## INTRODUCTION

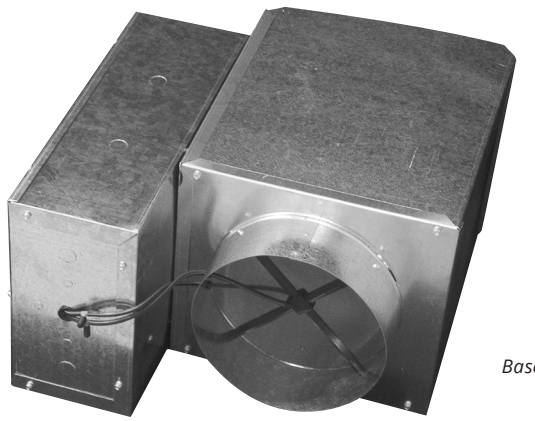
The LMHS terminal units are among the most versatile single duct air control products on the market, providing easy HVAC system integration with diverse control packages. The LMHS unit comes standard in several different configurations. The compact design simplifies the building layout process for virtually any application. The efficient and reliable LMHS unit is available with pneumatic, analog or direct digital control options. When your design requires an easily integrated terminal unit, the Krueger LMHS is the terminal unit of choice.

## MODEL

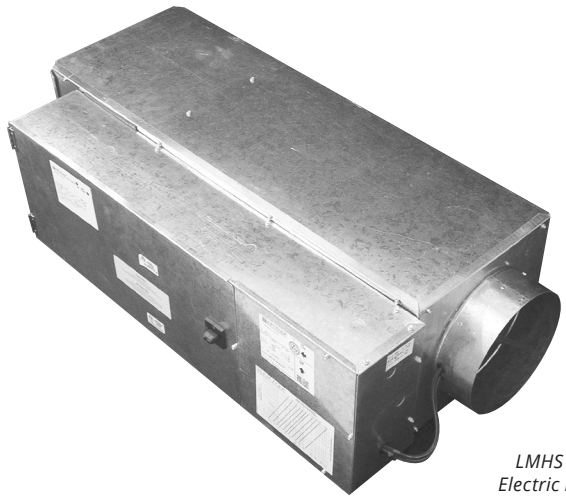
LMHS - Single Duct Terminal Unit

## FEATURES

- 22 Gauge Galvanized steel casing construction with a 20 gauge casing option that provides strength and product durability.
- AHRI listings for certified performance in accordance with AHRI Standard 880 testing standard.
- Suitable for low, medium, or high pressure applications; able to operate throughout a wide range of HVAC systems.
- Available 6”x9” access opening for easy accessibility during routine inspections and maintenance.
- Several casing liner options provide quiet and clean operation.
- Airflow capacities from 40 to 7000 CFM providing airflow control for most commercial applications.
- Round inlet sizes from 4” through 16” diameter which are slightly undersized to fit standard spiral and flex duct; size 20 inlet is rectangular, 13 1/2”x7 7/8”; size 22 inlet is rectangular, 15 7/8”x23 7/8”.
- Rectangular discharge with slip and drive connections providing quick and easy connection to hot water heat coils and downstream duct work.
- Pneumatic, analog, and digital controls may be customized for many building systems. BACnet/BMS compatible digital controls can be provided by Krueger.
- K4 Lineacross four quadrant, multi-point center averaging sensor or optional linear, multiple-point, averaging velocity sensor, offers low resistance to airflow while providing amplified velocity pressure signal to the controller.
- Gasketed round volume control damper operates over a full 90° range and provides a low leakage shutoff position.
- Compact unit casing sizes accommodates installation in reduced ceiling plenum space.
- A wide range of auxiliary heat options, including electric and hot water heat.
- LineaHeat solid state electronic proportional controlled heaters are available with or without leaving air temperature control.
- AC solid state relays offer silent operation for stage electric heat.
- Find Revit models at www.krueger-hvac.com/revit.



*LMHS Base Unit*



*LMHS with Electric Heat*

*LMHS with Hot Water Heat*

# LMHS

AHRI Certified Performance Data & Unit Capacities

KRUEGER

## AHRI CERTIFIED PERFORMANCE DATA

| INLET SIZE | RATED CFM | MIN Δ Ps | DISCHARGE DATA SOUND POWER @ 1.5" Δ Ps | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | 150 | 0.100 | 69 | 64 | 55 | 51 | 49 | 44 |
| 5 | 250 | 0.100 | 71 | 69 | 62 | 54 | 50 | 47 |
| 6 | 400 | 0.100 | 71 | 70 | 62 | 54 | 50 | 47 |
| 7 | 550 | 0.100 | 73 | 72 | 61 | 56 | 53 | 52 |
| 8 | 700 | 0.100 | 74 | 71 | 62 | 58 | 54 | 51 |
| 9 | 900 | 0.100 | 71 | 68 | 61 | 57 | 54 | 52 |
| 10 | 1100 | 0.100 | 71 | 68 | 63 | 59 | 57 | 54 |
| 12 | 1600 | 0.100 | 74 | 68 | 64 | 61 | 59 | 57 |
| 14 | 2100 | 0.100 | 74 | 68 | 63 | 61 | 59 | 57 |
| 16 | 2800 | 0.100 | 75 | 68 | 64 | 60 | 58 | 56 |

| INLET SIZE | RATED CFM | MIN Δ Ps | RADIATED DATA SOUND POWER @ 1.5" Δ Ps | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | 150 | 0.100 | 56 | 49 | 42 | 40 | 37 | 33 |
| 5 | 250 | 0.100 | 59 | 52 | 44 | 39 | 35 | 31 |
| 6 | 400 | 0.100 | 60 | 58 | 50 | 40 | 36 | 33 |
| 7 | 550 | 0.100 | 60 | 57 | 51 | 43 | 39 | 35 |
| 8 | 700 | 0.100 | 62 | 59 | 49 | 43 | 38 | 38 |
| 9 | 900 | 0.100 | 60 | 56 | 50 | 42 | 39 | 35 |
| 10 | 1100 | 0.100 | 58 | 54 | 50 | 43 | 38 | 32 |
| 12 | 1600 | 0.100 | 64 | 58 | 51 | 46 | 42 | 36 |
| 14 | 2100 | 0.100 | 60 | 56 | 47 | 44 | 41 | 36 |
| 16 | 2800 | 0.100 | 66 | 62 | 56 | 49 | 45 | 42 |

*NOTES: All sound data is based on tests conducted in accordance with AHRI 880-11. ΔPs is the difference in static pressure from inlet to discharge. Sound power levels are in dB, re $10^{-12}$ Watts. Discharge sound power is the sound emitted from the unit discharge. Radiated sound power is the sound transmitted through the casing walls. Discharge sound power has been corrected for end reflection. NC application data is from AHRI Standard 885-08 Appendix E, as a function of flow rate shown. See Krueger's selection program for specific sound data for optional liners; 1/2", dual density liner shown. See Engineering section for reductions and definitions. AHRI certification points are shown in bold, white font in the sound performance data found on page A2-22 and A2-23.*

AHRI CERTIFIED™ www.ahridirectory.org VAV Terminals AHRI Standard 880

## UNIT CAPACITIES

### SELECTION EXAMPLE - BASED ON CFM CRITERIA

A zone exists requiring VAV control. The maximum flow is to be 500 CFM; the minimum is to be 175 CFM, based on heat requirements. Use the table to the right to select a size 6. Note that size 7 will also be capable of controlling the required amount.

### AIRFLOW CAPACITY DETAILS

1. CFM ranges are factory set on all pressure independent pneumatic control sequences.
2. Factory set minimum CFMs are based on the controller's ability to accurately maintain flow setting. Factory will not set controls outside the ranges indicated.
3. Minimum CFM settings can be set at 0 CFM; however, ventilation requirements can be met by setting a minimum greater than zero. Krueger recommends a minimum setpoint equal to 25% of the nominal flow rating of the terminal.
4. Pressure dependent pneumatic or electric controls do not have the ability to control CFM settings. Therefore, the minimum setting is always zero. A set maximum flow rate is not possible.
5. Check the selected kW value to be sure it does not exceed the recommended 45°F temperature rise.

   **Formula: ΔT = (kW x 3160) / CFM**

   Discharge temperature must not exceed 120°F.
6. The ASHRAE handbook of fundamentals states that discharge temperatures in excess of 90°F are likely to result in objectionable air temperature stratification in the space. Also, ventilation short circuiting may occur. ASHRAE Standard 62.1 limits discharge temperatures to 90°F or increasing the ventilation rate when heating from the ceiling.

### STANDARD UNIT CAPACITIES

| INLET SIZE | MAX PRIMARY AIRFLOW - CFM | MIN AIRFLOW - CFM | |
|---|---|---|---|
| | | STANDARD* | ELECTRIC HEAT ** |
| 4 | 230 | 40 | 55 |
| 5 | 360 | 62 | 85 |
| 6 | 515 | 89 | 110 |
| 7 | 700 | 121 | 140 |
| 8 | 920 | 159 | 190 |
| 9 | 1160 | 201 | 240 |
| 10 | 1430 | 248 | 300 |
| 12 | 2060 | 357 | 425 |
| 14 | 2800 | 486 | 580 |
| 16 | 3660 | 634 | 750 |
| 22 | 7000 | 1212 | 1800 |

### LOW PROFILE UNIT CAPACITIES

| INLET SIZE | MAX PRIMARY AIRFLOW - CFM | MIN AIRFLOW - CFM | |
|---|---|---|---|
| | | STANDARD* | ELECTRIC HEAT ** |
| 4 | 230 | 40 | 55 |
| 5 | 360 | 62 | 85 |
| 6 | 515 | 89 | 110 |
| 7 | 700 | 121 | 140 |
| 8 | 920 | 159 | 190 |
| 20 | 2100 | 420 | 425 |

** The Standard Minimum CFM value is based on a signal of 0.03" WG differential pressure of the inlet sensor. Minimum CFM may be 0. The inlet sensor is capable of reading a signal down to .01" WG. To operate unit below the Standard Minimum CFM values listed, DDC Controller must be capable to accurately read below 0.03" WG.*

*** Electric heat based on CFM necessary to engauge airflow proving safety switch. Minimum CFM of unit will depend on the kW selected for that unit.*

## PRODUCT DESCRIPTION

### CASING
- All LMHS unit casing panels are constructed of 22 gauge galvanized steel with a 20 gauge option.

### INLET COLLARS
- All round 20 gauge inlet collars accommodate standard spiral and flex duct sizes.
- Left or right hand is determined by looking in the direction of airflow with the unit in the installed position.

### OUTLET CONNECTION
- All standard outlet connections are rectangular and require a slip and drive duct connection.
- Round and multi-outlet discharge options are available.

### DAMPER ASSEMBLY
- Unit sizes 4-16 utilize a round control damper. Unit sizes 20 and 22 have rectangular inlets. Size 20 utilizes a single blade damper design and size 22 has an opposed blade control damper. All damper assemblies utilize a solid 1/2" shaft that rotates in self-lubricating Delrin® bearings.
- Damper blade incorporates a flexible gasket for tight airflow shutoff and operates over a full 90° rotation.
- The damper position is marked by an arrow embossment on the end of the damper shaft, except size 22.

### CASING LINERS
All liners are attached to the unit casing with both adhesive and weld pins to ensure long term durability (excludes Sterilwall and Perforated Doublewall). The standard liner option is 1/2" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A.
- **(Optional)** 1" Thick Insulation: 1" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A.
- **(Optional)** Cellular Insulation: 1/2" or 1" thick, 1 1/2 lb. density, smooth surface, polyolefin, closed-cell foam insulation for fiber free application. Cellular insulation meets UL 181 and NFPA 90A and does not support mold or bacteria growth.
- **(Optional)** Steriliner Insulation: 13/16" thick, 4 lb. density, rigid board insulation with nylon reinforced foil covering insulation fibers that meets UL 181 and NFPA 90A. Liner shall be attached to unit casing by adhesive and weld pins with full-seam-length Z-strips to enclose and seal the insulation cut edges.
- **(Optional)** Sterilwall Insulation: 1/2" or 1" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a non-perforated internal sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.
- **(Optional)** Perforated Doublewall Insulation: 1/2" or 1", 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a perforated internal sheet metal cover extending over the fiberglass insulation and covering the liner cut edges.
- **(Optional)** No Liner: No internal insulation liner.
- See Krueger's selection program for acoustical impact of different liners.

### AIRFLOW SENSOR
- All units are equipped with a factory installed airflow measuring sensor.
- The standard sensor is a K4 LineaCross four quadrant, multipoint center averaging sensor.
- **(Optional)** Linear, multi-point, velocity averaging sensor with an amplified signal is also available.
- Balancing taps are provided to allow for easy airflow verification.
- Both the linear and K4 LineaCross sensors use the same flow constant.

### CONTROLS
- Pneumatic, analog or direct digital control types are available. Digital controls can be provided by others or Krueger for factory mounting. A "no control" unit is also available for field mounting of direct digital controls where a sheet metal enclosure will be provided by Krueger.

### ACCESS PANEL
- **(Optional)** Gasketed access panel in the terminal unit casing is available for viewing damper components and for upstream cleaning of the hot water coil fins. Available only on size 22 when ordered with integral attenuator. The access panel is insulated with the same liner as the unit.

### HOT WATER HEAT
- Hot water coils are constructed of ten aluminum fins per inch with sweat type, left or right hand, tubing connections. The 1/2" diameter coil tubing is water leakage tested to 400 PSIG and has a wall thickness of 0.016".
- **(Optional)** High capacity and steam coils are available by special request
- **(Optional)** Vent and drain on coil headers.

### ELECTRIC HEAT
- Heaters are ETL listed in accordance with UL standards and are constructed of 20 gauge galvanized steel.
- Available Combinations: [120, 208/240, 277 Volt, Single-Phase] [208/240 Volt, Three-Phase, Three-Wire] [480 Volt, Three-Phase, Four-Wire]. Other voltage options available as a special. Contact your Krueger Representative for more information.
- Standard heaters are equipped with primary automatic and secondary manual reset thermal cutout, de-energizing magnetic contactors, airflow proving switch and 80/20 Ni-Cr elements.
- Electric heater options include fused or non-fused door interlocking disconnect switch, AC solid state relay, fuse block and dust tight control enclosure.
- LineaHeat solid state electronic controlled heaters are available with or without leaving air temperature control. Contact your Krueger representative or the Krueger web site for additional information.

### CONTROL TRANSFORMERS
- Electric heat units include a factory supplied, mounted and wired 24-volt control transformer inside the electric heat enclosure for electronic control applications.
- Non-electric heat units, with electronic proportional controls are available with an optional factory supplied and wired control transformer mounted inside the control enclosure.

### LABELS
- Label information is adhered to each unit and includes model name, unit size, configuration code, airflow (CFM), balancing chart and tagging data.

### PACKAGING
- LMHS base units with and without hot water coils are individually packaged in a carton and stacked on a pallet. Attenuated units and electric heat units are stacked directly on the pallet. All pallets are banded and stretch wrapped with cellophane.

## TYPICAL APPLICATION

Krueger LMHS single duct terminal units are designed to be easily incorporated in the overall building HVAC design. Control packages allow the LMHS to be used in constant volume and variable volume applications. Although designed for compatibility with low pressure (<0.10"Ps), the LMHS unit performs reliably in high pressure systems as well (up to 6.0" Ps). See the Engineering section for more information.

In variable volume pressure independent applications, the LMHS unit compensates for system pressure, while adjusting the airflow in response to room thermostat demand. When used in a constant volume application, the LMHS can maintain a set flow requirement, compensating for fluctuations in system pressure.

Interior zones are typically controlled by an LMHS with a cooling-only control package; exterior zones are often controlled by an LMHS with electric or hot water reheat coils and a reheat control package.

Depending on the layout of the duct work, it is sometimes more practical to specify the LMHS with a single, factory-installed round discharge or with multiple round outlets.

