Carrier

AQUAEDGE™

19XR
Centrifugal Liquid Chiller

Built in India. Backed by Legacy.

*Cooling Capacity: 300~1,650 RT (Single-Stage)
600~3,400 RT (Two-Stage)
1,000~6,800 RT (Series Counter Flow System)

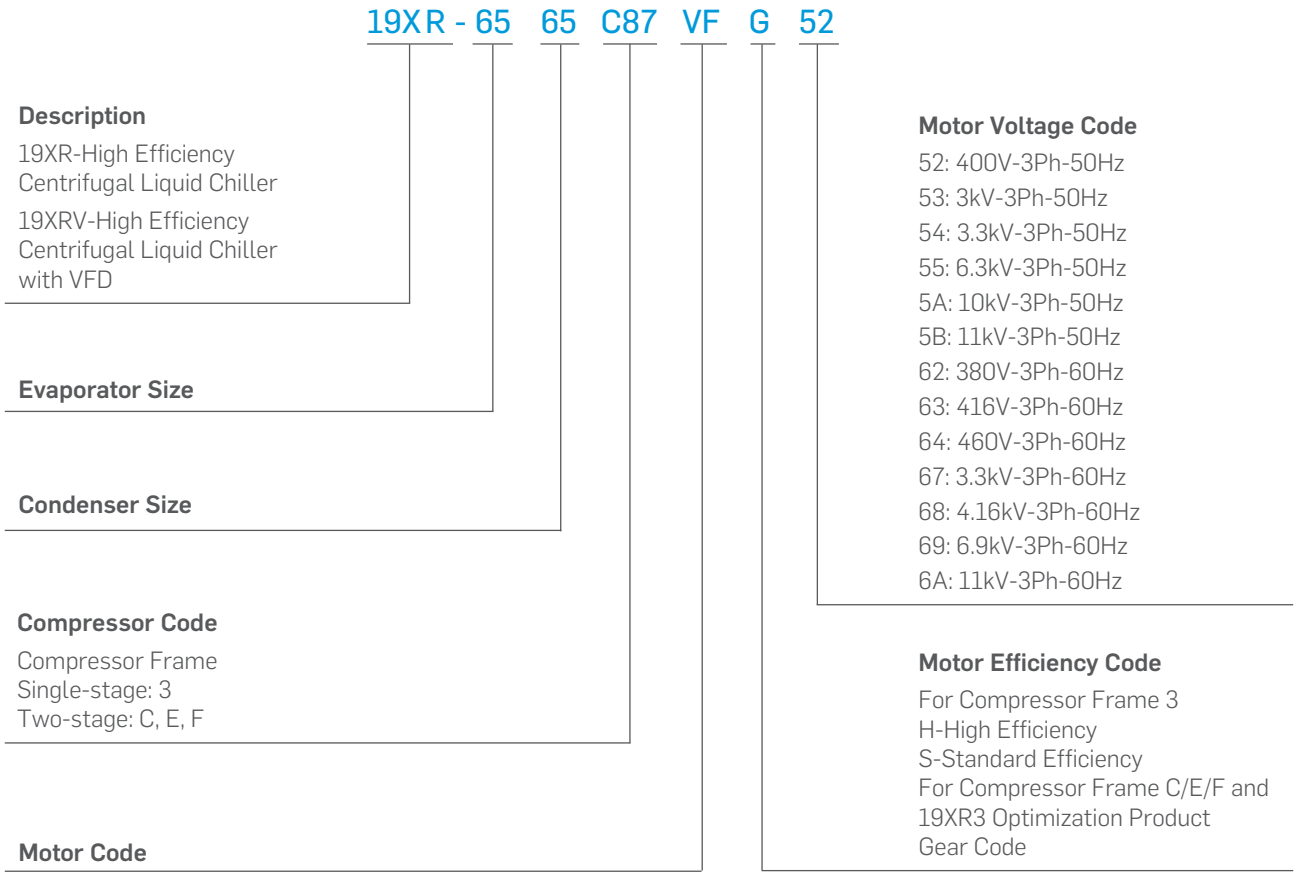
Select models/configurations are manufactured in India. Please consult your Carrier representative for availability.

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

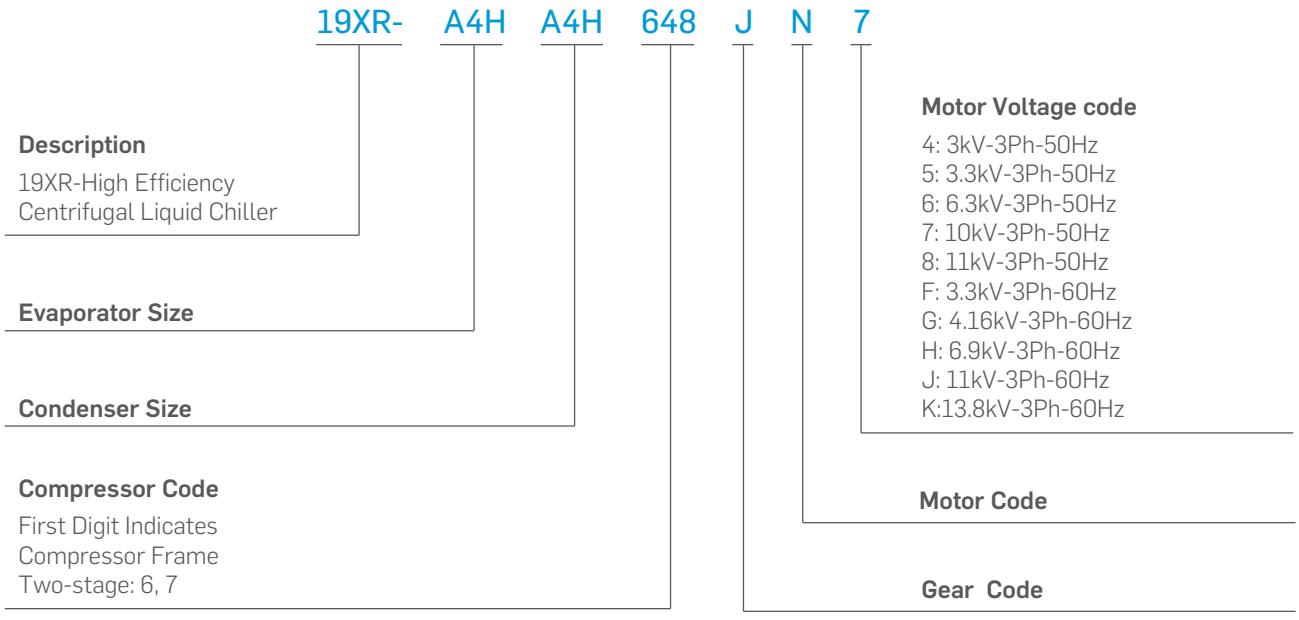
Carrier is a leading global provider of innovative HVAC, refrigeration, fire, security and building automation technologies. Supported by the iconic Carrier name, the company's portfolio includes industry-leading brands such as Carrier, Kidde, Edwards, LenelS2 and Automated Logic. Carrier's businesses enable modern life, delivering efficiency, safety, security, comfort, productivity and sustainability across a wide range of residential, commercial and industrial applications.

Model Number Nomenclature

19XR/XR-C/E/F



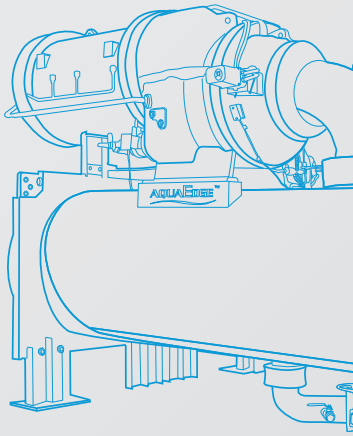
19XR-6/7



Energy-saving and High Efficiency

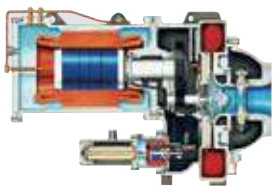
- Taper pipe diffuser is applied in single stage compressor to improve compressor efficiency.
- Vaneless diffuser designed for two-stage compressor, combined with inner-stage economizer improves chiller performance and makes it a better choice of high lift application.
- High performance tubing - Tubing with internally and externally enhanced fins improves chiller performance by reducing overall resistance to heat transfer. The new heat exchanger reduces refrigerant charge and manufacturing cost.
- Carrier AccuMeter system regulates refrigerant flow according to load conditions, provides a liquid seal at all operating conditions and eliminates unintentional hot gas bypass. Thus ensure the part load performance of chiller.





Stable Operation

- Variable inlet guide vanes - The guide vanes are controlled by a precise electronic actuator. The vanes regulate inlet flow to provide high efficiency through a wide operating range.
- Diffuser design - Pipe diffuser design uses jet engine technology, increasing centrifugal compressor peak efficiency (single-stage only). Two-stage compressor utilizes vaneless diffuser to meet high lift application requirement with stable operation.
- Semi-hermetic Motors - Cooling is accomplished by spraying liquid refrigerant on the motor windings. This highly efficient motor cooling method also eliminates the potential for shaft seal leaks and refrigerant/oil loss.



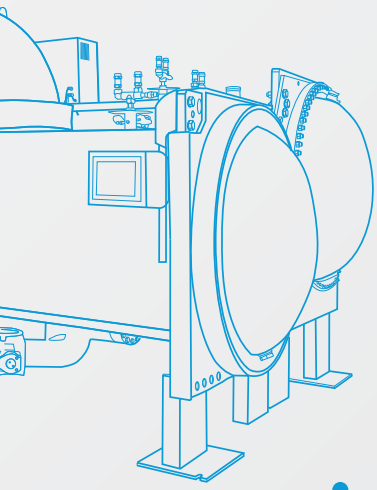

Environmental Sustainability

Designed for chlorine-free R-134a refrigerant, A1 class in ASHRAE 34 safety standard and R-513A or R-515B refrigerant with low global warming potential can be offered as option.

Flexible Combination

- 19XR/XR(V) AquaEdge chiller provides a complete line of compressors, motors and heat exchangers, ensuring good combination of chiller components regardless of tonnage, lift, and efficiency specifications.
- Carrier offers multiple starters choices for different power supply application.
- 19XR(V) AquaEdge chiller can be equipped with high tier LF2 VFD which with Active Rectifier, the harmonic distortion (THD) ≤ 5%, fully comply IEEE519-1992 requirement, also the fundamental power factor can be up to 0.99. With the help of VFD, the IPLV.IP of 19XR(V) can achieve to 11.0.
- Colorful Touch Screen - friendly human machine interface, graphical display screens for the main components and support multi languages.

Unit-mounted VFD starter



Convenient Installation

- Water boxes are equipped with standard flanges, which provides the ease of field piping.
- Positive pressure design can save valuable mechanical room space with reducing 35% chiller size compared with low pressure design. In addition, it eliminates the need for purge system to save the cost for customer.
- Refrigerant-cooled oil cooler, no need for field water piping, reduce installation cost.
- Cooler and condenser are designed and manufactured in accordance with relevant GB code.
- The unit isolation valves facilitate the condenser as a liquid container during the transition season, which provides ease of maintenance.

