

## **Standards & Certifications**

### **ARES Rooftop & Indoor Indirect Fired Gas**

#### A. All units must have:

1. AGA & CGA listed duct furnace(s) that conform to ANSI standards for safe performance.
2. AMCA blowers tested in accordance with publication 211.
3. ETL listed blower sections.

#### B. Fuel and Burners:

1. Duct furnace(s) suitable for operation with Natural Gas or LP
2. Burners shall be formed with stamped porting and 304 stainless steel port inserts to prevent scaling or foreign matter from obstructing the burner parts.
3. Burners must be individually removable for ease of cleaning and servicing. The entire burner assembly must be removable with a slide-out drawer design.

#### C. Heat Exchanger:

1. The heat exchanger shall be constructed of 20 gauge 409 stainless steel tubes mechanically bonded and 20 gauge headers, with 304 stainless steel baffles. 5 year warranty.

#### D. Venting System:

1. The Flue Collector shall be constructed of Aluminized steel.
2. All units shall be provided as Power Vented units. Outside air for the combustion and products of combustion have individual inlet and discharge grilles located on furnace service panel. The Power Venter shall be provided with a centrifugal switch to prove operation back to the ignition module.

#### E. Gas Control and Ignition System:

1. A solid state ignition system that ignites the burner by hot surface ignition each cycle of operation shall be provided. When flame is proven, the main burner valve shall continue to allow gas flow to the burners. Burners must be extinguished during the off cycle.

#### F. Valve:

1. Unit shall be provided with gas valve suitable for NEC Class 2 use, for maximum inlet of 4 – 7” W.C. on natural gas and 14” LP. The 24-volt combination automatic gas valves must include a main operating valve and manual shut-off. Valves must provide 3.5 inches W.C. to the burners.

#### G. Gas Controls:

1. Standard two-stage duct sensing gas valve, staging from 100% high fire to 50% of rated input on low fire. Units shall operate in response to a duct thermostat or a optional room thermostat override thermostat.
2. Optional Electronic Modulating Duct sensing thermostat for Natural and LP gas. Unit shall be provided with an automatic valve in series with the modulating valve to cycle the unit. Ignition shall fire at 100% of rated input and modulate the gas valve input to 40% of the rated input. The unit will modulate in response to a signal from the discharge duct sensor, optional room override thermostat.
3. Optional Electronic Modulating Gas Space sensing thermostat for Natural and LP gas. Unit shall be provided with an automatic valve in series with the modulating valve to cycle the unit. Ignition shall fire at 100% of rated input and modulate the gas valve input to 40% of the rated input. The unit will modulate in response to a signal from the ductstat, and/or optional room override thermostat.
4. An optional signal conditioner reading a 0-10 mV or 4 – 20 mV signal is also available.
5. Optional single stage gas valve, and duct thermostat.

#### H. Mechanical Arrangement

Units shall consist of:

1. A Single, Dual, or Triple Duct Furnace arrangement (175 – 1200 MBH). The firing rate of any single furnace shall not exceed 400 MBH. Each duct furnace shall have its own heat exchanger (409 stainless steel), power venter, Flue collector, Burners, and Safety / Ignition controls.
2. Blower section containing supply blower(s) with galvanized housing, galvanized wheel, steel shaft, and ball bearings, blower motor, cast iron pulley and adjustable sheave.
3. Electrical cabinet isolated from the air stream with a removable access panel located behind the outer service panel. Includes provision for factory provided component mounting, wiring, and high voltage field wiring connections.
4. Optional Outside and Return Air section with dampers may be provided. Dampers shall be parallel blade, with blade seals, of galvanized steel construction with nylon bushings, and blades interlocked to operate from single point actuator.
5. Return air shall enter through a bottom return air opening.
6. The Filter Section shall accommodate 1” disposable filters accessible through side service panels.

7. An optional down discharge airflow supply plenum shall be available.
8. An evaporative cooler with standard 2" rigid media sized not to exceed 350 FPM shall be provided. The Evaporative Cooler shall be furnished with a 304 stainless steel reservoir pan, thermally protected fractional voltage pump, regulated water flow, and bleed-off protection. The distribution tube shall be of schedule 40 PVC construction.

I. Cabinet:

1. Cabinetry shall be die-formed G90, 20 gauge minimum Galvanized steel, with tops cross broke for added strength, and to prevent water pooling on unit top.
2. Large service panels (2 panels) shall be provided of easy lift out design.
3. Furnace bottom and flue collection box shall be insulated with fire resistant, odorless, environmentally safe 1" foil face insulation. Down Discharge plenum to be internally insulated with 1" mastic backed insulation.
4. Cabinet shall not exceed 39" in height from top of roof curb or support base.

J. Mounting:

1. Rooftop units shall be provided with lifting hangars (field installed) and will be suitable for slab or curb mounting.

K. Supply Blower:

1. Motor shall be Open Drip Proof type with permanently lubricated ball bearings, and adjustable sheaves, standard NEMA frame size and service factor and Class B windings. Two speed motor option available.

L. Voltage:

1. Motor shall be available at all voltages and have horsepower ratings up to 10 h.p.
2. Motor wiring shall be enclosed in flexible metallic sheathed BX conduit.
3. Motor shall be activated through a Magnetic Motor Starter.
4. Motors not thermally protected internally shall be protected by IEC overload protection.

M. Damper Motor:

1. Damper motor shall be a Two Position Spring Return type, and shall operate at 24 or 120 volts AC.
2. Motor and control wiring shall be harnessed wiring with terminal block connections. Wire shall have a minimum temperature rating of 105° C outside of the duct furnace.
3. The Two Position Spring Return damper motor linked with outside air and return air dampers shall drive the outside air damper fully open with the return air damper fully closed, or in the opposite in response to the position of the return air switch on the remote console. When power is off to the unit, the motor will close the outside air damper, and open the return air damper.
4. Modulating damper motor with potentiometer adjustment on the remote console shall be available with spring return capabilities.

N. Electrical Systems:

1. All electrical components shall be UL listed or recognized.
2. All wire shall be rated to meet or exceed electrical requirements for voltage, ampacity, and dielectric strength of sheathing and temperature rating per location. Minimum temperature rating shall be 105°C.
3. All high voltage wiring shall be enclosed in flexible metallic sheathed BX and include the identifying marker corresponding to the wiring diagram.
4. All control wiring shall terminate at terminal strips with an identifying marker to correspond with the wiring diagram marker.
5. Unit Control Panel includes 24 volt transformer, HSI control module, line and low voltage terminal blocks, blower motor starter and overload (if motor not thermally protected), time delay, fuse block, pump relay, combustion blower relay, and air proving switch (indoor units).
6. Remote Control Panel (field installed) to have push button control with status indicator lights (off / cool / vent / heat). Optional R/A two position switch, and two speed motor switch included on panel. Electronic modulation set point control and damper modulation control is shipped separately for field mounting by others.

O. Standard Safety and Control Provisions:

1. Each duct furnace shall be provided with (2) two 24-volt high temperature limit switch and a 24 - volt fan safety switch.
2. A centrifugal proving switch shall be provided integral to the power venter on all gas fired units to disengage power to gas valve if power venter fails to operate.