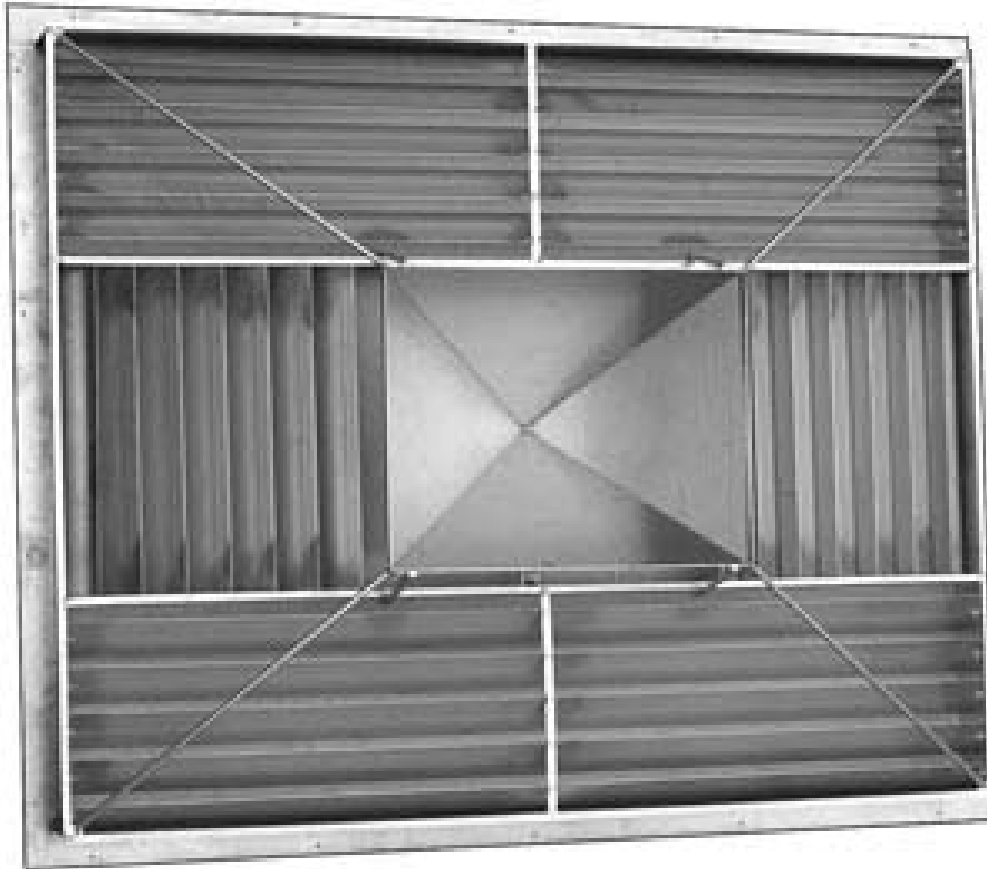




AIR MIX^XER™

SERIES III
INDEPENDENTLY TESTED



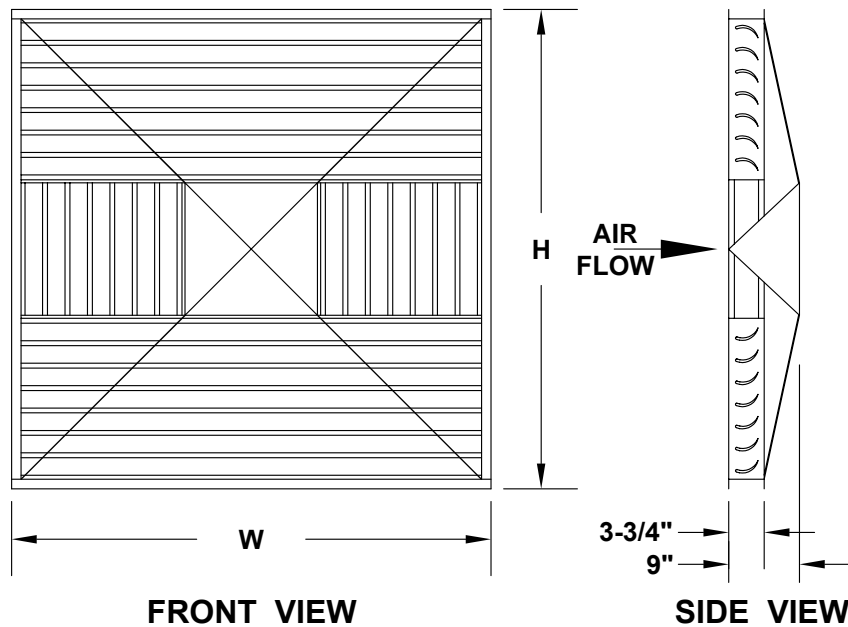
MIXES OUTSIDE AIR AND RETURN AIR STREAMS

