



Poolad Varzan-e-Kimia



Expanders ▶



پولاد ورزان کیمیا

اولین سازنده تیوب اکسپندر با تیراژ بالا در ایران

PK 900

PK 1300

PK 800

PK 800

five roll type expander

PK 1200

PK 1200

five roll type expander

PK 8012

Grooving Tool

POOLAD VARZAN-E-KIMIA

PKCO-Tube Expanders

For Heat Exchangers , Air Coolers and Boilers

PKCO tube expanders are made from high quality alloy steels and are specially heat treated.

The adjustable thrust collar incorporates a thrust bearing which eliminates frictional heating and possible tube end damage and makes these tools suitable for operation with electric or pneumatic power tools.

The tube expanders in this catalogue cover the range of tubes from 1/4" O.D. - 20 Gauge to 4-1/2" O.D. -2-18 Gauge.

SPECIAL TUBE EXPANDERS

Special Tube Expanders for any tube size and reach are manufactured to specification. PKCO has manufactured for example a special tube expander with 3-1/4" O.D. and 12 feet reach for diesel engines.

So do not hesitate to send your application for your specific need.

MANDREL EXTENSION AND UNIVERSAL JOINTS

These can be supplied as standard or special length with different square sizes.

Mandrel extensions can be utilized in situations where there is not sufficient room available to use standard expanders with a drive unit, e.g. in water boxes of condensers, etc.

STANDARD REVERSIBLE THRUST/COLLAR

The models PK-800 and PK-1200 Tube Expanders are equipped with a reversible thrust collar. This is specially designed by PKCO.

This offers the possibility of using the collar flush or recessed for the front tube sheet (please specify required recess depth). When reversed, the collar is now suitable for the rear tube sheet acting as a flow-collar allowing the tube to be drawn outwards. This eliminates the need to precisely cut the tube to length before expanding.

THRUST COLLARS

The following different models of thrust collar can be supplied:

- recessed thrust collar instead of standard collar (depth of recess to be specified).
- adjustable recess thrust collar to bring the tubes automatically to the right position in relation to the tube sheet; from a flush fitting on the tube sheet to as much as a 3/8" protrusion can be achieved.
- small diameter collars, for the expansion of the outside row of tubes into waterboxes for example.
- for thin gauge tube a special thrust collar can be supplied to prevent the tube from becoming trapped between the rolls and the collar as there is a possibility of thin tube being drawn up inside the collar whilst rolling.

CONSTRUCTION

PKCO tube expanders are of the self-feeding and parallel rolling type.

The taper feed angle ensures a uniform expansion and tightness of the tube.

The rolls have a radius at both ends to avoid a sharp ridge inside the tube.

TUBE SIZE INFORMATION

Tube O.D. refers to the measured outside diameter of a tube.

Tube I.D. refers to the measured inside diameter of a tube. Tube Gauge is Birmingham wire gauge (B.W.G.) of the wall thickness of the tube.

STANDARD REVERSIBLE THRUST/COLLAR



COLLAR



THRUST RACE



THRUST RACE HOUSING



NUT WITH SETSCREW

PKCO-Tube Expanders

For Heat Exchangers , Air Coolers and Boilers

LUBRICATION,CARE AND MAINTENANCE OF TUBE EXPANDERS

The type of use demanded of tube expanders is severe and therefore these precision tools should be given a reasonable amount of care. For long, trouble-free and economical service the following is suggested:

1. Remove all rust, mill scale and other foreign matter from the inside and outside of the tube. Foreign matter on the inside of the tube will tend to become embedded into the tube wall and being abrasive may cause the rolls and mandrel of the tube expander to start breaking up. Mill scale or dirt left on the outer wall of the tube can cause damage to the tube seat and prevent the formation of a pressure-tight joint. Cleaning of the tube ends may be best accomplished by wire brushing or polishing. Remove any protective coating by washing with light oil or other solvents.

NB: DO NOT LEAVE A RESIDUE OF LIGHT OIL ON THE OUTSIDE OF THE TUBE AS THIS MAY ALSO PREVENT A PRESSURE-TIGHT JOINT.

2. Before using, the expander should be washed in any commercial solvent to remove protective coatings, dirt, grease and other foreign matter. Make sure that the rolls and mandrel are in good condition and working correctly.

3. Before using, expander should be properly lubricated with a pressure-resistant lubricant. We recommend using **PKCO 'Lube-A-Tube'**. This water soluble lubricant was to the desired consistency. For small diameter and light tube gauges immerse the expander in **PKCO 'Lube-A-Tube'** or light oil such as SAE 10 or 20. For large diameter and heavy gauge tubes, brush the expander with **PKCO 'Lube-A-Tube'** or mixture of SAE 40 oil and graphite.

4. Expanders should be rotated at a speed proportionate to the tube size, gauge and length of tube seat. Tube materials must also be taken into consideration. The proper speed will provide a safe cold working of tube metal without crystallization or surface damage. Speed is also a major factor in expander life and if correctly set will prevent undue roller or mandrel breakdown. Ideal speed will keep to a minimum mandrel slip and the heat generated in mandrels and rolls when working.

5. After rolling each tube, clean and cool the expander in solvent or light oil and then properly lubricate the expander again. It is good practice to use two expanders so that one can be cooling whilst the clean expander is being used.

6. Inspect the rolls and the mandrel after rolling each tube. Replace any chipped rolls or mandrels immediately. A small chip in a roll can damage the entire expander, rolls or mandrel if not replaced at once. It can also damage the tube causing marks in the expanded area which may necessitate tube removal.

7. After the job has been completed, the expander should be cleaned thoroughly with a commercial solvent or a light oil and stored in a manner which will avoid possibility of parts rusting.

NB: DO NOT LEAVE A RESIDUE OF LIGHT OIL ON THE OUTSIDE OF THE TUBE AS THIS MAY ALSO PREVENT A PRESSURE-TIGHT JOINT.

SOME GUIDELINES FOR TUBE EXPANSION

Improperly rolled joints create additional expense to rectify. Under-rolling can be easily corrected merely by re-rolling, but over-rolling will require complete tube replacement. The optimum joint is one that develops a leak-tight joint with adequate strength for the service intended with the minimum amount of cold working or reduction of the tube wall thickness.

Experience indicates that joints of this type can be obtained with non-ferrous tubes in surface condensers by expanding to a wall reduction of 5% to 6%. This wall reduction is only achieved after metal-to-metal contact between the tube O.D. and the tube sheet hole. Steel tubes in heat exchangers may require wall reductions of 4% to 6%; soft copper and aluminum tubes in heat exchangers also require larger wall reductions in the area of 7% to 10%.

A typical example of the application of this method is indicated for 3/4" x 18 gauge (19.05 x 1.24 mm) tube in a condenser.

1.	
Tube Sheet Hole	= 19.30 mm (.760")
Tube O.D.	= 19.05 mm (.750")

Clearance	0.25 mm (.010")
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2.	
Tube I.D.	= 16.56 mm (.652")
Clearance	= +0.25 mm (.010")

I.D. Metal to Metal	16.81 mm (.662")
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3.	
6% of 1.24 mm x 2	= 0.14 mm (.006")
Tube I.D. Metal to Metal	= +16.81 mm (.662")

Expanded Tube I.D.	16.95 mm (.668")
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LUBE-A-TUBE

PKCO Lube- A- Tube is a water soluble lubricant especially compounded for use with tube expanders. When rolling large or small, ferrous or non- ferrous tubes, use PKCO Lube- A- Tube for smoother rolling and longer expander life. For clean tube ends after rolling simply wash with water.

