

KQFP

Introduction: KQFP

In today's commercial structures, sound performance is a major concern. To satisfy this, Krueger's KQF line of quiet fan powered induction terminals have been designed to handle sound sensitive applications. Through economical recirculation of plenum return air and accurate control of primary air (cooling) to the zone, these units maintain optimum temperatures in the conditioned space.

KQF fan terminal units offer a durable design that features an integral attenuator and isolated blower panel. The multi-voltage motors, blower, and primary air damper components are easily accessible from the bottom of the unit. All KQF units are ETL listed and AHRI certified. With several types of casing liners, there is a unit configuration to meet each job specification.

The Model KQFP features intermittent parallel fan operation and is designed to maintain optimum occupant comfort levels by supplying warm induced plenum air, cold primary air (VAV), or a mixture of both to condition the space. The fan cycles on to satisfy zone heating requirements. Optional electric or hot water heating coils provide terminal heat after the fan has cycled on.

The primary air is modulated with direct digital, analog, or pneumatic pressure independent type controls.

MODEL

KQFP - Ultra Quiet, Parallel Fan Powered Terminal Unit

FEATURES

- Ultra quiet operation for critical sound applications.
- Airflow capacities up to 3660 CFM for model KQFP, providing airflow control for commercial applications.
- 20 gage galvanized steel casing construction provides advantages in acoustics, quality, unit strength, and product durability.
- Several types of casing liner options provide quiet and clean operation.
- Round inlet sizes ranging from 6" to 16" diameter are sized to fit standard spiral and flex duct for quick installation.
- Each unit size offers multiple primary inlet sizes to allow for flexible system design.
- Fully removable bottom access panel included with each unit for easy access to internal components for maintenance.
- Integral induced air attenuator eliminates the requirement for a separate bolt-on attenuator.
- Control enclosure located on left-hand or right-hand side for easier installation.
- Single point electrical connection minimizes the number of ceiling plenum electrical connections.
- Recirculation multi-voltage fan motors are quiet, reliable, and permanently lubricated; ECM motors are available.
- Electronic speed control (SCR) allows field adjustable fan airflow.
- Isolated motor/blower assembly limits casing acoustical transmission.
- ETL listings under UL 1995 electrical safety.
- AHRI listings are certified in accordance with AHRI 880 testing standard.
- External filter option for quick access and routine replacement.
- Auxiliary heat offers a wide range of options, including electric and hot water heat; KQFP offers induction and discharge hot water configurations.
- Pneumatic, analog, and digital controls may be customized for many building systems. BACnet/BMS compatible digital controls can be provided by Krueger.
- LineaHeat solid state electronic proportional control of electric heat is available with or without leaving air temperature control.
- AC solid state relays offer silent operation for staged electric heat.
- Revit models are available at www.krueger-hvac.com/revit.

KQFP Unit Capacities & Damper Leakage
KQFP, UNIT CAPACITIES

		KQFP with PSC Motor							
Unit Size	Inlet Size	Primary Airflow		Fan Airflow		Motor HP	Motor Amps		
		Max.	Min.	Max.	Min.		120V	208/240V	277V
2	6	515	90 or 0	500	150	1/4	2.6	1.5	1.1
	8	920	160 or 0						
3	6	515	90 or 0	800	160	1/4	3.1	1.7	1.3
	8	920	160 or 0						
	10	1430	250 or 0						
4	6	515	90 or 0	900	190	1/4	3.4	1.9	1.4
	8	920	160 or 0						
	10	1430	250 or 0						
	12	2060	360 or 0						
5	10	1430	250 or 0	1700	480	1/2	7.3	4.1	3.1
	12	2060	360 or 0						
	14	2800	480 or 0						
6	10	1430	250 or 0	1700	500	1/2	7.3	4.1	3.1
	12	2060	360 or 0						
	14	2800	480 or 0						
	16	3660	630 or 0						
7	10	1430	250 or 0	2000	780	3/4	9.5	5.8	4.4
	12	2060	360 or 0						
	14	2800	480 or 0						
	16	3660	630 or 0						

FAN POWERED TERMINAL UNITS

		KQFP with ECM Motor							
Unit Size	Inlet Size	Primary Airflow		Fan Airflow		Motor HP	Motor Amps		
		Max.	Min.	Max.	Min.		120V	208/240V	277V
4	6	515	90 or 0	1000	150	1/2	7.7	5.0	4.1
	8	920	160 or 0						
	10	1430	250 or 0						
	12	2060	360 or 0						
7	10	1430	250 or 0	1600	240	1	12.8	10.5	6.9
	12	2060	360 or 0						
	14	2800	480 or 0						
	16	3660	630 or 0						

NOTES: KQFP maximum primary airflow (CFM) is based on 1.00" WG differential pressure signal from inlet airflow sensor. Minimum recommended airflow (CFM) is based on 0.03" WG differential pressure of the inlet airflow sensor, or 0 CFM. 0.03" WG is equal to 15%–20% of the nominal flow rating of the terminal. Less than 15%-20% may result in greater than +/-5% control of box flow. Maximum/minimum fan airflow (CFM) is based on 0.25" WG external downstream static pressure. See page B2-38 and B2-39 for complete fan curves.

KQFP, DAMPER LEAKAGE DETAIL

Inlet Size	Damper Leakage		
	1.5" WG	3.0" WG	6.0" WG
	CFM	CFM	CFM
6	4	5	7
8	4	5	7
10	4	5	7
12	4	5	7
14	4	6	8
16	5	7	9

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. Leakage testing conducted in accordance with ASHRAE 130-2008.

KQFP Product Description**CASING**

- All KQFP unit casing panels are constructed of 20 gage galvanized steel.
- Removable bottom panel allows easy access to motor/blower assemblies.
- The KQFP unit is equipped with a backdraft damper to prevent primary air entering ceiling plenum through induced inlet.

INLET COLLARS

- All round 20 gage inlet collars accommodate standard spiral and flex duct sizes.
- The primary air inlet is located on either the left-hand or right-hand side of the unit inlet panel of the KQFP unit. (Hand is determined by looking at the unit in the direction of airflow with the unit in the installed position.)

OUTLET CONNECTIONS

- All outlet connections are rectangular and require a flanged duct connection.

DAMPER ASSEMBLY

- All units utilize a round volume control damper with a solid 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.

INDUCED AIR INLET ATTENUATOR

- Integral induced air sound attenuator is a standard component for reducing radiated sound.

INDUCED AIR INLET FILTER

- Induced air inlet filters (construction type or MERV 8) are available. These filters are typically used for job start-up and are provided with clip frames for easy filter replacement.

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)** Steriliner Insulation: 13/16" thick, 4 lb. density, rigid board insulation with fiber reinforced foil covering insulation fibers that meets UL 181 and NFPA 90A. Liner shall be attached to unit casing by adhesive with weld pins and foil tape sealing the insulation cut edges.
- **(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)** Foil Encapsulated Insulation: Foil reinforced, wrapped edges, 1/2" or 1" thick, 1 1/2 lb. density fiberglass insulation that meets UL 181 and NFPA 90A.

- **(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" thick, 1 1/2 lb. dual density fiberglass insulation, (additional options: 1/2" or 1" thick, 1 1/2 lb. density foil reinforced fiberglass insulation or 13/16" thick, 4 lb. density, rigid board insulation with fiber reinforced foil covering) 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: No internal insulation liner.

AIRFLOW SENSOR

- All units are equipped with a factory installed inlet airflow sensor device.
- K4 LineaCross: A four-quadrant, multi-point, center averaging airflow sensor.
- **(Optional)** A linear, multi-point, velocity averaging airflow sensor with an amplified signal.
- Balancing taps are provided to allow for easy airflow verification.

FAN MOTORS

- Fan motors for model KQFP unit sizes 2 to 7, are multi-voltage, [120, 208/240, or 277 volt, single-phase] permanent split capacitor (PSC) type.
- **(Optional)** [120, 208/240, or 277 volt, single-phase] ECM (electronically commutated motor) fan motor is available.
- Units equipped with [120, 208/240 or 277 volt, single-phase] electric heat have fan motors wired with the same line voltage. Units with [208 volt, three-phase, three-wire] electric heat utilize [208/240 volt] fan motors. Units with [480 volt, three-phase, four-wire] heat are equipped with [277 volt, single-phase] fan motors.
- A motor disconnect switch is available (not available if the unit is equipped with electric heat including the door locking disconnect option).
- Motor fusing is available.

FAN SPEED CONTROL

- All units with PSC motors are equipped with an SCR fan speed controller capable of reducing fan output by as much as 50 to 55%.
- All units with optional ECM motors include either a manual or remote adjustable speed controller. The manual adjustable speed controller features a digital display that alternates between the RPM of the motor and percentage of flow and is set and adjusted in the field. The remote adjustable speed controller communicates with a DDC controller to remotely set and/or adjust the fan speed using either a 0-10 VDC or 2-10 VDC signal and provides a manual override capability to set and/or adjust the fan speed in the field.

KQFP Product Description

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 electronic controls.

HOT WATER HEAT

- The model KQFP coil is factory mounted to the induced air inlet or the unit discharge.
- One or two row coils are constructed of ten aluminum fins per inch with 5/8" O.D. sweat type connection. Left-hand or right-hand tubing connections are available. The coil tubing is water leakage tested to 400 PSIG.
- The standard unit access panel provides upstream cleaning capability of the coil fins for units with discharge mounted coils.
- Vent and drain option is available.

ELECTRIC HEAT

- Heaters are ETL listed and are constructed of 20 gage galvanized steel.
- Available combinations are [120, 208/240, 277 volt, single-phase], [208/240 volt, three-phase, three-wire], and [480 volt, three-phase, four-wire]. See fan motor description for electric heat/fan motor combinations.
- Standard heaters are equipped with automatic reset thermal cutout, magnetic contactors, airflow proving switch, and 80/20 Ni-Cr heating elements.
- Electric heater options include a fused or non-fused door

interlocking disconnect switch, fuse-block, manual reset cutout, and dust tight enclosure construction.

- AC solid state relays offer silent operation for staged electric heat.
- LineaHeat solid state electronic proportional control of electric heat is available with or without leaving air temperature control. See Krueger's Terminal Unit Engineering section for additional information.

CONTROL TRANSFORMERS

- Units with or without electric heat include a factory supplied, mounted and wired control transformer, mounted inside the control enclosure for electronic control applications.

