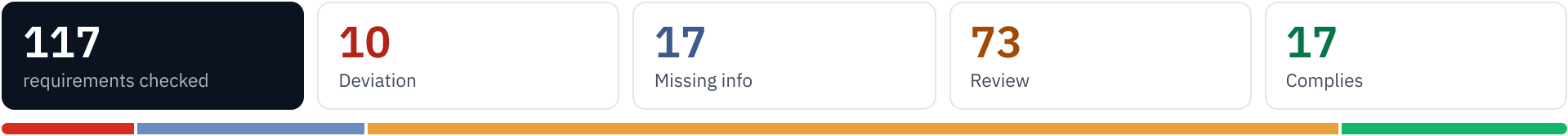


Specification compliance review

Section 237413 - Packaged Rooftop Heating and Cooling Units · Project: Sample: public university RTU spec vs. a major-brand 10-ton rooftop unit

Item: 10-ton packaged rooftop unit with gas heat (RTU) — Brand X RTU-10 (10-ton nominal gas heat/electric cooling packaged rooftop, R-454B, direct-drive ECM vane-axial supply fan), generic Product Data catalog (Rev D); no project-specific model string, options or schedule sheet included



10 of 117 requirements are not met by the proposed product.
Resolve the deviations below before submitting, then close the open items with the manufacturer.

Fix before submitting 10 items

Spec section	Requirement	Required	Proposed product
2.1.C	Acceptable manufacturers	Brand A (basis of design), Brand B, Brand C or Brand D	Manufacturer is Brand X; spec lists Brands A to D
2.2.A	Casing general fabrication	Formed and reinforced double-wall insulated panels, removable for access to internal components, joints between sections sealed	Single-wall galvanized cabinet with interior surfaces insulated with 1/2 in. neoprene-coated fiberglass; no double-wall panels
2.2.C.1	Inside casing	Galvanized steel, 0.028 inch thick	No inner casing/liner; insulation exposed to airstream (neoprene coated)
2.2.D.2	Casing insulation thickness	One (1) inch	Minimum 1/2 in. thick, 1 to 1-1/2 lb density
2.2.E	Condensate drain pan	Formed stainless steel sheet, minimum two (2) inches deep, complying with ASHRAE 62.1	Sloped, corrosion-resistant composite (non-metallic) drain pan, complies with ASHRAE 62; depth not stated

Spec section	Requirement	Required	Proposed product
2.3.A	Direct-driven supply air fan (if direct drive)	Double-width forward-curved centrifugal; permanently lubricated multispeed or ECM motor resiliently mounted in fan inlet; aluminum or painted steel wheel; galvanized or painted steel scroll	Direct-drive vane axial fan, ECM motor, permanently lubricated bearings, composite stator/rotor/inlet casing, slow ramp-up
2.4.A.5	Supply coil condensate drain pan	Stainless steel, formed with pitch and drain connections complying with ASHRAE 62.1	Composite (non-metallic) sloped drain pan, ASHRAE 62 compliant
2.4.C	Hot gas bypass	Hot gas bypass factory installed on the lead compressor for all units	No hot gas bypass listed in options/accessories; capacity control via 2-stage tandem scroll compressors
2.5.C.1	Refrigerant	R-407C or R-410A	R-454B (A2L), charge 14 lb 6 oz for M12
2.5.C.11	Hot gas bypass solenoid valve	With replaceable magnetic coil	No hot gas bypass valve offered

Request from the manufacturer 12 items

- 1 Provide a project-specific submittal: full 18-digit model number for the 10-ton RTU-10 unit with selected voltage, heat size, fan/static option, coil options, controls, economizer, service and electrical options, plus equipment schedule comparison (capacity, airflow, ESP, heat input/output, MCA/MOCP).
- 2 Provide manufacturer wind and seismic qualification certifications (ASCE 7) with basis (test or calculation), outline drawings identifying center of gravity and center of wind force, anchorage device descriptions and restraint bracket details, and fan-section seismic fabrication statement.
- 3 Provide unit-specific ladder wiring diagrams (factory vs field wiring), installation instructions (IOM), and roof curb shop drawing showing securing to roof structure and membrane flashing coordination.
- 4 Provide written warranty terms for the unit, compressor, heat exchanger, ignition module (IGC) and control board (minimum 3 years for ignition module and control boards).
- 5 Request formal substitution approval for Brand X (not a listed manufacturer) and engineer acceptance of: R-454B refrigerant in lieu of R-410A/R-407C, UL 60335-2-40 in lieu of UL 1995, single-wall cabinet with 1/2 in. insulation in lieu of double-wall 1 in., composite drain pan in lieu of stainless steel, vane-axial composite fan in lieu of forward-curved centrifugal, single-circuit tandem compressors in lieu of interlaced coil, gear-driven economizer in lieu of rod/linkage dampers.
- 6 Confirm with Brand X whether hot gas bypass on the lead compressor is available; if not, obtain engineer acceptance of 2-stage tandem compressor capacity control.
- 7 Confirm crankcase heater provision, manual-reset behavior of high pressure switch/lockout, presence of brass service valves, compressor minimum on-time, inter-stage delay, brown-out (low voltage) lockout, minimum heat on/off times, and supply airflow proving switch; confirm Time Guard accessory or premium for anti-recycle.
- 8 Confirm control selections: premium controller (option 3) with BACnet IP capability or required BACnet MS/TP-to-IP router; available BAS points (setpoints, fan status, OA damper position, SAT/RAT, room humidity, economizer status), schedule periods per day, unoccupied setbacks and 2-hour override, low discharge temperature and firestat safeties, memory backup type, and sequence of operation.

