

Quality and Environment  
Management System  
Approval

## 19XR/19XRV

Nominal cooling capacity 1000-5300 kW

The Carrier 19XR/19XRV centrifugal chillers provide exceptional value by achieving energy efficiency levels as high as 6.8 (EER) utilising proven technology designed specifically for chlorine-free refrigerants:

- Unique concept of the hermetic compressor:
  - Single-stage aerodynamic impeller
  - Tunnel diffusers, based on aircraft engine technology
  - Motor cooled by refrigerant gas injection
- Possibility to control the compressors using a variable-frequency drive (19XRV) to maximise machine energy efficiency.
- Use of high-efficiency evaporator and condenser tubes
- Expansion sub-cooler integrated into the condenser
- Patented float valve technology for optimised sub-cooling and refrigerant level in the evaporator

These advantages, together with the modularity of the units and their efficiency, economical operation and dimensional constraints allow the use of the Carrier 19XR/19XRV centrifugal chillers in any high-capacity water cooling applications.

### Features

- **HFC-134a - an environmentally-sound solution**  
The 19XR/19XRV chillers use chlorine-free HFC-134a refrigerant with zero ozone-depletion potential, still the refrigerant of choice for automotive and appliance manufacturers.
- **Mix-match capabilities**  
A complete line of compressors and heat exchangers is available for these chillers, optimising the machine component combination regardless of capacity, lift, and efficiency specifications.
- **Heat exchangers feature:**  
European pressure vessel code certified construction, ensuring maximum heat exchanger safety, reliability and long life.

The units also offer a wide choice of possible combinations to ensure optimised matching of the compressor performance to the specific requirements.

- **Single-stage hermetic compressor**  
This design:
  - increases product reliability by eliminating the additional moving parts associated with multiple stage machines, such as additional guide vanes and complex economizers.
  - eliminates refrigerant leaks from the compressor/motor transmission joints in open-drive compressors.

- **Compressor with variable-frequency drive (VFD)**  
19XR/19XRV chillers are equipped with a compressor variable-frequency system. By changing the compressor operating mode this system considerably reduces power consumption based on the motor rotational speed.

In addition, the variable-frequency drive control box is cooled by refrigerant minimising its size and ensuring optimal component cooling for an extended operating life. This concept makes water cooling unnecessary and eliminates the associated maintenance cost and water pump power consumption.

- **Aerodynamically-contoured impellers**  
Impellers that utilize high back sweep main blades with low-profile intermediate splitter blades are aerodynamically contoured to improve compressor full-load and part-load operating efficiency.

## Easy installation

- **Modular construction**  
The cooler, condenser, and compressor assemblies are completely bolted together, making the 19XR/19XRV chillers ideally suited for replacement projects where ease of disassembly and reassembly at the jobsite are essential.
- **Water piping**  
The unit has quick and easy piping: the standard unit includes nozzle-in head water boxes with Victaulic grooves to allow for use of Victaulic couplings. Flanges are available as an option.
- **Optional unit-mounted electronic starter**  
Carrier's unit-mounted electronic starter is only available as a low-voltage version and provides a single point power connection, reducing machine installation time and expense.
- **Quick start-up**  
The 19XR/19XRV unit manufacturing site uses a quality management process that is certified to ISO 9001. All units undergo factory checks to ensure easy and reliable start-up. Compressors are run-tested to ensure proper operation of all compressor systems, including oil management, vibration, electrical, power transmission, and compression.

## Power supply and controls

### 1 - Control boxes

- Serviceability and convenience have been "designed-in", for example:
  - Control transformer is fitted as standard
  - Single-point mains power connection if unit-mounted starter is supplied
  - All components are mounted using connectors to facilitate fast servicing and replacement
  - Components are labelled and numbered according to wiring diagrams
  - IP 23C protection on the whole unit

### 2 - Controls system

- **Numerical product-integrated control (PIC)**  
The Carrier numerical product-integrated PIC control provides unmatched flexibility and functionality. Each unit integrates directly with an installation control system (using several communication protocols) that offers a global system solution.
- **Human interface (ICVC)**  
The ICVC (Interface Chiller Visual Control), that can be configured to display units in Imperial or metric, provides unparalleled ease of operation. A 16-line by 40-character LCD (Liquid Crystal Display) features four menu-specific soft keys. Default display offers easy, quick display of key chiller operation data, simplifying the interaction between machine and user.

Local languages are available upon request.

- **Chilled-water reset**  
Reset can be accomplished manually or automatically from the building management system. Reset saves energy when warmer chilled water can be utilized.
- **Demand limiting**  
This function limits the power draw of the chiller during peak loading conditions. When incorporated into the Carrier Comfort Network building automation system, a red line command will hold chillers at their present capacity and prevent any other chillers from starting. If a load shed signal is received, the compressors are unloaded to avoid high demand charges whenever possible.
- **Ramp loading**  
Ramp loading ensures a smooth pulldown of water loop temperature and prevents a rapid increase in compressor power consumption during the pulldown period.
- **Automated controls test**  
The test can be easily executed prior to start-up to verify that the entire control system is functioning properly.
- **365-day real time clock**  
This feature allows for the operator to programme a yearly schedule for each week, weekends, and holidays.
- **Occupancy schedules**  
Schedules can be programmed into the controller to ensure that the chiller only operates when cooling is required.
- **Extensive service menu**  
Unauthorized access to the service menu can be password-protected. Built-in diagnostic capabilities assist in troubleshooting and recommend proper corrective action for preset alarms, resulting in less down time.
- **Battery backup**  
Battery backup provides protection during power failures and eliminates time consuming control reconfiguration. Encapsulated circuit boards are designed, built and tested in-house. Each board meets Carrier's stringent quality standards for superior reliability compared to open board designs.
- **Other control features include:**
  - Display of over 125 operating, status, and diagnostic messages for improved user interface.
  - Examples:
    - Monitoring of over 100 functions and conditions to protect the chiller from abnormal conditions.
    - Modular plug-in design, reducing wiring requirements and providing easy installation.
    - Low-voltage (24 V ac) design, providing the ultimate assurance of personal safety and control integrity.
- **Microprocessor-controlled oil heater**  
The heater prevents excessive absorption of refrigerant into the oil during compressor shutdown, ensuring a plentiful supply of undiluted lubrication oil in the oil sump.
- **Safeties**  
Unit is automatically shut down when any of the following conditions occur:
  - Motor overcurrent
  - Over voltage\*
  - Under voltage\*
  - Single cycle dropout\*
  - Bearing oil high temperature
  - Low evaporator refrigerant temperature
  - High condenser pressure
  - High motor temperature
  - High compressor discharge temperature
  - Low oil pressure
  - Prolonged surge
  - Loss of cooler water flow
  - Loss of condenser water flow
  - Starter fault

Each of these protective limits shall require manual reset and cause an alarm message to be displayed on the LCD screen, informing the operator of the shutdown cause.

\* Do not require manual reset or cause an alarm if auto-restart after power failure is enabled.

#### ■ **Alarm file**

This file maintains the last 25 time- and date-stamped alarm and alter messages in memory; this function reduces troubleshooting time and cost.

#### ■ **Overrides**

The control system detects conditions which approach protective limits and takes self-corrective action prior to an alarm occurring.

The system automatically reduces chiller capacity when any of the following parameters are outside their normal operating range:

- High condenser pressure
- High motor temperature
- Low evaporator refrigerant temperature
- High motor current

During the capacity override period, a pre-alarm (alert) message is displayed, informing the operator which condition is causing the capacity override. Once the condition is again within acceptable limits, the override condition is terminated and the chiller reverts to normal chiller water control.

During either condition, if the protective limit is reached, the chiller shuts down and a message is displayed informing the operator which condition has caused the shutdown and alarm. This function increases unit life.

### **Capacity control**

- On the 19XR base units capacity control is by means of variable inlet guide vanes located at the impeller inlet. Load modulation is from 100% to 15% of compressor full load under nominal ARI conditions without the use of hot gas bypass. The guide vanes are precisely positioned by a PID (proportional-integral-derivative) control algorithm to ensure precise and quick control of desired chilled-water temperature without hunting or overshooting the set point.