LABELS

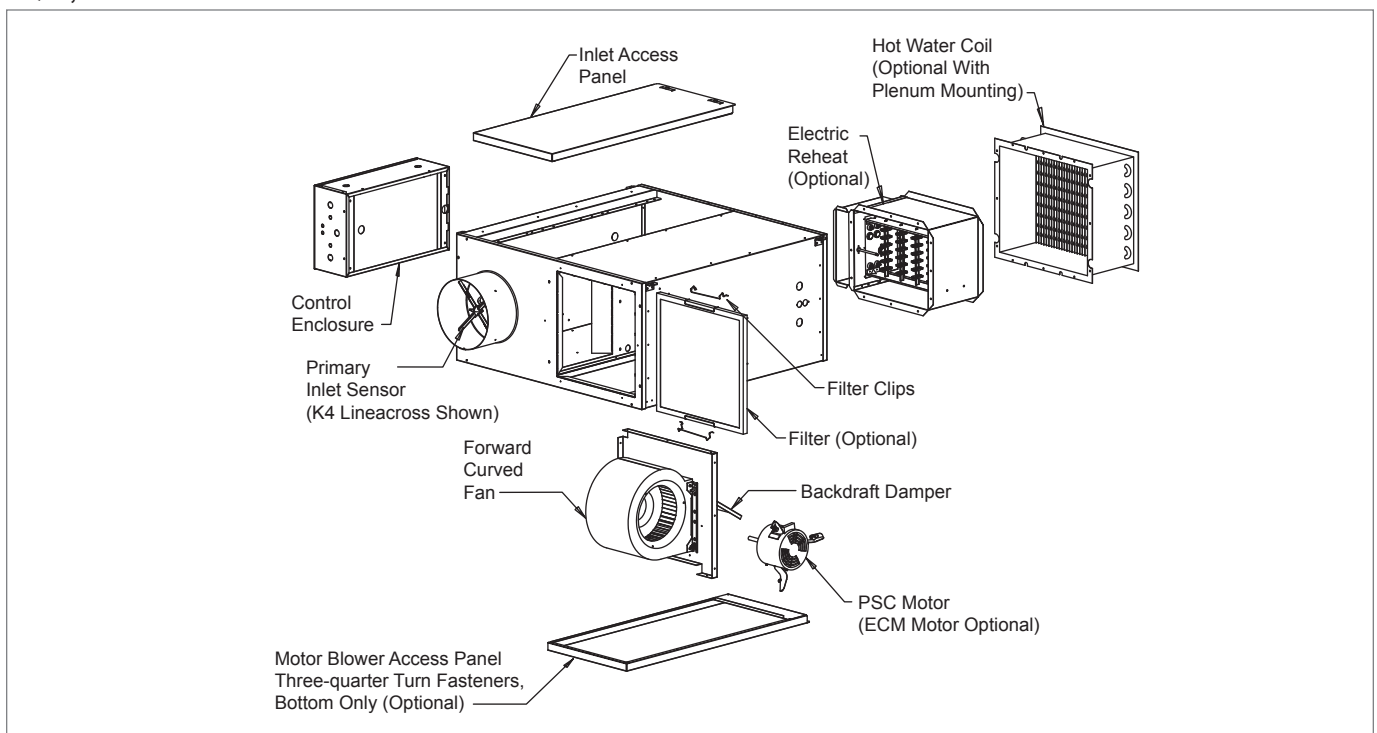
- Label information adhered to each unit includes model name, unit size, configuration code, airflow (CFM), balancing chart, tagging data, electrical ratings, removal of fan protection packing material information, and all required agency listings.

PACKAGING

- Units are palletized. Each pallet of units is banded and stretch wrapped with cellophane.

KQFP Exploded View

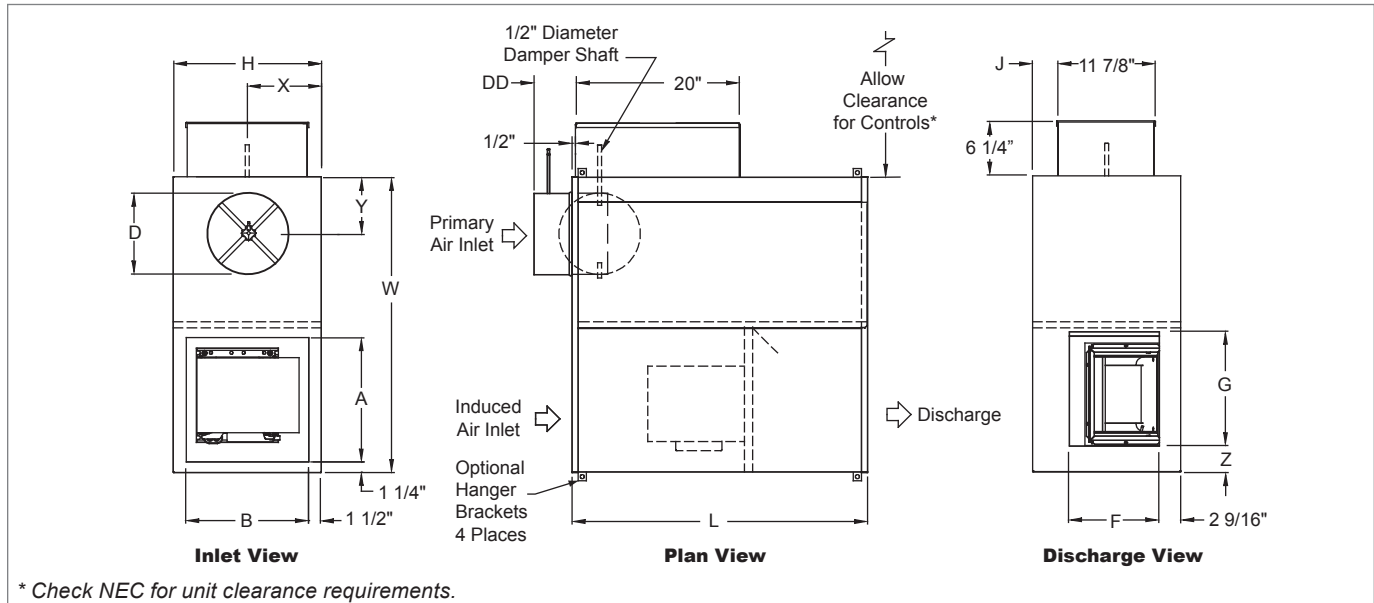
KQFP, EXPLODED VIEW



KQFP | Ultra Quiet, Parallel Flow

KQFP Base Unit Dimensional Information

KQFP BASE UNIT, INLET, PLAN, AND DISCHARGE VIEWS



* Check NEC for unit clearance requirements.

KQFP BASE UNIT, DIMENSIONAL DETAILS

Unit Size	Inlet Size	Max. Primary CFM	Max. Fan CFM	PSC HP	L	W	H	Induced Air			Discharge		J	X	Y	Z
								A	B	D	F	G				
2	06	515	530	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	5 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
2	08	920	530	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
3	08	920	875	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
3	10	1430	875	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	11"	14"	3 1/8"	9"	7"	2 5/8"
4	10	1430	975	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	11"	14"	3 1/8"	9"	7"	2 5/8"
4	12	2060	975	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	11 7/8"	11"	14"	3 1/8"	9"	8"	2 5/8"
5	12	2060	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	11 7/8"	15"	17"	4 1/8"	10"	8"	4 7/8"
5	14	2800	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	15"	17"	4 1/8"	10"	10"	4 7/8"
6	14	2800	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	15"	17"	4 1/8"	10"	10"	4 7/8"
6	16	3660	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	15"	17"	4 1/8"	10"	10 1/4"	4 7/8"
7	16	3660	2250	3/4	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	15"	17"	4 1/8"	10"	10 1/4"	4 7/8"

NOTES: Left-hand base unit with electronic control enclosure shown; right-hand is available. For a complete list of available inlet sizes, see page B2-29.

KQFP Base Unit Features & Options

STANDARD FEATURES

- 20 Gage galvanized steel casing construction.
- Control enclosure for electronic components.
- 1/2" Thick, Dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- [120, 208/240, or 277 volt, multi-voltage, single-phase, single-speed] permanently lubricated PSC motors.
- Field adjustable fan speed control.
- Integral induced air attenuator. • Motor/blower isolation.
- Removable bottom panel allows easy access to motor/blower assembly and primary air damper.
- Four quadrant, center averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"); sizes 12 - 16 (DD = 6 7/8").
- Discharge requires flanged duct; connection by others.
- Includes 24 volt control transformer.
- Backdraft damper assembly.
- ETL listed; adherence to UL 1995 and CSA C22.2 No. 236.95.
- AHRI certified sound ratings.

OPTIONAL FEATURES

- Liners: 1/2" or 1" Cellular insulation, 1" Dual density fiberglass insulation, 1/2" or 1" Foil encapsulated fiberglass insulation, Sterilwall, Steriliner, Perforated doublewall, or no liner.
- Linear averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"), sizes 12 - 16 (DD = 6 7/8").
- [120, 208/240, or 277 volt, single-voltage] ECM motor with manual or remote adjustable speed controller (on unit sizes 4 and 7).
- Cam locks (access panel).
- Motor disconnect.
- Induced air filter, construction type; unit sizes 2 - 4 (17"x17"x1"); unit sizes 5 - 7 (22"x19"x1").
- Left-hand or right-hand control enclosure.
- Hanger brackets (not available with Sterilwall or Perforated doublewall liner options).
- Motor fusing.
- Dust tight control enclosure.

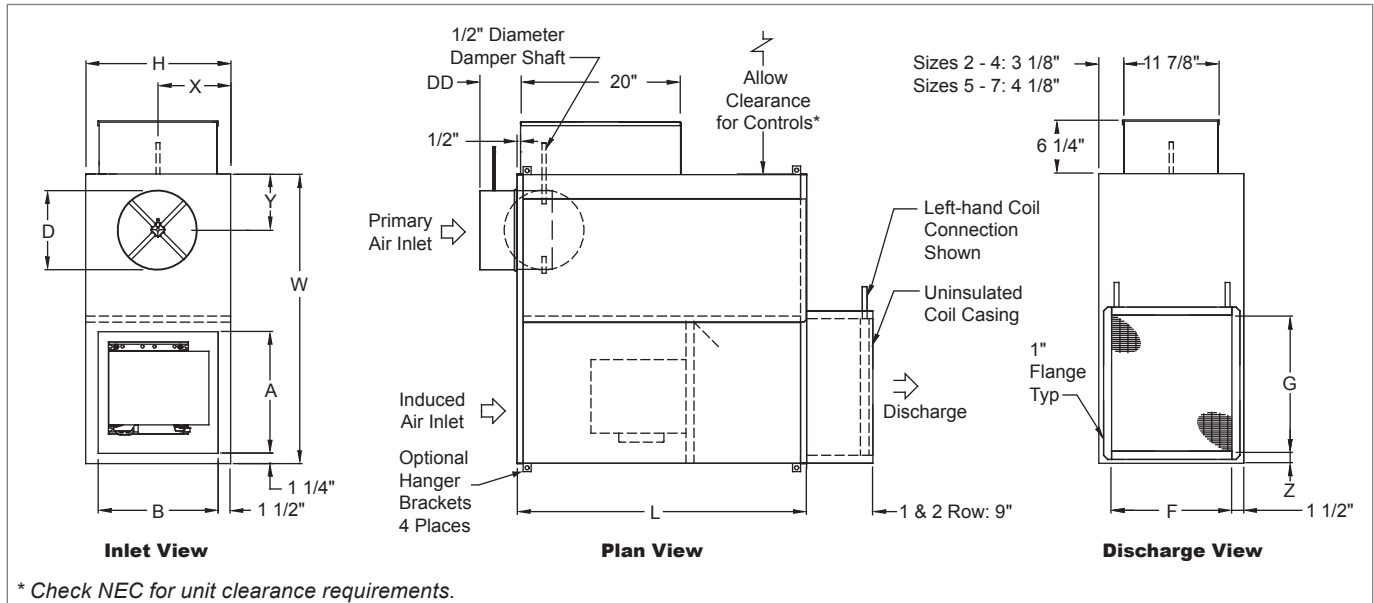
FAN POWERED TERMINAL UNITS

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KQFP Unit with Hot Water Heat on Discharge Dimensional Information

KQFP UNIT WITH HOT WATER HEAT ON DISCHARGE, INLET, PLAN, AND DISCHARGE VIEWS



FAN POWERED TERMINAL UNITS

KQFP UNIT WITH HOT WATER HEAT ON DISCHARGE, DIMENSIONAL DETAILS

Unit Size	Inlet Size	Max. Primary CFM	Max. Fan CFM		PSC HP	L	W	H	Induced Air		D	Discharge		X	Y	Z
			1 Row	2 Row					A	B		F	G			
2	06	515	525	520	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	5 7/8"	15 1/8"	17"	9"	6"	2"
2	08	920	525	520	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	15 1/8"	17"	9"	6"	2"
3	08	920	865	860	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	15 1/8"	17"	9"	6"	2"
3	10	1430	865	860	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	15 1/8"	17"	9"	7"	2"
4	10	1430	960	955	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	15 1/8"	17"	9"	7"	2"
4	12	2060	960	955	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	11 7/8"	15 1/8"	17"	9"	8"	2"
5	12	2060	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	11 7/8"	17 5/8"	25"	10"	8"	1"
5	14	2800	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	17 5/8"	25"	10"	10"	1"
6	14	2800	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	17 5/8"	25"	10"	10"	1"
6	16	3660	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	17 5/8"	25"	10"	10 1/4"	1"
7	16	3660	2050	1990	3/4	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	17 5/8"	25"	10"	10 1/4"	1"

NOTES: Left-hand base unit with electronic control enclosure shown; right-hand is available. For a complete list of available inlet sizes, see page B2-29.

