centaur forge ltd.

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Thank you for your inquiry regarding the KUHN AIR HAMMERS. Enclosed is literature describing the hammer sizes and pertinent information on each model.

Generally, a KUHN AIR HAMMER will do about three times the work of an equivalent ram-weight mechanical hammer, and with much more control and versatility. Maintenance is far simpler, too.

You will note the base prices of the hammers in this literature. To give you a complete price, I would like to size the hammer based on the your needs in regular production, and the maximum size of steel you would be forging on an occasional basis. With the KUHN AIR HAMMER, you will be able to complete your forging in one heat in regular production.

Several years ago, KUHN AIR HAMMERS were marketed under the "REITER" name. Mr. Alois Reiter has retired, and his plant manager, Mr. Josef Kuhn, assumed ownership of the company. There are a few differences between the "old" and "new" style hammers. Actual specifications are found on the respective literature enclosed. The newer hammers have a squared-off, more modern looking case, a much heavier anvil, and the motors are flange-mounted instead of foot-mounted. The new hammers are functionally redesigned for more efficiency and the valving (which has made the Reiter hammer so famous for precise control) has been replaced by a new type rotary slide valve for even more control.

The new models have a more efficient internal sound-deadening construction. This results in quieter operation (68 dbA). The air system is lubricated by a manually-adjusted oil drip feed device on the older designs, as compared to the built-in automatic oil pump in the later models. The internal air/oil filter on the later models results in the internals of the equipment remaining cleaner, and effectively prevents 98% of the oil from escaping into the air and being lost. This means less maintenance and lower oil consumption. Should you ever wish to change the orientation of the ram, it is much simpler on the new models and your choices are all 360 degrees, not just each 30 degrees.

About electrical power: most of the world uses 50 hz. cycle, AC 3-phase electricity. In North America, we use 60 hz. AC. Three-phase power is often not available cheaply. The K-0, KB-1 and K-23 hammers are available with either single-phase or 3-phase motors. The K-12, K-24, K-25, K-3, K-4, K-5 and K-6 models cannot be furnished with single-phase motors at a reasonable cost. There is another option available if you wish to operate 3-phase equipment from a single-phase line. This is called a "roto-phase" (Rotary-phase generator). It will generally cost more than having your hammer delivered with a single-phase motor, but you will be able to operate several other 3-phase machines on the same line in your shop.

If you have any questions after reviewing the literature enclosed, please feel free to call me. I'll do all I can to be of assistance. Thanks again for your interest in the KUHN AIR HAMMER

WILLIAM S. PIEH

COMPARISONS:

BRAND	*RAM WEIGHT*	*HORSEPOWER*	*HAMMER WEIGHT*
LITTLE GIANT	25 LB.	1	1000 LBS.
LITTLE GIANT	50 LB.	2	1800 LBS.
KUHN K-0	57 LB.	3	850 LBS.
KUHN KB-1	75 LB.	5	1100 LBS.
KUHN K-12	84 LB.	4	1000 LBS.
LITTLE GIANT	100 LB.	3	3300 LBS.
KUHN K-23	110 LB.	7.5	1450 LBS.
KUHN K-24/53	110 LB.	7.5	1965 LBS.
KUHN K-25	132 LB.	10	3090 LBS.
KUHN K-3	176 LB.	15	4400 LBS.
KUHN K-4	220 LB.	20	5500 LBS.
KUHN K-5	275 LB.	25	6600 LBS.
KUHN K-6	330 LB.	30	7400 LBS.

**Little Giant Power Hammers are no longer manufactured, nor are the parts available, as of January, 1990. Little Giant Hammers are not as efficient as the KUHN AIR HAMMERS due to the mechanical slippages and friction losses compounded by inefficiencies due to right angle changes in direction.

MODEL	*HIGH PRODUCTION*	*OCCASIONAL FORGING*
K-0	0.8"	1.5 to 2"
KB-1	1.6"	2 to 2.5"
K-12/42	1.8"	2 to 3"
K-23	2.4"	3 to 4"
K-24/53	2.6"	3.5 to 4.5"
K-25	2.8"	4.5 to 5.5"
K-3	3.2"	5.5 to 6"
K-4	4"	6 to 7"
K-5	5"	7 to 8"
K-6	6"	8 to 9"

How do you select the size hammer you will need? This is a difficult question to answer. The "force of the blow" in joules is great for engineers, but offers only a comparison for blacksmiths.

