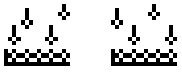
Chilled Water Valve Position



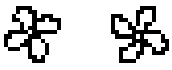
Cooling Indication



Heating Indication



Dehumidification



Fans

Controls

Temperature/ Humidity Sensor
Unit mounted temperature and humidity sensor shall be supplied as standard. This shall be mounted at the inlet side of the unit monitoring return air conditions.

Water Temperature Sensor
A water temperature sensor shall be fitted to the water inlet pipe work.

Tri colour LED for Easy Fault Detection
LED indication for alarm status shall be incorporated in the front face of the InRak unit which signals Healthy, Non Critical and Critical Alarm respectively (Green, Yellow and Red.)

Optional Features

Flood Detection
Leak detection for the water system, able to report alarm status to the BMS system shall be provided. The unit shall then be shut down before any damage occurs.
The leak detection tape shall be fitted within the base of the unit.

Smoke Detector
Shall be fitted into the roof of the unit to shut down the unit and activate the alarm upon sensing the presence of smoke.

Fire Detector
Shall be installed in the return air stream to shut down the unit in the event of an unusually high return air temperature.

Filter Change Monitoring
A filter change software timer is included to record the time since the filter was changed and give an alarm if the time is exceeded. This must be manually reset when the filters are changed.

Aisle Pressure Management
The InRak shall be fitted with Aisle pressure management, which allows the differential pressure across the IT equipment to be monitored and controlled to achieve:

- Positive air pressure in the cold aisle.
- Negative air pressure in the hot aisle at the server outlet, to prevent backwash of hot air (behind InRak coil guard).
- Controlled differential pressure across the IT hardware so that air is not ‘forced’ through the IT equipment

Dynamic Air Volume
The compressor will maintain the “air off” temperature while the fans control to the air volume as long as the evaporating temperature remains within the operating band. However, if the evaporating temperature changes beyond the high or low differential limits, the fans will modulate to bring the evaporating temperature back within the band, up to the minimum or maximum air volume band limits. If the evaporating temperature changes beyond that, the compressor will modulate to bring the evaporating temperature back within the control band. The evaporating temperature set point can be changed in the controls.

The unit will try to maintain the evaporating temperature as close as possible to the set point whilst maintaining the cooling demand and the air volume.

Note that at 12°C evaporating temperature the inverter will limit the compressor maximum speed to 90rps from 120rps. This is to protect the inverter against high currents.

Energy Manager
Analysis of system energy consumption can be monitored via a dedicated LCD display. Unit parameters can be adjusted via the unit microprocessor control to affect energy usage in line with the system need.

Controls

Optional Features

Lon BMS Connection

The Airedale controllers, using special serial cards, shall be integrated into LonWorks® networks. The RS485 and the FTT10 standards shall be supported by the LonWorks® serial cards.

The types of LonWorks® serial cards shall be FTT-10A 78 kbs (TP/FT-10) on the LonWorks® network.

pCOWeb

pCOWeb is a new generation of Airedale supervisory plug-in cards which make communicating with an Airedale unit simply a matter of logging onto the office Intranet or via the web.

Based on Ethernet TCP/IP secure technology, pCOWeb shall require no proprietary cabling. It shall have little or no set-up on site and can be pre-programmed with an IP address prior to dispatch from airedale.

BACnet Protocol

The BACnet protocol option shall be supplied either with a pCOWeb (Ethernet) or pCONet (RS485) interface card.

Modbus / Carel BMS Connection

The Airedale controllers shall be able to communicate directly using the Modbus® protocol.
The Modbus® card shall be a small PCB (60mm x 30mm), which can be plugged into the controller to provide it with the following protocol support

- Modbus® - JBus slave
- RTU mode (Remote Terminal Unit) with 8 bit encoding and error handling using 16 bit CRC
- Communication standard connection options of RS485 (multipoint) or RS232 (point-point)
- Maximum Baud Rate of 19200

The data communication shall be asynchronous serial, 8 data bits, 2 stop bits and no parity (in total 11 bits/datum).

The data/parameters from the controller shall be represented within Modbus® registers, each register containing information pertaining to temperatures, pressures, setpoint, status, etc and is available to the site integration company in a spreadsheet format

Programming Smart Key

A smart key shall be supplied to offer software back-up of the control strategy. The key shall feature simple plug in operation and allow transfer of software programs from the key to the microprocessor and vice versa. The use of a service laptop shall not be necessary.

Expansion Board

An expansion board can be added as an option to add up to 4 additional supply or return air temperature sensors to the unit. These can be placed on server racks adjacent to the unit to give better regulation over the controlled temperature and help prevent hot-spots occurring on a server rack or within the room.

Controls

Optional Features

Constant Pressure Control (CW units)

Constant pressure control is a method of maintaining a pressure differential between the hot and cold aisles by modulating the fan speed of the InRak unit.

A -100 to +100Pa differential pressure sensor is used to monitor the pressure difference between the aisles (the same sensor can be easily changed to -50/+50Pa using a jumper connection depending on individual requirements). This signal is sent back to the InRak unit microprocessor to modulate the fan speed to maintain a target differential pressure set point of -10Pa (adjustable). The fan speed modulates to maintain the target differential.

In the event of the differential pressure sensor failing, (open circuit), the unit will revert to the fixed fan speed (as commissioned). The fixed fan speed can be adjusted in the Manufacturer > Parameters > Evaporator fans menu.

As the pressure difference decreases the fan speed will increase until the pressure difference reaches the set point again. If the pressure difference was to increase the fans would lower their speed and decrease the pressure difference back to the set point.

Dynamic Pressure Control (DX units)

With DX units the fans will operate with constant pressure control except the fan speed will modulate within predefined upper and lower limits, to maintain the target differential whilst maintaining the evaporating temperature.

Similar to air volume control, the compressor will maintain the “air off” temperature while the fans control to the aisle pressure as long as the evaporating temperature remains within the operating band. However, if the evaporating temperature changes beyond the high or low differential limits, the fans will modulate to bring the evaporating temperature back within the band, up to the minimum or maximum aisle pressure band limits. If the evaporating temperature changes beyond that, the compressor will modulate to bring the evaporating temperature back within the control band.

Fan Capacity Control (CW unit)

Capacity control will allow the unit to modulate air volume based on demand for unit cooling. The controller will modulate the chilled water valve alone to try and increase unit cooling performance whilst maintaining the fans at their minimum speed. However, if the cooling performance is not increased sufficiently then the fan speed will increase to further satisfy demand.

By default, the valve/fan changeover point is set at 50% cooling demand. The fans will therefore stay at minimum speed until the cooling demand reaches 50% and then start to ramp up to satisfy the cooling demand. As the unit cooling demand increases the fan speed is modulated to match the required cooling performance. This feature enhances system energy efficiencies, by having only the required fan input power for particular loadings.

Heating

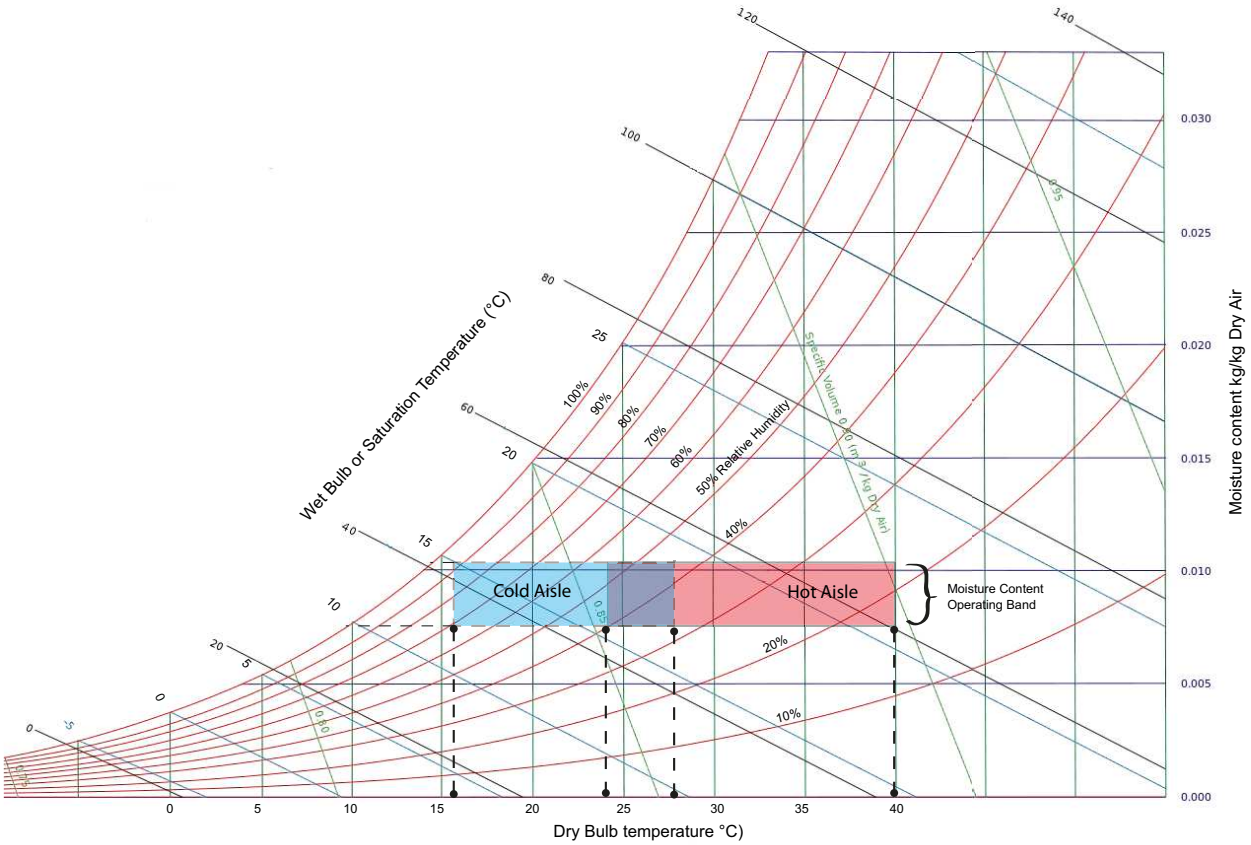
The InRak has the option of thyristor heating to give continuous analogue control to the heating produced.

The heating loop will be activated when the return air temperature falls below the set point, as with fan control the heating present within the unit will modulate to satisfy the unit heating demand.

Technical Data - Direct Expansion

Operating Limits

Cooling		Min	Max
Room Temperature	°C	16	28
Room RH at 24°C	%	40	55
Return Air Temperature	°C	25	40
Outdoor Ambient	°C	-20	48



⚠ Low humidity in a data centre can potentially cause static electricity build up.

Technical Data - Direct Expansion

Performance Data - Single Compressor (X1)

Full Load (X1)

Unit	Air On DB / RH		Ambient (°C) 25	30	35	40	46
LIR6042U-X123-0	25°C / 42%	Gross Total Cooling (kW)	18.83	18.83	21.14	20.33	20.50
		Power Input (kW)	4.43	4.43	6.19	6.84	9.53
		EER	4.25	4.25	3.42	2.97	2.15
	30°C / 32%	Gross Total Cooling (kW)	26.86	26.62	29.28	28.21	28.62
		Power Input (kW)	6.79	7.02	9.67	10.68	14.59
		EER	3.95	3.79	3.03	2.64	1.96
	35°C / 24%	Gross Total Cooling (kW)	33.93	35.35	34.24	33.05	30.55
		Power Input (kW)	8.16	10.80	11.98	13.23	14.66
		EER	4.16	3.27	2.86	2.50	2.08
	40°C / 18%	Gross Total Cooling (kW)	39.69	38.63	36.19	35.02	32.20
		Power Input (kW)	9.84	10.98	12.05	13.29	14.70
		EER	4.03	3.52	3.00	2.63	2.19
LIR6042U-X130-0	25°C / 42%	Gross Total Cooling (kW)	22.72	24.17	23.32	22.40	21.23
		Power Input (kW)	5.80	7.17	7.92	8.74	9.78
		EER	3.92	3.37	2.94	2.56	2.17
	30°C / 32%	Gross Total Cooling (kW)	32.40	33.97	32.81	31.57	29.98
		Power Input (kW)	8.38	10.93	12.11	13.34	14.88
		EER	3.87	3.11	2.71	2.37	2.01
	35°C / 24%	Gross Total Cooling (kW)	38.48	37.37	35.21	33.05	30.55
		Power Input (kW)	9.98	11.11	12.16	13.26	14.66
		EER	3.86	3.36	2.90	2.49	2.08
	40°C / 18%	Gross Total Cooling (kW)	40.98	38.63	36.19	35.02	32.20
		Power Input (kW)	10.01	11.01	12.05	13.30	14.69
		EER	4.09	3.51	3.00	2.63	2.19

Note: The shaded area indicates that the Compressor speed is modulated to achieve dew point control.
All the performance data is based on a SHR of 1.0.
Maximum duty data is based on achievable duty at maximum air volume
Performance data is based upon a unit with no filtration.

Technical - Direct Expansion

Performance Data - Tandem Compressor (X2)

Full Load (X2)

Unit	Air On DB / RH		Ambient (°C) 25	30	35	40	46
LIR6042U-X240-0	25°C / 42%	Gross Total Cooling (kW)	27.62	27.62	26.66	25.51	26.53
		Power Input (kW)	7.29	7.29	7.97	8.81	11.51
		EER	3.79	3.79	3.34	2.89	2.30
	30°C / 32%	Gross Total Cooling (kW)	38.23	39.06	37.62	39.29	38.88
		Power Input (kW)	9.49	11.34	12.54	16.01	20.70
		EER	4.03	3.44	3.00	2.45	1.88
	35°C / 24%	Gross Total Cooling (kW)	47.69	46.39	46.76	45.02	42.82
		Power Input (kW)	12.16	13.33	17.07	18.81	20.97
		EER	3.92	3.48	2.74	2.39	2.04
	40°C / 18%	Gross Total Cooling (kW)	54.42	52.89	51.26	47.68	43.65
		Power Input (kW)	14.11	15.69	17.37	18.77	20.61
		EER	3.85	3.37	2.95	2.54	2.12
LIR6042U-X250-0	25°C / 42%	Gross Total Cooling (kW)	32.02	32.02	31.01	29.69	31.65
		Power Input (kW)	9.18	9.18	9.89	10.83	15.63
		EER	3.49	3.49	3.14	2.74	2.02
	30°C / 32%	Gross Total Cooling (kW)	45.98	45.41	45.95	44.19	41.92
		Power Input (kW)	12.97	13.46	16.98	18.67	20.81
		EER	3.55	3.37	2.71	2.37	2.01
	35°C / 24%	Gross Total Cooling (kW)	53.52	52.45	50.75	48.48	43.71
		Power Input (kW)	14.55	15.58	17.20	18.61	20.08
		EER	3.68	3.37	2.95	2.61	2.18
	40°C / 18%	Gross Total Cooling (kW)	58.46	55.55	52.13	48.54	44.52
		Power Input (kW)	14.18	15.15	16.45	17.83	15.57
		EER	4.13	3.67	3.17	2.72	2.86

Note: The shaded area indicate that the Compressor speed is modulated to achieve dew point control.
All the performance data is based on a SHR of 1.0.
Maximum duty data is based on achievable duty at maximum air volume
Performance data is based upon a unit with no filtration.

Technical - Direct Expansion

Performance Data - Single Compressor (X1)

Max EER (X1)

Unit	Air On DB / RH		Ambient (°C) 25	30	35	40	46
LIR6042U-X123-0	25°C / 42%	Gross Total Cooling (kW)	10.85	10.85	10.97	10.52	13.66
		Power Input (kW)	2.15	2.15	2.27	2.58	4.43
		EER	5.05	5.05	4.83	4.08	3.08
	30°C / 32%	Gross Total Cooling (kW)	17.17	17.17	17.59	16.92	16.05
		Power Input (kW)	3.16	3.16	3.52	3.94	4.46
		EER	5.42	5.42	4.98	4.28	3.59
	35°C / 24%	Gross Total Cooling (kW)	17.89	17.89	18.56	19.43	18.24
		Power Input (kW)	3.06	3.06	3.36	3.97	4.43
		EER	5.85	5.85	5.52	4.89	4.12
	40°C / 18%	Gross Total Cooling (kW)	23.29	24.70	26.78	20.34	19.64
		Power Input (kW)	4.15	4.20	4.92	3.81	4.34
		EER	5.61	5.88	5.44	5.34	4.53
LIR6042U-X130-0	25°C / 42%	Gross Total Cooling (kW)	15.02	15.02	14.75	14.16	13.41
		Power Input (kW)	3.27	3.27	3.46	3.87	4.38
		EER	4.59	4.59	4.26	3.67	3.07
	30°C / 32%	Gross Total Cooling (kW)	17.17	22.81	17.26	16.63	15.81
		Power Input (kW)	3.16	4.56	3.47	3.89	4.41
		EER	5.43	5.00	4.97	4.28	3.59
	35°C / 24%	Gross Total Cooling (kW)	23.21	23.21	18.56	19.09	18.24
		Power Input (kW)	4.23	4.23	3.35	3.91	4.44
		EER	5.49	5.49	5.54	4.88	4.12
	40°C / 18%	Gross Total Cooling (kW)	23.29	24.70	26.78	20.34	19.64
		Power Input (kW)	4.14	4.19	4.95	3.80	4.33
		EER	5.63	5.89	5.41	5.35	4.54

All the performance data is based on a SHR of 1.0.
Max EER data is based on a part load condition (i.e. required duty of 50% of the maximum achievable duty of the unit).
Performance data is based upon a unit with no filtration.

Technical - Direct Expansion

Performance Data - Tandem Compressor (X2)

Max EER (X2)

Unit	Air On DB / RH		Ambient (°C) 25	30	35	40	46
LIR6042U-X240-0	25°C / 42%	Gross Total Cooling (kW)	14.94	14.94	14.82	14.24	13.80
		Power Input (kW)	3.22	3.22	3.30	3.70	4.34
		EER	4.64	4.64	4.49	3.85	3.18
	30°C / 32%	Gross Total Cooling (kW)	21.97	21.97	21.57	20.79	21.26
		Power Input (kW)	4.39	4.39	4.67	5.20	6.26
		EER	5.00	5.00	4.62	4.00	3.40
	35°C / 24%	Gross Total Cooling (kW)	30.41	30.41	24.29	26.00	25.13
		Power Input (kW)	5.61	5.61	4.69	5.63	6.30
		EER	5.42	5.42	5.18	4.62	3.99
	40°C / 18%	Gross Total Cooling (kW)	37.61	38.79	33.29	32.29	23.14
		Power Input (kW)	6.63	7.05	6.33	7.15	5.79
		EER	5.68	5.50	5.26	4.52	4.00
LIR6042U-X250-0	25°C / 42%	Gross Total Cooling (kW)	18.38	18.38	18.21	17.53	17.05
		Power Input (kW)	4.30	4.30	4.42	4.92	5.69
		EER	4.27	4.27	4.12	3.56	2.99
	30°C / 32%	Gross Total Cooling (kW)	27.06	27.06	26.49	25.43	24.06
		Power Input (kW)	5.66	5.66	6.07	6.82	7.79
		EER	4.78	4.78	4.36	3.73	3.09
	35°C / 24%	Gross Total Cooling (kW)	30.41	30.41	30.90	26.16	25.29
		Power Input (kW)	5.56	5.56	6.25	5.45	6.13
		EER	5.47	5.47	4.94	4.80	4.13
	40°C / 18%	Gross Total Cooling (kW)	37.61	37.61	33.57	32.58	23.30
		Power Input (kW)	6.58	6.58	6.05	6.86	5.64
		EER	5.72	5.72	5.55	4.75	4.12

Max EER data is based on a part load condition (i.e. required duty of 50% of the maximum achievable duty of the unit).
Unit duty based on a SHR = 1.0
Performance data is based upon a unit with no filtration.