KQFP Unit with Hot Water Heat on Discharge Features & Options

STANDARD FEATURES

- 20 Gage galvanized steel casing construction.
- Control enclosure for electronic components.
- 1/2" Thick, Dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- [120, 208/240, or 277 volt, multi-voltage, single-phase, single-speed] permanently lubricated PSC motors.
- Field adjustable fan speed control.
- Integral induced air attenuator.
- Motor/blower isolation.
- Removable bottom panel allows easy access to motor/blower assembly and primary air damper.
- Four quadrant center averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"); sizes 12 - 16 (DD = 6 7/8").
- Discharge requires flanged duct; connection by others.
- Includes 24 volt control transformer.
- Backdraft damper assembly.
- ETL listed; adherence to UL 1995 and CSA C22.2 No. 236.95.
- AHRI certified sound ratings.

OPTIONAL FEATURES

- Liners: 1/2" or 1" Cellular insulation, 1" Dual density fiberglass insulation, 1/2" or 1" Foil encapsulated fiberglass insulation, Sterilwall, Steriliner, Perforated doublewall, or no liner.
- Linear averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"), sizes 12 - 16 (DD = 6 7/8").
- [120, 208/240, or 277 volt, single-voltage] ECM motor with manual or remote adjustable speed controller (on unit sizes 4 and 7).
- Left-hand or right-hand control enclosure.
- Hot water coil vent and drain.
- Motor disconnect.
- Induced air filter, construction type; unit sizes 2 - 4 (17"x17"x1"); unit sizes 5 - 7 (22"x19"x1").
- Hanger brackets (not available with Sterilwall or Perforated doublewall liner options).
- Dust tight control enclosure.
- Motor fusing.
- Cam locks (access panel).

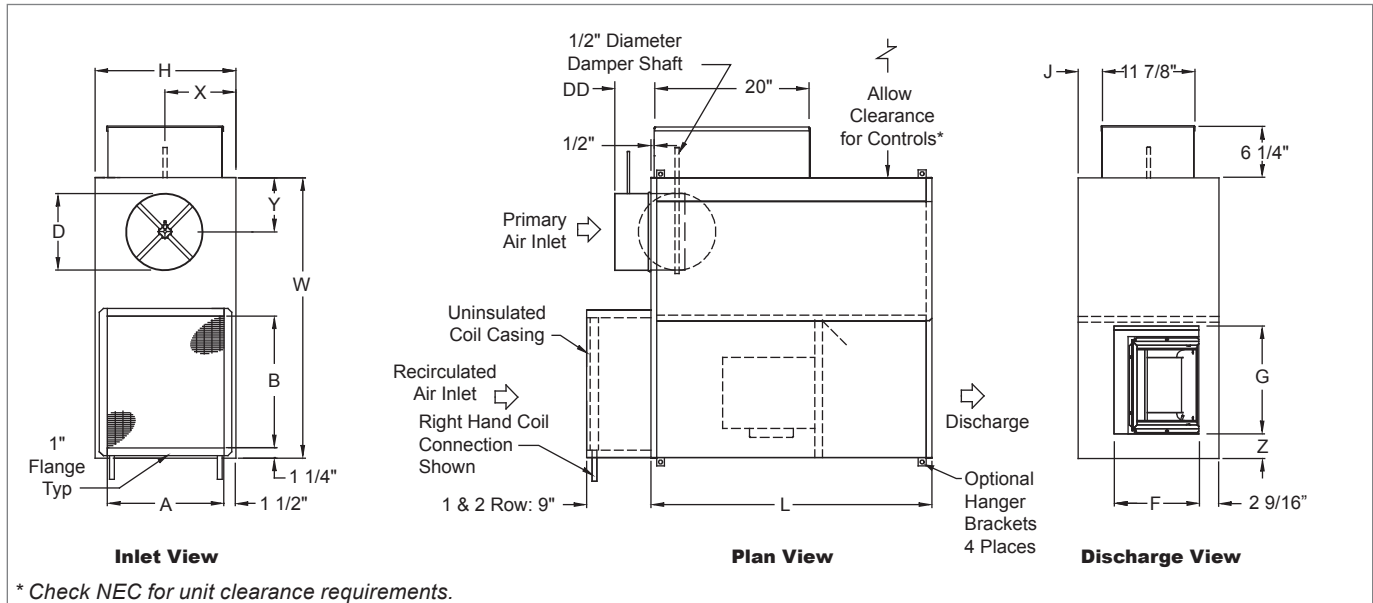
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KQFP Unit with Hot Water Heat on Induced Air Inlet Dimensional Information

KQFP UNIT WITH HOT WATER HEAT ON INDUCED AIR INLET, INLET, PLAN, AND DISCHARGE VIEWS



* Check NEC for unit clearance requirements.

KQFP UNIT WITH HOT WATER HEAT ON INDUCED AIR INLET, DIMENSIONAL DETAILS

Unit Size	Inlet Size	Max. Primary CFM	Max. Fan CFM		PSC HP	L	W	H	Induced Air		D	Discharge		J	X	Y	Z
			1 Row	2 Row					A	B		F	G				
2	06	515	525	520	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	5 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
2	08	920	525	520	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	7 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
3	08	920	865	860	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	7 7/8"	11"	14"	3 1/8"	9"	6"	2 5/8"
3	10	1430	865	860	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	9 7/8"	11"	14"	3 1/8"	9"	7"	2 5/8"
4	10	1430	960	955	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	9 7/8"	11"	14"	3 1/8"	9"	7"	2 5/8"
4	12	2060	960	955	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	17"	11 7/8"	11"	14"	3 1/8"	9"	8"	2 5/8"
5	12	2060	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	17 1/8"	25"	11 7/8"	15"	17"	4 1/8"	10"	8"	4 7/8"
5	14	2800	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	17 1/8"	25"	13 7/8"	15"	17"	4 1/8"	10"	10"	4 7/8"
6	14	2800	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	17 1/8"	25"	13 7/8"	15"	17"	4 1/8"	10"	10"	4 7/8"
6	16	3660	1810	1780	1/2	42 1/8"	46 1/8"	20 1/16"	17 1/8"	25"	15 7/8"	15"	17"	4 1/8"	10"	10 1/4"	4 7/8"
7	16	3660	2050	1990	3/4	42 1/8"	46 1/8"	20 1/16"	17 1/8"	25"	15 7/8"	15"	17"	4 1/8"	10"	10 1/4"	4 7/8"

NOTES: Left-hand base unit with electronic control enclosure shown; right-hand is available. For a complete list of available inlet sizes, see page B2-29.

KQFP Unit with Hot Water Heat on Induced Air Inlet Features & Options

STANDARD FEATURES

- 20 Gage galvanized steel casing construction.
- Control enclosure for electronic components.
- 1/2" Thick, Dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- [120, 208/240, or 277 volt, multi-voltage, single-phase, single-speed] permanently lubricated PSC motors.
- Field adjustable fan speed control.
- Integral induced air attenuator.
- Motor/blower isolation.
- Removable bottom panel allows easy access to motor/blower assembly and primary air damper.
- Four quadrant center averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"); sizes 12 - 16 (DD = 6 7/8").
- Discharge requires flanged duct; connection by others.
- Includes 24 volt control transformer.
- Backdraft damper assembly.
- ETL listed; adherence to UL 1995 and CSA C22.2 No. 236.95.
- AHRI certified sound ratings.

OPTIONAL FEATURES

- Liners: 1/2" or 1" Cellular insulation, 1" Dual density fiberglass insulation, 1/2" or 1" Foil encapsulated fiberglass insulation, Sterilwall, Steriliner, Perforated doublewall, or no liner.
- Linear averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"), sizes 12 - 16 (DD = 6 7/8").
- [120, 208/240, or 277 volt, single-voltage] ECM motor with manual or remote adjustable speed controller (on unit sizes 4 and 7).
- Left-hand or right-hand control enclosure.
- Hot water coil vent and drain.
- Heater disconnect, fused or not fused.
- Hanger brackets (not available with Sterilwall or Perforated doublewall liner options).
- Induced air filter, construction type; unit sizes 2 - 4 (19"x17"x1"); unit sizes 5 - 7 (27"x20"x1").
- Cam locks (access panel).
- Dust tight control enclosure.
- Motor fusing.
- Motor disconnect.