- 9 Confirm coil options: E-coat/pre-coat coating in lieu of baked phenolic on indoor and outdoor coils, polymer isolation strip on standard Al/Cu coils, coil casing/distributor construction, hot-gas reheat (hot gas reheat) option with solenoid coil details and humidity sensor.
- 10 Confirm filter selection (2 in. MERV-8 accessory or factory 4 in. MERV-13) with ASHRAE 52.1 arrestance/52.2 MERV data, single filter bank in lieu of pre/final filters, filter status switch option, and provide spare filter sets per spec.
- 11 Confirm accessories: low ambient controller (and winter start kit) for 0°F operation, 14 in. curb curb accessory 003 with vibration isolation/restraint provisions, curb insulation NFPA 90A/adhesive data, powered duplex GFCI convenience outlet, non-fused disconnect, gas burner compartment heater, smoke detectors and fire alarm interface contacts, power exhaust/relief fan if required.
- 12 Provide statements of compliance/data for ASHRAE 62.1 Sections 5 and 7, ASHRAE 33 coil testing, AHRI 270 sound rating basis, ASTM C 1071 Type I insulation and ASTM C 916 adhesive, G90 casing coating and casing gauge, and LEED EA4/IEQ1 documentation if the project is LEED.

● **Deviation** **Deviations: the product data contradicts the spec (10)**

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.1.C	Acceptable manufacturers	Brand A (basis of design), Brand B, Brand C or Brand D	Manufacturer is Brand X; spec lists Brands A to D	rtu_product_data.pdf, p. 1	● Deviation	Brand X is not a listed acceptable manufacturer; formal substitution approval required.
2.2.A	Casing general fabrication	Formed and reinforced double-wall insulated panels, removable for access to internal components, joints between sections sealed	Single-wall galvanized cabinet with interior surfaces insulated with 1/2 in. neoprene-coated fiberglass; no double-wall panels	rtu_product_data.pdf, p. 34	● Deviation	Spec requires double-wall insulated panels.
2.2.C.1	Inside casing	Galvanized steel, 0.028 inch thick	No inner casing/liner; insulation exposed to airstream (neoprene coated)	rtu_product_data.pdf, p. 34	● Deviation	Spec requires 0.028 in. galvanized inner casing.
2.2.D.2	Casing insulation thickness	One (1) inch	Minimum 1/2 in. thick, 1 to 1-1/2 lb density	rtu_product_data.pdf, p. 34	● Deviation	Spec requires 1 in. thickness.
2.2.E	Condensate drain pan	Formed stainless steel sheet, minimum two (2) inches deep, complying with ASHRAE 62.1	Sloped, corrosion-resistant composite (non-metallic) drain pan, complies with ASHRAE 62; depth not stated	rtu_product_data.pdf, p. 34	● Deviation	Not stainless steel; 2 in. minimum depth not documented.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.3.A	Direct-driven supply air fan (if direct drive)	Double-width forward-curved centrifugal; permanently lubricated multispeed or ECM motor resiliently mounted in fan inlet; aluminum or painted steel wheel; galvanized or painted steel scroll	Direct-drive vane axial fan, ECM motor, permanently lubricated bearings, composite stator/rotor/inlet casing, slow ramp-up	rtu_product_data.pdf, p. 37	● Deviation	Not a double-width forward-curved centrifugal fan; wheel is composite, not aluminum/painted steel. Motor type (ECM) complies.
2.4.A.5	Supply coil condensate drain pan	Stainless steel, formed with pitch and drain connections complying with ASHRAE 62.1	Composite (non-metallic) sloped drain pan, ASHRAE 62 compliant	rtu_product_data.pdf, p. 34	● Deviation	Not stainless steel (same as R44).
2.4.C	Hot gas bypass	Hot gas bypass factory installed on the lead compressor for all units	No hot gas bypass listed in options/accessories; capacity control via 2-stage tandem scroll compressors	rtu_product_data.pdf, p. 14	● Deviation	Hot gas bypass not offered per options list; confirm with Brand X whether available.
2.5.C.1	Refrigerant	R-407C or R-410A	R-454B (A2L), charge 14 lb 6 oz for M12	rtu_product_data.pdf, p. 11	● Deviation	Not R-407C/R-410A; note R-410A is no longer permitted in new RTUs under EPA AIM Act, so spec is outdated; engineer to accept R-454B and verify A2L code requirements.
2.5.C.11	Hot gas bypass solenoid valve	With replaceable magnetic coil	No hot gas bypass valve offered	rtu_product_data.pdf, p. 14	● Deviation	See R62.

• **Missing info** **Missing information: the product data does not address the requirement (17)**

