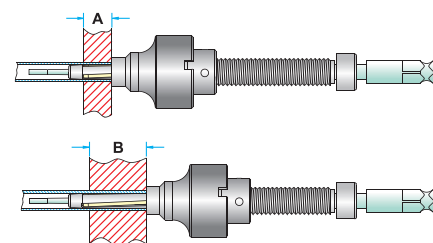


Tube Expander for Heat Exchanger and Condenser

'TN' Series



Roller Length	Adjustable Range	
	Min.	Max.
1" (25.4mm)	1/4" (6.35mm)	1" (25.4mm)

TUBE O.D. BWG	TUBE I.D.		MIN I.D. Tube Tool Enters		MAX Tool Expansion		EXPANDER With 1" (25.4 mm) long rolls		
	inch	mm	inch	mm	inch	mm	Expander Model	Roll Set Model	Mandrel Model
1/4 - 18	0.152	3.8	0.148	3.7	0.167	4.2	TA-25018	TR-20018	TM-21819
(6.35) - 19	0.166	4.2	0.160	4.0	0.180	4.5	TA-25019	TR-21920	TM-21819
- 20	0.180	4.5	0.175	4.4	0.196	4.9	TA-25020	TR-21920	TM-22021
- 21	0.186	4.7	0.180	4.5	0.202	5.1	TA-25021	TR-22124	TM-22021
- 22	0.194	4.9	0.190	4.8	0.213	5.4	TA-25022	TR-22124	TM-20022
- 23	0.200	5.0	0.195	4.9	0.216	5.5	TA-25023	TR-21920	TM-22324
- 24	0.206	5.2	0.201	5.1	0.224	5.7	TA-25024	TR-22124	TM-22324
- 28	0.222	5.6	0.217	5.4	0.243	6.1	TA-25028	TR-22830	TM-22830
- 29	0.224	5.7	0.217	5.4	0.243	6.1	TA-25028	TR-22830	TM-22830
- 30	0.226	5.7	0.217	5.4	0.243	6.1	TA-25028	TR-22830	TM-22830
3/8 - 14	0.209	5.3	0.204	5.1	0.230	5.8	TA-37514	TR-21920	TM-22830
(9.53) - 15	0.231	5.8	0.225	5.6	0.265	6.6	TA-37515	TR-31516	TM-22830
- 16	0.245	6.2	0.238	6.0	0.278	7.0	TA-37516	TR-31516	TM-31617
- 17	0.259	6.5	0.253	6.4	0.293	7.4	TA-37517	TR-31720	TM-31617
- 18	0.277	7.0	0.270	6.8	0.310	7.8	TA-37518	TR-31720	TM-30018
- 19	0.291	7.3	0.285	7.1	0.325	8.1	TA-37519	TR-31720	TM-30019
- 20	0.305	7.7	0.295	7.4	0.335	8.4	TA-37520	TR-31720	TM-32021
- 21	0.311	7.9	0.305	7.5	0.345	8.6	TA-37521	TR-32122	TM-32021
- 22	0.319	8.1	0.312	7.8	0.353	8.9	TA-37522	TR-32122	TM-32224
- 23	0.325	8.2	0.318	8.1	0.363	9.2	TA-37523	TR-32324	TM-32224
- 24	0.331	8.4	0.318	8.1	0.363	9.2	TA-37523	TR-32324	TM-32224

Tube Expander for Heat Exchanger and Condenser

T - 900 / 1300 Series



900 Series



1300 Series

T900 Series	Adjustable Range	
Roller Length	Min.	Max.
3/4" (19.05 mm)	1/4" (6.35 mm)	3/4" (19.05 mm)
1.1/4" (31.75 mm)	3/4" (19.05 mm)	1.1/4" (31.75 mm)

T1300 Series	Adjustable Range	
Roller Length	Min.	Max.
3/4" (19.05 mm)	3/4" (19.05 mm)	3" (76.20 mm)
1.1/4" (31.75 mm)	1.1/4" (31.75 mm)	3.1/2" (88.90 mm)

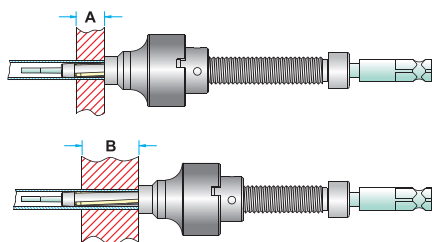
Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		900 Series Expander With				Mandrel Models	1300 Series Expander With				Mandrel Models
	inch	mm	inch	mm	inch	mm	3/4" (19.05 mm) rolls		1/4" (31.75 mm) rolls			1.3/4" (38 mm) rolls		1.1/4" (38 mm) rolls		
							Expander Model	Roll Set Model	Expander Model	Roll Set Model		Expander Model	Roll Set Model	Expander Model	Roll Set Model	
1/4" -18	0.152	3.8	0.151	3.8	0.173	4.4	T-921	TR-921			TM-39					
-19	0.166	4.2	0.165	4.1	0.185	4.7	T-922	TR-923			TM-39					
-20	0.180	4.5	0.175	4.4	0.200	5.1	T-923	TR-923			TM-40					
-21	0.186	4.7	0.180	4.5	0.207	5.2	T-924	TR-924			TM-40					
-22	0.194	4.9	0.190	4.8	0.216	5.5	T-925	TR-925			TM-41					
-23	0.200	5.0	0.195	4.9	0.222	5.6	T-926	TR-923			TM-41					
-24	0.206	5.2	0.201	5.1	0.230	5.8	T-927	TR-924			TM-41					
-28	0.222	5.6	0.222	5.6	0.238	6.0	T-928	TR-903			TM-928					
-29	0.224	5.7	0.222	5.6	0.238	6.0	T-928	TR-903			TM-928					
-30	0.226	5.7	0.222	5.6	0.238	6.0	T-928	TR-903			TM-928					
3/8"-14	0.209	5.3	0.201	5.1	0.232	5.8	T-927	TR-924			TM-41					
-15	0.231	5.8	0.230	5.8	0.265	6.7	T-915	TR-903			TM-42	T-1315	TR-1315	T-1316	TR-1316	TM-86
-16	0.245	6.2	0.240	6.1	0.275	6.9	T-916	TR-916			TM-36	T-1319	TR-1315	T-1319L	TR-916L	TM-86
-16	0.245	6.2	0.240	6.1	0.275	6.9			T-916L	TR-916L	TM-36L					
-17	0.259	6.5	0.255	6.4	0.289	7.3	T-918	TR-903	T-920	TR-904	TM-38	T-1317	TR-903	T-1318	TR-904	TM-88
-18	0.277	7.0	0.272	6.9	0.307	7.8	T-901	TR-903	T-902	TR-904	TM-30	T-1301	TR-903	T-1302	TR-904	TM-80
-19	0.291	7.3	0.286	7.2	0.320	8.1	T-903	TR-903	T-904	TR-904	TM-31	T-1303	TR-903	T-1304	TR-904	TM-81
-20	0.305	7.7	0.300	7.6	0.334	8.4	T-905	TR-907	T-906	TR-908	TM-32	T-1305	TR-907	T-1306	TR-908	TM-82
-21	0.311	7.9	0.306	7.7	0.340	8.6	T-907	TR-907	T-908	TR-908	TM-33	T-1307	TR-907	T-1308	TR-908	TM-83
-22	0.319	8.1	0.314	7.9	0.349	8.8	T-909	TR-909	T-910	TR-910	TM-34	T-1309	TR-909	T-1310	TR-910	TM-84
-23	0.325	8.2	0.320	8.1	0.357	9.0	T-911	TR-911	T-912	TR-912	TM-34	T-1311	TR-911	T-1312	TR-912	TM-84
-24	0.331	8.4	0.320	8.1	0.357	9.0	T-911	TR-911	T-912	TR-912	TM-34	T-1311	TR-911	T-1312	TR-912	TM-84