Carrier® SmartVu™ Intelligent Control System

User-friendly Interface

Carrier centrifugal chiller equips the latest Carrier® SmartVu™ control system with strong control and detecting function during chiller operation. The control system applies a 10 inch colorful touch screen, which can support up to ten language choices for customer, real time display of operation parameters with pictures makes it more human friendly and comfortable interface for operation. Carrier® SmartVu™ intelligent control system simulates and detects chiller operation, adjusts cooling or heating capacity according to load change and provides various protection during operation.

Smart Operation

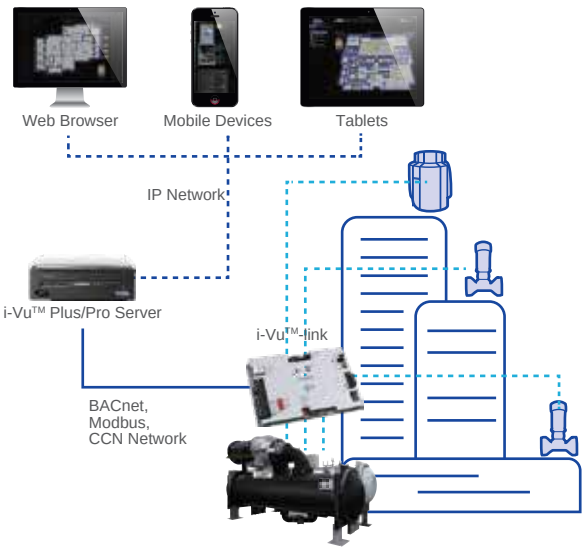
- Carrier® SmartVu™ control system provides smart password function to avoid any setting change without authorization.
- When chiller receives start-up order, controller will conduct following pre-start safety checking, to ensure parameters like oil sump temperature, condensing pressure, bearing temperature, motor winding temperature, discharge temperature, evaporator saturated temperature and average line voltage etc. are normal.
- During chiller operation, except for the function of detecting main operation parameters 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.
- Carrier® SmartVu™ control system has comprehensive protection during operation, such as oil sump temperature control, 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 an advanced solution to balance the chiller efficiency and reliability at very low load. The controller optimizes compressor speed, inlet guide vane position and stabilizer valve position to find the most efficient operating point throughout the operating range without compromising the chiller stability in real time.

Intelligent Diagnosis

- Carrier® SmartVu™ 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 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 lubricant and filter from this function.
- Carrier® SmartVu™ control system has email alarm function. If the controller has been connected to internet, 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 occurs.

Flexible Interface and Easy Connection with Building Automation System

- Carrier® SmartVu™ control panel supports BACnet or Modbus protocol, with which chiller can seamlessly connect with the Building Automation System or the i-Vu™/WebCTRL™ control network.
- With the powerful i-Vu™ Link (optional), user can integrate all plant equipment into i-Vu™ Building Automation System. The i-Vu™ Building Automation System provides everything user needs to access, manage, and control your building, including the powerful i-Vu™ user interface, plug-and-play BACnet or Modbus controllers and state-of-the-art Carrier equipment.
- Carrier provides WebCTRL™ as an additional option to provide similar function like i-Vu™ Link. If you have any questions, please contact with Carrier local agents.



The i-Vu™ Building Automation System

Smart Chiller

Using wireless cellular communications technologies, Carrier SMART Service continuously streams operating data to the cloud in real time directly from your chiller's controller. The data is then captured within our IoT platform for ongoing insight into your chiller's health.

Features:

- Integrated equipment sensors that capture key operating data
- Secure wireless connectivity to Carrier's cloud-based IoT platform
- Persistent and reliable data transmission

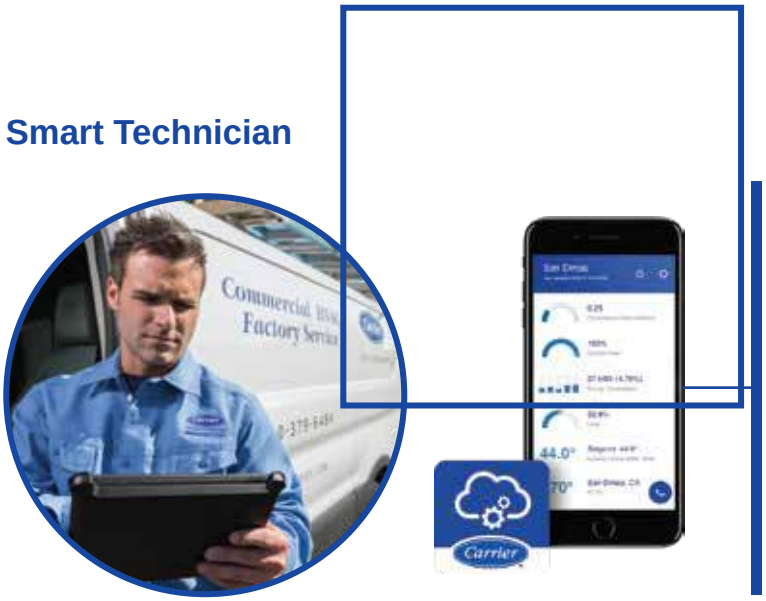
Smart Cloud

Carrier SMART Service continuously stores and assesses equipment operating data and service history, comparing it to established values for analytics and data validation. It compares this data to design specifications and matches it against allowable ranges, allowing Carrier to deliver pre-emptive service solutions as needed.

Features:

- Complete visibility into your system's performance, energy usage and service history
- Advanced diagnostics and analytics providing actionable insights

Smart Technician



Carrier SMART Service changes how equipment is serviced and maintained. Carrier service technicians now utilize mobile devices with access to put real-time chiller data and service history in the palm of their hands. With advance notification of problems, technicians arrive at the jobsite more informed, which leads to faster problem resolution and reduced mean time to repair.

Features:

- Advance notification
- Remote detection and diagnosis

19XR Two-stage Centrifugal Chiller

In 2013, Carrier introduced a high-efficiency two-stage centrifugal chiller to deliver energy saving and environmental sustainability, as well as comprehensive range of air-conditioning, heat pump, energy recovery, ice thermal storage, VFD and high-voltage applications.

Environmental Sustainability

Designed for chlorine-free R-134a refrigerant, A1 class in ASHRAE 34 safety standard and R-513A or R-515B refrigerant with low global warming potential can be offered as option.

Industry-leading Efficiency

19XR chillers can achieve up to 6.6 full load COP_R and 7.5 IPLV.IP (without VFD) or 11.0 IPLV.IP (with VFD) at AHRI conditions.

- Advanced high efficiency two-stage compressor.
- New blunt leading-edge IGV for part load efficiency improvement.
  An interstage economizer improves system efficiency and increases capacity.

Wide Application

The innovative two-stage compressor provides a wide range of capabilities. With a maximum LWT of 65℃ and a minimum LCWT of -6℃, the 19XR two-stage centrifugal chiller is ideal wherever energy conservation and environmental stewardship are required.

Stable Operation

The two-stage compressor has very good load-adjustment capabilities to achieve high efficiency and stability at a variety of load and temperature conditions, including its minimum load of 10%.
The 19XR two-stage centrifugal chiller also features a refrigerant cooled semi-hermetic low current inrush motor, eliminating the need for shaft seal and oil refrigerant containment components.
Double-grooved tube sheets make a superior leak-tight joint when combined with roller expansion.

Low Sound Level

For ultra-quiet operation, the advanced two-stage compressor has an optimized aero-structural design and allows lower impeller speed.

Modular Construction

The cooler, condenser and compressor assemblies are compact and entirely bolted together. This design makes the chiller ideally suited for replacement projects where ease of disassembly and reassembly at the jobsite is essential.

Series Counter Flow Application

Carrier 19XR centrifugal chillers fully support system application of Series Counter Flow with cooling capacity of each system up to 6800 Tons.

Better System Efficiency

Improved full load efficiency by reducing the lift of each circuit cycle.

- Optimized part load operation to achieve better system efficiency at duties less than 50%.

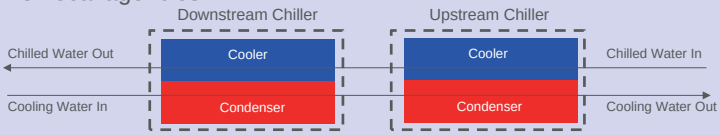
Better Reliability and Redundancy

- Two independent refrigeration circuits and either compressor can be configured as lead.
- Two compressors start-up orderly to reduce system inrush current.
- Two compressors operate in turn to balance operation time and enlarge service interval.

Advanced System Control (Standard in Carrier® SmartVu™)

- Optimized load balance by recalculating upstream chiller control point.
- Optimized surge control by synchronizing surge condition of both lead and lag chiller.
- Optimized lead/lag communications.

Two chiller modules of SCF system may be arranged in side-by-side or series depending on chiller plant layout. Details please contact Carrier local agencies.

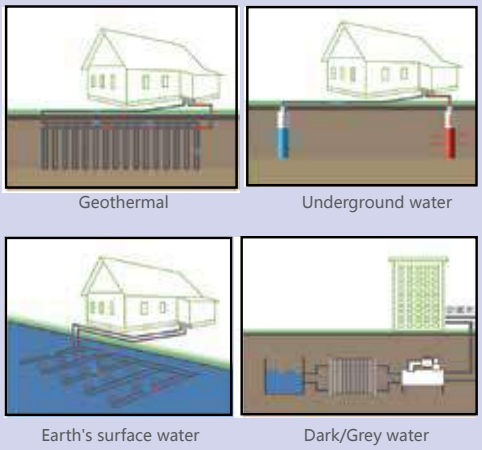


Heat Pump Application

The heat pump system utilizes natural energy storage in soil, bedrock, groundwater, surface water, wastewater and air to satisfy demand for building cooling, heating and hot water.

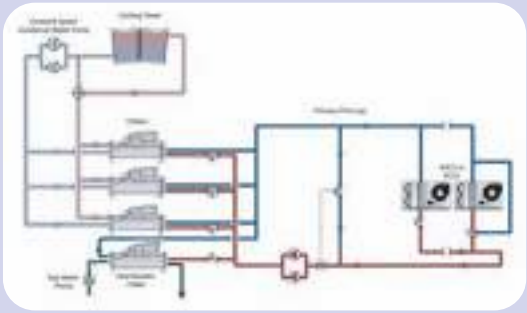
Heat Pump System Benefits
- Cooling/heating
- Improved system efficiency
- Use of low-grade energy

19XR-E/6/7 Benefits
- Wide range of applications with high efficiency
- Hot water temperature (LWT) up to 65℃



Energy Recovery Application

Discharging condenser heat via a cooling tower not only causes thermal pollution but also brings tremendous energy waste to the applications such as hotel, factory and hospital.



