CITEC

G-Volution PRO

Trusted Sustainable Technology Solution

PRECISION | EFFICIENCY | CREATIVITY

Factory

Dongguan
Jiangmen

Sales & Technical Support Offices

Guangzhou
Hong Kong
Malaysia
Singapore
Thailand

Distribution Networks

Australia
Bangladesh
Brunei
China
India
Indonesia
Japan
Laos
Macau
Myanmar
Pakistan
Philippines
Sri Lanka
United Arab Emirates
Vietnam

CITEC

We at CITEC, are committed to deliver innovative products and services that are revolutionizing advances the precision cooling needs.

From design and manufacturing to product and after sales support services, we constantly build upon our proven innovation of precision, efficiency and creativity to deliver a full range of consultancy for customized business needs or an array of designs and models to a myriad of clienteles.

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CHAPTER 01

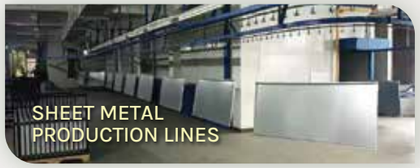
THE PRECISION AIR CONDITIONER SPECIALIST

CITEC Group

Established in Malaysia since 1996, CITEC International has transformed into one of the leading manufacturers for precision air conditioning products over the years with more than 25 years of experience.

As a specialist in the field of precision air conditioning, CITEC placed an important focus on Research and Development (R&D), In-house Sheet Metal and Coil Production Lines to ensure every CITEC products are designed according to international standards and highest quality control with best performance, reliability and efficiency.

At present, CITEC has established two manufacturing plants with one testing laboratory, four regional sales and technical support offices and a wide distributor network across Asia Oceania and Pacific regions to provide excellent product support and long-term services across various industries.



Certification

View full detailed list of certifications and licensing:
www.citecinternational.com

China Quality Certification

ISO Certification

CCC Certification

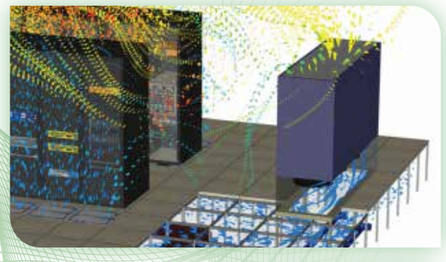
CE Certification

Research & Development

CITEC focus in research and development to continually strive for design excellence that meets, and wherever possible, exceeds customers' expectations.

Every CITEC products are engineered to ensure maximum reliability, efficiency, and ease of installation & maintenance as customer focus is our main design aspects. Products are designed with sophisticated 3D CAD system and computational fluid dynamics (CFD) analysis to ensure optimum airflow and maximum efficiency. Thus, best performance and highest efficiency products are guaranteed.

Products undergo extensive and stringent test following ASHRAE standards in CITEC's well-equipped testing laboratory facilities accredited with Class A certification by the national authorities.



CHAPTER 02

G-VOLUTION PRO

New

G-Volution PRO

Typical applications include:

Precision air-conditioning systems play a crucial role in maintaining stable and controlled environments in various industries.

The new G-Volution Pro is engineered to run seamlessly in critical mission environment. Capable to deliver cooling constantly through efficient and intelligent control. Precise temperature and humidity control all year round is guaranteed.

Designed to provide flexibility on installation space, limited or large space. The new G-Volution series is designed with wide range of options to suit every requirement for reliable and precise condition control.

Why R410A Refrigerant?

- Excellent thermodynamic properties
- Increased cooling efficiency
- Better performance and faster temperature regulation
- Zero ODP
- Improved energy efficiency
- Lower operating costs
- Decreased environmental footprint

CITEC's G-VOLUTION PRO SERIES

CITEC G-Volution series offer a wide range of system and capacity to suit various applications.

EZ & EV Range

EZ and EV Range are designed with modular concept to enable the flexibility and versatility in different unit capacity, cabinet configuration and space constraint during installation. One vital component of these systems is the refrigerant, which is responsible for transferring heat and ensuring efficient cooling. Among the various refrigerants available, R410A stands out as a highly suitable option for precision air-conditioners due to its superior properties and environmental compatibility.

EZ range direct expansion unit series comes with Fixed Speed Compressor whereas EV range unit series are fitted with DC Inverter Compressor using R410A refrigerant which offer a wide range capacity to suit various application.

Fixed speed compressor suits best for constant heat load application whereas DC Inverter Compressors series can regulate the capacity based on actual cooling demand from 30% - 100% and control supply air temperature precisely within a tight operating tolerance. This greatly reduces the unit energy consumption with higher efficiency during part load operation.

EZ range Chilled Water series offers cooling capacities ranges from 25-50kW which cater for small and medium size room.

EF "C/L" Range

EF Range Chilled Water series comes with two different range, EF "C" and EF "L" to suit various requirements and application. EF "C" range is designed to fit in large coil with maximum heat exchange surface. It has low coil face velocity thus reducing air friction loss and therefore ensuring the units to operate at highest efficiency. EF "L" range is designed to achieve maximum performance with minimum footprint. Cooling coils are designed and arranged in such a way that enable maximum heat transfer area within limited cabinet space. EF "L" range is best suited for data center with higher raised floor availability.

