

## EVT-028 AND EVT-036 ENERGY RECOVERY VENTILATORS

### APPLICATION

The EnERVent is an energy recovery ventilator with auxiliary heating and cooling capabilities. It is designed to provide outside air into a building without increasing the building HVAC load. The EnERVent is classified as a neutral air unit providing outside air into the building at room temperature.



### STANDARD CONSTRUCTION

#### FRAME

Modular aluminum

#### CABINET

Galvanized steel, fully insulated double wall

#### BLOWERS

Silent Pro Series Class II FC

#### ACCESS DOORS

Hinged double wall with 1/4 turn latches

#### WHEEL

AHRI certified polymeric Enthalpy Wheel, complete with rotation sensor

#### FILTERS

2" pleated, MERV 8

#### FINISH

Polyester resin based powder coat

#### CONTROL

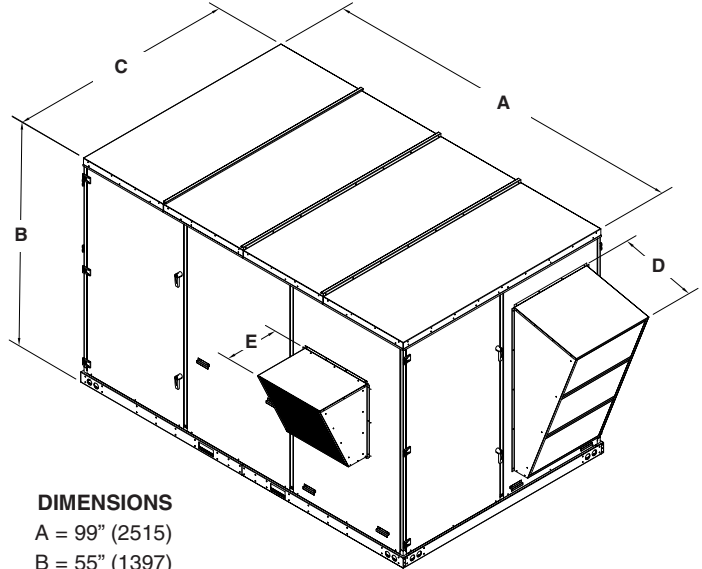
Digital programmable logic controller. Single point wiring with NEMA 3R disconnect.

#### WEIGHT

Installed: 2,000 lbs

Shipping: 2,200 lbs

Dimensions in parenthesis ( ) indicate millimeters.



#### DIMENSIONS

A = 99" (2515)

B = 55" (1397)

C = 55" (1397)

D = 14" (356)

E = 18" (457)

## ENERVENT

### OPTIONS

#### HEATING / COOLING

- R-410A DX COIL
- Chilled water coil
- Hot water coil
- Electric heat (pre & post)

#### FROST CONTROL

- Timed exhaust frost control
- Variable wheel speed frost control
- Electric Preheat

#### FILTERS

- 2" (51) Pleated MERV 11 or MERV 13 filters

#### DAMPERS

- Actuated exhaust air damper
- Actuated intake air damper

#### SENSORS

- Electronic Airflow Measuring
- Smoke Detectors
- CO<sub>2</sub> Sensors
- Dirty Filter Sensors

#### BLOWER MOTOR

- ODP or TEFC motors available

#### INTAKE LOUVER

- EME Wind Driven rain louver

#### ROOF CURBS

#### GFCI SERVICE OUTLET

#### CUSTOM PAINT

#### VFD BLOWER CONTROL

#### SENSIBLE WHEEL ONLY

| Model<br>EVT-028<br>or<br>EVT-036 | QTY. | MOTOR DATA |       |       | Roof Curb |     | Other (List) | TAG |
|-----------------------------------|------|------------|-------|-------|-----------|-----|--------------|-----|
|                                   |      | Voltage    | Phase | Cycle | 14"       | 24" |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |
|                                   |      |            |       |       |           |     |              |     |