Tube Expander for Heat Exchanger and Condenser

T - 800 / 1200 Series - 3 Rollers



800 Series



T800 Series		Adjustable Range	
Roller Length		Min.	Max.
1.1/2" (38.1 mm)		1/2" (12.7mm)	1.1/2" (38.1mm)
2.1/4" (57.1 mm)		1.1/4" (31.7mm)	2.1/4" (57.1mm)

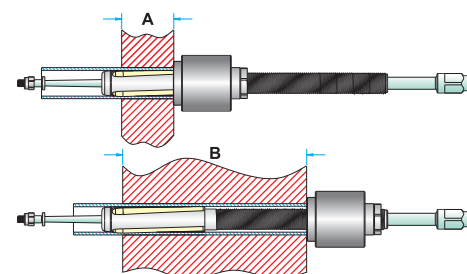
Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models
							1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls		
	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set								
	Model	Model	Model	Model	Model	Model	Model	Model								
1/2"-14	0.334	8.4	0.324	8.23	0.374	9.50	T-797	TR-797	-	-	TM-797	T-1197	TR-797	-	-	TM-1197
-15	0.356	9.0	0.349	8.84	0.398	10.11	T-799	TR-1	-	-	TM-799	T-1199	TR-1	-	-	TM-1199
-16	0.370	9.4	0.360	9.14	0.410	10.41	T-801	TR-1	-	-	TM-1	T-1201	TR-1	-	-	TM-51
-17	0.384	9.7	0.374	9.50	0.424	10.77	T-803	TR-2	-	-	TM-1	T-1203	TR-2	-	-	TM-51
-18	0.402	10.2	0.392	9.96	0.447	11.35	T-805	TR-3	-	-	TM-2	T-1205	TR-3	-	-	TM-52
-20	0.430	10.9	0.406	10.80	0.461	11.7	T-805S	TR-3	-	-	TM-3	T-1205S	TR-3	-	-	TM-53
5/8"-12	0.407	10.3	0.392	9.96	0.447	11.35	T-805	TR-3	-	-	TM-2	T-1205	TR-3	-	-	TM-52
-13	0.435	11.0	0.425	10.79	0.480	12.19	T-807	TR-4	-	-	TM-3	T-1207	TR-4	-	-	TM-53
-14	0.459	11.6	0.449	11.40	0.509	12.90	T-809	TR-4	T-810	TR-4-A	TM-4	T-1209	TR-4	T-1210	TR-4-A	TM-54
-15	0.481	12.2	0.471	11.96	0.536	13.61	T-811	TR-5	T-812	TR-5-A	TM-5	T-1211	TR-5	T-1212	TR-5-A	TM-55
-16	0.495	12.5	0.485	12.32	0.550	13.97	T-813	TR-6	T-814	TR-6-A	TM-5	T-1213	TR-6	T-1214	TR-6-A	TM-55
-17	0.509	12.9	0.499	12.67	0.564	14.32	T-815	TR-6	T-816	TR-6-A	TM-6	T-1215	TR-6	T-1216	TR-6-A	TM-56
-18	0.527	13.3	0.517	13.13	0.572	14.53	T-817	TR-7	T-818	TR-7-A	TM-7	T-1217	TR-7	T-1218	TR-7-A	TM-57
-19	0.541	13.7	0.522	13.26	0.582	14.7	T-819	TR-7	T-820	TR-7-A	TM-6	T-1219	TR-7	T-1220	TR-7-A	TM-56
-20	0.555	14.1	0.536	13.6	0.596	15.1	T-819S	TR-7	T-820S	TR-7-A	TM-8	T-1219S	TR-7	T-1220S	TR-7-A	TM-58
-21	0.561	14.2	0.536	13.6	0.596	15.1	T-819S	TR-7	T-820S	TR-7-A	TM-8	T-1219S	TR-7	T-1220S	TR-7-A	TM-58
-22	0.569	14.4	0.536	13.6	0.596	15.1	T-819S	TR-7	T-820S	TR-7-A	TM-8	T-1219S	TR-7	T-1220S	TR-7-A	TM-58
3/4"-10	0.482	12.2	0.471	11.96	0.536	13.61	T-811	TR-5	T-812	TR-5-A	TM-5	T-1211	TR-5	T-1212	TR-5-A	TM-55
-11	0.510	12.9	0.499	12.67	0.564	14.32	T-815	TR-6	T-816	TR-6-A	TM-6	T-1215	TR-6	T-1216	TR-6-A	TM-56
-12	0.532	13.5	0.522	13.26	0.582	14.70	T-819	TR-7	T-820	TR-7-A	TM-6	T-1219	TR-7	T-1220	TR-7-A	TM-56
-13	0.560	14.2	0.550	13.97	0.615	15.62	T-821	TR-8	T-822	TR-8-A	TM-8	T-1221	TR-8	T-1222	TR-8-A	TM-58
-14	0.584	14.8	0.574	14.58	0.639	16.23	T-823	TR-9	T-824	TR-9-A	TM-8	T-1223	TR-8	T-1224	TR-8-A	TM-58
-15	0.606	15.3	0.596	15.14	0.661	16.79	T-825	TR-10	T-826	TR-10-A	TM-8	T-1225	TR-8	T-1226	TR-8-A	TM-58
-16	0.620	15.7	0.605	15.37	0.685	17.40	T-827	TR-10	T-828	TR-10-A	TM-9	T-1227	TR-10	T-1228	TR-10-A	TM-59



