



# Guide Specification – Base Unit

Base Bid Temprite Model TMC \_\_\_ 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 \_\_\_ CFM at \_\_\_ ESP using a \_\_\_ horsepower (open) (TEFC) motor operating on 208/230/460/3/60.

## BURNER SECTION

The line burner shall be capable of delivering \_\_\_ BTUH firing on (natural gas) (propane air mixture) at an inlet pressure of \_\_\_ (inches water column) (PSIG) and in accordance with (manufacturer's standard) (FM) (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 pilot and 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 flame safeguard with timed prepurge and flame-sensed by means of a (flame rod) (ultra violet scanner).

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 suitably reinforced to insure rigidity. The base of the unit shall be adaptable for curb mounting. All casings shall be airtight and weatherproof. 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(s) rated in accordance with AMCA standards. The fan or fans 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). Maximum outlet velocity \_\_\_ FPM. Motor to be mounted on adjustable slide base. Motor cover shall be provided for protection when control cabinet door is open.

## 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 the U.L. label.

## CONTROLS

1. Main fan starters and overloads
2. Control circuit fuses
3. High temperature limit switch
4. Flame safeguard with alarm contacts
5. Flame rod sensor
6. Ignition transformer
7. Automatic pilot valve
8. Main gas automatic safety shutoff valve
9. Maxitrol modulation series 14
10. Air proving differential switch
11. Freeze protection
12. Control transformer

## OPTIONAL ACCESSORIES

1. Motorized inlet damper or discharge damper
2. V-bank filter box with filters
3. Inlet hood and birdscreen with or without filters
4. Insulation
5. Roof curb (fan to discharge within unit perimeter)
6. Extended grease lines
7. Vibration feet and hangers
8. Mild weather shutdown
9. Clogged filter switch
10. Disconnect switch
11. U.L. labeled control panel
12. Painted galvanized casing
13. Vertical arrangements
14. Mixing box with filters and automatic or manual dampers
15. Maxitrol modulation Series 44
16. High gas pressure regulator (required over 1/2 PSIG through 900 MBH input and over 5 PSIG for all larger inputs)
17. UV flame detection (mini or purple peeper)
18. Circuit analyzer (up to 10 points)
19. Remote control panel
20. TracRite control system

# Guide Specification – TracRite Control System



**NOTE: Canadian standards do not allow recirculation on direct fired units.**

Unit shall have mixing box with outside air and return air dampers with modulating actuator controlled by TracRite DDC control system. The TracRite DDC control system. In the heating operation the TracRite DDC control system shall digitally control the outside air quantity from a nominal minimum of 20% to 100% with integrated gas valve control at all room concentrations of CO<sub>2</sub>. In the cooling operation the TracRite DDC control system shall digitally control the outside air quantity from a nominal minimum of 0% to 100%.

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. Samples shall be smoothed to provide accurate data that is delivered to the TracRite DDC controller 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 shall be introduced.

**Building Pressure Mode:** The TracRite DDC control system shall be capable of controlling mixing dampers in "Building Pressure" mode. The manufacturer shall provide a pressure transducer capable of detecting positive and negative building pressure in the range of -0.05" W.C. to +0.05" W.C. 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 shall be introduced.

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

- Time of day operation with normal, holiday, and override schedules.
- Timed freeze protection to prevent heater from discharging unheated air into the building.
- Inlet temperature economizer shall turn burner off when inlet temperature equals desired discharge air temperature as fuel savings mode.
- Heating and cooling On-Off night setback control in unoccupied mode as fuel savings.
- Keypad and display for remote control capabilities and alarm indication.
- 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 setpoint
- 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