EF "D, B/X & I/Y" Range

CITEC EF "D" range 'C Version' is designed with 2 sets of chilled water coil within single cabinet, connected to two independent sources, primary and secondary. During maintenance for primary source or fault detected, unit shall changeover to secondary source for continuous operation.

CITEC EF "B/X" and EF "I/Y" range 'A/W' Version consists of dual system (DX system + CW system) within single cabinet. System will operate with low cost chilled water as primary source where DX system will take over during chilled water fault or chiller shut down for maintenance. In certain buildings with centralized chilled water supply during office hours, chilled water can be use as primary source and switched to DX system as secondary source after office hours.

DESIGN FEATURES

- Modular Concept
- Double Skin Front Access Panel
- Full Front Access
- Underfloor EC fan (option)
- PTC Heater

MAJOR COMPONENTS

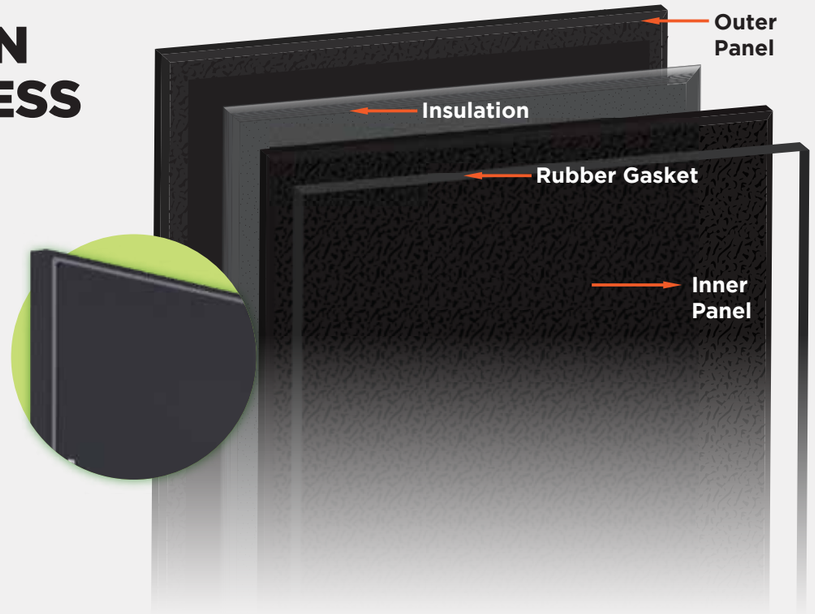
DX System	CW System
• Scroll Compressor R410A • EC Fan • Electronic Expansion Valve	• 2-way Modulating Valve • EC Fan • Screwed Water Connection (option) • Electronic Pressure Independent Valve (option)

01 MODULAR DESIGN

Modular concept offering flexibility to combine two smaller size units due to limited corridor space and allows combination of additional unit onto existing installed unit to meet higher cooling requirement for future facilities expansion.

02 DOUBLE SKIN FRONT ACCESS PANEL

Solid and rigid double skin insulated panel is equipped on G-Volution PRO series as standard to ensure the quality provided. Double skin panel has excellent sound isolation. The reduced in breakout noise greatly improve the working environment for the staffs who will need to work within the vicinity of the unit.



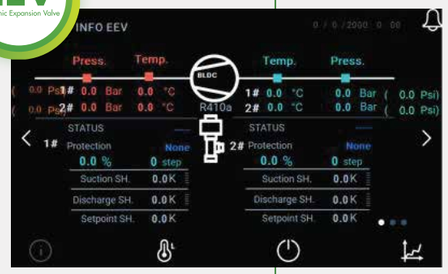
03 FULL FRONT ACCESS

Significantly improve the maintainability and serviceability to further extend the already long lifetime and reliability of the unit. No more worry about the accessibility of components in the deepest part of the unit.

04

ELECTRONIC EXPANSION VALVE

The innovative Electronic Expansion Valve (EEV) provides highly efficient control of refrigerant flow based on real-time feedback. The EEV can provide fast, stable and precise control even under low-load condition. The presence of the temperature and pressure probe allow real time monitoring of suction temperature and pressure as well as the superheat of the system.



05

DIRECT DRIVE EC FAN SYSTEM

The Electronically Commutated (EC) fan motor combination offers a number of advantages over traditional belt-driven forward curved centrifugal blower, such as:

- Higher efficiency compared to forward curved fans
- Reduced losses due to the absence of pulley and belt usage in the standard belt-driven fan
- 15-30% more energy savings
- Variable speed control
- Maintenance-free, higher reliability
- Soft start feature, where the fan slowly ramps up to the desired speed

06

ADVANCE COOLING WITH UNDERFLOOR EC FAN

An underfloor version of the EC fan is available for downflow models. Studies have shown that the placement of underfloor EC fans contribute to a 10% to 15% improvement in performance and is recommended for users who would like to utilize the full capacity of the EC fan. These fans are pre-wired and pre-packaged into the Precision Air Conditioning unit prior to delivery for instant installation.

With the innovation of CITEC, underfloor EC fan is mounted to the base of unit and lowered down to under-raised floor during site installation, promoting:

- Better air flow distribution
- Reduction of fan power inputs
- Convenience of service and maintenance
- Cost saving on installation and equipment

CHAPTER 03

INTELLIGENT CONTROL

Controller & Display

CITEC Genius-U Controller delivers intelligent and precise control for critical mission environment, achieving optimum performance and efficiency.