1200 Series

T1200 Series		Adjustable Range		
Roller Length	Reach	Min.	Max.	
1.1/2" (38.1mm)	Standard	1.1/2" (38.1mm)	6" (152.4 mm)	
	A	1.1/2" (38.1mm)	8" (203.1 mm)	
	B	1.1/2" (38.1mm)	10" (253.8 mm)	
2.1/4" (57.1 mm)	Standard	2.1/4" (57.1mm)	1.1/2" (38.1 mm)	
	A	2.1/4" (57.1mm)	8.3/4" (222.1 mm)	
	B	2.1/4" (57.1mm)	10.3/4 (323.6 mm)	

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



Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models	
							1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			
							Expander	Roll Set	Expander	Roll Set		Expander	Roll Set	Expander	Roll Set		
	inch	mm	inch	mm	inch	mm	Model	Model	Model	Model		Model	Model	Model	Model		
3/4"-17	0.634	16.1	0.619	15.72	0.699	17.75	T-829	TR-11	T-830	TR-11-A	TM-9	T-1229	TR-11	T-1230	TR-11-A	TM-59	
	-18	0.652	16.5	0.619	15.72	0.699	17.75	T-829	TR-11	T-830	TR-11-A	TM-9	T-1229	TR-11	T-1230	TR-11-A	TM-59
	-19	0.666	16.9	0.642	16.3	0.722	18.3	T-831	TR-12	T-832	TR-12-A	TM-9	T-1231	TR-12	T-1232	TR-12-A	TM-59
	-20	0.680	17.2	0.642	16.3	0.722	18.3	T-831	TR-12	T-832	TR-12-A	TM-9	T-1231	TR-12	T-1232	TR-12-A	TM-59
	-21	0.686	17.4	0.642	16.3	0.722	18.3	T-831	TR-12	T-832	TR-12-A	TM-9	T-1231	TR-12	T-1232	TR-12-A	TM-59
	-22	0.694	17.6	0.642	16.3	0.722	18.3	T-831	TR-12	T-832	TR-12-A	TM-9	T-1231	TR-12	T-1232	TR-12-A	TM-59
7/8"-10	0.607	15.4	0.596	15.1	0.661	16.7	T-825	TR-10	T-826	TR-10-A	TM-8	T-1225	TR-10	T-1226	TR-10-A	TM-58	
	-11	0.635	16.1	0.619	15.7	0.699	17.7	T-829	TR-11	T-830	TR-11-A	TM-9	T-1229	TR-11	T-1230	TR-11-A	TM-59
	-12	0.657	16.6	0.642	16.3	0.722	18.3	T-831	TR-12	T-832	TR-12-A	TM-9	T-1231	TR-12	T-1232	TR-12-A	TM-59
	-13	0.685	17.4	0.670	17.0	0.750	19.0	T-833	TR-13	T-834	TR-13-A	TM-10	T-1233	TR-13	T-1234	TR-13-A	TM-60
	-14	0.709	18.0	0.685	17.5	0.774	19.6	T-835	TR-14	T-836	TR-14-A	TM-11	T-1235	TR-14	T-1236	TR-14-A	TM-61
	-15	0.731	18.5	0.712	18.0	0.801	20.3	T-837	TR-15	T-838	TR-15-A	TM-11	T-1237	TR-15	T-1238	TR-15-A	TM-61
	-16	0.745	18.9	0.726	18.4	0.815	20.7	T-839	TR-15	T-840	TR-15-A	TM-12	T-1239	TR-15	T-1240	TR-15-A	TM-62
	-17	0.759	19.2	0.740	18.8	0.829	21.0	T-843	TR-16	T-844	TR-16-A	TM-12	T-1243	TR-16	T-1244	TR-16-A	TM-62
	-18	0.777	19.7	0.740	18.8	0.829	21.0	T-843	TR-16	T-844	TR-16-A	TM-12	T-1243	TR-16	T-1244	TR-16-A	TM-62
1"-8	0.670	17.0	0.655	16.6	0.735	18.6	T-841	TR-13	T-842	TR-13-A	TM-9	T-1241	TR-13	T-1242	TR-13-A	TM-59	
	-9	0.704	17.8	0.685	17.4	0.774	19.6	T-835	TR-14	T-836	TR-14-A	TM-11	T-1235	TR-14	T-1236	TR-14-A	TM-61
	-10	0.732	18.5	0.712	18.0	0.801	20.3	T-837	TR-15	T-838	TR-15-A	TM-11	T-1237	TR-15	T-1238	TR-15-A	TM-61
	-11	0.760	19.3	0.740	18.8	0.829	21.0	T-843	TR-16	T-844	TR-16-A	TM-12	T-1243	TR-16	T-1244	TR-16-A	TM-62
	-12	0.782	19.8	0.763	19.3	0.852	21.6	T-845	TR-17	T-846	TR-17-A	TM-12	T-1245	TR-17	T-1246	TR-17-A	TM-62
	-13	0.810	20.5	0.791	20.0	0.880	22.3	T-847	TR-18	T-848	TR-18-A	TM-12	T-1247	TR-18	T-1248	TR-18-A	TM-62
	-14	0.834	21.1	0.810	20.5	0.909	23.0	T-849	TR-18	T-850	TR-18-A	TM-13	T-1249	TR-18	T-1250	TR-18-A	TM-63
	-15	0.856	21.7	0.837	21.2	0.936	23.7	T-851	TR-19	T-852	TR-19-A	TM-13	T-1251	TR-19	T-1252	TR-19-A	TM-63
	-16	0.870	22.1	0.837	21.2	0.936	23.7	T-851	TR-19	T-852	TR-19-A	TM-13	T-1251	TR-19	T-1252	TR-19-A	TM-63