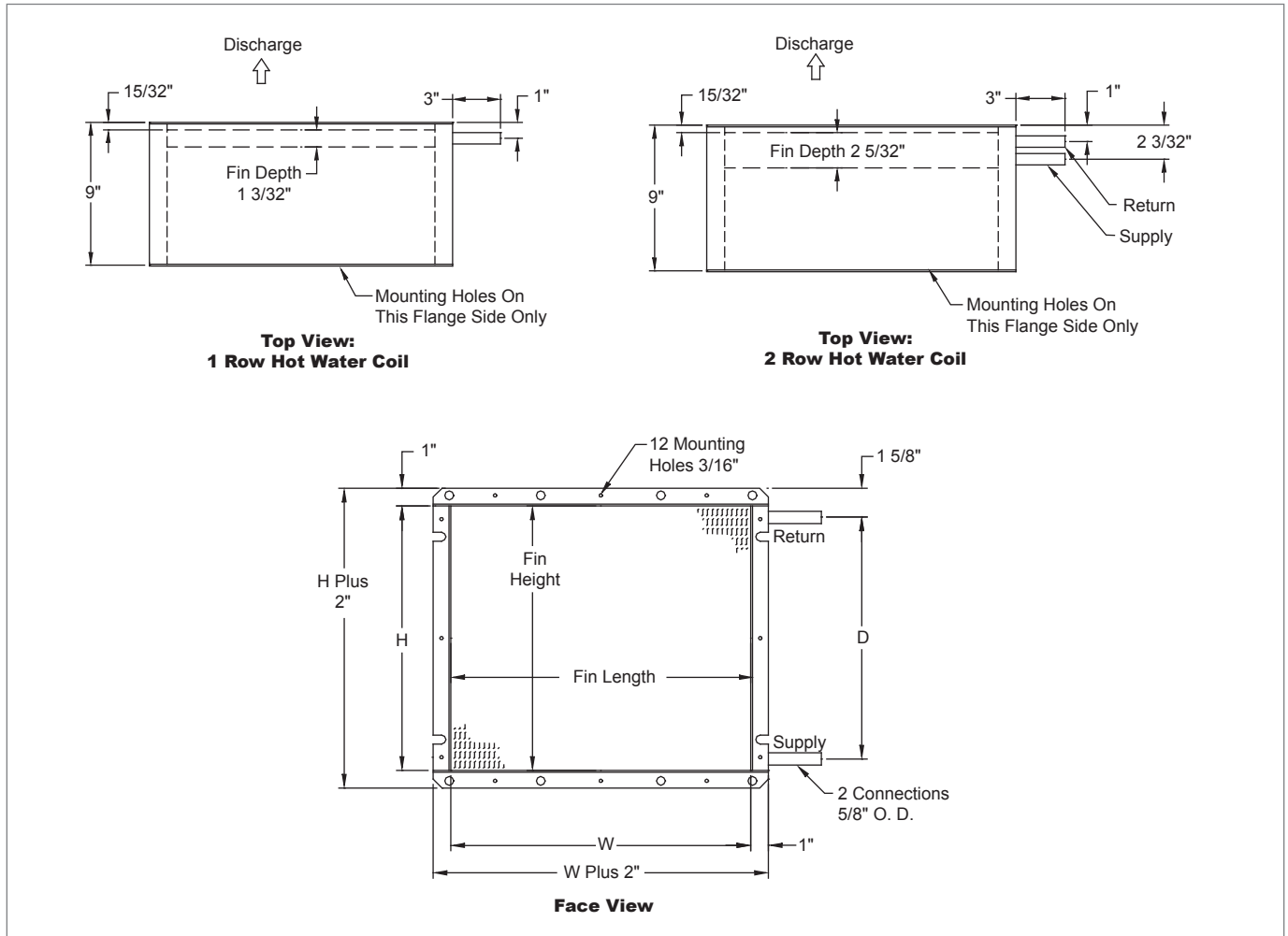
FAN POWERED TERMINAL UNITS

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KQFP Hot Water Coil Dimensional Information

KQFP HOT WATER COIL, TOP AND FACE VIEWS



FAN POWERED TERMINAL UNITS

KQFP HOT WATER COIL, DIMENSIONAL DETAILS

Unit Size	W	H	D
2	17"	15 1/8"	13 3/4"
3			
4			
5	25"	17 5/8"	16 1/4"
6			
7			

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.

KQFP Hot Water Coil Features & Options

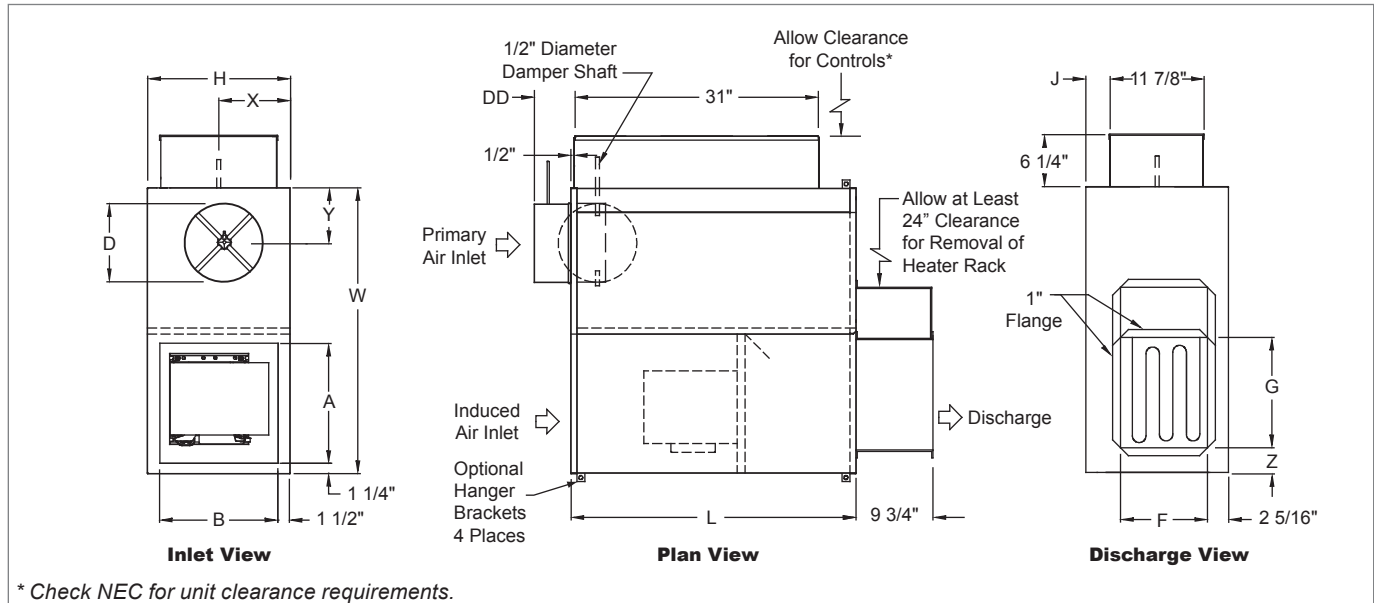
STANDARD FEATURES

- KQFP Coils are shipped from the factory attached to the unit discharge or induced air inlet.
- Hot water coils are configured for a flanged ductwork connection. Coil section is uninsulated.
- Coils are not for steam applications.
- Contact your Krueger Representative for high capacity or steam coil information.
- Connection Tubing - 5/8" O. D. male solder.
- Coil Casing - 20 gage galvanized steel.
- Coil Tubing - 1/2" O. D. x 0.016" thick copper.
- Coil Fins - 0.0045" thick aluminum, 10 per inch; mechanically bonded to tubing.
- Optional vent and drain.

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KQFP Unit with Electric Heat Dimensional Information

KQFP UNIT WITH ELECTRIC HEAT, INLET, PLAN, AND DISCHARGE VIEWS



* Check NEC for unit clearance requirements.

KQFP UNIT WITH ELECTRIC HEAT, DIMENSIONAL DETAILS

Unit Size	Inlet Size	Max. Primary CFM	Max. Fan CFM	PSC HP	L	W	H	Induced Air		D	Discharge		J	X	Y	Z
								A	B		F	G				
2	06	515	530	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	5 7/8"	11 1/2"	14 1/2"	3"	9"	6"	2 7/8"
2	08	920	530	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	11 1/2"	14 1/2"	3"	9"	6"	2 7/8"
3	08	920	875	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	7 7/8"	11 1/2"	14 1/2"	3"	9"	6"	2 7/8"
3	10	1430	875	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	11 1/2"	14 1/2"	3"	9"	7"	2 7/8"
4	10	1430	975	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	9 7/8"	11 1/2"	14 1/2"	3"	9"	7"	2 7/8"
4	12	2060	975	1/4	36 1/8"	36 1/8"	18 1/16"	15 1/8"	15"	11 7/8"	11 1/2"	14 1/2"	3"	9"	8"	2 7/8"
5	12	2060	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	11 7/8"	15"	17"	4"	10"	8"	5 1/2"
5	14	2800	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	15"	17"	4"	10"	10"	5 1/2"
6	14	2800	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	13 7/8"	15"	17"	4"	10"	10"	5 1/2"
6	16	3660	1860	1/2	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	15"	17"	4"	10"	10 1/4"	5 1/2"
7	16	3660	2250	3/4	42 1/8"	46 1/8"	20 1/16"	20 1/8"	17"	15 7/8"	15"	17"	4"	10"	10 1/4"	5 1/2"

NOTES: Left-hand base unit with electronic control enclosure shown; right-hand is available. See next page for electric heat standard features. For a complete list of available inlet sizes, see page B2-29.

KQFP Unit with Electric Heat Features & Options

STANDARD FEATURES

- 20 Gage galvanized steel casing construction.
- Control enclosure for electronic components.
- 1/2" Thick, Dual density fiberglass insulation that meets NFPA 90A and UL 181 safety requirements.
- [120, 208/240, or 277 volt, multi-voltage, single-phase, single-speed] permanently lubricated PSC motors.
- Field adjustable fan speed control.
- Integral induced air attenuator.
- Removable bottom panel allows easy access to motor/blower assembly and primary air damper.
- Four quadrant center averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"); sizes 12 - 16 (DD = 6 7/8").
- Discharge requires flanged duct; connection by others.
- Includes 24 volt control transformer.
- AHRI certified sound ratings.
- Motor/blower isolation.
- Backdraft damper assembly.
- ETL listed; adherence to UL 1995 and CSA C22.2 No. 236.95.

OPTIONAL FEATURES

- LineaHeat solid state electronic proportional control of electric heat.
- Liners: Cellular insulation, 1" Dual density fiberglass insulation, Foil encapsulated fiberglass insulation, Sterilwall, Steriliner, Perforated doublewall, or no liner.
- Linear averaging airflow sensor; inlet sizes 6 - 10 (DD = 4 7/8"), sizes 12 - 16 (DD = 6 7/8").
- [120, 208/240, or 277 volt, single-voltage] ECM motor with manual or remote adjustable speed controller (on unit sizes 3, 6, and 7).
- Hanger brackets (not available with Sterilwall or Perforated doublewall liner options).
- Fused or non-fused door interlocking disconnect.
- Left-hand or right-hand control enclosure.
- Manual reset.
- Motor fusing.
- Dust tight control enclosure.
- AC solid state relays.
- Induced air filter, construction type; unit sizes 2 - 4 (17"x17"x1"); unit sizes 5 - 7 (22"x19"x1").
- Cam locks (access panel).

FAN POWERED TERMINAL UNITS

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KQFP Electric Heat Features & Capacities

The kW charts below indicates the maximum and minimum safe limit capacities for each of the KQFP units and has been specifically designed for Krueger fan powered terminals. For safe operation, the electric heater controls are interlocked with the airflow proving switch to allow the heater to energize only after the fan is running. Each terminal unit has been tested by ETL in accordance with UL standards.

ELECTRIC HEAT STANDARD FEATURES

- 20 Gage galvanized steel casing construction.
- Line voltage combinations:
[120, 208/240, or 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 2 electric heat control enclosure.
- Flanged discharge for field duct connection.
- Single point connection between the heater and the fan motor (see combinations below).
- 80/20 Ni-Cr heating elements.
- Automatic reset thermal cutout.
- De-energizing magnetic contactors.
- Positive pressure airflow switch.

NOTE: A minimum of 0.1" w.g. downstream static pressure is required in the duct to ensure proper heater operation.

OPTIONAL HEATER CONTROL

- LineaHeat solid state electronic proportional control of electric heat is available with or without leaving air temperature control. See Krueger's Terminal Unit Engineering section for additional information.
- AC solid state relays offer silent operation for staged electric heat.

