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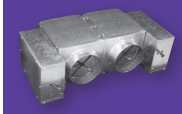
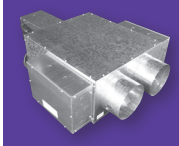


LMHD
This unit features a compact design for variable volume applications where blending of hot and cold air is not required.



LMHDT
This unit features a 20:1 mixing chamber for precise discharge temperature control, making it a great choice for applications where comfort is critical.

Introduction: LMHD, LMHDT

Krueger's dual duct terminals are designed to maintain optimal temperature control in the conditioned zone by varying the air volume supplied by the hot and cold supply ducts while providing the proper discharge air temperature. Dual duct terminals can also be used in fresh air applications where ventilation air must be monitored. One inlet can be a dedicated ventilation inlet. A wide variety of pressure independent pneumatic, analog, and factory mounted direct digital controls are available for variable or constant volume applications.

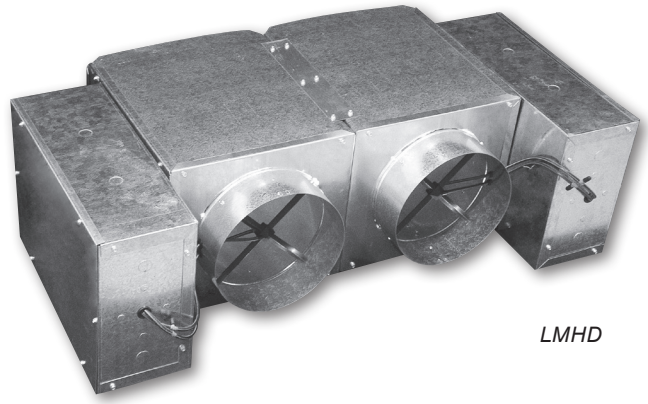
Krueger offers two styles of dual duct units to accommodate a variety of product applications:

The model LMHD provides a compact design ideally suited for variable volume applications where blending of the hot and cold air is not required.

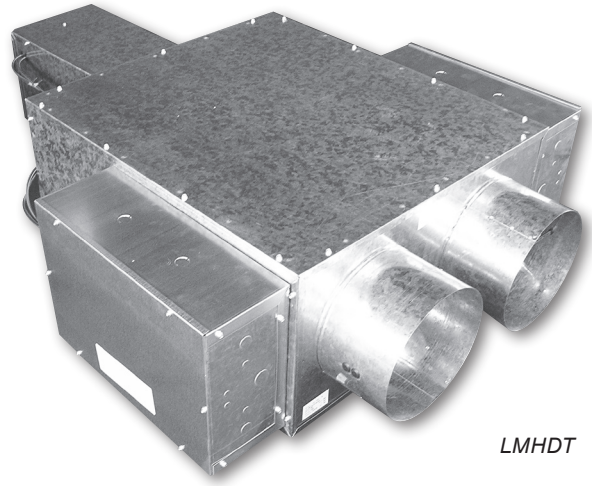
Hot and cold airstreams are controlled by inlet airflow sensing for pneumatic, analog, or direct digital control arrangements.

The model LMHDT is designed for those specific applications where temperature control is critical. This unit features an integral attenuator and hot/cold airstream mixing chamber for precise discharge temperature control. The LMHDT performs with a 20:1 air temperature mixing ratio in most conditions.

Hot and cold airstreams are controlled by inlet airflow sensing for variable volume control or a combination of inlet airflow sensing and discharge sensing for constant volume control with pneumatic, analog, or direct digital control arrangements.



LMHD



LMHDT

MODELS

LMHD - Variable Volume, Dual Duct Terminal Unit
LMHDT - Variable or Constant Volume, Dual Duct Terminal Unit