Tube Expander for Heat Exchanger and Condenser

T - 800 / 1200 Series - 3 Rollers



800 Series

T800 Series	Adjustable Range	
	Min.	Max.
1.1/2" (38.1mm)	1/2" (12.7mm)	1.1/2" (38.1mm)
2.1/4" (38.1mm)	1.1/4" (12.7mm)	2.1/4" (57.1 mm)

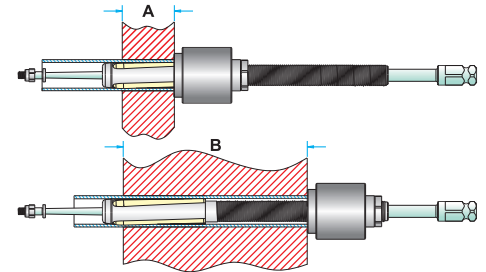
Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models
							1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls		
	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set								
	Model	Model	Model	Model	Model	Model	Model	Model	Model							
-17	0.884	22.4	0.865	21.9	0.964	24.4	T-855	TR-21	T-856	TR-21-A	TM-13	T-1255	TR-21	T-1256	TR-21-A	TM-63
-18	0.902	22.9	0.865	21.9	0.964	24.4	T-855	TR-21	T-856	TR-21-A	TM-13	T-1255	TR-21	T-1256	TR-21-A	TM-63
-19	0.916	23.2	0.865	21.9	0.964	24.4	T-855	TR-21	T-856	TR-21-A	TM-13	T-1255	TR-21	T-1256	TR-21-A	TM-63
-20	0.930	23.6	0.865	21.9	0.964	24.4	T-855	TR-21	T-856	TR-21-A	TM-13	T-1255	TR-21	T-1256	TR-21-A	TM-63
1.1/8"-8	0.795	20.1	0.776	19.7	0.875	22.2	T-853	TR-20	T-854	TR-20-A	TM-13	T-1253	TR-20	T-1254	TR-21-A	TM-63
-9	0.829	21.0	0.810	20.5	0.909	23.0	T-849	TR-18	T-850	TR-18-A	TM-13	T-1249	TR-18	T-1250	TR-18-A	TM-63
-10	0.857	21.7	0.837	21.2	0.936	23.7	T-851	TR-19	T-852	TR-19-A	TM-13	T-1251	TR-19	T-1252	TR-19-A	TM-63
-11	0.885	22.4	0.865	21.9	0.964	24.4	T-855	TR-21	T-856	TR-21-A	TM-13	T-1255	TR-21	T-1256	TR-21-A	TM-63
-12	0.907	23.0	0.883	22.4	0.982	24.9	T-857	TR-21	T-858	TR-21-A	TM-14	T-1257	TR-21	T-1258	TR-21-A	TM-64
-13	0.935	23.7	0.916	23.2	1.015	25.7	T-859	TR-22	T-860	TR-22-A	TM-14	T-1259	TR-22	T-1260	TR-22-A	TM-64
-14	0.959	24.3	0.935	23.7	1.044	26.5	T-861	TR-23	T-862	TR-23-A	TM-15	T-1261	TR-23	T-1262	TR-23-A	TM-65
-15	0.981	24.9	0.962	24.4	1.071	27.2	T-863	TR-24	T-864	TR-24-A	TM-15	T-1263	TR-24	T-1264	TR-24-A	TM-65
-16	0.995	25.2	0.962	24.4	1.071	27.2	T-863	TR-24	T-864	TR-24-A	TM-15	T-1263	TR-24	T-1264	TR-24-A	TM-65
-17	1.009	25.6	0.990	25.1	1.099	27.9	T-867	TR-26	T-868	TR-26-A	TM-16	T-1267	TR-26	T-1268	TR-26-A	TM-66
-18	1.027	26.0	0.990	25.1	1.099	27.9	T-867	TR-26	T-868	TR-26-A	TM-16	T-1267	TR-26	T-1268	TR-26-A	TM-66
1.1/4"-8	0.920	23.3	0.901	22.8	1.010	25.6	T-865	TR-25	T-866	TR-25-A	TM-15	T-1265	TR-25	T-1266	TR-25-A	TM-65
-9	0.954	24.2	0.935	23.7	1.044	26.5	T-861	TR-23	T-862	TR-23-A	TM-15	T-1261	TR-23	T-1262	TR-23-A	TM-65
-10	0.982	24.9	0.962	24.4	1.071	27.2	T-863	TR-24	T-864	TR-24-A	TM-15	T-1263	TR-24	T-1264	TR-24-A	TM-65
-11	1.010	25.6	0.990	25.1	1.099	27.9	T-867	TR-26	T-868	TR-26-A	TM-16	T-1267	TR-26	T-1268	TR-26-A	TM-66
-12	1.032	26.2	1.013	25.7	1.122	28.5	T-869	TR-27	T-870	TR-27-A	TM-16	T-1269	TR-27	T-1270	TR-27-A	TM-66
-13	1.060	26.9	1.041	26.4	1.150	29.2	T-871	TR-28	T-872	TR-28-A	TM-17	T-1271	TR-28	T-1272	TR-28-A	TM-67
-14	1.084	27.5	1.060	26.9	1.169	29.6	T-873	TR-29	T-874	TR-29-A	TM-17	T-1273	TR-29	T-1274	TR-29-A	TM-67
-15	1.106	28.0	1.087	27.6	1.196	30.3	T-875	TR-30	T-876	TR-30-A	TM-17	T-1275	TR-30	T-1276	TR-30-A	TM-67
-16	1.120	28.4	1.087	27.6	1.196	30.3	T-875	TR-30	T-876	TR-30-A	TM-17	T-1275	TR-30	T-1276	TR-30-A	TM-67



