Carrier

United Technologies

turn to the experts

greenspeed

AQUAEDGE

PUREtec

19DV

Back-to-Back Centrifugal Liquid Chiller with PUREtec™ Refrigerant and Greenspeed™ Intelligence

19DV Two-stage: 600 - 800Ton (Air-conditioning Low voltage VFD)

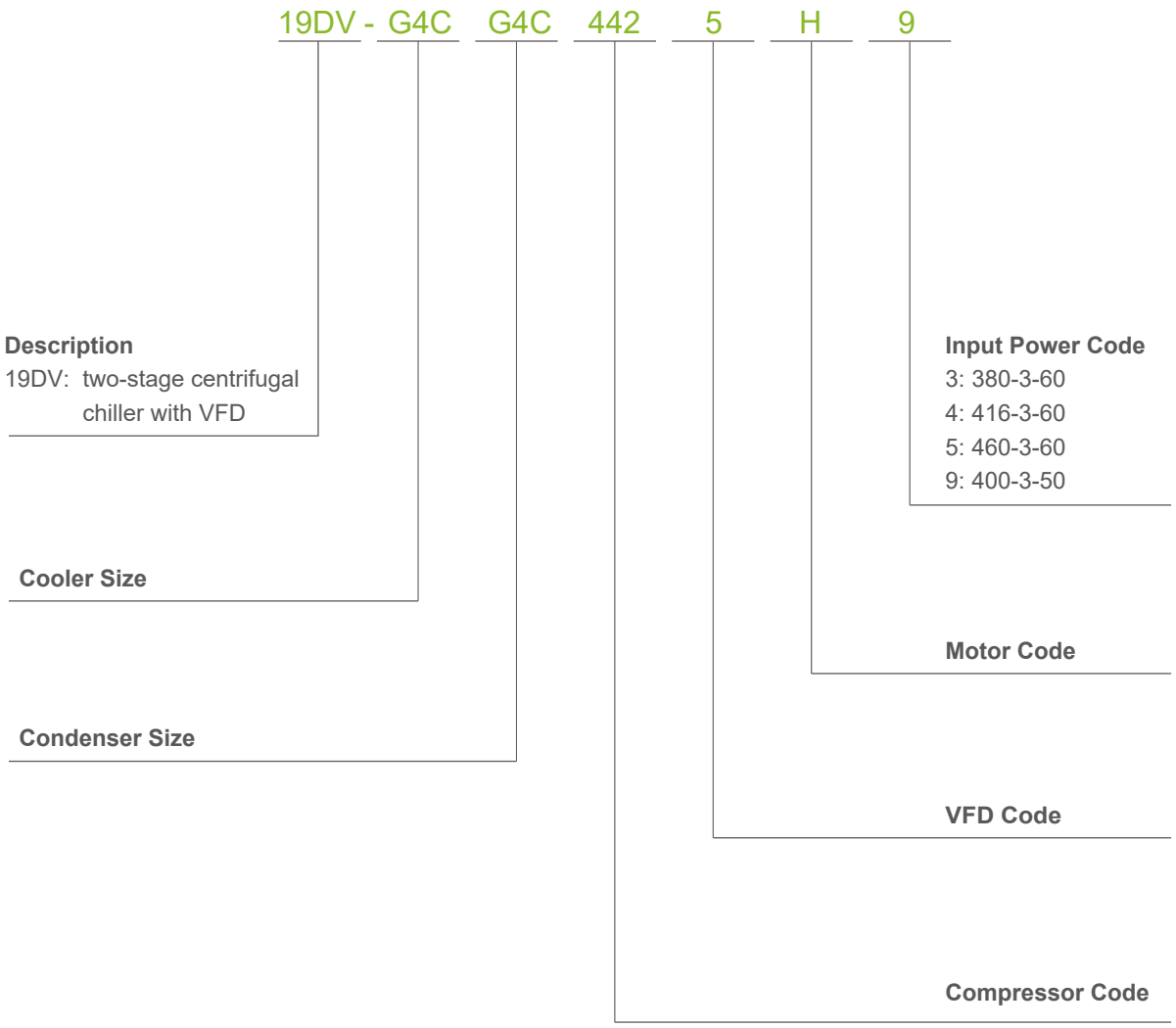
Turn To The Experts

Inheriting a rich legacy of innovation including inventing modern air-conditioning, Carrier has been a global leader in innovations for Heating Ventilation Air Conditioning (HVAC) and refrigeration solutions. Carrier is a part of UTC Climate, Controls & Security, a unit of United Technologies Corp., a leading provider to the aerospace and building systems industries worldwide.