SINGLE POINT CONNECTION COMBINATIONS

ELECTRIC HEATER/FAN MOTOR

- [120, 208/240 or 277 volt, single-phase] electric heat includes fan motor wired with same line voltage.
- [208 volt, three-phase, three-wire] electric heat utilizes a 208/240 volt, single-phase fan motor.
- [480 volt, three-phase, four-wire] electric heat is equipped with 277 volt, single-phase fan motor.

$$kW = \frac{CFM \times \Delta T (^{\circ}F)}{3160}$$

CALCULATING ELECTRIC HEATER AMPERES

$$\text{Single Phase Amperes} = \frac{\text{Watts}}{\text{Line Voltage}}$$

$$\text{Three Phase Amperes} = \frac{\text{Watts}}{\text{Line Voltage} \times 1.73}$$

NOTES: When selecting electric heaters, do not exceed 120°F discharge air temperature, per NEC. 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 now limits discharge temperatures to 90°F or increasing the ventilation rate when heating from the ceiling.

KQFP MINIMUM kW

Unit Sizes	1 Phase				3 Phase				
	120 Volt	208 Volt	240 Volt	277 Volt	208 Volt	480 Volt	5-7		
Stage 1	0.5	0.5	1.0	0.5	1.0	0.5	1.5	2.5	1.5
Stage 2	1.0	1.0	1.5	1.0	1.5	1.0	1.5	2.5	1.5
Stage 3	1.5	1.5	2.0	1.5	2.5	1.5	1.5	2.5	1.5

KQFP MAXIMUM kW

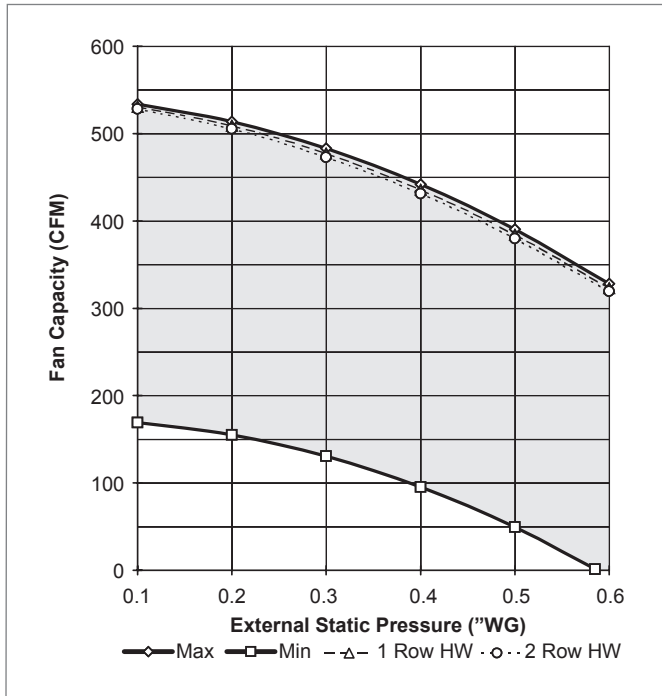
Unit Size	1 Phase				3 Phase	
	120 Volt	208 Volt	240 Volt	277 Volt	208 Volt	480 Volt
2	5.0	5.0	5.0	5.0	5.0	5.0
3	5.0	7.0	7.0	7.0	7.0	7.0
4	5.0	9.5	10.0	12.0	12.0	12.0
5	4.5	9.0	10.0	12.0	14.0	16.0
6	4.5	9.0	10.0	12.0	14.0	20.0
7	4.5	8.5	10.0	12.0	13.0	25.0

NOTES: Minimum and maximum values apply to staged heaters only. Contact your local Krueger representative for LineaHeat limits.

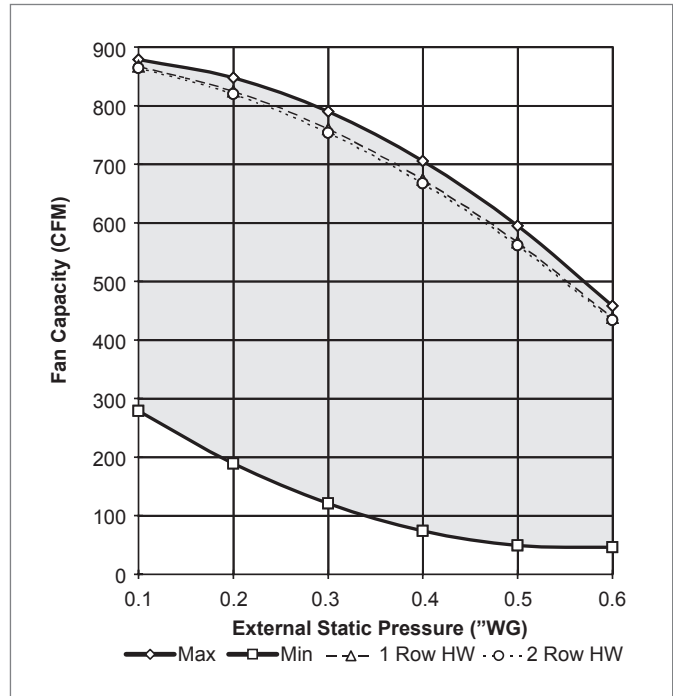
KQFP PSC Fan Curves

FAN POWERED TERMINAL UNITS

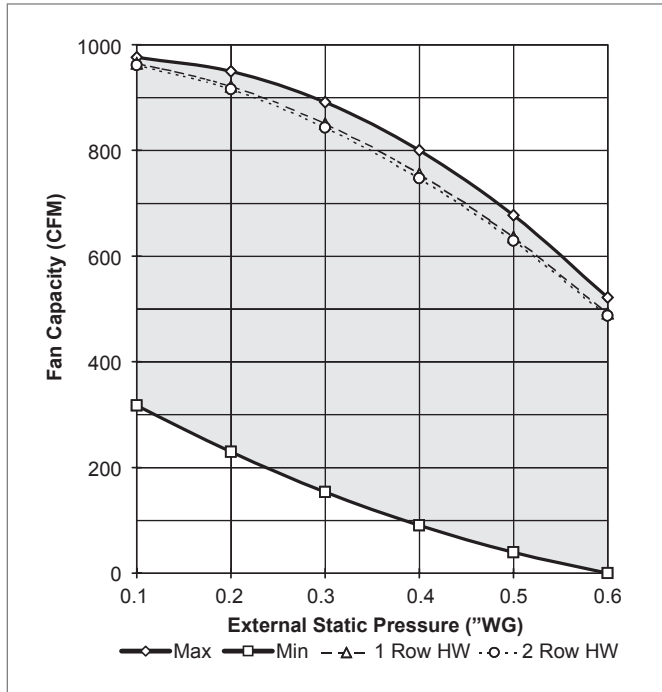
KQFP PSC FAN CURVE, UNIT SIZE 2



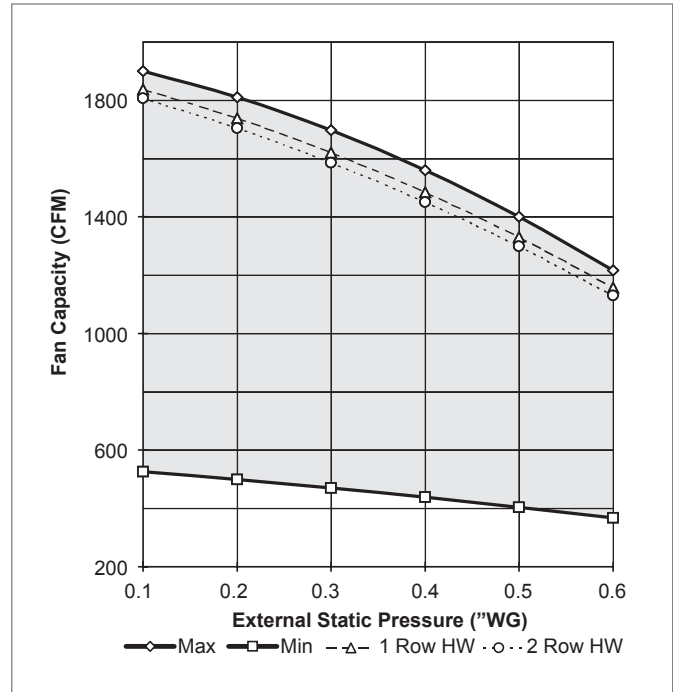
KQFP PSC FAN CURVE, UNIT SIZE 3



KQFP PSC FAN CURVE, UNIT SIZE 4

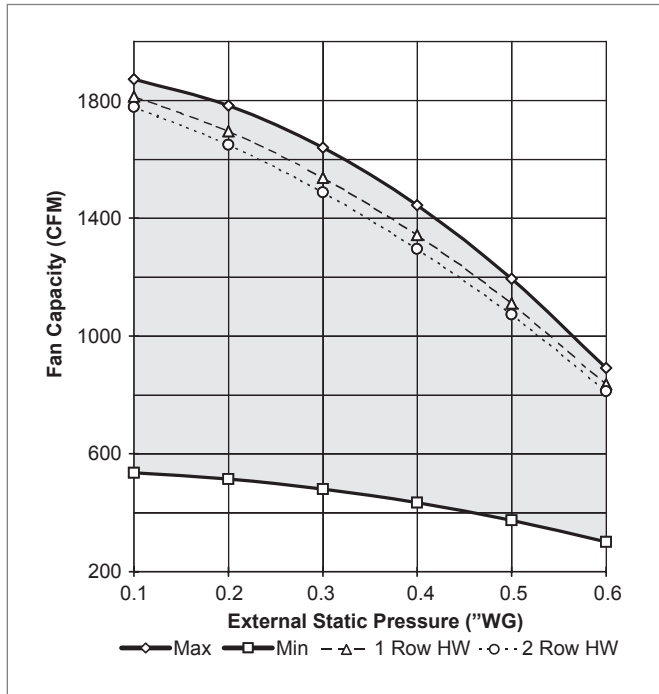
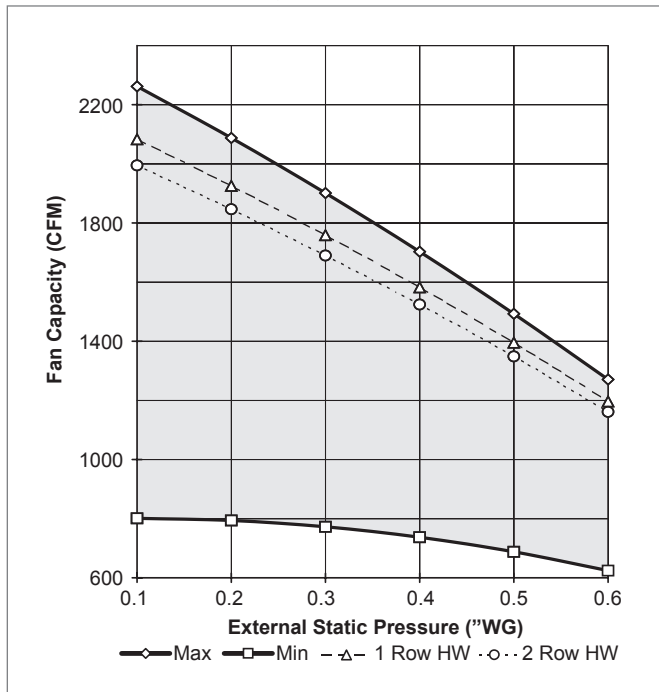