## SPECIFICATIONS AND ELECTRICAL DATA

|                     |                 | EVT-028         |                 |                   | EVT-036          |                 |                   |
|---------------------|-----------------|-----------------|-----------------|-------------------|------------------|-----------------|-------------------|
| Line Voltage - 60Hz |                 | 230v/3ph        | 460v/3ph        | 575v/3ph          | 230v/3ph         | 460v/3ph        | 575v/3ph          |
| Supply Air Blower   | Motor HP L/M/H  | 1.5 / 2 / 3     | 1.5 / 2 / 3     | 1.5 / 2 / 3       | 2 / 3 / 5        | 2 / 3 / 5       | 2 / 3 / 5         |
|                     | Drive Type      | Belt            | Belt            | Belt              | Belt             | Belt            | Belt              |
|                     | Size (DxW)      | 12 x 6          | 12 x 6          | 12 x 6            | 12 x 9           | 12 x 9          | 12 x 9            |
|                     | Blower Speed    | 2069            | 2069            | 2069              | 2058             | 2058            | 2058              |
|                     | Adjustment      | Sheave          | Sheave          | Sheave            | Sheave           | Sheave          | Sheave            |
|                     | Bearing Type    | Ball            | Ball            | Ball              | Ball             | Ball            | Ball              |
|                     | Full Load Amps  | 4.2 / 5.6 / 8.6 | 2.1 / 2.8 / 4.3 | 1.56 / 2.08 / 3.4 | 5.6 / 8.6 / 12.8 | 2.8 / 4.3 / 6.4 | 2.08 / 3.4 / 5.1  |
|                     | Service Factor  | 1.15            | 1.15            | 1.15              | 1.15             | 1.15            | 1.15              |
| Exhaust Air Blower  | Motor HP L/M/H  | 1 / 1.5 / 2     | 1 / 1.5 / 2     | 1 / 1.5 / 2       | 1.5 / 2 / 3      | 1.5 / 2 / 3     | 1.5 / 2 / 3       |
|                     | Drive Type      | Belt            | Belt            | Belt              | Belt             | Belt            | Belt              |
|                     | Size (DxW)      | 12 x 9          | 12 x 9          | 12 x 9            | 12 x 12          | 12 x 12         | 12 x 12           |
|                     | Blower Speed    | 2058            | 2058            | 2058              | 2091             | 2091            | 2091              |
|                     | Adjustment      | Sheave          | Sheave          | Sheave            | Sheave           | Sheave          | Sheave            |
|                     | Bearing Type    | Ball            | Ball            | Ball              | Ball             | Ball            | Ball              |
|                     | Full Load Amps  | 3.0 / 4.2 / 5.6 | 1.5 / 2.1 / 2.8 | 1.08 / 1.56 / 3.4 | 4.2 / 5.6 / 8.6  | 2.1 / 2.8 / 4.3 | 1.56 / 2.08 / 3.4 |
|                     | Service Factor  | 1.15            | 1.15            | 1.15              | 1.15             | 1.15            | 1.15              |
| Wheel Data          | Potential Volts | 208/230v/1ph    | 208/230v/1ph    | 208/230v/1ph      | 208/230v/1ph     | 208/230v/1ph    | 208/230v/1ph      |
|                     | Motor Speed     | 1725 RPM        | 1725 RPM        | 1725 RPM          | 1725 RPM         | 1725 RPM        | 1725 RPM          |
|                     | Full Load Amps  | 1.1             | 1.1             | 1.1               | 1.2              | 1.2             | 1.2               |
|                     | Wheel Model     | ERC-3628        | ERC-3628        | ERC-3628          | ERC-4136         | ERC-4136        | ERC-4136          |
|                     | Depth           | 3               | 3               | 3                 | 3                | 3               | 3                 |
|                     | Dia. (Nom. in.) | 38              | 38              | 38                | 42               | 42              | 42                |
| Preheat             | No. of Stages   | 1               | 1               | 1                 | 2                | 2               | 2                 |
|                     | kW/Stage        | 4.8             | 4.8             | 4.8               | 4.8              | 4.8             | 4.8               |
|                     | MCA/Circuit     | 14.4            | 7.2             | 6                 | 14.4             | 7.2             | 6                 |
|                     | MOCP            | 15              | 8               | 6                 | 30               | 15              | 15                |
| Post Heat           | No. of Stages   | 1               | 1               | 1                 | 2                | 2               | 2                 |
|                     | kW/Stage        | 19.2            | 19.2            | 19.2              | 19.2             | 19.2            | 19.2              |
|                     | MCA/Circuit     | 28.88           | 14.44           | 12.05             | 28.88            | 14.44           | 12.05             |
|                     | MOCP            | 30              | 15              | 15                | 60               | 30              | 25                |
|                     | Total MCA       | 57.8            | 28.9            | 24.1              | 115.6            | 57.8            | 48.2              |
|                     | Point Power     | Separate        | Separate        | Separate          | Separate         | Separate        | Separate          |
| Total               | MCA Minimum     | 87              | 4.7             | 2.46              | 12.8             | 6               | 2.76              |
|                     | MOCP Minimum    | 10              | 5               | 3                 | 15               | 10              | 3                 |
|                     | MCA Maximum     | 58.58           | 29.84           | 25.95             | 109.16           | 55318           | 45.8              |
|                     | MOCP Maximum    | 60              | 30              | 30                | 115              | 60              | 50                |