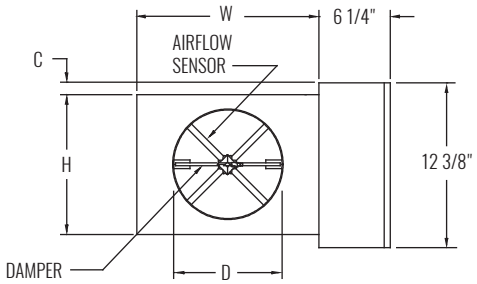
*NOTE: Reference the Design Guidelines in the Engineering section of this catalog for more details on Oversizing Terminal Units, Capacity Concentrated in Too Few Terminal Units, Insufficient Space, and Improper Discharge Conditions.*

## DAMPER AND CASING LEAKAGE

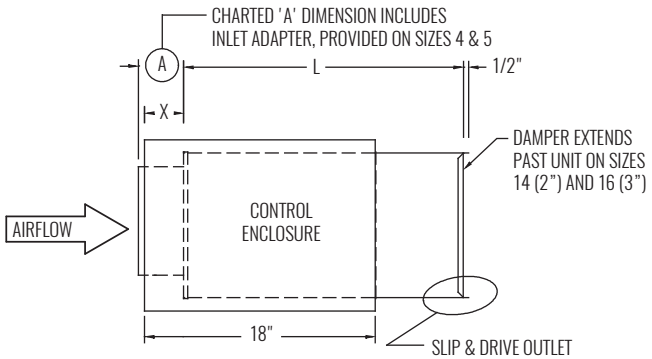
| INLET SIZE | DAMPER LEAKAGE | | | CASING LEAKAGE | | | |
|---|---|---|---|---|---|---|---|
| | 1.5" WG | 3.0" WG | 6.0" WG | 0.5" WG | 1.0" WG | 1.5" WG | 3.0" WG |
| | CFM | CFM | CFM | CFM | CFM | CFM | CFM |
| 4 | 4 | 5 | 7 | 2 | 3 | 4 | 5 |
| 5 | 4 | 5 | 7 | 2 | 3 | 4 | 5 |
| 6 | 4 | 5 | 7 | 2 | 3 | 4 | 5 |
| 7 | 4 | 5 | 7 | 4 | 5 | 6 | 9 |
| 8 | 4 | 5 | 7 | 4 | 5 | 6 | 9 |
| 9 | 4 | 5 | 7 | 4 | 6 | 7 | 10 |
| 10 | 4 | 5 | 7 | 4 | 6 | 7 | 10 |
| 12 | 4 | 5 | 7 | 5 | 7 | 9 | 12 |
| 14 | 4 | 6 | 8 | 6 | 9 | 11 | 16 |
| 16 | 5 | 7 | 9 | 7 | 10 | 13 | 17 |

*NOTES: Damper leakage is measured with the damper fully closed using an actuator. A precision low flow orifice is used upstream of the unit to measure the leakage rate as a function of the measured upstream static pressure. Casing leakage is determined with the damper fully open and the discharge of the unit sealed. A precision low flow orifice is used upstream of the unit to measure the leakage rate as a function of the supplied static pressure. Leakage testing conducted in accordance with ASHRAE 130-2008.*

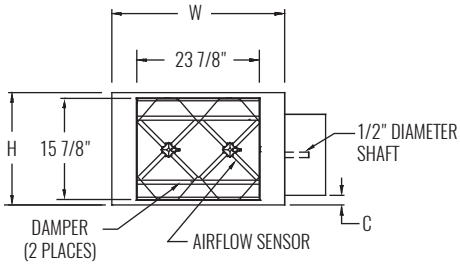
## BASE UNIT | DIMENSIONAL DATA



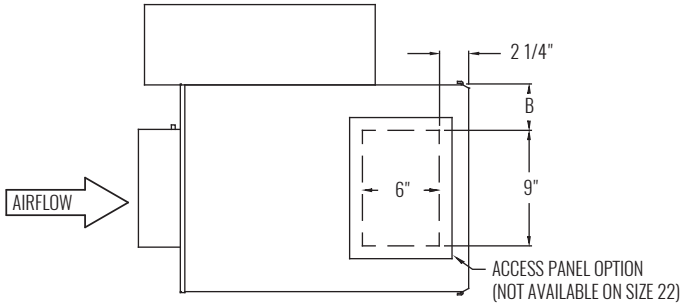

INLET VIEW - SIZES 4 - 16




SIDE VIEW




INLET VIEW - SIZE 22




BOTTOM VIEW

| INLET SIZE | MAX CFM [L/s] | L | W | H | A | B | C | D | X |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 15 1/2" | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 3 7/8" | 7 1/4" |
| 5 | 360 [170] | 15 1/2" | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 4 7/8" | 7 1/4" |
| 6 | 515 [243] | 15 1/2" | 12" | 8" | 3 3/8" | 1 1/2" | 2 1/8" | 5 7/8" | 7 1/4" |
| 7 | 700 [330] | 15 1/2" | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 6 7/8" | 7 1/4" |
| 8 | 920 [434] | 15 1/2" | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 7 7/8" | 7 1/4" |
| 9 | 1160 [547] | 15 1/2" | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 8 7/8" | 5 1/4" |
| 10 | 1430 [675] | 15 1/2" | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 9 7/8" | 5 1/4" |
| 12 | 2060 [972] | 15 1/2" | 16" | 15" | 3 3/8" | 3 1/2" | - | 11 7/8" | 5 1/4" |
| 14 | 2800 [1321] | 15 1/2" | 20" | 17 1/2" | 3 3/8" | 5 1/2" | - | 13 7/8" | 3 1/4" |
| 16 | 3660 [1727] | 15 1/2" | 24" | 18" | 3 3/8" | 7 1/2" | - | 15 7/8" | 3 1/4" |
| 22 | 7000 [3304] | 15" | 38" | 18" | 4 1/4" | 14 1/2" | 1 1/8" | SEE ABOVE | 5 1/4" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

## STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.
- AHRI certified sound ratings.

## OPTIONAL FEATURES

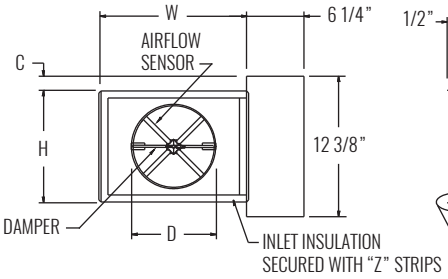
- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Bottom access panel.
- Cam locks (bottom access panel).
- Hanger brackets.

# LMHS

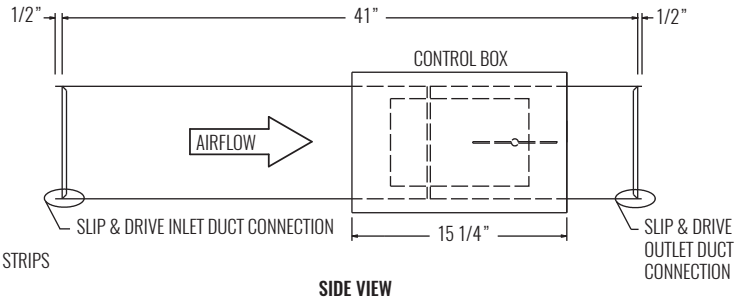
Dimensional Data, Features, and Options

KRUEGER

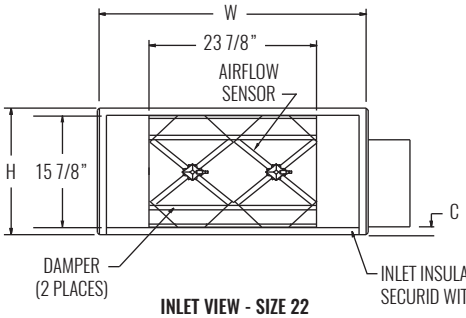
## EXHAUST UNIT | DIMENSIONAL DATA



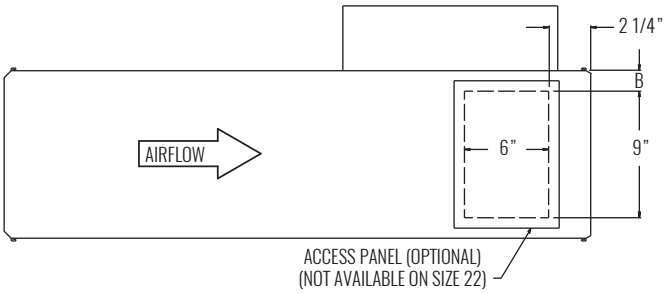

INLET VIEW - SIZES 4 - 16




SIDE VIEW




INLET VIEW - SIZE 22




BOTTOM VIEW

| INLET SIZE | MAX CFM [L/s] | W | H | B | C | D |
|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 1 1/2" | 2 1/8" | 3 7/8" |
| 5 | 360 [170] | 12" | 8" | 1 1/2" | 2 1/8" | 4 7/8" |
| 6 | 520 [245] | 12" | 8" | 1 1/2" | 2 1/8" | 5 7/8" |
| 7 | 710 [335] | 12" | 10" | 1 1/2" | 1 1/8" | 6 7/8" |
| 8 | 925 [437] | 12" | 10" | 1 1/2" | 1 1/8" | 7 7/8" |
| 9 | 1200 [566] | 14" | 12 1/2" | 2 1/2" | - | 8 7/8" |
| 10 | 1450 [685] | 14" | 12 1/2" | 2 1/2" | - | 9 7/8" |
| 12 | 2100 [991] | 16" | 15" | 3 1/2" | - | 11 7/8" |
| 14 | 2900 [1369] | 20" | 17 1/2" | 5 1/2" | - | 13 7/8" |
| 16 | 3700 [1746] | 24" | 18" | 7 1/2" | - | 15 7/8" |
| 22 | 7100 [3351] | 38" | 18" | 14 1/2" | 1 1/8" | 23 7/8" x 15 7/8" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

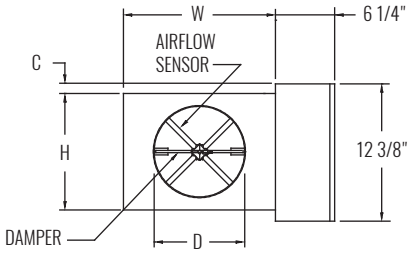
## STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A And UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

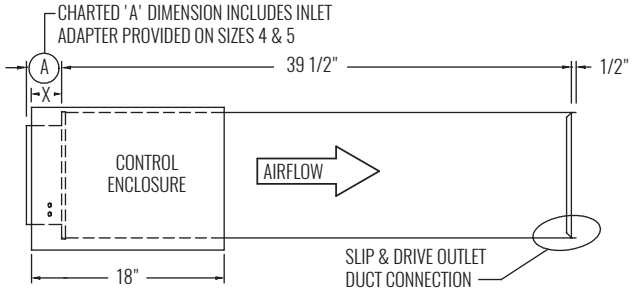
## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Bottom access panel.
- Cam locks (bottom access panel).
- Hanger brackets.

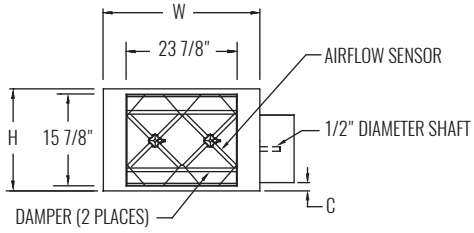
## BASE UNIT WITH ATTENUATOR | DIMENSIONAL DATA



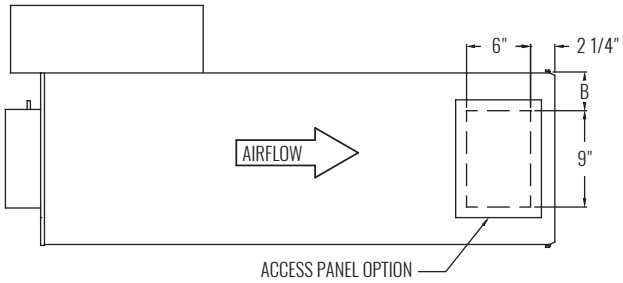

**INLET VIEW - SIZES 4 - 16**




**SIDE VIEW**




**INLET VIEW - SIZE 22**




**BOTTOM VIEW**

| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D | X |
|---|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 3 7/8" | 7 1/4" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 4 7/8" | 7 1/4" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 2 1/8" | 5 7/8" | 7 1/4" |
| 7 | 700 [330] | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 6 7/8" | 7 1/4" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 7 7/8" | 7 1/4" |
| 9 | 1160 [547] | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 8 7/8" | 5 1/4" |
| 10 | 1430 [675] | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 9 7/8" | 5 1/4" |
| 12 | 2060 [972] | 16" | 15" | 3 3/8" | 3 1/2" | - | 11 7/8" | 5 1/4" |
| 14 | 2800 [1321] | 20" | 17 1/2" | 3 3/8" | 5 1/2" | - | 13 7/8" | 3 1/4" |
| 16 | 3660 [1727] | 24" | 18" | 3 3/8" | 7 1/2" | - | 15 7/8" | 3 1/4" |
| 22 | 7000 [3304] | 38" | 18" | 4 1/4" | 14 1/2" | 1 1/8" | 23 7/8" x 15 7/8" | 5 1/4" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

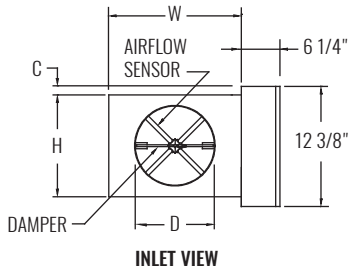
## STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

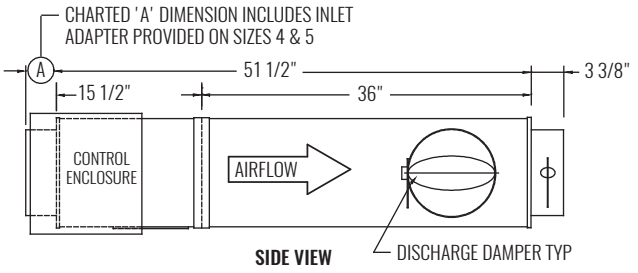
## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Bottom access panel.
- Cam locks (bottom access panel).
- Hanger brackets.

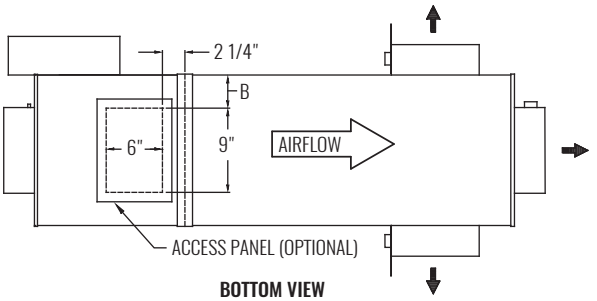
## BASE UNIT WITH MULTIPLE OUTLET ATTENUATOR | DIMENSIONAL DATA




INLET VIEW

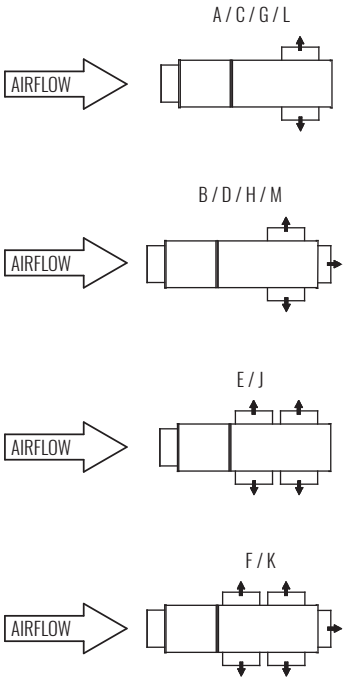



SIDE VIEW




BOTTOM VIEW

OPTIONAL OUTLETS




| INLET SIZE | MAX CFM [L/s] | W | H | A | B | D | OUTLET TYPES |
|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 3 7/8" | A / B |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 4 7/8" | A / B |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 5 7/8" | A / B |
| 7 | 700 [330] | 12" | 10" | 3 3/8" | 1 1/2" | 6 7/8" | C / D / E |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 7 7/8" | C / D / E / F |
| 9 | 1160 [547] | 14" | 12 1/2" | 3 3/8" | 2 1/2" | 8 7/8" | D / E / G / H / J |
| 10 | 1430 [675] | 14" | 12 1/2" | 3 3/8" | 2 1/2" | 9 7/8" | D / E / G / H / J |
| 12 | 2060 [972] | 16" | 15" | 3 3/8" | 3 1/2" | 11 7/8" | H / J / K / L / M |
| 14 | 2800 [1321] | 20" | 17 1/2" | 3 3/8" | 5 1/2" | 13 7/8" | H / J / K / L / M |
| 16 | 3660 [1727] | 24" | 18" | 3 3/8" | 7 1/2" | 15 7/8" | H / J / K / L / M |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available. Multiple outlets are not available in size 22. See page A2-11 for additional outlet information.*

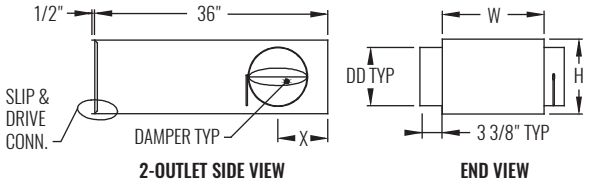
## STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Manual balancing valves/dampers.
- Variety of pneumatic, electric, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

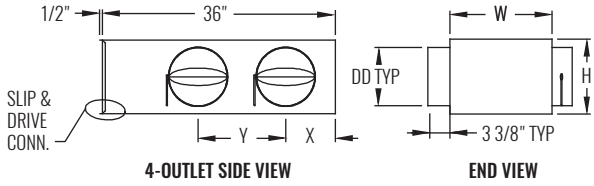
## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Steriliner, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Left-hand or right-hand control enclosure.
- Dust tight control enclosure.
- Bottom access panel.
- Cam locks (bottom access panel).
- Hanger brackets.