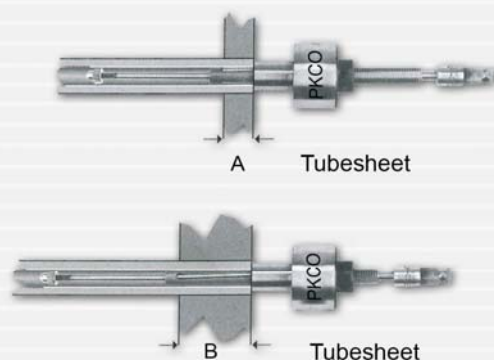
TUBE EXPANDERS

for Condensers and Heat Exchangers

Selection Guide:

Model : PK 900

Tube Size I.D. .155" - .0320"
(3.95 - 8.13 mm)



	TUBE SHEET THICKNESS	
	A MINIMUM	B MAXIMUM
TUBE EXPANDER WITH 3/4" ROLL LENGTH	1/8" (3.175 mm)	5/8" (15.87 mm)
TUBE EXPANDER WITH 1 1/4" ROLL LENGTH	1/2" (12.70 mm)	19/64" (28.98 mm)

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 3/4" (19 mm) ROLLS		EXPANDER WITH 1 1/4" (32 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	ROLL SET NO.	
1/4"-19	.155	3.95	.190	4.83	1/4"	PK-921	TR-921			MT-40
1/4"-20	.175	4.44	.205	5.21		PK-923	TR-923			MT-40
1/4"-21	.180	4.57	.212	5.38		PK-924	TR-924			MT-40
1/4"-22	.190	4.83	.220	5.59		PK-925	TR-925			MT-41
1/4"-23	.195	4.95	.226	5.74		PK-926	TR-923			MT-41
1/4"-24	.201	5.10	.232	5.92	1/4"	PK-927	TR-924			MT-41
1/4"-28	.219	5.55	.237	6.02		PK-928	TR-903			MT-928
3/8"-14	.199	5.05	.232	5.88	1/4"	PK-914	TR-914			MT-35
3/8"-15	.230	5.84	.265	6.73		PK-915	TR-915			MT-36
3/8"-16	.242	6.15	.275	6.98		PK-916	TR-916			MT-36
3/8"-16	.242	6.15	.280	7.11				PK-916-L	TR-916-L	MT-36-L
3/8"-17	.255	6.48	.289	7.34		PK-918	TR-903			MT-37
3/8"-18	.272	6.85	.307	7.80	1/4"	PK-901	TR-903	PK-902	TR-904	MT-30
3/8"-19	.286	7.26	.320	8.12		PK-903	TR-903	PK-904	TR-904	MT-31
3/8"-20	.300	7.62	.334	8.48		PK-905	TR-907	PK-906	TR-908	MT-32
3/8"-21	.306	7.77	.340	8.61		PK-907	TR-907	PK-908	TR-908	MT-33
3/8"-22	.314	7.98	.349	8.86		PK-909	TR-909	PK-910	TR-910	MT-34
3/8"-23	.320	8.13	.357	9.08	1/4"	PK-911	TR-911	PK-912	TR-912	MT-34
3/8"-24	.320	8.13	.357	9.08		PK-911	TR-911	PK-912	TR-912	MT-34

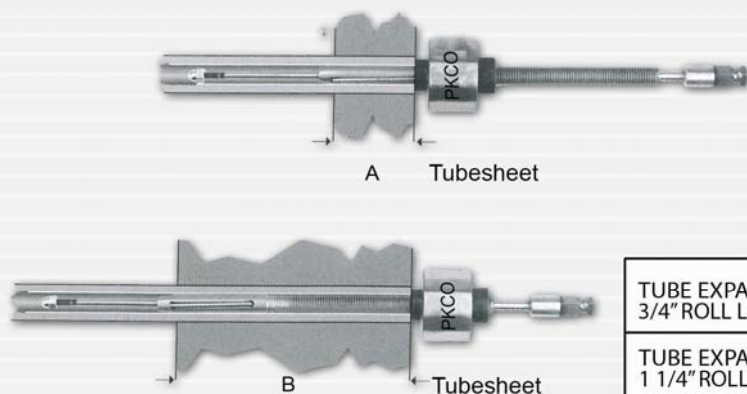
TUBE EXPANDERS

for Condensers and Heat Exchangers

Selection Guide:

Model : PK 1300

Tube Size I.D. .230" - .323"
(5.9 - 8.2 mm)



	TUBE SHEET THICKNESS	
	A MINIMUM	B MAXIMUM
TUBE EXPANDER WITH 3/4" ROLL LENGTH	1/4" (6.35 mm)	27/8" (73.03 mm)
TUBE EXPANDER WITH 1 1/4" ROLL LENGTH	3/4" (19.05 mm)	3 11/32" (84.93 mm)

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 3/4" (19 mm) ROLLS		EXPANDER WITH 1 1/4" (32 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	ROLL SET NO.	
3/8"-15	.230	5.84	.265	6.73	1/4"	PK-1301	TR-903	PK-1316	TR-1316	MT-86
3/8"-18	.270	6.85	.307	7.80		PK-1303	TR-903	PK-1302	TR-904	MT-80
3/8"-19	.286	7.26	.320	8.12		PK-1304	TR-907	PK-1304	TR-904	MT-81
3/8"-20	.300	7.62	.334	8.48		PK-1305		PK-1306	TR-908	MT-82
3/8"-21	.306	7.77	.340	8.61		PK-1307	TR-907	PK-1308	TR-908	MT-83
3/8"-22	.314	7.98	.349	8.86		PK-1309	TR-909	PK-1310	TR-910	MT-84
3/8"-23	.320	8.13	.357	9.08		PK-1311	TR-911	PK-1312	TR-912	MT-84
3/8"-24	.320	8.13	.357	9.08		PK-1311	TR-911	PK-1312	TR-912	MT-84

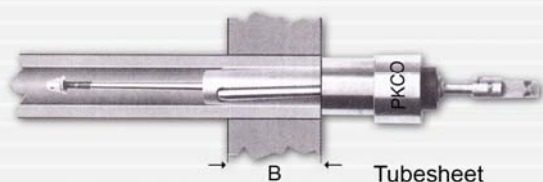
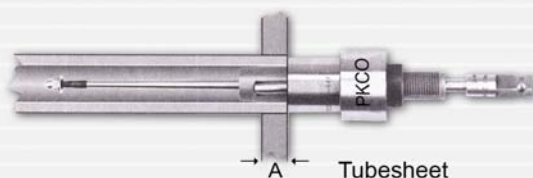
TUBE EXPANDERS

for Condensers and Heat Exchangers

Selection Guide:

Model : PK 800

Tube Size I.D. .335"-1.457"
(8.5 -37.0 mm)



	TUBE SHEET THICKNESS	
	A MINIMUM	B MAXIMUM
TUBE EXPANDER WITH 1 1/2" ROLL LENGTH	1/4" (6.35 mm)	1 1/4" (31.75 mm)
TUBE EXPANDER WITH 2 1/4" ROLL LENGTH	1" (25.40 mm)	2" (50.80 mm)