If the machine includes a factory-installed variable-frequency drive (19XRV), the compressor speed is regulated by the control of the voltage-frequency values, applied to the motor. The voltage applied, generated by pulse width modulation, is proportional to the frequency.

The calculation of the water temperature parameter deviation measured results in an adjustment of the machine capacity through a simultaneous and coordinated action on guide vane opening and compressor speed.

### **Simple to service**

- Mechanically cleanable cooler and condenser.
- The machine concept allows the refrigerant to be stored inside the chiller during servicing, reducing refrigerant loss and eliminating time-consuming transfer procedures.
- Easy-access suction and discharge pressure and temperature information using enhanced display module.

# Refrigeration cycle of the 19XR/19XRV units

## Suction

The compressor continuously draws refrigerant vapour from the evaporator at a rate set by the amount of guide vane opening or the compressor rotation speed.

## FLASC (flash subcooler)

After the condensing phase the liquid refrigerant passes through the orifices into the FLASC chamber (flash subcooler - see figure below).

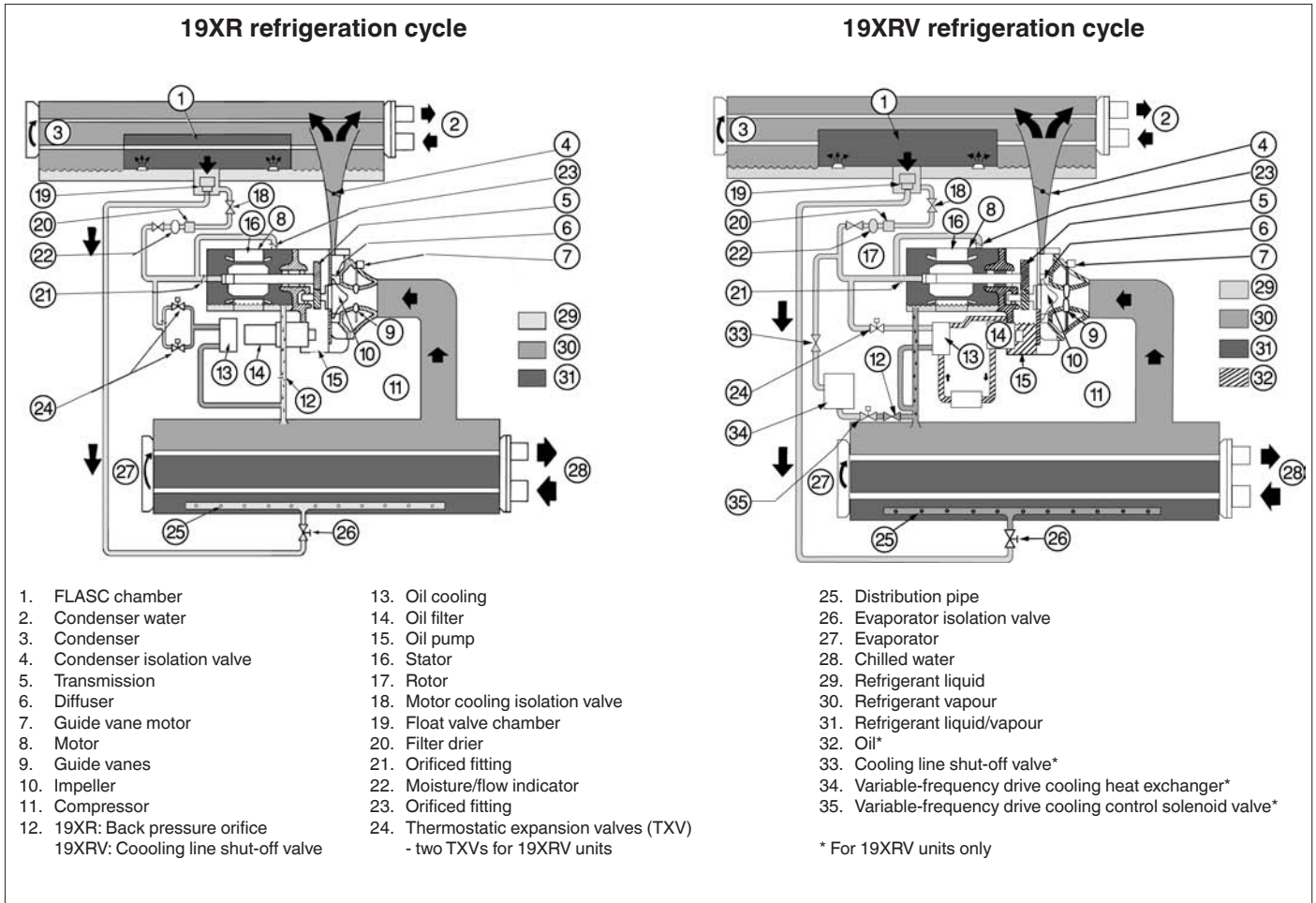
Passing over these orifices a part of the liquid refrigerant flashes to vapour. By coming into contact with the entering condenser water tubes (colder) this vapour is recondensed and the liquid refrigerant is collected in a chamber where a float valve forms a liquid seal to prevent the FLASC chamber vapour from entering the evaporator.

This device allows subcooling of the liquid refrigerant entering the evaporator, resulting in an enthalpy gain and improved unit energy efficiency.

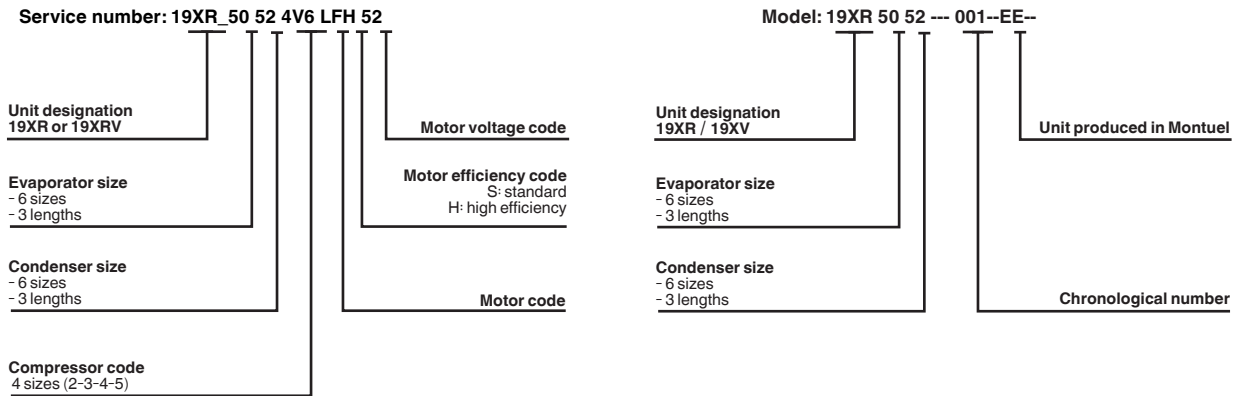
## Motor and oil cooling

The motor and the lubricating oil are cooled by liquid refrigerant taken from the bottom of the condenser vessel (at the level of the float chamber – see figure below). Flow of refrigerant is maintained by the pressure differential that exists due to compressor operation. The flow is split between motor cooling and oil cooling systems..

If the machine includes a factory-installed variable-frequency drive (19XRV), the motor and oil cooling system is the same as for the base machines. In this case the liquid refrigerant used for the motor and oil cooler also supplies a cooling heat exchanger in the variable-frequency drive cabinet.