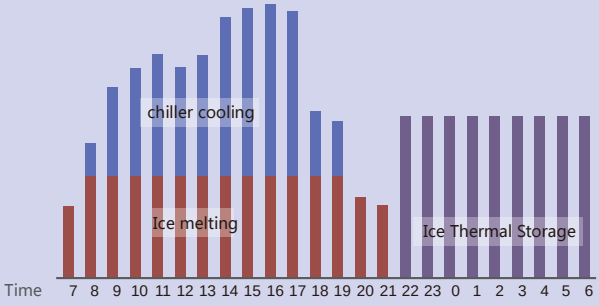
Energy Recovery System Benefits
- Reduced boiler size and operating time
- Reduced cooling tower size and waste heat discharge
- Improved system efficiency by 15-25%

19XR Benefits
- High efficiency operation
  Energy saving up to 70% versus boiler

Ice Thermal Storage Application

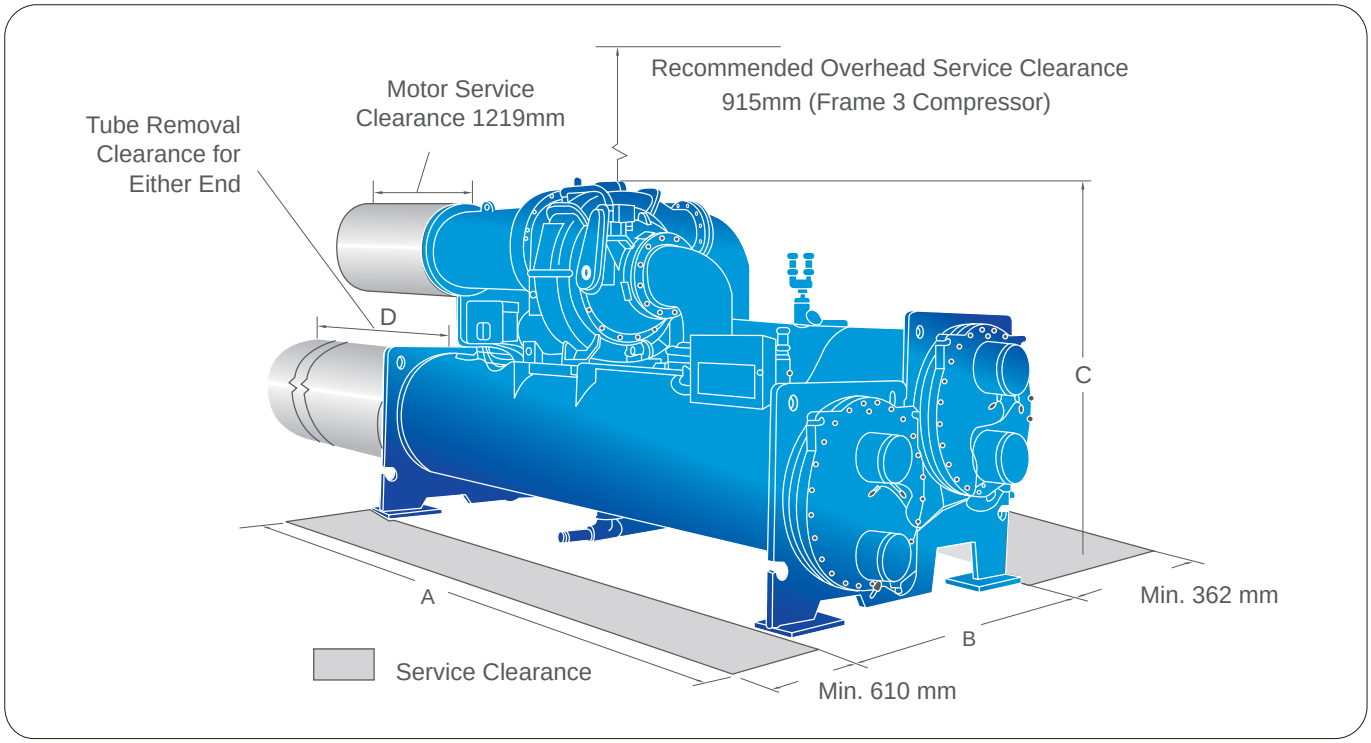
The chiller stores energy as ice during night, when electricity costs and utilization are low. The energy is discharged to meet cooling loads during day time when the electricity price is high, greatly reducing building operating costs.

Ice Thermal Storage System Benefits
- Reduced chiller and cooling tower size
- Reduced chiller operating time
- Operational cost savings by using off-peak electricity
- Backup cooling in emergency situations



19XR-E/6/7 Benefits
- Stable 24-hour operation
- Suitable for variable voltage and VFD applications
- Minimum leaving water temp (LCWT): -6℃
- Suitable for low temperature air distribution and district cooling systems

19XR Chiller Dimensions



Evaporator Size	Condenser Size	A-Length for NIH Waterbox (2 Passes)	B-Width	C-Height		D-Tube Removal Space for Either End
				without Unit-mounted Starter	with Unit-mounted Y-Δ/Solid State Starter 19XR-3	
		mm	mm	mm	mm	mm
3P~34	30~34	4181	1670	2051	2051	3848
3X~39	35~39	4702	1670	2051	2051	4369
4P~44	40~44	4359	1880	2130	2403	3848
4X~49	45~49	4880	1880	2130	2403	4369
5P~54	50~54	4394	1994	2137	2829	3848
5X~59	55~59	4915	1994	2137	2829	4369

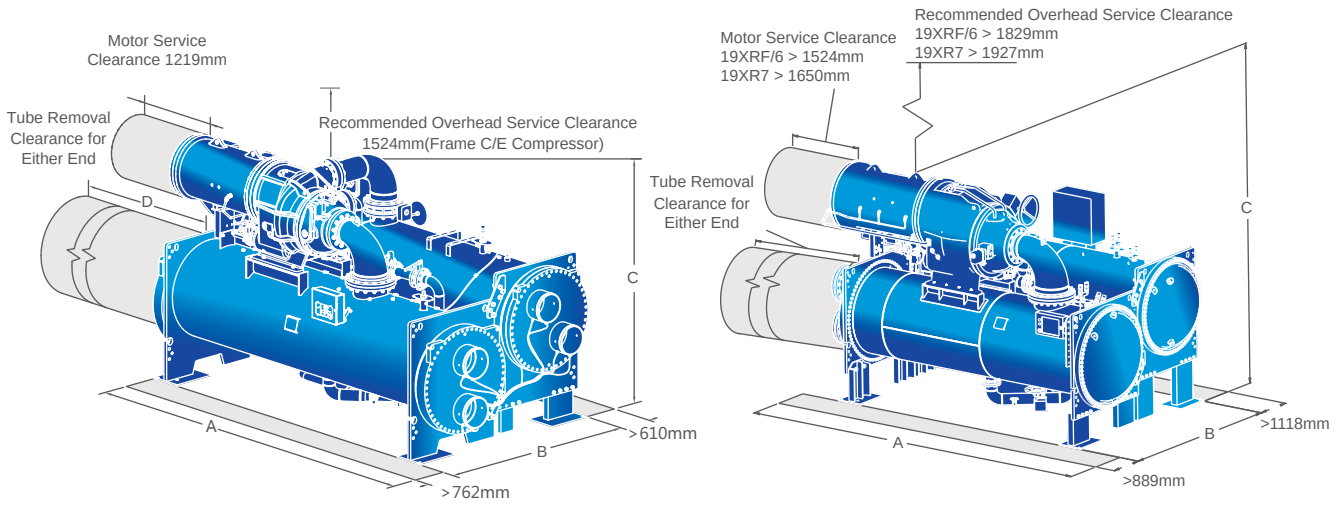
Notes: 1. A-length includes flanges with both cooler and condenser having two passes and nozzles being at the same end (drive end for standard units)
2. The above dimensions are based on the waterside pressure being 1.0Mpa. A-length will vary while the waterside pressure increases.

19XR/XR-C/E/F/6/7 Starter Dimensions (Free standing)

Voltage	Starter Type	Frame/Rated Current (A)	Width (mm)	Deepth (mm)	Height (mm)
400V	Y-Δ	19XR-3/C≤710A	800	600	2300
		19XR-3/C>710A	1000	600	2300
		19XR-E	1200	800	2200
10kV	Across the Line	19XR-C/E/F/6/7	1000	1650	2400
	Primary Reactor	19XR-C/E/F/6/7	2000	1650	2400
	Auto-transformer	19XR-C/E/F/6/7	2400	1650	2400

Notes: The wiring of 400V starter enters from the top and exits from the bottom.
The wiring of 10/11kV starter enters from the top and exits from the top.

19XR-C/E/F/6/7 Chiller Dimensions



19XR-C Unit Dimensions

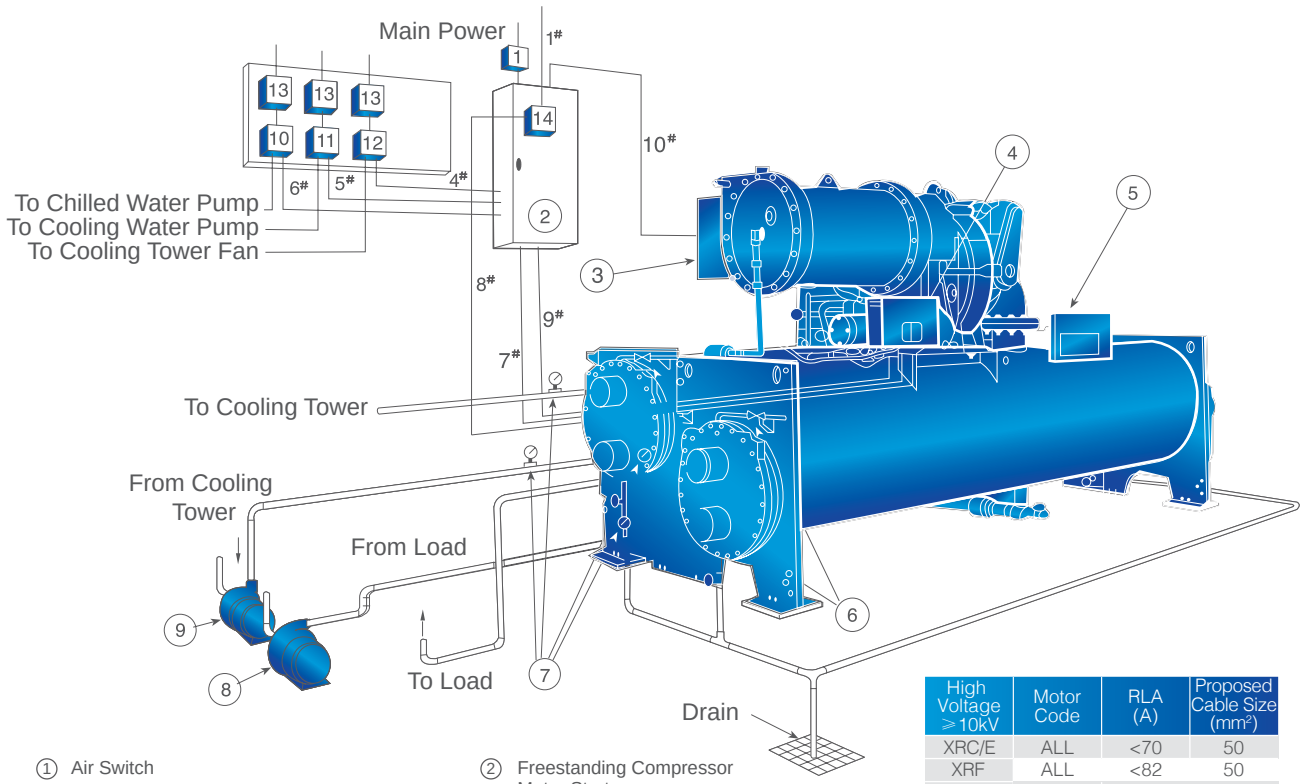
Evaporator Size	Condenser Size	A-Length for NIH Waterbox (2 Passes)	B-Width	C-Height		D-Tube Removal Space for Either End
				without Unit-mounted Starter	with Unit-mounted Y-Δ/Solid State Starter	
		mm	mm	mm	mm	mm
5P~54	50~54	4393	2098	2421	2850	3747
5X~59	55~59	4921	2078	2421	2850	4343
6P~64	60~64	4419	2163	2637	3071	3747
6X~69	65~69	4940	2148	2637	3071	4343
7P~74	70~74	5051	2472	2743	3155	4267
7X~79	75~79	5660	2472	2743	3155	4877