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	ROLL SET NO.	
1/2"-14	.324	8.23	.374	9.50	3/8"	PK-797	TR-797			MT-797
1/2"-15	.349	8.86	.398	10.11		PK-799	TR-1			MT-799
1/2"-16	.360	9.14	.410	10.41		PK-801	TR-1			MT-1
1/2"-17	.374	9.50	.424	10.77		PK-803	TR-2			MT-1
1/2"-18	.392	9.96	.447	11.35		PK-805	TR-3			MT-2
5/8"-12	.392	9.96	.447	11.35	3/8"	PK-805	TR-3			MT-2
5/8"-13	.425	10.79	.480	12.19		PK-807	TR-4			MT-3
5/8"-14	.449	11.40	.509	12.73		PK-809	TR-4	PK-810	TR-4-A	MT-4
5/8"-15	.471	11.96	.536	13.61		PK-811	TR-5	PK-812	TR-5-A	MT-5
5/8"-16	.485	12.32	.550	13.97		PK-813	TR-6	PK-814	TR-6-A	MT-5
5/8"-17	.499	12.67	.564	14.32	3/8"	PK-815	TR-6	PK-816	TR-6-A	MT-6
5/8"-18	.517	13.13	.572	14.53		PK-817	TR-7	PK-818	TR-7-A	MT-7
3/4"-10	.471	11.96	.536	13.61	3/8"	PK-811	TR-5	PK-812	TR-5-A	MT-5
3/4"-11	.499	12.67	.564	14.32		PK-815	TR-6	PK-816	TR-6-A	MT-6
3/4"-12	.522	13.30	.582	15.20		PK-819-N	TR-7	PK-820-N	TR-7-A	MT-8
3/4"-13	.550	13.97	.615	15.62		PK-821	TR-8	PK-822	TR-8-A	MT-8
3/4"-14	.574	14.58	.639	16.23		PK-823	TR-9	PK-824	TR-9-A	MT-8
3/4"-15	.596	15.14	.661	16.79	3/8"	PK-825	TR-10	PK-826	TR-10-A	MT-8
3/4"-16	.605	15.37	.685	17.40		PK-827	TR-10	PK-828	TR-10-A	MT-9
3/4"-17	.619	15.72	.699	17.75		PK-829	TR-11	PK-830	TR-11-A	MT-9
3/4"-18	.619	15.72	.699	17.75		PK-829	TR-11	PK-830	TR-11-A	MT-9

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	SET NO.	
7/8"-10	.596	15.14	.661	16.79	3/8"	PK-825	TR-10	PK-826	TR-10-A	MT-8
7/8"-11	.619	15.72	.699	17.75		PK-829	TR-11	PK-830	TR-11-A	MT-9
7/8"-12	.642	16.31	.722	18.34		PK-831	TR-12	PK-832	TR-12-A	MT-9
7/8"-13	.670	17.02	.750	19.05		PK-833	TR-13	PK-834	TR-13-A	MT-10
7/8"-14	.685	17.40	.774	19.66		PK-835	TR-14	PK-836	TR-14-A	MT-11
7/8"-15	.712	18.08	.801	20.34		PK-837	TR-15	PK-838	TR-15-A	MT-11
7/8"-16	.726	18.44	.815	20.70		PK-839	TR-15	PK-840	TR-15-A	MT-12
7/8"-17	.740	18.80	.829	21.06		PK-843	TR-16	PK-844	TR-16-A	MT-12
7/8"-18	.740	18.80	.829	21.06		PK-843	TR-16	PK-844	TR-16-A	MT-12
1"-8	.655	16.64	.735	18.67	3/8"	PK-841	TR-13	PK-842	TR-13-A	MT-9
1"-9	.685	17.40	.774	19.66		PK-835	TR-14	PK-836	TR-14-A	MT-11
1"-10	.712	18.08	.801	20.34		PK-837	TR-15	PK-838	TR-15-A	MT-11
1"-11	.740	18.80	.829	21.06		PK-843	TR-16	PK-844	TR-16-A	MT-12
1"-12	.763	19.38	.852	21.64		PK-845	TR-17	PK-846	TR-17-A	MT-12
1"-13	.791	20.09	.880	22.35		PK-847	TR-18	PK-848	TR-18-A	MT-12
1"-14	.810	20.57	.909	23.09		PK-849	TR-18	PK-850	TR-18-A	MT-13
1"-15	.837	21.26	.936	23.77		PK-851	TR-19	PK-852	TR-19-A	MT-13
1"-16	.837	21.26	.936	23.77	1/2"	PK-851	TR-19	PK-852	TR-19-A	MT-13
1"-17	.865	21.97	.964	24.48		PK-855	TR-21	PK-856	TR-21-A	MT-13
1"-18-20	.865	21.97	.964	24.48		PK-855	TR-21	PK-856	TR-21-A	MT-13
1 1/8"-8	.776	19.71	.875	22.22	3/8"	PK-853	TR-20	PK-854	TR-20-A	MT-13
1 1/8"-9	.810	20.57	.909	23.09		PK-849	TR-18	PK-850	TR-18-A	MT-13
1 1/8"-10	.837	21.26	.936	23.77		PK-851	TR-19	PK-852	TR-19-A	MT-13
1 1/8"-11	.865	21.97	.964	24.48		PK-855	TR-21	PK-856	TR-21-A	MT-13
1 1/8"-12	.883	22.43	.982	24.94	1/2"	PK-857	TR-21	PK-858	TR-21-A	MT-14
1 1/8"-13	.916	23.57	1.015	25.78		PK-859	TR-22	PK-860	TR-22-A	MT-14
1 1/8"-14	.835	23.75	1.044	26.52		PK-861	TR-23	PK-862	TR-23-A	MT-15
1 1/8"-15	.962	24.43	1.071	27.20		PK-863	TR-24	PK-864	TR-24-A	MT-15
1 1/8"-16	.962	24.43	1.071	27.20	1/2"	PK-863	TR-24	PK-864	TR-24-A	MT-15
1 1/8"-17	.990	25.15	1.099	27.91		PK-867	TR-26	PK-868	TR-26-A	MT-16
1 1/8"-18	.990	25.15	1.099	27.91		PK-867	TR-26	PK-868	TR-26-A	MT-16
1 1/4"-8	.901	22.88	1.010	25.60	1/2"	PK-865	TR-25	PK-866	TR-25-A	MT-15
1 1/4"-9	.935	23.75	1.044	26.52		PK-861	TR-23	PK-862	TR-23-A	MT-15
1 1/4"-10	.962	24.43	1.071	27.20		PK-863	TR-24	PK-864	TR-24-A	MT-15
1 1/4"-11	.990	25.15	1.099	27.91		PK-867	TR-26	PK-868	TR-26-A	MT-16
1 1/4"-12	1.013	25.73	1.122	28.50		PK-869	TR-27	PK-870	TR-27-A	MT-16
1 1/4"-13	1.041	26.44	1.150	29.21		PK-871	TR-28	PK-872	TR-28-A	MT-17
1 1/4"-14	1.060	26.92	1.169	29.69		PK-873	TR-29	PK-874	TR-29-A	MT-17
1 1/4"-15	1.087	27.61	1.196	30.38		PK-875	TR-30	PK-876	TR-30-A	MT-17
1 1/4"-16	1.087	27.61	1.196	30.38	1/2"	PK-875	TR-30	PK-876	TR-30-A	MT-17
1 3/8"-8	1.026	26.06	1.135	28.83		PK-877	TR-31	PK-878	TR-31-A	MT-17
1 3/8"-9	1.060	26.92	1.169	29.69		PK-873	TR-29	PK-874	TR-29-A	MT-17
1 3/8"-10	1.087	27.61	1.196	30.38		PK-875	TR-30	PK-876	TR-30-A	MT-17
1 3/8"-11	1.115	28.32	1.224	31.09		PK-879	TR-30	PK-880	TR-30-A	MT-18
1 3/8"-12	1.133	28.78	1.242	31.55		PK-881	TR-32	PK-882	TR-32-A	MT-18
1 3/8"-13	1.160	29.46	1.275	32.38		PK-883	TR-33	PK-884	TR-33-A	MT-19
1 3/8"-14	1.179	29.95	1.294	32.87		PK-885	TR-34	PK-886	TR-34-A	MT-20
1 3/8"-15	1.206	30.63	1.321	33.55	1/2"	PK-887	TR-35	PK-888	TR-35-A	MT-20
1 3/8"-16	1.206	30.63	1.321	33.55		PK-887	TR-35	PK-888	TR-35-A	MT-20
1 1/2"-8	1.145	29.08	1.260	32.00		PK-889	TR-34	PK-890	TR-34-A	MT-19
1 1/2"-9	1.179	29.95	1.294	32.87		PK-885	TR-34	PK-886	TR-34-A	MT-20
1 1/2"-10	1.206	30.63	1.321	33.55		PK-887	TR-35	PK-888	TR-35-A	MT-20
1 1/2"-11	1.235	31.37	1.350	34.29		PK-891	TR-36	PK-892	TR-36-A	MT-20
1 1/2"-12	1.257	31.93	1.372	34.85		PK-893	TR-37	PK-894	TR-37-A	MT-20
1 1/2"-13	1.285	32.64	1.400	35.56		PK-895	TR-37	PK-896	TR-37-A	MT-21
1 1/2"-14	1.285	32.64	1.400	35.56	1/2"	PK-895	TR-37	PK-896	TR-37-A	MT-21
1 1/2"-15	1.331	33.81	1.446	36.73		PK-897	TR-38	PK-898	TR-38-A	MT-21
1 1/2"-16	1.331	33.81	1.446	36.73		PK-897	TR-38	PK-898	TR-38-A	MT-21
1 3/4"-8	1.406	35.70	1.531	38.90	1/2"	PK-899	TR-38	PK-899RL	TR-38-A	MT-22