KQFP PSC FAN CURVE, UNIT SIZE 5

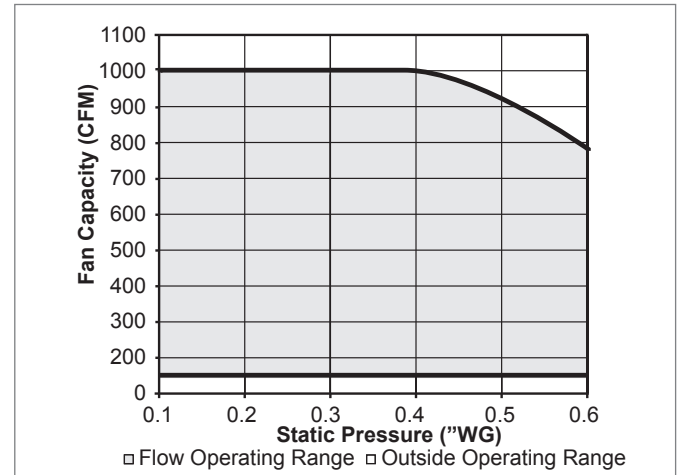
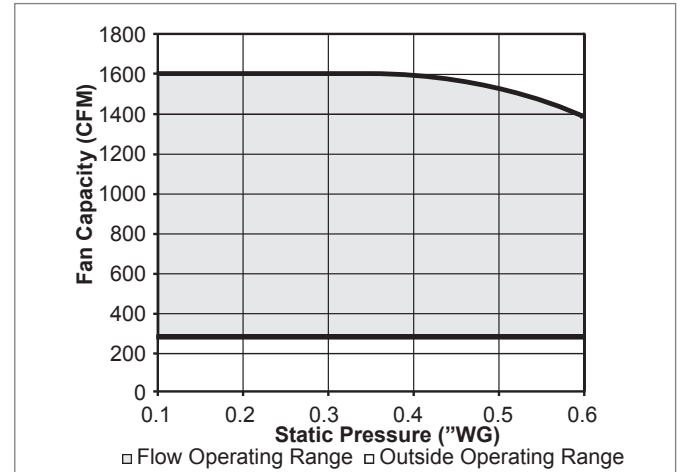


NOTES: Fan speed controller (SCR) is standard with each unit. Fan curves indicate maximum and minimum achievable flow reductions using SCR speed control. Units must be selected to operate within the flow and external static pressure ranges as shown. Fan discharge air volume will be reduced approximately 5% when unit is equipped with optional factory supplied electric heat coils.

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KQFP PSC Fan Curves
KQFP PSC FAN CURVE, UNIT SIZE 6

KQFP PSC FAN CURVE, UNIT SIZE 7


NOTES: Fan speed controller (SCR) is standard with each unit. Fan curves indicate maximum and minimum achievable flow reductions using SCR speed control. Units must be selected to operate within the flow and external static pressure ranges as shown. Fan discharge air volume will be reduced approximately 5% when unit is equipped with optional factory supplied electric heat coils.

KQFP ECM Fan Curves
KQFP ECM FAN CURVE, UNIT SIZE 4

KQFP ECM FAN CURVE, UNIT SIZE 7


NOTES: Manual or remote adjustable speed controller is standard with each unit. Fan curves indicate the maximum and minimum achievable airflows. See Product Description section, page B2-30 for definitions of manual and remote adjustable speed controllers. Units must be selected to operate within the airflow and external static pressure ranges shown.

AHRI Certified Performance Data for Parallel Fan Powered Terminal Units
KQFP, ULTRA QUIET PARALLEL FAN POWERED TERMINAL UNIT

Unit Size	Inlet Size	Primary CFM	Min. Ps	Discharge Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	6	400	0.200	400	355	69	66	62	57	53	50	64	58	52	45	42	39
3	8	700	0.200	700	400	73	71	67	62	60	59	69	63	54	49	44	40
4	10	1100	0.200	800	445	70	67	63	60	58	55	73	66	56	55	52	45
5	12	1600	0.200	1350	710	76	69	66	65	64	63	71	61	58	55	52	44
6	14	2100	0.200	1700	775	75	73	70	66	63	62	73	64	61	57	53	47
7	16	2800	0.200	1800	1300	78	74	70	70	68	67	80	71	66	64	60	53

Unit Size	Inlet Size	Primary CFM	Min. Ps	Radiated Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	6	400	0.200	400	355	71	67	60	60	53	49	56	51	46	40	38	36
3	8	700	0.200	700	400	70	67	62	58	52	52	64	57	50	45	40	35
4	10	1100	0.200	800	445	67	65	61	59	54	52	65	59	53	46	42	39
5	12	1600	0.200	1350	710	74	69	65	61	60	57	66	59	55	50	46	43
6	14	2100	0.200	1700	775	74	71	68	64	60	58	70	60	57	51	48	44
7	16	2800	0.200	1800	1300	79	76	68	66	62	59	75	68	64	62	59	57

QFV, PARALLEL FAN POWERED TERMINAL UNIT

Unit Size	Inlet Size	Primary CFM	Min. Ps	Discharge Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	6	400	0.200	330	190	72	62	60	58	54	53	81	75	67	63	59	53
3	8	700	0.200	505	230	72	62	60	58	55	54	81	78	70	67	61	55
4	10	1100	0.200	850	350	73	65	64	64	61	60	82	78	72	69	64	58
5	12	1600	0.200	1285	800	75	69	67	68	65	64	82	77	75	71	67	62
6	14	2100	0.200	1545	800	77	70	68	68	62	63	83	79	77	72	69	64
7	16	2800	0.200	1805	1030	78	69	70	71	67	66	84	81	79	76	72	67

Unit Size	Inlet Size	Primary CFM	Min. Ps	Radiated Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	6	400	0.200	330	190	71	65	60	58	52	47	67	60	57	50	45	38
3	8	700	0.200	505	230	71	65	60	57	52	47	70	64	63	56	51	46
4	10	1100	0.200	850	350	73	68	62	61	58	57	75	70	67	59	55	49
5	12	1600	0.200	1285	800	74	69	67	68	65	62	74	68	66	58	54	50
6	14	2100	0.200	1545	800	75	72	67	67	65	62	73	68	65	59	56	51
7	16	2800	0.200	1805	1030	75	73	68	67	64	63	81	79	77	71	68	65

KLPP, LOW PROFILE PARALLEL FAN POWERED TERMINAL UNIT

Unit Size	Inlet Size	Primary CFM	Min. Ps	Discharge Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	8	700	0.140	600	275	70	64	60	58	52	49	75	71	64	58	54	49
4	12	1575	0.766	800	400	70	65	66	62	55	55	80	106	97	107	121	137

Unit Size	Inlet Size	Primary CFM	Min. Ps	Radiated Data													
				Fan		Fan Only Sound Power, Lw							Primary Only @ 1.5" Inlet Ps				
				CFM	Watts	2	3	4	5	6	7	2	3	4	5	6	7
2	8	700	0.140	600	275	67	63	61	57	50	40	71	66	60	55	52	48
4	12	1575	0.220	800	400	67	67	66	63	57	48	72	69	65	58	52	48

NOTE: See notes on previous page.



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KQFP Discharge Sound Performance Data

KQFP, DISCHARGE SOUND DATA

FAN POWERED TERMINAL UNITS

Unit Size	Inlet Size	Flow Rate		Min. Δ Ps		Primary @ 0.5" Δ Ps							Primary @ 1.5" Δ Ps							Primary @ 2.0" 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
2	6	100	(47)	0.013	(3.1)	36	32	27	23	23	24	-	40	33	28	25	28	32	-	41	33	29	26	29	34	-			
		200	(94)	0.050	(12.4)	48	45	39	33	30	28	-	52	46	40	35	35	35	-	53	46	40	36	36	37	-			
		300	(142)	0.113	(28.0)	55	52	46	39	34	30	-	59	53	47	41	39	37	-	60	53	47	42	40	39	-			
		400	(189)	0.200	(49.8)	60	58	50	43	36	31	-	64	58	52	45	42	39	-	65	59	52	46	43	41	21			
		500	(236)	0.313	(77.8)	64	62	54	46	39	33	-	68	63	55	48	44	40	25	69	63	56	49	45	42	26			
3	8	180	(85)	0.013	(3.3)	39	42	40	31	26	23	-	45	46	44	35	31	31	-	47	47	45	36	33	33	-			
		360	(170)	0.053	(13.2)	51	50	45	38	32	28	-	57	55	49	42	38	35	-	59	56	50	43	39	37	-			
		540	(255)	0.119	(29.6)	58	55	48	42	36	31	-	64	60	52	46	42	38	20	66	61	53	47	43	40	22			
		700	(330)	0.200	(49.8)	63	59	50	45	38	33	-	69	63	54	49	44	40	26	71	64	55	50	45	42	28			
		900	(425)	0.331	(82.3)	67	62	52	47	41	34	-	73	66	56	51	46	42	32	75	67	57	53	48	44	34			
4	10	290	(137)	0.014	(3.5)	44	42	39	33	26	20	-	48	46	42	37	30	26	-	49	47	43	38	32	27	-			
		580	(274)	0.056	(13.8)	57	52	46	43	37	30	-	61	56	49	47	41	36	-	62	57	50	48	43	37	-			
		870	(411)	0.125	(31.1)	65	58	50	48	43	36	-	69	62	53	52	48	42	26	70	63	54	53	49	43	27			
		1100	(519)	0.200	(49.8)	69	62	52	51	47	40	-	73	66	56	55	52	45	31	74	66	57	56	53	47	33			
		1450	(684)	0.348	(86.5)	74	66	55	55	51	44	26	78	70	59	59	56	50	38	79	71	60	60	57	51	39			
5	12	420	(198)	0.014	(3.4)	46	43	43	35	26	20	-	53	49	48	40	32	29	-	55	51	49	41	34	31	-			
		840	(396)	0.055	(13.7)	55	49	48	43	36	28	-	63	56	53	48	42	37	-	65	57	54	49	44	39	21			
		1260	(595)	0.124	(30.9)	60	53	51	47	42	33	-	68	59	56	53	48	42	25	70	61	57	54	50	44	28			
		1600	(755)	0.200	(49.8)	64	55	53	50	45	36	-	71	61	58	55	52	44	29	73	63	59	57	53	47	32			
		2100	(991)	0.345	(85.7)	67	58	55	53	49	39	-	75	64	60	58	55	48	34	77	66	61	60	57	50	36			
6	14	570	(269)	0.015	(3.7)	49	42	39	34	27	21	-	56	50	47	41	34	29	-	58	52	49	42	36	32	-			
		1140	(538)	0.059	(14.7)	58	50	47	43	37	31	-	65	57	54	49	44	39	21	67	59	56	51	46	41	23			
		1710	(807)	0.133	(33.0)	63	54	51	48	44	36	-	70	62	59	54	50	44	28	72	64	61	56	52	47	30			
		2100	(991)	0.200	(49.8)	66	56	53	51	47	39	-	73	64	61	57	53	47	31	75	66	63	59	55	49	34			
		2850	(1345)	0.368	(91.7)	70	60	57	54	51	43	21	77	67	64	61	58	51	36	79	69	66	62	60	53	39			
7	16	740	(349)	0.014	(3.5)	54	49	44	42	34	23	-	61	55	51	47	39	30	-	63	57	53	48	40	32	-			
		1480	(698)	0.056	(13.9)	64	57	52	51	45	35	-	71	64	59	56	50	42	28	73	65	61	57	51	44	31			
		2220	(1048)	0.126	(31.3)	69	62	56	56	52	42	20	77	68	63	61	57	49	36	79	70	65	63	58	50	38			
		2800	(1321)	0.200	(49.8)	73	65	59	59	55	46	24	80	71	66	64	60	53	40	82	73	68	66	62	54	43			
		3700	(1746)	0.349	(86.9)	77	68	62	63	60	50	30	84	75	69	68	65	57	45	86	76	71	69	66	59	48			

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 pages B2-4 and B2-5. 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 Krueger's Terminal Unit Engineering section for reductions and definitions.