With a broad portfolio of advanced technical patent awards, our global R&D center in Shanghai develops innovative heat, ventilation and air-conditioning (HVAC) solutions.

In 1998, Time magazine named Dr. Carrier oneof its 20 most influential builders and titans of the 20th century.

Model Number Nomenclature

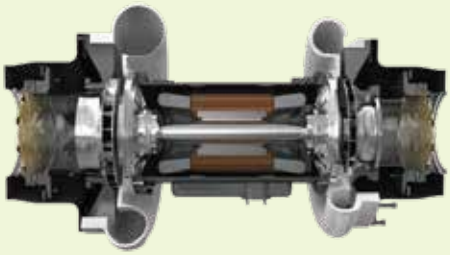


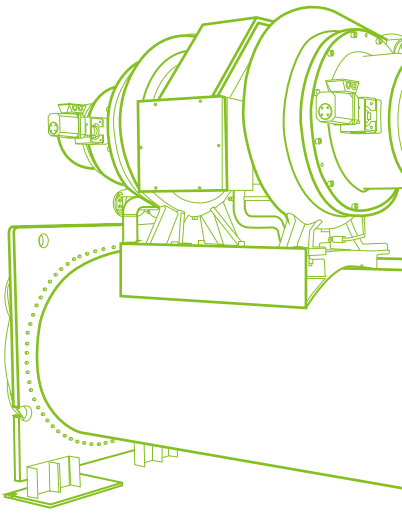
Cooling Capacity

19DV Two-stage: 600 - 800Ton (Air-conditioning Low voltage VFD）

Reliable

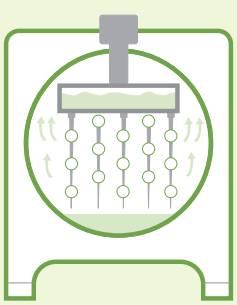
- Advanced back-to-back two-stage compressor naturally balances both radial and axial thrust on shaft.
- Simple and robust ceramic bearing system enables refrigerant lubrication that doesn't request oil lubrication which is requested by conventional chillers. Customers won't be troubled by oil related failures as well as maintenance cost and efforts.
- High tier variable speed starter equipped with harmonic filter(optional), total harmonic distortion (THD) ≤5% and fully complies with IEEE519 standard.
- Swift restart - 19DV can restart within 30 seconds (with UPS) after power recovery and achieve to required cooling load more rapidly, especially reliable for data center application.





Efficient

- Carrier back-to-back two-stage compressor integrated with inter-stage economizer which improves both cooling capacity and efficiency.
- High speed direct drive motor reduces mechanical loss by 75% resulting from the removal of gear driven system.
- By application of refrigerant lubricated ceramic bearings, the efficiency decline by oil in heat exchangers is not existed in 19DV.
- Pioneer falling film evaporator is designed for low pressure refrigerant, which performs a significantly enhanced heat transfer efficiency by mitigating submergence effect especially at part load conditions.
- High performance tubing with internally and externally enhanced fins improves chiller efficiency by reducing overall resistance to heat transfer.
- Greenspeed™ variable speed control gives a moment-to-moment control of compressor speed to adapt building load changes perfectly, which ensures the chiller always operating efficiently at both full load and part load.
- 19DV chillers can achieve up to 7.0 full load COP_R and 11.8 IPLV.IP at AHRI conditions.