# Model number nomenclature



## Options and accessories

Options	No.	Description	Advantages
IP54 protection for control box	20A	Control boxes with increased leak tightness	Increased protection of control boxes
Tropicalisation	22	Heating system controlled and inside the control box	Prevents condensation inside the control box
Unit equipped with soft starter	25	Electronic starter integrated with the control	More efficient compressor start-up control
Unit with star/delta starting	25A	Integrated star/delta starter connection	Adaptation to the customer power network
Unit with separate variable-frequency drive	25F	Unit with control box interface for wiring with separate variable-frequency drive + PICII control	More efficient, especially at part load
Hot gas bypass	29	Cooling line between the high-pressure discharge side and the evaporator, equipped with a motorised butterfly valve	Hot gas injection into the evaporator for optimised operation
Unit supplied in foursections	51A	Unit supplied in four sections (compressor/piping + control box + secondary components/evaporator/condenser	Adaptation to the customer installation requirements
Unit with aluminium protection jacket for evaporator and compressor	88A	Additional aluminium jacket on the evaporator shell and the water boxes, on the motor and the compressor suction elbow	Aesthetics/maintenance
External refrigerant level for the evaporator	97A	Additional external refrigerant level on the evaporator with shut-off valves	Reading of the evaporator refrigerant level
Evaporator with three passes	100A	Evaporator with three heat exchange passes.	Adaptation to customer installation requirements
Evaporator with one pass	100C	Evaporator with one heat exchange pass.	Adaptation to customer installation requirements
Condenser with three passes	102A	Condenser with three heat exchange passes.	Adaptation to customer installation requirements
Condenser with one pass	102C	Condenser with one heat exchange pass.	Adaptation to customer installation requirements
Evaporator with 21 bar water-side pressure	104	Evaporator with 21-bar NiH water box	Adaptation to customer installation requirements
Condenser with 21 bar water-side pressure	104A	Condenser with 21-bar NiH water box	Adaptation to customer installation requirements
Machine equipped with a transfer unit	110	Unit-mounted transfer unit	Ease-of-maintenance and service
CCN-JBus gateway	148	Two-way communication board according to JBus protocol	Connection facilitated by communication bus to a BMS system
Unit with heat exchangers in accordance with Swiss code	197	Unit with PED heat exchangers in accordance with special Swiss code	Adaptation to the certification requirements
Unit equipped with flanges and counter-flanges on evaporator and condenser	259	Additional flanges and counter-flanges on the heat exchanger water box inlets/outlets for customer system connections	Adaptation to the customer installation requirements
Unit supplied with anti-vibration platform	260	Anti-vibration platform for installation on each heat exchanger foot (accessory in part)	Mechanical isolation
Unit supplied with spring isolation kit	261	Spring isolation kit for each heat exchanger foot with level control screw (supplied as accessory)	Mechanical isolation
<b>Accessories</b>		<b>Description</b>	<b>Advantages</b>
CCN JBus gateway		See option 148	See option 148
Separate transfer unit		Separate refrigerant charge transfer unit	Ease-of-maintenance and service
800-litre storage tank only		800-litre refrigerant storage tank	Ease-of-maintenance and service
1500-litre storage tank only		1500-litre refrigerant storage tank	Ease-of-maintenance and service
800-litre storage tank with transfer unit		800-litre refrigerant storage tank with transfer unit and associated control box	Ease-of-maintenance and service
1500-litre storage tank with transfer unit		1500-litre refrigerant storage tank with transfer unit and associated control box	Ease-of-maintenance and service
Anti-vibration platform		See option 260	See option 260
Spring isolation kits		See option 261	See option 261

# Physical data, 19XR/19XRV units

## Unit operating weight

19XR size		3030	3232	3535	3737	4040	4242	4545	4747	5050	5252	5555	5757
<b>Operating weight*</b>													
With starter (option 25)	kg	7300	7700	7800	8300	9000	9500	9800	10400	11400	12000	12300	12900
Without starter**	kg	7300	7700	7800	8300	9000	9500	9800	10400	11190	11790	12090	12690
19XR size		6060	6262	6565	6767	7070	7272	7575	7777	8080	8282	8585	8787
<b>Operating weight*</b>													
With starter (option 25)	kg	12600	13400	13700	14200	20510	21610	21600	22900	23655	24805	24955	25955
Without starter**	kg	12390	13190	13490	13990	20300	21400	21390	22690	23500	24650	24800	25800

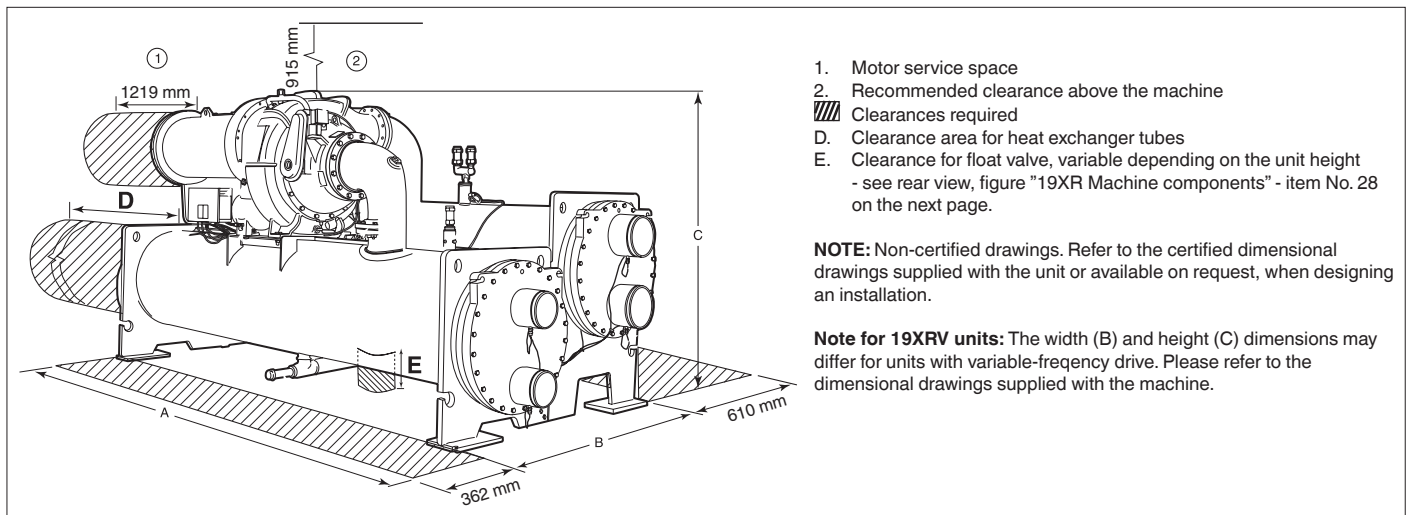
  

19XRV size**		3030	3232	3535	3737	4040	4242	4545	4747	5050	5252	5555	5757
<b>Operating weight*</b>													
kg		7850	8250	8350	8850	9550	10050	10350	10950	11930	12530	12830	13430
19XRV size**		6060	6262	6565	6767	7070	7272	7575	7777	8080	8282	8585	8787
<b>Operating weight*</b>													
kg		13100	13900	14200	14700	21520	22620	22610	23910	24625	25775	25925	26925

\* Weights given for information only. For more details please refer to the dimensional drawings.  
 \*\* Standard unit with control box interface.

\* Weights given for information only. For more details please refer to the dimensional drawings.  
 \*\* With variable-frequency drive.

## Dimensions/clearances, 19XR/XRV units



Dimensions (± 10 mm)

19XR heat exchanger size	A (length, with nozzle-in-head water-box)		B (Width except 19XRV)	C (height)***	D	E****
	2 pass*	1 or 3 pass**				
30 to 32	4230	4380	1670	2127	3747	250
35 to 37	4754	4904	1670	2127	4278	250
40 to 42	4230	4380	1880	2294	3747	250
45 to 47	4754	4904	1880	2294	4278	250
50 to 52	4230	4380	2054	2781	3754	250
55 to 57	4754	4904	2054	2780	4278	250
60 to 62	4230	4380	2124	2879	3754	250
65 to 67	4754	4904	2124	2878	4280	250
70 to 72	4919	5104	2530	3276	4278	460
75 to 77	5525	5710	2530	3276	4884	460
80 to 82	4919	5104	2530	3343	4278	460
85 to 87	5525	5710	2530	3343	4884	460

\* Assumes that both cooler and condenser nozzles are on the same end of the chiller.  
 \*\* One- or three-pass length applies if either (or both) cooler or condenser is a 1 or 3 pass design.  
 \*\*\* Sizes < 50-52: maximum height given for units with starter cabinet.  
 Sizes ≥ 50-52 and above: maximum height given for units with high-voltage terminal box.  
 For more details see dimensional drawings for each unit.  
 \*\*\*\* Clearance for float valve is variable, depending on the unit height - see chapter "19XR Machine components" - item No. 28.