19XR-E/F/6/7 Unit Dimensions

Cooler Size	Condenser Size	A-Length for NIH Waterbox (2 Passes)	B-Width	C-Height		D-Tube Removal Space for Either End
				Without Unit-mounted Starter	With Unit-mounted Y-Δ/Solid State Starter 19XR-E	
		mm	mm	mm	mm	mm
7P~74	70~74	5045	2426	2889	3266	4369
7X~79	75~79	5642	2426	2889	3266	4978
8P~84	80~84	5121	2711	2937	3381	4369
8X~89	85~89	5731	2711	2937	3381	4978
8P~84	V0~V4	5195	2926	3082		4267
8X~89	V5~V9	5805	2926	3082		4877
A4A~A47	A4A~A47	5229	3051	3484		4572
A6A~A67	A6A~A67	5839	3051	3484		5182
A4A~A47	B4A~B47	5229	3186	3484		4572
A6A~A67	B6A~B67	5839	3186	3484		5182
B6A~B67	C6A~C67	5969	3658	3742		5182
C6A~C67	C6A~C67	6019	3798	3813		5182
C6A~C67	D6A~D67	6019	4014	3813		5182
C8A~C87	D8A~D87	6629	4014	3813		5792

Notes: 1. A-length includes flanges with both cooler and condenser having two passes and nozzles being at the same end (drive end for standard units).
2. The above dimensions are based on the waterside pressure being 1.0Mpa. A-length will vary while the waterside pressure increases.

Typical Piping and Wiring (with Free-standing Starter)



High Voltage ⩾10kV	Motor Code	RLA (A)	Proposed Cable Size (mm²)
XRC/E	ALL	<70	50
XRF	ALL	<82	50
XR6	N	75	50
	P	82	50
	Q	88	50
	R	94	50
	S	100	70
	T	105	70
XR7	U	113	70
	V	119	70
	W	125	95
	X	131	95
	Y	138	95
	Z	145	95

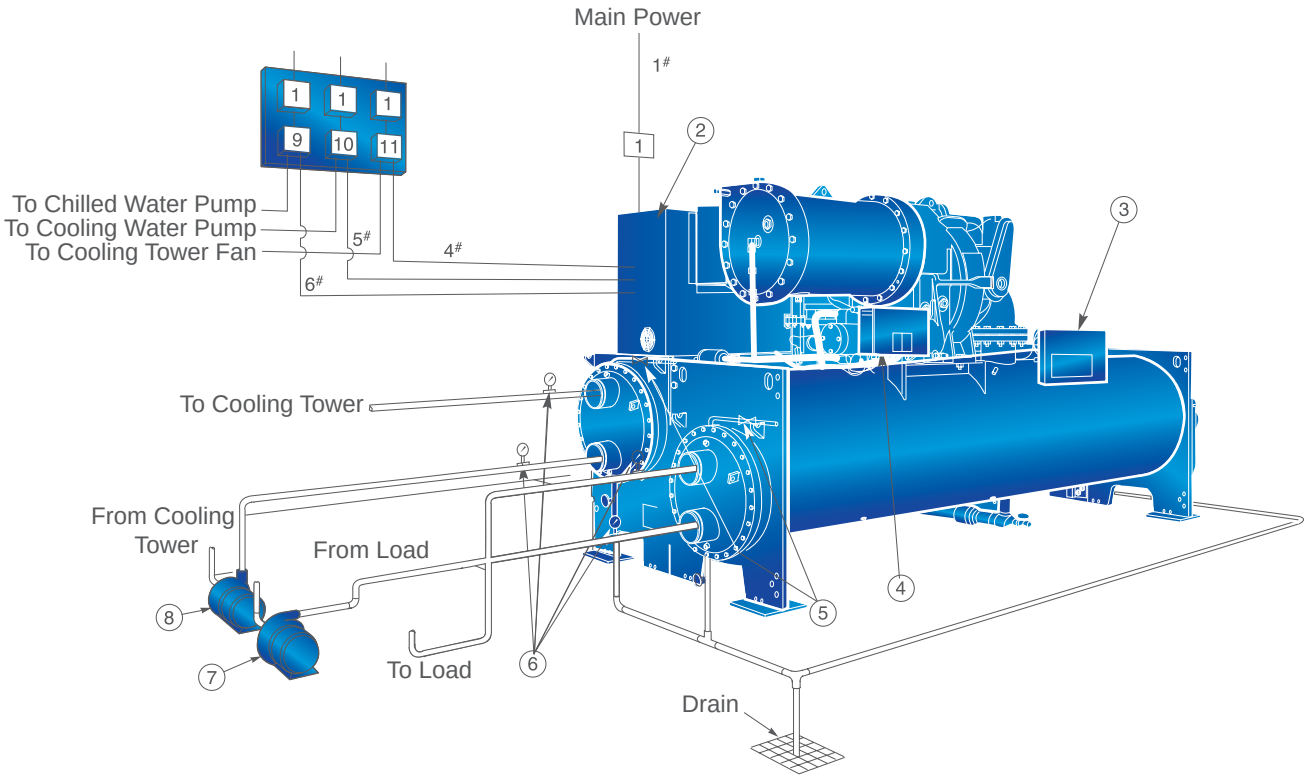
① Air Switch
② Freestanding Compressor Motor Starter
③ Compressor Motor Terminal Box
④ Oil Pump Controller
⑤ Control Panel
⑥ Vents
⑦ Pressure Gauges
⑧ Chilled Water Pump
⑨ Cooling Water Pump
⑩ Chilled Water Pump Starter
⑪ Cooling Water Pump Starter
⑫ Cooling Tower Fan Starter
⑬ Air Switch
⑭ Oil Pump Switch

Line	Purpose	Specification
1#	Main power to Starter:	400V AC: 3 phases, and 1 grounding 6.3kV/10kV/11kV AC: 3 phases, 1 grounding (medium/high voltage); 380V AC, 3 phases, 10A (19XR-6/7: 380V AC, 3 phases with grounding, 16A)
4#	To Cooling Tower Fan Starter:	4 control lines (optional)
5#	To Cooling Tower Water Pump Starter:	2 control lines (optional)
6#	To Chilled Water Pump Starter:	2 control lines (optional)
7#	To Oil Heater Contactor:	115V AC: 2 power lines(20A), 1 grounding (Not apply to 19XR-6/7; 19XRF: connect between starter and control panel)
8#	To Oil Pump Contactor:	19XR-6/7: connect between starter and control panel, 380V AC, 3 phases with grounding, 16A; 19XR-F: connect between starter and control panel, 380V AC, 3 phases, 5A; Other products: 380V AC, 3 phases, 5A
9#	To Lubrication System Power Panel:	8 control shielding lines, 600V, 80℃, grounding in starter (19XR-F/6/7: connect between starter and control panel)
10#	To Motor:	380V AC: 6 leads (Minimum ampacity per conductor = 0.721 x RLA), 1 grounding Or 6.3kV/10kV/11kV AC: 3 leads, 1 grounding (medium/high voltage)

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℃) 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 42mm, 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. Selected cable size range is from 50~120 square millimeter. If the customer select cable size is less than 50 square millimeter or more than 120 square millimeter, please contact YLC factory.
7. Communication cable between starter (ISM module) and control box (IOB module) shall apply Carrier specified one pair and half shielded twisted cable. The cable shall be installed as far away from high voltage cables and other strong jamming equipments as possible and keep the communication cable as shorter as possible to avoid noise. The communication cable must go through a metal conduit independently.

Typical Piping and Wiring (with VFD)



① Air Switch ② Unit-mounted Starter ③ Control Panel ④ Oil Pump Controller

⑤ Vents ⑥ Pressure Gauges ⑦ Chilled Water Pump ⑧ Cooling Water Pump

⑨ Chilled Water Pump Starter ⑩ Cooling Water Pump Starter

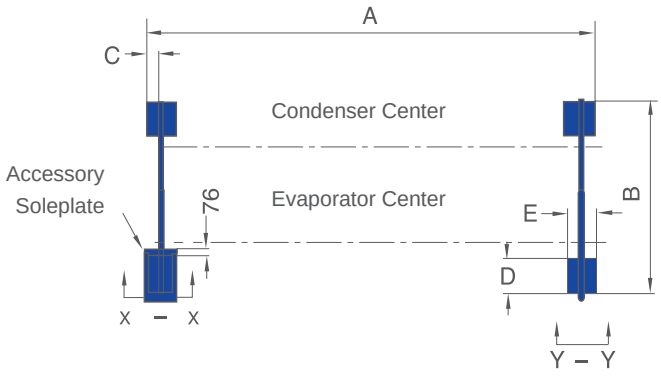
Line	Purpose	Specification
1#	Main power to Starter:	400V AC: 3 phases and 1 grounding
4#	To Cooling Tower Fan Starter:	4 control lines (Please contact local agencies if need this option)
5#	To Cooling Tower Water Pump Starter:	2 control lines (Please contact local agencies if need this option)
6#	To Chilled Water Pump Starter:	2 control lines (Please contact local agencies if need this option)

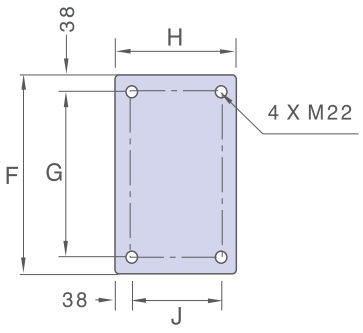
Piping and Wiring Requirements:

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 42mm, 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%.

