



Submittal

*The Trane Company
A Division of American Standard Inc.*

Prepared For:
NEBB Practical

Sold To:
NEBB Practical

Job Name:
NEBB Practical Building C

Products Included in this Submittal Package:

<i>Qty</i>	<i>Description</i>
4	Blower Coil Air Handling Units
1	Package Climate Changer Air Handler

Tag Data - Fan Coil Air Handling Units

Item	Tag(s)	Qty	Description	Model Number
A1	FCU-04 & 08	2	Blower Coil Air Handler	BCHB0181G
A2	FCU-03 & 07	2	Blower Coil Air Handler	BCHB0241G
A3	FCU-01, 02, & 06	3	Blower Coil Air Handler	BCHB0361G
A4	FCU-05	1	Blower Coil Air Handler	BCHB0481G

Product Data

Item A1 Qty: 2 Tag(s): FCU-04, FCU-08

Blower Coil - horizontal unit
 Horizontal configuration
 Unit size 18 - 1 1/2 ton
 Matt faced insulation - 1"
 Main water coil - 2 row
 No auxiliary water coil
 Right hand main coil connections
 Stages of heat - 1
 Kilowatt - 4.0
 Magnetic contactors - 24 volt
 Electric heater line fuse
 Motor, drive and control box located on the same side as the coil connections
 Unit voltage - 277/60/1
 Motor - 60hertz (1750 RPM)
 1/3 motor horsepower
 Drive D - 690 rpm
 Pleated throwaway filter - 2"
 Thermostat control interface

Product Data

Item A1 Qty: 2 Tag(s): FCU-03, FCU-07

Blower Coil - horizontal unit
 Horizontal configuration
 Unit size 24 - 2 ton
 Matt faced insulation - 1"
 Main water coil - 6 row
 No auxiliary water coil
 Right hand main coil connections
 Stages of heat - 2
 Kilowatt - 7.5
 Magnetic contactors - 24 volt
 Electric heater line fuse
 Motor, drive and control box located on the same side as the coil connections
 Unit voltage - 460/60/3
 Motor - 60hertz (1750 RPM)
 1/2 motor horsepower
 Drive D - 920 rpm
 Pleated throwaway filter - 2"
 Thermostat control interface

Product Data

Item A1 Qty: 3 Tag(s): FCU-01, FCU-02, FCU-06

Blower Coil - horizontal unit
 Horizontal configuration
 Unit size 36 - 3 ton

Matt faced insulation - 1"
Main water coil - 6 row
No auxiliary water coil
Right hand main coil connections
Stages of heat - 2
Kilowatt - 10
Magnetic contactors - 24 volt
Electric heater line fuse
Motor, drive and control box located on the same side as the coil connections
Unit voltage - 460/60/3
Motor - 60hertz (1750 RPM)
1/2 motor horsepower
Drive D - 1060 rpm
Pleated throwaway filter - 2"
Thermostat control interface

Product Data

Item A1 Qty: 1 Tag(s): FCU-05

Blower Coil - horizontal unit
Horizontal configuration
Unit size 48 - 4 ton
Matt faced insulation - 1"
Main water coil - 6 row
No auxiliary water coil
Right hand main coil connections
Stages of heat - 2
Kilowatt - 15
Magnetic contactors - 24 volt
Electric heater line fuse
Motor, drive and control box located on the same side as the coil connections
Unit voltage - 460/60/3
Motor - 60hertz (1750 RPM)
1/2 motor horsepower
Drive D - 985 rpm
Pleated throwaway filter - 2"
Thermostat control interface