### Nominal diameter - water inlet/outlet size (inches)

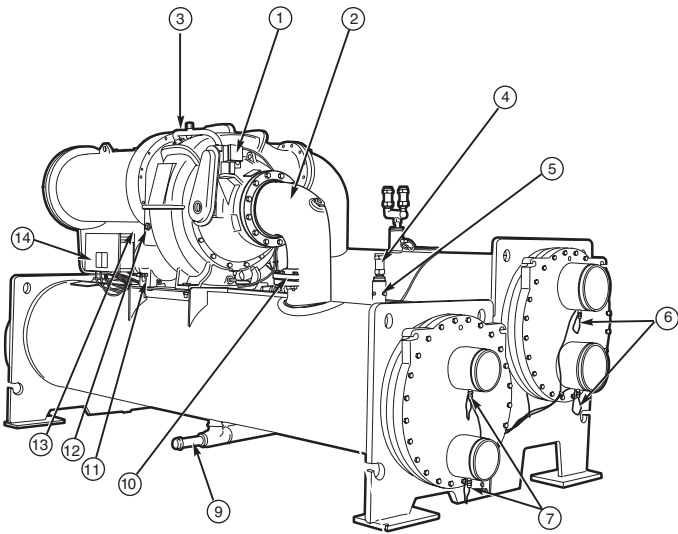
19XR heat exchanger size	Evaporator			Condenser		
	1 pass	2 pass	3 pass	1 pass	2 pass	3 pass
3	10	8	6	10	8	6
4	10	8	6	10	8	6
5	10	8	6	10	10	8
6	10	10	8	10	10	8
7	14	12	10	14	12	12
8	14	14	12	14	14	12

### NOTES

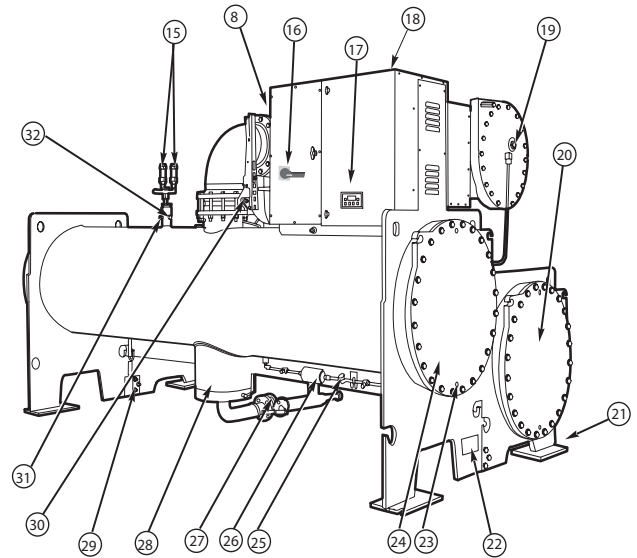
- Service clearance must comply with local regulations.
- Certified drawings available upon request.

## 19XR/XRV Machine components

Front view



Rear view



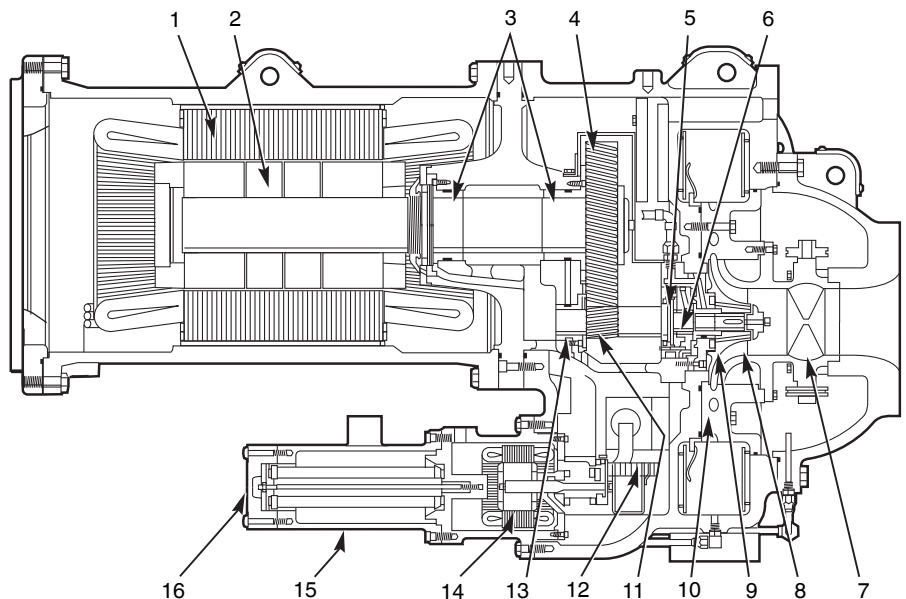
1. Guide vane actuator
2. Suction elbow
3. Compressor
4. Cooler valve\*
5. Cooler pressure transducer
6. Condenser in/out temperature thermistors
7. Cooler in/out temperature thermistors
8. Machine identification nameplate (situated on the starter cabinet side) - see right-hand figure 'Rear view'
9. Refrigerant charging valve
10. Typical flange connections
11. Oil drain valve
12. Oil level sight glass
13. Refrigerant oil cooler (hidden)
14. Branch circuit control box
15. Condenser relief valve\*
16. Circuit breaker/disconnect switch
17. ICVC

18. Unit-mounted starter (19XR) or variable-frequency drive (19XRV)
19. Motor sight glass
20. Cooler return-end waterbox cover
21. Cooler nameplate
22. Condenser nameplate
23. Waterbox drain port
24. Condenser return-end waterbox cover
25. Refrigerant moisture/flow indicator
26. Refrigerant filter/drier
27. Liquid line isolation valve (optional)
28. Linear float valve chamber
29. Vessel take-apart connector
30. Discharge isolation valve (optional)
31. Pumpout valve
32. Condenser pressure transducer

\* One relief valve is standard. The optional dual relief valves include change-over for each heat exchanger.

## Compressor cut-away view

1. Motor stator
2. Motor rotor
3. Motor shaft journal bearings
4. Low-speed bull gear
5. High-speed shaft thrust bearing
6. High-speed shaft journal bearing
7. Variable inlet guide vanes
8. Impeller shroud
9. Impeller
10. Pipe diffuser
11. High-speed pinion gear
12. Oil heater
13. High speed shaft journal bearing
14. Oil pump motor
15. Oil filter
16. Oil filter cover



# Electrical data, 19XR/XRV units

## Standard voltages for 50 Hz units

Nominal voltage, V	Operating range, V
400	380 to 415
690	656 to 716
3000	2900 to 3100
3300	3200 to 3400
6300	6000 to 6600
11000	10800 to 11200

### NOTES:

Motor nameplates can be stamped for any voltage within the listed supply/voltage range.  
Chillers shall not be selected at voltages above or below the listed supply voltage range.

The installer is responsible for the installation arrangement of the machine power supply. This must be defined using the data supplied on the specific machine selection sheet.

19XR/19XRV	Start-up current**	Maximum permanent operating current
Across-the-line start	Motor LRDA*	Motor OLTA*
Star/delta start (Y/Δ)	Motor LRYA*	Motor OLTA*
Electronic starter	3*Motor Rated Load Amps*	Motor OLTA*
Machine with variable-frequency drive (19XRV)	N/A	Chiller rated line current*

\* Value given on the specific machine selection sheet.  
\*\* The maximum start-up current duration is less than 10 s.