TUBE EXPANDERS

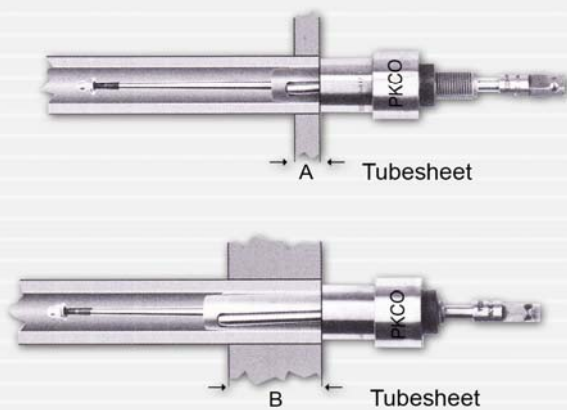
for Condensers and Heat Exchangers

Selection Guide:

Model : PK 800

five roll type expander

Tube Size I.D. .500"-1.457"
(12.7-37.0mm)



	TUBE SHEET THICKNESS	
	A MINIMUM	B MAXIMUM
TUBE EXPANDER WITH 1 1/2" ROLL LENGTH	1/4" (6.35 mm)	1 1/4" (31.75 mm)
TUBE EXPANDER WITH 2 1/4" ROLL LENGTH	1" (25.40 mm)	2" (50.80 mm)

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	SET NO.	
5/8"-17-19	.499	12.67	.578	14.69	3/8"	PK-815-5	TR-4-5	PK-816-5	TR-4-A-5	MT-9
5/8"-20-22	.539	13.70	.601	15.27		PK-819-SP-5	TR-4-5	PK-820-SP-5	TR-4-A-5	MT-11
5/8"-23-24	.550	13.97	.627	15.93		PK-821-5	TR-5-5	PK-822-5	TR-5-A-5	MT-12
3/4"-13-14	.550	13.97	.627	15.93	3/8"	PK-821-5	TR-5-5	PK-822-5	TR-5-A-5	MT-12
3/4"-15-16	.596	15.14	.688	17.21		PK-827-5	TR-8-5	PK-828-5	TR-8-A-5	MT-12
3/4"-17-18	.619	15.72	.706	17.94		PK-829-5	TR-8-5	PK-830-5	TR-8-A-5	MT-13
3/4"-19-21	.642	16.31	.730	18.56	1/2"	PK-831-5	TR-9-5	PK-832-5	TR-9-A-5	MT-13
3/4"-22-24	.670	17.02	.750	19.05		PK-833-5	TR-9-5	PK-834-5	TR-9-A-5	MT-14
7/8"-13	.670	17.02	.750	19.05		PK-833-5	TR-9-5	PK-834-5	TR-9-A-5	MT-14
7/8"-14	.685	17.40	.770	19.56	1/2"	PK-835-5	TR-10-5	PK-836-5	TR-10-A-5	MT-14
7/8"-15-16	.712	18.08	.807	20.50		PK-837-5	TR-11-5	PK-838-5	TR-11-A-5	MT-16
7/8"-17-18	.740	18.80	.826	20.98		PK-843-5	TR-11-5	PK-844-5	TR-11-A-5	MT-17
7/8"-19-22	.763	19.38	.848	21.65	1/2"	PK-845-5	TR-12-5	PK-846-5	TR-12-A-5	MT-17
7/8"-23-24	.791	20.09	.892	22.65		PK-847-5	TR-13-5	PK-848-5	TR-13-A-5	MT-18
1"-12	.763	19.38	.848	21.65		PK-845-5	TR-12-5	PK-846-5	TR-12-A-5	MT-17
1"-13	.791	20.09	.892	22.65	1/2"	PK-847-5	TR-13-5	PK-848-5	TR-13-A-5	MT-18
1"-14	.810	20.57	.904	22.97		PK-849-5	TR-14-5	PK-850-5	TR-14-A-5	MT-18
1"-15-16	.837	21.26	.933	23.69		PK-851-5	TR-15-5	PK-852-5	TR-15-A-5	MT-18
1"-17-20	.865	21.97	.971	24.67	1/2"	PK-855-5	TR-15-5	PK-856-5	TR-15-A-5	MT-20
1"-21-24	.883	22.43	.999	25.38		PK-857-5	TR-15-5	PK-858-5	TR-15-A-5	MT-21
1 1/8"-11	.865	21.97	.971	24.67		PK-855-5	TR-15-5	PK-856-5	TR-15-A-5	MT-20
1 1/8"-12	.883	22.43	.999	25.38	1/2"	PK-857-5	TR-15-5	PK-858-5	TR-15-A-5	MT-21
1 1/8"-13-14	.916	23.57	1.013	25.74		PK-859-5	TR-16-5	PK-860-5	TR-16-A-5	MT-21
1 1/8"-15-16	.962	24.43	1.064	27.02		PK-863-5	TR-18-5	PK-864-5	TR-18-A-5	MT-21
1 1/8"-17-20	.990	25.15	1.091	27.72	1/2"	PK-867-5	TR-19-5	PK-868-5	TR-19-A-5	MT-21
1 1/8"-21-24	1.013	25.73	1.118	28.40		PK-869-5	TR-21-5	PK-870-5	TR-21-A-5	MT-21
1 1/4"-10	.962	24.43	1.064	27.02		PK-863-5	TR-18-5	PK-864-5	TR-18-A-5	MT-21
1 1/4"-11	.990	25.15	1.091	27.72	1/2"	PK-867-5	TR-19-5	PK-868-5	TR-19-A-5	MT-21
1 1/4"-12	1.013	25.73	1.118	28.40		PK-869-5	TR-21-5	PK-870-5	TR-21-A-5	MT-21
1 1/4"-15-16	1.087	27.61	1.204	30.58		PK-875-5	TR-21-5	PK-876-5	TR-21-A-5	MT-22
1 1/4"-17-22	1.115	28.32	1.259	31.98	1/2"	PK-879-5	TR-23-5	PK-880-5	TR-23-A-5	MT-22
1 1/4"-23-25	1.133	28.78	1.285	32.64		PK-881-5	TR-24-5	PK-882-5	TR-24-A-5	MT-22
1 3/8"-12	1.133	28.78	1.285	32.64		PK-881-5	TR-24-5	PK-882-5	TR-24-A-5	MT-22
1 3/8"-14	1.179	29.95	1.294	32.88	1/2"	PK-885-5	TR-23-5	PK-886-5	TR-23-A-5	MT-23
1 1/2"-12	1.257	31.93	1.375	34.92	1/2"	PK-893-5	TR-26-5	PK-894-5	TR-26-A-5	MT-24
1 1/2"-17-24	1.374	34.90	1.505	38.22		PK-899-5	TR-29-5	PK-899-RL-5	TR-29-A-5	MT-25

