

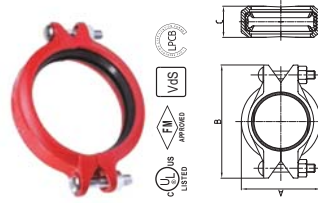
## Ductile Iron Grooved Fittings and Couplings

Material: ASTM A536, GRADE 65-45-12, QT450-10  
 Threads: ASME B1.20.1, ISO 7-1, GB 7306  
 Size Available: 1"-24"

Surface Treatment:  
 P: Painted E: Electroplated  
 B: Black S: Epoxy G: Hot-dip Galvanized

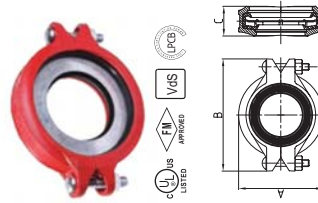
 <b>1N</b> Standard Flexible Coupling	 <b>1N</b> Standard Flexible Coupling	 <b>1N</b> Standard Reducing Flexible Coupling	 <b>1NS</b> Light-duty Flexible Coupling	 <b>1NH</b> Heavy-duty Flexible Coupling	 <b>3L</b> U-Bolt Mechanical Tee	 <b>3G</b> Mechanical Tee Grooved Outlet	 <b>3GS</b> Light-duty Mechanical Tee Grooved Outlet	 <b>3J</b> Mechanical Tee Threaded Outlet	 <b>3JS</b> Light-duty Mechanical Tee Threaded Outlet	 <b>90</b> 90° Elbow	 <b>90R</b> 90° Reducing Elbow	 <b>90S</b> Light-duty 90° Elbow	 <b>105</b> 11.25° Elbow	 <b>110</b> 22.5° Elbow	 <b>230N</b> Grooved Eccentric Reducer with Female Thread	 <b>240</b> Grooved Concentric Reducer with Female Thread	 <b>240N</b> Grooved Concentric Reducer with Female Thread	 <b>240W</b> Grooved Concentric Reducer with Male Thread	 <b>300</b> Cap	 <b>120</b> 45° Elbow	 <b>130</b> Tee	 <b>130S</b> Light-duty Tee	 <b>130R</b> Reducing Tee	 <b>130R</b> Reducing Tee	 <b>300PX</b> Cap with Eccentric Hole	 <b>321</b> Grooved Flange	 <b>321G</b> Adaptor Flange	 <b>300</b> Cap with Concentric Hole	 <b>131R</b> Reducing Tee with Female Thread	 <b>180</b> Cross	 <b>180R</b> Reducing Cross	 <b>181</b> Reducing Cross with Female Thread	 <b>Red</b>	 <b>Orange</b>	 <b>Galvanized</b>	 <b>White</b>	 <b>Blue</b>
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**11N**  
Standard Flexible Coupling

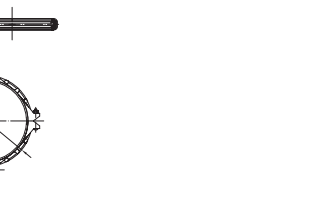


Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load KN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
25	33.7 1.327	500	3,048.0	0-1.6 0-0.06	55 2.16	92 3.62	42 1.65	UL FM V8S LFCB	
32	42.4 1.669	300	2,965.0	0-1.6 0-0.06	65 2.56	104 4.14	44 1.74	UL FM V8S LFCB	
40	48.3 1.901	300	3,868.0	0-3.2 0-0.13	70 2.75	110 4.33	44 1.74	UL FM V8S LFCB	
50	60.3 2.375	300	5,913.0	0-3.2 0-0.13	83 3.27	125 4.92	44 1.74	UL FM V8S LFCB	
65	73.0 2.875	300	8,718.0	0-3.2 0-0.13	96 3.78	143 5.63	45 1.78	UL FM LFCB UL FM V8S LFCB	
80	86.3 3.350	300	9,421.0	0-3.2 0-0.13	100 3.94	145 5.71	45 1.78	UL FM V8S LFCB	
100	108.0 4.250	500	12,828.5	0-3.2 0-0.13	115 4.53	160 6.30	45 1.78	UL FM V8S LFCB	
125	133.0 5.250	500	16,640.0	0-3.2 0-0.13	138 5.43	190 7.48	50 1.97	UL FM LFCB UL FM V8S LFCB	
150	159.0 6.250	500	21,247.0	0-3.2 0-0.13	145 5.71	198 7.80	50 1.97	UL FM V8S LFCB	
175	188.3 7.410	500	28,764.0	0-3.2 0-0.13	162 6.38	225 8.86	51 2.01	UL FM LFCB UL FM V8S LFCB	
200	219.1 8.625	500	41,932.0	0-3.2 0-0.13	170 6.69	232 9.13	51 2.01	UL FM V8S LFCB	
250	273.0 10.750	500	58,672.0	0-3.2 0-0.13	200 7.87	265 10.43	52 2.05	UL FM V8S LFCB	
300	323.9 12.750	500	80,467.0	0-3.2 0-0.13	220 8.66	295 11.61	52 2.05	UL FM V8S LFCB	
350	355.6 14.000	500	107,632.0	0-3.2 0-0.13	237 9.33	310 12.17	52 2.05	UL FM V8S LFCB	
400	406.4 16.000	500	143,840.0	0-3.2 0-0.13	258 10.16	330 13.00	52 2.05	UL FM V8S LFCB	
450	457.2 18.000	500	185,440.0	0-3.2 0-0.13	278 10.94	350 13.78	52 2.05	UL FM V8S LFCB	
500	508.0 20.000	500	242,240.0	0-3.2 0-0.13	298 11.73	370 14.57	52 2.05	UL FM V8S LFCB	
600	609.6 24.000	500	328,640.0	0-3.2 0-0.13	330 13.00	406 16.00	52 2.05	UL FM V8S LFCB	
800	812.8 32.000	500	442,240.0	0-3.2 0-0.13	378 14.88	465 18.31	52 2.05	UL FM V8S LFCB	
1000	1016.0 40.000	500	588,640.0	0-3.2 0-0.13	402 15.83	492 19.37	52 2.05	UL FM V8S LFCB	
1200	1219.2 48.000	500	798,640.0	0-3.2 0-0.13	432 16.99	522 20.55	52 2.05	UL FM V8S LFCB	
1400	1422.4 56.000	500	1,072,640.0	0-3.2 0-0.13	462 18.16	552 21.73	52 2.05	UL FM V8S LFCB	
1600	1625.6 64.000	500	1,412,640.0	0-3.2 0-0.13	492 19.37	582 22.91	52 2.05	UL FM V8S LFCB	
1800	1828.8 72.000	500	1,812,640.0	0-3.2 0-0.13	522 20.55	612 24.10	52 2.05	UL FM V8S LFCB	
2000	2032.0 80.000	500	2,272,640.0	0-3.2 0-0.13	552 21.73	642 25.28	52 2.05	UL FM V8S LFCB	
2400	2438.4 96.000	500	3,072,640.0	0-3.2 0-0.13	612 24.10	702 27.64	52 2.05	UL FM V8S LFCB	

**11N**  
Standard Flexible Coupling



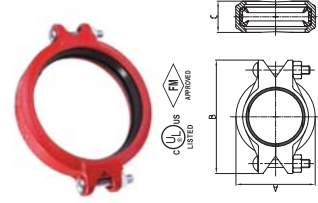
**11NH**  
Heavy-duty Flexible Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load KN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
50	60.3 2.375	500	9,822.0	0-3.2 0-0.13	90 3.54	134 5.28	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
65	73.0 2.875	500	14,432.0	0-3.2 0-0.13	100 3.94	150 5.91	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
80	86.3 3.375	500	19,042.0	0-3.2 0-0.13	110 4.33	164 6.46	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
100	108.0 4.250	500	25,652.0	0-3.2 0-0.13	121 4.76	172 6.78	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
125	133.0 5.250	500	34,262.0	0-3.2 0-0.13	132 5.19	180 7.10	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
150	159.0 6.250	500	45,872.0	0-3.2 0-0.13	143 5.63	188 7.41	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
175	188.3 7.410	500	61,482.0	0-3.2 0-0.13	154 6.06	196 7.72	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
200	219.1 8.625	500	82,092.0	0-3.2 0-0.13	165 6.49	204 8.03	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
250	273.0 10.750	500	111,702.0	0-3.2 0-0.13	187 7.36	224 8.82	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
300	323.9 12.750	500	148,312.0	0-3.2 0-0.13	200 7.87	244 9.61	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
350	355.6 14.000	500	197,922.0	0-3.2 0-0.13	211 8.31	252 9.92	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
400	406.4 16.000	500	264,532.0	0-3.2 0-0.13	222 8.74	260 10.24	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
450	457.2 18.000	500	350,142.0	0-3.2 0-0.13	233 9.17	268 10.55	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
500	508.0 20.000	500	465,752.0	0-3.2 0-0.13	244 9.61	276 10.87	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
600	609.6 24.000	500	621,362.0	0-3.2 0-0.13	255 10.04	284 11.18	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
800	812.8 32.000	500	847,972.0	0-3.2 0-0.13	277 10.91	304 12.00	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
1000	1016.0 40.000	500	1,133,582.0	0-3.2 0-0.13	299 11.77	324 12.76	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
1200	1219.2 48.000	500	1,533,192.0	0-3.2 0-0.13	310 12.19	332 13.07	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
1400	1422.4 56.000	500	2,033,802.0	0-3.2 0-0.13	321 12.62	340 13.39	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
1600	1625.6 64.000	500	2,734,412.0	0-3.2 0-0.13	332 13.05	348 13.70	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
1800	1828.8 72.000	500	3,635,022.0	0-3.2 0-0.13	343 13.48	356 14.01	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM
2000	2032.0 80.000	500	4,835,632.0	0-3.2 0-0.13	354 13.90	364 14.33	45 1.77	2-1/2X7/8 2-1/2X1/2	UL FM

### 1NS

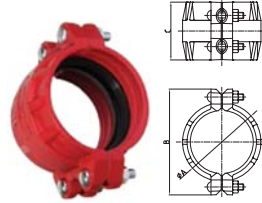
Light-duty Flexible Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load KN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
100	114.3 4.500	300 2.07	21.24/770	0-3.2 0-0.13	139 5.47	182 7.16	50 1.97	2-3/8x55 2-M10x57	UL FM
125	139.7 5.500	450 3.10	47.5/1680	0-3.2 0-0.13	168 6.61	228 8.98	51 2.01	2-5/8x60 2-M16x65	UL FM
165	165.1 6.500	300 2.07	44.3/960	0-3.2 0-0.13	192 7.56	244 9.61	51 2.01	2-1/2x75 2-M12x76	UL FM
165	168.3 6.625	300 2.07	46.0/1030	0-3.2 0-0.13	200 7.87	266 10.47	52 2.05	2-5/8x65 2-M16x65	UL FM
250	273.0 10.750	300 2.07	121.0/2720	0-4.1 0-0.13	320 12.60	388.0 15.67	64 2.52	2-3/4x120 2-M20x115	UL FM

### H305

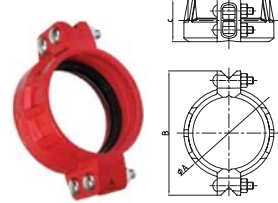
HDPE Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Dimensions			Bolt Size No.-Size mm
		A mm/in	B mm/in	C mm/in	
50	60.3 2.375	86.5 3.406	133 5.24	116 4.567	4-1/2x70
80	88.9 3.5	118 4.65	165 6.5	116 4.567	4-1/2x75
100	114.3 4.5	148 5.827	202 7.953	146 5.75	4-1/2x75
150	168.3 6.625	203 7.99	273 10.75	149 5.87	4-5/8x85
200	219.1 8.625	263 10.35	333 13.11	152 5.98	4-5/8x85
250	273.0 10.75	321 12.65	399 15.709	165 6.496	4-3/4x120
300	323.9 12.75	372 14.656	452 17.795	185 7.28	4-3/4x120

### H307

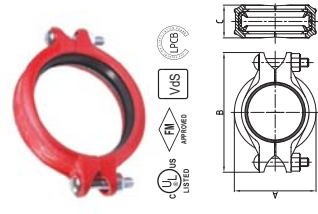
HDPE Transition Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Dimensions			Bolt Size No.-Size mm
		A mm/in	B mm/in	C mm/in	
50	60.3 2.375	86.5 3.406	147 5.787	79 3.11	4-1/2x70
80	88.9 3.5	116 4.567	176 6.929	79 3.11	4-1/2x75
100	114.3 4.5	148 5.827	200 7.874	95 3.75	4-1/2x75
150	168.3 6.625	202 7.95	290 11.02	95 3.74	4-5/8x85
200	219.1 8.625	264 10.39	342 13.46	107.5 4.23	4-5/8x85
250	273.0 10.75	321 12.65	424 16.693	117 4.61	4-3/4x120
300	323.9 12.75	372 14.656	483 19.016	127 5	4-3/4x120

### 1G

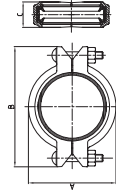
Standard Rigid Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load KN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
25	33.7 1.327	500 3.45	3.0/680	0-1.6 0-0.06	59 2.33	100 3.94	44 1.74	2-3/8x55 2-M10x57	UL FM V6S LPCB
32	42.4 1.669	500 3.45	4.8/1080	0-1.6 0-0.06	66 2.60	109.5 4.31	45 1.78	2-3/8x55 2-M10x57	UL FM V6S LPCB
40	48.3 1.900	500 3.45	6.3/1420	0-3.2 0-0.13	72 2.84	115 4.53	45 1.78	2-3/8x55 2-M10x57	UL FM V6S LPCB
50	60.3 2.375	300 2.07	5.0/1130	0-0.13 0-0.13	85 3.35	131 5.16	45 1.78	2-3/8x55 2-M10x57	UL FM V6S LPCB
65	73.0 2.875	500 3.45	14.4/3240	0-3.2 0-0.13	98 3.86	145 5.71	45 1.78	2-3/8x55 2-M10x57	UL FM LPCB
65	76.1 3.000	300 2.07	9.4/2120	0-3.2 0-0.13	101 3.99	147 5.78	45 1.77	2-3/8x55 2-M10x57	UL FM LPCB
80	88.9 3.500	300 2.07	12.8/2885	0-3.2 0-0.13	115.0 4.53	170 6.69	46 1.82	2-1/2x70 2-M12x70	UL FM V6S LPCB
100	108.0 4.250	500 3.45	31.5/7100	0-3.2 0-0.13	140 5.51	197 7.76	52 2.05	2-1/2x70 2-M12x70	UL FM LPCB
100	114.3 4.500	300 2.07	21.2/4770	0-3.2 0-0.13	146 5.75	200 7.88	52 2.05	2-1/2x70 2-M12x70	UL FM V6S LPCB
125	133 5.250	300 2.07	28.7/6460	0-3.2 0-0.13	165 6.50	232 9.13	52 2.05	2-5/8x85 2-M16x85	UL FM LPCB
125	139.7 5.500	450 3.10	47.5/10680	0-3.2 0-0.13	170 6.69	238 9.37	52 2.05	2-5/8x85 2-M16x85	UL FM V6S LPCB
125	141.3 5.563	300 2.07	32.4/7290	0-3.2 0-0.13	172 6.77	236.5 9.31	52 2.05	2-5/8x85 2-M16x85	UL FM LPCB
150	159.0 6.250	300 2.07	41.0/9240	0-3.2 0-0.13	190 7.48	259 10.16	52 2.05	2-5/8x85 2-M16x85	UL FM LPCB
150	165.1 6.500	300 2.07	44.3/9860	0-3.2 0-0.13	198 7.80	266 10.47	52 2.05	2-5/8x85 2-M16x85	UL FM LPCB
150	168.3 6.625	300 2.07	46.0/10340	0-3.2 0-0.13	202.0 7.95	270 10.63	52 2.05	2-5/8x85 2-M16x85	UL FM V6S LPCB
200	219.1 8.625	450 3.10	116.9/26260	0-3.2 0-0.13	260.0 10.24	346 13.625	62 2.44	2-3/4x115 2-M20x115	UL FM V6S LPCB
250A	267.4 10.528	300 2.07	116.2/2130	0-3.2 0-0.13	318 12.52	396 15.60	63 2.48	2-3/4x120 2-M20x115	UL FM
250	273.0 10.750	300 2.07	121.0/2720	0-3.2 0-0.13	327 12.88	420 16.54	63 2.48	2-7/8x125 2-M22x125	UL FM V6S
300A	318.5 12.539	300 2.07	164.8/37060	0-3.2 0-0.13	364 14.33	456 17.95	63 2.48	2-7/8x140 2-M22x140	UL FM
300	323.9 12.750	300 2.07	170.3/38260	0-3.2 0-0.13	378 14.88	466 18.35	63 2.48	2-7/8x140 2-M22x140	UL FM
350	355.6 14.000	300 2.07	205.5/46220	0-3.2 0-0.13	415 16.34	510 20.08	72 2.84	3-7/8x140 3-M22x140	UL FM
400	406.4 16.000	300 2.07	288.4/63070	0-3.2 0-0.13	488 19.43	575 22.64	72 2.84	3-7/8x140 3-M22x140	UL FM
450	457.2 18.000	225 1.6	262.5/58060	0-3.2 0-0.13	508 20.01	608 23.94	78 3.07	3-7/8x140 3-M22x140	—
500	508.0 20.0	225 1.6	324.1/72910	0-3.2 0-0.13	563 22.17	660 25.98	78 3.07	3-7/8x140 3-M22x140	—
600	609.6 24.000	225 1.6	466.7/104980	0-3.2 0-0.13	688 26.30	772 30.40	78 3.07	4-1/2x140	—

### 1GS

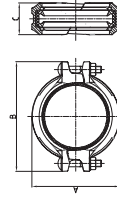
Light-duty Rigid Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
80	88.9	300	12.8/2885	0-3.2	114	160	45	UL FM	
3	3.500	2.07	2.841	0-0.13	4.50	6.30	1.78	VMS LPCB	
100	108.0	300	18.9/4260	0-3.2	135	185	50	UL FM LPCB	
4	4.250	2.07	4.250	0-0.13	5.30	7.28	1.97	UL FM LPCB	
100	114.3	300	21.2/4770	0-3.2	140	192	50	UL FM	
4	4.500	2.07	4.500	0-0.13	5.51	7.56	1.97	VMS LPCB	
125	139.7	300	31.7/7130	0-3.2	168	225	50	UL FM LPCB	
5	5.500	2.07	5.500	0-0.13	6.62	8.86	1.97	UL FM LPCB	
125	141.3	300	32.4/7290	0-3.2	170	225	50	UL FM LPCB	
5	5.563	2.07	5.563	0-0.13	6.69	8.86	1.97	UL FM LPCB	
150	159.0	300	41.0/9240	0-3.2	190	252	50	UL FM LPCB	
6	6.250	2.07	6.250	0-0.13	7.48	9.92	1.97	UL FM LPCB	
150	165.1	300	44.3/9860	0-3.2	195	250	50	UL FM LPCB	
6	6.500	2.07	6.500	0-0.13	7.68	9.84	1.97	UL FM LPCB	
150	168.3	300	46.0/10340	0-3.2	200	255	50	UL FM LPCB	
6	6.625	2.07	6.625	0-0.13	7.87	10.04	1.97	UL FM LPCB	
200A	216.3	300	76.0/17100	0-3.2	255	320	58	UL FM	
8	8.516	2.07	8.516	0-0.13	10.04	12.60	2.28	UL FM	
200	219.1	300	77.8/17500	0-3.2	255	324	58	UL FM LPCB	
8	8.625	2.07	8.625	0-0.13	10.05	12.76	2.28	UL FM LPCB	
250	273.0	300	121.0/27210	0-3.2	318	410	63	UL FM	
10	10.750	2.07	12.52	0-0.13	12.52	16.14	2.48	UL FM	