**NOTE:** The installation data must comply with any other short-circuit requirements supplied for the machine. In all cases, the machine power supply protection of the conductors against overloads is not guaranteed by the machine. It must be provided at the original conductor connection point in the installation.

### Electrical data notes and operating conditions

- 19XR units have one or two power connection points.
- The control box always includes the protection and control elements, as well as the power circuit for the oil pump and the heaters. As an option or as standard on the 19XRV machines, the electrical equipment also includes the start-up and protection elements for the compressor motor.

#### Field connections:

- All connections to the system and the electrical installations must be in full accordance with all applicable codes\*.
- The Carrier 19XR units are designed and built to ensure conformance with local codes. The recommendations of European standard EN 60204-1 (corresponds to IEC 60201-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

#### Notes:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204-1 is the best means of ensuring compliance with the Machines Directive and § 1.5.1.
  - Annex B of EN 60204 1 describes the electrical characteristics used for the operation of the machines.
- The operating environment for the 19XR/19XRV units is specified below:  
Environment\* Environment as classified in IEC 60364 § 3:  
- ambient temperature range: +5°C to +40°C, class AA4\*  
- humidity range (non-condensing)\*:  
50% relative humidity at 40°C  
90% relative humidity at 20°C

- altitude: ≤ 2000 m for 19XR machines (≤ 1000 m for 9XRV machines)
  - indoor installation
  - presence of water: class AD2\* (possibility of water droplets)
  - presence of hard solids, class AE2\* (no significant dust present)
  - presence of corrosive and polluting substances, class AF1 (negligible)
  - vibration and shock, class AG2, AH2
- Competence of personnel, class BA4\* (trained personnel - IEC 60364)
  - Power supply frequency variation: ± 2 Hz.
  - The neutral (N) conductor must not be connected directly to the unit (if necessary use a transformer).
  - Overcurrent protection of the power supply conductors is not provided with the unit.
  - The factory installed disconnect switch(es)/circuit breaker(s) is (are) disconnect devices of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
  - The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

**Note:** If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

\* The protection level required to conform to this class is IP21B (according to reference document IEC 60529). All 19XR/19XRV units are protected to IP23 and fulfil this protection condition. They are also protected against accidental and exceptional non-pressurised water jets.

## Operating limits

### Operating range, 19XR/XRV units

Evaporator	Minimum	Maximum
Evaporator entering water temperature*, °C	7	29
Evaporator leaving water temperature*, °C	3,3	12
Condenser (cooled by water)	Minimum	Maximum
Condenser entering water temperature*, °C	10	35
Condenser leaving water temperature*, °C	29	46

### NOTES:

- The selected unit operating range must always be verified at full and part load by the selection programme for the chosen configuration.
- The values from the selection programme apply.
- Applications at temperatures below zero at the evaporator are possible, depending on the temperatures at the condenser.
- Unit selections are obtained from the Carrier sales force.

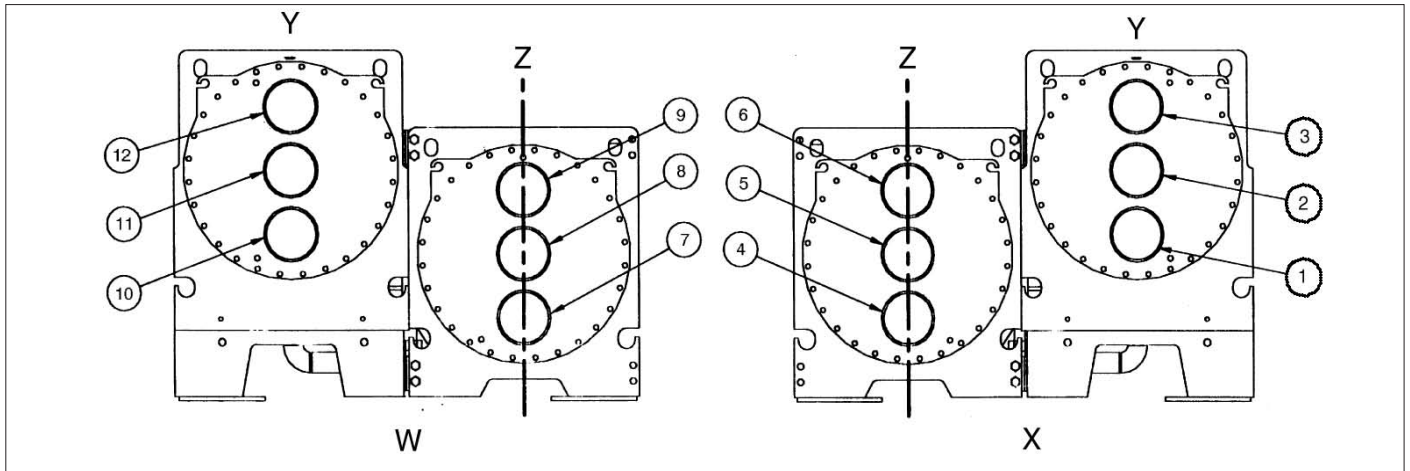
### Maximum ambient temperatures

The permitted minimum and maximum temperatures for storage and transport of 19XR/XRV units are -20°C and 48°C.



# Standard waterboxes and nozzle arrangements

## 19XR/19XRV frames 3 - 4 - 5- 6

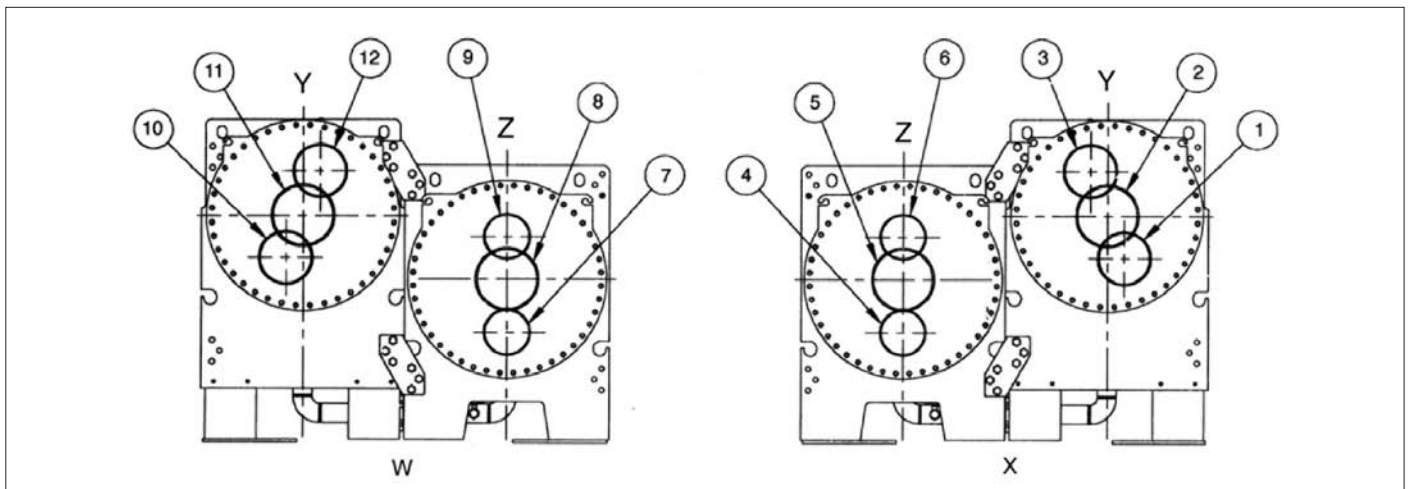


W Motor side  
 X Compressor side  
 Y Condenser  
 Z Evaporator

\* Code shown in certified drawings

**NOTE:** Non-certified drawings. Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

## 19XR/19XRV - frames 7 - 8



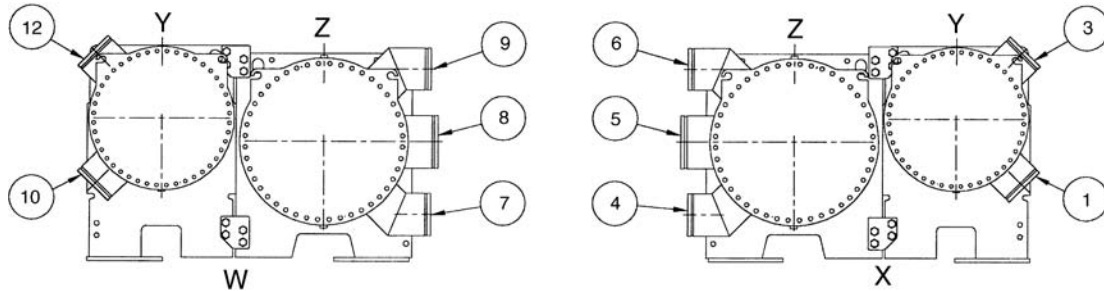
Nozzle arrangement codes for all standard 19XR/19XRV nozzle-in-head waterboxes