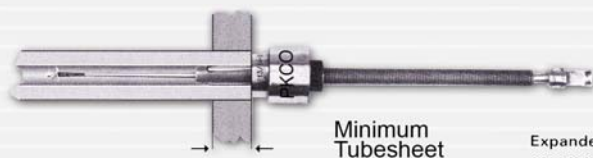
TUBE EXPANDERS

for Condensers and Heat Exchangers

Selection Guide:

Model : PK 1200

Tube Size I.D. .335"- 1.457"
(8.5 -37.0 mm)



Expanders with 1 1/2" (38.1mm) long rolls will accommodate tube sheet thickness as follows:
STANDARD REACH.... 3/4" to 5 7/8" (19.05 mm to 149.22 mm)
"B" REACH.... 3/4" to 10" (19.05 mm to 254.00 mm)
"C" REACH.... 3/4" to 12" (19.05 mm to 304.80 mm)



Expanders with 2 1/4" (57.1mm) long rolls will accommodate tube sheet thickness as follows:
STANDARD REACH.... 1 1/2" to 6 1/2" (38.1 mm to 165.10 mm)
"B" REACH.... 1 1/2" to 10 3/4" (38.1 mm to 273.05 mm)
"C" REACH.... 1 1/2" to 12 3/4" (38.1 mm to 323.85 mm)

Longer reaches available upon request in 2 inch (50.8 mm) increments.

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	ROLL SET NO.	
1/2"-14	.324	8.23	.374	9.50	3/8"	PK-1197	TR-797			MT-1197
1/2"-15	.349	8.86	.398	10.11		PK-1199	TR-1			MT-1199
1/2"-16	.360	9.14	.410	10.41		PK-1201	TR-1			MT-51
1/2"-17	.374	9.50	.424	10.77		PK-1203	TR-2			MT-51
1/2"-18	.392	9.96	.447	11.35		PK-1205	TR-3			MT-52
5/8"-12	.392	9.96	.447	11.35	3/8"	PK-1205	TR-3			MT-52
5/8"-13	.425	10.79	.480	12.19		PK-1207	TR-4			MT-53
5/8"-14	.449	11.40	.509	12.73		PK-1209	TR-4	PK-1210	TR-4-A	MT-54
5/8"-15	.471	11.96	.536	13.61		PK-1211	TR-5	PK-1212	TR-5-A	MT-55
5/8"-16	.485	12.32	.550	13.97		PK-1213	TR-6	PK-1214	TR-6-A	MT-55
5/8"-17	.499	12.67	.564	14.32		PK-1215	TR-6	PK-1216	TR-6-A	MT-56
5/8"-18	.517	13.13	.572	14.53		PK-1217	TR-7	PK-1218	TR-7-A	MT-57
3/4"-10	.471	11.96	.536	13.61	3/8"	PK-1211	TR-5	PK-1212	TR-5-A	MT-55
3/4"-11	.499	12.67	.564	14.32		PK-1215	TR-6	PK-1216	TR-6-A	MT-56
3/4"-12	.522	13.30	.582	15.20		PK-1219-N	TR-7	PK-1220-N	TR-7-A	MT-58
3/4"-13	.550	13.97	.615	15.62		PK-1221	TR-8	PK-1222	TR-8-A	MT-58
3/4"-14	.574	14.58	.639	16.23		PK-1223	TR-9	PK-1224	TR-9-A	MT-58
3/4"-15	.596	15.14	.661	16.79		PK-1225	TR-10	PK-1226	TR-10-A	MT-58
3/4"-16	.605	15.37	.685	17.40		PK-1227	TR-10	PK-1228	TR-10-A	MT-59
3/4"-17	.619	15.72	.699	17.75		PK-1229	TR-11	PK-1230	TR-11-A	MT-59
3/4"-18	.619	15.72	.699	17.75		PK-1229	TR-11	PK-1230	TR-11-A	MT-59