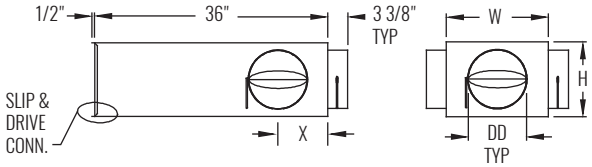
## BASE UNIT WITH MULTIPLE OUTLET ATTENUATOR AND SINGLE ROUND OUTLET | DIMENSIONAL DATA



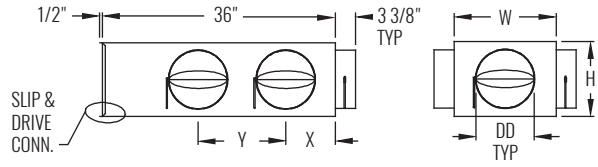

2-OUTLET SIDE VIEW | END VIEW




4-OUTLET SIDE VIEW | END VIEW




3-OUTLET SIDE VIEW | END VIEW

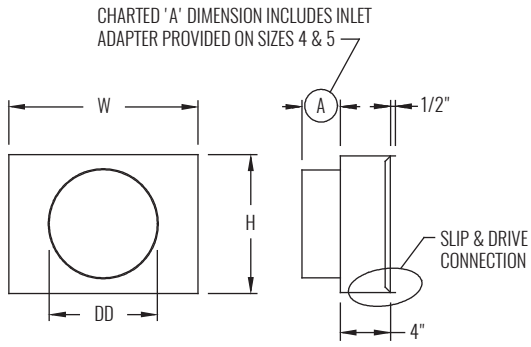



5-OUTLET SIDE VIEW | END VIEW

| OUTLET TYPE | OUTLET QUANTITY | | | | DD OUTLET SIZE | UNIT SIZES | X | Y |
|---|---|---|---|---|---|---|---|---|
| A | 2 | - | - | - | 5 7/8" | 4 / 5 / 6 | 4 3/8" (111) | - |
| B | - | 3 | - | - | | 4 / 5 / 6 | | - |
| C | 2 | - | - | - | 7 7/8" | 7 / 8 | 5 3/8" (137) | - |
| D | - | 3 | - | - | | 7 / 8 / 9 / 10 | | - |
| E | - | - | 4 | - | | 7 / 8 / 9 / 10 | | 12" |
| F | - | - | - | 5 | | 8 | | 12" |
| G | 2 | - | - | - | 9 7/8" | 9 / 10 | 6 3/8" (162) | - |
| H | - | 3 | - | - | | 9 / 10 / 12 / 14 / 16 | | - |
| J | - | - | 4 | - | | 9 / 10 / 12 / 14 / 16 | | 14" |
| K | - | - | - | 5 | | 12 / 14 / 16 | | 14" |
| L | 2 | - | - | - | 11 7/8" | 12 / 14 / 16 | 6 3/8" (162) | 14" |
| M | - | 3 | - | - | | 12 / 14 / 16 | | 14" |

*NOTES: Dash indicates not applicable.*

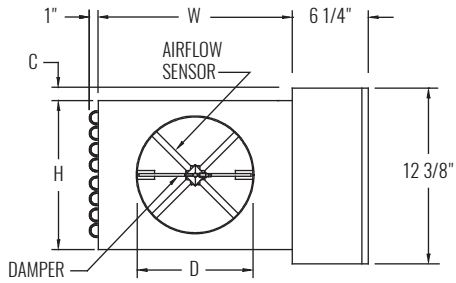
## ROUND OUTLET ADAPTER | DIMENSIONAL DATA



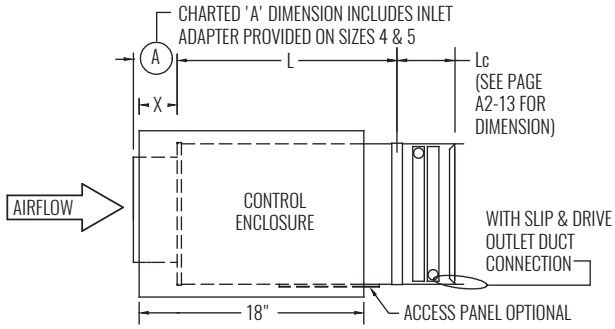

| UNIT SIZE | W | H | A | DD |
|---|---|---|---|---|
| 4 | 12" | 8" | 5 3/8" | 3 7/8" |
| 5 | 12" | 8" | 5 3/8" | 4 7/8" |
| 6 | 12" | 8" | 3 3/8" | 5 7/8" |
| 7 | 12" | 10" | 3 3/8" | 6 7/8" |
| 8 | 12" | 10" | 3 3/8" | 7 7/8" |
| 9 | 14" | 12 1/2" | 3 3/8" | 8 7/8" |
| 10 | 14" | 12 1/2" | 3 3/8" | 9 7/8" |
| 12 | 16" | 15" | 3 3/8" | 11 7/8" |
| 14 | 20" | 17 1/2" | 3 3/8" | 13 7/8" |
| 16 | 24" | 18" | 3 3/8" | 15 3/8" |

*NOTES: Multiple outlet plenums are for use with basic LMHS unit and hot water heat, factory assembled into one unit.*

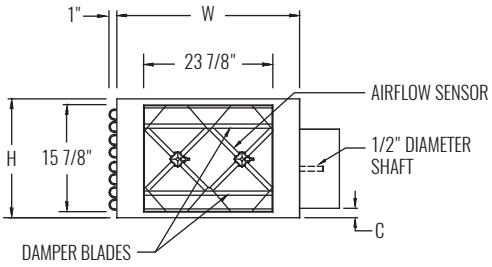
## BASE UNIT WITH HOT WATER HEAT | DIMENSIONAL DATA



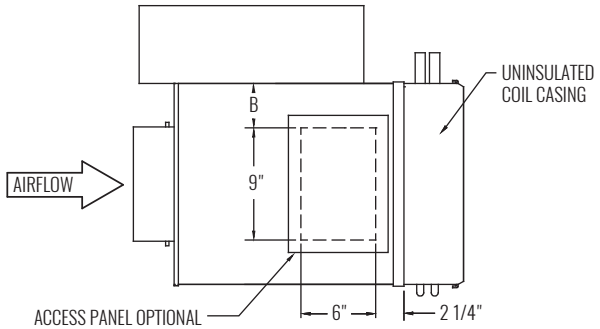

INLET VIEW - SIZES 4 - 16




SIDE VIEW




INLET VIEW - SIZE 22




BOTTOM VIEW

| INLET SIZE | MAX CFM [L/s] | L | W | H | A | B | C | D | X |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 15 1/2" | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 3 7/8" | 7 1/4" |
| 5 | 360 [170] | 15 1/2" | 12" | 8" | 5 3/8" | 1 1/2" | 2 1/8" | 4 7/8" | 7 1/4" |
| 6 | 515 [243] | 15 1/2" | 12" | 8" | 3 3/8" | 1 1/2" | 2 1/8" | 5 7/8" | 7 1/4" |
| 7 | 700 [330] | 15 1/2" | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 6 7/8" | 7 1/4" |
| 8 | 920 [434] | 15 1/2" | 12" | 10" | 3 3/8" | 1 1/2" | 1 1/8" | 7 7/8" | 7 1/4" |
| 9 | 1160 [547] | 15 1/2" | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 8 7/8" | 5 1/4" |
| 10 | 1430 [675] | 15 1/2" | 14" | 12 1/2" | 3 3/8" | 2 1/2" | - | 9 7/8" | 5 1/4" |
| 12 | 2060 [972] | 15 1/2" | 16" | 15" | 3 3/8" | 3 1/2" | - | 11 7/8" | 5 1/4" |
| 14 | 2800 [1321] | 15 1/2" | 20" | 17 1/2" | 3 3/8" | 5 1/2" | - | 13 7/8" | 3 1/4" |
| 16 | 3660 [1727] | 15 1/2" | 24" | 18" | 3 3/8" | 7 1/2" | - | 15 7/8" | 3 1/4" |
| 22 | 7000 [3304] | 15" | 38" | 18" | 4 1/4" | 14 1/2" | 1 1/8" | 23 7/8" x 15 7/8" | 5 1/4" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

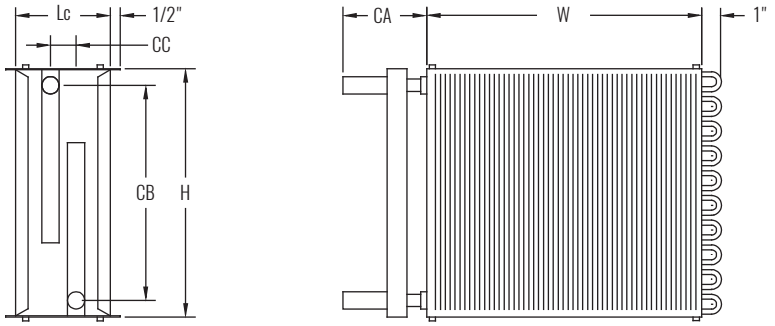
## STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Hot water coils.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Left-hand or right-hand water coil connection.
- Bottom access panel.
- Cam locks.
- Hanger brackets.
- Vent and drain water coils.

## HOT WATER COIL | DIMENSIONAL DATA




| UNIT SIZE | NUMBER OF COILS | H | W | Lc | CA | CB | CC | WATER CONNECTION* |
|---|---|---|---|---|---|---|---|---|
| 4, 5, 6 | 1 ROW | 7 7/8" (200) | 12" (305) | 5" (127) | 3" (76) | 6 1/4" (159) | -- | 1/2" (13) |
| | 2 ROW | 7 7/8" (200) | 12" (305) | 5" (127) | 3" (76) | 6 1/4" (159) | -- | 5/8" (16) |
| | 3 ROW | 7 7/8" (200) | 12" (305) | 7 1/4" (184) | 4 1/4" (108) | 5 7/8" (149) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 7 7/8" (200) | 12" (305) | 7 1/4" (184) | 4 1/4" (108) | 6 1/4" (159) | 3 1/4" (83) | 7/8" (22) |
| 7, 8 | 1 ROW | 10 1/4" (260) | 12" (305) | 5" (127) | 3" (76) | 8 3/4" (222) | -- | 1/2" (13) |
| | 2 ROW | 10 1/4" (260) | 12" (305) | 5" (127) | 2 4/7" (65) | 8 3/4" (222) | -- | 5/8" (16) |
| | 3 ROW | 10 1/4" (260) | 12" (305) | 7 1/4" (184) | 4 1/4" (108) | 8 3/8" (213) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 10 1/4" (260) | 12" (305) | 7 1/4" (184) | 4 1/4" (108) | 9" (229) | 3 1/4" (83) | 7/8" (22) |
| 9, 10 | 1 ROW | 12 3/4" (324) | 14" (356) | 5" (127) | 4 1/4" (108) | 10 7/8" (276) | 1 1/8" (29) | 7/8" (22) |
| | 2 ROW | 12 3/4" (324) | 14" (356) | 5" (127) | 4 1/4" (108) | 11 1/2" (292) | 1 1/16" (27) | 7/8" (22) |
| | 3 ROW | 12 3/4" (324) | 14" (356) | 7 1/4" (184) | 4 1/4" (108) | 10 7/8" (276) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 12 3/4" (324) | 14" (356) | 7 1/4" (184) | 4 1/4" (108) | 11 1/2" (292) | 3 1/4" (83) | 7/8" (22) |
| 12 | 1 ROW | 15 1/4" (387) | 16" (406) | 5" (127) | 4 1/4" (108) | 13 3/8" (340) | 1 1/8" (29) | 7/8" (22) |
| | 2 ROW | 15 1/4" (387) | 16" (406) | 5" (127) | 4 1/4" (108) | 14" (356) | 1 1/16" (27) | 7/8" (22) |
| | 3 ROW | 15 1/4" (387) | 16" (406) | 7 1/4" (184) | 4 1/4" (108) | 13 3/8" (340) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 15 1/4" (387) | 16" (406) | 7 1/4" (184) | 4 1/4" (108) | 14" (356) | 3 1/4" (83) | 7/8" (22) |
| 14 | 1 ROW | 17 3/4" (451) | 20" (508) | 7 1/2" (191) | 4 1/4" (108) | 15 7/8" (403) | 1 1/8" (29) | 7/8" (22) |
| | 2 ROW | 17 3/4" (451) | 20" (508) | 7 1/2" (191) | 4 1/4" (108) | 16 1/2" (419) | 1 1/16" (27) | 7/8" (22) |
| | 3 ROW | 17 3/4" (451) | 20" (508) | 9 3/4" (248) | 4 1/4" (108) | 15 7/8" (403) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 17 3/4" (451) | 20" (508) | 9 3/4" (248) | 4 1/4" (108) | 16 1/2" (419) | 3 1/4" (83) | 7/8" (22) |
| 16 | 1 ROW | 17 3/4" (451) | 24" (610) | 7 1/2" (191) | 4 1/4" (108) | 15 7/8" (403) | 1 1/8" (29) | 7/8" (22) |
| | 2 ROW | 17 3/4" (451) | 24" (610) | 7 1/2" (191) | 4 1/4" (108) | 16 1/2" (419) | 1 1/16" (27) | 7/8" (22) |
| | 3 ROW | 17 3/4" (451) | 24" (610) | 9 3/4" (248) | 4 1/4" (108) | 15 7/8" (403) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 17 3/4" (451) | 24" (610) | 9 3/4" (248) | 4 1/4" (108) | 16 1/2" (419) | 3 1/4" (83) | 7/8" (22) |
| 20 | 1 ROW | 10 1/4" (260) | 16" (406) | 5" (127) | 3" (76) | 8 3/4" (222) | -- | 1/2" (13) |
| | 2 ROW | 10 1/4" (260) | 16" (406) | 5" (127) | 2 9/16" (65) | 8 3/4" (222) | -- | 5/8" (16) |
| | 3 ROW | 10 1/4" (260) | 16" (406) | 7 1/4" (184) | 4 1/4" (108) | 8 3/8" (213) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 10 1/4" (260) | 16" (406) | 7 1/4" (184) | 4 1/4" (108) | 9" (229) | 3 1/4" (83) | 7/8" (22) |
| 22 | 1 ROW | 17 3/4" (451) | 38" (965) | 5" (127) | 4 1/4" (108) | 15 7/8" (403) | 1 1/8" (29) | 7/8" (22) |
| | 2 ROW | 17 3/4" (451) | 38" (965) | 5" (127) | 4 1/4" (108) | 16 1/2" (419) | 1 1/16" (27) | 7/8" (22) |
| | 3 ROW | 17 3/4" (451) | 38" (965) | 7 1/4" (184) | 4 1/4" (108) | 15 7/8 (403) | 2 3/16" (56) | 7/8" (22) |
| | 4 ROW | 17 3/4" (451) | 38" (965) | 7 1/4" (184) | 4 1/4" (108) | 16 1/2" (419) | 3 1/4" (83) | 7/8" (22) |

**NOTES: Water connection dimension is O.D.*

## STANDARD FEATURES

- Shipped from factory attached to the unit discharge
- Slip and drive field duct work installation
- Coil section is uninsulated
- Coil Casing - 20 gauge galvanized steel
- Connection Tubing – 0.032" thick copper (see O.D. connection diameter in table)
- Coil Tubing – 1/2" diameter x 0.016" thick copper
- Coil Fins – 0.0045" thick aluminum, 10 FPI, mechanically bonded to tubing

## OPTIONAL FEATURES

- 12 FPI, 0.0045" thick aluminum fins, 0.016" thick copper tube
- 10 FPI, 0.0045" thick aluminum fins, 0.035" thick copper tube
- Coil Accessories – Air vent and drain ports

## HOT WATER COIL | PERFORMANCE DATA

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 | 125 | 200 | 275 | 350 | 425 | 500 |
| 4-5-6 | 1 | 1.0 | 0.47 | 3.7 | 6.2 | 7.8 | 9.0 | 9.8 | 10.6 | 11.2 |
| | | 2.0 | 1.82 | 3.8 | 6.6 | 8.5 | 9.9 | 11.0 | 11.9 | 12.7 |
| | | 3.0 | 3.98 | 3.9 | 6.8 | 8.7 | 10.2 | 11.4 | 12.4 | 13.3 |
| | | 4.0 | 6.96 | 3.9 | 6.9 | 8.9 | 10.4 | 11.7 | 12.7 | 13.6 |
| | | **AIR PRESSURE DROP** | | **0.00** | **0.02** | **0.04** | **0.06** | **0.10** | **0.13** | **0.18** |
| | 2 | 1.0 | 0.12 | 5.0 | 9.3 | 12.0 | 14.0 | 15.5 | 16.7 | 17.6 |
| | | 2.0 | 0.47 | 5.3 | 10.2 | 10.2 | 16.1 | 18.2 | 19.9 | 21.3 |
| | | 4.0 | 1.81 | 5.4 | 10.7 | 14.5 | 17.5 | 20.0 | 22.1 | 24.0 |
| | | 6.0 | 3.98 | 5.4 | 10.9 | 14.9 | 18.1 | 20.7 | 23.0 | 25.0 |
| | | **AIR PRESSURE DROP** | | **0.01** | **0.04** | **0.08** | **0.14** | **0.21** | **0.29** | **0.38** |
| | 3 | 1.5 | 0.40 | 6.0 | 12.4 | 16.8 | 20.2 | 22.8 | 24.9 | 26.7 |
| | | 2.0 | 0.70 | 6.1 | 12.7 | 17.5 | 21.1 | 24.1 | 26.6 | 28.7 |
| | | 4.0 | 2.68 | 6.2 | 13.2 | 18.5 | 22.8 | 26.4 | 29.5 | 32.2 |
| | | 6.0 | 5.88 | 6.2 | 13.3 | 18.9 | 23.5 | 27.3 | 30.7 | 33.6 |
| | | **AIR PRESSURE DROP** | | **0.01** | **0.06** | **0.12** | **0.21** | **0.31** | **0.43** | **0.57** |
| | 4 | 2.0 | 0.50 | 6.4 | 14.0 | 19.6 | 24.0 | 27.5 | 30.4 | 32.8 |
| | | 3.0 | 1.11 | 6.5 | 14.3 | 20.4 | 25.4 | 29.4 | 32.9 | 35.8 |
| | | 4.0 | 1.95 | 6.5 | 14.5 | 20.9 | 26.1 | 30.5 | 34.3 | 37.5 |
| | | 6.0 | 4.32 | 6.5 | 14.7 | 21.3 | 26.9 | 31.6 | 35.8 | 39.4 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.08** | **0.16** | **0.28** | **0.42** | **0.58** | **0.76** |
| | | **CFM RANGE** | **SIZE 4** | | | | | | | |
| | | | **SIZE 5** | | | | | | | |
| | | | **SIZE 6** | | | | | | | |

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 160 | 285 | 410 | 535 | 660 | 785 | 900 |
| 7-8 | 1 | 1.0 | 0.64 | 8.0 | 10.5 | 12.1 | 13.4 | 14.4 | 15.2 | 15.8 |
| | | 2.0 | 2.45 | 8.6 | 11.5 | 13.6 | 15.2 | 16.5 | 17.6 | 18.5 |
| | | 3.0 | 5.37 | 8.8 | 11.9 | 14.2 | 16.0 | 17.4 | 18.6 | 19.6 |
| | | 4.0 | 9.37 | 8.9 | 12.2 | 14.5 | 16.4 | 17.9 | 19.2 | 20.3 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.04** | **0.08** | **0.12** | **0.18** | **0.24** | **0.30** |
| | 2 | 1.0 | 0.17 | 11.8 | 15.9 | 18.7 | 20.6 | 22.2 | 23.4 | 24.3 |
| | | 2.0 | 0.64 | 13.0 | 18.4 | 22.2 | 25.1 | 27.4 | 29.4 | 30.9 |
| | | 4.0 | 2.44 | 13.7 | 19.9 | 24.5 | 28.2 | 31.2 | 33.8 | 35.9 |
| | | 6.0 | 5.36 | 14.0 | 20.5 | 25.5 | 29.5 | 32.8 | 35.7 | 38.0 |
| | | **AIR PRESSURE DROP** | | **0.04** | **0.09** | **0.17** | **0.26** | **0.37** | **0.50** | **0.63** |
| | 3 | 1.5 | 0.28 | 15.4 | 21.9 | 26.3 | 29.5 | 32.0 | 33.9 | 35.4 |
| | | 2.0 | 0.50 | 15.9 | 23.1 | 28.2 | 32.0 | 35.0 | 37.4 | 39.3 |
| | | 4.0 | 1.95 | 16.7 | 25.1 | 31.5 | 36.5 | 40.7 | 44.2 | 47.0 |
| | | 6.0 | 4.32 | 17.0 | 25.9 | 32.8 | 38.3 | 43.0 | 47.0 | 50.2 |
| | | **AIR PRESSURE DROP** | | **0.05** | **0.14** | **0.25** | **0.39** | **0.56** | **0.75** | **0.94** |
| | 4 | 2.0 | 0.36 | 17.6 | 26.2 | 32.2 | 36.7 | 40.2 | 43.0 | 45.2 |
| | | 3.0 | 0.79 | 18.2 | 27.7 | 34.8 | 40.4 | 44.8 | 48.5 | 51.4 |
| | | 4.0 | 1.40 | 18.5 | 28.6 | 36.3 | 42.5 | 47.5 | 51.8 | 55.2 |
| | | 6.0 | 3.12 | 18.8 | 29.4 | 37.9 | 44.8 | 50.6 | 55.6 | 59.6 |
| | | **AIR PRESSURE DROP** | | **0.07** | **0.18** | **0.34** | **0.53** | **0.75** | **1.00** | **1.26** |
| | | **CFM RANGE** | **SIZE 7** | | | | | | | |
| | | | **SIZE 8** | | | | | | | |

*NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 55°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 125°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided on page 16. MBH correction factors are averaged across all LMHS unit sizes and may differ slightly than actual results. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.*

## HOT WATER COIL | PERFORMANCE DATA (CONTINUED)

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 250 | 445 | 640 | 835 | 1030 | 1225 | 1400 |
| 9 - 10 | 1 | 1.0 | 0.13 | 10.2 | 13.0 | 14.8 | 16.0 | 17.0 | 17.8 | 18.3 |
| | | 2.0 | 0.41 | 11.3 | 14.8 | 17.2 | 19.0 | 20.4 | 21.6 | 22.4 |
| | | 3.0 | 0.87 | 11.7 | 15.6 | 18.2 | 20.2 | 21.8 | 23.2 | 24.2 |
| | | 4.0 | 1.51 | 11.9 | 16.0 | 18.8 | 20.9 | 22.6 | 24.1 | 25.2 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.04** | **0.07** | **0.11** | **0.15** | **0.20** | **0.25** |
| | 2 | 1.5 | 0.19 | 17.4 | 23.5 | 27.4 | 30.1 | 32.1 | 33.8 | 35.0 |
| | | 2.0 | 0.27 | 18.2 | 25.2 | 29.9 | 33.3 | 35.9 | 38.0 | 39.6 |
| | | 4.0 | 0.99 | 19.5 | 27.9 | 33.9 | 38.5 | 42.2 | 45.3 | 47.6 |
| | | 6.0 | 2.13 | 20.0 | 29.0 | 35.5 | 40.7 | 44.8 | 48.3 | 51.0 |
| | | **AIR PRESSURE DROP** | | **0.03** | **0.08** | **0.14** | **0.22** | **0.31** | **0.40** | **0.50** |
| | 3 | 2.0 | 0.22 | 25.8 | 34.7 | 39.8 | 43.2 | 45.7 | 47.6 | 49.0 |
| | | 3.0 | 0.38 | 27.1 | 37.9 | 44.6 | 49.2 | 52.7 | 55.5 | 57.5 |
| | | 4.0 | 0.66 | 27.8 | 39.5 | 47.1 | 52.4 | 56.5 | 59.8 | 62.2 |
| | | 6.0 | 1.41 | 28.5 | 41.2 | 49.8 | 56.0 | 60.8 | 64.7 | 67.6 |
| | | **AIR PRESSURE DROP** | | **0.04** | **0.12** | **0.22** | **0.34** | **0.48** | **0.64** | **0.80** |
| | 4 | 2.5 | 0.46 | 26.9 | 41.2 | 48.5 | 53.6 | 57.2 | 60.0 | 62.0 |
| | | 3.0 | 0.66 | 27.4 | 42.8 | 51.3 | 57.1 | 61.5 | 64.9 | 67.3 |
| | | 4.0 | 1.16 | 28.0 | 44.7 | 54.4 | 61.3 | 66.5 | 70.6 | 73.7 |
| | | 6.0 | 2.58 | 28.7 | 46.7 | 57.7 | 65.8 | 72.1 | 77.2 | 81.0 |
| | | **AIR PRESSURE DROP** | | **0.08** | **0.16** | **0.29** | **0.45** | **0.64** | **0.86** | **1.07** |
| | | **CFM RANGE** | **SIZE 9** | | | | | | | |
| | | | **SIZE 10** | | | | | | | |

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 400 | 660 | 920 | 1180 | 1440 | 1700 | 1950 |
| 12 | 1 | 1.0 | 0.17 | 14.5 | 17.5 | 19.3 | 20.7 | 21.8 | 22.6 | 23.3 |
| | | 2.0 | 0.51 | 16.5 | 20.6 | 23.4 | 25.6 | 27.3 | 28.7 | 29.8 |
| | | 3.0 | 1.10 | 17.2 | 21.8 | 25.0 | 27.5 | 29.5 | 31.1 | 32.5 |
| | | 4.0 | 1.90 | 17.6 | 22.4 | 25.9 | 28.6 | 30.7 | 32.6 | 34.1 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.05** | **0.08** | **0.11** | **0.16** | **0.20** | **0.25** |
| | 2 | 1.5 | 0.23 | 25.1 | 31.6 | 35.8 | 38.8 | 41.0 | 42.8 | 44.2 |
| | | 2.0 | 0.32 | 26.7 | 34.5 | 39.8 | 43.7 | 46.7 | 49.1 | 51.0 |
| | | 4.0 | 1.17 | 29.3 | 39.3 | 46.5 | 52.0 | 56.5 | 60.2 | 63.2 |
| | | 6.0 | 2.51 | 30.2 | 41.1 | 49.1 | 55.5 | 60.6 | 65.0 | 68.5 |
| | | **AIR PRESSURE DROP** | | **0.04** | **0.09** | **0.15** | **0.23** | **0.31** | **0.41** | **0.51** |
| | 3 | 2.0 | 0.26 | 37.3 | 46.5 | 51.9 | 55.5 | 58.2 | 60.2 | 61.7 |
| | | 3.0 | 0.45 | 40.2 | 52.2 | 59.7 | 64.9 | 68.3 | 72.0 | 74.4 |
| | | 4.0 | 0.77 | 41.7 | 55.1 | 63.8 | 70.1 | 74.8 | 79.5 | 81.7 |
| | | 6.0 | 1.66 | 43.1 | 58.2 | 68.4 | 75.9 | 81.7 | 86.4 | 90.2 |
| | | **AIR PRESSURE DROP** | | **0.06** | **0.13** | **0.23** | **0.35** | **0.50** | **0.65** | **0.82** |
| | 4 | 2.5 | 0.26 | 43.0 | 56.0 | 63.9 | 69.2 | 73.0 | 75.9 | 78.1 |
| | | 3.0 | 0.31 | 44.3 | 59.1 | 68.3 | 74.7 | 79.5 | 83.1 | 86.0 |
| | | 4.0 | 1.29 | 42.6 | 62.5 | 73.6 | 81.5 | 87.4 | 92.1 | 95.8 |
| | | 6.0 | 2.88 | 44.0 | 66.2 | 79.3 | 89.0 | 96.6 | 102.6 | 107.5 |
| | | **AIR PRESSURE DROP** | | **0.08** | **0.18** | **0.31** | **0.47** | **0.66** | **0.87** | **1.10** |

*NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 55°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 125°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided on the next page. MBH correction factors are averaged across all LMHS unit sizes and may differ slightly than actual results. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.*

## HOT WATER COIL | PERFORMANCE DATA (CONTINUED)

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 500 | 860 | 1220 | 1580 | 1940 | 2300 | 2650 |
| 14 | 1 | 1.0 | 0.08 | 17.3 | 20.7 | 22.7 | 24.1 | 25.1 | 25.9 | 26.5 |
| | | 2.0 | 0.22 | 21.0 | 26.6 | 30.2 | 32.9 | 35.0 | 36.6 | 38.0 |
| | | 3.0 | 0.46 | 22.3 | 28.7 | 33.1 | 36.3 | 38.9 | 41.0 | 42.8 |
| | | 4.0 | 0.79 | 23.0 | 29.9 | 34.7 | 38.3 | 41.2 | 43.6 | 45.6 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.04** | **0.07** | **0.10** | **0.14** | **0.18** | **0.23** |
| | 2 | 2.0 | 0.23 | 33.2 | 43.1 | 49.4 | 53.8 | 57.0 | 59.5 | 61.5 |
| | | 3.0 | 0.41 | 35.9 | 48.4 | 56.8 | 62.9 | 67.6 | 71.4 | 74.5 |
| | | 4.0 | 0.70 | 37.3 | 51.2 | 60.8 | 68.0 | 73.7 | 78.4 | 82.1 |
| | | 6.0 | 1.51 | 38.8 | 54.2 | 65.4 | 73.9 | 80.8 | 86.5 | 91.2 |
| | | **AIR PRESSURE DROP** | | **0.03** | **0.07** | **0.13** | **0.20** | **0.28** | **0.36** | **0.46** |
| | 3 | 2.5 | 0.25 | 49.1 | 63.0 | 70.8 | 75.8 | 79.4 | 82.1 | 84.2 |
| | | 3.0 | 0.30 | 51.1 | 67.1 | 76.4 | 82.7 | 87.2 | 90.7 | 93.4 |
| | | 4.0 | 0.52 | 53.3 | 71.9 | 83.3 | 91.2 | 97.1 | 101.6 | 105.2 |
| | | 6.0 | 1.10 | 55.5 | 77.0 | 91.1 | 101.1 | 108.7 | 114.8 | 119.6 |
| | | **AIR PRESSURE DROP** | | **0.04** | **0.11** | **0.20** | **0.31** | **0.43** | **0.57** | **0.73** |
| | 4 | 3.5 | 0.28 | 56.7 | 77.2 | 89.4 | 97.5 | 103.3 | 107.7 | 111.0 |
| | | 4.0 | 0.92 | 53.5 | 80.2 | 94.1 | 103.5 | 110.3 | 115.6 | 119.7 |
| | | 5.0 | 1.43 | 54.8 | 83.9 | 99.8 | 111.0 | 119.3 | 125.7 | 130.8 |
| | | 6.0 | 2.05 | 55.6 | 86.4 | 103.9 | 116.4 | 125.8 | 133.3 | 139.2 |
| | | **AIR PRESSURE DROP** | | **0.06** | **0.15** | **0.26** | **0.41** | **0.58** | **0.77** | **0.97** |

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 700 | 1135 | 1570 | 2005 | 2440 | 2875 | 3300 |
| 16 | 1 | 1.5 | 0.16 | 24.7 | 29.4 | 32.5 | 34.7 | 36.4 | 37.7 | 38.8 |
| | | 2.0 | 0.24 | 26.5 | 32.2 | 36.0 | 38.8 | 41.0 | 42.8 | 44.3 |
| | | 3.0 | 0.52 | 28.5 | 35.2 | 39.9 | 43.4 | 46.2 | 48.5 | 50.4 |
| | | 4.0 | 0.89 | 29.5 | 36.9 | 42.1 | 46.0 | 49.2 | 51.9 | 54.1 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.04** | **0.07** | **0.11** | **0.15** | **0.19** | **0.24** |
| | 2 | 2.0 | 0.09 | 38.9 | 47.0 | 52.0 | 55.5 | 58.0 | 59.9 | 61.5 |
| | | 3.0 | 0.18 | 44.7 | 56.1 | 63.7 | 69.2 | 73.3 | 76.6 | 82.8 |
| | | 4.0 | 0.27 | 47.3 | 62.4 | 72.0 | 79.2 | 82.7 | 87.1 | 90.7 |
| | | 6.0 | 0.58 | 50.1 | 65.9 | 77.3 | 86.0 | 93.0 | 98.7 | 103.5 |
| | | **AIR PRESSURE DROP** | | **0.04** | **0.09** | **0.15** | **0.22** | **0.30** | **0.39** | **0.48** |
| | 3 | 2.5 | 0.11 | 56.7 | 67.0 | 72.7 | 76.4 | 79.1 | 81.0 | 82.6 |
| | | 3.0 | 0.15 | 60.9 | 73.6 | 80.9 | 85.7 | 89.2 | 91.9 | 93.9 |
| | | 4.0 | 0.23 | 66.5 | 82.9 | 92.9 | 99.7 | 104.7 | 108.6 | 111.7 |
| | | 6.0 | 0.44 | 71.2 | 92.1 | 105.7 | 115.3 | 122.5 | 128.3 | 132.9 |
| | | **AIR PRESSURE DROP** | | **0.06** | **0.13** | **0.22** | **0.34** | **0.47** | **0.62** | **0.78** |
| | 4 | 3.0 | 0.10 | 65.7 | 80.0 | 88.0 | 93.2 | 96.8 | 99.4 | 101.5 |
| | | 4.0 | 0.16 | 72.1 | 91.4 | 102.9 | 110.6 | 116.2 | 120.4 | 123.7 |
| | | 5.0 | 0.24 | 76.0 | 98.8 | 113.2 | 123.1 | 129.8 | 136.0 | 140.5 |
| | | 6.0 | 0.31 | 78.0 | 103.7 | 120.4 | 132.2 | 141.1 | 148.0 | 153.5 |
| | | **AIR PRESSURE DROP** | | **0.08** | **0.17** | **0.30** | **0.45** | **0.62** | **0.82** | **1.03** |

| MBH CORRECTION FACTORS FOR OTHER ENTERING CONDITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DELTA-T | 50 | 60 | 70 | 80 | 90 | 100 | 115 | 125 |
| FACTOR | 0.38 | 0.46 | 0.54 | 0.62 | 0.70 | 0.78 | 0.89 | 1.00 |

*NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 55°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 125°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided. MBH correction factors are averaged across all LMHS unit sizes and may differ slightly than actual results. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.*

## HOT WATER COIL | PERFORMANCE DATA (CONTINUED)

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 450 | 675 | 900 | 1125 | 1350 | 1575 | 1800 |
| 20 | 1 | 1.0 | 0.09 | 13.3 | 15.2 | 16.6 | 17.6 | 18.4 | 19.1 | 19.6 |
| | | 2.0 | 0.35 | 15.4 | 18.1 | 20.1 | 21.6 | 22.9 | 24.0 | 24.9 |
| | | 3.0 | 0.76 | 16.3 | 19.4 | 21.7 | 23.5 | 25.0 | 26.3 | 27.4 |
| | | 4.0 | 1.32 | 16.9 | 20.2 | 22.6 | 24.6 | 26.3 | 27.7 | 28.9 |
| | | **AIR PRESSURE DROP** | | **0.05** | **0.11** | **0.19** | **0.27** | **0.37** | **0.49** | **0.62** |
| | 2 | 1.0 | 0.20 | 21.6 | 25.2 | 27.5 | 29.3 | 30.6 | 31.7 | 32.6 |
| | | 2.0 | 0.75 | 25.9 | 31.3 | 35.2 | 38.2 | 40.6 | 42.6 | 44.3 |
| | | 4.0 | 2.86 | 28.8 | 35.7 | 40.9 | 45.1 | 48.6 | 51.6 | 54.1 |
| | | 6.0 | 6.25 | 29.9 | 37.5 | 43.3 | 48.1 | 52.1 | 55.5 | 58.5 |
| | | **AIR PRESSURE DROP** | | **0.12** | **0.24** | **0.40** | **0.57** | **0.78** | **1.01** | **1.26** |
| | 3 | 1.0 | 0.30 | 28.2 | 32.7 | 35.6 | 37.6 | 39.2 | 40.3 | 41.3 |
| | | 2.0 | 1.14 | 33.9 | 41.4 | 46.8 | 50.8 | 54.0 | 56.6 | 58.8 |
| | | 4.0 | 4.30 | 37.4 | 47.3 | 54.9 | 60.9 | 65.8 | 70.0 | 73.6 |
| | | 6.0 | 9.38 | 38.7 | 49.6 | 58.1 | 65.1 | 70.9 | 75.9 | 80.2 |
| | | **AIR PRESSURE DROP** | | **0.19** | **0.37** | **0.59** | **0.86** | **1.17** | **1.14** | **1.89** |
| | 4 | 1.0 | 0.41 | 32.5 | 37.8 | 41.0 | 43.2 | 44.8 | 46.0 | 47.0 |
| | | 2.0 | 1.54 | 39.3 | 48.7 | 55.2 | 60.1 | 63.9 | 66.9 | 69.4 |
| | | 4.0 | 5.81 | 43.3 | 55.9 | 65.4 | 73.1 | 79.3 | 84.6 | 89.1 |
| | | 6.0 | 12.65 | 44.7 | 58.6 | 69.5 | 73.4 | 85.8 | 92.2 | 97.8 |
| | | **AIR PRESSURE DROP** | | **0.25** | **0.49** | **0.79** | **1.15** | **1.56** | **2.02** | **2.53** |

| UNIT SIZE | ROWS | GPM | HEAD LOSS | AIRFLOW, CFM & RESULTING MBH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1250 | 2045 | 2840 | 3635 | 4430 | 5225 | 6000 |
| 22 | 1 | 1.5 | 0.21 | 37.5 | 43.5 | 47.1 | 49.6 | 51.4 | 52.9 | 54.0 |
| | | 2.0 | 0.33 | 41.4 | 49.1 | 53.9 | 57.4 | 60.0 | 62.1 | 63.8 |
| | | 3.0 | 0.71 | 45.5 | 55.3 | 61.7 | 66.4 | 70.1 | 73.1 | 75.5 |
| | | 4.0 | 1.21 | 47.9 | 58.9 | 66.4 | 71.9 | 76.3 | 79.9 | 82.9 |
| | | **AIR PRESSURE DROP** | | **0.02** | **0.05** | **0.09** | **0.13** | **0.18** | **0.24** | **0.30** |
| | 2 | 2.0 | 0.11 | 58.4 | 67.7 | 73.0 | 76.4 | 78.7 | 80.5 | 81.9 |
| | | 3.0 | 0.23 | 69.6 | 84.7 | 93.8 | 99.9 | 104.4 | 107.8 | 110.5 |
| | | 4.0 | 0.37 | 75.8 | 94.7 | 107.0 | 115.6 | 122.1 | 127.1 | 131.1 |
| | | 6.0 | 0.78 | 82.1 | 105.7 | 121.7 | 133.5 | 142.7 | 150.0 | 156.0 |
| | | **AIR PRESSURE DROP** | | **0.05** | **0.11** | **0.18** | **0.27** | **0.37** | **0.48** | **0.60** |
| | 3 | 2.5 | 0.13 | 83.6 | 93.9 | 99.2 | 102.5 | 104.7 | 106.4 | 107.7 |
| | | 3.0 | 0.18 | 92.0 | 105.7 | 112.9 | 117.4 | 120.6 | 122.9 | 124.7 |
| | | 4.0 | 0.30 | 103.7 | 123.6 | 134.5 | 141.5 | 146.5 | 150.3 | 153.2 |
| | | 6.0 | 0.57 | 115.5 | 143.7 | 160.6 | 172.1 | 180.5 | 187.0 | 192.1 |
| | | **AIR PRESSURE DROP** | | **0.07** | **0.16** | **0.28** | **0.42** | **0.59** | **0.77** | **0.98** |
| | 4 | 3.0 | 0.12 | 98.9 | 113.5 | 120.8 | 125.3 | 128.3 | 130.6 | 132.2 |
| | | 4.0 | 0.20 | 113.0 | 135.3 | 147.1 | 154.5 | 159.6 | 163.4 | 166.2 |
| | | 5.0 | 0.30 | 121.9 | 150.9 | 166.9 | 177.3 | 184.6 | 190.0 | 194.2 |
| | | 6.0 | 0.40 | 127.7 | 162.1 | 182.3 | 195.6 | 205.1 | 212.4 | 218.0 |
| | | **AIR PRESSURE DROP** | | **0.09** | **0.21** | **0.37** | **0.56** | **0.78** | **1.03** | **1.30** |

| MBH CORRECTION FACTORS FOR OTHER ENTERING CONDITIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DELTA-T | 50 | 60 | 70 | 80 | 90 | 100 | 115 | 125 |
| FACTOR | 0.38 | 0.46 | 0.54 | 0.62 | 0.70 | 0.78 | 0.89 | 1.00 |

*NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 55°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 125°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided. MBH correction factors are averaged across all LMHS unit sizes and may differ slightly than actual results. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.*

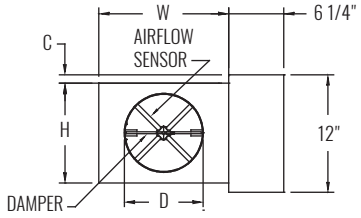
## NOTE:

For hot water performance data tables, visit the Krueger website at **www.krueger-hvac.com** or download the Krueger selection software to run customized selections. The selection program can provide performance data with different entering air and water conditions as well as show effects of altitude and glycol on the heating performance of the water coil. The selection software also allows selections to be saved in a schedule format that can be imported onto a set of project drawings.