| Effectiveness |              | Sensible | Latent | Total | Sensible | Latent | Total |
|---------------|--------------|----------|--------|-------|----------|--------|-------|
| AHRI Ratings  | Total @ 100% | 68%      | 60%    | 65%   | 68%      | 60%    | 65%   |
|               | Total @ 75%  | 74%      | 67%    | 71%   | 74%      | 67%    | 71%   |
|               | Net @ 100%   | 68%      | 60%    | 63%   | 68%      | 60%    | 63%   |
|               | Net @ 75%    | 74%      | 67%    | 70%   | 74%      | 67%    | 70%   |

# AIRFLOW PERFORMANCE

| EVT-028 SUPPLY AIR PERFORMANCE RATINGS |                       |                                     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------|-----------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| AIR VOLUME (CFM)                       | OUTLET VELOCITY (FMP) | EXTERNAL STATIC PRESSURE (in. w.g.) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                                        |                       | 0.00                                |      | 0.50 |      | 1.00 |      | 1.50 |      | 2.00 |      | 2.50 |      | 3.00 |      | 3.50 |      |
|                                        |                       | RPM                                 | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  |
| 1600                                   | 1951                  |                                     |      | 876  | 0.57 | 1033 | 0.75 | 1177 | 0.95 | 1309 | 1.15 |      |      |      |      |      |      |
| 1800                                   | 2317                  |                                     |      | 941  | 0.81 | 1083 | 1.02 | 1215 | 1.24 | 1338 | 1.47 | 1454 | 1.70 | 1564 | 1.95 | 1668 | 2.20 |
| 2200                                   | 2683                  | 865                                 | 0.87 | 1006 | 1.10 | 1136 | 1.34 | 1257 | 1.59 | 1372 | 1.84 | 1481 | 2.10 | 1585 | 2.37 | 1684 | 2.64 |
| 2500                                   | 3049                  | 950                                 | 1.21 | 1076 | 1.47 | 1196 | 1.74 | 1308 | 2.01 | 1414 | 2.29 | 1516 | 2.57 | 1614 | 2.87 | 1709 | 3.17 |
| 2800                                   | 3415                  | 1032                                | 1.62 | 1145 | 1.91 | 1255 | 2.20 | 1361 | 2.50 | 1461 | 2.81 | 1555 | 3.12 | 1648 | 3.44 |      |      |