Performance Data

Tags	FCU-04 & 08	FCU-03 & 07	FCU-01, 02, & 06	FCU-05
Design airflow (cfm)	375	500	750	1000
ESP (in H ₂ O)	0.17	0.3	0.36	0.39
TSP (in H ₂ O)	0.20	0.4	0.48	0.5
Fan speed (rpm)	690	920	1060	985
Actual motor bhp (hp)	0.05	0.12	0.29	0.36
Elevation (ft)	0.00	0.00	0.00	0.00
Installed weight (lb)	77.60	130.40	144.30	158.10
Filter APD (in H ₂ O)	0.01	0.02	0.03	0.03
Cooling EDB (F)	74.00	74.00	74.00	74.00
Cooling EWB (F)	61.00	61.00	61.00	61.00
Cooling LDB (F)	60.10	50.90	50.90	57.50
Cooling LWB (F)	53.80	49.53	49.53	54.60
Total cooling capacity (MBh)	11.85	15.80	23.69	31.59
Sensible cooling capacity (MBh)	9.36	12.47	18.71	24.95
Cooling ent fluid temp (F)	42.00	42.00	42.00	42.00
Cooling lvg fluid temp (F)	52.50	52.50	52.50	52.50
Cooling flow rate (gpm)	2.26	3.01	4.51	6.02
Cooling fluid PD (ft H ₂ O)	2.10	2.22	2.60	2.65
Cooling face velocity (ft/min)	300	300	300	300
Fluid freeze pt (F)	32.00	32.00	32.00	32.00

Mechanical Specifications

BCHB General

The product consists of a horizontal air handling unit, electric heating coils, and mixing boxes. Air handlers consist of Trane hydronic cooling and heating coils, drain pan, and centrifugal fan with motor and drive mounted in a common cabinet for independent air delivery from a single unit. Drive location and coil connections are independent for the same or opposite side location. Air handlers are provided with knockouts in all four corners allowing the unit to be suspended with threaded rods.

Casing

Casing – The casings (structural components) are structured of 18 gauge galvanized steel.

Fan Housing – The fan housing sides are directly attached to the air handler top and bottom panels, strengthening the entire unit assembly.

Access Panels – The coil access panels are located on both sides of the air handler and allow easy removal of the internal coil and drain pan. The main access panels provide generous access to the fan, motor, and drive from both sides of the air handler.

1" [26 mm] Matt Insulation

The interior surface of the unit casing is acoustically and thermally lined with 1 inch [26 mm] 1.9 lb./cu. ft. [30.4 kgs. cu. m.] R-Value of 4.2 density glass fiber with high density facing. The insulation is UL listed and meets NFPA-90A and UL 181 standards.

Water Coil

The main coils are two, four, or six row, designed for chilled or hot water. Auxiliary coils are one or two row, designed for heating only in the preheat or reheat position. All coils use highly efficient Wavy 3BS aluminum fins, at 144 fins per foot [.305 m], which are mechanically bonded to 3/8 inch [10 mm] O.D. seamless copper tubes. All coils are

specifically designed and circuited for water use. All coils are factory tested with 450psi [212 L/s] air under water to check for leaks and rigidity of joints. Maximum standard operating conditions are 300psi [141 L/s], 200 degrees F [93 degrees C.] Sweat type connections are standard.

2-Stage Electric Coil

Factory provided and mounted, UL recognized, resistance open-type, two stage heater with a disc-type automatic thermal primary safety device. Heater element material is nickel-chromium. The heater terminal box is provided with 7/8" [22 mm] knockouts for customer power supply. Terminal connections are plated steel with ceramic or phenolic insulators.

Magnetic Contactors

A 24 volt electric heater contact for use with Terminal Unit Controller (T.U.C.) or Thermostat Control Interface.

Reset Backup Protection

Secondary Manual Reset Backup Protection is provided.

Fan

The fans are forward curved, centrifugal blower type equipped with heavy-duty adjustable speed V-belts drives. The fan shaft is supported by heavy-duty, permanently sealed ball bearings. All fans are dynamically balanced. All air handlers have a single fan.

2" [52 mm High Efficiency Filter

A 2 inch [52 mm] high efficiency (50%) filter(s). Quantity of one for sizes 12, 18, 24; two for sizes 36, 54, 72; three for sizes 90, 120.

60 Hertz Motor

A 60 Hertz, 1750 RPM motor has a plus or minus 10% voltage utilization range. The motor is open drip-proof with permanently sealed ball bearings, internal overloads protection, and minimum 1.15 service factor and size 56 resilient base frames. The

motor is factory installed and wired to the air handler junction box and factory set to the sales order voltage.