### 1GK

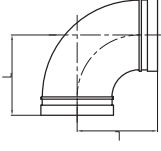
Angle Pad Coupling



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Max. End Load kN/Lbs	Pipe End Separation mm/in	Dimensions			Bolt Size No.-Size mm	Certificate
					A mm/in	B mm/in	C mm/in		
32	42.4	500	4.8/1080	0-0.6	64	99	46.5	2-M10X55	
1/4	1.669	3.45	1.067	0-0.06	2.52	3.90	1.83	2-M10X55	
40	48.3	500	6.3/1420	0-0.13	70	105	46.5	2-M10X55	
1/2	1.900	3.45	1.393	0-0.13	2.76	4.13	1.83	2-M10X55	
50	60.3	500	9.8/2210	0-0.13	85	121	46.5	2-M10X55	
2	2.375	3.45	2.167	0-0.13	3.35	4.76	1.83	2-M10X55	
65	73.0	300	8.7/1950	0-0.13	99	134	47.5	2-M10X63	
2 1/2	2.875	2.07	1.913	0-0.13	3.90	5.28	1.87	2-M10X63	
65	76.1	300	9.4/2120	0-0.13	102	137	47.5	2-M10X63	
2 1/2	3.000	2.07	2.070	0-0.13	4.02	5.39	1.87	2-M10X63	
80	88.9	300	12.8/2885	0-0.13	115	150	47.5	2-M10X60	
3	3.500	2.07	3.500	0-0.13	4.53	5.91	1.87	2-M10X60	
100	114.3	300	21.2/4770	0-0.13	142	180	52	2-M10X65	
4	4.500	2.07	4.500	0-0.13	5.59	7.09	2.05	2-M10X65	
125	139.7	300	31.7/7130	0-0.13	171	214	52.5	2-M12X75	
5	5.500	2.07	5.500	0-0.13	6.73	8.43	2.07	2-M12X75	
150	165.1	300	44.3/9860	0-0.13	198	242	52.5	2-M12X75	
6	6.500	2.07	6.500	0-0.13	7.80	9.92	2.07	2-M12X75	
150	168.3	300	46.0/10340	0-0.13	201	245	52.5	2-M12X75	
6	6.625	2.07	6.625	0-0.13	7.91	9.98	2.07	2-M12X75	
200	219.1	300	77.8/17500	0-0.13	259	331	63.5	2-M20X110	
8	8.625	2.07	8.625	0-0.13	10.16	13.03	2.50	2-M20X110	
250	273.0	300	121.0/27210	0-0.13	321	405	64.5	2-M22X140	
10	10.750	2.07	12.52	0-0.13	12.64	16.58	2.54	2-M22X140	

### 90° Elbow

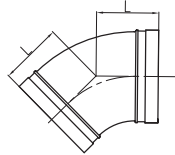
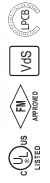
90° Elbow



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25	33.7	500	57	UL FM VMS LPCB
1	1.315	3.45	2.24	UL FM VMS LPCB
32	42.4	500	70	UL FM VMS LPCB
1 1/4	1.660	3.45	2.75	UL FM VMS LPCB
40	48.3	500	70	UL FM VMS LPCB
1 1/2	1.900	3.45	2.75	UL FM VMS LPCB
50	60.3	500	82.5	UL FM VMS LPCB
2	2.375	3.45	3.25	UL FM VMS LPCB
65	73.0	500	95	UL FM
2 1/2	2.875	3.45	3.74	UL FM
80	88.9	500	95	UL FM VMS LPCB
3	3.500	3.45	3.74	UL FM VMS LPCB
100	114.3	500	108	UL FM VMS LPCB
4	4.500	3.45	4.25	UL FM VMS LPCB
125	130.0	500	122	UL FM
5	5.250	3.45	4.80	UL FM
125	139.7	500	140	UL FM VMS LPCB
5	5.500	3.45	5.50	UL FM VMS LPCB
125	141.3	500	140	UL FM
5	5.563	3.45	5.50	UL FM
150	165.1	500	165	UL FM LPCB
6	6.500	3.45	6.50	UL FM LPCB
150	168.3	500	165	UL FM VMS LPCB
6	6.625	3.45	6.50	UL FM VMS LPCB
200	219.1	500	197	UL FM VMS LPCB
8	8.625	3.45	7.75	UL FM
250	287.4	500	229	UL FM
10	10.928	3.45	9.00	UL FM
250	273.0	500	225	UL FM VMS
10	10.750	3.45	9.00	UL FM VMS
300	318.5	500	254	UL FM
12	12.539	3.45	10.00	UL FM
300	325.0	500	254	UL FM VMS
12	12.750	3.45	10.00	UL FM VMS
350	354.5	300	280	—
14	14.000	2.07	10.00	—
400	406.4	300	325	—
16	6.300	2.07	12.00	—
450	487.2	300	360	—
18	7.000	2.07	15.50	—
500	508.0	300	438	—
20	7.875	2.07	17.25	—
600	609.6	300	508	—
24	9.500	2.07	20.00	—

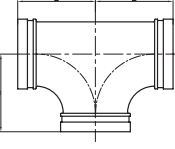


### 120 45° Elbow



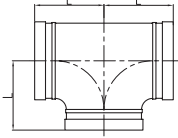
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25	33.7	500	44.5	UL FM VSS LPCB
1	1.315	3.45	1.75	
32	42.4	500	44.5	UL FM VSS LPCB
1 1/4	1.660	3.45	1.75	
40	48.3	500	44.5	UL FM VSS LPCB
1 1/2	1.900	3.45	1.75	
50	60.3	500	51	UL FM VSS LPCB
2	2.375	3.45	2.00	
65	73.0	500	57	UL FM
2 1/2	2.875	3.45	2.24	
80	88.9	500	63.5	UL FM VSS LPCB
3	3.500	3.45	2.50	
100	114.3	500	76	UL FM
4	4.250	3.45	3.00	
125	130.0	500	82.5	UL FM VSS LPCB
5	5.250	3.45	3.25	
150	141.3	500	82.5	UL FM VSS LPCB
6	5.500	3.45	3.25	
160	146.0	500	89	UL FM
6 1/2	5.750	3.45	3.50	
180	165.1	500	95	UL FM LPCB
7	6.250	3.45	3.75	
200	182.9	500	108	UL FM VSS LPCB
8	7.250	3.45	4.25	
250	216.3	500	130	UL FM
10	8.500	3.45	5.00	
300	261.6	500	152	UL FM VSS LPCB
12	10.300	3.45	6.00	
350	287.4	500	165	UL FM
14	11.300	3.45	6.75	
400	314.3	500	184	UL FM VSS
16	12.750	3.45	7.50	
450	342.9	500	203	UL FM
18	14.625	3.45	8.125	
500	381.0	500	229	UL FM VSS
20	16.125	3.45	9.00	
600	425.4	500	260	UL FM
24	17.000	3.45	10.25	
800	487.7	500	300	UL FM
32	19.625	3.45	12.00	
1000	549.9	500	340	UL FM
40	22.000	3.45	14.00	
1200	609.6	500	380	UL FM
48	24.000	3.45	16.00	

### 130 Tee



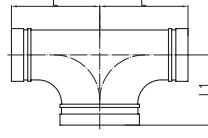
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
25	33.7	500	57	UL FM VSS LPCB
1	1.315	3.45	2.24	
32	42.4	500	70	UL FM VSS LPCB
1 1/4	1.660	3.45	2.75	
40	48.3	500	70	UL FM VSS LPCB
1 1/2	1.900	3.45	2.75	
50	60.3	500	82.5	UL FM VSS LPCB
2	2.375	3.45	3.25	
65	73.0	500	95	UL FM
2 1/2	2.875	3.45	3.74	
80	88.9	500	108	UL FM VSS LPCB
3	3.500	3.45	4.25	
100	114.3	500	127	UL FM VSS LPCB
4	4.500	3.45	5.00	
125	130.0	500	122	UL FM VSS LPCB
5	5.250	3.45	4.80	
150	141.3	500	140	UL FM VSS LPCB
6	5.500	3.45	5.50	
160	146.0	500	140	UL FM
6 1/2	5.750	3.45	5.50	
180	165.1	500	165	UL FM LPCB
7	6.500	3.45	6.50	
200	182.9	500	165	UL FM VSS LPCB
8	7.250	3.45	6.50	
250	216.3	500	197	UL FM VSS LPCB
10	8.500	3.45	7.75	
300	261.6	500	229	UL FM
12	10.300	3.45	9.00	
350	287.4	500	229	UL FM VSS
14	11.300	3.45	9.00	
400	314.3	500	254	UL FM VSS
16	12.750	3.45	10.00	
450	342.9	500	254	UL FM VSS
18	14.625	3.45	10.00	
500	381.0	500	280	UL FM VSS
20	16.125	3.45	11.00	
600	425.4	500	300	UL FM
24	17.000	3.45	12.00	
800	487.7	500	325	UL FM
32	19.625	3.45	12.80	
1000	549.9	500	340	UL FM
40	22.000	3.45	14.00	
1200	609.6	500	360	UL FM
48	24.000	3.45	16.00	

### 130S Light-duty Tee



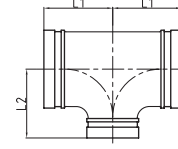
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
50	60.3	300	70	UL-FM-VGS-LPCB
2	2.375	2,07	2.75	
65	73.0	300	76	UL-FM
2½	2.875	2,07	3.00	
65	76.1	300	76	UL-FM-VGS-LPCB
2½	3.000	2,07	3.00	
80	88.9	300	85.5	UL-FM-VGS-LPCB
3	3.500	2,07	3.37	
100	108.0	300	101	UL-FM
4	4.500	2,07	3.98	
100	114.3	300	101	UL-FM-VGS-LPCB
4	4.500	2,07	3.98	
125	139.7	207	124	UL-FM-VGS-LPCB
5	5.500	2,07	4.88	
150	159.0	300	140	UL-FM
6	6.500	2,07	5.50	
150	165.1	300	140	UL-FM-LPCB
6	6.500	2,07	5.50	
150	168.3	300	140	UL-FM-VGS-LPCB
6	6.625	2,07	5.50	
200	216.3	300	175	UL-FM
8	8.625	2,07	6.89	
200	219.1	300	175	UL-FM-VGS-LPCB
8	8.625	2,07	6.89	

### 130R Reducing Tee



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Dimensions L1 mm/in	Certificate
65 × 65 × 80	76.1 × 76.1 × 88.9	500	108	95	
2½ × 2½ × 3	3,000 × 3,000 × 3,500	3,45	4,25	3,74	
65 × 65 × 100	76.1 × 76.1 × 114.3	500	127	102	
2½ × 2½ × 4	3,000 × 3,000 × 4,500	3,45	5,00	4,02	
80 × 80 × 100	88.9 × 88.9 × 114.3	500	127	102	
3 × 3 × 4	3,500 × 3,500 × 4,500	3,45	5,00	4,02	

### 130R Reducing Tee



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L1 mm/in	Dimensions L2 mm/in	Certificate
50 × 25	60.3 × 33.7	500	70	70	UL-FM-VGS-LPCB
2 × 1	2.375 × 1.315	3,45	2.75	2.75	
50 × 40	60.3 × 48.3	500	70	70	UL-FM-VGS-LPCB
2 × 1½	2.375 × 1.900	3,45	2.75	2.75	
65 × 40	73.0 × 48.3	500	76	76	UL-FM
2½ × 1½	2.875 × 1.900	3,45	3.00	3.00	
65 × 40	76.1 × 48.3	500	76	76	UL-FM
2½ × 1½	2.875 × 1.900	3,45	3.00	3.00	
80 × 32	88.9 × 42.4	500	76	76	UL-FM
3 × 1¼	3.000 × 1.660	3,45	3.00	3.00	
80 × 40	88.9 × 48.3	500	76	76	UL-FM-VGS-LPCB
3 × 1½	3.500 × 1.900	3,45	3.37	3.37	
80 × 50	88.9 × 60.3	500	85.5	85.5	UL-FM-VGS-LPCB
3 × 2	3.500 × 2.375	3,45	3.37	3.37	
80 × 65	88.9 × 73.0	500	85.5	85.5	UL-FM
3 × 2½	3.500 × 2.875	3,45	3.37	3.37	
80 × 65	88.9 × 76.1	500	85.5	85.5	UL-FM-VGS-LPCB
3 × 2½	3.500 × 2.913	3,45	3.37	3.37	
100 × 50	108.0 × 60.3	500	101	101	UL-FM
4 × 2	4.250 × 2.375	3,45	3.98	3.98	
100 × 80	108.0 × 88.9	500	101	101	UL-FM
4 × 3	4.250 × 3.500	3,45	3.98	3.98	
100 × 25	114.3 × 33.7	500	101	101	UL-FM-VGS-LPCB
4 × 1	4.500 × 1.315	3,45	3.98	3.98	
100 × 40	114.3 × 48.3	500	101	101	UL-FM-VGS-LPCB
4 × 1½	4.500 × 1.900	3,45	3.98	3.98	
100 × 50	114.3 × 60.3	500	101	101	UL-FM-VGS-LPCB
4 × 2	4.500 × 2.375	3,45	3.98	3.98	
100 × 65	114.3 × 73.0	500	101	101	UL-FM
4 × 2½	4.500 × 2.875	3,45	3.98	3.98	
100 × 65	114.3 × 76.1	500	101	101	UL-FM-VGS-LPCB
4 × 2½	4.500 × 3.000	3,45	3.98	3.98	
100 × 80	114.3 × 88.9	500	101	101	UL-FM-VGS-LPCB
4 × 3	4.500 × 3.500	3,45	3.98	3.98	
125 × 50	133.0 × 60.3	500	124	124	UL-FM
5 × 2	5.250 × 2.375	3,45	4.88	4.88	
125 × 65	133.0 × 76.1	500	124	124	UL-FM
5 × 2½	5.250 × 3.000	3,45	4.88	4.88	
125 × 100	133.0 × 103.0	500	124	124	UL-FM
5 × 4	5.250 × 4.250	3,45	4.88	4.88	
125 × 100	133.0 × 114.3	500	124	124	UL-FM
5 × 4	5.250 × 4.500	3,45	4.88	4.88	
125 × 40	139.7 × 48.3	500	124	124	UL-FM
5 × 1½	5.500 × 1.900	3,45	4.88	4.88	
125 × 50	139.7 × 60.3	500	124	124	UL-FM
5 × 2	5.500 × 2.375	3,45	4.88	4.88	
125 × 65	139.7 × 76.1	500	124	124	UL-FM
5 × 2½	5.500 × 3.000	3,45	4.88	4.88	
125 × 80	139.7 × 88.9	500	124	124	UL-FM
5 × 3	5.500 × 3.500	3,45	4.88	4.88	
125 × 100	139.7 × 114.3	500	124	124	UL-FM-VGS-LPCB
5 × 4	5.500 × 4.500	3,45	4.88	4.88	
125 × 50	141.3 × 60.3	500	124	124	UL-FM
5 × 2	5.563 × 2.375	3,45	4.88	4.88	
125 × 80	141.3 × 88.9	500	124	124	UL-FM
5 × 3	5.563 × 3.000	3,45	4.88	4.88	
125 × 100	141.3 × 114.3	500	124	124	UL-FM
5 × 4	5.563 × 4.500	3,45	4.88	4.88	
150 × 60	159.0 × 60.3	500	140	140	UL-FM
6 × 2	6.250 × 2.375	3,45	5.50	5.50	
150 × 65	159.0 × 76.1	500	140	140	UL-FM
6 × 2½	6.250 × 3.000	3,45	5.50	5.50	

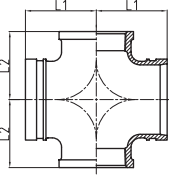






# 181

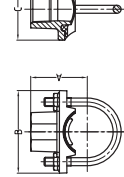
Reducing Cross with Female Thread



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions		Dimensions L 2 mm/in	Certificate
			L 1 mm/in	L 2 mm/in		
65 × 50	76.1 × 60.3	300	76	76	76	—
2 1/2 × 2	3,000 × 2,375	2,07	3,00	3,00	3,00	—
80 × 32	88.9 × 42.4	300	108	108	108	—
3 × 1 1/4	3,500 × 1,660	2,07	4,25	4,25	4,25	—
80 × 40	88.9 × 48.3	300	85.5	85.5	85.5	—
3 × 1 1/2	3,500 × 1,900	2,07	3,37	3,37	3,37	—
80 × 50	88.9 × 60.3	300	85.5	85.5	85.5	—
3 × 2	3,500 × 2,375	2,07	3,37	3,37	3,37	—
100 × 25	114.3 × 33.7	300	76	88	88	UL FM
4 × 1	4,500 × 1,315	2,07	2,99	3,47	3,47	—
100 × 32	114.3 × 42.4	300	76	88	88	UL FM
4 × 1 1/4	4,500 × 1,660	2,07	2,99	3,47	3,47	—
100 × 40	114.3 × 48.3	300	85	91	91	UL FM
4 × 1 1/2	4,500 × 1,900	2,07	3,35	3,58	3,58	—
100 × 50	114.3 × 60.3	300	85	91	91	UL FM
4 × 2	4,500 × 2,375	2,07	3,35	3,58	3,58	—
100 × 65	114.3 × 76.1	300	101	101	98	—
4 × 2 1/2	4,500 × 3,000	2,07	3,98	3,78	3,78	—
100 × 80	114.3 × 88.9	300	101	101	98	—
4 × 3	4,500 × 3,000	2,07	3,98	3,78	3,78	—
150 × 32	165.1 × 42.4	300	92	124	124	—
6 × 1 1/4	6,500 × 1,660	2,07	3,62	4,88	4,88	—
150 × 40	165.1 × 48.3	300	92	124	124	—
6 × 1 1/2	6,500 × 1,900	2,07	3,62	4,88	4,88	—
150 × 50	165.1 × 60.3	300	92	124	124	UL FM
6 × 2	6,500 × 2,375	2,07	3,62	4,88	4,88	—
150 × 65	165.1 × 76.1	300	110	140	140	—
6 × 2 1/2	6,500 × 3,000	2,07	4,50	5,50	5,50	—
150 × 80	165.1 × 88.9	300	110	140	140	—
6 × 3	6,500 × 3,000	2,07	4,50	5,50	5,50	—
200 × 80	219.1 × 88.9	300	125	175	175	—
8 × 3	8,625 × 3,000	2,07	6,88	8,88	8,88	—