Pass	Evaporator waterbox			Condenser waterbox		
	Inlet	Outlet	Arrangement code*	Inlet	Outlet	Arrangement code*
1	8	5	A	11	2	P
	5	8	B	2	11	Q
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	10	3	T
	4	9	F	1	12	U

\* Code shown in certified drawings

# Marine waterboxes and nozzle arrangements - 19XR/19XRV

## Frame 3



### Nozzle arrangement codes for all 19XR/19XRV marine waterboxes

Pass	Evaporator waterbox			Condenser waterbox		
	Inlet	Outlet	Arrangement code*	Inlet	Outlet	Arrangement code*
1	8	5	A	-	-	-
	5	8	B	-	-	-
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	-	-	-
	4	9	F	-	-	-

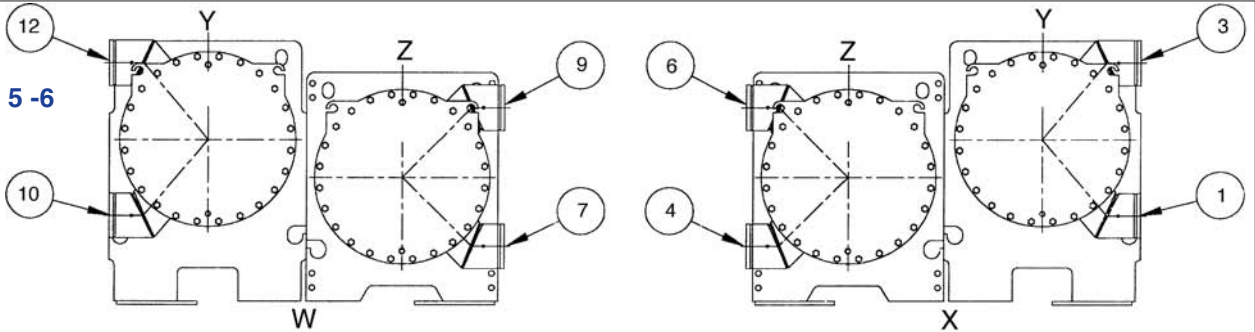
W Motor side  
X Compressor side  
Y Condenser  
Z Evaporator

\* Code shown in certified drawings

#### NOTE:

Non-certified drawings. Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

## Frames 4 - 5 - 6



### Nozzle arrangement codes for all 19XR/19XRV marine waterboxes

Pass	Evaporator waterbox			Condenser waterbox		
	Inlet	Outlet	Arrangement code*	Inlet	Outlet	Arrangement code*
1	9	6	A	-	-	-
	6	9	B	-	-	-
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	-	-	-
	4	9	F	-	-	-

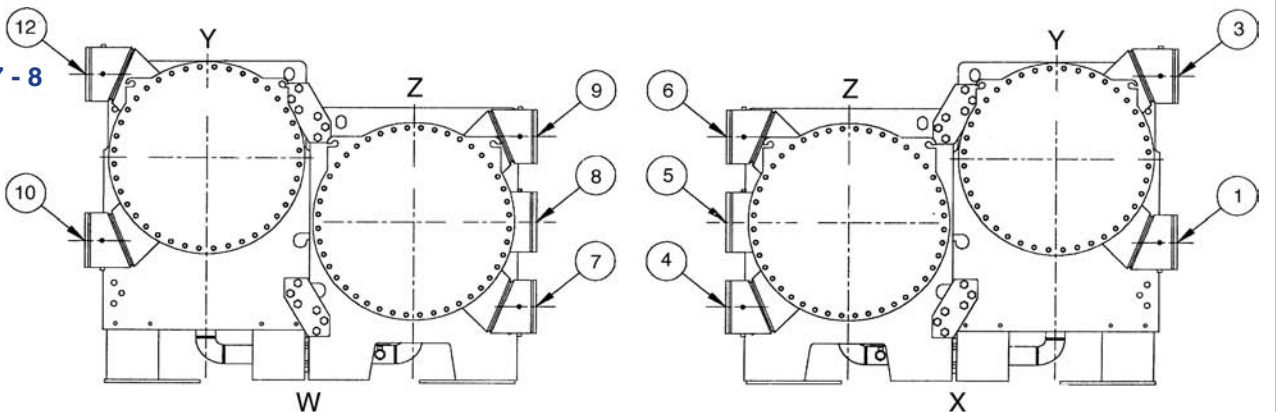
W Motor side  
X Compressor side  
Y Condenser  
Z Evaporator

\* Code shown in certified drawings

#### NOTE:

Non-certified drawings. Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

## Frames 7 - 8



### Nozzle arrangement codes for all 19XR/19XRV marine waterboxes

Pass	Evaporator waterbox			Condenser waterbox		
	Inlet	Outlet	Arrangement code*	Inlet	Outlet	Arrangement code*
1	8	5	A	-	-	-
	5	8	B	-	-	-
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	-	-	-
	4	9	F	-	-	-