| EVT-028 EXHAUST AIR PERFORMANCE RATINGS |                       |                                     |      |      |      |      |      |      |      |      |      |      |      |      |     |      |     |
|-----------------------------------------|-----------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|------|-----|
| AIR VOLUME (CFM)                        | OUTLET VELOCITY (FMP) | EXTERNAL STATIC PRESSURE (in. w.g.) |      |      |      |      |      |      |      |      |      |      |      |      |     |      |     |
|                                         |                       | 0.00                                |      | 0.50 |      | 1.00 |      | 1.50 |      | 2.00 |      | 2.50 |      | 3.00 |     | 3.50 |     |
|                                         |                       | RPM                                 | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP | RPM  | BHP |
| 1600                                    | 1416                  | 645                                 | 0.29 | 852  | 0.46 | 1024 | 0.64 |      |      |      |      |      |      |      |     |      |     |
| 1800                                    | 1681                  | 712                                 | 0.44 | 899  | 0.63 | 1060 | 0.84 | 1204 | 1.05 |      |      |      |      |      |     |      |     |
| 2200                                    | 1947                  | 772                                 | 0.61 | 943  | 0.84 | 1094 | 1.07 | 1231 | 1.31 | 1357 | 1.56 | 1473 | 1.82 |      |     |      |     |
| 2500                                    | 2212                  | 834                                 | 0.83 | 991  | 1.09 | 1133 | 1.35 | 1263 | 1.61 | 1383 | 1.88 | 1495 | 2.16 |      |     |      |     |
| 2800                                    | 2478                  | 890                                 | 1.09 | 1037 | 1.37 | 1171 | 1.66 | 1294 | 1.95 | 1409 | 2.25 |      |      |      |     |      |     |

| EVT-036 SUPPLY AIR PERFORMANCE RATINGS |                       |                                     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------|-----------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| AIR VOLUME (CFM)                       | OUTLET VELOCITY (FMP) | EXTERNAL STATIC PRESSURE (in. w.g.) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                                        |                       | 0.00                                |      | 0.50 |      | 1.00 |      | 1.50 |      | 2.00 |      | 2.50 |      | 3.00 |      | 3.50 |      |
|                                        |                       | RPM                                 | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  |
| 2400                                   | 2124                  |                                     |      | 939  | 0.94 | 1088 | 1.19 | 1222 | 1.44 | 1346 | 1.71 | 1462 | 1.98 | 1570 | 2.26 |      |      |
| 2700                                   | 2389                  |                                     |      | 987  | 1.21 | 1126 | 1.48 | 1224 | 1.76 | 1373 | 2.05 | 1484 | 2.34 | 1589 | 2.65 | 1689 | 2.95 |
| 3000                                   | 2655                  | 888                                 | 1.20 | 1032 | 1.51 | 1164 | 1.82 | 1285 | 2.12 | 1399 | 2.44 | 1506 | 2.75 | 1608 | 3.08 | 1705 | 3.41 |
| 3300                                   | 2920                  | 944                                 | 1.52 | 1078 | 1.86 | 1202 | 2.19 | 1318 | 2.53 | 1428 | 2.87 | 1531 | 3.21 | 1629 | 3.56 | 1723 | 3.92 |
| 3600                                   | 3186                  | 999                                 | 1.89 | 1125 | 2.26 | 1243 | 2.62 | 1353 | 2.99 | 1458 | 3.36 | 1557 | 3.73 | 1652 | 4.10 | 1744 | 4.48 |