CITEC Genius-U Controller provides intelligent and advanced control for precision cooling application.

The controller supports a wide range of cooling control strategies for mission critical facilities including auto- sequencing, supply air control and containment system. Energy-saving features such as EC fan control, compressor and EEV optimization and intelligent humidity control are built-in to the standard control program.

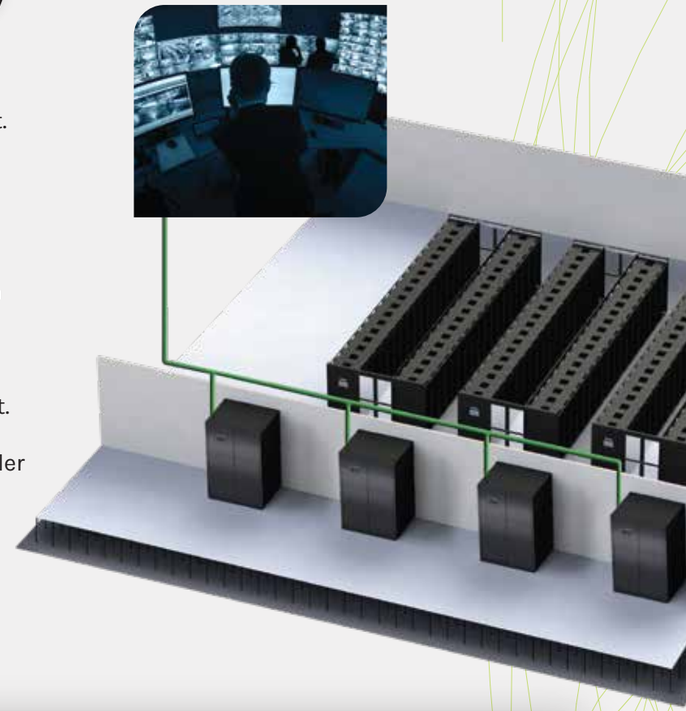
7” Colour touch screen display provides informative and user-friendly interface for easy navigation. The display can show graphical information via animated icons and also capable of plotting trend graphs for temperature and humidity.

Connectivity

CITEC Genius-U controller offers various common connectivity protocol used in Data Center for complete system monitoring and management.

CITEC Genius-U controller comes with built-in communication port for Modbus RTU, Modbus TCP/IP, Bacnet IP and SNMP as standard, providing a master slave communication between CRAC units to manage CRAC operation in duty standby or group control* up to 16 units. Furthermore, Modbus RTU and Modbus TCP/IP protocol can be connected to BMS directly providing system monitoring and management.

With optional BMS card, Citec Genius-U Controller is able to connect to other communication protocol as per table below:



Controller	GENIUS-U		
Gateway	Built In	pCOWEB	pCONET
Protocol			
MODBUS RTU	●		
MODBUS TCP / IP	●		
BACNET MS / TP			●
BACNET / IP	●*	●	
BACNET ETHERNET		●	
SNMP	●*	●	
HTTP	●	●	
FTP	●	●	
SMTP		●	

** Group control require separate control module - Gsys Visor*

All built-in communication ports will be using factory default IP address and license* required to be added. For other dedicated IP address, optional interface card will need to be added separately.

CITEC Advanced Group Control Solution

Integration of CITEC cooling system into a smart control system, all linked to a main control module to achieve the highest efficient cooling system.

CITEC Gsys – Visor Management & Control System offer advanced and precise thermal management control where all cooling units work as a team to achieve precise and uniform temperature distribution in the room with the changing loads of IT facilities, preventing hotspots and conflict in operation across multiple cooling units within the data centre, optimizing cooling performance with improved PUE.

- Equipped with large 7” colour interface
- Full touch screen control
- Deployment of actual site layout on screen interface
- At-a-glance reporting on performance metrics and room environment

CHAPTER 04

PRODUCT OVERVIEW

01 - Electrical & Control

High and low voltage cables are segregated and each component is protected by individual MCB. AC3 components such as fan motors and compressors are protected by manual motor starters. All cabling are colour coded and numbered for easy reference.