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.3.B	Wind restraint performance	Unit/restraints rated for project basic wind speed and building category; minimum 10 lb/sq ft times the maximum projected area normal to the wind and 45 degrees either side of normal (project values to be inserted by Engineer)	No wind load or wind restraint data	—	• Missing info	Product data never addresses wind speed, building category or wind restraint capacity.
1.5.B	Manufacturer wind loading qualification certification	Certification that equipment withstands wind forces in Performance Requirements and Section Vibration and Seismic Controls for HVAC Systems	No wind loading certification	—	• Missing info	Not addressed anywhere in product data.
1.5.C	Basis for wind certification	State whether certification is based on actual test of assembled components or on calculations	No basis for wind certification	—	• Missing info	Not addressed.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.5.E	Anchorage devices description (wind)	Detailed description of anchorage devices on which certification is based and their installation requirements	No anchorage device description	—	• Missing info	Not addressed.
1.5.G	Basis for seismic certification	State whether certification is based on actual test of assembled components or on calculation	No basis for seismic certification	—	• Missing info	Not addressed.
1.5.I	Anchorage devices description (seismic)	Detailed description of anchorage devices on which certification is based and their installation requirements	No anchorage device description	—	• Missing info	Not addressed.
1.6.B.1.b	Extra materials - filters	One (1) set of filters for each unit, packaged and labeled	No spare filter provision	—	• Missing info	Extra filter set is a contractor-furnished item; not addressed in product data.
1.7.B.2	Coil testing	Cooling and heating coils tested per ASHRAE 33	No reference to ASHRAE 33 coil test method	—	• Missing info	Only coil pressure/leak tests are described (p.36); ASHRAE 33 thermal test method not mentioned.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.8.B.1	Warranty - solid-state ignition modules	Manufacturer's standard but not less than three (3) years from Substantial Completion	No warranty period stated for ignition module/IGC	—	● Missing info	Not addressed.
2.2.B.1	Exterior casing thickness	0.05 inch thick	Casing sheet thickness not stated (only base rail min 16 gauge)	—	● Missing info	Exterior casing gauge not documented.
2.3.D	Fan section seismic fabrication	Fan section, mounting frame, housings, motors, casings and accessories reinforced to withstand seismic forces per Section Vibration and Seismic Controls for HVAC Systems	No seismic fabrication data for fan section	—	● Missing info	Not addressed.
2.6.B	Spare filters	Two (2) sets of spare filters per filter media type: one set installed for TAB, one set turned over to Owner	No spare filter provision	—	● Missing info	Contractor-furnished item; not addressed.
2.9.B.4.b	Safety - compressor minimum on time	Provided	Compressor minimum on time not mentioned	—	● Missing info	Not addressed.
2.9.B.4.c	Safety - delay between compressor stages	Provided	Delay between compressor stages not mentioned	—	● Missing info	Not addressed.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.C.2.b	Firestat safety	Stop fan and close outdoor air damper if entering air exceeds 130 deg F; additional contacts for fire alarm control panel interface	No firestat offered	—	Missing info	Firestat (130°F) not addressed.
2.10.A	Gas burner compartment heater	Electric heater with integral thermostat maintaining minimum 50 deg F in gas burner compartment	No gas burner compartment heater mentioned	—	Missing info	Not addressed.
2.11.D	Wind and seismic restraints	Metal brackets compatible with curb and casing, painted to match RTU, anchoring unit to curb, designed for project site loads per Section Vibration and Seismic Controls for HVAC	No wind/seismic restraint brackets described	—	Missing info	Not addressed.

● **Review** Needs review: partly met, option-dependent or ambiguous (73)

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.3.C	Seismic performance	RTU shall withstand earthquake motions per SEI/ASCE 7 (remain in place without separation of any parts)	Nomenclature position 16 'Packaging & Seismic Compliance: 0 = Standard'; no seismic rating or ASCE 7 statement	rtu_product_data.pdf, p. 5	● Review	Only a 'standard' seismic code is listed; no evidence unit withstands ASCE 7 seismic forces.
1.4.A	Product data content	Cut sheets, dimensional data, performance data, installation instructions, wiring diagrams, power requirements, specified options, and warranty information	Cut sheets, dimensions (pp.19-21), performance (pp.7-9,24-26), electrical data (pp.27-30) provided; installation instructions, wiring diagrams (TOC lists p.132, not included), specified options and unit warranty not provided	rtu_product_data.pdf, p. 2	● Review	Generic catalog only; project model number, selected options, wiring diagrams, IOM and warranty statement are not included.
1.4.B.1	Manufacturer technical data for each RTU	Rated capacities, dimensions, required clearances, characteristics, furnished specialties, and accessories	Rated capacities p.7/24-25, dimensions p.19-21, clearances p.20/22, options and accessory list p.14-18	rtu_product_data.pdf, p. 11	● Review	Technical data present for the RTU-10 range, but furnished specialties/accessories for this project are not identified.
1.4.C.1	LEED Credit EA 4 documentation (if LEED project)	Documentation that equipment and refrigerants comply	Refrigerant R-454B, GWP 466 stated; no LEED EA4 documentation	rtu_product_data.pdf, p. 3	● Review	Refrigerant data available but no LEED credit documentation/calculation submitted (applies only if LEED project).
1.4.C.2	LEED Prerequisite IEQ 1 documentation (if LEED project)	Documentation that units comply with ASHRAE 62.1 Section 5 - Systems and Equipment	Guide spec states condensate pan complies with ASHRAE Standard 62; no unit-level ASHRAE 62.1 Section 5 documentation	rtu_product_data.pdf, p. 34	● Review	No LEED IEQ1 documentation provided (applies only if LEED project).