- To Prevent Stratification
- To Provide Uniform Plenum Velocity
- To Eliminate Coil Freeze-Ups And Eliminate Or Reduce Tripping Freeze Stats
- To Help Provide For Equal Coil Discharge Temperatures
- To Help Equal Loading Of Filters
- Mixes Outside Air With Return Air To Provide IAQ Requirements
- Outside Air And Return Air Streams Are Mixed To Within $\pm 6^{\circ}$ F. Of Theoretical Mixed Air Temperature

Available In Aluminum Or Stainless Steel Construction

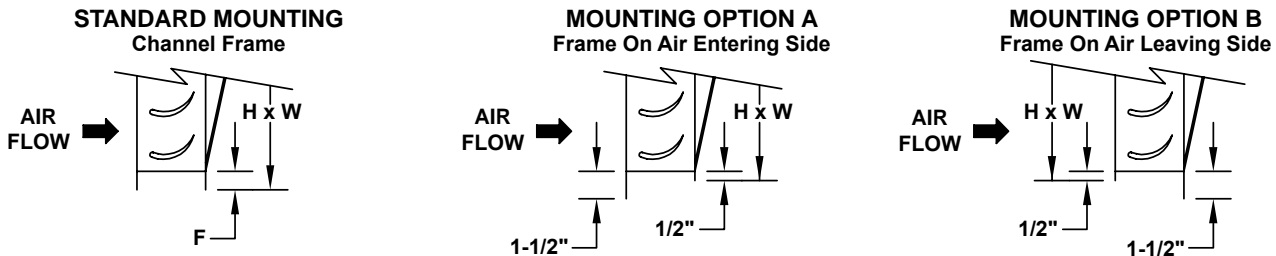
MIX^xER DESCRIPTION

- The KEES MIX^xER has no moving or adjustable parts and consists of a heavy gauge all welded channel frame containing a set of directional changing vanes and a cone designed for almost perfect mixing of air streams of different temperatures and velocities.
- Materials: Standard construction is 0.081" 5052-H34 aluminum. Shipping size limitations: Units over 92 inches in both dimensions are shipped in two sections for field bolting.
- Available construction of 100% 304 or 316 stainless steel.
- Air capacities from 300 through 172,800 C.F.M.
- Low pressure drops varying from 0.055 to 0.25 in. water gauge.
- Velocity of air at entering face of MIX^xER can range from 370 F.P.M. thru 1,200 F.P.M.
- Mixes air streams of different temperatures to within $\pm 6^{\circ}\text{F}$. of theoretical exact mixing temperature.
- Available in square sizes 12" x 12" through 144" x 144" in all increments. Rectangular sizes available 24" x 12" thru 144" x 72" in all increments where one side is not more than 2 times the other side.



MODELS

The framing shown below are available at no change in price. A and B frame widths will be factory modified as desired.