Drain Pan

The drain pan is made of white plastic that is sloped in both directions and is fully drainable. The coils mount above the drain pan, not in the drain pan, thus allowing the drain pan to be fully inspected and cleaned. The drain pan can also be removed for cleaning. The drain pan connections are unthreaded 3/4 inch [19 mm] schedule 40 PVC for solvent bonding. The main drain connection is at the lowest point of the drain pan. An auxiliary drain connection is provided on the same side as the main connection.

4X4 [102 mm X 102 mm] Junction Box

The unit is provided with a 4 inch X 4 inch [102 mm x 102 mm] junction box mounted on the drive side of the unit for motor power wire termination.

Thermostat Control Interface

The thermostat control interface is intended to be used with a field supplied low voltage thermostat or controller. The control box contains a line voltage to 24 volt transformer; a one, two, or three pole fan contactor; and a disconnect switch. The wires from the fan contactor and the low voltage side of the transformer are pulled and terminated on the inside of the two-sided terminal strip. The end devices are mounted and the wires are pulled and terminated on the inside of the two-sided terminal strip. All customer connections other than power are on the outside of the two-sided terminal strips.

Performance Data

Tags	AHU-01
Design airflow (cfm)	3000
Rated Voltage	460/60/3
ESP (in H2O)	1.22
TSP (in H2O)	2.50
Fan Wheel Size in.	12X9
Max rpm	1500.00
Min Des cfm	1500.00
Max design cfm	3600.00
Fan speed (rpm)	1270
Motor HP	3
Actual motor bhp (hp)	2.09
Elevation (ft)	0.00
Installed weight (lb)	232.00
Filter - 2in. Angle section	4-20X25X2
Filter APD (in H2O)	0.06
Cooling EDB (F)	74.00
Cooling EWB (F)	60.61
Cooling LDB (F)	50.40
Cooling LWB (F)	49.77
Total cooling capacity (MBh)	90.05
Sensible cooling capacity (MBh)	76.50
Cooling APD (in H2O)	0.82
Cooling ent fluid temp (F)	42.00
Cooling lvg fluid temp (F)	54.00
Cooling flow rate (gpm)	15.00
Cooling fluid PD (ft H2O)	1.60
Cooling face velocity (ft/min)	500
Fluid freeze pt (F)	32.00
Cooling numb of rows	8
Cooling coil number fins/inch.	9.00



Mechanical Specifications

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General

Packaged Climate Changer, air handlers are UL listed in the United States and Canada and comply with ARI 410, ARI 430, and NFPA 90A.

Casing

The unit casing is heavy-gage galvanized steel. All unit access panels and the wet section casing are double-wall construction with foamed-in-place insulation. All other sections are insulated with one-inch, 1-1/2 lbs. per cubic foot density fiberglass insulation using either matt facing or optional foil facing. Coil access panels are on both sides of the unit and allow easy access to clean the drain pan and remove internal coils. Fan access panels provide access to the fan, motor, and drive from both sides of the unit.

Mounting brackets are on all corners of the unit and optional sections to secure units to the floor or ceiling and connect optional sections.

All units have a drain pan and centrifugal fan with motor and drive mounted in a common cabinet. Motor and drive locations can be on the same side as the unit coil connections or on the opposite side.

Drain Pan

The drain pan is non-corrosive and double sloped to allow condensate drainage. The drain pan construction is a double-wall, foamed-in-place assembly of PVC material or optional stainless steel. Coils mount above the drain pan to allow easy drain pan inspection and cleaning.

The drain connection is 3/4" unthreaded and is positioned at the lowest point of the drain pan. In addition, unit sizes 3 and 6 are equipped with an auxiliary drain connection.

Hydronic Coils

Hydronic coils have 1/2" OD x 0.016" W round seamless copper tubes mechanically bonded to coil fins. Coil fins are aluminum, continuous Delta-Flo™ type H with full fin collars that provide maximum fin-tube contact and accurate spacing. Coils are available with 9, 12, and 14 fins per inch.