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	SET NO.	
7/8"-10	.596	15.14	.661	16.79	3/8"	PK-1225	TR-10	PK-1226	TR-10-A	MT-58
7/8"-11	.619	15.72	.699	17.75		PK-1229	TR-11	PK-1230	TR-11-A	MT-59
7/8"-12	.642	16.31	.722	18.34		PK-1231	TR-12	PK-1232	TR-12-A	MT-59
7/8"-13	.670	17.02	.750	19.05		PK-1233	TR-13	PK-1234	TR-13-A	MT-60
7/8"-14	.685	17.40	.774	19.66		PK-1235	TR-14	PK-1236	TR-14-A	MT-61
7/8"-15	.712	18.08	.801	20.34		PK-1237	TR-15	PK-1238	TR-15-A	MT-61
7/8"-16	.726	18.44	.815	20.70		PK-1239	TR-15	PK-1240	TR-15-A	MT-62
7/8"-17	.740	18.80	.829	21.06		PK-1243	TR-16	PK-1244	TR-16-A	MT-62
7/8"-18	.740	18.80	.829	21.06		PK-1243	TR-16	PK-1244	TR-16-A	MT-62
1"-8	.655	16.64	.735	18.67	3/8"	PK-1241	TR-13	PK-1242	TR-13-A	MT-59
1"-9	.685	17.40	.774	19.66		PK-1235	TR-14	PK-1236	TR-14-A	MT-61
1"-10	.712	18.08	.801	20.34		PK-1237	TR-15	PK-1238	TR-15-A	MT-61
1"-11	.740	18.80	.829	21.06		PK-1243	TR-16	PK-1244	TR-16-A	MT-62
1"-12	.763	19.38	.852	21.64		PK-1245	TR-17	PK-1246	TR-17-A	MT-62
1"-13	.791	20.09	.880	22.35		PK-1247	TR-18	PK-1248	TR-18-A	MT-62
1"-14	.810	20.57	.909	23.09		PK-1249	TR-18	PK-1250	TR-18-A	MT-63
1"-15	.837	21.26	.936	23.77		PK-1251	TR-19	PK-1252	TR-19-A	MT-63
1"-16	.837	21.26	.936	23.77	1/2"	PK-1251	TR-19	PK-1252	TR-19-A	MT-63
1"-17	.865	21.97	.964	24.48		PK-1255	TR-21	PK-1256	TR-21-A	MT-63
1"-18-20	.865	21.97	.964	24.48		PK-1255	TR-21	PK-1256	TR-21-A	MT-63
1 1/8"-8	.776	19.71	.875	22.22	3/8"	PK-1253	TR-20	PK-1254	TR-20-A	MT-63
1 1/8"-9	.810	20.57	.909	23.09		PK-1249	TR-18	PK-1250	TR-18-A	MT-63
1 1/8"-10	.837	21.26	.936	23.77		PK-1251	TR-19	PK-1252	TR-19-A	MT-63
1 1/8"-11	.865	21.97	.964	24.48		PK-1255	TR-21	PK-1256	TR-21-A	MT-63
1 1/8"-12	.883	22.43	.982	24.94	1/2"	PK-1257	TR-21	PK-1258	TR-21-A	MT-64
1 1/8"-13	.916	23.57	1.015	25.78		PK-1259	TR-22	PK-1260	TR-22-A	MT-64
1 1/8"-14	.935	23.75	1.044	26.52		PK-1261	TR-23	PK-1262	TR-23-A	MT-65
1 1/8"-15	.962	24.43	1.071	27.20		PK-1263	TR-24	PK-1264	TR-24-A	MT-65
1 1/8"-16	.962	24.43	1.071	27.20	1/2"	PK-1263	TR-24	PK-1264	TR-24-A	MT-65
1 1/8"-17	.990	25.15	1.099	27.91		PK-1267	TR-26	PK-1268	TR-26-A	MT-66
1 1/8"-18	.990	25.15	1.099	27.91		PK-1267	TR-26	PK-1268	TR-26-A	MT-66
1 1/4"-8	.901	22.88	1.010	25.60	1/2"	PK-1265	TR-25	PK-1266	TR-25-A	MT-65
1 1/4"-9	.935	23.75	1.044	26.52		PK-1261	TR-23	PK-1262	TR-23-A	MT-65
1 1/4"-10	.962	24.43	1.071	27.20		PK-1263	TR-24	PK-1264	TR-24-A	MT-65
1 1/4"-11	.990	25.15	1.099	27.91		PK-1267	TR-26	PK-1268	TR-26-A	MT-66
1 1/4"-12	1.013	25.73	1.122	28.50	1/2"	PK-1269	TR-27	PK-1270	TR-27-A	MT-66
1 1/4"-13	1.041	26.44	1.150	29.21		PK-1271	TR-28	PK-1272	TR-28-A	MT-67
1 1/4"-14	1.060	26.92	1.169	29.69		PK-1273	TR-29	PK-1274	TR-29-A	MT-67
1 1/4"-15	1.087	27.61	1.196	30.38		PK-1275	TR-30	PK-1276	TR-30-A	MT-67
1 1/4"-16	1.087	27.61	1.196	30.38	1/2"	PK-1275	TR-30	PK-1276	TR-30-A	MT-67
1 3/8"-8	1.026	26.06	1.135	28.83		PK-1277	TR-31	PK-1278	TR-31-A	MT-67
1 3/8"-9	1.060	26.92	1.169	29.69		PK-1273	TR-29	PK-1274	TR-29-A	MT-67
1 3/8"-10	1.087	27.61	1.196	30.38		PK-1275	TR-30	PK-1276	TR-30-A	MT-67
1 3/8"-11	1.115	28.32	1.224	31.09		PK-1279	TR-30	PK-1280	TR-30-A	MT-68
1 3/8"-12	1.133	28.78	1.242	31.55	1/2"	PK-1281	TR-32	PK-1282	TR-32-A	MT-68
1 3/8"-13	1.160	29.46	1.275	32.38		PK-1283	TR-33	PK-1284	TR-33-A	MT-69
1 3/8"-14	1.179	29.95	1.294	32.87		PK-1285	TR-34	PK-1286	TR-34-A	MT-70
1 3/8"-15	1.206	30.63	1.321	33.55		PK-1287	TR-35	PK-1288	TR-35-A	MT-70
1 3/8"-16	1.206	30.63	1.321	33.55	1/2"	PK-1287	TR-35	PK-1288	TR-35-A	MT-70
1 1/2"-8	1.145	29.08	1.260	32.00		PK-1289	TR-34	PK-1290	TR-34-A	MT-69
1 1/2"-9	1.179	29.95	1.294	32.87		PK-1285	TR-34	PK-1286	TR-34-A	MT-70
1 1/2"-10	1.206	30.63	1.321	33.55		PK-1287	TR-35	PK-1288	TR-35-A	MT-70
1 1/2"-11	1.235	31.37	1.350	34.29		PK-1291	TR-36	PK-1292	TR-36-A	MT-70
1 1/2"-12	1.257	31.93	1.372	34.85	1/2"	PK-1293	TR-37	PK-1294	TR-37-A	MT-70
1 1/2"-13	1.285	32.64	1.400	35.56		PK-1295	TR-37	PK-1296	TR-37-A	MT-71
1 1/2"-14	1.285	32.64	1.400	35.56		PK-1295	TR-37	PK-1296	TR-37-A	MT-71
1 1/2"-15	1.331	33.81	1.446	36.73		PK-1297	TR-38	PK-1298	TR-38-A	MT-71
1 1/2"-16	1.331	33.81	1.446	36.73	1/2"	PK-1297	TR-38	PK-1298	TR-38-A	MT-71
1 3/4"-8	1.406	35.70	1.531	38.90		PK-1299	TR-38	PK-1299RL	TR-38-A	MT-72

TUBE EXPANDERS

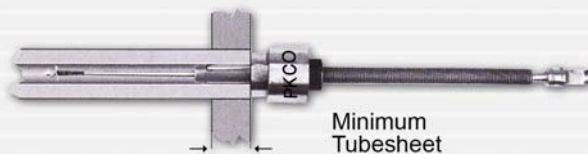
for Condensers and Heat Exchangers

Selection Guide:

Model : PK 1200

five roll type expander

Tube Size I.D. .500"-1.457"
(12.7-37.0mm)



Expanders with 1 1/2" (38.1mm) long rolls will accommodate tube sheet thickness as follows:

STANDARD REACH....	3/4" to 5 7/8"	(19.05 mm to 149.22 mm)
"B" REACH....	3/4" to 10"	(19.05 mm to 254.00 mm)
"C" REACH....	3/4" to 12"	(19.05 mm to 304.80 mm)



Expanders with 2 1/4" (57.1mm) long rolls will accommodate tube sheet thickness as follows:

STANDARD REACH....	1 1/2" to 6 1/2"	(38.1 mm to 165.10 mm)
"B" REACH....	1 1/2" to 10 3/4"	(38.1 mm to 273.05 mm)
"C" REACH....	1 1/2" to 12 3/4"	(38.1 mm to 323.85 mm)

Longer reaches available upon request in 2 inch (50.8 mm) increments.