AIR MIX^xER, AIR MIX^xING BOX, MIX^xER, MIX^xER BOX and MIX^xING BOX - TRADEMARKS. PATENT NO. 5,364,305

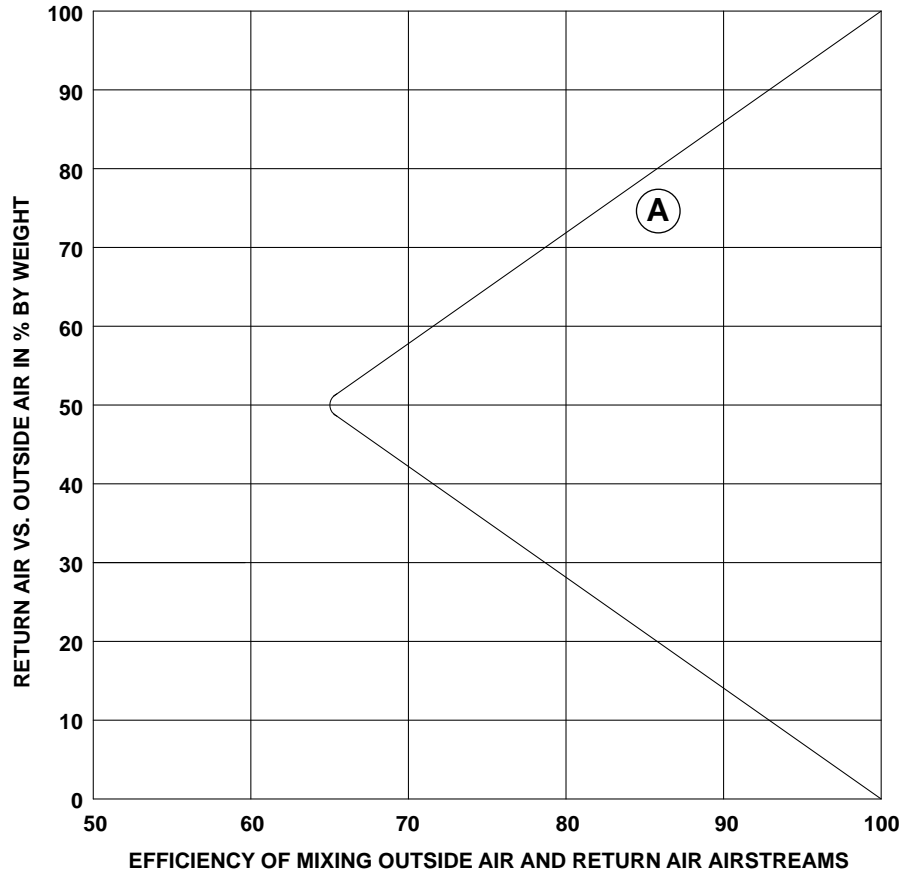
UPSTREAM AND DOWNSTREAM MIXER LOCATION

UPSTREAM:

20% of one side of a square mixer or if rectangular shape, 20% of the average of the two adjacent sides.

DOWNSTREAM:

A distance equal to 80% of one side of a square mixer or if rectangular shape, a distance equal to the average of the adjacent two sides.

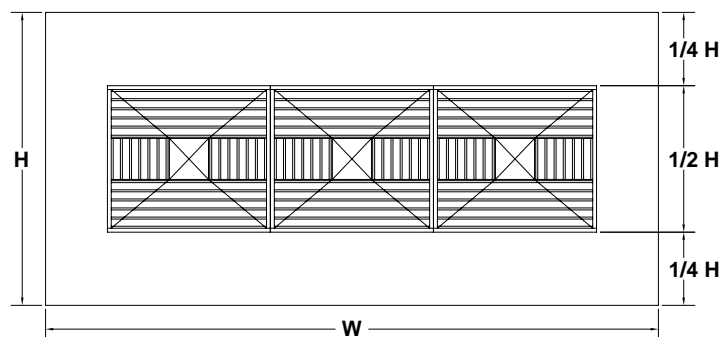


KEES, INC.
ELKHART LAKE, WI 53020
TEST: 101 DATE: 1-16-91

AIR MIXER EFFICIENCY BASED
ON DOWNSTREAM DISTANCE
AND PERCENT BY WEIGHT OF
RETURN AIR.

Ⓐ Distance from mixer to next downstream component is equal to one side of square mixer or average of two adjacent sides.