The work required to merely flatten the end or point up a piece of steel is not the same as what is required to full-length swage the same piece, or even to reduce the end to a tenon of 1/4 the original size. What grade of steel will be worked? What is your skill level? With this in mind, please take the above table to be only approximate comparative figures. (High production means just that -- forge the piece in one heat.) Please note that exceeding these numbers will not hurt the machine. It only means that working 4" square (for example) on a K-12 hammer to be slow going by comparison. Also as a comparison, a KB-1 air hammer will easily do more than triple the work of a 50 lb. Little Giant in the same time frame.

MODEL	K-0	KB-1	K12/42	K-23	K24/53	K-25	K-3	K-4	K-5	K-6
Weight of Ram (Kg/lb)	26/57	34/75	38/84	50/110	50/110	60/132	80/176	100/220	125/275	150/330
Maximum Clearance (mm/inch)	200/8	200/8	200/8	200/8	200/8	230/9	300/12	300/12	340/13¼	400/15-3/4
Appr. Blows Per Minute	220	220	225	220	220	210	200	200	190	170
Force (Joules/Foot Lb.)	600J/442	820/604	835/616	930/686	960/710	1180/870	1320/973	1560/1150	2000/1475	2600/1915
Motor (Kw/Hp)	3 Hp	4/5.5	3/4	5.5/7.5	5.5/7.5	7.5/10	12/15	15/20	18.6/25	22/30
Length (mm/inch)	1210/48	1240/49	1050/42	1380/54	1180/47	1300/52	1340/53	1500/60	1650/65.3	1650/65.3
Width (mm/inch)	530/21	575/22	700/28	620/24	820/33	860/34	620/25	660/26	720/28.5	820/32.5
Height (mm/inch)	1140/45	1280/50	1250/49	1510/59	1430/57	1500/60	2050/81	2070/82	2200/87	2330/92
Anvil Weight (Kg/lb)	100/220	100/220	160/353	200/440	300/660	500/1103	750/1650	1100/2420	1100/2420	1100/2420
Weight (including Anvil)	390/860	500/1100	450/992	670/1450	890/1962	1400/3087	2000/4400	2500/5500	3000/6600	3200/7040
Oil Feed Lubrication	A	A	B	A	B	B	B	B	B	B
A. DRIP FEED B. AUTOMATIC PUMP										
Maximum Economical Workpieces (mm/inch) (High Production)	25/1.0	40/1.6	45/1.75	50/2	60/2.3	65/2.6	80/3.2	100/4	125/5	150/6.4
(Occasional work, approximately double)										

ALL FIGURES TO BE USED COMPARATIVELY BETWEEN MODELS, NOT SUBJECTIVELY.

THESE FIGURES SHOULD BE USED COMPARATIVELY (BETWEEN MODELS) -- NOT SUBJECTIVELY. THE FIGURES SHOW HOW THE VARIOUS MODELS WOULD DO A TYPICAL FORGING JOB USING MILD STEEL (C-1010-1030) IN ONE HEAT. SOME JOBS REQUIRE LESS POWER AND TIME, AND SOME MORE.

Ratings and Working Capacities

Pneumatic Hammers are size rated by the nominal weight of the reciprocating ram assembly, i.e., the combined weight of the ram, rings, ram die and key.

The energy available per stroke and the recommended maximum sizes of square forging stock for each hammer size, grouped by relative forgeability, is given in the following tables.

The column headed "Occasional Production" lists sizes which should be considered when a hammer is to be used for maintenance purposes only and will not be considered a production tool. The columns headed "Manufacturing Production" serve as a guide to the proper hammer sizes for the most economical continuous production of forgings.

TABLE 1 CAPACITY OF PNEUMATIC HAMMERS

RATED SIZE HAMMER		MAX. ENERGY PER STROKE		SQUARE STOCK SIZES																					
				OCCASIONAL PRODUCTION		MANUFACTURING PRODUCTION																			
						GROUPS																			
				A		A		B		C		D		E		F		G		H		I		J	
Lbs.	Kgs.	Ft. Lbs.	Mkg.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
200	91	1180	163	4½	114	3	76	2⅞	73	2¾	70	2⅝	67	2½	63	2¼	57	2⅛	54	1⅞	48	1¾	44	1½	38
300	136	1850	255	5¼	133	3¾	95	3½	89	3⅜	86	3¼	83	3	76	2⅞	73	2⅝	67	2⅜	60	2⅛	54	2	51
500	227	4050	559	6¾	171	4¾	121	4½	114	4⅜	111	4⅛	105	3⅞	98	3½	89	3⅜	85	3	76	2¾	70	2½	63
750	340	6280	865	8	203	5½	140	5¼	133	5	127	4⅞	124	4½	114	4⅛	104	3⅞	98	3½	89	3⅛	80	3	76
1000	454	8800	1210	9¼	235	6½	165	6¼	159	6	152	5¾	146	5¼	133	4⅞	124	4⅝	117	4⅛	105	3¾	95	3½	89
1500	680	13700	1890	11	279	8	203	7½	190	7¼	184	7	178	6½	165	6	152	5⅝	143	5	127	4⅝	117	4¼	108
2000	907	18800	2600	12½	317	9	229	8½	216	8	203	7¾	197	7¼	184	6¾	171	6¼	159	5⅝	143	5⅛	131	4¾	121
3000	1361	29700	4100	15	381	11	279	10½	266	10	254	9½	242	9	228	8½	216	7¾	197	7	178	6¼	159	6	151
5000	2268	56000	7730	19	482	14	355	13¼	334	12¾	323	12¼	310	11½	292	10½	266	10	254	8¾	222	8	204	7½	190

