

**NEW**

CERAMIC BEARING CENTRIFUGAL  
LIQUID CHILLER WITH PURETEC™  
REFRIGERANT AND  
GREENSPEED® INTELLIGENCE



Reliability  
Efficiency  
Acoustic comfort  
Flexibility  
Footprint

COOLING

19DV

AQUAEDGE<sup>greenspeed</sup>  
PUREtec

Two-stage: 1400 > 3500 kw

Designed to perfectly meet the new requirements in terms of energy performance, acoustic comfort, refrigerant sustainability, low maintenance and total cost of ownership, the 19DV is the new standard for the medium cooling capacity centrifugal chiller market.

## FEATURES AND BENEFITS

### 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)  $\leq 5\%$  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

Advanced back-to-back two-stage compressor naturally balances both radial and axial thrust on shaft.

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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.

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 and 11.8 IPLV at AHRI conditions.

### Sustainable

R-1233zd(E) is new non-Ozone Depletion Substances, the ultra low Global Warming Potential of  $\sim 1$ , 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<sub>2</sub> emissions.

### 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.

### 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).

### 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.

### 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.



## FEATURES AND BENEFITS

### 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

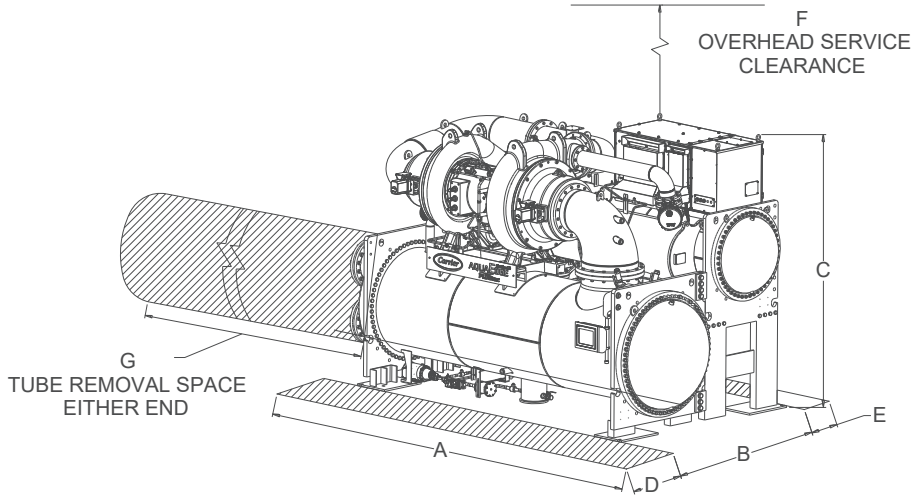
Control system main page operation and primary parameters monitored:

- 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

**DIMENSIONS/CLEARANCE**



**NOTES:**

1. Dished head waterbox shown.
2. Service areas shown are minimum space required. For major compressor service, it is desirable to have an 2.4m wide service area on the cooler or condenser side to allow the compressor to be positioned on the floor next to the chiller, unless arrangements are made that allow for rigging the compressor elsewhere.
3. Refer to Table 1 for A, B and C.

**Table 1-1— 19DV Chiller Dimensions (Nozzle-In-Head Waterbox)**

19DV Dimensions (Nozzle-In-Head Waterbox)					
Cooler heat exchanger size	Condenser heat exchanger size	A (length, dished head waterbox)		B (width)	C (height)
		2-Pass			
		Mm			
G2*	G2*	4778.5		2595.8	2928.1
G4*	G4*	5299.2		2595.8	2928.1
H2*	H2*	4778.5		2761.2	3073.0
H4*	H4*	5299.2		2761.2	3073.0

\*Assumes both cooler and condenser nozzle on same end of chiller.

**NOTES:**

1. Service access should be provided per American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, and local safety code.
2. Overhead clearance for service rigging 19DV compressor should be at least 1524 mm.
3. Dimensions are approximate. Certified drawings available upon request.
4. Marine waterboxes typically add to the width of the machine. See certified drawings for details.
5. 'A' length dimensions shown are for standard 1034kPa design and flanges connections. The 2068kPa design and flanges will add length. See certified drawings.
6. Table contains heat exchanger dimensions. For arrangements where the compressor motor housing extends past the waterbox, consult the 19DV certified drawings.
7. Consult factory for configurations not listed in the above table.

**Table 1-2— 19DV Chiller Dimensions (Marine Waterbox)**

19DV Dimensions (Nozzle-In-Head Waterbox)					
Cooler heat exchanger size	Condenser heat exchanger size	A (length, dished head waterbox)		B (width)	C (height)
		2-Pass			
		Mm			
G2*	G2*	5343.5		2595.8	2928.1
G4*	G4*	5864.2		2595.8	2928.1

\*Assumes both cooler and condenser nozzle on same end of chiller.

**NOTES:**

1. Service access should be provided per American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, and local safety code.
2. Overhead clearance for service rigging 19DV compressor should be at least 1524 mm.
3. Dimensions are approximate. Certified drawings available upon request.
4. 'A' length dimensions shown are for standard 1034kPa design and flanges connections. The 2068kPa design and flanges will add length. See certified drawings.
5. Table contains heat exchanger dimensions. For arrangements where the compressor motor housing extends past the waterbox, consult the 19DV certified drawings.
6. Consult factory for configurations not listed in the above table.

## PHYSICAL DATA

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

Model	Cooling Capacity	Input Power	Chiller Line Amps	Footprint		
				Length	Width	Height
	kW	kW	A	mm	mm	mm
19DV-G24G234425B9	2110	321,2	523	4762	2508	2882
19DV-G24G244525D9	2462	377,9	616	4762	2508	2882
19DV-G44G444625D9	2813	434,8	688	5284	2508	2882

**Note:**

1. The above selections are based on entering/leaving chilled water temperature 12/7°C, entering/leaving cooling water temperature 32/37°C, evaporator fouling factor 0.0176 m<sup>2</sup>C/kW and condenser fouling factor 0.044 m<sup>2</sup>C/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.