PLACEMENT OF MIX^xERS IN PLENUM



BEST MIX^xER SHAPE: Height of MIX^xER to be approximately 1/2 of height of plenum with blank-offs above and below the MIX^xER each 1/4 of plenum height. Width of MIX^xER can then be adjusted to provide proper MIX^xER area and be as much as the full width of the plenum. The most desirable air velocity thru MIX^xER is 800 - 1,100 F.P.M. for a constant volume system and 1,000 - 1,200 F.P.M. for a variable volume system. Multiple units work best when minimum outside air, economizer outside air and return air duct connections run the full width of an air handler and insure that each mixer see equal quantities of both incoming air streams.

CAUTION: When two or more mixers are used the same amount of outside air and return air must go through each mixer in order to get similar leaving results.

AVAILABLE SIZES

- In all increments thru 144" x 144".
- In multiples of 2, 3 (or 4) units totalling same area as one large unit and maintaining the same pressure drop.
- Rectangular units in all sizes provided one side is not more than 2 times the adjacent side. Convert rectangular area to equivalent square size and enter **TABLE 2** for performance.

QUICK SELECTION TABLE (1)

BEST C.F.M. RANGE	SELECTION AT APPROXIMATELY 1,000 F.P.M. AND PRESSURE DROP OF 0.15 IN. WATER		
	ONE MIXER	TWO MIXERS	THREE MIXERS
800 - 1,000	12" x 12"	-----	-----
1,120 - 1,400	14" x 14"	-----	-----
1,440 - 1,800	16" x 16"	2- 12" x 12"	3- 10" x 10"
1,840 - 2,300	18" x 18"	2- 14" x 14"	3- 11" x 11"
2,240 - 2,800	20" x 20"	2- 15" x 15"	3- 12" x 12"
2,720 - 3,400	22" x 22"	2- 16" x 16"	3- 13" x 13"
3,200 - 4,000	24" x 24"	2- 17" x 17"	3- 14" x 14"
3,760 - 4,700	26" x 26"	2- 18" x 18"	3- 15" x 15"
4,320 - 5,400	28" x 28"	2- 19" x 19"	3- 16" x 16"
5,040 - 6,300	30" x 30"	2- 21" x 21"	3- 18" x 18"
5,680 - 7,100	32" x 32"	2- 23" x 23"	3- 19" x 19"
6,400 - 8,000	34" x 34"	2- 24" x 24"	3- 20" x 20"
7,200 - 9,000	36" x 36"	2- 25" x 25"	3- 21" x 21"
8,000 - 10,000	38" x 38"	2- 27" x 27"	3- 22" x 22"
8,880 - 11,100	40" x 40"	2- 29" x 29"	3- 23" x 23"
10,720 - 13,400	44" x 44"	2- 31" x 31"	3- 26" x 26"
12,800 - 16,000	48" x 48"	2- 34" x 34"	3- 28" x 28"
15,040 - 18,800	52" x 52"	2- 37" x 37"	3- 30" x 30"
17,440 - 21,800	56" x 56"	2- 40" x 40"	3- 32" x 32"
20,000 - 25,000	60" x 60"	2- 42" x 42"	3- 35" x 35"
25,680 - 32,100	68" x 68"	2- 48" x 48"	3- 39" x 39"
28,800 - 36,000	72" x 72"	2- 51" x 51"	3- 42" x 42"
33,840 - 42,300	78" x 78"	2- 55" x 55"	3- 45" x 45"
39,200 - 49,000	84" x 84"	2- 59" x 59"	3- 48" x 48"
45,040 - 56,300	90" x 90"	2- 64" x 64"	3- 52" x 52"
51,200 - 64,000	96" x 96"	2- 68" x 68"	3- 56" x 56"
57,840 - 72,300	102" x 102"	2- 72" x 72"	3- 59" x 59"
64,800 - 81,000	108" x 108"	2- 76" x 76"	3- 62" x 62"
72,240 - 90,300	114" x 114"	2- 81" x 81"	3- 66" x 66"
80,000 - 100,000	120" x 120"	2- 85" x 85"	3- 69" x 69"
100,000 - 125,000	132" x 132"	2- 93" x 93"	3- 76" x 76"
125,000 - 142,000	144" x 144"	2- 102" x 102"	3- 83" x 83"

TYPICAL SPECIFICATIONS

Provide KEES AIR MIX*ER(s) of not less than 0.080 aluminum construction to mix outside and return airstreams to within $\pm 6^{\circ}\text{F}$ of the theoretical mixed air temperature. Pressure drop at () F.P.M. thru devise(s) shall not exceed () inches of W.G.. The mixer devices must have at least 25,000 installations, and have been tested by an independent agency.