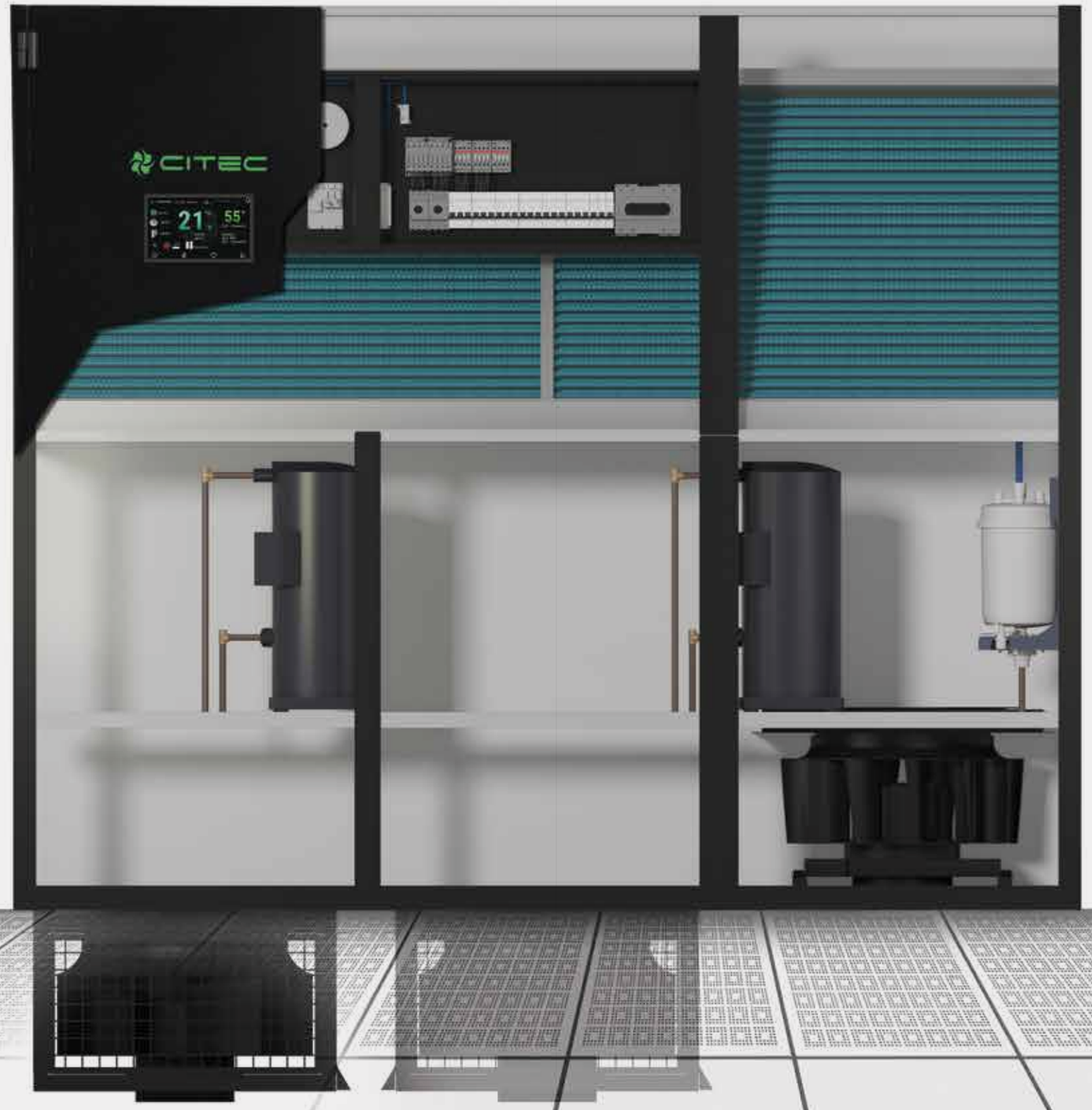
Electrical & Control Options

- Supply air control
- Hot standby control
- Differential pressure control
- Fire alarm relay
- Built-in Automatic Transfer Switch (ATS)
- Built-in mini UPS for controller
- 7” Colour touch screen display interface
- Phase monitoring relay
- Undervoltage relay
- Alarm buzzer
- E-stop button
- 3 stage heater*
- Thyristor heating

03 - Two types fans configuration

EC Fan

Underfloor EC Fan (option)



02 - Standard & Inverter Compressors using R410A refrigerant

- Standard compressor
- DC Inverter compressor

04 - Mechanical System

Direct Expansion system are fitted with electronic expansion valve (EEV), stainless steel condensate drain pan and hydrophilic coated coil, filter drier, front access sight glass and service valve.

Chilled Water system are fitted with 2-way valve, hydrophilic coated coil, stainless steel condensate drain pan.

Mechanical Options

- Built in water detection kit
- High efficiency filters (F5,F6,F7)
- Front horizontal discharge plenum for upflow models
- Serviceable humidifier with electrode boiler type
- Oil separator*
- Liquid solenoid valve*
- Fan speed controller*
- Crankcase heater*
- 3-way valve
- Screwed water connection
- Electronic Pressure Independent Valve (EPIV)
- Water In & Out temperature sensor

* Standard for Inverter models

Note: This diagram drawing is for illustration purpose only.

