



Guide Specification – Base Unit

Base Bid Temprite Model CMA __ make-up air unit(s) designed for outdoor application. The unit discharge shall be designed for easy adaptation to external duct work or optional accessories. The unit(s) shall be capable of delivering __ SCFM at __ ESP using a __ horsepower (open) (TEFC) motor operating on 115/230/1/60 or 208/230/460/575/3/60.

BURNER SECTION

The line burner shall be capable of delivering __ BTUH firing on (natural gas) (propane) at an inlet pressure of __ (inches water column) (PSIG). The standard ETL listed unit will meet ANSI, FM, and IRI requirements. Both burner and blower shall be compensated for an altitude of __ feet above sea level. Manifold to be located outside of air stream and shielded from atmospheric conditions by means of a protective compartment with hinged access. An observation port shall be located to provide view of main flame.

Unit(s) shall be supplied with a wide range burner with a modulating turndown ratio of 25:1. Adjustable profile plates shall be provided and sized to maintain the required velocity across the line burner. The operation of the burner shall be programmed through the ignition controller with timed prepurge and flame-sensed by means of a flame rod.

The burner assembly and gas manifold shall be completely prepiped and factory tested prior to shipment and shall be controlled by a (discharge duct stat) (discharge duct stat with room override control).

UNIT CASING

Unit casing and accessories shall be fabricated from heavy-gauge galvanized steel and extruded aluminum frame. The base of the unit shall be extruded aluminum with built in curb adapter (horizontal units only). All casings shall be airtight and weather-proof. Roof panels shall be convex to prevent ponding, and designed with a standing seam to prevent water entrainment. Cabinet shall be designed with roof eaves to prevent water from getting into wall panels. Complete access shall be provided to all components through gasketed, hinged access doors. This includes the motor, blower, burner, electrical components and manifold sections.

BLOWER SECTION

Each unit shall be supplied with centrifugal forward curve, DWDI fan rated in accordance with AMCA standards. The fan shall be mounted on a heavy-duty polished steel shaft designed for a maximum operating speed not to exceed 75% of its first critical speed. Bearings are to be heavy-duty industrial prelubricated type. Blowers to be

driven by a V-belt package sized with a capacity of 25% greater than the motor horsepower. Multiple belt applications will be matched sets. Drives are to be (fixed) (adjustable). Motor to be mounted on adjustable slide base. Door safety interlock switch shall be provided for protection when blower access door is opened

CONTROL ENCLOSURE

The unit(s) shall be supplied with a control compartment and all controls mounted within this compartment are to be wired to a numbered terminal strip. All wiring is to be color coded in accordance with the NEC. A circuit diagram is to be laminated to the inside of the control cabinet door. All electrical components shall bear a recognized label.

CONTROLS

1. Main fan starters and overloads
2. Control circuit fuse
3. High temperature limit switch
4. Flame rod sensor
5. Ignition module
6. Main gas automatic shutoff valves
7. Two stage valve for inputs up to 329 MBH or Maxitrol modulation series 14
8. Air proving differential switches
9. Factory wired motorized inlet damper c/w end switch
10. Control transformer

OPTIONAL ACCESSORIES

1. V-bank filter box with filters
2. Inlet hood and birdscreen with or without filters
3. Insulation
4. Full perimeter roof curb (horizontal unit only)
5. Timed freeze protection
6. Vibration hangers
7. Mild weather shutdown
8. Clogged filter switch
9. Disconnect switch
10. 20 gauge liner
11. Maxitrol modulation Series 44
12. High pressure regulator (required over 1/2 PSIG and up)
13. Circuit analyzer
14. Remote panel control
15. Vertical arrangement with support stand and inlet birdscreen
16. Mixing dampers with TracRite control package
17. Internal blower/motor isolation (horizontal units only)



Guide Specification – TracRite Control System

Unit shall have outside air and return air dampers with modulating actuator controlled by TracRite DDC control system. The TracRite DDC control system shall have capability to digitally control the outside air quantity from a nominal minimum of 20% to 100% with integrated gas valve control at all room concentrations of CO₂.

The return air inlet shall include a self-calibrating flow measuring station with a grid of velocity pressure probes with spacing no greater than 12" over the entire face of the return air opening and sampled every two seconds. Samples will be added to a twenty-five point rolling average and then on to a second rolling average to provide smooth, accurate data that is delivered to the TracRite DDC control system every two seconds. The DDC control system shall be capable of electronically displaying the return air/outside air ratio within 5% accuracy at all damper positions.

The TracRite DDC control module shall have full BACNET compatibility. Display shall have a minimum of two line, sixteen character display.