FEATURES

- 22 Gage galvanized steel casing construction with an optional 20 gage casing for strength and product durability.
- AHRI tested with certified performance data in accordance with AHRI Standard 880.
- Suitable for low, medium, or high pressure applications; capable of operating throughout a wide range of HVAC systems.
- Multiple liner options (depending on model) to provide quiet and clean operation.
- Airflow capacities range (from 40 to 7000 CFM for model LMHD) and (from 90 to 3660 CFM for model LMHDT) to allow airflow control for commercial applications.
- Round inlet sizes range from 4" to 16" diameter for model LMHD and LMHDT and are slightly undersized to fit standard spiral and flex duct for quick installation; model LMHD, size 22 provides a rectangular duct connection.
- LMHDT offers unequal inlet size combinations for a flexible design. See chart above.
- Square/Rectangular discharge connections provide a quick and easy connection to downstream ductwork.
- Pressure independent pneumatic, analog, and direct digital controls can be customized for many building systems.
- Multi-point, four quadrant, center averaging sensor or optional, linear averaging velocity sensor offers low resistance to airflow while amplifying the signal to the damper controllers.
- Gasketed volume control damper operating over a full 90° range and provides low leakage at the shutoff position.
- Compact unit casing sizes accommodates installation in reduced ceiling plenum space.
- Revit models are available at www.krueger-hvac.com/revit.

LMHDT INLET SIZE OPTIONS

Unit Size	Available Inlets									
	4	5	6	7	8	9	10	12	14	16
4	•									
5	•	•								
6	•	•	•							
7	•	•	•	•						
8	•	•	•	•	•					
9	•	•	•	•	•	•				
10	•	•	•	•	•	•	•			
12				•	•	•	•	•		
14				•	•	•	•	•	•	
16				•	•	•	•	•	•	•

Dot indicates available inlet size.

AHRI Certified Performance Data for LMHD & LMHDT Dual Duct Terminal Units

LMHD, NON-AIRFLOW MIXING DUAL DUCT TERMINAL UNIT

Unit Size	Rated CFM	Min. Δ Ps	Discharge Data Sound Power @ 1.5" Δ Ps						Radiated Data Sound Power @ 1.5" Δ Ps					
			2	3	4	5	6	7	2	3	4	5	6	7
4	150	0.100	66	62	55	51	49	44	56	49	42	40	37	33
5	250	0.100	68	68	62	54	50	47	59	52	44	39	35	31
6	400	0.100	69	68	61	54	50	47	60	58	50	40	36	33
7	550	0.100	71	70	61	56	53	52	60	57	51	43	39	35
8	700	0.100	71	70	62	57	54	51	62	59	49	43	38	38
9	900	0.100	69	67	61	56	54	52	60	56	50	42	39	35
10	1100	0.100	69	67	63	59	57	54	58	54	50	43	38	32
12	1600	0.100	72	68	64	61	59	57	64	58	51	46	42	36
14	2100	0.100	72	67	63	61	59	57	60	56	47	44	41	36
16	2800	0.100	75	68	64	60	58	56	66	62	56	49	45	42

LMHDT, AIRFLOW MIXING DUAL DUCT TERMINAL UNIT

Inlet Size	Rated CFM	Min. Δ Ps	Discharge Data Sound Power @ 1.5" Δ Ps						Radiated Data Sound Power @ 1.5" Δ Ps					
			2	3	4	5	6	7	2	3	4	5	6	7
6	400	0.440	80	74	66	57	50	44	66	64	54	47	44	42
8	700	0.387	82	74	67	60	53	46	68	64	56	52	52	51
10	1100	0.541	74	71	64	58	53	48	68	65	58	52	50	47
12	1600	0.467	78	70	65	59	53	48	73	67	60	56	54	52
14	2100	0.531	78	73	67	61	56	50	72	66	59	53	52	50
16	2800	0.462	81	75	68	62	58	53	73	65	61	54	52	50

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. Discharge sound power has been corrected for end reflection. Radiated sound power is the sound transmitted through the casing walls. NC application data is from AHRI Standard 885-08 Appendix E. 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. AHRI certification points are shown in bold white text in the sound performance data section for each of the corresponding models.

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

LMHD, LMHDT Unit Capacities

LMHD UNIT CAPACITIES (PER INLET)

Unit Size	Max. CFM	Min. CFM	Min. Pressure Ps
4	230	40	0.23
5	360	62	0.20
6	515	89	0.17
7	700	121	0.16
8	920	159	0.17
9	1160	201	0.17
10	1430	248	0.17
12	2060	357	0.17
14	2800	486	0.18
16	3660	634	0.17
22	7000	1212	0.17

NOTES: Minimum recommended airflow (CFM) is based on 0.03" WG differential pressure of the inlet airflow sensor or 0 airflow. 0.03" WG is equal to 15-20% of the nominal flow rating of the terminal unit. Less than 15-20% may result in greater than +/- 5% control of the unit airflow. Some DDC controls, supplied by others, may have differing limitations. Minimum flow may be 0. Maximum airflow (CFM) is based on a 1" WG differential pressure from the airflow sensor. The larger inlet size determines the discharge sensor size for LMHDT.