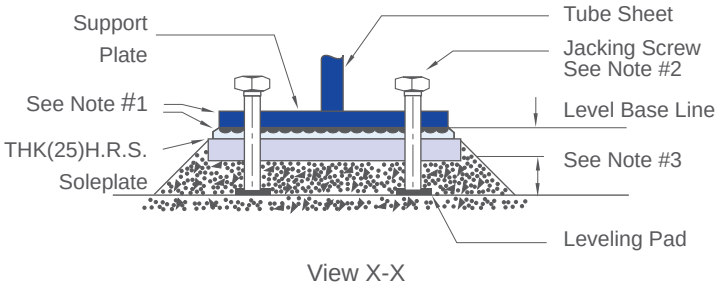
Types of Base Isolation

Location Of Isolator

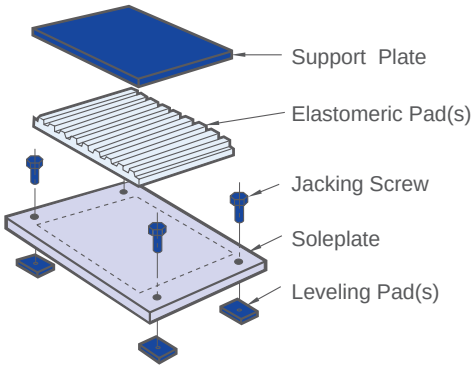




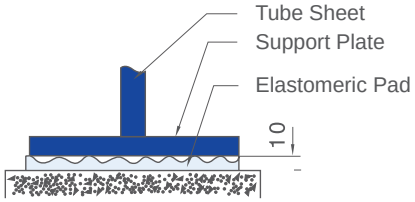
Standard Isolation



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 model	A	B	C	D	E	F	G	H	J
	mm	mm	mm	mm	mm	mm	mm	mm	mm
3P-34/30-34	3931	1632	92	387	229	540	464	254	178
3X-39/35-39	4451	1632	92	387	229	540	464	254	178
4P-44/40-44	3931	1829	92	387	229	540	464	254	178
4X-49/45-49	4451	1829	92	387	229	540	464	254	178
5P-54/50-54	3931	1969	92	387	229	540	464	254	178
5X-59/55-59	4451	1969	92	387	229	540	464	254	178
6P-64/60-64	3931	2070	92	387	229	540	464	254	178
6X-69/65-69	4451	2070	92	387	229	540	464	254	178
7P-74/70-74	4620	2400	176	559	406	711	635	432	356
7X-79/75-79	5320	2400	176	559	406	711	635	432	356
8P-84/80-84	4620	2686	176	559	406	711	635	432	356
8X-89/85-89	5320	2686	176	559	406	711	635	432	356
8P-84/V0-V4	4620	2686	176	559	406	711	635	432	356
8X-89/V5-V9	5320	2686	176	559	406	711	635	432	356
A4A-A47/A4A-A47	4492	3051	164	559	406	711	635	432	356
A6A-A67/A6A-A67	5102	3051	164	559	406	711	635	432	356
A4A-A47/B4A-B47	4492	3185	164	559	406	711	635	432	356
A6A-A67/B6A-B67	5102	3185	164	559	406	711	635	432	356
B6A-B67/C6A-C67	5082	3632	164	559	406	711	635	432	356
C6A-C67/C6A-C67	5080	3772	164	559	406	711	635	432	356
C6A-C67/D6A-D67	5082	4013	168	559	406	711	635	432	356
C8A-C87/D8A-D87	5691	4013	168	559	406	711	635	432	356

Field Wiring Specification (with Free-standing Starter)

I. General

1.0 Starters shall be designed and manufactured in accordance with Carrier Engineering Requirement Z-415.

1.1 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.

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

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

1.4 Contacts and switches are shown in the position they would with the circuit deenergized and the chiller shut down.

1.5 WARNING - Do not use aluminum conductors.

1.6 Installer is responsible for any damage caused by improper wiring between starter and machine.

II. Power Wiring to Starter

2.0 Circuit breaker is to be used to disconnect power to starter.

2.1 Lug adapters may be required if installation conditions dictate that conductors be sized beyond the minimum ampacity required.

2.2 Compressor motor and controls must be grounded by using equipment grounding lug provided inside starter enclosure.

III. Control Wiring

3.0 Field supplied control conductors should be at least 0.75mm^2 or larger.

3.1 Optional ice build start/remote lockout contacts, optional remote start/stop device contacts, optional fire alarm interlock and optional spare safety device contacts, must have 24 VAC rating. MAX current is 60 MA, nominal current is 10 MA. Switches with gold plated bifurcated contacts are recommended. (Not apply to Carrier® SmartVu™ control products. For Carrier® SmartVu™ control products, shall wire from control panel.)

3.2 Remove jumper wire between J2-1 and J2-2 before connecting auxiliary safeties between these terminals. (Not apply to Carrier® SmartVu™ control products. For Carrier® SmartVu™ control products, shall wire from control panel.)

3.3 Each integrated contact(ISM) output can control loads(VA) for evaporator pump, condenser pump, tower fan low, tow fan high, and alarm annunciator devices rated 5 amps at 115VAC and up to 3 amps at 277VAC. Do not use starter control transformer as the power source for contactor coil loads. (For Carrier® SmartVu™ control products, these relay outputs can also wire from control panel but rated 1 amp at 24VAC.)

3.4 Do not route control wiring carrying 30V or less within a conduit which has wires carrying 50V or higher or along side wires carrying 50V or higher.

3.5 Control wiring between free-standing starter and control panel must be separate shielded cables with minimum rating of 600V, 80°C For communication must use shield twist pair wire.

3.6 If optional oil pump circuit breaker is not supplied within the starter enclosure as shown, it must be located within sight of the chiller with wiring routed to suit. (Not applicable for 19XR6/7)

Field Wiring Specification (with Free-standing Starter)

IV. Power Wiring Between Free-standing Starter and Compressor Motor

4.0 Low voltage (600 v or less) compressor motors have (6) 5/8″ terminal studs (lead connectors not supplied by Carrier). Either 3 or 6 conductors must be run between compressor motor and starter, depending on the type of motor starter employed. If only 3 leads are utilized, jumper motor terminals as follows : 1 to 6, 2 to 4, and 3 to 5. Center to center distance between terminals is 8mm.Compressor motor starter must have nameplate stamped as to conform with Carrier Engineering Requirement Z-415.

4.1 Medium voltage [over 600 volts] compressor motors have (3) terminals. Connections are 9/16-threaded stud.Compressor motor starter must have nameplate stamped as to conform with Carrier Engineering requirement "Z-415."

4.2 Power conductor rating must meet minimum unit nameplate voltage and compressor motor RLA. When (3) conductors are used: Minimum ampacity per conductor = 1.25 x compressor RLA When (6) conductors are used: Minimum ampacity per conductor = 0.721 xcompressor RLA.

4.3 When more than one conduit is used to run conductors from starter to compressor motor terminal box, three leads from each phase (conductor) must be in each conduit to prevent excessive heating (e.g., conductors to motor terminals 1, 2, & 3 in one conduit, and those to 4, 5, & 6 in another).

4.4 Compressor motor power conductors may enter terminal box through top, bottom or right side using holes cut by contractor to suit conduit. Flexible conduit should be used for the last few feet to the terminal box for unit vibration isolation.

4.5 Compressor motor frame should be grounded in accordance with the National Electrical Code-us (NFPA-70) and applicable codes. Means for grounding compressor motor is a #4 AWG-500 MCM pressure connector, supplied and located in the lower left side corner of the compressor motor terminal box.

4.6 Do not allow motor terminals to support weight of wire cables. Use cable supports and strain relieves as required.

4.7 Use backup wrench when tightening lead connectors to motor terminal studs.

4.8 Motor terminals and wire connectors must be insulated with insulation putties and tapes attached to chillers to prevent moisture condensing and electrical arc.

Field Wiring Specification (with Unit-mounted VFD)

I. General

1.0 VFD starters shall be designed and manufactured in accordance with Carrier Engineering Requirement Z-420.

1.1 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.

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

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

1.4 Contacts and switches are shown in the position they would with the circuit deenergized and the chiller shut down.

1.5 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 Compressor motor and controls must be grounded by using equipment grounding lugs provided inside unit mounted starter enclossure.

III. Control Wiring

3.0 Field supplied control conductors should be at least 0.75 mm^2 or larger.

3.1 Optional ice build start/terminate device contacts, optional remote start/stop device contacts and optional spare safety device contacts, must have 24 VAC rating. MAX current is 60 MA, nominal current is 10 MA. Switches with gold plated bifurcated contacts are recommended. (Not apply to Carrier® SmartVu™ control products. For Carrier® SmartVu™ control products, shall wire from control panel.)

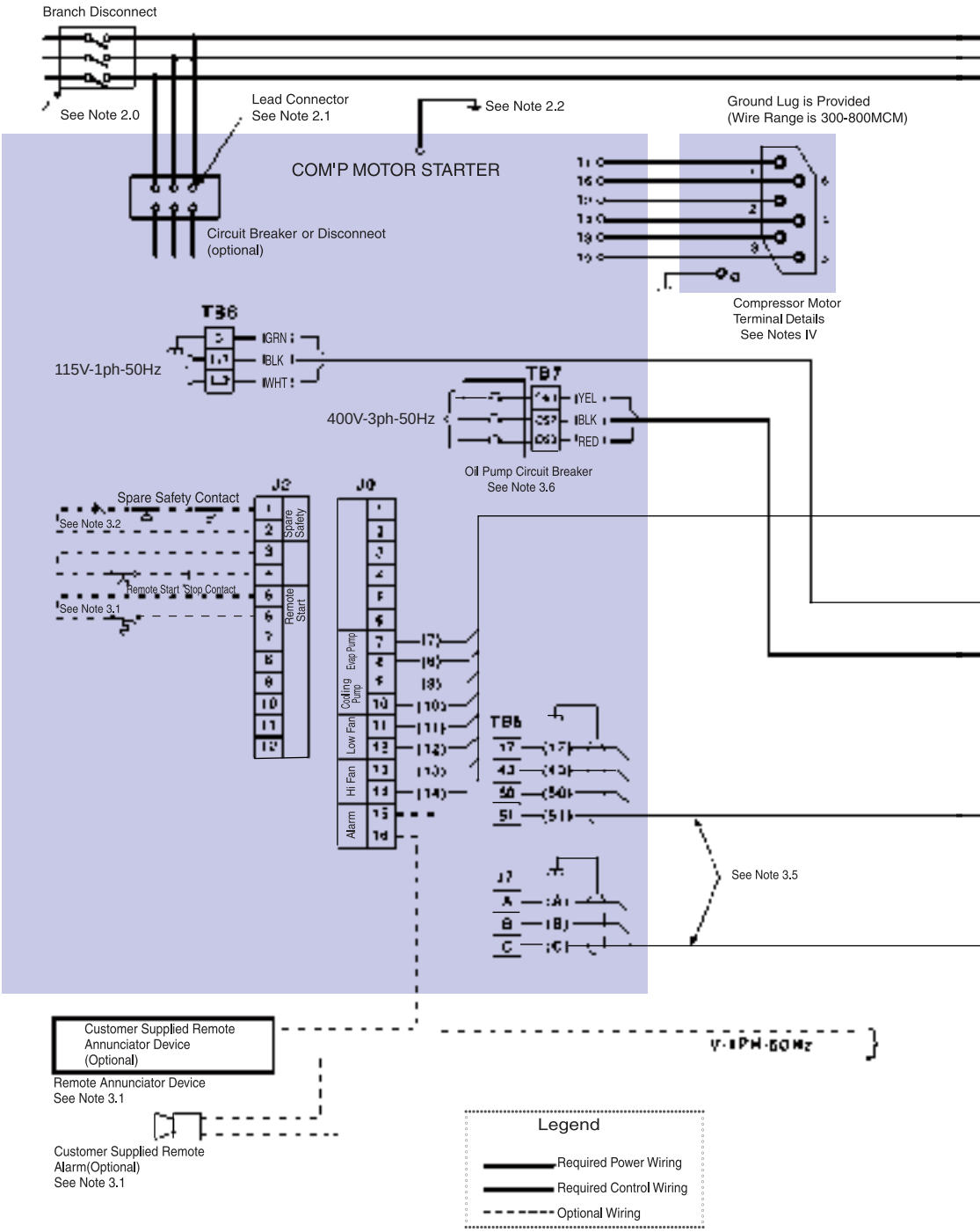
3.2 Remove jumper wire between TB1-19 and TB1-20 before connecting auxiliary safeties between these terminals. (Not apply to Carrier® SmartVu™ control products. For Carrier® SmartVu™ control products, shall wire from control panel.)