| EVT-036 EXHAUST AIR PERFORMANCE RATINGS |                       |                                     |      |      |      |      |      |      |      |      |      |      |      |      |     |      |     |
|-----------------------------------------|-----------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|------|-----|
| AIR VOLUME (CFM)                        | OUTLET VELOCITY (FMP) | EXTERNAL STATIC PRESSURE (in. w.g.) |      |      |      |      |      |      |      |      |      |      |      |      |     |      |     |
|                                         |                       | 0.00                                |      | 0.50 |      | 1.00 |      | 1.50 |      | 2.00 |      | 2.50 |      | 3.00 |     | 3.50 |     |
|                                         |                       | RPM                                 | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP  | RPM  | BHP | RPM  | BHP |
| 2400                                    | 1667                  |                                     |      | 932  | 0.86 | 1090 | 1.14 |      |      |      |      |      |      |      |     |      |     |
| 2700                                    | 1875                  | 809                                 | 0.80 | 974  | 1.08 | 1123 | 1.38 | 1259 | 1.70 | 1385 | 2.03 |      |      |      |     |      |     |
| 3000                                    | 2083                  | 859                                 | 1.02 | 1013 | 1.33 | 1154 | 1.65 | 1284 | 1.99 | 1405 | 2.35 | 1519 | 2.72 |      |     |      |     |
| 3300                                    | 2292                  | 908                                 | 1.27 | 1053 | 1.61 | 1186 | 1.96 | 1310 | 2.32 | 1427 | 2.70 | 1537 | 3.09 |      |     |      |     |
| 3600                                    | 2500                  | 956                                 | 1.56 | 1094 | 1.93 | 1220 | 2.31 | 1338 | 2.69 | 1450 | 3.09 |      |      |      |     |      |     |

## NOTES

1. This blower data accounts for the pressure drop across the Energy Recovery Wheel and the internal cabinet losses, but does **not** include the pressure drop for selected Accessories and Options which can be found in the corresponding tables and must be added to the External Static Pressure to determine correct RPM and BHP.
2. BHP rating does not include drive losses.
3. Performance ratings do not include the effects of appurtenances in the air stream.
4. Drives are sized for a minimum of 150% of driven horsepower.

|  |                                                                                                |
|--|------------------------------------------------------------------------------------------------|
|  | LOW SPEED                                                                                      |
|  | MED SPEED                                                                                      |
|  | HIGH SPEED                                                                                     |
|  | Empty space means this operating point is outside the efficient operating range of the blower. |

# ENERVENT SUGGESTED SPECIFICATION

## GENERAL

Ruskin Energy Recovery Ventilator shall be listed per UL 1995, Heating and Cooling Equipment. Energy transfer ratings of the energy recovery wheel shall be AHRI Certified. Performance shall be as scheduled on plans. Exhaust discharge and outside air intake shall not be located on the same side on roof top units. Basis of design is Ruskin Model EVT.

## UNIT CASING AND FRAMES

EVT frame shall be constructed of aluminum. EVT panels shall be G90 galvanized steel. All panels exposed to the weather shall be a minimum of 18 gauge galvanized steel. EVT shall be internally lined with galvanized sheet metal creating a double wall. Where top panels are joined there shall be an overlapping, standing seam to insure positive weather protection. All metal-to-metal seams shall be factory sealed, requiring no caulking at job site. EVT base to be designed for curb mounting. EVT base shall overhang the curb for a positive seal against water run-off. Ruskin EVT exterior panels shall be powder coated for superior finish.

## WEATHERHOODS

Weatherhoods shall be the same finish as the ERV. Outdoor air weatherhood shall incorporate a hooded design and moisture eliminator.

## INSULATION

EVT casing to be insulated with 1 inch fiberglass. Insulation shall meet requirements of NFPA 90A and tested to meet UL 181 requirements. Insulation to be enclosed in double wall construction.

## ENERGY RECOVERY WHEEL

Wheel shall be of the enthalpy type for both sensible and latent heat recovery and be designed to insure laminar flow. Energy transfer ratings must be AHRI Certified to Standard 1060 and bear the AHRI certification symbol for AHRI Air-to-Air Energy Recovery Ventilation Equipment Certification Program based on AHRI 1060. Ratings "in accordance with 1060" without certification are not acceptable. Desiccant shall be silica gel for maximum latent energy transfer. Wheel shall be constructed of lightweight polymer media to minimize shaft and bearing loads. Polymer media shall be mounted in a stainless steel rotor for corrosion resistance. Wheel design shall consist of removable segments for ease of service and/or cleaning. Silica gel desiccant shall be permanently bonded to wheel media to retain latent heat capability after cleaning. Wheels with sprayed on desiccant coatings are not acceptable. Wheels with desiccant applied after wheel formation are not acceptable. Energy recovery device shall transfer moisture entirely in the vapor phase. Energy recovery drive belt material shall be prestretched high strength urethane and shall be factory installed, eliminating the need for field belt tension adjustment. Link style belts are not acceptable.