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.4.D.1	Electrical shop drawings	Manufacturer's power supply wiring requirements and ladder-type wiring diagrams for interlock and control wiring, clearly differentiating factory-installed from field-installed wiring	Power supply requirements (MCA/MOCP, voltage) on pp.28-30; typical wiring diagrams listed in TOC (catalog p.132) but not included	rtu_product_data.pdf, p. 29	● Review	Ladder wiring diagrams differentiating factory vs field wiring not submitted.
1.4.D.2	Roof curb shop drawings	Details of mounting, securing, and flashing of roof curb to roof structure, with coordination requirements for roof membrane system	Roof curb drawing (standard curb drawing) shows curb section with field-supplied cant strip, flashing, roofing felt and counter flashing; curb-to-structure securing not detailed	rtu_product_data.pdf, p. 23	● Review	Generic curb drawing; mounting/securing to roof structure and membrane coordination not shown.
1.5.D	Dimensioned outline drawings (wind)	Identify center of wind force; locate and describe mounting and anchorage provisions	Dimensioned outline drawings provided with C.G.; center of wind force and anchorage provisions not identified	rtu_product_data.pdf, p. 20	● Review	Outline drawings exist but do not identify center of wind force or anchorage.
1.5.F	Manufacturer seismic qualification certification	Certification that RTU, accessories, and components withstand seismic forces per Performance Requirements and Section Vibration and Seismic Controls for HVAC Systems	Only 'Packaging & Seismic Compliance: 0 = Standard' in nomenclature; no seismic qualification certification	rtu_product_data.pdf, p. 5	● Review	Seismic topic touched by nomenclature code only; certification not provided.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.5.H	Dimensioned outline drawings (seismic)	Identify center of gravity; locate and describe mounting and anchorage provisions	RTU series-M12 C.G. X 39-7/8 in., Y 33-1/4 in., Z 18-1/2 in.; corner weights A 213, B 175, C 221, D 268 lb; std weight 878 lb; anchorage provisions not described	rtu_product_data.pdf, p. 20	● Review	Center of gravity identified; mounting/anchorage provisions not located or described.
1.5.K	Warranty submittal	Special warranty specified in this Section submitted	Only warranty statement is '3-year limited part warranty' for premium controller	rtu_product_data.pdf, p. 32	● Review	Unit/compressor/heat exchanger warranty terms not submitted.
1.7.A.2	Sound performance rating	Tested and rated per ARI 270	Outdoor sound power 79 dBA for M12; 'measured in accordance with AHRI' (standard number not stated)	rtu_product_data.pdf, p. 8	● Review	Sound data provided but rating standard (ARI/AHRI 270) not explicitly cited.
1.7.B.3	ASHRAE 62.1 compliance	Comply with ASHRAE 62.1 Section 5 (Systems and Equipment) and Section 7 (Construction and Startup)	Condensate pan 'shall comply with ASHRAE Standard 62'; no general Section 5/7 compliance statement	rtu_product_data.pdf, p. 34	● Review	Partial evidence only.
1.7.C	ASHRAE/IESNA 90.1 compliance	Comply with applicable requirements of ASHRAE/IESNA 90.1 Section 6 - HVAC	Meets DOE 2023, ASHRAE 90.1 and IECC requirements (efficiency); economizer/FDD compliance depends on economizer option	rtu_product_data.pdf, p. 3	● Review	Efficiency complies; other Section 6 items (economizer, FDD, damper leakage) require selecting economizer option (position 15 codes B/F/L/M/U/W).