Technical - Direct Expansion

Mechanical Data - Single Compressor (X1)

			LIR6042U-X123	LIR6042U-X130
Standard Condenser Match			**CR50**	**CR50**
Capacity				
Nom Cooling (Gross)	(1)	kW	34.24	35.21
Nom Power Input	(1)	kW	11.98	12.16
Nom EER	(1)		2.86	2.90
Capacity Steps			10 - 100% Modulation	
Dimensions – H x W x D		mm	600 x 1334 x 1994	600 x 1334 x 1994
Weight – Machine / Operating		kg	391 / 395	391 / 395
Construction			Panels: Galvanised Sheet Steel, Epoxy Baked Powder Coated	
Material			Frame: Aluminium Frame with Aluminium Corners, Epoxy Baked Powder Coated	
Colour			Optional: RAL7021 (Black Grey) or RAL7035 (Light Grey)	
Evaporator			Rifled Copper Tube / Turbulated Hydrophilic Coated Aluminium Fins	
Cooling/Dehum Stages			Modulating / 1	Modulating / 1
Fan Redundancy Configuration			N+1	N
Fan Motor			Backwards Curved, Centrifugal Direct Drive	
Motor Type			EC	EC
Quantity x Motor Size		kW	4 x 0.15	4 x 0.15
Maximum Speed		rpm	1925	1925
Minimum Airflow	(2)	m^3/s	0.70	0.70
Maximum Airflow		m^3/s	1.50	1.90
Compressor			EC Inverter Driven Scroll	
Configuration			Single Circuit – Single Compressor (1 x Variable)	Single Circuit – Single Compressor (1 x Variable)
Quantity			1	1
Oil Charge Volume		l	1 x 2.3	1 x 2.3
Seperator Oil Charge		l	0.4	0.4
Oil Type			Polyvinylether (PVE)	
Refrigeration			Single Circuit	
Refrigerant Control and Type			Electronic Expansion Valve	
Refrigerant Type			R410A	
Holding Charge			Inert Gas	
Refrigerant Charge		kg	3.8	3.8
Connections				
Liquid (sweat)		in	1/2	1/2
Discharge (sweat)		in	5/8	5/8
Condensate Drain Hose (ID)		mm	22	22
OPTIONAL EXTRAS				
Filtration			Disposable to BS EN 779-G4	
Quantity			3	3
Depth		mm	50	50
Electric Heating (Total)		kW	10.5	10.5
Type			Thyristor Controlled (Fully Modulating)	
Condensate Pump				
Head		m	8	8
Flow		l/min	5	5
Drain			10mm Stainless Steel Stub Connection	

(1) Nominal data based on 35°C/24% RH Air On condition, 35°C Ambient temperature, and without optional filtration.
(2) Minimum air volume increases to $1m^3/s$ if electric heat option is selected.

Technical - Direct Expansion

Mechanical Data - Tandem Compressor (X2)

			LIR6042U-X240-0	LIR6042U-X250-0
Standard Condenser Match			**CR65**	**CR80**
Capacity				
Nom Cooling (Gross)	(1)	kW	48.17	50.75
Nom Power Input	(1)	kW	17.34	17.17
Nom EER	(1)		2.78	2.95
Capacity Steps			10 - 100% Modulation	
Dimensions – H x W x D		mm	600 x 1334 x 1994	600 x 1334 x 1994
Weight – Machine / Operating		kg	438 / 442	438 / 442
Construction			Panels: Galvanised Sheet Steel, Epoxy Baked Powder Coated	
Material			Frame: Aluminium Frame with Aluminium Corners, Epoxy Baked Powder Coated	
Colour			Optional: RAL7021 (Black Grey) or RAL7035 (Light Grey)	
Evaporator			Rifled Copper Tube / Turbulated Hydrophilic Coated Aluminium Fins	
Cooling/Dehum Stages			Modulating / 1	Modulating / 1
Fan Redundancy Configuration			N+1	N
Fan Motor			Backwards Curved, Centrifugal Direct Drive	
Motor Type			EC	EC
Quantity x Motor Size		kW	4 x 0.5	4 x 0.5
Maximum Speed		rpm	2360	2360
Minimum Airflow	(2)	m^3/s	0.70	0.70
Maximum Airflow		m^3/s	2.30	3.05
Compressor			EC Inverter Driven Scroll	
Configuration			Single Circuit – Tandem Compressors (1 x Variable, 1 x Fixed)	Single Circuit – Tandem Compressors (1 x Variable, 1 x Fixed)
Quantity			2	2
Oil Charge Volume		l	1 x 1.7, 1x 2.3	1 x 1.7, 1 x 2.3
Seperator Oil Charge		l	0.4	0.4
Oil Type			Polyvinylether (PVE)	
Refrigeration			Single Circuit	
Refrigerant Control and Type			Electronic Expansion Valve	
Refrigerant Type			R410A	
Holding Charge			Inert Gas	
Refrigerant Charge		kg	4.2	4.2
Connections				
Liquid (sweat)		in	5/8	5/8
Discharge (sweat)		in	7/8	7/8
Condensate Drain Hose (ID)		mm	22	22
OPTIONAL EXTRAS				
Filtration			Disposable to BS EN 779-G4	
Quantity			3	3
Depth		mm	50	50
Electric Heating (Total)		kW	10.5	10.5
Type			Thyristor Controlled (Fully Modulating)	
Condensate Pump				
Head		m	8	8
Flow		l/min	5	5
Drain			10mm Stainless Steel Stub Connection	

(1) Nominal data based on 35°C/24% RH Air On condition, 35°C Ambient temperature, and without optional filtration.
(2) Minimum air volume increases to $1m^3/s$ if electric heat option is selected.

Technical - Direct Expansion

Electrical Data - Single Compressor (X1)

			LIR6042U-X123	LIR6042U-X130
Standard Condenser Match -			**CR50**	**CR50**
Unit Data Cooling only	(1)			
Nominal Run Amps		A	20.1	21.2
Maximum Start Amps		A	27.3	27.3
Recommended Mains Fuse Size	(4)	A	40	40
Max Mains Incoming Cable Size	(5)	mm²	16	16
Mains Supply 50Hz (-0)		V	400V / 3PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	380V / 3PH + N / 60Hz	
Control Circuit		VAC	24	24
Evaporator Fan - Motor - Per Fan				
Motor Type			EC	EC
Quantity x Motor Size	(2)	kW	4 x 0.15	4 x 0.15
Full Load Amps		A	1.2	1.2
Locked Rotor Amps		A	N/A	N/A
Compressor 1	(3)			
Motor Size		kW	5.25	5.25
Nominal Run Amps		A	18.8	18.8
Max Run Amps		A	24.9	24.9
Type of Start			Soft Start	Soft Start
Compressor 2	(3)			
Motor Size		kW	N/A	N/A
Nominal Run Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
Standard Condenser Match – AC Motor Per Fan				
Quantity x Motor Size (50Hz Supply)		kW	2 x 0.6	2 x 0.6
Full Load Amps (50Hz Supply)		A	2.6	2.6
Quantity x Motor Size (60Hz Supply)		kW	2 x 0.5	2 x 0.5
Full Load Amps (60Hz Supply)		A	2.2	2.2
OPTIONAL EXTRAS				
Electric Heating				
Stage of Reheat			Variable	Variable
Number of Elements			3	3
Rating (Total)		kW	10.5	10.5
Current Per Phase (50Hz Supply)		A	15.2	15.2
Current Per Phase (60Hz Supply)		A	16.0	16.0
Standard Condenser Match - EC Motor-Per Fan				
Mains Supply 50Hz (-0)		V	230V / 1PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	220V / 1PH + N / 60Hz	
Quantity x Motor Size (50Hz Supply)		kW	2 x 0.72	2 x 0.72
Full Load Amps (50Hz Supply)		A	3.2	3.2
Quantity x Motor Size (60Hz Supply)		kW	2 x 0.77	2 x 0.77
Full Load Amps (60Hz Supply)		A	3.3	3.3
SCAF Condenser Match - Motor - Per Fan				
Quantity x Motor Size (50Hz Supply)		kW	2 x 1.4	2 x 1.4
Full Load Amps (50Hz Supply)		A	6.0	6.0
Quantity x Motor Size (60Hz Supply)		kW	2 x 1.75	2 x 1.75
Full Load Amps (60Hz Supply)		A	7.8	7.8

(1) Values given for Cooling Only unit variants at 11°C evaporating and 46°C condensing.
(2) Stated motor power is based on maximum electrical power absorbed.
(3) Values are per compressor.
(4) Values may change based on additional selections (i.e. Heating).
(5) Values based on Fuse size., May change based on unit selections.

Technical - Direct Expansion

Electrical Data - Tandem Compressor (X2)

			LIR6042U-X240-0	LIR6042U-X250-0
Standard Condenser Match -			**CR65**	**CR80**
Unit Data Cooling only	(1)			
Nominal Run Amps		A	27.9	29.4
Maximum Start Amps		A	89.3	89.3
Recommended Mains Fuse Size	(4)	A	50	50
Max Mains Incoming Cable Size	(5)	mm²	16	16
Mains Supply 50Hz (-0)		V	400V / 3PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	380V / 3PH + N / 60Hz	
Control Circuit		VAC		24
Evaporator Fan - Motor - Per Fan				
Motor Type			EC	EC
Quantity x Motor Size	(2)	kW	4 x 0.5	4 x 0.5
Full Load Amps		A	2.2	2.2
Locked Rotor Amps		A	N/A	N/A
Compressor 1	(3)			
Motor Size		kW	5.25	5.25
Nominal Run Amps		A	18.8	18.8
Max Run Amps		A	24.9	24.9
Type of Start			Soft Start	Soft Start
Compressor 2	(3)			
Motor Size		kW	4.28	4.28
Nominal Run Amps		A	6.2	6.2
Locked Rotor Amps		A	60.0	60.0
Type of Start			Direct On Line	Direct On Line
Standard Condenser Match – AC Motor Per Fan				
Quantity x Motor Size (50Hz Supply)		kW	2 x 0.6	3 x 0.6
Full Load Amps (50Hz Supply)		A	2.6	2.6
Quantity x Motor Size (60Hz Supply)		kW	2 x 0.5	3 x 0.5
Full Load Amps (60Hz Supply)		A	2.2	2.2
OPTIONAL EXTRAS				
Electric Heating				
Stage of Reheat			Variable	Variable
Number of Elements			3	3
Rating (Total)		kW	10.5	10.5
Current Per Phase (50Hz Supply)		A	15.2	15.2
Current Per Phase (60Hz Supply)		A	16.0	16.0
Standard Condenser Match - EC Motor- Per Fan				
Mains Supply 50Hz (-0)		V	230V / 1PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	220V / 1PH + N / 60Hz	
Quantity x Motor Size (50Hz Supply)		kW	2 x 0.72	3 x 0.72
Full Load Amps (50Hz Supply)		A	3.2	3.2
Quantity x Motor Size (60Hz Supply)		kW	2 x 0.77	3 x 0.77
Full Load Amps (60Hz Supply)		A	3.3	3.3
SCAF Condenser Match - Motor - Per Fan				
Quantity x Motor Size (50Hz Supply)		kW	2 x 1.4	3 x 1.4
Full Load Amps (50Hz Supply)		A	6.0	6.0
Quantity x Motor Size (60Hz Supply)		kW	2 x 1.75	3 x 1.75
Full Load Amps (60Hz Supply)		A	7.8	7.8

(1) Values given for unit variants at 11°C evaporating and 46°C condensing.
(2) Stated motor power is based on maximum electrical power absorbed.
(3) Values are per compressor.
(4) Values may change based on additional selections (i.e. Heating).
(5) Values based on Fuse size., May change based on unit selections.

Technical - Direct Expansion

Sound Data - (X1 / X2)

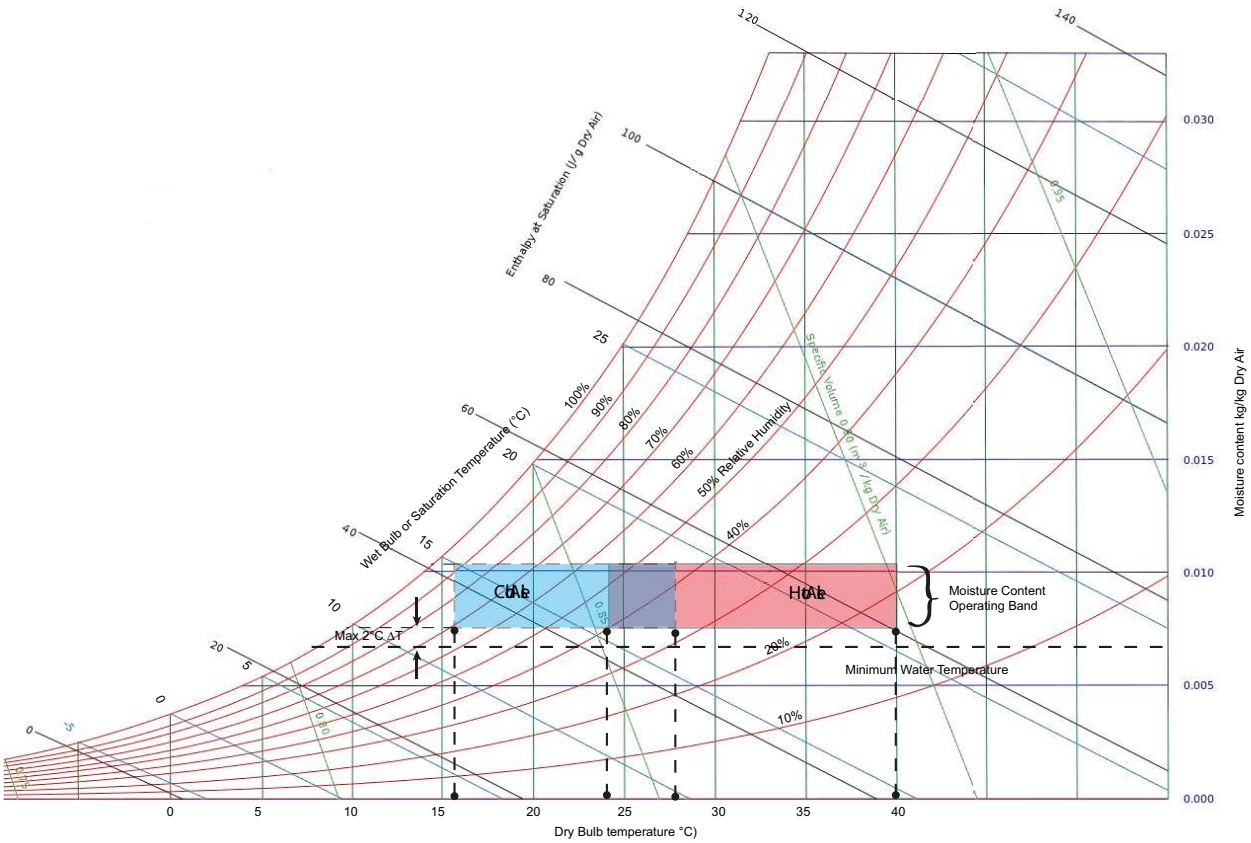
					Frequency (Hz) dB							
		Fan load %	Sound Measurement	Overall dB(A)	63	125	250	500	1000	2000	4000	8000
LIR6042U-X123	N+1	100	Overall Lw	85	84	97	79	72	72	72	68	71
			Sound Pressure @ 1m	77	76	89	71	64	64	64	60	63
		50	Overall Lw	82	69	92	65	68	71	72	67	71
			Sound Pressure @ 1m	74	61	84	57	60	63	64	59	63
LIR6042U-X130	N	100	Overall Lw	91	92	103	87	78	75	73	68	71
			Sound Pressure @ 1m	82	84	95	79	70	67	65	60	63
		50	Overall Lw	82	74	93	69	68	71	72	67	71
			Sound Pressure @ 1m	74	66	85	61	60	63	64	59	63
LIR6042U-X240	N+1	100	Overall Lw	88	68	77	79	75	78	77	71	71
			Sound Pressure @ 1m	79	60	69	71	67	70	69	63	63
		50	Overall Lw	82	58	92	68	68	71	72	67	71
			Sound Pressure @ 1m	73	50	84	60	60	63	64	59	63
LIR6042U-X250	N	100	Overall Lw	92	75	79	86	81	82	78	72	72
			Sound Pressure @ 1m	83	67	71	78	73	74	70	64	64
		50	Overall Lw	82	65	92	74	69	71	72	68	71
			Sound Pressure @ 1m	74	57	84	66	61	63	64	60	63

N+1 (75% Max fan speed) 100% fan load refers to 4 fans operating at this N+1 fan speed
N+1 (75% Max fan speed) 50% fan load refers to 4 fans operating at 50% of N+1 Max fan speed.
N (100% Fan speed) 100% fan load refers to 4 fans operating at 100% of N Max fan speed.
N (100% Fan speed) 50% fan load refers to 4 fans operating at 50% of N Max fan speed.

Technical Data - Chilled Water

Operating Limits

Cooling		Min	Max
Room Temperature	°C	16	28
Room RH at 24°C	%	40	55
Return Air Temperature	°C	25	40
Entering Water Temperature	°C	8	16
Leaving Water Temperature	°C	13	21



Low humidity in a data centre can potentially cause static electricity build up.