AHRI

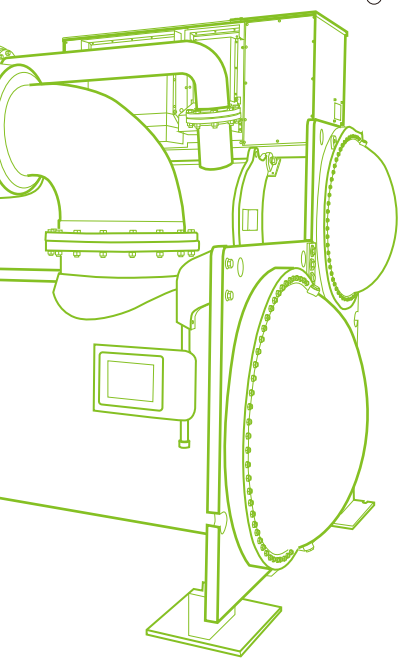
Water-Cooled Chillers
AHRI Standards 550/590

Sustainable

- R-1233zd(E) is new non-Ozone Depletion Substances, the low Global Warming Potential of ~ 1, non-flammability and non-toxicity refrigerant that provides a safe and environmentally steward solution to centrifugal chillers.
- Carrier pioneer falling film evaporator design helps reduce the refrigerant charge significantly.
- The industry leading energy efficiency of 19DV chiller leads to lower electrical power consumption and significant reduction of related CO_2 emissions.

PUREtec R-1233zd(E)

Quiet



- Refrigerant-cooled hermetic motor, no gear driven, optimized flow channel and 60% impeller speed of legacy design, all these features contribute to reduce refrigerant airflow noise.
- Greenspeed™ variable speed control adaptively turns down impeller speed at part load for better acoustic performance.
- 19DV chillers can meet 18001 standard recommended by Occupational Health and Safety Advisory Services (OHSAS).

Flexible

- System layout of 19DV chillers is well optimized and specific crescent shape economizer is designed to best leverage the space between evaporator and condenser that brings up to -15% smaller footprint versus legacy R-123 unit.
- Patented re-locatable control panel could be installed at any of the four corners of the chiller, which makes the layout of chillers more flexible to fit the site conditions.
- Bolt together modular design is ideal for retrofit project or installation in limited place.
- Miscellaneous optional offerings (such as marine water box) help to facilitate daily maintenance on jobsite.

Smart

- PIC5+ intelligent control - color touch screen, intuitive menu, animated component level interface, graphic trending, auto pushed alarm mail, smart password and more than 10 languages for choice.
- Multiple remote access methods present the users a flexible way to monitor and control the chillers.
- Carrier lifecycle data management system supports online data management and analysis, daily and key performance reports, prognostics and preventative maintenance, which will help the users continuously optimize the chiller and system operation.

CERTIFIED®
ww.ahridirectory.org
and 551/591

Carrier PIC5+ Control System - Intelligent Colorful Touch Screen

Carrier two-stage centrifugal chiller equips the latest PIC5+ control system with strong control and monitoring function during chiller operation. The control system applies a 10.4 inch high resolution touch screen, which can support more than ten language choices for customer, real time display of operation parameters with pictures makes it more human friendly and comfortable interface for operation. The control system simulates and monitors chiller operation, adjusts cooling or heating capacity according to load change and provides various protections during operation.

Reliable Start-up and Operation

- PIC5+ control system provides customer the smart password to avoid any setting change without authorization.
- When chiller receives start-up order, controller will conduct following pre-start safety checking, to ensure parameters like condensing pressure, bearing temperature, motor winding temperature, discharge temperature, evaporator saturated temperature and average line voltage etc. are normal.
- During chiller operation, except for the function of monitoring main operation parameters the control system also has capability to record and display trend curve, which is real time trend of key components during operation. It ensures effective and reliable operation of chiller by optimized intelligent and dynamic control algorithm.
- The control system has comprehensive protection during operation, such as surge protection, overvoltage and overcurrent protection, discharge temperature overheat protection, bearing temperature overheat protection, evaporator and condenser anti-freeze protection, low discharge superheat protection etc. in order to ensure chiller long time reliable operation.
- The optional envelope stability control is advanced parametric solution to control both chiller system and compressor to best balance the chiller efficiency and reliability. In real time, the controller optimizes compressor speed, guide vane position and stabilizer valve position to find the most efficient operating point throughout the operating range, without comprising the chiller stability.

Effective Failure Diagnostic

- The PIC5+ control system has failure diagnostic function and can be easily accessed via touch screen for detail chiller operation parameters. If control system detects failure the alarm will be initiated and related code will be recorded in alarm menu. The alarm records can be automatically saved by control system. Carrier service technician can read and delete alarm records by Carrier service/PCDCT tools.
- The control system has additional pre-diagnostic function. Different with diagnostic function, information displayed from this function is mainly for maintenance purpose. For an example, to inform customer periodically replace filter from this function.
- The control system has email alarm function. The control system can automatically send out an email with one or more alarm information to customer or service people through effective email address when alarm exists.