Heating coils are available in one or two-row configurations. Cooling coils are

available in four, six, or eight-row configurations. Multi-row coils have continuous tube circuits arranged for counterflow (water flow counter to the direction of unit airflow). Coils have 16 gauge galvanized steel casings. A foam sealing strip between casing (top and bottom) channels and fins helps eliminate air bypass and reduce potential water carryover. Coils have round seamless copper pipe headers with NPT external thread steel pipe connections. Coils have one vent and one drain connection consisting of 3/8" NPT internal thread copper adapter with steel square head pipe plug. Supply and return connections are located outside the unit casing (on the same side of the unit) and are clearly labeled to facilitate field piping. Coils are proof tested at 450 psig and leak tested at 300 psig air-under-water. Maximum standard operating conditions are 300 psig at 200 F.

Direct Expansion (DX) Coils

DX coils use refrigerant 22 and have 1/2" OD x 0.016" W round seamless copper tubes expanded into full fin collars for permanent fin-tube bond. Coil fins are continuous Delta-Flo™ H aluminum with full fin collars for maximum fin-tube contact and accurate spacing. Coils are available with 9, 12, and 14 fins per inch, in four and six-row configurations. The coil casing is 16-gauge G90 galvanized steel. A foam sealing strip between the casing (top and bottom) channels and fins helps eliminate air bypass and reduce potential water carryover. Coils have round, seamless, copper pipe liquid lines and suction headers with male sweat connections. Suction headers have bottom connections to aid drainage of any oil that may collect in the coil. Liquid line and suction connections are outside the unit casing (on the same side of the unit) to facilitate field piping. Connections are clearly labeled to ensure coils are piped correctly. Coils have venturi type distributor assemblies designed with a vertical downflow feed for low pressure drops.

Four-row coils have 3/16" distributor(s) and OD x 0.016" W round seamless copper tubes. Six-row coils have 1/4" distributor(s) and OD x 0.025" W round seamless copper tubes.

Each refrigeration circuit has one distributor. Coil circuiting options are:

- Single refrigeration circuit for unit sizes 3 through 10
- Horizontal face split circuiting (two distributors) for unit sizes 8 through 25
- Horizontal face split circuiting (four distributors) for unit size 30
- Intertwined circuiting (two distributors) for unit sizes 8 through 14
- Intertwined circuiting (four distributors) for unit sizes 17 through 30

Coils are proof tested at 450 psig and leak tested at 300 psig air-under-water. Coils are dehydrated and sealed with a dry nitrogen charge. Maximum standard operating conditions are 300 psig at 127 F with R-22.

Steam Coils (Type NS)

A one-row steam distributing coil is available in the pre-heat or reheat position. Steam coils are non-freezing and are pitched to ensure adequate condensate drainage. Coils have 1" OD x 0.031" W round seamless copper condensing tubes expanded into full fin collars for permanent fin-tube bond. Coil headers are cast iron for permanent leaktight joints. Coils have continuous Sigma-Flo™ aluminum fins with full fin collars for maximum fin-tube contact and accurate spacing at 6 fpi. The coil casing is 16-gauge G90 galvanized steel. Coil headers are gray cast iron with NPT internal thread connections. Supply, return, and vacuum breaker connections are located at the same end of the unit and clearly labeled to ensure coils are piped correctly. Distributor tubes are 7/16" OD copper. Also, they have die-formed, accurately spaced directional kinetic orifices that discharge steam in the direction of condensate flow (toward the return connection) to ensure even steam distribution across the coil face area and push out condensate. Distributor tubes are located concentrically within condensing tubes using corrosion resistant support clips. Supply header steam deflectors prevent impingement of steam into tubes in supply connection area. Coils are proof tested at 300 psig and leak tested at 200 psig air-under-water. Maximum standard operating conditions are 100 psig at 400F.

Mechanical Specifications

Fan

Units have a single, galvanized, forward curved, centrifugal blower type fan. The fan shaft is supported by permanently lubricated bearings with a 200,000 hour, L50 design life. The fan is dynamically balanced.

Drives

Drives are available either fixed or variable pitch, with V-belt sheaves.

An optional factory mounted and wired variable frequency drive (VFD) is available for fan speed modulation in a VAV application.