LMHDT UNIT CAPACITIES (PER INLET)

Unit Size	Max. CFM	Min. CFM	Min. Pressure Ps
4	230	40	0.15
5	360	62	0.36
6	515	90	0.73
7	700	121	0.39
8	920	160	0.66
9	1160	201	0.60
10	1430	250	0.91
12	2060	355	0.77
14	2800	485	0.95
16	3660	635	0.79

LMHDT DISCHARGE CAPACITIES

Unit Size	Max. Discharge CFM	Min. Discharge CFM
4, 5, 6	930	160
7, 8	1705	295
9, 10	1795	310
12	2840	490
14	3535	610
16	5235	905

LMHD, LMHDT Product Description

CASING
- All dual duct unit casing panels are constructed of 22 gage galvanized steel with a 20 gage option.

INLET COLLARS
- All round collars accommodate standard spiral or flex duct sizes. Unit sizes 4 - 16 have round inlet collars. The model LMHD, unit size 22, has a nominal inlet size of 16" x 24". (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 feature a slip and drive discharge duct connection.

DAMPER ASSEMBLIES
- Unit sizes 4 - 16 utilize round volume control dampers. The model LMHD, size 22, has a rectangular opposed blade volume control damper. All damper assemblies utilize a solid 1/2" shaft that rotates in Delrin® bearings.
- Damper blades incorporate a flexible gasket for tight airflow shutoff and operate over a full 90º.
- The damper position is marked by an arrow embossment on the end of the damper shaft.

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 insulation adhesive and 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" 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 two factory installed airflow sensing devices.
- The standard sensor location for LMHD and LMHDT is in each of the hot and cold inlets.
- LMHDT offers a discharge sensor option to control the total CFM leaving the unit.
- The standard sensor is the K4 LineaCross, four quadrant, multi-point 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 K4 LineaCross and linear sensors use the same flow constant.

CONTROLS
- Pneumatic, analog, or factory mounted direct digital control types are available. A "no control" unit option is also available for field mounting of direct digital controls.

CONTROL TRANSFORMER
- An optional control transformer is factory mounted and wired inside the control enclosure.

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

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

LMHD, LMHDT Damper Leakage

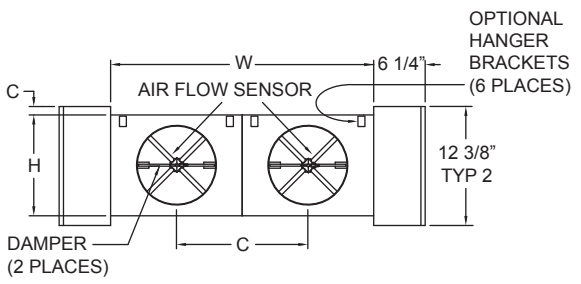
LMHD, LMHDT, DAMPER LEAKAGE DETAIL

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

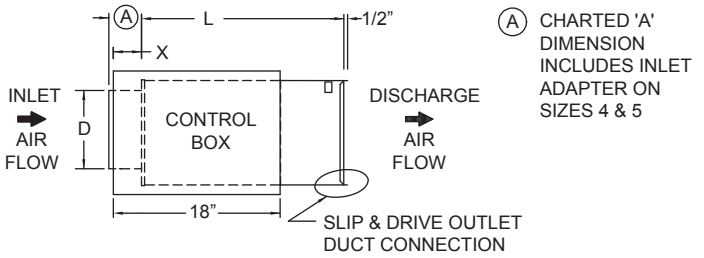
NOTES: Damper leakage is measured with the damper fully closed using an actuator. A precision low flow orifice is used upstream of the unit to measure the leakage rate as a function of the measured upstream static pressure. Casing leakage is determined with the damper fully open and the discharge of 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.