CHAPTER 05

TECHNICAL SPECIFICATION

EZ RANGE

Direct Expansion System (DX) with Standard Compressor

UNIT MODEL (EZ xxxx A/W)		1020	1025	1030	1035	1040	1045	1050	2040	2050	2060	2070	2075	2080	2090	2100
Gross Total Capacity	kW	20.58	25.94	29.80	37.26	41.10	44.40	49.70	41.10	50.42	62.8	68.66	75.54	82.40	88.40	98.12
Gross Sensible Capacity	kW	20.58	24.73	28.88	32.24	41.10	44.40	47.30	41.10	47.62	62.8	66.76	69.82	72.90	88.40	92.80
Sensible Heat Ratio		1.00	0.95	0.97	0.87	1.00	1.00	0.95	1.00	0.94	1.00	0.97	0.92	0.88	1.00	0.95
GENERAL DATA																
Nominal Air Flow	m^3/s	1.84	1.84	2.24	2.24	3.70	3.70	3.70	3.70	3.70	5.30	5.30	5.30	5.30	7.20	7.20
No. of Fan(s)		1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
No. of Compressor(s)		1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
Sound Level	dBA	61	61	62	62	64	64	64	64	64	66	66	66	66	67	67
CONDENSER																
Nominal Air Cooled Model	HEC	234	314	374	434	574	574	574	2x 234	2x 314	2x 374	2x 434	2x 574	2x 574	2x 574	2x 574
Nominal Water Cooled Model		40	50	60	70	70	60	70	2x 40	2x 50	2x 60	2x 60	2x 70	2x 70	2x 60	2x 70
Nominal Water Flow	l/s	1.24	1.53	1.79	2.19	2.48	2.67	2.99	2.48	3.04	3.78	4.12	4.54	4.96	5.32	5.90
Water Pressure Drop of Condenser	kPa	20.4	22.2	24.0	29.9	37.8	41.6	40.1	20.4	21.9	26.6	31.4	32.1	37.8	41.3	39.1
PTC HEATER																
Nominal Heater Capacity	kW	6	6	6	6	12	12	12	12	12	12	12	12	12	12	12
HUMIDIFIER																
Nominal Humidifier Capacity	kg/hr	5	5	5	5	5	5	5	5	5	5	5	5	5	8	8
UNIT DIMENSION & WEIGHT																
Width	mm	800	800	885	885	1315	1315	1315	1315	1315	1815	1815	1815	1815	2500	2500
Depth	mm	890	890	890	890	890	890	890	890	890	890	890	890	890	890	890
Height	mm	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985
Gross Weight - "A" Version	kg	269	296	302	305	440	444	444	451	491	596	596	602	605	780	780
- "W" Version	kg	281	311	316	322	455	459	459	466	509	624	624	625	631	810	810
Min. Service Allowance	mm	725	725	725	725	725	725	725	725	725	725	725	725	725	800	800

Notes

1. Cooling capacity is based on 24°C, 45%RH, R410A refrigerant at 45°C condensing temperature under nominal airflow, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. Nominal air cooled condenser sizing is suggestion only based on 35°C ambient temperature and nominal operating condition at sea level. Other sizes may be selected to suit requirement as necessary.
4. Nominal water cooled condenser sizing is suggestion only based on water in/out 30/35°C and nominal operating condition. Water pressure drop does not include optional valve. Other sizes may be selected to suit requirement as necessary.
5. For underfloor EC fan option, raise floor height must be >400mm.

EV RANGE

Direct Expansion System (DX) with DC Inverter Compressor

UNIT MODEL (EV xxxx A/W)		1020	1025	1030	1035	1040	1045	2060	2070	2080	2090
Gross Total Capacity	kW	21.06	25.03	30.34	34.93	41.17	46.36	59.69	72.62	79.98	92.81
Gross Sensible Capacity	kW	21.06	22.82	27.49	29.52	41.17	43.95	59.69	65.74	68.97	87.52
Sensible Heat Ratio		1.00	0.91	0.91	0.85	1.00	0.95	1.00	0.91	0.86	0.94
GENERAL DATA											
Nominal Air Flow	m³/s	1.84	1.84	2.24	2.24	3.70	3.70	5.30	5.30	5.30	7.20
No. of Fan(s)		1	1	1	1	1	1	2	2	2	2
No. of Compressor(s)		1	1	1	1	1	1	2	2	2	2
Sound Level	dBA	62	62	63	63	64	64	66	66	66	67
CONDENSER											
Nominal Air Cooled Model	HEC	234	314	374	574	574	574	2x 374	2x 574	2x 574	2x 574
Nominal Water Cooled Model		40	50	60	70	70	60	2x 60	2x 60	2x 70	2x 60
Nominal Water Flow	l/s	1.27	1.51	1.82	2.10	2.48	2.79	3.59	4.37	4.81	5.58
Water Pressure Drop of Condenser	kPa	21.3	21.6	24.8	27.7	37.8	45.4	24.2	35.0	35.8	45.4
PTC HEATER											
Nominal Heater Capacity	kW	6	6	6	6	12	12	12	12	12	12
HUMIDIFIER											
Nominal Humidifier Capacity	kg/hr	5	5	5	5	5	5	5	5	5	8
UNIT DIMENSION & WEIGHT											
Width	mm	800	800	885	885	1315	1315	1815	1815	1815	2500
Depth	mm	890	890	890	890	890	890	890	890	890	890
Height	mm	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985
Gross Weight - "A" Version	kg	265	265	275	280	415	430	545	545	570	725
- "W" Version	kg	277	279	289	296	431	446	573	573	602	757
Min. Service Allowance	mm	725	725	725	725	725	725	725	725	725	800

Notes

1. Cooling capacity is based on 24°C, 45%RH, R410A refrigerant at 45°C condensing temperature under nominal airflow, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. Nominal air cooled condenser sizing is suggestion only based on 35°C ambient temperature and nominal operating condition at sea level. Other sizes may be selected to suit requirement as necessary.
4. Nominal water cooled condenser sizing is suggestion only based on water in/out 30/35°C and nominal operating condition. Water pressure drop does not include optional valve. Other sizes may be selected to suit requirement as necessary.
5. For underfloor EC fan option, raise floor height must be >400mm.
6. Standard unit comes with fan speed controller, crankcase heater, oil separator and liquid solenoid valve.