Technical Data - Chilled Water

Performance Data - (C0)

Full Load - (C0)

	Air On DB / RH		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-C030	25°C / 42%	Gross Total Cooling (kW)	20.28	18.67	17.20	15.54	13.34
		Power Input (kW)	0.36	0.36	0.36	0.36	0.36
		EER	56.33	51.86	47.78	43.17	37.06
	30°C / 32%	Gross Total Cooling (kW)	29.01	27.44	26.05	24.48	22.35
		Power Input (kW)	0.36	0.36	0.36	0.36	0.36
		EER	80.58	76.22	72.36	68.00	62.08
	35°C / 24%	Gross Total Cooling (kW)	37.04	35.58	34.27	32.74	30.59
		Power Input (kW)	0.36	0.36	0.36	0.36	0.36
		EER	102.89	98.83	95.19	90.94	84.97
	40°C / 18%	Gross Total Cooling (kW)	44.61	43.28	42.13	40.65	38.31
		Power Input (kW)	0.36	0.36	0.36	0.36	0.36
		EER	123.92	120.22	117.03	112.92	106.42
LIR6042U-C040	25°C / 42%	Gross Total Cooling (kW)	24.56	22.58	20.70	18.59	15.93
		Power Input (kW)	0.65	0.65	0.65	0.65	0.65
		EER	37.78	34.74	31.85	28.60	24.51
	30°C / 32%	Gross Total Cooling (kW)	34.89	33.04	31.35	29.44	26.91
		Power Input (kW)	0.65	0.65	0.65	0.65	0.65
		EER	53.68	50.83	48.23	45.29	41.40
	35°C / 24%	Gross Total Cooling (kW)	44.87	43.02	41.32	39.42	36.97
		Power Input (kW)	0.65	0.65	0.65	0.65	0.65
		EER	69.03	66.18	63.57	60.65	56.88
	40°C / 18%	Gross Total Cooling (kW)	54.12	52.43	50.89	49.04	46.43
		Power Input (kW)	0.65	0.65	0.65	0.65	0.65
		EER	83.26	80.66	78.29	75.45	71.43

All the performance data is based on a SHR of 1.0.
Maximum duty data is based on achievable duty at maximum air volume.
Performance data is based upon a unit with no filtration.

Technical Data - Chilled Water

Performance Data - (C0)

Full Load - (C0)

	Air On DB / RH		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-C045	25°C / 42%	Gross Total Cooling (kW)	24.53	22.28	20.11	18.02	16.00
		Power Input (kW)	0.97	0.97	0.97	0.97	0.97
		EER	25.29	22.97	20.73	18.58	16.49
	30°C / 32%	Gross Total Cooling (kW)	36.59	34.45	32.33	30.07	27.52
		Power Input (kW)	0.97	0.97	0.97	0.97	0.97
		EER	37.72	35.52	33.33	31.00	28.37
	35°C / 24%	Gross Total Cooling (kW)	47.81	45.67	43.53	41.34	39.03
		Power Input (kW)	0.97	0.97	0.97	0.97	0.97
		EER	49.29	47.08	44.88	42.62	40.24
	40°C / 18%	Gross Total Cooling (kW)	58.37	56.24	54.11	51.95	49.71
		Power Input (kW)	0.97	0.97	0.97	0.97	0.97
		EER	60.18	57.98	55.78	53.56	51.25
LIR6042U-C060	25°C / 42%	Gross Total Cooling (kW)	30.71	27.74	24.82	21.98	19.29
		Power Input (kW)	1.88	1.88	1.88	1.88	1.88
		EER	16.34	14.76	13.20	11.69	10.26
	30°C / 32%	Gross Total Cooling (kW)	45.69	42.78	39.85	37.02	34.41
		Power Input (kW)	1.88	1.88	1.88	1.88	1.88
		EER	24.30	22.76	21.20	19.69	18.30
	35°C / 24%	Gross Total Cooling (kW)	59.57	56.76	53.94	51.17	48.49
		Power Input (kW)	1.88	1.88	1.88	1.88	1.88
		EER	31.69	30.19	28.69	27.22	25.79
	40°C / 18%	Gross Total Cooling (kW)	72.78	70.00	67.22	64.49	61.84
		Power Input (kW)	1.88	1.88	1.88	1.88	1.88
		EER	38.71	37.23	35.76	34.30	32.89

All the performance data is based on a SHR of 1.0.
Maximum duty data is based on achievable duty at maximum air volume.
Performance data is based upon a unit with no filtration.

Technical Data - Chilled Water

Performance Data - (C0)

Part Load - (C0)

	Air On DB / RH		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-C030	25°C / 42%	Gross Total Cooling (kW)	11.39	10.60	9.95	9.22	8.17
		Power Input (kW)	0.08	0.08	0.08	0.08	0.08
		EER	142.38	132.50	124.38	115.25	102.13
	30°C / 32%	Gross Total Cooling (kW)	15.41	14.85	14.37	13.58	12.05
		Power Input (kW)	0.08	0.08	0.08	0.08	0.08
		EER	192.63	185.63	179.63	169.75	150.63
	35°C / 24%	Gross Total Cooling (kW)	19.95	19.30	18.64	17.79	16.57
		Power Input (kW)	0.08	0.08	0.08	0.08	0.08
		EER	249.38	241.25	233.00	222.38	207.13
	40°C / 18%	Gross Total Cooling (kW)	24.26	23.45	22.55	21.65	20.84
		Power Input (kW)	0.08	0.08	0.08	0.08	0.08
		EER	303.25	293.13	281.87	270.63	260.50
LIR6042U-C040	25°C / 42%	Gross Total Cooling (kW)	13.70	12.69	11.83	10.86	9.49
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	105.38	97.62	91.00	83.54	73.00
	30°C / 32%	Gross Total Cooling (kW)	19.11	18.23	17.49	16.48	14.82
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	147.00	140.23	134.54	126.77	114.00
	35°C / 24%	Gross Total Cooling (kW)	24.49	23.62	22.82	21.80	20.30
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	188.38	181.69	175.54	167.69	156.15
	40°C / 18%	Gross Total Cooling (kW)	29.62	28.70	27.80	26.77	25.44
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	227.85	220.77	213.85	205.92	195.69

All the performance data is based on a SHR of 1.0.
Part load duty data is based on unit operating at half of maximum air volume.
Performance data is based upon a unit with no filtration.

Technical Data - Chilled Water

Performance Data - (C0)

Part Load - (C0)

	Air On DB / RH		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-C045	25°C / 42%	Gross Total Cooling (kW)	14.52	13.66	12.81	11.62	9.78
		Power Input (kW)	0.15	0.15	0.15	0.15	0.15
		EER	96.80	91.07	85.40	77.47	65.20
	30°C / 32%	Gross Total Cooling (kW)	20.62	19.03	17.58	16.44	15.80
		Power Input (kW)	0.15	0.15	0.15	0.15	0.15
		EER	137.47	126.87	117.20	109.60	105.33
	35°C / 24%	Gross Total Cooling (kW)	26.84	25.39	24.03	22.84	21.86
		Power Input (kW)	0.15	0.15	0.15	0.15	0.15
		EER	178.93	169.27	160.20	152.27	145.73
	40°C / 18%	Gross Total Cooling (kW)	32.30	31.09	29.98	28.86	27.60
		Power Input (kW)	0.15	0.15	0.15	0.15	0.15
		EER	215.33	207.27	199.87	192.40	184.00
LIR6042U-C060	25°C / 42%	Gross Total Cooling (kW)	17.76	16.42	15.13	13.69	11.91
		Power Input (kW)	0.25	0.25	0.25	0.25	0.25
		EER	71.04	65.68	60.52	54.76	47.64
	30°C / 32%	Gross Total Cooling (kW)	25.94	24.26	22.68	21.15	19.66
		Power Input (kW)	0.25	0.25	0.25	0.25	0.25
		EER	103.76	97.04	90.72	84.60	78.64
	35°C / 24%	Gross Total Cooling (kW)	33.87	32.24	30.68	29.15	27.65
		Power Input (kW)	0.25	0.25	0.25	0.25	0.25
		EER	135.48	128.96	122.72	116.60	110.60
	40°C / 18%	Gross Total Cooling (kW)	41.08	39.59	38.15	36.68	35.06
		Power Input (kW)	0.25	0.25	0.25	0.25	0.25
		EER	164.32	158.36	152.60	146.72	140.24

All the performance data is based on a SHR of 1.0.
Part load duty data is based on unit operating at half of maximum air volume.
Performance data is based upon a unit with no filtration.

Technical Data - Chilled Water

Mechanical Data - (C0)

			LIR6042U-C030	LIR6042U-C040	LIR6042U-C045	LIR6042U-C060
Capacity						
Nom Cooling (Gross)	(1)	kW	37.04	44.87	51.47	64.02
Nom Fan Power Input	(1)	kW	0.36	0.65	1.15	2.43
Nom EER	(1)		102.89	69.03	44.76	26.35
Dimensions – H x W x D		mm	600 x 1334 x 1994	600 x 1334 x 1994	600 x 1334 x 1994	600 x 1334 x 1994
Weight - Machine / operating		kg	319 / 338	319 / 338	328 / 348	328 / 348
Construction			Panels: Galvanised Sheet Steel, Epoxy Baked Powder Coated			
Material			Frame: Aluminium Frame with Aluminium Corners, Epoxy Baked Powder Coated			
Colour			Optional: RAL7021 (Black Grey) or RAL7035 (Light Grey)			
Cooling Coil			Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Cooling/Dehum Stages			Fully Modulating			
Water volume		l	25.82	25.82	29.79	29.79
Nominal Water Flow Rate		l/s	1.50	1.84	1.93	2.43
Nominal Pressure drop		kPa	32.4	47.9	28.7	43.4
Fan Redundancy Configuration			N+1	N	N+1	N
Fan & Motor			Backwards Curved, Centrifugal direct drive			
Motor Type			EC	EC	EC	EC
Quantity x Motor Size		kW	4 x 0.15	4 x 0.15	4 x 0.5	4 x 0.5
Maximum Speed		rpm	1525	1525	2360	2360
Minimum Airflow	(1)	m^3/s	0.70	0.70	0.70	0.70
Maximum Airflow		m^3/s	1.50	1.90	2.30	3.05
Connections						
Water Inlet / Outlet -		mm	35	35	42	42
Condensate Drain Hose		mm	22	22	22	22
OPTIONAL EXTRAS						
Filtration			**Disposable to BS EN 779-G4**			
Quantity			3	3	3	3
Depth		mm	50	50	50	50
Electric Heating (Total)		kW	10.5	10.5	10.5	10.5
Type			Thyristor controlled (Fully modulating)			
Condensate Pump						
Head		m	8	8	8	8
Flow		l/min	5	5	5	5
Drain			10mm Stainless Steel Stub Connection			
Threaded Connections						
Water Inlet/Outlet		in	1 1/4	1 1/4	1 1/2	1 1/2
Thread Type			BSP Male Taper			

(1) Nominal data based on 35°C/24% Air On condition, 10/16°C Water temperatures, and without optional filtration.
(2) Minimum air volume increases to $1m^3/s$ if electric heat option is selected.

Technical Data - Chilled Water

Electrical Data - (C0)

			LIR6042U-C030	LIR6042U-C040	LIR6042U-C045	LIR6042U-C060
Standard Outdoor Unit Match -			**Chiller**	**Chiller**	**Chiller**	**Chiller**
Unit Data Cooling only						
Nominal Run Amps	(1)	A	1.3	2.4	2.9	4.4
Maximum Start Amps		A	2.4	2.4	4.4	4.4
Recommended Mains Fuse Size	(3)	A	10	10	10	10
Max Mains Incoming Cable Size		mm²	10	10	10	10
Mains Supply 50Hz (-0)		V	400V / 3PH + N / 50Hz		400V / 3PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	380V / 3PH + N / 60Hz		380V / 3PH + N / 60Hz	
Control Circuit		VAC	24	24	24	24
Evaporator Fan - Motor - Per Fan						
Motor Type			EC	EC	EC	EC
Quantity x Motor Size	(2)	kW	4 x 0.15	4 x 0.15	4 x 0.5	4 x 0.5
Full Load Amps		A	1.2	1.2	2.2	2.2
Locked Rotor Amps		A	N/A	N/A	N/A	N/A
OPTIONAL EXTRAS						
Electric Heating						
Stage of Reheat			Variable	Variable	Variable	Variable
Number of Elements			3	3	3	3
Rating (Total)		kW	10.5	10.5	10.5	10.5
Current Per Phase (50Hz Supply)		A	15.2	15.2	15.2	15.2
Current Per Phase (60Hz Supply)		A	16.0	16.0	16.0	16.0

(1) Values given for Cooling Only unit .
(2) Stated motor power is based on maximum electrical power absorbed.
(3) Values may change based on additional selections (i.e. Heating).

Technical Data - Chilled Water

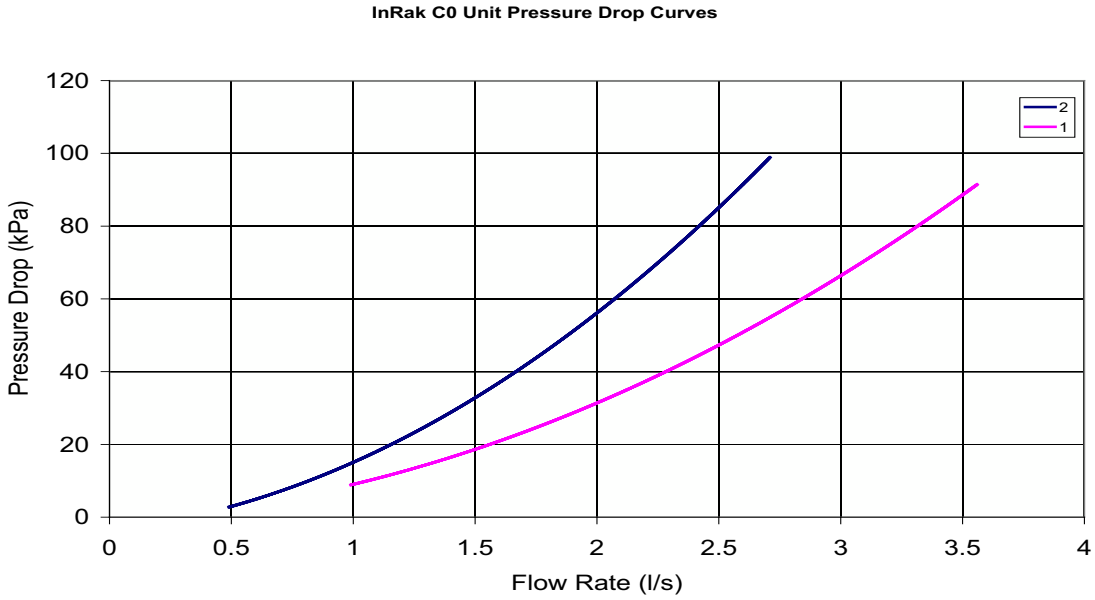
Sound Data - (C0)

					Frequency (Hz) dB							
		Fan load %	Sound Measurement	Overall dB(A)	63	125	250	500	1000	2000	4000	8000
LIR6042U-C030	N+1	100	Overall Lw	81	84	94	79	70	66	59	53	48
			Sound Pressure @ 1m	73	76	86	71	62	58	51	45	40
		50	Overall Lw	65	69	77	63	56	53	46	40	34
			Sound Pressure @ 1m	57	61	69	55	48	45	38	32	26
LIR6042U-C040	N	100	Overall Lw	90	92	102	87	77	73	65	59	55
			Sound Pressure @ 1m	81	84	94	79	69	65	57	51	47
		50	Overall Lw	70	74	83	69	61	57	50	44	39
			Sound Pressure @ 1m	62	66	75	61	53	49	42	36	31
LIR6042U-C045	N+1	100	Overall Lw	83	68	70	79	74	74	67	61	59
			Sound Pressure @ 1m	74	60	62	71	66	66	59	53	51
		50	Overall Lw	64	58	66	67	58	55	49	45	44
			Sound Pressure @ 1m	55	50	58	59	50	47	41	37	36
LIR6042U-C060	N	100	Overall Lw	90	75	76	86	81	81	73	68	66
			Sound Pressure @ 1m	81	67	68	78	73	73	65	60	58
		50	Overall Lw	70	65	73	74	65	61	54	50	50
			Sound Pressure @ 1m	62	57	65	66	57	53	46	42	42

N+1 (75% Max fan speed) 100% fan load refers to 4 fans operating at this N+1 fan speed
N+1 (75% Max fan speed) 50% fan load refers to 4 fans operating at 50% of N+1 Max fan speed.
N (100% Fan speed) 100% fan load refers to 4 fans operating at 100% of N Max fan speed.
N (100% Fan speed) 50% fan load refers to 4 fans operating at 50% of N Max fan speed.

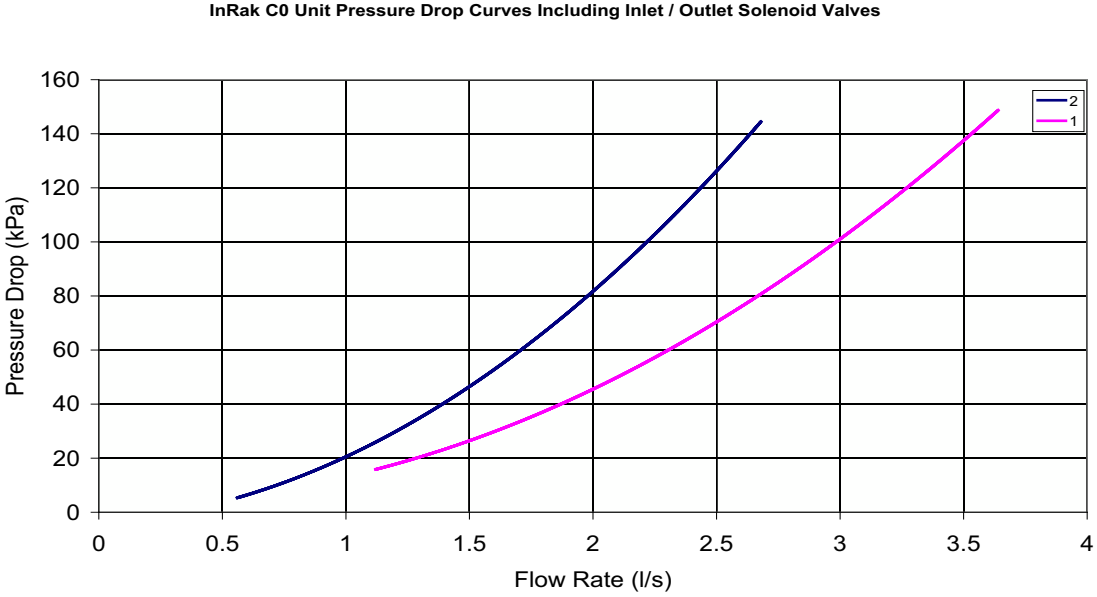
Technical Data - Chilled Water

Unit Pressure Drops (C0)



1 - LIR6042U-C045-0, LIR6042U-C060-0, LIR6042U-C045-1, LIR6042U-C060-1.
2 - LIR6042U-C030-0, LIR6042U-C040-0, LIR6042U-C030-1, LIR6042U-C040-1.