# 3L

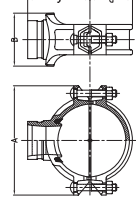
U-Bolt Mechanical Tee



Nominal Size mm/in	Hole Dia mm/in +1.6,0.063,0	Working Pressure PSI/MPa	Dimensions				U Bolt Size mm/in	Certificate
			A mm/in	B mm/in	C mm/in	D mm/in		
32X15	30	300	54.4	88.9	57.2	38X73	UL FM	
1 1/2 X 1 1/2	1.18	2,07	2.14	3.50	2.25	M10X73	—	
32X20	30	300	54.4	88.9	57.2	38X73	UL FM	
1 1/2 X 3/4	1.18	2,07	2.14	3.50	2.25	M10X73	—	
32X25	30	300	57.7	88.9	57.2	38X73	UL FM	
1 1/2 X 1	1.18	2,07	2.27	3.50	2.25	M10X73	—	
40X15	30	300	43	88.9	57.2	38X73	UL FM	
1 1/2 X 1 1/2	1.18	2,07	1.69	3.50	2.25	M10X73	—	
40X20	30	300	51	88.9	57.2	38X73	UL FM	
1 1/2 X 3/4	1.18	2,07	2.0	3.50	2.25	M10X73	—	
40X25	30	300	60.8	88.9	57.2	38X73	UL FM	
1 1/2 X 1	1.18	2,07	2.33	3.50	2.25	M10X73	—	
50X15	30	300	63.3	88.9	57.2	38X90	UL FM VMS	
2 X 1 1/2	1.18	2,07	2.49	3.75	2.25	M10X90	—	
50X20	30	300	63.3	88.9	57.2	38X90	UL FM VMS	
2 X 3/4	1.18	2,07	2.49	3.75	2.25	M10X90	—	
50X25	30	300	66.6	88.9	57.2	38X90	UL FM VMS	
2 X 1	1.18	2,07	2.62	3.75	2.25	M10X90	—	
50X32	45	2,07	66.6	47.2	300	10X32	—	
2 X 1 1/4	1.75	2,07	2.62	1.20	76	—	—	
65X15	30	300	69.9	108.0	57.2	38X105	UL FM	
2 1/2 X 1 1/2	1.18	2,07	2.75	4.25	2,250	M10X105	—	
65X20	30	300	69.9	108.0	57.2	38X105	UL FM	
2 1/2 X 3/4	1.18	2,07	2.75	4.25	2,250	M10X105	—	
65X25	30	300	73.2	108.0	57.2	38X105	UL FM	
2 X 1	1.18	2,07	2.88	4.25	2,25	M10X105	—	
65X15	30	300	69.9	108.0	57.2	38X105	UL FM VMS	
76.1X1/2	1.18	2,07	2.75	4.25	2,250	M10X105	—	
76.1X3/4	1.18	2,07	2.75	4.25	2,250	M10X105	UL FM VMS	
65X25	30	300	73.2	108.0	57.2	38X105	UL FM VMS	
76.1X1	1.18	2,07	2.88	4.25	2,25	M10X105	—	
88.9X1	38	300	79	145	73	10X38	UL FM VMS	
	1.5	2,07	3.11	5.70	2.87	—	—	

# 3G

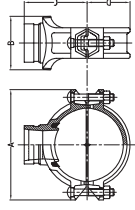
Mechanical Tee Grooved Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
50 × 32	60.3 × 42.4	300	45	116	76	68.5	38	3/8 × 55	UL FM VMS
2 × 1 1/4	2,375 × 1,660	2,07	1.75	4.57	2.99	2.74	1.54	M10X57	—
50 × 40	60.3 × 48.3	300	45	116	76	68.5	38	3/8 × 55	UL FM VMS
2 × 1 1/2	2,375 × 1,900	2,07	1.75	4.57	2.99	2.74	1.54	M10X57	—
65 × 25	73.0 × 33.7	300	38	137	71	78	48	1/2 × 70	—
2 1/2 × 1	2,875 × 1,315	2,07	1.50	5.39	2.80	3.07	1.93	M12X70	—
65 × 32	73.0 × 42.4	300	51	137	84.5	78	48	1/2 × 70	—
2 1/2 × 1 1/4	2,875 × 1,660	2,07	2.00	5.39	3.33	3.07	1.93	M12X70	UL FM
65 × 40	73.0 × 48.3	300	51	137	84.5	78	48	1/2 × 70	—
2 1/2 × 1 1/2	2,875 × 1,900	2,07	2.00	5.39	3.33	3.07	1.93	M12X70	UL FM
65 × 25	76.1 × 33.7	300	38	137	71	78	48.5	1/2 × 70	UL FM VMS
76.1 × 1	3,000 × 1,315	2,07	1.50	5.39	2.80	3.07	1.95	M12X70	—
65 × 32	76.1 × 42.4	300	51	137	84.5	78	48.5	1/2 × 70	UL FM VMS
76.1 × 1 1/4	3,000 × 1,660	2,07	2.00	5.39	3.33	3.07	1.95	M12X70	—
65 × 40	76.1 × 48.3	300	51	137	84.5	78	48.5	1/2 × 70	UL FM VMS
76.1 × 1 1/2	3,000 × 1,900	2,07	2.00	5.39	3.33	3.07	1.95	M12X70	—
80 × 25	88.9 × 33.7	300	38	152	72.5	84.5	56.5	1/2 × 75	UL FM VMS
3 × 1	3,500 × 1,315	2,07	1.50	5.98	2.85	3.33	2.22	M12X76	—
80 × 32	88.9 × 42.4	300	51	152	85.5	84.5	56.5	1/2 × 75	UL FM VMS
3 × 1 1/4	3,500 × 1,660	2,07	2.00	5.98	3.37	3.33	2.22	M12X76	—
80 × 40	88.9 × 48.3	300	51	152	85.5	84.5	56.5	1/2 × 75	UL FM VMS
3 × 1 1/2	3,500 × 1,900	2,07	2.00	5.98	3.37	3.33	2.22	M12X76	—
80 × 50	88.9 × 60.3	300	64	152	98	84.5	56.5	1/2 × 75	UL FM VMS
3 × 2	3,500 × 2,375	2,07	2.50	5.98	3.86	3.33	2.22	M12X76	—
100 × 25	114.3 × 33.7	300	38	188	78.4	102	70	1/2 × 75	UL FM VMS
4 × 1	4,500 × 1,315	2,07	1.50	7.40	3.09	4.02	2.76	M12X76	—
100 × 32	114.3 × 42.4	300	51	188	89	102	70	1/2 × 75	UL FM VMS
4 × 1 1/4	4,500 × 1,660	2,07	2.00	7.40	3.50	4.02	2.76	M12X76	—
100 × 40	114.3 × 48.3	300	50	188	89	102	70	1/2 × 75	UL FM VMS
4 × 1 1/2	4,500 × 1,900	2,07	2.00	7.40	3.50	4.02	2.76	M12X76	—
100 × 50	114.3 × 60.3	300	64	188	104.5	102	70	1/2 × 75	UL FM VMS
4 × 2	4,500 × 2,375	2,07	2.5	7.40	4.11	4.02	2.76	M12X76	—
100 × 65	114.3 × 73.0	300	70	188	104.5	102	70	1/2 × 75	UL FM
4 × 2 1/2	4,500 × 2,875	2,07	2.75	7.40	4.11	4.02	2.76	M12X76	—
100 × 65	114.3 × 76.1	300	70	188	104.5	102	70	1/2 × 75	VMS PCB
4 × 2 1/2	4,500 × 3,000	2,07	2.75	7.40	4.11	4.02	2.76	M12X76	—
100 × 80	114.3 × 88.9	300	89	188	128	102	70	1/2 × 75	UL FM
4 × 3	4,500 × 3,500	2,07	3.50	7.40	5.03	4.02	2.76	M12X76	—
125 × 80	130.0 × 88.9	300	89	209	132	109.5	77	5/8 × 85	UL FM
5 × 3	5,250 × 3,500	2,07	3.50	8.23	5.20	4.31	3.03	M16X85	—
125 × 32	137 × 42.4	300	51	221.5	95	118	64	5/8 × 85	UL FM
5 × 1 1/4	5,500 × 1,660	2,07	2.00	8.72	3.74	4.65	3.31	M16X85	—
137 × 1 1/4	5,500 × 1,900	2,07	2.00	8.72	3.74	4.65	3.31	M16X85	—
137 × 1 1/2	5,500 × 1,900	2,07	2.00	8.72	3.74	4.65	3.31	M16X85	—
125 × 40	137 × 48.3	300	51	221.5	95	118	64	5/8 × 85	UL FM
5 × 1 1/2	5,500 × 1,900	2,07	2.00	8.72	3.74	4.65	3.31	M16X85	—
137 × 1 1/2	5,500 × 1,900	2,07	2.00	8.72	3.74	4.65	3.31	M16X85	—
125 × 50	137 × 60.3	300	64	244	112.5	118	64	5/8 × 85	UL FM VMS
5 × 2	5,500 × 2,375	2,07	2.5	8.72	4.43	4.65	3.31	M16X85	—
137 × 1 1/2	5,500 × 2,375	2,07	2.5	8.72	4.43	4.65	3.31	M16X85	—
125 × 65	137 × 76.1	300	70	221.5	112.5	118	64	5/8 × 85	UL FM
5 × 1 1/4	5,500 × 3,000	2,07	2.75	8.72	4.43	4.65	3.31	M16X85	—
137 × 1 1/4	5,500 × 3,000	2,07	2.75	8.72	4.43	4.65	3.31	M16X85	—
125 × 80	137 × 88.9	300	89	221.5	132	118	64	5/8 × 85	UL FM
5 × 3	5,500 × 3,500	2,07	3.50	8.720	5.20	4.65	3.31	M16X85	—
137 × 1 1/2	5,500 × 3,500	2,07	3.50	8.720	5.20	4.65	3.31	M16X85	—
125 × 100	137 × 114.3	300	114	221.5	160	125	84	5/8 × 105	UL FM
6 × 4	6,500 × 4,500	2,07	4.50	8.720	6.30	4.92	3.31	M16X108	—
150 × 50	159.1 × 60.3	300	64	244	112.5	125	94	5/8 × 105	—
6 × 2	6,250 × 2,375	2,07	2.5	9.60	4.43				

3G

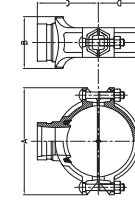
Light-duty Mechanical Tee Grooved Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +16.0/+0.063.0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
150 × 65 6 × 2 1/2	168.3 × 73.0 6.625 × 2.875	300	70	247	112.5	135	98.5	58 × 105 M16X108	ULFM
150 × 65 6 × 2 1/2	168.3 × 76.1 6.625 × 3.000	300	70	247	112.5	135	98.5	58 × 105 M16X108	VIS LPCB
150 × 80 6 × 3	168.3 × 88.9 6.625 × 3.500	300	89	247	132	141	98.5	58 × 105 M16X108	ULFM
150 × 80 6 × 3	168.3 × 114.3 6.625 × 4.500	207	114	247	160	138	98.5	58 × 105 M16X108	VIS LPCB
200 × 30 8 × 2	219.1 × 60.3 8.625 × 2.375	300	64	320	118	158	125	34 × 115 M20X115	ULFM VGS
200 × 30 8 × 2	219.1 × 73.0 8.625 × 2.875	207	70	320	118	158	125	34 × 115 M20X115	ULFM
200 × 65 8 × 2 1/2	219.1 × 76.1 8.625 × 3.000	300	70	320	118	158	125	34 × 115 M20X115	ULFM
200 × 65 8 × 2 1/2	219.1 × 114.3 8.625 × 4.500	207	114	320	162	161	125	34 × 115 M20X115	ULFM
200 × 80 8 × 3	219.1 × 88.9 8.625 × 3.500	300	89	320	136.5	161	125	34 × 115 M20X115	ULFM
200 × 100 8 × 4	219.1 × 108.0 8.625 × 4.250	207	114	320	162	161	125	34 × 115 M20X115	ULFM
200 × 100 8 × 4	219.1 × 143.3 8.625 × 5.625	300	114	320	162	161	125	34 × 115 M20X115	VIS LPCB
250 × 65 10 × 2 1/2	273.0 × 76.1 10.75 × 3.000	300	70	376	118	189	155	34 × 120 M20X115	---
250 × 80 10 × 3	273.0 × 88.9 10.75 × 3.500	300	89	376	136.5	189	155	34 × 120 M20X115	---
250 × 100 10 × 4	273.0 × 108.0 10.75 × 4.250	207	114	376	164	189	155	34 × 120 M20X115	ULFM
250 × 100 10 × 4	273.0 × 143.3 10.75 × 5.625	300	114	376	164	189	155	34 × 120 M20X115	ULFM VGS

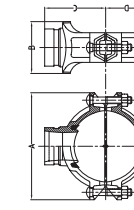
3GS

Light-duty Mechanical Tee Grooved Outlet



3GS

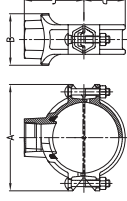
Light-duty Mechanical Tee Grooved Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +16.0/+0.063.0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
65 × 25 2 1/2 × 1	76.1 × 33.7 3.000 × 1.315	300	38	137	71	78	48.5	12 × 70 M12X70	ULFM
65 × 32 2 1/2 × 1 1/4	76.1 × 42.4 3.000 × 1.660	300	51	137	84.5	78	48.5	12 × 70 M12X70	ULFM
65 × 40 2 1/2 × 1 1/2	76.1 × 48.3 3.000 × 1.900	207	200	5.39	3.33	3.07	1.95	12 × 70 M12X70	ULFM
80 × 25 3 × 1	88.9 × 33.7 3.500 × 1.315	300	38	150	71.0	84	55.5	12 × 75 M12X76	ULFM
80 × 32 3 × 1 1/4	88.9 × 42.4 3.500 × 1.660	300	51	150	84.5	84	55.5	12 × 75 M12X76	ULFM
80 × 40 3 × 1 1/2	88.9 × 60.3 3.500 × 2.375	300	64	150	98	84	55.5	12 × 75 M12X76	ULFM
80 × 50 3 × 2	88.9 × 88.9 3.500 × 3.500	300	89	150	117	84	55.5	12 × 75 M12X76	ULFM
100 × 25 4 × 1	114.3 × 33.7 4.500 × 1.315	300	38	178	77.5	98	67.5	12 × 75 M12X76	ULFM
100 × 32 4 × 1 1/4	114.3 × 42.4 4.500 × 1.660	300	51	178	88	98	67.5	12 × 75 M12X76	ULFM
100 × 40 4 × 1 1/2	114.3 × 60.3 4.500 × 2.375	300	64	178	103.5	98	67.5	12 × 75 M12X76	ULFM
100 × 50 4 × 2	114.3 × 88.9 4.500 × 3.500	300	89	178	103.5	98	67.5	12 × 75 M12X76	ULFM
100 × 65 4 × 2 1/2	114.3 × 114.3 4.500 × 4.500	300	114	178	103.5	98	67.5	12 × 75 M12X76	ULFM
100 × 80 4 × 3	114.3 × 143.3 4.500 × 5.625	300	144	178	124	98	67.5	12 × 75 M12X76	ULFM

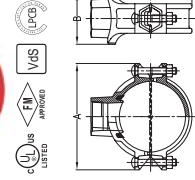
3J

Mechanical Tee  
Threaded Outlet



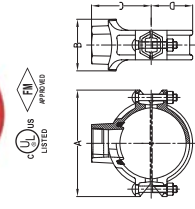
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.60/+0.063,0	Dimensions				Bolt Size mm/in	Certificate
				A mm/in	B mm/in	C mm/in	D mm/in		
25X10	33.7X17.2	300	23.5	86	46	26	24.5	M8X30	—
1X1/8	1.315X0.677	2.07	0.92	3.38	1.81	1.02	0.96		
25X15	33.7X21.3	300	23.5	86	46	26	24.5	M8X30	—
1X1/2	1.315X0.825	2.07	0.92	3.38	1.81	1.02	0.96		
25X20	33.7X26.9	300	23.5	86	52	41	24.5	M8X30	—
1X3/4	1.315X1.050	2.07	0.92	3.38	2.05	1.61	0.96		
25X25	33.7X33.7	300	23.5	86	57	45	24.5	M8X30	—
1X1	1.315X1.315	2.07	0.92	3.38	2.24	1.77	0.96		
32X10	42.4X17.2	300	30	95.5	53	32	29	M10X35	—
1 1/4X3/8	1.680X0.677	2.07	1.18	3.76	2.09	1.26	1.14		
32X15	42.4X21.3	300	30	95.5	57	32	29	M10X35	—
1 1/2X1/2	1.680X0.825	2.07	1.18	3.76	2.24	1.42	1.14		
32X20	42.4X26.9	300	30	95.5	57	44	29	M10X35	—
1 3/4X3/4	1.680X1.050	2.07	1.18	3.76	2.24	1.42	1.14		
32X25	42.4X33.7	300	30	95.5	57	53	29	M10X35	—
1 7/8X1	1.680X1.315	2.07	1.18	3.76	2.24	2.09	1.14		
40X10	48.3X17.2	300	30	101.5	53	34	32.5	M10X35	—
1 7/8X3/8	1.900X0.677	2.07	1.18	3.99	2.09	1.34	1.28		
40X15	48.3X21.3	300	30	101.5	57	35.5	32.5	M10X35	—
2X1/8	1.900X0.825	2.07	1.18	3.99	2.24	1.40	1.28		
40X20	48.3X26.9	300	30	101.5	57	47.5	32.5	M10X35	—
2X1/4	1.900X1.050	2.07	1.18	3.99	2.24	1.87	1.28		
40X25	48.3X33.7	300	30	101.5	57	56	32.5	M10X35	—
2 1/8X1/2	1.900X1.315	2.07	1.18	3.99	2.24	2.20	1.28		
50X10	60.3X17.2	300	38	116	68	44	39	3/8-55	—
2X3/8	2.375X0.877	2.07	1.50	4.57	2.68	1.73	1.54		
50X15	60.3X21.3	300	38	116	68	60	39	3/8-55	ULFM/VSS
2X1/2	2.375X1.050	2.07	1.50	4.57	2.68	2.36	1.54		
50X20	60.3X26.9	300	38	116	68	60	39	3/8-55	ULFM/VSS
2X3/4	2.375X1.050	2.07	1.50	4.57	2.68	2.36	1.54		
50X25	60.3X33.7	300	38	116	68	60	39	3/8-55	ULFM/VSS
2X1	2.375X1.315	2.07	1.50	4.57	2.68	2.36	1.54		
50X32	60.3X42.4	300	45	116	76	65	39	3/8-55	ULFM
2X1 1/4	2.375X1.680	2.07	1.75	4.57	2.99	2.56	1.54		
50X40	60.3X48.3	300	45	116	76	65	39	3/8-55	ULFM
2X1 1/2	2.375X1.900	2.07	1.75	4.57	2.99	2.56	1.54		
65X20	73.0X26.9	300	38	137	71	68	49	1/2-70	ULFM
2 1/2X1	2.875X1.050	2.07	1.50	5.39	2.76	2.75	1.83		
65X25	73.0X33.7	300	38	137	71	70	49	1/2-70	ULFM
2 3/4X1	2.875X1.315	2.07	1.50	5.39	2.76	2.75	1.83		
65X32	73.0X42.4	300	38	137	71	70	49	1/2-70	ULFM
2 3/4X1 1/4	2.875X1.680	2.07	1.50	5.39	2.76	2.75	1.83		
65X40	73.0X48.3	300	38	137	71	70	49	1/2-70	ULFM
2 3/4X1 1/2	2.875X1.900	2.07	1.50	5.39	2.76	2.75	1.83		
65X45	73.0X53.7	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 3/4	2.875X2.115	2.07	1.50	5.39	2.76	2.75	1.85		
65X50	73.0X59.1	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1	2.875X2.375	2.07	1.50	5.39	2.76	2.75	1.85		
65X55	73.0X64.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X2.639	2.07	1.50	5.39	2.76	2.75	1.85		
65X60	73.0X70.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X2.903	2.07	1.50	5.39	2.76	2.75	1.85		
65X65	73.0X75.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X3.167	2.07	1.50	5.39	2.76	2.75	1.85		
65X70	73.0X81.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 3/8	2.875X3.431	2.07	1.50	5.39	2.76	2.75	1.85		
65X75	73.0X86.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X3.695	2.07	1.50	5.39	2.76	2.75	1.85		
65X80	73.0X92.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X4.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X85	73.0X97.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X4.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X90	73.0X103.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X4.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X95	73.0X108.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X5.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X100	73.0X114.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X5.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X105	73.0X119.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X5.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X110	73.0X125.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X6.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X115	73.0X130.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X6.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X120	73.0X136.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X6.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X125	73.0X141.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X7.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X130	73.0X147.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X7.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X135	73.0X152.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X7.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X140	73.0X158.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X8.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X145	73.0X163.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X8.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X150	73.0X169.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X8.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X155	73.0X174.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X9.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X160	73.0X180.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X9.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X165	73.0X185.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X9.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X170	73.0X191.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X10.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X175	73.0X196.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X10.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X180	73.0X202.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X10.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X185	73.0X207.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X11.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X190	73.0X213.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X11.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X195	73.0X218.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X11.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X200	73.0X224.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X12.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X205	73.0X229.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X12.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X210	73.0X235.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X12.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X215	73.0X240.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X13.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X220	73.0X246.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X13.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X225	73.0X251.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X13.630	2.07	1.50	5.39	2.76	2.75	1.85		
65X230	73.0X257.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/4	2.875X14.000	2.07	1.50	5.39	2.76	2.75	1.85		
65X235	73.0X262.5	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/8	2.875X14.315	2.07	1.50	5.39	2.76	2.75	1.85		
65X240	73.0X268.0	300	38	137	71	70	49	1/2-70	ULFM/VSS
2 3/4X1 1/2	2.875X14.630	2.07	1.50	5.39	2.76	2.75	1.85		