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.7.E	UL compliance	Unit complies with UL 1995	Unit designed to UL 60335-1 and UL 60335-2-40; ANSI Z21.47 certified; cUL/US listed; UL 1995 not cited	rtu_product_data.pdf, p. 34	● Review	UL 60335-2-40 is the successor standard to UL 1995 for A2L rooftop units; engineer to accept as equivalent.
1.8.B.2	Warranty - control boards	Manufacturer's standard but not less than three (3) years from Substantial Completion	premium controller: 3-year limited part warranty	rtu_product_data.pdf, p. 32	● Review	3-year coverage applies to optional premium controller (control option 3); warranty for standard unit control board not stated.
2.1.A	Equipment design and selection	Unit selected in accordance with scheduled capacities on drawings (10-ton, gas heat) and this specification	RTU-10: 10 tons nominal, 118 MBH net at AHRI conditions, 3500 cfm rated; gas heat low/med/high 180/224/250 MBH input	rtu_product_data.pdf, p. 7	● Review	No equipment schedule or project selection sheet provided to verify capacity, airflow, ESP, heat size and voltage.
2.1.B.1	Basis of design	Brand A packaged rooftop series (3 to 10 ton range)	Brand X proposed; basis of design is Brand A	rtu_product_data.pdf, p. 1	● Review	Substitute for basis-of-design product; equivalence review required.
2.2.B	Exterior casing material and features	G90 galvanized steel with factory painted finish, pitched roof panels, knockouts with grommet seals for electrical and piping connections, lifting lugs	Galvanized steel, bonderized, prepainted baked enamel (0.003 in. DFT); single-piece top panel; single factory knockout for power; thru-the-base connections; rigging holes in base rails	rtu_product_data.pdf, p. 34	● Review	G90 coating class, pitched roof panels, grommet seals and lifting lugs not documented.
2.2.D.1	Casing insulation material	ASTM C 1071, Type I	Flexible fiberglass insulation with phenolic binder, neoprene coated; ASTM C 1071 not cited	rtu_product_data.pdf, p. 31	● Review	Material type consistent with duct liner but ASTM C 1071 Type I compliance not stated.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.2.D.4	Liner adhesive	Comply with ASTM C 916, Type I	Adhesive meets NFPA 90A; ASTM C 916 not cited	rtu_product_data.pdf, p. 34	● Review	Adhesive standard not documented.
2.2.E.1	Drain pan double-wall construction	Space between walls filled with foam insulation and sealed moisture-tight	Composite pan; double-wall/foam-insulated construction not described	rtu_product_data.pdf, p. 3	● Review	Pan construction details not documented.
2.2.E.3	Drain pan top surface coating	Corrosion-resistant compound	Composite pan described as corrosion resistant, 'will not rust'; no coating	rtu_product_data.pdf, p. 3	● Review	Inherent corrosion resistance in lieu of coated pan; engineer acceptance required.
2.2.F	Airstream surfaces	Surfaces in contact with airstream comply with ASHRAE 62.1	Neoprene-coated insulation on air side; drain pan complies with ASHRAE 62; no overall airstream surface statement	rtu_product_data.pdf, p. 34	● Review	Partial evidence.
2.3.C	Relief air fan	Forward curved, shaft mounted on permanently lubricated motor	Barometric relief standard with economizer; power exhaust is field-installed propeller-type accessory (12.6 FLA at 208/230V for size 12)	rtu_product_data.pdf, p. 41	● Review	Powered relief requires field accessory; propeller design differs from specified forward-curved fan.
2.3.E	Fan motor	Comply with Division 23 Section Motor Requirements for HVAC Equipment	ECM supply motor: 2.4 max bhp std/med static (5 bhp high static), 250-2000/2200 rpm, 90% efficiency, 6.4/12.6 FLA at 208/230V	rtu_product_data.pdf, p. 11	● Review	Motor data provided (also p.28); Division 23 motor section not available for comparison.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.4.A.1	Supply air (evaporator) coil construction	Aluminum plate fin, seamless copper tube, steel casing, equalizing-type vertical distributor	Evaporator coil Cu/Al 3/8 in. RTPF, 4 rows/15 FPI, 11.1 sq ft; aluminum lanced plate fins mechanically bonded to seamless copper tubes, brazed joints; TXV	rtu_product_data.pdf, p. 36	● Review	Fin/tube construction complies; steel casing and equalizing vertical distributor not documented.
2.4.A.2	Supply coil isolation	Polymer strip prevents copper coil from contacting steel coil frame or condensate pan	Polymer strip between coil and pan stated only for optional Cu/Cu coils	rtu_product_data.pdf, p. 36	● Review	Requires Cu/Cu indoor coil option (position 9 code S) or confirmation for standard Al/Cu coil.
2.4.A.3	Supply coil split	Interlaced	Single refrigerant circuit with tandem scroll compressors; 'fully active evaporator coil' at both stages	rtu_product_data.pdf, p. 37	● Review	Interlaced split not applicable to single-circuit design; full-face-active coil is functionally equivalent; engineer to accept.
2.4.A.4	Supply coil coating	Baked phenolic coating	Standard coil uncoated; optional E-coat (flexible epoxy polymer) indoor coil available	rtu_product_data.pdf, p. 36	● Review	Requires E-coat indoor coil option (position 9 code D or Q); coating is epoxy polymer, not baked phenolic.
2.4.B.1	Outdoor air (condenser) coil construction	Aluminum plate fin, seamless copper tube, steel casing, equalizing-type vertical distributor	Condenser coil Cu/Al 5/16 in. RTPF, 2 rows/18 FPI, 25.1 sq ft; aluminum lanced plate fins on seamless copper tubes	rtu_product_data.pdf, p. 11	● Review	Fin/tube construction complies; steel casing and distributor not documented.
2.4.B.2	Outdoor coil isolation	Polymer strip prevents copper coil from contacting steel coil frame or condensate pan	Polymer strip stated only for optional Cu/Cu coils	rtu_product_data.pdf, p. 15	● Review	Requires Cu/Cu outdoor coil option (position 9 code R/S) or confirmation for standard coil.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.4.B.3	Outdoor coil coating	Baked phenolic coating	Optional pre-coated outdoor coil with epoxy-phenolic fin coating; optional E-coat	rtu_product_data.pdf, p. 15	● Review	Requires pre-coat option (position 9 code B or N) or E-coat (C/P); confirm 'baked phenolic' equivalence.
2.4.C.1-3	Hot gas reheat coil construction	Aluminum plate fin, seamless copper tube, steel casing with equalizing vertical distributor; polymer strip isolation from steel frame/pan; baked phenolic coating	hot-gas reheat reheat coil Cu/Al 5/16 in. RTPF, 2 rows/18 FPI, 8.0 sq ft (option N in position 6)	rtu_product_data.pdf, p. 11	● Review	Requires hot-gas reheat option; polymer strip, casing and coating not documented.
2.5.B	Compressor	Scroll type, mounted on vibration isolators, with internal overcurrent and high-temperature protection, internal pressure relief, and crankcase heater	Tandem scroll on rubber grommets; internal line-break thermal/current overload, high discharge temperature and high pressure differential protection; crankcase heaters 'not required for normal operating range unless required by manufacturer'	rtu_product_data.pdf, p. 37	● Review	Crankcase heater not confirmed as furnished.
2.5.C.4	High pressure safety switch	Manual reset	High pressure switch trip/reset 630/505 psig (auto-reset pressure switch)	rtu_product_data.pdf, p. 11	● Review	Manual reset not documented; confirm control board lockout/manual reset behavior.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.5.C.6	Minimum off-time relay	Provided	Time Guard II (5-minute $\pm$ 2 min anti-short-cycle) field-installed accessory; not required with premium controller	rtu_product_data.pdf, p. 17	● Review	Requires Time Guard accessory (one per compressor) or premium option (control code 3).
2.5.C.8	Service valves	Brass service valves in compressor suction and liquid lines	Service gauge connections on suction and discharge lines and at filter drier; no shutoff service valves described	rtu_product_data.pdf, p. 36	● Review	Brass service valves not documented; packaged unit provides gauge ports only.
2.5.C.9	Low ambient kit high-pressure sensor	Provided	Low ambient controller is field accessory using condenser coil temperature sensor to control fan speed/cycling to 0°F	rtu_product_data.pdf, p. 17	● Review	Requires low ambient accessory (included with hot-gas reheat); sensor is temperature-based, not a high-pressure sensor.
2.5.C.10	Hot gas reheat solenoid valve	With replaceable magnetic coil	Hot gas reheat provided by hot-gas reheat option; solenoid valve/coil details not given	rtu_product_data.pdf, p. 40	● Review	Requires hot-gas reheat option (position 6 code N); replaceable coil not documented.
2.6.A.1	Pre-filter performance	Minimum 80% arrestance (ASHRAE 52.1) and MERV 5 (ASHRAE 52.2)	Standard filters: 4 ea 20x20x2 in. disposable fiberglass (MERV not stated); single filter bank; MERV-8 2 in. and MERV-13 2/4 in. options	rtu_product_data.pdf, p. 11	● Review	Standard fiberglass throwaway filters unlikely to meet 80% arrestance/MERV 5; unit has a single filter section (no separate pre/final filters).
2.6.A.2	Final filter performance	Minimum 95% arrestance (ASHRAE 52.1) and MERV 8 (ASHRAE 52.2)	MERV-8 2 in. filters (field accessory) or 4 in. MERV-13 filters (factory service option 6/7/8/9/A/B)	rtu_product_data.pdf, p. 14	● Review	Met only with filter upgrade option; 4 in. MERV-13 option not compatible with horizontal units with field-installed economizers (p.42).