LMHD Base Unit Dimensional Information

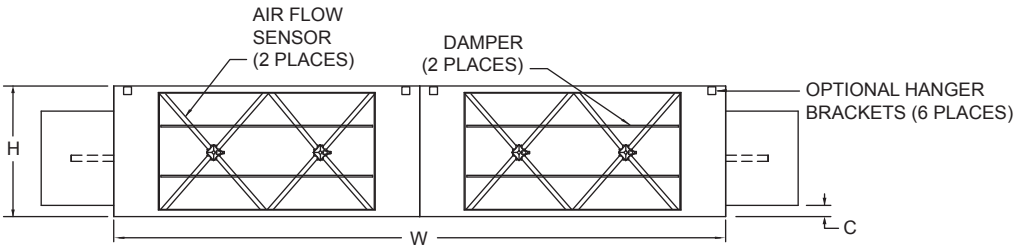
LMHD BASE UNIT, INLET AND SIDE VIEWS WITH OPTIONAL UNIT ACCESSORIES



INLET VIEW: SIZES 4 - 16



SIDE VIEW



INLET VIEW: SIZE 22 ONLY

LMHD BASE UNIT, DIMENSIONAL DETAILS

Unit Size	Inlet Max. CFM [L/s]	A	C	D	H	L	W
4	230 [109]	5 3/8"	12 1/8"	3 7/8"	8"	15 1/2"	24 1/8"
5	360 [170]	5 3/8"	12 1/8"	4 7/8"	8"	15 1/2"	24 1/8"
6	515 [243]	3 3/8"	12 1/8"	5 7/8"	8"	15 1/2"	24 1/8"
7	700 [330]	3 3/8"	12 1/8"	6 7/8"	10"	15 1/2"	24 1/8"
8	920 [434]	3 3/8"	12 1/8"	7 7/8"	10"	15 1/2"	24 1/8"
9	1160 [547]	3 3/8"	14 1/8"	8 7/8"	12 1/2"	15 1/2"	28 1/8"
10	1430 [675]	3 3/8"	14 1/8"	9 7/8"	12 1/2"	15 1/2"	28 1/8"
12	2060 [972]	3 3/8"	16 1/8"	11 7/8"	15"	15 1/2"	32 1/8"
14	2800 [1321]	3 3/8"	20 1/8"	13 7/8"	17 1/2"	15 1/2"	40 1/8"
16	3660 [1727]	3 3/8"	24 1/8"	15 7/8"	18"	15 1/2"	48 1/8"
22	7000 [3304]	3 3/8"	38 1/8"	23 7/8" x 15 7/8"	18"	15"	76 1/8"

NOTES: LMHD with electronic control enclosure is shown; cold inlet designates unit casing hand.

LMHD Base Unit Features & Options

STANDARD FEATURES

- 22 Gage galvanized steel casing construction.
- 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 independent systems.
- Sizes 4 - 16 include single-blade, heavy gage steel dampers; size 22 includes two-blade, heavy gage aluminum opposed blade dampers. Both dampers have polyethylene foam gasketing.
- ETL Listed - Adherence to UL 429 for electrically operated valves for units with electronic controls.
- AHRI certified sound ratings.

OPTIONAL FEATURES

- 20 Gage galvanized steel casing construction.
- Liners: 1/2" or 1" Cellular Insulation, 1" Dual Density Fiberglass Insulation, Sterilwall, Steriliner, Perforated Double Wall, or no liner.
- Linear averaging airflow sensor.
- Disconnect switch for electronic controls.
- Hanger brackets.
- Bottom access panel.
- Transformer.