Unit and Solenoid Valve Pressure Drops (C0)

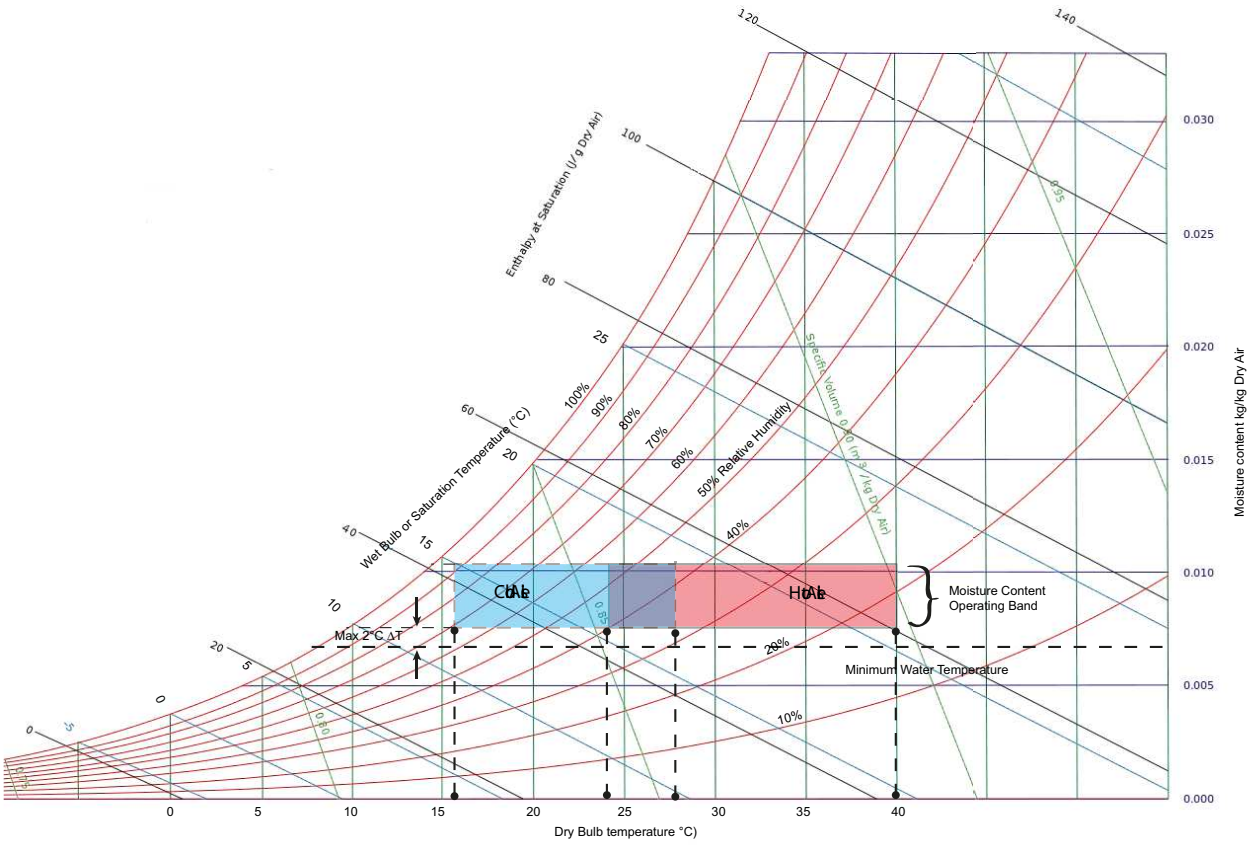


1 - LIR6042U-C045-0, LIR6042U-C060-0, LIR6042U-C045-1, LIR6042U-C060-1.
2 - LIR6042U-C030-0, LIR6042U-C040-0, LIR6042U-C030-1, LIR6042U-C040-1.

Technical Data - Dual Circuit Chilled Water

Operating Limits

Cooling		Min	Max
Room Temperature	°C	16	28
Room RH at 24°C	%	40	55
Return Air Temperature	°C	25	40
Entering Water Temperature	°C	8	16
Leaving Water Temperature	°C	13	21



Low humidity in a data centre can potentially cause static electricity build up.

Technical Data - Dual Circuit Chilled Water

Performance Data - (CC)

Full Load - (CC)

	Air On DB (°C)/RH (%)		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-CC22	25 / 42	Gross Total Cooling (kW)	12.65	11.40	10.16	8.92	7.68
		Power Input (kW)	0.33	0.33	0.33	0.33	0.33
		EER	38.33	34.55	30.79	27.03	23.27
	30 / 32	Gross Total Cooling (kW)	19.47	18.21	16.95	15.68	14.39
		Power Input (kW)	0.33	0.33	0.33	0.33	0.33
		EER	59.00	55.18	51.36	47.52	43.61
	35 / 24	Gross Total Cooling (kW)	25.82	24.58	23.35	22.11	20.88
		Power Input (kW)	0.33	0.33	0.33	0.33	0.33
		EER	78.24	74.48	70.76	67.00	63.27
	40 / 18	Gross Total Cooling (kW)	31.84	30.62	29.40	28.19	26.97
		Power Input (kW)	0.33	0.33	0.33	0.33	0.33
		EER	96.48	92.79	89.09	85.42	81.73
LIR6042U-CC26	25 / 42	Gross Total Cooling (kW)	15.33	13.72	12.14	10.61	9.16
		Power Input (kW)	0.67	0.67	0.67	0.67	0.67
		EER	22.88	20.48	18.12	15.84	13.67
	30 / 32	Gross Total Cooling (kW)	23.66	22.13	20.59	19.05	17.50
		Power Input (kW)	0.67	0.67	0.67	0.67	0.67
		EER	35.31	33.03	30.73	28.43	26.12
	35 / 24	Gross Total Cooling (kW)	31.40	29.89	28.38	26.87	25.37
		Power Input (kW)	0.67	0.67	0.67	0.67	0.67
		EER	46.87	44.61	42.36	40.10	37.87
	40 / 18	Gross Total Cooling (kW)	38.80	37.30	35.80	34.31	32.82
		Power Input (kW)	0.67	0.67	0.67	0.67	0.67
		EER	57.91	55.67	53.43	51.21	48.99

Important
Cooling capacity is based upon each coil running independently. If the unit is used with both circuits operating the second circuit will have reduced capacity due to the lower air on temperature (equal to the air off temperature of the first coil).

Technical Data - Dual Circuit Chilled Water

Performance Data - (CC)

Full Load - (CC)

	Air On DB (°C)/RH (%)		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-CC30	25 / 42	Gross Total Cooling (kW)	16.49	14.73	13.01	11.35	9.81
		Power Input (kW)	0.96	0.96	0.96	0.96	0.96
		EER	17.18	15.34	13.55	11.82	10.22
	30 / 32	Gross Total Cooling (kW)	25.39	23.75	22.10	20.44	18.77
		Power Input (kW)	0.96	0.96	0.96	0.96	0.96
		EER	26.45	24.74	23.02	21.29	19.55
	35 / 24	Gross Total Cooling (kW)	33.72	32.10	30.47	28.85	27.23
		Power Input (kW)	0.96	0.96	0.96	0.96	0.96
		EER	35.13	33.44	31.74	30.05	28.36
	40 / 18	Gross Total Cooling (kW)	41.69	40.08	38.47	36.86	35.25
		Power Input (kW)	0.96	0.96	0.96	0.96	0.96
		EER	43.43	41.75	40.07	38.40	36.72
LIR6042U-CC40	25 / 42	Gross Total Cooling (kW)	19.94	17.80	15.70	13.73	11.94
		Power Input (kW)	2.11	2.11	2.11	2.11	2.11
		EER	9.45	8.44	7.44	6.51	5.66
	30 / 32	Gross Total Cooling (kW)	30.61	28.62	26.62	24.62	22.60
		Power Input (kW)	2.11	2.11	2.11	2.11	2.11
		EER	14.51	13.56	12.62	11.67	10.71
	35 / 24	Gross Total Cooling (kW)	40.75	38.78	36.80	34.82	32.84
		Power Input (kW)	2.11	2.11	2.11	2.11	2.11
		EER	19.31	18.38	17.44	16.50	15.56
	40 / 18	Gross Total Cooling (kW)	50.49	48.53	46.57	44.60	42.65
		Power Input (kW)	2.11	2.11	2.11	2.11	2.11
		EER	23.93	23.00	22.07	21.14	20.21

Technical Data - Dual Circuit Chilled Water

Performance Data - (CC)

Part Load - (CC)

	Air On DB (°C) / RH (%)		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-CC22	25 / 42	Gross Total Cooling (kW)	8.24	7.62	6.96	6.23	5.39
		Power Input (kW)	0.09	0.09	0.09	0.09	0.09
		EER	91.56	84.67	77.33	69.22	59.89
	30 / 32	Gross Total Cooling (kW)	12.35	11.55	10.74	9.92	9.08
		Power Input (kW)	0.09	0.09	0.09	0.09	0.09
		EER	137.22	128.33	119.33	110.22	100.89
	35 / 24	Gross Total Cooling (kW)	16.37	15.61	14.84	14.06	13.28
		Power Input (kW)	0.09	0.09	0.09	0.09	0.09
		EER	181.89	173.44	164.89	156.22	147.56
	40 / 18	Gross Total Cooling (kW)	20.13	19.37	18.62	17.86	17.11
		Power Input (kW)	0.09	0.09	0.09	0.09	0.09
		EER	223.67	215.22	206.89	198.44	190.11
LIR6042U-CC26	25 / 42	Gross Total Cooling (kW)	9.44	8.64	7.82	6.95	6.00
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	72.62	66.46	60.15	53.46	46.15
	30 / 32	Gross Total Cooling (kW)	14.30	13.38	12.44	11.50	10.54
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	110.00	102.92	95.69	88.46	81.08
	35 / 24	Gross Total Cooling (kW)	18.96	18.06	17.17	16.27	15.36
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	145.85	138.92	132.08	125.15	118.15
	40 / 18	Gross Total Cooling (kW)	23.33	22.45	21.57	20.69	19.80
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	179.46	172.69	165.92	159.15	152.31

Important
Cooling capacity is based upon per coil running independent of each other. If the unit is used with both circuits operating the second circuit will have reduced capacity due to the lower air on temperature.

Technical Data - Dual Circuitl Chilled Water

Performance Data - (CC)

Part Load - (CC)

	Air On DB (°C) / RH (%)		Water Temperatures (°C) 10/16	11/17	12/18	13/19	14/20
LIR6042U-CC30	25 / 42	Gross Total Cooling (kW)	10.07	9.18	8.29	7.38	6.40
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	77.46	70.62	63.77	56.77	49.23
	30 / 32	Gross Total Cooling (kW)	15.59	14.59	13.57	12.55	11.52
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	119.92	112.23	104.38	96.54	88.62
	35 / 24	Gross Total Cooling (kW)	20.64	19.67	18.69	17.71	16.72
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	158.77	151.31	143.77	136.23	128.62
	40 / 18	Gross Total Cooling (kW)	25.42	24.46	23.50	22.54	21.57
		Power Input (kW)	0.13	0.13	0.13	0.13	0.13
		EER	195.54	188.15	180.77	173.38	165.92
LIR6042U-CC40	25 / 42	Gross Total Cooling (kW)	12.45	11.22	10.01	8.80	7.61
		Power Input (kW)	0.27	0.27	0.27	0.27	0.27
		EER	46.11	41.56	37.07	32.59	28.19
	30 / 32	Gross Total Cooling (kW)	19.23	17.99	16.74	15.49	14.22
		Power Input (kW)	0.27	0.27	0.27	0.27	0.27
		EER	71.22	66.63	62.00	57.37	52.67
	35 / 24	Gross Total Cooling (kW)	25.49	24.28	23.06	21.84	20.62
		Power Input (kW)	0.27	0.27	0.27	0.27	0.27
		EER	94.41	89.93	85.41	80.89	76.37
	40 / 18	Gross Total Cooling (kW)	31.45	30.24	29.04	27.84	26.63
		Power Input (kW)	0.27	0.27	0.27	0.27	0.27
		EER	116.48	112.00	107.56	103.11	98.63

Technical Data - Dual Circuit Chilled Water

Mechanical Data - (CC)

			LIR6042U-CC22	LIR6042U-CC26	LIR6042U-CC30	LIR6042U-CC40
Capacity						
Nom Cooling (Gross)	(1)	kW	25.82	31.40	36.03	42.68
Nom Fan Power Input	(1)	kW	0.33	0.67	1.10	2.39
Nom EER	(1)		78.24	46.87	30.53	17.86
Dimensions - W x D x H		mm	600 x 1334 x 1994	600 x 1334 x 1994	600 x 1334 x 1994	600 x 1334 x 1994
Weight - Machine / operating		kg	317 / 344	317 / 344	330 / 361	330 / 361
Construction			Panels: Galvanised Sheet Steel, Epoxy Baked Powder Paint - Black Grey (RAL 7021)			
Material			Frame: Aluminium Frame with Aluminium Corners, Epoxy Baked Powder Coated			
Colour			Optional: RAL7021 (Black Grey) or RAL7035 (Light Grey)			
Cooling Coil			Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Cooling/Dehum Stages			Fully Modulating			
Water volume		l				
Nominal Water flow rate		l/s	1.04	1.30	1.38	1.70
Nominal Pressure drop		kPa	15.8	24.4	23.3	34.7
Fan Redundancy Configuration			N+1	N	N+1	N
Fan			Backwards Curved, Centrifugal Direct Drive			
Motor Type			EC	EC	EC	EC
Quantity x Motor Size		kW	4 x 0.15	4 x 0.15	4 x 0.5	4 x 0.5
Maximum Speed		rpm	1525	1525	2360	2360
Minimum Airflow	(2)	m^3/s	0.70	0.70	0.70	0.70
Maximum Airflow		m^3/s	1.30	1.75	2.10	2.75
Connections						
Water Inlet / Outlet -		mm	28	28	35	35
Condensate Drain Hose		mm	22	22	22	22
OPTIONAL EXTRAS						
Filtration			Disposable to BS EN 779-G4			
Quantity			3	3	3	3
Depth		mm	50	50	50	50
Electric Heating (Total)		kW	10.5	10.5	10.5	10.5
Type			Thyristor Controlled (Fully Modulating)			
Condensate Pump						
Head		m	8	8	8	8
Flow		l/min	5	5	5	5
Drain			10mm Stainless Steel Stub Connection			
Threaded Connections						
Water Inlet/Outlet		in	1	1	1 1/4	1 1/4
Thread Type			BSP Male			

(1) Nominal data based on 35C/24% Air On condition, 10/16C Water temperatures, and without optional filtration.
(2) Minimum air volume increases to 1m3/s if electric heat option is selected.

Technical Data - Dual Circuit Chilled Water

Electrical Data - (CC)

			LIR6042U-CC22	LIR6042U-CC26	LIR6042U-CC30	LIR6042U-CC40
Standard Outdoor Unit Match -			**Chiller**	**Chiller**	**Chiller**	**Chiller**
Unit Data Cooling only						
Nominal Run Amps	(1)	A	1.3	2.4	2.9	4.4
Maximum Start Amps		A	2.4	2.4	4.4	4.4
Recommended Mains Fuse Size	(3)	A	10	10	10	10
Max Mains Incoming Cable Size		mm²	10	10	10	10
Mains Supply 50Hz (-0)		V	400V / 3PH + N / 50Hz		400V / 3PH + N / 50Hz	
Mains Supply 60Hz (-1)		V	380V / 3PH + N / 60Hz		380V / 3PH + N / 60Hz	
Control Circuit		VAC	24	24	24	24
Evaporator Fan - Motor - Per Fan						
Motor Type			EC	EC	EC	EC
Quantity x Motor Size	(2)	kW	4 x 0.15	4 x 0.15	4 x 0.5	4 x 0.5
Full Load Amps		A	1.2	1.2	2.2	2.2
Locked Rotor Amps		A	N/A	N/A	N/A	N/A
OPTIONAL EXTRAS						
Electric Heating						
Stage of Reheat			Variable	Variable	Variable	Variable
Number of Elements			3	3	3	3
Rating (Total)		kW	10.5	10.5	10.5	10.5
Current Per Phase (50Hz Supply)		A	15.2	15.2	15.2	15.2
Current Per Phase (60Hz Supply)		A	16.0	16.0	16.0	16.0

(1) Values given for Cooling Only unit .
(2) Stated motor power is based on maximum electrical power absorbed.
(3) Values may change based on additional selections (i.e. Heating).

Technical Data - Dual Cool Chilled Water

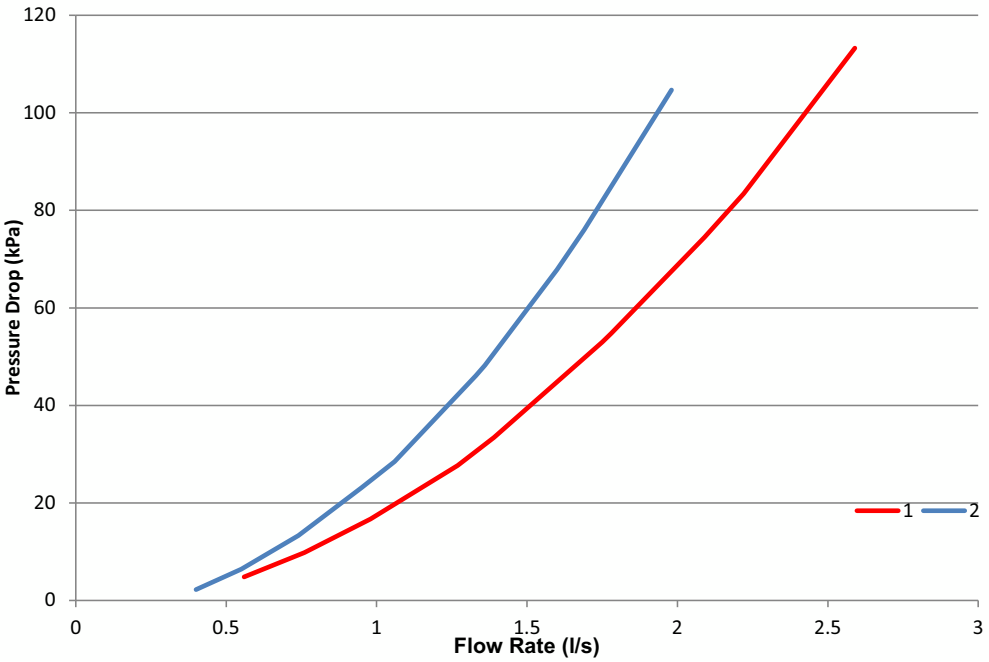
Sound Data - (CC)

					Frequency (Hz) dB							
		Fan Load %	Sound Measurement	Overall dB(A)	63	125	250	500	1000	2000	4000	8000
LIR6042U-CC22-0	N+1	100	Overall Lw	81	84	94	79	70	66	59	53	48
			Sound Pressure @ 1m	73	76	86	71	62	58	51	45	40
		50	Overall Lw	65	69	77	63	56	53	46	40	34
			Sound Pressure @ 1m	57	61	69	55	48	45	38	32	26
LIR6042U-CC26-0	N	100	Overall Lw	90	92	102	87	77	73	65	59	55
			Sound Pressure @ 1m	81	84	94	79	69	65	57	51	47
		50	Overall Lw	70	74	83	69	61	57	50	44	39
			Sound Pressure @ 1m	62	66	75	61	53	49	42	36	31
LIR6042U-CC30-0	N+1	100	Overall Lw	83	68	70	79	74	74	67	61	59
			Sound Pressure @ 1m	74	60	62	71	66	66	59	53	51
		50	Overall Lw	64	58	66	67	58	55	49	45	44
			Sound Pressure @ 1m	55	50	58	59	50	47	41	37	36
LIR6042U-CC40-0	N	100	Overall Lw	90	75	76	86	81	81	73	68	66
			Sound Pressure @ 1m	81	67	68	78	73	73	65	60	58
		50	Overall Lw	70	65	73	74	65	61	54	50	50
			Sound Pressure @ 1m	62	57	65	66	57	53	46	42	42

N+1 (75% Max fan speed) 100% fan load refers to 4 fans operating at this N+1 fan speed
N+1 (75% Max fan speed) 50% fan load refers to 4 fans operating at 50% of N+1 Max fan speed.
N (100% Fan speed) 100% fan load refers to 4 fans operating at 100% of N Max fan speed.
N (100% Fan speed) 50% fan load refers to 4 fans operating at 50% of N Max fan speed.