1200 Series

T1200 Series		Adjustable Range	
Roller Length	Reach	Min.	Max.
1.1/2" (38.1mm)	Standard	1.1/2" (38.1mm)	6" (152.4 mm)
	A	1.1/2" (38.1mm)	8" (203.1 mm)
	B	1.1/2" (38.1mm)	10" (253.8 mm)
2.1/4" (57.1 mm)	Standard	2.1/4" (57.1mm)	1.1/2" (38.1 mm)
	A	2.1/4" (57.1mm)	8.3/4" (222.1 mm)
	B	2.1/4" (57.1mm)	10.3/4 (323.6 mm)

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



Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models
							1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls		
	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set	Expander	Roll Set								
	Model	Model	Model	Model	Model	Model	Model	Model								
1.1/4"-17	1.134	28.8	1.115	28.3	1.224	31.0	T-879	TR-30	T-880	TR-30-A	TM-18	T-1279	TR-30	T-1280	TR-30-A	TM-68
-18	1.152	29.2	1.115	28.3	1.224	31.0	T-879	TR-30	T-880	TR-30-A	TM-18	T-1279	TR-30	T-1280	TR-30-A	TM-68
1.3/8"-8	1.045	26.5	1.026	26.0	1.135	28.8	T-877	TR-31	T-878	TR-31-A	TM-17	T-1277	TR-30	T-1278	TR-31-A	TM-67
-9	1.079	27.4	1.060	26.9	1.169	29.6	T-873	TR-29	T-874	TR-29-A	TM-17	T-1273	TR-29	T-1274	TR-29-A	TM-67
-10	1.107	28.1	1.087	27.6	1.196	30.3	T-875	TR-30	T-876	TR-30-A	TM-17	T-1275	TR-30	T-1276	TR-30-A	TM-67
-11	1.135	28.8	1.115	28.3	1.224	31.0	T-879	TR-30	T-880	TR-30-A	TM-18	T-1279	TR-30	T-1280	TR-30-A	TM-68
-12	1.157	29.3	1.133	28.7	1.242	31.5	T-881	TR-32	T-882	TR-32-A	TM-18	T-1281	TR-32	T-1282	TR-32-A	TM-68
-13	1.185	30.1	1.160	29.4	1.275	32.3	T-883	TR-33	T-884	TR-33-A	TM-19	T-1283	TR-33	T-1284	TR-33-A	TM-69
-14	1.209	30.7	1.179	29.9	1.294	32.8	T-885	TR-34	T-886	TR-34-A	TM-20	T-1285	TR-34	T-1286	TR-34-A	TM-70
-15	1.231	31.2	1.206	30.6	1.321	33.5	T-887	TR-35	T-888	TR-35-A	TM-20	T-1287	TR-35	T-1288	TR-35-A	TM-70
-16	1.245	31.6	1.206	30.6	1.321	33.5	T-887	TR-35	T-888	TR-35-A	TM-20	T-1287	TR-35	T-1288	TR-35-A	TM-70
1.1/2"-8	1.170	29.7	1.145	29.0	1.260	32.0	T-889	TR-34	T-890	TR-34-A	TM-19	T-1289	TR-34	T-1290	TR-34-A	TM-69
-9	1.204	30.5	1.177	29.9	1.294	32.8	T-885	TR-34	T-886	TR-34-A	TM-20	T-1285	TR-34	T-1286	TR-34-A	TM-70
-10	1.232	31.2	1.206	30.6	1.321	33.5	T-887	TR-35	T-888	TR-35-A	TM-20	T-1287	TR-35	T-1288	TR-35-A	TM-70
-11	1.260	32.0	1.235	31.3	1.350	34.2	T-891	TR-36	T-892	TR-36-A	TM-20	T-1291	TR-36	T-1292	TR-36-A	TM-70
-12	1.282	32.5	1.257	31.9	1.372	34.8	T-893	TR-37	T-894	TR-37-A	TM-20	T-1293	TR-37	T-1294	TR-37-A	TM-70
-13	1.310	33.2	1.285	32.6	1.400	35.5	T-895	TR-37	T-896	TR-37-A	TM-21	T-1295	TR-37	T-1296	TR-37-A	TM-71
-14	1.334	33.8	1.285	32.6	1.400	35.5	T-895	TR-37	T-896	TR-37-A	TM-21	T-1295	TR-37	T-1296	TR-37-A	TM-71
-15	1.356	34.4	1.331	33.8	1.446	36.7	T-897	TR-38	T-898	TR-38-A	TM-21	T-1297	TR-37	T-1298	TR-37-A	TM-71
-16	1.370	34.8	1.331	33.8	1.446	36.7	T-897	TR-38	T-898	TR-38-A	TM-21	T-1297	TR-37	T-1298	TR-37-A	TM-71
-17	1.384	35.1	1.331	33.8	1.472	37.3	T-899	TR-38	T-900	TR-38-A	TM-22	T-1299	TR-38	T-1300	TR-38-A	TM-72
-18	1.402	35.6	1.331	33.8	1.472	37.3	T-899	TR-38	T-900	TR-38-A	TM-22	T-1299	TR-38	T-1300	TR-38-A	TM-72
-19	1.416	35.9	1.331	33.8	1.472	37.3	T-899	TR-38	T-900	TR-38-A	TM-22	T-1299	TR-38	T-1300	TR-38-A	TM-72
-20	1.430	36.3	1.331	33.8	1.472	37.3	T-899	TR-38	T-900	TR-38-A	TM-22	T-1299	TR-38	T-1300	TR-38-A	TM-72

Tube Expander for Heat Exchanger and Condenser

T - 800 / 1200 Series - 5 Rollers

[For Thin Wall Tubes]



800 Series

T800 Series	Adjustable Range	
	Min.	Max.
Roller Length		
1.1/2" (38.1mm)	1/2" (12.7mm)	1.1/2" (38.1mm)
2.1/4" (57.1mm)	1.1/4" (31.7mm)	2.1/4" (57.1 mm)