**3J**  
Light-duty  
Mechanical Tee  
Threaded Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions			Bolt Size mm/in	Certificate	
				A mm/in	B mm/in	C mm/in			
150 x 50	159.0 x 60.3	300	64	244	112.5	125	94	58 x 105	ULFM
150 x 2	6.250 x 2.375	2.07	2.50	9.60	4.43	4.92	3.70	M16X108	ULFM
150 x 65	159.0 x 76.1	300	70	244	112.5	125	94	58 x 105	ULFM
150 x 76.1	6.250 x 3.000	2.07	2.75	9.60	4.43	4.92	3.70	M16X108	ULFM
150 x 80	159.0 x 88.9	300	89	244	133	125	94	58 x 105	ULFM
150 x 3	6.250 x 3.300	2.07	3.50	9.60	5.20	4.92	3.70	M16X108	ULFM
150 x 100	159.1 x 114.3	175	114	244	156.5	130	94	58 x 105	ULFM
150 x 4	6.250 x 4.500	1.20	4.50	9.60	6.16	5.12	3.70	M16X108	ULFM
150 x 15	165.1 x 21.3	300	38	244	78	110	97.5	58 x 105	ULFM
150 x 1/2	6.500 x 0.825	2.07	1.50	9.60	3.07	4.33	3.84	M16X108	ULFM
150 x 3/4	6.500 x 1.050	2.07	1.50	9.60	3.07	4.33	3.84	M16X108	ULFM
150 x 25	165.1 x 33.7	300	38	244	78	118	97.5	58 x 105	ULFM
150 x 1/4	6.500 x 1.315	2.07	1.50	9.60	3.07	4.65	3.84	M16X108	ULFM
150 x 3/2	165.1 x 42.4	300	51	244	93	118	97.5	58 x 105	ULFM
150 x 1 1/4	6.500 x 1.660	2.07	2.00	9.60	3.07	4.65	3.84	M16X108	ULFM
150 x 1 1/2	6.500 x 1.900	2.07	2.00	9.60	3.07	4.65	3.84	M16X108	ULFM
150 x 50	165.1 x 60.3	300	64	244	112.5	128.5	97.5	58 x 105	ULFM
165.1 x 2	6.500 x 2.375	2.07	2.50	9.60	4.43	5.43	3.84	M16X108	ULFM
150 x 65	165.1 x 76.1	300	70	244	112.5	128.5	97.5	58 x 105	ULFM
165.1 x 3	6.500 x 3.000	2.07	2.75	9.60	4.43	5.43	3.84	M16X108	ULFM
150 x 80	165.1 x 88.9	300	89	244	132	128.5	97.5	58 x 105	ULFM
165.1 x 4	6.500 x 3.300	2.07	3.50	9.60	5.20	5.06	3.84	M16X108	ULFM
150 x 100	165.1 x 114.3	225	114	244	154	135	97.5	58 x 105	ULFM
165.1 x 4	6.500 x 4.500	1.6	4.50	9.60	6.16	5.32	3.84	M16X108	ULFM
150 x 32	168.3 x 42.4	300	51	247	95	122	98.5	58 x 105	ULFM
6 x 1/4	6.500 x 1.660	2.07	2.00	9.72	3.74	4.80	3.88	M16X108	ULFM
150 x 40	168.3 x 48.3	300	51	247	95	122	98.5	58 x 105	ULFM
6 x 1/2	6.500 x 1.900	2.07	2.00	9.72	3.74	4.80	3.88	M16X108	ULFM
150 x 50	168.3 x 60.3	300	64	247	112.5	132	98.5	58 x 105	ULFM
6 x 2	6.625 x 2.375	2.07	2.50	9.72	4.43	5.20	3.88	M16X108	ULFM
150 x 65	168.3 x 73.0	300	70	247	112.5	132	98.5	58 x 105	ULFM
6 x 2 1/2	6.625 x 2.875	2.07	2.75	9.72	4.43	5.20	3.88	M16X108	ULFM
150 x 80	168.3 x 76.1	300	70	247	112.5	132	98.5	58 x 105	ULFM
6 x 3	6.625 x 3.000	2.07	2.75	9.72	4.43	5.20	3.88	M16X108	ULFM
150 x 100	168.3 x 114.3	300	89	247	132	140	98.5	58 x 105	ULFM
6 x 4	6.625 x 3.500	2.07	3.50	9.72	5.20	5.51	3.88	M16X108	ULFM
150 x 125	168.3 x 133.7	300	89	247	160	140	98.5	58 x 105	ULFM
6 x 4 1/2	6.625 x 4.500	2.07	4.50	9.72	6.30	5.51	3.88	M16X108	ULFM
200 x 25	219.0 x 33.7	300	38	320	79.5	150	125	34 x 115	ULFM
8 x 1	8.625 x 1.315	2.07	1.50	12.60	3.13	5.91	4.32	M20X115	ULFM
200 x 32	219.1 x 42.4	300	51	320	96.5	150	125	34 x 115	ULFM
8 x 1 1/4	8.625 x 1.660	2.07	2.00	12.60	3.90	5.91	4.32	M20X115	ULFM
200 x 40	219.1 x 48.3	300	51	320	96.5	150	125	34 x 115	ULFM
8 x 2	8.625 x 1.900	2.07	2.00	12.60	3.90	5.91	4.32	M20X115	ULFM
200 x 50	219.1 x 60.3	300	64	320	117	160	125	34 x 115	ULFM
8 x 2 1/2	8.625 x 2.375	2.07	2.50	12.60	4.61	6.30	4.32	M20X115	ULFM
200 x 65	219.1 x 73.0	300	70	320	118	160	125	34 x 115	ULFM
8 x 3	8.625 x 2.875	2.07	2.75	12.60	4.65	6.30	4.32	M20X115	ULFM
200 x 80	219.1 x 88.9	300	89	320	135	160	125	34 x 115	ULFM
8 x 4	8.625 x 3.500	2.07	3.50	12.60	5.37	6.30	4.32	M20X115	ULFM
200 x 100	219.1 x 114.3	300	114	320	164	160	125	34 x 115	ULFM
8 x 4 1/2	8.625 x 4.500	2.07	4.50	12.60	6.46	6.30	4.32	M20X115	ULFM
250 x 40	273.0 x 48.3	300	51	376	95.5	180	155	34 x 120	ULFM
10 x 1/2	10.750 x 1.900	2.07	2.00	14.80	3.78	7.09	6.10	M20X115	ULFM
250 x 50	273.0 x 60.3	300	64	376	118	185	155	34 x 120	ULFM
10 x 2	10.750 x 2.375	2.07	2.50	14.80	4.65	7.28	6.10	M20X115	ULFM
250 x 65	273.0 x 76.1	300	70	376	118	190	155	34 x 120	ULFM
10 x 3	10.750 x 3.000	2.07	2.75	14.80	4.65	7.48	6.10	M20X115	ULFM
250 x 80	273.0 x 88.9	300	89	376	135	190	155	34 x 120	ULFM
10 x 3 1/2	10.750 x 3.500	2.07	3.50	14.80	5.37	7.48	6.10	M20X115	ULFM
250 x 100	273.0 x 114.3	300	114	376	164	190	155	34 x 120	ULFM
10 x 4	10.750 x 4.500	2.07	4.50	14.80	6.46	7.48	6.10	M20X115	ULFM

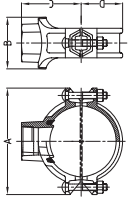
**3JS**  
Light-duty  
Mechanical Tee  
Threaded Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0/+0.063,0	Dimensions			Bolt Size mm/in	Certificate	
				A mm/in	B mm/in	C mm/in			
65 x 15	76.1 x 21.3	300	38	137	71	75	48.5	1/2 x 70	ULFM
76.1 x 1/2	3.000 x 0.825	2.07	1.50	5.39	2.80	3.05	1.95	M12X70	ULFM
65 x 20	76.1 x 26.9	300	38	137	71	75	48.5	1/2 x 70	ULFM
76.1 x 3/4	3.000 x 1.050	2.07	1.50	5.39	2.80	3.05	1.95	M12X70	ULFM
65 x 25	76.1 x 33.7	300	38	137	71	75	48.5	1/2 x 70	ULFM
76.1 x 1	3.000 x 1.315	2.07	1.50	5.39	2.80	3.05	1.95	M12X70	ULFM
65 x 32	76.1 x 42.4	300	51	137	84.5	75	48.5	1/2 x 70	ULFM
76.1 x 1 1/4	3.000 x 1.660	2.07	2.00	5.39	3.33	3.05	1.95	M12X70	ULFM
65 x 40	76.1 x 48.3	300	51	137	84.5	75	48.5	1/2 x 70	ULFM
76.1 x 1 1/2	3.000 x 1.900	2.07	2.00	5.39	3.33	3.05	1.95	M12X70	ULFM
60 x 15	68.9 x 21.3	300	38	150	71.0	68	55.5	1/2 x 75	ULFM
3 x 1/2	3.500 x 0.825	2.07	1.50	5.91	2.80	2.19	2.19	M12X76	ULFM
60 x 20	68.9 x 26.9	300	38	150	71.0	68	55.5	1/2 x 75	ULFM
3 x 3/4	3.500 x 1.050	2.07	1.50	5.91	2.80	2.19	2.19	M12X76	ULFM
60 x 25	68.9 x 33.7	300	38	150	71.0	71.0	55.5	1/2 x 75	ULFM
3 x 1	3.500 x 1.315	2.07	1.50	5.91	2.80	2.19	2.19	M12X76	ULFM
60 x 32	68.9 x 42.4	300	51	150	84.5	74	55.5	1/2 x 75	ULFM
3 x 1 1/4	3.500 x 1.660	2.07	2.00	5.91	3.33	2.51	2.19	M12X76	ULFM
60 x 40	68.9 x 48.3	300	51	150	84.5	74	55.5	1/2 x 75	ULFM
3 x 1 1/2	3.500 x 1.900	2.07	2.00	5.91	3.33	2.51	2.19	M12X76	ULFM
60 x 50	68.9 x 60.3	300	64	150	98	77	55.5	1/2 x 75	ULFM
3 x 2	3.500 x 2.375	2.07	2.50	5.91	3.86	3.03	2.19	M12X76	ULFM
100 x 15	108.1 x 21.3	300	38	172	77.5	65	64.5	1/2 x 75	ULFM
100 x 1/4	4.250 x 0.825	2.07	1.50	6.77	3.05	3.35	2.54	M12X76	ULFM
100 x 25	108.1 x 33.7	300	38	172	77.5	65	64.5	1/2 x 75	ULFM
100 x 1/2	4.250 x 1.315	2.07	1.50	6.77	3.05	3.35	2.54	M12X76	ULFM
100 x 32	108.1 x 42.4	300	51	172	88	65	64.5	1/2 x 75	ULFM
100 x 1/4	4.250 x 1.660	2.07	2.00	6.77	3.46	3.35	2.54	M12X76	ULFM
100 x 40	108.0 x 48.3	300	51	172	88	65	64.5	1/2 x 75	ULFM
100 x 1/2	4.250 x 1.900	2.07	2.00	6.77	3.46	3.35	2.54	M12X76	ULFM
100 x 50	108.0 x 60.3	300	64	172	103.5	90.5	64.5	1/2 x 75	ULFM
100 x 2	4.250 x 2.375	2.07	2.50	6.77	4.19	3.56	2.54	M12X76	ULFM
100 x 65	108.0 x 76.1	300	70	172	103.5	97.5	64.5	1/2 x 75	ULFM
100 x 1/2	4.250 x 3.000	2.07	2.75	6.77	4.07	3.84	2.54	M12X76	ULFM
100 x 15	114.3 x 21.3	300	38	178	77.5	62	67.5	1/2 x 75	ULFM
4 x 1/2	4.500 x 0.825	2.07	1.50	7.01	3.05	3.23	2.68	M12X76	ULFM
100 x 20	114.3 x 26.9	300	38	178	77.5	62	67.5	1/2 x 75	ULFM
4 x 3/4	4.500 x 1.050	2.07	1.50	7.01	3.05	3.23	2.68	M12X76	ULFM
100 x 25	114.3 x 33.7	300	38	178	77.5	62	67.5	1/2 x 75	ULFM
4 x 1	4.500 x 1.315	2.07	1.50	7.01	3.05	3.32	2.68	M12X76	ULFM
100 x 32	114.3 x 42.4	300	51	178	88	65	67.5	1/2 x 75	ULFM
4 x 1 1/4	4.500 x 1.660	2.07	2.00	7.01	3.46	3.33	2.68	M12X76	ULFM
100 x 40	114.3 x 48.3	300	51	178	88	65	67.5	1/2 x 75	ULFM
4 x 1 1/2	4.500 x 1.900	2.07	2.00	7.01	3.46	3.33	2.68	M12X76	ULFM
100 x 50	114.3 x 60.3	300	64	178	103.5	92	67.5	1/2 x 75	ULFM
4 x 2	4.500 x 2.375	2.07	2.50	7.01	4.07	3.62	2.68	M12X76	ULFM
100 x 65	114.3 x 73.0	300	70	178	103.5	98	67.5	1/2 x 75	ULFM
4 x 2 1/2	4.500 x 2.875	2.07	2.75	7.01	4.07	3.66	2.68	M12X76	ULFM
100 x 80	114.3 x 88.9	300	89	178	124	98	67.5	1/2 x 75	ULFM
4 x 3	4.500 x 3.500	2.07	3.50	7.01					

### 3JS

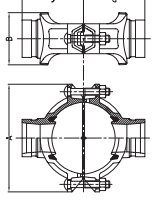
Light-duty  
Mechanical Tee  
Threaded Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0+0.063,0	Dimensions			Bolt Size mm/in	Certificate	
				A mm/in	B mm/in	C mm/in			
125 x 65	138.7 x 76.1	300	70	210	110	115	58 x 85	ULFM	
139.7 x 76.1	550.0 x 3.000	2.07	2.75	8.27	4.33	4.53	M16X85		
125 x 80	138.7 x 88.9	300	89	210	130	115	58 x 85	ULFM	
139.7 x 88.9	550.0 x 3.500	2.07	3.50	8.27	5.12	4.53	M16X85		
125 x 100	138.7 x 114.3	300	114	210	153	118	58 x 85	ULFM	
139.7 x 114.3	550.0 x 4.500	2.07	4.50	8.27	6.02	4.65	M16X85		
150 x 25	158.0 x 33.7	300	38	227	77	101	58 x 85	ULFM	
158.0 x 33.7	6.250 x 1.315	2.07	1.50	8.94	3.03	3.38	M16X85		
150 x 32	158.0 x 42.4	300	51	227	92.5	112	58 x 105	ULFM	
158.0 x 42.4	6.250 x 1.680	2.07	2.00	8.94	3.64	4.41	M16X108		
150 x 40	158.0 x 48.3	300	51	227	92.5	112	58 x 105	ULFM	
158.0 x 48.3	6.250 x 1.900	2.07	2.00	8.94	3.64	4.41	M16X108		
150 x 50	158.0 x 60.3	300	64	227	110	116.5	58 x 105	ULFM	
158.0 x 60.3	6.250 x 2.375	2.07	2.50	8.94	4.33	4.59	M16X108		
150 x 65	158.0 x 76.1	300	70	227	110	121.5	58 x 105	ULFM	
158.0 x 76.1	6.250 x 3.000	2.07	2.75	8.94	4.33	4.78	M16X108		
150 x 80	158.0 x 88.9	300	89	227	130	123.5	58 x 105	ULFM	
158.0 x 88.9	6.250 x 3.500	2.07	3.50	8.94	5.12	4.86	M16X108		
150 x 100	158.1 x 114.3	300	114	227	155	127	58 x 105	ULFM	
158.1 x 114.3	6.250 x 4.500	2.07	4.50	8.94	6.10	5.00	M16X108		
150 x 15	165.1 x 21.3	300	38	235	77	115	94.5	58 x 105	ULFM
165.1 x 21.3	6.500 x 0.825	2.07	1.50	9.25	3.03	4.33	M16X108		
125 x 20	165.1 x 26.9	300	38	235	77	115	94.5	58 x 105	ULFM
165.1 x 26.9	6.500 x 1.050	2.07	1.50	9.25	3.03	4.33	M16X108		
150 x 25	165.1 x 33.7	300	38	235	77	115	94.5	58 x 105	ULFM
165.1 x 33.7	6.500 x 1.315	2.07	1.50	9.25	3.03	4.33	M16X108		
150 x 32	165.1 x 42.4	300	51	235	92.5	115	94.5	58 x 105	ULFM
165.1 x 42.4	6.500 x 1.680	2.07	2.00	9.25	3.64	4.53	M16X108		
150 x 40	165.1 x 48.3	300	51	235	92.5	115	94.5	58 x 105	ULFM
165.1 x 48.3	6.500 x 1.900	2.07	2.00	9.25	3.64	4.53	M16X108		
150 x 50	165.1 x 60.3	300	64	235	110	120	94.5	58 x 105	ULFM
165.1 x 60.3	6.500 x 2.375	2.07	2.50	9.25	4.33	4.72	M16X108		
150 x 65	165.1 x 76.1	300	70	235	110	125	94.5	58 x 105	ULFM
165.1 x 76.1	6.500 x 3.000	2.07	2.75	9.25	4.33	4.92	M16X108		
150 x 80	165.1 x 88.9	300	89	235	130	125	94.5	58 x 105	ULFM
165.1 x 88.9	6.500 x 3.500	2.07	3.50	9.25	5.12	4.92	M16X108		
150 x 100	165.1 x 114.3	300	114	240	155	130	94.5	58 x 105	ULFM
165.1 x 114.3	6.500 x 4.500	2.07	4.50	9.45	6.10	5.12	M16X108		
150 x 25	168.3 x 33.7	300	38	240	77	115	96.5	58 x 105	ULFM
168.3 x 33.7	6.500 x 1.315	2.07	1.50	9.45	3.03	4.53	M16X108		
150 x 32	168.3 x 42.4	300	51	240	92.5	115	96.5	58 x 105	ULFM
168.3 x 42.4	6.500 x 1.680	2.07	2.00	9.45	3.64	4.53	M16X108		
150 x 40	168.3 x 48.3	300	51	240	92.5	115	96.5	58 x 105	ULFM
168.3 x 48.3	6.500 x 1.900	2.07	2.00	9.45	3.64	4.53	M16X108		
150 x 50	168.3 x 60.3	300	64	240	110	121	96.5	58 x 105	ULFM
168.3 x 60.3	6.500 x 2.375	2.07	2.50	9.45	4.33	4.76	M16X108		
150 x 65	168.3 x 73.0	300	70	240	110	127	96.5	58 x 105	ULFM
168.3 x 73.0	6.625 x 2.875	2.07	2.75	9.45	4.33	5.00	M16X108		
150 x 80	168.3 x 88.9	300	89	240	130	127	96.5	58 x 105	ULFM
168.3 x 88.9	6.625 x 3.000	2.07	2.75	9.45	4.33	5.00	M16X108		
150 x 100	168.3 x 114.3	300	114	240	155	130	96.5	58 x 105	ULFM
168.3 x 114.3	6.625 x 4.500	2.07	4.50	9.45	6.10	5.12	M16X108		
200 x 25	219.0 x 33.7	300	38	300	78	140	123	58 x 105	ULFM
219.0 x 33.7	8.625 x 1.315	2.07	1.50	11.81	3.07	5.51	M16X108		
200 x 32	219.1 x 42.4	300	51	300	96.5	140	123	58 x 105	ULFM
219.1 x 42.4	8.625 x 1.680	2.07	2.00	11.81	3.80	5.51	M16X108		
200 x 40	219.1 x 48.3	300	51	300	96.5	143	123	58 x 105	ULFM
219.1 x 48.3	8.625 x 1.900	2.07	2.00	11.81	3.80	5.63	M16X108		
200 x 50	219.1 x 60.3	300	64	300	117	149	123	58 x 105	ULFM
219.1 x 60.3	8.625 x 2.375	2.07	2.50	11.81	4.61	5.87	M16X108		
200 x 65	219.1 x 73.0	300	70	300	117	155	123	58 x 105	ULFM
219.1 x 73.0	8.625 x 2.875	2.07	2.75	11.81	4.61	6.10	M16X108		
200 x 80	219.1 x 88.9	300	89	300	133.5	155	123	58 x 105	ULFM
219.1 x 88.9	8.625 x 3.000	2.07	2.75	11.81	4.61	6.10	M16X108		
200 x 100	219.1 x 114.3	300	114	300	150	164	123	58 x 105	ULFM
219.1 x 114.3	8.625 x 4.500	2.07	4.50	11.81	6.65	6.30	M16X108		