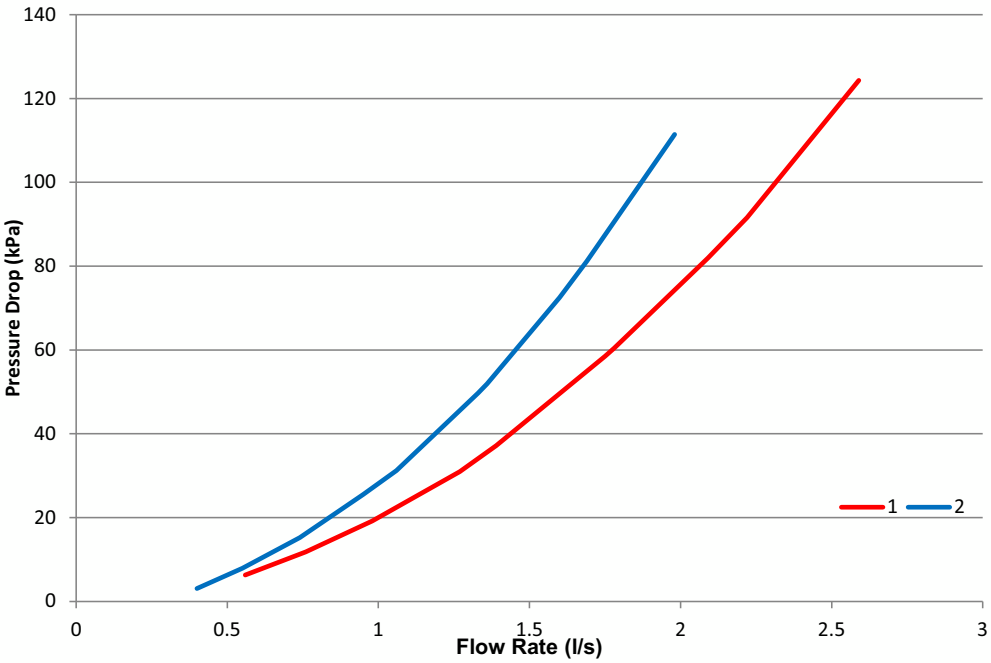
Technical Data - Dual Cool Chilled Water

Unit Pressure Drops (CC)



1 LIR6042U-CC30-0, LIR6042U-CC40-0, LIR6042U-CC30-1, LIR6042U-CC40-1.
2 LIR6042U-CC22-0, LIR6042U-CC26-0, LIR6042U-CC22-1, LIR6042U-CC26-1.

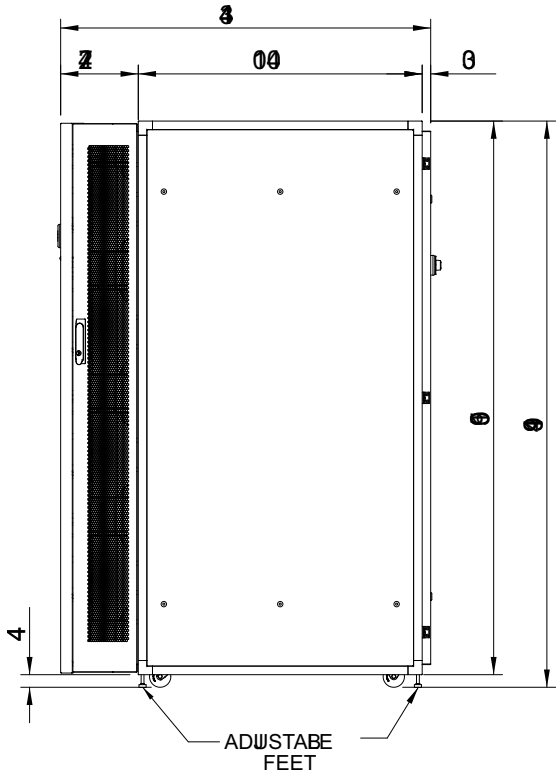
Unit and Leak Isolation Pressure Drop (CC)

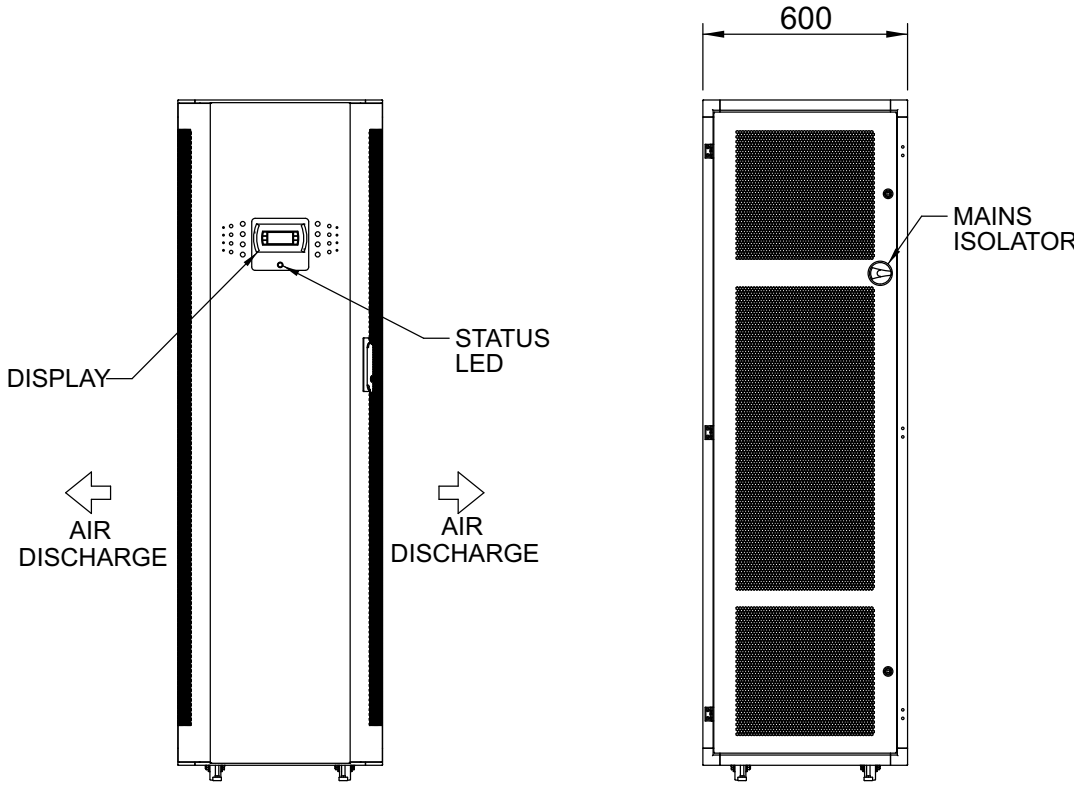


1 LIR6042U-CC30-0, LIR6042U-CC40-0, LIR6042U-CC30-1, LIR6042U-CC40-1.
2 LIR6042U-CC22-0, LIR6042U-CC26-0, LIR6042U-CC22-1, LIR6042U-CC26-1.

Installation

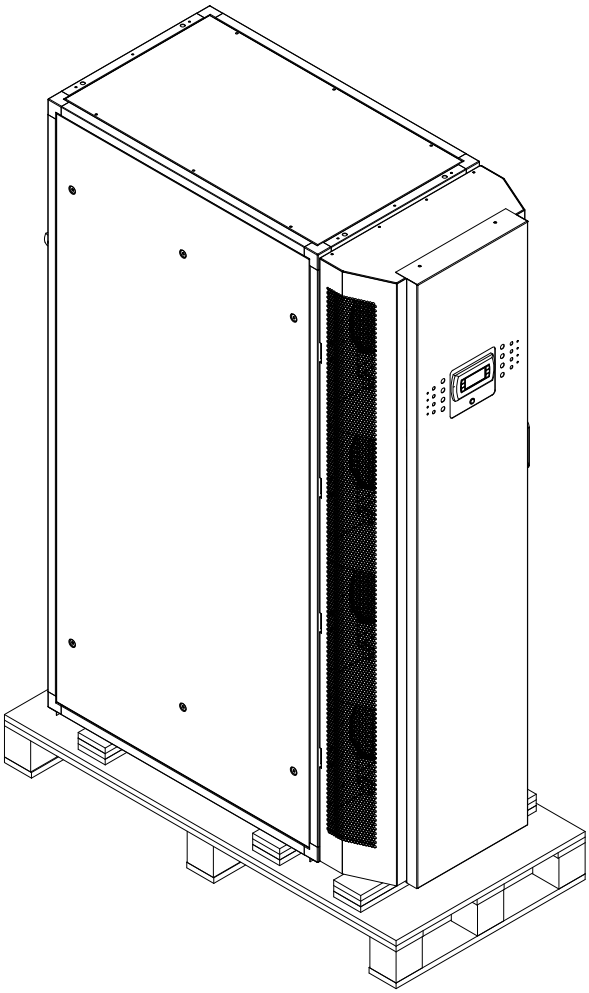
Dimensions





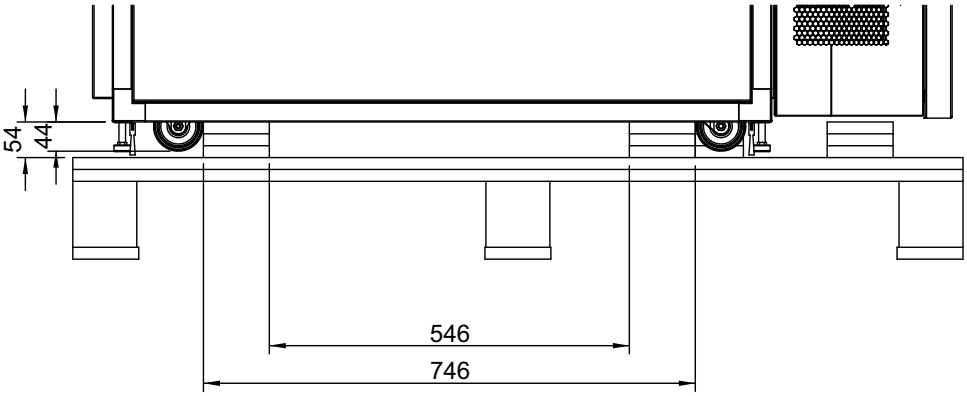
Installation

Unpacking and Lifting



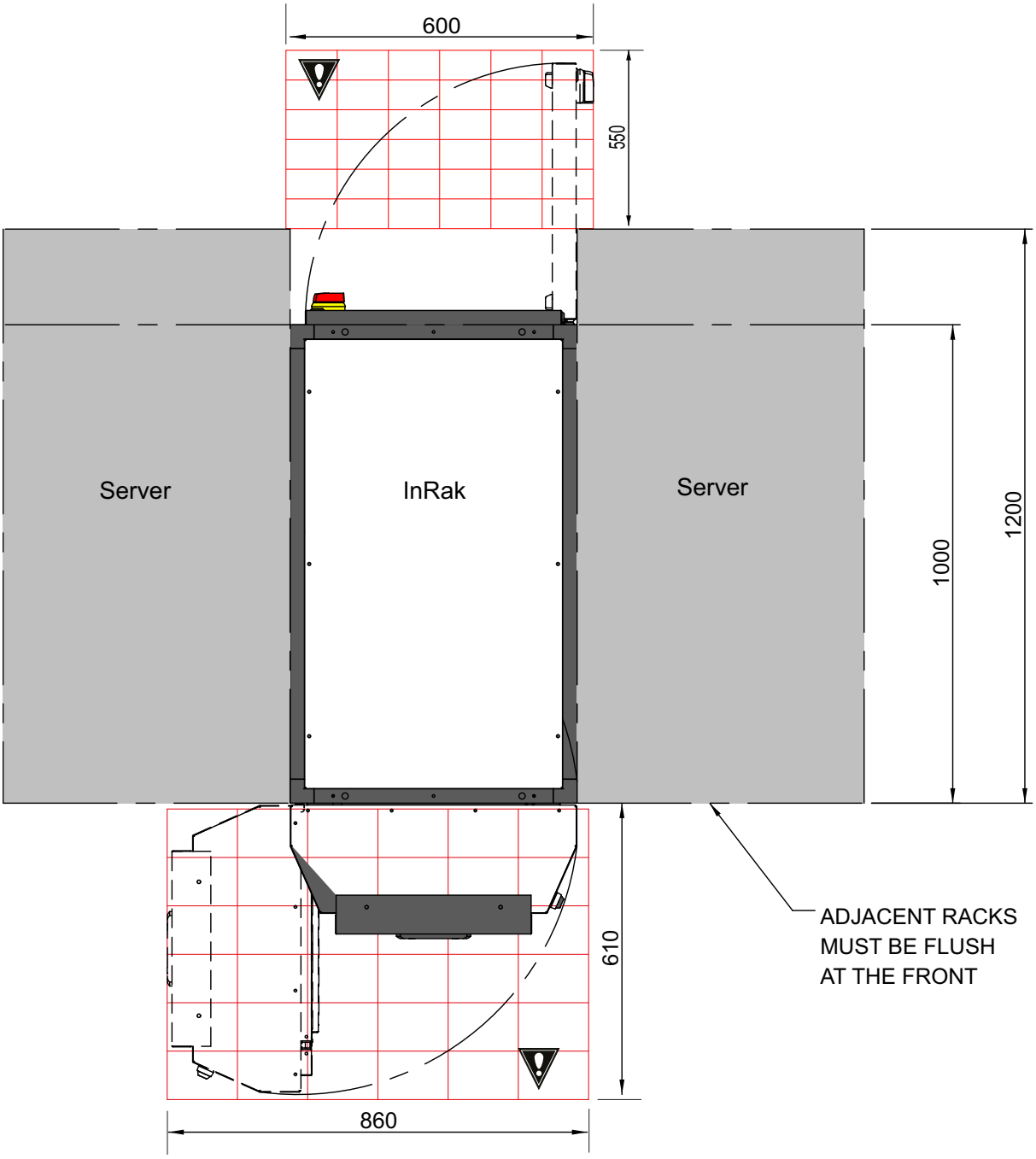
⚠ The unit is to be carefully unpacked, inspected and any damage reported to Airedale immediately.

All packaging is to be recycled accordingly.



Installation

Positioning

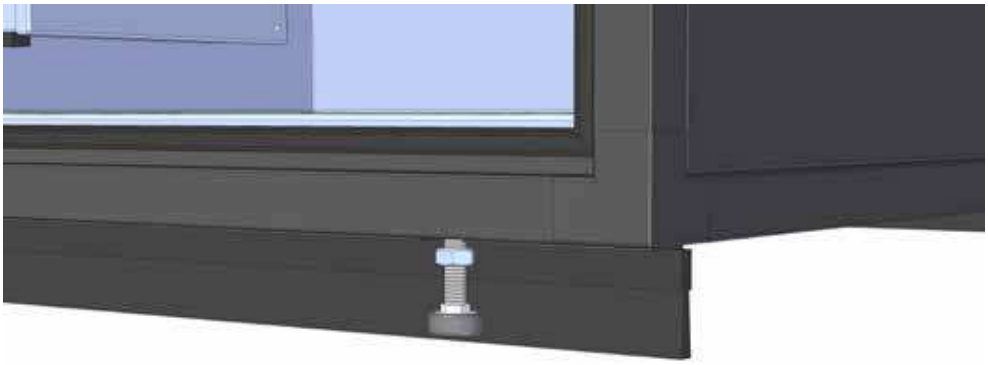


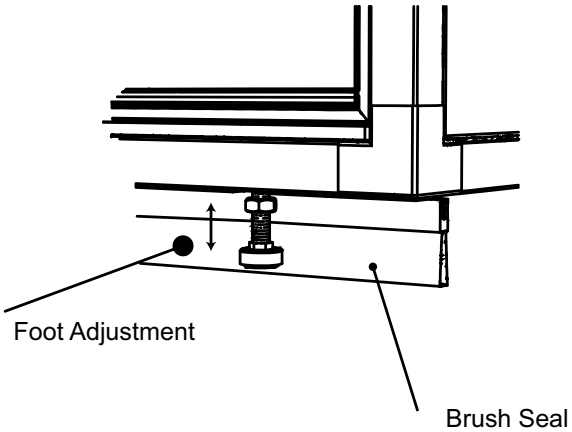
The InRak requires space at the front and rear of the unit for maintenance purposes.
This is highlighted above.

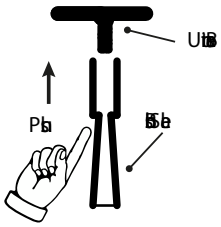
Installation

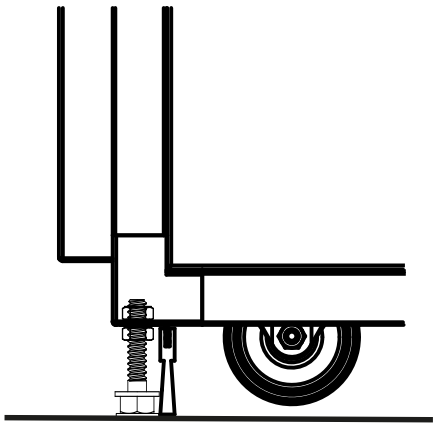
Levelling

The unit once positioned shall be levelled. This ensures that the unit has an air tight seal between the InRak and any adjacent server racks. Unit need to be level to ensure that any condensate collected is disposed of correctly.