TABLE (2)
MIXER AIR CAPACITY IN CUBIC FEET PER MINUTE (C.F.M.)
VERSUS AIR VELOCITY AT ENTERING FACE OF MIXER IN FT. PER MINUTE
PRESSURE DROP IN INCHES W.G.

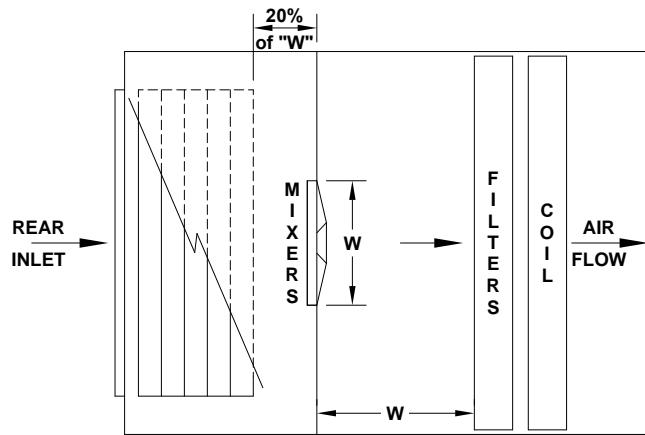
VELOCITY	300	400	500	600	700	800	900	1,000	1,100	1,200
MIXER* PRESSURE DROP	0.055	0.06	0.065	0.07	0.09	0.11	0.13	0.15	0.18	0.21
CAPACITY CFM/SQ. FT.	300	400	500	600	700	800	900	1,000	1,100	1,200
SIZE										
12" x 12"	300	400	500	600	700	800	900	1,000	1,100	1,200
14" x 14"	408	544	680	816	952	1,088	1,224	1,360	1,496	1,632
16" x 16"	531	708	885	1,062	1,239	1,416	1,593	1,770	1,947	2,124
18" x 18"	675	900	1,125	1,350	1,575	1,800	2,025	2,250	2,475	2,700
20" x 20"	831	1,108	1,385	1,662	1,939	2,216	2,493	2,770	3,047	3,324
22" x 22"	1,008	1,344	1,680	2,016	2,352	2,688	3,024	3,360	3,696	4,032
24" x 24"	1,200	1,600	2,000	2,400	2,800	3,200	3,600	4,000	4,400	4,800
26" x 26"	1,470	1,876	2,345	2,814	3,283	3,752	4,221	4,690	5,159	5,628
28" x 28"	1,632	2,176	2,720	3,264	3,808	4,352	4,896	5,440	5,984	6,528
30" x 30"	1,875	2,500	3,125	3,750	4,375	5,000	5,625	6,250	6,875	7,500
32" x 32"	2,133	2,844	3,555	4,266	4,977	5,688	6,399	7,110	7,821	8,532
34" x 34"	2,406	3,208	4,010	4,812	5,614	6,416	7,218	8,020	8,822	9,624
36" x 36"	2,700	3,600	4,500	5,400	6,300	7,200	8,100	9,000	9,900	10,800
40" x 40"	3,333	4,444	5,555	6,666	7,777	8,888	9,999	11,110	12,221	13,332
44" x 44"	4,032	5,376	6,720	8,064	9,408	10,752	12,096	13,440	14,784	16,128
48" x 48"	4,800	6,400	8,000	9,600	11,200	12,800	14,400	16,000	17,600	19,200
52" x 52"	5,631	7,508	9,385	11,262	13,139	15,016	16,893	18,770	20,647	22,524
56" x 56"	6,531	8,708	10,885	13,062	15,239	17,416	19,593	21,770	23,947	26,124
60" x 60"	7,500	10,000	12,500	15,000	17,500	20,000	22,500	25,000	27,500	30,000
68" x 68"	9,633	12,844	16,055	19,266	22,477	25,688	28,899	32,110	35,321	38,532
72" x 72"	10,800	14,400	18,000	21,600	25,200	28,800	32,400	36,000	39,600	43,200
78" x 78"	12,675	16,900	21,125	25,350	29,575	33,800	38,025	42,250	46,475	50,700
84" x 84"	14,700	19,600	24,500	29,400	34,300	39,200	44,100	49,000	53,900	58,800
90" x 90"	16,875	22,500	28,125	33,750	39,375	45,000	50,625	56,250	61,875	67,500
96" x 96"	19,200	25,600	32,000	38,400	44,800	51,200	58,500	64,000	70,400	76,800
102" x 102"	21,675	28,900	36,125	43,350	50,575	57,800	65,025	72,250	79,475	86,700
108" x 108"	24,300	32,400	40,500	48,600	56,700	64,800	72,900	81,000	89,100	97,200
114" x 114"	27,075	36,100	45,125	54,150	63,175	72,200	81,225	90,250	99,275	108,300
120" x 120"	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000	120,000
132" x 132"	36,300	48,400	60,500	72,600	84,700	96,800	108,900	121,000	133,100	145,200
144" x 144"	43,200	57,600	72,000	86,400	100,800	115,200	129,600	144,000	158,400	172,800