K Q F P

KQFP Radiated Sound Performance Data
KQFP, RADIATED SOUND DATA

Unit Size	Inlet Size	Flow Rate		Min. Δ Ps		Primary @ 0.5" Δ Ps							Primary @ 1.5" Δ Ps							Primary @ 2.0" Δ Ps									
						Octave Band Sound Power, Lw							Lp	Octave Band Sound Power, Lw							Lp	Octave Band Sound Power, Lw							Lp
						2	3	4	5	6	7	NC		2	3	4	5	6	7	NC		2	3	4	5	6	7	NC	
2	6	100	(47)	0.013	(3.1)	35	30	26	23	23	23	-	39	33	30	27	29	31	-	40	34	31	29	31	33	-			
		200	(94)	0.050	(12.4)	43	39	34	29	27	25	-	48	42	38	34	34	33	-	49	43	39	35	35	35	-			
		300	(142)	0.113	(28.0)	48	44	39	33	30	27	-	52	47	43	38	36	35	-	54	48	44	39	38	37	-			
		400	(189)	0.200	(49.8)	51	47	42	36	31	28	-	56	51	46	40	38	36	-	57	51	47	42	40	38	21			
		500	(236)	0.313	(77.8)	54	50	44	38	33	28	-	59	53	48	42	39	36	22	60	54	49	44	41	38	24			
3	8	180	(85)	0.013	(3.3)	43	38	32	26	18	15	-	48	43	38	32	25	26	-	49	45	40	33	27	28	-			
		360	(170)	0.053	(13.2)	51	45	38	33	25	20	-	56	50	44	38	32	30	-	57	52	46	40	34	33	-			
		540	(255)	0.119	(29.6)	56	49	41	37	30	23	-	61	55	47	42	37	33	23	62	56	49	44	39	36	25			
		700	(330)	0.200	(49.8)	59	52	43	39	33	25	21	64	57	50	45	40	35	27	65	58	51	46	41	38	28			
		900	(425)	0.331	(82.3)	62	55	45	42	35	27	25	67	60	52	47	42	37	31	68	61	53	49	44	40	32			
4	10	290	(137)	0.014	(3.5)	43	37	33	25	19	16	-	48	42	38	30	24	24	-	50	43	39	32	26	26	-			
		580	(274)	0.056	(13.8)	51	45	41	33	28	24	-	57	51	46	39	33	32	-	58	52	47	40	35	34	21			
		870	(411)	0.125	(31.1)	56	50	45	38	33	29	-	62	56	50	44	39	37	24	63	57	51	45	40	39	26			
		1100	(519)	0.200	(49.8)	59	53	48	41	37	31	22	65	59	53	46	42	39	28	66	60	54	48	43	41	30			
		1450	(684)	0.348	(86.5)	62	57	51	44	40	34	26	68	62	56	50	45	42	32	70	64	57	51	47	44	34			
5	12	420	(198)	0.014	(3.4)	38	40	36	33	27	20	-	44	45	42	38	33	28	-	46	46	44	39	34	30	-			
		840	(396)	0.055	(13.7)	49	47	43	39	34	28	-	55	52	49	44	40	36	23	57	54	51	45	41	38	25			
		1260	(595)	0.124	(30.9)	56	52	47	43	38	32	21	62	57	53	48	43	40	27	63	58	54	49	45	42	29			
		1600	(755)	0.200	(49.8)	59	54	49	45	40	35	23	66	59	55	50	46	43	30	67	61	57	51	47	45	31			
		2100	(991)	0.345	(85.7)	64	57	51	47	43	38	27	70	62	58	52	48	46	35	71	64	59	53	50	48	37			
6	14	570	(269)	0.015	(3.7)	45	39	37	32	26	22	-	53	46	44	37	32	31	-	55	48	46	39	34	34	-			
		1140	(538)	0.059	(14.7)	54	47	44	39	34	28	-	62	54	51	45	41	38	25	64	56	53	46	42	40	27			
		1710	(807)	0.133	(33.0)	59	51	48	43	39	32	22	67	58	55	49	45	42	31	69	60	57	50	47	44	34			
		2100	(991)	0.200	(49.8)	62	53	50	45	41	34	25	70	60	57	51	48	44	34	72	62	59	53	50	46	37			
		2850	(1345)	0.368	(91.7)	66	56	53	48	45	37	30	74	63	60	54	51	47	40	76	65	62	56	53	49	42			
7	16	740	(349)	0.014	(3.5)	50	45	40	36	31	27	-	58	54	50	47	43	43	24	61	57	52	50	46	47	27			
		1480	(698)	0.056	(13.9)	58	52	48	44	39	34	22	67	61	57	55	52	50	32	69	64	60	58	55	54	35			
		2220	(1048)	0.126	(31.3)	63	57	52	48	44	38	26	72	66	62	59	57	54	37	74	68	64	62	60	58	40			
		2800	(1321)	0.200	(49.8)	66	59	55	51	47	41	29	75	68	64	62	59	57	41	77	71	67	65	63	61	44			
		3700	(1746)	0.349	(86.9)	69	62	58	54	51	44	34	78	71	67	65	63	59	45	80	74	70	68	66	64	48			

FAN POWERED TERMINAL UNITS

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. AHRI certification points are shown in bold, white font. For a complete list of AHRI certified data, see pages B2-4 and B2-5. 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 Krueger's Terminal Unit Engineering section for reductions and definitions.

KQFP | Ultra Quiet, Parallel Flow

KQFP Radiated & Discharge Sound Performance Data

KQFP, FAN ONLY RADIATED & DISCHARGE SOUND DATA

FAN POWERED TERMINAL UNITS

Unit Size	Flow Rate		Discharge Sound Power							Radiated Sound Power						
			Octave Band Sound Power, Lw							Lp	Octave Band Sound Power, Lw					
	CFM	(L/s)	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2	150	(71)	62	56	54	47	40	36	-	47	51	45	37	32	23	-
	240	(113)	65	61	58	52	46	43	21	59	59	52	48	42	36	28
	325	(153)	67	64	61	55	51	47	22	66	64	57	55	48	43	34
	400	(189)	69	66	62	57	53	50	24	71	67	60	60	53	49	38
	500	(236)	70	68	64	59	57	53	26	76	70	63	65	57	54	43
3	300	(142)	61	60	56	51	50	46	-	50	49	47	38	35	34	20
	450	(212)	67	65	61	57	55	52	23	59	58	54	48	43	43	29
	600	(283)	71	69	65	60	58	57	28	66	63	59	54	48	49	34
	700	(330)	73	71	67	62	60	59	30	70	67	62	58	52	52	38
	910	(429)	77	74	70	65	63	63	33	76	72	67	64	57	58	44
4	370	(175)	62	63	56	51	47	42	20	59	60	52	46	42	39	29
	550	(260)	66	65	60	56	53	49	23	63	62	57	52	48	46	32
	700	(330)	69	66	62	58	56	53	24	65	64	60	56	52	50	35
	800	(378)	70	67	63	60	58	55	24	67	65	61	59	54	52	36
	1100	(519)	74	68	66	64	62	60	26	70	67	65	64	58	58	40
5	500	(236)	64	59	55	52	51	46	-	64	60	56	47	45	40	30
	800	(378)	69	64	60	58	57	54	21	69	64	60	54	52	48	35
	1100	(519)	73	67	64	62	61	60	25	72	67	63	58	56	54	38
	1350	(637)	76	69	66	65	64	63	28	74	69	65	61	60	57	41
	1700	(802)	78	72	68	68	67	67	69	77	71	67	64	63	62	44
6	750	(354)	72	69	65	59	56	54	26	66	67	59	54	48	42	38
	1000	(472)	73	70	67	61	58	57	28	68	69	62	58	52	48	40
	1275	(602)	74	71	68	63	61	59	29	71	70	65	60	56	52	41
	1700	(802)	75	73	70	66	63	62	31	74	71	68	64	60	58	44
	1800	(849)	76	73	70	66	64	63	32	74	71	69	64	61	59	45
7	750	(354)	67	63	61	58	55	51	20	69	65	59	53	48	43	35
	1060	(500)	71	67	64	63	60	57	25	73	69	63	58	53	49	40
	1375	(649)	75	70	67	66	64	62	28	76	72	65	62	57	54	44
	1800	(849)	78	74	70	70	68	67	32	79	76	68	66	62	59	48
	2000	(944)	80	75	71	71	70	68	34	80	77	69	68	63	61	49

NOTES: Discharge sound power is the sound emitted from the unit discharge. Discharge sound power has been corrected for end reflection. 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 pages B2-4 and B2-5. 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 Krueger's Terminal Unit Engineering section for reductions and definitions.

K Q F P

KQFP Control Information

Standard KQFP sequence of operation has the induced air flow fan operating intermittently, providing supplemental ceiling plenum/return air to the space for heat.

HEATING MODE

When the zone is at maximum heating demand, the primary air damper maintains a minimum volume of primary airflow. The fan supplies a constant flow of air to the zone by inducing a maximum amount of warm air from the ceiling plenum. Electric or hot water heat, if supplied, operates at maximum capacity.

As zone temperature rises, the optional heat, if supplied, cycles off. The fan continues to induce the maximum amount of ceiling plenum air. As zone temperature reaches setpoint, the fan will cycle off and a minimum amount of air will be discharged from the unit.

COOLING MODE

As the zone temperature rises above setpoint, the fan remains off and the primary air damper begins to modulate toward full open.

As the zone temperature continues to rise, the primary air damper will continue to modulate toward open. When the conditioned zone is at maximum cooling demand, the primary air damper will maintain a constant maximum flow setting. With pressure independent controls, the damper will maintain airflow settings regardless of central system pressure fluctuations.

CONTROL OPTIONS

- **Pneumatic Controls:** Pressure independent control packages are available with or without hot water or electric heat. All control arrangements include an inlet flow sensor, fan speed controller and fan PE switch.
- **Analog Controls:** Pressure independent control packages are available with or without hot water or electric heat, automatic night shutdown or night setback. All control arrangements include an inlet flow sensor, control enclosure, fan speed controller, 24 volt transformer, fan relay and wall thermostat to match the control type.
- **Direct Digital Controls:** Smart Equipment control packages are provided and programmed by the factory for in-house mounting, piping, and wiring.