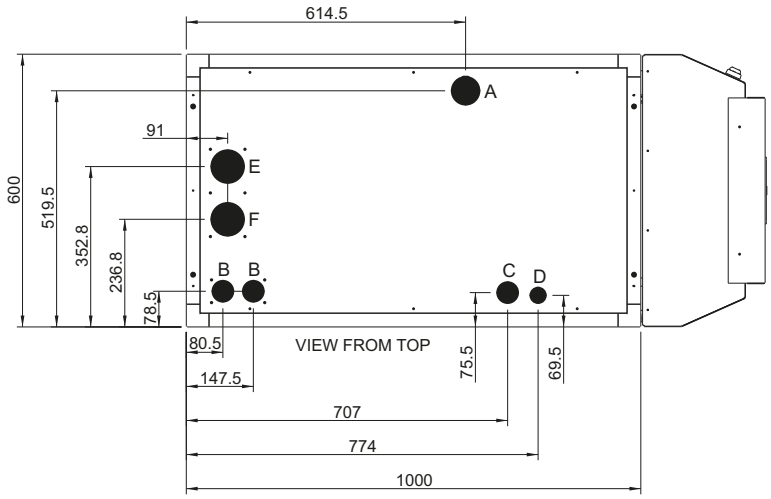


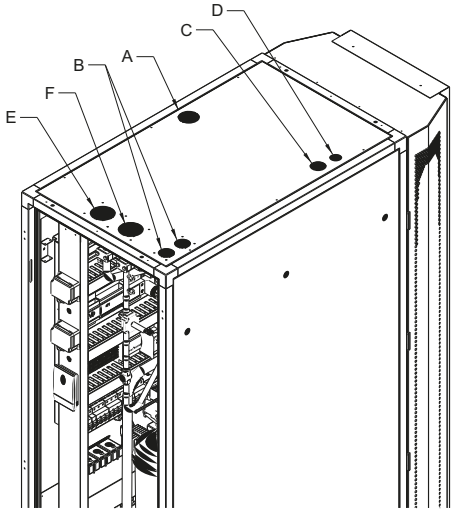
Note: The brush seal compresses when the feet are adjusted creating a tight seal to the floor.
The seal is supplied loose for easy fitment.

Installation

Incoming Services

Top Entry - Direct Expansion

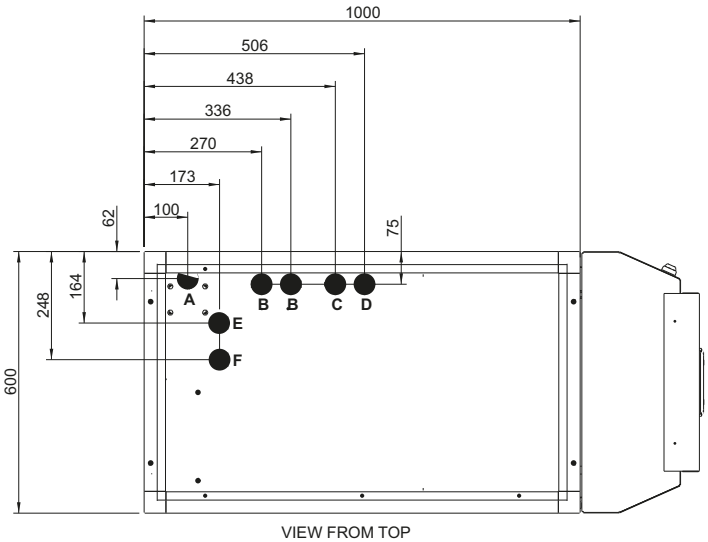


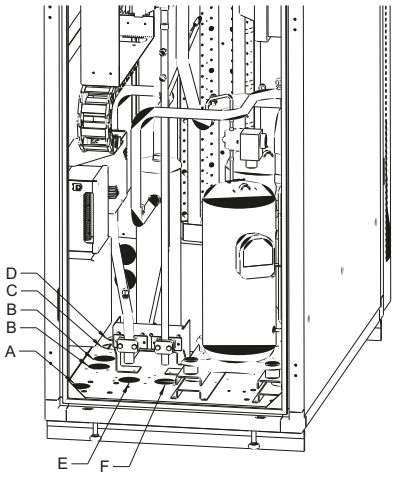


HOLE 'A' Ø65mm CONTROLS IN/OUT
HOLES 'B' Ø50mm MAINS POWER SUPPLY
HOLE 'C' Ø50mm
HOLE 'D' Ø38mm CONDENSATE DRAIN
HOLE 'E' Ø76mm DISCHARGE LINE
HOLE 'F' Ø76mm LIQUID LINE

HOLES 'B','E' AND 'F' TO BE SUPPLIED WITH GLAND PLATES FITTED .
ALL OTHER HOLES TO BE FITTED WITH BLIND GROMMETS

Bottom Entry - Direct Expansion





HOLE 'A' Ø50mm CONTROLS IN/OUT
HOLES 'B' Ø50mm MAINS POWER SUPPLY
HOLE 'C' Ø50mm
HOLE 'D' Ø50mm CONDENSATE DRAIN
HOLE 'E' Ø38mm 7/8" DISCHARGE LINE
HOLE 'F' Ø38mm 5/8" LIQUID LINE

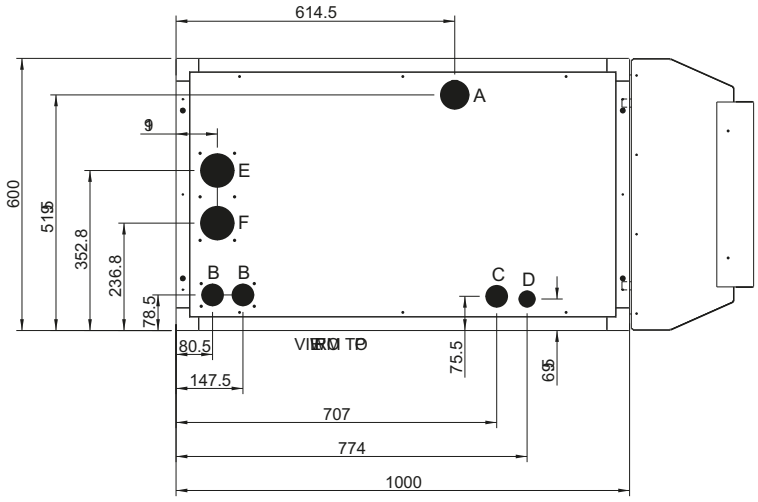
HOLE 'B', 'E' AND 'F' TO BE SUPPLIED WITH GLAND PLATES FITTED.
ALL OTHER HOLES TO BE FITTED WITH BLIND GROMMETS.

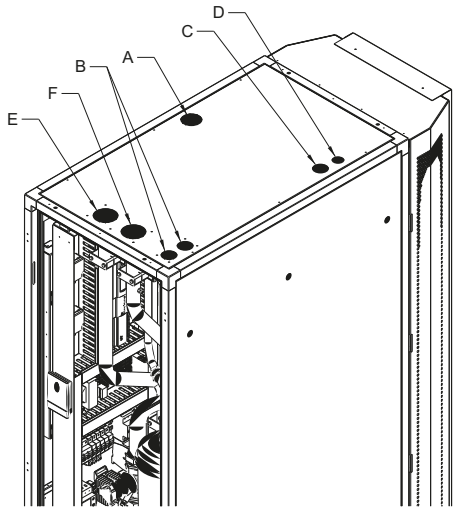
Cable and pipe work passing through floors / ceilings are required to be sealed by integral grommets to ensure efficient unit operation.

Installation

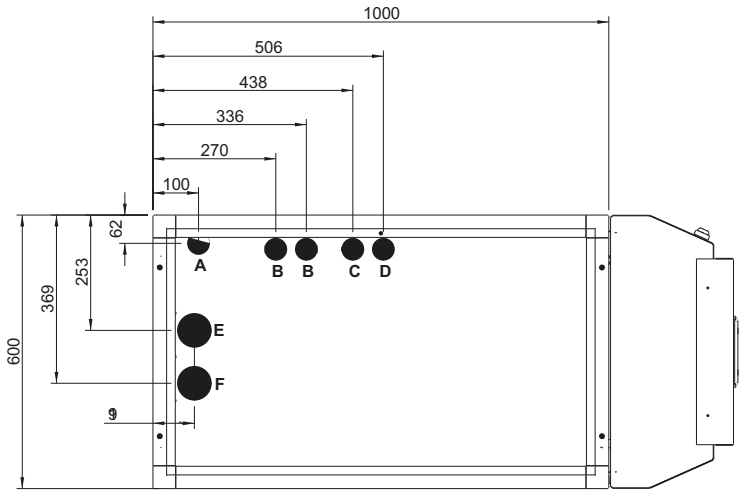
Incoming Services

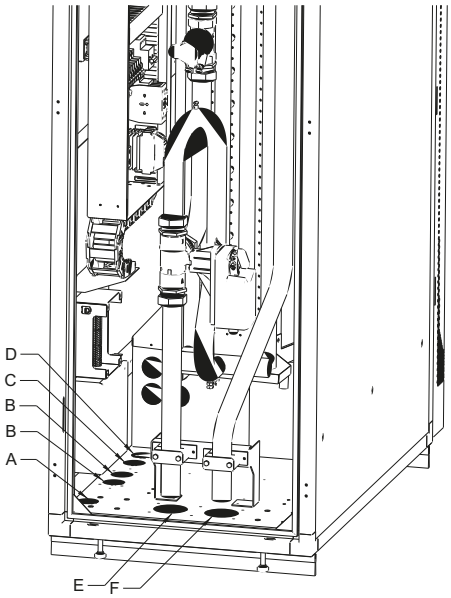
Top Entry - Chilled Water





Bottom Entry - Chilled Water



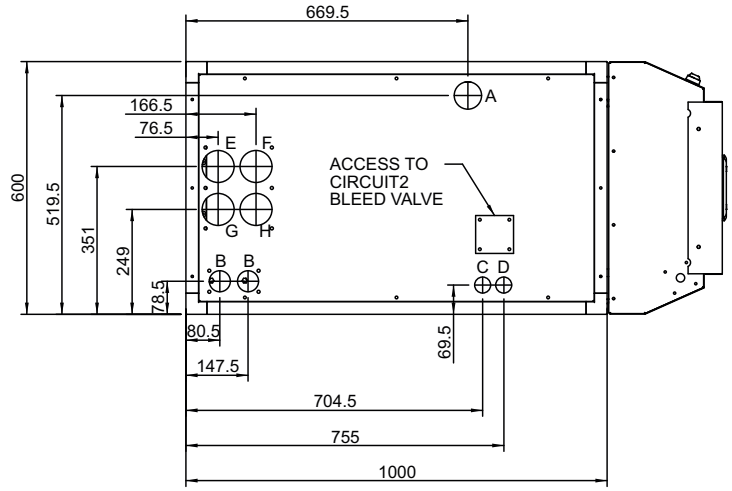


Cable and pipe work passing through floors / ceilings are required to be sealed by integral grommets to ensure efficient unit operation.

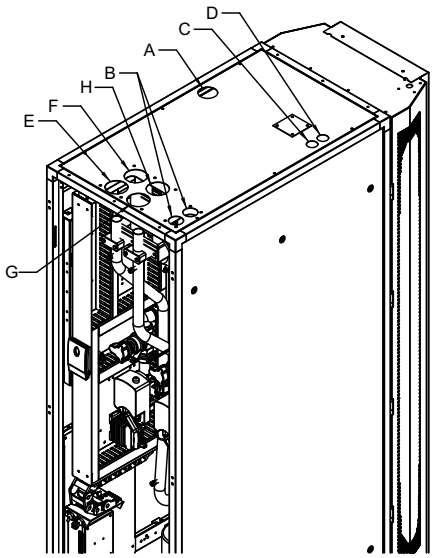
Installation

Incoming Services

Top Entry - Dual Cool Chilled Water

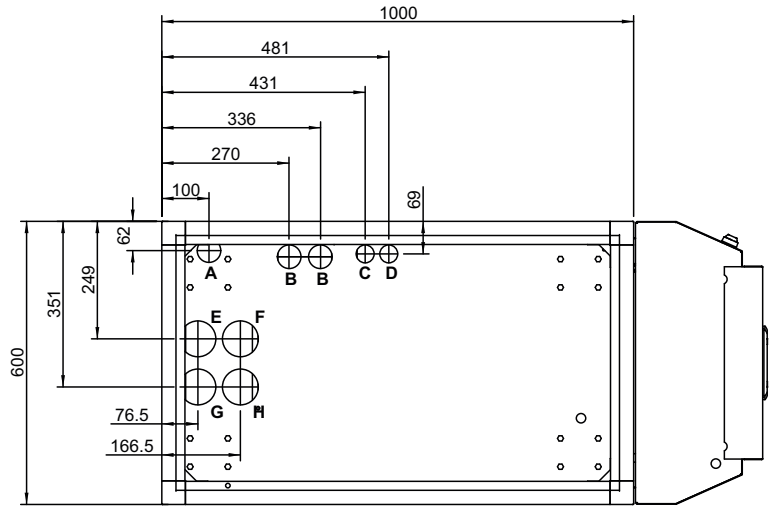


HOLE 'A' Ø50mm CONTROLS IN/OUT
HOLES 'B' Ø50mm MAINS POWER SUPPLY
HOLE 'C' Ø38mm
HOLE 'D' Ø38mm CONDENSATE DRAIN
HOLE 'E' Ø76mm CIRCUIT 1 WATER INLET
HOLE 'F' Ø76mm CIRCUIT 1 WATER OUTLET
HOLE 'G' Ø76mm CIRCUIT 2 WATER INLET
HOLE 'H' Ø76mm CIRCUIT 2 WATER OUTLET



HOLES 'B', 'E', 'F', 'G' AND 'H' TO BE SUPPLIED WITH GLAND PLATES FITTED.
GLAND PLATE CAN BE REVERSED TO SUIT PIPE SIZE.
ALL OTHER HOLES TO BE FITTED WITH BLIND GROMMETS

Bottom Entry - Dual Cool Chilled Water



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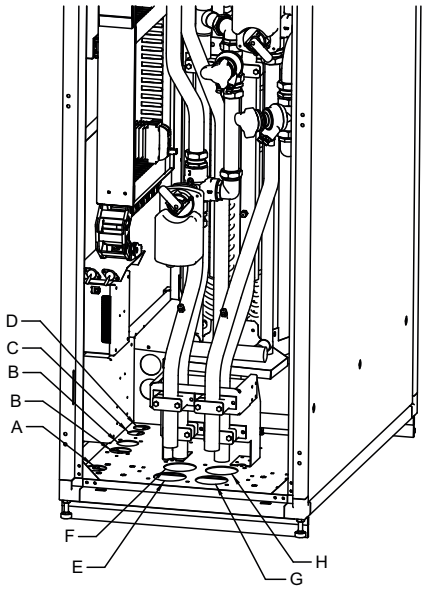

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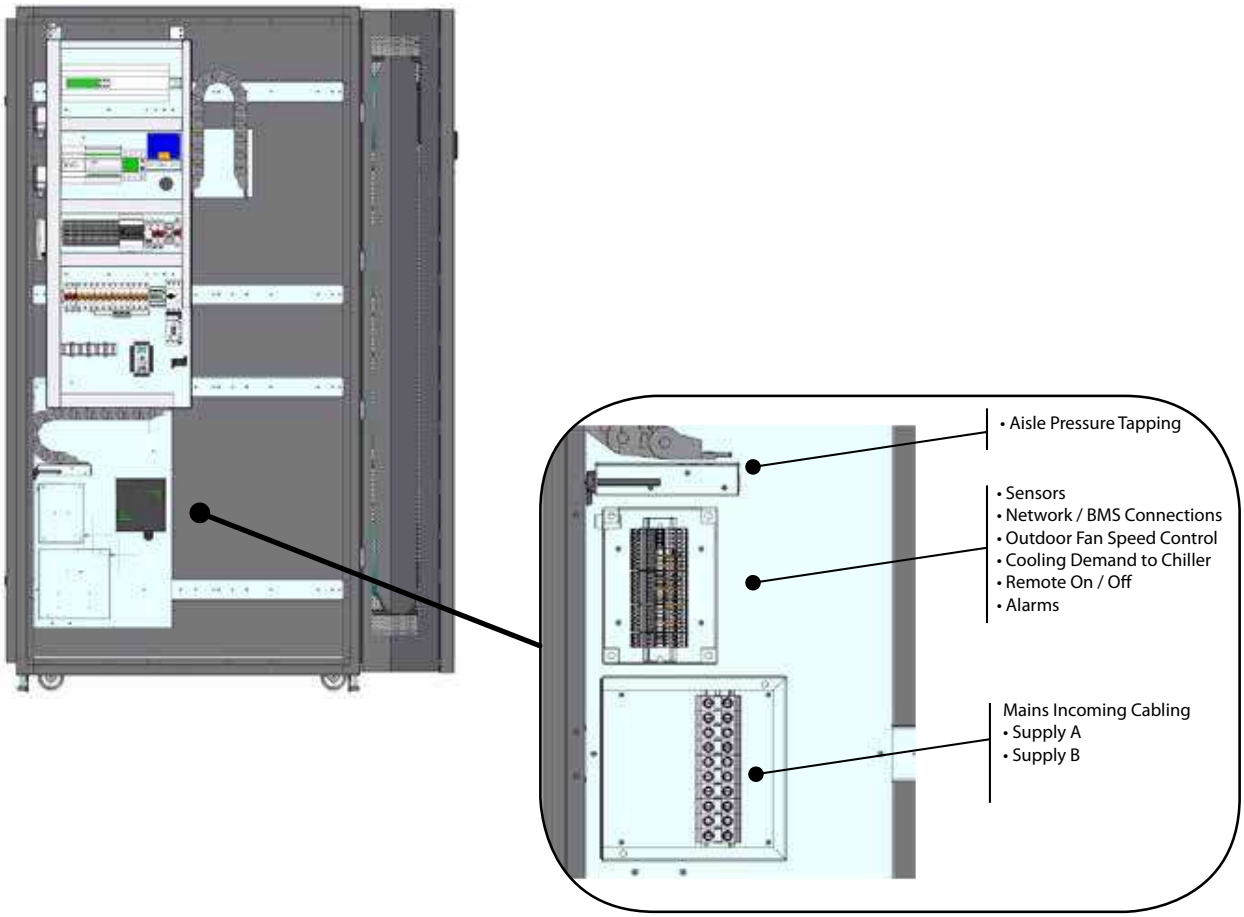
ALL OTHER HOLES TO BE FITTED WITH BLIND GROMMETS

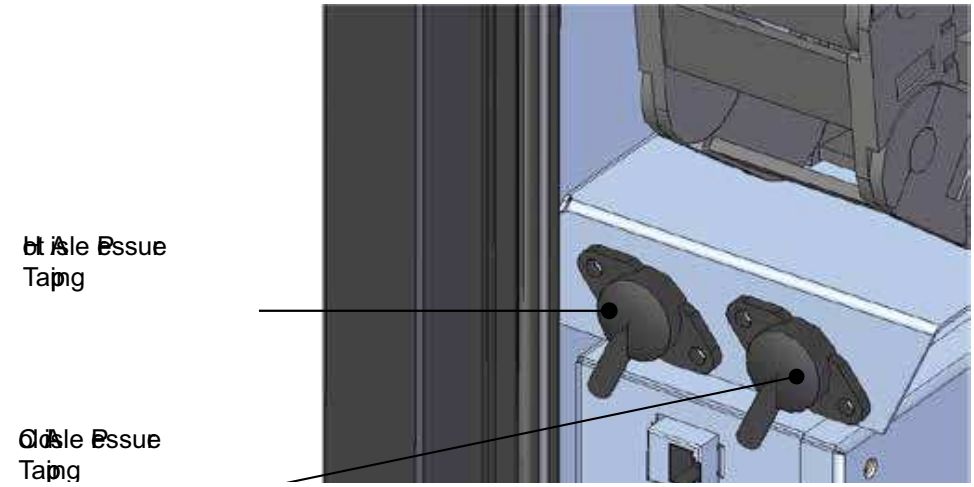
Cable and pipe work passing through floors / ceilings are required to be sealed by integral grommets to ensure efficient unit operation.