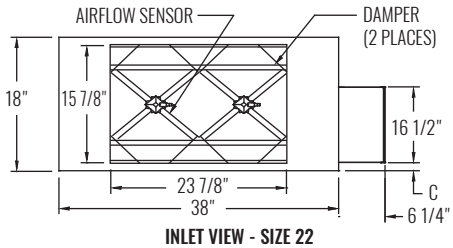
## GLOSSARY OF ABBREVIATIONS

EAT - Entering Air Temperature (°F)
EWT - Entering Water Temperature (°F)
CFM - Cubic Feet/Minute (Air Volume)
Btuh - Heating Capacity (British Thermal Units/hr)
MBH - 1,000 Btuh
WTD - Water Temperature Drop (°F)
ATR - Air Temperature Rise (°F)
LAT - Leaving Air Temperature (°F)
kW - Heating Capacity (kilowatts)
Ps - Static Pressure Drop (“WG)
GPM - Gallon Per Minute
WPD - Water Pressure Drop or Head Loss (ft WG)

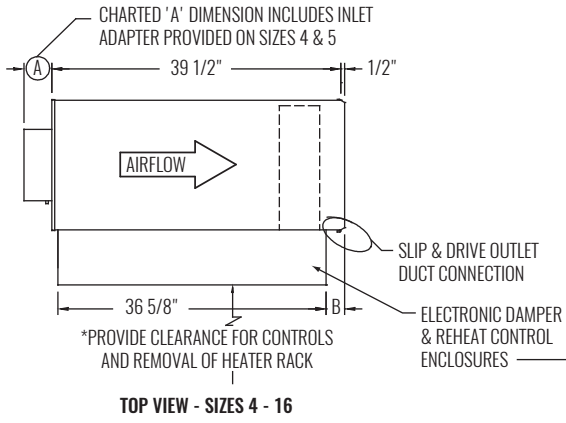
## DIMENSIONAL DATA | BASE UNIT WITH ELECTRIC HEAT



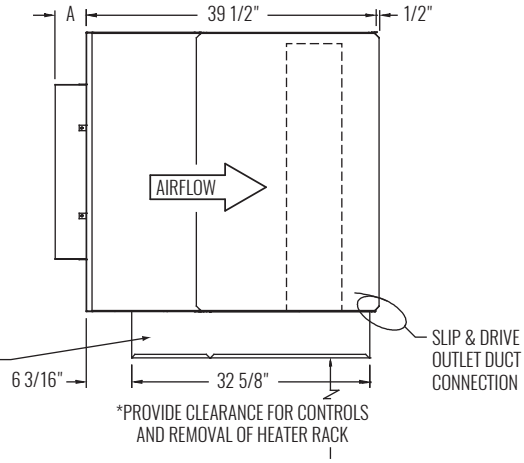

INLET VIEW - SIZES 4 - 16




INLET VIEW - SIZE 22




TOP VIEW - SIZES 4 - 16




TOP VIEW - SIZE 22

* Check NEC for unit clearance requirements.

| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D |
|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 5 1/2" | 2" | 3 7/8" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 5 1/2" | 2" | 4 7/8" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 5 1/2" | 2" | 5 7/8" |
| 7 | 700 [330] | 12" | 10" | 3 3/8" | 5 1/2" | 1" | 6 7/8" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 5 1/2" | 1" | 7 7/8" |
| 9 | 1160 [547] | 14" | 12 1/2" | 3 3/8" | 3 1/2" | - | 8 7/8" |
| 10 | 1430 [675] | 14" | 12 1/2" | 3 3/8" | 3 1/2" | - | 9 7/8" |
| 12 | 2060 [972] | 16" | 15" | 3 3/8" | 3 1/2" | - | 11 7/8" |
| 14 | 2800 [1321] | 20" | 17 1/2" | 3 3/8" | 1 1/2" | - | 13 7/8" |
| 16 | 3660 [1727] | 24" | 18" | 3 3/8" | 1 1/2" | - | 15 7/8" |
| 22 | 7000 [3304] | 38" | 18" | 4 1/4" | - | 1 1/8" | 23 7/8" x 15 7/8" |

NOTES: *Right-hand base unit with electronic control enclosure shown; left-hand is available. See page A2-4 for minimum CFM values. Horizontal installation only.

### STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- Integral sound attenuator.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed as an entire assembly under UL 1996.
- See Page A2-16 for electric heat standard features.

### OPTIONAL FEATURES*

- LineaHeat solid state electronic proportional control of electric heat.
- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- Left or right-hand control & electric heat enclosure.
- Fused or non-fused door interlocking heater disconnect switch.
- Fuse block with fuses for primary overload protection.
- AC solid state relays.
- Dust tight construction.
- Hanger brackets.

# LMHS

Electric Heat | Features and Capacities

KRUEGER

## ELECTRIC HEAT STANDARD FEATURES

- ETL Listed, Meeting NEC Requirements
- 20 Gauge Galvanized Steel Construction
- Line Voltage Combinations:
  [120, 208/240, 277 Volt, Single-Phase]
  [208 Volt, Three-Phase, Three-Wire]
  [480 Volt, Three-Phase, Four-Wire]
- Control Transformer for Analog and Direct Digital Controls
- NEMA 1 Electric Heat Control Enclosure
- Slip and Drive Discharge for Field Duct Connection
- 80/20 Ni-Cr Heating Elements
- Automatic Reset Thermal Cutout Secondary Manual Reset Thermal Cutouts
- De-energizing Magnetic Contactors (Electronic Controls)
- Positive Pressure Airflow Switch
- PE Switch Step Controllers (Pneumatic Controls)

## OPTIONAL FEATURES

- AC Solid State Relays offer silent operation for staged electric heat.
- Fuse Block with fuses for primary overload protection.
- Door interlocking disconnect switches (fused or non-fused).
- Dust-tight construction.

## OPTIONAL HEATER CONTROL

- LineaHeat Solid State Electronic Heater Control available with or without Leaving Air Temperature Control. See the Engineering section for more information.

### MINIMUM / MAXIMUM kW

| UNIT SIZE | STAGES | 1 PHASE | | | | | | | | 3 PHASE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 120 Volt | | 208 Volt | | 240 Volt | | 277 Volt | | 208 Volt (3 wire) | | 480 Volt (4 wire) | |
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| 4 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 3.0 | 1.0 | 3.0 | 1.5 | 3.0 | 1.5 | 3.0 | 1.5 | 3.0 | 2.5 | 3.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 5 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 5.0 | 1.5 | 5.0 | 1.5 | 5.0 | 1.5 | 5.0 | 2.5 | 5.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 6 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 7.5 | 1.5 | 7.5 | 1.5 | 7.5 | 1.5 | 7.5 | 2.5 | 7.5 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 7 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 9.5 | 1.5 | 9.5 | 1.5 | 9.5 | 1.5 | 9.5 | 2.5 | 9.5 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 8 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 9.5 | 1.5 | 11.0 | 1.5 | 13.0 | 1.5 | 13.0 | 2.5 | 13.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 9 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 9.5 | 1.5 | 11.0 | 1.5 | 13.0 | 1.5 | 16.0 | 2.5 | 16.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 10 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 9.5 | 1.5 | 11.0 | 1.5 | 13.0 | 1.5 | 16.0 | 2.5 | 21.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 12 | 1 | 0.5 | | 0.5 | | 1.0 | | 1.0 | | | | | |
| | 2 | 1.0 | 5.0 | 1.0 | 9.5 | 1.5 | 11.0 | 1.5 | 13.0 | 1.5 | 16.0 | 2.5 | 30.0 |
| | 3 | 1.5 | | 1.5 | | 2.0 | | 2.5 | | | | | |
| 14 | 1 | 1.0 | | 1.0 | | 1.0 | | 1.0 | | | | | |
| | 2 | 2.0 | 5.0 | 2.0 | 9.5 | 2.0 | 11.0 | 2.0 | 13.0 | 3.0 | 16.0 | 3.0 | 36.0 |
| | 3 | 3.0 | | 3.0 | | 3.0 | | 3.0 | | | | | |
| 16 | 1 | 1.0 | | 1.0 | | 1.0 | | 1.0 | | | | | |
| | 2 | 2.0 | 5.0 | 2.0 | 9.5 | 2.0 | 11.0 | 2.0 | 13.0 | 3.0 | 16.0 | 3.0 | 36.0 |
| | 3 | 3.0 | | 3.0 | | 3.0 | | 3.0 | | | | | |
| 20 | 1 | 1.0 | | 0.5 | | 1.0 | | 1.0 | | 1.5 | | 2.5 | |
| | 2 | 2.0 | 5.0 | 1.0 | 9.5 | 1.5 | 11.0 | 1.5 | 13.0 | 3.0 | 16.0 | 3.0 | 30.0 |
| | 3 | 3.0 | | 1.5 | | 2.0 | | 2.5 | | 3.0 | | 3.0 | |
| 22 | 1 | 1.0 | | 1.0 | | 1.0 | | 1.5 | | | | | |
| | 2 | 2.0 | 5.0 | 2.0 | 9.5 | 2.0 | 11.0 | 3.0 | 13.0 | 3.0 | 16.0 | 4.0 | 36.0 |
| | 3 | 3.0 | | 3.0 | | 3.0 | | 4.5 | | | | | |

## FORMULAS

Specify electric duct heaters using voltage, kW, and number of steps.

Required kW is calculated using the following relationship:

**kW = Btuh / 3413**
**kW = (CFM x ΔT) / 3160**

**Where:**
Btuh = Required Heating Capacity

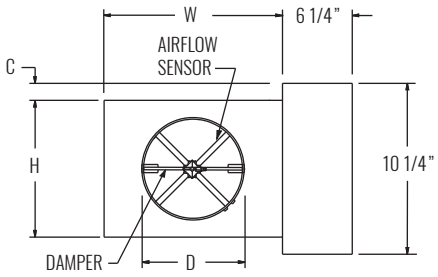
CFM = Volume of Air Controlled During Heating (Typically 30%-100% of Maximum Cooling Volume)

ΔT = Leaving Air Temperature minus the entering air temperature or the desired air temperature rise across the electric heater.*

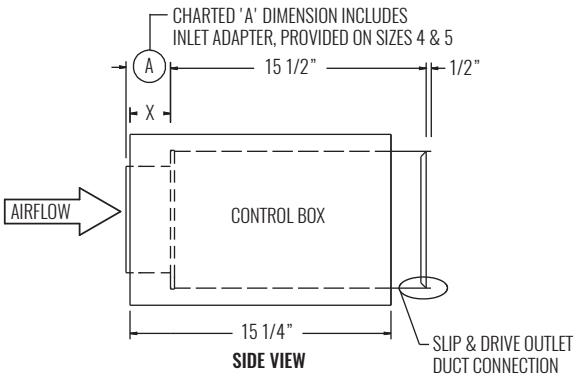
*NOTES: The ASHRAE handbook of fundamentals states that discharge temperatures in excess of 90°F are likely to result in objectionable air temperature stratification in the space. Also, ventilation short circuiting may occur. ASHRAE Standard 62.1 limits discharge temperatures to 90°F or increasing the ventilation rate when heating from the ceiling.*

*NOTES: Minimum and maximum values apply to staged heaters only. Contact your local Krueger representative for LineaHeat limits. Electric heaters are provided as slip-in type integrally mounted to the terminal unit. Where possible, select heater so that power (kW) is a whole number. Often rounding to the nearest whole number has negligible impact on discharge temperature and power consumption.*

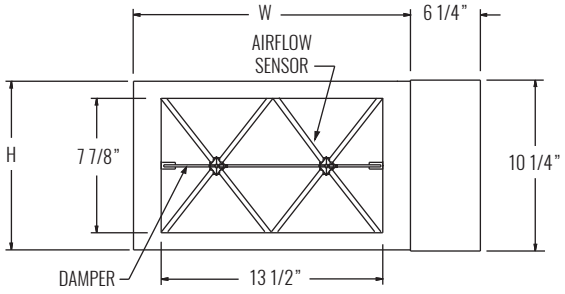
## LOW PROFILE UNIT | DIMENSIONAL DATA



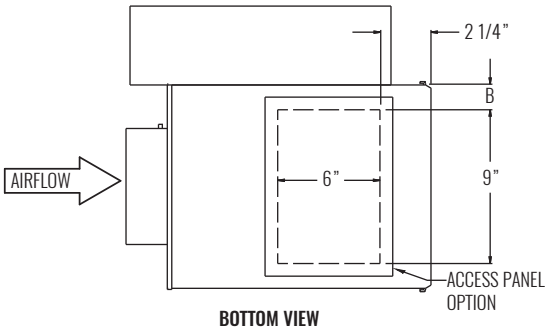

INLET VIEW - SIZES 4 - 8




SIDE VIEW




INLET VIEW - SIZE 20




BOTTOM VIEW

| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D | X |
|---|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 3 7/8" | 2 5/8" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 4 7/8" | 2 5/8" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 1 1/8" | 5 7/8" | 2 5/8" |
| 7 | 710 [335] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 6 7/8" | 2 5/8" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 7 7/8" | 2 5/8" |
| 20 | 2100 [991] | 16 1/4" | 10" | 2 7/8" | 3 5/8" | 1/8" | N/A | 2 5/8" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

## STANDARD FEATURES

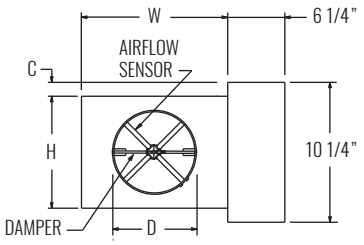
- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

## OPTIONAL FEATURES

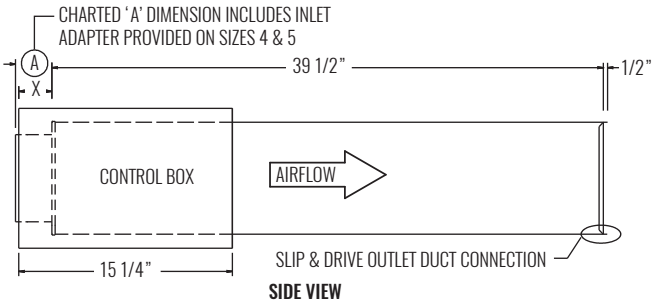
- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Hanger brackets.
- Bottom access panel.*
- Cam locks (bottom access panel).*

*NOTE: *Not available on size 20 with Sterilwall or Perforated Doublewall.*

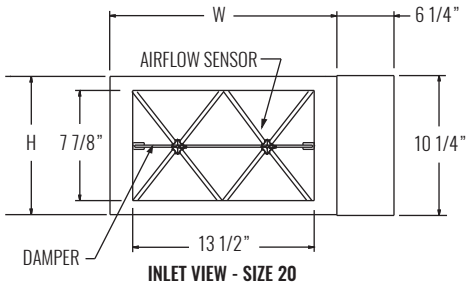
## LOW PROFILE UNIT WITH ATTENUATOR | DIMENSIONAL DATA



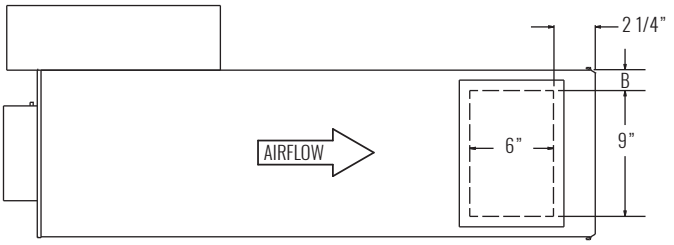

INLET VIEW - SIZES 4 - 8




SIDE VIEW




INLET VIEW - SIZE 20




BOTTOM VIEW

| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D | X |
|---|---|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 3 7/8" | 2 5/8" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 4 7/8" | 2 5/8" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 1 1/8" | 5 7/8" | 2 5/8" |
| 7 | 710 [335] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 6 7/8" | 2 5/8" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 7 7/8" | 2 5/8" |
| 20 | 2100 [991] | 16 1/4" | 10" | 2 7/8" | 3 5/8" | 1/8" | N/A | 2 5/8" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

