SECTION 23 42 00 – NON-THERMAL PLASMIC DISINFECTION DEVICE

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This Section includes the following:

1.1.2 UL listed indoor air quality system Non-Thermal Plasmic Disinfection (NTPD) installed in [Air Handler] [Return Air Grille] [Supply Air Grille] [Ductwork]. I mounted inside the air handling units or packaged units; The disinfection module shall be installed before the particulate filter.

1.1.3 The disinfection device shall be capable of receiving 120v or 220v single-phase power.

1.1.4 Please see drawings for a schedule of sizes.

1.2 SUBMITTALS

1.2.1 Product Data: Manufacturer's literature for NTPD Systems indicated.

1.2.2 Dimensions, weights, capacities, and ratings.

1.2.3 Wiring diagrams and control panel.

1.2.4 NTPD system components and accessories.

1.2.5 Static pressure drop of the NTPD system into the air handling unit or air stream for each size of air handling unit scheduled.

1.2.6 Catalog cuts, engineering data sheets, list of unit numbers, NTPD output, and power

consumption.

1.2.7 Operation and Maintenance data: For NTPD systems to include in emergency operations and maintenance manuals:

1.2.7.1 Provide catalog cuts of equipment and components.

1.2.7.2 Include instructions for emitter replacement and component replacement.

1.2.7.3 Provide spare parts list.

1.2.7.4 Provide a wiring diagram.

1.2.7.5 Provide installation, operation, and maintenance manuals.

1.3 QUALITY ASSURANCE

1.3.1 System to be factory tested and the design, construction, and installation to be in accordance

with all state, local, federal, or other regulations having jurisdiction.

1.3.2 Competency of Supplier/Manufacturer/Installer

1.3.3 The supplier/manufacturer/installer of the NTPD system is to have a qualified service

Organization. The organization has a history of competent third-party testing that conforms to ASHRAE standard 241.

1.4 WARRANTY

1.4.1 The NTPD system shall be warranted to be free from defects in material and workmanship for five (5) years.

1.4.2 Operation of the system shall be a minimum of 10 years without replacement or major service.

PART 2 - MANUFACTURING

2.1 MANUFACTURERS

2.1.1 Basis-of-Design Product shall be Reviveaire Aireshield: Subject to compliance with requirements, acceptable manufacturers are:

1. Reviveaire LLC
2.
3.

PART 3 - PRODUCT SPECIFICATION: Reviveaire Aireshield Disinfection Module/Filter

3.1 Product Overview

The Reviveaire Aireshield™ is an active non-thermal plasma disinfection module designed for integration into HVAC systems for advanced air purification. Installed in a 1" filter slot, Aireshield delivers superior air quality performance by inactivating pathogens, both DNA based and RNA based, agglomerating ultrafine particles, and oxidizing VOCs, while maintaining extremely low pressure drop. It provides **MERV 13–16 equivalency** with a passive MERV 8 or MERV 10 filter, offering both energy savings and enhanced indoor air quality, while maintaining low resistance to airflow.

The Aireshield is design to accommodate 120v or 220v and 50hz or 60hz. The onboard control /power pack shall module automatically to any of the above power supply.

The operating life shall be minimum 10 years without replacement, consumables, and cleaned only twice per year with water or a factory supplied cleaning bit for hand drills.

3.2 Performance Standards

- **Filtration Class Equivalency:** MERV 13–16 (via active particle agglomeration with MERV 8–10 filter media)
- **Test Standards:**
  - ASHRAE 52.2 (MERV equivalency)
    - 0.1% solution of potassium chloride was injected into the test chamber using a Laskin nozzle aerosol generator
    - Cumulative Particle Number Concentration 16.5-604.3nm (#/cc)

- ASHRAE 241 (airborne pathogen control)
- UL 2998 (zero ozone emission)

- **Efficiency Ranges (equivalent when paired with MERV 8):**
  - **E1 (0.3–1.0 µm): ≥50%**
  - **E2 (1.0–3.0 µm): ≥85%**
  - **E3 (3.0–10.0 µm): ≥95%**
- **Pathogen Performance:**
  - **SARS and Omicron: >99.9% efficacy**
  - **MS2 Bacteriophage Inactivation: >97.2% efficacy**

3.3 Construction

- **Core Module:**
  - Solid-state non-thermal plasma generator embedded in structural cartridge
  - Aerospace grade Aluminum front and back plates
  - 316F stainless steel pins with rare earth minerals enhancing plasma field and catalyzing Ozone
- **Media Compatibility:**
  - Works with standard MERV 8 or MERV 10 panel filters (not included)
- **Safety:**
  - Ozone-suppressing materials with active ion containment using rare earth materials
- **Frame:**
    - ABS Plastic
    - Die-cut with corner supports for structural rigidity

3.4 Dimensions and Sizes

- **Available Sizes in inches (nominal):**
    - 10x20x1, 14x20x1, 16x20x1, 16x25x1, 20x20x1, 20x25x1 (custom sizes available)
- **Nominal Thickness:** 1 inch
- **Actual Thickness:** 0.875"

3.5 Operating Conditions

- **Maximum Operating Temperature:** 160°F (71°C)
- **Initial (sustained for life) Pressure Drop:** 0.22” w.g. at 500 FPM
- **Power Requirements:** 12–24V AC/DC, 3–5W typical draw
- **Life Expectancy:** 3+ years under normal operating conditions

- **Maximum Operating Temperature:** 180°F (82°C)
- **Recommended Final Resistance:** 1.0” w.g.
- **Initial Resistance @ 500 FPM:** Approximately 0.30” w.g.

3.6 Applications

- Commercial HVAC systems (offices, schools, retail)
- Residential HVAC systems (central air handlers, furnaces)
- Healthcare and long-term care facilities
- Pre-filtration enhancement for HEPA/ULPA systems
- Ideal for WELL/LEED projects or ASHRAE 241 compliance upgrades

3.7 Certifications & Compliance

- **UL 2998 Certified:** Zero ozone generation
- **CSA 22.2, No. 187-20:** 1 PPB
- **Conforms to ASHRAE Standard 241:** Infection risk management
- **Complies with ASHRAE 52.2 via MERV-equivalent performance**

3.8 Installation & Maintenance

- **Installation:** Drop-in installation into standard 1" filter track; observe airflow direction marked on module.
- **Or:** in 2” filter track, use the 1” Aireshield with a 1” particle filter
- **Or:** in 4” filter track, use the 1” Aireshield with a 2” particle filter separated with a divider factory supplied.
- **Maintenance:** Visual inspection or illumination of yellow or red service lights (Typically every 6 months):
    - Use factory supplied felt tool drill bit
    - Or wash with water
- **Service Life:** 10 to 15 years without replacement
- **Filter Maintenance:** Compatible MERV 8–10 filters should be replaced every 2–3 months

PART 4 - EXECUTION

4.1 INSTALLATION

4.1.1 Install per manufacturer's recommendation.

4.2 TRAINING

4.2.1 Train Maintenance personnel to adjust, operate, and maintain the system.

4.2.2 Provide maintenance personnel a minimum of 3 hours of classroom and hands-on training.

4.3 MAINTENANCE

4.3.1 Each NTPD device has a fiber cleaning tool bit to match the diameter of the plasma pin and chamber.

4.3.2 The NTPD device shall be designed to be easily removable, requiring no tools. The device shall be designed to quickly release the power supply control box for servicing or cleaning.

4.3.3 No chemicals shall be required or used to clean the NTPD device.

4.3.4 Pre-filter mesh protective screen shall be designed in such a way to be removable, cleanable with water, and reinstalled without the need for any tools.

END OF SECTION 23 42 00