Installation

Electrical Services Incoming Cabling

The electrical services enter the unit through either the base or the roof of the unit. Termination is via a terminal box at the base of the unit (bottom connections only, top connection direct to isolator).





Connections are to be made between the tappings above (located in control panel) and pressure points in the aisles. The tappings above are linked to the differential pressure sensor in the unit making easier customer termination.

Installation

Interconnecting Wiring

InRak		N1	O	←		Mains incoming supply 1 400V/3~/50Hz 380V/3~/60Hz
		201	O	←	L1	
		202	O	←	L2	
		203	O	←	L3	
		PE	O	←		
		N2	O	←		Mains incoming supply 2 400V/3~/50Hz 380V/3~/60Hz
		204	O	←	L1	
		205	O	←	L2	
		206	O	←	L3	
		PE	O	←		
		860	O	←		Supply Air Temperature Sensor 1
		861	O	←		
		862	O	←		Supply Air Temperature Sensor 2
		863	O	←		
		864	O	←		Supply Air Temperature Sensor 3
		865	O	←		
		522	O	←		Remote On/Off
		502	O	→		24 Vac
		833	O	→		Outdoor Fan Speed Control 0 -10 Vdc
		500	O	→		0 Vdc
		560	O	→	NO	Non-Critical Alarm Normally Open
		561	O	←	Common	Common
		562	O	→	NC	Non-Critical Alarm Normally Closed
		563	O	→	NO	Critical Alarm Normally Open
		564	O	←	Common	Common
		565	O	→	NC	Critical Alarm Normally Closed

Caution
The InRak does not support condenser sub fusing. To ensure full system uninterrupted power compatibility the external condenser must have its own UPS.

Installation

Interconnecting Wiring

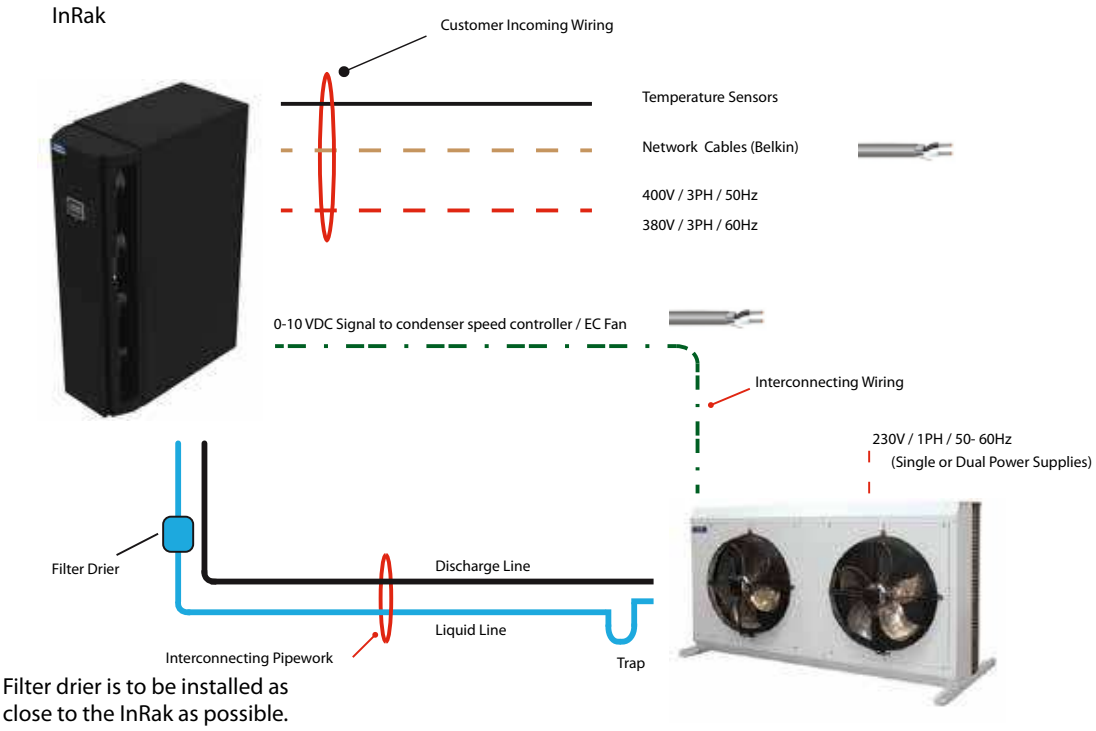
InRak		Rx-Tx-	○	←		Network Connections (Incoming connection)
		Rx+Tx+	○	←		
		GND	○	←		
		Rx-Tx-	○	→		Network Connections (Outgoing connection)
		Rx+Tx+	○	→		
		GND	○	→		

	881	○	↔	Wired BMS connection (ModBUS, BACNet, LON, RS485)	BMS Network Connections
	882	○	↔		
	883	○	↔		

	N/A	○	↔	Ethernet BMS connection	BMS Network Connections

Installation

Refrigeration Pipe work



Filter drier is to be installed as close to the InRak as possible.

IMPORTANT

The pipe sizes/refrigerant charges quoted are for guidance only. It is the responsibility of the installing contractor/site engineer to check the pipe sizes/refrigerant charges are correct for each system installation and application.

Split systems may require additional oil which should be added to the low side of each compressor.

Design should be in accordance with accepted refrigeration practice to ensure good oil return to the compressor(s) under all normal operating conditions.

Refrigerant Pipe Sizing Guide

			0-20m			20-40m			40-60m			60-80m		
	Unit Connection Sizes (“)		Liquid (“)	Discharge (“)		Liquid (“)	Discharge		Liquid (“)	Discharge		Liquid (“)	Discharge	
Unit	Liquid	Discharge	(H / V)	(H)	(V)	(H / V)	(H)	(V)	(H / V)	(H)	(V)	(H / V)	(H)	(V)
LIR6042U-X250	5/8	7/8	5/8	1 1/8	5/8	5/8	1 1/8	5/8	3/4	1 1/8	5/8	7/8	1 1/8	5/8
LIR6042U-X240	5/8	7/8	5/8	1 1/8	5/8	5/8	1 1/8	5/8	3/4	1 1/8	5/8	3/4	1 1/8	5/8
LIR6042U-X130	1/2	5/8	1/2	1 1/8	5/8	5/8	1 1/8	5/8	5/8	1 1/8	5/8	3/4	1 1/8	5/8
LIR6042U-X123	1/2	5/8	1/2	7/8	5/8	5/8	7/8	5/8	5/8	1 1/8	5/8	3/4	1 1/8	5/8

- All pipe sizing is based on capacities approaching the system minimum as this represents worst case scenario for oil return.
- Discharge lines with vertical components greater than 10m should be given great consideration.
- If the vertical component of the discharge line is greater than 10m then pressure drop will be excessive when approaching full load.
- In this instance, the option of carefully designed double risers should be considered to minimise this high pressure drop at full load whilst maintaining good oil velocities at minimum load.

Installation

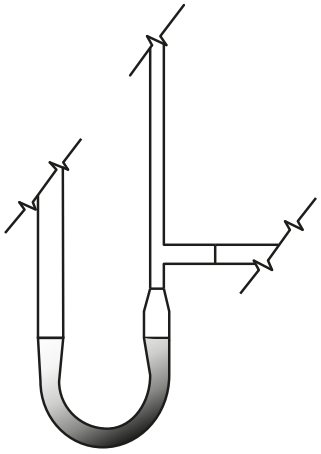
Refrigeration Pipe work

Oil Traps

For long vertical rises in both liquid and discharge lines, it is essential that oil traps are located every 4m to ensure proper oil movement / entrapment. In addition there should be an oil trap at the exit of the air handling unit before a vertical riser is applied (refer to example below).

Discharge Risers

Consideration must be taken when designing vertical risers. Refrigerant velocity must be ensured in vertical risers at a minimum of 8m/s.



If required double risers must be designed into the system. Pipework must be sized based upon a reduction in unit capacity as low as 30% of design. The double riser must be sized so that the refrigerant still maintains adequate velocity for the oil to travel around the system.

At part load the velocity is reduced in the larger diameter pipe (and cannot carry oil). An oil trap is formed forcing vapour up the smaller tube which still has adequate velocity due to its size to continue carrying oil around the system The trap at the base of the riser must be as small as possible. This ensures that the trap causes a pressure drop causing vapour to pass up the smaller tube

When the load increases the velocity of the refrigerant ensures that oil carries up both tubes.

Pipe Supports

The following table identifies the maximum distance between pipe supports on vertical and horizontal pipe runs.

Pipe O/D (inches)	Support Centres (m)
3/8 - 7/8”	1.0
1 1/8 - 2 1/8”	2.0

CAUTION
All pipe work should be clamped prior to insulation being applied. Clamping over insulation is not acceptable.

Lines passing through walls

Refrigerant lines that rub against solid objects wear holes in the copper pipework and cause leaks, the lines must pass through sleeved openings in such a manner that the lines do not touch.

Horizontal Sections

It is good practice to ensure a slight gradient toward the compressor in the direction of the refrigerant flow for suction lines running horizontal. This assists oil return to the compressor. A gradient of approximately 1:200 (0.5%) shall be used.

Installation

Liquid Line

If the system is configured with the InRak higher than the condenser unit it may be required to increase the degree of sub cooling to prevent flashing gas occurring in the liquid line. This flashing is due to excess pressure drop caused by the static head of liquid refrigerant and can result in poor operation of the evaporator and expansion device.

Careful pipe sizing is recommended to ensure that the liquid line does not have excessive pressure drop

Increasing the liquid line tube size can minimize pipe pressure drop.

However as a fail safe it is recommended that the condenser is installed above the indoor unit to allow for correct liquid drain.

Pipe insulation

The liquid line of the system must be insulated if passing through extremely warm places (boiler houses etc). Ensuring that the refrigerant does not become flash gas.

Refrigerant Charging Guide

The following information can be used to estimate the refrigerant quantity required in a typical split system installation.

Charging should be carried out with the compressors at 50% inverter speed (X1) or with a tandem compressor set (X2) 100% fixed speed and 50% variable inverter compressor operation.

Unit Refrigerant Charge

(kg / Circuit)

The following table shows the refrigerant charge / circuit for the indoor and outdoor units based on nominal capacity conditions.

Indoor Unit		Outdoor Unit	
InRak	kg/circuit	Standard CR Match	kg/circuit
LIR6042U-X250-0	4.2	CR80	8.4
LIR6042U-X240-0	4.2	CR65	9.8
LIR6042U-X130-0	3.8	CR50	4.9
LIR6042U-X123-0	3.8	CR50	4.9
LIR6042U-X130-1	3.8	CR50	4.9
LIR6042U-X123-1	3.8	CR50	4.9

Liquid Line Refrigerant

The following table shows the refrigerant charge / metre for the liquid line, using R410A and assuming a liquid line temperature of 40°C.

Liquid Line (m)	kg/m
3/8”	0.05
1/2”	0.09
5/8”	0.15
3/4”	0.21
7/8”	0.30
1 1/8”	0.53

Installation

Calculation of System Refrigerant Charge (kg)

The system refrigerant charge can be calculated using the following equation:

SR = LR + IR + OR

Where:

SR	=	Total System Refrigerant Charge (kg)
LR	=	Total Liquid Line Refrigerant Charge. (As calculated from above)
IR	=	Indoor Unit Refrigerant Charge.
OR	=	Outdoor Unit Refrigerant Charge.

Calculation of Liquid Line Refrigerant Charge (kg)

The liquid line refrigerant charge can be calculated using the following equation:

LR = L x m

Where:

LR	=	Total Liquid Line Refrigerant charge (kg)
L	=	Length of Interconnecting pipework (metres)
m	=	Liquid Line Refrigerant charge / metre. Refer to Liquid Line Refrigerant Charge (kg/m), above.

Example

Indoor Unit Model Ref. = LIR6042U-X250-0
Outdoor Unit Model Ref = CR80 Condenser
Interconnecting Pipework = 10 metres

From the Refrigerant Pipe Sizing Guide, the liquid line size given for pipework length of 10 metres is:0.15kg/m

LR = L x m

Where:

L	=	10 metres
m	=	0.15 kg/m (Liquid Line Size = 5/8”)
LR	=	10 x 0.15 = 1.5kg

System Refrigerant Charge

SR = LR + IR + OR

Where:

LR	= 1.5 kg. (As calculated from above)
IR	= 4.2 kg
OR	= 8.4 kg

SR = 1.5 + 4.2 + 8.4

Therefore System Refrigerant Charge

= 4.2 kg / Circuit

Installation

Liquid Sub Cooling

The degree of liquid sub cooling required to prevent flashing of liquid refrigerant can be calculated by the following method.

Subcooling = Condensing temperature — Saturation temperature (Nett pressure at expansion valve)

Given the following as an example:

- Refrigerant R410A
- Condensing temperature (54.4°C) equivalent condensing pressure at 54.4°C = 34 Bar
- Liquid lift 20m
- Piping friction loss 0.21 bar
- Losses through valves and fittings 0.5 Bar

Pressure Loss due to Liquid Lift

= H x spl

Where
H = Height (m)
spl = Static pressure loss

= 20 x 0.115 = 2.3 bar

Note:- At normal liquid temperatures the static pressure loss due to elevation at the top of a liquid lift 0.115 bar/m.

Total Pressure Loss in Liquid Line

TPL Liquid = PFL + Valves

Where
PFL = Pipe friction loss (0.21Bar)
Valves = Losses through Valves and fittings

= 0.21 +0.5 + 2.3
Total pressure loss in liquid line = 3.01 Bar

Nett Pressure at Expansion Valve

= Condensing pressure - Total pressure loss in liquid line

= 34 - 3.01 = 30.99 bar

Saturation temperature at the nett pressure at expansion valve (30.99 bar) = 52°C (from refrigerant tables)

Sub Cooling Required

=Condensing temperature - Saturation temperature

= 54.4 - 52 = 2.4 °C

Therefore liquid sub cooling required to prevent liquid flashing = 2.4 °C

Oil Charging Guide

In order to determine if a system requires additional oil to accommodate for long interconnecting pipe lines and oil traps, a simple calculation can be used to approximate the volume of oil required as follows:

OT = (RC / 200) - (OC x 0.09)

Where
OT = Additional Oil Charge / Circuit (kg)
RC = Total Refrigerant Charge / Circuit (kg)
OC = Total Compressor Oil Charge / Circuit (l)

This calculation is based on the following assumptions:

1) 10% of the total compressor oil charge enters the system
2) A specific gravity of 0.09 between oil and water
3) Oil is added at a rate of 5 grams per kilogram of refrigerant

Example
What is the additional oil charge required per circuit for an LIR6042U-X250-0 matched with a CR80 and a 5/8" 10m interconnecting liquid line?

Refrigerant charge of an LIR6042U-X250-0= 4.2 kg

Refrigerant charge of a CR80 = 8.4 kg

Interconnecting pipe line = 10 x 0.15 = 1.5kg

Total system refrigerant charge = 4.2 + 8.4 + 1.5 = 14.1 kg

Compressor oil charge(s) = 4.4 litre

So,

OT = (RC / 200) - (OC x 0.09)

OT = (14.1 / 200) - (4.4 x 0.09)

OT = -0.326 litre

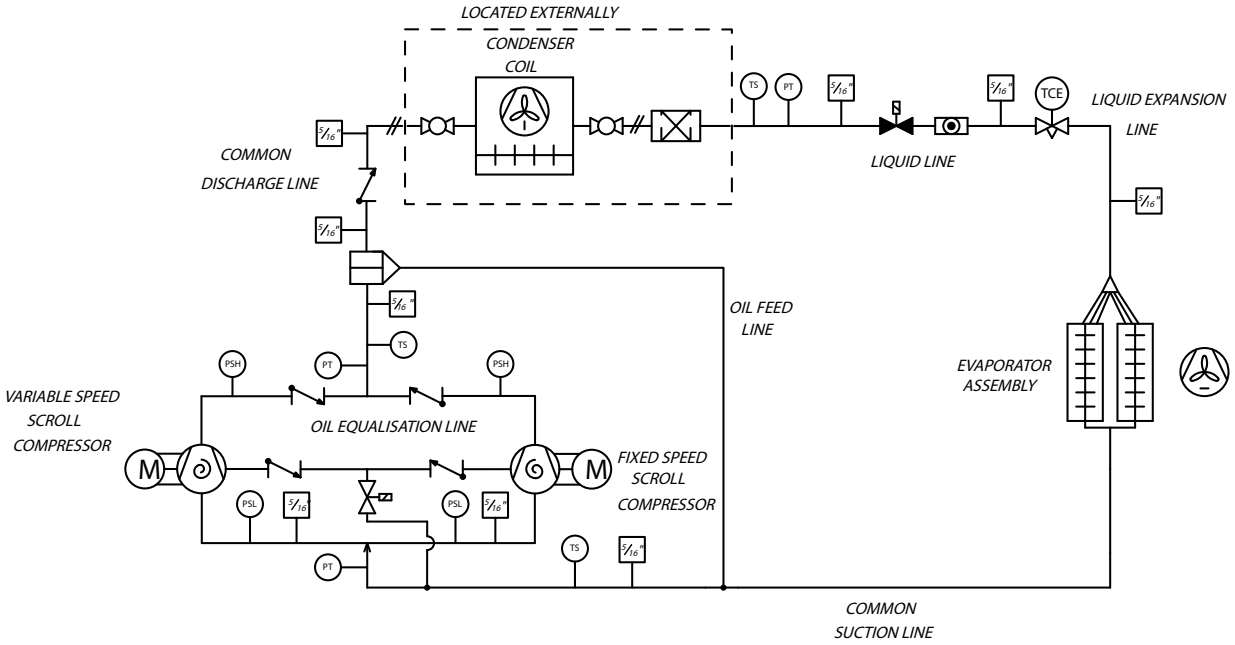
A negative value (as above) suggests that there is already sufficient oil in the system. You can calculate the maximum refrigerant charge for this system when additional oil charge is required as follows:

OT = (RC / 200) - (OC x 0.09)
RC = OT + (OC x 0.09 x 200)
RC = 0 + (4.4x 0.09 x 200)
RC = 79.2 kg

