

17. Extended Chassis:
Extended chassis designs shall contain an added length module, after the evaporator section, as shown in the contract drawings. Module shall contain tracks to accept field-supplied/installed auxiliary heating coil.
18. Non-Fused Disconnect:
A non-fused electrical disconnect for main unit power shall be factory installed. The disconnect shall be an interlocking through-the-door type.
19. 115-Volt Convenience Outlet:
A duplex GFCI (ground fault circuit interrupt) receptacle shall be factory mounted in a weatherproof enclosure and wired for a 10-amp load. It will remain powered when all unit circuit breakers have been turned off. The outlet will be deenergized by the unit disconnect.
20. Navigator™ Display Module:
The Navigator display module shall be a portable hand-held display module with a minimum of 4 lines and 20 characters per line, of clear English, Spanish, Portuguese or French language. Display menus shall provide clear language descriptions of all menu items, operating modes, configuration points and alarm diagnostics. Reference to factory codes shall not be accepted. An industrial grade coiled extension cord shall allow the display module to be moved around the chiller. Magnets shall hold the display module to any sheet metal panel to allow hands-free operation. Display module shall have NEMA 4x housing suitable for use in outdoor environments. Display shall have back light and contrast adjustment for easy viewing in bright sunlight or night conditions. The display module shall have raised surface buttons with positive tactile response.
21. Controls Expansion Module (CEM):
Factory-installed package shall include all hardware for additional control of base unit operation and product integrated controls features. The functions supported are:
 - a. Building pressurization, evacuation, and smoke purge control.
 - b. Supply air reset from external 4 to 20 mA signal.
 - c. Two-step demand limit inputs (when used with the CCN [Carrier Comfort Network®]).
 - d. Indoor air quality (IAQ) switch monitoring.
 - e. Outdoor airflow monitoring.
 - f. Outdoor humidity monitoring.
 - g. Space humidity monitoring (required for dehumidification control, reheat and humidifier control).
 - h. Return air humidity monitoring.
 - i. Demand limiting from an external 4 to 20 mA signal.
 - j. Static pressure reset from an external 4 to 20 mA signal.
22. Relative Humidity Sensors:
Package shall contain either duct-mounted or wall-mounted sensors to measure the relative humidity of the air within the occupied space (specify location) or return duct and/or outside air.
NOTE: For relative humidity sensor monitoring, the CEM must also be ordered (except for ZS sensors with RH sensing).
23. Indoor Air Quality (CO₂) Sensor:
 - a. Shall have the ability to provide demand controlled ventilation indoor-air quality (IAQ) control through the economizer with an indoor air quality sensor.
 - b. The IAQ sensor shall be available in duct mount, wall mount, and wall mount with LED display of CO₂ in parts per million. The set point shall have adjustment capability.
24. Return/Supply Air Smoke Detector:
The smoke detector shall send input to the controller to shut down the unit in case smoke is detected.
25. Outdoor Airflow Sensor:
Outdoor airflow sensor package shall contain a airflow station with airflow sensor, a transducer and all hardware required to measure the quantity of outdoor air brought in through the economizer dampers. Optional economizer and CEM are required with this accessory. This airflow sensor shall control to the following airflow ranges:
Sizes 030-050: 2,500 to 12,500 CFM
Sizes 055-070: 3,000 to 17,000 CFM
Sizes 075-100: 5,000 to 21,000 CFM
26. Differential Enthalpy Switch or Sensors (when equipped with both return air and outdoor air humidity sensors):
 - a. For use with economizer only.
 - b. Capable of comparing heat content (temperature and humidity) of outdoor and return air and controlling economizer cut-in point at the most economical level.
27. Hot Gas Bypass:
Unit shall be factory equipped with hot gas bypass valve and tubing to maintain capacity control at minimal cooling loads.
28. Condenser Coil Protective Coating — E-Coated Microchannel Coil:
E-coated aluminum microchannel coils shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers. Coating process shall ensure complete coil encapsulation, including all exposed fin edges. E-coat thickness of 0.8 to 1.2 mil with top coat having