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.7.A	Outdoor and return air mixing dampers	Parallel or opposed blade galvanized steel dampers mechanically fastened to cadmium-plated or galvanized steel operating rod in reinforced cabinet; rods connected with common linkage so dampers operate simultaneously	Economizer option: gear-driven opposing modulating galvanized steel blades with composite gears; actuator direct coupled, no linkage arms or control rods	rtu_product_data.pdf, p. 38	● Review	Requires economizer option (position 15 code B/F/L/M/U/W); gear drive in lieu of specified rod/linkage design (functionally equivalent, engineer to accept).
2.7.A.1	Damper motor	Modulating with adjustable minimum position	Modulating economizer with minimum and DCV maximum damper position potentiometers; spring return closed on power loss	rtu_product_data.pdf, p. 38	● Review	Complies only with economizer option selected.
2.7.A.2	Relief air damper	Gravity actuated or motorized as required by ASHRAE/IESNA 90.1, with bird screen and hood	Barometric relief damper included with economizer, relieves up to 100% return air, seals per ASHRAE 90.1; outdoor air hood; OA inlet screen 20x24x1	rtu_product_data.pdf, p. 38	● Review	Requires economizer option; bird screen on relief not explicitly documented.
2.8.A	Electrical power connection	Single point power connection; unit-mounted disconnect switch accessible from outside unit; control circuit transformer with built-in overcurrent protection	Single point gas and electrical connections standard; non-fused disconnect factory option (electrical option C/F/Q/T), accessible from outside; 24 V transformer 75 VA with resettable circuit breaker	rtu_product_data.pdf, p. 40	● Review	Disconnect requires NFDC option; RTU-10 at 208/230V std static MCA 52, MOCP 60 (p.29). Transformer protection complies (p.32).