Filters

The unit is available with two-inch 30% efficient flat filters. All filters are standard sizes. An optional accessory filter section is available with either:

- Four-inch 30% efficient pleated media filter in a flat-faced configuration
- Two-inch 30% efficient angle filter.

Motors

Motors are open drip proof with permanently sealed ball bearings. Single-phase motors are available for 208-230/60/1 or 277/60/1 electrical operation. Three phase motors are available for 208-230/60/3, 460/60/3, 575/60/3, or 380-415/50/3 electrical operation. All single-phase motors and fractional horsepower three-phase motors have internal current and thermal overload protection, a minimum 1.15 service factor, and 56 frame resilient bases. Three-phase motors, one horsepower and larger, have a 1.15 minimum service factor and require external current overload protection. Motors are in compliance with EPACT where applicable.

Mixing Section

The mixing section construction is heavy gage galvanized steel and has two low-leak, parallel blade dampers with edge and jamb seals. Dampers are Ruskin CD60 type double-skin airfoil design or equivalent. Damper blades are 14-gauge galvanized steel and damper frames are 16-gauge galvanized steel. The damper has a ½" drive for use with an optional factory-mounted actuator. The mixing section has two side access panels to allow access of internal components.

Face and Bypass Section

Low-leakage face and bypass dampers are provided as scheduled on drawings. Dampers are Ruskin CD60 type double-skin airfoil design or equivalent. Damper blades are 14-gauge galvanized steel and damper frames are 16-gauge galvanized steel. Damper blades are opposed-type blades, with metal compressible jamb seals and extruded vinyl blade edge seals. Blades rotate on stainless steel sleeve bearings. Face and bypass dampers are mechanically linked together and provide end driven control shafts. Leakage rate does not exceed five cfm/ft² at one-inch wg. and nine cfm/ft² at four-inch wg.

Electric Heat

The electric heat is an open-wire resistance heater and factory-installed in the reheat position. The heater has primary and secondary protection circuits, with up to four electric heat staging. The heaters may be controlled by either magnetic or mercury contactors. All heaters are UL recognized and available with an optional airflow switch. Optional line fuses are for units drawing less than 48 amps. Line fuses are standard on units drawing more than 48 amps. Optional door interlocking disconnect switches are available on units drawing less than 100 amps.

Control Interface

An optional control interface is available that includes a disconnect switch, fused transformer, fan contactor, and customer terminal strip for field-provided controls.

Also, various end device options are available with the control interface.

Binary end device options are:

- Low limit protection
- Condensate overflow switch
- Fan status switch
- Filter status switch

Analog end device options are:

- Discharge air sensor
- Mixed air sensor
- Damper actuator

Tracer AH540 Controller

The Tracer AH540 is factory-configured per unit configuration and order information. The controller is applied to air handling product configurations supporting analog modulating valves, econo-

mizer damper, and face and bypass damper. The controller supports a constant volume, variable air volume supply fan, and mixed air control.

There are seven analog inputs, five analog outputs, six binary inputs, and two binary outputs. In addition the AH540 controller follows the LonMark™ profiles of Space Comfort Space Comfort Controller (SCC) and Discharge Air Controller (DAC).

The seven analog inputs include:

1. Space temperature (5 to 122°F)
2. Space setpoint (50 to 85°F)
3. Fan mode switch (off, auto)
4. Discharge air temperature (-40 to 212°F)
5. Outdoor air temperature (-40 to 212°F)
6. Mixed air temperature (-40 to 212°F)
7. Duct static pressure (VAV) (0 to 1250 Pascal's).

The five analog outputs are:

1. Supply fan speed (VAV units only)
2. Cooling valve output (water)
3. Heating valve output (water or steam)
4. Face and bypass damper output
5. Outdoor air damper output

The binary inputs include:

1. Low temperature detection (freezestat)
2. Run/stop (smoke, condensate, etc)
3. Occupancy
4. Supply fan status
5. Filter status
6. Exhaust fan status

Binary outputs include:

1. Supply fan start/stop
2. Exhaust fan start/stop