- BACnet Compatible: 7301-7309
- Standalone: 6301-6309

Other digital control packages can be supplied to the factory for mounting, piping, and wiring.

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

- **No Control Unit:** Units are factory supplied without controls, assuming that the unit is being used for field mounting of direct digital control equipment. This arrangement includes an inlet flow sensor, control enclosure, fan speed controller, transformer to 24 volts and fan relay.

The following list shows the standard control arrangements available with the KQFP product offering. Each control approach offers a variety of pressure independent operating functions; combinations of control functions are identified by the Krueger control package number.

PNEUMATIC CONTROL ARRANGEMENTS

- 1400 - Single Function Controller;
DA-NO with or without Hot Water or Electric Heat
- 1401 - Single Function Controller;
RA-NC with or without Hot Water or Electric Heat
- 1402 - Multi-function Controller;
DA-NO with or without Hot Water or Electric Heat
- 1403 - Multi-function Controller;
RA-NO with or without Hot Water or Electric Heat
- 1404 - Multi-function Controller;
DA-NC with or without Hot Water or Electric Heat
- 1405 - Multi-function Controller;
RA-NC 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

ANALOG CONTROL ARRANGEMENTS

- 2300 - Cooling with Sequenced Fan
- 2301 - Cooling with Sequenced Fan and Automatic Night Shutdown
- 2302 - Cooling with Sequenced Fan and Automatic Night Setback
- 2303 - Cooling with Sequenced Fan and On/Off Hot Water Heat
- 2304 - Cooling with Sequenced Fan, On/Off Hot Water Heat, and Automatic Night Shutdown
- 2305 - Cooling with Sequenced Fan, On/Off Hot Water Heat, and Automatic Night Setback
- 2306 - Cooling with Sequenced Fan and Proportional Hot Water Heat
- 2307 - Cooling with Sequenced Fan, Proportional Hot Water Heat, and Automatic Night Shutdown
- 2308 - Cooling with Sequenced Fan, Proportional Hot Water Heat, and Automatic Night Setback
- 2309 - Cooling with Sequenced Fan and Up to Two Stages of Electric Heat
- 2310 - Cooling with Sequenced Fan, Up to Two Stages of Electric Heat, and Automatic Night Shutdown
- 2311 - Cooling with Sequenced Fan, Up to Two Stages of Electric Heat, and Automatic Setback
- 2313 - Cooling with Sequenced Fan and Proportional Electric Heat
- 2314 - Cooling with Sequenced Fan and Proportional Heat with Automatic Night Shutdown

DIRECT DIGITAL CONTROL ARRANGEMENTS

Visit Krueger's website at www.krueger-hvac.com or contact your Krueger representative for a complete list of factory mounted direct digital control arrangements.

KQFP Engineering Specification & Configuration**KQFP UNIT**

Fan powered terminal unit shall be designed to provide low sound levels. Unit shall be completely factory assembled and wired with motor, blower, mixing plenum, and primary air damper contained in a single unit housing. Unit shall be Krueger model KQFP.

Primary airflow controller shall compensate for central system pressure fluctuations. When room temperature requires maximum heating, the (direct digital) (analog) (pneumatic) pressure independent velocity controller maintains the minimum primary airflow setting by modulating the damper. The induction fan shall run, and the electric heating coil or hot water coil, if supplied, is energized (activated). As room temperature begins to rise, the heating coil is de-energized (deactivated). As room temperature calls for maximum cooling, the velocity controller shall maintain primary airflow setting.

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

The terminal unit shall be ETL listed as a complete assembly. All electrical components shall be UL listed and installed in accordance with the National Electric Code. All electrical components shall be mounted in sheet metal control enclosures. Electrical connection shall be single point.

Unit casing shall be constructed of not less than 20 gage galvanized steel. All primary air inlet collars shall accommodate standard flex duct sizes. Unit discharge shall be rectangular, suitable for flanged duct connections.

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

The unit casing shall incorporate an integral recirculated air inlet sound attenuator to achieve sound levels shown on equipment schedule.

KQFP 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.

Terminal unit shall be provided with 20 gage galvanized steel backdraft damper.

The primary air damper assembly shall be constructed of heavy gage galvanized steel with 1/2" solid shaft rotating in self lubricating 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.

Fan motor and all interior components must be accessible through a removable bottom access panel.

Fan shall be of the forward curve, centrifugal type. The fan motor shall be single speed, multi-voltage (120, 208/240, 277), 60 Hz, single phase, energy efficient design, permanently lubricated, using permanent split capacitor for starting and be specifically designed for use with an SCR fan speed controller. Motor must have thermal overload protection. The fan motor shaft shall be connected directly to the fan and the entire fan assembly shall be isolated from the unit casing to prevent transmission of vibration.

- **(Optional)** ECM Fan Motor: The fan motor shall be [120, 208/240, or 277 volt, single-phase] ECM (electronically commutated motor) fan motors including either a manual or remote adjustable speed controller. The manual adjustable speed controller is field set with a digital display alternating between RPM and percentage full flow. The remote adjustable speed controller provides a means to remotely set and/or adjust the fan speed.

The radiated and discharge attenuation factors for the specified NC levels shall be based on 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)** Steriliner Insulation: Unit casing shall be lined with 13/16" thick, 4 lb. density, rigid board insulation with fiber 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 foil tape sealing the insulation cut edges.
- **(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.
- **(Optional)** Foil Encapsulated Insulation: Unit casing shall be lined with foil reinforced, wrapped edges, 1/2" or 1" thick, 1 1/2 lb. density fiberglass insulation that meets UL 181 and NFPA 90A. Insulation shall be attached to the unit casing by adhesive and weld pins.
- **(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" or 1" thick, 1 1/2 lb. dual density fiberglass insulation, (additional options: 1/2" or 1" thick, 1 1/2 lb. density foil reinforced fiberglass insulation or 13/16"

KQFP Engineering Specification & Configuration

thick, 4 lb. density, rigid board insulation with fiber reinforced foil covering) 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.

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 gage galvanized steel. Elements shall be 80/20 Ni-Cr and supported by ceramic insulators. The integral control panel shall be housed in a NEMA 2 enclosure for access to all controls and safety devices.

Electric coils shall contain a primary automatic reset thermal cutout and differential pressure airflow switch for proof of airflow.

- **(Optional)** Electric coils shall include fused or non-fused door interlocking disconnect switch, AC solid state relay, fuse-block, manual reset cutout, and/or dust tight enclosure construction.
- **(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 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 gage galvanized steel with flanged discharge for attachment to downstream ductwork. The hot water coil may also be factory attached to the upstream side of the induced air inlet. Coils shall be factory installed on the terminal unit. Fins shall be rippled and corrugated heavy gage 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 and circuits 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.

KQFP Suggested Specification & Configuration

FAN POWERED TERMINAL UNITS

1. SERIES: (XXXX)

KQFP - Quiet Fan Terminal Unit

2. SENSOR TYPE: (X)

- 1 - Linear Averaging
- 3 - K4 LineaCross (Four Quadrant, Standard)

3. LINER TYPE: (X)

- 0 - 1/2" Liner
- 1 - 1" Liner
- 2 - Steriliner
- 3 - No Liner
- 4 - Sterilwall with 1/2" Dual Density
- 6 - 1/2" Foil Encapsulated
- 8 - Sterilwall with 1" Dual Density
- 9 - 1" Foil Encapsulated
- A - Perforated Double Wall with 1/2" Dual Density
- B - Perforated Double Wall with 1" Dual Density
- C - Perforated Double Wall with 1/2" Foil Encapsulated
- D - Perforated Double Wall with 1" Foil Encapsulated
- E - Perforated Double Wall with Steriliner
- F - 1/2" Cellular
- H - 1" Cellular

4. UNIT CASING CONTROLS: (XX)

- 1L - Left-hand Side, 20 Gage
- 1R - Right-hand Side, 20 Gage

5. UNIT SIZE: (X)

- 2 - Available Inlet Sizes: 6", 8"
- 3 - Available Inlet Sizes: 6", 8", 10"
- 4 - Available Inlet Sizes: 6", 8", 10", 12"
- 5 - Available Inlet Sizes: 10", 12", 14"
- 6 - Available Inlet Sizes: 10", 12", 14", 16"
- 7 - Available Inlet Sizes: 10", 12", 14", 16"

6. INLET CODE: (XX)

- 06 - 6" 08 - 8"
- 10 - 10" 12 - 12"
- 14 - 14" 16 - 16"

7. MOTOR VOLTAGE: (X)

- 1 - 120V, 1-Phase
- 2 - 208/240V, 1-Phase
- 3 - 277V, 1-Phase
- 4 - ECM Motor, 120V, 1-Phase *
- 5 - ECM Motor, 208/240V, 1-Phase *
- 6 - ECM Motor, 277V, 1-Phase *

8. CONTROL TYPE: (XXXX)

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

9. UNIT ACCESSORIES: (X) (X) (X) (X) (X) (X)

- 0 - None
- A - Motor Toggle Disconnect *
- E - Dust-tight Control Enclosure
- F - Fan Motor Fuse
- P - Cam Lock for Access Panels
- R - Induction Inlet Filter
- S - Hanger Brackets †

10. WATER HEAT:

(ROWS/CONNECTION HAND) (XXX)

- 000 - N/A / None
- W11 - 1 Row/Right/Unit Discharge
- W12 - 2 Row/Right/Unit Discharge
- W21 - 1 Row/Left/Unit Discharge
- W22 - 2 Row/Left/Unit Discharge
- W61 - 1 Row/Right/Induced Air Inlet
- W62 - 2 Row/Right/Induced Air Inlet
- W71 - 1 Row/Left/Induced Air Inlet
- W72 - 2 Row/Left/Induced Air Inlet

11. ELECTRIC HEAT: (XX)

- 00 - None
- E1 - 120v/1-Phase
- E2 - 208v/1-Phase
- E3 - 240v/1-Phase
- E4 - 277v/1-Phase
- E6 - 208v/3-Phase/3-Wire
- E9 - 480v/3-Phase/4-Wire

LINEAHEAT: (XX)

- L1 - 120v/1-Phase
- L2 - 208v/1-Phase
- L3 - 240v/1-Phase
- L4 - 277v/1-Phase
- L6 - 208v/3-Phase/3-Wire
- L9 - 480v/3-Phase/4-Wire

12. ELECTRIC HEAT STEPS: (X)

- 0 - None
- 1 - 1-Stage
- 2 - 2-Stage
- 3 - 3-Stage

13. HEAT COIL ACCESSORIES: (X) (X) (X) (X) (X)

- 0 - None
- C - Fuse Block
- E - Chicago Code Construction
- F - Manual Reset Cutout
- G - Dust-tight Construction
- H - Staged Solid State Relays
- K - Door-interlocking Fused Disconnect
- L - Door-interlocking Non-fused Disconnect
- P - Water Coil Vent & Drain

* Manual or remote adjustable speed controller for ECM motor option is required.

* Motor Toggle Disconnect not available with electric heat.

† Hanger brackets not available with Sterilwall or Perforated Doublewall liners.

SAMPLE CONFIGURATION: KQFP - 3 - 1 - 1L - 4 - 08 - 3 - 7302 - S - 0 - 0 - 0 - 0 - E41 - 1 - 0 - 0 - 0 - 0

K
Q
F
P