## STANDARD FEATURES

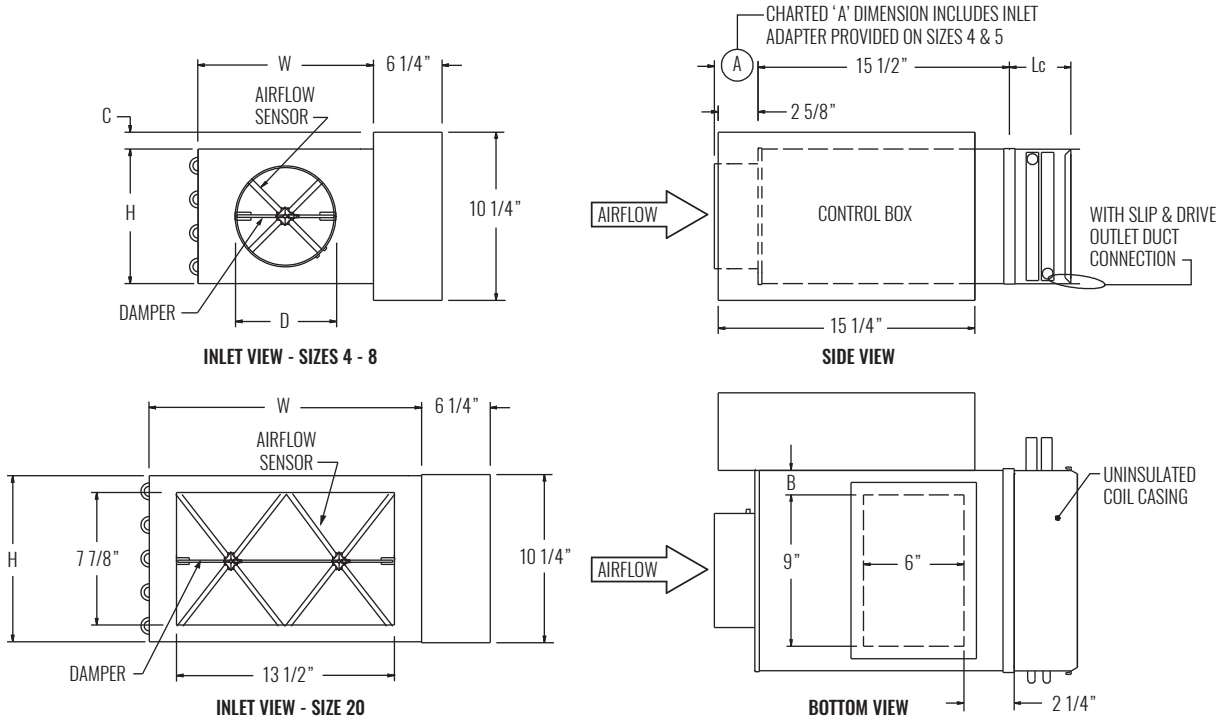
- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed - Adherence to UL 429 for electrically operated valves.

## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Hanger brackets.
- Bottom access panel. *
- Cam locks (bottom access panel). *

*NOTE: *Not available on size 20 with Sterilwall or Perforated Doublewall.*

## LOW PROFILE UNIT WITH HOT WATER HEAT | DIMENSIONAL DATA




| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D | Lc | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1-ROW | 2-ROW |
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 3 7/8" | 5" | 7 1/4" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 4 7/8" | 5" | 7 1/4" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 1 1/8" | 5 7/8" | 5" | 7 1/4" |
| 7 | 710 [335] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 6 7/8" | 5" | 7 1/4" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 7 7/8" | 5" | 7 1/4" |
| 20 | 2100 [991] | 16 1/4" | 10" | 2 7/8" | 3 5/8" | 1/8" | N/A | 5" | 7 1/4" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

## STANDARD FEATURES

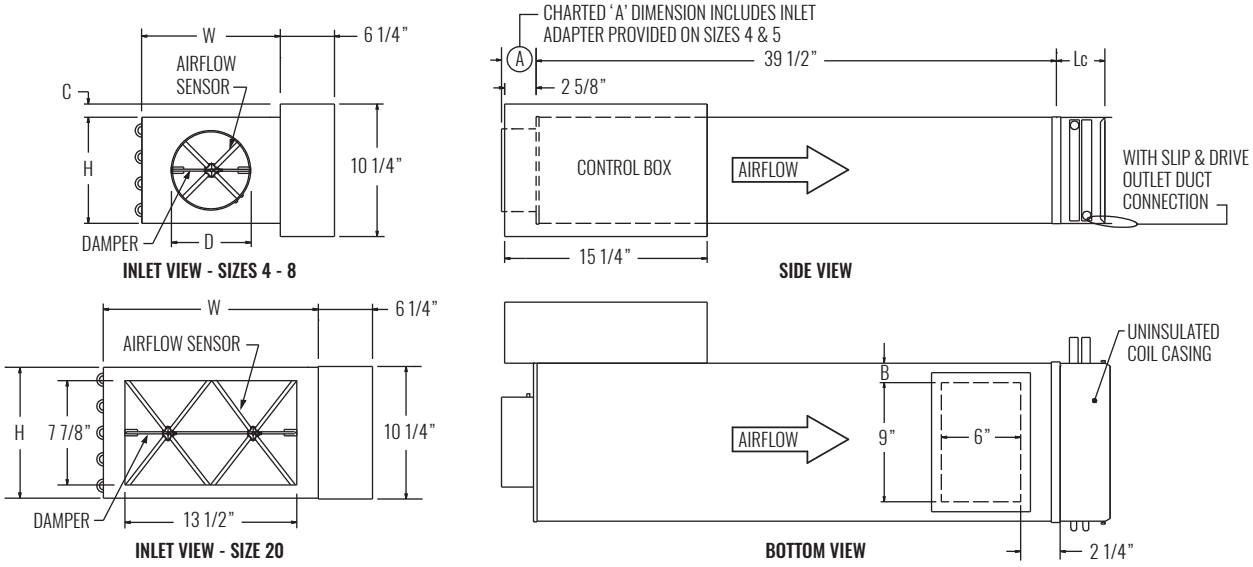
- 22 Gauge galvanized steel casing construction.
- NEMA 1 Steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Hot water coils.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- See pages A2-13 and A2-14 for hot water coil dimensional and engineering information.

## OPTIONAL FEATURES

- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Left-hand or right-hand water coil connection.
- Hanger brackets.
- Bottom access panel.*
- Cam locks (bottom access panel).*

*NOTE: *Not available on size 20 with Sterilwall or Perforated Doublewall.*

## LOW PROFILE UNIT WITH HOT WATER HEAT AND ATTENUATOR | DIMENSIONAL DATA




| INLET SIZE | MAX CFM [L/s] | W | H | A | B | C | D | Lc | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1-ROW | 2-ROW |
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 3 7/8" | 5" | 7 1/4" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/2" | 1 1/8" | 4 7/8" | 5" | 7 1/4" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/2" | 1 1/8" | 5 7/8" | 5" | 7 1/4" |
| 7 | 710 [335] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 6 7/8" | 5" | 7 1/4" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1 1/2" | 1/8" | 7 7/8" | 5" | 7 1/4" |
| 20 | 2100 [991] | 16 1/4" | 10" | 2 7/8" | 3 5/8" | 1/8" | N/A | 5" | 7 1/4" |

*NOTES: Right-hand base unit with electronic control enclosure shown; left-hand is available.*

## STANDARD FEATURES

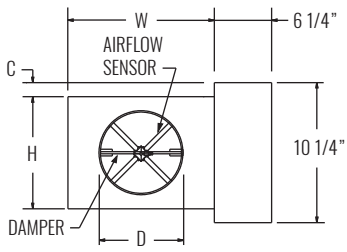
- 22 Gauge galvanized steel casing construction.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Hot water coils.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- See pages A2-13 and A2-14 for hot water coil dimensional and engineering information.

## OPTIONAL FEATURES

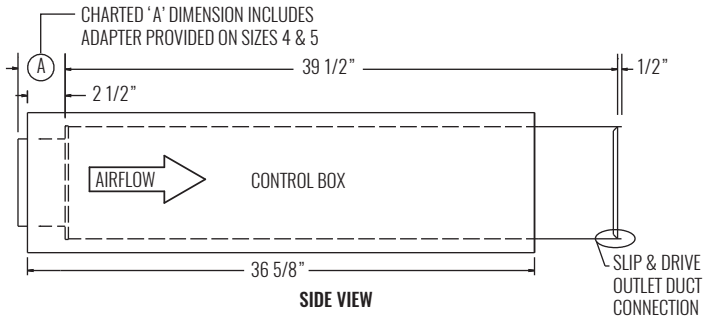
- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- 24-volt transformer.
- Disconnect switch for electronic controls.
- Dust tight control enclosure.
- Left-hand or right-hand control enclosure.
- Left-hand or right-hand water coil connection.
- Hanger brackets.
- Bottom access panel. *
- Cam locks (bottom access panel). *

*NOTE: *Not available on size 20 with Sterilwall or Perforated Doublewall.*

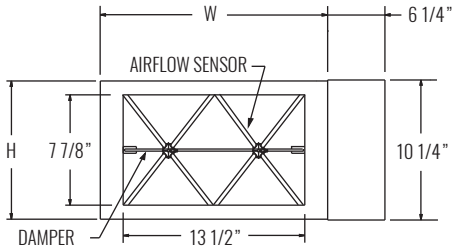
## DIMENSIONAL DATA | LOW PROFILE UNIT WITH ELECTRIC HEAT



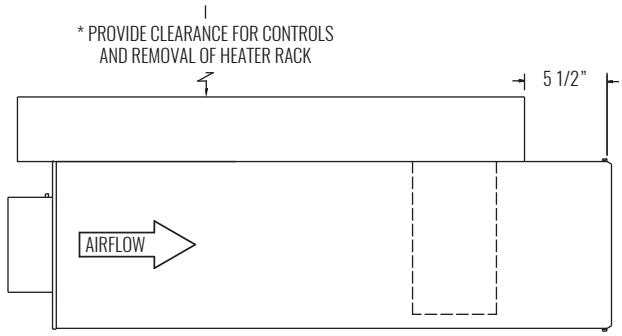

INLET VIEW - SIZES 4 - 8




SIDE VIEW




INLET VIEW - SIZE 20




BOTTOM VIEW

* Check NEC for unit clearance requirements.

| INLET SIZE | MAX CFM [L/s] | W | H | A | C | D |
|---|---|---|---|---|---|---|
| 4 | 230 [109] | 12" | 8" | 5 3/8" | 1 1/8" | 3 7/8" |
| 5 | 360 [170] | 12" | 8" | 5 3/8" | 1 1/8" | 4 7/8" |
| 6 | 515 [243] | 12" | 8" | 3 3/8" | 1 1/8" | 5 7/8" |
| 7 | 710 [335] | 12" | 10" | 3 3/8" | 1/8" | 6 7/8" |
| 8 | 920 [434] | 12" | 10" | 3 3/8" | 1/8" | 7 7/8" |
| 20 | 2100 [991] | 16 1/4" | 10" | 3 3/4" | 1/8" | N/A |

NOTES: *Right-hand base unit with electronic control enclosure shown; left-hand is available.

### STANDARD FEATURES

- 22 Gauge galvanized steel casing construction.
- Integral sound attenuator.
- NEMA 1 steel control enclosure for electric or electronic components.
- 1/2" Thick dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- Four quadrant center averaging airflow sensor.
- Variety of pneumatic, analog, and factory mounted direct digital control packages for pressure dependent and pressure independent systems.
- ETL Listed as an entire assembly under UL 1996.
- See Page A2-16 for electric heat standard features.

### OPTIONAL FEATURES*

- LineaHeat solid state electronic proportional control of electric heat.
- 20 Gauge galvanized steel casing construction.
- Liners: 1/2" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Doublewall, or no liner.
- Linear averaging airflow sensor.
- Left or right-hand control & electric heat enclosure.
- Fused or non-fused door interlocking heater disconnect switch.
- Fuse block with fuses for primary overload protection.
- AC solid state relays.
- Dust tight construction.
- Hanger brackets.