LMHD Performance Data

LMHD, DISCHARGE SOUND DATA

Unit 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)	51	39	35	34	29	25	-	52	41	38	38	33	31	-	52	42	41	41	36	35	-
	110	(52)	0.054	(13.37)	61	55	47	43	40	34	-	62	56	50	47	44	40	-	63	57	53	50	47	44	-
	150	(71)	**0.100**	(24.88)	65	61	51	47	45	38	**21**	**66**	**62**	**55**	**51**	**49**	**44**	**23**	67	63	57	54	51	48	**24**
	230	(109)	0.235	(58.51)	71	69	58	52	51	43	**30**	72	71	61	56	55	49	**31**	73	72	64	59	57	53	**32**
5	60	(28)	0.006	(1.43)	46	39	39	31	30	25	-	50	43	43	35	35	31	-	52	45	47	38	38	35	-
	140	(66)	0.031	(7.80)	58	54	50	42	39	34	-	61	57	54	46	44	40	-	63	60	58	49	47	45	-
	250	(118)	**0.100**	(24.88)	65	64	57	50	46	41	**23**	**68**	**68**	**62**	**54**	**50**	**47**	**27**	71	70	65	57	54	51	**30**
	360	(170)	0.207	(51.60)	70	71	62	55	50	45	**30**	73	74	66	59	55	51	**34**	76	77	70	62	58	55	**37**
6	100	(47)	0.006	(1.56)	49	46	34	31	33	29	-	52	51	40	35	38	36	-	55	55	44	38	42	41	-
	250	(118)	0.039	(9.72)	60	57	48	43	41	36	-	63	62	54	48	46	43	**21**	66	66	58	51	50	48	**26**
	400	(189)	**0.100**	(24.88)	65	63	56	50	45	40	**21**	**69**	**68**	**61**	**54**	**50**	**47**	**27**	71	72	65	57	54	52	**32**
	520	(245)	0.169	(42.05)	68	66	60	53	47	43	**25**	72	72	65	58	53	50	**31**	74	75	69	61	57	55	**36**
7	120	(57)	0.005	(1.18)	53	53	33	28	32	32	-	58	59	39	31	38	40	-	61	64	43	34	43	45	**23**
	330	(156)	0.036	(8.96)	62	60	48	44	42	41	-	66	67	53	48	48	48	**25**	69	71	58	50	52	54	**31**
	550	(260)	**0.100**	(24.88)	67	64	55	53	46	45	**22**	**71**	**70**	**61**	**56**	**53**	**52**	**30**	74	75	65	58	57	58	**35**
	700	(330)	0.162	(40.31)	69	66	59	56	49	47	**23**	73	72	65	60	55	54	**30**	76	77	69	62	59	60	**36**
8	160	(76)	0.005	(1.30)	54	50	42	34	37	33	-	58	55	48	39	42	40	-	60	60	52	42	46	45	-
	440	(208)	0.040	(9.83)	64	60	51	47	45	41	-	67	66	57	52	51	48	**24**	69	70	62	55	55	53	**29**
	700	(330)	**0.100**	(24.88)	68	64	56	53	49	44	**23**	**71**	**70**	**62**	**57**	**54**	**51**	**29**	74	74	66	61	58	56	**34**
	920	(434)	0.173	(42.98)	71	67	59	56	51	46	**25**	74	73	65	61	57	53	**31**	76	77	69	64	61	58	**36**
9	200	(94)	0.005	(1.23)	48	45	35	32	35	35	-	51	50	39	36	40	42	-	53	53	42	39	44	46	-
	550	(260)	0.037	(9.29)	60	56	49	46	44	42	-	63	61	54	50	50	48	-	65	65	57	52	53	53	**23**
	900	(425)	**0.100**	(24.88)	66	62	56	53	49	45	-	**69**	**67**	**61**	**56**	**54**	**52**	**24**	71	70	64	59	58	56	**28**
	1160	(547)	0.166	(41.34)	70	65	60	56	52	47	**22**	72	70	64	60	57	53	**28**	75	73	68	63	60	58	**32**
10	250	(118)	0.005	(1.29)	48	47	39	37	39	37	-	51	52	44	42	45	43	-	53	56	48	45	49	48	-
	700	(330)	0.040	(10.08)	60	58	52	49	47	45	-	63	62	57	54	53	51	**20**	66	66	61	57	57	55	**24**
	1100	(519)	**0.100**	(24.88)	66	62	58	54	51	48	-	**69**	**67**	**63**	**59**	**57**	**54**	**24**	71	71	66	62	61	58	**29**
	1450	(684)	0.174	(43.24)	69	65	61	58	53	50	**22**	72	70	66	62	59	56	**28**	75	73	70	65	63	61	**32**
12	400	(189)	0.006	(1.56)	50	47	38	42	42	42	-	54	52	43	46	47	48	-	56	55	46	50	50	52	-
	1000	(472)	0.039	(9.72)	63	57	52	52	50	48	-	66	62	57	56	55	54	-	69	66	60	60	58	58	**23**
	1600	(755)	**0.100**	(24.88)	69	62	59	57	54	51	-	**72**	**68**	**64**	**61**	**59**	**57**	**25**	75	71	67	65	62	61	**29**
	2060	(972)	0.166	(41.25)	72	65	63	59	56	52	**24**	76	70	68	64	61	58	**28**	78	74	71	67	64	63	**33**
14	480	(227)	0.005	(1.30)	45	44	33	39	38	40	-	49	48	36	43	42	46	-	51	51	39	46	45	50	-
	1375	(649)	0.043	(10.67)	62	57	52	52	50	48	-	66	62	56	56	54	54	-	68	65	58	59	57	58	**22**
	2100	(991)	**0.100**	(24.88)	69	63	60	57	55	52	-	**72**	**67**	**63**	**61**	**59**	**57**	**25**	75	70	66	64	62	62	**28**
	2800	(1321)	0.178	(44.24)	74	67	65	61	58	54	**26**	77	71	68	65	62	60	**30**	79	74	71	68	65	64	**33**
16	630	(297)	0.005	(1.26)	42	37	22	31	30	29	-	45	42	26	34	35	34	-	48	45	28	37	38	38	-
	1775	(838)	0.040	(10.00)	63	56	49	48	46	44	-	66	60	52	52	51	50	-	69	63	55	55	54	54	-
	2800	(1321)	**0.100**	(24.88)	72	64	60	56	53	51	**23**	**75**	**68**	**64**	**60**	**58**	**56**	**28**	78	71	66	63	61	60	**31**
	3660	(1727)	0.171	(42.52)	77	68	67	61	58	55	**30**	81	73	71	64	62	60	**35**	83	76	73	67	65	64	**38**
22	1200	(566)	0.005	(1.27)	63	55	55	50	46	38	-	69	63	57	55	51	44	-	73	68	60	59	55	49	**26**
	3300	(1557)	0.039	(9.64)	73	67	70	65	61	56	**25**	79	75	73	70	67	62	**33**	84	80	75	74	71	67	**40**
	5300	(2501)	0.100	(24.86)	78	73	77	71	69	65	**31**	84	80	80	77	74	71	**40**	89	86	82	81	78	76	**47**
	7000	(3304)	0.174	(43.37)	81	76	81	76	73	70	**36**	87	84	84	81	78	76	**44**	92	89	86	85	82	81	**51**