EZ RANGE

Chilled Water System (CW)

UNIT MODEL (EZ xxx C)		1025	1030	1050
Gross Total Capacity	kW	24.07	30.27	51.01
Gross Sensible Capacity	kW	22.31	27.58	46.08
Sensible Heat Ratio		0.93	0.91	0.90
GENERAL DATA				
Nominal Air Flow	m³/s	1.84	2.24	3.70
No. of Fan(s)		1	1	2
Sound Level	dBA	61	62	64
CHILLED WATER COIL				
Downflow				
Nominal Water Flow	l/s	1.15	1.45	2.44
Water Pressure Drop	kPa	34.6	56.6	67.7
PTC HEATER				
Nominal Heater Capacity	kW	6	6	12
ELECTRODE HUMIDIFIER				
Nominal Humidifier Capacity	kg/hr	5	5	5
UNIT DIMENSION & WEIGHT				
Width	mm	800	885	1315
Depth	mm	890	890	890
Height	mm	1985	1985	1985
Gross Weight	kg	245	260	355
Min. Service Allowance	mm	725	725	725

Notes

1. Cooling capacity is based on 24°C, 45%RH, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. For underfloor EC fan option, raise floor height must be >400mm.

EF RANGE

Chilled Water System (CW)

UNIT MODEL (EF xxx C)		60	70	80	95	110	125	135	150
Downflow									
Gross Total Capacity	kW	64.31	74.71	83.63	100.27	113.93	123.42	131.51	155.54
Gross Sensible Capacity	kW	57.00	66.77	73.76	87.09	99.01	106.18	115.05	133.88
Sensible Heat Ratio		0.89	0.89	0.88	0.87	0.87	0.86	0.87	0.86
Upflow									
Gross Total Capacity	kW	61.16	71.20	79.58	95.93	108.20	117.73	127.41	151.06
Gross Sensible Capacity	kW	54.22	63.76	70.39	83.55	94.22	101.33	111.52	130.11
Sensible Heat Ratio		0.89	0.90	0.88	0.87	0.87	0.86	0.88	0.86
GENERAL DATA									
Nominal Air Flow (Downflow)	m^3/s	4.40	5.20	5.20	6.00	7.00	7.00	7.60	8.60
Nominal Air Flow (Upflow)	m^3/s	4.20	5.00	5.00	5.80	6.70	6.70	7.40	8.40
No. of Fans		2	2	2	2	3	3	3	3
Sound Level	dBA	67	67	67	68	68	68	68	68
CHILLED WATER COIL									
Downflow									
Nominal Water Flow	l/s	3.07	3.57	4.00	4.79	5.44	5.90	6.28	7.43
Water Pressure Drop	kPa	107.9	69.2	70.9	107.6	145.4	90.6	60.6	87.2
Upflow									
Nominal Water Flow	l/s	2.92	3.40	3.80	4.58	5.17	5.63	6.09	7.22
Water Pressure Drop	kPa	104.0	65.8	65.9	101.2	135.0	89.5	59.8	86.5
PTC HEATER									
Nominal Heater Capacity	kW	12	12	12	12	12	12	12	12
ELECTRODE HUMIDIFIER									
Nominal Humidifier Capacity	kg/hr	5	5	5	8	8	8	8	8
UNIT DIMENSION & WEIGHT									
Width	mm	1550	1800	1800	2065	2300	2300	2550	2815
Depth	mm	890	890	890	890	890	890	890	890
Height	mm	1985	1985	1985	1985	1985	1985	1985	1985
Gross Weight	kg	405	485	505	535	570	595	635	710
Min. Service Allowance	mm	725	725	725	725	725	725	725	725

Notes

1. Cooling capacity is based on 24°C, 45%RH, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. For underfloor EC fan option, raise floor height must be >400mm.

EF RANGE

Chilled Water System (CW) - Large

UNIT MODEL (EF xxx L)		70	80	125	140	180	200
Gross Total Capacity	kW	69.20	76.74	127.79	141.71	180.09	200.13
Gross Sensible Capacity	kW	61.05	66.61	112.58	122.97	159.52	174.46
Sensible Heat Ratio		0.88	0.87	0.88	0.87	0.89	0.87
GENERAL DATA							
Nominal Air Flow	m^3/s	4.40	4.40	8.20	8.20	11.70	11.70
No. of Fan(s)		1	1	2	2	3	3
Sound Level	dBA	67	67	68	68	70	70
CHILLED WATER COIL							
Nominal Water Flow	l/s	3.31	3.67	6.11	6.77	8.60	9.56
Water Pressure Drop	kPa	105.3	68.3	86.3	86.3	111.5	122.3
PTC HEATER							
Nominal Heater Capacity	kW	12	12	12	12	12	12
ELECTRODE HUMIDIFIER							
Nominal Humidifier Capacity	kg/hr	5	5	8	8	8	8
UNIT DIMENSION & WEIGHT							
Width	mm	1315	1315	2065	2065	2815	2815
Depth	mm	990	990	990	990	990	990
Height	mm	1985	1985	1985	1985	1985	1985
Gross Weight	kg	385	400	600	630	785	825
Min. Service Allowance	mm	725	725	725	725	725	725

Notes

1. Cooling capacity is based on 24°C, 45%RH, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is measured at 1m in freefield conditions.
3. For underfloor EC fan option, raise floor height must be >500mm.