The TracRite DDC control system shall be capable of controlling mixing dampers in: (Choose One)

Manual Mode: The "Manual" mode allows manual positioning of the outside air (O.A.) damper and return air (R.A.) damper by changing the damper position setpoint.

Mixed Air Temperature Mode: The "Mixed

Air Temperature" mode shall provide automatic control of the mixed air temperature by modulating the O.A. damper and R.A. damper to maintain the mixed air temperature setpoint. As the mixed air temperature increases above the setpoint more outside air will be introduced.

Building Pressure Mode: The "Building Pressure" mode shall provide automatic building pressure control by modulating the O.A. damper and R.A. damper to maintain the indoor building pressure setpoint. As the building pressure decreases below the setpoint more outside air will be introduced.

The TracRite DDC control system shall include but not limited to the following controls required for standard operation:

- Electronic time clock with normal, holiday, and override schedules.
- Timed freeze protection to prevent heater from discharging unheated air into the building.
- Inlet On-Off ductstat which will turn burner off when inlet temperature equals desired discharge air temperature as fuel savings mode.
- On-Off night setback thermostat for lower operating temperatures in unoccupied mode as fuel savings mode.
- Keypad and display for remote control capabilities.
- Indicating lights for maintenance trouble shooting.



Guide Specification – TracRite Control System

The display functions of the remote keypad display for the TracRite DDC control system shall include but not be limited to the following:

- Return air temperature
- Outside air temperature
- Discharge air temperature
- Mixed air temperature
- Maximum allowable temperature rise
- Actual temperature rise
- Current percent of outside air
- Current building pressure (optional)
- Current damper input voltage
- Current burner input voltage
- Fan operating hours since last reset
- Fan start cycle count since last reset
- Burner operating hours since last reset
- Burner start cycle count since last reset
- Cooling interlock operating hours since last reset
- Cooling interlock cycle count since last reset
- Critical alarm conditions:
 - Airflow switch failure
 - Unit on, fan off
 - Unit off, fan on
 - Low discharge temperature
 - Safety circuit open
 - Burner jumped

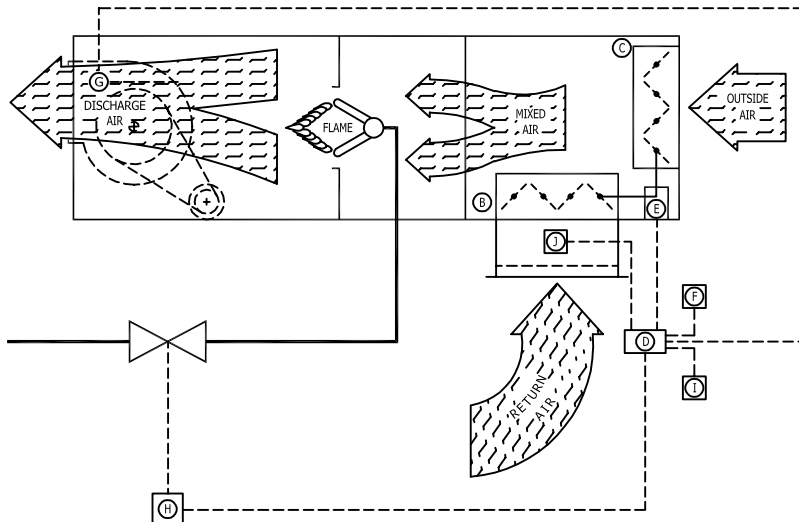
The control settings available on the remote keypad display for the TracRite DDC control system shall include but not be limited to the following:

- Heating setpoint
- Cooling setpoint
- Economizer options
- Setback setpoint
- Freeze protection setpoint
- Maximum discharge air temperature setpoint
- Minimum discharge air temperature setpoint
- Minimum ventilation option and setpoint
- Time of day schedule selection and setpoints
 - Normal 5/7 schedule
 - Holiday schedule
 - Manual override

Sequence of Operation – Return Air Units

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OPERATION WITH RETURN AIR UPSTREAM OF BURNER



Signal from remote control I to TracRite Controller D, sets operational parameters for dampers B and C, and burner. Damper operation can be manual, building pressure or mixed air temperature.

Return air dampers B, and outside air dampers C, are interlocked to move together. As one opens, the other closes. As the return air dampers open, allowing more return air to enter the unit, the outside air dampers move toward the closed position, decreasing the amount of outside air. Pressure sensor and flow station J, senses change in return airflow and signals TracRite Controller D.

Modulating gas valve H, regulates gas supply in response to signal from TracRite Controller D. TracRite Controller D, varies signal based on input from room temperature sensor F, discharge temperature sensor G, and airflow sensor J. Gas valve H can provide approximately 4% to 100% of rated burner capacity.