Flexible Interface and Connection

- The installation of Carrier colorful touch screen is very flexible. It greatly improves the convenience that customer can install touch screen at any corner of the chiller.
- The customer can not only directly operate on touch screen but also use the port to connect with BAS system. The control system facilitates various accesses, such as CCN to meet customer requirements. PIC5+ is compatible with Carrier i-Vu control network and integrated BACnet/IP protocol. PIC5+ also facilitates protocol such as native Modbus and converter for LonWorks to simplify the seamless connection with building automation systems.
- Carrier LDMS (Lifecycle Data Management System) is based on “Big Data Processing” and supports more value-added customer service such as online data management and analysis, daily and key performance reports, prognostics and preventative maintenance. The enhanced data management and analysis will help the users to achieve continuous optimization of the chiller and system operation.

Main Page

Control system main page operation and primary parameters monitored:

- Main page button
- Menu page button
- Log in/Language button
- Start-up/Stop page button
- Alarm menu button
- Setting point
- Chiller load percentage
- Inlet Guide Vane position percentage
- Condensing water pump status
- Chilled water pump status
- Condenser water inlet/outlet temperature
- Evaporator water inlet/outlet temperature
- Condenser saturated temperature and pressure
- Evaporator saturated temperature and pressure

Customer can easily read the primary information of chiller, components status and access to other interfaces from this page. They are:

- General parameter page
- Temperature/Pressure page
- Input/Output parameter page
- Water system parameter page
- Operation time
- Mode
- Graphic data trend

Air-conditioning (380V-3Ph-50Hz)

Model	Chiller				Chiller Line Amps	Evaporator		
	Cooling Capacity		Input Power	Full load COP_R		Flow Rate	Pressure Drop	Water Connection
	kW	Tons	kW	ikW/kW	A	l/s	kPa	mm
19DV-G24G234445B9	2110	600	321.2	0.1522	523	100.8	50.1	DN350
19DV-G24G244525D9	2462	700	377.9	0.1535	616	117.6	67.8	DN350
19DV-G44G444625D9	2813	800	434.8	0.1545	688	134.4	99.2	DN350

Model	Condenser			Footprint			Weight		
	Flow Rate	Pressure Drop	Water Connection	Length	Width	Height	Operating	Rigging (w/o Refrigerant)	Refrigerant Charge
	l/s	kPa	mm	mm	mm	mm	kg	kg	kg
19DV-G24G234445B9	117.0	55.4	DN250	4762	2508	2882	18440	15920	702
19DV-G24G244525D9	136.7	62.6	DN250	4762	2508	2882	18648	16078	700
19DV-G44G444625D9	156.3	90.8	DN250	5284	2508	2882	19528	16731	788

Air-conditioning (380V-3Ph-60Hz)

Model	Chiller				Chiller Line Amps	Evaporator		
	Cooling Capacity		Input Power	Full load COP_R		Flow Rate	Pressure Drop	Water Connection
	kW	Tons	kW	ikW/kW	A	l/s	kPa	mm
19DV-G24G234445B3	2110	600	321.2	0.1522	551	100.8	50.1	DN350
19DV-G24G244525D3	2462	700	377.9	0.1535	643	117.6	67.8	DN350
19DV-G44G444625D3	2813	800	434.8	0.1545	715	134.4	99.2	DN350

Model	Condenser			Footprint			Weight		
	Flow Rate	Pressure Drop	Water Connection	Length	Width	Height	Operating	Rigging (w/o Refrigerant)	Refrigerant Charge
	l/s	kPa	mm	mm	mm	mm	kg	kg	kg
19DV-G24G234445B3	117.0	55.4	DN250	4762	2508	2882	18440	15920	702
19DV-G24G244525D3	136.7	62.6	DN250	4762	2508	2882	18648	16078	700
19DV-G44G444625D3	156.3	90.8	DN250	5284	2508	2882	19528	16731	788