* The pressure drop shown is for the mixer only. Additional panel safing pressure drop occurs. Refer to the table below for this additional pressure drop for typical applications. Total pressure drop is the sum of mixer and panel safing pressure drops. (A) 1,000 F.P.M. optimum for constant volume systems.
(B) 1,200 F.P.M. optimum for variable volume systems.

PANEL SAFING PRESSURE DROP FOR MIXER IN A PANEL							
PLENUM VELOCITY, F.P.M.							
300	400	450	500	550	600	650	700
0.02	0.02	0.03	0.04	0.05	0.07	0.08	0.1

For rectangular shapes, convert area to approximate equivalent square shape and enter table above. One side of rectangular unit cannot be more than two times the other side. Capacity per square foot of face area is the same, square or rectangular.

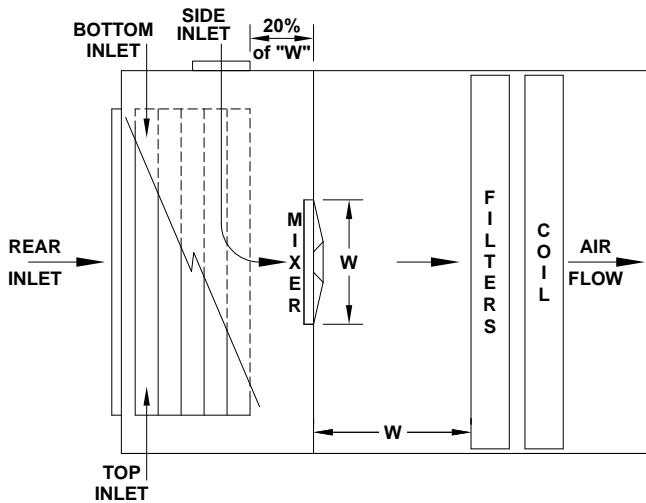
CORRECT APPLICATIONS FOR DRAW-THRU AIR HANDLER