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 C2-4. 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.

LMHD Performance Data

LMHD, RADIATED SOUND DATA

Unit 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. AHRI certification points are shown in bold, white font. For a complete list of AHRI certified data, see page C2-4. 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.

LMHD, LMHDT Control Information

The following standard control arrangements are available with the dual duct product offering. All control arrangements are pressure independent. Control functions are identified by the Krueger control package number.

PNEUMATIC CONTROL ARRANGEMENTS
All control packages are pressure independent and include standard linear airflow sensors in both the hot and cold inlets for variable air volume control or an airflow sensor in one inlet and the unit discharge for constant volume control arrangements.

Variable Air Volume Control - Models LMHD/LMHDT
(Inlet Airflow Sensing)
1500 - Multi-function Controller, DA-NC Cold Inlet, NC Hot Inlet
1501 - Multi-function Controller, DA-NC Cold Inlet, NO Hot Inlet
1502 - Multi-function Controller, DA-NO Cold Inlet, NO Hot Inlet
1503 - Multi-function Controller, DA-NO Cold Inlet, NC Hot Inlet
1504 - Multi-function Controller, RA-NC Cold Inlet, NC Hot Inlet
1505 - Multi-function Controller, RA-NC Cold Inlet, NO Hot Inlet
1506 - Multi-function Controller, RA-NO Cold Inlet, NO Hot Inlet
1507 - Multi-function Controller, RA-NO Cold Inlet, NC Hot Inlet

Constant Volume Control - Model LMHDT
(Hot Inlet/discharge Airflow Sensing)
1508 - Multi-function Controller, DA-NC Cold Inlet, NC Hot Inlet
1509 - Multi-function Controller, DA-NC Cold Inlet, NO Hot Inlet
1510 - Multi-function Controller, DA-NO Cold Inlet, NO Hot Inlet
1511 - Multi-function Controller, DA-NO Cold Inlet, NC Hot Inlet
1512 - Multi-function Controller, RA-NC Cold Inlet, NC Hot Inlet
1513 - Multi-function Controller, RA-NC Cold Inlet, NO Hot Inlet
1514 - Multi-function Controller, RA-NO Cold Inlet, NO Hot Inlet
1515 - Multi-function Controller, RA-NO Cold Inlet, NC Hot Inlet
(Cold Inlet/discharge Airflow Sensing)
1516 - Multi-function Controller, DA-NC Cold Inlet, NC Hot Inlet
1517 - Multi-function Controller, DA-NC Cold Inlet, NO Hot Inlet
1518 - Multi-function Controller, DA-NO Cold Inlet, NO Hot Inlet
1519 - Multi-function Controller, DA-NO Cold Inlet, NC Hot Inlet
1520 - Multi-function Controller, RA-NC Cold Inlet, NC Hot Inlet
1521 - Multi-function Controller, RA-NC Cold Inlet, NO Hot Inlet
1522 - Multi-function Controller, RA-NO Cold Inlet, NO Hot Inlet
1523 - Multi-function Controller, RA-NO Cold Inlet, NC Hot Inlet