### 4G

Mechanical Cross  
Grooved Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.6,0+0.063,0	Dimensions			Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	
65 x 32	73.0 x 42.4	300	51	144	84.5	75	75
73.0 x 42.4	2.875 x 1.669	2.07	2.75	5.67	3.33	2.95	M12X70
65 x 25	76.1 x 33.7	300	38	137	71	78	78
76.1 x 33.7	3.000 x 1.327	2.07	1.5	5.39	2.8	3.07	M12X70
65 x 32	76.1 x 42.4	300	51	137	84.5	78	78
76.1 x 42.4	3.000 x 1.669	2.07	2	5.39	3.33	3.07	M12X70
80 x 25	88.9 x 33.7	300	38	162	72.5	84.5	84.5
88.9 x 33.7	3.500 x 1.327	2.07	1.5	5.98	2.85	3.33	M12X76
80 x 32	88.9 x 42.4	300	51	162	85.5	84.5	84.5
88.9 x 42.4	3.500 x 1.669	2.07	2	5.98	3.37	3.33	M12X76
80 x 40	88.9 x 48.3	300	51	162	85.5	84.5	84.5
88.9 x 48.3	3.500 x 1.900	2.07	2	5.98	3.37	3.33	M12X76
100 x 25	114.3 x 33.7	300	38	188	78.4	102	102
114.3 x 33.7	4.500 x 1.327	2.07	1.5	7.4	3.09	4.02	M12X76
100 x 40	114.3 x 48.3	300	51	188	89	102	102
114.3 x 48.3	4.500 x 1.900	2.07	2	7.4	3.5	4.02	M12X76
100 x 50	114.3 x 60.3	300	64	188	104.5	102	102
114.3 x 60.3	4.500 x 2.375	2.07	2.5	7.4	4.11	4.02	M12X76
125 x 50	138.7 x 60.3	300	64	221.5	112.5	118	118
138.7 x 60.3	5.500 x 2.375	2.07	2.5	8.72	4.43	4.65	M16X85
125 x 65	138.7 x 76.1	300	70	221.5	112.5	118	118
138.7 x 76.1	5.500 x 3.000	2.07	2.75	8.72	4.43	4.65	M16X85
150 x 50	165.1 x 60.3	300	64	244	112.5	127	127
165.1 x 60.3	6.500 x 2.375	2.07	2.5	9.6	4.43	5	5
150 x 65	165.1 x 76.1	300	70	244	112.5	127	127
165.1 x 76.1	6.500 x 3.000	2.07	2.75	9.6	4.43	5	5
150 x 80	165.1 x 88.9	300	89	244	132	141	141
165.1 x 88.9	6.500 x 3.500	2.07	3.5	9.6	5.2	5.55	M16X108
150 x 40	168.3 x 48.3	300	51	247	95	128	128
168.3 x 48.3	6.625 x 1.900	2.07	2	9.72	3.74	5.04	M16X108
150 x 50	168.3 x 60.3	300	64	247	114	134	134
168.3 x 60.3	6.625 x 2.375	2.07	2.5	9.72	4.49	5.28	M16X108
150 x 65	168.3 x 73.0	300	70	247	115	134	134
168.3 x 73.0	6.625 x 2.875	2.07	2.75	9.72	4.53	5.28	M16X108
150 x 80	168.3 x 88.9	300	89	247	132	141	141
168.3 x 88.9	6.625 x 3.500	2.07	3.5	9.72	5.2	5.55	M16X108
200 x 50	219.1 x 60.3	300	64	320	118	158	158
219.1 x 60.3	8.625 x 2.375	2.07	2.5	12.8	4.65	6.22	M20X115
200 x 65	219.1 x 76.1	300	70	320	118	158	158
219.1 x 76.1	8.625 x 3.000	2.07	2.75	12.8	4.65	6.22	M20X115
200 x 80	219.1 x 88.9	300	89	320	136.5	161	161
219.1 x 88.9	8.625 x 3.500	2.07	3.5	12.8	5.37	6.34	M20X115
200 x 100	219.1 x 114.3	300	114	320	162	161	161
219.1 x 114.3	8.625 x 4.500	2.07	4.5	12.8	6.38	6.34	M20X115
250 x 100	273.0 x 76.1	300	70	378	118	189	189
273.0 x 76.1	10.750 x 3.000	2.07	2.75	14.8	4.65	7.44	M20X115
250 x 100	273.0 x 88.9	300	89	378	136.5	189	189
273.0 x 88.9	10.750 x 3.500	2.07	3.5	14.8	5.37	7.44	M20X115
250 x 100	273.0 x 114.3	300	114	378	164	189	189
273.0 x 114.3	10.750 x 4.500	2.07	4.5	14.8	6.46	7.44	M20X115

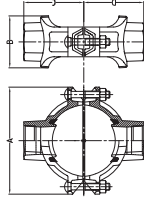






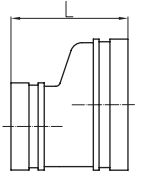
## 4JS

Light-duty Mechanical Cross Threaded Outlet



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Hole Dia mm/in +1.0/-0.063,0	Dimensions/mm/in			Bolt Size mm/in
				A mm/in	B mm/in	C mm/in	
125 x 65	130.7 x 76.1	300	70	210	110	115	5/8 x 85
130.7 x 76.1	130.7 x 76.1	207	275	8.27	4.33	4.53	M16x85
150 x 25	150.0 x 33.7	300	38	227	7.7	110	5/8 x 85
150.0 x 1	150.0 x 1.315	207	150	8.94	3.03	4.33	M16x85
150 x 32	150.0 x 42.4	300	51	227	9.25	112	5/8 x 85
150.0 x 1 1/4	150.0 x 1.680	207	200	8.94	3.64	4.41	M16x85
150 x 40	150.0 x 48.3	300	51	227	9.25	112	5/8 x 105
150.0 x 1 1/2	150.0 x 1.900	207	200	8.94	3.64	4.41	M16x108
150 x 50	150.0 x 60.3	300	64	227	110	116.5	5/8 x 105
150.0 x 2	150.0 x 2.375	207	250	8.94	4.33	4.59	M16x108
150 x 65	150.0 x 76.1	300	70	227	110	121.5	5/8 x 105
150.0 x 2 1/2	150.0 x 3.000	207	275	8.94	4.33	4.78	M16x108
150 x 80	150.0 x 88.9	300	89	227	130	123.5	5/8 x 105
150.0 x 3	150.0 x 3.500	207	350	9.25	5.12	4.86	M16x108
150 x 1 1/2	150.0 x 2.13	300	38	225	7.7	115	5/8 x 105
150.0 x 1 1/2	150.0 x 2.625	207	150	9.25	3.03	4.53	M16x108
150 x 20	150.0 x 25.9	300	38	225	7.7	115	5/8 x 105
150.0 x 1 1/4	150.0 x 1.680	207	150	9.25	3.03	4.53	M16x108
150 x 25	150.0 x 33.7	300	38	225	7.7	115	5/8 x 105
150.0 x 1 1/2	150.0 x 2.13	300	38	225	7.7	115	5/8 x 105
150 x 32	150.0 x 42.4	300	51	225	9.25	115	5/8 x 105
150.0 x 1 1/4	150.0 x 1.680	207	200	9.25	3.64	4.53	M16x108
150 x 40	150.0 x 48.3	300	51	225	9.25	115	5/8 x 105
150.0 x 1 1/2	150.0 x 1.900	207	200	9.25	3.64	4.53	M16x108
150 x 50	150.0 x 60.3	300	64	225	110	123	5/8 x 105
150.0 x 2	150.0 x 2.375	207	250	9.25	4.33	4.72	M16x108
150 x 65	150.0 x 76.1	300	70	225	110	125	5/8 x 105
150.0 x 2 1/2	150.0 x 3.000	207	275	9.25	4.33	4.92	M16x108
150 x 80	150.0 x 88.9	300	89	225	130	125	5/8 x 105
150.0 x 3	150.0 x 3.500	207	350	9.25	5.12	4.92	M16x108
150 x 25	150.0 x 33.7	300	38	225	7.7	115	5/8 x 105
150.0 x 1 1/4	150.0 x 1.680	207	150	9.25	3.03	4.53	M16x108
150 x 32	150.0 x 42.4	300	51	225	9.25	115	5/8 x 105
150.0 x 1 1/2	150.0 x 1.900	207	200	9.25	3.64	4.53	M16x108
150 x 40	150.0 x 48.3	300	51	225	9.25	115	5/8 x 105
150.0 x 1 1/2	150.0 x 1.900	207	200	9.25	3.64	4.53	M16x108
150 x 50	150.0 x 60.3	300	64	225	110	121	5/8 x 105
150.0 x 2 1/2	150.0 x 2.375	207	250	9.25	4.33	4.76	M16x108
150 x 65	150.0 x 76.1	300	70	225	110	121	5/8 x 105
150.0 x 3	150.0 x 3.500	207	275	9.25	4.33	5.00	M16x108
150 x 80	150.0 x 88.9	300	89	225	130	127	5/8 x 105
150.0 x 3	150.0 x 3.500	207	350	9.25	5.12	5.00	M16x108
200 x 25	210.0 x 33.7	300	38	300	78	140	5/8 x 105
200 x 1	210.0 x 1.315	207	150	11.61	3.07	5.51	M16x108
200 x 32	210.0 x 42.4	300	51	300	93	140	5/8 x 105
200.0 x 1 1/4	210.0 x 1.680	207	200	11.61	3.66	5.51	M16x108
200 x 40	210.0 x 48.3	300	51	300	93	143	5/8 x 105
200.0 x 1 1/2	210.0 x 2.375	207	250	11.61	3.66	5.53	M16x108
200 x 50	210.0 x 60.3	300	64	300	115	149	5/8 x 105
200.0 x 2	210.0 x 2.375	207	275	11.61	4.53	5.67	M16x108
200 x 65	210.0 x 76.1	300	70	300	115	155	5/8 x 105
200.0 x 2 1/2	210.0 x 3.000	207	275	11.61	4.53	6.10	M16x108
200 x 80	210.0 x 88.9	300	89	300	133.5	155	5/8 x 105
200.0 x 3	210.0 x 3.500	207	350	11.61	5.25	6.10	M16x108
200 x 100	210.0 x 114.3	300	114	300	159.5	160	5/8 x 105
200.0 x 4	210.0 x 4.500	207	450	11.61	6.29	6.30	M16x108

## 230 Grooved Eccentric Reducer



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PSI/MPa	Dimensions L mm/in	Certificate
302	3.500x2.375	3.45	3.50	
100x85	108.00x76.1	500	102	UL FM
42x1/2	42.50x3.000	3.45	4.00	
100x80	108.00x88.9	500	102	UL FM
42x1/2	42.50x3.500	3.45	4.00	
100x85	114.30x89.3	500	102	UL FM
42x1/2	45.00x2.000	3.45	4.00	
100x85	114.30x76.1	300	102	UL FM
42x1/2	45.00x3.000	2.07	4.00	
100x80	114.30x88.9	500	102	UL FM
43x3	45.00x3.500	3.45	4.00	
125x100	139.70x114.3	300	127	UL FM
150x100	159.00x108.0	300	140	UL FM
6x4	62.50x4.250	2.07	5.50	
150x100	159.00x114.3	300	140	UL FM
6x4	62.50x4.500	2.07	5.50	
150x80	165.10x88.9	300	140	UL FM
6x3	65.00x3.500	2.07	5.50	
150x100	165.10x114.3	300	140	UL FM
6x4	65.00x4.500	2.07	5.50	
150x125	165.10x127	300	140	UL FM
6x5	65.00x5.500	2.07	5.50	
150x80	168.30x88.9	300	140	UL FM
6x3	66.25x3.500	2.07	5.50	
150x100	168.30x114.3	300	140	UL FM
6x4	66.25x4.500	2.07	5.50	
150x125	168.30x127	300	140	UL FM
6x5	66.25x5.500	2.07	5.50	
200x100	216.10x114.3	300	216	UL FM
6x4	66.25x4.500	2.07	6.50	
200x100	216.10x127	300	216	UL FM
6x5	66.25x5.500	2.07	6.50	
200x100	216.10x151.1	300	216	UL FM
6x5	66.25x6.500	2.07	6.50	
200x100	216.10x165.1	300	216	UL FM
6x5	66.25x7.500	2.07	6.50	
200x100	216.10x181.1	300	216	UL FM
6x5	66.25x8.500	2.07	6.50	
200x100	216.10x203.2	300	216	UL FM
6x5	66.25x9.500	2.07	6.50	
200x100	216.10x227.8	300	216	UL FM
6x5	66.25x10.500	2.07	6.50	
200x100	216.10x254.0	300	216	UL FM
6x5	66.25x11.500	2.07	6.50	
200x100	216.10x281.3	300	216	UL FM
6x5	66.25x12.500	2.07	6.50	
200x100	216.10x310.0	300	216	UL FM
6x5	66.25x13.500	2.07	6.50	
200x100	216.10x340.0	300	216	UL FM
6x5	66.25x14.500	2.07	6.50	
200x100	216.10x371.3	300	216	UL FM
6x5	66.25x15.500	2.07	6.50	
200x100	216.10x404.0	300	216	UL FM
6x5	66.25x16.500	2.07	6.50	
200x100	216.10x438.0	300	216	UL FM
6x5	66.25x17.500	2.07	6.50	
200x100	216.10x473.0	300	216	UL FM
6x5	66.25x18.500	2.07	6.50	
200x100	216.10x509.0	300	216	UL FM
6x5	66.25x19.500	2.07	6.50	
200x100	216.10x546.0	300	216	UL FM
6x5	66.25x20.500	2.07	6.50	
200x100	216.10x584.0	300	216	UL FM
6x5	66.25x21.500	2.07	6.50	
200x100	216.10x623.0	300	216	UL FM
6x5	66.25x22.500	2.07	6.50	
200x100	216.10x663.0	300	216	UL FM
6x5	66.25x23.500	2.07	6.50	
200x100	216.10x704.0	300	216	UL FM
6x5	66.25x24.500	2.07	6.50	
200x100	216.10x746.0	300	216	UL FM
6x5	66.25x25.500	2.07	6.50	
200x100	216.10x789.0	300	216	UL FM
6x5	66.25x26.500	2.07	6.50	
200x100	216.10x833.0	300	216	UL FM
6x5	66.25x27.500	2.07	6.50	
200x100	216.10x878.0	300	216	UL FM
6x5	66.25x28.500	2.07	6.50	
200x100	216.10x924.0	300	216	UL FM
6x5	66.25x29.500	2.07	6.50	
200x100	216.10x971.0	300	216	UL FM
6x5	66.25x30.500	2.07	6.50	
200x100	216.10x1019.0	300	216	UL FM
6x5	66.25x31.500	2.07	6.50	
200x100	216.10x1068.0	300	216	UL FM
6x5	66.25x32.500	2.07	6.50	
200x100	216.10x1118.0	300	216	UL FM
6x5	66.25x33.500	2.07	6.50	
200x100	216.10x1169.0	300	216	UL FM
6x5	66.25x34.500	2.07	6.50	
200x100	216.10x1221.0	300	216	UL FM
6x5	66.25x35.500	2.07	6.50	
200x100	216.10x1274.0	300	216	UL FM
6x5	66.25x36.500	2.07	6.50	
200x100	216.10x1328.0	300	216	UL FM
6x5	66.25x37.500	2.07	6.50	
200x100	216.10x1383.0	300	216	UL FM
6x5	66.25x38.500	2.07	6.50	
200x100	216.10x1439.0	300	216	UL FM
6x5	66.25x39.500	2.07	6.50	
200x100	216.10x1496.0	300	216	UL FM
6x5	66.25x40.500	2.07	6.50	
200x100	216.10x1554.0	300	216	UL FM
6x5	66.25x41.500	2.07	6.50	
200x100	216.10x1613.0	300	216	UL FM
6x5	66.25x42.500	2.07	6.50	
200x100	216.10x1673.0	300	216	

## 230

### Grooved Eccentric Reducer



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PS/MPa	Dimensions L mm/in	Certificate
500X300 20X12	508.0X323.9 20.000X12.750	300 2.07	356 14.00	
500X350 20X14	508.0X355.6 20.000X14.000	300 2.07	356 14.00	
500X400 20X16	508.0X406.4 20.000X16.000	300 2.07	356 14.00	
500X450 20X18	508.0X457.2 20.000X18.000	300 2.07	356 14.00	
600X200 24X8	609.6X278.1 24.000X8.625	300 2.07	381 15.00	
600X250 24X10	609.6X278.0 24.000X10.750	300 2.07	381 15.00	
600X300 24X12	609.6X323.9 24.000X12.750	300 2.07	381 15.00	
600X350 24X14	609.6X355.6 24.000X14.000	300 2.07	381 15.00	
600X400 24X16	609.6X406.4 24.000X16.000	300 2.07	381 15.00	
600X450 24X18	609.6X457.2 24.000X18.000	300 2.07	381 15.00	
600X500 24X20	609.6X508.0 24.000X20.000	300 2.07	381 15.00	

## 230N

### Grooved Eccentric Reducer with Female Thread



Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PS/MPa	Dimensions L mm/in	Certificate
100X65 108.0X2 1/2	108.0X76.1 4.250X3.000	500 3.45	102 4.00	UL FM
100X85 4X2 1/2	114.3X76.1 4.500X3.000	500 3.45	102 4.00	UL FM
125X80 5X3	139.7X88.9 5.500X3.500	500 3.45	127 5.00	UL FM
150X80 6X3	165.1X88.9 6.500X3.500	500 3.45	140 5.50	UL FM