EF RANGE “D VERSION”

Dual Coil System (CW+CW)

UNIT MODEL (EF xx D)		60	70	85	95
Downflow					
Gross Total Capacity	kW	60.16	72.79	90.08	96.94
Gross Sensible Capacity	kW	53.68	65.49	79.77	88.47
Sensible Heat Ratio		0.89	0.90	0.89	0.91
Upflow					
Gross Total Capacity	kW	58.23	69.34	86.28	91.42
Gross Sensible Capacity	kW	51.99	62.51	76.55	83.44
Sensible Heat Ratio		0.89	0.90	0.89	0.91
GENERAL DATA					
Nominal Air Flow (Downflow)	m^3/s	4.2	5.2	6.2	7.2
Nominal Air Flow (Upflow)	m^3/s	4.1	5.0	6.0	6.8
No. of Fans		2	2	2	3
Sound Level	dBA	67	67	68	68
CHILLED WATER COIL					
Downflow					
Nominal Water Flow	l/s	2.87	3.48	4.30	4.63
Water Pressure Drop	kPa	92.1	63.8	104.3	75.4
Upflow					
Nominal Water Flow	l/s	2.78	3.31	4.12	4.37
Water Pressure Drop	kPa	91.6	60.6	100.3	70.0
PTC HEATER					
Nominal Heater Capacity	kW	12	12	12	12
ELECTRODE HUMIDIFIER					
Nominal Humidifier Capacity	kg/hr	5	5	5	8
UNIT DIMENSION & WEIGHT					
Width	mm	1550	1800	2065	2300
Depth	mm	990	990	990	990
Height	mm	1985	1985	1985	1985
Gross Weight	kg	475	565	610	650
Min. Service Allowance	mm	725	725	725	725

Notes

1. Cooling capacity is based on 24°C, 45%RH, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. For underfloor EC fan option, raise floor height must be >400mm.

EF RANGE “B/X VERSION”

Dual Coil System (DX+CW) with Standard Compressor

UNIT MODEL (EF xx B/X)		60	70	85	95
Direct Expansion Circuit					
Gross Total Capacity (Downflow/Upflow)	kW	64.16 / 63.47	75.14 / 74.10	84.24 / 83.16	98.27 / 96.54
Gross Sensible Capacity (Downflow/Upflow)	kW	55.92 / 54.72	67.10 / 65.16	77.65 / 75.58	91.72 / 87.73
Sensible Heat Ratio		0.89 / 0.86	0.89 / 0.88	0.92 / 0.91	0.93 / 0.91
Chillled Water Circuit					
Gross Total Capacity (Downflow/Upflow)	kW	61.77 / 59.80	74.50 / 70.99	91.62 / 87.77	102.09 / 95.37
Gross Sensible Capacity (Downflow/Upflow)	kW	54.75 / 53.04	66.63 / 63.62	80.81 / 77.57	92.75 / 86.64
Sensible Heat Ratio		0.89 / 0.89	0.89 / 0.90	0.88 / 0.88	0.91 / 0.91
GENERAL DATA					
Nominal Air Flow (Downflow/Upflow)	m^3/s	4.2 / 4.1	5.2 / 5.0	6.2 / 6.0	7.5 / 7.0
No. of Fans		2	2	2	3
No. of Compressors		2	2	2	2
Sound Level	dBA	67	67	68	68
CONDENSER					
Nominal Air Cooled Model		2x HEC374	2x HEC434	2x HEC574	2x HEC574
Nominal Water Cooled Model		2x WD42	2x WD50	2x WD58	2x WD68
Nominal Water Flow (Downflow/Upflow)	l/s	3.72 / 3.69	4.34 / 4.29	4.84 / 4.80	5.69 / 5.61
Water Pressure Drop of Condenser (Downflow/Upflow)	kPa	41.4 / 41.0	41.3 / 41.0	39.8 / 39.4	41.1 / 40.5
CHILLED WATER COIL					
Nominal Water Flow	l/s	2.95 / 2.86	3.56 / 3.39	4.38 / 4.19	4.88 / 4.56
Water Pressure Drop	kPa	99.7 / 99.3	68.5 / 65.2	110.3 / 106.2	84.4 / 77.0
PTC HEATER					
Nominal Heater Capacity	kW	12	12	12	12
ELECTRODE HUMIDIFIER					
Nominal Humidifier Capacity	kg/hr	5	5	5	8
UNIT DIMENSION & WEIGHT					
Width	mm	2050	2300	2565	2800
Depth	mm	990	990	990	990
Height	mm	1985	1985	1985	1985
Gross Weight - "A" Version	kg	600	670	750	825
- "W" Version	kg	630	705	785	860
Min. Service Allowance	mm	725	725	725	725

Notes

1. Cooling capacity is based on 24°C, 45%RH, R410A refrigerant at 45°C condensing temperature, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. Nominal air cooled condenser sizing is suggestion only based on 35°C ambient temperature and nominal operating condition at sea level. Other sizes may be selected to suit requirement as necessary.
4. Nominal water cooled condenser sizing is suggestion only based on water in/out 30/35°C and nominal operating condition. Water pressure drop does not include optional valve. Other sizes may be selected to suit requirement as necessary.
5. For underfloor EC fan option, raise floor height must be >400mm.