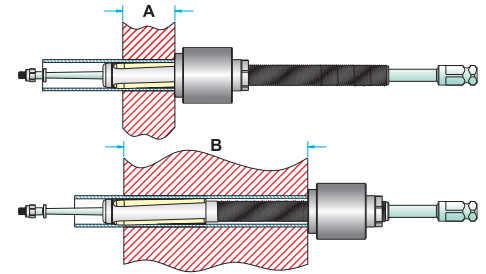
Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models
							1 1/2" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 1/2" (38 mm) rolls		2 1/4" (57.1 mm) rolls		
							Expander	Roll Set	Expander	Roll Set		Expander	Roll Set	Expander	Roll Set	
							Model	Model	Model	Model		Model	Model	Model	Model	
5/8"-17	0.509	12.9	0.499	12.7	0.564	14.3	T-815-5	TR-4	T-816-5	TR-4A	TM-816	-	-	-	-	-
-18	0.527	13.4	0.517	13.1	0.576	14.6	T-817-5	TR-4	T-818-5	TR-4A	TM-9	-	-	-	-	-
-19	0.541	13.7	0.522	13.3	0.582	14.8	T-819-5	TR-4	T-820-5	TR-4A	TM-820	-	-	-	-	-
-20	0.555	14.1	0.536	13.6	0.596	15.1	T-819S-5	TR-4	T-820S-5	TR-4A	TM-820S	-	-	-	-	-
-21	0.561	14.2	0.536	13.6	0.596	15.1	T-819S-5	TR-4	T-820S-5	TR-4A	TM-820S	-	-	-	-	-
-22	0.569	14.5	0.536	13.6	0.596	15.1	T-819S-5	TR-4	T-820S-5	TR-4A	TM-820S	-	-	-	-	-
3/4"-13	0.56	14.2	0.55	14.0	0.615	15.6	T-821-5	TR-5	T-822-5	TR-5A	TM-822	-	-	-	-	-
-14	0.584	14.8	0.574	14.6	0.629	16.0	T-823-5	TR-6	T-824-5	TR-6A	TM-824	T-1223-5	TR-6	T-1224-5	TR-6-A	TM-1224
-15	0.606	15.4	0.59	15.0	0.661	16.8	T-825-5	TR-7	T-826-5	TR-7A	TM-826	-	-	-	-	-
-16	0.620	15.7	0.605	15.4	0.68	17.3	T-827-5	TR-7	T-828-5	TR-7A	TM-13	T-1227-5	TR-7	T1228-5	TR-7-A	TM-63
-17-18	0.634	16.1	0.619	15.7	0.699	17.8	T-829-5	TR-7	T-830-5	TR-7A	TM-830	T-1229-5	TR-7	T1230-5	TR-7-A	TM-1230
-19	0.666	16.9	0.642	16.3	0.729	18.5	T-831-5	TR-9	T-832-5	TR-9A	TM-13	T1231-5	TR-7	T1232-5	TR-7-A	TM-63
-20	0.680	17.3	0.642	16.3	0.729	18.5	T-831-5	TR-9	T-832-5	TR-9A	TM-13	T1231-5	TR-7	T1232-5	TR-7-A	TM-63
-21	0.686	17.4	0.642	16.3	0.729	18.5	T-831-5	TR-9	T-832-5	TR-9A	TM-13	T1231-5	TR-7	T1232-5	TR-7-A	TM-63
-22	0.694	17.6	0.642	16.3	0.729	18.5	T-831-5	TR-9	T-832-5	TR-9A	TM-13	T1231-5	TR-7	T1232-5	TR-7-A	TM-63
7/8"-13	0.685	17.4	0.670	17.0	0.747	19.0	T-833-5	TR-9	T-834-5	TR-9A	TM-14	-	-	-	-	-
-14	0.709	18.0	0.685	17.4	0.750	19.1	T-835-5	TR-10	T-836-5	TR-10A	TM-15	-	-	-	-	-
-16	0.745	18.9	0.726	18.4	0.800	20.3	T-839-5	TR-11	T-840-5	TR-11A	TM-840	-	-	-	-	-
-17-18	0.759	19.3	0.740	18.8	0.824	20.9	T-843-5	TR-11	T-844-5	TR-11A	TM-17	-	-	-	-	-
-19	0.791	20.1	0.763	19.4	0.851	21.6	T-845-5	TR-11	T-846-5	TR-11A	TM-18	-	-	-	-	-
-20	0.805	20.4	0.763	19.4	0.851	21.6	T-845-5	TR-11	T-846-5	TR-11A	TM-18	-	-	-	-	-
-21	0.811	20.6	0.763	19.4	0.851	21.6	T-845-5	TR-11	T-846-5	TR-11A	TM-18	-	-	-	-	-
-22	0.819	20.8	0.763	19.4	0.851	21.6	T-845-5	TR-11	T-846-5	TR-11A	TM-18	-	-	-	-	-



1200 Series

T1200 Series		Adjustable Range		
Roller Length		Reach	Min.	Max.
1.1/2" (38.1mm)	Standard		1.1/2" (38.1mm)	6" (152.4 mm)
	A		1.1/2" (38.1mm)	8" (203.1 mm)
	B		1.1/2" (38.1mm)	10" (253.8 mm)
2.1/4" (57.1 mm)	Standard		2.1/4" (57.1mm)	1.1/2" (38.1 mm)
	A		2.1/4" (57.1mm)	8.3/4" (222.1 mm)
	B		2.1/4" (57.1mm)	10.3/4 (323.6 mm)

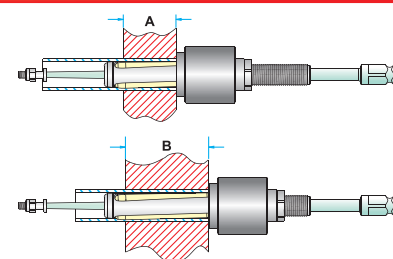
Longer reaches available upon request in 2 inch (50.8 mm) increments