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

ANALOG CONTROL ARRANGEMENTS
Analog control packages are pressure independent. Variable air volume controls include an airflow sensor in both the hot and cold inlets. Constant air volume controls include an airflow sensor in either the hot or cold inlet and the unit discharge. Analog controls include control enclosures and a wall thermostat to match the control type. An optional 24 volt transformer is available.

Variable Air Volume Control - Models LMHD/LMHDT
(Inlet Airflow Sensing)
2400 - Heating and Cooling Control

Constant Air Volume Control - Models LMHDT
(Hot Inlet Airflow Sensing)
2440 - DA Analog Heating and Cooling Control
(Cold Inlet Airflow Sensing)
2470 - DA Analog Heating and Cooling Control

DIRECT DIGITAL CONTROL ARRANGEMENTS
Control packages are field supplied for factory mounting, piping and wiring. All control arrangements include airflow sensors in both the hot and cold inlets for variable volume control, hot inlet and discharge or cold inlet and discharge for constant volume control. Control enclosures and are available with an optional 24 volt transformer mounted and wired inside one of the control enclosures.

Variable Air Volume Control – Models LMHD/LMHDT
(Inlet Airflow Sensing)
Contact your Krueger representative for a complete list of factory mounted direct digital control arrangements.

LMHD Suggested Specification & Configuration

LMHD UNIT

Furnish and install Krueger model LMHD dual duct (variable air volume) 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 gage galvanized steel. All inlet collars from 4" to 16" diameter shall accommodate standard spiral and flex duct sizes. Inlet sizes larger than 16" diameter shall be rectangular. Unit discharge shall be slip and drive construction for field attachment to downstream ductwork.

- **(Optional)** 20 Gage Galvanized Steel Unit Construction: Unit casing shall be constructed of not less that 20 gage galvanized steel. All inlet collars from 4" to 16" diameter shall accommodate standard spiral and flex duct sizes. Inlet sizes larger that 16" diameter shall be rectangular. 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 tagging data.

Control air damper assemblies shall be constructed of heavy gage steel with solid shafts rotating in self lubricating Delrin® bearings. Damper shafts shall be marked on the end to indicate damper position. Damper blades shall incorporate a flexible gasket for tight airflow shutoff and operate over a full 90° rotation.

LMHD 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 and 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.

- **(Optional)** Access panel(s) shall be in the unit casing for viewing of damper components.

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.
- **(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" 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: Unit casing shall be equipped with no internal insulation liner.

LMHD Suggested Specification & Configuration

1. SERIES: (XXXX)
LMHD - Dual Duct Terminal Unit

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

3. LINER TYPE: (X)
0 - Standard
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
C - Perforated Doublewall with 1/2" Foil Encapsulated
D - Perforated Doublewall with 1" Foil Encapsulated
E - Perforated Doublewall with Steriliner
F - 1/2" Cellular
H - 1" Cellular

4. UNIT CASING CONTROLS: (XX)
Cold Inlet On:
0L - Left-hand Side, 22 Gage
1L - Left-hand Side, 22 Gage & Access Panel
2L - Left-hand Side, 20 Gage
3L - Left-hand Side, 20 Gage & Access Panel
0R - Right-hand Side, 22 Gage
1R - Right-hand Side, 22 Gage & Access Panel
2R - Right-hand Side, 20 Gage
3R - Right-hand Side, 20 Gage & Access Panel

5. INLET CODE: (XX)
04 - 4"
05 - 5"
06 - 6"
07 - 7"
08 - 8"
09 - 9"
10 - 10"
12 - 12"
14 - 14"
16 - 16"
22 - 24"x16"

6. CONTROL TYPE: (X)
D - Digital Controls *
A - Analog Controls
P - Pneumatic Controls

7. UNIT ACCESSORIES: (X) (X) (X)
0 - None
S - Hanger Brackets
D - Disconnect for Controls
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

** Digital controls are supplied by others; mounted by Krueger.*

SAMPLE CONFIGURATION: LMHD - 3 - 2 - 0L - 08 - P - S - 0 - 0