PLAN VIEW

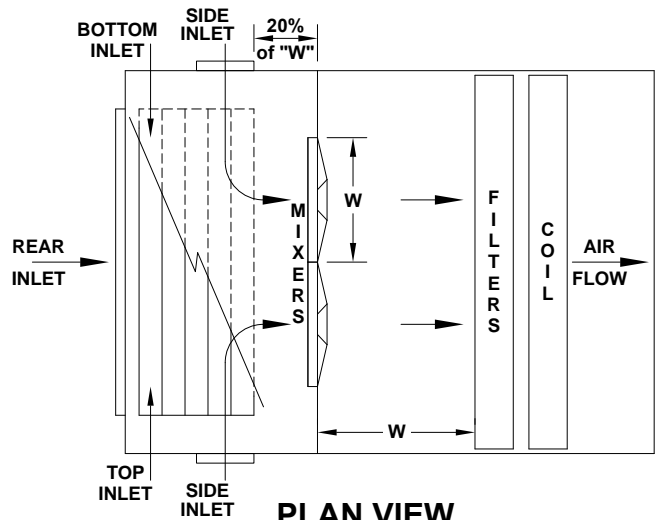
When one side inlet to the mixer is necessitated, only a single mixer can be employed.

When two side inlets to the mixer is necessitated, and each inlet introduces the same cfm, then two mixers can be employed.



PLAN VIEW

USE ONE MIXER IF THERE IS ONE SIDE INLET.



PLAN VIEW

USE TWO MIXERS IF THERE ARE TWO SIDE INLETS.

A PARTIAL LIST OF THE OVER 50,000 IN USE SINCE 1964

A FEW OF THE OVER 50,000 INSTALLED AIR MIXERS

AT&T (20 units)
 Bristol Meyers Squib
 Capitol Annex (18 units)
 Cory Jr.-Sr. High School (21 units)
 Creighton University (4 units)
 Denver Airport Terminal Bldg. (60 units)
 Detroit Airport Control Tower (12 units)
 Federal Reserve Center (12 units)
 Halifax International Airport
 Microsoft (128 units)
 Morningside College (6 units)
 Nellis AFB (26 units)
 Newcomb & Co. Warehouse (4 units)
 O'Hare Airport, Mail Processing
 Pyramid Building (26 units)
 Target Distribution Center (3 units)
 Tustimena School (4 units)
 U.S. Air Force Academy (80 units)
 Univ. of WI, Lapham Hall (15 units)
 Wyeth Nutritional (2 units)

Omaha, NE
 Wallingford, CT
 Lexington, KY
 Cory, PA
 Omaha, NE
 Denver, CO
 Detroit, MI
 St. Louis, MO
 Enfield, NS, Canada
 Data Center
 Sioux City, IA
 Las Vegas, NV
 Raleigh, NC
 Chicago, IL
 Memphis, TN
 Little Rock, AR
 Kenai Peninsula, AK
 Colorado Springs, CO
 Milwaukee, WI
 Georgia, VT

PARTIAL LISTING OF MIXER SECTIONS AND MIXER BOXES INSTALLED IN HOSPITALS AND MEDICAL FACILITIES

Allen Hospital (6 units)
 Borgess Medical Center (4 units)
 Composite Medical Facility (11 units)
 Flowers Hospital (6 units)
 Forbes Regional Health Center (2 units)
 Iuka Hospital (5 units)
 Luther Hospital (5 units)
 Lynchburg General Hospital (4 units)
 Methodist Hospital (4 units)
 Mt. Sinai Hospital (2 units)
 Porter Hospital (6 units)
 Robert Packer Hospital (4 units)
 Rock Hospital (24 units)
 Saul Prairie Memorial Hospital (2 units)
 St. Mary's Hospital (4 units)
 Sturdevant Hospital (11 units)
 Univ. of KY Medical Center (23 units)
 V.A. Hospital (6 units)
 V.A. Medical Center (4 units)

Waterloo, IA
 Kalamazoo, MI
 Las Vegas, NV
 Dothan, AL
 Pittsburgh, PA
 Iuka, MS
 Eau Claire, WI
 Lynchburg, VA
 Indianapolis, IN
 Hartford, CT
 Denver, CO
 Elmira, NY
 St. Louis, MO
 DeForest, WI
 Lewinston, ME
 St. Albert, AB, Canada
 Lexington, KY
 Cincinnati, OH
 Topeka, KS

To maintain KEES' policy of continuous product improvement, we reserve the right to change prices, specifications, ratings or dimensions without notice or obligation.

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