Tube O.D. BWG	Tube I.D.		Min I.D. Tube Tool Enters		Max Tool Expansion		800 Series Expander With				Mandrel Models	1200 Series Expander With				Mandrel Models
							1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls			1 ½" (38 mm) rolls		2 1/4" (57.1 mm) rolls		
							Expander	Roll Set	Expander	Roll Set		Expander	Roll Set	Expander	Roll Set	
							Model	Model	Model	Model		Model	Model	Model	Model	
1"-12	0.782	19.9	0.763	19.4	0.852	21.6	T-845-5	TR-11	T-846-5	TR-11A	TM-18	-	-	-	-	-
-13	0.810	20.6	0.791	20.1	0.880	22.4	T-847-5	TR-13	T-848-5	TR-13A	TM-18	-	-	-	-	-
-14	0.834	21.2	0.810	20.6	0.879	22.3	T-849-5	TR-12	T-850-5	TR-12A	TM-850	T-1249-5	TR-12	T-1250-5	TR-12A	TM-1250
-15-16	0.856	21.7	0.837	21.3	0.936	23.8	T-851-5	TR-13	T-852-5	TR-13A	TM-852	T-1251-5	TR-13	T-1252-5	TR-13A	TM-1252
-17	0.884	22.5	0.865	22.0	0.965	24.5	T-855-5	TR-13	T-856-5	TR-13A	TM-856	T-1255-5	TR-13	T-1256-5	TR-13A	TM-1256
-18	0.902	22.9	0.865	22.0	0.965	24.5	T-855-5	TR-13	T-856-5	TR-13A	TM-856	T-1255-5	TR-13	T-1256-5	TR-13A	TM-1256
-19	0.916	23.3	0.865	22.0	0.965	24.5	T-855-5	TR-13	T-856-5	TR-13A	TM-856	T-1255-5	TR-13	T-1256-5	TR-13A	TM-1256
-20	0.930	23.6	0.865	22.0	0.965	24.5	T-855-5	TR-13	T-856-5	TR-13A	TM-856	T-1255-5	TR-13	T-1256-5	TR-13A	TM-1256
1.1/8"-12	0.907	23.0	0.883	22.4	0.997	25.3	T-857-5	TR-15	T-858-5	TR-15A	TM-21	T-1257-5	TR-15	T-1258-5	TR-15A	TM-71
-13	0.935	23.7	0.916	23.3	1.000	25.4	T-859-5	TR-16	T-860-5	TR-16A	TM-860	-	-	-	-	-
-14	0.959	24.1	0.935	23.7	1.043	26.5	T-861-5	TR-17	T-862-5	TR-17A	TM-862	-	-	-	-	-
1.1/4"-15	1.106	28.1	1.087	27.6	1.196	30.4	T-875-5	TR-21	T-876-5	TR-21A	TM-876	-	-	-	-	-
-16	1.106	28.1	1.087	27.6	1.196	30.4	T-875-5	TR-21	T-876-5	TR-21A	TM-876	-	-	-	-	-
-17	1.134	28.8	1.115	28.3	1.231	31.3	T-879-5	TR-21	T-880-5	TR-21A	TM-880	-	-	-	-	-
-18	1.152	29.3	1.115	28.3	1.231	31.3	T-879-5	TR-21	T-880-5	TR-21A	TM-880	-	-	-	-	-
-20	1.18	29.6	1.115	28.3	1.231	31.3	T-879-5	TR-21	T-880-5	TR-21A	TM-880	-	-	-	-	-
-21	1.186	30.1	1.115	28.3	1.231	31.3	T-879-5	TR-21	T-880-5	TR-21A	TM-880	-	-	-	-	-
-22	1.194	30.3	1.115	28.3	1.231	31.3	T-879-5	TR-21	T-880-5	TR-21A	TM-880	-	-	-	-	-
1.3/8"-12	1.154	29.3	1.133	28.8	1.242	31.5	T-881-5	TR-21	T-882-5	TR-21A	TM-882	-	-	-	-	-
-14	1.209	30.7	1.179	29.9	1.296	32.9	T-885-5	TR-23	T-886-5	TR-23A	TM-882	-	-	-	-	-
1.12"-17	1.384	35.2	1.331	33.8	1.489	37.8	T-899-5	TR-29	T-900-5	TR-29A	TM-900	T-1299-5	TR-29	T-1300-5	TR-29A	TM-1299
-18	1.384	35.2	1.331	33.8	1.489	37.8	T-899-5	TR-29	T-900-5	TR-29A	TM-900	T-1299-5	TR-29	T-1300-5	TR-29A	TM-1299
-19-20	1.416	36.0	1.331	33.8	1.489	37.8	T-899-5	TR-29	T-900-5	TR-29A	TM-900	T-1299-5	TR-29	T-1300-5	TR-29A	TM-1299
-21-22	1.436	36.5	1.331	33.8	1.489	37.8	T-899-5	TR-29	T-900-5	TR-29A	TM-900	T-1299-5	TR-29	T-1300-5	TR-29A	TM-1299

Heat Exchanger and Boiler Tube Expander

'T-8012' Series



- ❑ More durable components
- ❑ Extended service life
- ❑ In built thrust bearing
- ❑ Heavy duty application

Tube Expanders fitted with Roller Length		For Tube Sheet Adjustment Range	
		Minimum "A"	Maximum "B"
2.1/4" (57.15 mm)	STD Reach	1.1/2" (38.10 mm)	4" (101.40 mm)
	"6" Reach	1.1/2" (38.10 mm)	6" (152.40 mm)
	"8" Reach	1.1/2" (38.10 mm)	8" (203.20 mm)