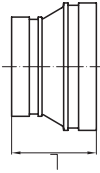
## 240

### Grooved Concentric Reducer



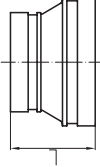
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PS/MPa	Dimensions L mm/in	Certificate
32X25 1 1/4 X 1	42.4X33.7 1.680X1.315	500 3.45	64 2.50	UL FM VSS LPCB
40X25	48.3X33.7 1.900X1.315	500 3.45	64 2.50	UL FM VSS LPCB
40X32	48.3X42.4 1.900X1.680	500 3.45	64 2.50	UL FM VSS LPCB
50X25	60.3X33.7 2.375X1.315	500 3.45	64 2.50	UL FM VSS LPCB
50X32	60.3X42.4 2.375X1.680	500 3.45	64 2.50	UL FM VSS LPCB
60X25	73.0X33.7 2.875X1.315	500 3.45	64 2.50	UL FM
60X32	73.0X42.4 2.875X1.680	500 3.45	64 2.50	UL FM
65X40	73.0X48.3 2.875X1.900	500 3.45	64 2.50	UL FM
65X50	73.0X60.3 2.875X2.375	500 3.45	64 2.50	UL FM
65X25	76.1X33.7 3.000X1.315	500 3.45	64 2.50	UL FM
65X32	76.1X42.4 3.000X1.680	500 3.45	64 2.50	UL FM VSS LPCB
65X40	76.1X48.3 3.000X1.900	500 3.45	64 2.50	UL FM VSS LPCB
65X50	76.1X60.3 3.000X2.375	500 3.45	64 2.50	UL FM VSS LPCB
80X65	88.9X73.0 3.500X2.875	500 3.45	64 2.50	UL FM
80X65	88.9X76.1 3.500X3.000	500 3.45	64 2.50	UL FM VSS LPCB
100X50	108.0X60.3 4.250X2.375	500 3.45	76 3.00	UL FM
100X65	108.0X73.0 4.250X2.875	500 3.45	76 3.00	UL FM
100X85	108.0X88.9 4.250X3.000	500 3.45	76 3.00	UL FM
125X80	139.7X88.9 4.250X3.500	500 3.45	76 3.00	UL FM
150X80	165.1X88.9 4.250X3.500	500 3.45	76 3.00	UL FM VSS
100X40	114.3X48.3 4.500X1.900	500 3.45	76 3.00	UL FM VSS LPCB
100X50	114.3X60.3 4.500X2.375	500 3.45	76 3.00	UL FM VSS LPCB
100X65	114.3X73.0 4.500X2.875	500 3.45	76 3.00	UL FM
100X85	114.3X88.9 4.500X3.000	500 3.45	76 3.00	UL FM VSS LPCB
125X80	139.7X88.9 4.500X3.500	500 3.45	76 3.00	UL FM VSS LPCB
125X100	152.4X108.0 5.250X4.250	500 3.45	89 3.50	UL FM
125X150	165.1X152.4 5.250X6.000	500 3.45	89 3.50	UL FM
150X100	165.1X108.0 5.250X4.250	500 3.45	89 3.50	UL FM VSS
150X150	165.1X152.4 5.250X6.000	500 3.45	89 3.50	UL FM VSS
125X100	139.7X114.3 5.500X4.500	500 3.45	89 3.50	UL FM VSS LPCB
125X65	141.3X73.0 5.500X2.875	500 3.45	89 3.50	UL FM
125X80	141.3X88.9 5.500X3.500	500 3.45	89 3.50	UL FM

**240**  
Grooved Concentric Reducer



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P.S.I./M.P.a	Dimensions L mm/in	Certificate
125X100 5/4	141.3X114.3 5.6/4.5	500 3.45	89 3.50	UL FM
150X90 6/3	159.0X60.3 6.2/5.0	500 3.45	102 4.00	UL FM
150X85 6/3	159.0X76.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X80 6/3	159.0X68.9 6.2/5.0	500 3.45	102 4.00	UL FM
150X75 6/3	159.0X61.7 6.2/5.0	500 3.45	102 4.00	UL FM
150X70 6/4	159.0X54.5 6.2/5.0	500 3.45	102 4.00	UL FM
150X65 6/4	159.0X47.3 6.2/5.0	500 3.45	102 4.00	UL FM
150X60 6/5	159.0X40.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X55 6/5	159.0X32.9 6.2/5.0	500 3.45	102 4.00	UL FM
150X50 6/6	159.0X25.7 6.2/5.0	500 3.45	102 4.00	UL FM
150X45 6/6	159.0X18.5 6.2/5.0	500 3.45	102 4.00	UL FM
150X40 6/7	159.0X11.3 6.2/5.0	500 3.45	102 4.00	UL FM
150X35 6/8	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X30 6/8	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X25 6/9	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X20 6/9	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X15 6/10	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X10 6/10	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X5 6/11	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/12	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/13	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/14	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/15	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/16	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/17	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/18	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/19	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/20	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/21	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/22	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/23	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/24	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/25	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/26	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/27	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/28	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/29	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/30	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/31	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/32	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/33	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/34	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/35	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/36	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/37	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/38	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/39	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/40	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/41	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/42	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/43	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/44	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/45	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/46	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/47	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/48	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/49	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/50	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/51	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/52	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/53	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/54	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/55	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/56	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/57	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/58	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/59	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/60	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/61	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/62	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/63	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/64	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/65	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/66	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/67	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/68	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/69	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/70	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/71	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/72	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/73	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/74	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/75	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/76	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/77	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/78	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/79	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/80	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/81	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/82	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/83	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/84	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/85	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/86	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/87	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/88	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/89	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/90	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/91	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/92	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/93	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/94	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/95	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/96	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/97	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/98	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/99	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM
150X0 6/100	159.0X4.1 6.2/5.0	500 3.45	102 4.00	UL FM

**240**  
Grooved Concentric Reducer



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P.S.I./M.P.a	Dimensions L mm/in	Certificate
350X200 14/8	355.6X219.1 14.000X8.625	300 2.07	203 7.99	—
350X250 14X10	355.6X273.0 14.000X10.750	300 2.07	203 7.99	—
350X300 14X12	355.6X323.9 14.000X12.750	300 2.07	203 7.99	—
400X200 16/8	406.4X219.1 16.000X8.625	300 2.07	229 9.00	—
400X250 16X10	406.4X273.0 16.000X10.750	300 2.07	229 9.00	—
400X300 16X12	406.4X323.9 16.000X12.750	300 2.07	229 9.00	—
450X350 18X14	457.2X323.9 18.000X12.750	300 2.07	241 9.50	—
450X400 18X16	457.2X355.6 18.000X14.000	300 2.07	241 9.50	—
450X450 18X18	457.2X387.4 18.000X16.000	300 2.07	241 9.50	—
500X300 20X12	508.0X219.1 20.000X10.750	300 2.07	254 10.00	—
500X350 20X14	508.0X273.0 20.000X12.750	300 2.07	254 10.00	—
500X400 20X16	508.0X323.9 20.000X14.000	300 2.07	254 10.00	—
500X450 20X18	508.0X355.6 20.000X16.000	300 2.07	254 10.00	—
600X250 24X10	609.6X219.1 24.000X10.750	300 2.07	305 12.00	—
600X300 24X12	609.6X273.0 24.000X12.750	300 2.07	305 12.00	—
600X350 24X14	609.6X323.9 24.000X14.000	300 2.07	305 12.00	—
600X400 24X16	609.6X355.6 24.000X16.000	300 2.07	305 12.00	—
600X450 24X18	609.6X387.4 24.000X18.000	300 2.07	305 12.00	—
600X500 24X20	609.6X419.1 24.000X20.000	300 2.07	305 12.00	—

# 240N

Grooved Concentric Reducer with Female Thread

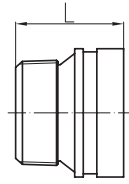


Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure PS/MPa	Dimensions L mm/in	Certificate
50X15	60.3X21.3	500	64	VIS
2X1/2	2.375X0.825	3.45	2.50	UL FM V/S L/PCB
50X20	60.3X26.9	500	64	UL FM V/S L/PCB
2X3/4	2.375X1.05	3.45	2.50	UL FM V/S L/PCB
50X25	60.3X33.7	500	64	UL FM V/S L/PCB
2X1	2.375X1.315	3.45	2.50	UL FM V/S L/PCB
50X32	60.3X42.4	500	64	UL FM V/S L/PCB
1 1/4X1 1/4	2.375X1.660	3.45	2.50	UL FM V/S L/PCB
50X40	60.3X50.8	500	64	UL FM V/S L/PCB
2X1 1/2	2.375X1.900	3.45	2.50	UL FM V/S L/PCB
60X25	73.0X33.7	500	64	UL FM
60X25	73.0X42.4	500	64	UL FM
2 1/4X1 1/4	2.875X1.660	3.45	2.50	UL FM
60X40	73.0X48.3	500	64	UL FM
2 1/2X1 1/2	2.875X1.900	3.45	2.50	UL FM
60X50	73.0X60.3	500	64	UL FM
2 1/2X2	2.875X2.375	3.45	2.50	UL FM V/S
60X15	76.1X21.3	500	64	UL FM V/S
2 1/2X1/2	3.000X0.825	3.45	2.50	UL FM V/S
60X20	76.1X26.9	500	64	UL FM V/S
2 3/4X1/4	3.000X1.05	3.45	2.50	UL FM V/S
60X25	76.1X33.7	500	64	UL FM V/S
2 3/4X1/2	3.000X1.315	3.45	2.50	UL FM V/S L/PCB
60X32	76.1X42.4	500	64	UL FM V/S L/PCB
3X1/4	3.000X1.660	3.45	2.50	UL FM V/S L/PCB
60X40	76.1X48.3	500	64	UL FM V/S L/PCB
3X1/2	3.000X1.900	3.45	2.50	UL FM V/S L/PCB
60X50	76.1X60.3	500	64	UL FM V/S L/PCB
3X2	3.000X2.375	3.45	2.50	UL FM V/S L/PCB
80X15	88.9X21.3	500	64	V/S
3X1/2	3.500X0.825	3.45	2.50	UL FM V/S
80X20	88.9X26.9	500	64	UL FM V/S
3X3/4	3.500X1.05	3.45	2.50	UL FM V/S
80X25	88.9X33.7	500	64	UL FM V/S
3X1	3.500X1.315	3.45	2.50	UL FM V/S
80X32	88.9X42.4	500	64	UL FM V/S
3X1 1/4	3.500X1.660	3.45	2.50	UL FM V/S
80X40	88.9X48.3	500	64	UL FM V/S
3X1 1/2	3.500X1.900	3.45	2.50	UL FM V/S
80X50	88.9X60.3	500	64	UL FM V/S
3X2	3.500X2.375	3.45	2.50	UL FM V/S
80X65	88.9X73.0	500	64	UL FM
3X2 1/2	3.500X2.875	3.45	2.50	UL FM V/S L/PCB
80X80	88.9X86.3	500	64	UL FM
3X3	3.500X3.000	3.45	2.50	UL FM
100X25	108.0X33.7	500	76	UL FM
100X32	108.0X42.4	500	76	UL FM
4X1/4	4.250X1.660	3.45	3.00	UL FM
100X40	108.0X48.3	500	76	UL FM
4X1/2	4.250X1.900	3.45	3.00	UL FM
100X50	108.0X60.3	500	76	UL FM
4X2	4.250X2.375	3.45	3.00	UL FM
100X65	108.0X76.1	500	76	UL FM
4X2 1/2	4.250X3.000	3.45	3.00	UL FM
100X80	108.0X86.3	500	76	UL FM
4X3	4.250X3.500	3.45	3.00	UL FM
100X100	108.0X108.0	500	76	UL FM V/S
4X4	4.250X4.000	3.45	3.00	UL FM V/S
100X125	108.0X127.0	500	76	UL FM V/S
4X5	4.250X4.500	3.45	3.00	UL FM V/S
100X150	108.0X152.4	500	76	UL FM V/S
4X6	4.250X5.000	3.45	3.00	UL FM V/S
100X200	108.0X203.2	500	76	UL FM V/S
4X8	4.250X6.000	3.45	3.00	UL FM V/S
100X250	108.0X254.0	500	76	UL FM V/S
4X10	4.250X7.000	3.45	3.00	UL FM V/S
100X300	108.0X304.8	500	76	UL FM V/S
4X12	4.250X8.000	3.45	3.00	UL FM V/S
100X350	108.0X355.6	500	76	UL FM V/S
4X14	4.250X9.000	3.45	3.00	UL FM V/S
100X400	108.0X406.4	500	76	UL FM V/S
4X16	4.250X10.000	3.45	3.00	UL FM V/S
100X450	108.0X457.2	500	76	UL FM V/S
4X18	4.250X11.000	3.45	3.00	UL FM V/S
100X500	108.0X508.0	500	76	UL FM V/S
4X20	4.250X12.000	3.45	3.00	UL FM V/S
100X550	108.0X558.8	500	76	UL FM V/S
4X22	4.250X13.000	3.45	3.00	UL FM V/S
100X600	108.0X609.6	500	76	UL FM V/S
4X24	4.250X14.000	3.45	3.00	UL FM V/S
100X650	108.0X660.4	500	76	UL FM V/S
4X26	4.250X15.000	3.45	3.00	UL FM V/S
100X700	108.0X711.2	500	76	UL FM V/S
4X28	4.250X16.000	3.45	3.00	UL FM V/S
100X750	108.0X762.0	500	76	UL FM V/S
4X30	4.250X17.000	3.45	3.00	UL FM V/S
100X800	108.0X812.8	500	76	UL FM V/S
4X32	4.250X18.000	3.45	3.00	UL FM V/S
100X850	108.0X863.6	500	76	UL FM V/S
4X34	4.250X19.000	3.45	3.00	UL FM V/S
100X900	108.0X914.4	500	76	UL FM V/S
4X36	4.250X20.000	3.45	3.00	UL FM V/S
100X950	108.0X965.2	500	76	UL FM V/S
4X38	4.250X21.000	3.45	3.00	UL FM V/S
100X1000	108.0X1016.0	500	76	UL FM V/S
4X40	4.250X22.000	3.45	3.00	UL FM V/S
100X1050	108.0X1066.8	500	76	UL FM V/S
4X42	4.250X23.000	3.45	3.00	UL FM V/S
100X1100	108.0X1117.6	500	76	UL FM V/S
4X44	4.250X24.000	3.45	3.00	UL FM V/S
100X1150	108.0X1168.4	500	76	UL FM V/S
4X46	4.250X25.000	3.45	3.00	UL FM V/S
100X1200	108.0X1219.2	500	76	UL FM V/S
4X48	4.250X26.000	3.45	3.00	UL FM V/S
100X1250	108.0X1270.0	500	76	UL FM V/S
4X50	4.250X27.000	3.45	3.00	UL FM V/S
100X1300	108.0X1320.8	500	76	UL FM V/S
4X52	4.250X28.000	3.45	3.00	UL FM V/S
100X1350	108.0X1371.6	500	76	UL FM V/S
4X54	4.250X29.000	3.45	3.00	UL FM V/S
100X1400	108.0X1422.4	500	76	UL FM V/S
4X56	4.250X30.000	3.45	3.00	UL FM V/S
100X1450	108.0X1473.2	500	76	UL FM V/S
4X58	4.250X31.000	3.45	3.00	UL FM V/S
100X1500	108.0X1524.0	500	76	UL FM V/S
4X60	4.250X32.000	3.45	3.00	UL FM V/S
100X1550	108.0X1574.8	500	76	UL FM V/S
4X62	4.250X33.000	3.45	3.00	UL FM V/S
100X1600	108.0X1625.6	500	76	UL FM V/S
4X64	4.250X34.000	3.45	3.00	UL FM V/S
100X1650	108.0X1676.4	500	76	UL FM V/S
4X66	4.250X35.000	3.45	3.00	UL FM V/S
100X1700	108.0X1727.2	500	76	UL FM V/S
4X68	4.250X36.000	3.45	3.00	UL FM V/S
100X1750	108.0X1778.0	500	76	UL FM V/S
4X70	4.250X37.000	3.45	3.00	UL FM V/S
100X1800	108.0X1828.8	500	76	UL FM V/S
4X72	4.250X38.000	3.45	3.00	UL FM V/S
100X1850	108.0X1879.6	500	76	UL FM V/S
4X74	4.250X39.000	3.45	3.00	UL FM V/S
100X1900	108.0X1930.4	500	76	UL FM V/S
4X76	4.250X40.000	3.45	3.00	UL FM V/S
100X1950	108.0X1981.2	500	76	UL FM V/S
4X78	4.250X41.000	3.45	3.00	UL FM V/S
100X2000	108.0X2032.0	500	76	UL FM V/S
4X80	4.250X42.000	3.45	3.00	UL FM V/S
100X2050	108.0X2082.8	500	76	UL FM V/S
4X82	4.250X43.000	3.45	3.00	UL FM V/S
100X2100	108.0X2133.6	500	76	UL FM V/S
4X84	4.250X44.000	3.45	3.00	UL FM V/S
100X2150	108.0X2184.4	500	76	UL FM V/S
4X86	4.250X45.000	3.45	3.00	UL FM V/S
100X2200	108.0X2235.2	500	76	UL FM V/S
4X88	4.250X46.000	3.45	3.00	UL FM V/S
100X2250	108.0X2286.0	500	76	UL FM V/S
4X90	4.250X47.000	3.45	3.00	UL FM V/S
100X2300	108.0X2336.8	500	76	UL FM V/S
4X92	4.250X48.000	3.45	3.00	UL FM V/S
100X2350	108.0X2387.6	500	76	UL FM V/S
4X94	4.250X49.000	3.45	3.00	UL FM V/S
100X2400	108.0X2438.4	500	76	UL FM V/S
4X96	4.250X50.000	3.45	3.00	UL FM V/S
100X2450	108.0X2489.2	500	76	UL FM V/S
4X98	4.250X51.000	3.45	3.00	UL FM V/S
100X2500	108.0X2540.0	500	76	UL FM V/S
4X100	4.250X52.000	3.45	3.00	UL FM V/S
100X2550	108.0X2590.8	500	76	UL FM V/S
4X102	4.250X53.000	3.45	3.00	UL FM V/S
100X2600	108.0X2641.6	500	76	UL FM V/S
4X104	4.250X54.000	3.45	3.00	UL FM V/S
100X2650	108.0X2692.4	500	76	UL FM V/S
4X106	4.250X55.000	3.45	3.00	UL FM V/S
100X2700	108.0X2743.2	500	76	UL FM V/S
4X108	4.250X56.000	3.45	3.00	UL FM V/S
100X2750	108.0X2794.0	500	76	UL FM V/S
4X110	4.250X57.000	3.45	3.00	UL FM V/S
100X2800	108.0X2844.8	500	76	UL FM V/S
4X112	4.250X58.000	3.45	3.00	UL FM V/S
100X2850	108.0X2895.6	500	76	UL FM V/S
4X114	4.250X59.000	3.45	3.00	UL FM V/S
100X2900	108.0X2946.4	500	76	UL FM V/S
4X116	4.250X60.000	3.45	3.00	UL FM V/S
100X2950	108.0X2997.2	500	76	UL FM V/S
4X118	4.250X61.000	3.45	3.00	UL FM V/S
100X3000	108.0X3048.0	500	76	UL FM V/S
4X120	4.250X62.000	3.45	3.00	UL FM V/S
100X3050	108.0X3098.8	500	76	UL FM V/S
4X122	4.250X63.000	3.45	3.00	UL FM V/S
100X3100	108.0X3149.6	500	76	UL FM V/S
4X124	4.250X64.000	3.45	3.00	UL FM V/S
100X3150	108.0X3200.4	500	76	UL FM V/S
4X126	4.250X65.000	3.45	3.00	UL FM V/S
100X3200	108.0X3251.2	500	76	UL FM V/S
4X128	4.250X66.000	3.45	3.00	UL FM V/S
100X3250	108.0X3302.0	500	76	UL FM V/S
4X130	4.250X67.000	3.45	3.00	UL FM V/S
100X3300	108.0X3352.8	500	76	UL FM V/S
4X132	4.250X68.000	3.45	3.00	UL FM V/S
100X3350	108.0X3403.6	500	76	UL FM V/S
4X134	4.250X69.000	3.45	3.00	UL FM V/S
100X3400	108.0X3454.4	500	76	UL FM V/S
4X136	4.250X70.000	3.45	3.00	UL FM V/S
100X3450	108.0X3505.2	500	76	UL FM V/S
4X138	4.250X71.000	3.45	3.00	UL FM V/S
100X3500	108.0X3556.0	500	76	UL FM V/S
4X140	4.250X72.000	3.45	3.00	UL FM V/S
100X3550	108.0X3606.8	500	76	UL FM V/S
4X142	4.250X73.000	3.45	3.00	UL FM V/S
100X3600	108.0X3657.6	500	76	UL FM V/S
4X144	4.250X74.000	3.45	3.00	UL FM V/S
100X3650	108.0X3708.4	500	76	UL FM V/S
4X146	4.250X75.000	3.45	3.00	UL FM V/S
100X3700	108.0X3759.2	500	76	UL FM V/S
4X148	4.250X76.000	3.45	3.00	UL FM V/S
100X3750	108.0X3810.0	500	76	UL FM V/S
4X150	4.250X77.000	3.45	3.00	UL FM V/S
100X3800	108.0X3860.8	500	76	UL FM V/S
4X152	4.250X78.000	3		