Installation

Pipework Schematics

X2



KEY: ALL ITEMS

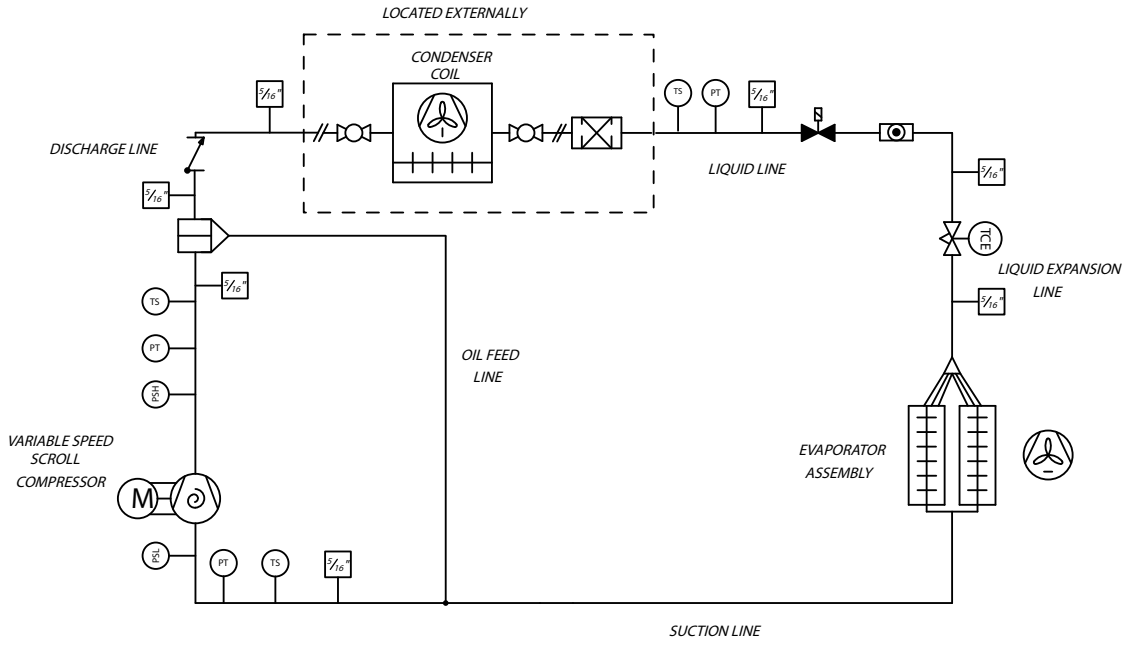
- CENTRIFUGAL FAN
- AXIAL FAN
- SCROLL COMPRESSOR
- ELECTRONIC EXPANSION VALVE
- NORMALLY OPEN SOLENOID VALVE
- NORMALLY CLOSED SOLENOID VALVE
- FILTER DRIER (SUPPLIED LOOSE)
- SIGHT GLASS
- PRESSURE TRANSDUCER
- TEMPERATURE SENSOR
- CHECK VALVE
- LOW PRESSURE SWITCH
- HIGH PRESSURE SWITCH
- SCHRADER VALVE (SIZE SHOWN INDIVIDUALLY ON EACH VALVE)
- SHUT OFF VALVE (OPTIONAL - SUPPLIED LOOSE)
- OIL SEPARATOR

⚠ The liquid line filter drier must be installed as close to the indoor unit as possible.

Installation

Pipework Schematics

X1



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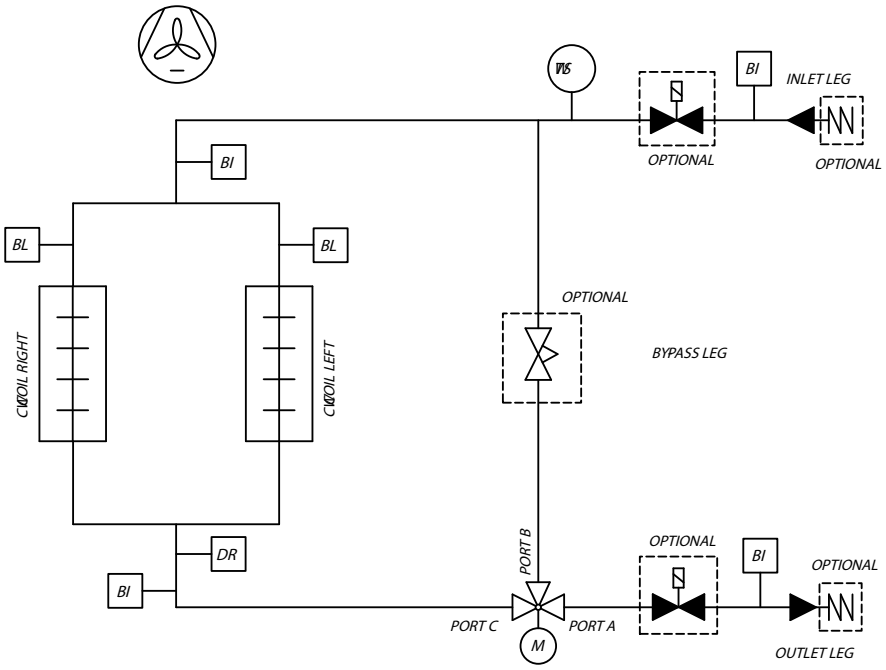
Installation

Pipework Schematics

C0 (3 Port Valve)



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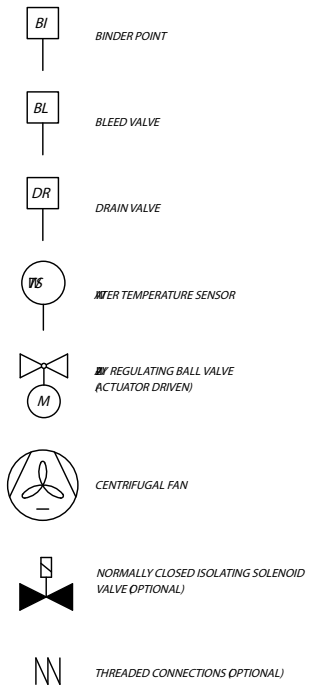
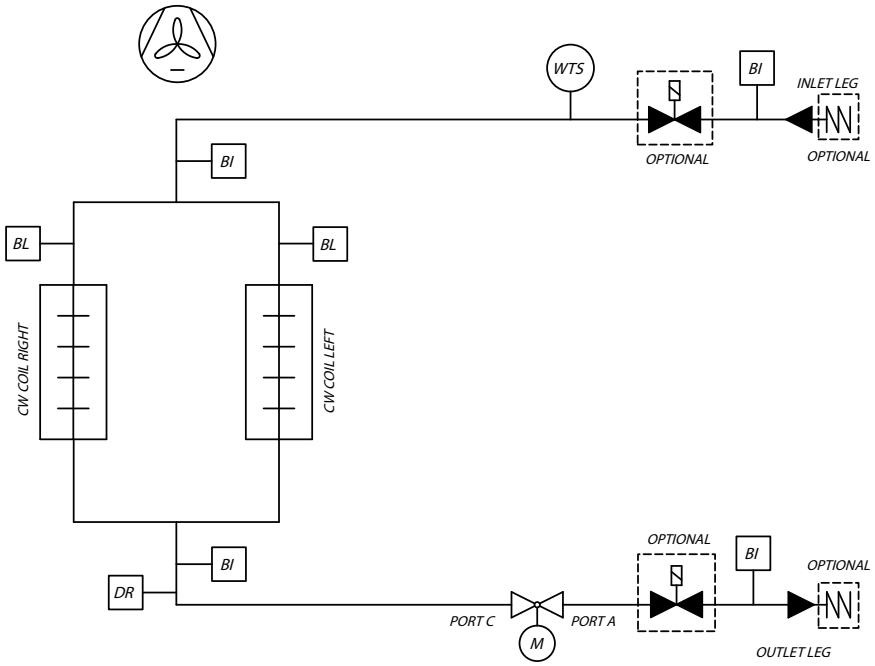


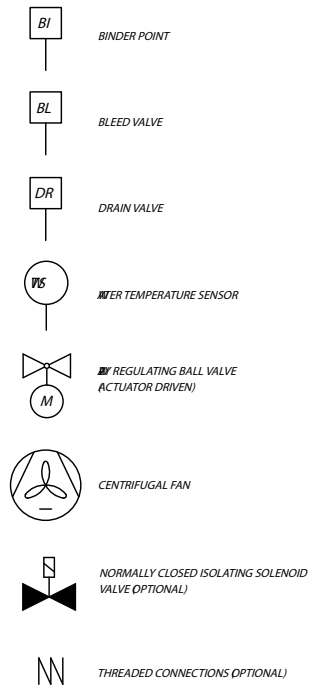
Installation

Pipework Schematics

C0 (2 Port Valve)



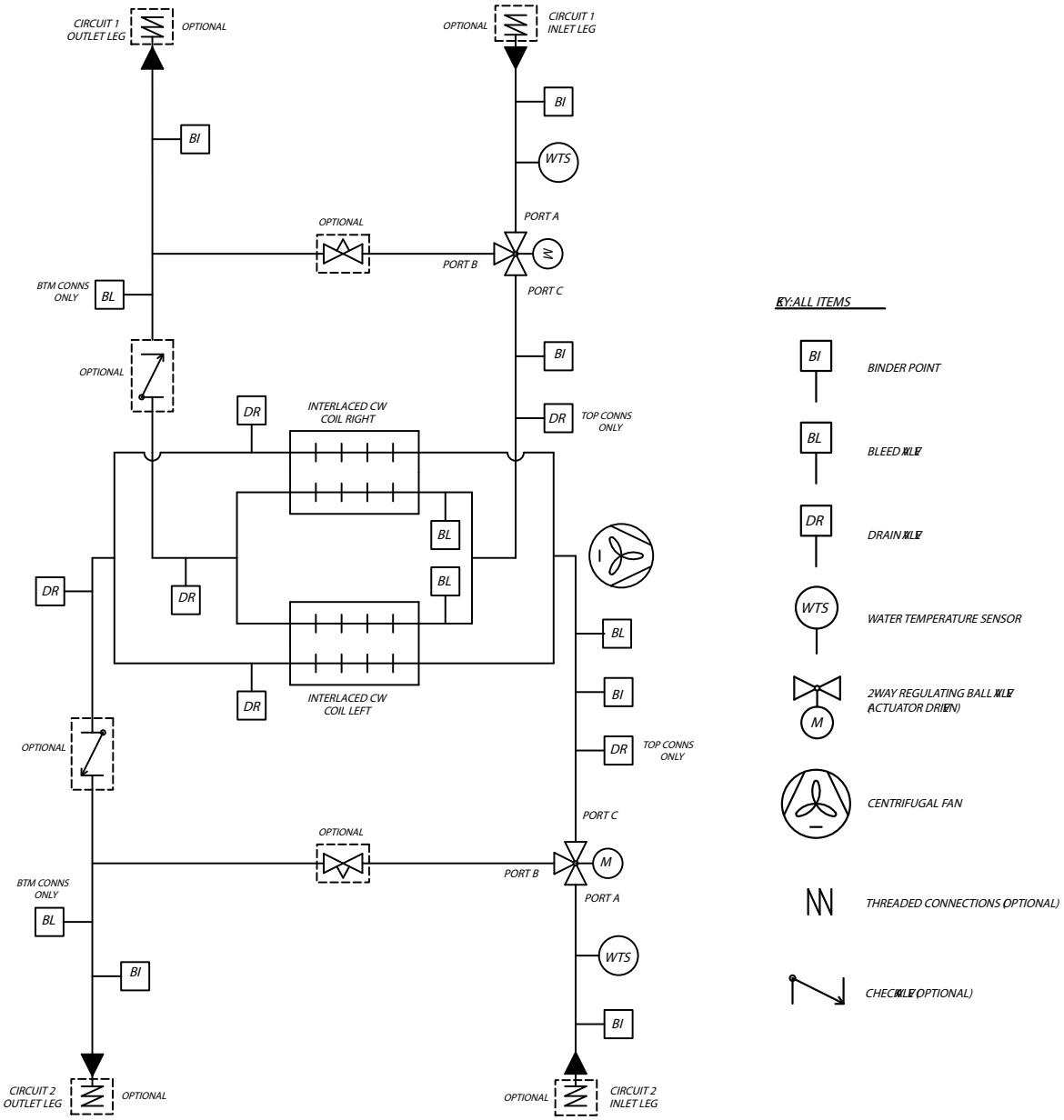
KEY:ALL ITEMS



Installation

Pipework Schematics

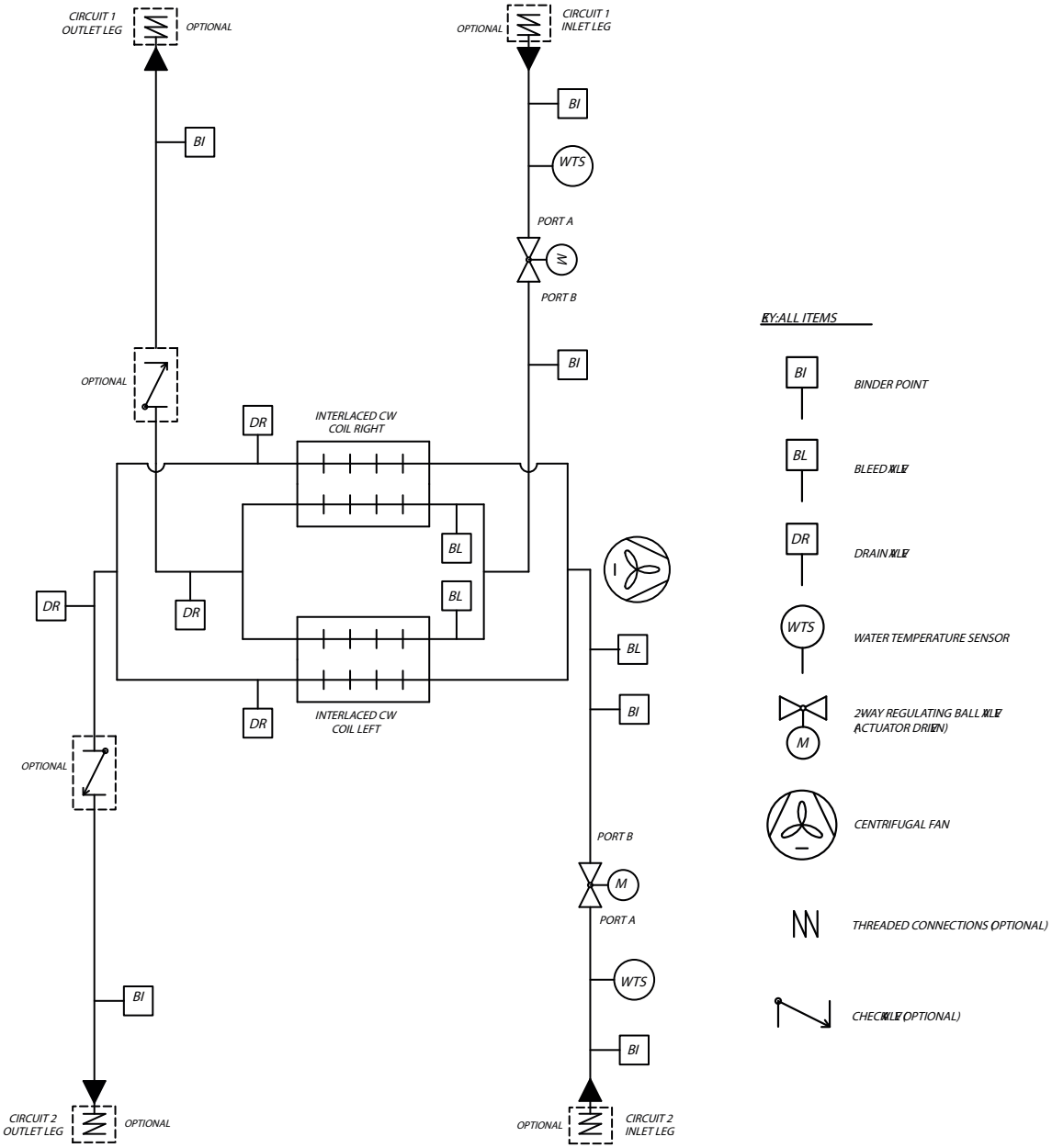
CC (3 Port Valve)



Installation

Pipework Schematics

CC (2 Port Valve)



After Sales

Warranty

All Airedale products or parts (non consumable) supplied for installation within the UK mainland and commissioned by an Airedale engineer, carry a full Parts & Labour warranty for a period of 12 months from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.
Parts or Equipment supplied by Airedale for installation within the UK or for Export that are properly commissioned in accordance with Airedale standards and specification, not commissioned by an Airedale engineer; carry a 12 month warranty on non consumable Parts only from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.
Parts or equipment installed or commissioned not to acceptable Airedale standards or specification invalidate all warranty.

Warranty is only valid in the event that

In the period between delivery and commissioning the equipment: is properly protected & serviced as per the Airedale installation & maintenance manual provided where applicable the glycol content is maintained to the correct level.
In the event of a problem being reported and once warranty is confirmed as valid under the given installation and operating conditions, the Company will provide the appropriate warranty coverage (as detailed above) attributable to the rectification of any affected Airedale equipment supplied (excluding costs for any specialist access or lifting equipment that must be ordered by the customer).

Any spare part supplied by Airedale under warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery, whichever period is the longer.
To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.

Procedure

When a component part fails, a replacement part should be obtained through our Spares department. If the part is considered to be under warranty, the following details are required to process this requirement. Full description of part required, including Airedale's part number, if known. The original equipment serial number. An appropriate purchase order number.
A spares order will be raised under our warranty system and the replacement part will be despatched, usually within 24 hours should they be in stock. When replaced, the faulty part must be returned to Airedale with a suitably completed and securely attached "Faulty Component Return" (FCR) tag. FCR tags are available from Airedale and supplied with each Warranty order.
On receipt of the faulty part, suitably tagged, Airedale will pass to its Warranty department, where it will be fully inspected and tested in order to identify the reason for failure, identifying at the same time whether warranty is justified or not.
On completion of the investigation of the returned part, a full "Report on Goods Returned" will be issued. On occasion the release of this complete report may be delayed as component manufacturers become involved in the investigation.
When warranty is allowed, a credit against the Warranty invoice will be raised. Should warranty be refused the Warranty invoice becomes payable on normal terms.

Exclusions

Warranty may be refused for the following reasons.

- Misapplication of product or component
- Incorrect site installation
- Incomplete commissioning documentation
- Inadequate site installation
- Inadequate site maintenance
- Damage caused by mishandling
- Replaced part being returned damaged without explanation
- Unnecessary delays incurred in return of defective component

Returns analysis

All faulty components returned under warranty are analysed on a monthly basis as a means of verifying component and product reliability as well as supplier performance. It is important that all component failures are reported correctly.

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Leeds LS19 6JY

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TM_InRak_7462807_v1.6.0_03_2015