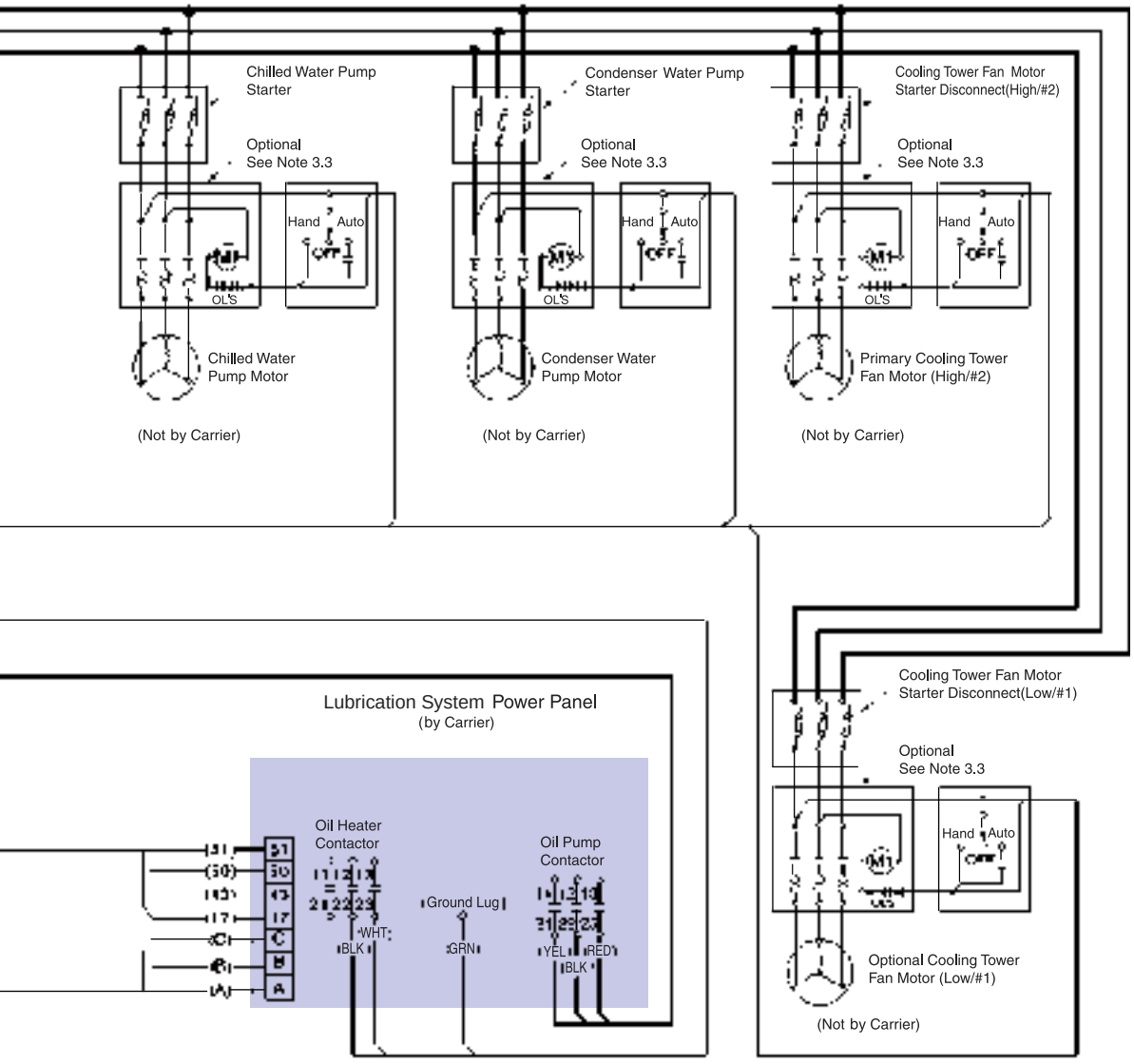
3.3 VFD contact outputs can control cooler and condenser pump and tower fan motor contactor coil loads (VA) rated 5 Amps at 115 VAC up to 3 Amps at 250 VAC. Do not use VFD starter control transformer as the power source for contactor coil loads. (For Carrier® SmartVu™ control products, these relay outputs can also wire from control panel but rated 1 amp at 24VAC.)

3.4 Do not route control wiring carrying 30V or less within a conduit which has wires carrying 50V or higher or along side wires carrying 50V or higher.

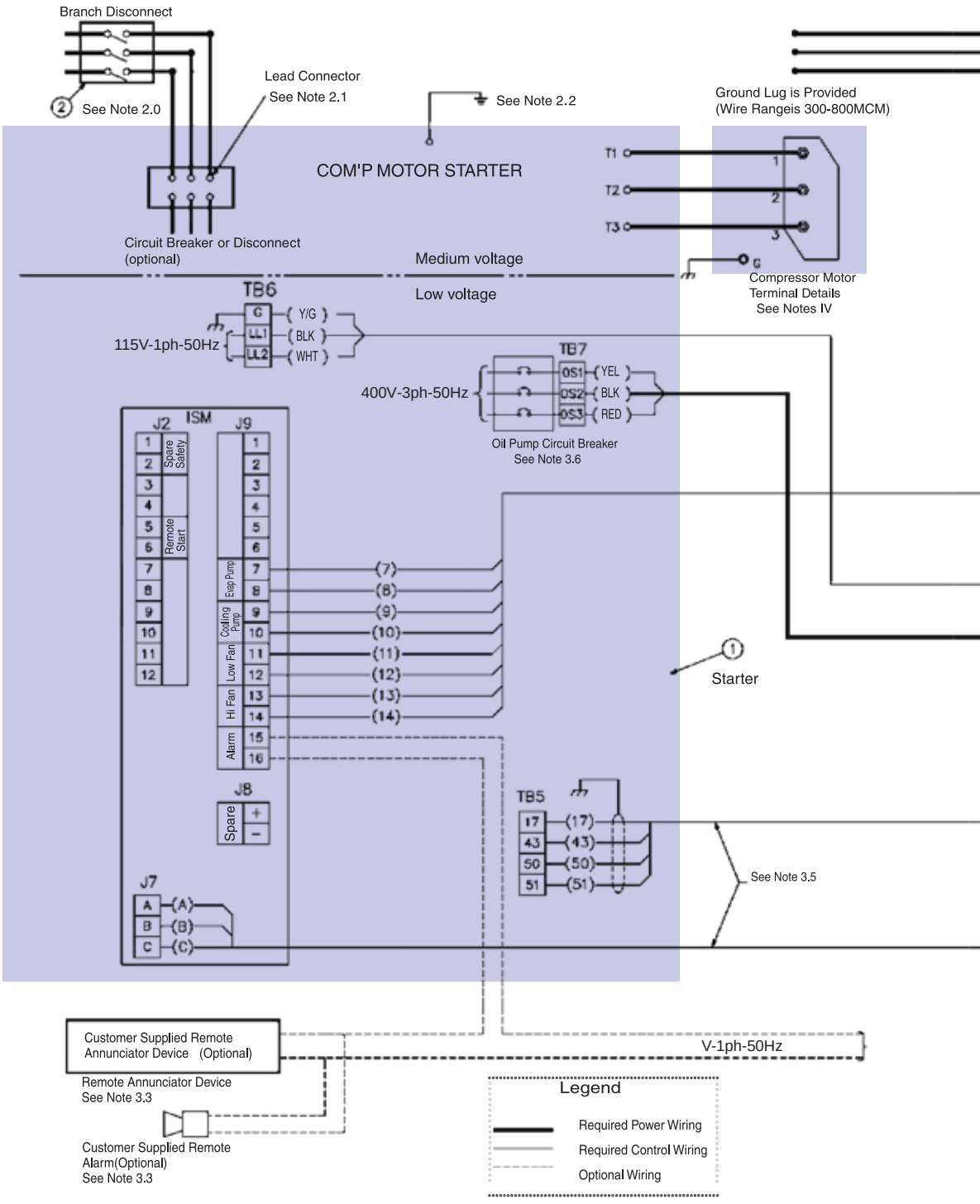
3.5 VFD provide spare output terminal for customer, Input sign must be 4~20mA, not grounded. Input resistance of terminal is soon. (Not apply to Carrier® SmartVu™ control products. For Carrier® SmartVu™ control products, shall wire from control panel.)

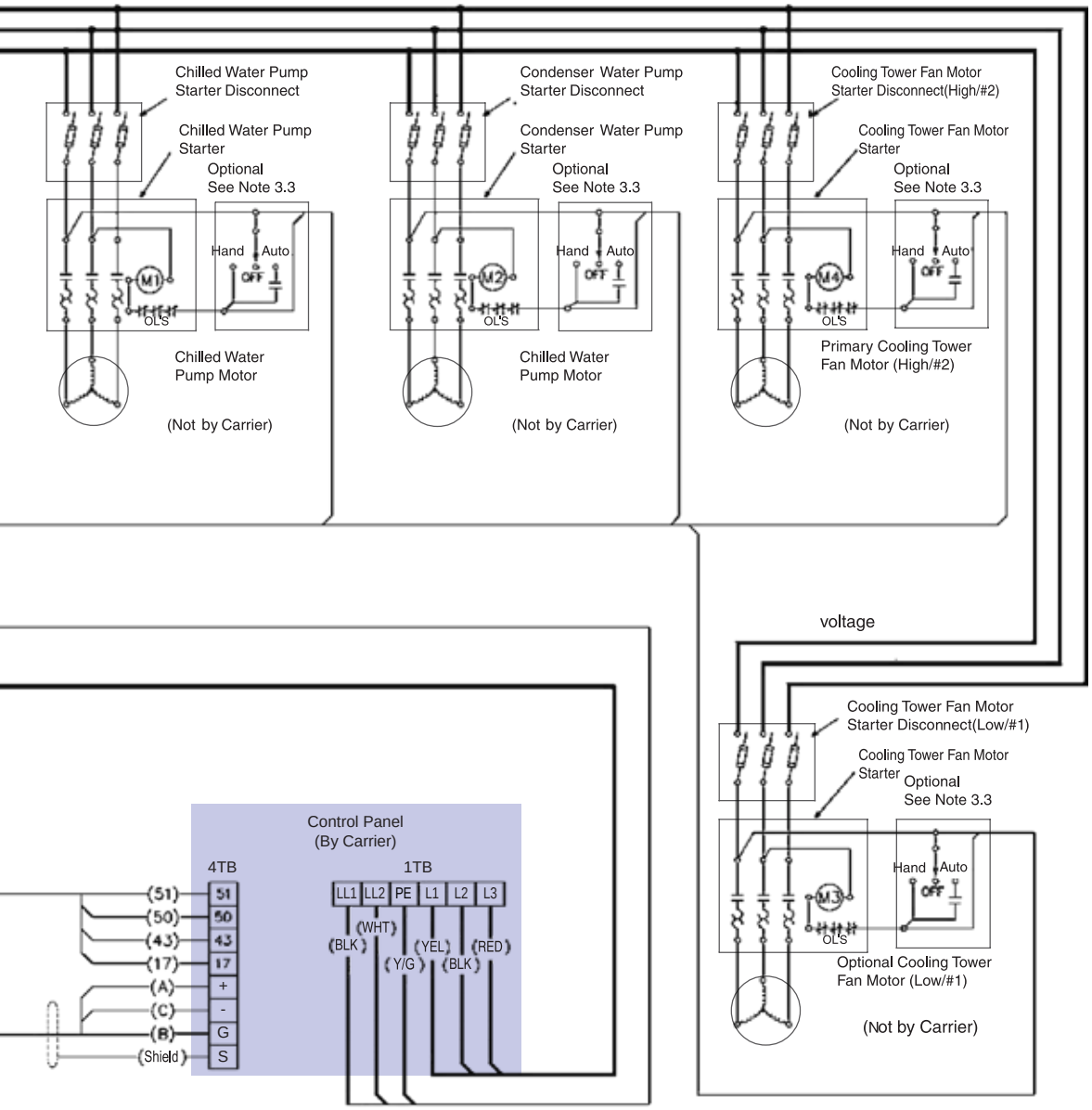
19XR/XR-C/E Typical Field Wiring with Free-Standing Starter (Low Voltage)