### 240W Grooved Concentric Reducer with Male Thread



Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P-SI/MPa	Dimensions L mm/in	Certificate
68X50 2 1/2 X 2	74.0X60.3 2.91 X 2.36	500 3.45	64 2.50	UL FM
68X50 2 1/2 X 2	76.1X60.3 2.99 X 2.36	500 3.45	64 2.50	UL FM
80X25 3 X 1	88.9X33.7 3.50 X 1.31	500 3.45	64 2.50	UL FM
100X50 4 X 2	114.3X69.3 4.51 X 2.73	500 3.45	76 3.00	UL FM



### 300 Cap



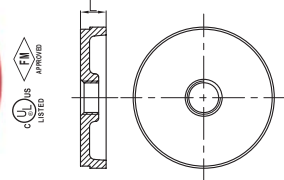
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P-SI/MPa	Dimensions L mm/in	Certificate
25 1	33.7 1.31	500 3.45	22.1 0.87	UL FM WSLPCB
32 1 1/4	42.4 1.68	500 3.45	23.5 0.93	UL FM WSLPCB
40 1 1/2	48.3 1.90	500 3.45	23.5 0.93	UL FM WSLPCB
50 2	63.5 2.50	500 3.45	23.5 0.93	UL FM WSLPCB
65 2 1/2	73.0 2.87	500 3.45	23.5 0.93	UL FM
80 3	88.9 3.50	500 3.45	24 0.96	UL FM WSLPCB
100 4	114.3 4.51	500 3.45	27 1.06	UL FM
125 5	141.3 5.56	500 3.45	27 1.06	UL FM WSLPCB
150 6	165.1 6.50	500 3.45	27 1.06	UL FM
175 7	188.9 7.44	500 3.45	27 1.06	UL FM WSLPCB
200 8	216.3 8.52	500 3.45	30 1.18	UL FM
250 10	273.0 10.75	500 3.45	32 1.26	UL FM WSLPCB
300 12	323.9 12.75	500 3.45	32 1.26	UL FM WSLPCB
350 14	355.6 14.00	300 2.07	102 4.00	—
400 16	406.4 16.00	207 8.00	102 4.00	—
450 18	457.2 18.00	300 2.07	127 5.00	—
500 20	508.0 20.00	300 2.07	152 6.00	—
600 24	609.6 24.00	300 2.07	152 6.00	—



### 300 Cap with Concentric Hole



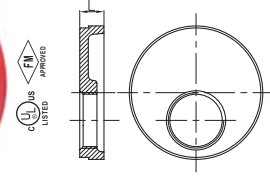
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P-SI/MPa	Dimensions L mm/in	Certificate
50X25 2 X 1	60.3X33.7 2.37 X 1.31	500 3.45	23.5 0.93	—
50X40 2 X 1 1/2	60.3X48.3 2.37 X 1.90	500 3.45	23.5 0.93	—
65X50 2 1/2 X 2	76.1X50.8 2.99 X 2.00	500 3.45	23.5 0.93	—
65X25 2 1/2 X 1	76.1X33.7 2.99 X 1.31	500 3.45	23.5 0.93	—
65 X 40 2 1/2 X 1 1/2	76.1 X 48.3 2.99 X 1.90	500 3.45	23.5 0.93	UL FM
68X50 2 3/4 X 2	76.1X60.3 2.99 X 2.36	500 3.45	24 0.94	—
80X15 3 X 1/2	88.9X15.2 3.50 X 0.60	500 3.45	24 0.94	UL FM
80X25 3 X 1	88.9X33.7 3.50 X 1.31	500 3.45	24 0.94	UL FM
80X40 3 X 1 1/2	88.9X48.3 3.50 X 1.90	500 3.45	23.5 0.93	UL FM
80 X 50 3 X 2	88.9 X 50.8 3.50 X 2.00	500 3.45	23.5 0.93	UL FM
100 X 15 4 X 1/2	114.3 X 15.2 4.51 X 0.60	500 3.45	27.0 1.06	UL FM
100 X 25 4 X 1	114.3 X 33.7 4.51 X 1.31	500 3.45	27.0 1.06	UL FM
100X40 4 X 1 1/2	114.3X48.3 4.51X1.90	500 3.45	26.4 1.00	UL FM
100 X 50 4 X 2	114.3 X 50.8 4.51 X 2.00	500 3.45	26.4 1.00	—
125 X 50 5 X 2	127.0 X 50.8 5.00 X 2.00	345 2.46	26.4 1.00	UL FM
150 X 15 6 X 1/2	151.1 X 15.2 5.94 X 0.60	500 3.45	27 1.06	UL FM
150 X 25 6 X 1	151.1 X 33.7 5.94 X 1.31	500 3.45	27 1.06	UL FM
150 X 40 6 X 1 1/2	151.1 X 48.3 5.94 X 1.90	500 3.45	26.4 1.00	—
150 X 50 6 X 2	151.1 X 50.8 5.94 X 2.00	500 3.45	26.4 1.00	—
200X25 8 X 1	219.1X33.7 8.62 X 1.31	500 3.45	30 1.18	—



### 300PX Cap with Eccentric Hole



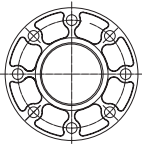
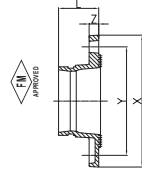
Nominal Size mm/in	Pipe O.D. mm/in	Working Pressure P-SI/MPa	Dimensions L mm/in	Certificate
65X25 2 1/2 X 1	76.1X33.7 2.99 X 1.31	500 3.45	23.5 0.93	—
65X40 2 1/2 X 1 1/2	76.1X48.3 2.99 X 1.90	500 3.45	23.5 0.93	—
80X25 3 X 1	88.9X33.7 3.50 X 1.31	500 3.45	23.5 0.93	—
80X40 3 X 1 1/2	88.9X48.3 3.50 X 1.90	500 3.45	23.5 0.93	UL FM
100 X 50 4 X 2	114.3 X 50.8 4.51 X 2.00	500 3.45	27 1.06	UL FM
100X25 4 X 1	114.3X33.7 4.51X1.31	500 3.45	27 1.06	—
100X40 4 X 1 1/2	114.3X48.3 4.51X1.90	500 3.45	25.4 1.00	UL FM
100 X 50 4 X 2	114.3 X 50.8 4.51 X 2.00	500 3.45	25.4 1.00	UL FM
125 X 50 5 X 2	127.0 X 50.8 5.00 X 2.00	345 2.46	25.4 1.00	UL FM
125 X 50 5 X 2	127.0 X 50.8 5.00 X 2.00	345 2.46	25.4 1.00	UL FM
150 X 40 6 X 1 1/2	151.1 X 48.3 5.94 X 1.90	500 3.45	25.4 1.00	UL FM
150 X 50 6 X 2	151.1 X 50.8 5.94 X 2.00	500 3.45	25.4 1.00	UL FM
200 X 40 8 X 1 1/2	219.1 X 48.3 8.62 X 1.90	500 3.45	30.2 1.19	UL FM
200 X 50 8 X 2	219.1 X 50.8 8.62 X 2.00	500 3.45	30.2 1.19	UL FM



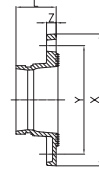




**321G**  
BS.TABLE 'E'  
Adaptor Flange



**321GJ**  
JIS 10K  
Adaptor Flange



**Gasket Data**



Gasket	Name	Temperature Range	General Service Recommendations	Color Mark
E	EPDM	-34→+110°C (-30→+230° F)	Recommended for hot water service within the specified temperature range plus a variety of dilute acids,oil-free air and many chemical services.UL classified in accordance with ANSI/NSF 61 for cold+86° F(+30° )and hot +180° F(+82°C) potable water service.Not recommended for petroleum service.	Black Green Strip
D	NBR	-29→+82°C (-20→+180° F)	Recommended for petroleum products , air with oil vapors,vegetable and mineral oils within the specified temperature range. Not recommended for hot water services.	Orange Strip
S	Silicone	-40→+177°C (-40→+350° F)	Recommended for high temperature dry air and some high temperature chemical products.	White

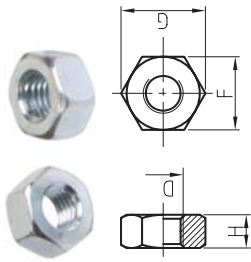
Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No. SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
65	76.1	225	70	165	127	16	4M16	---
76.1	3.000	1.6	2.756	6.50	5.00	0.63	4M16	---
80	88.9	225	70	184	146	16	4M16	---
3	3.500	1.6	2.756	7.24	5.75	0.63	4M16	---
100	114.3	225	70	216	178	16	8-M16	FM
4	4.500	1.6	2.756	8.50	7.00	0.63	8-M16	---
150	165.1	225	70	280	235	21	8-M20	FM
165.1	6.500	1.6	2.756	11.02	9.25	0.71	8-M20	---
200	219.1	225	102	337	292	19	12-M20	---
8	8.625	1.6	4.02	13.27	11.50	0.75	12-M20	---
250	273.0	225	85	405	355	25	12-M20	---
10	10.75	1.6	3.35	15.94	14.02	0.98	12-M20	---
300	323.9	200	102	457	405	25.5	12-7/8	---
12	10.750	1.4	4.02	18.00	16.00	1.00	12-7/8	---
350	355.6	200	127	527	470	32	12-7/8	---
14	12.750	1.4	5.00	20.75	18.50	1.26	12-7/8	---
400	406.4	200	127	578	521	32	12-7/8	---
16	16.000	1.4	5.00	22.76	20.51	1.26	12-7/8	---
450	457.2	200	140	641	584	36	16-7/8	---
18	18.000	1.4	5.50	25.24	23.00	1.42	16-7/8	---

Nominal Size mm/in	Pipe O.D mm/in	Working Pressure PSI/MPa	Dimensions				Bolt/Nut No. SIZE mm	Certificate
			L mm/in	X mm/in	Y mm/in	Z mm/in		
65	76.3	145	65	175	140	18	4M16	---
2 1/2	3.00	1.0	2.559	6.89	5.51	0.71	4M16	---
80	89.1	145	65	185	150	18	8-M16	---
3	3.50	1.0	2.559	7.28	5.91	0.71	8-M16	---
100	114.3	145	70	210	175	18	8-M16	---
4	4.50	1.0	2.756	8.27	6.89	0.71	8-M16	---
125	138.8	145	70	250	210	20	8-M20	---
5	5.50	1.0	2.756	9.84	8.27	0.79	8-M20	---
150	165.2	145	70	280	240	20	8-M20	---
6	6.50	1.0	2.756	11.02	9.45	0.79	8-M20	---



### ANSI Heavy Hex Nut

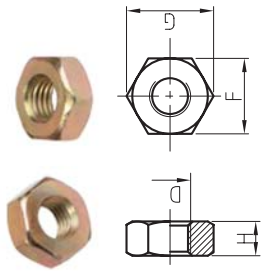
1. Material: SAE J995 2.
2. Thread: ANSI B 1.1-1982, class 2B.
3. Surface Treatment: Zinc electroplated per ASTM B633 CLASS FE/Zn5 TYPE III, thickness  $\geq 5 \mu\text{m}$  per class SC1.



d	F		G		H	
	Min	Max	Min	Max	Min	Max
3/8-16UNC	16.99	17.47	19.38	20.17	8.66	9.57
1/2-13UNC	21.59	22.22	24.61	25.65	11.78	12.80
5/8-11UNC	26.19	26.97	29.85	31.16	14.90	16.02
3/4-10UNC	30.78	31.75	35.10	36.65	18.03	19.25
7/8-9UNC	36.41	36.53	40.36	42.16	21.16	22.48

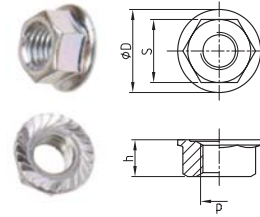
### Metric Heavy Hex Nut

1. Material: ISO 898-2:1992 \ GB/T3098.2-2000 Class 8.
2. Thread: ISO 261, tolerance 6h for M10& M12, 7h for M16 and above.
3. Surface Treatment: Zinc Electroplated followed by a yellow chromate dip per ISO 2081 FE/Zn5, ISO4520 CLASS 1A.



d	F		G		H	
	Min	Max	Min	Max	Min	Max
M10	15.73	16.0	17.7	17.7	8.0	8.4
M12	21.16	22.0	23.9	23.9	9.34	10.0
M16	23.16	24.0	26.17	26.17	14.1	15.9
M20	28.16	30.0	32.95	32.95	16.9	19.0
M22	33.0	34.0	37.29	37.29	18.1	20.2

### Hexagon Flange Nut

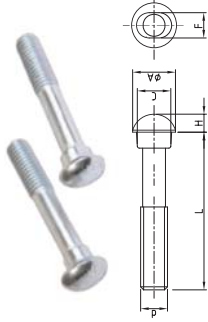


Dimension according to DIN6923.

d	S		D		h	
	Min	Max	Max	Max	Min	Max
M8	12.3	13	17.9	17.9	7.6	8
M10	14.73	15.0	21.8	21.8	9.64	10
M12	17.73	18.0	26.0	26.0	11.57	12.0

### ANSI Oval Neck Track Bolt

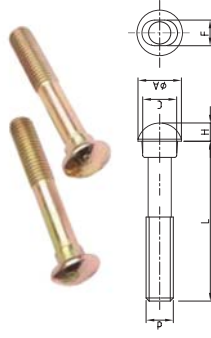
1. Material:
2. Thread: UNC thread per ANSI B 1.1 Class 2A.
3. Surface Treatment: Silver chromate electroplated per ASTM B633 CLASS FE/Zn5 TYPE III, thickness  $\geq 5 \mu\text{m}$  per class SC1.



d	A	C	F	H	L
3/8-16UNC	19	13.9	9.50	6.0	5570
1/2-13UNC	22.5	16	12.70	8.0	7075
5/8-11UNC	27.4	19.8	15.90	10.0	8085/105
3/4-10UNC	32.5	26.2	19.05	12.0	1151/20
7/8-9UNC	37.7	28.8	22.20	14.0	1251/40

### Metric Oval Neck Track Bolt

1. Material: ISO 898-1:1992 \ GB/T3098.1-2000 Class 8.8.
2. Thread: ISO metric thread per ISO 261, tolerance 6h.
3. Surface Treatment: Yellow chromate electroplated per ISO 2081 FE/Zn5, ISO4520 CLASS 1A.



d	A	C	F	H	L
M10	18.5	13.5	9.5	5	5057/637/7089
M12	23.5	17.5	12.3	6	7076/828/8108
M16	29.5	20.5	15.7	10	85/89/95/108
M20	38	27	18.3	12.5	110/115
M22	42.2	31	21.4	14	125/140/150

### Hole Diameter of pipe



Hole-cutting Machine



Run Nominal Size mm/in	Outlet Nominal Size mm/in	Hole Dia. +3.2 0-0.13.0 mm/in	Run Nominal Size mm/in	Run Nominal Size mm/in	Outlet Nominal Size mm/in	Hole Dia. +3.2 0-0.13.0 mm/in
50 2"63.3	15	38	15	15	15	38
	20	150	20	20	20	150
	25	A89	25	34	34	A89
	32	45	32	1	1	51
	40	1.75	40	1/4	1/4	2.00
	50	A102	50	1/2	1/2	A102
	64	70	64	50	50	64
	80	2.75	80	159.0	2	2.50
	100	4"114.3	100	165.1	2	A114
	125	108.0	125	6"168.3	2	A114
	150	138.7	150	70	65	70
	65 2 1/2" 76.1	20	38	20	20	20
25		A89	25	2/676.1	2/676.1	A89
32		45	32	89	89	51
40		1.75	40	3	3	2.00
50		A102	50	108.0	108.0	A102
64		70	64	114	114	A114
80		2.75	80	100	100	114
100		4"114.3	100	108.0/4	108.0/4	A165
125		138.7	125	1	1	150
150		150	150	25	25	150
200		200	200	32	32	200
80 3"63.9		32	51	32	32	32
	40	2.00	40	40	40	2.00
	50	A102	50	50	50	A102
	64	70	64	2	2	64
	80	2.75	80	65	65	2.75
	100	4"114.3	100	2/676.1	2/676.1	A114
	125	138.7	125	80	80	125
	150	150	150	3	3	150
	200	200	200	100	100	200
	250	250	250	108.0/4	108.0/4	A165
	300	300	300	114	114	A165

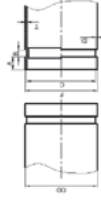
The outside surface of the pie within 16mm from the hole must be clean and smooth.