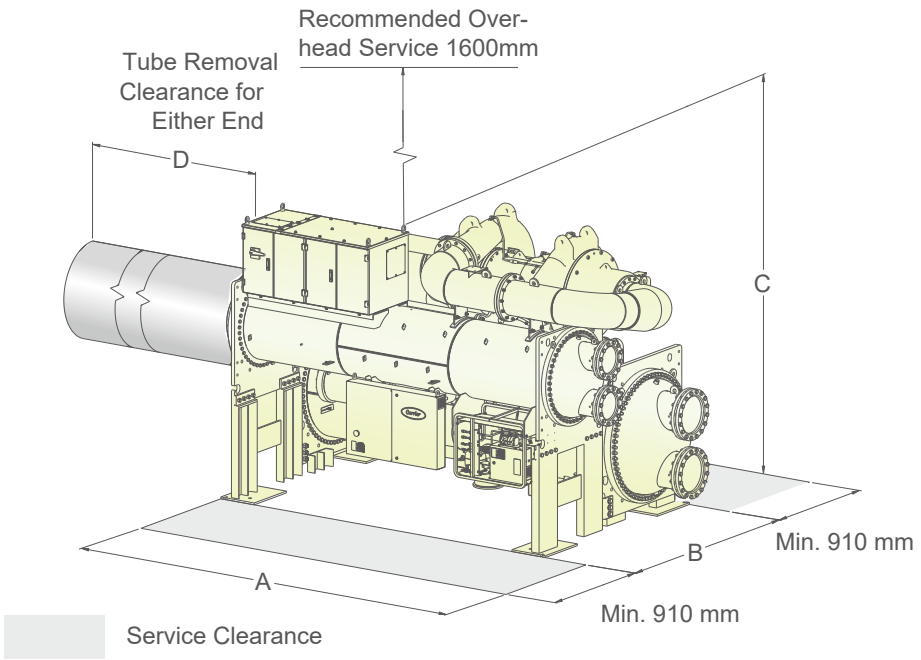
Notes:

1. The above selections are based on entering/leaving chilled water temperature 12/7℃, entering/leaving cooling water temperature 32/37℃, evaporator fouling factor 0.0176 m^2℃/kW and condenser fouling factor 0.044 m^2℃/kW.
2. Carrier will select specific models using E-Cat on different requests for tonnage, lift, and efficiency. For details, please contact local agencies.
3. Standard evaporator and condenser water side pressure is 1.0MPa. For more requirements, please contact local agencies.
4. For more details or customized selections, please contact local agencies.

Certified in accordance with the AHRI Water-Cooled Water-Chilling and Heat Pump Water-Heating Packages. Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at www.ahndirectory.org

http://www.ahridirectory.org

19DV Chiller Dimensions



Evaporator Size	Condenser Size	A-Length for NIH Waterbox mm (2-Pass)	B-Width mm	C-Width mm	D-Tube Removal Space for Either End mm
G2A-G29	G2C-G29	4762	2508	2882	4267
G4A-G49	G4C-G49	5284	2508	2882	4877

Field Wiring Specifications (with VFD)

I. General

1.0 All field-supplied conductors, devices and the field-installation wiring, termination of conductors and devices must be in compliance with all applicable codes and job specifications.

1.1 The routing of field-installed conduit and conductors and location of field-installed devices must not interfere with equipment access or the reading, adjusting or servicing of any component.

1.2 Equipment installation and all starting and control devices must comply with details in equipment submittal drawings and literature.