W Motor side  
X Compressor side  
Y Condenser  
Z Evaporator

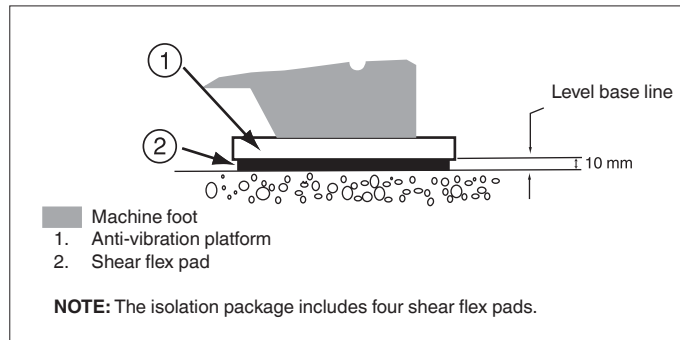
\* Code shown in certified drawings

#### NOTE:

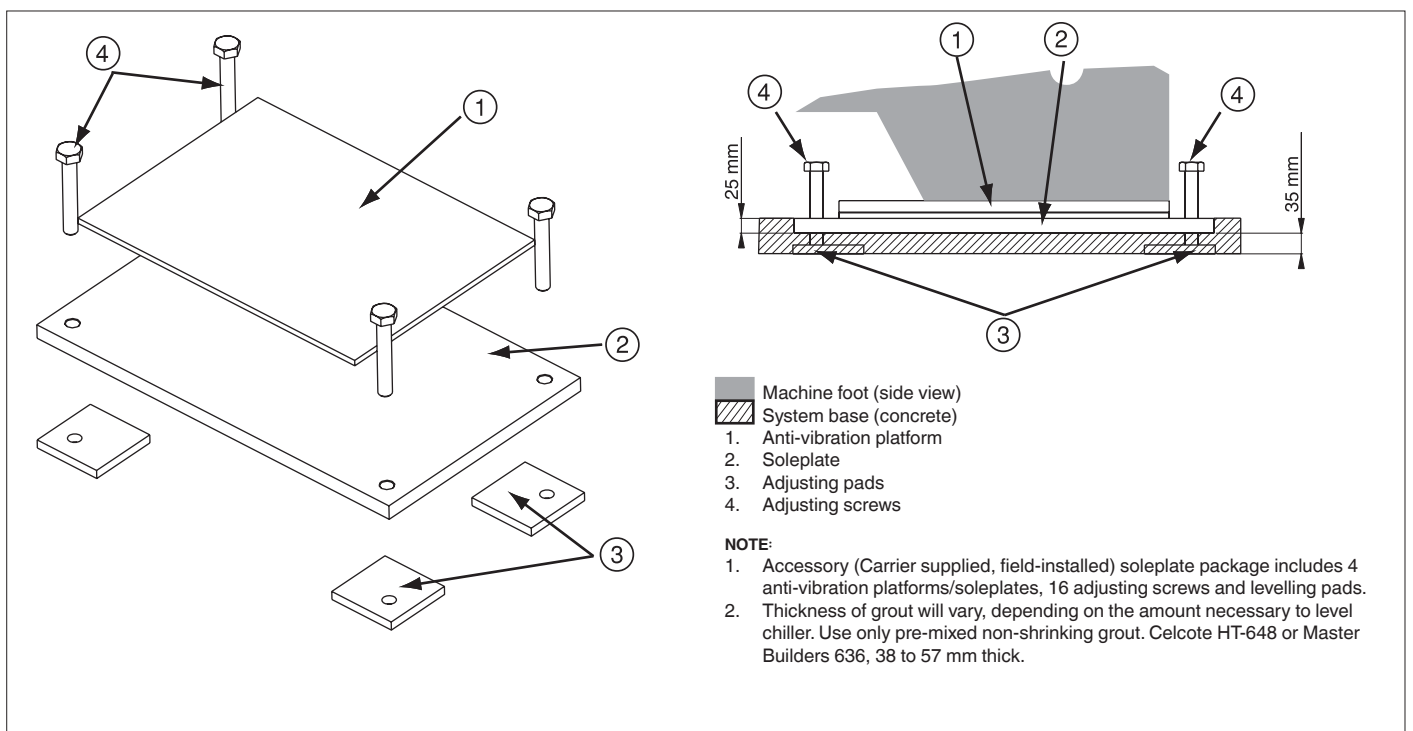
Non-certified drawings. Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation.

# Application data, anti-vibration platform

## Standard isolation



## Levelling support pate for 19XR/XRV units (option)

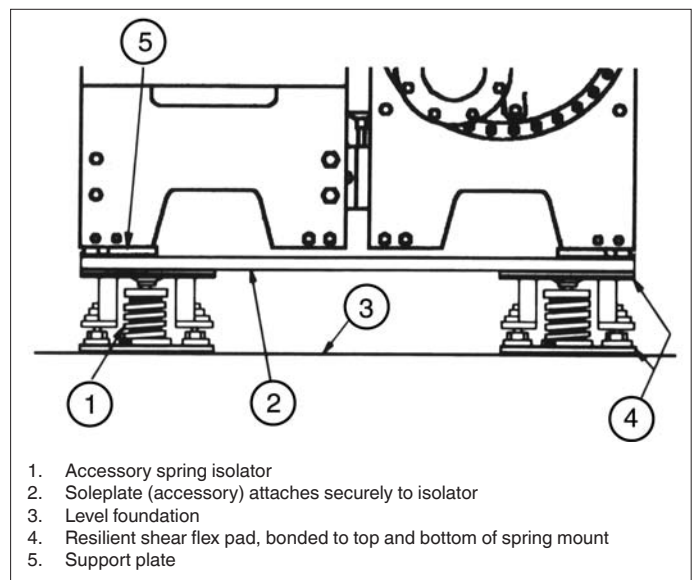


## Install spring isolation

Spring isolation may be purchased as an accessory from Carrier for field installation. It may also be field supplied and installed.

Spring isolators may be placed directly under machine support plates or located under machine soleplates.

## 19XR Spring isolation



# Guide specification

Water-cooled packaged liquid chiller for indoor installation, equipped with numerical control, and operating with chlorine-free refrigerant HFC-134a.

## ■ Regulations

The unit characteristics must be published in accordance with ARI standards.

The machines with CE marking must comply with the following European directives:

- Pressurised equipment directive (PED) 97/23/EC
- Machinery directive 2004/108/EEC, modified
- Low voltage directive 2006/90/EC, modified
- Electromagnetic compatibility directive 2004/108/EEC, modified
- Machine safety: electrical equipment in machines, general regulations, EN 60204-1
- Electromagnetic immunity, industrial levels: EN61000-6-4 for 19XR machines, and EN61800-3, second installation environment for 19XR machines.
- Electromagnetic emission, industrial levels: EN61000-6-2 for 19XR machines and 61800-3 for 19XR machines.

## ■ Quality assurance

- The unit shall be designed, manufactured and tested at a facility with a quality assurance system certified ISO 9001.
- The unit shall be manufactured at a facility with an environment management system certified ISO 14001.
- The unit must satisfy the quality control tests in the factory (pressure and electrical tests).

## Compressor

- One high-performance, single-stage centrifugal hermetic compressor. Connections to the compressor casing use O-rings instead of gaskets to reduce the occurrence of refrigerant leakage.
- The open type impeller with machined shroud contours and impeller diameter optimise compressor efficiency for each specified application.

## Evaporator and condenser

- Tubing is copper, high-efficiency type, with integral internal and external enhancement. Tubes are nominal 3/4-in. OD with nominal wall thickness of 0.635 mm measured at the root of the fin. Tubes are rolled into tube sheets and are individually replaceable. Tube sheet holes are double grooved for joint structural integrity. Intermediate support sheet spacing does not exceed 914 mm.
- Waterboxes and nozzle connections are designed for 1034 kPa maximum working pressure unless otherwise noted. Nozzles have grooves to allow use of Victaulic couplings.
- The tube sheets of the cooler and condenser are bolted together to allow for field disassembly and reassembly.
- Waterboxes have vents, drains, and covers to permit tube cleaning within the space shown on the drawings. A thermistor type temperature sensor is factory installed in each water nozzle.
- The heat exchangers display a European code nameplate which shows the pressure-temperature data. A pressure relief valve is installed on each heat exchanger. A pressure relief valve device is installed on each heat exchanger which permits verification of the set point without transfer of the charge.
- Cooler is designed to prevent liquid refrigerant from entering the compressor.

- Tubes are individually replaceable from either end of the heat exchanger without affecting the strength and durability of the tube sheet and without causing leakage in adjacent tubes.
- The condenser shell includes a FLASC (flash subcooler) which cools the condensed liquid refrigerant to a reduced temperature, thereby increasing the refrigeration cycle efficiency.

## Power and control wiring box

Galvanized sheet steel, polyester paint finish, colour light grey, with hinged access doors, containing:

- The variable-frequency drive/starter with the unit disconnect device and the short-circuit protections (standard for 19XR machines and optional for 19XR machines)
- The heater and oil pump control and power supply equipment.
- The automated electronic control devices including the ICVC interface and the electronic input/output boards.

## Control functions

### ■ Set point functions

The control provides the capability to view and change the leaving chilled water set point, entering chilled water set point, and demand limit set point at any time during chiller operating or shutdown periods. The controls allow for the specification of capacity control by either leaving chilled water or entering chilled water.