Tube I.D. inch		Tube I.D.		Min. I.D.		Max Expansion		Expander with 2.1/4" (57.15 mm) long rollers		
		inch	mm	inch	mm	inch	mm	Model No.	Mandrel	Rollers Set.
1.3/4" (44.45)	8	1.420	36.1	1.368	34.7	1.550	39.3	T 8012-1.3/4-8	TM-90	TR-33-A
	10	1.482	37.6	1.420	36.0	1.607	40.8	T 8012-1.3/4-8		TR-37-A
	11	1.510	38.3	1.454	36.9	1.635	41.5	T 8012-1.3/4-11		TR-42
	12	1.532	38.9	1.482	37.6	1.657	42.0	T 8012-1.3/4-12		TR-44
	13	1.560	39.6	1.510	38.3	1.685	42.7	T 8012-1.3/4-13		TR-46
	14	1.584	40.2	1.532	38.9	1.709	43.4	T 8012-1.3/4-14		TR-48
2" (50.80)	8	1.670	42.4	1.595	40.5	1.795	45.6	T 8012-2-8	TM-91	TR-48
	10	1.732	43.9	1.640	41.6	1.857	47.1	T 8012-2-10		TR-50
	11	1.760	44.7	1.670	42.4	1.885	47.8	T 8012-2-11		TR-52
	12	1.782	45.2	1.704	43.4	1.970	48.4	T 8012-2-12		TR-54
	13	1.810	45.9	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
	14	1.834	46.5	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
	15	1.856	47.1	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
	16	1.870	47.4	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
	17	1.884	47.9	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
	18	1.902	48.3	1.732	43.9	1.956	49.6	T 8012-2-13-18		TR-56
2.1/4" (57.15)	10	1.982	50.3	1.890	48.0	2.107	53.5	T 8012-2.1/4-10	TM-92	TR-56
	11	2.010	51.0	1.920	48.7	2.137	54.2	T 8012-2.1/4-11		TR-58
	12	2.032	51.6	1.954	49.6	2.157	54.7	T 8012-2.1/4-12		TR-60
	13	2.060	52.3	1.982	50.3	2.185	55.4	T 8012-2.1/4-13-16		TR-62
	14	2.084	52.9	1.982	50.3	2.185	55.4	T 8012-2.1/4-13-16		TR-62
	15	2.106	53.4	1.982	50.3	2.185	55.4	T 8012-2.1/4-13-16		TR-62
	16	2.120	53.8	1.982	50.3	2.185	55.4	T 8012-2.1/4-13-16		TR-62
2.1/2" (63.50)	10	2.232	56.6	2.140	54.3	2.407	61.1	T 8012-2.1/2-10-12	TM-93	TR-64
	11	2.260	57.4	2.140	54.3	2.407	61.1	T 8012-2.1/2-10-12		TR-64
	12	2.282	57.9	2.140	54.3	2.407	61.1	T 8012-2.1/2-10-12		TR-64
2.1/2" (63.50)	13	2.310	58.6	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18	TM-94	TR-64
	14	2.334	59.2	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18		TR-64
	15	2.356	59.8	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18		TR-64
	16	2.370	60.1	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18		TR-64
	17	2.384	60.6	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18		TR-64
	18	2.402	61.0	2.232	56.6	2.450	62.2	T 8012-2.1/2-13-18		TR-64

T-8012 expanders can be supplied with 4 and 5 rollers

Tube O.D. inch	Thk bwg	Tube I.D.		Min I.D.		Max Expansion		Expander with 2.1/4" (57.15 mm) long rollers		
		inch	mm	inch	mm	inch	mm	Model No.	Mandrel	Rollers Set.
2.3/4 (69.85)	10	2.482	63.0	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16	TM-95	TR-66
	11	2.510	63.7	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
	12	2.532	64.3	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
	13	2.560	65.0	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
	14	2.584	65.6	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
	15	2.606	66.1	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
	16	2.620	66.6	2.390	60.7	2.702	68.6	T8012-2.3/4-10-16		TR-66
3" (76.20)	8	2.670	67.8	2.560	65.0	2.829	71.8	T8012-3-8-9	TM-96	TR-67
	9	2.701	68.6	2.560	65.0	2.829	71.8	T8012-3-8-9		TR-67
	10	2.732	69.3	2.640	67.0	2.952	74.9	T8012-3-10-18	TM-97	TR-67
	11	2.760	70.1	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	12	2.782	70.6	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	13	2.810	71.3	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	14	2.834	71.9	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	15	2.856	72.5	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	16	2.870	72.8	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	17	2.884	73.3	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
	18	2.902	73.7	2.640	67.0	2.952	74.9	T8012-3-10-18		TR-67
3.1/2" (88.90)	13	3.311	84.1	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18	TM-98	TR-70
	14	3.334	84.7	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18		TR-70
	15	3.354	85.2	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18		TR-70
	16	3.370	85.6	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18		TR-70
	17	3.385	86.0	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18		TR-70
	18	3.401	86.4	3.190	81.0	3.464	88.0	T8012-3.1/2-13-18		TR-70
4" (100.60)	3	3.480	88.4	3.425	87.0	3.780	96.0	T8012-3.1/2-3-4	TM-99	TR-71
	4	3.527	89.6	3.425	87.0	3.780	96.0	T8012-3.1/2-3-4		TR-71
	8	3.670	93.2	3.582	91.0	3.940	100.0	T8012-3.1/2-8-9		TR-71
	9	3.704	94.1	3.582	91.0	3.940	100.0	T8012-3.1/2-8-9		TR-71
	10	3.732	94.8	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
	11	3.760	95.5	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
	12	3.783	96.1	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
	13	3.811	96.8	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
	14	3.834	97.4	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
	16	3.870	98.3	3.661	93.0	3.960	100.6	T8012-4-10-16		TR-72
4.1/2" (114.30)	3	3.980	101.1	3.940	100.0	4.291	109.0	T8012-4.1/2-3-4	TM-100	TR-73
	4	4.030	102.3	3.940	100.0	4.291	109.0	T8012-4.1/2-3-4		TR-73
	8	4.170	105.9	4.020	102.0	4.370	111.0	T8012-4.1/2-8-9		TR-74
	9	4.204	106.8	4.020	102.0	4.370	111.0	T8012-4.1/2-8-9		TR-74
	10	4.232	107.5	4.100	104.0	4.450	113.0	T8012-4.1/2-10-16		TR-74
	12	4.283	108.8	4.100	104.0	4.450	113.0	T8012-4.1/2-10-16		TR-74
	16	4.370	111.0	4.100	104.0	4.450	113.0	T8012-4.1/2-10-16		TR-74
5" (127.0)	3	4.480	113.8	4.410	112.0	4.763	121.0	T8012-5-3-4	TM-101	TR-76
	4	4.527	115.0	4.410	112.0	4.763	121.0	T8012-5-3-4		TR-76
	8	4.670	118.6	4.566	116.0	4.921	125.0	T8012-5-8-9		TR-77
	9	4.704	119.5	4.566	116.0	4.921	125.0	T8012-5-8-9		TR-77
	10	4.732	120.2	4.606	117.0	4.960	126.0	T8012-5-10-16		TR-78
	11	4.763	121.0	4.606	117.0	4.960	126.0	T8012-5-10-16		TR-78
	12	4.783	121.5	4.606	117.0	4.960	126.0	T8012-5-10-16		TR-78
	14	4.834	122.8	4.606	117.0	4.960	126.0	T8012-5-10-16		TR-78
	16	4.870	123.7	4.606	117.0	4.960	126.0	T8012-5-10-16		TR-78