## DISCHARGE SOUND PERFORMANCE DATA

| INLET SIZE | FLOW RATE | | MIN Δ Ps | | 0.75" Δ Ps | | | | | | | 1.5" Δ Ps | | | | | | | 2.5" Δ Ps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp |
| | CFM | (L/s) | "WG | (Pa) | 2 | 3 | 4 | 5 | 6 | 7 | NC | 2 | 3 | 4 | 5 | 6 | 7 | NC | 2 | 3 | 4 | 5 | 6 | 7 | NC |
| 4 | 50 | (24) | 0.011 | (2.76) | 53 | 41 | 35 | 34 | 29 | 25 | - | 54 | 42 | 39 | 38 | 33 | 31 | - | 55 | 43 | 42 | 41 | 36 | 35 | - |
| | 110 | (52) | 0.054 | (13.37) | 63 | 56 | 47 | 43 | 40 | 34 | - | 64 | 58 | 51 | 47 | 44 | 40 | **20** | 65 | 59 | 53 | 50 | 47 | 44 | **21** |
| | 150 | (71) | 0.100 | (24.88) | 68 | 62 | 52 | 47 | 45 | 38 | **24** | 69 | 64 | 55 | 51 | 49 | 44 | **26** | 69 | 65 | 58 | 54 | 51 | 48 | **27** |
| | 230 | (109) | 0.235 | (58.51) | 73 | 71 | 58 | 52 | 51 | 43 | **32** | 74 | 72 | 62 | 56 | 55 | 49 | **33** | 75 | 73 | 64 | 59 | 57 | 53 | **34** |
| 5 | 60 | (28) | 0.006 | (1.43) | 49 | 41 | 39 | 31 | 30 | 25 | - | 52 | 44 | 44 | 35 | 35 | 31 | - | 55 | 47 | 47 | 38 | 38 | 35 | - |
| | 140 | (66) | 0.031 | (7.80) | 60 | 55 | 50 | 43 | 39 | 34 | - | 63 | 59 | 55 | 47 | 44 | 40 | - | 66 | 61 | 58 | 50 | 48 | 45 | **22** |
| | 250 | (118) | 0.100 | (24.88) | 67 | 66 | 58 | 50 | 46 | 41 | **25** | 71 | 69 | 62 | 54 | 50 | 47 | **29** | 73 | 72 | 66 | 57 | 54 | 51 | **32** |
| | 360 | (170) | 0.207 | (51.60) | 72 | 72 | 63 | 55 | 50 | 45 | **31** | 76 | 75 | 67 | 59 | 55 | 51 | **35** | 78 | 78 | 70 | 62 | 58 | 55 | **38** |
| 6 | 100 | (47) | 0.006 | (1.56) | 51 | 47 | 35 | 31 | 33 | 29 | - | 55 | 52 | 40 | 35 | 38 | 36 | - | 57 | 56 | 44 | 39 | 42 | 41 | - |
| | 250 | (118) | 0.039 | (9.72) | 62 | 59 | 49 | 44 | 41 | 36 | - | 66 | 64 | 54 | 48 | 46 | 43 | **23** | 68 | 68 | 58 | 51 | 50 | 48 | **28** |
| | 400 | (189) | 0.100 | (24.88) | 68 | 65 | 56 | 50 | 45 | 40 | **23** | 71 | 70 | 62 | 54 | 50 | 47 | **29** | 74 | 74 | 66 | 57 | 54 | 52 | **33** |
| | 520 | (245) | 0.169 | (42.05) | 71 | 68 | 60 | 54 | 47 | 43 | **27** | 74 | 73 | 66 | 58 | 53 | 50 | **33** | 77 | 77 | 70 | 61 | 57 | 55 | **37** |
| 7 | 120 | (57) | 0.005 | (1.18) | 56 | 54 | 33 | 28 | 32 | 32 | - | 60 | 60 | 39 | 32 | 38 | 40 | - | 63 | 65 | 43 | 34 | 43 | 45 | **25** |
| | 330 | (156) | 0.036 | (8.96) | 65 | 61 | 48 | 44 | 42 | 41 | - | 69 | 68 | 54 | 48 | 48 | 48 | **27** | 72 | 73 | 58 | 50 | 52 | 54 | **32** |
| | 550 | (260) | 0.100 | (24.88) | 69 | 65 | 56 | 53 | 47 | 45 | **23** | 73 | 72 | 61 | 56 | 53 | 52 | **31** | 76 | 76 | 66 | 59 | 57 | 58 | **37** |
| | 700 | (330) | 0.162 | (40.31) | 71 | 67 | 59 | 57 | 49 | 47 | **24** | 75 | 73 | 65 | 60 | 55 | 54 | **32** | 78 | 78 | 69 | 62 | 59 | 60 | **38** |
| 8 | 160 | (76) | 0.005 | (1.30) | 57 | 51 | 42 | 34 | 37 | 33 | - | 60 | 57 | 48 | 39 | 42 | 40 | - | 62 | 61 | 53 | 42 | 47 | 45 | - |
| | 440 | (208) | 0.040 | (9.83) | 66 | 61 | 52 | 47 | 45 | 41 | - | 69 | 67 | 58 | 52 | 51 | 48 | **25** | 72 | 71 | 62 | 55 | 55 | 53 | **30** |
| | 700 | (330) | 0.100 | (24.88) | 70 | 66 | 56 | 53 | 49 | 44 | **24** | 74 | 71 | 62 | 58 | 54 | 51 | **31** | 76 | 76 | 67 | 61 | 58 | 56 | **36** |
| | 920 | (434) | 0.173 | (42.98) | 73 | 68 | 59 | 56 | 51 | 46 | **26** | 76 | 74 | 65 | 61 | 57 | 53 | **33** | 78 | 78 | 69 | 64 | 61 | 58 | **38** |
| 9 | 200 | (94) | 0.005 | (1.23) | 50 | 46 | 35 | 32 | 35 | 35 | - | 53 | 51 | 39 | 36 | 40 | 42 | - | 55 | 54 | 43 | 39 | 44 | 46 | - |
| | 550 | (260) | 0.037 | (9.29) | 62 | 57 | 49 | 46 | 44 | 42 | - | 65 | 62 | 54 | 50 | 50 | 48 | - | 67 | 66 | 57 | 53 | 53 | 53 | **24** |
| | 900 | (425) | 0.100 | (24.88) | 68 | 63 | 56 | 53 | 49 | 46 | - | 71 | 68 | 61 | 57 | 54 | 52 | **25** | 73 | 71 | 64 | 59 | 58 | 56 | **30** |
| | 1160 | (547) | 0.166 | (41.34) | 72 | 66 | 60 | 56 | 52 | 47 | **23** | 74 | 71 | 65 | 60 | 57 | 53 | **29** | 76 | 74 | 68 | 63 | 60 | 58 | **33** |
| 10 | 250 | (118) | 0.005 | (1.29) | 50 | 48 | 40 | 38 | 39 | 37 | - | 53 | 53 | 45 | 42 | 45 | 43 | - | 55 | 57 | 48 | 45 | 49 | 48 | - |
| | 700 | (330) | 0.040 | (10.08) | 62 | 58 | 52 | 49 | 48 | 45 | - | 65 | 63 | 57 | 54 | 53 | 51 | **21** | 68 | 67 | 61 | 57 | 57 | 55 | **26** |
| | 1100 | (519) | 0.100 | (24.88) | 68 | 63 | 58 | 54 | 51 | 48 | - | 71 | 68 | 63 | 59 | 57 | 54 | **26** | 73 | 72 | 67 | 62 | 61 | 58 | **30** |
| | 1450 | (684) | 0.174 | (43.24) | 71 | 66 | 61 | 58 | 53 | 50 | **23** | 74 | 71 | 66 | 62 | 59 | 56 | **29** | 77 | 74 | 70 | 65 | 63 | 61 | **33** |
| 12 | 400 | (189) | 0.006 | (1.56) | 52 | 47 | 39 | 42 | 42 | 42 | - | 56 | 52 | 43 | 46 | 47 | 48 | - | 58 | 56 | 46 | 50 | 50 | 52 | - |
| | 1000 | (472) | 0.039 | (9.72) | 64 | 58 | 53 | 52 | 50 | 48 | - | 68 | 63 | 57 | 56 | 55 | 54 | - | 70 | 67 | 60 | 60 | 58 | 58 | **24** |
| | 1600 | (755) | 0.100 | (24.88) | 71 | 63 | 60 | 57 | 54 | 51 | **22** | 74 | 68 | 64 | 61 | 59 | 57 | **26** | 77 | 72 | 67 | 65 | 62 | 61 | **30** |
| | 2060 | (972) | 0.166 | (41.25) | 74 | 66 | 63 | 59 | 56 | 52 | **26** | 78 | 71 | 68 | 64 | 61 | 58 | **30** | 80 | 75 | 71 | 67 | 64 | 63 | **34** |
| 14 | 480 | (227) | 0.005 | (1.30) | 47 | 44 | 33 | 39 | 38 | 40 | - | 50 | 48 | 37 | 43 | 42 | 46 | - | 52 | 52 | 39 | 46 | 45 | 50 | - |
| | 1375 | (649) | 0.043 | (10.67) | 64 | 58 | 53 | 52 | 50 | 48 | - | 67 | 62 | 56 | 56 | 54 | 54 | - | 69 | 65 | 58 | 59 | 57 | 58 | **22** |
| | 2100 | (991) | 0.100 | (24.88) | 71 | 63 | 60 | 58 | 55 | 52 | **22** | 74 | 68 | 63 | 61 | 59 | 57 | **26** | 76 | 71 | 66 | 64 | 62 | 62 | **29** |
| | 2800 | (1321) | 0.178 | (44.24) | 75 | 67 | 66 | 61 | 58 | 54 | **28** | 78 | 71 | 69 | 65 | 62 | 60 | **32** | 81 | 75 | 71 | 68 | 65 | 64 | **35** |
| 16 | 630 | (297) | 0.005 | (1.26) | 41 | 37 | 22 | 31 | 30 | 29 | - | 44 | 41 | 26 | 34 | 35 | 34 | - | 47 | 45 | 28 | 37 | 38 | 38 | - |
| | 1775 | (838) | 0.040 | (10.00) | 62 | 55 | 49 | 48 | 46 | 44 | - | 65 | 60 | 52 | 52 | 51 | 50 | - | 68 | 63 | 55 | 55 | 54 | 54 | - |
| | 2800 | (1321) | 0.100 | (24.88) | 71 | 63 | 60 | 56 | 53 | 51 | **23** | 75 | 68 | 64 | 60 | 58 | 56 | **27** | 77 | 71 | 66 | 63 | 61 | 60 | **30** |
| | 3660 | (1727) | 0.171 | (42.52) | 77 | 68 | 67 | 61 | 58 | 55 | **30** | 80 | 72 | 71 | 64 | 62 | 60 | **34** | 83 | 76 | 73 | 67 | 65 | 64 | **37** |
| 22 | 1200 | (566) | 0.005 | (1.27) | 67 | 57 | 55 | 50 | 46 | 38 | - | 73 | 65 | 58 | 55 | 51 | 44 | **25** | 78 | 70 | 60 | 59 | 55 | 49 | **31** |
| | 3300 | (1557) | 0.039 | (9.64) | 78 | 69 | 71 | 65 | 61 | 56 | **31** | 84 | 77 | 73 | 70 | 67 | 62 | **39** | 88 | 82 | 76 | 74 | 71 | 67 | **44** |
| | 5300 | (2501) | 0.100 | (24.86) | 83 | 75 | 78 | 72 | 69 | 65 | **37** | 89 | 82 | 81 | 77 | 74 | 71 | **45** | 93 | 88 | 83 | 81 | 78 | 76 | **51** |
| | 7000 | (3304) | 0.174 | (43.37) | 86 | 78 | 82 | 76 | 73 | 70 | **41** | 92 | 86 | 85 | 81 | 78 | 76 | **49** | 96 | 91 | 87 | 85 | 82 | 81 | 54 |

*NOTES: Discharge sound power is the sound emitted from the unit discharge. All sound data is based on tests conducted in accordance with AHRI 880-11 and corrected for end reflection. Sound power levels are in dB, re $10^{-12}$ Watts. ΔPs is the difference in static pressure from inlet to discharge. NC application data is from AHRI Standard 885-08 Appendix E, as a function of flow rate shown. AHRI certification points are shown in bold, white font. For a complete list of AHRI certified data, see page A2-4. All other data points listed are application ratings outside the scope of the Certification Program. See Krueger's selection program for specific sound data for optional liners; 1/2", dual density liner shown. Dash indicates a NC is less than 20. See Engineering section for reductions and definitions.*

## RADIATED SOUND PERFORMANCE DATA

| INLET SIZE | FLOW RATE | | MIN Δ Ps | | 0.75" Δ Ps | | | | | | | 1.5" Δ Ps | | | | | | | 2.5" Δ Ps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp | OCTAVE BAND SOUND POWER, Lw | | | | | | Lp |
| | CFM | (L/s) | "WG | (Pa) | 2 | 3 | 4 | 5 | 6 | 7 | NC | 2 | 3 | 4 | 5 | 6 | 7 | NC | 2 | 3 | 4 | 5 | 6 | 7 | NC |
| 4 | 50 | (24) | 0.011 | (2.76) | 37 | 28 | 24 | 23 | 17 | 10 | - | 38 | 29 | 27 | 25 | 19 | 15 | - | 38 | 30 | 30 | 27 | 21 | 18 | - |
| | 110 | (52) | 0.054 | (13.37) | 50 | 42 | 34 | 33 | 30 | 23 | - | 51 | 43 | 38 | 35 | 32 | 28 | - | 51 | 45 | 40 | 37 | 34 | 31 | - |
| | 150 | (71) | 0.100 | (24.88) | 55 | 47 | 39 | 37 | 35 | 29 | - | 56 | 49 | 42 | 40 | 37 | 33 | - | 56 | 50 | 45 | 41 | 39 | 37 | - |
| | 230 | (109) | 0.235 | (58.51) | 62 | 55 | 45 | 43 | 42 | 36 | **24** | 62 | 57 | 48 | 45 | 44 | 40 | **26** | 63 | 58 | 51 | 47 | 46 | 44 | **27** |
| 5 | 60 | (28) | 0.006 | (1.43) | 38 | 21 | 17 | 12 | 8 | 6 | - | 43 | 26 | 22 | 15 | 11 | 12 | - | 47 | 30 | 26 | 18 | 14 | 17 | - |
| | 140 | (66) | 0.031 | (7.80) | 47 | 36 | 30 | 26 | 22 | 17 | - | 52 | 41 | 35 | 29 | 25 | 23 | - | 56 | 45 | 39 | 32 | 28 | 28 | - |
| | 250 | (118) | 0.100 | (24.88) | 53 | 47 | 39 | 36 | 31 | 25 | - | 59 | 52 | 44 | 39 | 35 | 31 | **20** | 62 | 55 | 47 | 41 | 38 | 36 | **25** |
| | 360 | (170) | 0.207 | (51.60) | 57 | 53 | 44 | 42 | 37 | 30 | **21** | 62 | 58 | 49 | 45 | 41 | 36 | **27** | 66 | 62 | 53 | 47 | 44 | 41 | **31** |
| 6 | 100 | (47) | 0.006 | (1.56) | 43 | 35 | 24 | 15 | 10 | 6 | - | 46 | 40 | 28 | 20 | 16 | 13 | - | 49 | 44 | 31 | 24 | 20 | 19 | - |
| | 250 | (118) | 0.039 | (9.72) | 52 | 47 | 38 | 28 | 23 | 19 | - | 56 | 52 | 43 | 33 | 29 | 26 | - | 58 | 55 | 46 | 37 | 33 | 32 | **24** |
| | 400 | (189) | 0.100 | (24.88) | 57 | 53 | 46 | 35 | 30 | 26 | **21** | 60 | 58 | 50 | 40 | 36 | 33 | **27** | 63 | 61 | 53 | 43 | 40 | 38 | **31** |
| | 520 | (245) | 0.169 | (42.05) | 60 | 56 | 50 | 39 | 34 | 29 | **25** | 63 | 61 | 54 | 43 | 39 | 37 | **30** | 65 | 64 | 57 | 47 | 43 | 42 | **35** |
| 7 | 120 | (57) | 0.005 | (1.18) | 38 | 42 | 25 | 17 | 12 | 7 | - | 42 | 47 | 31 | 21 | 16 | 14 | - | 44 | 51 | 35 | 24 | 19 | 19 | - |
| | 330 | (156) | 0.036 | (8.96) | 50 | 48 | 38 | 31 | 27 | 22 | - | 54 | 54 | 44 | 36 | 31 | 28 | **22** | 57 | 58 | 49 | 39 | 34 | 33 | **27** |
| | 550 | (260) | 0.100 | (24.88) | 56 | 52 | 45 | 39 | 34 | 29 | - | 60 | 57 | 51 | 43 | 39 | 35 | **26** | 63 | 61 | 55 | 46 | 42 | 40 | **31** |
| | 700 | (330) | 0.162 | (40.31) | 59 | 53 | 48 | 42 | 38 | 32 | **23** | 63 | 59 | 54 | 46 | 42 | 38 | **29** | 66 | 63 | 59 | 50 | 45 | 43 | **34** |
| 8 | 160 | (76) | 0.005 | (1.30) | 45 | 39 | 27 | 22 | 18 | 16 | - | 48 | 45 | 34 | 27 | 23 | 23 | - | 50 | 49 | 39 | 30 | 27 | 28 | - |
| | 440 | (208) | 0.040 | (9.83) | 55 | 49 | 38 | 33 | 28 | 26 | - | 58 | 54 | 45 | 38 | 33 | 33 | **23** | 60 | 59 | 50 | 41 | 37 | 38 | **28** |
| | 700 | (330) | 0.100 | (24.88) | 59 | 53 | 43 | 38 | 32 | 31 | **21** | 62 | 59 | 49 | 43 | 38 | 38 | **28** | 64 | 63 | 55 | 46 | 41 | 43 | **33** |
| | 920 | (434) | 0.173 | (42.98) | 62 | 56 | 45 | 41 | 35 | 34 | **24** | 65 | 62 | 52 | 46 | 40 | 41 | **31** | 67 | 66 | 57 | 49 | 44 | 46 | **37** |
| 9 | 200 | (94) | 0.005 | (1.23) | 38 | 36 | 21 | 22 | 21 | 19 | - | 42 | 42 | 26 | 26 | 26 | 27 | - | 44 | 47 | 29 | 29 | 30 | 33 | - |
| | 550 | (260) | 0.037 | (9.29) | 50 | 45 | 38 | 33 | 30 | 24 | - | 54 | 51 | 42 | 37 | 35 | 32 | - | 56 | 56 | 45 | 40 | 39 | 38 | **25** |
| | 900 | (425) | 0.100 | (24.88) | 56 | 49 | 46 | 38 | 34 | 27 | - | 60 | 56 | 50 | 42 | 39 | 35 | **24** | 62 | 60 | 53 | 45 | 43 | 41 | **30** |
| | 1160 | (547) | 0.166 | (41.34) | 59 | 52 | 50 | 41 | 37 | 28 | **24** | 63 | 58 | 54 | 45 | 42 | 36 | **28** | 65 | 63 | 57 | 48 | 46 | 42 | **32** |
| 10 | 250 | (118) | 0.005 | (1.29) | 33 | 33 | 17 | 16 | 11 | 3 | - | 39 | 39 | 21 | 20 | 19 | 14 | - | 43 | 44 | 23 | 24 | 25 | 23 | - |
| | 700 | (330) | 0.040 | (10.08) | 46 | 43 | 37 | 31 | 24 | 15 | - | 52 | 50 | 41 | 36 | 32 | 27 | - | 56 | 54 | 44 | 40 | 38 | 35 | **23** |
| | 1100 | (519) | 0.100 | (24.88) | 52 | 48 | 46 | 38 | 30 | 21 | **20** | 58 | 54 | 50 | 43 | 38 | 32 | **24** | 62 | 59 | 52 | 46 | 44 | 41 | **28** |
| | 1450 | (684) | 0.174 | (43.24) | 55 | 51 | 52 | 42 | 33 | 24 | **26** | 61 | 57 | 55 | 47 | 42 | 36 | **30** | 66 | 62 | 58 | 51 | 48 | 44 | **33** |
| 12 | 400 | (189) | 0.006 | (1.56) | 42 | 44 | 29 | 24 | 20 | 15 | - | 46 | 49 | 33 | 28 | 24 | 20 | - | 50 | 53 | 37 | 31 | 28 | 25 | **21** |
| | 1000 | (472) | 0.039 | (9.72) | 54 | 50 | 41 | 36 | 32 | 25 | - | 58 | 55 | 45 | 40 | 36 | 31 | **23** | 61 | 58 | 48 | 43 | 40 | 35 | **27** |
| | 1600 | (755) | 0.100 | (24.88) | 60 | 53 | 47 | 42 | 38 | 31 | **22** | 64 | 58 | 51 | 46 | 42 | 36 | **28** | 67 | 61 | 54 | 49 | 46 | 41 | **32** |
| | 2060 | (972) | 0.166 | (41.25) | 63 | 55 | 50 | 45 | 41 | 33 | **26** | 67 | 59 | 54 | 49 | 46 | 39 | **32** | 71 | 63 | 58 | 52 | 49 | 43 | **36** |
| 14 | 480 | (227) | 0.005 | (1.30) | 35 | 35 | 19 | 24 | 21 | 18 | - | 39 | 40 | 22 | 27 | 24 | 22 | - | 43 | 44 | 25 | 30 | 27 | 26 | - |
| | 1375 | (649) | 0.043 | (10.67) | 50 | 46 | 37 | 36 | 33 | 28 | - | 54 | 51 | 40 | 39 | 37 | 32 | - | 58 | 55 | 43 | 42 | 39 | 36 | **24** |
| | 2100 | (991) | 0.100 | (24.88) | 56 | 51 | 44 | 41 | 38 | 32 | - | 60 | 56 | 47 | 44 | 41 | 36 | **25** | 64 | 60 | 50 | 47 | 44 | 40 | **29** |
| | 2800 | (1321) | 0.178 | (44.24) | 60 | 54 | 49 | 44 | 41 | 34 | **23** | 65 | 59 | 52 | 48 | 45 | 39 | **28** | 68 | 63 | 55 | 50 | 47 | 42 | **33** |
| 16 | 630 | (297) | 0.005 | (1.26) | 38 | 36 | 29 | 28 | 25 | 22 | - | 43 | 43 | 34 | 33 | 32 | 30 | - | 47 | 48 | 38 | 37 | 38 | 36 | - |
| | 1775 | (838) | 0.040 | (10.00) | 54 | 49 | 44 | 39 | 34 | 30 | - | 59 | 56 | 49 | 44 | 41 | 38 | **25** | 62 | 61 | 53 | 48 | 47 | 44 | **31** |
| | 2800 | (1321) | 0.100 | (24.88) | 60 | 55 | 51 | 44 | 38 | 34 | **25** | 66 | 62 | 56 | 49 | 45 | 42 | **31** | 69 | 67 | 60 | 53 | 51 | 48 | **38** |
| | 3660 | (1727) | 0.171 | (42.52) | 64 | 58 | 55 | 47 | 41 | 36 | **30** | 70 | 65 | 60 | 52 | 48 | 44 | **36** | 73 | 70 | 64 | 55 | 53 | 50 | **42** |
| 22 | 1200 | (566) | 0.005 | (1.27) | 51 | 50 | 41 | 42 | 39 | 37 | - | 56 | 55 | 51 | 49 | 44 | 41 | **25** | 59 | 59 | 58 | 54 | 48 | 44 | **33** |
| | 3300 | (1557) | 0.039 | (9.64) | 65 | 61 | 55 | 53 | 51 | 47 | **30** | 69 | 66 | 65 | 60 | 56 | 51 | **41** | 73 | 69 | 73 | 66 | 60 | 54 | **49** |
| | 5300 | (2501) | 0.100 | (24.86) | 71 | 66 | 62 | 58 | 56 | 52 | **37** | 76 | 71 | 72 | 66 | 61 | 56 | **48** | 79 | 74 | 79 | 71 | 65 | 59 | **56** |
| | 7000 | (3304) | 0.174 | (43.37) | 75 | 69 | 66 | 62 | 59 | 55 | **42** | 80 | 74 | 76 | 69 | 65 | 59 | **52** | 83 | 77 | 83 | 74 | 69 | 61 | 60 |

*NOTES: Radiated sound power is the sound transmitted through the casing walls. All sound data is based on tests conducted in accordance with AHRI 880-11. Sound power levels are in dB, re $10^{-12}$ Watts. ΔPs is the difference in static pressure from inlet to discharge. NC application data is from AHRI Standard 885-08 Appendix E, as a function of flow rate shown. AHRI certification points are shown in bold, white font. For a complete list of AHRI certified data, see page A2-4. All other data points listed are application ratings outside the scope of the Certification Program. See Krueger's selection program for specific sound data for optional liners; 1/2", dual density liner shown. Dash indicates a NC is less than 20. See Engineering section for reductions and definitions.*

## CONTROL INFORMATION

The following list of standard control arrangements are available with the LMHS product offering. Each control approach offers a variety of pressure independent, pressure dependent or manual operating functions. Control functions are identified by the Krueger control package number.