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 1 1/2" (38.1 mm) ROLLS		EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	EXPANDER NO.	ROLL SET NO.	
5/8"-17-19	.499	12.67	.578	14.69	3/8"	PK-1215-5	TR-4-5	PK-1216-5	TR-4-A-5	MT-59
5/8"-20-22	.539	13.70	.601	15.27		PK-1219-SP-5	TR-4-5	PK-1220-SP-5	TR-4-A-5	MT-61
5/8"-23-24	.550	13.97	.627	15.93		PK-1221-5	TR-5-5	PK-1222-5	TR-5-A-5	MT-62
3/4"-13-14	.550	13.97	.627	15.93	3/8"	PK-1221-5	TR-5-5	PK-1222-5	TR-5-A-5	MT-62
3/4"-15-16	.596	15.14	.688	17.21		PK-1227-5	TR-8-5	PK-1228-5	TR-8-A-5	MT-62
3/4"-17-18	.619	15.72	.706	17.94		PK-1229-5	TR-8-5	PK-1230-5	TR-8-A-5	MT-63
3/4"-19-21	.642	16.31	.730	18.56		PK-1231-5	TR-9-5	PK-1232-5	TR-9-A-5	MT-63
3/4"-22-24	.670	17.02	.750	19.05		PK-1233-5	TR-9-5	PK-1234-5	TR-9-A-5	MT-64
7/8"-13	.670	17.02	.750	19.05	1/2"	PK-1233-5	TR-9-5	PK-1234-5	TR-9-A-5	MT-64
7/8"-14	.685	17.40	.770	19.56		PK-1235-5	TR-10-5	PK-1236-5	TR-10-A-5	MT-64
7/8"-15-16	.712	18.08	.807	20.50		PK-1237-5	TR-11-5	PK-1238-5	TR-11-A-5	MT-66
7/8"-17-18	.740	18.80	.826	20.98		PK-1243-5	TR-11-5	PK-1244-5	TR-11-A-5	MT-67
7/8"-19-22	.763	19.38	.848	21.65		PK-1245-5	TR-12-5	PK-1246-5	TR-12-A-5	MT-67
7/8"-23-24	.791	20.09	.892	22.65		PK-1247-5	TR-13-5	PK-1248-5	TR-13-A-5	MT-68
1"-12	.763	19.38	.848	21.65	1/2"	PK-1245-5	TR-12-5	PK-1246-5	TR-12-A-5	MT-67
1"-13	.791	20.09	.892	22.65		PK-1247-5	TR-13-5	PK-1248-5	TR-13-A-5	MT-68
1"-14	.810	20.57	.904	22.97		PK-1249-5	TR-14-5	PK-1250-5	TR-14-A-5	MT-68
1"-15-16	.837	21.26	.933	23.69		PK-1251-5	TR-15-5	PK-1252-5	TR-15-A-5	MT-68
1"-17-20	.865	21.97	.971	24.67		PK-1255-5	TR-15-5	PK-1256-5	TR-15-A-5	MT-70
1"-21-24	.883	22.43	.999	25.38		PK-1257-5	TR-15-5	PK-1258-5	TR-15-A-5	MT-71
1 1/8"-11	.865	21.97	.971	24.67	1/2"	PK-1255-5	TR-15-5	PK-1256-5	TR-15-A-5	MT-70
1 1/8"-12	.883	22.43	.999	25.38		PK-1257-5	TR-15-5	PK-1258-5	TR-15-A-5	MT-71
1 1/8"-13-14	.916	23.57	1.013	25.74		PK-1259-5	TR-16-5	PK-1260-5	TR-16-A-5	MT-71
1 1/8"-15-16	.962	24.43	1.064	27.02		PK-1263-5	TR-18-5	PK-1264-5	TR-18-A-5	MT-71
1 1/8"-17-20	.990	25.15	1.091	27.72		PK-1267-5	TR-19-5	PK-1268-5	TR-19-A-5	MT-71
1 1/8"-21-24	1.013	25.73	1.118	28.40		PK-1269-5	TR-21-5	PK-1270-5	TR-21-A-5	MT-71
1 1/4"-10	.962	24.43	1.064	27.02	1/2"	PK-1263-5	TR-18-5	PK-1264-5	TR-18-A-5	MT-71
1 1/4"-11	.990	25.15	1.091	27.72		PK-1267-5	TR-19-5	PK-1268-5	TR-19-A-5	MT-71
1 1/4"-12	1.013	25.73	1.118	28.40		PK-1269-5	TR-21-5	PK-1270-5	TR-21-A-5	MT-71
1 1/4"-15-16	1.087	27.61	1.204	30.58		PK-1275-5	TR-21-5	PK-1276-5	TR-21-A-5	MT-72
1 1/4"-17-22	1.115	28.32	1.259	31.98		PK-1279-5	TR-23-5	PK-1280-5	TR-23-A-5	MT-72
1 1/4"-23-25	1.133	28.78	1.285	32.64		PK-1281-5	TR-24-5	PK-1282-5	TR-24-A-5	MT-72
1 3/8"-12	1.133	28.78	1.285	32.64	1/2"	PK-1281-5	TR-24-5	PK-1282-5	TR-24-A-5	MT-72
1 3/8"-14	1.179	29.95	1.294	32.88		PK-1285-5	TR-23-5	PK-1286-5	TR-23-A-5	MT-73
1 1/2"-12	1.257	31.93	1.375	34.92	1/2"	PK-1293-5	TR-26-5	PK-1294-5	TR-26-A-5	MT-74
1 1/2"-17-24	1.374	34.90	1.505	38.22		PK-1299-5	TR-29-5	PK-1299-RL-5	TR-29-A-5	MT-75

TUBE EXPANDERS

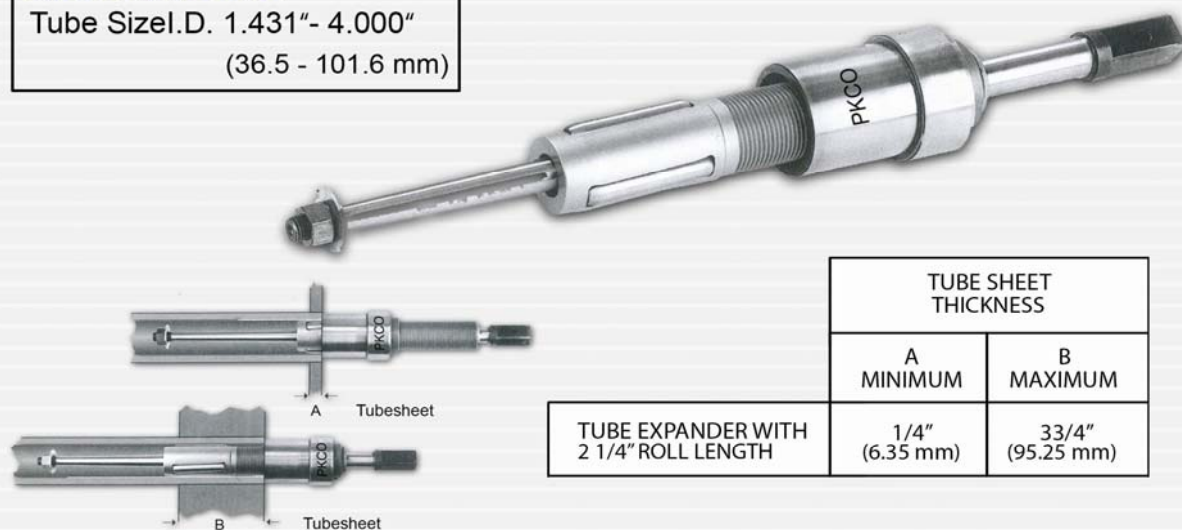
for Condensers and Heat Exchangers

Selection Guide:

Model : PK 8012

Tube Size I.D. 1.431" - 4.000"

(36.5 - 101.6 mm)



TUBE EXPANDER WITH 2 1/4" ROLL LENGTH	TUBE SHEET THICKNESS	
	A MINIMUM	B MAXIMUM
	1/4" (6.35 mm)	33/4" (95.25 mm)