TABLE 2 GUIDE TO RELATIVE FORGEABILITY **

FORGEABILITY INDEX ►	1.00	1.10	1.20	1.30	1.50	1.75	2.00	2.50	3.00	3.50
MATERIAL ►	1010-1030 BRASS	1035-1050 BRONZE 1112-1137	9310-9315 1055-1075 2300-2330 3100-3135 4100-4140 4600-4620 5100-5140 6100-6135 8600-8630	2335-2350 3140-3150 3300-3335 4300-4340 4625-4640 4815-4820 6140-6150 8635-8650	HY-TUFF AMS 6407 AMS 6427 400 SERIES SS 14S (ALUMINUM)	300 SERIES SS TRICENT VASCO JET 1000 THERMOLD J 75S (ALUMINUM)	17-4 PH 17-7 PH AM-350 AM-355	A-286 DISCALOY STAINLESS W INCONEL X 16-25-6 19-9-DL	TITANIUM ALLOYS N-155 HASTELLOY C	UDIMET 500 INCO 700 RENE 41 M-252 WASPALOY

PLEASE NOTE THE "RELATIVE FORGEABILITY" TABLE ABOVE. CERTAIN HIGH ALLOY/CARBON STEELS ARE TOUGHER THAN OTHERS AND CAN ONLY BE FORGED WITHIN NARROW TEMPERATURE RANGES.

KUHN AIR HAMMER PRICING (AS OF JANUARY 31, 1991)

MODEL K-0	$ 7,290.00	(Single-phase or 3-phase)
MODEL KB-1	8,985.00	(Single-phase or 3-phase)
MODEL K-23	12,650.00	(Single-phase or 3-phase)
MODEL K-12	12,700.00**	(3-Phase)
MODEL K-24	16,750.00**	(3-Phase)
MODEL K-25	22,985.00**	(3-Phase)

Prices apply subject to stock on hand. Please call to check current stock. Above prices are base prices, and subject to change. Extras apply depending upon tooling, etc. as needed. All prices include foundation plans as required. **Includes factory-supplied foot pedal and linkage.

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EXTRAS:

Vulkollen Plate (resilient plastic mat to be placed between hammer and foundation before bolting down -- one required) $191.00 to 390.00 (depending on model)

Anchor Bolts (anvil, spring-loaded) for KB-1, K-12, K-23, K-24 or K-25 $180.00/pair of 2 ea.

Anvil Hold-down Springs (used on steel bases where above spring-loaded anchor bolts are not used) $10.00/each

Anchor Bolts (frame)	*Size M-18x280*	*Size M-18x360*	*Size M-20x400*
Set of 6 (for K-0 & K-23)	$93.00	104.00	------
Set of 8 (for KB-1, K-12 & K-24)	124.00	138.00	------
Set of 8 (for K-25)	------	------	240.00

Information on request for special permanent in-ground vibration free installations.

Rubber Profiles for K-0 or KB-1 (top of floor foundation)	$113.00/set of 4 ea.
Rubber Profiles for K-23 or K-24 (" ")	122.00/set of 4 ea.
Rubber Profiles for K-25 (" ")	150.00/set of 4 ea.

MOST POPULAR TOOLING	*K-0, KB-1, K-12*	*K-23, K-24, K-25*
Flat Regular Die	#1101	#2101
Flat Extra Wide Die	#1102	#2102
Convex Die	#1104	#2104
Round Die	#1106	#2106
Pointing Die (used in pairs)	#1109	#2109
Sharpening Die (used in sets)	#1110/#1210	#2110/#2210
Splitting Die (requires #1126)	#1120	#2120
Combination Die (used in pairs)	#1121	#2121
Ball Die	#1114VM	#2114VM
Stretched Carriage Convex Die	#1119	#2119
Bottom Die for Above	#1126	#2126
Special Bottom Die(use w/flatdie)	#1124	#2124