### Roll Groove Dimensions



Roll Grooving Machine



Nominal Size mm/in	Pipe OD		Gasket seat A ±0.7/650.03 mm/in	Groove Width B ±0.7/650.03 mm/in	Groove Dia C		Groove Depth D(ref) mm/in	Max/Allow Flare Dia F mm/in	Min/Allow wall thickness T mm/in
	Basic mm/in	Tolerance mm/in			Basic mm/in	Tolerance mm/in			
25	33.7	+0.41	16.88	7.14	30.23	-0.38	1.63	34.5	1.0
	1.327	+0.016	0.625	0.281	1.190	-0.015	0.063	1.353	0.071
32	16.91	+0.51	16.88	7.14	16.89	-0.38	1.63	18.3	1.0
	0.669	+0.020	0.625	0.281	0.669	-0.015	0.063	1.703	0.071
40	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
50	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
65	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
75	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
80	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
100	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
125	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
150	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
200A	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
200	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
250A	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
300A	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
300	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
350	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
400	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
500	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071
20	16.3	+0.41	16.88	7.14	16.30	-0.38	1.63	18.4	1.0
	0.630	+0.017	0.625	0.281	0.630	-0.015	0.063	1.846	0.071



Pressure Ratings and End Loads for Mech Couplings on Steel Pipe



Nom. Size	Pipe O.D	Pipe Sched	1G Rigid		1GS L/Duty Rigid		1N Reducing	
			Wall Thick.	Roll Grooved	Roll Grooved	Roll Grooved	Roll Grooved	Roll Grooved
DN/in	mm	(Sch)	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load
			Bar/Psi	kN/lbs	Bar/Psi	kN/lbs	Bar/Psi	kN/lbs
25	33.7	40	35500	3,0680	--	--	20300	1,8410
		10	35500	3,0680	--	--	20300	1,8410
32	42.4	40	35500	4,81080	--	--	20300	2,9650
		10	35500	4,81080	--	--	20300	2,9650
40	48.3	40	35500	6,31420	--	--	20300	3,8850
		10	35500	6,31420	--	--	20300	3,8850
50	60.3	40	35500	9,82210	--	--	20300	5,91330
		10	35500	9,82210	--	--	20300	5,91330
65	73	40	35500	14,43240	--	--	20300	8,71950
		10	35500	14,43240	--	--	20300	8,71950
		--	6.35	--	--	--	--	--
65	76.1	--	35500	15,73530	20300	9,42120	20300	9,42120
		--	35500	15,73530	20300	9,42120	20300	9,42120
80	88.9	40	35500	21,44800	20300	12,82885	20300	12,82885
		10	35500	21,44800	20300	12,82885	20300	12,82885
100	114.3	40	35500	35,47950	20300	21,24770	20300	21,24770
		10	35500	35,47950	20300	21,24770	20300	21,24770
125	141.3	40	31450	48,610930	20300	32,47290	20300	32,47290
		10	31450	48,610930	20300	32,47290	20300	32,47290
150	165.1	--	31450	66,414930	20300	44,39960	20300	44,39960
		--	31450	66,414930	20300	44,39960	20300	44,39960
150	168.3	40	31450	68,915500	20300	46,010340	20300	46,010340
		10	31450	68,915500	20300	46,010340	20300	46,010340
200	219.1	30	31450	116,926280	20300	77,817500	--	--
		10	31450	116,926280	20300	77,817500	--	--
		40	20300	77,817500	20300	77,817500	--	--
250	273	40	20300	121,027210	--	--	--	--
		30	20300	121,027210	--	--	--	--
		10	4.77	20300	121,027210	--	--	--
300	323.9	40	10.31	20300	170,336280	--	--	--
		STD	9.53	20300	170,336280	--	--	--
		30	6.35	20300	170,336280	--	--	--
		10	4.77	20300	170,336280	--	--	--



Pressure Ratings and End Loads for Mech Couplings on Steel Pipe



Nom. Size	Pipe O.D	Pipe Sched	1N Flexible		1NH Heavy Duty Flexible		321 Flange	
			Wall Thick.	Roll Grooved	Roll Grooved	Roll Grooved	Roll Grooved	Roll Grooved
DN/in	mm	(Sch)	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load	Max.Work Press.	Max.End Load
			Bar/Psi	kN/lbs	Bar/Psi	kN/lbs	Bar/Psi	kN/lbs
25	33.7	40	35500	3,0680	--	--	--	--
		10	35500	3,0680	--	--	--	--
32	42.4	40	35500	4,81080	--	--	--	--
		10	35500	4,81080	--	--	--	--
40	48.3	40	35500	6,31420	--	--	--	--
		10	35500	6,31420	--	--	--	--
50	60.3	40	35500	9,82210	52750	14,83320	16225	3,2710
		10	35500	9,82210	52750	14,83320	16225	3,2710
65	73	40	35500	14,43240	52750	21,74870	20300	5,91330
		10	35500	14,43240	41600	17,39900	20300	5,91330
		--	6.35	--	--	--	--	--
65	76.1	--	35500	15,73530	52750	23,605300	16225	7,11590
		--	35500	15,73530	41600	18,94240	16225	7,11590
80	88.9	40	35500	21,44800	52750	32,17210	16225	9,62165
		10	35500	21,44800	41600	25,65760	16225	9,62165
100	114.3	40	35500	35,47950	52750	53,011920	16225	15,93580
		10	35500	35,47950	41600	42,499540	16225	15,93580
125	141.3	40	31450	48,610930	48700	75,717010	20300	31,37035
		10	31450	48,610930	31450	48,610930	20300	31,37035
150	165.1	--	31450	66,414930	48700	102,723060	16225	33,27460
		--	31450	66,414930	31450	66,414930	16225	33,27460
150	168.3	40	31450	68,915500	48700	107,324120	16225	34,57750
		10	31450	68,915500	31450	68,915500	16225	34,57750
200	219.1	30	31450	116,926280	41600	155,735000	16225	58,413140
		10	31450	116,926280	41600	155,735000	16225	58,413140
		40	20300	77,817500	20300	77,817500	16225	58,413140
250	273	40	20300	121,027210	--	--	16225	90,820410
		30	20300	121,027210	--	--	16225	90,820410
		10	4.19	20300	121,027210	--	16225	90,820410
300	323.9	40	10.31	20300	170,336280	--	16225	127,728710
		STD	9.53	20300	170,336280	--	16225	127,728710
		30	6.35	20300	170,336280	--	16225	127,728710
		10	4.57	20300	170,336280	--	16225	127,728710



## Installation Instruction For Rigid & Flexible Coupling



### 1. Pipe preparation

Check pipe end for proper groove dimensions and to assure that pipe end is free of indentations and projections that would prevent proper sealing.



### 2. Lubricate gasket

Check gasket to be sure its compatible for the intended service. Apply thin lubricant to the outside and sealing lips of the gasket.



### 3. Gasket installation

Slip the gasket over one pipe, making sure the gasket lip does not overhang the pipe end.



### 4. Alignment

After aligning two pipe ends together, pull the gasket into position, centering between the grooves on each pipe. The gasket should not extend into the groove on either pipe.



### 5. Housing installation

Remove one bolt nut and loosen the other nut. Place one housing over the gasket, making sure the housing keys fit into the pipe grooves. Swing the other housing over the gasket and into the grooves on both pipes. Re-insert the bolt and connect two housings.



### 7 a. Assembly completed- Rigid Coupling

For Rigid Coupling, keep the gaps at both ends evenly spaced. Gaskets can't be seen visually.



### 7 b. Assembly completed- Flexible Coupling

For Flexible Coupling, two housings should be free to iron to iron connected. Gaskets can't be seen visually.



### 1. Pipe preparation

Clean the gasket sealing surface within 16mm of the hole and visually inspect the sealing surface for defects that may prevent proper sealing of the gasket. Don't drill the hole on weld line.



### 2. Remove burrs

If any burrs or slug exists at the pipe hole, please remove them before assembly, to protect the gasket and avoid leakage.



### 3. Gasket installation

Insert the gasket into outlet housing making sure the tab in the gasket line up with the tab recesses in the housing. Align outlet housing over the pipe hole making sure that the locating collar is in the pipe hole.



### 4. Alignment

Align the strap around the pipe, insert the bolts and tighten the nuts finger tight.



### 5. Tighten nuts

Alternatively and evenly tighten the nuts to the specified bolt torque.



### 6. Assembly completed

There should be even gaps on two sides between upper and lower housings.

Caution	
Proper torquing of bolts is required to obtain specified performance.	
- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.	
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.	

Specified Bolt Torque	
ANSI BOLTS	
Bolt Size	Specified Bolt Torque
Inch	Lbs-Ft. N.m
3/8	30-45 40-60
1/2	80-100 110-135
5/8	100-130 135-175
3/4	130-180 175-245
7/8	180-240 245-325

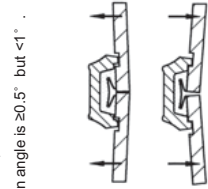
Caution	
Proper torquing of bolts is required to obtain specified performance.	
- Over torquing the bolts may result in damage to the bolt and / or casting which could result in pipe joint separation.	
- Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.	

Specified Bolt Torque	
ANSI BOLTS	
Bolt Size	Specified Bolt Torque
Inch	Lbs-Ft. N.m
3/8	30-45 40-60
1/2	80-100 110-135
5/8	100-130 135-175
3/4	---
7/8	---



### Flexible Coupling

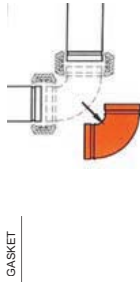
1. A flexible coupling accommodates pipe deflection and or non-alignment as below:  
 If nominal diameter <math>\leq DN200</math>, deflection angle is  $\geq 1^\circ$  ; If nominal diameter  $\geq DN200</math>, deflection angle is  $\geq 0.5^\circ$  but  $< 1^\circ$  .$



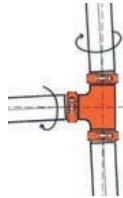
2. The C-shaped rubber gasket provides excellent self-sealing capabilities in both low and high pressure service as well as under certain vacuum conditions.

3. The design and construction of the coupling with elastomeric gaskets can provide significant noise and vibration absorption as well as seismic stress.  
 4. With the removal of just a few bolts you

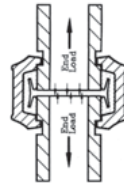
can easily access the system for cleaning, maintenance, changes or system expansion.



5. Coupling are non-directive and pipe can be rotated 360° during installation.

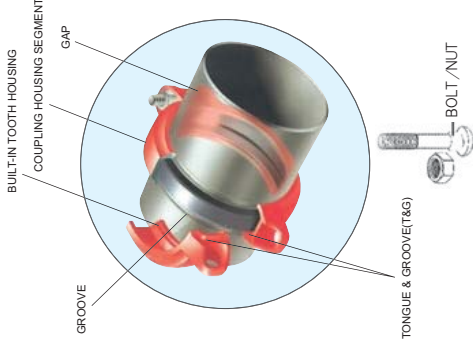


6. Coupling keys engage the full circumference of the grooves and provide significant pressure and end load restraint against pipe movement from internal and external forces.



### Rigid Coupling

1. The T&G mechanism in combination with a slightly shortened key diameter provides a mechanical and frictional interlock resulting in a rigid joint which reduces undesired angular movement.



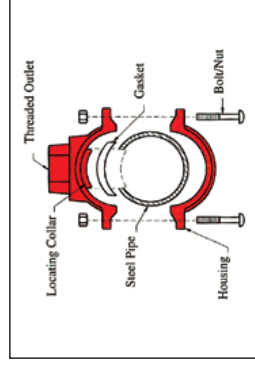
2. The built-in teeth on the coupling grip the groove shoulder and serve to reduce linear movement.

3. The T&G mechanism features a slight offset at the foot of the coupling halves which serve to protect the gasket from exposure.

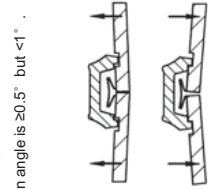
4. With the T&G style coupling no metal-to-metal contact of the bolt pads is required. You will normally see a 1/16" - 1/8" (1.6mm to 3.2mm) gap between the bolt pads when installed.

### Mechanical Tee Connection

The Mechanical Tee (3L, 3G, 3L) provide for a fast and easy grooved or threaded branch outlet and eliminate the need for welding or the use of a reducing tee and couplings. Simply cut a hole to the specified size at the expected location and fasten the mechanical tee to the pipe with the nuts and bolts provided. As the housing bolts are tightened, the pressure responsive gasket forms a leak-tight seal.



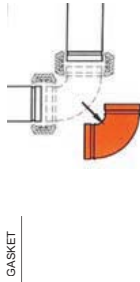
1. A flexible coupling accommodates pipe deflection and or non-alignment as below:  
 If nominal diameter <math>\leq DN200</math>, deflection angle is  $\geq 1^\circ$  ; If nominal diameter  $\geq DN200</math>, deflection angle is  $\geq 0.5^\circ$  but  $< 1^\circ$  .$



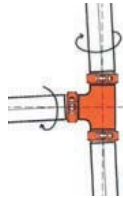
2. The C-shaped rubber gasket provides excellent self-sealing capabilities in both low and high pressure service as well as under certain vacuum conditions.

3. The design and construction of the coupling with elastomeric gaskets can provide significant noise and vibration absorption as well as seismic stress.  
 4. With the removal of just a few bolts you

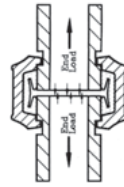
can easily access the system for cleaning, maintenance, changes or system expansion.



5. Coupling are non-directive and pipe can be rotated 360° during installation.



6. Coupling keys engage the full circumference of the grooves and provide significant pressure and end load restraint against pipe movement from internal and external forces.



## Movement

Each flexible design coupling can provide for pipe system movement up to the design maximum for the specific size and type coupling being utilized. Movement is possible in the coupling due to two factors: (1) designed-in clearance between the key of the coupling and the groove diameter and groove width, and (2) the gap between pipe ends joined by the coupling.

### 1. Linear Movement

Linear movement is accommodated within the coupling by allowing the pipe ends to move together or apart in response to pressure thrusts and temperature changes. The available linear movement provided by couplings is shown below:

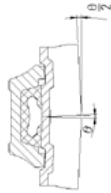
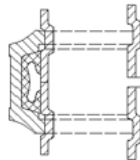
Size	Linear Movement	Roll Groove
1 1/2	1-1 1/4 (25-32MM)	1 1/2-1 1/2 (40-300MM)
movement	0-4.0MM	0-6.4MM

### 2. Angular Movement

Designed-in clearances allow limited deflection of the pipe joint within the coupling, without introducing eccentric loads into the coupling joint.

The maximum available angular movement of coupling joints is shown in the performance data for each coupling type. The amount of angular flexibility varies for each coupling size and type. For design purposes the published figures should be reduced by the below listed factors to account for pipe, groove and coupling tolerances.

Size	Angular Movement	Roll Groove
1-12	1-3 (IN)	4-12 (IN)
Design factor	Reduce to 50%	Reduce to 75%



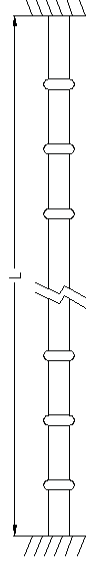
## Flexible Couplings: Linear Movement and Angular Movement

Size	Linear Movement		Angular Movement		Roll Groove	
	mm	Degree	mm	Degree	mm	Degree
1	33.7	2°-4.5'	48	1°-22'	24	1°-05'
1 1/4	42.4	2°-10'	38	1°-05'	19	0°-57'
1 1/2	48.3	1°-5.4'	33	1°-16'	16.5	0°-45'
2	60.3	1°-3.1'	26	0°-45'	13	0°-43'
2 1/2	73	1°-2.7'	25	0°-36'	10.5	0°-31'
3	88.9	1°-0.2'	18	0°-36'	9	0°-31'
4	109	1°-5.1'	32	0°-55'	16	0°-48'
5	133	1°-3.6'	28	0°-50'	15	0°-40'
6	165.1	1°-4.1'	30	0°-37'	11.5	0°-30'
8	219.1	1°-1.9'	23	0°-39'	9	0°-35'
10	273	1°-0.3'	18	0°-35'	10	0°-32'
12	323.9	1°-1.8'	20	0°-25'	6	0°-20'

## Movement -Application

### • Thermal stress

Thermal stress is caused by changes in temperature, resulting in either expansion or contraction. When designing a system you must allow for this thermal movement. To determine the appropriate number of flexible couplings to allow for this thermal movement please refer to the following.



Example:

- 4" straight steel pipe, 30m long
- Anchored on both ends
- Minimum temperature (during installation) = 5°C
- Maximum working temperature = 55°C

From the thermal expansion table, we know the overall pipeline length will increase by 18mm (0.71"). You can also use Formula 1 or Table 3 to find the amount of thermal expansion. We want to know the number of couplings that are required to address this thermal movement problem.

The allowed movement of a 4" flexible coupling is :

Movement range x Adjustment = Allowed movement  
4.3mm x 75% = 3.2mm

The appropriate number of coupling is:

Thermal expansion / Allowed movement = Number of couplings  
18mm / 3.2mm = 5.6

Conclusion:

The appropriate number of coupling is 6.

### • Thermal Expansion

Temperature difference (°C)	Pipe length (m)				
	1	5	10	20	30
1	0.012	0.06	0.12	0.24	0.36
5	0.06	0.3	0.6	1.2	1.8
10	0.12	0.6	1.2	2.4	3.6
20	0.24	1.2	2.4	4.8	7.2
30	0.36	1.8	3.6	7.2	10.8
40	0.48	2.4	4.8	9.6	14.4
50	0.6	3	6	12	18
60	0.72	3.6	7.2	14.4	21.6
70	0.84	4.2	8.4	17	25.2
80	0.96	4.8	9.6	19.2	28.8

Thermal Expansion Formula 1

$$\lambda = \alpha \times L \times T$$

$\lambda$  : Thermal Expansion

$\alpha$  : Linear Expansion

coefficient for steel

L : Pipe length

T : Temperature difference

## Riser Design

Risers assembled with Flexible couplings are generally installed in either of two ways. In the most common method, the pipe ends are butted together within the coupling joint. Note that when installing risers, the gasket is first placed onto the lower pipe and rolled back away from the pipe end prior to positioning the upper pipe. Anchoring of the riser may be done prior to pressurization with the pipe ends butted or while pressurized, when, due to pressure thrust, the pipe ends will be fully separated.

An alternative method or riser installation is to place a metal spacer of a predetermined thickness, between the pipe ends when an additional length of pipe is added to the riser stack. The upper pipe length is anchored, the spacer removed and the coupling is then installed. This method creates a predetermined gap at each pipe joint which can be utilized in pipe systems where thermal movement is anticipated and in systems with rigid (threaded, welded, flanged) branch connections where shear forces due to pressure thrust could damage the rigid connections.

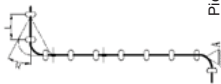
The following examples illustrate methods of installing commonly encountered riser designs.

### • Risers without Branch Connections

Install the riser with the pipe ends butted.

Locate an anchor at the base of the riser (A) to support the total weight of the pipe, couplings and fluid. Provide pipe guides on every other pipe length, as a minimum, to pre-vent possible deflection of the pipe line at the coupling joints as the riser expands due to pressure thrust or thermal growth. Note that no intermediate anchors are required.

When the system is pressurized the pipe stack will "grow" due to pressure thrust which causes maximum separation of pipe ends within the couplings. The maximum amount of stack growth can be predetermined (see Linear Movement). In this example the pipe length "L" at the top of the riser must be long enough to permit sufficient deflection (see Angular Movement) to accommodate the total movement "M" from both pressure thrust and thermal gradients.

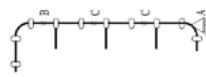


Picture 1

### • Risers with Branch Connections

Install the riser with the predetermined gap method. Anchor the pipe at or near the base with a pressure thrust anchor "A" capable of supporting the full pressure thrust, weight of pipe and the fluid column. Anchor at "B" with an anchor capable of withstanding full pressure thrust at the top of the riser plus weight of pipe column. Place intermediate anchors "C" as shown, between anchors "A" and "B". Also place intermediate clamps at every other pipe length as a minimum.

When this system is pressurized, the pipe movement due to pressure thrust will be restrained and there will be no shear forces acting at the branch connections.



Picture 2

### • Misalignment & Deflections

The angular movement capability of the flexible coupling permits the assembly of pipe joints where the piping is not properly aligned. At least two couplings are required to provide for lateral pipe misalignment. Deflection (longitudinal misalignment) may be accommodated within a single coupling as long as the angle of deflection does not exceed the value shown in the coupling performance data for the particular size and coupling type.

A pipe joint that utilizes the angular deflection capability of the coupling will react to pressure and thermal forces dependent upon the manner in which it is restrained. An unrestrained joint will react to these forces by straightening, thus reducing, if not eliminating, the deflection at the joint. If joint deflection has been designed into the pipe layout and must be maintained, then sufficient anchors must be provided to resist the lateral forces and hold the joint in the deflected condition.

The amount of deflection from pipe run centerline can be calculated utilizing the following equations:

$$M=L \text{ Sin}\theta$$

$$\theta=\text{Sin}^{-1} (G+D)$$

$$M= (G+D) \times L$$

Where:

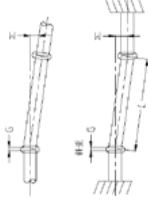
M = Misalignment (inches)

G = Maximum Allowable Pipe End Movement (Inches) as shown under "Performance Data" (Value to be reduced by Design Factor)

$\theta$  = Maximum Deflection (Degrees) from centerline as shown under "Performance Data" (Value to be reduced by Design Factor)

D = Pipe Outside Diameter (Inches)

L = Pipe Length (Inches)



### • Curve Layout

Utilizing the angular deflection at each coupling joint curves may be laid out using straight pipe lengths and Couplings.

This example shows how to calculate the curve radius, required pipe lengths, and number of required couplings.

$$R = L / (2 \times \text{Sin}(\theta/2))$$

$$L = 2 \times R \times \text{Sin}(\theta/2)$$

$$N = T / \theta$$

WHERE:

N = Number of Couplings

R = Radius of Curve (feet)

L = Pipe Length (feet)

$\theta$  = Deflection from centerline (Degrees) of each Coupling

(See coupling performance data, value to be reduced by Design Factor)

T = Total Angular Deflection of all Couplings.