1.3 Contacts and switches are shown in the position, which would de-energize the circuit and cause chiller shut down.

1.4 WARNING-Do not use aluminum conductors.

II. Power Wiring to VFD Starter

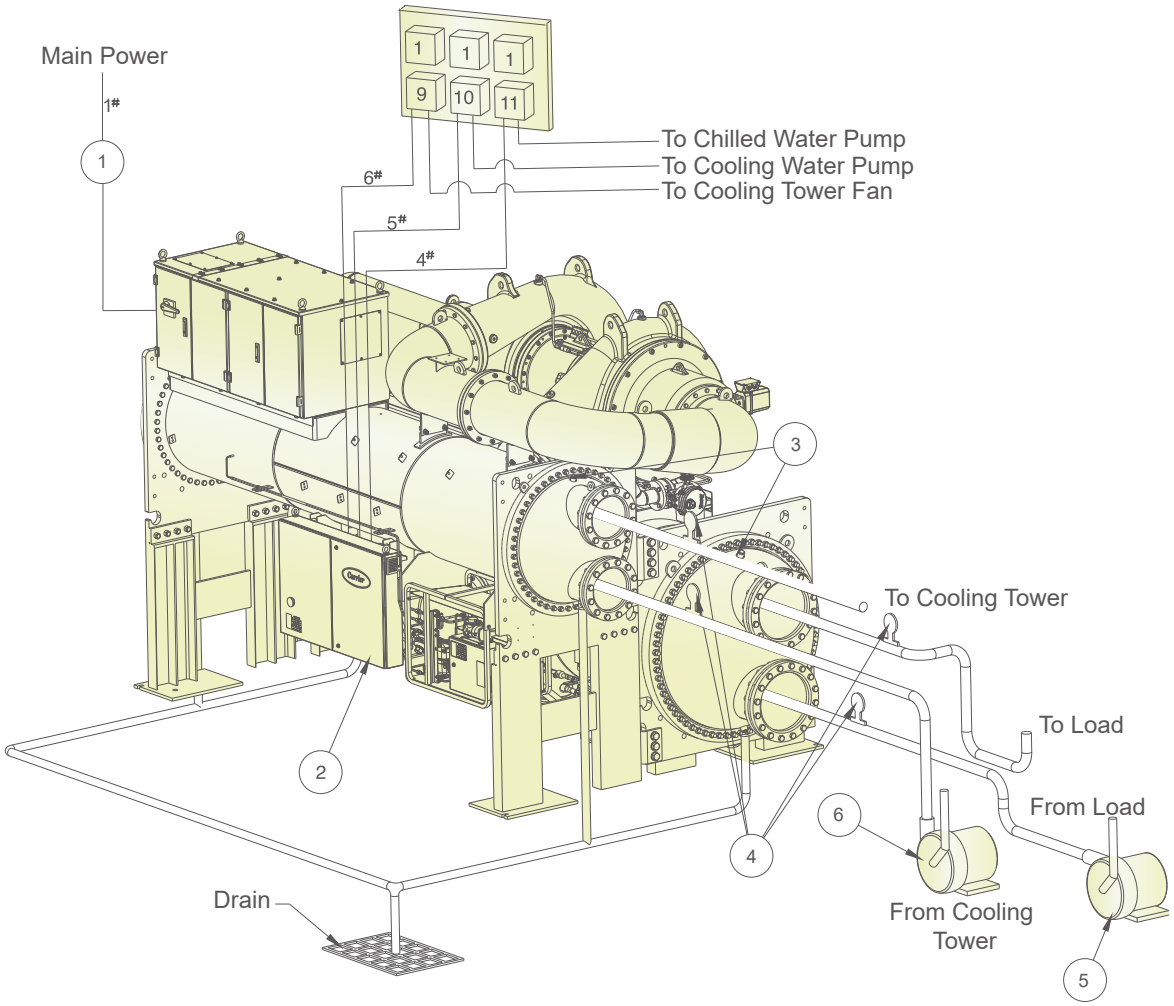
2.0 Provide a means of disconnecting power to starter. Fused disconnect is required on VFD.

2.1 Incoming power wire must be protected with metal jacket.

2.2 Line side power conductor rating must meet VFD nameplate voltage and chiller full load amps (minimum circuit ampacity).

2.3 VFD and controls must be grounded by using equipment grounding lugs provided inside unit mounted starter enclosure.

Typical Piping and Wiring (Unit Mounted VFD)



① Air switch ② Control box ③ Vent
④ Pressure gauges ⑤ Chilled water pump ⑥ Cooling water pump