EF RANGE "I/Y VERSION"

Dual Coil System (DX+CW) with DC Inverter Compressor

UNIT MODEL (EF xx I/Y)		60	70	85
Direct Expansion Circuit				
Gross Total Capacity (Downflow/Upflow)	kW	60.92 / 60.31	74.54 / 73.56	88.03 / 86.99
Gross Sensible Capacity (Downflow/Upflow)	kW	54.49 / 53.32	66.84 / 64.92	79.29 / 77.25
Sensible Heat Ratio		0.89 / 0.88	0.90 / 0.88	0.90 / 0.89
Chillled Water Circuit				
Gross Total Capacity (Downflow/Upflow)	kW	61.77 / 59.80	74.50 / 70.99	91.62 / 87.77
Gross Sensible Capacity (Downflow/Upflow)	kW	54.75 / 53.04	66.63 / 63.62	80.81 / 77.57
Sensible Heat Ratio		0.89 / 0.89	0.89 / 0.90	0.88 / 0.88
GENERAL DATA				
Nominal Air Flow (Downflow/Upflow)	m^3/s	4.2 / 4.1	5.2 / 5.0	6.2 / 6.0
No. of Fans		2	2	2
No. of Compressors		2	2	2
Sound Level	dBA	67	67	68
CONDENSER				
Nominal Air Cooled Model		2x HEC374	2x HEC434	2x HEC574
Nominal Water Cooled Model		2x WD42	2x WD50	2x WD58
Nominal Water Flow (Downflow/Upflow)	l/s	3.62 / 3.60	4.45 / 4.41	5.20 / 5.16
Water Pressure Drop of Condenser (Downflow/Upflow)	kPa	37.4 / 37.2	40.6 / 40.2	43.4 / 43.0
CHILLED WATER COIL				
Nominal Water Flow	l/s	2.95 / 2.86	3.56 / 3.39	4.38 / 4.19
Water Pressure Drop	kPa	99.7 / 99.3	68.5 / 65.2	110.3 / 106.2
PTC HEATER				
Nominal Heater Capacity	kW	12	12	12
ELECTRODE HUMIDIFIER				
Nominal Humidifier Capacity	kg/hr	5	5	5
UNIT DIMENSION & WEIGHT				
Width	mm	2050	2300	2565
Depth	mm	990	990	990
Height	mm	1985	1985	1985
Gross Weight - "A" Version	kg	600	670	750
- "W" Version	kg	630	705	785
Min. Service Allowance	mm	725	725	725

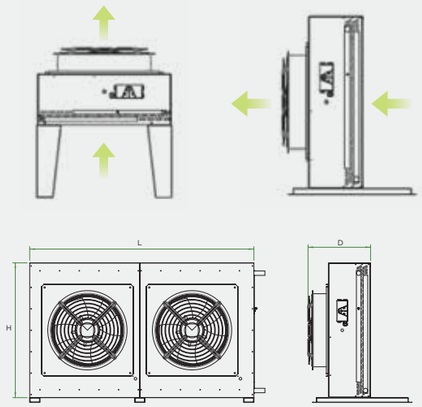
Notes

1. Cooling capacity is based on 24°C, 45%RH, R410A refrigerant at 45°C condensing temperature, Chilled Water in/out based on 7/12°C, 400V/3Ph+N/50Hz power supply, 50Pa ESP.
2. Sound level is for downflow models measured at 1m in freefield conditions.
3. Nominal air cooled condenser sizing is suggestion only based on 35°C ambient temperature and nominal operating condition at sea level. Other sizes may be selected to suit requirement as necessary.
4. Nominal water cooled condenser sizing is suggestion only based on water in/out 30/35°C and nominal operating condition. Water pressure drop does not include optional valve. Other sizes may be selected to suit requirement as necessary.
5. For underfloor EC fan option, raise floor height must be >400mm.
6. Standard unit comes with fan speed controller, crankcase heater, oil separator and liquid solenoid valve.

HEC
AIR COOLED CONDENSER

Vertical air discharge

Horizontal air discharge



The latest CITEC compact air cooled condenser series is built for high performance. Unit is fitted with high efficient axial fan, enclosed with powder coated panel body and weatherproof isolator.

Condenser may be installed in both vertical or horizontal air discharge orientation.

TECHNICAL SPECIFICATION

UNIT MODEL	HEC	234	274	314	374	434	574	654	904
Heat Rejection	kW	22.63	26.64	31.00	37.43	43.04	57.03	65.17	90.46
Air Flow	m^3/s	2.10	2.19	2.24	2.53	2.65	4.50	4.60	6.60
No. of Fan(s)		1	1	1	1	1	2	2	3
Sound Level	dBA	56	57	59	60	61	62	62	64
DIMENSON & WEIGHT	**HEC**	**234**	**274**	**314**	**374**	**434**	**574**	**654**	**904**
Length	mm	822	862	987	1212	1362	1562	1768	2318
Depth	mm	473	473	494	494	524	471	494	494
Height	mm	825	926	926	1028	1155	1063	1063	1063
Header Size	mm	7/8"	1 1/8"	1 1/8"	1 1/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"
Gross Weight	kg	60	63	75	90	110	125	150	205

Notes

1. Heat rejection capacity based on 35°C ambient & 15°C delta T.
2. Sound level is measured at 5m, based on free field condition.
3. Above data is for 230V/1Ph/50Hz power supply. Models are available at different power supplies.
4. Unit dimensions do not include mounting legs, isolator and piping. Condenser may be placed in vertical or horizontal air discharge orientation.

NOTES

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