- a uniform dry thickness from 1.0 to 2.0 mil on all external coil surface areas, including fin edges, shall be provided. E-coated coils shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross-hatch adhesion of 4B-5B per ASTM D3359-02. E-coated coils shall have superior impact resistance with no cracking, chipping, or peeling per NSF/ANSI 51-2002 Method 10.2.
29. Condenser Coil Hail Guard (sizes 040 to 060 only):
Canted face enclosure and welded wire grille complete with support retainers and fasteners shall be provided for protection of condenser coils. Field-assembled.
 30. BACnet¹ Communication Option:
Shall provide factory-installed communication capability with a BACnet MS/TP network. Allows integration with i-Vu[®] Open Control System or a BACnet Building Automation System.
 31. MODBUS¹ Protocol Translator:
A controller-based accessory module shall provide CCN access to MODBUS Remote Terminal Unit (RTU) protocol conversion.
 32. LonWorks¹ Protocol Translator:
A controller-based accessory module shall provide CCN access to LON FT-10A ANSI/EIA-709.1 protocol conversion.
 33. Space Temperature Sensor (T-56):
The T-56 space temperature sensor (for CV applications) shall monitor space temperature. Device shall be suited for wall mounting in the occupied space. The T-56 sensor shall incorporate a front-panel located slider switch to effect a remote change in set point of $\pm 5^{\circ}\text{F}$. The T-56 sensor shall also include a button used to initiate Unoccupied Override function.
 34. Space Temperature Sensor (T-56) with CO₂ Sensor:
This device shall incorporate interior space temperature sensing and interior space CO₂ level monitoring functions. Space temperature sensor shall sense the actual temperature in the conditioned space via 10,000-ohm thermistor. Temperature set point adjustment potentiometer via slide scale shall provide $\pm 5^{\circ}\text{F}$ adjustment. CO₂ sensor shall provide CO₂ measurement range of 0 to 2000 ppm. IAQ signal to unit base board terminals shall be 4 to 20 mA. Sensor shall be equipped with an override button for timed override. Sensor must be powered by a separate field-supplied 24-v transformer.
 35. Suction and Liquid Service Valves:
Shall be equipped with ball type service valves in the suction and liquid line for each circuit.
 36. Discharge Service Valve:
Shall be equipped with a ball type service valve in the discharge line of each circuit.
 37. Replaceable Core Filter Drier:
Shall be equipped with a replaceable core filter drier in each liquid line.
 38. Roof Curb:
Designed to comply with criteria established by NRCA Guideline B-1986.
 - a. Size 030-060 Units:
Formed 14-gage galvanized steel with wood nailer. Supports full perimeter of unit.
 - b. Size 070-100 Units:
Formed 14-gage galvanized steel with wood nailer strip as perimeter curb supporting the air-handling portion of unit, and rail for supporting the condenser portion of the unit.
 39. Roof Curb Condenser Section (accessory for size 070-100 units only):
Formed 14-gage galvanized steel with wood nailer strip for supporting condenser section of the unit to complete a full perimeter curb under entire unit.
 40. Silicon Controlled Rectifier (SCR) Controlled Electric Heat (30 to 70 ton units only):
 - a. SCR electric heat option shall monitor unit supply-air temperature and control the unit heater section to provide the following sequences:
 - 1) Demand heating control, with modulation to maintain user-configured heating supply air temperature set point.
 - 2) Full output heating on heating control command.
 - 3) Tempering heat control, based on user-configured ventilation supply air temperature set point, to eliminate cold draft conditions with low mixed-air temperatures.
 - b. SCR heat control option shall consist of:
 - 1) SCR controller capable of ensuring the proper heating rates.
 - 2) Supply air temperature thermistors with duct-mounting base.
 - 3) Limit switch temperature thermistors.
 - c. Field installation shall be limited to installing three supply air temperature thermistors in the supply duct. All other hardware and wiring shall be factory-completed.
 41. Greenspeed Intelligence Control Option:
This factory-installed option shall regulate outdoor fan motor speeds in response to the saturated condensing temperature of the refrigeration circuits and local ambient conditions.

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- a. The control shall be capable of operating the rooftop unit with outdoor temperature at -20°F.
 - b. Fans shall be direct-driven shrouded-axial propeller type fans only, with 9-blade AeroAcoustic™ airfoil cross section (except size 35), reinforced polymer construction blades bolted to corrosion resistant steel supports for all size units.
 - c. Fans discharge air vertically upward and are protected by PVC coated steel wire safety guards.
 - d. Fans are statically and dynamically balanced.
 - e. The condenser fan motors will be VFD driven.
 - f. Compressor blankets will be applied to mitigate the level of outdoor sound on all refrigerant compressors. They shall be weather resistant and applied in both single and tandem arrangements.
 - g. Unit efficiency is maximized by monitoring the refrigerant system and ambient conditions and controlling condenser fan performance.
42. High Short Circuit Current Rating (SCCR):
- An optional SCCR of 65kA shall be provided for 208/230 and 460 volt units. An optional of 25kA shall be provided for 575 volt units.
43. Low Compressor Sound Blanket:
Low compressor sound blanket accessory shall be available for field installation.
44. Phase Loss Monitor Option:
Phase loss monitor protection shall be available as a factory-installed option.
45. ZS Communicating Sensors
The ZS room temperature sensor sensors shall be available in a variety of zone sensing combinations, including temperature, relative humidity, and indoor air quality, and shall be selected to meet the application requirements. The ZS room sensor shall be compatible with units with the factory installed BACnet communication option.
46. Equipment Touch
Shall be a touchscreen interface with 4.3" color display and integral temperature and humidity sensing. The Equipment Touch shall be compatible with units with the factory installed BACnet communication option.

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