TUBE O.D. AND G.A.	MIN. I.D. TUBE TOOL ENTERS		MAX. TOOL EXPANSION		SIZE SQUARE ON MAN- DREL	EXPANDER WITH 2 1/4" (57.1 mm) ROLLS		MANDREL NO.
	Inch	mm	Inch	mm		EXPANDER NO.	ROLL SET NO.	
1 3/4"-9-10	1.420	36.10	1.617	41.08	3/4"	PK-8012-1 3/4-10	TR-37-A	MT-90
1 3/4"-11	1.452	36.90	1.637	41.58		PK-8012-1 3/4-11	TR-42	MT-90
1 3/4"-12	1.480	37.60	1.659	42.14		PK-8012-1 3/4-12	TR-44	MT-90
1 3/4"-13	1.507	38.30	1.687	42.84		PK-8012-1 3/4-13	TR-46	MT-90
1 3/4"-14	1.532	38.90	1.711	43.46		PK-8012-1 3/4-14	TR-48	MT-90
2"-6-7	1.563	39.70	1.791	45.51	3/4"	PK-8012-2 6-7	TR-48	MT-91
2"-8-10	1.625	41.30	1.859	47.23		PK-8012-2 8-10	TR-50	MT-91
2"-11	1.662	42.00	1.888	47.95		PK-8012-2-11	TR-52	MT-91
2"-12	1.685	42.80	1.910	48.51		PK-8012-2-12	TR-54	MT-91
2"-13-16	1.724	43.80	1.949	49.51		PK-8012-2-13-16	TR-56	MT-91
2 1/4"-5	1.788	45.40	2.019	51.28	3/4"	PK-8012-2 1/4-5	TR-50	MT-92
2 1/4"-6-7	1.839	46.70	2.069	52.56		PK-8012-2 1/4-6-7	TR-54	MT-92
2 1/4"-8-10	1.882	47.80	2.109	53.56		PK-8012-2 1/4-8-10	TR-56	MT-92
2 1/4"-11	1.921	48.50	2.137	54.28		PK-8012-2 1/4-11	TR-58	MT-92
2 1/4"-12	1.933	49.10	2.159	54.84		PK-8012-2 1/4-12	TR-60	MT-92
2 1/4"-13-16	1.936	49.80	2.187	55.56		PK-8012-2 1/4-13-16	TR-62	MT-92
2 1/2"-5-7	2.043	51.90	2.348	59.64	1"	PK-8012-2 1/2-5-7	TR-62	MT-96
2 1/2"-8-12	2.134	54.20	2.409	61.20	3/4"	PK-8012-2 1/2-8-12	TR-64	MT-93
2 1/2"-13-16	2.232	56.70	2.437	61.90		PK-8012-2 1/2-13-16	TR-64	MT-94
2 3/4"-5-7	2.291	58.20	2.598	65.98	1"	PK-8012-2 3/4-5-7	TR-64	MT-96
2 3/4"-8-14	2.366	60.10	2.673	67.90		PK-8012-2 3/4-8-14	TR-66	MT-96
3"-3-4	2.449	62.20	2.752	69.90	1"	PK-8012-3 3-4	TR-64	MT-97-SP
3"-5	2.478	62.90	2.791	70.90		PK-8012-3-5	TR-64	MT-98
3"-6-7	2.547	64.70	2.867	72.82		PK-8012-3 6-7	TR-66	MT-98
3"-8-14	2.618	66.50	2.924	74.26		PK-8012-3 8-14	TR-67	MT-96
3 1/4"-5-9	2.744	69.70	3.045	77.35	1"	PK-8012-3 1/4-5-9	TR-67	MT-97
3 1/4"-7-14	2.871	72.90	3.174	80.63		PK-8012-3 1/4-7-14	TR-68	MT-97
3 1/2"-7-13	3.043	77.30	3.361	85.38	1"	PK-8012-3 1/2-7-13	TR-69	MT-98
3 1/2"-8-14	3.122	79.30	3.440	87.38		PK-8012-3 1/2-8-14	TR-69	MT-99
3 1/2"-11-18	3.224	81.90	3.543	89.98		PK-8012-3 1/2-11-18	TR-70	MT-99
4"-6-11	3.575	90.80	3.898	99.00	1"	PK-8012-4 6-11	TR-71	MT-99
4"-10-16	3.701	94.00	4.014	100.96		PK-8012-4 10-16	TR-72	MT-99
4"-12-18	3.732	94.80	4.050	102.86		PK-8012-4 12-18	TR-71	MT-100
4 1/4"-8-12	3.851	97.80	4.179	105.76	1"	PK-8012-4 1/4-8-12	TR-72	MT-100
4 1/2"-2-3	3.851	97.80	4.179	105.76	1"	PK-8012-4 1/2-2-3	TR-72	MT-100

Note: Expander PK 8012 is also available as four or five roll expander.

TUBE EXPANDERS

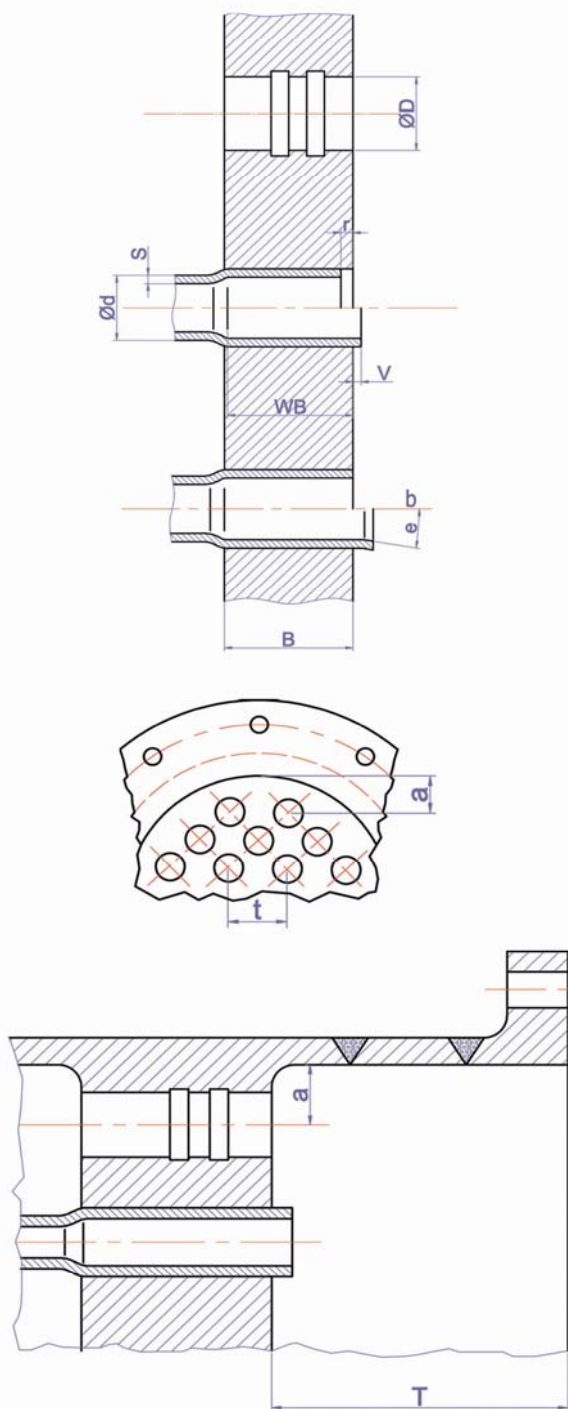
for Condensers and Heat Exchangers

GROOVING TOOL



Model no.	Tubesheet I.D.	Depth	Groove Spacing	Groove width	Shank
PKG- 625	5/8" (15.8 mm)	0" to 1 1/2"	1/4" or 3/8"	1/8"	MT-2 or MT-3
PKG- 750	3/4" (19.05 mm)				
PKG- 875	7/8" (22.22 mm)	0 mm to 38.1 mm	6.3 mm or 9.4 mm	3 mm	
PKG-1000	1" (25.40 mm)				

Larger sizes on request



Machine type:

Mec. Hydraulic ☐Electrical ☐Pnumatic ☐

Company Name

PKCO. order No.

Tube o.d. $d \pm$ mmTube wall thickn. $s \pm$ mm

Tube material

Dia. of tube sheet hole $D \pm$ mmTube sheet thickness $B \pm$ mm

Tube sheet material

Length of rolling $WB \pm$ mmTube protrusion v mmTube recession r mmDegree of angle when belling e Minimum distance between two holes t mm

No. of tubes

Straight tubes Yes/No

U-tubes Yes/No

Welded joint Yes/No

Welded and expanded joint Yes/No

Required expansion of tube (on wall) %

Pressure

Temperature

For difficult T mmexpansion a mm

For recessing head, pilot ring and tool holder

Bore $D \pm$ mm

Distance bore-groove mm

Groove mm

Distance between grooves mm

Prepared by:

Approved by:

The End