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.B.2	VAV control (if unit is VAV)	Supply air temperature sensor for cooling; staging based on deviation from setpoint and rate of change; morning warm-up enabled at occupied start when return air temperature is below setpoint	Unit is constant-volume with 2-speed staged air volume ECM fan; no VFD/VAV control	rtu_product_data.pdf, p. 2	● Review	Not VAV capable; requirement applies only if the schedule calls for VAV operation.
2.9.B.3	Control sensors	Supply air temperature sensor, duct static pressure sensor, and space static pressure sensor for modulating economizer exhaust	premium includes return, supply and outdoor air temperature sensors; no duct static or space static pressure sensors offered	rtu_product_data.pdf, p. 32	● Review	Supply air sensor with premium option only; static pressure sensors not available (CV unit).
2.9.B.4.d	Safety - compressor anti-recycle (minimum off time)	Provided	Time Guard II accessory: 5-minute (± 2 min) delay before compressor restart; not required with premium	rtu_product_data.pdf, p. 41	● Review	Requires Time Guard accessory or premium option.
2.9.B.4.e	Safety - brown-out protection	Lock out compressors on drop in voltage	Phase monitor option provides phase loss/reversal protection; ECM fan has phase loss protection; no under-voltage/brown-out compressor lockout stated	rtu_product_data.pdf, p. 17	● Review	Brown-out (low voltage) lockout not documented; phase monitor is option code N/Q/R/T.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.B.4.f	Safety - low ambient cooling lockout	Cooling lockout at 0 deg F	Standard compressor operation to 40°F; winter start kit to 25°F; low ambient controller accessory to 0°F; economizer compressor lockout adjustable -45 to 80°F (default 32°F)	rtu_product_data.pdf, p. 34	● Review	0°F operation/lockout requires field low ambient controller (and winter start kit); with premium, winter start kit not compatible.
2.9.B.4.g	Safety - minimum heat on/off times	Provided	IGC anti-cycle protection on flame rollout/high limit; minimum heat on/off times not stated	rtu_product_data.pdf, p. 35	● Review	Heating cycle timing not documented.
2.9.B.4.h	Safety - airflow proving switch	Proper airflow required for heat or cool operation	Induced-draft combustion pressure switch and high temperature limits; no supply airflow proving switch	rtu_product_data.pdf, p. 32	● Review	Supply airflow proving switch for heat/cool not documented.
2.9.C.1	DDC controller memory	Volatile memory backup	premium: USB backup/restore, 365-day real time clock; memory backup type not stated	rtu_product_data.pdf, p. 31	● Review	Non-volatile/battery-backed memory not documented; depends on premium option.
2.9.C.2.a	Smoke detector safety	Stop fan and close outdoor air damper on smoke detection; additional contacts for fire alarm control panel interface	Factory smoke detector options (sensor codes B/C/D/K/L/M) shut down unit; controller has NO alarm initiation contacts for FACP and two Form-C auxiliary relays; economizer spring-returns closed on fan shutoff/power loss	rtu_product_data.pdf, p. 41	● Review	Requires smoke detector option; damper closure via economizer spring return.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.C.2.c	Fire alarm control panel interface	Control interface coordinated with Division 28 fire alarm sequence	Smoke detector controller contacts for FACP; horn/strobe annunciator accessory	rtu_product_data.pdf, p. 41	● Review	Interface hardware depends on options; coordination with Division 28 sequence not documented.
2.9.C.2.d	Low discharge temperature safety	Stop fan and close outdoor air damper if supply air temperature is below 40 deg F	Mixed air temperature switch stops compressors below 60°F mixed air; premium supply air tempering maintains minimum SAT with heat; no fan stop/damper close on low SAT	rtu_product_data.pdf, p. 32	● Review	Specified low-discharge safety action (stop fan, close OA damper at 40°F) not documented.
2.9.C.3	Scheduled operation	Occupied/unoccupied periods on 7-day or 365-day clock with minimum two (2) or four (4) programmable periods per day (per project edit)	premium: 365-day real time clock, 20 holiday schedules, occupied/unoccupied scheduling; periods per day not stated	rtu_product_data.pdf, p. 32	● Review	Requires premium option (control code 3); number of programmable periods per day to confirm.
2.9.C.4	Unoccupied period	Heating setback 10 deg F; cooling setback system off; override operation two (2) hours (per project edit)	premium adjustable setpoints and demand limit setpoint expansion; specific setback values and 2-hour override not stated	rtu_product_data.pdf, p. 32	● Review	Unoccupied setback/override capability not documented.
2.9.C.5	Supply fan operation	Occupied: run continuously; unoccupied: cycle to maintain setback temperature	Supply fan occupied/unoccupied operation not described (thermostat/premium controlled)	rtu_product_data.pdf, p. 31	● Review	Sequence not documented; catalog section 'Sequence of Operation' (p.154) not included.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.C.6.a-b	Refrigerant circuit operation	Occupied: cycle/stage compressors (and hot gas bypass) to match load and maintain room/discharge temperature (and humidity); cycle condenser fans for maximum hot gas pressure; low ambient kit maintains minimum hot gas pressure. Unoccupied: compressors off or cycle to setback (per project edit)	2-stage tandem compressors cycled to maintain temperature; hot gas bypass not available; low ambient controller cycles/modulates condenser fans for head pressure; humidity control via hot-gas reheat option	rtu_product_data.pdf, p. 40	● Review	Depends on options; hot gas bypass not offered (see R62).
2.9.C.7	Hot gas reheat coil operation	Occupied: humidistat opens hot gas valve for reheat and cycles compressor; unoccupied: reheat not required	hot-gas reheat hot gas reheat mode when only humidity is not satisfied (neutral leaving air)	rtu_product_data.pdf, p. 40	● Review	Requires hot-gas reheat option (position 6 code N) and humidity sensor/humidistat.
2.9.D	BAS interface protocol	Interface to Campus BAS by BACnet IP	premium controller: proprietary protocols and BACnet MS/TP	rtu_product_data.pdf, p. 31	● Review	BACnet IP not stated (MS/TP only); a BACnet router/gateway or confirmation from Brand X is required.
2.9.D.1	BAS interface relay - scheduling	Interface relay for scheduled operation	premium BAS scheduling capability; dedicated interface relay not described	rtu_product_data.pdf, p. 31	● Review	Depends on premium option; relay output for schedule not documented.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.9.D.2	BAS interface relay - fault	Fault indication at central workstation and diagnostic code storage	premium: >100 alarm codes, alarm history, Run/Alert/Fault LEDs, BAS alarm points	rtu_product_data.pdf, p. 16	● Review	Met only with premium option (control code 3).
2.9.D.3.a-i	BAS interface points	Setpoint adjustment; supply fan start/stop/status; OA damper position, supply and room air temperature and humidity; occupied/unoccupied status; constant and variable motor loads; VFD operation; cooling load; economizer cycles; duct static pressure and ventilation air volume	premium: >260 status/diagnostic points, >270 setpoints, economizer feedback, refrigerant pressures, supply/return/outdoor temperatures	rtu_product_data.pdf, p. 16	● Review	Depends on premium; room humidity, VFD status, duct static pressure and ventilation air volume points not documented (VFD/static not applicable to CV unit).
2.10.B	Convenience outlet	Duplex 115 V GFI outlet with 15 A overcurrent protection; transformer included if required	Powered convenience outlet factory option: 15 A, 115 V GFCI receptacle, factory step-down transformer, wet-in-use cover (service option 2/5/8/B)	rtu_product_data.pdf, p. 15	● Review	Requires PCO option; duplex configuration not explicitly stated. Note PCO precludes high SCCR option.
2.10.C	Low ambient kit	Provided	Low Ambient Controller to 0°F is a field-installed accessory (9 lb); included with hot-gas reheat	rtu_product_data.pdf, p. 14	● Review	Must be ordered as accessory.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.10.D	Filter differential pressure switch	Sensor tubing on either side of filter; set for final filter pressure loss	Fan filter status switch option (fan option 5/6): differential pressure switch across filter, adjustable setpoint, activates field-supplied dry contact indicator	rtu_product_data.pdf, p. 16	● Review	Requires filter status switch option; setpoint field-adjusted for final filter pressure loss; text refers to 'outside air filter' – confirm it senses return air filter bank.
2.11.A	Roof curb isolation and restraints	Vibration isolators and wind/seismic restraints per Section Vibration and Seismic Controls for HVAC Systems	Manufacturer roof curb accessory curb accessory 003 (14 in.) has no vibration isolators or restraints	rtu_product_data.pdf, p. 23	● Review	Isolation/restraint curb per Vibration and Seismic Controls section not documented.
2.11.B.1	Curb insulation and adhesive	Comply with NFPA 90A or NFPA 90B	Curb insulated panels 1 in. polyurethane foam, 1-3/4 lb density; NFPA 90A not cited	rtu_product_data.pdf, p. 23	● Review	Insulation flame/smoke compliance not documented.
2.11.B.2	Curb insulation application	Factory applied to internal surface with adhesive (ASTM C 916 Type I) and galvanized steel mechanical fasteners; airstream surface coated or faced	Insulated deck panels with 1 in. polyurethane foam; adhesive, fasteners and airstream facing not described	rtu_product_data.pdf, p. 23	● Review	Application details not documented.
2.11.C	Curb height	Fourteen (14) inches	Roof curb accessories: curb accessory 003 14 in. (356 mm) and curb accessory 004 24 in.	rtu_product_data.pdf, p. 23	● Review	14 in. curb curb accessory 003 must be specified (143 lb per p.18).