### ■ Service function

The control provides a password protected service function which allows authorized individuals to:

- View an alarm history file which contains the last 25 alarm/alert messages with time and date stamp. These messages are displayed in text form, not codes.
- Execute a chiller controls test function for quick identification of malfunctioning components
- View/modify chiller configuration
- View/modify chiller occupancy periods
- View/modify schedule holiday periods
- View/modify schedule override periods
- View/modify system time and date

### ■ Lead/lag function

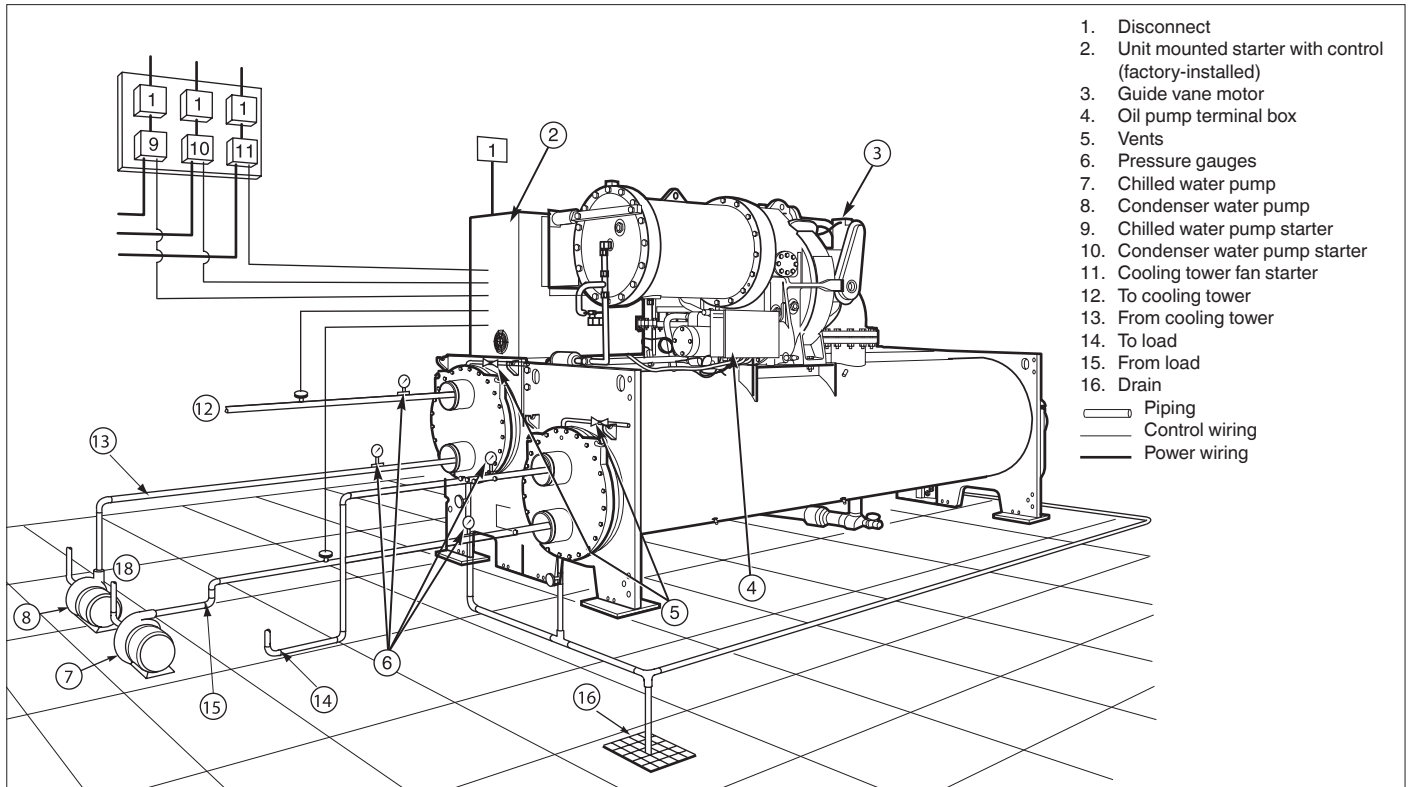
Lead/lag function automatically controls two chillers, including the reversing sequence. A third chiller can be added to the lead lag system as a standby chiller.

### ■ Communication

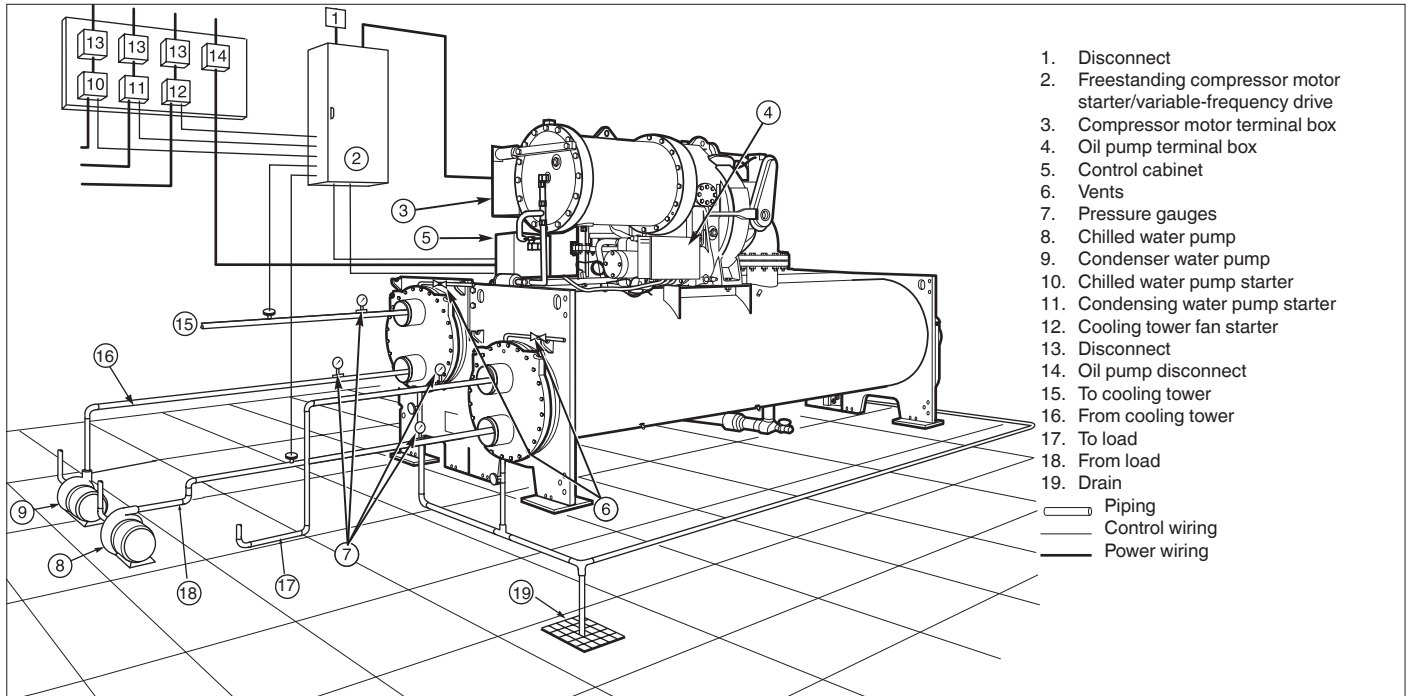
Interface with other CCN devices is available as standard. A CCN/JBus (Carrier Comfort Network) interface facilitates communication with other BMS systems.

# Typical piping and wiring for 19XR/19XRV units

## Unit with unit-mounted starter/variable-frequency drive



## Unit with separate starter/variable-frequency drive



### IMPORTANT:

Ensure correct phasing is followed for proper motor rotation (clockwise). Do not isolate the terminals until the wiring has been verified and approved by the Carrier personnel in charge of the commissioning.

**NOTE:** The oil pump disconnect switch can be placed near element 2, (separate starter cabinet).

### NOTES.

1. Wiring and piping shown are for general point-of-connection only and are not intended to show details for a specific installation. Certified field wiring and dimensional diagrams are available on request.
2. All wiring must comply with applicable codes.
3. Refer to Carrier System Design Manual for details regarding piping techniques.
4. Wiring not shown for optional devices such as:
  - remote start-stop
  - remote alarm
  - optional safety device
  - 4 to 20 mA resets
  - optional remote sensors



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