## FREE COOLING MODE

The on-board control logic shall automatically cease energy recovery when outside air conditions are within a 40°F to 70°F (4°C to 21°C) temperature range to allow for space cooling. During the free cooling period, the wheel shall automatically jog at preset time intervals to purge wheel of moisture and contaminant build up.

## ACCESS DOORS

All components shall be easily accessible through hinged access doors for exhaust, supply, filter, and damper compartments. Energy recovery wheels shall be mounted in a slide-out track for inspection, removal, and cleaning.

## ROOF CURBS

Roof curb to be supplied by EVT manufacturer for field assembly. Curb shall consist of die formed galvanized steel sections. Curb shall be full perimeter type with gasket provided for field installation between curb and EVT base.

## FAN SECTIONS

Centrifugal fans to be double width, double inlet, forward curved type. All blower wheels shall be statically and dynamically balanced. Steel fan shafts shall be ground and polished and shall be mounted in permanently lubricated, sealed ball bearing pillow blocks. Bearings shall be selected for a minimum (L10) life in excess of 100,000 hours at maximum cataloged operating speeds. Adjustable sheaves on belt-driven fans with motors less than 15hp shall allow independent balancing of exhaust and supply airflows. Fan and motor assemblies are mounted to EVT base with neoprene isolators as standard. Fans shall be located in draw-through position in reference to the energy recovery wheel.

## MOTORS AND DRIVES

Motors shall be energy efficient, complying with EPACT standards, for single speed ODP and TEFC enclosures. Motors shall be permanently lubricated, heavy-duty type, matched to the fan load and furnished at the specified voltage, phase, and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the fully machined cast type, keyed and securely attached to the fan wheel and motor shafts; 10 horsepower and less shall be supplied with an adjustable drive pulley. Energy wheel motors shall have integral overload protection.

## FILTERS

Supply and exhaust filters shall be 2-inch thick pleated fiberglass with a minimum MERV 8 rating. MERV 11 or 13 filters are optional. Filter racks shall be die-formed galvanized steel.

## ELECTRICAL

All internal electrical components shall be factory wired for single point power connection. Units with electric preheat or post heat will be wired with independent power supply. All electrical components shall be UL Listed, Approved, or Classified where applicable and wired in compliance with the National Electrical Code. Weatherproof, integral door interlocking disconnect switch, motor starters, control circuit fusing, control transformer for 24 VAC circuit, and terminal strip shall be supplied as standard components in the control center. Motor starters consist of a contactor and Class 20 electronic adjustable overload protection and shall be provided for all motors in the unit. Ruskin's ER optimizer PLC controller is included to control all unit functions and outputs and will be fully compliant with BAS systems including LONWORKS, BACNET, and MODBUS.

## DX COOLING COILS

Direct expansion (DX) shall be factory tested and rated in accordance with AHRI 410. Coils shall have rifled copper tubes with permanently expanded aluminum fins and shall be equipped with adjustable expansion valve connected to distributors.

## CHILLED AND HOT WATER COILS

Water coils shall be factory tested and rated in accordance with AHRI 410. Coils shall have copper tubes with permanently expanded aluminum fins.

## ELECTRIC HEAT COILS

Electric heat shall be UL listed and circuit fused per NEC over 48 amps. Heater shall be sequentially controlled via on-board sequencers. Electric heat shall be factory wired and installed. Control will be 24 volt with class 2 transformer. Standard air flow proving switch will shut down heater if air ceases to flow across heating elements.

The electric preheat option provides frost protection for year round operation. It features steel finned tubular heater with high temperature baked-on aluminum finish protecting them from corrosion and deterioration. Modular heat stages for single or dual stage heat are provided.

The post electric heat option utilizes nickel chromium electric wire resistance elements and allows for modular heat stages for single or multiple stage heat.

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