● **Complies** **Complies (17)**

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
1.3.A	Minimum efficiency requirements	Unit efficiency shall meet ASHRAE 90.1-2010 minimums	RTU-10 (M): EER 11.0, IEER 15.0 (AHRI 340/360); manufacturer states all RTU series units comply with ASHRAE 90.1-2019 and DOE-2023 minimum IEER	rtu_product_data.pdf, p. 7	● Complies	ASHRAE 90.1-2010 minimum for 65-135 MBH gas/electric units is 11.0 EER / 11.2 IEER; unit rates 11.0 EER / 15.0 IEER and is stated to meet the stricter 90.1-2019.
1.6.B.1.a	Extra materials - fan belts	One (1) set of fan belts for each belt-driven fan, packaged and labeled	Supply fan direct-drive ECM vane axial (no belts, pulleys or shafts); condenser and combustion fans direct drive	rtu_product_data.pdf, p. 3	● Complies	No belt-driven fans on unit; spare belt requirement not applicable.
1.7.A.1	AHRI energy efficiency rating	Tested and rated per AHRI 340/360	Rated in accordance with AHRI Standards 340/360; AHRI Certified mark shown	rtu_product_data.pdf, p. 7	● Complies	RTU-10 (M) AHRI ratings: 118 MBH net, 10.7 kW, EER 11.0, IEER 15.0.
1.7.B.1	Refrigeration system safety	Comply with ASHRAE 15	Guide spec: 'Unit shall be designed to conform to ASHRAE 15'	rtu_product_data.pdf, p. 34	● Complies	Note R-454B is an A2L refrigerant; unit includes UL 60335-2-40 certified leak dissipation system (p.3, p.33).
1.7.D	NFPA compliance	Comply with NFPA 90A and NFPA 90B	Insulation and adhesive meet NFPA 90A flame spread and smoke generation requirements	rtu_product_data.pdf, p. 34	● Complies	NFPA 90A stated; NFPA 90B (residential/small systems) not referenced and not applicable to this unit class.
1.7.F	Electrical components listing	Listed and labeled per NFPA 70 Article 100 by a testing agency acceptable to AHJ, marked for intended use	cUL/US listing mark; UL-listed and certified as total package	rtu_product_data.pdf, p. 7	● Complies	Also stated in guide spec p.34.

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.2.D	Casing insulation and adhesive standard	Comply with NFPA 90A or NFPA 90B	Insulation and adhesive meet NFPA 90A	rtu_product_data.pdf, p. 34	● Complies	Also stated p.31.
2.2.D.3	Liner airstream surface	Coated with erosion- and temperature-resistant coating, or faced with plain or coated fibrous mat or fabric	Insulation neoprene coated on the air side	rtu_product_data.pdf, p. 34	● Complies	Coated airstream surface.
2.2.E.2	Drain pan connection	Threaded nipple	3/4 in. 14 NPT drain connection (bottom or side)	rtu_product_data.pdf, p. 34	● Complies	Threaded connection; size also on p.11.
2.3.B	Belt-driven supply air fan (if belt drive)	Double-width forward-curved centrifugal; permanently lubricated single-speed motor on adjustable fan base resiliently mounted in casing; aluminum or painted steel wheel; galvanized or painted steel scroll	No belt-driven supply fan offered (direct drive on all static options)	rtu_product_data.pdf, p. 37	● Complies	Not applicable; unit is direct drive (see R49 for fan type deviation).
2.5.C.2	Expansion valve	Thermostatic expansion valve with replaceable thermostatic element	TXV with removable power element allowing bulb/element change without removing valve body	rtu_product_data.pdf, p. 36	● Complies	Also listed on p.11 (Metering Device: TXV).

Spec section	Requirement	Required	Proposed product	Source	Status	Remarks
2.5.C.3	Refrigerant filter/dryer	Provided	Solid-core refrigerant filter drier with pre/post service gauge connections	rtu_product_data.pdf, p. 36	● Complies	Standard.
2.5.C.5	Low pressure safety switch	Automatic reset	Low pressure switch trip/reset 54/117 psig	rtu_product_data.pdf, p. 11	● Complies	Automatic reset.
2.5.C.7	Compressor motor thermal overload	Automatic reset	Compressor internal line-break thermal/current overload; 'automatic reset, motor thermal overload protector'	rtu_product_data.pdf, p. 37	● Complies	Internal line-break overload is automatic reset (also p.32 item B.5).
2.9.B.1	Unit controls	Completely factory packaged	Factory-installed unit control board standard; premium DDC factory-installed and tested option	rtu_product_data.pdf, p. 16	● Complies	Controls factory packaged.
2.9.B.4.a	Safety - pressure cutouts	High and low pressure cutouts, one per refrigerant circuit	High and low pressure switches standard; one refrigerant circuit	rtu_product_data.pdf, p. 3	● Complies	One HP/LP pair for the single circuit (p.11, p.32).
2.11.B	Roof curb materials	Galvanized steel with corrosion protection coating, watertight gaskets, factory-installed wood nailer; complying with NRCA standards	18 gauge formed galvanized steel curb, wood nailer strip, gasket supplied with curb, designed to conform to NRCA standards	rtu_product_data.pdf, p. 23	● Complies	Also p.34 item B.8 and p.41 item 17.

Reviewer notes. The product data is the manufacturer's generic Product Data catalog (Rev D), not a project-specific submittal; several catalog sections (fan data for other sizes, wiring diagrams p.132+, sequence of operation p.154+) are not included in the provided file. File page numbers (1-42) differ from printed catalog page numbers (e.g., printed p.159-170 guide specifications = file pp.31-42, printed p.104-106 electrical data = file pp.28-30). Dimension drawings on pp.19-23 are reduced and partly hard to read. The specification itself contains unedited template placeholders (wind speed, building category, heating setback, refrigerant, fan type) and is dated 2011; refrigerant and UL standard requirements are outdated relative to current EPA AIM Act and UL 60335-2-40 requirements.