### PNEUMATIC CONTROL ARRANGEMENTS

All control packages are pressure independent, unless otherwise noted, and are available with or without hot water and electric heat, dual maximum airflow, heating and cooling maximum airflow and dual minimum airflow. All control arrangements include a standard linear inlet airflow sensor.

1100 - Actuator Only; DA-NC Pressure Dependent Control
1101 - Actuator Only; RA-NO Pressure Dependent Control
1102 - Single Function Controller;
DA-NO With or Without Hot Water or Electric Heat
1103 - Single Function Controller;
RA-NC With or Without Hot Water or Electric Heat
1104 - Multi-function Controller;
DA-NO With or Without Hot Water or Electric Heat
1105 - Multi-function Controller;
DA-NC With or Without Hot Water or Electric Heat
1106 - Multi-function Controller;
RA-NO With or Without Hot Water or Electric Heat
1107 - Multi-function Controller;
RA-NC With or Without Hot Water or Electric Heat
1108 - Dual Maximum Control;
DA-NO With or Without Hot Water or Electric Heat
1109 - Heating/Cooling Maximum Control;
DA-NO With or Without Hot Water or Electric Heat
1110 - Dual Minimum Control;
DA-NO With or Without Hot Water or Electric Heat

**Pneumatic Control Legend:**
DA - Direct Acting Thermostat
RA - Reverse Acting Thermostat
NO - Normally Open Damper Position
NC - Normally Closed Damper Position
Single Function Controller - Provides Single Function, DA-NO or RA-NC
Multi-function Controller - Capable of Providing DA-NO, DA-NC,RA-NC or RA-NO Functions

### MANUAL CONTROL

Manual control package consists of a manual handle fixed to the unit damper shaft.

4100 - Manual Damper Control

## CONTROL INFORMATION

### DIRECT DIGITAL CONTROL ARRANGEMENTS

Smart Equipment control packages are provided and programmed by the factory for in-house mounting, piping, and wiring.

- BACnet Compatible: 7101-7109
- Standalone: 6101-6109

Standard Features

- Single Duct, Series Fan, and Parallel Fan Terminal Units
- Occupied, Unoccupied, and Standby modes
- Plug and Play connection with the Smart Equipment system
- BACnet compatible for ease of communication with building automation systems
- Standalone option available for non-communicating systems
- Factory programming tailored to customer specified airflow values and control sequence
- Control sequences for warm supply air are available

Optional Features

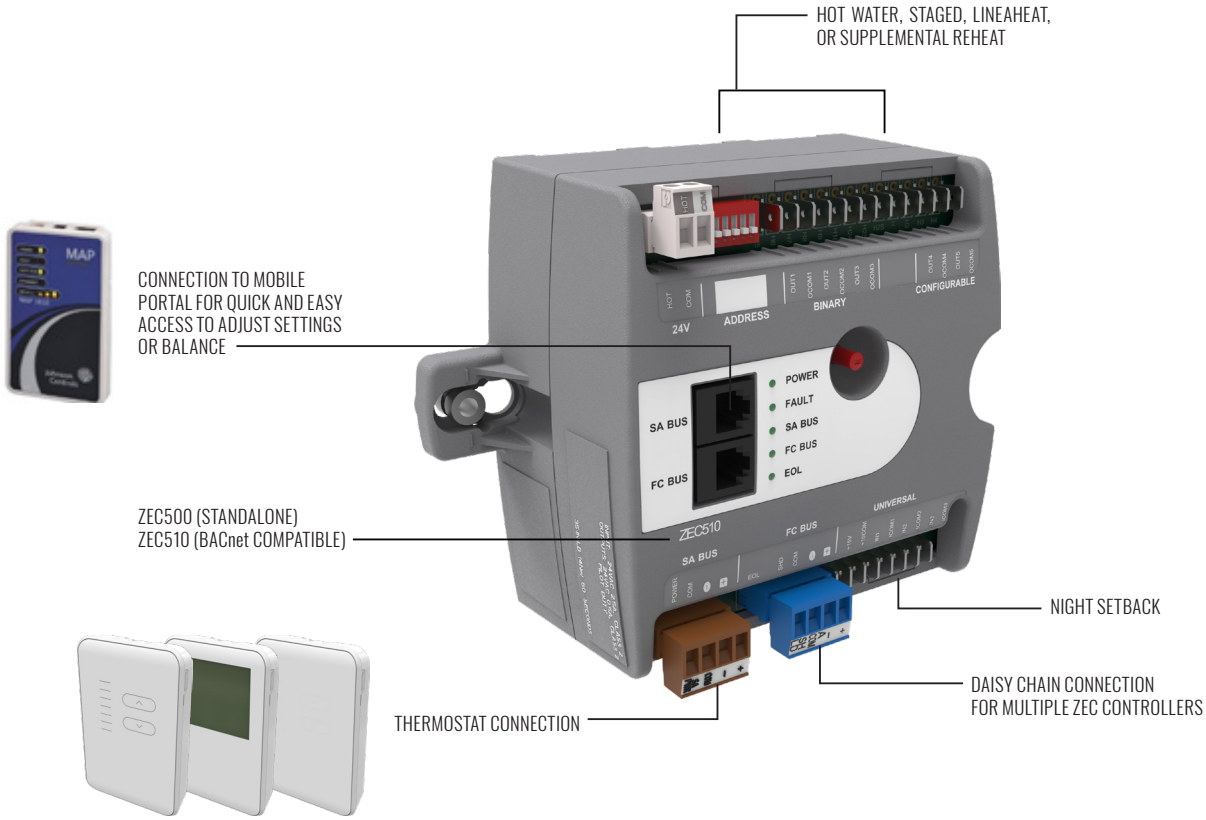
- LCD Display Thermostat
- Warmer/Cooler Interface Thermostat
- No Display Thermostat
- Supply or Discharge Air Temperature Sensors
- Night Setback Mode
- Mobile Access Portal with RJ12 connections for easy settings adjustments
- Balancing tool with RJ12 connection for ease of balancing either at controller or thermostat

Other Digital Control packages can be supplied to the factory for mounting, piping, and wiring.

All DDC control arrangements include an inlet airflow sensor and control enclosure and are available with an optional 24-volt transformer mounted and wired inside the control enclosure.

Contact your Krueger representative for a complete list of direct digital control arrangements.

### SMART EQUIPMENT CONTROLLER DETAIL



## SUGGESTED SPECIFICATION & CONFIGURATION

Furnish and install Krueger model LMHS single duct (variable or constant) terminal units of the sizes shown in the plans.

Terminals shall be certified by use of the AHRI Standard 880 Certification Program and carry the AHRI seal.

Unit casing shall be constructed of not less than 22 gauge galvanized steel.
- **(Optional)** Unit casing shall be constructed of not less than 20 gauge galvanized steel.

All round air inlet collars shall accommodate standard flex duct sizes. Unit discharge shall be slip and drive construction for field attachment to downstream duct work.

Unit labels shall be adhered to each unit including model size, airflow (CFM), balancing chart, and tagged data.

The control air damper assembly shall be constructed of heavy gauge galvanized steel with solid 1/2" shaft rotating in Delrin® bearings. Damper shaft shall be marked on the end to indicate damper position. Damper blade shall incorporate a flexible gasket for tight airflow shutoff and operate over a full 90° rotation.

LMHS unit shall be equipped with a factory installed airflow sensing device. Provide a K4 LineaCross, four quadrant, multi-point center averaging sensor with an amplified signal.
- **(Optional)** Provide a linear, multi-point, velocity averaging sensor with an amplified signal.

Provide balancing taps to allow for easy airflow verification.

The radiated and discharge attenuation factors for the specified NC levels shall be based on either room absorption, plus an environmental adjustment factor or the attenuation factors from AHRI Standard 885-08 Appendix E, which includes room absorption, environmental adjustment factor, duct insertion, end reflection and duct branching.

### CASING LINERS

Unit casing shall be lined with 1/2" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A. Insulation shall be attached to the unit casing by adhesive and weld pins.
- **(Optional)** 1" Thick Insulation: Unit casing shall be lined with 1" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A. Insulation shall be attached to the unit casing by adhesive and weld pins.
- **(Optional)** Cellular Insulation: Unit casing shall be lined with 1/2" or 1" thick, 1 1/2 lb. density, smooth surface, polyolefin, closed-cell foam insulation for fiber free application. Cellular insulation meets UL 181 and NFPA 90A and does not support mold or bacteria growth. Insulation shall be attached to the unit casing by adhesive and weld pins. Units with electric reheat 1/2" cellular insulation is enclosed between the unit casing and a non-perforated internal sheet metal cover extending over the cellular insulation, as well as covering the liner cut edges.
- **(Optional)** Steriliner Insulation: Unit casing shall be lined with 13/16" thick, 4 lb. density, rigid board insulation with nylon reinforced foil covering insulation fibers that meets UL 181 and NFPA 90A. Liner shall be attached to unit casing by adhesive and weld pins with full-seam-length Z-strips to enclose and seal the insulation cut edges.
- **(Optional)** Sterilwall Insulation: Unit casing shall be lined with 1/2" or 1" thick, 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a non-perforated internal sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.
- **(Optional)** Perforated Doublewall Insulation: Unit casing shall be lined with 1/2", 1 1/2 lb. dual density fiberglass insulation that meets UL 181 and NFPA 90A, enclosed between the unit casing and a perforated internal sheet metal cover extending over the fiberglass insulation, as well as covering the liner cut edges.
- **(Optional)** No Liner: Unit casing shall be equipped with no internal insulation liner.

### (OPTIONAL) SOUND ATTENUATOR

The single duct terminal units shall be provided with a one-piece integral sound attenuator section. The sound attenuator section shall consist of a continuous extension of the standard galvanized coated steel casing. Separate slip and drive attached attenuator will not be accepted.

### ELECTRIC HEATING COILS

Electric coils shall be supplied by the terminal unit manufacturer and shall be ETL listed in accordance with UL Standards. Construct coil casing with minimum of 20 gauge galvanized steel. Elements shall be 80/20 Ni-Cr and supported by ceramic isolators. The integral control panel shall be housed in a NEMA 1 enclosure with access to all controls and safety devices.

Electric coils shall contain a primary automatic and secondary manual reset thermal cutout and differential pressure airflow switch for proving of airflow.
- **(Optional)** Electric coils shall include fused or non-fused door interlocking disconnect switch, AC solid state relay, fuse block, dust tight enclosure construction, all mounted and/or wired within the control enclosure.
- **(Optional)** LineaHeat solid state electronic proportional control of electric heat shall meet the requirements of ASHRAE Standard 62, Addenda N.
- **(Optional)** LineaHeat solid state electronic controlled electric heater with control of the leaving air temperature limiting the unit discharge temperature to a set value.

### HOT WATER COILS

- Hot water coil casing shall be constructed with minimum 20 gauge galvanized steel with slip and drive discharge for attachment to downstream duct work. Coils shall be factory attached to the terminal unit. Fins shall be rippled and corrugated heavy gauge aluminum, mechanically bonded to tubes. Tubes shall be copper with minimum wall thickness of 0.016" and with male solder header connections. Coils shall be leak tested to 400 psi. Number of coil rows, circuits, and fins per inch shall be selected to provide performance as required by the plans. Coil performance data shall be based on tests run in accordance with AHRI Standard 410.
- **(Optional)** Vent and Drain Ports shall be factory installed on coil headers.

### ACCESS PANEL

Access panel shall be in the unit casing for viewing of damper components and/or for upstream cleaning of the hot water coil fins. (Access panel not available with electric heat.)

**1. SERIES: (XXXX)**
LMHS - Single Duct Terminal Unit

**2. SENSOR TYPE: (X)**
1 - Linear Averaging (Standard)
3 - K4 LineaCross (Four Quadrant)

**3. UNIT STYLE: (X)**
0 - Standard LMHS
1 - LMHS with Attenuator
2 - LMHS with Multiple Outlets
3 - LMHS with Electric Heat
4 - LMHS with Water Heat and Multiple Outlets
5 - LMHS Exhaust Unit +
6 - LMHS Low Profile
7 - LMHS Low Profile with Attenuator
8 - LMHS Low Profile with Electric Heat

**4. LINER TYPE: (X)**
0 - 1/2" Liner
1 - 1" Liner
2 - Steriliner
3 - No Liner
4 - Sterilwall with 1/2" Dual Density
8 - Sterilwall with 1" Dual Density
A - Perforated Doublewall with 1/2" Dual Density
B - Perforated Doublewall with 1" Dual Density
F - 1/2" Cellular
H - 1" Cellular ++

**5. UNIT CASING: (XX)**
**(CONTROLS HANDING, GAUGE, ACCESS)**
0L - Left-hand Side, 22 Gauge
1L - Left-hand Side, 22 Gauge & Access Panel *
2L - Left-hand Side, 20 Gauge
3L - Left-hand Side, 20 Gauge & Access Panel *
0R - Right-hand Side, 22 Gauge
1R - Right-hand Side, 22 Gauge & Access Panel *
2R - Right-hand Side, 20 Gauge
3R - Right-hand Side, 20 Gauge & Access Panel *

**6. INLET CODE: (XX)**

| | |
|---|---|
| 04 - 4" | 05 - 5" |
| 06 - 6" | 07 - 7" |
| 08 - 8" | 09 - 9" |
| 10 - 10" | 12 - 12" |
| 14 - 14" | 16 - 16" |
| 20 - 13 1/2"x 7 7/8" | 22 - 24"x16" |

**7. CONTROL TYPE: (XXXX)**
(2XXX) - Analog
(7XXX) - Digital, BACnet Compatible
(6XXX) - Digital, Standalone
(XXXX) - Factory Mounted, Provided by Others
(1XXX) - Pneumatic

**8. UNIT ACCESSORIES: (X) (X) (X) (X)**
0 - None
S - Hangers
D - Disconnect for Controls **
E - Dust-tight Control Enclosure **
G - 24-24 VAC Transformer
H - 120-24 VAC Transformer
J - 208-24 VAC Transformer
K - 240-24 VAC Transformer
L - 277-24 VAC Transformer
P - Cam Locks (for Liner Codes 1 - 5)
Y - Cam Locks (for Liner Codes 4 & A)

**9. WATER HEAT: (XXX) ◊**
**(ROWS/CONNECTION HAND)**
000 - N/A / None

| | |
|---|---|
| W11 - 1-Row/Right, 10 FPI | U11 - 1-Row/Right, 12 FPI |
| W12 - 2-Row/Right, 10 FPI | U12 - 2-Row/Right, 12 FPI |
| W13 - 3-Row/Right, 10 FPI | U13 - 3-Row/Right, 12 FPI |
| W14 - 4-Row/Right, 10 FPI | U14 - 4-Row/Right, 12 FPI |
| W21 - 1-Row/Left, 10 FPI | U21 - 1-Row/Left, 12 FPI |
| W22 - 2-Row/Left, 10 FPI | U22 - 2-Row/Left, 12 FPI |
| W23 - 3-Row/Left, 10 FPI | U23 - 3-Row/Left, 12 FPI |
| W24 - 4-Row/Left, 10 FPI | U24 - 4-Row/Left, 12 FPI |

**10.ELECTRIC HEAT: (XX)** **LINEAHEAT: (XX)**

| | |
|---|---|
| 00 - None | |
| E1 - 120V/1-Phase | L1 - 120V/1-Phase |
| E2 - 208V/1-Phase | L2 - 208V/1-Phase |
| E3 - 240V/1-Phase | L3 - 240V/1-Phase |
| E4 - 277V/1-Phase | L4 - 277V/1-Phase |
| E6 - 208V/3-P/3-Wire | L6 - 208V/3-P/3-Wire |
| E9 - 480V/3-P/4-Wire | L9 - 480V/3-P/4-Wire |

**11.ELECTRIC HEAT STEPS: (X)**
0 - None
1 - 1-Stage
2 - 2-Stage
3 - 3-Stage

**12.HEAT COIL ACCESSORIES: (X) (X) (X) (X)**
0 - None
C - Fuse Block
E - Chicago Code Construction
H - Staged Solid State Relays
K - Door-interlocking Fused Disconnect Switch
L - Door-interlocking Non-fused Disconnect Switch
P - Vent and Drain Ports
S - Discharge Temperature Sensor/Cable
(*For LineaHeat Control Only*)

* *Access Panel is not available with electric heat.*
** *Disconnect for Controls not available with electric heat. Dust-tight Control Enclosure not available with Pneumatic Control Types. Transformer standard when ordering electric heat.*
◊ *Water coil vent and drain optional.*
\+ *Exhaust unit not available with hot water or electric heat.*
++ *1" Cellular liner not available with electric heat or exhaust.*

**SAMPLE CONFIGURATION:** LMHS - 3 - 1 - F - 1L - 06 - 7104 - SDL0 - W12 - 000 - P000