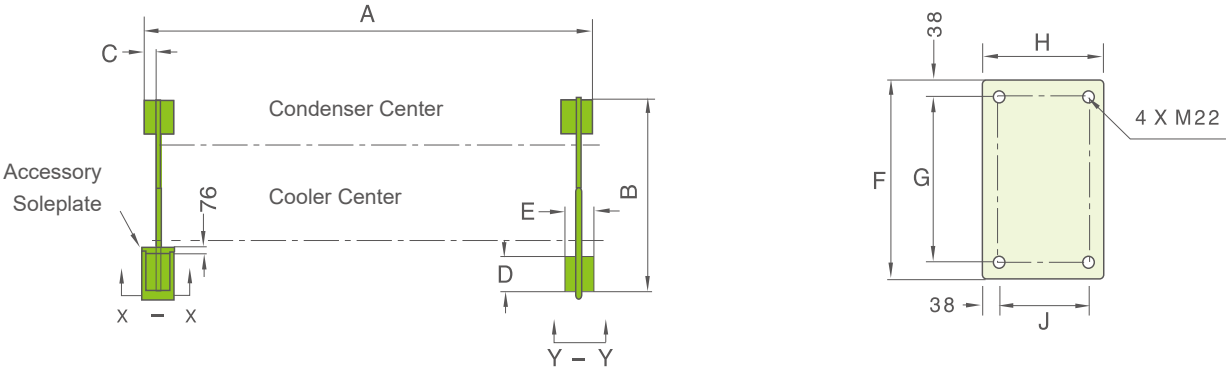
Line	Purpose	Specification
1#	Main power to Starter	50Hz or 60Hz low voltage AC power source: 3 phase, 1 grounding
4#	To cooling tower fan starter (option)	2 control lines (option)
5#	To cooling water pump starter (option)	2 control lines (option)
6#	To chilled water pump starter (option)	2 control lines (option)

Piping and Wiring Requirements:

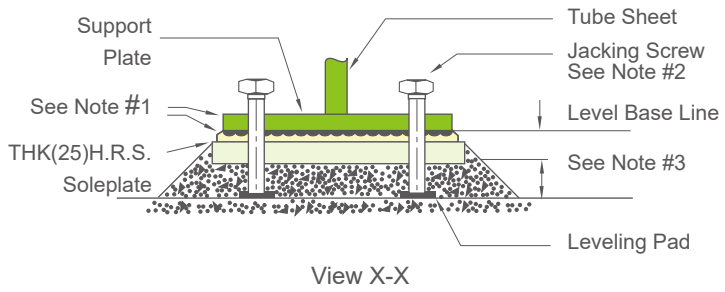
1. The installer must get all pipes and wires in place and mark the ends.
2. Filters must be installed in cooling water and chilled water pipes.
3. Thermometer (0-50˚C) and pressure gauge (0~1Mpa or 2MPa) must be installed at inlet and outlet of the pipes.
4. The installer must install the relief valve vent to outdoors with a steel pipe(outer diameter 48mm, thickness 4mm).
5. It is suggested that an oxygen content monitor be installed in the machine room for safety, which will give an alarm when the oxygen content is less than 19.5%.
6. Input power shall be in compliance with Carrier applicable codes and job specifications. For more details or customized conditions, please contact local agencies.

Types of Base Isolation

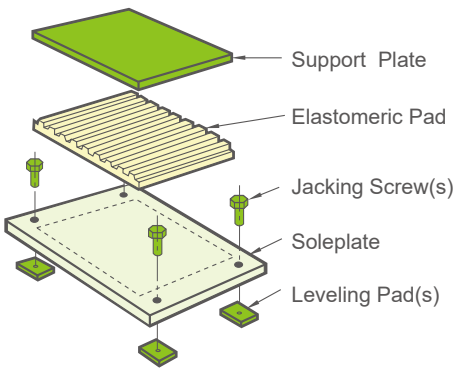
Location of Isolator



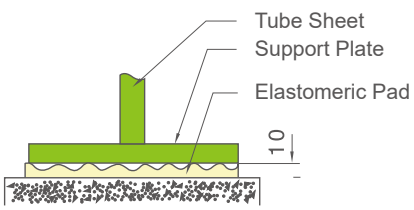
Standard Isolation



View X-X



Simplified Isolation



View Y-Y

Notes:

1. Accessory soleplate package includes 4 soleplates, 16 jacking screws, and 16 leveling pads.
2. Jacking Screws should be removed after the grout has set.
3. Thickness of grout varies, depending on the amount necessary to level chiller.

Evaporator/Condenser Size	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	J mm
G2A-G29/G2C-G29	3951	2508	102	559	406	711	635	432	356
G4A-G49/G4C-G49	4472	2508	102	559	406	711	635	432	356

improve buildings™

Carrier improves the world around us; Carrier improves people's lives; our products and services improve building performance; our culture of improvement will not allow us to rest when it comes to the environment.

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