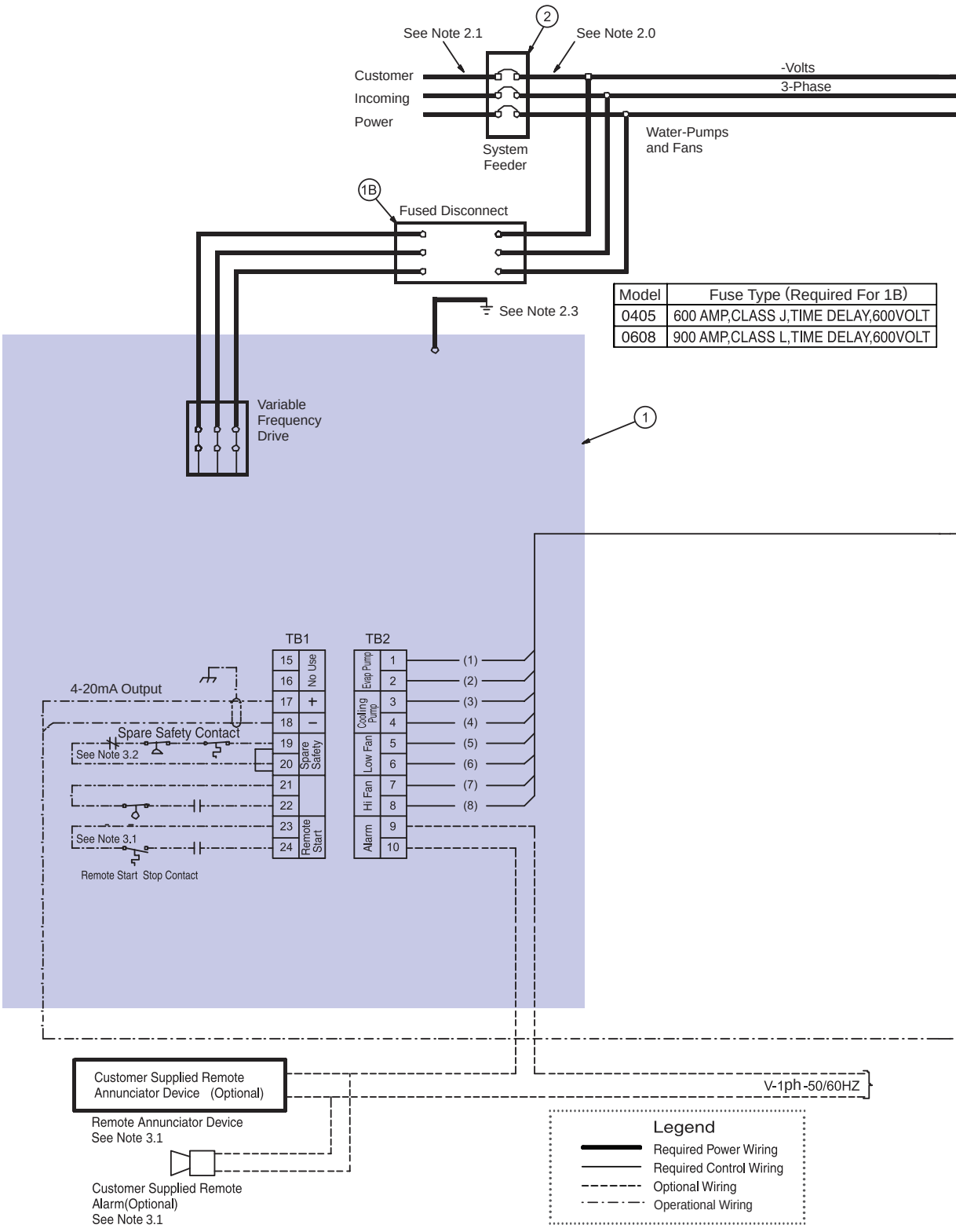

Chilled Water Pump
Starter
Optional
See Note 3.3
Hand
Auto
OL'S
Chilled Water
Pump Motor
(Not by Carrier)
Condenser Water Pump
Starter
Optional
See Note 3.3
Hand
Auto
OL'S
Condenser Water
Pump Motor
(Not by Carrier)
Cooling Tower Fan Motor
Starter Disconnect(High/#2)
Optional
See Note 3.3
Hand
Auto
OL'S
Primary Cooling Tower
Fan Motor (High/#2)
(Not by Carrier)
Lubrication System Power Panel
(by Carrier)
Oil Heater
Contactor
Ground Lug
Oil Pump
Contactor
WHT
BLK
GRN
YEL
RED
BLK
Cooling Tower Fan Motor
Starter Disconnect(Low/#1)
Optional
See Note 3.3
Hand
Auto
Optional Cooling Tower
Fan Motor (Low/#1)
(Not by Carrier)

19XR/XR-C/E/F Typical Field Wiring with Free-Standing Starter (Medium/High Voltage)

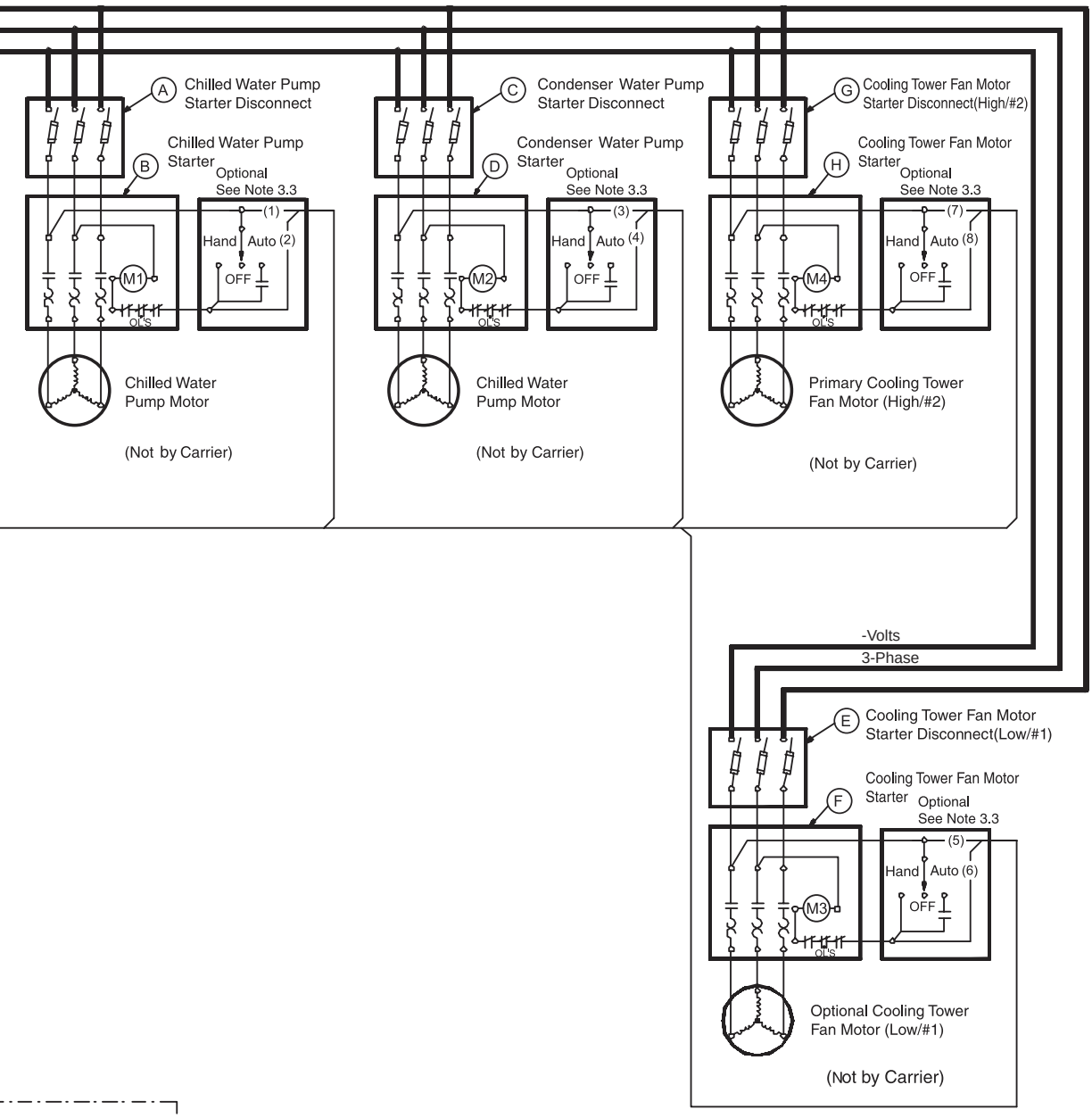



Chilled Water Pump
Starter Disconnect
Chilled Water Pump
Starter
Optional
See Note 3.3
Hand
Auto
OFF
M1
OL'S
Chilled Water
Pump Motor
(Not by Carrier)
Condenser Water Pump
Starter Disconnect
Condenser Water Pump
Starter
Optional
See Note 3.3
Hand
Auto
OFF
M2
OL'S
Chilled Water
Pump Motor
(Not by Carrier)
Cooling Tower Fan Motor
Starter Disconnect(High/#2)
Cooling Tower Fan Motor
Starter
Optional
See Note 3.3
Hand
Auto
OFF
M4
OL'S
Primary Cooling Tower
Fan Motor (High/#2)
(Not by Carrier)
voltage
Cooling Tower Fan Motor
Starter Disconnect(Low/#1)
Cooling Tower Fan Motor
Starter
Optional
See Note 3.3
Hand
Auto
OFF
M3
OL'S
Optional Cooling Tower
Fan Motor (Low/#1)
(Not by Carrier)
Control Panel
(By Carrier)
4TB
1TB
(51)
(50)
(43)
(17)
(A)
(C)
(B)
(Shield)
51
50
43
17
+
-
G
S
LL1
LL2
PE
L1
L2
L3
(WHT)
(BLK)
(YEL)
(RED)
(Y/G)
(BLK)

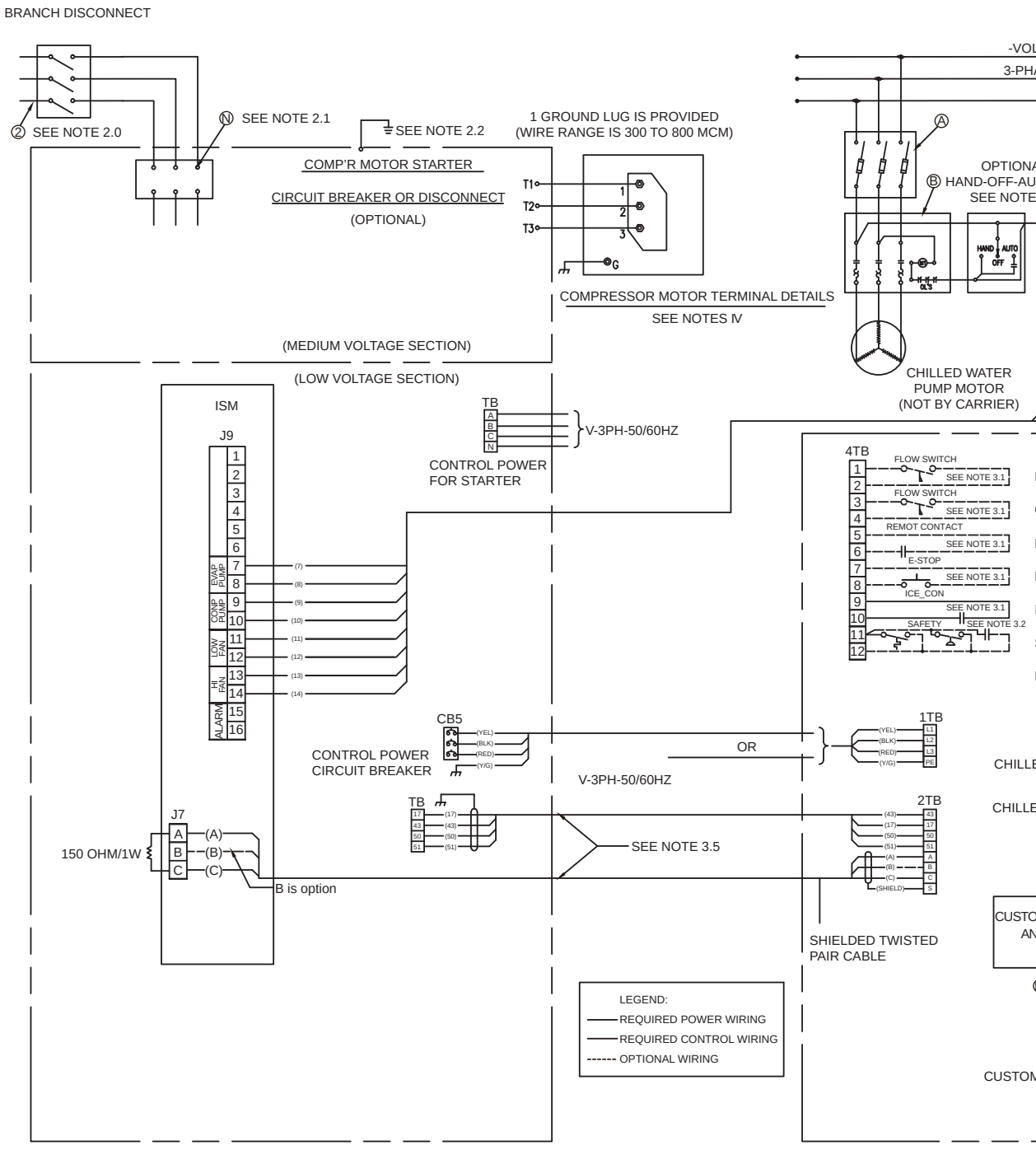
19XRV/XRV-C/E Typical Field Wiring with UM-VFD

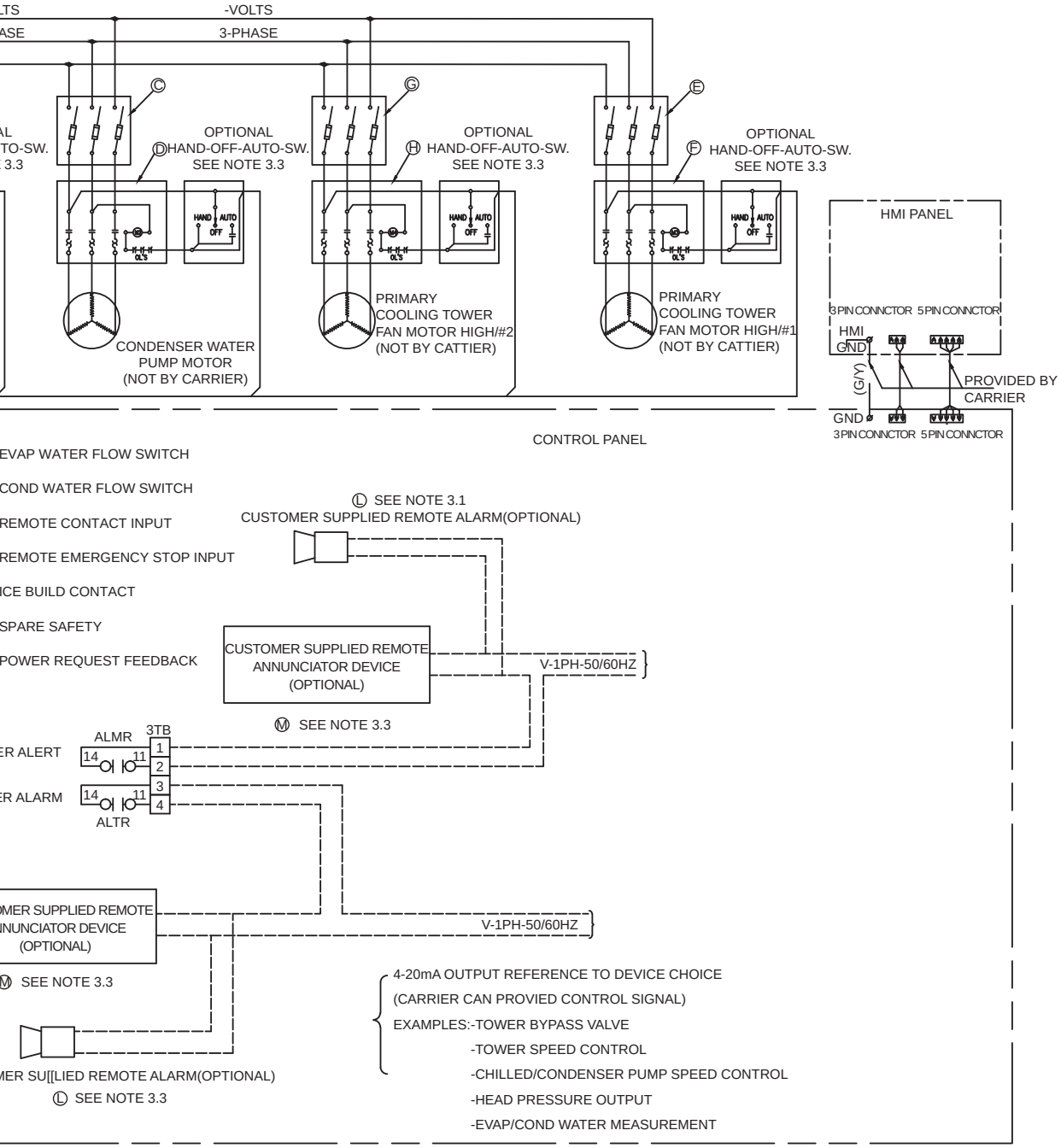


Model	Fuse Type (Required For 1B)
0405	600 AMP,CLASS J,TIME DELAY,600VOLT
0608	900 AMP,CLASS L,TIME DELAY,600VOLT


A
Chilled Water Pump
Starter Disconnect
B
Chilled Water Pump
Starter
Optional
See Note 3.3
(1)
Hand
Auto (2)
OFF
M1
OL's
Chilled Water
Pump Motor
(Not by Carrier)
C
Condenser Water Pump
Starter Disconnect
D
Condenser Water Pump
Starter
Optional
See Note 3.3
(3)
Hand
Auto (4)
OFF
M2
OL's
Chilled Water
Pump Motor
(Not by Carrier)
G
Cooling Tower Fan Motor
Starter Disconnect(High/#2)
H
Cooling Tower Fan Motor
Starter
Optional
See Note 3.3
(7)
Hand
Auto (8)
OFF
M4
OL's
Primary Cooling Tower
Fan Motor (High/#2)
(Not by Carrier)
-Volts
3-Phase
E
Cooling Tower Fan Motor
Starter Disconnect(Low/#1)
F
Cooling Tower Fan Motor
Starter
Optional
See Note 3.3
(5)
Hand
Auto (6)
OFF
M3
OL's
Optional Cooling Tower
Fan Motor (Low/#1)
(Not by Carrier)
4-20mA Output Reference to Device Choice (Not by Carrier)
Examples: Tower Bypass Value
Tower Speed Control
Condenser Pump Speed Control
See Note 3.5

19XR-6/7 Typical Field Wiring with Free-Standing Starter (Medium/High Voltage)




LTS
ASE
-VOLTS
3-PHASE
C
G
E
OPTIONAL
D HAND-OFF-AUTO-SW.
SEE NOTE 3.3
OPTIONAL
H HAND-OFF-AUTO-SW.
SEE NOTE 3.3
OPTIONAL
F HAND-OFF-AUTO-SW.
SEE NOTE 3.3
HAND AUTO OFF
CONDENSER WATER
PUMP MOTOR
(NOT BY CARRIER)
PRIMARY
COOLING TOWER
FAN MOTOR HIGH/#2
(NOT BY CATTIER)
PRIMARY
COOLING TOWER
FAN MOTOR HIGH/#1
(NOT BY CATTIER)
HMI PANEL
3PIN CONNCTOR 5PIN CONNCTOR
HMI
GND
(G/Y)
PROVIDED BY
CARRIER
GND
3PIN CONNCTOR 5PIN CONNCTOR
CONTROL PANEL
EVAP WATER FLOW SWITCH
COND WATER FLOW SWITCH
REMOTE CONTACT INPUT
REMOTE EMERGENCY STOP INPUT
ICE BUILD CONTACT
SPARE SAFETY
POWER REQUEST FEEDBACK
L SEE NOTE 3.1
CUSTOMER SUPPLIED REMOTE ALARM(OPTIONAL)
CUSTOMER SUPPLIED REMOTE
ANNUNCIATOR DEVICE
(OPTIONAL)
V-1PH-50/60HZ
M SEE NOTE 3.3
ALMR
3TB
ER ALERT
14
11
1
2
ER ALARM
3
4
ALTR
OMER SUPPLIED REMOTE
INUNCIATOR DEVICE
(OPTIONAL)
V-1PH-50/60HZ
M SEE NOTE 3.3
MER SU[[LIED REMOTE ALARM(OPTIONAL)
L SEE NOTE 3.3
4-20mA OUTPUT REFERENCE TO DEVICE CHOICE
(CARRIER CAN PROVIED CONTROL SIGNAL)
EXAMPLES:-TOWER BYPASS VALVE
-TOWER SPEED CONTROL
-CHILLED/CONDENSER PUMP SPEED CONTROL
-HEAD PRESSURE OUTPUT
-EVAP/COND WATER MEASUREMENT

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Supersede:	NA
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